OpenEdge® Development:
ADM Reference
## Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preface</td>
<td>Preface–1</td>
</tr>
<tr>
<td>1. ADM2 SmartObject API Reference</td>
<td>1–1</td>
</tr>
<tr>
<td>Paths to source files</td>
<td>1–2</td>
</tr>
<tr>
<td>Source-file types</td>
<td>1–3</td>
</tr>
<tr>
<td>ADM class hierarchy</td>
<td>1–4</td>
</tr>
<tr>
<td>SmartObjects, templates, and super-procedure hierarchies</td>
<td>1–5</td>
</tr>
<tr>
<td>SmartObjects and their files</td>
<td>1–7</td>
</tr>
<tr>
<td>SmartObject</td>
<td>1–7</td>
</tr>
<tr>
<td>SmartContainer</td>
<td>1–7</td>
</tr>
<tr>
<td>SmartBusinessObject</td>
<td>1–8</td>
</tr>
<tr>
<td>SmartB2BObject</td>
<td>1–9</td>
</tr>
<tr>
<td>SmartCombo</td>
<td>1–10</td>
</tr>
<tr>
<td>SmartConsumer</td>
<td>1–10</td>
</tr>
<tr>
<td>SmartDataBrowser</td>
<td>1–11</td>
</tr>
<tr>
<td>SmartDataField</td>
<td>1–11</td>
</tr>
<tr>
<td>SmartDataObject</td>
<td>1–12</td>
</tr>
<tr>
<td>SmartDataViewer</td>
<td>1–13</td>
</tr>
<tr>
<td>SmartDialog</td>
<td>1–13</td>
</tr>
<tr>
<td>SmartFilter</td>
<td>1–14</td>
</tr>
<tr>
<td>SmartFolder</td>
<td>1–15</td>
</tr>
<tr>
<td>SmartFrame</td>
<td>1–15</td>
</tr>
<tr>
<td>SmartLookup</td>
<td>1–16</td>
</tr>
<tr>
<td>SmartPanel</td>
<td>1–16</td>
</tr>
<tr>
<td>SmartProducer and SmartConsumer</td>
<td>1–17</td>
</tr>
<tr>
<td>Messaging class</td>
<td>1–18</td>
</tr>
<tr>
<td>SmartRouter</td>
<td>1–18</td>
</tr>
<tr>
<td>SmartSelect</td>
<td>1–19</td>
</tr>
<tr>
<td>SmartSender and SmartReceiver</td>
<td>1–19</td>
</tr>
<tr>
<td>SmartToolbar</td>
<td>1–20</td>
</tr>
<tr>
<td>SmartWindow</td>
<td>1–21</td>
</tr>
<tr>
<td>Reading and writing object properties</td>
<td>1–22</td>
</tr>
<tr>
<td>get(propname) and set(propname) functions</td>
<td>1–22</td>
</tr>
<tr>
<td>{get} and {set} pseudo-functions</td>
<td>1–23</td>
</tr>
<tr>
<td>The need for two different syntaxes</td>
<td>1–23</td>
</tr>
</tbody>
</table>
## 2. SmartObjects and Their Methods and Properties .......................... 2–1

Base methods for SmartObjects ........................................... 2–2
- addLink ................................................................. 2–2
- addMessage ......................................................... 2–4
- adjustTabOrder .................................................... 2–5
- anyMessage ......................................................... 2–6
- applyEntry .......................................................... 2–6
- assignLinkProperty ............................................... 2–7
- changeCursor ....................................................... 2–8
- createControls ..................................................... 2–8
- destroyObject ...................................................... 2–8
- displayLinks ......................................................... 2–9
- editInstanceProperties .......................................... 2–9
- exitObject .......................................................... 2–10
- fetchMessages ..................................................... 2–11
- fixQueryString ..................................................... 2–11
- initializeObject .................................................. 2–12
- instanceof .......................................................... 2–13
- instancePropertyList ........................................... 2–13
- hideObject ......................................................... 2–14
- linkHandles ........................................................ 2–15
- linkProperty ......................................................... 2–16
- linkStateHandler .................................................. 2–17
- mappedEntry ....................................................... 2–18
- messageNumber .................................................... 2–18
- modifyListProperty .............................................. 2–19
- modifyUserLinks .................................................. 2–20
- oneObjectLinks .................................................... 2–21
- propertyName ....................................................... 2–21
- removeAllLinks .................................................... 2–21
- removeLink .......................................................... 2–22
- repositionObject ................................................... 2–22
- returnFocus ........................................................ 2–23
- reviewMessages ..................................................... 2–23
- showMessage ......................................................... 2–24
- showMessageProcedure ......................................... 2–24
- Signature ............................................................. 2–25
- start-super-proc ................................................... 2–25
- viewObject .......................................................... 2–25

AppServer methods for SmartObjects .................................... 2–27
- bindServer .......................................................... 2–27
- destroyObject ...................................................... 2–27
- destroyServerObject .............................................. 2–27
- disconnectObject .................................................. 2–27
- initializeServerObject .......................................... 2–27
- runServerObject .................................................... 2–28
- runServerProcedure ............................................. 2–28
- unbindServer ....................................................... 2–29

SmartObject properties .................................................... 2–30
- AppService .......................................................... 2–30
- ASBound ............................................................. 2–30
- AsDivision .......................................................... 2–30
- ASHandle ............................................................ 2–31
- ASHasStarted ....................................................... 2–31
- ASInitializeOnRun ................................................ 2–31
- ChildDataKey ....................................................... 2–31
- ContainerHandle ................................................... 2–32
3. Visual Objects and Their Methods and Properties .................................. 3–1

   Base methods for visual objects .................................................. 3–2
      applyLayout ................................................................. 3–2
      assignFocusedWidget ............................................... 3–2
      assignWidgetValue ............................................... 3–3
      assignWidgetValueList ........................................... 3–4
      blankWidget .......................................................... 3–5
      disableObject .......................................................... 3–6
      disableRadioButton ..................................................... 3–6
      disableWidget .......................................................... 3–7
      enableObject ............................................................ 3–8
      enableRadioButton ....................................................... 3–8
      enableWidget ............................................................ 3–9
      formattedWidgetValue ................................................... 3–10
      formattedWidgetValueList .............................................. 3–11
      hideWidget .................................................................. 3–12
      highlightWidget ......................................................... 3–13
      initializeObject ....................................................... 3–14
      resetWidgetValue ...................................................... 3–15

   UserProperty ................................................................. 2–39
   UseRepository .............................................................. 2–39
   UIBMode ....................................................................... 2–39
   ServerOperatingMode .......................................................... 2–38
   SupportedLinks .............................................................. 2–38
   TranslatableProperties .......................................................... 2–37
   QueryObject ................................................................. 2–37
   RunAttribute ................................................................. 2–38
   ServerFileName .............................................................. 2–38
   ContainerHidden ............................................................. 2–32
   ContainerSource .............................................................. 2–32
   ContainerSourceEvents ......................................................... 2–32
   ContainerType ................................................................. 2–32
   DataSourceEvents ............................................................ 2–33
   DataTargetEvents ............................................................. 2–33
   DataBase ....................................................................... 2–34
   inactiveLinks ................................................................. 2–34
   InstanceProperties ............................................................ 2–34
   LogicalObjectName ............................................................ 2–34
   LogicalVersion ............................................................... 2–34
   ObjectHidden ................................................................. 2–35
   ObjectInitialized ............................................................ 2–35
   ObjectName ................................................................. 2–35
   ObjectPage ................................................................. 2–35
   ObjectParent ................................................................. 2–35
   ObjectType ................................................................. 2–35
   ObjectVersion .............................................................. 2–36
   ParentDataKey ............................................................... 2–36
   PassThroughLinks ............................................................. 2–36
   PhysicalObjectName .......................................................... 2–36
   PhysicalVersion ............................................................. 2–36
   PropertyDialog ................................................................. 2–37
   QueryObject ................................................................. 2–37
   RunAttribute ................................................................. 2–38
   ServerFileName .............................................................. 2–38
   ServerOperatingMode .......................................................... 2–38
   SupportedLinks .............................................................. 2–38
   TranslatableProperties .......................................................... 2–37
   QueryObject ................................................................. 2–37
   RunAttribute ................................................................. 2–38
   ServerFileName .............................................................. 2–38
   ContainerHidden ............................................................. 2–32
   ContainerSource .............................................................. 2–32
   ContainerSourceEvents ......................................................... 2–32
   ContainerType ................................................................. 2–32
   DataSourceEvents ............................................................ 2–33
   DataTargetEvents ............................................................. 2–33
   DataBase ....................................................................... 2–34
   inactiveLinks ................................................................. 2–34
   InstanceProperties ............................................................ 2–34
   LogicalObjectName ............................................................ 2–34
   LogicalVersion ............................................................... 2–34
   ObjectHidden ................................................................. 2–35
   ObjectInitialized ............................................................ 2–35
   ObjectName ................................................................. 2–35
   ObjectPage ................................................................. 2–35
   ObjectParent ................................................................. 2–35
   ObjectType ................................................................. 2–35
   ObjectVersion .............................................................. 2–36
   ParentDataKey ............................................................... 2–36
   PassThroughLinks ............................................................. 2–36
   PhysicalObjectName .......................................................... 2–36
   PhysicalVersion ............................................................. 2–36
   PropertyDialog ................................................................. 2–37
   QueryObject ................................................................. 2–37
   RunAttribute ................................................................. 2–38
   ServerFileName .............................................................. 2–38
   ServerOperatingMode .......................................................... 2–38
   SupportedLinks .............................................................. 2–38
   TranslatableProperties .......................................................... 2–37
   QueryObject ................................................................. 2–37
   RunAttribute ................................................................. 2–38
   ServerFileName .............................................................. 2–38
   ContainerHidden ............................................................. 2–32
Methods for data visualization objects

addRecord ................................................. 3–22
cancelObject ............................................ 3–22
cancelRecord ............................................. 3–23
canNavigate ............................................... 3–24
collectChanges ........................................... 3–24
confirmCancel ............................................ 3–25
confirmCommit ............................................ 3–25
confirmContinue ......................................... 3–25
confirmDelete ............................................. 3–25
confirmExit ................................................ 3–26
confirmOK .................................................. 3–26
confirmUndo ............................................... 3–26
copyRecord ............................................... 3–27
dataAvailable ............................................ 3–27
deleteRecord .............................................. 3–28
disableFields ............................................. 3–28
displayObjects .......................................... 3–29
displayRecord ............................................ 3–29
enableFields .............................................. 3–29
fieldModified ............................................. 3–30
initializeObject ......................................... 3–30
isUpdateActive .......................................... 3–31
linkStateHandler ........................................ 3–31
okObject ................................................... 3–31
okToContinueProcedure ............................... 3–32
queryPosition ............................................. 3–32
resetRecord ............................................... 3–33
showDataMessages ........................................ 3–33
showDataMessagesProcedure .......................... 3–33
undoChange ............................................... 3–34
undoRecord ............................................... 3–34
updateMode ............................................... 3–34
updateRecord ............................................. 3–35
updateState ............................................... 3–35
validateFields ........................................... 3–35
valueChanged ............................................. 3–36
Filtering methods for visual objects

applyFilter ............................................... 3–37
blankField ............................................... 3–38
blankFields ............................................. 3–38
blankFillIn .............................................. 3–38
createField ............................................. 3–39
createLabel .............................................. 3–40
createOperator ......................................... 3–40
dataAvailable .......................................... 3–41
dataValue ............................................... 3–41
deleteObjects .......................................... 3–41
disableFields .................................................. 3–41
enableFields .................................................. 3–42
fieldLookup ..................................................... 3–42
fieldProperty ................................................... 3–42
initializeObject .............................................. 3–43
insertFieldProperty .......................................... 3–43
removeSpace ................................................... 3–43
resetFields ..................................................... 3–44
showDataMessages ............................................ 3–44
unBlankFillin .................................................. 3–44
unBlankLogical ............................................... 3–45

Browser methods for visual objects
addRecord ..................................................... 3–46
applyCellEntry ................................................ 3–46
applyEntry ..................................................... 3–47
assignMaxGuess .............................................. 3–47
calcWidth ..................................................... 3–47
cancelNew ...................................................... 3–48
cancelRecord .................................................. 3–48
colValues ....................................................... 3–49
copyRecord .................................................... 3–49
createPopupMenu ............................................. 3–50
dataAvailable ............................................... 3–50
defaultAction ................................................. 3–50
deleteComplete .............................................. 3–51
deleteRecord .................................................. 3–51
destroyObject ............................................... 3–51
disableFields ............................................... 3–51
displayFields ............................................... 3–52
enableFields ............................................... 3–52
enableObject ............................................... 3–53
fetchDataSet ............................................... 3–53
filterActive ................................................... 3–54
hasActiveAudit .............................................. 3–54
hasActiveComments ....................................... 3–54
initializeColumnSettings .................................. 3–54
initializeObject ............................................. 3–55
launchFolderWindow ........................................ 3–55
linkStateHandler .......................................... 3–55
offEnd .......................................................... 3–56
offHome ....................................................... 3–56
onEnd ........................................................... 3–56
onHome ........................................................ 3–56
onValueChanged ............................................. 3–57
refreshBrowse ............................................... 3–57
refreshQuery .................................................. 3–57
resizeBrowse ............................................... 3–57
resizeObject .................................................. 3–58
rowDisplay .................................................... 3–58
rowEntry ....................................................... 3–58
rowLeave ....................................................... 3–59
rowVisible ..................................................... 3–59
searchTrigger ............................................... 3–59
showSort ........................................................ 3–59
startSearch ................................................... 3–60
stripCalcs ..................................................... 3–60
toolbar .......................................................... 3–60
updateRecord .................................................. 3–61
updateState .................................................. 3–61
updateTitle ............................................... 3–61
viewObject .................................................. 3–62

Methods for SmartDataViewers ......................... 3–63
addRecord .................................................. 3–63
cancelRecord ............................................. 3–64
copyRecord ............................................... 3–64
disableFields ............................................. 3–65
displayFields ............................................ 3–65
ableFields .................................................. 3–66
fieldModified ............................................. 3–67
initializeObject ......................................... 3–68
toolbar ..................................................... 3–68
updateState ................................................. 3–69
valueChanged .............................................. 3–69
viewRecord .................................................. 3–69

Methods for TreeView objects ......................... 3–70
addNode ...................................................... 3–70
deleteNode ............................................... 3–71
deleteTree .................................................. 3–71
disableObject ............................................. 3–71
emptyTree .................................................. 3–72
enableObject .............................................. 3–72
isNodeExpanded ........................................... 3–72
loadImage .................................................. 3–72
populateTree .............................................. 3–73
repositionObject ......................................... 3–74
resizeObject .............................................. 3–74
selectFirstNode ........................................... 3–74
selectNode .................................................. 3–75
showTVError .............................................. 3–75
updateTree ................................................. 3–75

Visual object properties ................................. 3–76
ActionEvent ............................................... 3–76
AllFieldHandles .......................................... 3–76
AllFieldNames ............................................ 3–77
ApplyActionOnExit ........................................ 3–77
ApplyExitOnAction ....................................... 3–77
AutoSort .................................................... 3–77
BrowseHandle ............................................. 3–77
CalcWidth ................................................... 3–78
CanUndoChanges ......................................... 3–78
ClientRect .................................................. 3–78
Col ......................................................... 3–78
color3DFace .............................................. 3–78
color3DHighLight ......................................... 3–78
color3DShadow ............................................ 3–79
ColumnsMovable ........................................... 3–79
ColumnsSortable ........................................... 3–79
CreateHandles ............................................ 3–79
CtrlFrameHandle .......................................... 3–79
DataModified .............................................. 3–80
DataObject .................................................. 3–80
DataObjectHandle ....................................... 3–80
DataSignature ............................................ 3–80
DefaultCharWidth ........................................ 3–81
DefaultEditorLines .......................... 3–81
DefaultLayout ............................... 3–81
DefaultWidth ................................. 3–81
DisableOnInit ............................... 3–81
DisplayedField .............................. 3–81
DisplayFieldsSecurity ...................... 3–82
DisplayedTables ............................. 3–82
Down ....................................... 3–82
Editable .................................... 3–82
EnabledObjFlgs .............................. 3–82
EnabledObjFlgsToDisable ................. 3–83
EnabledObjHdls ............................. 3–83
EnabledFields ............................... 3–83
EnabledHandles .............................. 3–83
ExpandOnAdd ............................... 3–84
FetchOnReposToEnd ......................... 3–84
FieldColumn ................................ 3–84
FieldFormats ................................ 3–84
FieldHandles ................................ 3–84
FieldHelpIds ............................... 3–85
FieldsEnabled .............................. 3–85
FieldLabels ................................ 3–85
FieldOperatorStyles ....................... 3–85
FieldToolTips ............................... 3–85
FieldWidths ................................ 3–85
FilterActive ................................ 3–86
FilterTarget ................................ 3–86
FilterTargetEvents ......................... 3–86
FolderWindowToLaunch ..................... 3–86
FrameMinHeightChars ....................... 3–86
FrameMinWidthChars ......................... 3–87
FullRowSelect .............................. 3–87
GroupAssignHidden ......................... 3–87
GroupAssignSource ......................... 3–87
GroupAssignSourceEvents ................. 3–87
GroupAssignTarget ......................... 3–88
GroupAssignTargetEvents ................. 3–88
Height ..................................... 3–88
HideOnInit .................................. 3–88
HideSelection ................................ 3–88
ImageHeight ................................ 3–88
ImageWidth ................................ 3–89
ILComHandle ................................ 3–89
Indentation ................................ 3–89
LabelEdit .................................. 3–89
LayoutOptions .............................. 3–89
LayoutVariable ............................. 3–89
LineStyle .................................. 3–90
MaxWidth .................................. 3–90
MinHeight .................................. 3–90
MinWidth .................................. 3–90
ModifyFields ............................... 3–90
NextNodeKey ................................ 3–91
NodeExpanded .............................. 3–91
NumDown ................................... 3–91
ObjectEnabled .............................. 3–92
ObjectEnabled .............................. 3–92
4. **Container Objects and Their Methods and Properties** 4–1

Base methods for container objects

- applyContextFromServer 4–2
- assignContainedProperties 4–2
- assignPageProperty 4–3
cancelObject 4–3
changePage 4–4
confirmExit 4–5
confirmOk 4–5
constructObject 4–5
containedProperties 4–6
ContextandDestroy 4–7
createObjects 4–7
confirmCancel 4–8
deletePage 4–8
destroyObject 4–9
disablePagesInFolder 4–9
enablePagesInFolder 4–9
fetchContainedData 4–10
hidePage 4–10
initializeObject 4–10
initializeVisualContainer 4–11
initPages 4–11
isUpdateActive 4–12
notifyPage 4–13
obtainContextForServer 4–13
okObject 4–14
pageNTargets 4–14
passThrough 4–15
removePageNTarget 4–15
resizeWindow 4–15
selectPage 4–16
targetPage 4–16
toolbar 4–17
updateActive 4–18
viewObject 4–18
viewPage 4–18

Methods for SmartBusiness container objects
addDataTarget 4–20
addNavigationSource 4–21
addQueryWhere 4–21
addRow 4–22
appendContainedObjects 4–22
assignCurrentMappedObject 4–22
assignMaxGuess 4–23
assignQuerySelection 4–23
cancelNew 4–23
cancelRow 4–24
canNavigate 4–24
colValues 4–24
commitData 4–25
commitTransaction 4–25
confirmContinue 4–25
copyRow 4–25
currentMappedObject 4–26
dataAvailable 4–26
dataObjectHandle 4–26
deleteComplete 4–26
deleteRow 4–27
destroyServerObject 4–27
endClientDataRequest 4–27
fetchBatch 4–27
fetchContainedData .................................................. 4–28
fetchContainedRows ................................................. 4–28
fetchDOProperties .................................................. 4–28
fetchFirst .......................................................... 4–29
fetchLast .......................................................... 4–29
fetchNext .......................................................... 4–29
initDataObjectOrdering ............................................. 4–29
fetchPrev .......................................................... 4–30
findRowWhere ....................................................... 4–30
initializeObject .................................................... 4–31
initializeServerObject ............................................. 4–31
isUpdatePending ................................................... 4–31
newDataObjectRow .................................................. 4–32
openQuery .......................................................... 4–32
postCreateObjects .................................................. 4–32
prepareErrorsForReturn ......................................... 4–33
prepareQueriesForFetch ......................................... 4–33
queryPosition ....................................................... 4–33
refreshBrowse ....................................................... 4–34
registerLinkedObjects ............................................. 4–34
registerObject ....................................................... 4–34
remoteCommitTransaction ......................................... 4–35
remoteFetchContainedData ......................................... 4–35
remoteSendRows ..................................................... 4–36
removeQuerySelection ............................................. 4–37
repositionRowObject .............................................. 4–37
resetQuery .......................................................... 4–38
restartServerObject ............................................... 4–38
serverCommitTransaction ......................................... 4–39
serverContainedSendRows ........................................ 4–39
serverFetchContainedData ......................................... 4–40
serverFetchContainedRows ....................................... 4–40
serverFetchDOProperties ......................................... 4–41
setPropertyList ...................................................... 4–41
startServerObject .................................................. 4–41
submitRow .......................................................... 4–41
undoTransaction ..................................................... 4–42
updateState .......................................................... 4–42

Methods for TreeView controller container objects ................. 4–43
initializeObject ...................................................... 4–43
showTVError .......................................................... 4–43
updateState .......................................................... 4–43

Container object properties .......................................... 4–44
BlockDataAvailable .................................................. 4–44
CallerObject .......................................................... 4–44
CallerProcedure ...................................................... 4–44
CallerWindow .......................................................... 4–45
CascadeOnBrowse ..................................................... 4–45
CommitSource .......................................................... 4–45
CommitSourceEvents .................................................. 4–45
CommitTarget .......................................................... 4–45
CommitTargetEvents ................................................... 4–46
ContainedDataColumns ............................................... 4–46
ContainedDataObjects ............................................... 4–46
ContainerTarget ....................................................... 4–46
ContainerTargetEvents ............................................... 4–46
ContextAndInitialize ............................................... 4–47
5. Data Objects and Their Methods and Properties

Base methods for data objects
- addForeignKey
- assignQuerySelection
- confirmCommit
- confirmContinue
- confirmUndo
- exportData
- filterContainerHandler
- findRow
- indexInformation
- insertExpression
- isUpdateActive
- isUpdatePending
- linkState
- newQueryString
- newWhereClause
- printToCrystal
- removeForeignKey

Column properties for container objects
<table>
<thead>
<tr>
<th>Method</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>removeQuerySelection</td>
<td>5–11</td>
</tr>
<tr>
<td>resetQueryString</td>
<td>5–11</td>
</tr>
<tr>
<td>resolveColumn</td>
<td>5–12</td>
</tr>
<tr>
<td>rowAvailable</td>
<td>5–12</td>
</tr>
<tr>
<td>rowValues</td>
<td>5–13</td>
</tr>
<tr>
<td>sortExpression</td>
<td>5–14</td>
</tr>
<tr>
<td>startFilter</td>
<td>5–14</td>
</tr>
<tr>
<td>tableOut</td>
<td>5–14</td>
</tr>
<tr>
<td>transferToExcel</td>
<td>5–15</td>
</tr>
<tr>
<td>updateQueryPosition</td>
<td>5–15</td>
</tr>
<tr>
<td>updateState</td>
<td>5–16</td>
</tr>
<tr>
<td>Methods for DataView objects</td>
<td></td>
</tr>
<tr>
<td>addRow</td>
<td>5–17</td>
</tr>
<tr>
<td>applyContextFromServer</td>
<td>5–17</td>
</tr>
<tr>
<td>cancelRow</td>
<td>5–17</td>
</tr>
<tr>
<td>canNavigate</td>
<td>5–18</td>
</tr>
<tr>
<td>closeQuery</td>
<td>5–18</td>
</tr>
<tr>
<td>colValues</td>
<td>5–18</td>
</tr>
<tr>
<td>commitTransaction</td>
<td>5–19</td>
</tr>
<tr>
<td>copyRow</td>
<td>5–19</td>
</tr>
<tr>
<td>createObjects</td>
<td>5–19</td>
</tr>
<tr>
<td>dataAvailable</td>
<td>5–20</td>
</tr>
<tr>
<td>deleteRow</td>
<td>5–20</td>
</tr>
<tr>
<td>destroyObject</td>
<td>5–20</td>
</tr>
<tr>
<td>fetchBatch</td>
<td>5–21</td>
</tr>
<tr>
<td>fetchFirst</td>
<td>5–21</td>
</tr>
<tr>
<td>fetchLast</td>
<td>5–21</td>
</tr>
<tr>
<td>fetchNext</td>
<td>5–22</td>
</tr>
<tr>
<td>fetchPrev</td>
<td>5–22</td>
</tr>
<tr>
<td>findRowWhere</td>
<td>5–22</td>
</tr>
<tr>
<td>hasActiveAudit</td>
<td>5–23</td>
</tr>
<tr>
<td>hasActiveComments</td>
<td>5–23</td>
</tr>
<tr>
<td>hasForeignKeyChanged</td>
<td>5–23</td>
</tr>
<tr>
<td>initializeObject</td>
<td>5–24</td>
</tr>
<tr>
<td>isDataQueryComplete</td>
<td>5–24</td>
</tr>
<tr>
<td>keyWhere</td>
<td>5–24</td>
</tr>
<tr>
<td>linkStateHandler</td>
<td>5–25</td>
</tr>
<tr>
<td>obtainContextFromServer</td>
<td>5–25</td>
</tr>
<tr>
<td>openDataQuery</td>
<td>5–26</td>
</tr>
<tr>
<td>open DataView</td>
<td>5–26</td>
</tr>
<tr>
<td>openQuery</td>
<td>5–26</td>
</tr>
<tr>
<td>openQueryAtPosition</td>
<td>5–27</td>
</tr>
<tr>
<td>refreshQuery</td>
<td>5–27</td>
</tr>
<tr>
<td>refreshRow</td>
<td>5–27</td>
</tr>
<tr>
<td>resetRow</td>
<td>5–28</td>
</tr>
<tr>
<td>resolveBuffer</td>
<td>5–28</td>
</tr>
<tr>
<td>resortQuery</td>
<td>5–28</td>
</tr>
<tr>
<td>retrieveData</td>
<td>5–29</td>
</tr>
<tr>
<td>rowChanged</td>
<td>5–30</td>
</tr>
<tr>
<td>submitData</td>
<td>5–30</td>
</tr>
<tr>
<td>submitRow</td>
<td>5–31</td>
</tr>
<tr>
<td>undoRow</td>
<td>5–31</td>
</tr>
<tr>
<td>undoTransaction</td>
<td>5–31</td>
</tr>
<tr>
<td>whereClauseBuffer</td>
<td>5–32</td>
</tr>
<tr>
<td>Methods for query objects</td>
<td></td>
</tr>
<tr>
<td>addNotFoundMessage</td>
<td>5–33</td>
</tr>
<tr>
<td>addQueryWhere</td>
<td>5–33</td>
</tr>
<tr>
<td>Method</td>
<td>Page</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>assignDBRow</td>
<td>5–34</td>
</tr>
<tr>
<td>batchServices</td>
<td>5–34</td>
</tr>
<tr>
<td>bufferCopyDBToRO</td>
<td>5–35</td>
</tr>
<tr>
<td>ColumnPhysicalColumn</td>
<td>5–35</td>
</tr>
<tr>
<td>ColumnPhysicalTable</td>
<td>5–36</td>
</tr>
<tr>
<td>closeQuery</td>
<td>5–36</td>
</tr>
<tr>
<td>colValues</td>
<td>5–36</td>
</tr>
<tr>
<td>createObjects</td>
<td>5–37</td>
</tr>
<tr>
<td>dataAvailable</td>
<td>5–37</td>
</tr>
<tr>
<td>dbColumnDataName</td>
<td>5–38</td>
</tr>
<tr>
<td>dbColumnHandle</td>
<td>5–38</td>
</tr>
<tr>
<td>defineDataObject</td>
<td>5–38</td>
</tr>
<tr>
<td>deleteRecordStatic</td>
<td>5–39</td>
</tr>
<tr>
<td>destroyObject</td>
<td>5–40</td>
</tr>
<tr>
<td>fetchFirst</td>
<td>5–40</td>
</tr>
<tr>
<td>fetchLast</td>
<td>5–40</td>
</tr>
<tr>
<td>fetchNext</td>
<td>5–40</td>
</tr>
<tr>
<td>fetchPrev</td>
<td>5–40</td>
</tr>
<tr>
<td>fetchCurrentBatch</td>
<td>5–41</td>
</tr>
<tr>
<td>fetchFirstBatch</td>
<td>5–41</td>
</tr>
<tr>
<td>fetchLastBatch</td>
<td>5–41</td>
</tr>
<tr>
<td>fetchNextBatch</td>
<td>5–41</td>
</tr>
<tr>
<td>fetchPrevBatch</td>
<td>5–41</td>
</tr>
<tr>
<td>firstBufferName</td>
<td>5–42</td>
</tr>
<tr>
<td>firstRowIds</td>
<td>5–42</td>
</tr>
<tr>
<td>initProps</td>
<td>5–42</td>
</tr>
<tr>
<td>newQueryValidate</td>
<td>5–43</td>
</tr>
<tr>
<td>newQueryWhere</td>
<td>5–43</td>
</tr>
<tr>
<td>openQuery</td>
<td>5–44</td>
</tr>
<tr>
<td>prepareQuery</td>
<td>5–44</td>
</tr>
<tr>
<td>resolveBuffer</td>
<td>5–44</td>
</tr>
<tr>
<td>rowidWhere</td>
<td>5–45</td>
</tr>
<tr>
<td>rowidWhereCols</td>
<td>5–46</td>
</tr>
<tr>
<td>transferDBRow</td>
<td>5–46</td>
</tr>
<tr>
<td>Methods for data query objects</td>
<td></td>
</tr>
<tr>
<td>addRow</td>
<td>5–47</td>
</tr>
<tr>
<td>askQuestion</td>
<td>5–47</td>
</tr>
<tr>
<td>batchRowAvailable</td>
<td>5–48</td>
</tr>
<tr>
<td>beginTransactionValidate</td>
<td>5–48</td>
</tr>
<tr>
<td>cancelRow</td>
<td>5–49</td>
</tr>
<tr>
<td>canNavigate</td>
<td>5–49</td>
</tr>
<tr>
<td>clientSendRows</td>
<td>5–50</td>
</tr>
<tr>
<td>closeQuery</td>
<td>5–51</td>
</tr>
<tr>
<td>colStringValues</td>
<td>5–51</td>
</tr>
<tr>
<td>colValues</td>
<td>5–52</td>
</tr>
<tr>
<td>Commit</td>
<td>5–52</td>
</tr>
<tr>
<td>commitData</td>
<td>5–52</td>
</tr>
<tr>
<td>commitTransaction</td>
<td>5–53</td>
</tr>
<tr>
<td>copyRow</td>
<td>5–53</td>
</tr>
<tr>
<td>createData</td>
<td>5–54</td>
</tr>
<tr>
<td>createObjects</td>
<td>5–54</td>
</tr>
<tr>
<td>createRow</td>
<td>5–54</td>
</tr>
<tr>
<td>dataAvailable</td>
<td>5–55</td>
</tr>
<tr>
<td>dataContainerHandle</td>
<td>5–56</td>
</tr>
<tr>
<td>deleteData</td>
<td>5–56</td>
</tr>
<tr>
<td>deleteRow</td>
<td>5–57</td>
</tr>
<tr>
<td>describeSchema</td>
<td>5–57</td>
</tr>
</tbody>
</table>
destroyObject .......................................................... 5–57
doBuildUp ............................................................... 5–58
doCreateUpdate ......................................................... 5–58
doEmptyTempTable ....................................................... 5–59
doReturnUpd .............................................................. 5–59
doUndoDelete ............................................................. 5–59
doUndoRow ................................................................. 5–60
doUpdateTrans ........................................................... 5–60
doUpdate ................................................................. 5–60
endTransactionValidate ............................................. 5–60
fetchBatch ............................................................... 5–61
fetchFirst ............................................................... 5–61
fetchLast ............................................................... 5–62
fetchNext ............................................................... 5–62
fetchPrev ............................................................... 5–62
fetchRow ............................................................... 5–63
fetchRowIdent .......................................................... 5–63
findRowWhere .......................................................... 5–64
firstRowIds .............................................................. 5–65
hasActiveAudit ......................................................... 5–65
hasActiveComments ................................................... 5–65
hasForeignKeyChanged ............................................... 5–65
initializeObject ......................................................... 5–66
initializeLogicObject .................................................. 5–66
isUpdatePending ....................................................... 5–66
newRowObject .......................................................... 5–67
getContextForServer .................................................... 5–67
openDataQuery .......................................................... 5–68
openQuery .............................................................. 5–68
postTransactionValidate ............................................. 5–68
prepareErrorsForReturn ............................................. 5–69
preTransactionValidate .............................................. 5–69
pushTableAndValidate ............................................... 5–69
refreshRow ............................................................. 5–70
remoteCommit .......................................................... 5–70
remoteSendRows ........................................................ 5–71
saveContextAndDestroy ............................................. 5–72
sendRows ............................................................... 5–72
serverCommit .......................................................... 5–73
serverSendRows ........................................................ 5–74
startServerObject ...................................................... 5–74
submitCommit .......................................................... 5–75
submitForeignKey ....................................................... 5–75
submitRow ............................................................. 5–76
undoClientUpdate ...................................................... 5–76
updateAddQueryWhere ................................................ 5–77
updateData ............................................................. 5–77
updateQueryPosition .................................................. 5–78
updateRow ............................................................. 5–78
Query object properties ............................................. 5–79
AssignList .............................................................. 5–79
AuditEnabled ............................................................ 5–79
AutoCommit ............................................................. 5–80
BLOBColumns .......................................................... 5–80
BusinessEntity .......................................................... 5–80
CalculatedColumns ..................................................... 5–80
<table>
<thead>
<tr>
<th>Function/Property</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>CheckCurrentChanged</td>
<td>5–81</td>
</tr>
<tr>
<td>CheckLastOnOpen</td>
<td>5–81</td>
</tr>
<tr>
<td>ClientProxyHandle</td>
<td>5–81</td>
</tr>
<tr>
<td>CLOBColumns</td>
<td>5–81</td>
</tr>
<tr>
<td>CommitSource</td>
<td>5–82</td>
</tr>
<tr>
<td>CommitSourceEvents</td>
<td>5–82</td>
</tr>
<tr>
<td>CommitTarget</td>
<td>5–82</td>
</tr>
<tr>
<td>CommitTargetEvents</td>
<td>5–82</td>
</tr>
<tr>
<td>CurrentRowModified</td>
<td>5–82</td>
</tr>
<tr>
<td>CurrentUpdateSource</td>
<td>5–83</td>
</tr>
<tr>
<td>DataColumns</td>
<td>5–83</td>
</tr>
<tr>
<td>DataColumnsByTables</td>
<td>5–83</td>
</tr>
<tr>
<td>DataContainerHandle</td>
<td>5–83</td>
</tr>
<tr>
<td>DataDelimiter</td>
<td>5–84</td>
</tr>
<tr>
<td>DataFieldDefs</td>
<td>5–84</td>
</tr>
<tr>
<td>DataHandle</td>
<td>5–84</td>
</tr>
<tr>
<td>DataLogicObject</td>
<td>5–84</td>
</tr>
<tr>
<td>DataModified</td>
<td>5–84</td>
</tr>
<tr>
<td>DataIsFetched</td>
<td>5–85</td>
</tr>
<tr>
<td>DataLogicProcedure</td>
<td>5–85</td>
</tr>
<tr>
<td>DataQueryBrowsed</td>
<td>5–85</td>
</tr>
<tr>
<td>DataQueryString</td>
<td>5–85</td>
</tr>
<tr>
<td>DataReadBuffer</td>
<td>5–85</td>
</tr>
<tr>
<td>DataReadColumns</td>
<td>5–86</td>
</tr>
<tr>
<td>DataReadHandler</td>
<td>5–86</td>
</tr>
<tr>
<td>DatasetName</td>
<td>5–86</td>
</tr>
<tr>
<td>DatasetSource</td>
<td>5–86</td>
</tr>
<tr>
<td>DataSignature</td>
<td>5–86</td>
</tr>
<tr>
<td>DataTable</td>
<td>5–87</td>
</tr>
<tr>
<td>DbNames</td>
<td>5–87</td>
</tr>
<tr>
<td>DestroyStateless</td>
<td>5–87</td>
</tr>
<tr>
<td>DisconnectAppServer</td>
<td>5–87</td>
</tr>
<tr>
<td>EnabledTables</td>
<td>5–88</td>
</tr>
<tr>
<td>EnabledObjFldsToDisable</td>
<td>5–88</td>
</tr>
<tr>
<td>FetchOnOpen</td>
<td>5–88</td>
</tr>
<tr>
<td>FillBatchOnRepos</td>
<td>5–89</td>
</tr>
<tr>
<td>FilterActive</td>
<td>5–89</td>
</tr>
<tr>
<td>FilterAvailable</td>
<td>5–89</td>
</tr>
<tr>
<td>FilterSource</td>
<td>5–89</td>
</tr>
<tr>
<td>FilterWindow</td>
<td>5–89</td>
</tr>
<tr>
<td>FirstRowNum</td>
<td>5–89</td>
</tr>
<tr>
<td>FirstRowModified</td>
<td>5–90</td>
</tr>
<tr>
<td>ForeignFields</td>
<td>5–90</td>
</tr>
<tr>
<td>ForeignValues</td>
<td>5–90</td>
</tr>
<tr>
<td>GroupAssignSource</td>
<td>5–90</td>
</tr>
<tr>
<td>GroupAssignSourceEvents</td>
<td>5–90</td>
</tr>
<tr>
<td>GroupAssignTarget</td>
<td>5–90</td>
</tr>
<tr>
<td>GroupAssignTargetEvents</td>
<td>5–91</td>
</tr>
<tr>
<td>HasFirst</td>
<td>5–91</td>
</tr>
<tr>
<td>HasLast</td>
<td>5–91</td>
</tr>
<tr>
<td>IndexInformation</td>
<td>5–91</td>
</tr>
<tr>
<td>InternalEntries</td>
<td>5–91</td>
</tr>
<tr>
<td>KeyFields</td>
<td>5–92</td>
</tr>
<tr>
<td>KeyTableId</td>
<td>5–92</td>
</tr>
<tr>
<td>KeyWhere</td>
<td>5–92</td>
</tr>
<tr>
<td>LargeColumns</td>
<td>5–92</td>
</tr>
<tr>
<td>LastCommitErrorKeys</td>
<td>5–93</td>
</tr>
</tbody>
</table>
Contents

Column properties for query objects ............................................. 5–108

WordIndexedFields ................................................................. 5–107

ViewTables ............................................................................. 5–107

UpdatableColumns ................................................................. 5–106

UpdateFromSource ................................................................. 5–106

UseDBQualifier ................................................................. 5–106

TransferChildrenForAll ...................................................... 5–105

ToggleDataTargets ............................................................... 5–105

Tables ................................................................................. 5–105

ServerSubmitValidation ...................................................... 5–104

Scrollable ........................................................................... 5–104

RowUpdated ........................................................................ 5–104

RowObjUpdTable ................................................................. 5–103

RowObjUpd ........................................................................... 5–103

RowObjectState ................................................................. 5–103

RowObjectTable ................................................................. 5–103

RowObject ............................................................................ 5–103

SubmitParent ..................................................................... 5–104

SubmitParent ..................................................................... 5–104

RequestHandle ................................................................. 5–102

RebuildOnRepos ................................................................. 5–102

LogicBuffer ....................................................................... 5–101

LastResultRow .................................................................... 5–101

LastCommitErrorType ...................................................... 5–101

LastDbRowIdent ................................................................. 5–101

LastRowNum ....................................................................... 5–101

ManualAddQueryWhere .................................................. 5–100

ManualAssignQuerySelection .......................................... 5–100

ManualSetQuerySort ........................................................ 5–100

NavigationSource ............................................................. 5–99

NavigationSourceEvents ................................................... 5–99

NewMode ........................................................................ 5–98

NewRow ........................................................................... 5–98

OpenOnInit ....................................................................... 5–98

OpenQuery ......................................................................... 5–97

PhysicalTable ..................................................................... 5–97

PositionSource .................................................................. 5–97

PrimarySDOSource ............................................................ 5–97

PromptColumns ................................................................. 5–98

PromptOnDelete ................................................................. 5–98

PropertyList ....................................................................... 5–98

QueryColumns ................................................................. 5–98

QueryContainer ................................................................. 5–98

QueryHandle ................................................................. 5–99

QueryOpen ......................................................................... 5–99

QueryPosition ................................................................. 5–99

QueryRowIdent ................................................................. 5–99

QuerySort ......................................................................... 5–100

QuerySortDefault ............................................................. 5–100

QueryString ....................................................................... 5–100

QueryStringDefault .......................................................... 5–101

QueryTables ................................................................. 5–101

QueryWhere ....................................................................... 5–101

LastCommitErrorType ...................................................... 5–94

LastDbRowIdent ................................................................. 5–94

LastRowNum ....................................................................... 5–94

LogicBuffer ....................................................................... 5–94

ManualAddQueryWhere .................................................. 5–95

ManualAssignQuerySelection .......................................... 5–95

ManualSetQuerySort ........................................................ 5–95

NavigationSource ............................................................. 5–95

NavigationSourceEvents ................................................... 5–95

NewMode ........................................................................ 5–96

NewRow ........................................................................... 5–96

OpenOnInit ....................................................................... 5–96

OpenQuery ......................................................................... 5–97

PhysicalTable ..................................................................... 5–97

PositionSource .................................................................. 5–97

PrimarySDOSource ............................................................ 5–97

PromptColumns ................................................................. 5–98

PromptOnDelete ................................................................. 5–98

PropertyList ....................................................................... 5–98

QueryColumns ................................................................. 5–98

QueryContainer ................................................................. 5–98

QueryHandle ................................................................. 5–99

QueryOpen ......................................................................... 5–99

QueryPosition ................................................................. 5–99

QueryRowIdent ................................................................. 5–99

QuerySort ......................................................................... 5–100

QuerySortDefault ............................................................. 5–100

QueryString ....................................................................... 5–100

QueryStringDefault .......................................................... 5–101

QueryTables ................................................................. 5–101

QueryWhere ....................................................................... 5–101

RebuildOnRepos ................................................................. 5–102

RequestHandle ................................................................. 5–102

RowIdent ........................................................................... 5–102

RowObject ............................................................................ 5–103

RowObjectState ................................................................. 5–103

RowObjectTable ................................................................. 5–103

RowObjUpd ........................................................................... 5–103

RowObjUpdTable ................................................................. 5–103

RowsToBatch ................................................................. 5–104

RowUpdated ....................................................................... 5–104

Scrollable ........................................................................... 5–104

ServerSubmitValidation ................................................... 5–104

SubmitParent ..................................................................... 5–104

Tables ................................................................................. 5–105

ToggleDataTargets ............................................................. 5–105

TransferChildrenForAll .................................................. 5–105

UseDBQualifier ................................................................. 5–105

UpdateFromSource ........................................................... 5–106

UpdatableColumns .......................................................... 5–106

UpdatableColumnsByTable ................................................ 5–106

ViewTables ......................................................................... 5–107

WordIndexedFields .......................................................... 5–107

Column properties for query objects ............................................. 5–108
6. Toolbar Objects and Their Methods and Properties

Methods for toolbar object actions
- canFindAction ........................................ 6–2
- canFindCategory .................................. 6–2
- categoryLink ....................................... 6–2
- checkRule ......................................... 6–3
- defineAction ...................................... 6–3
- displayActions ..................................... 6–3
- initAction .......................................... 6–4
- initializeObject .................................. 6–4

Panel methods for toolbar objects
- activeTarget ......................................... 6–5
- countButtons ....................................... 6–5
- disableActions ...................................... 6–5
- enableActions ....................................... 6–6
- enableObject ....................................... 6–6
- hasActiveGATarget .................................. 6–6
- initializeObject .................................. 6–7
- linkState ........................................... 6–7
- loadPanel ............................................ 6–8
- onChoose .......................................... 6–8
- queryPosition ....................................... 6–8
- resetCommit ........................................ 6–8
- resetNavigation ..................................... 6–9
- resetTableio ........................................ 6–9
- resetTargetActions .................................. 6–9
- resizeObject ........................................ 6–10
- sensitizeActions .................................... 6–10
- targetActions ...................................... 6–10
- updateState ......................................... 6–11
- viewHideActions .................................... 6–11

Toolbar methods for toolbar objects
- actionCanRun ........................................ 6–12
- actionCaption ....................................... 6–12
- actionCategoryIsHidden ......................... 6–12
- actionChecked ....................................... 6–13
- actionLabel ......................................... 6–13
- actionPublishCreate ................................ 6–13
- actionTarget ........................................ 6–14
- actionTooltip ........................................ 6–14
- buildAllMenus ....................................... 6–14
- categoryActions ..................................... 6–14
- constructMenu ..................................... 6–15
- constructToolbar .................................... 6–15
- createMenuTable .................................... 6–15
- createMenuTable2 ................................... 6–16
- createToolbar ....................................... 6–16
- filterState ......................................... 6–17
- hideObject ......................................... 6–17
- imageName ........................................... 6–17
- initializeObject .................................... 6–18
- insertMenu .......................................... 6–18
- linkRuleBuffer ...................................... 6–18
- linkState ............................................ 6–19
- modifyDisabledActions ......................... 6–19
- onChoose .......................................... 6–20
onMenuDrop ................................................................. 6–20
onValueChanged ......................................................... 6–20
queryPosition .............................................................. 6–21
repositionObject ......................................................... 6–21
resetTargetActions ..................................................... 6–21
resetToolbar .............................................................. 6–21
resizeObject .............................................................. 6–22
rowObjectState ........................................................ 6–22
runInfo ................................................................. 6–22
storePendingSensitivity ............................................. 6–23
targetActions ........................................................... 6–23
updateActive ............................................................ 6–23
updateCategoryLists ............................................... 6–24
updateState ............................................................ 6–24
updateStates ........................................................... 6–24
viewHideActions ...................................................... 6–25
viewObject .............................................................. 6–25

<table>
<thead>
<tr>
<th>Toolbar object properties</th>
<th>6-26</th>
</tr>
</thead>
<tbody>
<tr>
<td>AvailMenuActions</td>
<td>6-26</td>
</tr>
<tr>
<td>AvailToolbarActions</td>
<td>6-26</td>
</tr>
<tr>
<td>AvailToolbarBands</td>
<td>6-26</td>
</tr>
<tr>
<td>BoxRectangle</td>
<td>6-27</td>
</tr>
<tr>
<td>BoxRectangle2</td>
<td>6-27</td>
</tr>
<tr>
<td>ButtonCount</td>
<td>6-27</td>
</tr>
<tr>
<td>DeactivateTargetOnHide</td>
<td>6-27</td>
</tr>
<tr>
<td>DisabledActions</td>
<td>6-27</td>
</tr>
<tr>
<td>EdgePixels</td>
<td>6-28</td>
</tr>
<tr>
<td>HiddenActions</td>
<td>6-28</td>
</tr>
<tr>
<td>HiddenMenuBands</td>
<td>6-28</td>
</tr>
<tr>
<td>HiddenToolbarBands</td>
<td>6-28</td>
</tr>
<tr>
<td>Image</td>
<td>6-28</td>
</tr>
<tr>
<td>ImagePath</td>
<td>6-28</td>
</tr>
<tr>
<td>MarginPixels</td>
<td>6-29</td>
</tr>
<tr>
<td>Menu</td>
<td>6-29</td>
</tr>
<tr>
<td>MenuMergeOrder</td>
<td>6-29</td>
</tr>
<tr>
<td>MinHeight</td>
<td>6-29</td>
</tr>
<tr>
<td>MinWidth</td>
<td>6-29</td>
</tr>
<tr>
<td>NavigationTargetEvents</td>
<td>6-29</td>
</tr>
<tr>
<td>NavigationTargetName</td>
<td>6-30</td>
</tr>
<tr>
<td>PanelFrame</td>
<td>6-30</td>
</tr>
<tr>
<td>PanelLabel</td>
<td>6-30</td>
</tr>
<tr>
<td>PanelState</td>
<td>6-30</td>
</tr>
<tr>
<td>PanelType</td>
<td>6-30</td>
</tr>
<tr>
<td>SecuredTokens</td>
<td>6-30</td>
</tr>
<tr>
<td>ShowBorder</td>
<td>6-31</td>
</tr>
<tr>
<td>StaticPrefix</td>
<td>6-31</td>
</tr>
<tr>
<td>TableIOTarget</td>
<td>6-31</td>
</tr>
<tr>
<td>TableIOTargetEvents</td>
<td>6-31</td>
</tr>
<tr>
<td>TableIOType</td>
<td>6-31</td>
</tr>
<tr>
<td>Toolbar</td>
<td>6-31</td>
</tr>
<tr>
<td>ToolbarAutoSize</td>
<td>6-32</td>
</tr>
<tr>
<td>ToolbarBands</td>
<td>6-32</td>
</tr>
<tr>
<td>ToolbarDrawDirection</td>
<td>6-32</td>
</tr>
<tr>
<td>ToolbarHeightPxl</td>
<td>6-32</td>
</tr>
<tr>
<td>ToolbarInitialState</td>
<td>6-32</td>
</tr>
<tr>
<td>ToolbarTargetEvents</td>
<td>6-32</td>
</tr>
</tbody>
</table>
7. **Field Objects and Their Methods and Properties** .......................... 7–1

Field Objects and Their Methods and Properties

*Base methods for field objects*
- initializeObject .................................................. 7–2
- resizeObject ...................................................... 7–2

*Methods for select field objects*
- anyKey ................................................................. 7–3
- browseHandler ..................................................... 7–3
- buildList ............................................................. 7–3
- createLabel .......................................................... 7–4
- dataAvailable ....................................................... 7–4
- destroyObject ...................................................... 7–4
- destroySelection .................................................. 7–5
- disableButton ....................................................... 7–5
- disableField ......................................................... 7–5
- disable_UI ............................................................ 7–5
- enableButton ......................................................... 7–5
- enableField .......................................................... 7–6
- endMove ............................................................... 7–6
- enterSelect ........................................................... 7–6
- formattedValue ..................................................... 7–6
- hideObject ............................................................ 7–7
- initializeBrowse .................................................... 7–7
- initializeObject .................................................... 7–7
- initializeSelection ................................................. 7–7
- leaveSelect ........................................................... 7–7
- queryOpened ........................................................ 7–8
- refreshObject ....................................................... 7–8
- repositionDataSource .............................................. 7–8
- resizeObject ........................................................ 7–8
- rowSelected .......................................................... 7–9
- valueChanged ....................................................... 7–9
- viewObject ........................................................... 7–9

*Methods for combo field objects*
- anyKey ................................................................. 7–10
- createLabel .......................................................... 7–10
- destroyCombo ....................................................... 7–10
- destroyObject ...................................................... 7–10
- disableField ......................................................... 7–11
- disable_UI ............................................................ 7–11
- displayCombo ....................................................... 7–11
- enableField .......................................................... 7–11
- enterCombo ........................................................... 7–12
- endMove ............................................................... 7–12
- hideObject ............................................................ 7–12
- initializeCombo ..................................................... 7–12
- insertExpression ................................................... 7–13
- leaveCombo ............................................................ 7–13
- newQueryString ..................................................... 7–14
- newWhereClause ................................................... 7–15
- refreshChildDependancies ....................................... 7–15
- refreshCombo ....................................................... 7–15
- resizeObject ........................................................ 7–16
DisplayFormat .............................................................. 7–31
DisplayValue .............................................................. 7–31
EdgePixels ..................................................................... 7–31
EnableField ..................................................................... 7–31
EnableOnAdd .................................................................... 7–31
ExitBrowseOnAction ......................................................... 7–32
FieldEnabled .................................................................... 7–32
FieldHidden ...................................................................... 7–32
FieldLabel ...................................................................... 7–32
FieldName ...................................................................... 7–32
FieldToolTip ..................................................................... 7–32
FlagValue ........................................................................ 7–33
Format ............................................................................. 7–33
HelpId ............................................................................. 7–33
InnerLines ....................................................................... 7–33
KeyDataType ..................................................................... 7–33
KeyField .......................................................................... 7–33
KeyFormat ........................................................................ 7–34
Label ............................................................................... 7–34
LabelHandle ....................................................................... 7–34
LinkedFieldDataTypes ....................................................... 7–34
LinkedFieldFormats ........................................................... 7–34
ListItemPairs ..................................................................... 7–34
LookupFilterValue ........................................................... 7–35
LookupHandle ..................................................................... 7–35
LookupImage ....................................................................... 7–35
LookupQuery ...................................................................... 7–35
MaintenanceObject ............................................................ 7–35
MaintenanceSDO ................................................................ 7–36
NumRows ........................................................................... 7–36
Optional ............................................................................ 7–36
OptionalBlank .................................................................... 7–36
OptionalString .................................................................... 7–36
ParentField ......................................................................... 7–36
ParentFilterQuery .............................................................. 7–37
PopupOnAmbiguous ............................................................ 7–37
PopupOnUniqueAmbiguous .................................................. 7–37
PopupOnNotAvail ............................................................... 7–37
QueryTables ....................................................................... 7–37
RefreshList ....................................................................... 7–38
RepositionDataSource ......................................................... 7–38
RowsToBatch ..................................................................... 7–38
SavedScreenValue .............................................................. 7–38
SDFFileName ..................................................................... 7–38
SDFTemplate ..................................................................... 7–39
Secured ............................................................................. 7–39
StartBrowseKeys ............................................................... 7–39
Tooltip ............................................................................... 7–39
UsePairedList ..................................................................... 7–39
ViewAs ............................................................................. 7–39
ViewerLinkedFields ........................................................... 7–40
ViewerLinkedWidgets .......................................................... 7–40
### 8. Messaging Objects and Their Methods and Properties

<table>
<thead>
<tr>
<th>Method for messaging objects</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>destroyObject</td>
<td>8–2</td>
</tr>
<tr>
<td>errorHandler</td>
<td>8–2</td>
</tr>
<tr>
<td>initializeObject</td>
<td>8–2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Methods for consumer messaging objects</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>assignUnsubscribe</td>
<td>8–3</td>
</tr>
<tr>
<td>createConsumers</td>
<td>8–3</td>
</tr>
<tr>
<td>defineDestination</td>
<td>8–3</td>
</tr>
<tr>
<td>destroyObject</td>
<td>8–4</td>
</tr>
<tr>
<td>errorHandler</td>
<td>8–4</td>
</tr>
<tr>
<td>initializeObject</td>
<td>8–4</td>
</tr>
<tr>
<td>messageHandler</td>
<td>8–4</td>
</tr>
<tr>
<td>processDestinations</td>
<td>8–5</td>
</tr>
<tr>
<td>startWaitFor</td>
<td>8–5</td>
</tr>
<tr>
<td>stopHandler</td>
<td>8–5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Methods for producer messaging objects</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>destroyObject</td>
<td>8–6</td>
</tr>
<tr>
<td>initializeObject</td>
<td>8–6</td>
</tr>
<tr>
<td>replyHandler</td>
<td>8–6</td>
</tr>
<tr>
<td>sendMessage</td>
<td>8–7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Method for message handler objects</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>sendMessage</td>
<td>8–8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Methods for XML messaging objects</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>assignAttribute</td>
<td>8–9</td>
</tr>
<tr>
<td>assignNodeValue</td>
<td>8–9</td>
</tr>
<tr>
<td>createAttribute</td>
<td>8–10</td>
</tr>
<tr>
<td>createDocument</td>
<td>8–10</td>
</tr>
<tr>
<td>createElement</td>
<td>8–10</td>
</tr>
<tr>
<td>createNode</td>
<td>8–11</td>
</tr>
<tr>
<td>createText</td>
<td>8–11</td>
</tr>
<tr>
<td>deleteDocument</td>
<td>8–11</td>
</tr>
<tr>
<td>destroyObject</td>
<td>8–12</td>
</tr>
<tr>
<td>nodeHandle</td>
<td>8–12</td>
</tr>
<tr>
<td>nodeType</td>
<td>8–12</td>
</tr>
<tr>
<td>ownerElement</td>
<td>8–12</td>
</tr>
<tr>
<td>parentNode</td>
<td>8–13</td>
</tr>
<tr>
<td>processCDataSection</td>
<td>8–13</td>
</tr>
<tr>
<td>processComment</td>
<td>8–13</td>
</tr>
<tr>
<td>processDocument</td>
<td>8–13</td>
</tr>
<tr>
<td>processElement</td>
<td>8–14</td>
</tr>
<tr>
<td>processRoot</td>
<td>8–14</td>
</tr>
<tr>
<td>processText</td>
<td>8–14</td>
</tr>
<tr>
<td>receiveHandler</td>
<td>8–15</td>
</tr>
<tr>
<td>receiveReplyHandler</td>
<td>8–15</td>
</tr>
<tr>
<td>sendHandler</td>
<td>8–15</td>
</tr>
<tr>
<td>sendReplyHandler</td>
<td>8–16</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Methods for business to business messaging objects</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>callOutParams</td>
<td>8–17</td>
</tr>
<tr>
<td>characterValue</td>
<td>8–17</td>
</tr>
<tr>
<td>createSchemaAttributes</td>
<td>8–17</td>
</tr>
<tr>
<td>createSchemaChildren</td>
<td>8–18</td>
</tr>
<tr>
<td>createSchemaPath</td>
<td>8–18</td>
</tr>
<tr>
<td>dataSource</td>
<td>8–18</td>
</tr>
<tr>
<td>defineMapping</td>
<td>8–19</td>
</tr>
<tr>
<td>destroyObject</td>
<td>8–19</td>
</tr>
<tr>
<td>endDocument</td>
<td>8–19</td>
</tr>
</tbody>
</table>
endElement ........................................ 8–20
findDataRow ........................................ 8–20
initializeObject .................................... 8–20
loadProducerSchema .................................. 8–21
loadSchema .......................................... 8–21
mapNode ............................................. 8–21
NotFoundError ....................................... 8–22
numParameters ....................................... 8–22
processMappings ...................................... 8–22
processMessages ...................................... 8–23
produceAttributes .................................. 8–23
produceChildren .................................... 8–23
produceDocument .................................... 8–24
receiveHandler ...................................... 8–24
rowNotFound .............................. 8–24
schemaField .......................................... 8–25
sendHandler ......................................... 8–25
sendMessage ......................................... 8–25
startDataRow ........................................ 8–26
startElement ........................................ 8–26
storeNodeValue ...................................... 8–27
storeParameterNode .................................. 8–27
storeParameterValue ................................ 8–28
targetProcedure ..................................... 8–28
Methods for router messaging objects .............. 8–29
createDocument ...................................... 8–29
initializeObject ..................................... 8–29
internalSchemaFile .................................. 8–29
obtainInMsgTarget .................................. 8–30
processFileRefs ...................................... 8–30
routeBytesMessage .................................. 8–30
routeDocument ....................................... 8–31
routeMessage ........................................ 8–31
startB2BObject ...................................... 8–31
Message object properties .......................... 8–32
ClientId ............................................. 8–32
ConsumerSchema ..................................... 8–32
ContextForServer .................................... 8–32
CurrentMessage ...................................... 8–33
CurrentMessageId .................................... 8–33
Destination .......................................... 8–33
DestinationList ...................................... 8–33
Destinations ......................................... 8–33
DirectionList ........................................ 8–34
DocumentElement .................................... 8–34
DocumentHandle ...................................... 8–34
DocumentInitialized .................................. 8–34
Domain ............................................... 8–34
DTDPublicId ......................................... 8–34
DTDPublicIdList ..................................... 8–35
DTDSYSTEMID ........................................ 8–35
DTDSYSTEMIDList .................................... 8–35
ExternalRefList ...................................... 8–35
InMessageSource ..................................... 8–35
InternalRefList ....................................... 8–35
JMSpartition ......................................... 8–36
JMSpassword ......................................... 8–36
9. Alphabetic Listing of WebSpeed-specific API Routines
   addColumnLink ............................ 9–1
   addContextFields ........................ 9–2
   addSearchCriteria ......................... 9–4
   addTDMODifier ............................ 9–5
   anyMessage ................................ 9–6
   AddMode .................................. 9–6
   assignColumnFormat ...................... 9–6
   assignColumnHelp ........................ 9–7
   assignColumnLabel ....................... 9–7
   assignColumnWidth ....................... 9–7
   assignExtentAttribute ................... 9–8
   assignFields ............................. 9–9
   assignFields ............................. 9–9
   assignTDMODifier ......................... 9–10
   bufferHandle ............................. 9–11
   bufferHandle ............................. 9–11
   columnIndexType ......................... 9–11
   columnFormat ............................. 9–12
   columnHandle ............................. 9–12
<table>
<thead>
<tr>
<th>Method</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>columnHelp</td>
<td>9–12</td>
</tr>
<tr>
<td>columnHTMLName</td>
<td>9–13</td>
</tr>
<tr>
<td>columnHTMLName</td>
<td>9–13</td>
</tr>
<tr>
<td>columnLabel</td>
<td>9–14</td>
</tr>
<tr>
<td>columnReadOnly</td>
<td>9–14</td>
</tr>
<tr>
<td>columnStringValue</td>
<td>9–14</td>
</tr>
<tr>
<td>columnTable</td>
<td>9–15</td>
</tr>
<tr>
<td>columnTDMultiplier</td>
<td>9–15</td>
</tr>
<tr>
<td>columnValMsg</td>
<td>9–15</td>
</tr>
<tr>
<td>constructObject</td>
<td>9–16</td>
</tr>
<tr>
<td>dataAvailable</td>
<td>9–16</td>
</tr>
<tr>
<td>deleteBuffer</td>
<td>9–17</td>
</tr>
<tr>
<td>deleteOffsets</td>
<td>9–17</td>
</tr>
<tr>
<td>deleteRow</td>
<td>9–18</td>
</tr>
<tr>
<td>destroy</td>
<td>9–18</td>
</tr>
<tr>
<td>destroyDataObject</td>
<td>9–18</td>
</tr>
<tr>
<td>destroyObject</td>
<td>9–18</td>
</tr>
<tr>
<td>disconnectObject</td>
<td>9–19</td>
</tr>
<tr>
<td>dispatchUtilityProc</td>
<td>9–19</td>
</tr>
<tr>
<td>displayFields</td>
<td>9–20</td>
</tr>
<tr>
<td>enableFields</td>
<td>9–20</td>
</tr>
<tr>
<td>exclusiveLockBuffer</td>
<td>9–21</td>
</tr>
<tr>
<td>extentAttribute</td>
<td>9–21</td>
</tr>
<tr>
<td>extentValue</td>
<td>9–21</td>
</tr>
<tr>
<td>fetchCurrent</td>
<td>9–21</td>
</tr>
<tr>
<td>fetchFirst</td>
<td>9–22</td>
</tr>
<tr>
<td>fetchLast</td>
<td>9–22</td>
</tr>
<tr>
<td>fetchLast</td>
<td>9–22</td>
</tr>
<tr>
<td>fetchNext</td>
<td>9–23</td>
</tr>
<tr>
<td>fetchNext</td>
<td>9–23</td>
</tr>
<tr>
<td>fetchPrev</td>
<td>9–23</td>
</tr>
<tr>
<td>fieldExpression</td>
<td>9–23</td>
</tr>
<tr>
<td>findRecords</td>
<td>9–24</td>
</tr>
<tr>
<td>getAttribute</td>
<td>9–24</td>
</tr>
<tr>
<td>getAttribute</td>
<td>9–25</td>
</tr>
<tr>
<td>getContextFields</td>
<td>9–25</td>
</tr>
<tr>
<td>getCurrentPage</td>
<td>9–26</td>
</tr>
<tr>
<td>getCurrentRowids</td>
<td>9–26</td>
</tr>
<tr>
<td>getDeleteTables</td>
<td>9–26</td>
</tr>
<tr>
<td>getForeignFieldList</td>
<td>9–26</td>
</tr>
<tr>
<td>getFrameHandle</td>
<td>9–26</td>
</tr>
<tr>
<td>getNavigationMode</td>
<td>9–27</td>
</tr>
<tr>
<td>getNextHtmlField</td>
<td>9–27</td>
</tr>
<tr>
<td>getQueryEmpty</td>
<td>9–28</td>
</tr>
<tr>
<td>getQueryWhere</td>
<td>9–28</td>
</tr>
<tr>
<td>getRowids</td>
<td>9–28</td>
</tr>
<tr>
<td>getSearchColumns</td>
<td>9–29</td>
</tr>
<tr>
<td>getServerConnection</td>
<td>9–29</td>
</tr>
<tr>
<td>getTableRowids</td>
<td>9–29</td>
</tr>
<tr>
<td>getTableRows</td>
<td>9–29</td>
</tr>
<tr>
<td>getTables</td>
<td>9–30</td>
</tr>
<tr>
<td>getTables</td>
<td>9–30</td>
</tr>
<tr>
<td>getUpdateMode</td>
<td>9–30</td>
</tr>
<tr>
<td>getWebState</td>
<td>9–30</td>
</tr>
<tr>
<td>getWebTimeout</td>
<td>9–31</td>
</tr>
</tbody>
</table>
getWebTimeRemaining ............................ 9–31
getWebToHdr ................................. 9–31
htmAssociate .................. ............................ 9–32
HTMLAlert .............................................. 9–32
HTMLColumn ........................................ 9–33
HTMLSetFocus ....................................... 9–33
HTMLTable .......................................... 9–34
initializeObject ................... ............................... 9–34
inputFields ........................................ 9–35
joinExternalTables .................. ........................................ 9–36
joinForeignFields ......................... ........................................ 9–36
lockRow ........................................... 9–37
openQuery ........................................ 9–37
outputFields ....................................... 9–38
pageBackward ..................................... 9–38
processWebRequest .................. ....................................... 9–39
processWebRequest .................. ....................................... 9–39
processWebRequest .................. ....................................... 9–39
readOffsets ....................................... 9–40
removeEntry ....................................... 9–41
reOpenQuery ....................................... 9–41
rowidExpression .................................. 9–41
setAddMode ........................................ 9–42
setAppService ...................................... 9–42
setAttributeList .................... ....................................... 9–43
setBuffers ........................................ 9–43
setColumns ........................................ 9–44
setContextFields .................... ....................................... 9–44
setCurrentRowids .................. ....................................... 9–44
setDeleteTables .................... ....................................... 9–45
setExternalJoinList .................. ....................................... 9–45
setExternalTableList .................. ....................................... 9–46
setExternalTables .................. ....................................... 9–47
setExternalWhereList .................. ....................................... 9–47
setForeignFieldList .................. ....................................... 9–48
setFrameHandle ...................... ....................................... 9–48
setLinkColumns ...................... ....................................... 9–48
setLinkColumns ...................... ....................................... 9–49
setQueryWhere ..................... ....................................... 9–49
setSearchColumns .................. ....................................... 9–49
setServerConnection .................. ....................................... 9–49
setTableModifier .................. ....................................... 9–50
setTableRows ......................... ....................................... 9–50
setUpdateMode ....................... ....................................... 9–51
setUseColumnLabels .................. ....................................... 9–51
setWebState ......................... ....................................... 9–52
setWebToHdr ....................... ....................................... 9–52
showDataMessages .................. ....................................... 9–53
startDataObject .................. ....................................... 9–53
timingOut ........................................ 9–53
urlJoinParams ...................... ....................................... 9–54
urlLink ........................................... 9–54
validateColumns .................... ....................................... 9–55
validateColumnValue .................. ....................................... 9–55
## A. Progress Dynamics Call Wrapper

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invoking the call wrapper using dynlaunch.i</td>
<td>A–2</td>
</tr>
<tr>
<td>Invoking the call wrapper using a single-entry point</td>
<td>A–3</td>
</tr>
<tr>
<td>callstring.p</td>
<td>A–3</td>
</tr>
<tr>
<td>callstringtt.p</td>
<td>A–4</td>
</tr>
<tr>
<td>calltable.p</td>
<td>A–6</td>
</tr>
<tr>
<td>calltablett.p</td>
<td>A–8</td>
</tr>
<tr>
<td><strong>Temp-table include files</strong></td>
<td></td>
</tr>
<tr>
<td>calltables.i</td>
<td>A–9</td>
</tr>
<tr>
<td>callttparam.i</td>
<td>A–10</td>
</tr>
<tr>
<td><strong>Temp-table types</strong></td>
<td></td>
</tr>
<tr>
<td>Position native data type table</td>
<td>A–12</td>
</tr>
<tr>
<td>Position character table</td>
<td>A–14</td>
</tr>
<tr>
<td>Name native data type table</td>
<td>A–15</td>
</tr>
<tr>
<td>Name character table</td>
<td>A–16</td>
</tr>
<tr>
<td><strong>Invoking the call wrapper at the API level</strong></td>
<td></td>
</tr>
<tr>
<td><strong>API reference</strong></td>
<td></td>
</tr>
<tr>
<td>callstring.p procedure</td>
<td>A–23</td>
</tr>
<tr>
<td>callstringtt.p procedure</td>
<td>A–25</td>
</tr>
<tr>
<td>calltable.p procedure</td>
<td>A–27</td>
</tr>
<tr>
<td>calltablett.p procedure</td>
<td>A–29</td>
</tr>
<tr>
<td>cleanupCall procedure</td>
<td>A–31</td>
</tr>
<tr>
<td>determineTableType function</td>
<td>A–31</td>
</tr>
<tr>
<td>InvokeCall procedure</td>
<td>A–32</td>
</tr>
<tr>
<td>obtainCallInfo function</td>
<td>A–34</td>
</tr>
<tr>
<td>obtainParamPropValue function</td>
<td>A–34</td>
</tr>
<tr>
<td>obtainProcHandle function</td>
<td>A–35</td>
</tr>
<tr>
<td>setupTTFromSig function</td>
<td>A–35</td>
</tr>
<tr>
<td>setupTTFromString function</td>
<td>A–36</td>
</tr>
<tr>
<td>setupTTFromTable function</td>
<td>A–37</td>
</tr>
</tbody>
</table>

**Index**

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index</td>
<td>Index–1</td>
</tr>
</tbody>
</table>
## Figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 1–1</td>
<td>ADM2 class tree diagram showing inheritance relationships</td>
<td>1–4</td>
</tr>
<tr>
<td>Figure 1–2</td>
<td>Commented source code of GET pseudo-function</td>
<td>1–24</td>
</tr>
<tr>
<td>Figure A–1</td>
<td>Position native data type table definition</td>
<td>A–12</td>
</tr>
<tr>
<td>Figure A–2</td>
<td>Position character table type definition</td>
<td>A–14</td>
</tr>
<tr>
<td>Figure A–3</td>
<td>Name native data type table definition</td>
<td>A–15</td>
</tr>
<tr>
<td>Figure A–4</td>
<td>API calls required to invoke a Progress Dynamics call</td>
<td>A–18</td>
</tr>
</tbody>
</table>
Table 1–1: SmartObjects and their files .............................................. 1–5
Table 1–2: Class and custom files for SmartObjects .......................... 1–7
Table 1–3: Class and custom files for SmartContainers ..................... 1–7
Table 1–4: Class and custom files for AppServer .............................. 1–8
Table 1–5: Class and custom files for SmartBusinessObjects ............... 1–8
Table 1–6: Class and custom files for SmartB2BObjects .................... 1–9
Table 1–7: Class and custom files for MsgHandler ........................... 1–9
Table 1–8: Class and custom files for XML ..................................... 1–10
Table 1–9: Class and custom files for SmartCombo .......................... 1–10
Table 1–10: Class and custom files for SmartDataBrowser ................ 1–11
Table 1–11: Class and custom files for SmartDataField ...................... 1–11
Table 1–12: Custom and class files for SmartDataObjects .................. 1–12
Table 1–13: Custom and class files for queries ................................. 1–12
Table 1–14: Class and custom files for SmartDataViewer ................... 1–13
Table 1–15: Class and custom files for SmartDialog .......................... 1–14
Table 1–16: Class and custom files for SmartFilter ............................ 1–14
Table 1–17: Class and custom files for SmartFolder ........................... 1–15
Table 1–18: Class and custom files for SmartFrame ............................ 1–15
Table 1–19: Class and custom files for SmartLookup .......................... 1–16
Table 1–20: Class and custom files for SmartPanel ............................ 1–16
Table 1–21: Class and custom files for SmartProducer ........................ 1–17
Table 1–22: Class and custom files for Consumer ............................... 1–17
Table 1–23: Class and custom files for messaging .............................. 1–18
Table 1–24: Class and custom files for SmartRouter ........................... 1–18
Table 1–25: Class and custom files for SmartSelect ............................ 1–19
Table 1–26: Class and custom files for SmartSender and SmartReceiver .... 1–19
Table 1–27: Class and custom files for SmartToolBar .......................... 1–20
Table 1–28: Class and custom files for SmartWindow .......................... 1–21
Table 3–1: Color values for foreground and background widget attributes ..... 3–13
Table 3–2: Default color values for visual class attributes .................... 3–13
Table 3–3: Temp-table includes for TVController fields ...................... 3–70
Table 3–4: Browse column properties ............................................. 3–103
Table 3–5: Column properties for visual objects ............................... 3–104
Table 4–1: Column properties for container objects ........................... 4–55
Table 5–1: Column properties for query objects ............................... 5–108
Table 6–1: Action properties for toolbar objects ............................... 6–34
Table 7–1: Column properties for field objects ................................. 7–41
Examples

Example A–1: Example server-side procedure ........................................... A–4
Example A–2: Making a call to the obtainCustomerData procedure ............ A–5
Example A–3: Using calltable.p to invoke a call ..................................... A–6
Example A–4: Using calltable.p to invoke a call and to instantiate calls.p .... A–7
Example A–5: Using callstringtt.p to make a call .................................... A–8
Example A–6: Using the callttparam.i include file ................................... A–11
Example A–7: Parameters stored in a position native data type table .......... A–13
Example A–8: Parameters specified in iParamNo ...................................... A–13
Example A–9: Parameters stored in a position character table type ............ A–14
Example A–10: Name native data type table .......................................... A–15
Example A–11: Name character table definition ...................................... A–16
Example A–12: Steps for making Progress Dynamics calls ...................... A–19
Example A–13: Creating the parameter holder temp-table ....................... A–20
Example A–14: Deriving parameters from the signature ........................... A–21
Example A–15: Deriving parameters from a string to create a temp-table .... A–22
This Preface contains the following sections:

- Purpose
- Audience
- Organization
- Using this manual
- Typographical conventions
- Examples of syntax descriptions
- OpenEdge messages
- Third party acknowledgements
Purpose

This manual is an API reference manual for the OpenEdge® Application Development Model (ADM2). It describes the procedures and functions that define the default behavior of Progress® SmartObjects™.

Audience

This book is for OpenEdge ADM2 application developers. Developers who use the ADM2 need a strong understanding of the underlying ABL.

Organization

Chapter 1, “ADM2 SmartObject API Reference”

Provides a brief discussion of the ADM architecture, illustration of the class hierarchy tree, each of the current SmartObjects and the files that define them, the two syntaxes for property reads and writes, and tables showing properties defined in each of the class files

Chapter 2, “SmartObjects and Their Methods and Properties”

Lists and describes the methods (internal procedures and functions) and properties used for the base ADM2 SmartObjects.

Chapter 3, “Visual Objects and Their Methods and Properties”

Lists and describes the methods (internal procedures and functions) and properties used for visualization SmartObjects.

Chapter 4, “Container Objects and Their Methods and Properties”

Lists and describes the methods (internal procedures and functions) and properties used for container SmartObjects.

Chapter 5, “Data Objects and Their Methods and Properties”

Lists and describes the methods (internal procedures and functions) and properties used for query SmartObjects.

Chapter 6, “Toolbar Objects and Their Methods and Properties”

Lists and describes the methods (internal procedures and functions) and properties used for toolbar SmartObjects.

Chapter 7, “Field Objects and Their Methods and Properties”

Lists and describes the methods (internal procedures and functions) and properties used for field SmartObjects.
Chapter 8, “Messaging Objects and Their Methods and Properties”

Lists and describes the methods (internal procedures and functions) and properties used for messaging SmartObjects.

Chapter 9, “Alphabetical Listing of WebSpeed-specific API Routines”

Provides a description, including calling sequence, of each of the routines in the WebSpeed® super-procedure files.

Appendix A, “Progress Dynamics Call Wrapper”

This appendix provides information about the Progress Dynamics® Call Wrapper. The Progress Dynamics Call Wrapper provides an efficient way to dynamically invoke code with parameter lists that are defined at run time.

Using this manual

This manual is organized based on SmartObject type and each chapter lists and describes the methods and properties relevant to the specific SmartObjects type. Depending on the object type you want to create, refer to the chapter that covers that specific type of object.

For each chapter that describes properties that you can retrieve and set, the chapter provides a description of the get and set functions and identifies which properties can be read and which can be set.

For objects that use column or actions properties, these properties are listed in a table format and the chapter provides information about how to assign values for a property and identifies which properties can be read and which can be set.

OpenEdge provides a special purpose programming language for building business applications. In the documentation, the formal name for this language is ABL (Advanced Business Language). With few exceptions, all keywords of the language appear in all uppercase, using a font that is appropriate to the context. All other alphabetic language content appears in mixed case.

For the latest documentation updates see the OpenEdge Product Documentation category on PSDN http://www.psdn.com/library/kbcategory.jspa?categoryID=129.

References to ABL compiler and run-time features

ABL is both a compiled and interpreted language that executes in a run-time engine that the documentation refers to as the ABL Virtual Machine (AVM). When documentation refers to ABL source code compilation, it specifies ABL or the compiler as the actor that manages compile-time features of the language. When documentation refers to run-time behavior in an executing ABL program, it specifies the AVM as the actor that manages the specified run-time behavior in the program.
For example, these sentences refer to the ABL compiler’s allowance for parameter passing and the AVM’s possible response to that parameter passing at run time: “ABL allows you to pass a dynamic temp-table handle as a static temp-table parameter of a method. However, if at run time the passed dynamic temp-table schema does not match the schema of the static temp-table parameter, the AVM raises an error.” The following sentence refers to run-time actions that the AVM can perform using a particular ABL feature: “The ABL socket object handle allows the AVM to connect with other ABL and non-ABL sessions using TCP/IP sockets.”

References to ABL data types

ABL provides built-in data types, pre-defined class data types, and user-defined class data types. References to built-in data types follow these rules:

- Like most other keywords, references to specific built-in data types appear in all **UPPERCASE**, using a font that is appropriate to the context. No uppercase reference ever includes or implies any data type other than itself.
- Wherever *integer* appears, this is a reference to the INTEGER or INT64 data type.
- Wherever *decimal* appears, this is a reference to the DECIMAL data type.
- Wherever *numeric* appears, this is a reference to the INTEGER, INT64, or DECIMAL data type.

References to pre-defined class data types appear in mixed case with initial caps, for example, *Progress.Lang.Object*. References to user-defined class data types appear in mixed case, as specified for a given application example.

Typographical conventions

This manual uses the following typographical conventions:

<table>
<thead>
<tr>
<th>Convention</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bold</strong></td>
<td>Bold typeface indicates commands or characters the user types, provides emphasis, or the names of user interface elements.</td>
</tr>
<tr>
<td><em>Italic</em></td>
<td>Italic typeface indicates the title of a document, or signifies new terms.</td>
</tr>
<tr>
<td><strong>SMALL, BOLD CAPITAL LETTERS</strong></td>
<td>Small, bold capital letters indicate OpenEdge key functions and generic keyboard keys; for example, GET and CTRL.</td>
</tr>
<tr>
<td><strong>KEY1+KEY2</strong></td>
<td>A plus sign between key names indicates a simultaneous key sequence: you press and hold down the first key while pressing the second key. For example, <strong>CTRL+X</strong>.</td>
</tr>
<tr>
<td><strong>KEY1 KEY2</strong></td>
<td>A space between key names indicates a sequential key sequence: you press and release the first key, then press another key. For example, <strong>ESCAPE H</strong>.</td>
</tr>
</tbody>
</table>
Examples of syntax descriptions

In this example, ACCUM is a keyword, and aggregate and expression are variables:

**Syntax**

```
ACCUM aggregate expression
```

FOR is one of the statements that can end with either a period or a colon, as in this example:

```
FOR EACH Customer:
  DISPLAY Name.
END.
```

In this example, STREAM stream, UNLESS-HIDDEN, and NO-ERROR are optional:

**Syntax**

```
DISPLAY [ STREAM stream ] [ UNLESS-HIDDEN ] [ NO-ERROR ]
```

In this example, the outer (small) brackets are part of the language, and the inner (large) brackets denote an optional item:

**Syntax**

```
INITIAL [ constant [ , constant ] ]
```
A called external procedure must use braces when referencing compile-time arguments passed by a calling procedure, as shown in this example:

**Syntax**

```
{ &argument-name }
```

In this example, EACH, FIRST, and LAST are optional, but you can choose only one of them:

**Syntax**

```
PRESELECT [ EACH | FIRST | LAST ] record-phrase
```

In this example, you must include two expressions, and optionally you can include more. Multiple expressions are separated by commas:

**Syntax**

```
MAXIMUM ( expression, expression [ , expression ] ) ...
```

In this example, you must specify MESSAGE and at least one expression or SKIP [ (n) ], and any number of additional expression or SKIP [ ( n ) ] is allowed:

**Syntax**

```
MESSAGE { expression | SKIP [ ( n ) ] } ...
```

In this example, you must specify { include-file, then optionally any number of argument or &argument-name = "argument-value", and then terminate with }:

**Syntax**

```
{ include-file
  [ argument | &argument-name = "argument-value" ] ... }
```

### Long syntax descriptions split across lines

Some syntax descriptions are too long to fit on one line. When syntax descriptions are split across multiple lines, groups of optional and groups of required items are kept together in the required order.

In this example, WITH is followed by six optional items:

**Syntax**

```
WITH [ ACCUM max-length ] [ expression DOWN ]
[ CENTERED ] [ n COLUMNS ] [ SIDE-LABELS ]
[ STREAM-IO ]
```
Complex syntax descriptions with both required and optional elements

Some syntax descriptions are too complex to distinguish required and optional elements by bracketing only the optional elements. For such syntax, the descriptions include both braces (for required elements) and brackets (for optional elements).

In this example, ASSIGN requires either one or more field entries or one record. Options available with field or record are grouped with braces and brackets:

Syntax

ASSIGN { [ FRAME frame ] { field [ = expression ] }  
[ WHEN expression ] } ...  
| { record [ EXCEPT field ... ] } }

OpenEdge messages

OpenEdge displays several types of messages to inform you of routine and unusual occurrences:

- **Execution messages** inform you of errors encountered while OpenEdge is running a procedure; for example, if OpenEdge cannot find a record with a specified index field value.

- **Compile messages** inform you of errors found while OpenEdge is reading and analyzing a procedure before running it; for example, if a procedure references a table name that is not defined in the database.

- **Startup messages** inform you of unusual conditions detected while OpenEdge is getting ready to execute; for example, if you entered an invalid startup parameter.

After displaying a message, OpenEdge proceeds in one of several ways:

- Continues execution, subject to the error-processing actions that you specify or that are assumed as part of the procedure. This is the most common action taken after execution messages.

- Returns to the Procedure Editor, so you can correct an error in a procedure. This is the usual action taken after compiler messages.

- Halts processing of a procedure and returns immediately to the Procedure Editor. This does not happen often.

- Terminates the current session.

OpenEdge messages end with a message number in parentheses. In this example, the message number is 200:

```
** Unknown table name table. (200)
```

If you encounter an error that terminates OpenEdge, note the message number before restarting.
Obtaining more information about OpenEdge messages

In Windows platforms, use OpenEdge online help to obtain more information about OpenEdge messages. Many OpenEdge tools include the following Help menu options to provide information about messages:

- Choose **Help → Recent Messages** to display detailed descriptions of the most recent OpenEdge message and all other messages returned in the current session.

- Choose **Help → Messages** and then type the message number to display a description of a specific OpenEdge message.

- In the Procedure Editor, press the **HELP** key or **F1**.

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The behavior of each type of Progress® SmartObject™ is defined by a set of methods (procedures and functions) based on one or more classes in super-procedure files. Super-procedure files are comparable to dynamically-linked run-time libraries in that they are loaded into memory as required by an application, and typically make their internal routines available to callers during a session. This reference describes the ADM2 methods and properties supplied in the current release of OpenEdge®.

For information about the ADM2 and creating or modifying SmartObjects, see the *OpenEdge Development: ADM and SmartObjects*. For information about creating applications with SmartObjects, see the *OpenEdge Development: AppBuilder*. For information about SmartObjects in a Progress Dynamics® environment, see *OpenEdge Development: Progress Dynamics Advanced Development* and *OpenEdge Development: Progress Dynamics Basic Development*. This chapter provides information about the following:

- Paths to source files
- Source-file types
- ADM class hierarchy
- SmartObjects, templates, and super-procedure hierarchies
- SmartObjects and their files
- Reading and writing object properties
Paths to source files

The default paths to the files defining the SmartObjects are:

- **Class Source Path** — src\adm2
- **Class Rcode Path** — adm2
- **Class Template Path** — src\adm2\template

The default paths to the ADM2 files supporting WebSpeed are:

- **Class Source Path** — src\web2
- **Class Rcode Path** — web2
- **Class Template Path** — src\web2\template

Objects defined under the original ADM standard (Version 8) continue to be supported. You can find their files by changing adm2 to adm (or web2 to web) in the paths shown.
Source-file types

Each ADM class is defined by a group of files. Some of the files define the base class as distributed with OpenEdge. Others—they have the substring “custom” in their names—are supplied as a convenience to you and stored in src\adm2\custom. Use those when you write custom extensions or modifications. By doing so, you reduce the risk of accidently destroying your work when you update your OpenEdge distribution.

The naming convention for all files is: classname+filetype.extension. The classname portion can be spelled out in one filename but abbreviated in another within the same group, usually depending on total length. There is no convention for these abbreviations.

The standard files and their roles are:

- **classname.cld** — The class-definition file. It lists, in a comment, the class category, derivation, and the names of the class files.
- **classname.i, classnamenomodule.i** — The primary and custom include-files. Unlike similar files in other languages such as C, these include-files sometimes have whole executable routines defined in them.
- **classname.p, classnamenomodule.p** — The primary and custom super-procedure files. These files contain the source code for most of the routines that define the class.
- **classnameprop.i, classnamenomoduleprop.i** — The primary and custom property-definition files.
- **classnameproto.i, classnamenomoduleproto.i** — The primary and custom prototype files. These files contain prototype definitions for the routines in the super-procedure files (IN SUPER). Prototype definitions are not the same as FORWARD declarations.
- **classname.w** — The template file.
- **classnameexclcustom.i** — The (custom) exclusions file. This file defines EXCLUDE-identifier preprocessor variables that exclude routines from the super procedure.
- **classnamedefnmodulecustom.i** — The (custom) instance-definitions file. This file deals with custom instance properties and defines the corresponding instance-property dialog box.

For additional information, see *OpenEdge Development: ADM and SmartObjects*. 
ADM class hierarchy

Figure 1–1 illustrates the hierarchy of relationships between the ADM classes used to create the objects. All Objects begin with the base Smart Object and from this object, you extend classes to create the other objects.

Figure 1–1: ADM2 class tree diagram showing inheritance relationships
Table 1–1 summarizes the current set of SmartObjects, the groups of super-procedure files that define their capabilities, and the template files from which finished objects are created.

<table>
<thead>
<tr>
<th>SmartObject</th>
<th>Super-procedure files</th>
<th>Template files</th>
</tr>
</thead>
<tbody>
<tr>
<td>SmartObject</td>
<td>smart.p</td>
<td>smart.w</td>
</tr>
<tr>
<td>SmartContainer™</td>
<td>smart.p containr.p</td>
<td>cntnrsimp1.w</td>
</tr>
<tr>
<td>SmartBusinessObject™</td>
<td>smart.p visual.p (appserver.p) containr.p sbo.p sboext.p</td>
<td>sbo.w</td>
</tr>
<tr>
<td>SmartB2BObject™</td>
<td>smart.p msghandler.p xml.p b2b.p</td>
<td>b2b.w dynb2b.w</td>
</tr>
<tr>
<td>SmartCombo™</td>
<td>smart.p visual.p field.p combo.p</td>
<td>dyncombo.w</td>
</tr>
<tr>
<td>SmartConsumer™ (complements SmartProducer™)</td>
<td>smart.p messaging.p consumer.p</td>
<td>consumer.w dynconsumer.w</td>
</tr>
<tr>
<td>SmartDataBrowser™</td>
<td>smart.p visual.p datavis.p browser.p</td>
<td>browser.w dynbrowser.w</td>
</tr>
<tr>
<td>SmartDataField™</td>
<td>smart.p visual.p field.p</td>
<td>field.w</td>
</tr>
<tr>
<td>SmartDataObject™</td>
<td>smart.p (appserver.p) dataquery.p query.p queryext.p data.p dataext.p</td>
<td>data.w dyndata.w</td>
</tr>
<tr>
<td>DataViw</td>
<td>smart.p (appserver.p) dataquery.p dataview.p</td>
<td>dataview.w</td>
</tr>
<tr>
<td>SmartDataViewer™</td>
<td>smart.p visual.p datavis.p viewer.p</td>
<td>viewer.w</td>
</tr>
<tr>
<td>SmartDialog™</td>
<td>smart.p visual.p containr.p</td>
<td>cntnrdlg.w</td>
</tr>
<tr>
<td>SmartFilter™</td>
<td>smart.p visual.p filter.p</td>
<td>dynfilter.w</td>
</tr>
<tr>
<td>SmartObject</td>
<td>Super-procedure files</td>
<td>Template files</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>----------------------------------------------</td>
<td>------------------</td>
</tr>
</tbody>
</table>
| SmartFolder™                      | smart.p  
visual.p  
datavis.p | folder.w        |
| SmartFrame™                       | smart.p  
visual.p  
containr.p | cntnrfrm.w      |
| SmartLookup™                      | smart.p  
visual.p  
field.p  
lookup.p | dynlookup.w     |
| SmartPanel™                       | smart.p  
visual.p  
panel.p  
toolbar.p | pcommit.w  
pnavico.w  
pnavlbl.w  
pupdsav.w |
| SmartProducer (complements        | smart.p  
messaging.p  
producer.p | dynproducer.w   |
SmartConsumer)                    |                                             |                  |
| SmartReceiver (complements        | smart.p  
messaging.p  
producer.p | receiver.w      |
SmartSender)                      |                                             |                  |
| SmartRouter™                      | smart.p  
msghandler.p  
xml.p  
router.p | dynrouter.w     |
| SmartSelect™                      | smart.p  
visual.p  
field.p  
select.p | dynselect.w     |
| SmartSender™                      | smart.p  
messaging.p  
producer.p | sender.w        |
| SmartSender™                      | smart.p  
messaging.p  
producer.p | sender.w        |
| SmartToolbar™                     | smart.p  
visual.p  
panel.p  
toolbar.p | dyntoolbar.w    |
SmartObjects and their files

This section briefly describes each of the SmartObjects in the current distribution and lists all the files that define it.

**SmartObject**

The SmartObject is the base object used for defining other objects. It has no special class identity of its own but is an expression of the class Smart.

The file `src/adm2/smart.p` is the super procedure supporting the base SmartObject. Table 1–2 lists the class and custom files related to `smart.p`.

<table>
<thead>
<tr>
<th>Class files</th>
<th>Customer files</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td>smart.cld</td>
</tr>
<tr>
<td>Method</td>
<td>smart.i</td>
</tr>
<tr>
<td>Property</td>
<td>smrtprop.i</td>
</tr>
<tr>
<td>Prototype</td>
<td>smrtppto.i</td>
</tr>
<tr>
<td>Template</td>
<td>smart.w</td>
</tr>
<tr>
<td>Other</td>
<td>admmsgs.i</td>
</tr>
</tbody>
</table>

**SmartContainer**

The SmartContainer provides all functionality from the class Container without the overhead of a visible run-time representation. It has no special class or super-procedure file of its own but is an expression of the Container class and uses `containr.p` as its super-procedure file. Table 1–3 lists the class and custom files related to `containr.p`.

<table>
<thead>
<tr>
<th>Class files</th>
<th>Customer files</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td>containr.cld</td>
</tr>
<tr>
<td>Method</td>
<td>containr.i</td>
</tr>
<tr>
<td>Property</td>
<td>cntnprop.i</td>
</tr>
<tr>
<td>Prototype</td>
<td>cntnprto.i</td>
</tr>
<tr>
<td>Template</td>
<td>cntnrsqlmpl.w</td>
</tr>
<tr>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>
**AppServer class**

If the macro `{&APP-SERVER-VARS}` is defined, the Container and Query classes inherit from the AppServer™ class, represented by the super procedure `appserver.p`. To force the macro to be defined, set the **AppServer-Aware** check box in the Procedure Settings dialog box for the object. If there is no such check box, or it is disabled, then you cannot force the definition. Table 1–4 lists the class and custom files related to `appserver.p`.

<table>
<thead>
<tr>
<th>Table 1–4: Class and custom files for AppServer</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Class files</strong></td>
</tr>
<tr>
<td>Definition</td>
</tr>
<tr>
<td>appserver.cld</td>
</tr>
<tr>
<td>Method</td>
</tr>
<tr>
<td>appserver.i</td>
</tr>
<tr>
<td>Property</td>
</tr>
<tr>
<td>appsprop.i</td>
</tr>
<tr>
<td>Prototype</td>
</tr>
<tr>
<td>appsprto.i</td>
</tr>
<tr>
<td>Template</td>
</tr>
<tr>
<td>–</td>
</tr>
<tr>
<td>–</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

**SmartBusinessObject**

The SmartBusinessObject integrates up to 20 SmartDataObjects. It is a special-purpose organizer object and a member of the class Container. SmartBusinessObjects provide a single point of contact for other objects, and allow you to synchronize updates on multiple SmartDataObjects in a single server-side transaction.

The class name of the object is SBO. It is a user-defined class. The file `src/adm2/sbo.p` is the super procedure file for the SBO class. Table 1–5 lists the class and custom files related to `sbo.p`.

<table>
<thead>
<tr>
<th>Table 1–5: Class and custom files for SmartBusinessObjects</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Class files</strong></td>
</tr>
<tr>
<td>Definition</td>
</tr>
<tr>
<td>sbo.cld</td>
</tr>
<tr>
<td>Method</td>
</tr>
<tr>
<td>sbo.i</td>
</tr>
<tr>
<td>Property</td>
</tr>
<tr>
<td>sboprop.i</td>
</tr>
<tr>
<td>Prototype</td>
</tr>
<tr>
<td>sboprto.i</td>
</tr>
<tr>
<td>Template</td>
</tr>
<tr>
<td>sbo.w</td>
</tr>
<tr>
<td>Overflow file</td>
</tr>
<tr>
<td>sboext.p</td>
</tr>
<tr>
<td>Additional method files</td>
</tr>
</tbody>
</table>
SmartB2BObject

The SmartB2BObject transforms data between XML and ABL based on an agreed-upon XML schema mapped to local data representations. It performs this service on behalf of other SmartObjects, particularly the SmartBusinessObject and SmartDataObject.

A single instance transforms either inbound or outbound messages, but not both. Two instances of this object are required when transforming both inbound and outbound messages.

The class name of the object is B2B, and it inherits from classes MsgHandler and XML. All are user-defined classes.

The file `src/adm2/b2b.p` is the super procedure for the SmartB2BObject class. It contains logic that uses the XML mapping schema to read or store data in data objects. Table 1–6 lists the class and custom files related to `b2b.p`.

### Table 1–6: Class and custom files for SmartB2BObjects

<table>
<thead>
<tr>
<th>Class files</th>
<th>Customer files</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition</strong></td>
<td><strong>Super</strong></td>
</tr>
<tr>
<td>b2b.cld</td>
<td>b2bcustom.p</td>
</tr>
<tr>
<td><strong>Method</strong></td>
<td><strong>Method</strong></td>
</tr>
<tr>
<td>b2b.i</td>
<td>b2bcustom.i</td>
</tr>
<tr>
<td><strong>Property</strong></td>
<td><strong>Property</strong></td>
</tr>
<tr>
<td>b2bprop.i</td>
<td>b2bpropcustom.i</td>
</tr>
<tr>
<td><strong>Prototype</strong></td>
<td><strong>Prototype</strong></td>
</tr>
<tr>
<td>b2bprto.i</td>
<td>b2bprtocustom.i</td>
</tr>
<tr>
<td><strong>Template</strong></td>
<td><strong>Exclude</strong></td>
</tr>
<tr>
<td>b2b.w</td>
<td>b2bexclcustom.i</td>
</tr>
<tr>
<td>dynb2b.w</td>
<td>–</td>
</tr>
<tr>
<td><strong>Instance</strong></td>
<td><strong>Instance</strong></td>
</tr>
<tr>
<td>–</td>
<td>b2bdefscustom.i</td>
</tr>
</tbody>
</table>

MsgHandler class

The MsgHandler class is represented by the super procedure `msghandler.p`. Table 1–7 lists the class and custom files related to `msghandler.p`.

### Table 1–7: Class and custom files for MsgHandler

<table>
<thead>
<tr>
<th>Class files</th>
<th>Customer files</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition</strong></td>
<td><strong>Super</strong></td>
</tr>
<tr>
<td>msghandler.cld</td>
<td>msghandlercustom.p</td>
</tr>
<tr>
<td><strong>Method</strong></td>
<td><strong>Method</strong></td>
</tr>
<tr>
<td>msghandler.i</td>
<td>msghandlercustom.i</td>
</tr>
<tr>
<td><strong>Property</strong></td>
<td><strong>Property</strong></td>
</tr>
<tr>
<td>msghprop.i</td>
<td>msghpropcustom.i</td>
</tr>
<tr>
<td><strong>Prototype</strong></td>
<td><strong>Prototype</strong></td>
</tr>
<tr>
<td>msghprto.i</td>
<td>msghprtocustom.i</td>
</tr>
<tr>
<td><strong>Template</strong></td>
<td><strong>Exclude</strong></td>
</tr>
<tr>
<td>msghandler.w</td>
<td>msghandlerexclcustom.i</td>
</tr>
<tr>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Instance</strong></td>
<td><strong>Instance</strong></td>
</tr>
<tr>
<td>–</td>
<td>msghandlerdefscustom.i</td>
</tr>
</tbody>
</table>
XML class

The Xml.p file presents a simplified DOM API by encapsulating the ABL DOM statements so that x-noderef handles never need to be exposed to b2b.p. Table 1–8 lists the class and custom files related to xml.p.

Table 1–8: Class and custom files for XML

<table>
<thead>
<tr>
<th>Class files</th>
<th>Customer files</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td>xml.cld</td>
</tr>
<tr>
<td>Method</td>
<td>xml.i</td>
</tr>
<tr>
<td>Property</td>
<td>xmlprop.i</td>
</tr>
<tr>
<td>Prototype</td>
<td>xmlproto.i</td>
</tr>
<tr>
<td>Template</td>
<td>xml.w</td>
</tr>
<tr>
<td>Instance</td>
<td>–</td>
</tr>
</tbody>
</table>

SmartCombo

The SmartCombo extends ADM2 Smart technology to the Combo Box level. The class Combo is a user-defined class. Table 1–9 lists the class and custom files related to combo.p.

Table 1–9: Class and custom files for SmartCombo

<table>
<thead>
<tr>
<th>Class files</th>
<th>Customer files</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td>combo.cld</td>
</tr>
<tr>
<td>Method</td>
<td>combo.i</td>
</tr>
<tr>
<td>Property</td>
<td>comboprop.i</td>
</tr>
<tr>
<td>Prototype</td>
<td>combproto.i</td>
</tr>
<tr>
<td>Template</td>
<td>dyncombo.w</td>
</tr>
<tr>
<td>Instance</td>
<td>–</td>
</tr>
</tbody>
</table>

SmartConsumer

See the “SmartProducer and SmartConsumer” section on page 1–17.
SmartDataBrowser

The SmartDataBrowser displays multiple virtual records in a simple, tabular row/column format. It obtains and updates the data in cooperation with a SmartDataObject or SmartBusinessObject. This object is supplied in both dynamic and customizable versions.

The class name of the object is Browser. It is a OpenEdge class, and the file src/adm2/sbo.p is its super procedure. Browser inherits from OpenEdge class DataVis. Table 1–10 lists the class and custom files related to browser.p.

Table 1–10: Class and custom files for SmartDataBrowser

<table>
<thead>
<tr>
<th>Class files</th>
<th>Customer files</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition</strong></td>
<td>browser.cld</td>
</tr>
<tr>
<td><strong>Method</strong></td>
<td>browser.i</td>
</tr>
<tr>
<td><strong>Property</strong></td>
<td>brsprop.i</td>
</tr>
<tr>
<td><strong>Prototype</strong></td>
<td>brsproto.i</td>
</tr>
<tr>
<td><strong>Template</strong></td>
<td>browser.w</td>
</tr>
<tr>
<td><strong>Additional method files</strong></td>
<td>brschnge.i</td>
</tr>
<tr>
<td></td>
<td>brsentry.i</td>
</tr>
<tr>
<td></td>
<td>brshome.i</td>
</tr>
<tr>
<td></td>
<td>brsleave.i</td>
</tr>
<tr>
<td></td>
<td>brsoffhm.i</td>
</tr>
<tr>
<td></td>
<td>brsoffnd.i</td>
</tr>
<tr>
<td></td>
<td>brsscroll.i</td>
</tr>
<tr>
<td><strong>Instance</strong></td>
<td>browserdefscustom.i</td>
</tr>
</tbody>
</table>

SmartDataField

The SmartDataField brings Smart technology down to the field level. You can create a SmartDataField object using any visualization you desire, and insert it as a replacement for one of the standard Fill-ins that make up a SmartDataViewer.

The class name of the object is Field. It is a OpenEdge class, and the file src/adm2/field.p is its super procedure. Table 1–11 lists the class and custom files related to field.p.

Table 1–11: Class and custom files for SmartDataField

<table>
<thead>
<tr>
<th>Class files</th>
<th>Custom files</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition</strong></td>
<td>field.cld</td>
</tr>
<tr>
<td><strong>Method</strong></td>
<td>field.i</td>
</tr>
<tr>
<td><strong>Property</strong></td>
<td>fieldprop.i</td>
</tr>
<tr>
<td><strong>Prototype</strong></td>
<td>fieldproto.i</td>
</tr>
<tr>
<td><strong>Template</strong></td>
<td>field.w</td>
</tr>
<tr>
<td><strong>Instance</strong></td>
<td>fielddefscustom.i</td>
</tr>
</tbody>
</table>
SmartDataObject

The SmartDataObject is a data pump. It creates and manages a data stream based on the terms of a query that you define within it. You can often avoid complicated JOINs by linking SmartDataObjects together, each managing a single table. If your application runs in a distributed environment, you can update multiple SmartDataObjects on an AppServer by linking them inside a SmartBusinessObject.

The class name of the SmartDataObject is Data, and it inherits from class Query. Both are OpenEdge classes, and the file src/adm2/data.p is Data’s super procedure. Table 1–12 lists the class and custom files related to data.p.

Table 1–12: Custom and class files for SmartDataObjects

<table>
<thead>
<tr>
<th>Class files</th>
<th>Custom files</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td>data.cld</td>
</tr>
<tr>
<td>Method</td>
<td>data.i</td>
</tr>
<tr>
<td>Property</td>
<td>dataprop.i</td>
</tr>
<tr>
<td>Prototype</td>
<td>dataprto.i</td>
</tr>
<tr>
<td>Template</td>
<td>data.w</td>
</tr>
<tr>
<td>Overflow Files</td>
<td>dataext.p</td>
</tr>
<tr>
<td>Additional Method Files</td>
<td>cltorsvr.i</td>
</tr>
</tbody>
</table>

Query class

The super-procedure file for class Query is query.p. Table 1–13 lists the class and custom files related to query.p.

Table 1–13: Custom and class files for queries

<table>
<thead>
<tr>
<th>Class files</th>
<th>Custom files</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td>query.cld</td>
</tr>
<tr>
<td>Method</td>
<td>query.i</td>
</tr>
<tr>
<td>Property</td>
<td>qryprop.i</td>
</tr>
<tr>
<td>Prototype</td>
<td>qryprto.i</td>
</tr>
</tbody>
</table>
**Note:** If the macro `{&APP-SERVER-VARS}` is defined, the Query class inherits from the AppServer class, represented by the super procedure `appserver.p`. To force the macro to be defined, set the AppServer-Aware check box in the Procedure Settings dialog box for your object. If there is no such check box, or it is disabled, then you cannot force the definition in that instance. For the list of files defining the AppServer class, see the “AppServer class” section on page 1–8.

**SmartDataViewer**

The SmartDataViewer displays a single virtual record at a time using a combination of basic fill-ins and, if you choose, SmartDataFields. It obtains and updates the data in cooperation with a SmartDataObject or SmartBusinessObject.

Its class is Viewer, a OpenEdge class, for which the file `src/adm2/data.p` is its super procedure. Table 1–14 lists the class and custom files related to `viewer.p`.

**SmartDialog**

The SmartDialog is a special type of Frame object supported by a dedicated Window. One of several expressions of the class Container, it is a modal object. Because modal objects completely own the focus while open, they are best used to capture data without which the application cannot continue.
The SmartDialog has no class of its own; the file src/adm2/containr.p is its super procedure. Table 1–15 lists the class and custom files related to containr.p and the SmartDialog.

Table 1–15: Class and custom files for SmartDialog

<table>
<thead>
<tr>
<th>Class files</th>
<th>Custom files</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td>containrcustom.p</td>
</tr>
<tr>
<td>Method</td>
<td>containrcustom.i</td>
</tr>
<tr>
<td>Property</td>
<td>cntnpropcustom.i</td>
</tr>
<tr>
<td>Prototype</td>
<td>cntnprtocustom.i</td>
</tr>
<tr>
<td>Template</td>
<td>containrexclcustom.i</td>
</tr>
<tr>
<td>Additional method file</td>
<td>containrdefscustom.i</td>
</tr>
</tbody>
</table>

**SmartFilter**

The SmartFilter allows the user to reduce a data stream to a more manageable size, in real time. Logically, SmartFilter resides between some SmartDataObject and some visualization object such as a SmartDataBrowser. By choosing different setups for the Filter, you can give the eventual user more or less control over the contents of the data stream being displayed.

This object’s class is Filter, a OpenEdge class, and its super-procedure file is src/adm2/filter.p. Table 1–16 lists the class and custom files related to filter.p.

Table 1–16: Class and custom files for SmartFilter

<table>
<thead>
<tr>
<th>Class files</th>
<th>Custom files</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td>filtercustom.p</td>
</tr>
<tr>
<td>Method</td>
<td>filtercustom.i</td>
</tr>
<tr>
<td>Property</td>
<td>filtpropcustom.i</td>
</tr>
<tr>
<td>Prototype</td>
<td>filtprtocustom.i</td>
</tr>
<tr>
<td>Template</td>
<td>filterexclcustom.i</td>
</tr>
<tr>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Instance</td>
<td>filterdefscustom.i</td>
</tr>
</tbody>
</table>
SmartFolder

The SmartFolder implements a version of the now-standard tabbed-folders metaphor. SmartFolder is an expression of the Visual class, and has only a template file of its own. The super-procedure file for the Visual class is src/adm2/visual.p. Table 1–17 lists the class and custom files related to visual.p.

Table 1–17: Class and custom files for SmartFolder

<table>
<thead>
<tr>
<th>Class files</th>
<th>Custom files</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td>–</td>
</tr>
<tr>
<td>Method</td>
<td>–</td>
</tr>
<tr>
<td>Property</td>
<td>–</td>
</tr>
<tr>
<td>Prototype</td>
<td>–</td>
</tr>
<tr>
<td>Template</td>
<td>folder.w</td>
</tr>
<tr>
<td></td>
<td>Exclude</td>
</tr>
</tbody>
</table>

SmartFrame

The SmartFrame provides a platform for constructing reusable subsystems. Like the SmartDialog and the SmartWindow, the SmartFrame has no special class of its own: it is an expression of the Container class, for which the super-procedure file is src/adm2/containr.p. Table 1–18 lists the class and custom files related to containr.p and SmartFrame.

Table 1–18: Class and custom files for SmartFrame

<table>
<thead>
<tr>
<th>Class files</th>
<th>Custom files</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td>–</td>
</tr>
<tr>
<td>Method</td>
<td>–</td>
</tr>
<tr>
<td>Property</td>
<td>–</td>
</tr>
<tr>
<td>Prototype</td>
<td>–</td>
</tr>
<tr>
<td>Template</td>
<td>cntnrfrm.w</td>
</tr>
<tr>
<td></td>
<td>Exclude</td>
</tr>
<tr>
<td></td>
<td>Instance</td>
</tr>
</tbody>
</table>
SmartLookup

The SmartLookup is a faster but less-general version of the SmartSelect. It provides quick, read-only lookup using a focused, dynamic query. The class Lookup is a user-defined class. Table 1–19 lists the class and custom files related to lookup.p.

Table 1–19: Class and custom files for SmartLookup

<table>
<thead>
<tr>
<th>Class files</th>
<th>Custom files</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td>lookup.cld</td>
</tr>
<tr>
<td>Method</td>
<td>lookup.i</td>
</tr>
<tr>
<td>Property</td>
<td>lookprop.i</td>
</tr>
<tr>
<td>Prototype</td>
<td>lookprto.i</td>
</tr>
<tr>
<td>Template</td>
<td>dynlookup.w</td>
</tr>
<tr>
<td>Instance</td>
<td></td>
</tr>
</tbody>
</table>

SmartPanel

The SmartPanel presents an array of related buttons. Several such arrays, dedicated to different purposes, are supplied with AppBuilder. These arrays are all members of the OpenEdge class Panel. Panel inherits from class Visual, and its super-procedure file is src/adm2/panel.p. Table 1–20 lists the class and custom files related to panel.p.

Table 1–20: Class and custom files for SmartPanel

<table>
<thead>
<tr>
<th>Class files</th>
<th>Custom files</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td>panel1.cld</td>
</tr>
<tr>
<td>Method</td>
<td>panel1.i</td>
</tr>
<tr>
<td>Property</td>
<td>panlprop.i</td>
</tr>
<tr>
<td>Prototype</td>
<td>panlprto.i</td>
</tr>
<tr>
<td>Template</td>
<td>pcommit.w</td>
</tr>
<tr>
<td></td>
<td>pnavico.w</td>
</tr>
<tr>
<td></td>
<td>pnavlbl.w</td>
</tr>
<tr>
<td></td>
<td>pupdsav.w</td>
</tr>
<tr>
<td>Instance</td>
<td></td>
</tr>
</tbody>
</table>
SmartProducer and SmartConsumer

The SmartMessageProducer sends messages using some message-transport system. At present, the only transport system supported is SonicMQ.

On demand, SmartMessageProducer creates a message body of the appropriate kind, passes it back to the requesting object—such as a SmartB2BObject or SmartSender—to be filled in, and finally inserts the message into the outbound message-transport queue. If it receives a reply to a message, it accepts it and passes it upstream for processing.

The SmartConsumer handles inbound traffic from some message-transport system. It accepts incoming messages and passes them on for processing by some other object such as a SmartB2BObject or SmartReceiver. It also sends reply messages when required.

The class names of the objects are Producer and Consumer, respectively. They are OpenEdge classes derived from the Messaging class.

The file src/adm2/producer.p is the super procedure for the class SmartProducer. The file src/adm2/consumer.p is the super procedure for the class SmartConsumer. Table 1–21 lists the class and custom files related to producer.p.

Table 1–21: Class and custom files for SmartProducer

<table>
<thead>
<tr>
<th>Class files</th>
<th>Custom files</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td>producercustom.p</td>
</tr>
<tr>
<td>Method</td>
<td>producercustom.i</td>
</tr>
<tr>
<td>Property</td>
<td>prodpropcustom.i</td>
</tr>
<tr>
<td>Prototype</td>
<td>prodprtocustom.i</td>
</tr>
<tr>
<td>Template</td>
<td>producerexclcustom.i</td>
</tr>
<tr>
<td>Instance</td>
<td>producerdefscustom.i</td>
</tr>
</tbody>
</table>

Table 1–22 lists the files for the Consumer class.

Table 1–22: Class and custom files for Consumer

<table>
<thead>
<tr>
<th>Class files</th>
<th>Custom files</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td>consumercustom.p</td>
</tr>
<tr>
<td>Method</td>
<td>consumercustom.i</td>
</tr>
<tr>
<td>Property</td>
<td>conspropcustom.i</td>
</tr>
<tr>
<td>Prototype</td>
<td>consprtocustom.i</td>
</tr>
<tr>
<td>Template</td>
<td>consumerexclcustom.i</td>
</tr>
<tr>
<td>Instance</td>
<td>consumerdefscustom.i</td>
</tr>
</tbody>
</table>
Messaging class

The file `src/adm2/messaging.p` is the super procedure for the class Messaging. Table 1–23 lists the class and custom files related to `messaging.p`.

Table 1–23: Class and custom files for messaging

<table>
<thead>
<tr>
<th>Class files</th>
<th>Custom files</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td><code>messaging.cld</code></td>
</tr>
<tr>
<td>Method</td>
<td><code>messaging.i</code></td>
</tr>
<tr>
<td>Property</td>
<td><code>messprop.i</code></td>
</tr>
<tr>
<td>Prototype</td>
<td><code>messprto.i</code></td>
</tr>
<tr>
<td>Template</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Exclude</td>
</tr>
<tr>
<td></td>
<td><code>messpropcustom.i</code></td>
</tr>
<tr>
<td></td>
<td><code>messprtocustom.i</code></td>
</tr>
<tr>
<td></td>
<td><code>messagingexclcustom.i</code></td>
</tr>
<tr>
<td></td>
<td><code>messagingdefscustom.i</code></td>
</tr>
</tbody>
</table>

SmartRouter

The SmartRouter is a utility object that routes incoming documents to the appropriate SmartB2BObject for transformation. The SmartRouter uses the Router class, a user-defined class whose super-procedure file is `src/adm2/router.p`. Table 1–24 lists the class and custom files related to `router.p`.

Table 1–24: Class and custom files for SmartRouter

<table>
<thead>
<tr>
<th>Class files</th>
<th>Custom files</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td><code>router.cld</code></td>
</tr>
<tr>
<td>Method</td>
<td><code>router.i</code></td>
</tr>
<tr>
<td>Property</td>
<td><code>routprop.i</code></td>
</tr>
<tr>
<td>Prototype</td>
<td><code>routprto.i</code></td>
</tr>
<tr>
<td>Template</td>
<td><code>router.w</code></td>
</tr>
<tr>
<td></td>
<td>Exclude</td>
</tr>
<tr>
<td></td>
<td><code>routpropcustom.i</code></td>
</tr>
<tr>
<td></td>
<td><code>routprtocustom.i</code></td>
</tr>
<tr>
<td></td>
<td><code>routerexclcustom.i</code></td>
</tr>
<tr>
<td></td>
<td><code>routerdefscustom.i</code></td>
</tr>
</tbody>
</table>
SmartSelect

The SmartSelect object is a type of SmartDataField. It represents a self-populating Selection List. Its class is a OpenEdge-type class, Select, whose super-procedure file is src/adm2/select.p. Table 1–25 lists the class and custom files related to select.p.

Table 1–25: Class and custom files for SmartSelect

<table>
<thead>
<tr>
<th>Class files</th>
<th>Custom files</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td>select.cld</td>
</tr>
<tr>
<td>Method</td>
<td>seleprop.i</td>
</tr>
<tr>
<td>Property</td>
<td>seleprto.i</td>
</tr>
<tr>
<td>Prototype</td>
<td>select.w</td>
</tr>
<tr>
<td>Template</td>
<td>select.w</td>
</tr>
</tbody>
</table>

SmartSender and SmartReceiver

These message-handling objects can usually be substituted for the SmartB2BObject when you do not need to perform protocol-based transformation between XML and ABL. To use these objects, you must complete their handler routines to suit your customer’s business needs. You can make the handler functions as simple or complex as you like.

The SmartSender and SmartReceiver objects are based on the msghandler class, whose super procedure is msghandler.p. The Msghandler class is derived from the class Smart. Table 1–26 lists the class and custom files related to msghandler.p for SmartSender and SmartReceiver.

Table 1–26: Class and custom files for SmartSender and SmartReceiver

<table>
<thead>
<tr>
<th>Class files</th>
<th>Custom files</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td>msghandler.cld</td>
</tr>
<tr>
<td>Method</td>
<td>msghandler.i</td>
</tr>
<tr>
<td>Property</td>
<td>msghprop.i</td>
</tr>
<tr>
<td>Prototype</td>
<td>msghprto.i</td>
</tr>
<tr>
<td>Template</td>
<td>receiver.w</td>
</tr>
<tr>
<td></td>
<td>sender.w</td>
</tr>
</tbody>
</table>
SmartToolbar

The SmartToolbar object is related to the SmartPanel, combining a menu component with a toolbar. The default SmartToolbar can replace all the dedicated SmartPanels that are also distributed with AppBuilder. The SmartToolbar object also provides access to toolbar and menu actions that you want to define.

Both the menu and the toolbar can be turned off. If you turn off the toolbar, you can use SmartPanels to supply the same capabilities. If you turn off the menu, however, you have no menu at all. You cannot use the menu that is available through the SmartWindow properties dialog box. The two menu designs are not compatible.

The SmartToolbar is an expression of the OpenEdge Toolbar class, descended from the Panel class. The Toolbar super-procedure file is src/adm2/toolbar.p. Table 1–27 lists the class and custom files related to toolbar.p.

Table 1–27: Class and custom files for SmartToolbar

<table>
<thead>
<tr>
<th>Class files</th>
<th>Custom files</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td>toolbar.cld</td>
</tr>
<tr>
<td>Method</td>
<td>toolbar.i</td>
</tr>
<tr>
<td>Property</td>
<td>toolprop.i</td>
</tr>
<tr>
<td>Prototype</td>
<td>toolprto.i</td>
</tr>
<tr>
<td>Template</td>
<td>toolbar.w</td>
</tr>
<tr>
<td>Overflow files</td>
<td>tobbarext.p</td>
</tr>
</tbody>
</table>

| Super       | toolbarcustom.p |
| Method      | toolbarcustom.i |
| Property    | toolpropcustom.i |
| Prototype   | toolprtocustom.i |
| Exclude     | toolbarexclcustom.i |
| Instance    | tobbardefscustom.i |
| Instance    | actiondefscustom.i |
SmartWindow

The SmartWindow™ object is the leading member of the Container class. Unlike other members of that class, SmartWindows are extremely general and versatile. SmartWindow, like SmartFrame™ and SmartDialog, does not have a special class of its own. It is an expression of the Container class. The super-procedure file for the Container class is src/adm2/containr.p. Table 1–28 lists the class and custom files related to container.p for SmartWindow.

Table 1–28: Class and custom files for SmartWindow

<table>
<thead>
<tr>
<th>Class files</th>
<th>Custom files</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td>Super</td>
</tr>
<tr>
<td>container.cld</td>
<td>containrcustom.p</td>
</tr>
<tr>
<td>Method</td>
<td>Method</td>
</tr>
<tr>
<td>container.i</td>
<td>containrcustom.i</td>
</tr>
<tr>
<td>Property</td>
<td>Property</td>
</tr>
<tr>
<td>cntnprop.i</td>
<td>cntnpropcustom.i</td>
</tr>
<tr>
<td>Prototype</td>
<td>Prototype</td>
</tr>
<tr>
<td>cntnproto.i</td>
<td>cntnprotocustom.i</td>
</tr>
<tr>
<td>Template</td>
<td>Exclude</td>
</tr>
<tr>
<td>cntnrwin.w</td>
<td>containrexlcustom.i</td>
</tr>
<tr>
<td>Additional method file</td>
<td>Instance</td>
</tr>
<tr>
<td>windowmn.i</td>
<td>containrdefscustom.i</td>
</tr>
</tbody>
</table>
Reading and writing object properties

Every SmartObject makes its public properties available to other objects. The other objects might be other SmartObjects, non-Smart ABL code, or non-OpenEdge modules using the Open4GL interface.

The standard properties for an object type are defined in the ADMProps temp-table. That table and its global handle ghADMProps are declared in the file smrtprop.i. Fields in the table represent individual properties, and are defined by the class that needs them. For example, a SmartDataObject has properties defined in dataprop.i, qryprop.i, and smrtprop.i, and smrtprop.i declares the ADMProps table and defines properties common to all SmartObjects, qryprop.i adds properties common to all query-based objects, and finally dataprop.i adds the properties specific to the SmartDataObject.

Refer to Figure 1–1 to see the inheritance hierarchy for each object class.

get(propname) and set(propname) functions

Every public-readable property must have a function defined to return the current value of the property. Similarly, every public-writable property must have a function defined to set a new value for the property. These functions conform to certain conventions:

- **get** — The get function identifier takes the form getpropname. The function accepts no arguments, and returns the current value of the property. It can also perform other processing, if needed.

- **set** — The set function identifier takes the form setpropname. It accepts a single argument—the new value for the property—and returns TRUE/FALSE depending on whether it succeeded in changing the value. It can perform additional processing, if needed.

A very small number of these functions vary slightly from the model described here, but these differences are not significant.


\section*{\{get\} and \{set\} pseudo-functions}

In addition to the conventional get and set functions, the ADM supports a pseudo-function syntax for use in super-procedure files particularly. These pseudo-functions are implemented by the include files \texttt{get} and \texttt{set} (not \texttt{get.i} or \texttt{set.i}) located in the tty and gui directories.

A call to \{get\} takes one of the following forms:

\begin{verbatim}
{get pro pname returnvar}.
{get pro pname returnvar ownerhandle}
\end{verbatim}

Where \texttt{pro pname} is the property name in the TARGET-PROCEDURE object and \texttt{returnvar} is the variable into which the value is to be returned. If the property does not belong to the TARGET-PROCEDURE object, provide the appropriate handle in \texttt{ownerhandle}.

The \{set\} syntax is very similar:

\begin{verbatim}
{set pro pname newvalue}
{set pro pname newvalue ownerhandle}
\end{verbatim}

The only difference between \{get\} and \{set\} syntax is that the second \{set\} argument is the new value for the property.
The need for two different syntaxes

Properties store the current state of the object, so reading and writing them is a high-frequency activity. It pays to optimize high-frequency activities, even when the net gain per operation is small. The pseudo-functions provide that slight optimization, and should be used in code that runs inside a SmartObject. Code that runs outside the Smart world—basic ABL and Open4GL routines—should use the conventional get/set functions.

Figure 1–2 shows the \{get\} code reformatted and commented. The \{set\} code is very similar.

```plaintext
/* \{get propname returnvar [ownerhandle]\} */
&IF "[3]":U = "":U &THEN /* no handle is passed in, but */
  &IF DEFINED(xp{1}) NE 0 &THEN /* there is an xp macro defined */
    ASSIGN
      ghProp = WIDGET-HANDLE( /* pick up the handle to the */
        ENTRY1, /* target proc's ADM-DATA table */
        TARGET-PROCEDURE:ADM-DATA,
        CHR(1))
      ghProp = ghProp:BUFFER-FIELD('{1}':U) /* then pick up the handle */
        /* to the slot for the prop */
    {2} = ghProp:BUFFER-VALUE. /* and finally assign the */
        /* value in the slot to */
    &ELSE /* there is no xp macro defined */
      {2} = DYNAMIC-FUNCTION( /* set the prop var by */
        "get{1}":U IN TARGET-PROCEDURE). /* building and firing a call */
        /* to the ordinary function */
    &ENDIF /* end xp-macro-defined */
  &ELSE  /* a handle was passed in... */
    &IF DEFINED(xp{1}) NE 0 &THEN  /* and if there is an xp macro */
      ASSIGN
        ghProp = WIDGET-HANDLE( /* pick up the handle to */
          ENTRY1, /* the passed-in handle's */
          {3}:ADM-DATA, /* props table */
          CHR(1))
        ghProp = ghProp:BUFFER-FIELD('{1}':U) /* pick up the handle to */
          /* the slot for the prop in */
        {2} = ghProp:BUFFER-VALUE. /* and finally set the variable */
          /* with contents of that slot */
      &ELSE /* but no xp macro defined */
        {2} = DYNAMIC-FUNCTION( /* set the var by building */
          "get{1}":U IN {3}). /* and firing a call to the */
          /* ordinary function */
      &ENDIF /* end if-xp-macro-defined */
  &ENDIF /* end if-no-handle-passed-in */
```

Figure 1–2: Commented source code of GET pseudo-function
SmartObjects and Their Methods and Properties

This chapter lists and describes the methods (internal procedures and functions) and properties used for the base ADM2 SmartObjects. The base SmartObject is used for defining all other objects. Refer to Figure 1–1 to see the inheritance hierarchy for each object class.

Note: For information specific to the WebSpeed environment, see Chapter 9, “Alphabetical Listing of WebSpeed-specific API Routines.”

This chapter provides information about the following:

- Base methods for SmartObjects
- AppServer methods for SmartObjects
- SmartObject properties
Base methods for SmartObjects

The following section describes the base methods and general super procedures for the SmartObjects used to create ADM2 applications.

addLink

Procedure that adds a link between two objects by setting property values in each.

**Location:** smart.p

**Parameters:**

**INPUT** phSource AS HANDLE

Source procedure handle.

**INPUT** pcLink AS CHARACTER

Link name.

**INPUT** phTarget AS HANDLE

Target procedure handle.

**Notes:**

- A NavigationSource (toolbar) linked to a SmartBusinessObject navigates the SmartDataObject that is linked to the visual DataTarget on a paged container.

- Normally addLink is run from code generated by the AppBuilder in the internal procedure adm–create–objects, in response to the developer adding links to a SmartContainer at design time. Additional calls to addLink can be written into an application when additional links are needed at run time.

- If the link is not in the SupportedLinks list for either object, then the link name is treated as a single subscription in the Target for an event of that name in the Source.

- If the link is in the list of PassThroughLinks, and the object at one end or the other of the new link is a SmartContainer, addLink checks to see if a link of the same type exists for that container. If so, the two links are combined, or chained together, into a single link that connects the original Source with the final Target, bypassing the Container. Refer to documentation for ADM2 or OpenEdge® AppBuilder for more information about PassThrough links.

- If the link name is of the type PageN, where N is an integer, then the caller is defining the Target to be on logical page n of the Source, which must be a SmartContainer. The addLink procedure adds the Target to the special link name PageNTargets in the Source.
For each entry in an object’s SupportedLinks, there must be a property that stores the handle(s) of the object(s) at the other end of the link, and functions to set and get that property. There must also be a property that stores a list of the named events which are associated with that link. For example, if Navigation–Source is one of a SmartPanel’s SupportedLinks, and Navigation–Target is one of a SmartDataObject’s SupportedLinks, in executing the second example above, addLink adds hdCust to the NavigationTarget property of the SmartPanel, and hSmartPanel to the NavigationSource property of the SmartDataObject. The addLink procedure checks the RETURN data type of the get property functions for these properties: a RETURN type of HANDLE means that only a single object is supported on that end of the link and that the property value is stored as a value of type HANDLE. If the RETURN type is CHARACTER, multiple objects are supported on that end of the link and the object handle is added to a property value stored as a comma-separated list of object handles. For example, the NavigationTarget property is CHARACTER, because a panel may have multiple Navigation–Targets. The NavigationSource property is HANDLE because an SmartDataObject may have only one Navigation–Source. The NavigationSourceEvents property for the SmartDataObject stores a list of the events to be subscribed to in the Source.

Examples:

```/* This example defines a dynamic link from MyWindow to the SDODcust. If the link type SpecialEvent is not defined as a SupportedLink for either SmartWindows or SmartDataObjects, then addLink will do a single SUBSCRIBE in hdCust to 'SpecialEvent' in hMyWindow. This means that when code in MyWindow does 'PUBLISH 'SpecialEvent'. The user-defined internal procedure named SpecialEvent in dCust will be executed. */
RUN addLink (INPUT hMyWindow, INPUT 'SpecialEvent':U, INPUT hdCust).

/* This example will add an instance of the SupportedLink 'Navigation' from a SmartPanel to an SDO. Normally this link would be defined at design time and the call to addLink generated automatically by the if the SmartPanel were run after startup by application code, if response to some application event, then the link would need to be created by application code also. AddLink will SUBSCRIBE the SDO to fetchFirst, fetchNext, fetchPrev, and fetchLast in the SmartPanel, because these events are listed in the SmartPanel property NavigationSourceEvents in the SDO. */
RUN addLink (INPUT hSmartPanel, INPUT 'Navigation':U, INPUT hdCust).```
addMessage

Procedure that inserts the message text into a data message log along with its Field, and Table if known.

Location: smart.p

Parameters:

INPUT pcText AS CHARACTER

Text of the message.

INPUT pcField AS CHARACTER

The field name for which the message occurred, if it was related to a specific field.

INPUT pcTable AS CHARACTER

The database table for which the message occurred, if it was related to an update to a database table.

Notes:

• If pcText is the Unknown value (?), that signals that this function should retrieve messages from the error–status system handle.

• The message log is a character string in a special format intended to be decoded with the functions fetchMessages or showDataMessages.

• Message texts that are intended to be seen by end users can be enabled for translation into other languages by putting them into the application code as quoted strings, and then using the Translation Manager tool. Generally, ADM messages which are expected to be seen by developers, for example, messages that indicate errors in the application design, are entered into the ADM super procedures as quoted strings with the :U suffix so that they are not seen by the Translation Manager tool.

• If the Unknown value (?) is passed as the message text value, then addMessage retrieves as many error messages as are stored in the ERROR–STATUS handle using the GET–MESSAGE method. This would be appropriate, for example, after executing a database access statement NO–ERROR, then checking the value of ERROR–STATUS:ERROR.

Example:

/* This example adds a specific message to the log for the SDO field whose name is stored in the variable cField, for no particular database table. */

RUN addMessage ("This operation could not be completed.":U, cField, ?).
adjustTabOrder

Procedure that changes the tab order of SmartObjects.

**Location:** smart.p

**Parameters:**

INPUT phObject AS HANDLE

Handle of the smart object.

INPUT phAnchor AS HANDLE

Handle of either another SmartObject procedure or a widget-handle of the object that anchors the SmartObject.

INPUT pcPosition AS CHARACTER

“After” if the SmartObject is moved after the anchor.

“Before” if the SmartObject is moved before the anchor.

**Note:** adjustTabOrder calls are generated by the AppBuilder in adm–create–objects. Calls to this procedure can be added to an application to do dynamic re-ordering of the tab order of SmartObjects in a SmartContainer at run time.

**Example:**

```csharp
/* Make sure that the tab order position of a SmartPanel in a SmartWindow is immediately before the fill-in field FIELD-1 in that window. */

RUN adjustTabOrder (INPUT hSmartPanel, INPUT FIELD-1:HANDLE
IN FRAME {&FRAME-NAME}, INPUT "BEFORE":U).
```
anyMessage

Returns a flag indicating whether there are messages in the error message log.

Location: smart.p
Parameters: None
Returns: LOGICAL
Note: Error messages generated during the execution of SmartObjects (especially SmartDataObjects) are normally saved in a message log (actually just a specially formatted character string). This assures that multiple messages can be accumulated for multiple errors that occur during an update and that messages are returned properly to the client when the errors occur in a separate session on an AppServer. If using a SmartDataObject as the data-source, check BOTH in the SmartDataObject and internally, because WebSpeed-specific errors are always stored internally.

Example:

```plaintext
IF anyMessage() THEN
   /* code for unsuccessful update */
ELSE
   /* code for successful update */
```

applyEntry

Procedure that applies ENTRY to the first enabled and visible object in the default frame (unless pcField is specified) or in the first child that is a Frame.

Location: smart.p
Parameters:

INPUT pcField AS CHARACTER

   An optional field name; if specified (that is, if this parameter is not blank or unknown), the frame field of that name is positioned to.

Notes: None
assignLinkProperty

Sets a property value in one or more SmartObjects at the other end of a specified link, relative to the TARGET–PROCEDURE.

**Location:** smart.p

**Parameters:**

- **INPUT pcLink AS CHARACTER**
  
  Link type.

- **INPUT pcPropName AS CHARACTER**
  
  Property name.

- **INPUT pcPropValue AS CHARACTER**
  
  Property value.

**Returns:** LOGICAL (TRUE if the property set-function succeeded, else FALSE.)

**Notes:**

- This is the Version 9 (ADM2) Version of the set–link–attribute procedure in Version 8. Note that only one property name and value is allowed, as opposed to the attribute-list format of Version 8.

- If the property function is not there or is invalid, or if any of the set-functions fail, this function returns FALSE.

**Examples:**

/* This example code from the updateRecord procedure makes sure that when an update completes, and the DataModified property is turned off in the SmartDataViewer which initiated the update, it is also turned off in all other Viewers which may be linked in a GroupAssign. */

`lSuccess = DYNAMIC-FUNCTION('assignLinkProperty',`

  INPUT 'GroupAssign-Target':U, INPUT 'DataModified':U, ‘no’:U).

/* This example will move focus to the first enabled and visible field in the SmartDataViewer vCust. The handle hvCust would normally be available in the SmartDataViewer's container. This statement could follow a message indicating that values needed to be entered for the current record, for example. */

RUN applyEntry IN hvCust (?).

/* This example applied focus to a specific field ("City") in a SmartDataViewer. This could result from field validation failing for field, for example. See updateRecord in the super procedure datavis.p for an actual example of how the ADM repositions focus to a specific field. */

RUN applyEntry In hvCust ("City":U).
changeCursor

Procedure that sets the cursor on all windows and on any dialog box frames that are currently on the screen.

**Location:** smart.p

**Parameters:**

INPUT pcCursor AS CHARACTER

Name of cursor to use. This should be either WAIT or "."

**Note:** Normally used internally by the ADM. Could be used by application code to set and then clear the WAIT (hourglass) cursor during a lengthy operation.

createControls

Procedure that defines the default action for SmartObject-specific initialization of ActiveX Controls. Runs adm–create–controls, an AppBuilder-generated procedure.

**Location:** smart.p

**Parameters:** None

**Note:** A localization of this behavior should be placed in a procedure called createControls in the SmartObject. The Version 8-style name adm–create–controls for the standard behavior is maintained in order to allow a localization in the same procedure file.

destroyObject

Procedure that cleans up and deletes the current object procedure and its descendents, if any.

**Location:** smart.p

**Parameters:** None

**Notes:**

- Checks first to see if any object is not prepared to be destroyed (for example, if DataModified is set). This is done by publishing the named event confirmExit, which is implemented for example in datavis.p for visual data objects which can return FALSE if their DataModified property is set, indicating that they have unsaved changes to the current record. Because of this possible error return, application code that runs destroyObject should check ERROR–STATUS:ERROR to see whether the operation succeeded or not.

- The destroyObject procedure runs removeAllLinks to delete all SmartLinks associated with this object.

- The standard ADM construct for a SmartWindow is to have the CLOSE trigger run destroyObject. Therefore, the statements APPLY CLOSE to hSmartWin and RUN destroyObject IN hSmartWin normally have equivalent results. You should use APPLY CLOSE so as to catch any other effects of this event. For other SmartObjects, RUN destroyObject is the recommended way to destroy the object.
• All SmartContainers PUBLISH destroyObject to delete all the SmartObject procedures they contain, before destroying themselves.

• You can localize the destroyObject procedure to add a check to do cleanup before a destroy completes, or to stop a destroy event from finishing. (See the “confirmExit” section on page 3–26 entry for the standard event procedure for doing this.)

**displayLinks**

Utility procedure used to put up a dialog showing all the ADM links for a given container object.

**Location:** smart.p

**Parameters:** None

**Notes:**

• Can be executed by selecting displayLinks from the PRO*Tools procedure object viewer for the desired SmartContainer.

• As noted, this is a utility procedure that is not executed by any standard ADM code and is not intended to be called from a SmartObject application.

**editInstanceProperties**

Procedure that runs the dialog to get run-time property settings.

**Location:** smart.p

**Parameters:** None

**Notes:**

• Generally run by the AppBuilder in design mode to bring up the dialog procedure that has been defined in the object property include file as the ADM–PROPERTY–DLG preprocessor value. Normally there is one such standard program per template, whose name is specified in the template. This dialog allows application designers to define values for SmartObject properties that are appropriate to assign when an instance of the object is created.

• You can create special InstanceProperty programs for specific types of SmartObjects (a particular SmartDataViewer with extra run-time Properties, for example). No assumptions are made about the structure or functionality of the dialog program except that it sets each of the modified Instance Properties by executing their set property functions. The existing Instance Property dialog procedures in the src/adm2/support directory can be used as models for building new ones or extending existing ones.

• Application code could invoke this procedure (by adding a double-click trigger to a widget, for example), to allow the InstanceProperty dialog to be invoked at run time.
• This is the Version 9 (ADM2) equivalent of the edit–attribute–list procedure in Version 8.

• Generally run by the AppBuilder in design mode.

Examples:

```
PROCEDURE editInstanceProperties:
  /* Purpose: Display a different Instance Property Dialog if this object is in a Template. Use the normal dialog if this is in a standard Master file. */
  DEFINE VARIABLE cInfo AS CHARACTER NO-UNDO.

  /* Use the AppBuilder API to determine if this instance is in a Template. */
  RUN adeuib/_uibinfo.p (?, ‘HANDLE’:U + STRING(THIS-PROCEDURE),
      ‘TEMPLATE’:U, OUTPUT cInfo).

  /* Use a special attribute dialog for templates. */
  IF cInfo = ‘yes’:U THEN
    RUN special.w (INPUT THIS-PROCEDURE).
  /* Dispatch standard ADM event. */
  ELSE
    RUN SUPER.
  END PROCEDURE.
```

`exitObject`

Procedure that passes an exit request to its container.

Location: smart.p

Parameters: None

Notes:

• By convention, the standard routine always passes an exit request to its CONTAINER–SOURCE. The container that actually initiates the exit should define a local version and not call the standard one. That local exitObject is built into the SmartWindow template. This allows any SmartObject to initiate a destroy operation on its container. When it runs exitObject (for example, when a user pressing a Done button), this event is passed up through the Container link hierarchy until an object is found that is at the appropriate level to initiate a destroy of all its contents. As noted, this is normally the SmartWindow, where exitObject does APPLY ‘CLOSE’ TO THIS–PROCEDURE, that in turn runs destroyObject.

• exitObject could be customized when you want behavior other than, or in addition to, invoking exitObject in the ContainerSource. As noted, the default localization in SmartWindows is to APPLY CLOSE to initiate a destroyObject sequence. A local version of this, in an object other than a SmartWindow, could do additional custom cleanup. Note that because exitObject is defined in the SmartWindow template, a localization of it in a SmartWindow must exclude the standard code to prevent a duplicate procedure definition.
Example:

```/* This example is taken from the standard code for the "Done" button in the AppBuilder palette. If the object containing the button is a SmartWindow, then the code executes the standard convention for destroying a SmartWindow, APPLY "CLOSE". If not, the code runs exitObject to pass the event up to its Container, otherwise the effect would be to destroy only the SmartPanel or other SmartObject containing the button, which is probably not what is intended. */
&IF "([PROCEDURE-TYPE])" EQ "SmartWindow" &THEN
   RUN exitObject.
&ELSE
   APPLY "CLOSE":U TO THIS-PROCEDURE.
&ENDIF
```

**fetchMessages**

Returns a delimited list of all messages in their raw form. The message log is cleared.

**Location:** smart.p

**Parameters:** None

**Returns:** CHARACTER (specially formatted message string).

**Notes:**

- The fetchMessage procedure is not normally expected to be used by application code. The showDataMessages function can be used—and customized if desired—to parse this specially formatted message string into a series of error messages.

- The message list is delimited by CHR(3); within each message, the Message Text, the Field (if any), and the Table (if any) are delimited by CHR(4).

- The fetchMessages function clears the message log, and it is the responsibility of the calling procedure to display the messages or handle them appropriately. Use the similar function reviewMessages to read messages without deleting them.

**fixQueryString**

Conventionalizes decimal delimiters in query strings to be full-stops.

**Location:** smart.p

**Parameters:**

`INPUT pcQueryString AS CHARACTER`

The string to be conventionalized.

**Returns:** CHARACTER

**Note:** Wherever a query prepare is being used, call this routine immediately to resolve conventional differences in the query string, such as decimal formatting. The main issues arise when the query string contains stringed decimal values.
**initializeObject**

Procedure that performs general initialization common to all objects.

**Location:**  smart.p

**Parameters:**  None

**Notes:**

- There is a version of `initializeObject` in virtually every Super procedure; each performs the initialization appropriate to that class of objects. This top-level version runs the `createControls` and `control_load` procedures, if they exist, to initialize ActiveX Controls in the object, and sets the `ObjectInitialized` property to TRUE.

- Initialization of SmartObjects takes place in two phases. In the first phase, the `constructObject` procedure is run (normally from the AppBuilder-generated procedure `adm–create–objects`) for each SmartObject in a SmartWindow or other container. This runs the persistent procedures which instantiates the object and initializes Instance Properties for which values have been defined. `adm–create–objects` then creates links between objects. Once this is complete, the container runs `initializeObject`. This passes the `initializeObject` event down through all the contained objects. Therefore, any version of `initializeObject` can assume that all the SmartObjects and SmartLinks in a container have been established and that they can be checked, for example, whether there is a link to some other particular kind of object. Code should not, however, assume the order in which SmartObjects are initialized.

For example, a SmartDataObject opens its query and publishes `dataAvailable` to signal that to other objects. A SmartDataViewer runs `dataAvailable` in itself to see if there is already a row waiting for display, which would happen if the associated SmartDataObject was initialized first.

- Application code can therefore localize `createObjects` in a SmartContainer to add code to the creation phase (for example, to define additional application-specific links or set application-specific properties that need to be looked at during initialization), or to `initializeObject` to add code to the initialization phase after all objects have been created and all links created. For noncontainer SmartObjects, code to be executed during the creation phase (that is, when the object’s procedure is first run) should be placed in the Main Block. Code to be executed after the object and other related objects have been created should be placed into a local `initializeObject`. 


instanceOf

Takes an object type as input and resolves the query inheritance as defined in the Progress Dynamics Repository.

**Location:** smart.p

**Parameters:**

INPUT pcObjectType AS CHARACTER

The object type for which you want to resolve the inheritance.

**Notes:**

- This function is used only in a Progress Dynamics® environment.
- Returns TRUE if the instance inherits from the requested class anywhere in the hierarchy.

instancePropertyList

Returns a list of the values of the names of the object’s InstanceProperties, that is, those properties that can be set to initial values in design mode. These can be set in the AppBuilder to determine the object instance’s behavior at run time.

**Location:** smart.p

**Parameters:**

INPUT pcPropList AS CHARACTER

Optional list of properties wanted. If this parameter is blank, the default is all of the instance properties. Other valid options are "*" (all properties), or a list of the specific properties wanted.

**Returns:** CHARACTER (Specially delimited list of property names and values.)

**Notes:**

- The properties are returned in a string delimited by CHR(3) between property name/value pairs, and CHR(4) between the name and the value.
- Normally used internally by the AppBuilder at application design time to retrieve a list of property names and values to insert into the generated code in the adm–create–objects procedure.
- If the input parameter is the special value ADM–TRANSLATABLE–FORMAT, then the property list string is returned in precisely the form used in generating adm–create–objects, with the special translation suffix :U inserted in the list following nontranslatable property values, and the suffix left off for special translatable properties such as the Tab Folder’s FolderLabels property.
• If the input parameter is the special value *, then all object properties are returned with their values. A list of object properties is determined by identifying all the get property functions for the object (functions beginning get with no following hyphen, taking no input parameters), plus all dynamic properties stored in the UserProperty string.

• If the input parameter is a comma-separated list of property names, just those properties and their values are returned.

**hideObject**

Procedure that hides the current object if it is a visual object and sets the ObjectHidden property to TRUE to indicate the state of the object.

**Location:** smart.p

**Parameters:** None

**Notes:**

• The Hide concept is a logical one; nonvisual objects might also be hidden, meaning that they are not currently active. This might affect whether code in some event procedures is executed. For example, SmartDataObjects does not respond to events such as fetchNext and fetchLast if they are logically hidden, even though they have no visualization. This allows certain SmartLinks to be effectively deactivated when the object at one end or the other is hidden.

• When a SmartContainer is hidden, it is not necessary for all of the objects it contains to be individually hidden because they are hidden along with the container. For this reason, hideObject, when executed for a SmartContainer, sets the property ContainerHidden in each contained SmartObject without actually running hideObject in each object. The setContainerHidden function, in turn, sets the ObjectHidden property to TRUE so that it can be queried successfully. Not running hideObject in each individual SmartObject improves performance when SmartObjects are being paged (alternately hidden and viewed), and can eliminate problems with flashing of visual objects or problems restoring proper frame order when objects are hidden and viewed.

• The hideObject procedure can be localized when behavior in addition to the default is needed when a SmartObject is hidden, for example to decide whether a hidden component should actually be destroyed to conserve memory.
Examples:

```plaintext
ON CHOOSE OF MENU-ITEM mi_Hide_Children DO:
  DEFINE VARIABLE cHandles AS CHARACTER NO-UNDO.
  DEFINE VARIABLE hSMO     AS HANDLE    NO-UNDO.
  DEFINE VARIABLE ix       AS INTEGER   NO-UNDO.
  /* Find all the children of a SmartWindow and HIDE the child windows. */
  cHandles = DYNAMIC-FUNCTION('linkHandles':U, INPUT 'Container-Target':U).
  DO ix = 1 TO NUM-ENTRIES (cHandles):
    /* cHandles is a comma-separated list of SmartObject handles. */
    hSMO = WIDGET-HANDLE(ENTRY(ix, cHandles)).
    /* See if this SmartObject is a SmartWindow. */
    IF DYNAMIC-FUNCTION('getObjectType':U IN hSMO) = "SmartWindow":U THEN
      RUN hideObject IN hSMO.
    END.
  END.
END.
```

**linkHandles**

Takes a link name and returns a list of handles of objects at the other end of that link, relative to the TARGET–PROCEDURE.

**Location:** smart.p

**Parameters:**

INPUT pcLink AS CHARACTER

The link name (including -SOURCE or -TARGET).

**Returns:** CHARACTER (Comma-separated list of handles to the SmartObject procedures at the other end of the link.)

**Notes:**

- This is the Version 9 (ADM2) equivalent of the procedure get–link–handle in Version 8.
- If the link type does not exist in the object, then the empty string (""") is returned.
- The procedure handle list is returned as a character string because (if the link type requested supports multiple objects at that end of the link) there might be multiple SmartObjects connected by that link type, so these come back as a comma-separated list. The developer must check the NUM–ENTRIES in the returned list (which might be zero, one, or more), and apply the WIDGET–HANDLE function to each entry to derive the procedure’s handle.
SmartObjects and Their Methods and Properties

Examples:

```plaintext
/* Here, a pass-through link is created from a SmartDataObject in a parent SmartWindow, through the SmartWindow containing this code, to a SmartDataBrowser contained in this window. The Data link from the SDO will go both to the SmartWindow and to the Browser. There is no standard implementation of the 'dataAvailable' event that is published whenever a new row is selected in the parent SDO, but this local version will intercept that event and use it to modify the title of the window. */

PROCEDURE dataAvailable:
  /* This input parameter is defined, but we don't look at it. */
  DEFINE INPUT PARAMETER cType AS CHARACTER NO-UNDO.

  DEFINE VARIABLE cValues AS CHARACTER NO-UNDO.
  DEFINE VARIABLE hDataSource AS HANDLE NO-UNDO.
  DEFINE VARIABLE hWindow AS HANDLE NO-UNDO.

  /* Convert the return value directly to a handle because we know there is only one Data Source. */
  hDataSource = WIDGET-HANDLE(
    DYNAMIC-FUNCTION('linkHandles':U, 'Data-Source':U)).

  /* Ask for the Customer Name field from a Customer SDO. */
  cValues = DYNAMIC-FUNCTION('colValues':U IN hDataSource, INPUT 'Name':U).

  /* Get the widget handle of the window itself. */
  hWindow = DYNAMIC-FUNCTION('getContainerHandle':U).

  /* First value returned from colValues is always the RowIdent, so skip it. */
  hWindow:TITLE = "Orders for Customer " + ENTRY(2, cValues, CHR(1)).
  END PROCEDURE.
```

**linkProperty**

Returns the requested property in the object at the other end of the specified link, relative to TARGET–PROCEDURE.

**Location:** smart.p

**Parameters:**

INPUT pcLink AS CHARACTER

  The link name.

INPUT pcPropName AS CHARACTER

  The property name.

**Returns:** CHARACTER: property value in string form.
Notes:

- This function is the Version 9 (ADM2) equivalent of the request–attribute procedure in Version 8.
- The value is returned in character format, regardless of its native datatype. If there is not exactly one object at the other end of the link, or that object is no longer there, the unknown value is returned.

Examples:

```plaintext
/* This example determines whether the AutoCommit property is TRUE in the SmartDataObject associated with the current visual object. */
lCommit = DYNAMIC-FUNCTION('linkProperty':U, INPUT 'Data-Source':U, INPUT 'AutoCommit':U).
```

**linkStateHandler**

Procedure Handler for the linkState event. This procedure is also used by addLink and removeLink to subscribe and unsubscribe to the link events in the object.

**Location:** smart.p

**Parameters:**

INPUT pcState AS CHARACTER

Mode for the object. The valid values are:

- **Add** — Activate new link by subscribing to the link events of the passed object.
- **Remove** — Deactivate removed link by unsubscribing to the link events of the passed object.
- **Active** — Activate links by subscribing to the link events of the passed object.
- **Inactive** — Deactivate links by unsubscribing to the link events of the passed object.

INPUT phObject AS HANDLE

Object to which you want to subscribe or unsubscribe.

INPUT pcLink AS CHARACTER

Full link name pointing to the passed object. Both **DataSource** and **Data-source** are supported.

**Note:** The name handler attempts to indicate that this is an event handler that should not be called directly outside of the intended events, but instead be actively used as an event to ensure that properties that are link dependant are set for removal.
mappedEntry

Returns the other entry in a separated list of paired entries. This is required to ensure that the lookup does not find a matching entry in the wrong part of the pair.

**Location:** smart.p

**Parameters:**

INPUT pcEntry AS CHARACTER

Entry to lookup.

INPUT pcList AS CHARACTER

Comma-separated list with paired entries.

INPUT plFirst AS LOGICAL

If TRUE, lookup first and return second. If FALSE, lookup second and return first.

INPUT pcDelimiter AS CHARACTER

Delimiter of pcList.

**Returns:** CHARACTER

**Note:** Used to find mapped RowObject or database column in assignList. In other cases, such as the ObjectMapping property of SBOs, an entry might occur more than once in the list, in which case a list of matching values is returned, using the same delimiter as the list.

messageNumber

Returns the message text given a message number. Allows these messages to be translated and tracked in one place.

**Location:** smart.p

**Parameters:**

INPUT piMessage AS INTEGER

**Returns:** CHARACTER

**Notes:**

- In order to allow certain messages to be translated, it is helpful to group them into a single file, since the ADM super procedure source files are not otherwise regarded as part of a translatable application. To facilitate this, messages that are expected to be seen by end users and, therefore, should be translated are located in a single include file (`src/adm2/admmsgs.i`) in the form of a character array. This allows a translated version of this single file to be substituted and smart.p, which includes admmsgs.i, to be recompiled or run through the Translation Manager tool in order to translate end-user messages that are raised from code located in super procedures.

- The messageNumber function is normally invoked from the addMessage procedure, as in the example.
• The ADM convention is that error messages that are expected to be seen only by developers or application testers (errors indicating errors in application construction, for example, caused by missing links or the like) are not translated, and, therefore, appear in the super procedures as literal strings with the :U suffix.

Example:

```plaintext
/* This example retrieves the text for message number 4 ("Current values must be saved or cancelled before Commit.") and passes it to the addMessage procedure to add that message to the error message log. */
RUN addMessage (messageNumber(4), ?, ?).
```

**modifyListProperty**

Procedure that allows values to be added to or deleted from any object property that is a comma-separated list.

**Location:** smart.p

**Parameters:**

INPUT phCaller AS HANDLE

Handle of the object whose property is being changed.

INPUT pcMode AS CHARACTER

ADD or REMOVE.

INPUT pcListName AS CHARACTER

The name of the property.

INPUT pcListValue AS CHARACTER

The value to add or remove.

**Notes:**

• This is the ADM 2 equivalent of what was modify-list-attribute in the Version 8 ADM.

• Normally the first argument is the handle THIS–PROCEDURE, if the property value is to be changed for the current SmartObject. However, this can be another procedure handle if the property is to be modified in another object.

• The modifyListProperty procedure first runs the get propname function to retrieve the current value of the property. If a new value is being added, and is already contained in the list, or if a value to be removed is not present in the list, modifyListProperty simply returns without error. Otherwise, the change to the list is made and the set propname function is run to reset the value of the list property. Both the get and set functions must exist; otherwise, modifyListProperty returns without error.
There are many ADM Properties that are expressed as comma-separated lists of handles or other values. All of these should be maintained using the modifyListProperty procedure. Using the setpropname function resets the entire list to the value, which is normally not what is desired.

**Examples:**

```plaintext
/* This code will add an additional entry to the SupportedLinks property for
the object.*/
RUN modifyListProperty (INPUT THIS-PROCEDURE, INPUT 'ADD':U,
INPUT 'SupportedLinks':U, INPUT 'SpecialLink':U).

/* This code adds the specified source procedure handle to the list of
"Source"s for the specified link in the specified Target procedure handle
(from addLink). */
RUN modifyListProperty (INPUT phTarget, INPUT 'ADD':U,
INPUT pcLink + "Source":U, INPUT STRING(phSource)).
```

**modifyUserLinks**

Procedure that maintains a delimited list of user-defined links (that is, links that are not in the SupportedLinks list for an object), and the handles of the objects at the other end of the links.

**Location:** smart.p

**Parameters:**

INPUT pcMode AS CHARACTER

**ADD** or **REMOVE**.

INPUT pcLinkName AS CHARACTER

The link name including -Source or -Target.

INPUT phObject AS HANDLE

The procedure handle of the object at the other end of the link.

**Notes:**

- Run from addLink and removeLink; used primarily by the linkHandles function. When addLink encounters a link that is not in the list of SupportedLinks, it defines a single SUBSCRIBE for an event of that name (see addLink). Because there are no properties where the objects at either end of a nonsupported (or dynamic) link can be stored, they are stored in this list so that functions such as linkHandles, which returns the handle of an object at the other end of a link, can keep track of what the relationships are.

- This function is not intended to be run from application code.

- The list is the third entry in ADM–DATA, delimited by CHR(1). Each entry in the list consists of a link name followed by CHR(4) followed by a comma-separated list of one or more handles. The list entries are delimited by CHR(3). Users should not be concerned about the specific format and location of the list, which might be subject to change; using this procedure to access the list preserves compatibility with any possible changes.
oneObjectLinks

Procedure that adds linkage for some object.

**Location:** smart.p

**Parameters:**

INPUT hObject AS HANDLE

Handle of the object to be linked.

**Note:** This procedure is called by displayLinks.

propertyType

Locates the set property function for the specified property name either locally or in a SUPER procedure, and returns its data type.

**Location:** smart.p

**Parameters:**

INPUT pcPropName AS CHARACTER

Property name.

**Returns:** CHARACTER (The data type of the property.)

**Note:** This procedure is generally used internally by the ADM.

**Example:**

```plaintext
/* This code, adapted from the addLink procedure, determines whether a link is permitted to have multiple Targets based on whether the supporting property function accepts a handle (for a single object handle) or a character string (for a comma-separated list of handles. */

IF DYNAMIC-FUNCTION('propertyType':U,
                   INPUT pcLinkType + "Source":U) = "CHARACTER":U THEN
    RUN modifyListProperty ('ADD':U ) /* Add the string to a list. */
ELSE
    DYNAMIC-FUNCTION('set':U + pcLinkType + "Source":U, INPUT phTarget).
```

removeAllLinks

Procedure that removes all links for a SmartObject, normally as part of destroying a SmartObject procedure.

**Location:** smart.p

**Parameters:** None

**Note:** This procedure runs automatically as part of destroyObject. Not normally expected to be run by user application code (see removeLink for a procedure to remove a single specific link).
removeLink

Procedure that removes a specific link between two objects.

**Location:** smart.p

**Parameters:**

- INPUT phSource AS HANDLE
  Source procedure handle.
- INPUT pcLink AS CHARACTER
  Link type name.
- INPUT phTarget AS HANDLE
  Link target object handle.

**Notes:**

- This procedure both removes the handles of both Source and Target from the appropriate SmartObject properties (see addLink) and also does an UNSUBSCRIBE for each named event associated with the link.
- All SmartObject links are removed when an object is destroyed. This procedure could be used in application code to remove a specific link based on application requirements.

**Example:**

```verbatim
/* This example removed the Update link between a visual SmartObject such as a SmartDataViewer and its associated SmartDataObject, perhaps in response to an application event or security check which should make the SmartDataObject non-updatable. */
hTarget = WIDGET-HANDLE(
    DYNAMIC-FUNCTION('linkHandles', INPUT 'Update-Target':U)).
IF VALID-HANDLE(hTarget) THEN
    RUN removeLink(THIS-PROCEDURE, 'Update':U, hTarget).
```

repositionObject

Procedure that adjusts the position of container objects.

**Location:** smart.p

**Parameters:**

- INPUT pdRow AS DECIMAL
- INPUT pdCol AS DECIMAL

**Notes:** None
**returnFocus**

Procedure that returns focus to the containing window.

**Location:** smart.p

**Parameters:**

INPUT hTarget AS HANDLE

A handle to the target procedure object.

**Notes:** None

**reviewMessages**

Returns a delimited list of all messages without removing them from the log.

**Location:** smart.p

**Parameters:** None

**Returns:** CHARACTER (Specially delimited message list.)

**Notes:**

- **reviewMessages** is not normally expected to be used by application code. The showDataMessages function can be used (and customized if desired) to parse this specially formatted message string into a series of error messages.

- The message list is delimited by CHR(3); within each message, the Message Text, the Field (if any), and the Table (if any) are delimited by CHR(4).

- **reviewMessages** is intended to be used in situations where it is necessary to examine messages in the error log without deleting them, so that some other procedure can later process them. Use the similar function fetchMessages to read messages and simultaneously delete them from the log. Note that if all that is needed is to determine if there are any messages in the log, the anyMessage function can be used.
**showMessage**

Displays, using a simple MESSAGE statement by default, either a literal message string or the
return value from a call to messageNumber.

**Location:** smart.p

**Parameters:**

**INPUT pcMessage AS CHARACTER**

A message string, which might be a message number in string form

**Returns:** LOGICAL

**Note:** This function can be overridden to use a mechanism other than the
MESSAGE statement to display messages, and still use the messageNumber
function to map message numbers to translatable text. Note that this is
different from addMessage, fetchMessages, etc., which log messages in a
temp-table for later retrieval.

**showMessageProcedure**

Procedure used by Progress Dynamics override for showMessage function to use Progress
Dynamics message handling routines. By default using a simple MESSAGE statement, displays
either a literal message string, or a message number that is returned by the messageNumber
function. The user’s button choice is returned in the OUTPUT parameter.

**Location:** smart.p

**Parameters:**

**INPUT pcMessage AS CHARACTER**

Either a literal message string, or a message number in string form. A message number can
be followed by a comma-separated list with up to 10 entries. All the entries except the last
are used as replacements for parameters of form ‘&n’ in the message string, where n is
some number in the range 1 - 9. The last entry must be ‘Question’, ‘YesNo’, or
‘YesNoCancel’, which determines which buttons are provided in the message box.

**OUTPUT plAnswer AS LOGICAL**

The user’s choice of button: TRUE or FALSE (Question or YesNo), or
TRUE/FALSE/UNDEFINED (YesNoCancel).

**Notes:** None

**Example:**

```
showMessageProcedure ("Is this not a nice &1 &2 message?", "short", "sample", "Question").
```
Signature

Returns the signature of the named function or internal procedure in the format returned by the GET–SIGNATURE method.

**Location:** smart.p

**Parameters:**

INPUT pcName AS CHARACTER

The function or procedure name.

**Returns:** CHARACTER (Signature in GET–SIGNATURE format.)

**Notes:** None

**start-super-proc**

Procedure that starts a super procedure if it is not already running and adds it as a super procedure in any case.

**Location:** smart.i

**Parameters:**

INPUT pcProcName AS CHARACTER

**Notes:** None

**viewObject**

Procedure that logically views the current object and sets its ObjectHidden property to FALSE.

**Location:** smart.p

**Parameters:** None

**Notes:**

- The ADM supports a logical concept of viewing that you can apply to all objects regardless of whether they have a visualization.

- When an object is:
  - Viewed, the linkState property is typically set to active which activates the links.
  - Hidden, the link is sometimes deactivated, depending on the link type. If an object has an actual visualization, the version of viewObject in visual.p views it.
• When a SmartContainer is viewed, it is not necessary for all of the objects it contains to be individually viewed, because they are not explicitly hidden when the container is hidden (see hideObject). For this reason, viewObject, when executed for a SmartContainer, sets the property ContainerHidden to FALSE in each contained SmartObject, without actually running viewObject in each object. The setContainerHidden function then sets the ObjectHidden property to FALSE so that it can be queried successfully. Not running hideObject and viewObject in each individual SmartObject improves performance when SmartObjects are being paged (alternately hidden and viewed), and can eliminate problems with “flashing” of visual objects or problems restoring proper frame order when objects are hidden and viewed.

Example:

```sql
/* Views an object when a button is pressed. */
ON CHOOSE OF Btn_View_Browser DO:
  RUN viewObject IN hSDBrowser.
END.
```
AppServer methods for SmartObjects

The AppServer methods expend the Container and Query classes. If you define the macro `{&APP-SERVER-VARS}`, the Container and Query classes inherit from the AppServer class. This section describes the AppServer methods.

bindServer

Procedure that binds the object to the server, as does getASHandle. However, bindServer does not expose the handle, making it a better choice for outside callers.

Location: appserver.p  
Parameters: None  
Notes: None

destroyObject

Procedure that disconnects the AppServer connection if present before invoking the standard destroy code.

Location: appserver.p  
Parameters: None  
Notes: None

destroyServerObject

Destroys the server object and retrieves its context.

Location: appserver.p  
Parameters: None  
Notes:

• Called from unbindServer when stateless.

• This event is not always called because queryObjects now supports singlet data requests or calls destroyObject directly when BindScope is data.

disconnectObject

Procedure that disables fields in the ENABLED-FIELDS list.

Location: appserver.p  
Parameters: None  
Note: If Asbound is TRUE, an explicit destroyObject is done on the AppServer to give the object an opportunity to clean up. This procedure is invoked from destroyObject, but can also be run directly to disconnect without exiting.
initializeServerObject

Procedure that initializes the server object after it has been started or restarted.

**Location:** appserver.p  
**Parameters:** None  
**Note:** This is an internal event that is called from runServerObject after a successful run on server. It silently ignores any calls when not bound.

runServerObject

Procedure that runs the server part of this object and sets AShandle.

**Location:** appserver.p  
**Parameters:**

INPUT phAppService AS HANDLE  
AppServer Session handle.

**Note:** Called from startServerObject and restartServerObject.

runServerProcedure

Returns the handle of a procedure after it runs on server.

**Location:** appserver.p  
**Parameters:**

INPUT pcServerFileName AS CHARACTER  
INPUT phAppService AS HANDLE  
**Returns:** HANDLE  
**Note:** Simplifies an override of the RUN statement, such as to use a bind procedure instead of running the procedure directly.
unbindServer

Procedure that unbinds the AppServer by destroying the server side object started by the client.

**Location:** appserver.p

**Parameters:**

**INPUT pcMode AS CHARACTER**

Valid values are `unconditional`, `conditional`, and the empty string. If `conditional`, unbinding only takes place if the caller is at the same level as BindSignature. The empty string is recognized, but not currently supported.

**Notes:**

- This procedure allows nested calls of procedures that binds and unbinds, but still postpone the unbinding until we are back at the level that did the actual binding.

- The logic in this procedure is dependent of the fact that getAsHandle or bindServer does the actual binding (if AsHandle is the Unknown value (?)) and logs the call level by setBindSignature = program-name(2).

- An external caller uses the following sequence to ensure that all calls are done with one connection:

  ```
  RUN bindServer in <handle>.
  somerequest in handle
  somerequest in handle
  RUN unbindServer(?).
  ```

- Internal calls typically look like the following:

  ```
  hAsHandle = getAsHandle().
  somerequest in hasHandle
  RUN unbindServer(?).
  ```

- Overrides need to do the following:

  ```
  DEFINE INPUT PARAMETER pcMode AS CHARACTER NO-UNDO.
  RUN SUPER(IF pcMode = ? THEN PROGRAM–NAME(2) ELSE pcMode).
  ```

- Limitations apply as recursive calls and external callers have the same signature, so an unbind might happen too early. (This can probably be fixed by saving the complete stack in BindSignature).
SmartObject properties

SmartObject properties provide information about SmartObject and their classes. This information can include whether an object is enabled, the contents of the object and so on. You can read property values and in many instances you can change property values. To read a value for a property, you use a `get` function, and to change a value for a property, you use a `set` function.

These functions conform to the following conventions:

- `get` — Uses the form `get proname` and returns the current value of the property.

  **Note:** This function accepts no arguments.

- `set` — Uses the form `set proname`. The set function accepts a single argument—the new value for the property—and returns TRUE/FALSE depending on whether the value change succeeds.

For more information about getting and setting property values, see Chapter 1, “ADM2 SmartObject API Reference.”

This section lists and describes the SmartObject properties that you can use with the get and set functions. The description also identifies the properties for which you can read and write (change) a value and the properties for which you can only read the value.

**AppService**

Logical partition name of the stored AppService used to connect to an AppServer. This value identifies the AppService in which the SmartDataObject is to be started.

**Data type:** CHARACTER  
**Note:** Read and Write

**ASBound**

Indicates whether this object binds the AppServer with a persistently running procedure: usually the server part of this object. If the object binds the AppServer with a persistently running procedure, the value for this property is TRUE.

**Data type:** LOGICAL  
**Note:** Read only

**AsDivision**

A string indicating whether the object is running on the client side or the server side of the AppServer. If this value is an empty string, there is no AppServer.

**Data type:** CHARACTER  
**Note:** Read and Write
**ASHandle**

Handle of the persistent procedure to this object’s companion procedure (the copy of itself) running on the AppServer.

**Data type:** HANDLE  
**Note:** Read and Write

**ASHasStarted**

Indicates where the object has completed its first call to its server-side object. This value is TRUE if the object has completed its first call.

**Data type:** LOGICAL  
**Note:** Read only

**ASInitializeOnRun**

Indicates whether runServerObject should call initializeServerObject. initializeServerObject is called on the client, but usually has a call to the server for context. This value is TRUE if runServerObject should call initializeServerObject.

**Data type:** LOGICAL  
**Note:** Read and Write

**ChildDataKey**

When a program is run for a specific record, that is a specific customer, ChildDataKey would record that this instance of the object is for this specific piece of child data, and the key would represent the key passed into the object.

Then, when selecting a record in an object controller, you can use this key to determine if an object containing data for the selected key is already open. If that is the case, that window can be brought to the top.

**Data type:** CHARACTER  
**Notes:**

- Read and Write.
- Used in a Progress Dynamics environment by the Session Manager when it is keeping track of the running instance of programs.
- Use this property when multiple windows are supported, and you do not want to bring up two windows containing the same child data.
- ChildDataKey is an input parameter to the launch container API.
**SmartObjects and Their Methods and Properties**

**ContainerHandle**

Though available for all SmartObjects, this property is most meaningful for SmartObjects that have a window or frame. For a frame-based object, such as a Browser or Viewer, this property returns frame. For a window-based objects such as a SmartWindow, this property returns the window handle. You can use this information when you need to query or manipulate the properties of the container widget itself.

**Data type:** HANDLE  
**Note:** Read only

**ContainerHidden**

Indicates whether or not an object’s SmartContainer: SmartWindow, SmartFrame and so on, is hidden. Returns TRUE if the container is hidden.

**Data type:** LOGICAL  
**Note:** Read and Write

**ContainerSource**

Handle of the object that should become the Container-Source.

**Data type:** HANDLE  
**Note:** Read and Write

**ContainerSourceEvents**

Comma-separated list of the events to which this object wants to subscribe to in its ContainerSource.

**Data type:** CHARACTER  
**Note:** Read and Write

**ContainerType**

Type of container this SmartObject is (Window or Frame), or the empty string if the object is not a container.

**Data type:** CHARACTER  
**Note:** Read only
**DataLinksEnabled**

Indicates whether or not data links are enabled.

**Data type:** LOGICAL  
**Note:** Read and Write

**DataSource**

Object's data source, if any.

**Data type:** HANDLE  
**Note:** Read and Write

**DataSourceEvents**

Comma-separated list of the events this object wants to subscribe to in its data source.

**Data type:** CHARACTER  
**Note:** Read and Write

**DataSourceNames**

ObjectName of the Data Object that sends data to this visual object. This would be set if the data source is an SmartBusinessObject (SBO) or other Container with DataObjects.

**Data type:** CHARACTER  
**Note:** Read and Write

**DataTarget**

Handle in character format, or a comma-separated list of handles for the case of multiple data targets.

**Data type:** CHARACTER  
**Note:** Read and Write

**DataTargetEvents**

List of events this object class should be subscribed to in its data targets.

**Data type:** CHARACTER  
**Note:** Read and Write
**DBAware**

Value of DBAware. TRUE if this object is dependent on being connected to a database. This allows some code, for example in data objects, to execute two different ways.

**Data type:** LOGICAL  
**Note:** Read and Write

**InactiveLinks**

Comma-separated paired list of inactive links. The second entry of each pair is a semicolon-separated list of object handles.

**Data type:** Logical  
**Notes:**
- Read and Write.
- modifyInactiveLinks should be used to maintain this property.
- isLinkInactive should be used to check if an actual link is inactive.

**InstanceProperties**

A list of the ADM instance properties of the SmartObject. Instance properties are those properties that can be set at design time for initialization as part of startup.

**Data type:** CHARACTER  
**Note:** Read and Write

**LogicalObjectName**

Value of LogicalObjectName.

**Data type:** CHARACTER  
**Note:** Read and Write

**LogicalVersion**

Version number of the object name as stored in the Progress Dynamics Repository. This value is read from the rym_data_version table which keeps a record of all repository object versions for version managed data, for example, ryc_smartobject objects.

**Data type:** CHARACTER  
**Note:** Read and Write
ObjectHidden

Flag indicating whether or not the current object is hidden. Before checking ObjectHidden, the routine examines the parent state in ContainerHidden. If ContainerHidden is TRUE, there is no need to examine ObjectHidden, and the function immediately returns TRUE. Note that hidden is a logical concept in the ADM. A nonvisual object can be hidden to indicate that it is not currently active in some way, because it is a Container-Target of some visual object that is hidden.

Data type: LOGICAL
Note: Read and Write

ObjectInitialized

Flag indicating whether this object has been initialized. TRUE if this object has been initialized.

Data type: LOGICAL
Note: Read only

ObjectName

Name of the object that can be the filename or some other designation meaningful to the repository and other objects.

Data type: CHARACTER
Note: Read and Write

ObjectPage

Logical page on which this object has been placed.

Data type: INTEGER
Note: Read only

ObjectParent

Widget handle of this object's Window or Frame parent, that is, the handle of the visual container of its CONTAINER-SOURCE.

Data type: HANDLE
Note: Read and Write
**ObjectType**

Type of the SmartObject, such as SmartDataObject and so on. If this is a super procedure, `SUPER` is returned.

**Data type:** CHARACTER  
**Note:** Read only

**ObjectVersion**

ADM version of the SmartObject.

**Data type:** CHARACTER  
**Note:** Read and Write

**ParentDataKey**

ParentData Key.

**Data type:** CHARACTER  
**Note:** Read and Write

**PassThroughLinks**

List of link types that can be pass-through links. Used by addLink. This property is shared by all objects should normally be modified using modifyListProperty.

**Data type:** CHARACTER  
**Note:** Read and Write

**PhysicalObjectName**

The name of the physical file run to instantiate either a static or Progress Dynamics object.

Static objects have only a physical object name. Progress Dynamics objects have a logical object name which is the name of the repository object, and a physical object name which is the name of the rendering object used to build the Progress Dynamics object. For example, a dynamic browser could have a logical object name of `customerbrowse` and a physical object name of `rydynbrowb.w`.

**Data type:** CHARACTER  
**Notes:**
- Read and Write.
- This property includes the file extension but does not include the path for the file name.
- This property is set internally and should not be changed by application code.
PhysicalVersion

Version number of the physical object. This number is displayed in the Help About message dialog box. The version number for all Progress Dynamics objects are created using the standard templates.

If Roundtable is being used, this version number is automatically updated to match the version number that is in Roundtable for the object. If Roundtable is not being used, you must manually update this version number.

**Data type:** CHARACTER

**Note:** Read and Write

PropertyDialog

Name of the dialog procedure that sets InstanceProperties.

**Data type:** CHARACTER

**Note:** Read only

QueryObject

Flag that indicates whether this object manages its own database query.

**Data type:** LOGICAL

**Note:** Read only
RunAttribute

Property that maps to attributes set up in the gsc_instance_attribute table in the Progress
Dynamics Repository. Use this property to change the behavior of generic objects. For example,
If you have a generic object that you want to behave differently for a creditors system and a
debtors system, you can use this property to determine the functionality for the specific instance
of the generic object. That is, is the object being used in the creditors system or the debtors
system.

Data type: CHARACTER

Notes:

- Read and Write.
- The mapped value is used for the container and all contained objects.
- The property is posted to the program using either the menu option the program was run
  from or coded in a program if the program was run from a button and so on. As a result,
some of these properties are owned by the system and cannot be maintained or deleted by
users.
- When security is applied, for example field-level security, they can be defined globally,
  for a specific product, product module or to an individual program level. The RunAttribute
  property is a level below the program level that permits security settings per instance of a
  program.

ServerFileName

Property representing the actual server-side SDO filename to run on the AppServer. This value
might not be the ObjectName if that has been modified.

Data type: CHARACTER

Note: Read and Write

ServerOperatingMode

A string representing the connection state. Valid values are stateless, state-reset, state-aware,
or none (no AppServer connection).

Data type: CHARACTER

Note: Read and Write

SupportedLinks

Comma-separated list of the SmartObject links supported by this object.

Data type: CHARACTER

Note: Read and Write
TranslatableProperties

List of properties that should not have a :U following their literal values when code is generated in adm-create-objects. Because this is a comma-separated list, it should normally be invoked indirectly through modifyListAttribute.

Data type: CHARACTER  
Note: Read and Write

UIBMode

Indicates whether an object is in Design mode in AppBuilder (AppBuilder was originally called User-interface Builder). This value is blank if the object is not in design mode, that is, not running in an AppBuilder design window. This value is Design if the object is in design mode, or Design-Child if it is contained in another SmartObject that is in design mode, such as a SmartFrame. This value is the Unknown value (?) if the object is not a SmartObject and does not have a valid handle in ADM-DATA.

Data type: CHARACTER  
Note: Read and Write

UseRepository

Indicates whether the repository is running and available. If this value is TRUE, then Progress Dynamics is running and the Repository is available.

Data type: LOGICAL  
Note: Read only

UserProperty

Dynamically defined property.

Data type:  
Notes:  
- Write only.  
- You cannot set or get user-defined properties in an application running in n-tier (client and AppServer) mode.
Visual Objects and Their Methods and Properties

This chapter lists and describes the methods (internal procedures and functions) and properties for visual objects. Refer to Figure 1–1 to see the inheritance hierarchy for each object class.

Note: For information specific to the WebSpeed environment, see Chapter 9, “Alphabetical Listing of WebSpeed-specific API Routines.”

This chapter provides information about:

- Base methods for visual objects
- Methods for data visualization objects
- Filtering methods for visual objects
- Browser methods for visual objects
- Methods for SmartDataViewers
- Methods for TreeView objects
- Visual object properties
- Browse column properties
- Column properties for visual objects
Base methods for visual objects

This section describes the base methods for visual objects.

**applyLayout**

Procedure that applies the Master or an alternate layout for a SmartObject that has multiple layouts.

**Location:** visual.p

**Parameters:** None

**Notes:**

- applyLayout is invoked from initializeObject to set the correct layout during SmartObject initialization. Runs the Layout procedure to apply the Master layout if it is already current (in order to reset the user interface to its original state), and then runs the Layout procedure (determined by the LayoutVariable property that is storing the LAYOUT–VARIABLE preprocessor value) to apply the new layout.
- applyLayout can be customized when special processing is needed to change layouts.

**assignFocusedWidget**

Sets focus to the named object. Not supported for SmartDataFields and returns FALSE if attempted for SmartDataFields.

**Location:** visual.p

**Parameters:**

- INPUT name AS CHARACTER

  The name of a single Progress Dynamics object.

**Returns:** LOGICAL

**Notes:** None

**Examples:**

The following illustrates the use of this method in ABL code for use with a graphical user interface:

```ABL
IF widgetIsModified("name":U) THEN
  assignFocusedWidget("description":U).
```

The following illustrates the use of this method in DHTML code for use with a Web browser:

```DHTML
if (logic.widgetIsModified('orderviewv.name'))
  logic.assignFocusedWidget('orderviewv.description');
```
assignWidgetValue

Takes the name of one object and a character screen value as input and sets the SCREEN-VALUE of the object. The DataValue is set for a SmartDataField. (This would always be the key field for a lookup even when the display field is different.)

**Location:** visual.p

**Parameters:**

INPUT name AS CHARACTER

The name of a single Progress Dynamics object.

INPUT value AS CHARACTER

A string representing the intended screen value of the widget.

**Returns:** LOGICAL

**Notes:**

- Sets DataModified to make the toolbar enable saving data (it behaves as if the user actually changed the field value manually).
- Sets DataModified to TRUE whether or not the field is enabled.

**Examples:**

The following illustrates the use of this method in ABL code for use with a graphical user interface:

```
```

The following illustrates the use of this method in DHTML code for use with a Web browser:

```
logic.assignWidgetValue('orderfullo.browse.status','Shipped');
```
**assignWidgetValueList**

Takes the name of one or more objects and character screen values and a delimiter as input and sets the SCREEN-VALUE of the objects. The DataValue is set for a SmartDataField (this would always be the key field for a lookup even where the display field is different).

This function sets the DataModified attribute to force the toolbar to enable saving data (it behaves as if the user actually changed the field value manually). The DataModified attribute is set to TRUE whether the field is enabled or not.

**Location:** visual.p

**Parameters:**

**INPUT namelist AS CHARACTER**

The name of one or more objects, separated by commas.

**INPUT valuelist AS CHARACTER**

A string representing the intended screen values for one or more widgets separated by the specified or default delimiter.

If the name list contains more than one object, then the value list must be either a single value, which will be applied to each field in the name list, or it must be a list of an equal number of entries to the name list, in which case the values are assigned to the corresponding object names. If there is more than one entry in the value list and the number of entries in the namelist and the number of entries in the value list do not match, nothing is done and FALSE is returned. If any assignments fail because the widget is not found, FALSE is returned but it still processes through the list and assigns those that it can.

**INPUT delimiter AS CHARACTER**

(Optional) Specifies the delimiter to use for the value list. Specify the Unknown value (?) to use the default delimiter, which is the pipe character (“|”).

**Returns:** LOGICAL

**Note:** For the DHTML client, the delimiter is optional as the third parameter. If it is not specified, the function uses the default, which is the pipe symbol (“|”).

**Examples:**

The following illustrates the use of this method in ABL code for use with a graphical user interface:

```abl
assignWidgetValueList("city,state":U, "Boston|MA":U, ?).
```

The following illustrates the use of this method in DHTML code for use with a Web browser:

```dhtml
!Ret=logic.assignWidgetValueList('customerviewv.name,customerviewv.city', 'Reeds Ferry|Nashua');
```
blankWidget

Blanks the SCREEN-VALUE of the objects in the namelist. The DataValue is blanked for a SmartDataField (this would always be the key field for a lookup even where the display field is different).

**Location:** visual.p

**Parameters:**

`INPUT namelist AS CHARACTER`

The name of one or more objects, separated by commas.

**Returns:** LOGICAL

**Notes:**

- This function sets the DataModified attribute to force the toolbar to enable saving data (it behaves as if the user actually changed the field value manually).
- This function does nothing to objects that do not support SCREEN-VALUE and to objects where a blank screen value does not make sense, such as toggle boxes. It blanks a combo-box by setting its list items to its list items.

**Examples:**

The following illustrates the use of this method in ABL code for use with a graphical user interface:

```ABL
IF widgetIsTrue("customerviewv.disableAccount":U) THEN
  blankWidget("Self.accountID":U).
```

The following illustrates the use of this method in DHTML code for use with a Web browser:

```javascript
if (logic.widgetIsTrue('customerviewv.disableAccount'))
  logic.blankWidget('myviewv.accountID');
```
disableObject

Procedure that disables all enabled objects in a frame, including RowObject fields.

Location: visual.p

Parameters: None

Notes:

- disableObject invokes disableFields to disable RowObject fields. In addition, it disables objects in the frame that are not mapped to RowObject fields, which the disableFields procedure does not do. This allows applications to distinguish between disabling data-related fields (because no row is available for display or for some other reason) from disabling the entire object and all fields in its frame.

- disableObject can be customized when additional processing is needed when a SmartObject is disabled. You might do this to selectively re-enable selected widgets in the SmartObject based on the application state or to disable other related widgets.

disableRadioButton

Disables the specified radio button of the radio set objects identified in the namelist. Returns FALSE if a widget in the list is not a radio-set, if a widget in the list is not found, or if the button number is invalid.

Location: visual.p

Parameters:

INPUT namelist AS CHARACTER

The name of one or more radio-set objects, separated by commas.

INPUT buttonNum AS INTEGER

The numerical ID of a radio button in a particular radio set.

Returns: LOGICAL

Note: This API is not supported by the DHTML client.

Example:

The following illustrates the use of this method in ABL code for use with a graphical user interface:

```abl
IF widgetIsTrue("shipped":U) THEN
   disableRadioBtn("shippingTrans":U, 2).
```
**disableWidget**

Disables the object or objects identified in the namelist.

For SmartDataFields, it runs the disableField function. disableField is not a generic SmartDataField function, therefore this API is only supported for SmartDataFields that have disableField defined. If a field in the list is not found, or a SmartDataField without disableField is included in the list, disableWidget returns FALSE.

**Location:** visual.p

**Parameters:**

INPUT namelist AS CHARACTER

The name of one or more objects, separated by commas.

**Returns:** LOGICAL

**Notes:**

- Data fields are removed from the EnabledFields and EnabledHandles properties to ensure that once the field is disabled by the API, it remains disabled.

- Local fields are removed from the EnabledObjFldsToDisable property when the property is set to a field list. When the EnabledObjFldsToDisable property is set to (All), the disableWidget function sets this property to the value of the EnabledObjFlds property without the field being disabled. This action ensures that once a field is disabled by the API, it remains disabled. When the EnabledObjFldsToDisable property is set to (None), it is not changed.

**Examples:**

The following illustrates the use of this method in ABL code for use with a graphical user interface:

```abl
IF widgetValue("Browse.Terms":U) NE "":U THEN
disableWidget("SelF.Discount":U).
```

The following illustrates the use of this method in DHTML code for use with a Web browser:

```html
if (logic.widgetValue('orderfullo.browse.terms')!='')
    logic.disableWidget('customerviewv.discount');
```
**enableObject**

Procedure that enables an object. Includes all components except RowObject fields. They are enabled using EnableFields().

**Location:** visual.p

**Parameters:** None

**Notes:**
- enableObject is invoked from initializeObject to enable a SmartObject (different from when a SmartObject’s RowObject fields are enabled with enableFields).
- You can customize enableObject when a SmartObject is enabled, perhaps for initialization that is needed each time a SmartObject is enabled, or to enable other related SmartObjects.
- enableObject and disableObject are not completely opposite in their effects. disableObject always invokes disableFields because it is not meaningful to have a SmartObject disabled while RowObject fields inside it are enabled. On the other hand, enableObject does not invoke enableFields; this is done separately to allow enabling of a SmartObject’s RowObject fields independently of other basic widgets it contains.

**enableRadioButton**

Enables the specified radio button of the radio set objects identified in the name list. Returns FALSE if a widget in the list is not a radio-set, if a widget in the list is not found, or if the button number is invalid.

**Location:** visual.p

**Parameters:**

- **INPUT namelist AS CHARACTER**
  
  The name of one or more radio-set objects, separated by commas.

- **INPUT buttonNum AS INTEGER**
  
  The numerical ID of a radio button in a particular radio set.

**Returns:** LOGICAL

**Note:** This API is not supported by the DHTML client.

**Example:**

The following illustrates the use of this method in ABL code for use with a graphical user interface:

```abl
IF NOT widgetIsTrue("shipped":U) THEN
  enableRadioButton("shippingTrans":U, 2).
```
enableWidget

Enables the object or objects identified in the name list. For SmartDataFields, it runs the enableField function. Note that enableField is not a generic SmartDataField function, therefore this API is only supported for SmartDataFields that have enableField defined. If a field in the list is not found, or a SmartDataField without enableField is included in the list, enableWidget returns FALSE.

**Location:** visual.p

**Parameters:**

INPUT namelist AS CHARACTER

The name of one or more objects, separated by commas.

**Returns:** LOGICAL

**Notes:**

- Data fields are added to the EnabledFields and EnabledHandles properties to ensure that once the field is enabled by the API, it remains so enabled.

- Local fields are added to the EnabledObjFldsToDisable property when the property is not set to (None) or (All). This action ensures that once a field is enabled by the API, it remains enabled. It could also result in adding a field that was not included in the EnabledObjFldsToDisable property initially to the property by a call to this API. If this behavior is not desired, do not use the enableWidget function or manipulate the EnabledObjFldsToDisable property after using the function to remove the field.

**Examples:**

The following illustrates the use of this method in ABL code for use with a graphical user interface:

```abl
IF widgetIsModified("customerviewv.discount":U) THEN
  enableWidget("Self.terms":U).
```

The following illustrates the use of this method in DHTML code for use with a Web browser:

```java
if (logic.widgetIsModified('customerviewv.discount'))
  logic.enableWidget('orderviewv.terms');
```
formattedWidgetValue

Returns the SCREEN-VALUE of the object, or in the case of a browse column when in a ROW-DISPLAY trigger, the STRING-VALUE from the RowObject buffer field. The DataValue is returned for a SmartDataField (this would always be the key field for a lookup even where the display field is different). For example, you could use this function to get the formatted value of a single field to use for comparisons.

Location: visual.p

Parameters:

INPUT name AS CHARACTER

The name of a single Progress Dynamics object.

Returns: CHARACTER

Notes: None

Examples:

The following illustrates the use of this method in ABL code for use with a graphical user interface:

```
IF formattedWidgetValue("orderviewv.ordernum":U) > cNumber THEN ...
```

The following illustrates the use of this method in DHTML code for use with a Web browser:

```
if (logicformattedWidgetValue('orderviewv.ordernum')>cNumber) ...
```
formattedWidgetValueList

Takes the name of one or more objects and returns the SCREEN-VALUE of the object or objects. For example, use this function to retrieve the formatted values of several fields to assign their screen values to other fields.

If the object is a browse column (called from within a ROW-DISPLAY trigger), the STRING-VALUE from the RowObject buffer field is added to the list of returned values.

If the object is a SmartDataField, the DataValue field is returned. The DataValue field is always the key field, even when the display field is different.

If a field in the list is not found or a field has an unknown value, the function returns the Unknown value (?) for its value in the returned character list.

**Location:** visual.p

**Parameters:**

**INPUT namelist AS CHARACTER**

The name of one or more objects, separated by commas.

**INPUT delimiter AS CHARACTER**

(Optional) Specifies the delimiter to use for the return value only. Specify the Unknown value (?) to use the default delimiter, which is the pipe character ("|").

**Returns:** CHARACTER

**Note:** Use the pipe ("|") delimiter in the DHTML client, since manipulating unprintable characters such as CHR(3) is problematic. The delimiter is optional. If not specified it defaults to the pipe delimiter.

**Examples:**

The following illustrates the use of this method in ABL code for use with a graphical user interface:

```ABL
ASSIGN
  cValues = formattedWidgetValueList("salesrepviewv.region,county,city":U, CHR(3))
  cCounty = ENTRY(2, cValues, CHR(3)).
  assignWidgetValue("county":U, cCounty).
```

The following illustrates the use of this method in DHTML code for use with a Web browser:

```DHTML
values=logic.formattedWidgetValueList('salesrepviewv.region, salesrepviewv.city','|');
```
hideWidget

Hides the object or objects identified in the namelist (and their popup buttons). For SmartDataFields, it invokes the hideObject method.

**Location:** visual.p

**Parameters:**

INPUT namelist AS CHARACTER

The name of one or more objects, separated by commas.

**Returns:** LOGICAL

**Notes:** None

**Examples:**

The following illustrates the use of this method in ABL code for use with a graphical user interface:

```ABL
IF widgetIsTrue("Self.Current":U)THEN
```

The following illustrates the use of this method in DHTML code for use with a Web browser:

```javascript
if (logic.widgetIsTrue('familyviewv.coveredonbenefits'))
    logic.hideWidget('customerfullo.browse.balance');
```
highlightWidget

Sets the background and foreground colors (FGCOLOR and BGCOLOR widget attributes) of the named object or objects to a standard highlight color, depending on the value of the highlightType argument. For example, you may want to change the background color of a field with an invalid value to red.

**Location:** visual.p

**Parameters:**

**INPUT namelist AS CHARACTER**

The name of one or more objects, separated by commas.

**INPUT highlightType AS CHARACTER**

Determines the color values applied to the FGCOLOR and BGCOLOR widget attributes. Table 3–1 shows the valid values of this parameter map to certain attributes of the visual class.

**Table 3–1: Color values for foreground and background widget attributes**

<table>
<thead>
<tr>
<th>Valid value</th>
<th>Foreground color</th>
<th>Background color</th>
</tr>
</thead>
<tbody>
<tr>
<td>info or information</td>
<td>colorInfoFG attribute</td>
<td>colorInfoBG attribute</td>
</tr>
<tr>
<td>warn or warning</td>
<td>colorWarnFG attribute</td>
<td>colorWarnBG attribute</td>
</tr>
<tr>
<td>err or error</td>
<td>colorErrorFG attribute</td>
<td>colorErrorBG attribute</td>
</tr>
<tr>
<td>def or default</td>
<td>Windows default</td>
<td>Windows default</td>
</tr>
</tbody>
</table>

The default setting uses the default Windows color values for foreground and background. The visual class attributes use values mapped to the application’s color table. Table 3–2 shows the default values for the visual class attributes.

**Table 3–2: Default color values for visual class attributes**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Default color value</th>
</tr>
</thead>
<tbody>
<tr>
<td>colorInfoFG</td>
<td>Unknown value (?)</td>
</tr>
<tr>
<td>colorInfoBG</td>
<td>10 (green)</td>
</tr>
<tr>
<td>colorWarnFG</td>
<td>Unknown value (?)</td>
</tr>
<tr>
<td>colorWarnBG</td>
<td>14 (yellow)</td>
</tr>
<tr>
<td>colorErrorFG</td>
<td>Unknown value (?)</td>
</tr>
<tr>
<td>colorErrorBG</td>
<td>12 (red)</td>
</tr>
</tbody>
</table>
Returns: LOGICAL

Notes:

- To remove highlighting from a widget, call the function with the highlight type set to default.
- If code in one object, attempts to highlight a widget in another object, the color values come from the attribute the widget resides in.

Examples:

The following illustrates the use of this method in ABL code for use with a graphical user interface:

```
IF widgetIsBlank("phone":U) THEN highlightWidget("phone":U, "warn":U).
```

The following illustrates the use of this method in DHTML code for use with a Web browser:

```
logic.highlightWidget('customerviewv.phone,customerviewv.fax','warn');
```

initializeObject

Procedure that initializes code specific to visualizations.

Location: visual.p

Parameters: None

Notes:

- Invoked with RUN SUPER from container.p’s version of initializeObject.
- Reads through the list of enabled objects (which does not include RowObject fields) and gets their handles to store in EnabledObjHdls property.
- Invokes enableObject and viewObject depending on the values of DisableOnInit and HideOnInit property settings.
- Invokes applyLayout to change the object to the correct layout if there are multiple layouts.
**resetWidgetValue**

Resets the SCREEN-VALUE of the object or objects identified in the name list back to its original value from its data source. If a field in the list is not found or there is no data source for a field in the list, FALSE is returned and it will process all others in the list.

**Location:** visual.p

**Parameters:**

INPUT namelist AS CHARACTER

The name of one or more objects, separated by commas.

**Returns:** LOGICAL

**Notes:** None

**Examples:**

The following illustrates the use of this method in ABL code for use with a graphical user interface:

```abl
IF widgetIsModified("itemId":U) THEN resetWidgetValue("discount":U).
```

The following illustrates the use of this method in DHTML code for use with a Web browser:

```dhtml
if (logic.widgetIsModified('orderlineviewv.itemnum'))
    logic.resetWidgetValue('customerviewv.discount');
```

**toggleWidget**

Reverses the value of one or more objects of type LOGICAL in the name list. The format of the widget is used to reverse its SCREEN-VALUE. For example, a logical with a format of credit/debit would change a “credit” screen-value to “debit.” A null value is not changed and FALSE is returned.

**Location:** visual.p

**Parameters:**

INPUT namelist AS CHARACTER

The name of one or more objects, separated by commas.

**Returns:** LOGICAL

**Notes:**

- Sets the DataModified attribute to force the toolbar to enable saving data (it behaves as if the user actually changed the field value manually).
- The DHTML client supports logical text fill-ins (HTML input) and toggle boxes (HTML check box).
Examples:

The following illustrates the use of this method in ABL code for use with a graphical user interface:

```abl
IF widgetValue("status":U) = "Shipped":U THEN
toggleWidget("transType":U).
```

The following illustrates the use of this method in DHTML code for use with a Web browser:

```dhtml
if (logic.widgetValue('orderviewv.shipped')=='Shipped')
logic.toggleWidget('myviewv.transtype');
```

**viewWidget**

Views the object or objects identified in the namelist (and their popup buttons). For SmartDataFields, it invokes the viewObject method.

**Location:** visual.p

**Parameters:**

INPUT namelist AS CHARACTER

The name of one or more objects, separated by commas.

**Returns:** LOGICAL

**Notes:** None

**Examples:**

The following illustrates the use of this method in ABL code for use with a graphical user interface:

```abl
IF widgetIsTrue("Shipped":U) THEN
viewWidget("ShipDate":U).
```

The following illustrates the use of this method in DHTML code for use with a Web browser:

```dhtml
if (logic.widgetIsTrue('myviewv.shipped'))
logic.viewWidget('orderviewv.shipdate');
```
**widgetHandle**

Returns the handle of the requested object. For a basic object it returns the widget-handle, for a SmartDataField it returns the procedure handle.

**Caution:** While this is not a low-level API, future versions of Progress Dynamics might not automatically migrate calls to this API. Try to avoid using this function. If you do use it, keep track of its use so that you can quickly locate potential migration issues later.

**Location:** visual.p

**Parameters:**

INPUT name AS CHARACTER

The name of a single Progress Dynamics object.

**Returns:** HANDLE

**Notes:** None

---

**widgetIsBlank**

Returns TRUE if the widget is blank, otherwise FALSE. If the namelist contains more than one object, then the function returns TRUE if all of them are blank, otherwise FALSE.

**Location:** visual.p

**Parameters:**

INPUT namelist AS CHARACTER

The name of one or more objects, separated by commas.

**Returns:** LOGICAL

**Notes:** None

**Examples:**

The following illustrates the use of this method in ABL code for use with a graphical user interface:

```abl
IF widgetIsBlank("terms":U) THEN
disableWidget("discount":U).
```

The following illustrates the use of this method in DHTML code for use with a Web browser:

```html
if (logic.widgetIsBlank('orderviewv.terms'))
logic.disableWidget('customerviewv.discount');
```
**widgetIsFocused**

Returns TRUE if the widget has focus. This is not supported for SmartDataFields. This returns unknown if the field is not found or if the widget is a SmartDataField.

**Location:** visual.p

**Parameters:**

INPUT name AS CHARACTER

The name of a single Progress Dynamics object.

**Returns:** LOGICAL

**Note:** This API is not supported by the DHTML client.

**Example:**

The following illustrates the use of this method in ABL code for use with a graphical user interface:

```abl
IF widgetIsFocused("shipped":U) AND widgetIsTrue("shipped":U) THEN
    assignFocusedWidget("comments":U).

IF widgetIsModified("deposit":U) THEN
    assignWidgetValue("status":U, "current":U).
```

**widgetIsModified**

Returns TRUE if the MODIFIED attribute or its equivalent is set for the object, otherwise FALSE. If the name list contains more than one object, then the function returns TRUE if any of them have changed, otherwise FALSE. If any field in the name list is not found, unknown is returned.

For example, use this function to check if any of multiple values involved in a calculation or expression have been modified.

**Location:** visual.p

**Parameters:**

INPUT namelist AS CHARACTER

The name of one or more objects, separated by commas.

**Returns:** LOGICAL

**Notes:** None

**Examples:**

The following illustrates the use of this method in ABL code for use with a graphical user interface:

```abl
IF widgetIsModified("deposit":U) THEN
    assignWidgetValue("status":U, "current":U).
```
The following illustrates the use of this method in DHTML code for use with a Web browser:

```javascript
if (logic.widgetIsModified('customerviewv.name'))
    logic.assignWidgetValue('orderviewv.orderstatus','current');
```

### widgetIsTrue

Returns TRUE if the value of a LOGICAL object is TRUE, otherwise FALSE. This function does not support SmartDataFields. This function returns unknown if the field is not found, if the value of the LOGICAL is unknown, if the widget is not a LOGICAL field, or if the widget is a SmartDataField. Contrast with the widgetValue function which returns a CHARACTER value.

**Location:** visual.p

**Parameters:**

**INPUT** name **AS** CHARACTER

The name of a single Progress Dynamics object.

**Returns:** LOGICAL

**Notes:** None

**Examples:**

The following illustrates the use of this method in ABL code for use with a graphical user interface:

```plaintext
IF widgetIsTrue("writeToConfig":U) THEN
    RUN genConfig.
```

The following illustrates the use of this method in DHTML code for use with a Web browser:

```javascript
if (logic.widgetIsTrue('myviewv.writeToConfig'))
    getConfig();
```
**widgetValue**

For most objects, returns the INPUT-VALUE of the object.

For a browse column within a ROW-DISPLAY trigger, the function returns the BUFFER-VALUE from the RowObject buffer field. If INPUT-VALUE returns an ABL error because the value is actually blank, widgetIsBlank will be invoked and blank will be returned. For SmartDataFields, which do not have a standard function for returning an unformatted value, this function does nothing and returns unknown.

**Location:** visual.p

**Parameters:**

INPUT namelist AS CHARACTER

The name of one or more objects, separated by commas.

**Returns:** CHARACTER

**Note:** The DHTML client supports for DATE, DECIMAL, and INTEGER data types. CHARACTER and LOGICAL data types are not supported.

**Examples:**

The following illustrates the use of this method in ABL code for use with a graphical user interface:

```java
IF widgetValue("custID":U) = cID THEN _
```

The following illustrates the use of this method in DHTML code for use with a Web browser:

```java
if (logic.widgetValue('customerviewv.custnum') == cID) _
```

**widgetValueList**

Takes the name of one or more objects and a delimiter and returns the INPUT-VALUE of the object. In the case of a browse column reference from within a ROW-DISPLAY event, it returns the BUFFER-VALUE from the RowObject buffer field. SmartDataFields do not have a standard function for returning an unformatted value so this function does nothing for SmartDataFields and returns unknown.

If a field in the list is not found or a field has an unknown value, the function returns the Unknown value (?) for its value in the returned character list.

**Location:** visual.p
Parameters:

INPUT namelist AS CHARACTER

The name of one or more objects, separated by commas.

INPUT delimiter AS CHARACTER

(Optional) Specifies the delimiter to use for the return value only. Specify the Unknown
value (?) to use the default delimiter, which is the pipe character (“|”).

Returns: CHARACTER

Notes:

- The DHTML client supports DATE, DECIMAL, and INTEGER data types.
  CHARACTER and LOGICAL data types are not supported.

- For the DHTML client, the delimiter is optional. If it is not specified, it uses the default
delimiter, which is the pipe symbol (“|”).

Examples:

The following illustrates the use of this method in ABL code for use with a graphical user
interface:

```abl
ASSIGN
cValues  = widgetValueList("Self.discount,balance":U, ?)
iDiscount = INTEGER(ENTRY(1, cValues, "|":U))
dBalance  = DECIMAL(ENTRY(2, cValues, "|":U)).
```

The following illustrates the use of this method in DHTML code for use with a Web browser:

```html
cValues = logic.widgetValueList
  (‘customerviewv.discount,customerviewv.balance’);
```
Methods for data visualization objects

The following section describes the data visualization methods for visual objects.

addRecord

Procedure that initiates the creation of a new record. First verifies that there is no update pending. If there is an update pending, notifies the user that current values must be saved or cancelled before the Add operation takes place, then it displays initial values.

Location: datavis.p
Parameters: None
Notes:
- Publishes updateState Update to signal related objects that the update is in progress.
- Sets the NewRecord property to Add.
- Invokes enableFields. The addRow method in the associated SmartDataObject is invoked at a lower level (from addRecord in viewer.p for a SmartDataViewer or in browse triggers for a SmartDataBrowser).
- Is invoked when an Add is initiated (typically by choosing the Add button in an Update SmartPanel, or the Add button or Add menu item in a SmartToolbar).

cancelObject

Procedure that passes a cancel request to its container.

Location: datavis.p
Parameters: None
Notes:
- The convention is that the standard routine always passes an cancel, OK, or exit request to its CONTAINER-SOURCE. The container that is actually able to initiate the cancel should override this and not call SUPER.
- Is customized when additional processing is needed in the visual SmartObject at the start of an Add operation. When an addRecord override is invoked, the new record has not yet been created, and there is no transaction active. If you want to customize the Add operation for the SmartDataObject that manages the table being shown in the visualization, you can override addRow to customize the processing at the time the new row is added to the RowObject temp–table, or override submitRow to customize the saving of the newly added row.
Examples:

<table>
<thead>
<tr>
<th>PROCEDURE addRecord:</th>
</tr>
</thead>
<tbody>
<tr>
<td>/* Code placed here will execute PRIOR to standard behavior. */</td>
</tr>
<tr>
<td>RUN SUPER.</td>
</tr>
<tr>
<td>/* Code placed here will execute AFTER standard behavior. */</td>
</tr>
<tr>
<td>iRecTotal = iRecTotal + 1.</td>
</tr>
<tr>
<td>DISPLAY iRecTotal WITH FRAME {&amp;FRAME-NAME}.</td>
</tr>
<tr>
<td>END PROCEDURE.</td>
</tr>
</tbody>
</table>

**cancelRecord**

Procedure that cancels an Update, Add, or Copy operation. For a cancel of an add or copy, resets the fields in their previous state. If no record was available before the add, the fields are disabled.

**Location:** datavis.p

**Parameters:** None

**Notes:**

- Invokes the cancelRow() function in the update target of the visualization to delete the row created for add or copy.

- When you choose the Cancel button during:
  - **Add** or **Copy** — The new record is erased and the previously current record is displayed again.
  - **Update** — The Update is cancelled and the record’s original values are displayed.

- Invoked when an update is cancelled, usually by choosing the Cancel button in an Update SmartPanel or the Cancel button.

- Sets DataModified property FALSE.

- Customized when additional processing is needed when a record Add, Copy, or Update is cancelled. You might want to do this to restore other related nondatabase fields or other objects to their original values, or to undo some action that was taken when the Add, Copy, or Update was initiated.
canNavigate

Returns TRUE if the object can allow a navigation.

**Location:** datavis.p

**Parameters:** None

**Returns:** LOGICAL

**Notes:**
- An object cannot navigate if there are uncommitted or unsaved changes in the updateTarget or unsaved changes in any of the Datatargets of the updateTarget. The check is used as a rule for enabling of toolbar actions. This includes delete and add / copy as navigation is an implicit result of these actions on the client.
- See details in the data.p canNavigate.

collectChanges

Procedure that collects the screen values and assigns them to the appropriate record. Values are collected as a character value of a list form.

**Location:** datavis.p

**Parameters:**

- INPUT-OUTPUT pcChanges AS CHARACTER
  A CHR(1)-delimited list made of changed fields and their corresponding value.
- INPUT-OUTPUT pcInfo AS CHARACTER
  A comma-delimited list with three entries per object containing the number of fields changed, the page number of the object, and its handle. This allows the proper page to be viewed and focus applied to the proper field in the event of an error.

**Notes:**
- collectChanges is invoked from updateRecord and published to any GroupAssign target.
- The collectChanges procedure is not intended to be run from application code. If validation of modified field values is required, this should generally be done using one of the methods in the SmartDataObject (under submitRow), rather than in the associated visualization.
- Only values of fields that are modified are collected. (The MODIFIED attribute is used to determine if the field is modified or not.)
- Use the ModifyFields property to control from which fields to collect values. See the “ModifyFields” section on page 3–90 for more information.
**confirmCancel**

Procedure that verifies that no data is lost before allowing its container to initiate a destroy operation.

**Location:** datavis.p

**Parameters:**

INPUT-OUTPUT plError AS LOGICAL

If TRUE on output, there is a problem and you should cancel the destroy operation.

**Note:** The name confirm is used as it is in family with the other confirm methods, but this does not ask any questions.

**confirmCommit**

Procedure that checks to be sure there are no unsaved changes before allowing the data-source to start a commitTransaction operation.

**Location:** datavis.p

**Parameters:**

INPUT-OUTPUT plCancel AS LOGICAL

Returns TRUE if the transaction can be committed.

**Notes:** None

**confirmContinue**

Checks to make sure there are no unsaved or uncommitted data changes before allowing its data-source to start an Apply filter operation.

**Location:** datavis.p

**Parameters:** None

**Returns:** LOGICAL

**Notes:** None

**confirmDelete**

Procedure that allows you to force the user to confirm a pending deletion so that it can be aborted if not intended.

**Location:** datavis.p

**Parameters:**

INPUT-OUTPUT plAnswer AS LOGICAL

**Notes:** None
Visual Objects and Their Methods and Properties

**confirmExit**

Data visualization version of confirmExit. This procedure checks the value of the DataModified and RowObjectState properties to make sure there are not unsaved or uncommitted changes before allowing its container to initiate a Destroy operation.

**Location:** datavis.p

**Parameters:**

INPUT p1Cancel AS LOGICAL

If field values have been modified and not saved, it returns TRUE and the destroyObject is cancelled.

**Notes:**

- Invoked from destroyObject and confirmExit itself.
- A SmartContainer publishes this event to all its container targets before initiating destroyObject. If data are modified in one of its container targets, the destroyObject is cancelled.
- The first object where updates are uncommitted displays the message “Unsaved changes. Exit operation cancelled.”
- Used internally. Could be customized to add additional checks before allowing an Exit, or to modify the message displayed.

**confirmOk**

Procedure that verifies unsaved changes are saved and uncommitted data is committed before allowing its container to carry out a destroy operation.

**Location:** datavis.p

**Parameters:** None

**Note:** The name confirm is used as it is in family with the other confirm methods, but this does not ask any questions.

**confirmUndo**

Procedure that checks to make sure there are no unsaved changes before allowing its data-source to start an undoTransaction operation.

**Location:** datavis.p

**Parameters:**

INPUT-OUTPUT p1Cancel AS LOGICAL

Returns TRUE if the transaction can be undone.

**Notes:** None
copyRecord

Procedure that initiates creation of a new record, starting with a copy of the previously displayed record.

**Location:** datavis.p  
**Parameters:** None  
**Notes:**
- `copyRow()` is invoked in the update target, which creates the new RowObject temp-table record and copies the current row to it.
- Displays the previously displayed record’s values and allows data entry. The new record is not actually created until it is committed in `serverCommit`. See the addRecord reference entry for additional notes.
- Sets NewRecord property to Copy.
- Invoked when a Copy operation is initiated, usually by choosing the Copy button.
- Customized when copy needs special processing.

dataAvailable

Data visualization version of `dataAvailable`. Procedure that requests that data columns be displayed in the Data source that the data visualization object is connected to, and displays them.

**Location:** datavis.p  
**Parameters:**

```plaintext
INPUT pcRelative AS CHARACTER
```

A flag that signals whether this is a different row than was previously sent; this version of `dataAvailable` does not care; it displays the row in any case.

**Notes:**
- Invoked whenever the Data source has a new row.
- Invokes `colValues()` in its Data source and `displayFields` in itself to display the data.
- Parallel to row–available for Version 8 SmartViewers.
deleteRecord

Procedure that initiates the deletion of the current record in the associated SmartDataObject. Invoked when the delete button is chosen in an Update SmartPanel or in a SmartToolbar.

**Location:** datavis.p  
**Parameters:** None  
**Note:** Invokes deleteRow( ) in the update target the data visualization object is connected to. If the deleteRow( ) fails, error messages are displayed by invoking showDataMessages( ). Typically customized when you want to add a message to confirm the deletion.

**Example:**

```c
PROCEDURE deleteRecord:
/* Purpose: Super Override*/
/* Code placed here will execute PRIOR to standard behavior. */
MESSAGE "Are you sure you want to delete this record?"
VIEW-AS ALERT-BOX QUESTION BUTTONS YES-NO
UPDATE lAnswer AS LOGICAL.
IF lAnswer THEN
RUN SUPER.

/* Code placed here will execute AFTER standard behavior. */
END PROCEDURE.
```

disableFields

Procedure that sets the View for ObjectMode.

**Location:** datavis.p  
**Parameters:** None  
**Note:** Viewer and browser classes have complete override for disabling. The ObjectMode is also set in updateMode, but users might call this directly.
displayObjects

Procedure that displays values for nondatabase-related fields.

Location: datavis.i
Parameters: None
Notes:

• Invoked from displayFields.
• Displays the values of the fields that are listed in the AppBuilder-maintained preprocessor variable {&DISPLAYED–OBJECTS}. These are fill-ins and other frame fields that are not associated with fields in the associated SmartDataObject.
• This procedure is located in the datavis.i include file rather than the super procedure datavis.p in order to provide access to the DISPLAYED–OBJECTS preprocessor value. Therefore, to override this procedure, it is necessary to define a local version of displayedObjects in an individual visual SmartObject and then define the EXCLUDE–displayedObjects preprocessor, which removes the standard version from the compilation.

displayRecord

Procedure that displays the rows for the current data source.

Location: datavis.p
Parameters: None
Notes: None

enableFields

Procedure that sets ObjectMode to Modify if the value is not Update.

Location: datavis.p
Parameters: None
Note: Viewer and browser classes have complete override for enabling. The ObjectMode is also set in updateMode, but users might call this directly.
**fieldModified**

This procedure runs whenever a field is modified. It sets `DataModified` to TRUE unless the `ModifyFields` property is specified to ignore the field.

**Location:** datavis.p

**Parameters:**

**INPUT phField AS HANDLE**

Handle of the field whose value has changed.

**Notes:**

- The passed field must be in the `EnabledFields` or `EnabledObjFlds` list.
- This procedure is called from `valueChanged`, SDF's `setDataModified`, or client APIs that change widget values.

**initializeObject**

Data visualization version of `initializeObject`. Procedure that performs initialization appropriate to visual objects that display data values. Part of the general initialization process. Sets certain property values and displays if any nondatabase-related fields.

**Location:** datavis.p

**Parameters:** None

**Notes:**

- Invokes `initializeObject` in `smart.p` (RUN SUPER), first.
- Sets the value of `EnabledHandles`, `CreateHandles`, and `FieldHandles` property.
- Disables any associated Update SmartPanel or SmartToolbar it is connected to if no Update target is present.
- Invokes `displayObjects` to display nondatabase fields that might be present in the data visualization object.
**IsUpdateActive**

Procedure that is received from container source to check whether contained objects have unsaved or uncommitted changes, including addMode.

**Location:** datavis.p

**Parameters:**

*INPUT-OUTPUT plActive AS LOGICAL*

This is published thru the container link and is used for close logic (ok, cancel, exit). It is very similar to canNavigate->isUpdatePending which is published thru the data link. This can be called directly, but canExit() is the intended API. canExit() is used to check an actual container from the toolbar.

**Notes:** None

**linkStateHandler**

Procedure that refreshes visual data targets.

**Location:** datavis.p

**Parameters:**

*INPUT PARAMETER pcState AS CHARACTER*
*INPUT PARAMETER phObject AS HANDLE*
*INPUT PARAMETER pcLink AS CHARACTER*

**Note:** This version of linkStateHandler is different from the version in data.p in that queryPosition must be run in addition to dataAvailable to pass the passed QueryPosition property of the data source.

**okObject**

Procedure that passes an OK request to its container.

**Location:** datavis.p

**Parameters:** None

**Note:** The convention is that the standard routine always passes an cancel, ok, or exit request to its CONTAINER-SOURCE. The container that is actually able to initiate the OK should override this and NOT call SUPER.
**okToContinueProcedure**

Procedure that checks whether the visual object has modified screen data or its data-source has uncommitted changes. If either of these conditions is TRUE we issue Yes-No-Cancel questions allowing the user to choose how to proceed. The choices are: save/commit and continue; cancel/undo and continue; not continue.

**Location:** datavis.p

**Parameters:**

**INPUT pcAction AS CHARACTER**

Used to retrieve the correct message. Valid values are:

- **Exit** — Exit/close application window.
- `' ' (the empty string) — Continue.
- **Commit** — Commit (yes, no, cancel).
- **Undo** — Undo (no save option).
- **OK** — No question: save and commit.
- **Cancel** — No question: cancel and undo.

**OUTPUT plAnswer AS LOGICAL**

The user’s response to the question, if any.

**Note:** confirmExit and confirmOpenQuery call this function. This is copied from okToContinue function in datavis.p for use with Progress Dynamics.

**queryPosition**

Procedure that captures state events for the associated query in the object’s data source.

**Location:** datavis.p

**Parameters:**

**INPUT pcState AS CHARACTER**

Possible values are: **FirstRecord** (first record); **NotFirstOrLast** (not the first or last record); **LastRecord** (last record); **NoRecordAvailable** (no record); **OnlyRecord** (only one record).

**Notes:**

- When any state begins with NoRecordAvail, it means to disable; all others (FirstRecord, NotFirstOrLast, LastRecord, OnlyRecord) mean to enable if in Save mode (SaveSource property is set to yes).
- Sets the RecordState property to NoRecordAvailable when the state is equivalent to that; but for any other state, sets the value to RecordAvilable.
resetRecord

A general code for reset operation. This procedure displays the original field values retrieved from the SmartDataObject by invoking the colValues() function for the fields that are displayed.

**Location:** datavis.p  
**Parameters:** None  
**Notes:**
- Invoked when the Reset button is pressed on an Update SmartPanel or a SmartToolbar.
- Publishes resetRecord in the case of a GroupAssign. Sets DataModified property to the Unknown value (?)

showDataMessages

Returns the name of the field (if any) from the first error message. Allows the caller to use it to position the cursor.

**Location:** datavis.p  
**Parameters:** None  
**Returns:** CHARACTER  
**Note:** Invokes fetchMessages() to retrieve all Data-related messages (normally database update-related error messages), and displays them in an alert-box of type error. This function expects to receive back a single string from fetchMessages with one or more messages delimited by CHR(3), and within each message the message text, Fieldname (or blank) + a Tablename (or blank), delimited by CHR(4) if present.

showDataMessagesProcedure

Procedure that replaces the showDataMessages function. Returns the name of the field (if any) from the first error message, to allow the caller to use it to position the cursor. A Progress Dynamics procedure that uses Progress Dynamics message handling routines.

**Location:** datavis.p  
**Parameters:**  
OUTPUT pcReturn AS CHARACTER  
**Notes:**
- Invokes fetchMessages() to retrieve all Data-related messages (normally database update-related error messages), and displays them in an alert-box of type error.
- This function expects to receive back a single string from fetchMessages with one or more messages delimited by CHR(3), and within each message the message text, Fieldname (or blank) + a Tablename (or blank), delimited by CHR(4) if present.
**undoChange**

This procedure undoes the last change. The precedence for undoing changes is as follows:

1. Undo changes to current screen values.
2. Undo the unsaved new record created by an Add or Copy, if this option is enabled for the current object.
3. Undo any stored changes for the selected record.

**Location:** datavis.p  
**Parameters:** None  
**Notes:** None

**undoRecord**

This procedure undoes a saved record. It calls `undoRow` if the record is modified and `deleteRow` if the record is newly created.

**Location:** datavis.p  
**Parameters:** None  
**Notes:** None

**updateMode**

Procedure that enables or disables fields when the data visualization object is linked to an Update SmartPanel for which the type is **Update**.

**Location:** datavis.p  
**Parameters:**

- `pcMode` AS CHARACTER

  Update mode possible values are:

  - **updateBegin** — Signals that the user has pressed the update button.
  - **updateEnd** — Signals that the user has pressed the save button.

**Note:** UpdateBegin signals that the Update button has been pressed in an Update SmartPanel in Update mode. Enable fields for data entry. `updateEnd` signals that Save has completed; disable fields. `update-begin` was a state msg in V8. `updateEnd` corresponds to the save button dispatching disable-fields in V8.
updateRecord

Procedure that receives a Save message from a TableIO source and sends the changed values back to the SmartDataObject. General code to start the save operation.

Location: datavis.p
Parameters: None
Note: Invoked when the Save button is pressed on an Update SmartPanel or a SmartToolbar. PUBLISHes “collectChanges” to gather changes made eventually in any GroupAssign target. Invokes submitRow() in the Data source that actually applies the changes to the database. If any validations failed or errors occurred during the save operation for a field, it brings up the page where the field is, if necessary, and repositions to it.

updateState

Procedure that receives the updateState event (for example, from a GroupAssign target) and sets its own DataModified property accordingly (which in turn passes on the updateState event).

Location: datavis.p
Parameters:

INPUT pcState AS CHARACTER

pcState AS CHARACTER update state Possible values are:

• Update — Signals that update is in progress.
• Complete — Signals that update is terminated.

Notes: None

validateFields

Procedure that validates a field in a data-display object.

Location: datavis.p
Parameters:

INPUT-OUTPUT pcNotValidFields AS CHARACTER

Valid values on output are:

• The empty string, if validation succeeded.
• A comma-separated list of the fieldname, object handle and page, if validation failed.

The updateRecord routine uses this output value to set focus.
Notes:

- Called from updateRecord to ensure that data can be saved.
- Field validation on leave cannot be trusted because save can be triggered by accelerators and no-focus buttons (toolbar).
- Currently, only one error is handled. Validate() on hidden objects does not give any message.
- Validation always checks unmodified fields. This is useful for add/copy but not otherwise, as those fields are not saved.

valueChanged

This procedure captures the VALUE-CHANGED event of all field changes in the object's frame and passes the handle on to the fieldModified procedure.

Location: datavis.p
Parameters: None
Notes: None

You can extend the base visual object to filter what it displays. The following section lists the functions and procedures for SmartFilter objects.
Filtering methods for visual objects

This section describes the methods for SmartFilter objects. Filtering allows users to view data in more manageable groupings.

applyFilter

Procedure that applies filter criteria to the filter-target.

Location: filter.p
Parameters: None
Notes:

- The procedure parses the dynamic filter fields and builds a list of fields, operators and values to pass to the query. The fields are only added to the list if the field or the operator is MODIFIED. (A better mechanism to identify values that need to be added to the query might become necessary). If columnQuerySelection returns any criteria for the field with an operator that is not in the list to add, it is added to a list of fields and operators to remove from the query.

- The operator for the field is:
  - In a separate widget (combo-box or radio-set).
  - If wild card is in the value use MATCHES or BEGINS.
  - GE and LE if there is a range field with a second value.
  - First blank separated entry in the field if OperatorStyle is set to inline.
  - Implicit, specified by the Operator property.
**blankField**

Fully blanks some field and sets MODIFIED to FALSE.

**Location:** filter.p

**Parameters:**

- INPUT phField AS HANDLE
  
  The handle of the actual filter field.

- INPUT phRangeField AS HANDLE
  
  The handle of the optional range field.

- INPUT phOperator AS HANDLE
  
  The handle of the optional operator.

**Returns:** LOGICAL

**Note:** Called by blankFields and resetFields. The special blankFillIn function ensures that fill-in widgets are fully blanked.

**blankFields**

Procedure that restores all filter fields to the empty, unmodified state.

**Location:** filter.p

**Parameters:** None

**Notes:** None

**blankFillIn**

Makes a fill-in appear blank by manipulating its format string.

**Location:** filter.p

**Parameters:**

- INPUT phFillIn AS HANDLE
  
  The handle of the fill-in to be blanked.

**Returns:** LOGICAL

**Note:** Utility function called by blankFields and blankField.
createField

Create the Filter for one field.

**Location:** filter.p

**Parameters:**

- **INPUT phFrame AS HANDLE**
  Frame handle.
- **INPUT pcName AS CHARACTER**
  Name of the column.
- **INPUT pcDataType AS CHARACTER**
  Data type to use.
- **INPUT pcViewAs AS CHARACTER**
  View-as.
- **INPUT pcFormat AS CHARACTER**
  Format.
- **INPUT plEnable AS LOGICAL**
  Enable for input.
- **INPUT pcTooltip AS CHARACTER**
  Tooltip text.
- **INPUT piHelpid AS INTEGER**
  Help ID.
- **INPUT pdRow AS DECIMAL**
  Row.
- **INPUT pdCol AS DECIMAL**
  Column.
- **INPUT pdHeight AS DECIMAL**
  Height. (If this is an editor, a height > 2 is used to set inner-lines instead of height, and the editor has word-wrap and a vertical scrollbar.)
- **INPUT pdWidth AS DECIMAL**
  Width.

**Returns:** HANDLE

**Note:** PRIVATE function
createLabel

Creates the label for the filter-field.

Location: filter.p

Parameters:

INPUT phField AS HANDLE

The handle of the filter-field.

INPUT pcLabel AS CHARACTER

The label of the filter-field.

Returns: HANDLE

Note: PRIVATE function

createOperator

Creates the widget to use as operator or fill-in for the range option.

Location: filter.p

Parameters:

INPUT phField AS HANDLE

The handle of the filter-field.

INPUT pcType AS CHARACTER

The widget type (radio-set or combo-box; otherwise, a fill-in is created).

INPUT pcValues AS CHARACTER

List of operator values for the combo-box or radio-set.

INPUT pdCol AS DECIMAL

Column position.

INPUT pdWidth AS DECIMAL

Column width.

Returns: HANDLE

Notes: None
dataAvailable

Procedure that subscribes to the filter-target in order to make sure that the filter reflects ForeignFields and values.

Location: filter.p
Parameters:

INPUT pcRelative AS CHARACTER

Not used.

Note: The pcRelative parameter is necessary in order not to override the ForeignField criteria in the query.

dataValue

Returns the RowObject fieldname of a database fieldname.

Location: filter.p
Parameters:

INPUT pcColumn AS CHARACTER
INPUT pcValue AS CHARACTER

Returns: CHARACTER
Notes: None

deleteObjects

Deletes all dynamic widgets.

Location: filter.p
Parameters: None
Returns: LOGICAL
Note: Called at design-time every time the Instance Properties are changed.

disableFields

Procedure that disables fields in the ENABLED-FIELDS list.

Location: filter.p
Parameters: None
Notes: None
enableFields

Procedure that enables fields in the ENABLED-FIELDS list.

Location: filter.p
Parameters: None
Notes: None

fieldLookup

Finds the LOOKUP position of the corresponding value to the field in a CHR(1) list of fields and values.

Location: filter.p
Parameters:

INPUT pcField AS CHARACTER
    Fieldname.

INPUT pcList AS CHARACTER
    CHR(1)-separated list with fieldnames and values.

Returns: INTEGER PRIVATE
Note: PRIVATE used for all defined or overridden column properties.

fieldProperty

Finds the actual value of the corresponding value to the field in a CHR(1) list of fields and values.

Location: filter.p
Parameters:

INPUT pcList AS CHARACTER
    Fieldname.

INPUT pcField AS CHARACTER
    CHR(1)-separated list with fieldnames and values.

Returns: CHARACTER PRIVATE
Note: PRIVATE used for all defined or overridden column properties.
initializeObject

Procedure that filters object initialization code.

Location: filter.p
Parameters: None

Note: Dynamic widgets are created for the list of fields specified in DisplayedFields. The deleteObjects() function is called to clean up to reflect changes in the Instance Property dialog. WordIndexedFields property is never checked again. Operator objects assumes that CONTAINS is allowed if the filter field object type is EDITOR. UseContains also only works together with EDITOR fields. RANGE is not used for word-indexed fields unless UseContains is FALSE.

insertFieldProperty

Inserts or adds a fields property to the CHR(1)-separated internal property that holds fields and values.

Location: filter.p
Parameters:

INPUT pcList AS CHARACTER
CHR(1)-separated list with fieldnames and values.

INPUT pcFields AS CHARACTER
Fieldname.

INPUT pcValue AS CHARACTER
Value of the field property.

Returns: CHARACTER PRIVATE
Notes: None

removeSpace

Procedure that backspaces, deletes, and sets the field to unmodified. Keeps it out of the selection criteria.

Location: filter.p
Parameters: None

Note: Start persistent in initializeObject. Note that filter.i has the following trigger anywhere on frame: on valueChanged > u10 > unblankFillin trigger resets format when all fields have been blanked (emptied).
**resetFields**

Procedure that resets all the fields to the previously applied filter values.

**Location:** filter.p  
**Parameters:** None  
**Note:** The field values and operator values are retrieved from the actual filter-targets query.

**showDataMessages**

Returns the name of the field (if any) from the first error message to allow the caller to use it to position the cursor.

**Location:** filter.p  
**Parameters:** None  
**Returns:** CHARACTER  
**Note:** Invokes fetchMessages() to retrieve database update-related error messages, and displays them in an alert-box of type error. This function expects to receive back a single string from fetchMessages with one or more messages delimited by CHR(3), and within each message the message text, Fieldname (or blank) + a Tablename (or blank), delimited by CHR(4), if present.

**unBlankFillin**

Resets the format of a blank fill-in.

**Location:** filter.p  
**Parameters:**  
**Input** phField  
The handle of a field.  
**Returns:** LOGICAL  
**Note:** The blankFields changes the format of fill-ins to make it appear blank. This function is called as soon as the user starts editing the field; value-Changed -> "U10" triggers in filter.i makes this happen.
unBlankLogical

Procedure that resets the format of a blank fill-in of data-type LOGICAL.

Location: filter.p

Parameters:

INPUT phField AS HANDLE

The handle of a field.

Note: The blankFields changes the format of fill-ins to make it appear blank. This procedure is defined ON ANY-PRINTABLE PERSISTENT trigger when the field is blanked.
Browser methods for visual objects

This section describes the methods for SmartDataBrowsers. SmartDataBrowsers display multiple virtual records in a simple, tabular row and column format.

addRecord

SmartDataBrowser version of addRecord. This procedure initiates the creation of a new record. Inserts a new row below the current row, if any. The ROW–ENTRY trigger in the SmartDataBrowser (src/adm2/brsentry.i) displays initial values.

Location: browser.p
Parameters: None
Notes:
• Invokes addRecord version in datavis.p (RUN SUPER).
• Sets the BrowseInitted property to FALSE. This property is used in the ROW–ENTRY trigger where the actual display of initial values takes place to make sure that the initialization logic for add is executed once.
• Invoked when an Add is initiated (typically by choosing the Add button in an Update SmartPanel, or the Add button or Add menu item in a SmartToolbar).
• Customized when additional processing is needed at the start of an Add operation. When an addRecord override is invoked, the new record has not yet been created, and there is no transaction active.

applyCellEntry

Procedure that applies ENTRY to the first enabled column in the browse, or to the column passed as an input parameter.

Location: browser.p
Parameters:
INPUT pcCellName AS CHARACTER

Either the name of the browse column on which to put focus or a the Unknown value (?) to indicate the first column.

Notes:
• Used internally to reposition to the correct column, for example, when a validation fails for that column.
• Invoked from applyEntry when the SmartDataBrowser has enabled fields.
**applyEntry**

SmartDataBrowser version of applyEntry. Procedure that applies ENTRY to the first enabled column in the browse if columns are enabled, or to the first enabled object in the SmartDataBrowser.

**Location:** browser.p

**Parameters:**

INPUT pcField AS CHARACTER

Either the name of the browse column on which to put focus or the name of an object part of the SmartDataBrowser.

**Notes:**

- Invoked when the ADM code needs to give focus to a SmartDataBrowser. The applyEntry procedure runs applyCellEntry to do browse-specific repositioning to the proper browse cell.
- Customized when focus is given to a different column or object in the SmartDataBrowser or when special processing is needed. Be aware that repositioning to a specific column after a validation or update fails might alter the behavior of the SmartDataBrowser.

**assignMaxGuess**

Procedure that sets the argument value of the Browse widget’s MAX-DATA-GUESS attribute.

**Location:** browser.p

**Parameters:**

INPUT piMaxGuess AS INTEGER

The value to add to MAX-DATA-GUESS.

**Notes:** None

**calcWidth**

Procedure that calculates the exact width of the Browse in the dynamic SmartDataBrowser based on the columns being displayed by it.

**Location:** browser.p

**Parameters:** None

**Note:** Called by initializeObject.
cancelNew

Procedure that deletes a currently selected NEW row from the Browse’s viewport.

**Location:** browser.p

**Parameters:** None

**Note:** Published from dataSource on cancel of a new row. This works for the case of an SBO where the SDO has no updateSource and the SBO has several. Too much work is involved to have some kind of property to keep track of this. Publish seems to be a more future-proof and dynamic way to do this, as it should also work when supporting multiple/switchable updateSources for SDOs. As the method ensures that this really is new, this should ensure that the query only can have one browse.

cancelRecord

SmartDataBrowser version of cancelRecord. This procedure cancels an Update, Add, or Copy operation. For a cancel of an add or copy, deletes the previously added row from the RowObject temp–table in the associated SmartDataObject, and displays the previously current record again. For a cancel of an update, displays the field values of the previous row again. Sets the value of the NewRecord property back to No.

**Location:** browser.p

**Parameters:** None

**Notes:**

- Invokes cancelRecord in datavis.p (RUN SUPER).
- Invoked when an update is cancelled, usually by choosing the Cancel button in an Update SmartPanel or the Cancel button or Cancel menu item in a SmartToolbar.
- Customized when additional processing is needed when a record Add, Copy, or Update is cancelled. You might want to do this to restore other related nondatabase fields or other objects to their original values, or to undo some action that was taken when the Add, Copy, or Update was initiated.
**colValues**

Formats the values in the current row of the SmartDataBrowser query for the specified column list. SmartDataBrowser version of colValues.

**Location:** browser.p

**Parameters:**

INPUT pcViewColList AS CHARACTER

A comma-separated list of requested columns.

**Returns:** CHARACTER (Values of the specified columns.)

**Notes:**

- Only used when the SmartDataBrowser has its own database query defined.
- Passes back a CHR(1)-delimited list with the RowIdent as the first value in all cases and fields values (in the order they are requested).

**copyRecord**

Procedure that initiates creation of a new record starting with a copy of the previously displayed record. SmartDataBrowser version of copyRecord.

**Location:** browser.p

**Parameters:** None

**Notes:**

- Invokes copyRecord in datavis.p (RUN SUPER), which in turn invokes the copyRow function in the associated SmartDataObject to add a new row to the RowObject temp-table.
- For a SmartDataBrowser, a new blank row is inserted below the currently selected one. Values that are copied from copyRecord are not displayed here, they are displayed from the ROW–ENTRY trigger (src/adm2/brsentry.i).
- Sets the BrowseInit ted property to FALSE. This property is used in the ROW–ENTRY trigger where the actual display of the copied record takes place to make sure the “initialization logic” for copy is executed once.
- Invoked when a Copy operation is initiated, usually by choosing the Copy button in an Update SmartPanel or in a SmartToolbar.
- Customized when copy needs special processing.
createPopupMenu

This procedure creates the browser’s popup menu.

**Location:** browser.p  
**Parameters:** None  
**Notes:** None

dataAvailable

SmartDataBrowser version of dataAvailable. This procedure repositions the SmartDataBrowser to a specific row in response to a query reposition in its data source.

**Location:** browser.p  
**Parameters:**  

```
INPUT pcRelative AS CHARACTER
```

Indicates the relative query position in which to reposition. For the current version of dataAvailable, valid values are *First, Last, Prev, Next*, and *Repos*. The values *Same* and *Different* used by other forms of this procedure are simply passed to the super procedure and do not cause a reposition of the browse.

**Notes:**  
- You can override the version of dataAvailable in browser.p.  
- This routine resides in browser.i rather than browser.p because it must sometimes use query.p, and sometimes datavis.p, as its super procedure, depending on whether the SmartDataBrowser has its own database query.

defaultAction

Procedure that runs persistently from default action.

**Location:** browser.p  
**Parameters:** None  
**Note:** The trigger is defined in setActionEvent.
deleteComplete

Procedure that deletes the currently selected row from the viewport of the browse when that row has been deleted from the RowObject result set.

**Location:** browser.p  
**Parameters:** None  
**Note:** Invoked from the SmartDataObject. The SmartDataBrowser is connected to synchronize the viewport with the current contents of the RowObject temp-table being browsed. If the SmartDataBrowser has its own query and is updatable, it is invoked from deleteRecord, which in this case does nothing as the row was already deleted.

deleteRecord

Procedure that deletes the current record. SmartDataBrowser version of deleteRecord. Invoked when the delete button is chosen in an Update SmartPanel or in a SmartToolbar.

**Location:** browser.p  
**Parameters:** None  
**Note:** Invokes deleteRecord in datavis.p (RUN SUPER), which then runs deleteRow in the associated SmartDataObject to delete the row from the RowObject result set. Makes sure a row is selected in the SmartDataBrowser before deleting the row. Runs deleteComplete when the SmartDataBrowser has its own database query. Typically customized when you want to add a message to confirm the deletion.

destroyObject

SmartDataBrowser version of destroyObject. This procedure invokes the standard behavior in datavis.p and as a result, destroyObject informs the SmartDataObject (and any attached SmartDataBrowser) that it is no longer being browsed.

**Location:** browser.p  
**Parameters:** None  
**Note:** To ensure that a SmartDataObject can only be browsed by one SmartDataObject at a time, when a SmartDataBrowser is destroyed, destroyObject informs the associated SmartDataObject that it is no longer browsed.
**disableFields**

Procedure that sets the READ–ONLY attribute of the browse control to TRUE. This is the SmartDataBrowser version of disableFields.

**Location:** browser.p

**Parameters:**

INPUT PcFields AS CHARACTER

Acceptable values: **All** or **Create**.

**Notes:**

- It is not possible to disable only a subset of columns. The **Create** option is intended to support disabling fields that are enabled only for an Add or Copy operation; this is not yet supported.
- Sets the FieldsEnabled property to FALSE.

**displayFields**

Procedure that displays the current row values by moving them to the screen values of the browse. Invokes displayObjects to display the values of any other objects that are in the SmartDataBrowser.

This is the SmartDataBrowser version of displayFields.

**Location:** browser.p

**Parameters:**

INPUT pcColValues AS CHARACTER

CHR(1)-delimited list of field values. The first entry in the list represents the RowIdent of the row being displayed.

**Notes:**

- Ordinarily the columns in each row of a browse are displayed automatically just by the opening of the query with which the browse is associated. Therefore, this procedure is only invoked after changes that have been made to a row are saved or undone, necessitating the displaying the current row again.
- For special display (modifying the value of a column in each row of the browse, for example), use the ROW–DISPLAY trigger of the SmartDataBrowser.
- Runs displayObjects to display any object values that are part of the SmartDataBrowser. These would be additional fields which have been placed into the Frame along with the browse widget.
enableFields

SmartDataBrowser version of enableFields. This procedure enables columns in a SmartDataBrowser by turning off the READ–ONLY attribute for the browse object.

Location: browser.p
Parameters: None
Notes:

- If no Update target is present, or if no record is available, the columns in the browse are not enabled.
- Customized when you require additional processing when RowObject fields are enabled. You might want to do this to enable or hide other widgets not associated with RowObject fields.

enableObject

This procedure overrides the enableObject method in the Visual class.

Location: browser.p
Parameters: None
Notes: None

fetchDataSet

Procedure that changes or resets the state of a Browse, depending on which action occurs.

Location: browser.p
Parameters:

INPUT pcState AS CHARACTER

The character value of one of the supported states. Possible values include: BatchStart, BatchEnd, NextStart, NextEnd, PrevStart, PrevEnd.

Note: Used internally to turn on/off the REFRESHABLE attribute of the browse. Used to avoid flashing when batches of records are fetched, or to apply the SET–REPOSITIONED–ROW method to the browse.
filterActive

Procedure that calls updateState in the toolbar to set the filter on or off, depending on the argument.

**Location:** browser.p

**Parameters:**

INPUT p1Active AS LOGICAL

TRUE if the filter tick is to be turned on.

**Notes:** None

hasActiveAudit

If there is a valid DataSource, returns the result of hasActiveAudit.

**Location:** browser.p

**Parameters:** None

**Returns:** LOGICAL

**Notes:** None

hasActiveComments

If there is a valid DataSource, returns the result of hasActiveComments.

**Location:** browser.p

**Parameters:** None

**Returns:** LOGICAL

**Notes:** None

initializeColumnSettings

This procedure is called from initializeObject to initialize the column settings and browser properties. It sets the FieldHandles and EnabledHandles properties.

**Location:** browser.p

**Parameters:** None

**Notes:** None
**initializeObject**

SmartDataBrowser version of initializeObject. Part of the general initialization process, this procedure sets certain property values.

**Location:** browser.p  
**Parameters:** None  
**Notes:**
- Invokes initializeObject in datavis.p (RUN SUPER).
- Starting with Version 9.1A, dynamically creates columns of the SmartDataBrowser when the Dynamic SmartDataBrowser is used.
- For a SmartDataBrowser that is connected to a SmartDataObject as its Data source, sets the DataQueryBrowsed property to TRUE indicating the SmartDataObject is being browsed, and preventing it from being browsed by more than one SmartDataBrowser at a time.
- Sets the value of EnabledHandles, CreateHandles and FieldHandles property.
- Might create a Search Field for searching in the SmartDataBrowser if the corresponding SearchField property is set.

**launchFolderWindow**

Procedure that calls launchContainer in the session manager to start a folder window, if there is not already one available.

**Location:** browser.p  
**Parameters:**  
INPUT pcContainerMode AS CHARACTER  
**Notes:** None

**linkStateHandler**

This override of the Smart class method runs a profile sort before the SDO initializes.

**Location:** browser.p  
**Parameters:**  
INPUT pcState AS CHARACTER  
INPUT phObject AS HANDLE  
INPUT pcLink AS CHARACTER  
**Notes:** None
offEnd

Procedure that fires trigger code for OFF-END trigger of SmartDataBrowse.

Location: browser.p
Parameters: None
Notes: None

offHome

Procedure that fires trigger code for OFF-HOME trigger of SmartDataBrowse.

Location: browser.p
Parameters: None
Notes: None

onEnd

Event procedure for the END event. This procedure uses the QueryPosition property of the dataSource to determine whether the position is already last or whether fetchLast needs to be called in the dataSource.

Location: browser.p
Parameters: None
Note: This event must call fetchLast in the dataSource for the normal case when it is a TRUE user event. However, APPLY END must be used to make the browse respond to a fetchLast in the dataSource. When using APPLY END, QueryPosition is already set in the dataSource and can be used to avoid an extra or endless loops.

onHome

Event procedure for the HOME event. This procedure uses the QueryPosition property of the dataSource to determine whether the position is already first or whether fetchFirst needs to be called in the dataSource.

Location: browser.p
Parameters: None
Notes: None
onValueChanged

Event procedure for the browse VALUE-CHANGED event. Because it fires from the VALUE-CHANGED trigger, it only runs when a user changes the row in the browse (or as a backfire from home and end events). It does not run in all cases where a record is changed.

**Location:** browser.p  
**Parameters:** None  
**Notes:**
- The event procedure which fires for value changes in the fields is valueChanged in the Datavis class.
- This event should NOT be overridden as a place to trap change of record. DataAvailable is the event that traps the change of record.

refreshBrowse

Procedure that publishes from dataSource when APPEND display is not enough or not required.

**Location:** browser.p  
**Parameters:** None  
**Notes:** None

refreshQuery

This procedure refreshes the browse query and repositions it to the currently selected row.

**Location:** browser.p  
**Parameters:** None  
**Notes:** None

resizeBrowse

Procedure that changes the size of the BROWSER WIDGET-HANDLE IN APPEND SmartDataBrowser.

**Location:** browser.p  
**Parameters:**
- **INPUT pd_height AS DECIMAL**
  The desired height (in rows).
- **INPUT pd_width AS DECIMAL**
  The desired width (in columns).

**Notes:** None
**resizeObject**

Procedure that changes the size of the SmartDataBrowser.

**Location:** browser.p

**Parameters:**

- INPUT pdHeight AS DECIMAL
  
  A decimal value that represents the new height of the SmartDataBrowser.

- INPUT pdWidth AS DECIMAL
  
  A decimal value that represents the new width of the SmartDataBrowser.

**Notes:**

- Invoked at design time when the SmartDataBrowser is resized. Can be invoked at run time to change the size of the SmartDataBrowser.

- The presence of the resizeObject procedure causes the AppBuilder to generate a statement in the adm–create–objects procedure for a SmartContainer setting the size of a contained SmartDataBrowser. The presence of resizeObject also signals the AppBuilder to allow the SmartDataBrowser to be resized at design time.

**rowDisplay**

Event Handle procedure for the ROW-DISPLAY event.

**Location:** browser.p

**Parameters:** None

**Notes:** None

**rowEntry**

Event Handle procedure for the ROW-ENTRY event. This procedure retrieves and displays initial values for Add or Copy.

**Location:** browser.p

**Parameters:** None

**Notes:** None
rowLeave

Event Handle procedure for the ROW-LEAVE event. If the selected object is not a SmartPanel button, this procedure saves any changes to the row. Otherwise, the appropriate action for the button occurs.

Location: browser.p
Parameters: None
Notes: None

rowVisible

Determines if the records currently visible in the browse are the first or last records in the batch.

Location: browser.p
Parameters:
INPUT pcRowids AS CHARACTER
Comma-separated list of ROWIDs that are currently visible.
INPUT phQryBuffer AS HANDLE
Returns: CHARACTER
Notes: None

searchTrigger

Procedure that contains the logic to support the SearchField property of the Dynamic SmartDataBrowser. The SmartDataBrowser repositions to the first record that is greater than or equal to the value entered in the SearchField.

Location: browser.p
Parameters: None
Note: In the Data source connected to the SmartDataBrowser, searchTrigger Invokes in the following order the columnDataType, rowidWhere, and fetchRowIdent functions to reposition to a corresponding record.

showSort

This function adds a sort arrow to the browser column reflecting the current sort in the datasource.

Location: browser.p
Parameters: None
Returns: LOGICAL
Note: ABL allows showing multiple sort columns with a sort number. However, this function currently shows only the first column in the sort expression, since there is no default support to manipulate the secondary sort.
**startSearch**

Procedure that launches the start-search trigger.

**Location:** browser.p

**Parameters:**

INPUT phBrowse AS HANDLE

The browse handle.

**Note:** Because persistent triggers have early binding, current-column cannot be passed in.

**stripCalcs**

Strips the expression portion of expression @ variable.

**Location:** browser.p

**Parameters:**

INPUT cClause AS CHARACTER

The clause to be edited.

**Returns:** CHARACTER

**Notes:** None

**toolbar**

Procedure that performs one of several operations depending on the value of the argument passed. Valid values are: comments; export for exporting data to Excel; preview for previewing a report; filter or find to launch a filter window; view, copy, modify, or add to launch the appropriate folder window; delete to delete a record with autocommit; and audit.

**Location:** browser.p

**Parameters:**

INPUT pcValue AS CHARACTER

The type of operation.

**Notes:** None
**updateRecord**

SmartDataBrowser version of updateRecord. This procedure initiates the Save process after an **add**, **copy**, or **update**. This version of updateRecord stores the RowIdent property of the current record if it is an add or a copy.

**Location:** browser.p  
**Parameters:** None  
**Notes:**
- Invokes updateRecord in datavis.p (RUN SUPER).
- If an error occurs after invoking updateRecord in datavis.p (which means the update failed), updateRecord puts focus back in the SmartDataBrowser if it is not already there.
- If the SmartDataBrowser has its own database query, and if the save operation comes after an add or a copy, the SmartDataBrowser’s query is reopened and repositioned to the last row of the viewport.

**updateState**

Procedure that receives state messages on updates. Enables or Disables the SmartDataBrowser while updates are made to other objects sharing the same SmartDataObject. SmartDataBrowser version of updateState.

**Location:** browser.p  
**Parameters:**  
**INPUT** PcState **AS** CHARACTER  

The update state value to be passed to the SmartDataBrowser. Valid values are **UpdateBegin**, **Update**, and **UpdateComplete**.

**Notes:**
- Possible input values are UpdateBegin, Update, and UpdateComplete.
- Returns if the DataModified property equals TRUE (meaning updates are in progress), or if the NewRecord property is not equivalent to No (which means add or copy).
- Used internally.

**updateTitle**

Procedure for the SmartDataBrowser version of updateTitle.

**Location:** browser.p  
**Parameters:** None  
**Note:** Setting up a window title for an object controller is different than for a viewer. This code gets the information from the browser’s data-sources.
**viewObject**

Procedure that overrides run setDown to set the DOWN attribute for the browse when it is being viewed and to fix problems caused by the browse’s implicit visualization behavior.

**Location:** browser.p

**Parameters:** None

**Notes:**

- setDown must be called from viewObject as opposed to initializeObject to support the object being on a page other than zero, because set down requires a visible browse. This sets DOWN when the object is actually being viewed rather than when it is initialized, which could happen before it is viewed if it is on a page other than zero.

- The browser implicitly sets the buffer to its currently selected row when it is visualized. This might cause problems if the DataSource is being manipulated by another object. An update-target might have called AddRow in the DataSource, which creates a RowObject while the browse still has the old row selected.
Methods for SmartDataViewers

This section describes the methods for SmartDataViewers. SmartDataViewers display a single virtual record at a time using a combination of fill-in fields and SmartDataFields.

addRecord

Procedure that initiates the creation of a new record in the RowObject temp-table. Initial values for the new record are displayed in the viewer’s frame. Keeps a running total of the records added.

Location: viewer.p
Parameters: None
Notes:

- addRow() is invoked in the update target, which creates the new RowObject temp-table record and returns the column values. When the SmartDataViewer is a GroupAssign target, its GroupAssign source has already added the record, therefore only the values of the columns are retrieved.

- Column values are passed to displayFields, which displays the values in the viewer’s frame.

- The record is not actually created in the database until it is committed. This is done in assignDBRow procedure.

- For Add and Copy, it is important that key fields, and any other fields assigned by the CREATE trigger, not be set to updateable in the SmartDataObject and enabled for data entry. If they are, the screen values are assigned on top of the key values set by the trigger, with an error as the likely result.

- applyEntry is run to apply entry to the first field in the frame after the initial column values are displayed.

- The procedure submitForeignKey in data.p automatically assigns key values inherited as ForeignField values from another SmartDataObject. For example, in an Order SmartDataViewer used for adding new Orders for the current Customer selected in another object, the CustNum field can (and normally should) be left disabled in the Order SmartDataViewer. Its value is assigned in the Order SmartDataObject to the CustNum value from the parent Customer SmartDataObject at the time the new record is Saved. You can override submitForeignKey in the SmartDataObject your Data visualization object is connected to in order to write any additional special logic you want to apply when adding or copying a record.

- addRecord is invoked when an Add is initiated, typically by choosing the Add button in an Update SmartPanel, or the Add button or Add menu item in a SmartToolbar.

- addRecord republishes the addRecord event to handle the Add for GroupAssign targets.

- addRecord can be customized when additional processing is needed at the start of an Add operation. Keep in mind that when an addRecord override is invoked, the new record has not yet been created, and there is no transaction active.
**cancelRecord**

Procedure that cancels an Update, Add, or Copy operation.

**Location:** viewer.p  
**Parameters:** None  

**Notes:**
- When you choose the Cancel button during:
  - Add or Copy — The new record is erased and the previously current record is redisplayed.
  - Update — The Update is cancelled and the record’s original values are redisplayed.
- cancelRecord is invoked when an update is cancelled, usually by choosing the Cancel button in an Update SmartPanel or the Cancel button or Cancel menu item in a SmartToolbar.
- cancelRecord republishes the “cancelRecord” event to handle the cancel for GroupAssign targets.
- cancelRecord can be customized when additional processing is needed when a record Add, Copy, or Update is canceled. You might want to do this to restore other related nondatabase fields or other objects to their original values, or to undo some action that was taken when the Add, Copy, or Update was initiated.

**copyRecord**

Procedure that initiates creation of a new record starting with a copy of the previously displayed record.

**Location:** viewer.p  
**Parameters:** None  

**Notes:**
- copyRecord displays the previously displayed record’s values and allows data entry. The new record is not actually created until it is committed in serverCommit. See the addRecord reference entry for additional notes.
- copyRow() is invoked in the update target, which creates the new RowObject temp-table record and copies the current row to it.
- copyRecord is invoked when a Copy operation is initiated, usually by choosing the Copy button from an Update SmartPanel or the Copy button or Copy menu item from a SmartToolbar.
- copyRecord republishes the “copyRecord” event to handle the Copy operation for any GroupAssign targets.
- copyRecord can be customized when a Copy operation needs special processing.
disableFields

Procedure that disables the fields in a list represented by the AppBuilder generated preprocessor value \{&ENABLED–FIELDS\}.

Location: viewer.p

Parameters:

INPUT pcFieldType AS CHARACTER

Can have values of All or Create.

Notes:

- disableFields is invoked when a SmartDataViewer’s RowObject fields are to be disabled without disabling other fields or variables in the viewer.
- The ENABLED–FIELDS preprocessor value contains a list of RowObject fields that are enabled in a SmartDataViewer. At initialization time, this is turned into the EnabledHandles property, which stores a list of the widget handles of the enabled fields in the SmartDataViewer’s frame, allowing efficient access to them.
- The pcFieldType parameter can have a value of All or Create. This allows disabling of all the fields or only fields that were used to create (add/copy) a new record. The Create option is not yet supported.
- disableFields re-publishes the disableFields event to disable fields in any GroupAssign targets.
- When a field in the list is a SmartObject itself (for example, a SmartField object), disableField is run in the SmartObject to disable it.
- For editor fields, READ–ONLY is turned on rather than making the field insensitive since editors need to be sensitive for scrolling.
- disableFields can be customized when you require additional processing when RowObject fields are disabled. You might want to do this to disable or hide other widgets not associated with RowObject fields.

displayFields

Procedure that displays the current row values by moving them to the viewer’s frame screen-values.

Location: viewer.p

Parameters:

INPUT pcColValues AS CHARACTER

CHR(1)-delimited list of the STRING–VALUEs of the requested columns; the first value of this list is the RowIdent value of the corresponding record to be displayed.
Notes:

- The `pcColValues` input parameter contains the field values to be displayed in the SmartDataViewer.

- `displayFields` is invoked from `resetRecord`, `cancelRecord`, `copyRecord`, `addRecord`, and from `dataAvailable` when the data source has a new row.

- `displayFields` runs `displayObjects` to display values for non-database-related fields.

- When a field is a SmartObject itself (for example, a SmartField object), `setDataValue` is invoked in the SmartObject to set its value.

- No RowObject record is available in a SmartDataViewer, so a customization of `displayFields` cannot refer to the RowObject buffer. You can use the `colValues` function to access a list of column values from the Viewer’s SmartDataObject if needed, or the `columnStringValue` function can return the formatted value of a particular field.

Examples:

```plaintext
PROCEDURE displayFields:
/* ----------------------------------------------------------------------
Purpose: Super Override
This SmartDataViewer gets the handle of its container. If this is a window, then the title of the window is changed to reflect the current record.
Parameters:
Notes: */
DEFINE INPUT PARAMETER pcColValues AS CHARACTER NO-UNDO.
DEFINE VARIABLE hContainerSource AS HANDLE NO-UNDO.
/* Code placed here will execute PRIOR to standard behavior. */
hContainerSource = DYNAMIC-FUNCTION('linkProperty':U,
 mornings 'Container-Source':U, INPUT 'ContainerHandle':U).
RUN SUPER(INPUT pcColValues).
/* Code placed here will execute AFTER standard behavior. */
RowObject.Name:SCREEN-VALUE IN FRAME {&FRAME-NAME} WHEN VALID-HANDLE(hContainerSource)
AND ContainerSource:TYPE = 'WINDOW':U.
END PROCEDURE.

PROCEDURE displayFields:
/*----------------------------------------------------------------------
Purpose: Super Override
If the value of the country field is 'France' in this SmartDataViewer, then make the background color of this field red. Otherwise leave it the its default color.
Parameters:
Notes: */
DEFINE INPUT PARAMETER pcColValues AS CHARACTER NO-UNDO.
/* Code placed here will execute PRIOR to standard behavior. */
RUN SUPER(INPUT pcColValues).
/* Code placed here will execute AFTER standard behavior. */
END PROCEDURE.
```
enableFields

Procedure that enables fields in the ENABLED-FIELDS list AppBuilder generated preprocessor.

Location: viewer.p

Parameters: None

Notes:

- When the frame field is a SmartObject (for example, a SmartField), enableField is run in the SmartObject. The ENABLED–FIELDS preprocessor value contains a list of RowObject fields that are enabled in a SmartDataViewer. At object initialization, this is turned into the EnabledHandles property, which holds a list of the widget handles of the enabled fields in the SmartDataViewer’s frame, for efficient access.

- If no TableIO–Source (or GroupAssign–Source connected to a TableIO–Source for SmartDataViewers) is present or no record is available, the fields are not enabled.

- enableFields republishes the enableFields event to handle enabling fields in any GroupAssign targets.

- enableFields can be customized when you require additional processing when RowObject fields are enabled. You might want to do this to enable or hide other widgets not associated with RowObject fields.

fieldModified

Event procedure that handles the setting of DataModified when a field has changed in the datavisual (viewer or browser) object. The setting for DataModified is determined by the setting specified for the ModifyFields property.

Location: viewer.p

Parameters:

INPUT phField AS HANDLE

Handle of a field whose value has changed.

Notes:

- By default, DataModified is set to TRUE. For information about changing the default, see the “ModifyFields” section on page 3–90 property.

- The passed field must be in the list of EnabledFields or EnabledObjFlds.

- This procedure is called from valueChanged, DataModified of the SmartDataField, or the Client APIs that change widget values.

- Returns TRUE if this change triggers a DataModified change. For example, this is the first change in the object.
**initializeObject**

Procedure that enables fields in the list represented by the AppBuilder generated preprocessor value `{&ENABLED–FIELDS}`.

**Location:** viewer.p

**Parameters:** None

**Notes:**
- The ENABLED–FIELDS preprocessor value contains a list of RowObject fields that are enabled in a SmartDataViewer. At object initialization, this is turned into the EnabledHandles property, which holds a list of the widget handles of the enabled fields in the SmartDataViewer’s frame, for efficient access.
- If no TableIO–Source (or GroupAssign–Source connected to a TableIO–Source for SmartDataViewers) is present or no record is available, the fields are not enabled.
- enableFields republishes the “enableFields” event to handle enabling fields in any GroupAssign targets.
- enableFields can be customized when you require additional processing when RowObject fields are enabled. You might want to do this to enable or hide other widgets not associated with RowObject fields.

**toolbar**

Toolbar event handler procedure that handles the cases **OK** and **Cancel**.

**Location:** viewer.p

**Parameters:**

```
INPUT pcValue AS CHARACTER
```

Valid values are **OK** and **Cancel**.

**Notes:** None
**updateState**

Procedure that initializes code specific to SmartDataViewers.

**Location:** viewer.p

**Parameters:** None

**Notes:**
- initializeObject reads through the list of enabled and displayed fields and gets their handles to store in the FieldHandles and EnabledHandles properties.
- dataAvailable is invoked to check to see if the data-source already has a record available for display.

If there is an Update–Target and a TableIO–Source in Save mode, or if this is part of a GroupAssign and the GroupAssign–Source is already enabled, enableFields is invoked to enable fields in the ENABLED–FIELDS list.

**valueChanged**

Procedure that defines the persistent event handler of the value-changed event of the frame. This handler is important to how a viewer and browser sets DataModified to TRUE. Because all field-level objects value-changed events are also managed by this procedure, it calls fieldModified to set DataModified to TRUE based on the setting for the ModifyFields property.

**Location:** viewer.p

**Parameters:** None

**Notes:**
- Static objects can reach this also by applying U10 event to run it.
- See the “ModifyFields” section on page 3–90 for more information.

**viewRecord**

Procedure that sets object in viewMode.

**Location:** viewer.p

**Parameters:** None

**Notes:** None
Methods for TreeView objects

This section describes the methods for TreeView objects.

**addNode**

Procedure that adds a node to the tree.

**Location:** `treeview.p`

**Parameters:**

INPUT `phBuffer` AS HANDLE

Handle to buffer of temp-table `tTreeData` used to defined the node.

Table 3–3 lists and describes the fields and temp-table includes defined in TVController.

<table>
<thead>
<tr>
<th>Field</th>
<th>Temp-table includes</th>
</tr>
</thead>
<tbody>
<tr>
<td>node_key</td>
<td>Unique key of node.</td>
</tr>
<tr>
<td>parent_node_key</td>
<td>Key of either parent node or sibling node (depending on node_insert).</td>
</tr>
<tr>
<td>node_label</td>
<td>Label of node that appears in TreeView.</td>
</tr>
<tr>
<td>private_data</td>
<td>Information stored for the node in the node’s TAG property.</td>
</tr>
<tr>
<td>image</td>
<td>Relative path and filename of the image of the node.</td>
</tr>
<tr>
<td>selected_image</td>
<td>Relative path and filename of the node when it is selected. If blank, it uses the same image as the image field.</td>
</tr>
<tr>
<td>node_insert</td>
<td>Specifies where to insert the node, relative to the parent:</td>
</tr>
<tr>
<td></td>
<td>• 0 - As first node at same level as the parent_node_key</td>
</tr>
<tr>
<td></td>
<td>• 1 - As last node at same level as the parent_node_key</td>
</tr>
<tr>
<td></td>
<td>• 2 - After (next) the parent_node_key</td>
</tr>
<tr>
<td></td>
<td>• 3 - Before (previous) the parent_node_key</td>
</tr>
<tr>
<td></td>
<td>• 4 - As child of parent_node_key</td>
</tr>
<tr>
<td>node_sort</td>
<td>If TRUE, sort node (This must be specified for all nodes within the same level). Default is FALSE.</td>
</tr>
</tbody>
</table>
**Note:** This procedure is called from populateTree but can be called by itself.

### deleteNode

Procedure that removes an individual node from the tree.

**Location:** treeview.p

**Parameters:**

**INPUT** pckey AS CHARACTER

The unique key that identifies the node.

**Notes:** None

### deleteTree

Procedure that can be called to remove nodes from the Tree.

**Location:** treeview.p

**Parameters:**

**INPUT** phTable AS HANDLE

The handle of tTreeData temp-table (defined in TVController.i).

**Note:** This differs from the deleteNode procedure in that the temp-table can specify multiple nodes to delete at one time.

### disableObject

TreeView version of disableObject procedure.

**Location:** treeview.p

**Parameters:** None

**Notes:** None
**emptyTree**

Procedure that clears all nodes on the TreeView.

**Location:** treeview.p  
**Parameters:** None  
**Notes:** None

**enableObject**

TreeView version of enableObject procedure.

**Location:** treeview.p  
**Parameters:** None  
**Notes:** None

**isNodeExpanded**

Returns TRUE if some node is expanded.

**Location:** treeview.p  
**Parameters:**  
  **INPUT pcNodeKey AS CHARACTER**  
    The node in question.  
**Returns:** LOGICAL  
**Notes:** None

**loadImage**

Returns the index of some image file in the ImageList, first loading it if necessary. If the load fails, the function returns 0 (zero).

**Location:** treeview.p  
**Parameters:**  
  **INPUT pcImageFile AS CHARACTER**  
    The file of interest.  
**Returns:** INTEGER PRIVATE  
**Note:** The filename must specify the relative path and filename with the extension. Since the image list does not contain any images, the ImageList property is assigned to the TreeView only once, after an image is added.
**populateTree**

Procedure that controls the population of the TreeView. Creates the node given in the argument and all its descendents.

**Location:** `treeview.p`

**Parameters:**

INPUT `phTable` AS HANDLE

The handle of the temp-table containing the data (defined in `tvcontroller.i`).

INPUT `pcStartNodeKey` AS CHARACTER

The highest-level node.

**Notes:**

- This routine is called recursively to descend the tree pointed to by `phTable`.
- The temp-table `tTreeData` includes the following fields as defined in `tvcontroller.i`:
  - **node_key** — Unique key of node.
  - **parent_node_key** — Key of either parent node or sibling node (depending on `node_insert`).
  - **node_label** — Label of node that appears in TreeView.
  - **private_data** — Information stored for the node in the node’s TAG property.
  - **image** — Relative path and filename of the image of the node.
  - **selected_image** — Relative path and filename of the node when it is selected. If blank, no special image is used.
  - **node_insert** — Specifies where to insert the node, relative to the parent node:
    - 0 — As first node at same level as the `parent_node_key`
    - 1 — As last node at same level as the `parent_node_key`
    - 2 — After (next) the `parent_node_key`
    - 3 — Before (previous) the `parent_node_key`
    - 4 — As child of `parent_node_key`
  - **node_sort** — TRUE if the node is to be shown sorted within its sibling group. All of this node’s siblings must have this option set for sorting to be complete. Default is FALSE.
  - **node_expanded** — TRUE if the node is to be expanded upon adding it to TreeView. Default is FALSE.
  - **node_checked** — TRUE if the node is to be shown checked. Default is FALSE. (The property ‘ShowCheckBoxes’ must be set TRUE to enable this option).
repositionObject

Procedure used for super override for TreeView object repositioning.

Location: treeview.p
Parameters:

INPUT pdRow AS DECIMAL
    New row.
INPUT pdCol AS DECIMAL
    New column.

Notes: None

resizeObject

Procedure that resizes a SmartTreeView object.

Location: treeview.p
Parameters:

INPUT pdHeight AS DECIMAL
    New height.
INPUT pdWidth AS DECIMAL
    New width.

Notes: None

selectFirstNode

Procedure that selects the first node in the TreeView.

Location: treeview.p
Parameters: None
Notes: None
selectNode

Switches focus to node passed in by phNodeKey, selects this node, and generates a tvNodeSelected event.

Location: treeview.p
Parameters:

INPUT pcNodeKey AS CHARACTER

Node to receive focus.

Returns: LOGICAL
Notes: None

showTVError

Procedure that displays the error message passed as the argument.

Location: treeview.p
Parameters:

INPUT pcMessage AS CHARACTER

The error message to display.

Notes: None

updateTree

Procedure that updates details of nodes that are currently in the tree.

Location: treeview.p
Parameters:

INPUT phTable AS HANDLE

Handle of tTreeData.

Notes: None
Visual Object properties

Visual Object properties provide information about visual objects and their classes. This information can include whether an object is enabled, the contents of the object and so on. You can read property values and in many instances you can change property values. To read a value for a property, you use a get function, and to change a value for a property, you use a set function.

These functions conform to the following conventions:

- **get** — Uses the form `get propname` and returns the current value of the property.

  **Note:** This function accepts no arguments.

- **set** — Uses the form `set propname`. The set function accepts a single argument—the new value for the property—and returns TRUE/FALSE depending on whether the value change succeeds.

For more information about getting and setting property values, see Chapter 1, “ADM2 SmartObject API Reference.”

**ActionEvent**

This property returns the event to publish on `defaultAction` of the browse. When setting this, you define the persistent trigger that runs `defaultAction` and also subscribes the source-procedure.

**Data type:** CHARACTER

**Note:** Read and Write

**AllFieldHandles**

This property is defined for all visual objects and returns a list of handles for all widgets in the SmartObject’s frame.

**Data type:** CHARACTER

**Note:** Read and Write
**AllFieldNames**

This property is defined for all visual objects and returns a list of all widgets in the SmartObject’s frame. This list of widgets includes data fields that come back as part of the DisplayFields list and other objects such as buttons and fields that are not derived from an SDO, including rectangles and fields labels that are separate widgets with their own handles.

**Data type:** CHARACTER

**Notes:**

- Read and Write.
- For SmartDataFields, the logical name of the dynamic Lookup or Combo is returned in the AllFieldNames list along with its procedure handle in the AllFieldHandles list.

**ApplyActionOnExit**

Currently used by SmartSelect, this property indicates whether or not exit is to perform the same action as the DEFAULT-ACTION. Set to TRUE if exit is to perform the same action. Currently used by SmartSelect.

**Data type:** LOGICAL

**Note:** Read and Write

**ApplyExitOnAction**

Currently used by SmartSelect, this property indicates whether or not the DEFAULT-ACTION is to exit the browse. Set to TRUE if DEFAULT-ACTION is to exit the browse.

**Data type:** LOGICAL

**Note:** Read and Write

**AutoSort**

Indicates whether the root node should be auto.sorted.

**Data type:** LOGICAL

**Note:** Read and Write

**BrowseHandle**

Handle of the browse control.

**Data type:** HANDLE

**Note:** Read only
CalcWidth

Logical value that determines whether the width of the browse is calculated to the exact amount needed for the fields it contains.

**Data type:** LOGICAL

**Note:** Read and Write

CanUndoChanges

Determines whether there is something to undo, either screen changes or saved changes. It also returns true if UndoNew is true and NewRecord is 'add' or 'copy'.

**Data type:** LOGICAL

**Note:** Read only

ClientRect

Returns the client rectangle for the TreeView.

**Data type:** Read only

Col

Column of the object.

**Data type:** DECIMAL

**Note:** Read only

color3DFace

Property that can be used to set BGCOLOR or FGCOLOR on any three-dimensional face widget.

**Data type:** Integer

**Note:** Read only

color3DHighlight

Property that can be used to set BGCOLOR or FGCOLOR on any three-dimensional highlight widget.

**Data type:** INTEGER

**Note:** Read only
**color3DShadow**

Property that can be used to set BGCOLOR or FGCOLOR on any three-dimensional shadow widget.

**Data type:** INTEGER  
**Note:** Read only

**ColumnsMovable**

This property determines whether the browser’s columns are movable. If the browser has been initialized and its handle is valid, COLUMN-MOVABLE is set.

**Data type:** LOGICAL  
**Note:** Read and Write

**ColumnsSortable**

This property determines whether the browser’s columns are movable. If the browse object has been initialized and its handle is valid, ALLOW-COLUMN-SEARCHING is set to turn on or off the START-SEARCH trigger which is used to sort the columns.

**Data type:** LOGICAL  
**Note:** Read and Write

**CreateHandles**

Comma-separated list of the handles, in character form, of the fields in the data visualization object that should be enabled for an Add or Copy operation.

**Data type:** CHARACTER  
**Note:** Read only

**CtrlFrameHandle**

Handle of the TreeView’s control frame.

**Data type:** HANDLE  
**Note:** Read only
**DataModified**

Indicates whether the current SCREEN-VALUES have been modified but not saved.

**Data type:** LOGICAL  
**Notes:**  
- Read and Write.  
- When DataModified is set to TRUE, the check occurs before any other code is executed.  
- Disables searching while there is an update in progress in the SmartDataBrowser. SmartDataBrowser version of setDataModified.

**DataObject**

Filter used at design time for data objects.

**Data type:** CHARACTER  
**Note:** Read and Write

**DataObjectHandle**

This property returns the handle of the actual data object, rather than the SBO. This property is used where the browser needs to access the actual data object but the datasource is an SBO.

**Data type:** HANDLE  
**Note:** Read only

**DataSignature**

A character string that lists the integers corresponding to the data types of the fields in an object temp-table. This string is used to compare objects for equivalence as follows:

- 1 = CHARACTER  
- 2 = DATE  
- 3 = LOGICAL  
- 4 = INTEGER  
- 5 = DECIMAL  
- 6 = Reserved for FLOAT OR DOUBLE in the future  
- 7 = RECID  
- 8 = RAW  
- 9 = Reserved for IMAGE in the future  
- 10 = HANDLE  
- 13 = ROWID
**DefaultCharWidth**

Default width of character fields.

**Data type:** CHARACTER  
**Note:** Read and Write

**DefaultEditorLines**

Default number of inner lines for editors.

**Data type:** DECIMAL  
**Note:** Read and Write

**DefaultLayout**

The default layout for the object.

**Data type:** CHARACTER  
**Note:** Read only

**DefaultWidth**

Default width for non-character fields.

**Data type:** DECIMAL  
**Note:** Read and Write

**DisableOnInit**

Indicates whether the current object should be left disabled when it is first initialized.

**Data type:** LOGICAL  
**Note:** Read and Write

**DisplayedField**

Name of the field to display in the selection. This property can be used in signature matching.

**Data type:** CHARACTER  
**Note:** Read and Write
**DisplayFieldsSecurity**

Comma-separated list of security types corresponding to AllFieldHandles.

**Data type:** CHARACTER  
**Note:** Read and Write

**DisplayedTables**

List of SDO table names used by the visualization. Can be only `RowObject`. If the object was built against an SBO, it is the list of SDO ObjectNames whose fields are used.

**Data type:** CHARACTER  
**Note:** Read only

**Down**

Down attribute for the browse. Called from initializeObject for dynamic SmartDataBrowsers.

**Data type:** INTEGER  
**Note:** Write only

**Editable**

Indicates whether this object can be edited (add/copy/save/update).

**Data type:** LOGICAL  
**Note:** Read and Write

**EnabledObjFlds**

List of the field names of widgets enabled in this object not associated with data fields.

**Data type:** CHARACTER  
**Note:** Read only
**EnabledObjFldsToDisable**

Property that controls whether or not to disable non-database objects when the data fields are disabled. You can enter one of the following:

- **None** — Non-database objects remain enabled when the fields are disabled.
- **All** — Non-database objects are disabled in view mode.
- **Comma separated list** — A comma-separated list of non-database object names that you want disabled in view mode.

**Data type:** CHARACTER

**Notes:**

- Read and Write.
- The property only applies to non-database objects that have been defined as enabled in the master. See the “EnabledObjFlds” section on page 3–82 for more information about enabling.
- You can edit this property using the viewer's Instance Property dialog box.

**EnabledObjHdls**

List of the handles of widgets enabled in this object and not associated with data fields.

**Data type:** CHARACTER

**Note:** Read only

**EnabledFields**

A comma-separated list of the names of enabled fields in this object that map to fields in the SmartDataObject (&ENABLED-FIELDS).

**Data type:** CHARACTER

**Notes:**

- Read and Write.
- When EnabledFields is set to FALSE, the check occurs before other code is executed.

**EnabledHandles**

A comma-separated list of the handles, in character format, of the enabled fields in the visualization object.

**Data type:** CHARACTER

**Note:** Read and Write
ExpandOnAdd

Use this property along with the TreeView property to automatically expand a node that has been newly added to a TreeView.

**Data type:** LOGICAL  
**Note:** Read and Write

FetchOnReposToEnd

This property returns TRUE if the browse should fetch more data from the server to fill the batch when repositioning to the end of a batch.

**Data type:** LOGICAL  
**Notes:**
- Read and Write
- Using this setting gives the correct visual appearance, but requires an additional request to the server.

FieldColumn

Column number of the left most field.

**Data type:** DECIMAL  
**Note:** Read and Write

FieldFormats

Internal override of formats for fields.

**Data type:** CHARACTER  
**Note:** Read and Write

FieldHandles

A comma-separated list of the handles, in character format, of the Data Fields in the visualization object.

**Data type:** CHARACTER  
**Note:** Read and Write
**FieldHelpIds**

Internal list of properties for the fields. Each element consists of a name and a value, separated by CHR(1).

**Data type:** CHARACTER  
**Note:** Read and Write

**FieldsEnabled**

Indicates whether the fields in this visualization object are enabled.

**Data type:** LOGICAL  
**Note:** Read only

**FieldLabels**

Internal list of properties for the fields. Each element consists of a name and a value, separated by CHR(1).

**Data type:** CHARACTER  
**Note:** Read and Write

**FieldOperatorStyles**

Internal list of properties for the fields. Each element consists of a name and a value, separated by a CHR(1).

**Data type:** CHARACTER  
**Note:** Read and Write

**FieldToolTips**

Internal list of properties for the fields. Each element consists of a name and a value, separated by a CHR(1).

**Data type:** CHARACTER  
**Note:** Read and Write

**FieldWidths**

Internal list of properties for the fields. Each element consists of a name and a value, separated by a CHR(1).

**Data type:** CHARACTER  
**Note:** Read and Write
**FilterActive**

Values of FilterActive and QueryColumns. TRUE if a filter is active and QueryColumns is not the empty string and TRUE if the DataSource has a logical filter.

**Data type:** LOGICAL

**Notes:**
- Read only.
- It might be set to TRUE explicitly or use the Querycolumns.

**FilterTarget**

Handle for a data object, in character format or the name of the linked filter object. Currently supports only one.

**Data type:** CHARACTER

**Note:** Read and Write

**FilterTargetEvents**

Comma-separated list of the events to which this object wants to subscribe to in its FilterTarget.

**Data type:** CHARACTER

**Note:** Read and Write

**FolderWindowToLaunch**

Property that contains the name of a logical object (usually a folder window) to launch when a user selects a maintenance option on an object controller (usually a container and a browser with a toolbar). Use this property to launch an object that allows the user to maintain details for records.

**Data type:** CHARACTER

**Note:** Read only

**FrameMinHeightChars**

Predetermined character height of a frame.

**Data type:** DECIMAL

**Note:** Read and Write
FrameMinWidthChars

Predetermined character width of a frame.

Data type: DECIMAL
Note: Read and Write

FullRowSelect

The FullRowSelect property of the tree. If TRUE, the entire node (text and icon) is highlighted.

Data type: LOGICAL
Note: Read and Write

GroupAssignHidden

Property used to verify whether the object is hidden and if it can remain hidden.

Data type: Logical
Notes:
  • Read only.
  • This property is used by the linkState procedure in the data.p file to verify that the link
    can be deactivated and how to republish the message.
  • Returns FALSE as soon as any visible object is found.
  • This property is also used to verify whether all GroupAssignTargets are hidden and if they
    should remain hidden.

GroupAssignSource

Handle of the object’s GroupAssign source.

Data type: HANDLE
Note: Read and Write

GroupAssignSourceEvents

Comma-separated list of the events this object wants to subscribe to in its GroupAssign source.

Data type: CHARACTER
Note: Read and Write
**GroupAssignTarget**

Handle, in character format, of the object’s GroupAssign target.

Data type: CHARACTER  
Note: Read and Write

**GroupAssignTargetEvents**

Comma-separated list of the events this object wants to subscribe to in its GroupAssign target.

Data type: CHARACTER  
Note: Read and Write

**Height**

Height of the object.

Data type: DECIMAL  
Note: Read only

**HideOnInit**

Indicates whether the current object should be left hidden when it is first initialized.

Data type: LOGICAL  
Note: Read and Write

**HideSelection**

Indicates whether the Tree View remains highlighted. If TRUE, the current node in the TreeView does not remain highlighted when focus leaves the Tree View.

Data type: LOGICAL  
Note: Read and Write

**ImageHeight**

Height of images in the image list associated with the TreeView.

Data type: INTEGER  
Note: Read and Write
**ImageWidth**

Width of images in the image list associated with the TreeView.

**Data type:** INTEGER  
**Note:** Read and Write

**ILComHandle**

The com-handle of the ImageList ActiveX object.

**Data type:** HANDLE  
**Note:** Read only

**Indentation**

Number of pixels of indentation between two generations of nodes.

**Data type:** INTEGER  
**Note:** Read and Write

**LabelEdit**

Indicates whether a user can edit a node. If TRUE, the user can click on the node to edit it.

**Data type:** INTEGER  
**Note:** Read and Write

**LayoutOptions**

List of multi-layout options for the object.

**Data type:** CHARACTER  
**Note:** Read and Write

**LayoutVariable**

Name of the &LAYOUT-VARIABLE preprocessor for the object, which is used as a prefix to the name of the procedure that resets it.

**Data type:** CHARACTER  
**Note:** Read only
**LineStyle**

Determines the line style for a tree. This property has the following options:

- **0 (Default)** — Displays lines between child nodes and their parent.
- **1** — Displays lines between root nodes and lines between child and parent nodes.

**Data type:** INTEGER  
**Note:** Read and Write

**MaxWidth**

Maximum width of the browse when CalcWidth is TRUE.

**Data type:** DECIMAL  
**Note:** Read and Write

**MinHeight**

Determines the minimum height.

**Data type:** DECIMAL  
**Note:** Read and Write

**MinWidth**

Determines the minimum width.

**Data type:** DECIMAL  
**Note:** Read and Write

**ModifyFields**

Property that determines which fields should set DataModified to TRUE in their containing viewer when fields are modified. For data-source fields, this property also controls the fields from which values are collected for passing to the data source and update target.

Valid values for this property are:

- **All** — All EnabledObjects should set DataModified
- **None** — No EnabledObjects should set DataModified
- **EnabledFields** — Only Fields from the data source should set DataModified
- **Updatable** — Only EnabledFields that can be updated in the data source should set DataModified
- **Comma separated list** — List of object names that can set DataModified when changed
Data type: CHARACTER

Notes:

- Read and Write.
- Setting DataModified to TRUE in the viewer enables Save and Reset in the TableioSource toolbar.
- DataFields that do not set DataModified using one of these values are not passed to the update target on save. However, the data source value is displayed again on save.
- ModifyFields is used to determine which field values are collected by the collectChanges procedure. For more information, see the “collectChanges” section on page 3–24.
- You can edit this property using the viewer's Instance Property dialog box.

**NextNodeKey**

Unique code to be used for the Key attribute of the Tree view.

Data type: CHARACTER

Notes:

- Read only.
- You cannot begin a key for a node with a number in Microsoft TreeView. Therefore, the prefix xcNodePrefix is used.
- The key is used as the sort field when adding nodes. Therefore, the string “999999999999” is used to guarantee a valid sort order.

**NodeExpanded**

Expands or collapse a node based on the argument passed.

Data type: LOGICAL

Note: Write only

**NumDown**

Number of rows that are displayed DOWN in the browse.

Data type: INTEGER

Note: Read and Write
ObjectEnabled
Indicate whether the current object is enabled.

Data type: LOGICAL
Note: Read only

ObjectLayout
Current layout name for the object.

Data type: CHARACTER
Note: Read and Write

OLEDrag
Determines whether OLEDrag is supported. If TRUE, drag is supported.

Data type: LOGICAL
Note: Read and Write

OLEDrop
Determines whether OLEDrop is supported. If TRUE, drop is supported.

Data type: LOGICAL
Note: Read and Write

Operator
The Operator, the default when OperatorStyle is Implicit.

Data type: CHARACTER
Note: Read and Write

OperatorLongValues
List of operators and long text.

Data type: CHARACTER
Note: Read and Write
OperatorStyle

The style for the operator. The following lists the valid values for operator:

- **Explicit** — Specify operator in a separate widget.
- **Implicit** — Use the Operator and UseBegins property.
- **Range** — Use two fill-ins and specify GE and LE values.
- **Inline** — Type the operator into the field (defaults to Equals, or BEGINS if UseBegins is TRUE).

**Data type:** CHARACTER  
**Note:** Read and Write

OperatorViewAs

View-as type used to define the operator when OperatorStyle equals **Explicit**.

**Data type:** CHARACTER  
**Note:** Read and Write

Property

Properties for the specified node. These can include the following properties:

- **BACKCOLOR** — The background color of the node.
- **BOLD** — Whether the node is bold.
- **CHECKED** — Whether the node is checked.
- **CHILD** — The first child node.
- **CHILDREN** — The number of children of the node.
- **COUNT** — The number of nodes in the tree.
- **EXPANDED** — Whether the node is expanded or collapsed.
- **FIRSTSIBLING** — The first sibling of the node.
- **FORECOLOR** — The foreground color of the note.
- **FULLPATH** — The full path of the node.
- **GETVISIBLECOUNT** — The number of visible nodes.
- **IMAGE** — The image (contained in imagelist) for the node.
- **INDEX** — The index of the node.
- **KEY** — The unique key of the node.
- **LASTSIBLING** — The last sibling of the node.
- **PARENT** — The parent of the node.
- **NEXT** — The next node key.
- **PATHSEPARATOR** — The delimiter returned by the FullPath property.
- **PREVIOUS** — The previous node key.
- **ROOT** — The root of the node.
- **SELECTEDITEM** — The selected node.
- **SORTED** — Whether the children of the node are sorted.
- **TAG** — The tag of the specified node.
- **TEXT** — The label text of the specified node.
- **VISIBLE** — Whether the entire tree is visible/invisible.

**Data type:** CHARACTER  
**Note:** Read and Write

### QueryRowObject

Handle of the RowObject temp-table associated with the Browse’s query.

**Data type:** HANDLE  
**Note:** Read and Write

### RecordState

String indicating whether a record is available or not. Valid values are **RecordAvailable** and **NoRecordAvailable**.

**Data type:** CHARACTER  
**Note:** Read only

### RefreshTree

Refreshes the tree view.

**Data type:** LOGICAL  
**Note:** Write only
Visual object properties

**ResizeHorizontal**

Indicates whether an object can be resized horizontally. The value for this property is TRUE if the object can be resized horizontally (in X).

**Data type:** LOGICAL

**Note:** Read and Write

**ResizeVertical**

Indicates whether an object can be resized vertically. The value for this property is TRUE if the object can be resized vertically (in Y).

**Data type:** LOGICAL

**Note:** Read and Write

**RootNodeParentKey**

Parent key for root nodes on the tree. You can use the parent key to find all root nodes that has this parent.

**Data type:** CHARACTER

**Note:** Read only

**Row**

Height of the object. Use repositionObject to set the Row.

**Data type:** DECIMAL

**Note:** Read only

**RowIdent**

The ROWID, in character format, of the current row of the visualization. If the update-target is an SmartDataObject (SDO), the database ROWIDs can be stored as the second entry of the list. If connected to a SmartBusinessObject (SBO), the value is a semicolon-separated list corresponding to the SBO’s DataObjectNames list. If the SBO is a valid UpdateTarget, then the ROWIDs are for the UpdateTargetNames; otherwise the DataSourceNames.

**Data type:** CHARACTER
Notes:

- Read and Write.
- Returns only the ROWIDs that uniquely identify this object’s connection to the dataSource/updateTarget and remove unnecessary ROWIDs so the property can be used directly as input to update methods in the SBO. The assumption is that all tables that are displayed only in the visual object are on the one side of a one-to-many or many-to-one relation of the table that is updated, so that they are uniquely identified through the updatable table and their ROWIDs are not part of this object Ident. However, return more than one ROWID is returned for the case where more than one SDO is updated as one-to-one in the SBO.

RowUpdated

Returns TRUE if the current record has been saved, but not committed. The value is supposed to reflect the visual object's status, so it uses the UpdateTarget (not the DataSource) in order to only return TRUE if the object did the change and/or can undo/save the change.

Data type: LOGICAL
Note: Read only

RowObject

Handle of the RowObject temp-table buffer or the Browser’s temp-table definition.

Data type: HANDLE
Note: Read only

SaveSource

Indicates whether the TableIO-Source is set to Save or Update. This value is TRUE if the TableIO-Source is set to Save and FALSE if set to Update (modal).

Data type: LOGICAL
Note: Read and Write

Scroll

Scroll property of the tree. If TRUE, scrollbars appear.

Data type: LOGICAL
Note: Read and Write
ScrollRemote

Value of ScrollRemote.

**Data type:** LOGICAL

**Note:** Read and Write

SearchField

Name of a field where searching is enabled. If set, space is allocated for a fill-in to accept a value to be repositioned to.

**Data type:** CHARACTER

**Note:** Read and Write

SelectedNode

Key of the selected node.

**Data type:** CHARACTER

**Note:** Read only

ShowCheckBoxes

Indicates whether a check box appears next to a node. If TRUE, check boxes appear beside each node on the TreeView.

**Data type:** LOGICAL

**Note:** Read and Write

ShowRootLines

Indicates whether there should be lines to the root of the tree. If TRUE, there should be lines leading to the roots of the tree.

**Data type:** LOGICAL

**Note:** Read and Write

SingleSel

Controls whether a node is expanded when selected. If TRUE, the node is expanded when selected or clicked.

**Data type:** LOGICAL

**Note:** Read and Write
**Sort**

Identifies whether a selection should be sorted. If TRUE, the selection is to be sorted.

**Data type:** LOGICAL  
**Note:** Read only

**TableIOSource**

Identifies the source for the input and output Table.

**Data type:** HANDLE  
**Note:** Read and Write

**TableIOEvents**

Comma-separated list of the events to which this object wants to subscribe to in its TableIO source.

**Data type:** CHARACTER  
**Note:** Read and Write

**ToggleDataTargets**

Property used to control whether or not dataTargets should be set to on or off in linkState. This value changes based on what is passed with the active or inactive parameter.

**Data type:** Logical  
**Notes:**

- Read and Write.
- If TRUE, dataTargets should be set to on or off in linkState depending on what is passed with the active or inactive parameter.
- If FALSE, dataTargets should not be set to on or off in linkState depending on what is passed with the active or inactive parameter.

**ToolbarSource**

Handle or list of handles.

**Data type:** CHARACTER  
**Note:** Read and Write
**ToolbarSourceEvents**

List of events to be subscribed to in the Toolbar-Source.

**Data type:** CHARACTER  
**Note:** Read and Write

**ToolTip**

Property containing the ToolTip for the browser.

**Data type:** CHARACTER  
**Notes:**  
- Read and Write.  
- This property is supported in both Progress Dynamics and Non-Progress Dynamics environments.

**TreeDataTable**

Handle of a dynamic temp-table populated with property fields for a TreeView.

**Data type:** HANDLE  
**Note:** Read only

**TreeStyle**

Use this property with the TreeView property to specify the appearance for a TreeView. You can specify the following to define the appearance of a Tree View:

- 0 — Text only.  
- 1 — Image and text.  
- 2 — Plus and minus with text.  
- 3 — Plus and minus with image and text.  
- 4 — Lines and text.  
- 5 — Lines, image, and text.  
- 6 — Lines, plus and minus, with text.  
- 7 — (Default) Lines, plus and minus with image and text.

**Data type:** INTEGER  
**Note:** Read and Write
**TVControllerSource**

Handle of the procedure controlling this TreeView.

*Data type:* HANDLE  
*Note:* Read and Write

**TVControllerTarget**

Usually, the handle of the TreeView being controlled.

*Data type:* HANDLE  
*Note:* Read and Write

**TVControllerTargetEvents**

List of target events to which this controller wants to subscribe.

*Data type:* CHARACTER  
*Note:* Read only

**UndoChangeCaption**

Returns the appropriate text for the Undo button’s tooltip. The tooltip changes to indicate what is undone by each click of the button.

*Data type:* CHARACTER  
*Note:* Read only

**UndoNew**

Returns true if UndoChange can undo unsaved records created by an Add or Copy. If false, cancelRecord must be called directly.

*Data type:* LOGICAL  
*Note:* Read and Write

**UpdateTarget**

Used for pass-through links, to connect an object inside the container with an object outside the container.

*Data type:* CHARACTER  
*Note:* Read and Write
**UpdateTargetNames**

ObjectName of the Data Object to be updated by this visual object. This is set if the Update-Target is an SBO or other Container with DataObjects.

*Data type:* CHARACTER  
*Note:* Read and Write

**UseBegins**

Value of UseBegins. This value is TRUE when BEGINS is supposed to be used for character tests.

*Data type:* LOGICAL  
*Note:* Read and Write

**UseContains**

Property used to determine when to use Contains. If TRUE, then Contains should be used as operator for character values.

*Data type:* LOGICAL  
*Note:* None

**UseSortIndicator**

Indicates whether the browser uses a graphical arrow in the column label to show sort column and sort direction. The default is TRUE, which displays the arrow.

*Data type:* LOGICAL  
*Note:* Read and Write

**ValidKey**

Indicates whether there is a valid key. If TRUE, there is a valid key.

*Data type:* LOGICAL  
*Note:* Read only

**VisualBlank**

Used to visualize searching for BLANK values.

*Data type:* CHARACTER  
*Note:* Read and Write
**Width**

Width of the object.

**Data type:** DECIMAL  
**Note:** Read only

**WindowTitleField**

This property usually contains the name of a field that you want to concatenate to the window title of a container. You can use this property to indicate what record is being maintained.

For example, if you have an object controller for Products, and you launch a folder window and you want the product code to appear in the title, you would assign the value `gsc_product.product_code` to this property. As a result, when the folder window launches, the product code of the product being maintained is concatenated to the window title.

**Data type:** CHARACTER  
**Note:** Read and Write
Browse column properties

There are a number of column properties specific to browsers. To read or write these properties, use methods that comply to the following naming convention:

```
getBrowseColumnpropertyName
setBrowseColumnpropertyName
```

Where `property-name` is the name of the property.

Table 3–4 lists the available browse column properties.

<table>
<thead>
<tr>
<th>Property</th>
<th>Data Type</th>
<th>Read</th>
<th>Write</th>
</tr>
</thead>
<tbody>
<tr>
<td>AutoCompletions</td>
<td>CHARACTER</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>BGColors</td>
<td>CHARACTER</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Delimiters</td>
<td>CHARACTER</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>FGColors</td>
<td>CHARACTER</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Fonts</td>
<td>CHARACTER</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>InnerLines</td>
<td>CHARACTER</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>ItemPairs</td>
<td>CHARACTER</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Items</td>
<td>CHARACTER</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>LabelBGColors</td>
<td>CHARACTER</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>LabelFGColors</td>
<td>CHARACTER</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>LabelFonts</td>
<td>CHARACTER</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Labels</td>
<td>CHARACTER</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>MaxChars</td>
<td>CHARACTER</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Sorts</td>
<td>CHARACTER</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Types</td>
<td>CHARACTER</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>UniqueMatches</td>
<td>CHARACTER</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Widths</td>
<td>CHARACTER</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

These properties match up with ABL attributes. For more information on the attribute’s function, see *OpenEdge Development: ABL Reference*. 
Column properties for visual objects

There are a number of column properties available for which you can obtain and set (write) field values. All of these properties can be read and some of them can be set. To read and set column properties, you use the following prefixes with the specific column property:

- **Column** — Use to read the value of a specific column property. For example, if you want to read the value of the FilterTarget property, you would specify `FilterTarget`. This would return the label of the column you specify. To obtain the data type for a specific column property, you would specify `DataType`. This would return the data type of the specified column.

- **Assign** — Use to set the value of the specified column property.

**Note:** For Container objects, there are no column properties for which you can assign the value.

For additional information, see *OpenEdge Development: Progress Dynamics Basic Development* and *OpenEdge Development: Progress Dynamics Advanced Development*.

Table 3–5 lists and provides a brief description of the column properties for field objects.

### Table 3–5: Column properties for visual objects

<table>
<thead>
<tr>
<th>Column property</th>
<th>Description</th>
<th>Read</th>
<th>Write</th>
<th>Data type</th>
</tr>
</thead>
<tbody>
<tr>
<td>DataType</td>
<td>Data type of the specified column.</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>FilterTarget</td>
<td>Filter-Target of the specified column.</td>
<td>Yes</td>
<td>No</td>
<td>HANDLE</td>
</tr>
<tr>
<td>Format</td>
<td>Format text of a specified column.</td>
<td>Yes</td>
<td>Yes</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>HelpID</td>
<td>HelpID for a column.</td>
<td>Yes</td>
<td>Yes</td>
<td>INTEGER</td>
</tr>
<tr>
<td>Label</td>
<td>Label text for a column.</td>
<td>Yes</td>
<td>Yes</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>OperatorStyle</td>
<td>Operator style for some field, derived either from <code>FieldOperatorStyles</code> or the <code>OperatorStyle</code> property.</td>
<td>Yes</td>
<td>Yes</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>StyleDefault</td>
<td>Name of the column in the filter-target. Used only in design-time because the <code>columnOperatorStyle</code> function returns the overridden value. TRUE if the style has been overridden.</td>
<td>Yes</td>
<td>No</td>
<td>LOGICAL</td>
</tr>
<tr>
<td>Tooltip</td>
<td>Tooltip for a column.</td>
<td>Yes</td>
<td>Yes</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>Column property</td>
<td>Description</td>
<td>Read</td>
<td>Write</td>
<td>Data type</td>
</tr>
<tr>
<td>-----------------</td>
<td>--------------------------------------------------</td>
<td>------</td>
<td>-------</td>
<td>-----------</td>
</tr>
<tr>
<td>Width</td>
<td>Width (in character units) of a specified column.</td>
<td>Yes</td>
<td>Yes</td>
<td>DECIMAL</td>
</tr>
<tr>
<td>WidthDefault</td>
<td>Indicates whether or not a column width has been overridden. TRUE if the width has been overridden.</td>
<td>Yes</td>
<td>No</td>
<td>DECIMAL</td>
</tr>
</tbody>
</table>
Container Objects and Their Methods and Properties

This chapter lists and describes the methods (internal procedures and functions) and properties used for Container Objects. Refer to Figure 1–1 to see the inheritance hierarchy for each object class.

Note: For information specific to the WebSpeed environment, see Chapter 9, “Alphabetical Listing of WebSpeed-specific API Routines.”

This chapter provides information about the following:

- Base methods for container objects
- Methods for SmartBusiness container objects
- Methods for TreeView controller container objects
- Container object properties
- Column properties for container objects
Base methods for container objects

This section describes the base methods for Container Objects.

**applyContextFromServer**

Applies context returned from the server after a server call.

**Location:** container.p

**Parameters:** None

**Returns:** LOGICAL

**Notes:** None

**assignContentsProperties**

Function that returns properties in contained objects that use the returned value of containedProperties.

**Location:** container.p

**Parameters:**

**INPUT pcPropValues AS CHARACTER**

A CHR(3)-separated list of properties and values from the containedProperties function. The first entry is a header that defines to which properties the remaining entries in the list apply. The header has two possible formats:

- Comma separated list of properties when all objects are SmartDataObjects (SDOs).
- A paired semicolon lists with object type and a comma delimited list of properties. THIS is used instead of ObjectType for this container instance. For example:

  ```plaintext
  SmartBusinessObject;Prop1;SmartDataObject;propA,propB,propC
  ```

- The remaining CHR(3) entries are a paired list of objectNames and a CHR(4)-delimited list of property values, where each CHR(4) entry corresponds to the comma separated property list for the object's Object type.
- A blank objectname indicates this container is an instance.
- ObjectNames is qualified with ':' to specify container relationships.

**INPUT pcReplace AS CHARACTER**

A comma separated pair of replacement properties not qualified by ObjectTypes.

**Returns:** LOGICAL

**Notes:** None
**assignPageProperty**

Procedure that assigns a property in all objects on the CurrentPage of a SmartContainer. If an object on the page does not have a property, it is ignored without error.

**Location:** containr.p

**Parameters:**

- **INPUT pcProp AS CHARACTER**
  The property to set.

- **INPUT pcValue AS CHARACTER**
  The value to assign to that property.

**Notes:**

- This variation on assignLinkProperty is necessary because the notion of paging does not fit well with PUBLISH/SUBSCRIBE. This is because there is a single property (PageNTargets) that stores the handles of all of a SmartContainer’s objects that are not on page 0 in a specially delimited list.

- Although the pcValue parameter is specified in CHARACTER form, you can use these parameters to assign values to noncharacter properties.

- All objects in a Container subscribe to initializeObject, and so on, but the paging performs the operation on subsets of those objects at a time. That is, the container does not publish initializeObject to objects on a page other than zero until that page is first viewed. So properties such as HideOnInit, which are set as part of initialization, must be set page-by-page.

**Example:**

```
/* Sets the DataModified property to "no" */
RUN assignPageProperty ('DataModified':U, 'no':U).
```

**cancelObject**

Procedure that cancels an object.

**Location:** containr.p

**Parameters:** None

**Notes:**

- If this is the window container or a virtual container then override and do not call SUPER. If not a window/virtual container, cancel and undo all container targets and then destroy. Published from containerTargets or called directly.

- There is a slight overhead in this construct as destroyObject (called from exitObject apply close) does a publish confirmExit, which really is unnecessary after this has published confirmCancel. The reason is that destroyObject might be called directly.
• We currently have to call `exitObject` as AppBuilder’s WAIT-FOR complains if we destroy the object directly. Even apply `close` to target-procedure does not trigger the WAIT-FOR. It seems as this has to be fired from the actual instance. (`exitObject` should be local in all container instances) This might very well be a problem for application WAIT-FOR as well.

**changePage**

Procedure that views (and creates if necessary) objects on a newly selected page in a Container when `CurrentPage` is reset.

**Location:** `containr.p`

**Parameters:** None

**Notes:**

• The `changePage` procedure is normally used internally and called from either `selectPage` or `viewPage`. Although you can customize `changePage` to perform some application-specific task each time a page is changed, if it is called from `selectPage` (the standard methods for switching pages within a Container), the previous page will have already been hidden.

• The `changePage` procedure expects the `CurrentPage` property to have been set to the new page before it is called.

• The `changePage` procedure does not hide the previously selected page. This is done before it is called from `selectPage`. If it is called from `viewPage`, the previous page is not hidden first. This would be the case if the new page is a SmartWindow to be viewed in addition to the current page in its container.

• The `changePage` procedure first publishes `changeFolderPage` to let the associated SmartFolder visualization, if any, know about the page change.

• If the new page is not page zero (which is always initialized at startup), and the objects on the page have not yet been created, `changePage` runs `createObjects` to create all the SmartObjects on the new page. If the SmartContainer itself has been initialized, it also publishes `initializeObject` to initialize the new objects, and publishes “`viewObject`” to view them.

**Example:**

```plaintext
/* Display the current page number in a fill-in field whenever the page is changed. */
PROCEDURE changePage:
    RUN SUPER. /* Perform the standard code first. */
    FILL-IN-1:SCREEN-VALUE IN FRAME {&FRAME-NAME} =
        STRING(DYNAMIC-FUNCTION("getCurrentPage":U)).
END PROCEDURE.
```
confirmExit

Procedure that passes this event on to its descendents, to check whether it is OK to exit (that is, there are no unsaved changes).

**Location:** containr.p

**Parameters:**

INPUT-OUTPUT plCancel AS LOGICAL

If field values have been modified and not saved, it returns TRUE and the destroyObject is cancelled.

**Note:** Invoked from destroyObject.

confirmOk

Procedure that verifies that unsaved changes are saved and uncommitted data is committed before allowing its container to initiate a **destroy** operation.

**Location:** containr.p

**Parameters:**

INPUT-OUTPUT plError AS LOGICAL

TRUE if the destroyObject is to be cancelled.

**Notes:**

- This routine is named ‘confirm’ because it is similar to the other confirm methods, though this one does not ask any questions.
- Invoked at the top by okObject.
- Only republished if the container is non-virtual and non-window.

constructObject

Procedure that runs from adm-create-objects to RUN a SmartObject to establish its parent and initial property settings.

**Location:** containr.p

**Parameters:**

INPUT pcProcName AS CHARACTER

The procedure name to run.

INPUT phParent AS HANDLE

Handle to its parent.
INPUT pcPropList AS CHARACTER
    Property list to set.
OUTPUT phObject AS HANDLE
    The new procedure handle.

Notes: None

containedProperties

Returns a CHR(3)-delimited list where the first entry is the passed query parameter. The rest of the entries consists of paired objectNames and CHR(4)-delimited properties. For plDeep queries, the ObjectName is colon separated to uniquely identify levels in the tree. The second in each pair is a CHR(4)-separated list of values where each entry corresponds to the Propertlist for that object.

Location: container.p

Parameters:

INPUT pcQueryProps AS CHARACTER
    Comma-separated lists of properties to retrieve from SmartDataObjects (SDOs). You can optionally use paired semicolon lists to query different Object types.

INPUT plDeep AS LOGICAL
    Determines the level at which a query should run. If TRUE, continue query in children of children. If FALSE, query only one level down.

Returns: CHARACTER

Notes:
• The FORMAT of the returned string is INTERNAL and intended to be transported as is (across servers) to be passed into assignContainedProperties.
• If the ClientNames property is defined, the ObjectName entry in the returned list is replaced with the corresponding entry in the ClientNames list. This information is used to enable communication among clients with different container structures.

Example:

<pcQueryProps>CHR(3)<ObjectName1>CHR(3)<PropAvalue>CHR(4)<PropBvalue>CHR(3)<ObjectName2>CHR(3)<PropAvalue>CHR(4)<PropBvalue>.
ContextandDestroy

Server-side procedure to run after new data has been requested by the client.

**Location:** contain.r.p

**Parameters:** None

**Notes:** None

createObjects


**Location:** contain.r.p

**Parameters:** None

**Notes:**

- This procedure runs adm–create–objects, the AppBuilder-generated procedure that creates and initializes all the SmartObjects in a Container. This allows both the AppBuilder-generated code and any customization of it to exist in the same SmartContainer procedure, because the customization is called using createObjects.

- This can be customized to add application-specific behavior to the creation of SmartObjects in a Container. createObjects runs once for each page as it is initialized, so code in a custom version should always check the CurrentPage property to verify that the custom code is executed for the proper page (0 for general code to be executed exactly once).

**Examples:**

```plaintext
PROCEDURE createObjects:
/* Purpose: Add some extra objects to key pages. Because these objects are being created by custom code, they will not appear in the AppBuilder at design time. */
DEFINE VARIABLE hWin AS HANDLE NO-UNDO.
RUN SUPER. /* Get the other objects on this page created. */

/* Now create a child window which appears when page 100 is selected. */
IF DYNAMIC-FUNCTION('getCurrentPage':U) = 100 THEN DO:
    RUN constructObject (INPUT 'wChild.w':U, /* Master file to run */
            INPUT {&WINDOW-NAME}, /* Parent handle */
            INPUT '':U, /* No Instance Properties */
            OUTPUT hWin). /* New object handle */
    /* Add a custom link. The Container link is created automatically. */
    RUN addLink (THIS-PROCEDURE, 'Custom':U, hWin).
END.

RETURN.
END PROCEDURE.
```
confirmCancel

Procedure that verifies that unsaved changes are cancelled and uncommitted data are undone before allowing its container to initiate a destroy operation.

**Location:** containr.p

**INPUT-OUTPUT** plError AS LOGICAL

TRUE if the destroyObject is to be cancelled.

**Notes:**

- The name confirm is used as it is in family with the other confirm methods, but this does not ask any questions Invoked at the top by cancelObject.
- Only republished if the container is non-virtual and non-window.

deletePage

Procedure that deletes all the objects on the specified page.

**Location:** containr.p

**Parameters:**

INPUT piPageNum AS INTEGER

Number of page to be purged.

**Notes:**

- The deletePage procedure is not run from any standard ADM code; it can be run from application code to delete a page when no longer needed, or for other reasons.
- The deletePage procedure publishes deleteFolderPage to remove the folder tab for the page, if any.

**Examples:**

```plaintext
ON CHOOSE OF Btn_Delete_Page DO:
  DEFINE VARIABLE iPage AS INTEGER NO-UNDO.
  DEFINE VARIABLE lAnswer AS LOGICAL NO-UNDO.

  /* Get the current page number and delete it */
  iPage = getCurrentPage().
  MESSAGE "OK to delete page" STRING(iPage) + "?"
    VIEW-AS ALERT-BOX QUESTION BUTTONS YES-NO UPDATE lAnswer.
  IF lAnswer THEN
    RUN deletePage(iPage).
  END.
```
**destroyObject**

Procedure that destroys a container object.

**Location:** container.p

**Parameters:** None

**Notes:** None

**disablePagesInFolder**

Disables the specified folder pages.

**Location:** container.p

**Parameters:**

INPUT pcPageInformation AS CHARACTER

The pages to be disabled.

**Returns:** LOGICAL

**Notes:** None

**enablePagesInFolder**

Enables the specified folder pages.

**Location:** container.p

**Parameters:**

INPUT pcPageInformation AS CHARACTER

The pages to be enabled.

**Returns:** LOGICAL

**Notes:** None
**fetchContainedData**

Client-side procedure that retrieves a set of data from the server for the client.

**Location:** container.p  
**Parameters:**

INPUT pcObject AS CHARACTER

Name of the client-side query object for which data is being retrieved. If the name is:

- Unknown, then result sets are fetched for all QueryObjects in this container and all QueryObjects in all contained containers
- Specified, then result sets are fetched from that Object down following only that data link

**Notes:**

- The data links are followed when preparing and retrieving data for all objects in containers.
- The data links can go across containers but it cannot go into a container that is not a descendant of that container.

**hidePage**

Procedure that cycles through all objects on a page, hiding them.

**Location:** container.p  
**Parameters:** None  
**Notes:** None

**initializeObject**

Procedure that does container-specific initialization. If the container is a SmartFrame or nonvisual container, createObjects is run at this time. It is not run for a SmartFrame when it is first created to avoid creating objects that are not needed until after startup. If there is a StartPage (a first page to position to other than page 0), it is selected. If the HideOninit or DisableOnInit property is set for the Container, it is propagated to all contained objects before they are initialized. Then the container publishes “initializeObject” to initialize all its contents. Finally it does RUN SUPER to execute the initialization code in smart.p.

**Location:** container.p  
**Parameters:** None  
**Notes:** None
initializeVisualContainer

Procedure that translates window title and tab folder page labels and checks security for page labels.

**Location:** container.p  
**Parameters:** None  
**Notes:** None

initPages

Procedure that initializes one or more pages, which are not yet being viewed, in order to establish links or to prepare for the pages being viewed.

**Location:** container.p  
**Parameters:**

INPUT pcPageList AS CHARACTER  
A comma-separated list of page numbers.

**Notes:**

- The initPages procedure can be run by application code to initialize more pages than those that are initially viewed, either in order to reduce the startup time for pages later on, or to communicate with objects on pages not yet selected.

- If a SmartObject on one page in a SmartContainer is a link target of a SmartObject on another page other than page 0, the AppBuilder detects this during the design process and automatically generates an appropriate call to initPages as part of adm–create–objects. This assure that when the dependent page is initialized, the pages it depends on are initialized as well.

- Ordinarily only objects on page 0 and on the StartPage (if any) are created when the SmartContainer is created. Objects on other pages are created when the page they are on is first selected.

- In some cases a SmartDataObject can be an Update Target for a SmartDataViewer or Browser, which can be on a later page in the Container. This might cause more pages to be created at startup than is desired. If this is the case, the design time Update link can be removed, and created instead by application code in a local createObjects, as in the second example below.
isUpdateActive

Procedure that is received from container source to check if contained objects have unsaved or uncommitted changes (including addMode).

Location: containr.p

Parameters:

INPUT-OUTPUT plActive AS LOGICAL

Note: This is published thru the container link and used mainly to validate that a FALSE value received in updateActive can be used to set UpdateActive. This is NOT intended to be called directly, but part of the logic that updates UpdateActive. These are the steps: (1) Updating objects publishes updateActive (TRUE or FALSE) to their container targets. (2) If the value is FALSE the container then publishes this to ALL ContainerTargets before it is stored in UpdateActive. This way the value is only stored as FALSE if ALL contained objects are inactive.

Examples:

PROCEDURE initializeObject:
/* Purpose: Initialize the current SmartContainer and initialize some frequently used pages at the same time. */

RUN SUPER. /* Execute standard page creation first. */

/* Initialize pages 2, 8, and 106 at startup. This will create the pages but not view them. */
RUN initPages ('2,8,106':U).
END PROCEDURE.

PROCEDURE createObjects:
/* Purpose: Local version to add an Update link between a SmartDataObject on page 0 and a SmartDataViewer on page 2; not done until page 2 is created. */

RUN SUPER. /* Do the standard creation for each page first. */
IF getCurrentPage() = 2 THEN
RUN addLink(h_Vcust, 'Update':U, h_Dcust).
END PROCEDURE.
notifyPage

Procedure that invokes the specified procedure in all objects on the CurrentPage of A SmartContainer.

**Location:** containr.p

**Parameters:**

INPUT pcProc AS CHARACTER

The internal procedure to run.

**Notes:**

- This procedure is necessary because paging does not work well with PUBLISH/SUBSCRIBE. For example, although all objects in a Container subscribe to initialize (and so on), the paging performs the operation on subsets of those objects.
- The notifyPage procedure uses the PageNtargets property values to run an event procedure in all the objects on the current page.

**Example:**

```plaintext
/* This code fragment from changePage causes initializeObject to be run in each newly created object on a page selected for the first time. NotifyPage effectively does a PUBLISH to each object on the current page. */
{get ObjectInitialized lInitiated}. /* Is the container itself initialized? */
IF lInitiated THEN
  RUN notifyPage In TARGET-PROCEDURE ("initializeObject":U).
```

obtainContextForServer

Function used to obtain the context properties to pass to the server.

**Location:** containr.p

**Parameters:** None

**Returns:** CHARACTER

**Note:** The server must know whether or not this is the first call. Determining whether or not it is the first call can be done using either one of the following:

- **Client:** AsHasStarted = no until a response from server
- **Server:** serverFirstCall = no unless client passes YES

Two similar properties are provided to support different defaults on client and server.

**Note:** This function is always called before an Appserver call and is used to send context in initializeServerObject as well as in all data requests.
okObject

Procedure that saves and closes an object (OK action).

Location: containr.p
Parameters: None

Notes:
- If this is the window container or a virtual container then override and do not call SUPER. If not, then save and commit all Container-Targets and destroy if no errors occurred. Published from containerTargets or called directly.
- There is a slight overhead in this construct as destroyObject (called from exitObject -> apply close) does a publish confirmExit, which really is unnecessary after this has published confirmOk. The reason is that destroyObject might be called directly.
- We currently have to call exitObject as the appbuilder wait-for protests if we destroy directly. Even apply ‘close’ to target-procedure does not trigger the wait-for. It seems as this has to be fired from the actual instance. (exitObject should be local in all container instances) This might very well be a problem for application wait-for as well.

pageNTargets

Returns a comma-separated list of the objects on the specified page for this container.

Location: containr.p
Parameters:
- INPUT phTarget AS HANDLE
- INPUT piPageNum AS INTEGER

Returns: CHARACTER

Notes:
- The actual property pageNTarget keeps track of SmartObject page assignments within a Container. It is stored as a comma-separated list of entries, where each entry consists of an object handle in string format and its page number, separated by a vertical bar. The Target-Procedure is passed as a parameter because this function is only invoked locally, not in the Target-procedure.
- This function is only used internally by the ADM paging code.
**passThrough**

Procedure that acts as an intermediary for dynamic links that need the pass-through mechanism to either get an event from an object outside a container to an object inside a container or to get an event from and object inside a container to an object outside a container.

**Location:** container.p

**Parameters:**

- **INPUT pcLinkName AS CHARACTER**
  
  The link (event) name to be passed on.

- **INPUT pcArgument AS CHARACTER**
  
  A single character-string argument.

**Note:** To use this for single pass-through events, define a PassThrough link from the Source to the intermediate container, and define the actual dynamic link from the container to the Target. Then PUBLISH **PassThrough** (LinkName, Argument) to send the event.

**removePageNTarget**

Procedure that removes an object from the list of Targets on a page.

**Location:** container.p

**Parameters:**

- **INPUT phTarget AS HANDLE**
  
  The handle of the object to be removed.

- **INPUT piPage AS INTEGER**
  
  The page number of the object to be removed.

**Note:** Run from removeAllLinks for objects not on Page 0. Not intended to be run from application code.

**resizeWindow**

Procedure that respond to a resize event from user event or container targets.

**Location:** container.p

**Parameters:** None

**Note:** The current functionality just resizes the frame according to the window size. This was added to make the call from the toolbar’s resizeObject after it expands a window have some default functionality, but this is mostly a placeholder for logic to resize all contained objects, currently implemented in ry/uib/rydyncontw.w.
**selectPage**

Procedure that changes the currently selected page. If the previous current page is not page 0 (the background page that is always visible), then hideObject is run in all the objects on the CurrentPage. Then the CurrentPage is changed to the new page number of piPageNum, and the changePage procedure is run to view and, if necessary, create the objects on the new page.

**Location:** container.p

**Parameters:**

INPUT piPageNum AS INTEGER

**Notes:**

- This procedure switches from one page on a single frame to another page so that objects on the previous page are hidden and objects on the new page are viewed. If the new page is a separate SmartWindow, in most cases you should use the viewPage procedure to view the objects on the new page without hiding the current page.

- The selectPage procedure runs when a user presses a tab on the SmartFolder. It can also run from application code when some other mechanism is used to change pages.

**Example:**

/* This trigger code allows the user to select a page by typing the number into a field. */

ON LEAVE OF PageNum DO:
  RUN SelectPage (INTEGER(PageNum:SCREEN-VALUE)).
END.

**targetPage**

Returns the ADM page number associated with some object.

**Location:** container.p

**Parameters:**

INPUT phObject AS HANDLE

The object of interest.

**Returns:** INTEGER

**Notes:** None
**toolbar**

Procedure that is a generic event handler for toolbar events.

**Location:** container.p

**Parameters:**

**INPUT pcValue AS CHARACTER**

The string used by the handler's CASE statement to determine behavior. Valid values are:

- **EnableData** — Activates data links by publishing ToggleData
- **DisableData** — Deactivates data links by publishing ToggleData
- **Notepad** — Launches the Notepad application by calling launchExternalProcess
- **Wordpad** — Launches the Wordpad application by calling launchExternalProcess
- **Calculator** — Launches the Calculator application by calling launchExternalProcess
- **Internet** — Launches the Internet Explorer browser by calling launchExternalProcess
- **Email** — Runs sendEmail
- **Word** — Launches the Word word-processor application
- **Excel** — Launches the Excel spreadsheet application
- **PrintSetup** — Opens the system’s printer-setup dialog box
- **Suspend** — Runs af/cod2/aftemsuspd.w
- **Re-Logon** — Runs relogon
- **Preferences** — Launches the preferences applet rydynpref.w
- **Translate** — Launches the translation applet rydyntran.w
- **Help** — Runs contextHelp
- **HelpAbout** — Runs helpabout
- **HelpTopics** — Runs helptopics
- **HelpContents** — Runs helpcontents
- **HelpHelp** — Runs helphelp
- **Spell, Audit, Comments, History, Status** — Currently trapped, but undefined.

**Notes:** None
updateActive

Procedure that is published from ContainerTargets when they change state as a result of, for example, setDataModified, setNewRecord, or setRowObjectState.

**Location:** container.p

**Parameters:**

INPUT plActive AS LOGICAL

TRUE if some update is known active and ContainerTargets need not be surveyed

**Note:** This is part of the logic to make the UpdateActive property reflect the containers state.

viewObject

Procedure this is container-specific code for viewObject. If the HideOnInit property has been set during initialization to allow this object and its contents to be initialized without being viewed, turn that off here and explicitly view all contents.

**Location:** container.p

**Parameters:** None

**Notes:**

• This Container-specific version of viewObject checks the HideOnInit property for the Container. If it was TRUE, then the container was not viewed when first initialized. Now that it is being viewed, it turns off the HideOnInit property in itself and its contents, and explicitly visualizes its contents.

• See viewObject for visual.p for more general information on using and customizing this event procedure.

viewPage

Procedure that views a new page without hiding the current page. You should run this from application code when you want a user to view a new page that is a separate SmartWindow. viewPage runs changePage to view (and if necessary create) the new SmartWindow, but does not hide the objects on the current page, since they are in a separate window that can be viewed at the same time.

**Location:** container.p

**Parameters:**

INPUT piPageNum AS INTEGER
Notes:

- Because the previous page is not hidden, the CurrentPage property is reset only temporarily so that changePage knows the new page number; then it is reset to its previous value.

- Use the procedure selectPage to hide the current page in a container and view a different one.

Example:

```plaintext
/* In this example, a SmartWindow has been placed onto page 5 of a containing SmartWindow. When a button is pressed, viewPage views the subwindow without hiding anything or changing the current page on the main SmartWindow. */

ON CHOOSE OF Btn_SubWin DO:
    RUN viewPage(5).
END.
```
Methods for SmartBusiness container objects

This section describes the methods for SmartBusinessObjects (SBOs). The SBO integrates multiple SmartDataObjects and is a special purpose organizer object that is part of the Container class. SBOs provide a single point of contact for other objects, and allow you to synchronize updates on multiple SmartDataObjects in a single server-side transaction.

addDataTarget

Procedure that updates the ObjectMapping property. This property is used to broker messages between the contained objects and outside objects in communication with them. It is also used to set DataSourceNames and UpdateTargetNames in the data-targets.

Location: sbo.p

Parameters:

INPUT phTarget AS HANDLE

The target handle to be added.

Notes:

• Called by registerObject, subscribed as DataTargetEvent and published from the DataTarget's initializeObject.

• DataSourceNames might be specified by the user in which case it actually specifies how to generate the ObjectMapping. If it is not set, both it and UpdateTargetNames are always set here so that colValues, addRow, deleteRow, updateRow, etc. can identify the intended target or source without looping through all the fields again and again.

• Objects built against RowObject must find ALL columns in ONE of the ContainedDataObjects in order to become mapped.

• Only this procedure is allowed to add Data-Targets to the ObjectMapping property.

• ObjectMapping versus DataSourceNames. There is some overlap here and add-, copy- and deleteRow with ObjectMapping could be used instead of DataSourceNames. But since both cases require knowing the requester, there is not much advantage to only using the ObjectMapping. A way to distinguish between UpdateTargets and DataSources is necessary, and having them implemented similarly makes it all a bit easier to use.

Ideally, the SBO should not have to know about or deal with the object mapping. That should happen at the visual level instead, so the way mapping works might change in some future release.
addNavigationSource

Procedure that adds a NavigationSource to the ObjectMapping property that is used to broker messages between contained objects and the outside objects with which they communicate.

Location: sbo.p

Parameters:

INPUT phSource AS HANDLE

The handle of the source.

Note: Called by registerObject, which is subscribed as NavigationSourceEvent and published by the Navigation-Source’s initializeObject.

addQueryWhere

SmartBusinessObject version of this where-clause function. It simply passes the parameters on to the SmartDataObject named in the pcBuffer argument.

Location: sbo.p

Parameters:

INPUT pcWhere AS CHARACTER

Same as in query.p function addQueryWhere.

INPUT pcObject AS CHARACTER

Must match a SmartDataObject ObjectName.

INPUT pcAndOr AS CHARACTER

Same as in the query.p function.

Returns: LOGICAL

Note: Currently the pcBuffer argument must be specified.
addRow

SmartBusinessObject version of the function. It passes the column list on to the contained SmartDataObject that manages that data.

Location: sbo.p
Parameters:
INPUT pcViewColList AS CHARACTER

Returns: CHARACTER
Notes: None

appendContainedObjects

Builds the list of ContainedObjects in top-down Data-link order.

Location: sbo.p
Parameters:
INPUT-OUTPUT pcObjects AS CHARACTER
INPUT phObject AS HANDLE

Returns: LOGICAL PRIVATE
Note: Private function.

assignCurrentMappedObject

Current contained Data Object for Navigation or other access by the caller.

Location: sbo.p
Parameters:
INPUT phRequester AS HANDLE
INPUT pcObjectName AS CHARACTER

Returns: LOGICAL
Note: This function maps the caller to the specified SmartDataObject using the ObjectMapping property.
assignMaxGuess

Procedure that identifies the MaxGuess event from a contained SDO that was passed to the appropriate Data-Target.

Location: sbo.p
Parameters:
INPUT piMaxGuess AS INTEGER
Notes: None

assignQuerySelection

SmartBusinessObject version of this where-clause function. It separates the Columns by SmartDataObject and appropriately passes on the columns, their values, and operators.

Location: sbo.p
Parameters:
INPUT pcColumns AS CHARACTER
Comma-separated list of column names.
INPUT pcValues AS CHARACTER
CHR(1)-separated list of the corresponding values.
INPUT pcOperators AS CHARACTER
Operator (one for all columns):
• A blank defaults to (EQ).
• A slash defines alternative string operators (EQ/BEGINS, and so forth).
• A comma-separated list for each column/value.
Returns: LOGICAL
Note: All columns must be qualified by their SmartDataObject Objectname as TableName. This name is replaced with RowObject when the columns are passed on to the SmartDataObject.

cancelNew

Procedure that receives the cancelNew event from a contained SDO and passes it on to the appropriate DATA-TARGET.

Location: sbo.p
Parameters: None
Notes: None
cancelRow

SmartBusinessObject version of this function. It passes the cancel request on to the appropriate contained SmartDataObject, which does the actual work.

Location:  sbo.p
Parameters:  None
Returns:  CHARACTER
Note:  See the entry for data.p.

canNavigate

Acts as a pass-through for the same function in some contained SDO, passing the result back to the caller to which the SDO is mapped. An SDO can navigate if it has no children or its children have no commits pending. Children with uncommitted updates prevent navigation by the parent.

Location:  sbo.p
Parameters:  None
Returns:  LOGICAL
Note:  This routine publishes isUpdatePending because that includes rowObjectState in the check. Navigation objects receive updateState from the objects they navigate and must perform this check in the source of any updateComplete message. The updateComplete message can come from a branch of a data-link tree; publishing isUpdatePending checks the whole tree.

colValues

Locates requested columns in contained Data Objects and assembles a list of their values. SmartBusinessObject version of the similar SmartDataObject function.

Location:  sbo.p
Parameters:  

\[
\text{INPUT pcViewColList AS CHARACTER}
\]

Comma-separated list of columns, qualified by the ObjectNames of their respective owning SmartDataObjects.

Returns:  CHARACTER
Note:  If values are requested from only one SmartDataObject, then the RowIdent entry returned as the head of the return value is the RowIdent from that SmartDataObject (its tt rowid + db rowids). Otherwise, a list of all the tt rowids without their db rowids is returned. This allows submitRow() to send the correct rowid on to each contained SmartDataObject on update.columnWidth (sbo.p).
commitData

Procedure that calls undoTransaction to clean up temp-tables after the commit operation finishes.

**Location:**  
sbo.p

**Parameters:**

- OUTPUT pcError AS CHAR

**Notes:**  
None

commitTransaction

Client-side event procedure that receives the Commit event, collects the updates from contained SmartDataObjects, and passes the update to the server.

**Location:**  
sbo.p

**Parameters:**  
None

**Notes:**  
None

confirmContinue

If called with a value of FALSE, asks all contained SDOs whether they have changes pending.

**Location:**  
sbo.p

**Parameters:**

- INPUT-OUTPUT pioCancel AS LOGICAL

**Returns:**  
LOGICAL

**Note:**  
If any SDO reports a pending change, this routine returns pioCancel = TRUE to the caller. The caller then must handle the discrepancy, typically by reporting the unsaved changes to the user and requesting disposition instructions (Save, Discard, etc.).

copyRow

Passes the column list on to the contained DataObject that manages that data.  
SmartBusinessObject version of this function.

**Location:**  
sbo.p

**Parameters:**

- INPUT pcViewColList AS CHARACTER

**Returns:**  
CHARACTER

**Note:**  
Qualify all columns or no columns.
**currentMappedObject**

Returns the object name that is currently mapped to the calling routine.

**Location:** sbo.p

**Parameters:**

INPUT phRequester AS HANDLE

**Returns:** CHARACTER

**Note:** The value is derived from the ObjectMapping property in the SmartDataObject.

**dataAvailable**

Procedure that notifies other objects (Data-Targets) that the current row has been changed. If the DataSource is an external object, uses the Foreign Fields property to get the key-field values. Uses the key-field values to reopen the Master object’s query.

This procedure is the SmartBusinessObject version of the SmartDataObject routine.

**Location:** sbo.p

**Parameters:**

INPUT pcRelative AS CHARACTER

Flag indicating the state of the record.

**Note:** See the description of the SmartDataObject return for more information.

**dataObjectHandle**

Returns the handle of the ObjectName (logical name) of a contained SmartDataObject.

**Location:** sbo.p

**Parameters:**

INPUT pcObjectName AS CHARACTER

**Returns:** HANDLE

**Notes:** None

**deleteComplete**

Procedure that receives the deleteComplete event from a contained SDO and passes it on to the appropriate DATA-TARGET.

**Location:** sbo.p

**Parameters:** None

**Notes:** None
deleteRow

Passes the rowident on to the contained DataObject that manages that data. SmartBusinessObject version of this function.

Location: sbo.p
Parameters:
INPUT pcRowIdent AS CHARACTER
Returns: LOGICAL
Notes: None

destroyServerObject

Procedure that fetches context from the server-side procedure.

Location: sbo.p
Parameters: None
Note: unbindServer is the public interface to this procedure.

endClientDataRequest

Procedure that contains logic to retrieve data properties from the Appserver after a data request. Both queries and commits are considered as data requests.

Location: sbo.p
Parameters: None
Note: The purpose of this function is to encapsulate the logic for stateless and state-aware requests in one call.

fetchBatch

Procedure that returns the next batch of rows to a browse object, communicating with its SmartDataObject.

Location: sbo.p
Parameters:
INPUT plForwards AS LOGICAL
TRUE if moving forward in the database, FALSE if backward.
Notes: None
fetchContainedData

Procedure that retrieves a set of data from the server, given a where-clause for (currently) the top-level SmartDataObject. Client-side procedure.

Location: sbo.p

Parameters:

INPUT pcObject AS CHARACTER

If specified, then fetch result set from that Object down only.

Note: The WHERE clause for the MasterDataObject can be specified in advance of this call by running setMasterQueryWhere(). The WHERE clause for individual SmartDataObjects can also be set by running the standard functions for that purpose (addQueryWhere(), assignQuerySelection()) in the SmartDataObject handle (retrieved by the dataHandle() function).

fetchContainedRows

A client-side procedure that gets a batch of data from one SmartDataObject and all the tables from SmartDataObjects lower in the data-link chain or tree.

Location: sbo.p

Parameters:

INPUT pcObject AS CHARACTER

INPUT piStartRow AS INTEGER

INPUT pcRowIdent AS CHARACTER

INPUT piNext AS LOGICAL

INPUT piRowsToReturn AS INTEGER

OUTPUT piRowsReturned AS INTEGER

Note: If pcObject AS CHARACTER is specified, then this procedure only fetches result sets from that Object on down. Intended for internal use. Called from clientSendRows in the contained SDO.

fetchDOProperties

Procedure that retrieves any properties from the server-side SmartBusinessObject and its SmartDataObjects, and sets them in the contained SmartDataObjects on the client.

Location: sbo.p

Parameters: None

Note: Currently retrieves the OpenQuery property, which is set only on the server but needed on both sides.
**fetchFirst**

Procedure that retrieves the first row in one of the ContainedDataObjects. It uses the ObjectMapping SmartBusinessObject property to match the caller to its Target, or uses the MasterDataObject by default. It is a SmartBusinessObject version of this event procedure.

- **Location:** sbo.p
- **Parameters:** None
- **Note:** Uses the MasterDataObject by default.

**fetchLast**

Procedure that retrieves the last row in one of the ContainedDataObjects. It uses the ObjectMapping SmartBusinessObject property to match the caller to its Target or uses the MasterDataObject by default. It is a SmartBusinessObject version of this event procedure.

- **Location:** sbo.p
- **Parameters:** None
- **Note:** Uses the MasterDataObject by default.

**fetchNext**

Procedure that retrieves the next row in one of the ContainedDataObjects. It uses the ObjectMapping SmartBusinessObject property to match the caller to its Target, or uses the MasterDataObject by default. SmartBusinessObject version of this event procedure.

- **Location:** sbo.p
- **Parameters:** None
- **Note:** Uses the MasterDataObject by default.

**initDataObjectOrdering**

Initializes the mapping of the AppBuilder-generated order of Upd tables to the developer-defined update order.

- **Location:** sbo.i
- **Parameters:** None
- **Returns:** CHARACTER
- **Note:** This is used in commitTransaction and serverCommitTransaction to order the table parameters properly.
**fetchPrev**

Procedure that retrieves the previous row in one of the ContainedDataObjects. It uses the ObjectMapping SmartBusinessObject property to match the caller to its Target, or uses the MasterDataObject by default. SmartBusinessObject version of this event procedure.

**Location:** sbo.p  
**Parameters:** None  
**Note:** Uses the MasterDataObject by default.

**findRowWhere**

Finds a row and repositions to that row.

**Location:** sbo.p  
**Parameters:**

INPUT pcColumns AS CHARACTER

For a SmartBusinessObject (SBO), column names (comma separated); fieldname of a table in the query in the form of TBL.FLDNM or DB.TBL.FLDNM (only if qualified with db).

For a SmartDataObjects (SDO), column names (comma separated); fieldname of a table in the query in the form of RowObject.FLDNM.

If the fieldname is not qualified, it checks the tables in the TABLES property and uses the first match.

INPUT pcValues AS CHARACTER

Corresponding Values (CHR(1) separated).

INPUT pcOperators AS CHARACTER

The operator (one for all columns):

- Blank — Defaults to (EQ)
- Slash — Used to define an alternative string operator (EQ/BEGINS, etc.)
- A comma-separated list for each column/value

**Returns:** LOGICAL
Notes:

- This method resolves the row reposition on the server. As a result, the SDO can no longer determine whether the row position is invalid until after the request has been executed. However, if the RebuildOnRepos property is set to TRUE, the temp-table is emptied before the request.

- The current behavior for a FIND that does not find anything when RebuildOnRepos is TRUE is to read the current batch again.

- The logic is in the query.p super procedure.

**initializeObject**

Procedure that initializes objects of class SBO. Sets the MasterDataObject property to the leading SmartDataObject.

**Location:** sbo.p

**Parameters:** None

**Note:** Later this procedure must also establish the AppServer connection and other tasks.

**initializeServerObject**

Procedure that sets context and initializes the server object.

**Location:** sbo.p

**Parameters:** None

**Notes:** None

**isUpdatePending**

Procedure that is published through data-targets to check if any updates are pending. This SBO version of the event turns around and RUNS it in the SDO to which the caller is mapped. If no pending updates are found, it publishes isUpdatePending to its targets.

**Location:** sbo.p

**Parameters:**

INPUT-OUTPUT plUpdate AS LOGICAL

Returns TRUE and stops the publication if update is pending.

**Notes:**

- New is included as a pending update.

- This routine is called from canNavigate, which is used by navigating objects to check whether they can trust an updateState("UpdateComplete") message.
newDataObjectRow

Prepares one or more contained SDOs to add or copy (create) a new record.

**Location:** sbo.p

**Parameters:**

INPUT pcMode AS CHARACTER

The operation to be performed. Valid values are Add and Copy.

INPUT pcTargetNames AS CHARACTER

The list of SDOs to be notified. These might be qualified with the ObjectName.

INPUT pcViewColList AS CHARACTER

The list of column names.

**Returns:** CHARACTER

**Note:** Called by addRow and copyRow.

openQuery

A wrapper used by fetchContainedData(), allows you to use the SmartDataObject calling sequence.

**Location:** sbo.p

**Parameters:** None

**Returns:** LOGICAL

**Notes:** None

postCreateObjects

Procedure that runs at the end of createObjects(), after all contained Objects have been created but before they have been initialized. Sets various properties that are dependent on knowing the handles and Instance Properties of all contained objects, and fetches property settings from the server-side SmartBusinessObject.

**Location:** sbo.p

**Parameters:** None

**Notes:** None
prepareErrorsForReturn

Procedure that appends the RETURN-VALUE from the user-defined transaction validation procedure or other update-related error to the list of any errors already in the log. Formats this string to prepare for returning it to the client.

**Location:** sbo.p

**Parameters:**

INPUT pcReturnValue AS CHARACTER
INPUT pcASDivision AS CHARACTER
INPUT-OUTPUT pcMessages AS CHARACTER

**Note:** Invoked internally from serverCommitTransaction().

prepareQueriesForFetch

Procedure that prepares queries in SmartDataObjects for a fetch of data from the server.

**Location:** sbo.p

**Parameters:**

INPUT pcObjectName AS CHARACTER
INPUT pcOptions AS CHARACTER
OUTPUT pocQueries AS CHARACTER
OUTPUT poctempTables AS CHARACTER

**Notes:**

- This procedure exists in order to have common logic for fetchContainedData and fetchContainedRows.
- Cannot be used across sessions because temp-table handles are concatenated in a list. Tests indicate that it is faster to add all the handles to a list than have a procedure with 20 output parameters for the temp-table handles.

queryPosition

Procedure that receives the queryPosition event from a contained SmartDataObject and passes it on to the appropriate Navigation-Source or other object.

**Location:** sbo.p

**Parameters:**

INPUT pcPosition AS CHARACTER

**Notes:** None
**refreshBrowse**

Procedure that receives the refreshBrowse event from a contained SDO and passes it on to the appropriate DataTarget.

**Location:** sbo.p

**Parameters:**

INPUT pcPosition AS CHARACTER

**Notes:** None

**registerLinkedObjects**

Procedure that registers objects in the ObjectMapping and other properties. This currently applies to navigationSources and Datatargets. Currently we assume that UpdateSources are DataTargets also.

**Location:** sbo.p

**Parameters:** None

**Note:** This procedure is used to register objects that have already been initialized when the SBO is initialized. The SBO also subscribes to ‘registerObject’ in these objects, which they publish at initialization.

**registerObject**

A general purpose register event procedure published from objects at initialization. This object defines this as navigationSourceEvent and dataTargetEvent. The event is used to register objects in ObjectMapping and other properties. (Currently, assume that updateSources are also DataTargets.)

**Location:** sbo.p

**Parameters:** None

**Notes:** None
remoteCommitTransaction

Server-side version of CommitTransaction that receives all RowObjUpd table updates and passes them on to server-side SmartDataObjects (SDOs).

**Location:**  
sbo.i

**Parameters:**

INPUT-OUTPUT pccontext AS CHAR

RowObjUpd table references. This parameter can include up to twenty RowObjUpd table references.

OUTPUT pcMessages AS CHARACTER

The generated error messages.

OUTPUT pcUndoIds AS CHARACTER

Rowids of rows that generated error messages.

**Note:**  
Unused tables use the placeholder TABLE-HANDLE.

remoteFetchContainedData

Server-side procedure that prepares and opens a query and returns all the resulting data to the client.

**Location:**  
sbo.p

**Parameters:**

INPUT-OUTPUT pcContext AS CHARACTER

Input context from and output context to client.

pcQueries AS CHARACTER

CHR(1)-delimited-list of QueryString properties of the SmartDataObjects (SDOs).

pocMessages

Error messages generated.
remoteSendRows

A stateless version of sendRows that does no processing but runs sendRows to pass all parameters except for the context and returns the RowObject table as an output parameter to the caller that has the new batch of records created in sendRows.

**Location:** sbo.p

**Parameters:**

INPUT-OUTPUT **pcContext**

CHR(3) separated list of propCHR(4)value pairs. INPUT is the current context and OUTPUT is the new context. The INPUT and OUTPUT can have different properties.

INPUT **piStartRow**

The RowNum value of the record to start the batch to return. Typically piStartRow is a flag with the Unknown value (?) which indicates pcRowIdent should be used instead of piStartRow.

INPUT **pcRowIdent**

The RowIdent of the first record of the batch to return. Can also be FIRST or LAST to force the retrieval of the first or last batch of RowObject records.

INPUT **plNext**

Determines whether serverSendRows should start on the next record instead of what is indicated by piStartRow or piRowIdent. If TRUE, serverSendRows should start on the next record instead of what is indicated by piStartRow or piRowIdent.

INPUT **piRowsToReturn**

The number of rows in a batch.

OUTPUT **piRowsReturned**

The actual number of rows returned. This number is either the same as piRowsToReturn or less if there are not enough records to fill the batch.

OUTPUT **pcMessages**

Used for error messages.

**Notes:**

- If piStartRow is not 0 or the Unknown value (?), then pcRowIdent is ignored. plNext is ignored if pcRowIdent is FIRST or LAST. The most common use of piRowsReturned is to indicate that the entire result list has been returned when it is less than piRowToReturn.

- The object should only be started persistently before this is called and not initialized because initializeObject is run after the context has been set.

- The caller is responsible for destroying the object.

- For more details, see synchronizeProperties and genContext.
removeQuerySelection

Separates the Columns by SmartDataObject and passes columns and operators on to the appropriate SmartDataObjects. SmartBusinessObject version of this where-clause function.

Location: sbo.p

Parameters:

INPUT pcColumns AS CHARACTER

Comma-separated list of column names, qualified by their ObjectNames, that are the subject part of a phrase to be removed.

INPUT pcValues AS CHARACTER

Comma-separated list of the corresponding values.

INPUT pcOperators AS CHARACTER

The operator might be:

- A blank defaults to (EQ).
- A slash (/) is used to define an alternative string operator (EQ/BEGINS, and so on).
- A comma-separated list corresponding to columns and values lists.

Returns: LOGICAL

Note: All columns must be qualified by their SmartDataObject ObjectName as TableName. This name is replaced with RowObject when the columns are passed on to the SmartDataObject.

repositionRowObject

Passes the rowident on to the contained DataObject that manages that data. SBO version of the routine.

Location: sbo.p

Parameters:

INPUT pcRowIdent AS CHARACTER

Semicolon-separated list, one entry for each ContainedDataObject. The visual object’s getRowIdent returns this correctly.

Returns: LOGICAL

Notes: None
resetQuery

Resets the query for the identified SmartDataObject. If the query being reset belongs to the Master object, the operation brings it to its default state (Open Query). If the query belongs to some other object, the reset operation clears the QueryString property.

If pcObject is not specified, this routine resets the queries for all contained SmartDataObjects.

Location: sbo.p
Parameters:

INPUT pcObject AS CHARACTER

Returns: LOGICAL

Note: This function is here because QueryWhere is not supported for SmartBusinessObjects, and running QueryWhere("") would be the way to do it otherwise.

restartServerObject

A procedure that shuts down a SmartBusinessObject after each use and then restarts it when the SmartBusinessObject is split and running stateless on an AppServer. restartServerObject is run on the client to restart the SmartBusinessObject on the server.

Location: sbo.p
Parameters: None

Note: This override is for error handling to show error message and return adm-error.
serverCommitTransaction

Server-side version of CommitTransaction. This procedure receives all RowObjUpd table updates and passes them on to server-side SDOs.

**Location:** sbo.i

**Parameters:**

**INPUT-OUTPUT TABLE FOR...**

Up to 20 RowObjUpd table references, assembled through include files and macro definitions. Each table is dedicated to a contained SmartDataObject. If there are fewer than 20 contained SDOs, the unallocated tables are represented by dummy handles.

**OUTPUT pcMessages AS CHARACTER**

List of error messages.

**OUTPUT pcUndoIds AS CHARACTER**

List of ROWIDs for rows provoking error messages.

**Notes:** None

serverContainedSendRows

A procedure that receives the SmartDataObject ObjectName and runs SendRows in that, returning the RowObject table. Server-side SmartBusinessObject version of serverSendRows.

**Location:** sbo.p

**Parameters:**

**INPUT piStartRow AS INTEGER**

The RowNum value of the record to start the batch to return. Typically piStartRow is the Unknown value (?) as a flag to use pcRowIdent instead of piStartRow.

**INPUT pcRowIdent AS CHARACTER**

The RowIdent of the first record of the batch to return. Can also be FIRST or LAST to force the retrieval of the first (or last) batch of RowObject records.

**INPUT plNext AS LOGICAL**

TRUE if serverSendRows() is to start on the record after the one indicated by piStartRow or piRowIdent.

**INPUT piRowsToReturn AS INTEGER**

The number of rows in a batch.

**INPUT pcObjectName AS CHARACTER**

The ObjectName of the SmartDataObject to get data from.
OUTPUT piRowsReturned AS INTEGER

The actual number of rows returned. This number is either the same as piRowsToReturn or less when there are not enough records to fill up the batch.

OUTPUT TABLE-HANDLE phRowObject

The batch of rows in the RowObject table.

Notes: None

serverFetchContainedData

Procedure that prepares and opens a query and returns all the resulting data to the client side. Server-side procedure.

Location: sbo.p

Parameters:

INPUT pcQueries AS CHARACTER

CHR(1)-delimited list of QueryString properties of the SmartDataObjects.

INPUT pcPositions AS CHARACTER

Reserved for future use to provide information on positioning each of the queries.

OUTPUT TABLE-HANDLE phRowObject1 ... phRowObject20

Temp-table handles for the maximum allowed number of SmartDataObjects.

Notes: None

serverFetchContainedRows

Procedure that prepares and opens a query on the server side and returns all resulting data to the client side.

Location: sbo.p

Parameters:

INPUT pcQueries AS CHARACTER

CHR(1)-delimited list of SDO QueryString properties.

INPUT pcPositions AS CHARACTER

Reserved for future use in providing positioning information for each of the queries.

OUTPUT TABLE-HANDLE phRowObject1 ... phRowObject20

Temp-table handle for each SDO.

Notes: None
serverFetchDOProperties

A procedure that runs at startup to return property values needed on the client. Server-side procedure.

Location: sbo.p
Parameters:

OUTPUT pcPropList AS CHARACTER

Note: Currently returns the OpenQuery property of each SmartDataObject.

setPropertyList

A list of properties taken from a CHR(3)-delimited list of “prop CHR(4) value” pairs.

Location: sbo.p
Parameters: None
Notes: None

startServerObject

When a SmartBusinessObject is split and running statelessly on an AppServer, the startServerObject procedure is run on the client to start the SmartBusinessObject on the server.

Location: sbo.p
Parameters: None
Note: This override is for error handling to show error message and returns adm–error.

submitRow

Accepts a list of changed values for a row and passes them on to the SmartDataObjects from which they came.

Location: sbo.p
Parameters:

INPUT pcRowIdent AS CHARACTER

Key with row number to update, plus a list of the ROWIDs of the db records from which the RowObject is derived.

INPUT pcValueList AS CHARACTER

A CHR(1)-delimited list of alternating column names and values to be assigned.

Returns: LOGICAL
Notes: None
undoTransaction

Procedure that passes the undoTransaction event on to each contained SmartDataObject that has any uncommitted changes.

Location: sbo.p

Parameters: None

Notes: None

updateState

Procedure that republishes any updateState event messages received from a Data-Target, to get them, for example, to Navigation Panel/Toolbar.

Location: sbo.p

Parameters:

INPUT pcState AS CHARACTER

Notes: None
Methods for TreeView controller container objects

This section describes the methods for TreeView controller objects.

**initializeObject**

TreeViewController initialization procedure.

**Location:** tvcontroller.p  
**Parameters:** None  
**Notes:** None

**showTVCError**

A procedure that runs showMessages in the Session Manager to display a TreeView controller error message.

**Location:** tvcontroller.p  
**Parameters:**  
INPUT pcMessage AS CHARACTER  
The message to be displayed.  
**Notes:** None

**updateState**

A procedure that disables the Treeview during user editing and re-enables on completion.

**Location:** tvcontroller.p  
**Parameters:**  
INPUT pcState AS CHARACTER  
The new state.  
**Notes:** None
Container object properties

Container Object properties provide information about container objects and their classes. This information can include whether an object is enabled, the contents of the object and so on. You can read property values and in many instances you can change property values. To read a property value, you use a `get` function, and to change a property value, you use a `set` function.

These functions conform to the following conventions:

- **get** — Uses the form `get propname` and returns the current value of the property.

  **Note:** This function accepts no arguments.

- **set** — Uses the form `set propname`. The set function accepts a single argument—the new value for the property—and returns TRUE/FALSE depending on whether the value change succeeds.

For more information about getting and setting property values, see Chapter 1, “ADM2 SmartObject API Reference”, *OpenEdge Development: Progress Dynamics Basic Development*, and *OpenEdge Development: Progress Dynamics Advanced Development*.

**BlockDataAvailable**

Controls whether or not DataAvailable messages from contained SDOs are to be ignored and not republished. If TRUE, DataAvailable messages are to be ignored and not republished.

**Data type:** LOGICAL  
**Note:** Read and Write

**CallerObject**

Value of CallerObject.

**Data type:** HANDLE  
**Note:** Read and Write

**CallerProcedure**

Value of CallerProcedure.

**Data type:** HANDLE  
**Note:** Read and Write
**CallerWindow**

Value of CallerWindow.

**Data type:** HANDLE  
**Note:** Read and Write

**CascadeOnBrowse**

Determines whether data is retrieved from a dependent SDO if the parent SDO has more than one row in its current result set. If TRUE (the default), data is retrieved for the first row in the parent result set, otherwise not.

**Data type:** LOGICAL  
**Note:** Read and Write

**CommitSource**

Used for pass-through for regular containers, but also inherited by the SBO, which uses it generally.

**Data type:** HANDLE  
**Note:** Read and Write

**CommitSourceEvents**

Represents the list of events to be subscribed to in the Commit Panel or other Commit-Source.

**Data type:** CHARACTER  
**Notes:**

- Read and Write.
- Commit is a pass-through link, but the SBO uses it for real.
- This property is here because the link and event properties are kept together.

**CommitTarget**

List in character format the handles of this object’s Commit-Targets.

**Data type:** CHARACTER  
**Note:** Read and Write
CommitTargetEvents

List of events to be subscribed to in the Commit Panel or other Commit-Target.

Data type: CHARACTER
Note: Read and Write

ContainedDataColumns

Delimited list of all the DataColumns of all the Data Objects in this SBO.

Data type: CHARACTER
Note: Read and Write

ContainedDataObjects

List of the handles of the Data Objects contained in this container object.

Data type: CHARACTER
Notes:

- Read and Write
- The container class uses this property to keep track of the data objects for the stateless server side.
- The SmartBusinessObject (SBO) class uses this property on both the client and server for most logic and at design time to get names and column lists from the individual data objects.

ContainerTarget

List of the handles of the object’s contained objects.

Data type: CHARACTER
Note: Read and Write

ContainerTargetEvents

Comma-separated list of the events this object wants to subscribe to in its ContainerTarget.

Data type: CHARACTER
Note: Read only
Container object properties

**ContextAndInitialize**

Resets context and initializes this server-side object. Called from a stateless client before a request.

Data type: CHARACTER  
Note: Write only

**CurrentPage**

Current page number of the Container.

Data type: INTEGER  
Note: Read and Write

**DataHandle**

Handle of the RowObject query for the SBO.

Data type: HANDLE  
Note: Read only

**DataObjectName**

Ordered list of ObjectNames of contained SDOs.

Data type: CHARACTER  
Notes:  
• Read and Write.  
• This property is normally changed through the SBO Instance Property dialog. It should not be changed until after the Objectnames for the SDOs within the SBO have been set.  
• Used to check whether the value is still valid, which might not be the case if objects have been removed, added, or replaced since the SBO was last saved.  
• If this list no longer matches the list of contained SDOs, then it is blank and a default list is created again.

**DataObjectOrdering**

Mapping of the order of Update Tables as generated by AppBuilder to the developer-defined update order.

Data type: CHARACTER  
Note: Write only
**DataQueryBrowsed**

DataQueryBrowsed value after mapping the requesting Browser (or other such client object) to the SDO whose query it is browsing.

**Data type:** LOGICAL

**Note:** Read and Write

**DynamicSDOProcedure**

Name of the dynamic SmartDataObject (SDO) procedure. That is adm/dyndata.w by default, but it can be modified if the dynamic SDO is customized.

**Data type:** CHARACTER

**Note:** Read and Write

**FetchOnOpen**

Provides a consistent interface for all Data Objects.

**Data type:** CHARACTER

**Note:** Read and Write

**FilterSource**

Represents the Filter Source for pass-through support.

**Data type:** HANDLE

**Note:** Read and Write

**InitialPageList**

Comma-delimited list of pages to construct at startup, or * to indicate all pages must be initialized at startup.

**Data type:** CHARACTER

**Note:** Read and Write

**InMessageTarget**

Value of InMessageTarget.

**Data type:** HANDLE

**Note:** Write only
InstanceNames

Property that provides an ordered list of ObjectNames of ContainerTargets.

Data type: CHARACTER

Notes:

• Read and Write.

• This property is used to enforce unique instance names in the container and is updated in constructObject and destroyObject along with the container link.

• This property allows containedProperties and assignContainedProperties to work together.

LastCommitErrorKeys

Property that provides information about records that failed during the last data commit. For:

• SmartDataObjects (SDOs) — A comma-delimited list of the key values of the records that failed to be committed. The KeyFields property of the SDO holds the key field names.

• SmartBusinessObjects (SBOs) — A semicolon-delimited list of the values of each individual contained SDO that has failed records.

Data type: CHARACTER

Notes:

• Read and Write.

• A blank indicates that the last commit was successful.

LastCommitErrorType

Property that identifies the type of error encountered the last time data was committed:

• Blank — The last commit was successful.

• Unknown — A commit was not attempted after run.

• Conflict — A locking conflict occurred.

• Error — An unspecified error occurred.

Data type: CHARACTER

Notes:

• Read and Write.

• Currently used to identify a Conflict error when using the UpdateData procedure. See Update Data for additional information.
MasterDataObject

Handle of the SmartDataObject (SDO) that has no data source of its own and is the parent to other SDOs.

Data type: HANDLE
Note: Read only

MultiInstanceActivated

Value of MultiInstanceActivated.

Data type: LOGICAL
Note: Read and Write

MultiInstanceSupported

Value of MultiInstanceSupported.

Data type: LOGICAL
Note: Read and Write

NavigationSource

Comma-separated list of strings for Navigation sources. Used for pass-thru for regular containers, but also inherited by the SBO that actually uses it.

Data type: CHARACTER
Note: Read and Write

NavigationSourceEvents

List of events to be subscribed to in the Navigation Panel or other Navigation-Source.

Data type: CHARACTER
Note: Read and Write

NavigationTarget

Value of NavigationTarget.

Data type: HANDLE
Note: Read and Write
ObjectMapping

List of handles of Navigation-Source objects (panels) or other objects that are mapped to contained Data Objects, and the SDOs the SBO has connected them up to, according to their NavigationTargetName property or setCurrentMappedObject request.

**Data type:** CHARACTER

**Note:** Read and Write

OutMessageTarget

Out message target for Pass-through support.

**Data type:** HANDLE

**Note:** Read and Write

PageNTarget

List of objects that are on some page other than 0. The list items are of the form handle|pagenum. Use addLink rather than editing them by hand.

**Data type:** CHARACTER

**Note:** Read and Write

PageSource

Handle of the object's folder, if any.

**Data type:** HANDLE

**Note:** Read and Write

PrimarySdoTarget

Value of PrimarySdoTarget.

**Data type:** HANDLE

**Note:** Read and Write

QueryPosition

For SBOs, indicates whether the requester is the target-procedure or the source-procedure, and whether the MasterDataObject is involved, and identifies the SDO to which the caller is mapped.

**Data type:** CHARACTER

**Note:** Read and Write
RouterTarget

Value of RouterTarget.

**Data type:** CHARACTER

**Note:** Read and Write

RowObjectState

Signals whether there are uncommitted updates in the object. Valid return values are NoUpdates and RowUpdated.

**Data type:** CHARACTER

**Note:** Read and Write

RunDataLogicProxy

Property that provides user control over which Data Logic Procedure (DLP) file to run.

**Data type:** LOGICAL

**Notes:**

- Read and Write.
- The default value is Unknown. When the default value is used, which DLP file to run is determined by a search process that depends on the client type and whether the file can be found. The following describes the search process for a DLP file with the name myDLP.p:
  - For WebClients, run myDLP_c1.p and automatically download the DLP file if necessary.
  - For GUI clients, determine whether any databases are connected. If yes, search for myDLP_r. If found, verify that all required databases are connected and if they are connected, run myDLP_p. If myDLP_p cannot be found and run using this search criteria, then do the following:
    - Search for myDLP_c1.r. If myDLP_c1.r is found, then run myDLP_c1.p. If myDLP_c1.r is not found, then search for myDLP_c1.p. If myDLP_c1.p is found, run the file. If myDLP_c1.p is not found, a cannot find myDLP_c1.p error message displays.
- For both GUI clients and WebClient, if the selected DLP file fails to run, the SmartDataObject (SDO) does not start and an error message displays.
- If an appropriate DLP file is not found, an error message displays under the following conditions:
  - RunDataLogicProxy=TRUE.
  - Session:ClientType=WebClient.
  - All required databases are not connected.
Container object properties

- A TRUE value forces the DLP proxy to run so that it can be downloaded automatically in a WebClient environment.
- A FALSE value starts the data object without the DLP.
- For related information, see the “RunDOOptions” section on page 4–53.

RunDOOptions

Comma-separated list of options that determine how Data Objects are run from constructObject. The available options are:

- **dynamicOnly** — Run the Progress Dynamics client proxy SDO specified in the DynamicSDOProcedure property. By default, this is adm2/dyndata.w. When you select this option, no other version of the data object will be run.
- **sourceSearch** — Search for and run the actual source object. If it is not available or the required databases are not connected, use the clientOnly option.
- **clientOnly** — Do not locate or run the actual object file (sdo-name.w). Instead, locate the static client file (*.c1.w) and run it. If this file is not available, run the Progress Dynamics client proxy.
- **StaticClientOnly** — This option is similar to the clientOnly option, except that the Progress Dynamics client proxy (dyndata.w) is not run if the static client (*.c1.w) is not available. This option takes precedence over the dynamicOnly option when there is a conflict.

Data type: CHARACTER

Notes:

- Read and Write.
- The StaticClientOnly option is useful in a WebClient session when you do not want to run the Progress Dynamics client proxy and the static client does not reside on the client. Under those conditions, selecting the StaticClientOnly option forces an automatic WebClient download of the static client (*.c1).
- If dynamicOnly, clientOnly, or both of these options are specified, the Data Object must have an AppServer partition defined. If an AppServer partition is not defined, and dynamicOnly, clientOnly, or both options are specified, you will experience the same errors that occur when the Data Object is running on an AppServer that has not been started.
- To run source code when no rcode is found, you must customized container.p by setting RunDOOptions to sourceSearch in constructObject.

SdoForeignFields

Value of SdoForeignFields.

Data type: CHARACTER

Note: Read and Write
TopOnly
Indicates whether or not to get the window top only (toggle).

Data type: LOGICAL
Note: Read and Write

UpdateActive
Indicates whether any contained objects have active updates. TRUE if ANY of the contained objects have active updates.

Data type: LOGICAL
Note: Read and Write

UpdateSource
Used for pass-through links to connect an object inside the container with an object outside the container. It is CHARACTER because at least one type of container (SBO) supports multiple update sources.
Handle of the object’s update-source.

Data type: CHARACTER
Note: Read and Write

WaitForObject
Handle of the object (most likely a SmartConsumer) in the container that contains a wait-for that needs to be started with startWaitFor.

Data type: HANDLE
Notes: Read and Write

WindowFrameHandle
Handle of the optional Frame widget of a Window container.

Data type: HANDLE
Notes:
• Read and Write.
• This property only identifies the frame of a window container. This is not the same as ContainerHandle, which is the widget handle of the container in all object. In most cases the ContainerHandle is also the Frame handle for a SmartContainer.
• Even if Window containers do not need a frame they often have one and in that case we must include it when, for example, resizing, widget-tree logic, and so on.
Column properties for container objects

There are a number of column properties available for which you can obtain and set (write) field values. All of these properties can be read and some of them can be set. To read and set column properties, you use the following prefixes with the specific column property:

- **Column** — Use to read the value of a specific column property. For example, if you want to read the value of the ColumnLabel property, you would specify `ColumnColumnLabel`. This would return the label of the column you specify. To obtain the data type for a specific column property, you would specify `ColumnDataType`. This would return the data type of the specified column.

- **Assign** — Use to set the value of the specified column property.

**Note:** For Container objects, there are no column properties for which you can assign the value.

For additional information, see *OpenEdge Development: Progress Dynamics Basic Development* and *OpenEdge Development: Progress Dynamics Advanced Development*.

Table 4–1 lists the column properties for container objects, provides a brief description of each property, indicates whether the property can be read or set (write), and lists the data type for each property.

<table>
<thead>
<tr>
<th>Column property</th>
<th>Description</th>
<th>Read</th>
<th>Write</th>
<th>Data type</th>
</tr>
</thead>
<tbody>
<tr>
<td>ColumnLabel</td>
<td>Label of the specified column.</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>DataType</td>
<td>Data type of the specified column.</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>DbColumn</td>
<td>Qualified database name (DatabaseName.TableName.FieldName) mapped to the RowObject column identified by pcColumn.</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>Extent</td>
<td>Extent of the specified RowObject column.</td>
<td>Yes</td>
<td>No</td>
<td>INTEGER</td>
</tr>
<tr>
<td>Format</td>
<td>Format of the specified RowObject column.</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>Help</td>
<td>Help text for the specified RowObject column.</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
</tbody>
</table>

Table 4–1: Column properties for container objects (1 of 2)
<table>
<thead>
<tr>
<th>Column property</th>
<th>Description</th>
<th>Read</th>
<th>Write</th>
<th>Data type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial</td>
<td>Initial value for a specified field as a character string with the field FORMAT applied. SmartBusinessObject version of the SmartDataObject.</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>Label</td>
<td>Label for the specified column.</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>LabelDefault</td>
<td>Design-time function. Returns TRUE if the label for the specified Filter-Target column is overridden.</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>Mandatory</td>
<td>SmartBusinessObject version of the SmartDataObject, indicates whether or not a specified RowObject field is mandatory. TRUE if mandatory, FALSE if not mandatory.</td>
<td>Yes</td>
<td>No</td>
<td>LOGICAL</td>
</tr>
<tr>
<td>Modified</td>
<td>SmartBusinessObject version of the SmartDataObject, indicates whether or not a specified RowObject field has been modified. TRUE if modified, FALSE if not modified.</td>
<td>Yes</td>
<td>No</td>
<td>LOGICAL</td>
</tr>
<tr>
<td>ObjectHandle</td>
<td>Procedure handle of the first SmartDataObject in the specified SmartBusinessObject that has the specified SmartDataObject column name.</td>
<td>Yes</td>
<td>No</td>
<td>HANDLE</td>
</tr>
<tr>
<td>PrivateData</td>
<td>Private Data property of the specified RowObject field for the SmartBusinessObject version of the SmartDataObject.</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>QuerySelection</td>
<td>SmartBusinessObject version of the SmartDataObject, this is a CHR(1)-separated string with all operators and values, but no field names, that have been added to the Query for this column.</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
</tbody>
</table>
### Table 4–1: Column properties for container objects (3 of 3)

<table>
<thead>
<tr>
<th>Column property</th>
<th>Description</th>
<th>Read</th>
<th>Write</th>
<th>Data type</th>
</tr>
</thead>
<tbody>
<tr>
<td>ReadOnly</td>
<td>SmartBusinessObject version of the SmartDataObject, this property identifies whether or not the specified column is Read Only in the owning SmartDataObject. TRUE, if the column is Read Only and FALSE, if not Read Only.</td>
<td>Yes</td>
<td>No</td>
<td>LOGICAL</td>
</tr>
<tr>
<td>StringValue</td>
<td>SmartBusinessObject version of the SmartDataObject, this property is the String Value of the specified column in the SmartDataObject RowObject buffer.</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>Table</td>
<td>SmartBusinessObject version of the SmartDataObject, this property is the database table name of the specified column.</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>ValExp</td>
<td>SmartBusinessObject version of the SmartDataObject, this property is the validation expression for the specified column in a RowObject temp-table.</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>ValMsg</td>
<td>SmartBusinessObject version of the SmartDataObject, this property is the validation message for the specified column in a Row-Object temp-table.</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>Value</td>
<td>SmartBusinessObject version of the SmartDataObject, this property is the raw (unformatted) character value of the specified field in a RowObject temp-table.</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>Width</td>
<td>SmartBusinessObject version of the SmartDataObject, this property is the width in character units of the specified column.</td>
<td>Yes</td>
<td>No</td>
<td>DECIMAL</td>
</tr>
</tbody>
</table>
This chapter lists and describes the methods (internal procedures and functions) and properties used for data objects. Refer to Figure 1–1 to see the inheritance hierarchy for each object class.

**Notes:** The generic term *data object* is used to cover the various objects (DataViews, SDOs, and so on) that might be using these methods.

For information specific to the WebSpeed environment, see Chapter 9, “Alphabetical Listing of WebSpeed-specific API Routines.”

This chapter provides information about:

- Base methods for data objects
- Methods for DataView objects
- Methods for query objects
- Methods for data query objects
- Query object properties
- Column properties for query objects
Base methods for data objects

This section lists and describes the methods for all data objects.

addForeignKey

This function assigns the ForeignKey to the query string. The ForeignKey consists of ForeignKeys and ForeignValues.

Location: dataquery.p
Parameters: None
Returns: LOGICAL
Notes: None

assignQuerySelection

This function assigns selection criteria for a query. The function distributes column/value pairs to the corresponding buffer’s WHERE clause. Each buffer’s expression is enclosed in parenthesis.

Location: dataquery.p
Parameters:

INPUT pcColumns AS CHARACTER

A comma-separated list of column names. The column names can be in the following forms:

• tablename.fieldname
• database tablename.fieldname (Should be used only if “Qualified with database” is specified.)
• RowObject.fieldname for SDOs.
• If unqualified fieldnames are passed in, the function checks the Tables property and assumes the first table with a match is the correct table.

INPUT pcValues AS CHARACTER

A CHR(1)-separated list of the corresponding values.

INPUT pcOperators AS CHARACTER

A comma-separated list of the operator for each column/value (one for all columns). A blank defaults to (EQ). A slash defines an alternative string operator (EQ/BEGINS, and so forth).

Returns: LOGICAL
Notes:

- This procedure can be called before initialization. However, because the data type is unknown, the alternative string operator is not supported before the object is initialized.

- This procedure is designed to be called multiple times. This design lets you build up the query’s WHERE clause by storing intermediate results in the QueryString property before it is finally used in a Query–Prepare method.

- Uses openQuery to prepare the QueryString property.

- The QueryColumns property ensures that each column and operator is added only once to the QueryString. The property also stores the offset and length of the corresponding values.

**confirmCommit**

This procedure checks the state of all data-targets to see if it is alright to commit. The transaction should not be committed if a data-target is modified or the RowUpdateState is 'rowUpdated'. If there are unsaved changes, the I-O parameter returns TRUE. In this case, the visual objects (visual.p) offer the user the opportunity to save or cancel a record to proceed with the commit process.

Location: dataquery.p

Parameters:

INPUT-OUTPUT pioCancel AS LOGICAL

Returns TRUE if the transaction should not be committed.

Notes: None

**confirmContinue**

This procedure asks all data-targets whether they have changes pending.

Location: dataquery.p

Parameters:

INPUT-OUTPUT pioCancel AS LOGICAL

Returns TRUE if any data-target reports a pending change.

Returns: LOGICAL

Notes:

- If any data-target reports a pending change, this routine returns pioCancel = TRUE to its caller. The caller then must handle the discrepancy, typically by reporting the unsaved changes to the user and requesting disposition instructions (Save, Discard, etc.).

- Call this procedure from any method that might change the result set somewhere in the data-source chain, like openQuery or navigation actions.
- This procedure is called from the filter-source to see if new criteria can be applied.
- The standard behavior in the ADM disables navigation when there are pending changes. If you have enabled navigation, you can call this procedure from the fetch* methods to check for pending changes.

**confirmUndo**

This procedure, if called with a FALSE argument, publishes confirmUndo all data-targets to determine whether any are Modified or in AddMode. The procedure returns TRUE if the undo should be cancelled. The visual objects (visual.p) warn the user that unsaved changes will be cancelled.

**Location:** dataquery.p

**Parameters:**

INPUT-OUTPUT pioCancel AS LOGICAL

Returns TRUE if the commit should not continue.

**Note:** If called with a TRUE argument, the routine does nothing.

**exportData**

This procedure exports the contents of a data object to an external tool.

**Location:** dataquery.p

**Parameters:**

INPUT pcExportType AS CHARACTER

The target tool of the export. Valid values are Excel and Crystal.

INPUT pcFieldList AS CHARACTER

Either a list of input fields (visible fields only) or leave blank for all (no table prefix).

INPUT plIncludeObj AS LOGICAL

Indicates whether or not the input should include object fields. The options available are Yes or No.

INPUT plUseExisting AS LOGICAL

Indicates whether to use a currently active instance of the target tool. (Currently supported for Excel only). The available options are Yes or No.

INPUT piMaxRecords AS INTEGERINPUT

Maximum number of records to process. Passing the Unknown value (?) is the signal to prompt for the maximum records and whether to return all fields or just the displayed fields. This ensures backwards compatibility if anyone uses the old style of asking before calling printToExcel in a SDO.
Notes:

- When this procedure is inherited by the Data class, it always excludes RowObject specific fields. For example, RowNum, RowIndent, RowMod.
- The external tool's exportData procedure does a call back to the data object's tableOut procedure for the actual retrieval of the data.

**filterContainerHandler**

This procedure adds a Filter link between a Filter container handler and a Filter container. This procedure is called from startFilter after the Filter container is constructed.

**Location:** dataquery.p

**Parameters:**

- `phFilterContainer AS HANDLE`
  Handle of the Filter container.

**Note:** The code to add the Filter link has been separated from startFilter to enable overriding of this procedure to add other links between this object and the Filter container.

**findRow**

This function finds a row and repositions to it using the key.

**Location:** dataquery.p

**INPUT pcKeyValues AS CHARACTER**

- Comma- or CHR(1)-separated list of keyfields.

**Returns:** LOGICAL

**Note:** This method resolves the row reposition on the server. As a result, the data object cannot determine whether the row position is invalid until after the request has been executed. If the RebuildOnRepos property is set to TRUE, the temp-table is emptied before the request.
indexInformation

This function returns a CHR(1)-separated list of index information for all buffers in the query. You can specify whether or not the fieldnames are qualified with the tablename (and database if appropriate). If the fieldnames are not qualified, CHR(2) is used as a table separator.

Location: dataquery.p

Parameters:

INPUT pcQuery AS CHARACTER

The type of index information to return. You can specify different information for each buffer by adding the buffer number in parenthesis to the type, for example, 'Primary(1)'. Valid values are:

- 'All' — All indexed fields.
- 'Standard' or '' — All indexed fields excluding word indexes.
- 'Word' — Word-indexed indexes.
- 'Unique' — Unique indexes.
- 'NonUnique' — Non-unique indexes.
- 'Primary' — Primary index.
- 'Info' — All information. This is meaningless if pcIndexInfo is not the Unknown value (?).

INPUT plUseTableSep AS LOGICAL

Whether to use the table separator. If YES, the separator is used. If NO, the separator is not used. If this is NO and pcIndexInfo is the Unknown value (?), fieldnames are qualified. Otherwise, they are as specified in pcIndexInfo.

INPUT pcIndexInfo AS CHARACTER

Previously retrieved index information in the exact format returned from this function using indexInformation('info',yes,?). This enables you to use the function without a database connection.

Returns: CHARACTER

Note: The parameter enables the function to be used without a database connection.
insertExpression

This function inserts an expression into a single buffer’s WHERE clause.

**Location:** dataquery.p

**Parameters:**

INPUT pcWhere AS CHARACTER

Complete WHERE clause with or without the FOR keyword, but without commas.

INPUT pcExpression AS CHARACTER

New expression or OF phrase (Existing OF phrase is replaced).

INPUT pcAndOr AS CHARACTER

Specifies what operator is used to add the new expression to existing ones, either AND (the default) or OR.

**Returns:** CHARACTER (PRIVATE)

**Notes:**

- The new expression is embedded in parentheses, but no parentheses are placed around the existing expression.
- Lock keywords must be unabbreviated or without –LOCK (for example, SHARE or EXCLUSIVE).
- Any keyword in comments might cause problems.

isUpdateActive

This procedure is published from the container source through the container link to check whether contained objects have unsaved or uncommitted changes. This includes objects in `addMode`.

**Location:** dataquery.p

**Parameters:**

INPUT-OUTPUT plActive AS LOGICAL

FALSE if the ContainerTargets should be surveyed.

**Notes:**

- This procedure is published through the container link from `canExit` for close logic (OK, Cancel, Exit). It is very similar to how `canNavigate` and `isUpdatePending` interact through the data link.
- This procedure only checks `rowObjectState` as the other states are checked in the visual objects.
isUpdatePending

This procedure publishes to data-targets to check pending updates. It returns TRUE and stops publishing if there is a pending update.

Location: dataquery.p

Parameters:

INPUT-OUTPUT plUpdate AS LOGICAL

Whether or not there are pending updates.

Notes:

• New is included as a pending update.

• Called from canNavigate, which is used by navigating objects to check if they can trust an updateState('updateComplete') message.

• This check is ONLY valid from a dataSource point of view. Use canNavigate to check an actual object.

linkState

This procedure receives the state of the link from the publisher. It uses that information to decide whether or not to disable the link.

Location: dataquery.p

Parameters:

INPUT pcState AS CHARACTER

The link state of the publisher. This can be active or inactive. These states correspond to whether or not a visual object is hidden.

Notes:

• The received event is republished up the groupAssignSource and the dataSource.

• When the object cannot respond to an ‘inactive’ message, it must not republish the event to its data-source. However, the LinkState is needed for other types of links like the NavigationSource. This conflict is solved by republishing the event with a different modifier, such as ‘inactive-target’. The data-source can then ignore it while the NavigationSource still can react to it.

• The logic is separated into processLinkState to allow the Data class to override this without duplicating all logic.
newQueryString

This function returns a new query string to the passed query. The tables in the passed query must match with the getTables function. This function adds column/value pairs to the corresponding buffer’s WHERE clause. Each buffer’s expression is always embedded in parentheses.

**Location:** dataquery.p

**Parameters:**

**INPUT pcColumns AS CHARACTER**

A comma-separated list of column names of a table in the query. The column names can be in the following forms:

- `tablename.fieldname`
- `database.tablename.fieldname` (Should be used only if “Qualified with database” is specified.)
- `RowObject.fieldname` for SDOs.
- If unqualified fieldnames are passed in, the function checks the Tables property and assumes the first table with a match is the correct table.

**INPUT pcValues AS CHARACTER**

A CHR(1)-separated list of corresponding values for the columns.

**INPUT pcOperators AS CHARACTER**

A comma-separated list of the operator for each column/value (one for all columns). A blank defaults to (EQ). A slash defines an alternative string operator (EQ/BEGINS, and so forth).

**INPUT pcQueryString AS CHARACTER**

A complete, qualified query string matching the queries tables. The Unknown value (?) means use the existing query.

**INPUT pcAndOr AS CHARACTER**

How to append each new expression to the passed query. You can specify AND or OR for each buffer.

**Returns:** CHARACTER

**Notes:**

- This procedure can be called before initialization. However, because the data type is unknown, the alternative string operator is not supported before the object is initialized.
- This function operates like assignQuerySelection without the replace functionality.
newWhereClause

This function inserts a new expression to a specified buffer’s WHERE clause.

**Location:** dataquery.p

**Parameters:**

INPUT pcBuffer AS CHARACTER

The buffer.

INPUT pcExpression AS CHARACTER

The new expression.

INPUT pcWhere AS CHARACTER

The current query prepare string.

INPUT pcAndOr AS CHARACTER

Specifies what operator is used to add the new expression to existing expressions, either AND (the default) or OR.

**Returns:** CHARACTER

**Note:** This is supported as a utility function that does not use any properties. However, if the target procedure is the super procedure, the qualifications of the passed buffer and the query must match. If the target procedure is not the super procedure, the buffer is corrected if it exists in the object’s query. Otherwise, it must match.

printToCrystal

This procedure transfers the data from the data object to Crystal Reports.

**Location:** dataquery.p

**Parameters:**

INPUT pcFieldList AS CHARACTER

The list of fields to be transferred, or the empty string to mean ‘all’. Do not include the table prefix.

INPUT plIncludeObj AS LOGICAL

TRUE if object fields are to be included.

INPUT piMaxRecords AS INTEGER

The maximum number of records to transfer.

**Note:** Because this procedure makes use of tableOut, always excludes rowobject specific fields, for example, RowNum, RowIdent, and RowMod.
removeForeignKey

This function removes the ForeignKey from the query string.

Location: dataquery.p
Parameters: None
Returns: LOGICAL
Note: The ForeignKey consists ofForeignKeys andForeignValues.

removeQuerySelection

This function removes field expressions criteria for specified columns and operators from the query that were added by assignQuerySelection.

Location: dataquery.p
Parameters:
INPUT pcColumns AS CHARACTER
    A comma-separated list of column names in the phrase to be removed.
INPUT pcOperators AS CHARACTER
    A comma-separated list of the operator for each column/value (one for all columns). A blank defaults to (EQ). A slash defines an alternative string operator (EQ/BEGINS, and so forth).
Returns: LOGICAL
Note: This procedure modifies theQueryString property. TheopenQuery function prepares the query using theQueryString property. The removal of the expression is done using the value of the position and length stored in theQueryColumns property.

resetQueryString

This function removes all filter and sort criteria from theQueryString.

Location: dataquery.p
Parameters: None
Returns: LOGICAL
Notes: None
resolveColumn

This function resolves a column reference for query manipulation APIs.

Location:    dataquery.p
Parameters:

INPUT pcColumn AS CHARACTER

The column to resolve.

Returns:    CHARACTER

Note:    The function qualifies unqualified columns or replaces a RowObject qualifier with the DataTable.

rowAvailable

This function checks RowObject availability. It encapsulates the different query position alternatives required to check for availability.

Location:    dataquery.p
Parameters:

INPUT pcDirection AS CHARACTER

Indicates the direction to check for a record. The valid values are:

- **NEXT** — Is there a next record available?
- **PREV** — Is there a previous record available?
- `'`, **Unknown value** (?), or **CURRENT** — The current record.

Returns:    LOGICAL

Note:    This can be used in loops to simplify logic when navigating.
rowValues

This function retrieves a list of data from all rows in the data object.

Location: dataquery.p

Parameters:

INPUT pcColumns AS CHARACTER

Comma-separated list of RowObject column names.

INPUT pcFormat AS CHARACTER

The following formatting options available for the data:

- **blank** or **the Unknown value (?)** — Unformatted, as from columnValue.
- **Formatted** — Formatted without trailing blanks.
- **TrimNumeric** — Formatted without leading spaces for numeric data (left justified).
- **NoTrim** — Formatted with leading and trailing blanks.
- **&n** — A free form format. The number references the column in pcColumns order and indicates that the column values should be substituted as specified instead of returned as delimiter-separated values.

This allows formatting data to be mixed with the returned values. For example, '&2 (&1), &2 / &1' and so on. To build a list-item-pair list, you must ensure that the delimiter is in the format. For example, '&2 (&1) + , + &1' where ',' is also passed as a delimiter and would return a paired list where the second item of the pair is column number one.

INPUT pcDelimiter AS CHARACTER

A single character delimiter. The Unknown value (?) defaults to CHR(1). A blank defaults to a single space.

Returns: CHARACTER

Notes:

- This function is intended for use by SmartSelect or other nonbrowser objects that need to show all rows of the data object.
- This function should not be used with large amounts of data since all data needs to fit in the return value.
- A maximum of nine columns can be passed when a substitute format is specified.
- This function reads all data without publishing dataAvailable to its data-targets. However, if the query is browsed, dataAvailable publishes to its data-targets when reposition-to-rowid is executed to return to the current record.
sortExpression

This function returns the sort expression of the passed QueryString.

Location: dataquery.p

Parameters:

INPUT pcQueryString AS CHARACTER

The QueryString for which to find the sort expression.

Returns: CHARACTER

Note: Unlike the getQuerySort function, the returned string includes the first BY keyword and removes extra spaces.

startFilter

This procedure views, starts, or both views and starts the linked filter-source.

Location: dataquery.p

Parameters: None

Note: This procedure uses filterContainerHandle to add the Filter link between the object and the Filter container.

tableOut

This procedure outputs requested fields from the data object to a standard temp-table format.

Location: dataquery.p

Parameters:

INPUT pcFieldList AS CHARACTER

The list of fields wanted. Do not use a table prefix.

INPUT plIncludeObj AS LOGICAL

Whether to include object fields.

INPUT piMaxRecords AS INTEGER

Maximum number of records to handle.

OUTPUT TABLE FOR ttTable

The data object data.

OUTPUT iExtractedRecs AS INTEGER

The actual number of records handled.
Notes:

- Temp-table is defined in afttsdoout.i. Fields passed in are checked with a CAN-DO to support * for all or ! field_name to exclude a field, for example, !RowNum, !RowIdent, !RowMod, * would use all non-data object specific fields.
- The temp-table contains a record for each record/field combination.

**transferToExcel**

Procedure transfers the contents of the data object to Microsoft Excel.

**Location:** dataquery.p

**Parameters:**

INPUT pcFieldList AS CHARACTER

The list of fields to be transferred. Do not use the table prefix.

INPUT plIncludeObj AS LOGICAL

Whether to include object fields.

INPUT plUseExisting AS LOGICAL

Whether to use the currently-running copy of Excel.

INPUT piMaxRecords AS INTEGER

Maximum number of records to transfer.

**Note:** Because this procedure makes use of tableOut, always excludes rowobject specific fields, for example, RowNum, RowIdent, and RowMod.

**updateQueryPosition**

This procedure resets the QueryPosition property after a record navigation. This function eliminates duplication, eliminates errors, and minimizes messaging (published by setQueryPosition) in fetchFirst, fetchPrev, fetchNext, and fetchLast.

**Location:** dataquery.p

**Parameters:** None

**Notes:**

- data.p should update the LastRowNum, FirstRowNum, and LastDbRowIdent properties and then call this function.
- The LastRowNum and FirstRowNum properties store the RowObject.RowNum of the first and last record in the data provider.
updateState

This procedure passes along update-related messages (to its Navigation–Source, for example) and adjusts the DataModified property.

**Location:** dataquery.p

**Parameters:**

`INPUT pcState AS CHARACTER`

The state of an updatable record. Valid values are:

- **UpdateBegin** — The user has indicated that an update can take place, either by pressing the Update button in a panel or by entering an updatable field in a browser.
- **Update** — An update is in progress in another object (a viewer or browser).
- **UpdateEnd** — A save has completed (the same as UpdateComplete.)
- **UpdateComplete** — Any changes to the RowObject temp-table have been either committed or backed out.

**Notes:**

- The data object also saves its own copy of the DataModified property. The property is set TRUE when updateState is Update and set FALSE when updateState is UpdateComplete, so that it can be queried by other objects (such as other Data–Targets).
- For visual objects, the updateState is both a DataSourceEvent and DataTargetEvent. To avoid bouncing messages back to the dataTargets that are both subscribers and publishers, we set the CurrentUpdateSource so the DataTarget can avoid republishing the event.
Methods for DataView objects

This section lists and describes the methods for DataView objects.

addRow

This function creates a new RowObject temp-table record, initializes it, and returns a CHR(1)-separated list of values for the requested columns of the new RowObject row. The first entry in the list is a comma-separated list of the RowObject ROWID and blank values for the database RowIDs that have not been created yet.

Location: dataview.p
Parameters:
INPUT pcViewColList AS CHARACTER

A comma-separated list of column names that are to be displayed in the SmartDataViewer that called addRow.

Returns: CHARACTER
Notes: None

applyContextFromServer

This function applies context returned from server after a server call. It receives values returned from the service adapter's optional context.

Location: dataview.p
Parameters:
INPUT pcContext AS CHARACTER

A CHR(4) separated paired list with attribute name and value.

Returns: LOGICAL
Notes: None

cancelRow

This function cancels an Add, Copy, or Save operation.

Location: dataview.p
Parameters: None
Returns: CHARACTER
Note: This function restores the original values of a modified row from the before-image record.
canNavigate

This function checks if this object or its children have pending updates. Uncommitted changes in children block navigation. This function returns TRUE if it finds nothing to block navigation, while isUpdatePending does the opposite.

Location: dataview.p
Parameters: None
Returns: LOGICAL
Notes:
  • This routine publishes isUpdatePending because that includes rowObjectState in the check to check the stat of children.
  • Navigating objects call this function to check if an object can be navigated. Navigation objects receive updateState from the objects they navigate and must perform this check in the source of any updateComplete message. The updateComplete message can come from a branch of a data-link tree; publishing isUpdatePending checks the whole tree.

closeQuery

This function closes the query.

Location: dataview.p
Parameters: None
Returns: LOGICAL
Notes: None

colValues

This function formats into character strings (using the field format specification) a row of values from the current row of the database query for the specified column list.

Location: dataview.p
Parameters:
  INPUT pcViewColLis AS CHARACTER
    A comma-separated list of column names whose values are to be returned.
Returns: CHARACTER
Note:  Passes back a CHR(1)-separated list of formatted values preceded by the RowIdent code (a comma-separated list of rowids of the database records from which the row is derived) as the first value in all cases.
commitTransaction

This procedure saves all data set changes, including data in children.

Location:     dataview.p
Parameters:   None
Notes:        None

copyRow

This function creates a new RowObject temp-table record and copies all of the current row values to it. The return value of this function is a CHR(1)-separated list of the values of the current row as specified in the input parameter pcViewColList. The first value of this return value is the RowIdent of the newly created row.

Location:     dataview.p
Parameters:

INPUT pcViewColList AS CHARACTER

A comma-separated list of columns whose values are to be returned for the newly created row.

Returns:      CHARACTER
Notes:        None

createObjects

This procedure defines an object and its handles.

Location:     dataview.p
Parameters:   None
Note:         This procedure should only be called at run time.
dataAvailable

This procedure receives dataAvailable events from the data source as well as data targets.

**Location:** dataview.p

**Parameters:**

INPUT pcMode AS CHARACTER

Provides information about a new or changed record. Valid entries are:

- DIFFERENT — Open query.
- RESET — Open query if the foreign key changed.
- VALUE-CHANGED — Row change only, as in browse navigation.

**Notes:** None

deleteRow

This function submits a row for deletion. It returns FALSE if an error occurs.

**Location:** dataview.p

**Parameters:**

INPUT pcRowIdent AS CHARACTER

The RowId of the RowObject temp-table to delete. The Unknown value (?) means delete the current row.

**Returns:** LOGICAL

**Note:** If auto-commit is on, the row is immediately returned to the database for deletion.

destroyObject

This procedure cleans up and deletes the object and its contained objects.

**Location:** dataview.p

**Parameters:** None

**Notes:** None
**fetchBatch**

This procedure transfers another batch of rows from the data provider or service to the temp-table query, without changing the current record position.

**Location:** dataview.p

**Parameters:**

INPUT p1Forwards AS LOGICAL

The direction from which to retrieve the next batch of records. If TRUE, it retrieves the block of rows following the current row. If FALSE, it retrieves the block preceding the current row.

**Notes:**

- This procedure runs from a browser to get another batch of rows from the database query appended to the RowObject temp-table query (when the browser scrolls to the end and not all rows have been retrieved).
- fetchBatch does some checking and sets up the proper parameters to sendRows, but sendRows is called to do the actual work.

**fetchFirst**

This procedure repositions the RowObject temp-table to the first record or to the row matching the QueryRowIdent property (if it has been set.) If the first record has not been fetched yet, then it calls sendRows to get the first batch of RowObject records of the data object and then repositions the RowObject Temp-Table to the first row.

**Location:** dataview.p

**Parameters:** None

**Notes:** None

**fetchLast**

This procedure repositions the RowObject query to the last row of the data set. If the last row has not yet been retrieved, then fetchLast gets the last batch of records and repositions the RowObject query to the last row.

**Location:** dataview.p

**Parameters:** None

**Note:** If RebuildOnReposition is FALSE and the last row has not been fetch yet, fetchLast asks for the rest of the data and appends it to the current data. If RebuildOnReposition is TRUE and the last row from the data provider or service has not been fetched yet, all temp-table records are discarded and just the last batch is fetched.
fetchNext

This procedure repositions the RowObject query to the next row. If a new batch is required to do so, then sendRows is called to get the new batch.

Location: dataview.p  
Parameters: None  
Notes: None

fetchPrev

This procedure repositions the RowObject query to the previous row. If a new batch is needed to do so, then it calls sendRows to get the new batch. Getting a new batch is only necessary when the RebuildOnReposition property is TRUE.

Location: dataview.p  
Parameters: None  
Notes: None

findRowWhere

This function finds a row and repositions to that row.

Location: dataview.p  
Parameters:

INPUT pcColumns AS CHARACTER  
A comma-separated list of qualified column names.

INPUT pcValues AS CHARACTER  
A CHR(1)-separated list of the corresponding values for the columns.

INPUT pcOperators AS CHARACTER  
A comma-separated list of operators, one for each column/value pair:

- Blank — Defaults to (EQ).
- Slash — Used to define an alternative string operator (EQ/BEGINS, etc.).

Returns: LOGICAL  
Notes: None
**hasActiveAudit**

This function tells the toolbar source that there is no active audit data. This function is hard coded to return FALSE.

**Location:** dataview.p  
**Parameters:** None  
**Returns:** LOGICAL  
**Notes:**
- This is a record level value that is used to show a tick mark on the Auditing action if the current record has auditing data.
- Overrides should be implemented if this information is available in the Business Entity.

**hasActiveComments**

This function tells the toolbar source that there is no active comments. This function is hard coded to return FALSE.

**Location:** dataview.p  
**Parameters:** None  
**Returns:** LOGICAL  
**Notes:**
- This is a record level value that is used to show a tick mark on the Comment action if the current record has comments.
- Overrides should be implemented if this information is available in the Business Entity.

**hasForeignKeyChanged**

This function determines whether or not the dataSource foreign fields are different from the current ForeignValues.

**Location:** dataview.p  
**Parameters:** None  
**Returns:** LOGICAL  
**Notes:**
- The function returns TRUE if the dataSource foreign fields are different from the current ForeignValues. If TRUE, the query needs to be reopened.
- This function is an important part of the logic used with the dataAvailable when RESET is specified.
- Uncommitted values are not considered to be a change, so the dataSource's before-image values are checked if RowObjectState is RowUpdated.
- The ForeignKey is considered changed if the query closes.
### initializeObject
This procedure initializes the DataView before the data request.

**Location:** dataview.p  
**Parameters:** None

**Notes:**
- Initialization of the DataView can happen before the actual data definition, data retrieval, and query opening. The definitions may arrive together with the data outside the scope of this procedure.
- When the DataView is on a container, data is retrieved as part of the container's initialization after all DataViews have been initialized.
- An override can manipulate query properties or other request related information, but should not assume that any table or field definitions are available. The startObject procedure captures the event of first time retrieval of definitions as well as data, unless OpenOnInit is false.

### isDataQueryComplete
This function determines whether or not the temp-table has all of the records. The function checks that there are no records in any direction from the current row left on the server.

**Location:** dataview.p  
**Parameters:** None

**Returns:** LOGICAL

**Note:** You can check this function before you open the actual query.

### keyWhere
This function returns a query expression with the key fields and current values.

This function is used to find a record without relying on the ROWID, for example, in the deleteRow error handling. In that case, the ProDataSet methods might have reused the ROWID of a deleted record that needs to be undeleted.

**Location:** dataview.p

**Parameters:**

**INPUT phBuffer AS HANDLE**  
The buffer for which to return the query expression, typically the before-image or after-image buffer.

**INPUT pcQual AS CHARACTER**  
The qualifier for the column reference. (Optional)
Methods for DataView objects

Returns: CHARACTER
Notes: None

linkStateHandler

This procedure overrides the linkStateHandler in smart.p in order to run dataAvailable when a dataSource link is made active. Publishing dataAvailable enables synchronization with the data source.

Location: dataview.p

Parameters:

INPUT pcState AS CHARACTER
Mode for the object. The valid values are:

• Add — Activate new link by subscribing to the link events of the passed object.
• Remove — Deactivate removed link by unsubscribing to the link events of the passed object.
• Active — Activate links by subscribing to the link events of the passed object.
• Inactive — Deactivate links by unsubscribing to the link events of the passed object.

INPUT phObject AS HANDLE
Object to which you want to subscribe or unsubscribe.

INPUT pcLink AS CHARACTER
Full link name pointing to the passed object. Both DataSource and Data-source are supported.

Note: While this class should never be database aware, this procedure currently checks database aware objects to avoid certain logic for objects that inherit from this class and run as superprocedures to reach the smart class.

obtainContextForServer

This function returns context to pass to the server.

Location: dataview.p
Parameters: None
Returns: CHARACTER
Note: There is no default context.
openDataQuery

This function opens the temp-table query.

Location: dataview.p

Parameters:

INPUT pcPosition AS CHARACTER

Where to reposition after opening the query. The valid values are:

- **First** — Open on the first record.
- **Last** — Open on the last record.
- **WHERE <criteria>** — Open on the record matching the WHERE clause.
- **STRING(Rowid)** — Open on the record with this Rowid.
- **""(Blank)** — Open the query but do not position.

Returns: LOGICAL

Notes: None

openDataView

This function opens the DataView on data that already exists on the client.

Location: dataview.p

Parameters: None

Returns: LOGICAL

Note: This function is an integral part of the DataView start up and data management. It can also be called separately to refresh or reset visual data-targets from existing data.

openQuery

This function opens the query based on the current WHERE clause. Typically, this results in a new request for data from the data provider or service.

Location: dataview.p

Parameters: None

Returns: LOGICAL

Notes: None
openQueryAtPosition

This function opens the query based on the current QueryString and positions to the indicated row.

Location: dataview.p
Parameters: None

INPUT pcPosition AS CHARACTER
Where to reposition after opening the query. The valid values are:

- First — Open on the first record.
- Last — Open on the last record.
- WHERE <criteria> — Open on the record matching the WHERE clause.

Returns: LOGICAL
Notes: None

refreshQuery

This function refreshes the current query.

Location: dataview.p
Parameters: None
Returns: LOGICAL
Notes:
- This function cannot refresh a query that has never been opened or closed.
- This function refreshes all dependant child queries.

refreshRow

This procedure retrieves the current values from the data provider for a row already in the temp-table.

Location: dataview.p
Parameters: None
Note: This procedure publishes dataAvailable('SAME') to cause a SmartDataViewer or Browser to display the latest values.
resetRow

This function resets the specified RowObject record’s state from modified to unmodified in a visual data target.

Location: dataview.p

Parameters:

INPUT pcRowident AS CHARACTER

The RowObject’s ROWID. Passing in the Unknown value (?) resets the current RowObject.

Returns: LOGICAL

Note: This function is used to reset the current row from a visual object’s resetRecord.

resolveBuffer

This function is the interface for generic query processing.

Location: dataview.p

Parameters:

INPUT pcBuffer AS CHARACTER

Buffer name, qualified or unqualified.

Returns: CHARACTER

Note: This function is used by generic query processing that originally was implemented in the Query class and worked on database queries. That generic processing has now been moved up to the DataView class to also handle temp-table and ProDataSet queries.

resortQuery

This function resorts the current query locally.

Location: dataview.p

Parameters:

INPUT pcSort AS CHARACTER

The sort expression. A blank value removes all sort information from the current query. The Unknown value (?) resets to the default sort expression.

Returns: LOGICAL

Notes:

- See the QuerySort property for more details on the sort expression.
- If the query is closed, the passed sort expression is stored in the QueryString.
retrievedata

This function retrieves data. It passes FillBatch to the service or server.

**Location:** dataview.p

**Parameters:**

INPUT pcMode AS CHARACTER

Where to start retrieving in relation to current batch (and typically current record). The valid values are:

- **First** — Retrieve FIRST batch. This value is only valid if RebuildOnRepos is enabled.
- **Last** — Retrieve LAST batch (This acts as APPEND if RebuildOnRepos is not enabled.)
- **Next** — Retrieve next batch.
- **Prev** — Retrieve previous batch.
- **WHERE <criteria>** — Opens the next record that matches the WHERE clause.

INPUT p1Refresh AS LOGICAL

Whether or not to empty the temp-tables.

INPUT piNumRows AS INTEGER

The number of records to retrieve. Passing '0' (zero) reads all the data that is not already on the client. Passing the Unknown value (?) uses the value of RowsToBatch.

**Returns:** LOGICAL

**Notes:** None
**rowChanged**

This procedure encapsulates the events that all linked objects (data-targets and navigation-sources) subscribe to in order to reflect the current state of the object. The procedure is called on any change to a row or reposition.

**Location:**  dataview.p

**Parameters:**

INPUT pcMode AS CHARACTER

The event modifier to pass to data-targets. The possible values are as follows:

- **SAME** — The current record is being resent because it has been updated. This procedure ignores this value.
- **VALUE–CHANGED** — A target data object has changed its query position. This procedure needs to set the QueryPosition property then change pcRelative to DIFFERENT before passing it to other target procedures so that it appears as though the change occurred in this procedure.
- **RESET** — Resets the status and foreign fields, and refreshes visual objects and panels for all objects that are part of the data link. This option provides more functionality than SAME and less functionality that DIFFERENT. Use this option when you want to send notification about a change in the RowObject record without having to reopen all the dependent queries.
- **DIFFERENT** — Values for foreign fields should be reapplied.
- **FIRST, NEXT, PREV, LAST** — Treated the same as DIFFERENT in this version of dataAvailable.

**Note:** Currently, the event modifier is just passed on to the dataAvailable procedure.

**Note:** The valid values for pcMode change depending on the dataAvailable procedure in the subscriber.

**submitData**

This function submits all dataset changes to the server or service.

**Location:**  dataview.p

**Parameters:**  None

**Returns:**  LOGICAL

**Note:** External visual callers should call commitTransaction, which does the necessary check for unsaved changes before calling this function.
submitRow

This function accepts a list of changed values for a row and assigns them, returning FALSE if any errors occur. This is done only to the RowObject temp-table. Committing the changes back to the data provider or service is a separate step, which is invoked from here if AutoCommit is set on.

**Location:** dataview.p

**Parameters:**

INPUT pcRowIdent AS CHARACTER

The RowObject ROWID, which is typically derived from the DataTarget’s RowIdent property. The Unknown value (?) indicates the current record.

INPUT pcValueList AS CHARACTER

A CHR(1)-separated list of alternating column names and values to be assigned.

**Returns:** LOGICAL

**Notes:** None

undoRow

This function undoes the specified RowObject record to a state of unchanged.

**Location:** dataview.p

**Parameters:**

INPUT pcRowident AS CHARACTER

The RowObject ROWID. The Unknown value (?) indicates the current record.

**Returns:** LOGICAL

**Notes:**

- Visual objects do not currently call this function directly.
- This function does not undo deleted rows.

undoTransaction

Procedure undoes any uncommitted changes to the RowObject table when the Undo button is pressed in the commit panel.

**Location:** dataview.p

**Parameters:** None

**Note:** The undoTransaction calls doUndoTrans to restore the RowObject temp-table and empty the RowObjUpd temp-table.
**whereClauseBuffer**

This function returns the buffer name of a WHERE clause expression. The function avoids problems with leading or double blanks in WHERE clauses.

**Location:**  
dataview.p

**Parameters:**

**INPUT**  
pcWhere AS CHARACTER

The complete WHERE clause for one table, with or without the FOR keyword. The buffer name must be the second token in the where clause as in “EACH order OF Customer” or if “FOR” is specified the third token as in “FOR EACH order”.

**Returns:**  
CHARACTER

**Notes:**  
None
Methods for query objects

This section lists and describes the methods for query objects.

addNotFoundMessage

Function that adds an error message for a record not found based on keys and values using the same format as findRowWhere and other query functions.

**Location:** query.p

**Parameters:**

INPUT pcFields AS CHAR

Comma-separated list of column names.

INPUT pcValues AS CHAR

CHR(1)-separated list of corresponding values.

**Note:** The message is for unique finds.

addQueryWhere

Function that adds string-expressions to the query’s WHERE clause and stores the result in the QueryString property. The function returns TRUE if successful, FALSE if an appropriate buffer name for the WHERE-clause cannot be located.

**Location:** query.p

**Parameters:**

INPUT pcWhere AS CHARACTER

Expression to add (might also be an “OF” phrase).

INPUT pcBuffer AS CHARACTER

An optional buffer specification.

INPUT pcAndOr AS CHARACTER

Specifies the operator that is used to add the new expression to an existing expression or expressions, either AND (the default) or OR.

**Returns:** LOGICAL

**Notes:**

- Returns FALSE if it cannot find a buffer name to associate with the WHERE clause.
- This procedure is designed to run on the client so that it can be called multiple times. This design lets you add multiple phrases to the where-clause before the full where-clause is used to reopen the query.
assignDBRow

Procedure that modifies values copied from the RowObject row to the database records (which for an Update have already been retrieved and locked).

**Location:** query.p

**Parameters:**

INPUT phRowObjUpd AS HANDLE

Handle of the buffer from which to copy.

**Notes:**

- The SmartDataObject determines which fields to save to the database tables based on a comparison of the before-image and the changed record.
- The RowObjUpd.ChangedFields that was used for this purpose is now obsolete.
- The procedure copies over only those fields whose values were actually modified. If this is a copied record, all the fields that were enabled for update are saved.
- If the RowMod field is A for Add or C for Copy, the procedure creates the database records first and then does the assign.

batchServices

A procedure that groups a sequence of SmartDataObject service requests into a single request and thereby minimizes network messaging and improves performance.

**Location:** query.p

**Parameters:**

INPUT pcServices AS CHARACTER

A CHR(1)-separated list of SmartDataObject internal procedures and functions to be executed. Each entry consists of a CHR(2)-separated list of INPUT PARAMETER values with the first entry being the NAME of the procedure or function to be executed.

OUTPUT pcValues AS CHARACTER

A CHR(1)-separated list of CHR(2)-separated strings of output values that result from the execution of the services listed in pcServices (above). There is a one-to-one correspondence between the CHR(1)-separated list of Services in pcServices (above) and the CHR(1)-separated list in pcValues. Procedures with no output parameters have a NULL entry. The return values of functions appear as the first entry of the corresponding CHR(2)-separated list, followed by any output parameters.

**Note:** batchServices supports only a limited list of services. This list consists of all get and set functions that do not require processing other than getting and setting the property in the ADMProps temp-table record as well as columnProps, initializeObject, openQuery, and synchronizeProperties. The list of cases is extended from release to release. Developers can extend the list by overriding batchServices with a local version that has an extended list then running SUPER.
bufferCopyDBToRO

Procedure that performs a BUFFER–COPY of a database buffer to a row object buffer. In particular, if an assign–list is used to map individual array elements from the database buffer to the row object buffer, this procedure ensures that the values are copied properly.

**Location:**  query.p

**Parameters:**

- **INPUT phRowObj AS HANDLE**
  - Handle to the row object buffer that is to be the target of the BUFFER–COPY.

- **INPUT phBuffer AS HANDLE**
  - Handle to the database buffer that is to be the source of the BUFFER–COPY.

- **INPUT pcExcludes AS CHARACTER**
  - Comma-separated list of fields to be excluded from the BUFFER–COPY.

- **INPUT pcAssigns AS CHARACTER**
  - Comma-separated list of field pairs to be individually copied. The field pairs are mappings of fields from the target/source buffers where the field names differ.

**Note:** The primary purpose of this procedure is to detect when individual array fields are referenced in the assign–list (pcAssigns) from the database buffer and to ensure that they are copied properly. It is assumed that the database buffer is always the source of the BUFFER–COPY, so that the second field in the assign–list field pair is always where the individual array reference is found (for example, pcAssigns = “ROfld1,DBfld[1]”).

ColumnPhysicalColumn

Function that returns the qualified physical name ([DB.]TBL._FLDNM) mapped to the RowObject column specified in pcColumn.

**Location:**  query.p

**Parameters:**

- **INPUT pcColumn AS CHAR**
  - Rowobject name to look up.

**Returns:**  CHARACTER

**Notes:**  None
ColumnPhysicalTable

Function that returns [dbname.]table of a rowobject or database column.

**Location:** query.p

**Parameters:**

INPUT pcColumn AS CHAR

Database fieldname. Can be in the form of: DB.TBL.FLDNM, TBL.FLDNM or FLDNM. If not qualified, the FIRST reference in query is used.

**Returns:** CHARACTER

**Notes:**

- Used to ensure and fix a column reference according to the query’s use of database qualification. See dbColumnHandle for additional information.

- Supports a pcColumn specified with brackets.

closeQuery

This function closes the database query.

**Location:** query.p

**Parameters:** None

**Returns:** LOGICAL

**Note:** In a split SDO, there is no database query to close on the client side. Therefore, executing closeQuery on the client side of a split SDO does nothing.

colValues

This function formats into character strings (using the field format specification) a row of values from the current row of the database Query for the specified column list.

**Location:** query.p

**Parameters:**

INPUT pcViewColLis AS CHARACTER

A comma-separated list of column names whose values are to be returned.

**Returns:** CHARACTER

**Note:** Passes back a CHR(1)-separated list of formatted values preceded by the RowIdent code (a comma-separated list of rowids of the database records from which the row is derived) as the first value in all cases.
createObjects

This procedure defines the temp-tables for a dynamic SDO.

Location: query.p
Parameters: None
Notes: None

dataAvailable

This event procedure generates a dependent query dynamically based on the ForeignFields property. This event occurs when dataAvailable is published by a data source because the data source has been repositioned to a different row in its query and this has an impact on dependent objects.

Location: query.p
Parameters:

INPUT pcRelative AS CHARACTER

Provides information about a newly available record. Valid entries are:

- **SAME** — The current record is being resent because it has been updated. This procedure ignores this value.

- **VALUE–CHANGED** — A target SDO has changed its query position. This procedure needs to set the QueryPosition property then change pcRelative to DIFFERENT before passing it to other target procedures so that it appears as though the change occurred in this procedure.

- **RESET** — Resets the status and foreign fields, and refreshes visual objects and panels for all objects that are part of the data link. This option provides more functionality than **SAME** and less functionality that **DIFFERENT**. Use this option when you want to send notification about a change in the RowObject record without having to reopen all the dependent queries.

- **DIFFERENT** — Values for foreign fields should be reapplied.

- **FIRST, NEXT, PREV, LAST** — Treated the same as **DIFFERENT** in this version of dataAvailable.

- **TRANSFER** — Joins the child data object to the current record in a parent data object. As a result, the call only needs to be performed in the parent data object inside of a container.

Note: This version of dataAvailable is for SDOs that depend on another SDO. The code is different from that for a Viewer. If there are no foreign fields, then this procedure is run when a target is repositioned (usually a SmartDataBrowser). In this case, just the event is passed on to other targets.
**dbColumnDataName**

Returns the RowObject field name of a database field name.

**Location:** query.p

**Parameters:**

INPUT pcDbColumn AS CHARACTER

A qualified database field name. It must be in the form `DataBase.Table.FieldName`, or the form `Table.FieldName`.

**Returns:** CHARACTER

**Note:** The passed fieldname must match the SmartDataObject’s definition in regards to qualifying with database name or not.

**dbColumnHandle**

Returns the handle of a database column.

**Location:** query.p

**Parameters:**

INPUT pcColumn AS CHARACTER

The column whose handle is wanted. Can be unqualified (column), partly qualified (table.column), or fully qualified (database.table.column). If not fully qualified, the first match is returned.

**Returns:** HANDLE

**Note:** Is capable of processing a pcColumn specified with brackets. Used by columnDataType, ColumnValMsg, and ColumnTable.

**defineDataObject**

Function used to define the following Progress Dynamics data object properties:

- Tables
- BaseQuery
- DataColumns
- DataColumnsByTable
- UpdatableColumnsByTable
- AssignList
Methods for query objects

**Location:** query.p

**Parameters:**

**INPUT pcTableList** AS CHARACTER

Comma-separated list of tables. If the table names are database qualified then the column list also needs to be database qualified.

**INPUT pcBaseQuery** AS CHARACTER

Query used for the dynamic SmartDataObject.

**INPUT pcColumnList** AS CHARACTER

Comma-separated list of qualified columns in the format: `TableName.ColumnName[, RenamedColumnName]`. Where `TableName` is the database table name, `ColumnName` is the field name, and `RenamedColumnName` is the renamed field name. This parameter is optional.

**INPUT pcUpdatableColumns** AS CHARACTER

Comma-separated list of logical values with special cases such as YES, NO, or a combination of YES,NO,YES,NO. If the value is:

- **YES** — All the columns are updatable.
- **NO** — All the columns are not updatable.
- **YES,NO,YES,YES** — The individual columns have the specified value.

**Returns:** LOGICAL

**Notes:** None.

**deleteRecordStatic**

Deletes a record from the specified table in the query.

**Location:** query.i

**Parameters:**

**INPUT piTableIndex** AS INTEGER

**Returns:** LOGICAL

**Note:** This function is necessary in order to work around a limitation with the `BUFFER-DELETE( )` method for buffer handles. The method fails if there is delete validation defined on the target table. The workaround is to use a static “DELETE {table}.” statement instead.
**destroyObject**

This procedure cleans up and deletes the object and its contained objects.

- **Location:** `query.p`
- **Parameters:** None
- **Notes:** None

**fetchFirst**

This procedure repositions the database query to the first row.

- **Location:** `query.p`
- **Parameters:** None
- **Note:** The procedure requests rows to be transferred from the database query if the RowObject query is empty.

**fetchLast**

This procedure repositions the database query to the last row.

- **Location:** `query.p`
- **Parameters:** None
- **Notes:** None

**fetchNext**

This procedure repositions the database query to the next row.

- **Location:** `query.p`
- **Parameters:** None
- **Notes:** None

**fetchPrev**

This procedure repositions the database query to the previous row.

- **Location:** `query.p`
- **Parameters:** None
- **Notes:** None
**fetchCurrentBatch**

Reads the current batch of the data object.

Location: `query.p`  
Parameters: None  
Notes: None

**fetchFirstBatch**

Procedure that reads the first batch of the data object.

Location: `query.p`  
Parameters: None  
Notes: None

**fetchLastBatch**

Procedure that reads the last batch of the data object.

Location: `query.p`  
Parameters: None  
Notes: None

**fetchNextBatch**

Procedure that reads the next batch of the data object but does not fill the batch at the end.

Location: `query.p`  
Parameters: None  
Notes: None

**fetchPrevBatch**

Procedure that reads the next batch of the data object and fills the batch at the beginning.

Location: `query.p`  
Parameters: None  
Notes: None
**firstBufferName**

Returns the first buffer reference in a where-clause expression.

**Location:** query.p  
**Parameters:**  
INPUT pcExpression AS CHARACTER  
A string expression.  
**Returns:** CHARACTER PRIVATE  
**Note:** In order to be recognized as a buffer name, it must contain at least one ".", otherwise the return value is the Unknown value (?).

**firstRowIds**

Returns the ROWID (converted to a character string) of the first database query row satisfying the passed query prepare string.

**Location:** query.p  
**Parameters:**  
INPUT pcQueryString AS CHARACTER  
A complete query WHERE clause that matches the database query's buffers.  
**Returns:** CHARACTER  
**Note:** Used by rowidwhere, findRow, and findRowWhere.

**initProps**

Procedure that, during initialization, sets all the object’s properties that are related to the Query.

**Location:** query.i  
**Parameters:** None  
**Notes:** None
newQueryValidate

Inserts a new expression to the passed prepare string if the buffer reference, usually extracted from the expression, is valid. Returns the Unknown value (?) if error (after an error message has been shown).

**Location:** query.p

**Parameters:**

- **INPUT pcQueryString AS CHARACTER**
  Complete query string to which the expression is going to be added.

- **INPUT pcExpression AS CHARACTER**
  The new expression to add to the query. The first field reference is used as buffer reference unless pcBuffer is defined.

- **INPUT pcBuffer AS CHARACTER**
  Optional buffer reference.

- **INPUT pcAndOr AS CHARACTER**
  Operator used to append if query string already has an expression. Default is "=".

**Returns:** CHARACTER

**Notes:**

The function avoids duplicate logic in add and setQueryWhere and acts as a wrapper for newWhereClause with some significant additions and differences:

- The buffer reference is usually extracted from the new expression.
- pcBuffer is optional and as a result is not the first parameter.
- The buffer reference is validated and qualification does not need to match the original query.
- Displays error message and returns the Unknown value (?) if the buffer is unknown or ambiguous.

newQueryWhere

Returns a new query.

**Location:** query.p

**Parameters:**

- **INPUT pcWhere AS CHARACTER**

**Returns:** CHARACTER

**Note:** For internal use only. This functions exists only to have the same logic in setQueryWhere in data.p and query.p. Returns unknown if the buffer reference is invalid.
openQuery

This function opens the database query either for a data object.

Location: query.p
Parameters: None
Returns: LOGICAL
Note: The QueryString property that is modified by the addQueryWhere, assignQuerySelection, and setQuerySort methods is used (if it is not blank) in the QUERY-PREPARE method before opening the query.

prepareQuery

Internal function. Prepares the database query for some querying object such as a SmartDataObject.

Location: query.p
Parameters:

INPUT pcQuery AS CHARACTER

The complete query expression.

Returns: LOGICAL
Notes:
The main purpose for this is to prepare a query on an AppServer. You can do this in two different ways:

- The addQueryWhere and assignQueryWhere methods manipulates a client-side property that openQuery checks and uses as input to this method.
- setQueryWhere calls this method and blank properties used by 1 in order to make openQuery NOT call this.

resolveBuffer

This function resolves the correct, qualified buffer name of the passed buffer reference.

Location: query.p
Parameters:

INPUT pcBuffer AS CHARACTER

Buffer name, qualified or unqualified.

Returns: CHARACTER
Notes:

- The function returns blank if the buffer cannot be resolved in the SDO. It returns the Unknown value (?) if the table reference is ambiguous, that is, if more than one table in the SDO matches the unqualified input parameter.

- Used internally (columnTable and others) to resolve cases where the qualification of the passed column name is different from that of the object’s name.

- There is no reference to the query handle in order to resolve this on the client.

**rowidWhere**

Returns the ROWID (converted to a character string) of the first database query row satisfying the where clause. In the case of a join, only the rowid of the first table in the join is returned and the expression in pcWhere can only reference that table.

**Location:** query.p

**Parameters:**

INPUT pcWhere AS CHARACTER

The where clause to apply to the database query to fetch the first record whose ROWID is to be returned.

**Returns:** CHARACTER

**Note:** The ROWID is returned as a string both in anticipation of it being used as an argument to fetchRowIdent, and also to allow this function to be invoked from outside the OpenEdge environment.
**rowidWhereCols**

Returns a list of ROWIDs and adds column/value pairs to the corresponding buffer’s WHERE clause. Each buffer’s expression is embedded in parentheses.

**Location:** query.p

**Parameters:**

INPUT pcColumns AS CHARACTER

Column names (comma-separated). Fieldname of a table in the query in the form of TBL.FLDNM or DB.TBL.FLDNM (only if qualified with db), (RowObject.FLDNM should be used for SDOs). If the fieldname is not qualified, it checks the tables in the TABLES property and assumes the first is a match.

INPUT pcValues AS CHARACTER

Corresponding Values (CHR(1)-separated).

INPUT pcOperators AS CHARACTER

The operator (one for all columns):

- A blank defaults to (EQ).
- A slash is used to define an alternative string operator (EQ/BEGINS, and so forth).
- A comma-separated list for each column/value.

**Returns:** CHARACTER

**Notes:** None

**transferDBRow**

A procedure that buffer–copies the database records for the current query row into the RowObject temp-table.

**Location:** query.p

**Parameters:**

INPUT pcRowIdent AS CHARACTER

A comma-separated list consisting of the ROWID of the RowObject record followed by the ROWIDs of the database records; if unknown or blank, then the database records have already been retrieved.

INPUT piRowNum AS INTEGER

The integer value to assign to the RowNum field in the RowObject temp-table record.

**Note:** This procedure replaces the transferRowFromDB function from Version 9.0. It can be localized to perform additional custom operations each time a row is transferred from the database to the RowObject table.
Methods for data query objects

This section lists and describes methods for data query objects.

addRow

This function creates a new RowObject temp-table record, initializes it, and returns a CHR(1)-separated list of values for the requested columns of the new RowObject row. The first entry in the list is a comma-separated list of the RowObject ROWID and blank values for the database RowIDs that have not been created yet.

Location: data.p
Parameters:
INPUT pcViewColList AS CHARACTER
A comma-separated list of column names that are to be displayed in the SmartDataViewer that called addRow.

Returns: CHARACTER
Note: Overrides the DataView class to handle foreign values from a SBO and call newRowObject to set Rowobject fields and call the logic procedure hook.

askQuestion

Procedure that prompts for the maximum number of records to export and confirms the transfer of data in these records.

Location: exportdata.p
Parameters:
INPUT pcMessage AS CHARACTER
Message to display.
INPUT pcTitle AS CHARACTER
Title of message box.
INPUT plFieldChoice AS LOGICAL
Available options for DisplayFields. You can select:
• Yes — Displays three buttons: Displayed, All, and Cancel.
• No — Displays two buttons: OK and Cancel.
INPUT-OUTPUT piMaxRecords AS INTEGER
Maximum number of records to export.
OUTPUT pDisplayed AS LOGICAL

Indicates which button the user chose in the dialog box. The available outputs are:

- **Yes** — All fields.
- **No** — Displayed fields only
- **Unknown value (?)** — Cancel

**Note:** All text is defined as variables in the definition section.

### batchRowAvailable

Checks to determine whether there are more records in the batch.

**Location:** data.p

**Parameters:**

pcMode AS CHRAR

Specifies the direction in which to look for records. Values are:

- **Next**
- **Prev**
- **Current**

**Note:** Use this function before navigating with the normal fetch navigation methods to avoid an implicit read of a new batch in cases when you want to just navigate through one batch of data.

### beginTransactionValidate

Wrapper procedure called automatically on entry into a transaction block.

**Location:** data.p

**Parameters:** None

**Notes:** None
cancelRow

This function cancels an Add, Copy, or Save operation.

**Location:** data.p  
**Parameters:** None  
**Returns:** CHARACTER  
**Note:** Calls to cancelRow in turn call UndoUpdate, which restores the original values of a modified row from the RowObjUpd record then deletes the RowObjUpd record. In the cases of an Add or a Copy, both the new RowObject and the RowObjUpd records are deleted. After all of this work has been done, doUndoUpdate repositions the RowObject temp-table to what was previously the current row.

canNavigate

This function checks if this object or its children have pending updates. Uncommitted changes in children block navigation. This function returns TRUE if it finds nothing to block navigation, while isUpdatePending does the opposite.

**Location:** data.p  
**Parameters:** None  
**Returns:** LOGICAL  
**Notes:**

- This routine publishes isUpdatePending because that includes rowObjectState in the check to check the state of children.
- Navigating objects call this function to check if an object can be navigated. Navigation objects receive updateState from the objects they navigate and must perform this check in the source of any updateComplete message. The updateComplete message can come from a branch of a data-link tree; publishing isUpdatePending checks the whole tree.
**clientSendRows**

Calls across the AppServer boundary to serverSendRows to fetch a batch of RowObject temp-table records. When the SmartDataObject (SDO) is divided between the client and AppServer, this client-side procedure runs from the generic sendRows procedure and then runs a server-side version that returns the RowObject temp-table records.

**Location:** data.p

**Parameters:**

INPUT piStartRow AS INTEGER

The RowNum value of the record to start the batch to return. Typically piStartRow is the Unknown value (?) as a flag to use pcRowIdent instead of piStartRow.

INPUT pcRowIdent AS CHARACTER

The RowIdent of the first record of the batch to return. Can also be FIRST or LAST to force the retrieval of the first (or last) batch of RowObject records.

INPUT plNext AS LOGICAL

TRUE if serverSendRows is to start on the next record from what is indicated by piStartRow or piRowIdent.

INPUT piRowsToReturn AS INTEGER

The number of rows in a batch.

OUTPUT piRowsReturned AS INTEGER

The actual number of rows returned. This number is either the same as piRowsToReturn or less when there are not enough records to fill up the batch.

**Notes:**

- All of the parameters are simply received from the caller and passed through to serverSendRows on the AppServer.
- If piStartRow is not 0 or the Unknown value (?) then pcRowIdent is ignored.
- plNext is ignored if pcRowIdent is FIRST or LAST.
- The most common use of piRowsReturned is to indicate that the entire result list has been returned when it is less than piRowToReturn.
**closeQuery**

This function closes the RowObject temp-table query (on both the client side and the server side if the SDO is split). It then RUNs SUPER, which invokes closeQuery in query.p, to close the database query.

**Location:** data.p  
**Parameters:** None  
**Returns:** LOGICAL  
**Notes:** None

**colStringValues**

Returns a list of values (delimited by the ADM default delimiter set in pcDelimiter) for the requested columns of the current row of the RowObject.

**Location:** dataextcols.p  
**Parameters:**

- **INPUT pcColumnList** AS CHARACTER  
  Comma-separated list of RowObject column names.

- **INPUT pcFormatOption**  
  Format of returned values. Possible values are:
  - **Blank** or **Unknown value (?)** — No formatting, buffer values only.
  - **Formatted** — Formatted according to the columnFormat with right justified numeric values.
  - **Trim Numeric** — Formatted according to the columnFormat with left justified numeric values.

- **INPUT pcDelimiter**  
  Optional delimiter (default CHR(1)).

**Returns:** CHARACTER  
**Note:** This function is different from colValues in that it does NOT return rowidents as the first entry and does not look in the dataSource.
**colValues**

Returns a CHR(1)-separated list of values for the requested columns (in pcViewColList) of the current row of the RowObject. The first value is the RowObject ROWID and RowIdent (the RowIDs of the database records from which the RowObject row is derived)-separated with a comma. Subsequent values are formatted according to each column’s FORMAT expression.

**Location:** dataextcols.p

**Parameters:**

INPUT pcViewColList AS CHARACTER

A comma-separated list of RowObject column names.

**Returns:** CHARACTER

**Note:** The form of the first value is: <RowObject ROWID>,<DB Buffer1 ROWID>,<DB Buffer2 ROWID>. This is used as a key to uniquely identify the row and its origins in the database.

**Commit**

Client-side part of the Commit function. Copies changed records into an update temp-table and sends it to the serverCommit procedure.

**Location:** data.p

**Parameters:** None

**Returns:** LOGICAL

**Notes:**

- Called by commitTransaction, which is called by submitRow. The submitRow code has already reserved an unchanged copy of each record to be updated, in case the update must be undone.
- Invokes procedures in the SmartDataObject itself to manipulate the RowObject temp-tables.

**commitData**

Procedure that calls undoTransaction to clean up the temp-tables after the commit operation finishes.

**Location:** dataextapi.p

**Parameters:**

OUTPUT pcError AS CHAR

**Notes:** None
commitTransaction

This event procedure receives the Commit message from a Commit panel or other Commit source. It then invokes the Commit function to actually commit the changes. After the Commit function finishes, commitTransaction handles any error messages by calling showDataMessages.

Location:  data.p
Parameters:  None
Note:  A transaction block is opened in serverCommit (called by the commit function) only if the SDO is split between the client and server. That is, no transaction block occurs on the client side of a split SmartDataObject.

copyRow

This function creates a new RowObject temp-table record, copies all of the current row values to it. The return value of this function is a CHR(1)-separated list of the values of the current row as specified in the input parameter pcViewColList. The first value of this return value is the RowIdent of the newly created row.

Location:  data.p
Parameters:

INPUT pcViewColList AS CHARACTER

  A comma-separated list of columns whose values are to be returned for the newly created row.

Returns:  CHARACTER
Note:  This is an override of the DataView mostly because of copyColumns and newRowobject. newRowobject is only in the Data class and overriding this here free the DataView to have a cleaner implementation.
**createData**

Creates a new record for a data object.

**Location:** dataextapi.p

**Parameters:**

- **pcColumnNames** AS CHARACTER
  
  Comma-separated list of column names.

- **pcNewValues** AS CHARACTER
  
  Current values of the updated record-separated by the Data Delimiter property. For more information, see the “DataDelimiter” section on page 5–84.

- **pcError** AS CHARACTER
  
  All error messages in ADM/Dynamic format.

**Note:** Output data is formatted according to the DataReadFormat property.

**createObjects**

This procedure defines the temp-tables for a dynamic SmartDataObjects.

**Location:** data.p

**Parameters:** None

**Note:** This functionality is in createObjects because this is the common API used to realize objects for design time use.

**createRow**

Accepts a list of values to create a new row in a RowObject temp-table.

**Location:** data.p

**Parameters:**

- **INPUT pcValueList** AS CHARACTER
  
  CHR(1)-separated list of alternating column names and values to be assigned.

**Returns:** LOGICAL

**Notes:**

- If an error occurs, it returns FALSE.

- Committing the changes back to the database is a separate step, which is invoked from here if AutoCommit is set on.
dataAvailable

This event procedure handles changes to data on a dataSource, changes to a record position, or a change to the data or record position of this object. Changes are handled by assigning a new value to the ForeignFields property, reopening the query, resetting QueryPosition, and republishing the event.

Location: data.p

Parameters:

INPUT pcRelative AS CHARACTER

Provides information about a new or changed record. Valid entries are:

- **SAME** — Performs a RETURN only because the new record is the same as the current record.
- **RESET** — Resets the status and foreign fields, and refreshes visual objects and panels for all objects that are part of the data link. This option provides more functionality than SAME and less functionality that DIFFERENT. Use this option when you want to send notification about a change in the RowObject record without having to reopen all the dependent queries.
- **VALUE–CHANGED** — Indicates that the data target has changed position. However, ensures that the query is not reopened but published as DIFFERENT from from this point so the data targets for this object are opened.
- **DIFFERENT** — Reapply Foreign Fields values except when called from a dataTarget. In that instance, handle as VALUE-CHANGED.
- **FIRST, NEXT, PREV, LAST, REPOSITIONED** — Handle the same as DIFFERENT in this version of dataAvailable.
- **TRANSFER** — Joins the child data object to the current record in a parent data object. As a result, the call only needs to be performed in the parent data object inside of a container.

Note: The dataTarget passes VALUE-CHANGED to indicate a change that does not require the value for foreign fields be reapplied. As a result, the source for dataAvailable does not need to be checked, and this procedure provides support for SmartBusinessObjects (SBOs) as dataSources.
**dataContainerHandle**

An AppServer-aware container that handles data requests and also acts as the container of THIS object. The container can be a standard container or an SBO.

This function also provides the required checks of the AppServer properties for THIS object and returns only the handle if the current or permanent state allows it to be part of a stateless request handled by another object.

**Location:** data.p

**Returns:** HANDLE

**Notes:** None

**deleteData**

Deletes an existing record of a data object.

**Location:** dataextapi.p

**Parameters:**

pcColumnNames AS CHARACTER

Comma-separated list of column names.

pcOldValues AS CHARACTER

Current values of the updated record delimited by the DataDelimiter property. For more information, see the “DataDelimiter” section on page 5–84. The values are used to support optimistic locking and also to identify the record.

pcError AS CHARACTER

All error messages in ADM/Dynamic format.

**Notes:**

- For information about the columns that identify the record, see the “KeyFields” section on page 5–92

- Rowid and RowIdent are supported as a value in the ColumnNames parameter.
**deleteRow**

Submits a row for deletion. Returns FALSE if an error occurs.

**Location:** data.p

**Parameters:**

INPUT pcRowIdent AS CHARACTER

The RowId of the RowObject temp-table to delete. The Unknown value (?) means delete the current row.

**Returns:** LOGICAL

**Note:** If auto-commit is on, the row is immediately returned to the database for deletion.

**describeSchema**

A procedure that returns a temp-table with a schema description in it, assembled by this routine.

**Location:** data.p

**Parameters:**

INPUT pcIndexFieldList AS CHARACTER

The list of fields of interest.

OUTPUT TABLE-HANDLE hTtSchema

The handle to the ttSchema table.

**Notes:** None

**destroyObject**

This procedure overrides destroyObject to get rid of the datalogic object.

**Location:** data.p

**Parameters:** None

**Notes:** None
doBuildUpd

A procedure that transfers changed rows into the Update temp-table and returns it to the Commit function (the caller function).

**Location:** dataext.p

**Parameters:** None

**Notes:**
- This code must be inside the SmartDataObject itself to allow the BUFFER-COPY operations. They can be specialized by defining like-named procedures in another support procedure.
- For each existing row to be updated, there is already a **before** copy in the RowObjUpd table, so create an **after** row.
- There is already a row in RowObjUpd for each Added/Copied row, so just update it with the latest values.
- There is already a row in RowObjUpd for each Deleted row, so there is no need to do anything for these rows.

doCreateUpdate

A procedure that uses FIND to find the specified row to be updated and saves a copy into the RowObjUpd table, to support Undo. Run from submitRow when it receives a set of value changes from a UI object.

**Location:** dataext.p

**Parameters:**

- **INPUT pcRowIdent AS CHARACTER**
  
  Encoded key of the row to be updated.

- **INPUT pcValueList AS CHARACTER**
  
  Chr(1)-separated list of FieldName/NewValue pairs.

- **OUTPUT p1Reopen AS LOGICAL**
  
  TRUE if the row is new, the result of a COPY or ADD.

- **OUTPUT pcMessage AS CHARACTER**
  
  Error message, if any.

**Note:** Run from submitRow. Returns error message or "". If the row is not available in the RowObject temp-table (this would be because the SmartDataObject was not the DataSource) this routine FINDs the database record(s) using the RowIdent key before applying the changes, unless it’s a new row.
doEmptyTempTable

A procedure that empties the RowObject temp-table when the query is reopened while a transaction is active.

Location: dataext.p
Parameters: None
Note: This routine is only needed when a transaction is active. In other cases, use the faster EMPTY-TEMP-TABLE method.

doReturnUpd

A procedure that runs from Commit on the client side. Obtains the latest state of the records in RowObjUpd from the server for refreshing data-display objects.

Location: dataext.p
Parameters:

INPUT cUndoIds AS CHARACTER

List of any RowObject ROWIDs for which changes were rejected by a commit. Takes the form of RowNum/ADM-ERROR-STRING pairs, CHR(3) separators inside the pairs, comma separators between the pairs.

Notes:

• If the error string in cUndoIds is ADM-FIELDS-CHANGED, then another user has changed at least one field value. In this case, RowObjUpd fields contains the refreshed db values and passes those values back to the client.

• If not autocommit, also reposition here. Otherwise, the caller has both the rowident and more information, (submitCommit knows whether a reopen is required; deleteRow just uses fetchNext if required).

doUndoDelete

A procedure that restores deleted rows.

Location: dataext.p
Parameters: None
Note: This is separated because:

• A failed commit should restore this, otherwise the user has to undo to correct mistakes.

• The regular undo needs to restore these.
**doUndoRow**

A procedure that restores the row using the saved image of the unchanged RowObjUpd record.

**Location:** dataext.p  
**Parameters:** None  
**Notes:** None

**doUndoTrans**

Procedure that performs the buffer delete and copy operations needed to restore the RowObject temp-table when an Undo occurs. Added or copied records are deleted, modified and deleted records are restored. The RowObjUpd table is emptied.

**Location:** dataext.p  
**Parameters:**  
**Note:** Called by the event procedure undoTransaction. Runs on the client side.

**doUndoUpdate**

Procedure that supports cancelRow by copying the current RowObjUpd record back to the current RowObject record.

**Location:** dataext.p  
**Parameters:** None  
**Notes:** None

**endTransactionValidate**

An optional validation procedure called automatically by serverCommit after completing all updates, but before exiting the transaction block.

**Location:** data.p  
**Parameters:** None  
**Notes:** None
**fetchBatch**

This procedure transfers another batch of rows from the database query to the RowObject temp-table query, without changing the current record position.

**Location:** data.p

**Parameters:**

INPUT plForwards AS LOGICAL

The direction from which to retrieve the next batch of records. If TRUE, it retrieves the block of rows following the current row. If FALSE, it retrieves the block preceding the current row.

**Notes:**

- This procedure runs from a Browser to get another batch of rows from the database query appended to the RowObject temp-table query (when the browser scrolls to the end and not all rows have been retrieved).
- `fetchBatch` does some checking and sets up the proper parameters to `sendRows`, but `sendRows` is called to do the actual work.

**fetchFirst**

This procedure repositions the RowObject temp-table to the first record or to the row matching the QueryRowIdent property (if it has been set.) If the first record has not been fetched yet, then it calls `sendRows` to get the first batch of RowObject records of the data object and then repositions the RowObject Temp-Table to the first row.

**Location:** data.p

**Parameters:** None

**Notes:** None
**fetchLast**

This procedure repositions the RowObject query to the last row of the data set. If the last row has not yet been retrieved from the database, then fetchLast gets the last batch of RowObject records for the SDO and repositions the RowObject query to the last row.

*Location:* data.p  
*Parameters:* None  
*Notes:*  
- If the SDO RebuildOnReposition property is FALSE and the last row from the database query has not yet been fetched, fetchLast keeps asking for batches of rows until the last batch is received. This is required, otherwise there would be a discontinuous set of rows in the RowObject temp-table.
- If RebuildOnReposition is TRUE and the last row from the database query has not yet been fetched, all RowObject records are discarded and just the last batch is fetched. In this case, the RowNum of the last row becomes 2000000 (just to start with a high value so that all RowNum values continues to be positive integers), and all other records have smaller numbers (except for additions).

**fetchNext**

This procedure repositions the RowObject query to the next row. If a new batch is required to do so, then sendRows is called to get the new batch.

*Location:* data.p  
*Parameters:* None  
*Notes:* None

**fetchPrev**

This procedure repositions the RowObject query to the previous row. If a new batch is needed to do so, then it calls sendRows to get the new batch. Getting a new batch is only necessary when the RebuildOnReposition property is TRUE.

*Location:* data.p  
*Parameters:* None  
*Notes:* None
**fetchRow**

Repositions the Row Object’s query to the desired row (indicated by piRow) and returns that row’s values (as specified in pcViewColList). The return value is a CHR(1)-separated list of values (formatted according to each columns FORMAT expression). The first value in the list is the RowIdent of the fetched row.

**Location:** data.p

**Parameters:**

**INPUT** piRow AS INTEGER

The desired row number within the result set.

**INPUT** pcViewColList AS CHARACTER

A comma-separated list of names of columns to be returned.

**Returns:** CHARACTER

**Notes:** None

**fetchRowIdent**

Repositions the RowObject’s query to the desired row, based on the corresponding database record ROWID as specified by pcRowIdent and returns values for the rows as specified in pcViewColList. The return value is a CHR(1)-separated list of values that are formatted according to the FORMAT expression for each column. The first value in the list is the RowIdent of the fetched row. If that row is not in the RowObject table, it repositions the database query to that row and resets the RowObject table.

**Location:** data.p

**Parameters:**

**INPUT** pcRowIdent AS CHARACTER

The desired rowids within the result set, expressed as a comma-separated list of database rowids.

**INPUT** pcViewColList AS CHARACTER

Comma-separated list of names of columns to be returned.

**Returns:** CHARACTER
Notes:

- If called with unknown or nonexisting rowid, the query is closed and the SDO fetchNext
  and Prev do not work. The application needs to call fetchRowident with a valid value or
  fetchFirst, fetchLast, or openQuery to get back to normal.

- This method resolves the row reposition on the server. As a result, the SDO can no longer
determine whether the row position is invalid until after the request has been executed.
However, if the RebuildOnRepos property is set to TRUE, the temp-table is emptied
before the request.

- The current behavior for a FIND that does not find anything when RebuildOnRepos is
TRUE is to read the current batch again.

**findRowWhere**

This function finds a row and repositions to that row.

**Location:** data.p

**Parameters:**

INPUT `pcColumns` AS CHARACTER

For a SmartBusinessObject (SBO), column names (comma-separated); fieldname of a
table in the query in the form of TBL.FLDNM or DB.TBL.FLDNM (only if qualified with
db).

For a SmartDataObject (SDO), column names (comma-separated); fieldname of a table in
the query in the form of RowObject.FLDNM.

If the fieldname is not qualified, it checks the tables in the TABLES property and assumes
the first is a match.

INPUT `pcValues` AS CHARACTER

A CHR(1)-separated list of the corresponding values for the columns.

INPUT `pcOperators` AS CHARACTER

A comma-separated list of operators, one for each column/value pair.

**Returns:** LOGICAL

**Notes:**

- This method resolves the row reposition on the server. As a result, the SDO can no longer
determine whether the row position is invalid until after the request has been executed.
However, if the RebuildOnRepos property is set to TRUE, the temp-table is emptied
before the request.

- The current behavior for a FIND that does not find anything when RebuildOnRepos is
TRUE is to read the current batch again.

- The logic is in the query.p super.
**firstRowIds**

Returns the ROWID (converted to a character string) of the first database query row satisfying the passed query prepare string.

**Location:** data.p

**Parameters:**

INPUT pcQueryString AS CHARACTER

A complete query WHERE clause that matches the database query’s buffers.

**Returns:** CHARACTER

**Note:** Used by rowidwhere, findRow, and findRowWhere.

**hasActiveAudit**

This function returns the value of hasActiveAudit.

**Location:** data.p

**Parameters:** None

**Returns:** LOGICAL

**Notes:** None

**hasActiveComments**

This function returns the value of hasActiveComments.

**Location:** data.p

**Parameters:** None

**Returns:** LOGICAL

**Notes:** None

**hasForeignKeyChanged**

This function determines whether or not the dataSource foreign fields are different from the current ForeignValues.

**Location:** data.p

**Parameters:** None

**Returns:** LOGICAL

**Notes:**

- The function returns TRUE if the dataSource foreign fields are different from the current ForeignValues. If TRUE, the query needs to be reopened.

- This function is an important part of the logic used with the dataAvailable when RESET is specified.
- Uncommitted values are not considered to be a change, so the dataSource's before-image values are checked if RowObjectState is RowUpdated.

- The ForeignKey is considered changed if the query closes.

- Used by SmartBusinessObject (SBO) commitTransaction.

**hasOneToOneTarget**

Returns TRUE if this DataObject has DataTargets that are updated as part of this.

**Location:** data.p  
**Parameters:** None  
**Returns:** LOGICAL  
**Notes:** None

**initializeObject**

This procedure performs SDO-specific initialization. Specifically, it starts the server-side copy of this object if the AppService (partition) is defined.

**Location:** data.p  
**Parameters:** None  
**Notes:** None

**initializeLogicObject**

Procedure that loads the data logic procedure as a super procedure.

**Location:** data.p  
**Parameters:** None  
**Notes:** None

**isUpdatePending**

This procedure publishes to data-targets to check pending updates. It returns TRUE and stops publishing if there is a pending update.

This version overrides DataView to include UpdateFromSource and RowObjectState.

**Location:** data.p  
**Parameters:**  
**INPUT-OUTPUT** plUpdate AS LOGICAL

Whether or not there are pending updates.
Notes:

- New is included as a pending update.
- Called from `canNavigate`, which is used by navigating objects to check if they can trust an `updateState('updateComplete')` message.
- This check is ONLY valid from a dataSource point of view. Use `canNavigate` to check an actual object.

**newRowObject**

Assigns some general RowObject fields and updates LastRowNum and FirstRowNum when a new RowObject has been created.

**Location:** data.p

**Parameters:**

- `pcMode` AS CHARACTER

  The operation to be performed. Valid values are Add and Copy.

**Returns:** LOGICAL

**Notes:**

- The main purpose for this procedure is to ensure that copy and add behaves similarly.
- The buffer must be created first.
- Currently defined as PRIVATE.
- Used in procedure `copyColumns` and function `addRow()`.

**obtainContextForServer**

Function that returns a list of properties and sets the required client query context properties.

**Location:** data.p

**Returns:** CHARACTER

**Parameters:** None

**Note:** Called from `initializeServerObject` or directly when the single-hit stateless procedures are called.
openDataQuery

This function opens the SDO’s database query based on the current WHERE clause.

**Location:** data.p

**Parameters:**

- INPUT pcPosition AS CHARACTER
  Where to reposition after opening the query. The valid values are:
  - **First** — Open on the first record.
  - **Last** — Open on the last record.
  - **WHERE <criteria>** — Open on the record matching the WHERE clause.
  - **STRING(Rowid)** — Open on the record with this Rowid.
  - **""(Blank)** — Open the query but do not position.

**Returns:** LOGICAL

**Note:** This function is currently used by SBOs after new temp-tables have been fetched.

openQuery

This function opens the data object’s database query based on the current WHERE clause.

**Location:** data.p

**Parameters:** None

**Returns:** LOGICAL

**Notes:** None

postTransactionValidate

Optional validation procedure called automatically by serverCommit after all updates complete and the transaction block ends.

**Location:** data.p

**Parameters:** None

**Notes:** None
prepareErrorsForReturn

Procedure that appends the RETURN-VALUE to the list of logged errors, formats the string for return to the client. Called from serverCommit.

**Location:** data.p

**Parameters:**

- INPUT pcReturnValue AS CHARACTER
- INPUT pcASDivision AS CHARACTER
- INPUT-OUTPUT pcMessages AS CHARACTER

**Note:** PRIVATE procedure.

preTransactionValidate

Optional validation procedure called automatically by serverCommit and before entering the transaction block.

**Location:** data.p

**Parameters:** None

**Note:** Use this in place of TransactionValidate (maintained for backward compatibility).

pushTableAndValidate

When running from a SmartBusinessObject, acts as a wrapper for preTransactionValidate and postTransactionValidate procedures.

**Location:** data.p

**Parameters:**

- INPUT pcValType AS CHARACTER
  
  Type of procedure needing the wrapper. Valid values are Pre and Post.

- INPUT-OUTPUT TABLE FOR RowObjUpd

**Returns:** RETURN-VALUE

**Notes:** None
refreshRow

This procedure retrieves the current database values for a row already in the RowObject table.

**Location:** data.p

**Parameters:** None

**Note:** Publishes dataAvailable('SAME') to cause a SmartDataViewer or Browser to display the latest values. Since reading does not lock the database records, you can use this procedure to fetch the latest values upon a request from an application. However, this cannot guarantee that the values do not change before an update.

remoteCommit

Procedure executed on a server side SmartDataObject. This is the equivalent of serverCommit, but can be run in a non-initialized object as it has INPUT and OUTPUT parameters for context.

**Location:** data.p

**Parameters:**

INPUT-OUTPUT pcContext

INPUT context is current context from the client and OUTPUT context is the new context.

INPUT-OUTPUT TABLE RowObjUpd

The Update version of the RowObject temp-table.

OUTPUT cMessages

A CHR(3)-separated string of accumulated messages from the server.

OUTPUT cUndoIds

List of RowObject ROWIDs whose changes must be undone because of errors. The list uses the following form to display the RowObject ROWIDs whose changes need to be undone: RowNumCHR(3)ADM-ERROR-STRING,RowNumCHR(3)ADM-ERROR.

**Note:** If another user modifies the database records after the original records are read, the new database values are copied into the RowObjUpd record and returned to Commit so the user interface object can display them.
**remoteSendRows**

A stateless version of sendRows that does no processing but runs sendRows to pass all parameters except for the context and returns the RowObject table as an output parameter to the caller that has the new batch of records created in sendRows.

**Location:** data.p

**Parameters:**

**INPUT-OUTPUT** pcContext

CHR(3)-separated list of propCHR(4)value pairs. INPUT is the current context and OUTPUT is the new context. The INPUT and OUTPUT can have different properties.

**INPUT** piStartRow

The RowNum value of the record to start the batch to return. Typically piStartRow is a flag with a value of the Unknown value (?) that indicates pcRowIdent should be used instead of piStartRow.

**INPUT** pcRowIdent

The RowIdent of the first record of the batch to return. Can also be FIRST or LAST to force the retrieval of the first or last batch of RowObject records.

**INPUT** plNext

Determines whether serverSendRows should start on the next record instead of what is indicated by piStartRow or piRowIdent. If TRUE, serverSendRows should start on the next record instead of what is indicated by piStartRow or piRowIdent.

**INPUT** piRowsToReturn

The number of rows in a batch.

**OUTPUT** piRowsReturned

The actual number of rows returned. This number is either the same as piRowsToReturn or less if there are not enough records to fill the batch.

**OUTPUT** pcMessages

Used for error messages.

**Notes:**

- If piStartRow is not 0 or the Unknown value (?), then pcRowIdent is ignored. plNext is ignored if pcRowIdent is FIRST or LAST. The most common use of piRowsReturned is to indicate that the entire result list has been returned when it is less than piRowToReturn.

- The object should only be started persistently before this is called and not initialized because initializeObject is run after the context has been set.

- The caller is responsible for destroying the object.

- For more details, see synchronizeProperties and genContext.
saveContextAndDestroy

Procedure that saves the context of the server-side SmartDataObject in support of running in Stateless mode and then destroys it.

Location: data.p

Parameters:

OUTPUT pcContext AS CHARACTER

The context string to be returned.

Note: saveContextAndDestroy is invoked from the client side of the SmartDataObject and executed on the server side.

sendRows

Procedure that fetches the requested number of rows from the database Query and creates corresponding records in the Row Object temp-table. The batch typically starts at the row indicated by the pcRowIdent parameter, however, it can start on the row indicated by the piStartRow parameter.

Location: data.p

Parameters:

INPUT piStartRow AS INTEGER

The RowNum to start on. The Unknown value (?) indicates that the next argument (pcRowIdent) determines the start of the batch to be returned.

INPUT pcRowIdent AS CHARACTER

An alternative to StartRow. It is either FIRST, LAST, or a comma-separated list of database ROWIDs. If it is FIRST or LAST, the first or last batch of records in the result set is retrieved and piStartRow is forced to the Unknown value (?). If it is a comma-separated list of database ROWIDs, the batch starts with a RowObject that comprises those records.

INPUT p1Next AS LOGICAL

TRUE if the query should perform NEXT/PREV (depending on the direction of navigation) before starting to return more rows. In other words, SKIP to the next record at the start of the batch.
INPUT piRowsToReturn AS INTEGER

The maximum number of rows to return (supply a negative value to move backwards in the result set).

OUTPUT piRowsReturned AS INTEGER

The actual number of rows returned.

**Note:** Before returning, sendRows repositions the RowObject query to what was the current row when it started. The pcRowIdent argument is used by fetchRowIdent to allow query repositioning to a specific database query row.

**serverCommit**

Server-side counterpart of the client-side Commit function, used when running in n-tier (client + AppServer) mode. This procedure receives from the client-side counterpart a dual set of records (original and changed versions) for update. If comparing the original and current versions reveals no outside changes, updates the records. Otherwise, returns the current (changed) versions to the client side without update, for display to the user.

**Location:** data.p

**Parameters:**

INPUT-OUTPUT TABLE FOR RowObjUpd

The Update version of the RowObject temp-table.

OUTPUT cMessages AS CHARACTER

A CHR(3)-separated string of accumulated messages from the server.

OUTPUT cUndoIds

List of any RowObject ROWIDs for which changes were rejected by a commit. Takes the form of RowNum/ADM-ERROR-STRING pairs, CHR(3) separators within pairs, comma separators between pairs.

**Note:** The current versions of not-updatable records, if any, are returned in the RowObject temp-table.
serverSendRows

Server-side procedure called by its counterpart (clientSendRows) when operating in n-tier mode (client, AppServer). This procedure acts as a pass-through proxy to sendRows for assembling and retrieving a batch of records. Runs in the ASHandle if in a SmartBusinessObject.

Location: data.p

Parameters:

INPUT piStartRow AS INTEGER

The RowNum value of the record to start the batch to return. Typically piStartRow is the Unknown value (?) as a flag to use pcRowIdent instead of piStartRow.

INPUT pcRowIdent AS CHARACTER

The RowIdent of the first record of the batch to return. Can also be FIRST or LAST to force the retrieval of the first (or last) batch of RowObject records.

INPUT plNext AS LOGICAL

TRUE if serverSendRows is to start on the NEXT record offset from piStartRow/piRowIdent. Ignored if pcRowIdent is FIRST or LAST.

INPUT piRowsToReturn AS INTEGER

The desired number of rows to return.

OUTPUT piRowsReturned AS INTEGER

The actual number of rows returned. This number is always <= piRowsToReturn.

Notes:

- All of the parameters are simply received from the client and passed through to sendRows. The temp-table result is then received from sendRows and passed back to the client counterpart routine.

- If piStartRow is not 0 or the Unknown value (?) then pcRowIdent is ignored. plNext is ignored if pcRowIdent is FIRST or LAST.

- The most common use of piRowsReturned is to indicate that the entire result list has been returned when it is less than piRowToReturn.

startServerObject

When a SmartDataObject is split and running statelessly on an AppServer, this procedure runs on the client to start the SmartDataObject on the server.

Location: data.p

Parameters: None

Note: This override is for error handling to show error message and returns adm–error.
submitCommit

Called by submitRow, this procedure commits changes to the database.

**Location:** data.p

**Parameters:**

**INPUT** pcRowIdent

The identifier of the row to commit. It is a comma-separated list of ROWIDS. The first entry is the ROWID of the RowObject temp-table containing the record to commit. Subsequent entries in the comma-separated list are the database ROWIDs of the records to be modified.

**INPUT p1Reopen**

TRUE if the RowObject query is to be reopened and repositioned to the RowObject record identified by pcRowIdent.

**Notes:** None

submitForeignKey

Called from submitRow, this procedure defines Foreign Key values for a new row.

**Location:** data.p

**Parameters:**

**INPUT** pcRowIdent

The RowIdent (a comma-separated list of ROWIDs that uniquely identify the RowObject record) of the new RowObject record to be stored in the database. Since this is a new record, only the first ROWID (that of the RowObject itself) is valid. There are no database ROWIDs because they have not yet been created.

**INPUT-OUTPUT** pcValueList

A CHR(1)-separated list of column and value pairs to be set in the RowObject record identified by pcRowIdent. On input it is a list that has been set before submitForeignKey was called. On output it is the now current list with the addition of any foreign fields that have been set.

**INPUT-OUTPUT** pcUpdColumns

A comma-separated list of column names that are updatable in the SmartDataObject. If ForeignFields are set and added to the pcValueList, they are also added to pcUpdColumns to let the calling code know that it is permissible to update them.

**Notes:**

- The list of updatable fields (pcUpdColumns—derived from the UpdatableColumns property in submitRow) usually does not contain key fields. However, because submitForeignKey is called when creating a new RowObject record, key fields need to be populated, so pcUpdColumns is expanded to allow for this. However, only the variable pcUpdColumns is expanded. The UpdatableColumns property remains unchanged.
• You can use this procedure to automatically assign foreign key values when new records are created. For example, if the current SmartDataObject is for Orders of the current Customer, where the Customer is maintained in a parent SmartDataObject query, then when new orders are added, the CustNum value for the current Customer should be assigned automatically to all newly created Orders. This procedure does that by adding the CustNum field and its value to the list of modified fields. In addition, since these ForeignFields are often not directly updatable (would not be enabled in a visualization), the code also needs to let the calling code (the submitRow function) know that the Foreign Field update should be allowed. It is for this reason that the UpdColumns parameter is passed; the key fields being updated are added to the parameter value if they are not already there. As noted, this also modifies the list of updatable columns only for this one transaction; it does not cause the caller to modify the UpdatableColumns property itself.

• The submitForeignField procedure can be localized in a particular application’s SmartDataObject to make other changes to the initial values of newly created records by modifying the two INPUT-OUTPUT parameters as described here; what is done in the standard code for ForeignFields can be done by application code for other fields to be initialized.

**submitRow**

This function accepts a list of changed values for a row and assigns them, returning FALSE if any errors occur. This is done only to the RowObject temp-table. Committing the changes back to the database is a separate step, which is invoked from here if AutoCommit is set to on.

**Location:** data.p

**Parameters:**

INPUT pcRowIdent AS CHARACTER

The RowObject ROWID, which is typically derived from the DataTarget’s RowIdent property. The Unknown value (?) indicates the current record.

INPUT pcValueList AS CHARACTER

A CHR(1)-separated list of alternating column names and values to be assigned.

**Returns:** LOGICAL

**Notes:** None

**undoClientUpdate**

This procedure rolls back updates to the RowObject table in the event of a client-side error. Using a FOR EACH loop, BUFFER-COPYs appropriate RowObjUpd records to RowObject, omitting RowMod.

**Location:** data.p

**Parameters:** None

**Note:** This is to deal with errors before commit has been run - i.e. client side validation errors.
**updateAddQueryWhere**

Procedure restores a query to design-time state, re-adds the filters, then adds and saves the new WHERE clause.

**Location:** data.p

**Parameters:**

INPUT pcWhere AS CHARACTER

New WHERE clause.

INPUT pcField AS CHARACTER

Field to search and replace.

**Notes:**

- Ensures WHERE clause added is not cleared by filters, and is not duplicated in saved manualaddquerywhere. Where clause must be in correct format for an addquerywhere. If WHERE clause is blank but the field is passed in, then manual queries for that field are removed and default back to all.

- Only supports adding a single where clause, but may be called many times. Used when putting a manual filter viewer above a browser.

**updateData**

Updates an existing record.

**Location:** dataextapi.p

**Parameters:**

pcUpdateColumnNames AS CHARACTER

Comma-separated list of column names.

pcOldValues AS CHARACTER

Current values of the updated record delimited by the DataDelimiter property. For more information, see the “DataDelimiter” section on page 5–84. The values are used to support optimistic locking and also to identify the record.

pcNewValues AS CHARACTER

Current values of the updated record delimited by the DataDelimiter property. For more information, see the “DataDelimiter” section on page 5–84.

pcError AS CHARACTER

All error messages in ADM/Dynamic format.

**Note:** Output data is formatted according to the DataReadFormat property.
updateQueryPosition

This procedure overrides and duplicates some of the logic in DataQuery to account for the use of RowNum and the possibility of being inside an SBO.

Location: data.p
Parameters: None
Notes:
- data.p should update the LastRowNum, FirstRowNum, and LastDbRowIdent properties and then call this function.
- The LastRowNum and FirstRowNum properties store the RowObject.RowNum of the first and last record in the database query.

updateRow

Updates an existing row.

Location: data.p
Parameters:
- INPUT pcKeyValues AS CHARACTER
  A comma-separated or CHR(1)-separated list of keyvalues.
- INPUT pcValueList AS CHARACTER
  A CHR(1)-separated list of alternating column names and values to be assigned.

Returns: LOGICAL
Notes: None
Query object properties

Query Object properties provide information about query objects and their classes. This information can include whether an object is enabled, the contents of the object and so on. You can read property values and in many instances you can change property values. To read a property value, you use a `get` function, and to change a property value, you use a `set` function.

**Note:** The generic term *data object* is used to cover the various objects (DataViews, SDOs, and so on) that might be using these methods.

These functions conform to the following conventions:

- **get** — Uses the form `get propname` and returns the current value of the property.

  **Note:** This function accepts no arguments.

- **set** — Uses the form `set propname`. The set function accepts a single argument—the new value for the property—and returns TRUE or FALSE depending on whether the value change succeeds.

For more information about getting and setting property values, see Chapter 1, “ADM2 SmartObject API Reference” in this guide.

**AssignList**

List of updatable columns whose names have been modified in the SmartDataObject. This string takes the form: `<RowObjectFieldName>,<DBFieldName>[,...][CHR(1)...]` with a comma-separated list of pairs of fields for each db table, and CHR(1) between the lists of pairs.

**Data type:** CHARACTER  
**Note:** Read only.

**AuditEnabled**

Indicates whether or not auditing is enabled. This property is used to enable the Audit action in a toolbar.

**Data type:** LOGICAL  
**Notes:**

- Read only.

- This property is hard-coded to FALSE in the DataView. DataViews do not have default support for auditing.
**AutoCommit**

Determines whether a Commit happens on every record update. This is FALSE by default, but if set to TRUE a Commit is automatically done after any change.

**Data type:** LOGICAL

**Note:** Read and Write.

**BLOBColumns**

A comma-separated list of the BLOB data-type columnNames for the SmartDataObject.

**Data type:** CHARACTER

**Notes:**
- Read only.
- This runtime property is resolved on the first call from the DataColumns and RowObject definitions.
- This property should be requested only after the first data request. Otherwise, it might be very expensive as it might resolve each column's data-type on the server.

**BusinessEntity**

The Business Entity that supplies data for the SmartDataObject.

The logical name of the Business Entity on which the DataView operates. The actual realization of the Business Entity is the responsibility of the Service Interface. The ADM expects the service to return and accept Business Entity data as dataset references. The ADM has no requirement for how or where the Business Entity is realized.

**Data type:** CHARACTER

**Note:** Read and Write.

**CalculatedColumns**

Comma-separated list of the calculated columns for the SmartDataObject. To obtain this information, the values of DataColumnsByTable and Tables are examined.

**Data type:** CHARACTER

**Note:** Read only.
**CheckCurrentChanged**

Determines whether the DataObject code should check whether the database rows being updated have been changed since read.

**Data type:** LOGICAL  
**Note:** Read and Write.

**CheckLastOnOpen**

Flag indicating whether a get-last should be performed on an open in order for fetchNext to detect that we are on the last row. This is necessary to make the QueryPosition attribute reliable.

**Data type:** LOGICAL  
**Notes:**  
• Read and Write.  
• The DataColumnsByTable property that stores in different tables delimited by CHR(1) instead of a comma in order to identify which columns are from which table in the event of a join. For example, if the query is a join of customer and order and the Name field from customer and the OrderNum and OrderData field from Order are selected, then the property value becomes equal to Name<CHR(1)>OrderNum,OrderDate.  
• This function replaces CHR(1) with "," returns just a comma-separated list.

**ClientProxyHandle**

Character version of the client-side data object handle. The string containing the client-side data object procedure handle.

**Data type:** CHARACTER  
**Note:** Write only.

**CLOBColumns**

A comma-separated list of the CLOB data-type columnNames for the SmartDataObject.

**Data type:** CHARACTER  
**Notes:**  
• Read only.  
• This runtime property is resolved on the first call from the DataColumns and RowObject definitions.  
• This property should be requested only after the first data request. Otherwise, it might be very expensive as it might resolve each column's data-type on the server.
CommitSource

The handle of the object's commit-source.

Data type: HANDLE
Note: Read and Write.

CommitSourceEvents

The list of events this object subscribes to in its commit-source.

Data type: CHARACTER
Note: Read and Write.

CommitTarget

The handle of the object's commit-target. The handle is passed as a string when you read or write this property.

Data type: CHARACTER
Note: Read and Write.

CommitTargetEvents

The list of events this object subscribes to in its commit-target.

Data type: CHARACTER
Note: Read and Write.

CurrentRowModified

Identifies whether or not the current RowObject row has been modified. If TRUE, the current RowObject row has been modified. If there is no current RowObject record, then CurrentRowModified returns the Unknown value (?)..

Data type: LOGICAL
Note: Read only.
CurrentUpdateSource

The current updateSource.

**Data type:** HANDLE

**Notes:**

- Read and Write.
- This property is set temporarily in updateState before that is republished. This action enables the updateSource or DataTarget to avoid a republish when it is the original publisher.

DataColumns

Comma-separated list of the columnNames for the data object.

**Data type:** CHARACTER

**Notes:**

- Read and Write.
- The DataColumnsByTable property that stores in different tables delimited by CHR(1) instead of a comma in order to identify which columns are from which table in the event of a join. For example, if the query is a join of customer and order and the Name field from customer and the OrderNum and OrderData field from Order are selected, then the property value becomes equal to Name<CHR(1)>OrderNum,OrderDate.
- This function replaces CHR(1) with ""," and returns just a comma-separated list.

DataColumnsByTables

A comma-separated list of the columnNames delimited by CHR(1) to identify which columns are from which table.

**Data type:** CHARACTER

**Notes:**

- Read and Write.
- To get a comma-separated list of just columnNames for a SmartObject, use DataColumn.

DataContainerHandle

The handle of the DataContainer that handles all data requests.

**Data type:** HANDLE

**Note:** Read only.
**DataDelimiter**

Delimiter for values passed to receiveData and output for the input-output in updateData and createData.

- **Data type:** CHARACTER
- **Note:** Read and Write.

**DataFieldDefs**

Name of the include file in which the field definitions for this data object’s temp-table are stored.

- **Data type:** CHARACTER
- **Note:** Read only.

**DataHandle**

SmartBusinessObject version of getDataHandle is run from a browser to get the query from the contained Data object.

- **Data type:** HANDLE
- **Note:** Read only.

**DataLogicObject**

Handle of the logic procedure that contains business logic for the data object.

- **Data type:** HANDLE
- **Note:** Read only.

**DataModified**

Flag that indicates whether the current SCREEN-VALUES have been modified but not saved.

- **Data type:** LOGICAL
- **Notes:**
  - Read and Write.
  - The difference from getNewRow is that it also returns TRUE for saved and uncommitted new record and thus cannot be used to check the object’s state. This uses the RowMod field in the temp-table to see if the row is new (just as getNewRow) and in addition checks to see if the RowObjUpd is not available, which indicates that this has not been committed. Do some double checking if a rowObjUpd is available to ensure that this is the right one.
**DataIsFetched**

Flag indicating whether data has been fetched for the data object. The SmartBusinessObject (SBO) sets this to TRUE in the SDO when it has fetched data for the SDO to prevent the SDO from using another server call to fetch the data it already has.

**Data type:** LOGICAL

**Notes:**
- Read and Write.
- This is checked in query.dataAvailable and openQuery is skipped if its TRUE. It is immediately turned off after it is checked.

**DataLogicProcedure**

Name of the logic procedure that contains business logic for the data object.

**Data type:** CHARACTER

**Notes:**
- Read and Write.
- The DataLogicProcedure is added as a super procedure when it is set using the setDataLogicProcedure. As a result, if other properties are set before the super procedure is added, you cannot override the property settings in the logic procedure.

**DataQueryBrowsed**

Identifies whether or not this SmartDataObject’s query is being browsed by a SmartDataBrowser. If TRUE, this SmartDataObject’s query is being browsed.

**Data type:** LOGICAL

**Note:** Read and Write.

**DataQueryString**

DataQueryString used to prepare the RowObject query.

**Data type:** CHARACTER

**Note:** Read and Write.

**DataReadBuffer**

Value or DataReadBuffer.

**Data type:** HANDLE

**Note:** Read and Write.
DataReadColumns

A comma-separated list of columns to pass to the registered DataReadHandler when traversing the query.

Data type: CHARACTER
Note: Read and Write.

DataReadHandler

The handle of a procedure that has been registered to receive output from the object during data read.

Data type: HANDLE
Note: Read and Write.

DatasetName

The instance name of the object's DatasetSource.

Data type: CHARACTER
Note: Read and Write.

DatasetSource

The handle of the object's DatasetSource. The DatasetSource is a procedure that encapsulates all access to the ProDataSet that holds the data for the DataView.

Data type: HANDLE
Notes:

- Read and Write.
- There is currently no Dataset link. But, the name, DatasetSource, is used intentionally in the anticipation of a true link.

DataSignature

A character string that lists the integers corresponding to the data types of the fields in a RowObject temp-table. This string is used to compare objects for equivalence as follows:

- 1 = CHARACTER
- 2 = DATE
- 3 = LOGICAL
- 4 = INTEGER
- 5 = DECIMAL
- 6 = Reserved for FLOAT OR DOUBLE in the future
Query object properties

- 7 = RECID
- 8 = RAW
- 9 = Reserved for IMAGE in the future
- 10 = HANDLE
- 13 = ROWID

**Data type:** CHARACTER
**Note:** Read only.

**DataTable**

The table in the Business Entity. The name must match the physical name of a temp-table in the DataSet returned from the service.

**Data type:** CHARACTER
**Note:** Read and Write.

**DbNames**

Property that contains a comma-separated list of DBNames that corresponds to the tables in the query objects.

**Data type:** CHARACTER
**Note:** Read and Write.

**DestroyStateless**

Determines whether the persistent data object should be destroyed on stateless requests.

**Data type:** LOGICAL
**Note:** Read and Write.

**DisconnectAppServer**

Determines whether the persistent data object disconnects the AppServer.

**Data type:** LOGICAL
**Note:** Read and Write.
EnabledObjFldsToDisable

Property that controls whether or not to disable nondatabase objects when the data fields are disabled. You can enter one of the following:

- **None** — Nondatabase objects remain enabled when the fields are disabled.
- **All** — Nondatabase objects are disabled in view mode.
- **Comma-delimited list** — A comma-separated list of nondatabase object names that you want disabled in view mode.

**Data type:** CHARACTER

**Notes:**

- Read and Write.
- The property only applies to nondatabase objects that have been defined as enabled in the master. See EnabledObjFlds for more information.
- You can edit this property using the viewer's Instance Property dialog box.

EnabledTables

List of the database tables that have enabled fields.

**Data type:** CHARACTER

**Note:** Read only.

FetchOnOpen

Determines what sort of fetch should happen when a database query is opened. The valid values are as follows:

- **Blank** — Do not perform a fetch.
- **First** — Run fetchFirst.
- **Last** — Run fetchLast.
- **Unknown value (?)** — Perform the default action.

**Data type:** CHARACTER

**Note:** Read and Write.
**FillBatchOnRepos**

Determines whether fetch RowIdent should retrieve enough rows to fill a batch of records when repositioning to the end or near the end of the result set where an entire batch would not be retrieved.

**Data type:** LOGICAL  
**Note:** Read and Write.

**FilterActive**

Flag indicating whether or not the dataSource has a logical filter and whether or not a filter is active. If TRUE, a filter is active.

**Data type:** LOGICAL  
**Note:** Read and Write.

**FilterAvailable**

Flag indicating whether or not a filter is available.

**Data type:** LOGICAL  
**Note:** Read and Write.

**FilterSource**

The handle of the object's FilterSource.

**Data type:** HANDLE  
**Note:** Read and Write.

**FilterWindow**

Name of the partition, if any, on which this object runs.

**Data type:** CHARACTER  
**Note:** Read and Write.

**FirstResultRow**

Pointer to the first record in the current batch. It is currently made up of the first record's RowNum and RowIdent separated by a semi-colon. Though the content of this property can change, the property **must never** be changed by application code.

**Data type:** CHARACTER  
**Note:** Read and Write.
**FirstRowNum**

Temp-table row number of the first row.

- **Data type:** INTEGER
- **Note:** Read and Write.

**ForeignFields**

Sets the Foreign Fields property of the object and removes the current values for Foreign Fields from the current query if they have been applied.

- **Data type:** CHARACTER
- **Note:** Read and Write.

**ForeignValues**

Identifies the most recently received values for foreign field received by for the dataAvailable property. The values are character strings formatted according to the field format specification and are separated by the `{&adm-tabledelimiter}` character.

- **Data type:** CHARACTER
- **Note:** Read only.

**GroupAssignSource**

Handle of the object’s GroupAssign source.

- **Data type:** HANDLE
- **Note:** Read and Write.

**GroupAssignSourceEvents**

Comma-separated list of the events this object wants to subscribe to in its GroupAssign source.

- **Data type:** CHARACTER
- **Note:** Read and Write.

**GroupAssignTarget**

Handle, in character format, of the object’s GroupAssign target.

- **Data type:** CHARACTER
- **Note:** Read and Write.
GroupAssignTargetEvents

Comma-separated list of the events this object wants to subscribe to in its GroupAssign target.

**Data type:** CHARACTER  
**Note:** Read and Write.

HasFirst

Returns TRUE if the first record of the resultset is present.

**Data type:** LOGICAL  
**Note:** Read only.

HasLast

Returns TRUE if the last record of the resultset is present.

**Data type:** LOGICAL  
**Note:** Read only.

IndexInformation

Index Information formatted as the 4 GL index-information attribute, but with RowObject column names, CHR(1) as index separator, and CHR(2) as table separator.

**Data type:** CHARACTER  
**Notes:**
- Read and Write.
- Intended for internal use by other index info functions, which use this as input to indexInformation(). (Unmapped columns are returned fully qualified!) This property can be used as input parameter to indexInformation() for further refinement.
- If the property is the Unknown value (?), it calls the indexInformation() in query.p and stores the returned value for future calls.

InternalEntries

Internal entries of data object as internal entries cannot be accessed for remote proxy procedures.

**Data type:** CHARACTER  
**Note:** Read only.
KeyFields

Comma-separated list of the key fields. The indexInformation is used to try to figure out the default KeyFields list, but this is currently restricted to conditions:

- The First Table in the join is the only enabled table.
- All the fields of the index are present is the data object.
- The following index might be selected:
  - Primary index if unique.
  - First Unique index.
- There is currently no check whether the field is mandatory.

Data type: CHARACTER
Note: Read only.

KeyTableId

The Progress Dynamics unique identifier for a table in your application database.

Data type: CHARACTER
Notes:

- Read only.
- This identifier is used as a foreign key to provide access at runtime to tables of related data, such as the auditing and comments tables.

KeyWhere

A WHERE string with criteria that uniquely identifies the current record.

Data type: CHARACTER
Note: Read only.

LargeColumns

A comma-separated list of the columnNames for the SmartDataObject that are formatted as one of the large datatypes.

Data type: CHARACTER
Notes:

- Read and Write.
- This runtime property is resolved on the first call from the DataColumns and RowObject definitions.
• This property should be requested only after the first data request. Otherwise, it might be very expensive as it might resolve each column's data-type on the server.

• By default, only CLOB and BLOB columns are considered large datatype columns.

**LastCommitErrorKeys**

Property that provides information about records that failed during the last data commit. For:

• **SDOs** — A comma-separated list of the key values of the records that failed to be committed. The KeyFields property of the SDO holds the key field names.

• **SBOs** — A semicolon-separated list of the values of each individual contained SDO that has failed records.

**Data type:** CHARACTER

**Notes:**

• Read and Write.

• A blank indicates that the last commit was successful.

**LastCommitErrorType**

Property that identifies the type of error encountered the last time data was committed:

• **Blank** — The last commit was successful.

• **Unknown** — A commit was not attempted after run.

• **Conflict** — A locking conflict occurred.

• **Error** — An unspecified error occurred.

**Data type:** CHARACTER

**Notes:**

• Read and Write.

• Currently used to identify a Conflict error when using the UpdateData procedure. See [Update Data](#) for additional information.

**LastDbRowIdent**

Identifies the database rowid(s) for the last row fetched row. This value is unknown if the last row has not been fetched.

**Data type:** CHARACTER

**Note:** Write only.
**LastCommitErrorType**

Property that identifies the type of error encountered the last time data was committed. Valid values are:

- **Blank** — The last commit was successful.
- **Unknown** — A commit was not attempted after run.
- **Conflict** — A locking conflict occurred.
- **Error** — An unspecified error occurred.

**Data type:** CHARACTER

**Notes:**

- Read and Write.
- Currently used to identify a Conflict error when using the UpdateData procedure. See the “updateData” section on page 5–77 for additional information.

**LastResultRow**

Returns a semicolon-separated string of **RowNum;RowID** of the last RowObject table currently residing on the client side.

Though the content of this property can change, the property **must never** be changed by application code.

**Data type:** CHARACTER

**Note:** Read and Write.

**LastRowNum**

Temp-table row number of the last row. This value is unknown if the last row has not been fetched.

**Data type:** INTEGER

**Note:** Read and Write.

**LogicBuffer**

Handle of the data-logic table, if possible.

**Data type:** HANDLE

**Note:** Read and Write.
**ManualAddQueryWhere**

Manual calls to addQueryWhere. This value is reapplied by the filter when needed to ensure the original query remains intact.

**Data type:** CHARACTER

**Notes:**
- Read and Write.
- Value is pcwhere + CHR(3) + pcbuffer or empty or "?" + CHR(3) + pcandor.
- Multiple entries are supported, delimited by CHR(4).

**ManualAssignQuerySelection**

Manual calls to assignQuerySelection. This value is reapplied by the filter when needed to preserve the original query.

**Data type:** CHARACTER

**Notes:**
- Read and Write.
- Value is pccolumns + CHR(3) + pcvalues + CHR(3) + pcooperators.
- Multiple entries are supported, delimited by CHR(4).

**ManualSetQuerySort**

Manual calls to setQuerySort. This value is reapplied by the filter when needed to preserve the original query.

**Data type:** CHARACTER

**Note:** Read and Write.

**NavigationSource**

Handle of the query object’s navigation source.

**Data type:** CHARACTER

**Note:** Read and Write.

**NavigationSourceEvents**

Comma-separated list of the events this object wants to subscribe to in its NavigationSource.

**Data type:** CHARACTER

**Note:** Read only.
NewMode

Whether or not the current RowObject record is in New mode. This is identical to the current object’s NewMode when an Add or Copy of an existing record has not been saved. This property is TRUE if the record is in New mode. The Unknown value (?) is returned if there is no current RowObject.

Data type: LOGICAL

Notes:

- Read only.
- Note that the NewRow property cannot be used for this purpose. It returns TRUE for ANY saved and uncommitted new record.

NewRow

Indicates whether the current RowObject record is a new record or a copy of an existing record. If the value for this property is:

- TRUE — Then either a new record or a copy of an existing record was added to the database.
- Unknown value (?) — Then there is no current RowObject.

This (SmartBusinessObject) SBO property is similar to DataHandle and is run from a browser to get the query from the contained Data object.

For more information, see the “DataHandle” section on page 5–84.

Data type: LOGICAL

Note: Read only.

OpenOnInit

Flag indicating whether or not the object's database query should be opened automatically when the object is initialized. The default value is yes.

Data type: LOGICAL

Note: Read and Write.
OpenQuery

Original design WHERE clause for a database query. The value for this property is used by QueryWhere to manipulate data.

Data type: CHARACTER

Notes:
- Read and Write.
- OpenQuery is called from the client on AppServer.
- No matter how the query is dynamically modified, it can be reset to its original state using the value of this property in a QUERY-PREPARE method.
- For more information, see the “RebuildOnRepos” section on page 5–102.

PhysicalTable

Property that contains the physical names that corresponds to the tables used to build the base query.

Data type: CHARACTER

Notes:
- Read and Write.
- The names used in the query are defined in the corresponding Tables property.
- If the query is defined with dbname, it must be qualified with database name.

PositionSource

The data source which indirectly controls the position of a DataView.

For example, consider a viewer for a Customer DataView. The viewer has a SDF built against a SalesRep DataView. The Customer DataView is the PositionSource for the SalesRep DataView, because the SalesRep DataView derives its position from the Customer DataView.

Data type: HANDLE

Note: Read only.

PrimarySDOSource

The handle of the object’s PrimarySDOSource.

Data type: HANDLE

Note: Read and Write.
PromptColumns

A comma-separated list of field values to display when prompting for a delete action. When setting this property, the following values are valid:

- **(NONE)** — Do not display any fields. This is the default for security reasons.
- **(ALL)** — Display all fields in the data object.
- **Field list** — A comma-separated list of the specific fields to display.

**Data type:** CHARACTER

**Note:** Read and Write.

PromptOnDelete

Whether or not to prompt the user before executing a Delete action.

**Data type:** LOGICAL

**Note:** Read and Write.

PropertyList

List of properties taken from a CHR(3)-separated list of “propCHR(4) value” pairs. Used internally to support running in Stateless mode.

**Data type:** CHARACTER

**Note:** Write only.

QueryColumns

A comma-separated list of the fields in the query.

**Caution:** The ADM uses this property to track and manage field expressions in the QueryString property. It should only be managed by the ADM. It is described here only to caution against directly using it.

**Data type:** CHARACTER

**Note:** Read and Write.

QueryContainer

Indicates whether or not the Container is a QueryObject. Use this information to determine if an SBO handles the transaction.

**Data type:** CHARACTER

**Note:** Read only.
**QueryHandle**

Handle of the database query of the database object.

*Data type:* HANDLE

*Note:* Read only.

**QueryOpen**

Returns TRUE if the Query is currently open.

*Data type:* LOGICAL

*Notes:*

- Read only.
- On the server side, it is the database query of the query object.
- On the client side, it is the RowObject query.

**QueryPosition**

Identifies the state and position of the current record in the data object and is actively used by other objects like the Navigation toolbar. Valid values are:

- FirstRecord
- LastRecord
- NotFirstOrLast
- NoRecordAvailable
- NoRecordAvailableExt.

*Data type:* CHARACTER

*Note:* Read and Write.

**QueryRowIdent**

The row indentation to be used to position an data object query when it is first opened.

*Data type:* CHARACTER

*Notes:*

- Read only.
- Generally used to save the position of a query when it is closed so that position can be restored on reopen.
QuerySort

Property that contains the sorting criteria (BY phrase) of the database query. The value of this property is then stored in the QueryString property.

Data type: CHARACTER

Notes:

- Read and Write.
- If you need to set the query sort criteria using a field that was renamed in a data object, you must qualify the field name using RowObject. For example, if a SmartDataObject for the customer table includes the field customer.contact and that field was renamed to custContact in the SDO, you can pass the custContact field to setQuerySort either as the field RowObject.custContact or the database column name contact.
- The sort expression is removed if blank is passed as input.
- setQueryWhere overrides the entire query string including any previous setting of the QuerySort.
- When you specify sort direction in a BY phrase within this property, you can use a pseudo-keyword, TOGGLE. The setQuerySort function has internal logic to handle this word in a BY phrase. When the function finds TOGGLE in a BY phrase, the function checks the sort direction of the current BY phrase. The function applies the opposite sort direction to the new BY phrase.

Caution: TOGGLE is not a true ABL keyword. You cannot use this word in BY phrases outside the context of this function and a few related functions.

QuerySortDefault

The default sort phrase.

Data type: CHARACTER

Notes:

- Read only.
- The returned string does NOT contain the initial BY keyword in the sort phrase.
**QueryString**

Pending query string to use in the next openQuery. This value is updated on the client by query manipulation functions.

**Data type:** CHARACTER

**Notes:**

- Read and Write.
- This property should not be changed by code but is useful for debugging code.
- The method always returns a WHERE clause. If the QueryString property has not been set, it uses the current WHERE clause - QueryWhere. If there is no current use the design where clause - OpenQuery.
- The openQuery calls prepareQuery with this property.

**QueryStringDefault**

A default query string that is used to initiate or reset the QueryString property. The property separates the logic to initiate the QueryString from the various query manipulation methods. The property allows the DataView class to implement a query manipulation method that can be used by the Data class.

**Data type:** CHARACTER

**Notes:**

- Read only.
- QueryStringDefault can be referenced before the dataset is retrieved and created. QueryStringDefault is based upon the DataQueryString property, which can be set at design time to capture that more than one table is in a sort.
- If the DataQueryString is not set, the value of QueryStringDefault is resolved from the dataset using QueryTables, or from the datatable if there is no dataset.
- QueryTables has similar logic using Tables as the design time storage and using the dataset for default.

**QueryTables**

The tables that can be used in sorting, filtering, and browsing. This property is used in query manipulation. It can be referenced before the dataset is retrieved and created.

**Data type:** CHARACTER

**Notes:**

- Read only.
- The DataTable is always the first entry and all the other tables have a many-to-one (or one-to-one) relationship to the DataTable.
Data Objects and Their Methods and Properties

- ViewTables always includes all the tables in QueryTables. The QueryTables might not include all the tables in ViewTables. For example, QueryTables does not include the parent of a one-to-many relation.

- QueryTables should not include tables that cannot be inner-joined.

- The user can define the QueryTables at design time, storing the result in the DataQueryString. If a query has not been defined yet, the getQueryTables function resolves the tables again from the DataQueryString. The dataset resolves the default if the QueryHandle and QueryString are not yet defined. The DataTable is returned if not dataset exists.

QueryWhere

WHERE clause that is appended to the basic static database query definition on either the client or server side, or a completely modified Where clause.

**Data type:** CHARACTER

**Note:** Read and Write.

RebuildOnRepos

Flag indicating whether the RowObject temp-table should be rebuilt if a fetchLast or other reposition is done outside the bounds of the current result set.

**Data type:** LOGICAL

**Note:** Read and Write.

RequestHandle

The handle that defines the scope of service requests for the object.

The handle is passed to the DataContainer to identify the requestor. Typically, the container's getRequestHandle function searches through the parent container's getRequestHandle function to resolve this.

**Data type:** HANDLE

**Notes:**

- Read only.

- The getRequestHandle function returns the DataView's own handle if no container is present.

- If a container cannot handle the request either because it is already initialized or is not defined as a data container, the container's RequestHandle is the Unknown value (?). In this case, the getRequestHandle function returns the DataView's own handle.
RowIdent

Comma-separated character string containing the ROWIDs of the database records that are the source of the RowObject record.

**Data type:** CHARACTER
**Note:** Read only.

RowObject

The handle of the RowObject temp-table buffer.

**Data type:** HANDLE
**Note:** Read and Write.

RowObjectState

Indicates whether there are uncommitted updates in the object. Valid return values are NoUpdates and RowUpdated.

**Data type:** CHARACTER
**Note:** Read and Write.

RowObjectTable

Temp-table handle of the RowObject table.

**Data type:** HANDLE
**Note:** Read and Write.

RowObjUpd

Handle of the temp-table buffer where updates are stored.

**Data type:** HANDLE
**Note:** Read only.

RowObjUpdTable

Handle of the RowObjUpd temp-table.

**Data type:** HANDLE
**Note:** Read only.
RowsToBatch

Number of rows to be transferred from the database query into the RowObject temp-table in a single operation.

**Data type:** INTEGER

**Note:** Read and Write.

RowUpdated

Returns TRUE if the current record has been saved, but has not been submitted to the service.

**Data type:** LOGICAL

**Note:** Read and Write.

Scrollable

Whether or not the object has scrollable data, which is currently decided by the dataset relationship. However, that decision can be overridden by a request for all data for the specific table. In that case, isDataquerycomplete is TRUE.

**Data type:** LOGICAL

**Notes:**
- Read only.
- Reading this property returns the Unknown value (?) if it is called before definitions are retrieved.

ServerSubmitValidation

Signals whether the column and RowObject Validation procedures done as part of client validation are to be executed on the server side. If yes, normally when the data object is being run through the open client interface, then serverCommit executes SubmitValidation itself.

**Data type:** LOGICAL

**Note:** Read and Write.

SubmitParent

Signals whether the parent record should be submitted together with this object's changed records. YES indicates that the parent record should be included.

**Data type:** LOGICAL

**Note:** Read and Write.
Tables

Property that contains a comma-separated list of tables from which data is retrieved. The data is retrieved either from a SmartDataObject or a database.

Data type: CHARACTER

Notes:

• Read and Write.

• Qualified with database name if the query is defined with dbname.

• Currently this property is a design-time property whereas before it was resolved from the actual query.

• There is currently no way to change the order of the tables at run time. But it would be even more important to have this as a property if the order of the tables were changed dynamically, because several other properties have table delimiters and are totally dependent on the design time order of this property.

• The names in the list references to the tables as defined in the data object and referenced in the query and each entry must be unique. Therefore, the names might be buffer names that differ from the actual physical names, and the physical name is defined in the corresponding PhysicalTables property.

ToggleDataTargets

Property used to determine whether or not dataTargets should be switched between on and off in LinkState.

Data type: Logical

Notes:

• Read and Write.

• If set to FALSE, dataTargets should not be switched between on and off based on the active or inactive parameter in LinkState.

TransferChildrenForAll

Whether or not children for all records (of the batch) are transferred from the database.

Data type: LOGICAL

Notes:

• Read and Write.

• This property is currently only supported for read event handlers during a fetch. The child data object is only left with temp-table records for one parent when the fetch* batch is finished.
**UseDBQualifier**

Indicates whether table references are qualified with database. If TRUE, table references are qualified with database.

**Data type:** LOGICAL  
**Note:** Read only.

**UpdateFromSource**

Identifies whether or not an object should be updated as one-to-one of the datasource updates. TRUE if this object should be updated.

**Data type:** LOGICAL  
**Note:** Read and Write.

**UpdatableColumns**

A comma-separated list of the updatable columns for this data object, or a list of all updatable columns of contained data objects qualified by their object names.

**Data type:** CHARACTER  
**Notes:**
- This property is Read and Write in the DataView class. However, it is Read only in the Data class.
- If you want a list of updatable columns in different tables delimited by CHR(1), instead of by a comma, that identifies which columns are from which table in the event of a join, use the UpdatableColumnsByTable property.

**UpdatableColumnsByTable**

A list of updatable columns in different tables, delimited by CHR(1) instead of a comma, that identifies which columns are from which table in the event of a join.

For example, if the query is a join of customer and order and the Name field from customer and the OrderNum and OrderData field from Order are updatable, then this property value equals Name<CHR(1)>OrderNum,OrderDate.

**Data type:** CHARACTER  
**Notes:**
- Read and Write.
- If you want a comma-separated list of the updatable columns for the data object, use the UpdatableColumns property.
**ViewTables**

All tables in the view, including the DataTable. The DataTable is always the first entry. All the other tables have a many-to-one (or one-to-one) relationship to the DataTable.

This property can include outer join tables that are currently not added to the physical query due to ABL limitations that make get-last and reposition unusable on outer-join queries.

**Data type:** CHARACTER  
**Notes:**  
- Read only.  
- This property can be referenced before the dataset is retrieved and created. It defines which tables to retrieve from the service.  
- If the object needs to retrieve more than just the DataTable, the Tables property must be defined at design time because the dataset is not available before the first request.  
- The user defines this property at design time storing the value in the Tables property, which should not be accessed outside of the getViewTables function at runtime.  
- The default, which is mainly for design time, is resolved from the dataset relationships.  
- QueryTables defines the tables in the query.

**WordIndexedFields**

Comma-separated list of RowObject fields that are mapped to database fields that have a word indexed.

**Data type:** CHARACTER  
**Note:** Read only.
Column properties for query objects

There are a number of column properties available for which you can obtain and set (write) field values. All of these properties can be read and some of them can be set. To read and set column properties, you use the following prefixes with the specific column property:

- **Column** — Use to read the value of a specific column property. For example, if you want to read the value of the ColumnLabel property, you would specify `ColumnColumnLabel`. This would return the label of the column you specify. To obtain the data type for a specific column property, you would specify `ColumnDataType`. This would return the data type of the specified column.

- **Assign** — Use to set the value of a specific column property. For example, if you want to set the label value for a specific column, you specify `assignColumnColumnLabel`. This would set the label value for the column you specify. To set a value for the column format, you would specify `assignColumnFormat`.

For additional information, see *OpenEdge Development: Progress Dynamics Basic Development* and *OpenEdge Development: Progress Dynamics Advanced Development*.

Table 5–1 lists the column properties for query objects, provides a brief description of each property, indicates whether the property can be read or set (write), and lists the data type for each property.

### Table 5–1: Column properties for query objects

<table>
<thead>
<tr>
<th>Column property</th>
<th>Description</th>
<th>Read</th>
<th>Write</th>
<th>Data type</th>
</tr>
</thead>
<tbody>
<tr>
<td>ColumnLabel</td>
<td>Label of the specified column.</td>
<td>Yes</td>
<td>Yes</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>DataType</td>
<td>Data type of the specified column</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>DbColumn</td>
<td>Qualified database name (DatabaseName.TableName.FieldName) mapped to the RowObject column identified by pcColumn</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>DefaultValue</td>
<td>The OpenEdge help text of the specified column</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>Extent</td>
<td>Extent of the specified RowObject column</td>
<td>Yes</td>
<td>No</td>
<td>INTEGER</td>
</tr>
<tr>
<td>Format</td>
<td>Format of the specified RowObject column</td>
<td>Yes</td>
<td>Yes</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>Handle</td>
<td>Handle of the specified RowObject column</td>
<td>Yes</td>
<td>No</td>
<td>HANDLE</td>
</tr>
<tr>
<td>Help</td>
<td>Help text for the specified RowObject column</td>
<td>Yes</td>
<td>Yes</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>Initial</td>
<td>Initial value for a specified field as a character string with the field FORMAT applied</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>Label</td>
<td>Label for the specified column</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
</tbody>
</table>
### Table 5–1: Column properties for query objects

<table>
<thead>
<tr>
<th>Column property</th>
<th>Description</th>
<th>Read</th>
<th>Write</th>
<th>Data type</th>
</tr>
</thead>
<tbody>
<tr>
<td>LongCharValue</td>
<td>The LONGCHAR value of the specified column in the DataView DataTable buffer</td>
<td>Yes</td>
<td>No</td>
<td>LONGCHAR</td>
</tr>
<tr>
<td>Modified</td>
<td>Indicates whether or not a specified RowObject field has been modified. TRUE if modified, FALSE if not modified</td>
<td>Yes</td>
<td>No</td>
<td>LOGICAL</td>
</tr>
<tr>
<td>Name</td>
<td>The external unique name of the specified column</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>PrivateData</td>
<td>Private Data property of the specified column</td>
<td>Yes</td>
<td>Yes</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>QuerySelection</td>
<td>CHR(1)-separated string with all operators and values, but no field names, that have been added to the Query for this column</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>ReadOnly</td>
<td>Identifies whether or not the specified column is in the list of columns that you can update. TRUE, if the column is in the list and FALSE, if not in the list</td>
<td>Yes</td>
<td>No</td>
<td>LOGICAL</td>
</tr>
<tr>
<td>StringValue</td>
<td>String Value of the specified column in the SmartDataObject RowObject buffer</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>Table</td>
<td>Database table name of the specified column</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>ValExp</td>
<td>Validation expression for the specified column in a RowObject temp-table</td>
<td>Yes</td>
<td>Yes</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>ValMsg</td>
<td>Validation message text for the specified column of the SmartDataObjects RowObject temp-table</td>
<td>Yes</td>
<td>Yes</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>Value</td>
<td>Raw (unformatted) character value of the specified field in a RowObject temp-table</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>Width</td>
<td>Width in character units of the specified column of the SmartDataObjects RowObject temp-table</td>
<td>Yes</td>
<td>No</td>
<td>DECIMAL</td>
</tr>
</tbody>
</table>
This chapter lists and describes the methods (internal procedures and functions) and properties used for Toolbar Objects. Refer to Figure 1–1 to see the inheritance hierarchy for each object class.

Note: For information specific to the WebSpeed environment, see the Chapter 9, “Alphabetical Listing of WebSpeed-specific API Routines.”

This chapter provides information about the following:

- Methods for toolbar object actions
- Panel methods for toolbar objects
- Toolbar methods for toolbar objects
- Toolbar object properties
- Action properties for toolbar objects
Methods for toolbar object actions

This section lists and describes the methods for Toolbar Object actions.

**canFindAction**

Returns TRUE if an action exists.

**Location:** toolbar.p

**Parameters:**

INPUT pcAction AS CHARACTER

Name of the action.

**Returns:** LOGICAL

**Notes:** None

**canFindCategory**

Calls findCategory to determine whether some category exists in TARGET-PROCEDURE.

**Location:** toolbar.p

**Parameters:**

INPUT pcCategory AS CHARACTER

The category (action) of interest.

**Returns:** LOGICAL

**Notes:** None

**categoryLink**

Returns the value of Link for the specified category.

**Location:** toolbar.p

**Parameters:**

INPUT pcCategory AS CHARACTER

The category of interest.

**Returns:** CHARACTER

**Notes:** None
checkRule

Checks the rules of an action against the target.

**Location:** toolbar.p

**Parameters:**

INPUT pcRule AS CHARACTER

The rules for the target.

INPUT phHandle AS HANDLE

Handle of the dynamic Buffer with the rules or the handle of the target.

INPUT plDefault AS LOG

Default is used when the function or property is not found, or when the function returns the Unknown value (?).

**Returns:** CHARACTER

**Note:** This functionality is duplicated in panel.p.

defineAction

Creates a temp-table entry defining an action, possibly overwriting the existing definition.

**Location:** toolbar.p

**Parameters:**

INPUT pcId AS CHARACTER

INPUT pcColumns AS CHARACTER

INPUT pcValues AS CHARACTER

**Returns:** LOGICAL

**Note:** If “Instance” is one of the listed fields, the action is created as an instance class and the target-procedure stored in the temp-table.

displayActions

Utility procedure that displays a dialog showing all the Actions currently defined.

**Location:** toolbar.p

**Parameters:** None

**Note:** Can be executed by selecting displayActions from the PRO*TOOLS procedure object viewer for the desired SmartContainer.
**initAction**

Procedure that defines all default actions for the SmartToolbar.

**Location:** toolbar.p  
**Parameters:** None  
**Note:** Called once from initializeObject.

**initializeObject**

Procedure that calls initAction to define the set of actions used by SmartToolbars.

**Location:** toolbar.p  
**Parameters:** None  
**Notes:** None
Panel methods for toolbar objects

This section lists and describes the methods for panel Toolbar Objects.

**activeTarget**

Return the targets of the specified link type.

**Location:** panel.p

**Parameters:**

INPUT pcLink AS CHARACTER

The type of link: TableIO, Navigation, Commit.

**Returns:** HANDLE

**Notes:**

- The toolbar only supports one active object in these, but it might be linked to inactive objects on hidden pages. If more than one target this procedure returns the active hidden object where ObjectHidden = FALSE for some link type.

- This is not overridden by Toolbar.

**countButtons**

Procedure that walks the widget tree of the frame, counts all the buttons, and sets the ButtonCount property.

**Location:** panel.p

**Parameters:** None

**Note:** This sets the Panel property ButtonCount. For internal use only.

**disableActions**

Disables a specified list of actions.

**Location:** panel.p

**Parameters:**

INPUT pcActions AS CHARACTER

A comma-separated list of actions to be disabled. "*" means All.

**Returns:** LOGICAL

**Note:** This function is used internally to turn actions on/off depending on the state. Use modifyDisabledActions or setDisabledActions to override enabling.
EnableActions

Enables a specified list of actions.

**Location:** panel.p

**Parameters:**

INPUT pcActions AS CHARACTER

A comma-separated list of actions to be enabled. "*" means All.

**Returns:** LOGICAL

**Note:** This function is used internally to turn actions on/off depending on the state. Use modifyDisabledActions or setDisabledActions to override enabling.

EnableObject

Procedure that restores the panel buttons to their previous state whenever the panel is re-enabled.

**Location:** panel.p

**Parameters:** None

**Note:** The correct state is the state that the buttons were in before the SmartPanel was disabled. This might not be the initial state. If a SmartPanel has been disabled because the page it is on was hidden, its previous state must be restored when the page is viewed again.

HasActiveGATarget

Checks to determine whether any group assign targets are active.

**Location:** panel.p

**Parameters:**

INPUT phObject AS HANDLE

- **phObject** – Procedure object that is tableioTarget and potential GroupAssignTarget.

**Returns:** LOGICAL PRIVATE

**Notes:** None
**initializeObject**

Procedure used for SmartPanel-specific initialization.

**Location:**  
panel.p

**Parameters:**  
None

**Notes:**

- A SmartPanel is set to the appropriate state depending on its Navigation–Target or Update–Target. A Navigation SmartPanel retrieves the QueryPosition property of its Navigation–Target to determine which buttons to enable. These QueryPosition values map to the value of the PanelState property that is set in the SmartPanel:
  - `FirstRecord` — maps to `first`.
  - `LastRecord` — maps to `last`.
  - `NotFirstOrLast` — maps to `enable–all`.
  - `NoRecordAvailable` — maps to `disable–all`.

- An Update Panel retrieves the RecordState property of its Update–Target to do the same thing. These changes to the PanelState property are interpreted by the setButtons procedure in the SmartPanels:
  - `NoRecordAvailable` — maps to `add–only`.
  - `NoRecordAvailableExt` — maps to `disable–all`.
  - `RecordAvailable` — maps to `initial`.

**linkState**

Receives messages when an object linked to this object becomes active or activeTarget (when it is viewed) or inactive or inactiveTarget (when it is hidden).

**Location:**  
panel.p

**INPUT PARAMETER** pcState AS CHARACTER

State of a linked object. Valid states are:

- active
- activeTarget
- inactive
- inactiveTarget
loadPanel

Procedure that loads actions.

Location: panel.p
Parameters: None
Notes: None

onChoose

Procedure that reads actions and parameters from Action class (Repository) and publishes the call built from them.

Location: panel.p
Parameters:
INPUT pcAction AS CHARACTER

The action to be undertaken.

Notes: None

queryPosition

Procedure that captures state events for the associated Query in the Panel’s NavigationTarget. Invokes the setPanelState function, which stores the new state in the object’s PanelState property and then invokes the setButtons procedure to change the Panel.

Location: panel.p
Parameters:
INPUT pcState AS CHARACTER

Panel State.

Note: For an Update panel, first/last/notfirstnotlast/only are all forms of recordAvailable. This event is ignored if the source of the event is hidden.

resetCommit

Procedure that resets the commit target actions.

Location: panel.p
Parameters: None
Notes: None
resetNavigation

Procedure that resets the navigation target actions.

**Location:** panel.p

**Parameters:** None

**Notes:** None

resetTableio

Procedure that encapsulates ALL tableio settings.

**Location:** panel.p

**Parameters:** None

**Notes:**

Can probably replace ALL other events except:

- linkChanged('inactive').
- updateState (updateComplete) and Tableiomode = update backfire of updateMode().

resetTargetActions

Procedure that resets action sensitivity and visibility.

**Location:** panel.p

**Parameters:**

INPUT pcLink AS CHARACTER

The link type whose actions are to be reset.

**Note:** Overridden in toolbar.p with use of temp-tables and additional logic for alternate image.
**resizeObject**

Procedure that changes the size and shape of the panel. This routine spaces the buttons to fill the available space.

*Location:* panel.p  
*Parameters:*

- **INPUT** `pd_height` AS DECIMAL  
  The desired height (in rows).
- **INPUT** `pd_width` AS DECIMAL  
  The desired width (in columns).

*Note:* Used internally. Calls to resizeObject are generated by the AppBuilder in `adm-create-objects` for objects that implement it. Having a resizeObject procedure is also the signal to the AppBuilder to allow the object to be resized at design time.

**sensitizeActions**

Turns sensitivity on or off for a specified list of actions.

*Location:* panel.p  
*Parameters:*

- **INPUT** `pcActions` AS CHARACTER  
  The comma-separated list of actions to be altered.
- **INPUT** `plSensitive` AS LOGICAL  
  TRUE if the actions are to be made sensitive.

*Returns:* LOGICAL  
*Note:* This is the static version; the dynamic version is in `toolbar.p`.

**targetActions**

Return the actions of a target.

*Location:* panel.p  
*Parameters:*

- **INPUT** `pcLinkType` AS CHARACTER  
  The type of target.

*Returns:* CHARACTER  
*Note:* This is the static version used for static buttons in panels. Overridden in `toolbar.p`.
updateState

Procedure that receives state-message events related to record updates.

**Location:** panel.p

**Parameters:**

INPUT pcState AS CHARACTER

Update state can be **Update** or **UpdateComplete**.

**Notes:**

- For **Update**, a Navigation Panel set its PanelState property to disable–all, to prevent navigation during an update operation. A Save or Update panel sets its state to **action–chosen**, meaning that a button has been pressed that puts the panel in the middle of an Update or Add or Copy operation that must be explicitly Saved to be completed.

- For **UpdateComplete**, a Navigation Panel restores the prior PanelState (having been disabled when the update began). A Save or Update panel sets its state to **add–only** if no rows are available in the current result set, to **disable–all** if no rows are available and there is also no available parent row for this result set (meaning that not even an Add could be done), or to **initial** if the RecordState is RecordAvailable, meaning that all operations are allowed (Update/Add/Copy/Delete).

- In addition, for an Update panel, which explicitly enables fields when an Update begins and disables them when the operation is Saved, the updateMode event is published with a value of **UpdateEnd**, to tell visualizations to disable their fields.

viewHideActions

Procedure that views and hides static actions.

**Location:** panel.p

**Parameters:**

INPUT pcViewActions AS CHARACTER

The comma-separated list of actions to make visible.

INPUT pcHideActions AS CHARACTER

The comma-separated list of actions to make hidden.

**Note:** Dynamic version in toolbar.p.
Toolbar methods for toolbar objects

This section lists and describes the methods for Toolbar objects.

**actionCanRun**

Determines whether or not a target is valid and a procedure exists. If TRUE, the target is valid and the procedure exists.

Location: toolbar.p

Parameters:

INPUT pcAction AS CHARACTER

The action of interest, of type RUN.

Returns: LOGICAL

Note: Called from buildMenu and createToolbar.

**actionCaption**

Override action class and caption.

Location: toolbar.p

Parameters:

INPUT pcAction AS CHARACTER

The replacement action.

Returns: CHARACTER

Notes: None

**actionCategoryIsHidden**

Determines whether or not the category for an action is hidden. If TRUE, the category is hidden.

Location: toolbar.p

Parameters:

INPUT pcAction AS CHARACTER

The action to be evaluated.

Returns: LOGICAL

Notes: None
**actionChecked**

Determines whether or not a call to `get propName` returns a value that matches the actions checked. If TRUE, the call to `get propName` returns a value that matches the actions checked.

**Location:** toolbar.p

**Parameters:**

INPUT pcAction AS CHARACTER

Action ID of an action of type RUN.

**Returns:** LOGICAL

**Note:** Currently we only support logical values. If the get function does not exist, or the object is not valid, this function returns the undefined value.

**actionLabel**

Overides the label of an action.

**Location:** toolbar.p

**Parameters:**

INPUT pcAction AS CHARACTER

The overriding action.

**Returns:** CHARACTER

**Notes:** None

**actionPublishCreate**

Subscribes create events to objects.

**Location:** toolbar.p

**Parameters:**

INPUT pcAction AS CHARACTER

The action of interest.

**Returns:** LOGICAL

**Notes:**

- Subscribes both active and inactive/hidden objects. Target links are considered as multiple, source links as single.
- Using the publish/subscribe mechanism makes it possible to refer to SOURCE-PROCEDURE in the events.
actionTarget

Handle of the target. By default, this is the handle of CONTAINER-SOURCE.

Location: toolbar.p
Parameters:
INPUT pcAction AS CHARACTER

The action of interest.
Returns: HANDLE
Note: Called by actions of type RUN and PROPERTY.

actionTooltip

Overrides the tooltip of an action.

Location: toolbar.p
Parameters:
INPUT pcAction AS CHARACTER

The overriding action.
Returns: CHARACTER
Notes: None

buildAllMenus

Procedure that builds all submenu branches before the persistent trigger Menu-Drop creates them at the mouse click. As a result, accelerators (keyboard shortcuts) are enabled from startup.

Location: toolbar.p
Parameters: None
Notes: None

categoryActions

Returns the available actions for a specific category on this toolbar master.

Location: toolbar.p
Parameters:
INPUT pcCategory AS CHARACTER

The category of interest. "*" means All; the empty string means uncategorized.
Returns: CHARACTER
Note: Used in the Instance Property dialog to select MenuBands.
**constructMenu**

Runs from initializeMenu when toolbar instance is first instantiated. Returns TRUE if successful.

**Location:** toolbar.p  
**Parameters:** None  
**Returns:** LOGICAL  
**Note:** This procedure must only be run ONCE and must be run before buildToolbar.

**constructToolbar**

Construct the toolbar from Repository data.

**Location:** toolbar.p  
**Parameters:** None  
**Returns:** LOGICAL  
**Note:** This realizes bands read from the repository. Non-repository toolbars are created with createToolbar. Both use createToolbarAction to realize the actions/widgets.

**createMenuTable**

Creates a temp-table for a menu.

**Location:** toolbar.p  
**Parameters:**

- INPUT pcParent AS CHARACTER  
  The unique action name of already-created parent. If blank, the table belongs to the menu bar.
- INPUT pcName AS CHARACTER  
  A unique name.
- INPUT phTarget AS HANDLE  
  The TARGET-PROCEDURE handle.
- INPUT pcBefore AS CHARACTER  
  The unique action name of an already-created sibling.

**Returns:** LOGICAL PRIVATE  
**Note:** This is done before it is built in order to be able to insert actions. Because some disable/enable actions might occur before initialization, some menu records might exist with "*" as parent.
createMenuTable2

Create the temp-table for a menu.

Location: toolbar.p

Parameters:

INPUT pcParent AS CHARACTER

The unique action name of an existing parent, or the empty string if the new menu is the menu bar.

INPUT pcName AS CHARACTER

The name of the menu.

INPUT phTarget AS HANDLE

Where to create it.

INPUT pcBefore AS CHARACTER

The unique action name of an existing sibling.

Returns: HANDLE PRIVATE

Note: This is done before it is built in order to be able to insert actions. Because some disable and enable actions might take place BEFORE initialization, someMenu record might exist with "*" as parent.

createToolbar

Create a toolbar from non-Repository data.

Location: toolbar.p

Parameters:

INPUT pcActions AS CHARACTER

Comma-separated list of actions or action-groups to include. RULE means a separator line.

Returns: LOGICAL

Notes: None
**filterState**

Procedure published from NAVIGATION-TARGET that enables the panel to filter action when it is linked.

**Location:** toolbar.p

**Parameters:**

INPUT pcState AS CHARACTER

Valid value: **FilterAvailable**.

**Notes:** None

**hideObject**

Procedure that hides the object.

**Location:** toolbar.p

**Parameters:** None

**Note:** For sizing reasons, the label is not really a part of the object, but added as a text widget to the parent frame.

**imageName**

Returns the name of the specified button image.

**Location:** toolbar.p

**Parameters:**

INPUT pcAction AS CHARACTER

The action of interest.

INPUT piNumber AS INTEGER

The image number, which can be 1 or 2.

**Returns:** CHARACTER

**Note:** This is published thru the container link and used mainly to validate that a FALSE value received in updateActive can be used to set UpdateActive. This is **NOT** intended to be called directly, but part of the logic that updates UpdateActive. These are the steps: (1) Updating objects publishes updateActive (TRUE or FALSE) to their container targets. (2) If the value is FALSE the container turns around and publishes this to ALL ContainerTargets before it is stored in UpdateActive. This way the value is only stored as FALSE if ALL contained objects are inactive.
initializeObject

Procedure that initializes the toolbar by creating all dynamic buttons and menus.

Location:    toolbar.p
Parameters:  None
Notes:       None

insertMenu

Creates a set of menu items or submenus under a parent menu.

Location:    toolbar.p
Parameters:

INPUT pcParent AS CHARACTER
            The unique action name of an already-inserted parent. Blank means this is the menu bar itself.

INPUT pcActions AS CHARACTER
            Comma-separated list of actions or ActionGroups. The term RULE specifies that delimiter.

INPUT p1Expand AS LOGICAL
            If TRUE, all actions in the action group are added under this parent. If FALSE, action groups are created as submenus.

INPUT pcBefore AS CHARACTER
            The unique action name of an already-inserted sibling.

Returns:     LOGICAL
Notes:       None

linkRuleBuffer

Creates the dynamic table used to check the rules against a target.

Location:    toolbar.p
Parameters:

pcLink AS CHAR
            Name of the link.

phTarget AS Handle
            Handle of any Target.

Returns:     HANDLE
Notes:

- The handle for the target is not created again if the link is changed. Instead, the same handle is used based on the assumption that all objects of the same type have the same API. If this is not TRUE, and the handle is not found, the data type is set to CHARACTER.

- This functionality is duplicated in panel.p.

**linkState**

Receives messages when an object linked to this object becomes active or activeTarget (when it is viewed) or inactive or inactiveTarget (when it is hidden).

**Location:** toolbar.p

**Parameters:**

**INPUT PARAMETER** pcState AS CHARACTER

State of a linked object. Valid states are:

- active
- activeTarget
- inactive
- inactiveTarget

**Note:** Resets panel buttons to reflect the state of the object.

**modifyDisabledActions**

Modifies the DisabledActions property and makes it possible to permanently disable actions independent of state changes.

**Location:** toolbar.p

**Parameters:**

**INPUT** pcMode AS CHARACTER

If **ADD**, adds the actions to the DisabledActions. If **REMOVE**, removes the actions from the DisabledActions.

**INPUT** pcActions AS CHARACTER

Comma-separated list of actions.

**Returns:** LOGICAL

**Note:** If pcMode = **ADD**, the actions are immediately disabled and subsequent calls to enableActions cannot enable them again. If pcMode = **REMOVE**, the actions that are removed from the list are enabled the next time they are called with enableActions.
onChoose
Procedure that is a persistent trigger code for dynamic menu and toolbar objects.

Location: toolbar.p
Parameters:
  INPUT pcName AS CHARACTER
    The Action identifier.
Notes: None

onMenuDrop
Procedure used to identify what logic to execute when a submenu is dropped.

Location: toolbar.p
Parameters:
  INPUT pcAction AS CHARACTER
    The action’s unique identifier.
Note: Added as a persistent trigger when the submenu is created.

onValueChanged
Procedure that is a persistent trigger for toggle menu-items.

Location: toolbar.p
Parameters:
  INPUT pcAction AS CHARACTER
    Name of action.
Note: Added as a persistent trigger when the submenu is created. Currently supports only logical properties.
**queryPosition**

Procedure that captures state events for the associated query in the Panel’s NAVIGATION-TARGET. Invokes the setPanelState() function to store the new state in the object’s PanelState property. Then invokes the setButtons procedure to change the Panel.

*Location:* toolbar.p

*Parameters:*

<table>
<thead>
<tr>
<th>INPUT pcState AS CHARACTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>State of the Panel.</td>
</tr>
</tbody>
</table>

*Note:* For an UPDATE panel, first/last/notfirstnotlast/only are all forms of recordAvailable.

**repositionObject**

Procedure that overrides default reposition. Because the coordinates are NOT assigned in design, the position only changes through direct manipulation and not when dropped in the container.

*Location:* toolbar.p

*Parameters:*

<table>
<thead>
<tr>
<th>INPUT pdRow AS DECIMAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>INPUT pdCol AS DECIMAL</td>
</tr>
</tbody>
</table>

*Note:* The file toolbar.i defines EXCLUDE-repositionObject (for smart.i).

**resetTargetActions**

Procedure that resets target actions of some kind for an object.

*Location:* toolbar.p

*Parameters:*

<table>
<thead>
<tr>
<th>INPUT pcLink AS CHARACTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>The kind of actions to reset.</td>
</tr>
</tbody>
</table>

*Notes:* None

**resetToolbar**

Procedure that resets toolbar actions by calling resetTargetActions.

*Location:* toolbar.p

*Parameters:* None

*Notes:* None
**resizeObject**

Procedure that overrides the size after a resize. The only allowed sizing is shrinking to the last button.

**Location:** toolbar.p  
**Parameters:**

INPUT pd_height AS DECIMAL  
INPUT pd_width AS DECIMAL  

**Note:** Used internally. Calls to resizeObject are generated by the AppBuilder in adm-create-objects for objects that implement it. Having a resizeObject procedure is also the signal to the AppBuilder to allow the object to be resized at design time.

**rowObjectState**

Procedure that is published from COMMIT-TARGET to tell the panel when to enable/disable itself. The panel enables itself when there are uncommitted changes, and disables itself at other times.

**Location:** toolbar.p  
**Parameters:**

INPUT pcState AS CHARACTER  

Valid values: NoUpdates, RowUpdated.  

**Note:** This could be a property, but at present the solution is to just check the state of the Commit button.

**runInfo**

Procedure that returns the necessary information for RUN or PROPERTY.

**Location:** toolbar.p  
**Parameters:**

INPUT pcAction AS CHARACTER  

Action Id where type = RUN.  

OUTPUT pocProcedure AS CHARACTER  

Target Procedure.  

OUTPUT pocParam AS CHARACTER  

**Note:** Encapsulates the logic that looks in the parent for this information, if it is not defined in the action itself.
storePendingSensitivity

Procedure used to store pending sensitivity settings used to resolve timing issues where sensitivity is set before the toolbar is built.

Location: toolbar.p

INPUT pcActions AS CHARACTER
INPUT plSensitive AS LOGICAL

Notes: None

targetActions

Returns the actions that apply to a specified target.

Location: toolbar.p

Parameters:

INPUT pcLinkType AS CHARACTER

The type of target.

Returns: CHARACTER

Notes: None

updateActive

Procedure that is published from Toolbar-Target (the container) to signal that some of its objects have changed state. Runs resetToolbar in TARGET-PROCEDURE.

Location: toolbar.p

Parameters: None

Notes: None
updateCategoryLists

Procedure that updates the lists of available categories for the toolbar. Called from loadBands at design time. The result is stored in AvailMenuActions and AvailToolbarActions.

Location: toolbar.p

Parameters:

INPUT pcBand AS CHARACTER

The band.

INPUT pcTopLevelType AS CHARACTER

The type of the band directly connected to the toolbar.

INPUT-OUTPUT pcMenuCategories AS CHARACTER

The list of categories.

INPUT-OUTPUT pcToolbarCategories AS CHARACTER

The list of categories.

Notes: None

updateState

Procedure that receives state message events related to record updates.

Location: toolbar.p

Parameters:

INPUT pcState AS CHARACTER

Update state.

Notes: None

updateStates

Procedure that updates state temp-table whenever bands/actions are loaded. Adds actions to already-loaded states.

Location: toolbar.p

Parameters:

INPUT pcState AS CHARACTER

The name of some state. Empty string means all.

Notes: None
viewHideActions

Procedure that sets actions to visible or hidden according to state (called from setbuttons). Loops through the pcViewActions list, then the pcHideActions.

Location: toolbar.p
Parameters:

INPUT pcViewActions AS CHARACTER
    List of actions to be made visible.

INPUT pcHideActions AS CHARACTER
    List of actions to be made HIDDEN.

Note: For buttons we simply hide/view existing buttons and then remove them into new positions. For menu items we must reconstruct any submenus that have been modified as menu items do not have a hidden attribute.

viewObject

Procedure used to view an object. The purpose for the override is to add the menu bar handle to the window.

Location: toolbar.p
Parameters: None
Notes: None
Toolbar Objects and Their Methods and Properties

Toolbar object properties

Toolbar Object properties provide information about toolbar objects and their classes. This information can include whether an object is enabled, the contents of the object and so on. You can read property values and in many instances you can change property values. To read a property value, you use a get function, and to change a property value, you use a set function.

These functions conform to the following conventions:

- **get** — Uses the form get propname and returns the current value of the property.

  **Note:** This function accepts no arguments.

- **set** — Uses the form set propname. The set function accepts a single argument—the new value for the property—and returns TRUE/FALSE depending on whether the value change succeeds.

For more information about getting and setting property values, see Chapter 1, “ADM2 SmartObject API Reference.”

AvailMenuActions

Actions that are available in the menu of the toolbar object. Updated internally from insertMenu. The Instance Property dialog shows these and AvailToolbarActions. The actions selected are saved as ActionGroups.

**Data type:** CHARACTER

**Note:** Read and Write.

AvailToolbarActions

List of actions available in the menu of this toolbar. The Instance Properties dialog shows these and AvailMenuActions. The actions selected are saved as ActionGroups.

**Data type:** CHARACTER

**Note:** Read and Write.

AvailToolbarBands

Comma-separated list of the available toolbar bands for this toolbar master. Assembles the list by looping through the temp-table.

**Data type:** CHARACTER

**Note:** Read only.
**BoxRectangle**

Handle to the rectangle, if any, around the buttons in the Panel used by resizeObject.

**Data type:** HANDLE

**Note:** Read only.

**BoxRectangle2**

Used for bottom rectangle on toolbars where ToolbarAutosize is TRUE.

**Data type:** HANDLE

**Note:** Read and Write.

**ButtonCount**

Number of buttons in a SmartPanel. Used by resizeObject.

**Data type:** INTEGER

**Note:** Read only.

**DeactivateTargetOnHide**

Property used to control whether or not a target should be deactivated immediately on hide. If TRUE, the target should be deactivated.

**Data type:** Logical

**Notes:**

- Read and Write.
- If TRUE, the received event is returned to the linkStateHandler of the source procedure along with the handle of the toolbar so that it can activate or deactivate the link accordingly.
- If FALSE, an inactive state is ignored and an active event is used to pass inactive to the linkStateHandler procedure for all the targets that are not the source of the publish and active is passed to the source for activation.

**DisabledActions**

Comma-separated list of disabled actions. Placing actions in this list immediately disables them and calls to enableActions have no effect on them while they are listed. That makes it possible to permanently disable actions regardless of state changes. Removing actions from this list with modifyDisabledActions allows enableActions to enable them again.

**Data type:** CHARACTER

**Note:** Read and Write.
**EdgePixels**

Value of EdgePixels.

**Data type:** INTEGER  
**Note:** Read and Write.

**HiddenActions**

Comma separated list of hidden actions.

**Data type:** CHARACTER  
**Note:** Read and Write.

**HiddenMenuBands**

Comma-separated list of hidden menu bands.

**Data type:** CHARACTER  
**Note:** Read and Write.

**HiddenToolbarBands**

Comma-separated list of hidden toolbar bands.

**Data type:** CHARACTER  
**Note:** Read and Write.

**Image**

Name of the button of interest or button-image number.

**Data type:** LOGICAL  
**Note:** Write only.

**ImagePath**

Path to the images in the file system.

**Data type:** LOGICAL  
**Note:** Read and Write.
MarginPixels

Number of pixels to reserve for the Panel margin used by resizeObject.

**Data type:** INTEGER

**Note:** Read only.

Menu

Determines whether or not to generate a menu. TRUE if a menu is to be generated.

**Data type:** LOGICAL

**Note:** Read and Write.

MenuMergeOrder

Determines the order in which menus are merged with other toolbar instances.

**Data type:** INTEGER

**Note:** Read and Write.

MinHeight

Determines the minimum height.

**Data type:** DECIMAL

**Note:** This property is Read only in `toolbar.p` and Read and Write in `visual.p`.

MinWidth

Determines the minimum width.

**Data type:** DECIMAL

**Note:** Read only.

NavigationTargetEvents

Comma-separated list of the events this object wants to subscribe to in its NavigationTarget.

**Data type:** CHARACTER

**Note:** Read only.
### NavigationTargetName

Object name of the Data Object to be navigated by this panel. This is set if the Navigation-Target is an SBO or other Container with DataObjects.

**Data type:** CHARACTER  
**Note:** Read and Write.

### PanelFrame

Frame handle of the SmartPanel, for resizeObject.

**Data type:** HANDLE  
**Note:** Read only.

### PanelLabel

Handle of the label for the Panel, if any.

**Data type:** HANDLE  
**Note:** Read only.

### PanelState

Current state of the SmartPanel.

**Data type:** CHARACTER  
**Note:** Read and Write.

### PanelType

Type of SmartPanel (**Update**, **Navigation**, and so on).

**Data type:** CHARACTER  
**Note:** Read and Write.

### SecuredTokens

Comma-separated list of secured tokens available from the container.

**Data type:** CHARACTER  
**Note:** Read and Write.
**ShowBorder**

Determines whether or not a three-dimensional border is to be used around the buttons and as a delimiter when `RULE` is specified in `createToolbar`. TRUE if a three-dimensional border is to be used around.

**Data type:** LOGICAL  
**Note:** Read and Write.

**StaticPrefix**

Prefix used before the action name in static definitions. Needed for use with the Repository.

**Data type:** CHARACTER  
**Note:** Read and Write.

**TableIOTarget**

List of the handles, in character format, of the TableIO Targets of an object.

**Data type:** CHARACTER  
**Note:** Read and Write.

**TableIOTargetEvents**

Comma-separated list of the events to which this object wants to subscribe to in its TableIO Target.

**Data type:** CHARACTER  
**Note:** Read and Write.

**TableIOType**

Comma-separated list in CHARACTER format of the object’s TableIO-Target handles.

TableIO-specific values of `PanelType`, if any, so that `resetTableio` can handle panels similar to toolbar.

**Data type:** CHARACTER  
**Note:** Read and Write.

**Toolbar**

Determines whether or not to create a toolbar. TRUE if the toolbar is to be created.

**Data type:** LOGICAL  
**Note:** Read and Write.
ToolbarAutoSize

Determines whether or not the toolbar should be auto-sized to the width of the window at runtime. TRUE if the toolbar should be auto-sized.

Data type: LOGICAL
Note: Read and Write.

ToolbarBands

List of the toolbar bands selected in the Instance Properties.

Data type: CHARACTER
Note: Read and Write.

ToolbarDrawDirection

Draw direction: horizontal or vertical of the toolbar.

Data type: CHARACTER
Note: Read and Write.

ToolbarHeightPxl

Calculates and returns the toolbar height in pixels from the three properties: ToolHeightPXL, ToolbarMarginPxl, and ShowBorder.

Data type: INTEGER
Note: Read only.

ToolbarInitialState

State selected in the Instance Properties. Used to view or hide buttons and menus according to state.

Data type: CHARACTER
Note: Read and Write.

ToolbarTargetEvents

List of events to which this object wants to subscribe in the Toolbar-Target.

Data type: CHARACTER
Note: Read and Write.
Toolbar object properties

**ToolbarWidthPxl**
Calculates and returns the toolbar width: ToolMarginPxl, ToolWidthPxl, and ToolMaxWidthPxl.

**Data type:** INTEGER

**Note:** Read only.

**ToolMarginPxl**
Returns a constant zero.

**Data type:** INTEGER

**Note:** Read and Write.
### Action properties for toolbar objects

There are a number of action properties that you use to specify actions for the toolbar. All of these properties can be read and some of them can be set using `assign`. Action properties are class-level properties, and as a result, changing an action property using `assignAction<Property>` affects all toolbars that are initialized after the change.

Table 6–1 lists and provides a brief description of the action properties for toolbar objects.

Table 6–1: **Action properties for toolbar objects**

<table>
<thead>
<tr>
<th>Action property</th>
<th>Description</th>
<th>Read</th>
<th>Write</th>
<th>Data type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accelerator</td>
<td>Accelerator string, if any, for the specified action.</td>
<td>Yes</td>
<td>Yes</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>AccessType</td>
<td>Access type, if any, for some action.</td>
<td>Yes</td>
<td>Yes</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>AlternateImageRule</td>
<td>TRUE if able to successfully assign some value to the AlternateImageRule for some action.</td>
<td>No</td>
<td>Yes</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>Caption</td>
<td>Caption for some action, or the empty string if there is no caption defined.</td>
<td>Yes</td>
<td>Yes</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>Category</td>
<td>Category for the action identified in the argument.</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>Children</td>
<td>Comma-separated list of all children of a specified action.</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>ControlType</td>
<td>Control-type for the action identified in the argument.</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>CreateEvent</td>
<td>Creates an event for the specified action.</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>Description</td>
<td>Value for the specified action.</td>
<td>Yes</td>
<td>Yes</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>Disabled</td>
<td>Value of actionDisabled. TRUE if the action identified in the argument has been disabled.</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>DisableRule</td>
<td>Flag indicating whether or not a value can be assigned to DisableRule. TRUE if a value can be assigned.</td>
<td>No</td>
<td>Yes</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>EnableRule</td>
<td>The ImageEnableRule for a given action as stored in the repository.</td>
<td>Yes</td>
<td>Yes</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>Action property</td>
<td>Description</td>
<td>Read</td>
<td>Write</td>
<td>Data type</td>
</tr>
<tr>
<td>-------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>------</td>
<td>-------</td>
<td>---------------</td>
</tr>
<tr>
<td>EnableRulex</td>
<td>Query string for the specified argument. Valid values are reset, add, copy,</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td></td>
<td>delete, save, cancel, first, prev, next, and last</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Event</td>
<td>Identifies the event to publish on Default-action of the browse. This</td>
<td>Yes</td>
<td>Yes</td>
<td>CHARACTER</td>
</tr>
<tr>
<td></td>
<td>property defines the persistent trigger that runs defaultAction and also</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>subscribes the source-procedure.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>Identifies the action groups specified by Instance Properties. Instance</td>
<td>Yes</td>
<td>Yes</td>
<td>CHARACTER</td>
</tr>
<tr>
<td></td>
<td>Properties list the ADM instance properties of the selected SmartObject. See</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>the “InstanceProperties” section on page 2–34 for more information.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HideRule</td>
<td>Value of HideRule for the action supplied as the argument.</td>
<td>Yes</td>
<td>Yes</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>HideRuleX</td>
<td>A string value depending on the argument. The empty string is returned if</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td></td>
<td>the argument is not valid. Valid values are update, txtTableioOk, and</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>txtTableioCancel.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Image</td>
<td>Value for ActionImage.</td>
<td>Yes</td>
<td>Yes</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>ImageAlternate</td>
<td>Value actionImageAlternate.</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>ImageAlternateRule</td>
<td>ImageAlternateRule for a given action as stored in the repository. The</td>
<td>Yes</td>
<td>Yes</td>
<td>CHARACTER</td>
</tr>
<tr>
<td></td>
<td>rules are evaluated in ruleStateChanges.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>InitCode</td>
<td>Value of InitCode.</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>Action property</td>
<td>Description</td>
<td>Read</td>
<td>Write</td>
<td>Data type</td>
</tr>
<tr>
<td>--------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>------</td>
<td>-------</td>
<td>---------------</td>
</tr>
<tr>
<td>IsMenu</td>
<td>Flag determines whether or not an action is Menu. TRUE if the action is Menu. Actions defined as a menu are considered to be a constant part of the toolbar and are not selectable. This means that the action is always available. The action needs to be added to a toolbar with createToolbar or insertMenu(). It does not appear as a selectable action in the instance property dialog even if actionIsParent returns a TRUE status.</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>IsParent</td>
<td>Indicates whether or not an action is a parent. TRUE if the identified action is a parent.</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>Label</td>
<td>Button label for the action button.</td>
<td>Yes</td>
<td>Yes</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>Link</td>
<td>Link value for a specified action.</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>LogicalObjectName</td>
<td>LogicalObjectName value for a specified action.</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>Name</td>
<td>Name value for a specified action.</td>
<td>Yes</td>
<td>Yes</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>OnChoose</td>
<td>OnChoose value for a specified action.</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>Order</td>
<td>Associates an integer order number with an action.</td>
<td>No</td>
<td>Yes</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>Parameter</td>
<td>RunParameter value for a specified action.</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>Parent</td>
<td>Parent value for a specified action.</td>
<td>Yes</td>
<td>Yes</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>PhysicalObjectName</td>
<td>PhysicalObjectName value for a specified action.</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>Refresh</td>
<td>Flag indicating whether or not the specified action can be refreshed. TRUE if the specified action can be refreshed.</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>RunAttribute</td>
<td>RunAttribute value for a specified action.</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
</tbody>
</table>
### Table 6–1: Action properties for toolbar objects

<table>
<thead>
<tr>
<th>Action property</th>
<th>Description</th>
<th>Read</th>
<th>Write</th>
<th>Data type</th>
</tr>
</thead>
<tbody>
<tr>
<td>SecondImage</td>
<td>Image2 value for a specified action. TRUE if able to assign a new value to Image2 for some action.</td>
<td>Yes</td>
<td>Yes</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>SecuredToken</td>
<td>SecurityToken value for a specified action.</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
<tr>
<td>SubstituteProperty</td>
<td>SubstituteProperty value for a specified action.</td>
<td>Yes</td>
<td>No</td>
<td>CHARACTER</td>
</tr>
</tbody>
</table>
| Tooltip         | Value depends on the value of TranslatedActionTooltip for a specified action. The values that might be returned are:  
  - TranslatedActionMLabel  
  - TranslatedActionLabel  
  - Tooltip.  
  TRUE if able to assign a new value to Tooltip for a specified action. | Yes   | Yes   | CHARACTER |
| Type            | Type value for a specified action. | Yes   | No    | CHARACTER |
Field Objects and Their Methods and Properties

This chapter lists and describes the methods (internal procedures and functions) and properties used for Toolbar Objects. Field Object methods and properties let you define SmartObject at a field level. Using these methods and properties, you can identify and get handles of fields and objects inside other objects for your application code. Refer to Figure 1–1 to see the inheritance hierarchy for each object class.

Note: For information specific to the WebSpeed environment, see the Chapter 9, “Alphabetical Listing of WebSpeed-specific API Routines.”

This chapter provides information on the following:

• Base methods for field objects
• Methods for select field objects
• Methods for combo field objects
• Methods for lookup field objects
• Field object properties
• Field object column properties
Base methods for field objects

The field methods support Smart technology at the field level. With these methods you can create SmartDataFields the support a wide variety of different visualizations.

initializeObject

The procedure generates special code for initializing SmartDataFields.

**Location:** field.p

**Parameters:** None

**Note:** This procedure stores the procedure handle of the SmartDataField in the PRIVATE-DATA of its Frame, in order that the procedure can be located from the frame. It also adds itself to the DisplayedFields property of its containing SmartDataViewer if the DisplayField logical property is TRUE, and, if EnableField is TRUE, to the EnabledFields property as well.

resizeObject

Procedure that resizes the field by looping through all fields in the Frame and resizing any that do not have ‘NO-RESIZE’ in the PRIVATE-DATA property.

**Location:** field.p

**Parameters:**

INPUT pidHeight AS DECIMAL

New height.

INPUT pidWidth AS DECIMAL

New width.

**Note:** No resizing is done by default. For this you need to create an override procedure in your SmartDataField with your own code, specific to your SmartDataField.
Methods for select field objects

You use the select methods for SmartSelect objects. These objects represent a self-populating selection list.

anyKey

Procedure that runs persistently on any key of the selection fill-in.

Used only with the view-as browse option. The persistent trigger that calls this is defined if DefineAnyKeyTrigger is TRUE. The user could define an override of this in selectcustom.p if more sophisticated interactions with the data-source are required without starting the browse. For example:

```plaintext
listif last-event:key-function = "cursor-down"
then run fetchNext in getDataSource().
```

Location: select.p
Parameters: None
Example:

```plaintext
listif last-event:key-function = "cursor-down"
then run fetchNext in getDataSource().
```

Notes: None

browseHandler

Procedure that sets the properties in the newly started Browse widget.

Location: select.p
Parameters:

```plaintext
INPUT phBrowseObject AS HANDLE

Handle of the Browse.
```

Note: Called by initializeBrowse before the Browse has been linked or initialized. Override this function to set/override properties for the Browse.

buildList

Builds the list of fields to display and the corresponding SCREEN-VALUE for the widget.

Location: select.p
Parameters: None
Returns: CHARACTER PRIVATE
Note: Loops through all the rows in the data-source, building the list.
**createLabel**

Creates the label of the selection. The label is added to the parent frame.

**Location:** select.p  
**Parameters:**  
INPUT pcLabel AS CHARACTER  
**Returns:** HANDLE  
**Notes:**  
- This function is separated in order to create the label in design-mode.  
- Instance properties:
  - Shows label when label is set from the data-source. The dialog knows the Data-Source, but this super procedure cannot find it because the link is not implemented.  
  - EndMove. Moves label accordingly.

**dataAvailable**

Procedure that defines logic to receive data from the data-source when the view-as is a fill-in.

**Location:** select.p  
**Parameters:**  
INPUT pcMode AS CHARACTER  
**Note:** Use a Modify property to avoid marking the value as changed when setdataValue calls fetchRowident in the data-source in order to display the record. If Modify is TRUE, check the source-procedure because this identifies whether this is called directly from value-changed, or indirectly from default-action.

**destroyObject**

Local override of destroyObject, this procedure deletes created widgets.

**Location:** select.p  
**Parameters:** None  
**Notes:** None
**destroySelection**

Cleans up all dynamically created objects.

Location: select.p
Parameters: None
Returns: LOGICAL PRIVATE
Notes: None

**disableButton**

Procedure that disables a SmartSelect's controls. Used to prevent finding and perhaps unintentionally changing a second record when an update is pending.

Location: select.p
Parameters: None
Notes: None

**disableField**

Procedure that disables SmartSelection component.

Location: select.p
Parameters: None
Note: The SmartDataViewer container calls this procedure if a widget of type PROCEDURE is encountered in disableFields.

**disable_UI**

Procedure that disables the user interface parameters.

Location: select.p
Parameters: None
Note: Clean up the user interface by deleting dynamic widgets that have been created or by hiding frames, as appropriate. This procedure is usually called when ready to clean up after running.

**enableButton**

Procedure that undoes the action of disableButton.

Location: select.p
Parameters: None
Notes: None
**enableField**

Procedure that enables SmartSelection component.

Location: select.p

Parameters: None

Note: The SmartDataViewer Container calls this procedure if a widget of type PROCEDURE is encountered in enableFields.

**endMove**

In design mode, this procedure moves the label when the field is moved.

Location: select.p

Parameters: None

Note: Defined as PERSISTENT on END-MOVE of the frame of the widget.

**enterSelect**

When a trigger fires on entry of SmartSelect field, this procedure copies the screen value to the object. As a result, the lookup can be avoided if the new value actually exists as a unique record.

Location: select.p

Parameters: None

Notes: None

**formattedValue**

Returns the formatted value of a passed value according to the SmartSelects format.

Location: select.p

Parameters:

INPUT pcValue AS CHARACTER

The value that needs to be formatted.

Returns: CHARACTER

Note: Used internally in order to ensure that unformatted data can be applied to screen-value (setDataValue), or used as a lookup in list-item-pairs in (getDisplayValue).
hideObject

Procedure that overrides to ensure that the label is hidden.

Location: select.p
Parameters: None
Note: For sizing reasons, the label is not really a part of the object, but added as a text widget to the parent frame.

initializeBrowse

Code to initialize a browse. This procedure starts a browse to show the Data-source data. The browse procedure is specified in the BrowseProcedure property and defaults to the dynamic SmartDataBrowser. A dynamic SmartWindow (BrowseContainer) is started first and the browse procedure is started with the containers constructObject.

Location: select.p
Parameters: None
Notes: None

initializeObject

Procedure that overrides initializeObject in order to subscribe to the ChangedEvent, if defined, and to initializeSelection.

Location: select.p
Parameters: None
Notes: None

initializeSelection

Unless the view-as is specified to be a browse, this procedure creates a selection widget and populates it with data.

Location: select.p
Parameters: None
Notes: None

leaveSelect

This procedure fires on leave of a SmartSelect field and determines whether the lookup can be avoided because the new value exists as a unique record.

Location: select.p
Parameters: None
Note: This works only if the displayed field is in the first buffer of the linked SDO.
**queryOpened**

Procedure that subscribes to dataSource parameters.

**Location:** select.p  
**Parameters:** None  
**Note:** SmartSelect needs to know that the query has changed, since this cannot be detected through an ordinary publish with dataAvailable.

---

**refreshObject**

Procedure that refreshes the data in a SmartSelect.

**Location:** select.p  
**Parameters:** None  
**Note:** openQuery in the datasource publishes “queryOpened” which is Subscribed to run this (in initializeSelection). Also defined as PERSISTENT trigger on F5 of the selection widget.

---

**repositionDataSource**

Repositions the current dataSource according to the key field. Conditionally called from setValue() and valueChanged().

**Location:** select.p  
**Parameters:**  
- INPUT pcValue AS CHARACTER

**Returns:** LOGICAL  
**Notes:** None

---

**resizeObject**

Procedure that resizes the SmartSelect.

**Location:** select.p  
**Parameters:**  
- INPUT pidHeight AS DECIMAL
  - New height of component.  
- INPUT pidWidth AS DECIMAL
  - New width of component.  

**Note:** The procedure deletes the current widget, resizes the frame, and re-creates the widget.
**rowSelected**

Procedure that publishes from the browser when a row is selected.

**Location:** select.p  
**Parameters:** None  
**Note:** The browser is selected on default action and exits (if CancelrowObExit = FALSE). The subscripting is done in browseHandler.

**valueChanged**

Procedure used to notify the SmartDataViewer container that this value has changed.

**Location:** select.p  
**Parameters:** None  
**Note:** Defined as a PERSISTENT value-changed trigger in the dynamic-widget. The code currently duplicates the logic that is defined in the U10 trigger in the SmartDataViewer when the view-as is browse, because this code’s check of FOCUS is wrong when the actual change is caused by a user event in the browser.

**viewObject**

Procedure that makes sure the label is viewed.

**Location:** select.p  
**Parameters:** None  
**Notes:** None
Methods for combo field objects

This section lists and describes the methods for SmartCombo field objects.

**anyKey**

Procedure used to trap a keypress and scroll to the first entry beginning with that key character. Add your code to complete.

Location: combo.p
Parameters: None
Note: Use LAST-EVENT:FUNCTION for testing keypress.

**createLabel**

Creates the label for the Combo Box.

Location: combo.p
Parameters: INPUT pcLabel AS CHARACTER
Returns: HANDLE
Note: This function is separated in order to be able to create the label in design-mode. The label is defined in the parent Frame.

**destroyCombo**

Cleans up all dynamically created objects.

Location: combo.p
Parameters: None
Returns: LOGICAL
Notes: None

**destroyObject**

Local override of destroyObject. This procedure deletes dynamic Combo Box objects by calling destroyCombo.

Location: combo.p
Parameters: None
Notes: None
disableField

Procedure that sets SENSITIVE and FieldEnabled to FALSE.

**Location:** combo.p

**Parameters:** None

**Note:** The SmartDataViewer container calls this procedure if a widget of type PROCEDURE is encountered in disableFields.

disable_UI

Procedure that purges THIS-PROCEDURE, if persistent.

**Location:** combo.p

**Parameters:** None

**Note:** Clean up the user-interface. This routine is usually called after execution completes.

displayCombo

This procedure is published from the SmartViewer containing the SmartDataField to populate the Combo with the evaluated query data, if the query was successful. It is published from displayFields in the viewer. The queries are initially built in ComboQuery.

**Location:** combo.p

**Parameters:**

INPUT TABLE FOR ttDCombo

**Note:** This is designed to allow all combo queries to be built at the cost of only a single appserver call.

enableField

Procedure that enables a Combo field. The SmartDataViewer calls this procedure if a widget of type PROCEDURE is encountered in enableFields.

**Location:** combo.p

**Parameters:** None

**Notes:** None
**enterCombo**

This procedure fires a trigger on entry into a Combo field to store the current screen value of the displayed field.

**Location:** combo.p  
**Parameters:** None  
**Note:** The typical case is that the displayed field are not the same as the keyfield. In that case, logic can be fired when the displayed field is changed in the leave trigger to see if the new value keyed in actually exists as a unique record, and if so, avoid having to use the combo.

**endMove**

This procedure moves the label whenever the field is moved in design mode.

**Location:** combo.p  
**Parameters:** None  
**Note:** Defined as PERSISTENT on END-MOVE of the frame of the widget.

**hideObject**

This procedure gets the value of LabelHandle, hides the label, and then calls RUN SUPER.

**Location:** combo.p  
**Parameters:** None  
**Note:** For sizing reasons, the label is not really a part of the object, but added as a text widget to the parent frame.

**initializeCombo**

Procedure that runs as part of initializeObject to set up the combo.

**Location:** combo.p  
**Parameters:** None  
**Note:** Defaults keyfield to actual field if not defined. Defaults displayed field to keyfield if not defined. Assumes a data type of decimal for keyfield and character for displayed field if different.
**insertExpression**

Inserts an expression into ONE buffer’s WHERE clause.

**Location:** combo.p

**Parameters:**

- **INPUT pcWhere** AS CHARACTER
  
  A complete WHERE clause with or without the FOR keyword, and without leading or trailing commas.

- **INPUT pcExpression** AS CHARACTER
  
  New expression/OF phrase to replace the existing OF phrase.

- **INPUT pcAndOr** AS CHARACTER
  
  Whether to AND (default) or OR the new expression.

**Returns:** CHARACTER PRIVATE

**Notes:**

- The new expression is embedded in parentheses, but no parentheses are placed around the existing expression.

- Lock keywords must be unabbreviated or without –LOCK (that is, SHARE or EXCLUSIVE).

- Any keyword in comments might cause problems.

**leaveCombo**

This procedure fires a trigger on leave of combo field. It stores the current screen value in the combo.

**Location:** combo.p

**Parameters:** None

**Notes:** None
newQueryString

Returns a new query string to the passed query. The tables in the passed query must match getQueryTables(). Adds column / value pairs to the corresponding buffer’s where-clause. Each buffer’s expression is always embedded in parenthesis.

**Location:** combo.p

**Parameters:**

INPUT pcColumns AS CHARACTER

Comma-separated list of column names of the form table.fieldname.

INPUT pcValues AS CHARACTER

Chr(1)-separated list of corresponding values.

INPUT pcDataTypes AS CHARACTER

Comma-separated list of corresponding data types.

INPUT pcOperators AS CHARACTER

Comma-separated list of corresponding operators. If blank, the operator is EQ for all columns. Alternative string operators can be separated with a slash, for example: EQ/BEGINS.

INPUT pcQueryString AS CHARACTER

A complete query string. This must be qualified correctly and match the queried tables. If the Unknown value (?), the base query is presumed.

INPUT pcAndOr AS CHARACTER

The operator that defines how the new clause is appended, for each buffer, to the query in pcQueryString. Valid values are **AND** and **OR**.

**Returns:** CHARACTER

**Note:** This was taken from query.p but changed for Combos to work without an SDO.
newWhereClause

Inserts a new expression to query’s prepare string for a specified buffer.

**Location:** combo.p

**Parameters:**

- **INPUT pcBuffer** AS CHARACTER
  
  The buffer.

- **INPUT pcExpression** AS CHARACTER
  
  The new expression.

- **INPUT pcWhere** AS CHARACTER
  
  The current query-prepare string.

- **INPUT pcAndOr** AS CHARACTER
  
  The operator used to relate the new expression to the existing query. Valid values are **AND** (default) and **OR**.

**Returns:** CHARACTER

**Note:** This is a utility function that does not use properties.

refreshChildDependancies

Procedure that refreshes any children of the Combo identified in the argument.

**Location:** combo.p

**Parameters:**

- **INPUT pcFieldName** AS CHARACTER
  
  The possible parent.

**Notes:** None

refreshCombo

This procedure runs displayCombo in TARGET-PROCEDURE. This is usually triggered from a value-changed event of a parent combo.

**Location:** combo.p

**Parameters:** None

**Notes:** None
### resizeObject

This procedure resizes the Combo by deleting the widget, resizing the frame, and recreating the widget in the new size.

**Location:** combo.p  
**Parameters:**

- INPUT pidHeight AS DECIMAL  
  New height of the widget.  
- INPUT pidWidth AS DECIMAL  
  New width of the widget.

**Notes:** None

### returnParentFieldValues

This procedure loops through all field handles.

**Location:** combo.p  
**Parameters:**

- OUTPUT pcNewQuery AS CHARACTER

**Notes:** None

### showQuery

Procedure that displays the current query of the combo.

**Location:** combo.p  
**Parameters:** None  
**Notes:** None

### valueChanged

Procedure used to notify the SmartDataViewer that the Combo’s value has changed. Publishes populateChildCombo and comboValueChanged.

**Location:** combo.p  
**Parameters:** None  
**Note:** Defined as a PERSISTENT value-changed trigger in the dynamic-widget. The code currently duplicates the logic that is defined in the U10 trigger in the SmartDataViewer because this code’s check of FOCUS is wrong when the actual change is caused by a user event in the browser.
whereClauseBuffer

Returns the buffername of a WHERE clause expression. This function avoids problems with leading or double blanks in WHERE clauses.

**Location:** combo.p

**Parameters:**

INPUT pcWhere AS CHARACTER

Complete where clause for ONE table with or without the FOR keyword. The buffer name must be the second token in the clause, not counting any FOR. For example: "EACH order OF Customer", but "FOR EACH order".

**Returns:** CHARACTER PRIVATE

**Note:** PRIVATE, used internally in query.p only.

viewObject

Procedure that turns off HIDDEN to make the label visible.

**Location:** combo.p

**Parameters:** None

**Note:** For sizing reasons, the label is not really a part of the object, but added as a text widget to the parent frame.
Methods for lookup field objects

This section lists and describes the methods for SmartLookup field objects. A SmartLookup is a faster but less general version of a SmartSelect object.

**anyKey**

Procedure used to trap a keypress and display a single-value return by going directly to the query.

- **Location:** lookup.p
- **Parameters:** None
- **Note:** Use LAST-EVENT:FUNCTION for testing keypress.

**createLabel**

Creates the label for the Lookup.

- **Location:** lookup.p
- **Parameters:**
  - INPUT pcLabel AS CHARACTER

  The label string.
- **Returns:** HANDLE
- **Note:** This function is separated in order to create the label in design-mode. The label is defined in the parent Frame.

**destroyLookup**

Destroys associated lookups, labels, and buttons.

- **Location:** lookup.p
- **Parameters:** None
- **Returns:** LOGICAL
- **Notes:** None

**destroyObject**

Local override of destroyObject, this procedure deletes created widgets.

- **Location:** lookup.p
- **Parameters:** None
- **Notes:** None
disableButton

Procedure that disables the specific Lookup’s button and Browser to prevent the use of the Lookup.

Location: lookup.p
Parameters: None
Note: Use this procedure when you want to modify a specific record, but do not want a user to use a specific Lookup to find another record and potentially modify the record.

disableField

Procedure that disables Lookup field in a Viewer.

Location: lookup.p
Parameters: None
Note: The SmartDataViewer calls this procedure if a widget of type PROCEDURE is encountered in disableFields.

disable_UI

Procedure that disables the user interface and releases memory, typically at the end of a session.

Location: lookup.p
Parameters: None
Note: This procedure cleans up the user interface by deleting dynamic widgets that were created and hiding Frames.

displayLookup

Procedure that finds and displays a Lookup. This routine is published by the SmartViewer to populate the Lookup with the evaluated query data, if the query was successful. The queries were initially built in getLookupQuery.

Location: lookup.p
Parameters: None
Notes:
- This allows all lookup queries to be built at the cost of a single AppServer call.
- Note that this is not run at all in ADD mode, unless the Lookup is manually fired.
enableButton

If you disable the Lookup button to prevent the user from using it, this procedure calls this routine to re-enable the button again.

Location: lookup.p
Parameters: None
Notes: None

enableField

This procedure, enables a Lookup Field. The SmartDataViewer calls this routine if a widget of type PROCEDURE is encountered in enableFields.

Location: lookup.p
Parameters: None
Notes: None

endMove

In design mode, this procedure moves the label when the field is moved.

Location: lookup.p
Parameters: None
Note: Defined as PERSISTENT on END-MOVE of the frame of the widget.

enterLookup

This procedure fires a trigger on entry of lookup field.

Location: lookup.p
Parameters: None
Note: This trigger stores the current screen value of the displayed field in the Lookup. When the displayed and key fields are not the same, and the displayed field is changed in the leave trigger, code can be run to check whether the value entered actually exists as a unique record. If it does, the Lookup need not be used.

hideObject

This procedure gets the value of LabelHandle, hides the label, and then calls RUN SUPER.

Location: lookup.p
Parameters: None
Note: For sizing reasons, the label is not really a part of the object, but added as a text widget to the parent frame.
initializeBrowse

This procedure initializes the lookup browser window.

**Location:** lookup.p

**Parameters:** None

**Notes:** None

initializeLookup

This procedure runs as part of initializeObject to set up the lookup.

**Location:** lookup.p

**Parameters:** None

**Note:** Defaults keyfield to actual field if not defined. Defaults displayed field to keyfield if not defined. Assumes a data type of decimal for keyfield and character for displayed field if different.

insertExpression

PRIVATE function. Inserts an expression into one buffer’s WHERE clause.

**Location:** lookup.p

**Parameters:**

INPUT pcWhere AS CHARACTER

A complete WHERE clause with or without the FOR keyword, and without leading or trailing commas.

INPUT pcExpression AS CHARACTER

New expression/OF phrase to replace the existing OF phrase.

INPUT pcAndOr AS CHARACTER

Whether to AND (default) or OR the new expression.

**Returns:** CHARACTER PRIVATE

**Notes:**

- The new expression is embedded in parentheses, but no parentheses are placed around the existing expression.

- Lock keywords must be unabbreviated or without –LOCK (that is, SHARE or EXCLUSIVE.)

- Any keyword in comments might cause problems.
**leaveLookup**

This procedure is fired on leave of a lookup field and handles the situation when a value is manually entered rather than using the lookup key.

When this occurs, it must be determined whether the screen value has changed. If the screen value has changed, it must be verified whether the changed screen value is a valid record. If it is a valid record, the key value is reset to avoid using the lookup.

**Location:** lookup.p  
**Parameters:** None  
**Notes:** None

**newQueryString**

Returns a new query string to the passed query. The tables in the passed query must match getQueryTables(). Adds column/value pairs to the corresponding buffer’s WHERE clause. Each buffer’s expression is always enclosed in parentheses.

**Location:** lookup.p  
**Parameters:**

- **INPUT pcColumns AS CHARACTER**  
  Comma-separated list of column names, of the form table.fieldname.

- **INPUT pcValues AS CHARACTER**  
  Comma-separated list of the corresponding values.

- **INPUT pcDataTypes AS CHARACTER**  
  Comma-separated list of the corresponding data type.

- **INPUT pcOperators AS CHARACTER**  
  Comma-separated list of operators. If a single operator, applies to all columns. If blank, defaults to EQ. Separate alternative string operators with a slash; example: EQ/BEGINS.

- **INPUT pcQueryString AS CHARACTER**  
  A complete, fully-qualified query string matching the queries tables. If the Unknown value (?), use the base query.

- **INPUT pcAndOr AS CHARACTER**  
  How to relate the new expression to the existing query (for each buffer). Valid values are AND and OR.

**Returns:** CHARACTER  
**Note:** This was taken from query.p but changed for lookups to work without an SDO.
### newWhereClause

Appends a new expression to the query’s prepare string for a specified buffer.

**Location:** lookup.p

**Parameters:**

- **INPUT pcBuffer** AS CHARACTER
  
  The target buffer.

- **INPUT pcExpression** AS CHARACTER
  
  The new expression.

- **INPUT pcWhere** AS CHARACTER
  
  The current query-prepare string.

- **INPUT pcAndOr** AS CHARACTER
  
  The operator with which to append the new expression: ‘AND’ (default) or ‘OR’.

**Returns:** CHARACTER

**Note:** This is a utility function that does not use properties.

### resizeObject

This procedure resizes the Lookup by deleting the widget, resizing the Frame, and recreating the widget.

**Location:** lookup.p

**Parameters:**

- **INPUT pidHeight** AS DECIMAL
  
  The new height.

- **INPUT pidWidth** AS DECIMAL
  
  The new width.

**Notes:** None

### returnParentFieldValues

Value of returnParentFieldValues.

**Location:** lookup.p

**Parameters:**

- **OUTPUT pcNewQuery** AS CHARACTER

**Notes:** None
rowSelected

This procedure publishes a lookup complete event in the container allowing developers to perform some action when a row is selected from the browser.

Location: lookup.p

Parameters:

INPUT pcAllFields AS CHARACTER

Comma-separated list of found fieldnames.

INPUT pcValues AS CHARACTER

Chr(1)-separated list of corresponding field values.

INPUT pcRowIdent AS CHARACTER

Comma-separated list of ROWIDs of query buffers (ROWIDENT.)

Note: This will not fire if the field is changed manually in the fill-in, so you will need to use lookupleave as well to trap for this.

translateBrowseColumns

This procedure translates lookup and filter browse columns.

Location: lookup.p

Parameters:

INPUT pcObjectName AS CHARACTER

INPUT phBrowseHandle AS HANDLE

Notes: None

valueChanged

This procedure sets DataModified to YES to ensure that the SmartDataViewer container is notified that the value has changed for Lookup.

Location: lookup.p

Parameters: None

Note: Defined as a PERSISTENT value-changed trigger in the dynamic-widget. The code currently duplicates the logic defined in the U10 trigger in the SmartDataViewer because checking FOCUS is not helpful when the change is caused by a user event in the Browser.
viewObjec

This procedure makes sure the label is not HIDDEN.

**Location:** lookup.p

**Parameters:** None

**Note:** For sizing reasons, the label is not really a part of the object, but added as a text widget to the parent frame.

whereClauseBuffer

Returns the buffer name of a WHERE clause expression. This function avoids problems with leading/double blanks in WHERE clauses.

**Location:** lookup.p

**Parameters:**

```plaintext
INPUT pcWhere AS CHARACTER
```

The complete WHERE clause, with or without the FOR keyword, for a single table. The buffer name must be the second token (third if FOR is present) in the clause. For example: "EACH order OF customer", "FOR EACH order".

**Returns:** CHARACTER PRIVATE

**Note:** PRIVATE, used internally in query.p only.
Field object properties

Field object properties provide information about field objects and its classes. This information can include whether an object is enabled, the contents of the object and so on. You can read property values and in many instances you can change property values. To read a value for a property, you use a get function, and to change a value for a property, you use a set function.

These functions conform to the following conventions:

- **get** — Uses the form `get propname` and returns the current value of the property.

  **Note:** This function accepts no arguments.

- **set** — Uses the form `set propname`. The set function accepts a single argument—the new value for the property—and returns TRUE/FALSE depending on whether the value change succeeds.

For more information about getting and setting property values, see Chapter 1, “ADM2 SmartObject API Reference.”

This section lists and describes the Field object properties that you can use with the get and set functions. The description also identifies the properties for which you can read and write (change) a value and the properties for which you can only read the value.

**BaseQueryString**

Base query string used for dynamic Lookups and dynamic Combos. This is the original query assigned to the object when initialized.

**Data type:** CHARACTER

**Note:** Read and Write.

**BrowseFields**

Comma-separated list of field names to display in the lookup browse for the dynamic Lookup.

**Data type:** CHARACTER

**Note:** Read and Write.

**BrowseFieldFormats**

Pipe-delimited list of field formats that correspond to the BrowseFields properties. These formats are assigned to the fields in the browser being used for the dynamic Lookup browserValue of BrowseFieldFormats.

**Data type:** CHARACTER

**Note:** Read and Write.
**BrowseFields**

List of fields to display in the browse when the viewAs property is set to **browse**.

**Data type:** CHARACTER  
**Note:** Read and Write.

**BrowseTitle**

Title to display in the browse SmartWindowContainer when the ViewAs property is set to **browse**.

**Data type:** CHARACTER  
**Note:** Read and Write.

**BuildSequence**

Used for dynamic Combos to determine the order in which to initialize a dynamic Lookup. This property allows you to use of the Parent filter query option when you have a dynamic Combo that is a parent for another dynamic Combo.

**Data type:** INTEGER  
**Note:** Read and Write.

**CancelBrowseOnExit**

Controls whether or not to select the value in the browse on exit. If TRUE, the value in the browse is NOT to be selected on exit.

**Data type:** LOGICAL  
**Note:** Read and Write.

**ChangedEvent**

Optional event to publish on value-changed.

**Data type:** CHARACTER  
**Note:** Read and Write.

**ComboDelimiter**

Property assigned at runtime that contains the delimiter assigned to a dynamic Combo.

**Data type:** CHARACTER  
**Note:** Read and Write.
**ComboFlag**

Property that allows you to specify options for a dynamic Combo. You can specify the following for this property:

- **Blank** — If a dynamic Combo should only contain the data retrieved from the BaseQueryString.
- **A** — If the dynamic combo allows the user to select a value of `<All>`.
- **N** — If the dynamic combo allows the user to select a value of `<None>`.

If the value for this property is **A** or **N**, the ComboFlagValue property must also have a value.

**Data type:** CHARACTER  
**Note:** Read and Write.

**ComboFlagValue**

The value for this property is used to assign a value to a record when the user selects either **All** or **None** for a dynamic combo. This property contains a value only when the ComboFlag property has a value of **A** or **N**.

**Data type:** CHARACTER  
**Note:** Read and Write.

**ComboHandle**

The value for this property is available only at run time and contains the handle of the combo-box of a dynamic Combo.

**Data type:** HANDLE  
**Note:** Read and Write.

**ComboQuery**

Used to pass the query required by this combo back to the viewer for building. Once built, the query is returned into the procedure displayCombo.

**Data type:** HANDLE  
**Notes:**

- Read only.
- This design facilitates all combo queries being built with a single AppServer hit. It is published in the viewer.
- This function is not run in add mode.
- This function is published from displayFields in the viewer.
**ComboSort**

Sort property for the Combo.

**Data type:** LOGICAL

**Note:** Write only.

**CurrentDescValue**

The value for this property is available only at run time and contains a description of the currently selected option in a dynamic Combo. Basically, this is the current SCREEN-VALUE of the dynamic Combo.

**Data type:** CHARACTER

**Note:** Read and Write.

**CurrentKeyValue**

The value for this property is available only at run time and contains the current key value for the selected option. The value of this property is the same as getting the DataValue of the dynamic Combo.

**Data type:** CHARACTER

**Note:** Read and Write.

**DataModified**

Indicates whether SmartDataField value has changed but not saved. If TRUE, the field has changed and saved. If FALSE, the field has changed but not saved.

**Data type:** LOGICAL

**Note:** Read and Write.

**DataSourceFilter**

This property is an optional filter expression for the data source.

**Data type:** CHARACTER

**Note:** Read and Write.
DataValue

This property is used by the SmartDataViewer when it collect changes using collectChanges.

**Data type:** CHARACTER

**Notes:**
- Read and Write.
- If it encounters this PROCEDURE in the list of EnabledHandles and the DataModified property of this object equals TRUE.

DefineAnyKeyTrigger

Controls whether or not a persistent trigger is to be defined on ANY-KEY. TRUE if a persistent trigger is defined. Does not use the \{get\} syntax.

**Data type:** LOGICAL

**Note:** Read and Write

DescSubstitute

Property that stores the sequence for displaying the fields specified in the DisplayedField property list in a dynamic Combo. For example, &1 (&2) displays the value of the first field specified in DisplayedField and then concatenates that value with the value of the second field.

**Data type:** CHARACTER

**Note:** Read and Write.

DisplayDataType

Property that stores the data type of DisplayField for both the dynamic Lookup and dynamic Combo.

**Data type:** CHARACTER

**Note:** Read and Write.

DisplayField

Determines whether or not the SmartDataField is to be displayed along with other fields in its Contain. If TRUE, the SmartDataField is to be displayed. If FALSE, the SmartDataField is not to be displayed.

**Data type:** CHARACTER

**Note:** Read and Write.
Field object properties

DisplayFormat

This property stores the format for DisplayedField for both the Dynamic Lookup and Dynamic Combo.

**Data type:** CHARACTER  
**Note:** Read and Write.

DisplayValue

Saved screen or display value of a SmartDataField. DisplayValue is based on the DataValue. If the keyfield and displayfield are the same, the keyfield value (datavalue) is returned. If they are not the same, then if a reposition source is set, it returns the displayedfield value that is obtained from the SDO. In all other cases it searches the list-item-pairs (or radio-buttons for radio-sets) given the datavalue and will return the display value.

**Data type:** CHARACTER  
**Note:** Read and Write.

EdgePixels

Number of pixels that should be used to draw the rectangle around the buttons on a SmartPanel.

**Data type:** INTEGER  
**Note:** Read and Write.

EnableField

Determines whether or not the SmartDataField is to be enabled for user input along with other fields in its Container. TRUE if the SmartDataField is to be enabled for user input along with other fields in its Container, otherwise FALSE.

**Data type:** CHARACTER  
**Note:** Read and Write.

EnableOnAdd

Value of EnableOnAdd.

**Data type:** LOGICAL  
**Note:** Read and Write.
**ExitBrowseOnAction**

Determines whether or not the selection of a value in the browse should also Exit the browse. TRUE if the selection of a value in the browse should Exit.

**Data type:** LOGICAL  
**Note:** Read and Write.

**FieldEnabled**

Determines whether or not the SmartDataField is enabled for user input. TRUE if the SmartDataField is enabled, otherwise FALSE.

**Data type:** LOGICAL  
**Note:** Read and Write.

**FieldHidden**

Hides or unhides a lookup field.

**Data type:** LOGICAL  
**Note:** Read only.

**FieldLabel**

Label to use for the specified field.

**Data type:** CHARACTER  
**Note:** Read and Write.

**FieldName**

Name of the SDO field to which this object maps.

**Data type:** CHARACTER  
**Note:** Read and Write.

**FieldToolTip**

Text used for a tool tip for the specified field.

**Data type:** CHARACTER  
**Note:** Read and Write.
### FlagValue

Option flag key values for **All** and **None**.

*Data type:* CHARACTER  
*Note:* Read and Write.

### Format

An overridden format string.

*Data type:* CHARACTER  
*Note:* Read and Write.

### HelpId

Optional HelpId of the selection.

*Data type:* INTEGER  
*Note:* Read and Write.

### InnerLines

Option flag key values for **All** and **None**.

*Data type:* INTEGER  
*Note:* Read and Write.

### KeyDataType

Property that stores the data type for the KeyField for both the dynamic Lookup and dynamic Combo.

*Data type:* CHARACTER  
*Note:* Read and Write.

### KeyField

Name of the field whose value is either received or retrieved from the SmartDataViewer using the value in DataValue. For more information, see DataValue.

*Data type:* CHARACTER  
*Note:* Read and Write.
**KeyFormat**

Property that stores the KeyField format for both the dynamic Lookup and dynamic Combo.

- **Data type:** CHARACTER
- **Note:** Read and Write.

**Label**

Label defined for the selection. If the value is undefined, it is converted to a string.

- **Data type:** CHARACTER
- **Note:** Read and Write.

**LabelHandle**

Property value that is available only at run time and contains the handle of the lookup FILL-IN's handle of a dynamic Lookup.

- **Data type:** HANDLE
- **Note:** Read and Write.

**LinkedFieldDataTypes**

Property that identifies the Data Types of Linked Fields to display in a viewer when a user selects a value in a dynamic Lookup. These values are comma-separated.

- **Data type:** CHARACTER
- **Note:** Read and Write.

**LinkedFieldFormats**

Property that identifies the Formats of Linked Fields to display in viewer when a user selects a value in a dynamic Lookup. These values are pipe-delimited.

- **Data type:** CHARACTER
- **Note:** Read and Write.

**ListItemPairs**

Property value that is available only at run time and contains the current list-item-pairs of a selected dynamic Combo.

- **Data type:** CHARACTER
- **Note:** Read and Write.
**LookupFilterValue**

Property value that is valid only at run time and contains the last value of a dynamic Lookup when the user presses the lookup button or the shortcut-key. You use this value to filter the values returned in the lookup browse.

*Data type:* CHARACTER  
*Note:* Read and Write.

**LookupHandle**

Property value that is available only at run time and contains the handle of the FILL-IN of a dynamic Lookup.

*Data type:* HANDLE  
*Note:* Read and Write.

**LookupImage**

Property that contains a relative-path name of the image to display on the lookup button.

*Data type:* CHARACTER  
*Note:* Read and Write.

**LookupQuery**

Passes the query required by this lookup back to the viewer for building. Once built, the query is returned into the procedure displayLookup.

*Data type:* CHARACTER  
*Notes:*  
- Read only.  
- The query is published from displayfields in the viewer to facilitate all lookup queries being built with a single AppServer hit.  
- This routine is not run at all in add mode.

**MaintenanceObject**

Represents the logical object name for the lookup to be launched when allowing maintenance.

*Data type:* CHARACTER  
*Note:* Read and Write.
MaintenanceSDO

Name of the SDO to launch when allowing maintenance for the lookup.

Data type: CHARACTER
Note: Read and Write.

NumRows

Number of rows to display in the selection widget.

Data type: INTEGER
Note: Read and Write.

Optional

Indicates whether or not the selection is optional, and as a result, the property OptionalString holds the value to display. TRUE if the selection is optional and the property OptionalString holds the value to display.

Data type: LOGICAL
Note: Read and Write.

OptionalBlank

Determines whether or not the optional value is a blank value. TRUE if the optional value is a blank value.

Data type: LOGICAL
Notes:
- Read and Write.
- Applies to character fields only.

OptionalString

Displays an optional value when the Optional property is set to TRUE.

Data type: CHARACTER
Note: Read and Write.

ParentField

Parent field name of the parent dependent object of a Combo or Lookup.

Data type: CHARACTER
Note: Read and Write.
ParentFilterQuery

Foreign fields of the parent object.

**Data type:** CHARACTER

**Note:** Read and Write.

PopupOnAmbiguous

Property used to determine whether or not a Lookup Browse should automatically open when the results of a search string are ambiguous.

Use this property to open a Lookup Browse when the search string is modified and a match cannot be found because the search string is ambiguous. This is the default behavior.

**Data type:** LOGICAL

**Note:** Read and Write.

PopupOnUniqueAmbiguous

Property used to determine whether or not a Lookup Browse should automatically open when the results of a search string include multiple matches that are not unique but ambiguous.

Use this property to open a Lookup Browse when the search string returns multiple matches that are unique but ambiguous. For example, if you search for “John”, all instances of “John” are found, but instances that begin with “John”, such as “Johnson”, are also found.

**Data type:** LOGICAL

**Note:** Read and Write.

PopupOnNotAvail

Property used to determine whether or not a Lookup Browse should automatically open when an exact match cannot be found for a search string.

Use the property to open a Lookup Browse when an exact match cannot be found.

**Data type:** LOGICAL

**Note:** Read and Write.

QueryTables

Property that contains a comma-separated list of tables used in the BaseQueryString of a dynamic Lookup or Combo.

**Data type:** CHARACTER

**Note:** Read and Write.
RefreshList

Comma-separated list of the names of the Dynamic Combos to be refreshed for the parent Combo named in the argument.

Data type: CHARACTER
Note: Read only.

RepositionDataSource

Determines whether or not the data-source is to be repositioned on valueChanged of the select. TRUE if the data-source is to be repositioned.

Data type: LOGICAL
Notes:
- Read and Write.
- This is not needed for the view-as browse option.
- This must be set to TRUE if, for example, the data-source also is a data-source for other objects, and those objects need to be refreshed when a value is changed in the combo-box.

RowsToBatch

Number of records read in a single operation.

Data type: INTEGER
Note: Read and Write.

SavedScreenValue

Replaced by DisplayValue (which it calls). Property is used for backwards compatibility.

Data type: LOGICAL
Note: Read and Write.

SDFFileName

Property that contains the name of the SmartObject for the Lookup or Combo when you save a dynamic Lookup or Combo to the Repository. You can use this property to identify the object in the Repository when you want to make modifications.

Data type: CHARACTER
Note: Read and Write.
Field object properties

SDFTemplate

Property used to save the name of the SmartDataField (SDF) when a dynamic Combo or dynamic Lookup is created using an existing SDF from the Repository.

Data type: CHARACTER
Note: Read and Write.

Secured

Determines whether or not the combo’s security is set to HIDDEN. TRUE, if the combo’s security is set to HIDDEN.

Data type: LOGICAL
Note: Read and Write.

StartBrowseKeys

List of Keylabels or KeyFunctions that starts the browse.

Data type: CHARACTER
Note: Read and Write.

ToolTip

Optional ToolTip for the selection.

Data type: CHARACTER
Note: Read and Write.

UsePairedList

Checks to see if an object is an editable combo-box. If getUsePairedList determines the object is an editable combo-box, it returns FALSE, indicating a paired list cannot be used.

Data type: LOGICAL
Note: Read only.

ViewAs

Definition of the selection: combo-box, radio-set, selection-list, or browse. Uses a colon as a separator to define SUB-TYPE for combo-box or horizontal/vertical radio-set. For example: radio-set:vertical.

Data type: CHARACTER
Note: Read and Write.
**ViewerLinkedFields**

A comma-separated list of fields that you want returned when a value is selected in a dynamic Lookup. You can then use these values either to fill selected fields on a viewer or as references to values required by the developer.

**Data type:** CHARACTER  
**Note:** Read and Write.

**ViewerLinkedWidgets**

If the ViewerLinkedFields attribute contains a value and the values returned from these fields should be automatically filled on a viewer when a value was selected in a dynamic Lookup, then this attribute would contain a comma-separated list of widget names on the viewer where these values should be filled in.

**Data type:** CHARACTER  
**Note:** Read and Write.
Field object column properties

There are a number of column properties available for which you can obtain and set (write) field values. All of these properties can be read and some of them can be set. To read and set column properties, you use the following prefixes with the specific column property:

- **Column** — Use to read the value of a specific column property. For example, if you want to read the value of the Format property, you would specify `Format`. This would return the format of the browse column you specify.

- **Assign** — Use to set the value of the specified column property.

**Note:** For Container objects, there are no column properties for which you can assign the value.

For additional information, see "OpenEdge Development: Progress Dynamics Basic Development" and "OpenEdge Development: Progress Dynamics Advanced Development."

Table 7–1 lists the column properties, provides a brief description of the property, and indicates whether the property can be read and set (Write).

**Table 7–1:** Column properties for field objects

<table>
<thead>
<tr>
<th>Column property</th>
<th>Description</th>
<th>Read</th>
<th>Write</th>
</tr>
</thead>
<tbody>
<tr>
<td>Format</td>
<td>Browse column format overrides</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Labels</td>
<td>Browse column label overrides</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
This chapter lists and describes the methods (internal procedures and functions) and properties used for Messaging Objects. Refer to Figure 1–1 to see the inheritance hierarchy for each object class.

**Note:** For information specific to the WebSpeed environment, see Chapter 9, “Alphabetical Listing of WebSpeed-specific API Routines.”

This chapter provides information on the following:

- Base methods for messaging objects
- Methods for consumer messaging objects
- Methods for producer messaging objects
- Method for message handler objects
- Methods for XML messaging objects
- Methods for business to business messaging objects
- Methods for router messaging objects
- Message object properties
Base methods for messaging objects

This section lists and describes base methods for Messaging objects.

**destroyObject**

Procedure that deletes the JMS session if no other messaging object instances are using it. This routine is used by all messaging objects.

**Location:** messaging.p

**Parameters:** None

**Notes:** None

**errorHandler**

Handles asynchronous errors, if any.

**Location:** messaging.p

**Parameters:**

- INPUT phMessage AS HANDLE
- INPUT phMessageConsumer AS HANDLE
- OUTPUT phReply AS HANDLE

**Note:** This adds the message to the message queue for later retrieval.

**initializeObject**

Procedure that initializes objects of class Messaging.

**Location:** messaging.p

**Parameters:** None

**Note:** Creates the JMS session and sets the Broker URL in the session. Also gets and sets the user, password, and clientID in the session before starting the session.
Methods for consumer messaging objects

This section lists and describes methods for consumer Messaging objects.

assignUnsubscribe

Set the value for the unsubscribe-on-close flag for a persistent subscription. You use this function when you want an application to prompt users at log off whether they want to cancel a subscription that would otherwise persist into the next session.

**Location:** consumer.p

**Parameters:**

- INPUT pcDestination AS CHARACTER
- INPUT pcSubscription AS CHARACTER
- INPUT plUnsubscribe AS LOGICAL

**Notes:** None

createConsumers

Procedure that creates message consumers for normal message retrieval, shutdown message retrieval, and error handling.

**Location:** consumer.p

**Parameters:** None

**Note:** A message consumer for normal message delivery is created for each destination temp-table record. A message consumer is created to receive a shutdown message if the ShutDown property has a value. And a message consumer is created to handle errors.

defineDestination

Creates a tDestination temp-table record for use by createConsumers( ) for creating message consumers.

**Location:** consumer.p

**Parameters:**

- INPUT pcDestination AS CHARACTER
- INPUT pcColumns AS CHARACTER
- INPUT pcValues AS CHARACTER

**Returns:** LOGICAL

**Note:** This can be called from an override of processDestinations( ) to explicitly create tDestination temp-table records rather than using instance properties.
**destroyObject**

The message consumer’s version of destroyObject, this procedure deletes the message consumers and cancels any durable subscriptions that need to be cancelled.

**Location:** consumer.p  
**Parameters:** None  
**Notes:** None

**errorHandler**

The SmartConsumer’s version of initializeObject, this procedure fetches messages to get and display from the SUPER version of ErrorHandler.

**Location:** consumer.p  
**Parameters:**  
INPUT phMessage AS HANDLE  
INPUT phMessageConsumer AS HANDLE  
OUTPUT phReply AS HANDLE  
**Notes:** None

**initializeObject**

Procedure that is a SmartMessageConsumer version of initializeObject.

**Location:** consumer.p  
**Parameters:** None  
**Note:** This redirects output to a log file when running in batch mode. If a JMS Session is started without errors, processDestinations is run to get the destinations needed for creating message consumers. When running in batch mode, startWaitFor is invoked to start the Adapter’s waitForMessages.

**messageHandler**

This procedure runs when a message is received and handles the incoming message by calling appropriate procedures in its INMESSAGE-TARGET.

**Location:** consumer.p  
**Parameters:**  
INPUT phMessage AS HANDLE  
INPUT phMessageConsumer AS HANDLE  
OUTPUT phReply AS HANDLE  
**Notes:** None
**processDestinations**

Procedure that creates tDestination temp-table records from the Destinations, Subscriptions, and Selectors property values.

**Location:** consumer.p

**Parameters:** None

**Note:** createConsumers() uses tDestination temp-table records when creating the consumers that will monitor the individual destinations. You can override this with a version of processDestinations() that creates its own tDestination temp-table records rather than using the property values.

**startWaitFor**

Procedure that starts watching for messages when in batch mode.

**Location:** consumer.p

**Parameters:** None

**Note:** This is called from initializeObject when SESSION:BATCH-MODE = YES. It should not be called if the consumer is running in an interactive environment because it blocks user input.

**stopHandler**

Procedure that clears the Waiting property to shut down the Consumer object.

**Location:** consumer.p

**Parameters:**

- INPUT phMessage AS HANDLE
- INPUT phMessageConsumer AS HANDLE
- OUTPUT phReply AS HANDLE

**Note:** The stopHandler() routine is used to handle a ShutDown message, typically when in batch mode.
Methods for producer messaging objects

This section lists and describes the methods for producer Messaging objects.

**destroyObject**

Procedure that deletes the Reply and Error message consumers. SmartProducer’s version of destroyObject.

**Location:** producer.p  
**Parameters:** None  
**Notes:** None

**initializeObject**

Procedure that initializes objects of class Producer.

**Location:** producer.p  
**Parameters:** None  
**Notes:** None

**replyHandler**

Procedure that handles replies to messages.

**Location:** producer.p  
**Parameters:**

- INPUT phReply AS HANDLE  
- INPUT phConsumer AS HANDLE  
- OUTPUT phResponse AS HANDLE  
**Notes:** None
sendMessage

Procedure that creates and sends a message.

Location: producer.p

Parameters:

INPUT pcDestination AS CHARACTER
INPUT plReplyRequired AS LOGICAL
INPUT pcReplySelector AS CHARACTER
OUTPUT pcMessageID AS CHARACTER

Note: This is run from the InMessage-Source to send a message.
Method for message handler objects

This section lists and describes the method for Message-handler objects.

sendMessage

Procedure that sends the message to the OutMessage-Target.

Location: msghandler.p

Parameters: None

Notes:

- This runs sendMessage with NO-ERROR and checks the error status after the call. If an error occurred, the errors are retrieved with fetchMessages() and passed to the sendErrorHandler. Errors that occur in sendMessage() in the OutMessageTarget are expected to be added to the message queue with addMessage().

- The Message Id returned from the Out Message Target will be stored in the CurrentMessageId property if ReplyRequired.
Methods for XML messaging objects

This section lists and describes methods for XML Messaging objects.

assignAttribute

*pdOwner* node and *pcValue* for the attribute *pcName*.

**Location:** xml.p

**Parameters:**

- INPUT *pdOwner* AS DECIMAL
- INPUT *pcName* AS CHARACTER
- INPUT *pcValue* AS CHARACTER

**Returns:** LOGICAL

**Notes:** None

assignNodeValue

Value of a node.

**Location:** xml.p

**Parameters:**

- INPUT *pdNode* AS DECIMAL
- INPUT *pcValue* AS CHARACTER

**Returns:** LOGICAL

**Note:** This adds the attribute in the document to its owner.
createAttribute

Creates an Attribute in an element and returns its unique id.

Location: xml.p

Parameters:

INPUT pdOwner AS DECIMAL
    NodeId of OwnerElement.

INPUT pcName AS CHARACTER
    Name of the attribute.

INPUT pcValue AS CHARACTER
    AttributeValue.

Returns: DECIMAL

Note: The attribute is not added to the actual element if pcValue is undefined.

createDocument

Creates an empty document.

Location: xml.p

Parameters: None

Returns: LOGICAL

Notes: None

createElement

Creates an Element in the document and returns its unique id.

Location: xml.p

Parameters:

INPUT pcParent AS DECIMAL
    NodeId of Parent.

INPUT pcName AS CHARACTER
    Name of the node.

INPUT pcText AS CHARACTER
    Text. (The Unknown value (?) represents no text.)

Returns: DECIMAL

Notes: None
createNode

Creates a Node in the document and returns its id.

**Location:** xml.p

**Parameters:**

- INPUT pdParent AS DECIMAL
  
  NodeId of Parent.

- INPUT pcName AS CHARACTER
  
  Name of the node.

- INPUT pcType AS CHARACTER
  
  Node type (defaults to Element).

**Returns:** DECIMAL

**Notes:** None

createText

Creates a Text Node in the document and returns its unique id.

**Location:** xml.p

**Parameters:**

- INPUT pdParent AS DECIMAL
  
  NodeId of Parent Element.

- INPUT pcText AS CHARACTER
  
  Text of the node.

**Returns:** DECIMAL

**Notes:** None

deleteDocument

Deletes the document and cleans up all the temp-tables.

**Location:** xml.p

**Parameters:** None

**Returns:** LOGICAL

**Notes:** None
**destroyObject**

Procedure that destroys the document. Override this routine to delete the document and temp-table.

**Location:** xml.p  
**Parameters:** None  
**Notes:** None

**nodeHandle**

Returns the handle of the node identified by the `pdId` argument.

**Location:** xml.p  
**Parameters:**  
INPUT `pdId` AS DECIMAL  
**Returns:** CHARACTER  
**Notes:** None

**nodeType**

Returns the type of the node identified by `pdId`.

**Location:** xml.p  
**Parameters:**  
INPUT `pdId` AS DECIMAL  
**Returns:** CHARACTER  
**Notes:** None

**ownerElement**

Returns the OwnerElement corresponding to `pdAttributeNode`.

**Location:** xml.p  
**Parameters:**  
INPUT `pdAttributeNode` AS DECIMAL  
**Returns:** DECIMAL  
**Notes:** None
parentNode

Returns the ID of pdNode’s parent.

Location: xml.p
Parameters:

INPUT pdNode AS DECIMAL

ID of the node whose parent is wanted.

Returns: DECIMAL node ID of the parent.
Notes: None

processCDataSection

Procedure that processes a CDATA-Section node.

Location: xml.p
Parameters:

INPUT phText AS HANDLE
INPUT pcPath AS CHARACTER

Note: This method just passes an event with path and value information.

processComment

Procedure that processes a comment node.

Location: xml.p
Parameters:

INPUT phText AS HANDLE
INPUT pcPath AS CHARACTER

Note: This method does nothing and must be overridden if you need to process comments.

processDocument

Procedure that starts processing of the current document.

Location: xml.p
Parameters: None
Notes: None
processElement

Procedure that processes an element document.

Location: xml.p
Parameters:

INPUT phNode AS HANDLE
    Current x-noderef handle.

INPUT pcPath AS CHARACTER
    Current Document path (This is the logical path and not the numbered XPath).

Notes:
- Calls startEvent before the children are processed and endEvent after.
- Attributes are NOT processed in xml.p, but all the attribute’s names are passed as parameters to the startEvent. The developer or super-procedure extension is responsible for processing data from attributes.

processRoot

Procedure that starts processing the elements of the document.

Location: xml.p
Parameters: None
Note: This is just a starting point without events.

processText

Procedure that processes a text node.

Location: xml.p
Parameters:

INPUT phText AS HANDLE

INPUT pcPath AS CHAR

Note: Passes the event with path and value information.
receiveHandler

Procedure that handles receiving a message.

**Location:** xml.p

**Parameters:**

INPUT phMessage AS HANDLE

**Note:**
phMessage is the handle of the JMS message being received. An XML document is created and it is loaded with the memptr from the message. The Document is NOT processed by default. The developer can override this to start processing the document either by calling processDocument or getElementsByTagName or other equivalent methods.

receiveReplyHandler

Procedure that handles any reply to a message that has been sent.

**Location:** xml.p

**Parameters:**

INPUT phMessage AS HANDLE

Handle of the JMS reply message being received.

**Note:**
An override of this procedure should get the Correlation ID of the message to synchronize it to the original message being replied to. It should also get any needed property values and the body of the reply message.

sendHandler

Procedure that sets the body of an outgoing message.

**Location:** xml.p

**Parameters:**

INPUT phMessage AS HANDLE

Handle of the JMS message being sent.

**Notes:**

- The document handle is saved into a MEMPTR, and the MEMPTR is used to set the body of the Bytes Message.
- The DocumentHandle is expected to return an XML document.
sendReplyHandler

Procedure that processes a reply to a message.

Location: xml.p

Parameters:

INPUT phMessage AS HANDLE

Handle of the JMS reply message being sent.

Note: An override of this procedure should set any necessary properties as well as supply the body of the reply message.
Methods for business to business messaging objects

This section lists and describes the methods for business to business Messaging objects.

**callOutParams**

Looks through a table and calls zero or more methods based on the value of `pdNode`.

*Location:* b2b.p  
*Parameters:*  
INPUT `pdNode` AS DECIMAL  
*Returns:* LOGICAL  
*Notes:* None

**characterValue**

Procedure that traps the event of a text node being parsed.

*Location:* b2b.p  
*Parameters:*  
INPUT `pcPath` AS CHARACTER  
INPUT `pcValue` AS CHARACTER  
*Notes:* None

**createSchemaAttributes**

Returns a new query handle for the schema temp-table to use for navigation through the children or a schema node.

*Location:* b2b.p  
*Parameters:*  
INPUT `piParentNode` AS INTEGER  
*Returns:* HANDLE  
*Note:* At present, the caller is responsible for deleting the object.
Messaging Objects and Their Methods and Properties

**createSchemaChildren**

Returns a new query handle for the schema temp-table to use for navigation through the children of a schema node.

**Location:** b2b.p  
**Parameters:**  
INPUT piParentNode AS INTEGER  
**Returns:** HANDLE  
**Note:** At present, the caller is responsible for deleting the object.

**createSchemaPath**

Returns a new query handle for the schema temp-table to use for navigation through the children of a schema node.

**Location:** b2b.p  
**Parameters:**  
INPUT pcPath AS CHARACTER  
**Returns:** HANDLE  
**Note:** At present, the caller is responsible for deleting the object.

**dataSource**

Returns the handle of the data source identified by the argument.

**Location:** b2b.p  
**Parameters:**  
INPUT pcName AS CHARACTER  
**Returns:** HANDLE  
**Notes:** None
**defineMapping**

Creates a tMapping temp-table record.

**Location:** b2b.p  
**Parameters:**
- INPUT pcName AS CHARACTER  
- INPUT pcColumns AS CHARACTER  
- INPUT pcValues AS CHARACTER  
**Returns:** LOGICAL  
**Note:** This can be called from an override of processMappings() to explicitly create tMapping temp-table records rather than using instance properties.

**destroyObject**

Procedure that overrides in order to delete the schema temp-table.

**Location:** b2b.p  
**Parameters:** None  
**Notes:** None

**endDocument**

Procedure that traps the document-processed event and passes all the collected data that has been stored on other events during the processing.

**Location:** b2b.p  
**Parameters:** None  
**Note:** Collect all the data to ensure that all the updates are done in the order in which the mapped objects are linked to nodes. It is too early on startEvent and even on endEvent because child nodes end before parent nodes (do not save orderlines before the order).
endElement

Procedure that traps the XML-element-processed event. Stub routine meant to be overridden.

Location:        b2b.p

Parameters:

INPUT pcPath    AS CHARACTER
    Logical path (not the numbered XPath).

INPUT pcNameSpace  AS CHARACTER
    Namespace (future support).

INPUT pcName    AS CHARACTER
    Name of the element.

INPUT pcQualName AS CHARACTER
    Name qualified with the namespace prefix.

Note: This is just an empty stub to override. It really belongs in xml.p, or xml.p should use no-error.

findDataRow

Finds a row of a mapped DataObject. If any of the KeyFields are blank, use ForeignFields from the object’s DataSource.

Location:        b2b.p

Parameters:

INPUT phObject AS HANDLE
    The DataObject who’s row to find in pcKeyValues.

INPUT pcKeyValues AS CHARACTER
    CHR(1)-separated list with the exact same number of entries as the KeyFields property of the object.

Returns:        LOGICAL

Notes:          None

initializeObject

Procedure that loads schema.

Location:        b2b.p

Parameters:     None

Notes:          None
**loadProducerSchema**

Returns the result of identifying and loading the appropriate producer schema.

- **Location:** b2b.p
- **Parameters:** None
- **Returns:** LOGICAL
- **Notes:** None

**loadSchema**

Loads the schema temp-table.

- **Location:** b2b.p
- **Parameters:**
  - INPUT pcSchema AS CHARACTER
- **Returns:** LOGICAL
- **Notes:** None

**mapNode**

Maps a node to a procedure, function, or column in a data object.

- **Location:** b2b.p
- **Parameters:**
  - INPUT pdNode AS DECIMAL
  - INPUT phDataSource AS HANDLE
  - INPUT pcMapType AS CHARACTER
  - INPUT pcMapName AS CHARACTER
  - INPUT pcConversion AS CHARACTER
  - INPUT pcMapParameter AS CHARACTER
  - INPUT pcNodeType AS CHARACTER
  - INPUT pcNodeName AS CHARACTER
- **Returns:** DECIMAL
- **Note:** If the node is mapped to more than one parameter of the Data-Source method, the mapping is stored in storeParameters and the data will be processed in callOutParams().
**NotFoundError**

Returns a useful ‘Record not found’ error message with keyfields.

**Location:** b2b.p

**Parameters:**

INPUT phDataSource AS HANDLE

DataSource.

INPUT pcKeyValues AS CHARACTER

CHR(1) list with keyvalues corresponding to KeyFields.

**Returns:** CHARACTER

**Notes:** None

**numParameters**

Returns the number of parameters for a method.

**Location:** b2b.p

**Parameters:**

INPUT phProc AS HANDLE

Valid procedure handle.

INPUT pcMethod AS CHARACTER

Function or procedure name.

**Returns:** INTEGER

**Notes:** None

**processMappings**

Procedure that creates tMapping temp-table records from DirectionList, NameList, SchemaList, DocTypeList, DestinationList, ReplyReqList, and ReplySelectorList property values.

**Location:** b2b.p

**Parameters:** None

**Notes:** None
**processMessages**

Procedure that is called from receiveHandler() when an error occurs.

**Location:** b2b.p

**Parameters:**

INPUT pcMessages AS CHARACTER

Chr(3) and chr(4) delimited list, as returned from fetchMessages().

**Note:** Passes the data from fetchMessages() so the user does not have to do this. Otherwise, the default is exactly as in ShowDataMessages() in other ADM objects. This is called from ReceiveHandler() so RETURN ERROR or ADM-ERROR will make sure that the message is not acknowledged.

**produceAttributes**

Procedure that produces attributes of schema nodes.

**Location:** b2b.p

**Parameters:**

INPUT piParentSchemaNode AS INTEGER
INPUT pdOwnerNode AS DECIMAL
INPUT phDataSource AS HANDLE

**Notes:** None

**produceChildren**

Procedure that produces all child nodes of an element or document.

**Location:** b2b.p

**Parameters:**

INPUT piParentSchemaNode AS INTEGER

Schema parent node.

INPUT pdParentNode AS DECIMAL

Actual parent node.

INPUT phDataSource AS HANDLE

LINKed data source of parent.

**Notes:** None
produceDocument

Procedure that creates a document and runs produceChildren() on it.

Location: b2b.p
Parameters: None
Notes: None

receiveHandler

Procedure that handles receiving a message.

Location: b2b.p
Parameters:

INPUT phMessage AS HANDLE
    Handle of the JMS message being received.

Note: The xml.p SUPER creates an XML document and loads it from the message.

rowNotFoundError

Returns a “Record not found” error message with key fields.

Location: b2b.p
Parameters:

INPUT phDataSource AS HANDLE
    DataSource.

INPUT pcKeyValues AS CHARACTER
    CHR(1) list with KeyValues corresponding to KeyFields.

Returns: CHARACTER
Notes: None
schemaField

Returns the buffer-value of a schema field.

**Location:** b2b.p

**Parameters:**

INPUT phQuery AS HANDLE

Handle of a query defined for the schema.

INPUT pcName AS CHARACTER

Buffer name.

**Returns:** CHARACTER PRIVATE (buffer-value)

**Note:** This is intended to be an interim solution.

sendHandler

Procedure for event handler for sending the message.

**Location:** b2b.p

**Parameters:**

INPUT phMsgHandler AS HANDLE NO-UNDO.

Handle of message being sent.

**Notes:**

- Gets the actual schema and produces an XML document before calling super, which takes care of the actual saving of the document to the MEMPTR that is transferred to the message object.

- Overrides this to set header and other message information.

sendMessage

Procedure that overrides the msgHandler message in order to set message-specific properties.

**Location:** b2b.p

**Parameters:** None

**Notes:** None
**startDataRow**

Registers the dataRow record used to find, create, or update the data.

**Location:** b2b.p

**Parameters:**

INPUT phDataSource AS HANDLE

DataSource handle.

INPUT pcAction AS CHARACTER

The operation to be carried out: FIND, CREATE, UPDATE, CREATE UPDATE or DELETE.

**Returns:** LOGICAL

**Notes:** None

**startElement**

Procedure that traps the event of a new XML element being processed, checks whether it is mapped to a dataObject, and, if so, registers it.

**Location:** b2b.p

**Parameters:**

INPUT pcPath AS CHARACTER

Logical path (not the numbered XPath).

INPUT pcNameSpace AS CHARACTER

Namespace (future support).

INPUT pcName AS CHARACTER

Name of the element.

INPUT pcQualName AS CHARACTER

Name qualified with the namespace prefix.

**Notes:** None
storeNodeValue

Store node values for a data source until the endDocument event. (Consume XML).

Location: b2b.p

Parameters:

INPUT phDataSource AS HANDLE
    The data source.

INPUT pcColumnName AS CHARACTER
    The name of the node.

INPUT pcNodeValue AS CHARACTER
    The value.

Returns: LOGICAL

Notes: None

storeParameterNode

Store mapping information for Output parameters (Produce XML).

Location: b2b.p

Parameters:

INPUT phDataSource AS HANDLE
    The data source.

INPUT pcMethod AS CHARACTER
    The mapping procedure/function.

INPUT pdNode AS DECIMAL
    The node bearing the value.

INPUT piNum AS INTEGER
    The parameter number.

INPUT piNumParam AS INTEGER
    The total number of parameters in the method.

Returns: LOGICAL

Note: This information is stored until the parent node of the first parameter is processed. callOutParams() will then call the pcMethod in phDataSource and use the piNum parameter values to populate the node or attribute.
**storeParameterValue**

Stores values for input parameters.

**Location:** b2b.p

**Parameters:**

- INPUT phDataSource AS HANDLE
  - DataSource.
- INPUT pcmMethod AS CHARACTER
  - Procedure or function.
- INPUT piNum AS INTEGER
  - Parameter number.
- INPUT piNumParam AS INTEGER
  - Number of parameters in the method.
- INPUT pcValue AS CHARACTER
  - Value to pass as input.

**Returns:** LOGICAL

**Note:** This information is stored until the endDocument call. InParams calls the pcmMethod in phDataSource and passes the PcValue as the piNum parameter.

**targetProcedure**

Procedure used by the router to subscribe to an event of the schema name in order to find whether it is already started.

**Location:** b2b.p

**Parameters:**

- OUTPUT phHandle AS HANDLE.
  - phHandle = TARGET-PROCEDURE.

**Notes:** None
Methods for router messaging objects

This section lists and describes the methods for router Messaging objects.

**createDocument**

Creates an empty document.

**Location:** router.p  
**Parameters:** None  
**Returns:** LOGICAL  
**Note:** Override of xml.p that does not delete the current document.

**initializeObject**

Procedure that initializes objects of class Router.

**Location:** router.p  
**Parameters:** None  
**Notes:** None

**internalSchemaFile**

Returns the internal Schema filename based on the external and internal file reference definitions.

**Location:** router.p  
**Parameters:**  
INPUT pcNameSpace AS CHAR  
Target Namespace, the XMLNS attribute from the incoming XML document.

**Returns:** CHARACTER (filename)  
**Notes:** None
**obtainInMsgTarget**

Procedure that gets the handle of the incoming message and starts some container (containing, for example, a SmartB2BObject and a business object such as a SmartDataObject). It then returns the handle of the INMESSAGE-TARGET from that container.

**Location:** router.p  
**Parameters:**  
INPUT phMessage AS HANDLE  
OUTPUT phInMessageTarget AS HANDLE  
**Notes:** None

**processFileRefs**

Procedure that creates tFileReference temp-table records from ExternalRefList and InternalRefList property values.

**Location:** router.p  
**Parameters:** None  
**Notes:** None

**routeBytesMessage**

Procedure that takes a procedure that has a BytesMessage, loads the message, and sends the document to a SmartB2BObject.

**Location:** router.p  
**Parameters:**  
INPUT phMessage AS HANDLE  
A procedure handle to the object with the BytesMessage and a corresponding getMemptr function to retrieve the message.  
OUTPUT phInMessageTarget AS HANDLE  
The procedure handle of the SmartB2BObject.  
**Note:** Used for backward compatibility, but it is possible to override if message type requires a different routing. See obtainInMsgTarget (router.p) for details.
routeDocument

Procedure that routes the documentHandle to a SmartB2BObject, including starting the SmartContainer with the SmartB2B if required, and giving it the loaded schema.

Location: router.p
Parameters:
INPUT   pcContainer AS CHARACTER

OUTPUT pohInMessageTarget AS HANDLE

The SmartB2B that received the document.

Notes: None

routeMessage

Procedure that takes a procedure that has a message, loads the message, and sends the document to a B2B object and returns its handle.

Location: router.p
Parameters:
INPUT phMessage AS HANDLE

OUTPUT pohInMessageTarget AS HANDLE

A procedure handle to the object with the JMS message or any object with getMessageType and a corresponding get function to retrieve the message.

The procedure handle of the SmartB2B that received the document.

Note: Called directly from obtainInMesages or from specific route MessageType procedures.

startB2BObject

Starts the Container with the SmartB2BObject, links it to the consumer, and returns its handle.

Location: router.p
Parameters:

INPUT pcContainer AS CHARACTER

Returns: HANDLE of the container.

Notes: None
Messaging Object properties provide information about messaging objects and their classes. This information can include whether an object is enabled, the contents of the object and so on. You can read property values and in many instances you can change property values. To read a value for a property, you use a `get` function and to change a value for a property, you use a `set` function.

These functions conform to the following conventions:

- **get** — Uses the form `get propname` and returns the current value of the property. This function accepts no arguments.
- **set** — Uses the form `set propname`. The set function accepts a single argument—the new value for the property—and returns TRUE/FALSE depending on whether the value change succeeds.

For more information about getting and setting property values, see Chapter 1, “ADM2 SmartObject API Reference.”

**_ClientID_**

Property that stores the Client ID for the JMS broker connection. This property value is used during creation of the JMS session to set the ClientID of the JMS session. It should only be set before initialization of the messaging object.

**Data type:** CHARACTER

**Note:** Read and Write.

**ConsumerSchema**

XML Schema filename.

**Data type:** CHARACTER

**Note:** Read only.

**ContextForServer**

Value for gcContextForServer.

**Data type:** LOGICAL

**Note:** Write only.
**CurrentMessage**

Property that stores the handle of the current message being produced. This property is set when the message is created by the producer's `sendMessage`, it should not be set in any other way. The handle of the message is sent to the send handler, therefore in most circumstances, it should not be necessary to get this handle for use in application code.

**Data type:** HANDLE  
**Note:** Read and Write.

**CurrentMessageId**

ID from the previous `sendMessage` where `ReplyRequired`.

**Data type:** CHARACTER  
**Note:** Read and Write.

**Destination**

Property that stores the destination of the message being sent. This would usually be set by the instance properties of the message handling object (SmartB2BObject or SmartSender) that is sending the message. It could be set after initialization of the object before the message is sent.

**Data type:** CHARACTER  
**Note:** Read and Write.

**DestinationList**

Value of DestinationList.

**Data type:** CHARACTER  
**Note:** Read and Write.

**Destinations**

Property that stores a CHR(1) delimited list of destinations from which a SmartConsumer object can receive messages. This property is set from the instance properties of the object and used during initialization of the object to create message consumers for each destination.

**Data type:** CHARACTER  
**Note:** Read and Write.
DirectionList

Value of DirectionList.

Data type: CHARACTER
Note: Read and Write.

DocumentElement

ID of the root element.

Data type: DECIMAL
Note: Read only.

DocumentHandle

Property that stores the XML document handle.

Data type: HANDLE
Note: Read and Write.

DocumentInitialized

Determines if the document is initialized. For example, it has a root node.

Data type: LOGICAL
Note: Read only.

Domain

Property that stores the messaging domain (Publish and Subscribe or Point-to-Point) for the SmartProducer and SmartConsumer messaging objects to determine how the JMS session is started for the object. This property can only be set before initialization of the messaging object and cannot be changed once the object is initialized.

Data type: CHARACTER
Note: Read and Write.

DTDPublicId

DTDPublicId property of the Document.

Data type: CHARACTER
Note: Read and Write.
DTDPublicIdList

CHR(1)- separated list of DTD Public Ids for producer.

**Data type:** CHARACTER  
**Note:** Read and Write.

DTDSYSTEMID

DTDSYSTEMID property of the Document.

**Data type:** CHARACTER  
**Note:** Read and Write.

DTDSYSTEMIDLIST

CHR(1)-separated list of DTD System Ids for producer.

**Data type:** CHARACTER  
**Note:** Read and Write.

EXTERNALREFLIST

List of external references this router uses to determine how external target namespaces map to internal XML mapping schemas.

**Data type:** CHARACTER  
**Note:** Read and Write.

INMESSAGESOURCE

Handle that accesses the source of a message.

**Data type:** HANDLE  
**Note:** Read and Write.

INTERNALREFLIST

Comma-separated list. You can change this list by calling modifyListAttribute.

**Data type:** CHARACTER  
**Note:** Read and Write.
**JMSpartition**

Value of JMSpartition.

**Data type:** CHARACTER  
**Note:** Read and Write.

**JMSpassword**

Property that stores the password for the JMS broker connection for messaging objects (SmartProducer and SmartConsumer objects).

**Data type:** CHARACTER  
**Notes:**
- Read and Write.  
- This property must be set before initialization objects because it must be set in the JMS session before the JMS session begins.

**JMSsession**

Handle of the JMS session this instance is using.

**Data type:** CHARACTER  
**Note:** Write only.

**JMSuser**

Property that stores the user for the JMS broker connection for messaging objects (SmartProducer and SmartConsumer objects).

**Data type:** CHARACTER  
**Notes:**
- Read and Write.  
- This property must be set before initialization objects because it must be set in the JMS session before the JMS session begins.

**LoadedByRouter**

Determines whether or not the XML and Schema have already been loaded by the router. If TRUE, the XML and Schema have already been loaded.

**Data type:** LOGICAL  
**Note:** Read and Write.
**LogFile**

Property that stores the name of the log file written to for a SmartConsumer object running in batch. This should be set before initialization of the object.

**Data type:** CHARACTER  
**Note:** Read and Write.

**MapNameProducer**

Value of MapNameProducer.

**Data type:** CHARACTER  
**Note:** Read and Write.

**MapObjectProducer**

Value of MapObjectProducer.

**Data type:** CHARACTER  
**Note:** Read and Write.

**MapTypeProducer**

Value of MapTypeProducer.

**Data type:** CHARACTER  
**Note:** Read and Write.

**MessageType**

Identifies the type of message being sent.

**Data type:** CHARACTER  
**Note:** Read and Write.

**NameList**

Value of NameList.

**Data type:** CHARACTER  
**Note:** Read and Write.
**NameSpaceHandle**

Handle of the loaded XML mapping schema namespaces.

**Data type:** HANDLE  
**Note:** Write only.

**NewNode**

Identifies the next unused node number in sequence.

**Data type:** DECIMAL  
**Notes:**
- Read only.
- Returns TRUE if the current RowObject record is in new mode. Returns the Unknown value (?) if there is no current RowObject.
- Returns TRUE if the matching contained SDO is in NewMode. This is the SBO version of getNewMode.

**OutMessageSource**

Property that stores the handle of the OUTMESSAGE-SOURCE object (SmartSender or SmartB2BObject) of a SmartProducer object. This is set during creation of the SmartProducer object and should not be set by application code.

**Data type:** HANDLE  
**Note:** Read and Write.

**Persistency**

Property that stores the persistency for messages sent in a SmartProducer's object's session. This property is initially set during initialization based on instance property values but can be set at any time to affect any messages sent after it is set.

**Data type:** CHARACTER  
**Note:** Read and Write.

**PingInterval**

Value of the ping interval for the session.

**Data type:** INTEGER  
**Note:** Read and Write.
Priority

Property that stores the priority for messages sent in a SmartProducer's object's session. This property is initially set during initialization based on instance property values but can be set at any time to affect any messages sent after it is set.

Data type: INTEGER
Note: Read and Write.

PromptLogin

Determines whether or not the producer, consumer, or both prompts the user for the JMS broker login.

Data type: LOGICAL
Note: Read and Write.

ReplyReqList

Value of ReplyReqList.

Data type: CHARACTER
Note: Read and Write.

ReplyRequired

Property that stores a value that determines whether a reply is required for a message being sent for a message handling object (SmartB2BObject acting as a producer or SmartSender). This property is initially set during initialization based on instance property values but can be set at any time to affect messages sent after it is set.

Data type: LOGICAL
Note: Read and Write.

ReplySelector

Property that stores a reply selector value to be used for messages that require replies that are being sent for a message handling object (SmartB2BObject or SmartSender).

Data type: CHARACTER
Note: Read and Write.
Messaging Objects and Their Methods and Properties

**ReplySelectorList**

Value of ReplySelectorList.

*Data type:* CHARACTER  
*Note:* Read and Write.

**RouterSource**

Property that stores the handle(s) of the ROUTER-SOURCE objects for a SmartRouter object.

*Data type:* CHARACTER  
*Note:* Read and Write.

**SchemaHandle**

Handle of the loaded XML mapping schema.

*Data type:* HANDLE  
*Note:* Read and Write.

**SchemaList**

List of the schema this B2B uses.

*Data type:* CHARACTER  
*Note:* Read and Write.

**SchemaManager**

Starts the schema manager, if necessary, and returns its procedure handle.

*Data type:* HANDLE  
*Note:* Read only.

**Selectors**

Represents the message selectors used when receiving messages.

*Data type:* CHARACTER  
*Note:* Read and Write.
Message object properties

**ShutDownDest**
Queue to which a message can be sent to shut down a SmartConsumer running unattended.

**Data type:** CHARACTER  
**Note:** Read and Write.

**Subscriptions**
Represents the information this consumer uses when subscribing to topics (only for Pub/Sub domain).

**Data type:** CHARACTER  
**Note:** Read and Write.

**SupportedMessageTypes**
Property that stores the Sonic Adapter supported message types. It is used by the SmartProducer's instance property dialog to provide a combo-box of supported messages types used to choose the message type to be stored in the MessageType property for that object.

**Data type:** CHARACTER  
**Note:** Read only.

**TargetNameSpace**
Defines the XMLNS attribute of the document instance.

**Data type:** CHARACTER  
**Note:** Read only.

**TimeToLive**
Represents the time during which the message is considered current and not stale.

**Data type:** DECIMAL  
**Note:** Read and Write.

**TypeName**
Identifies the documentation, destination, or both for multi-document producers.

**Data type:** CHARACTER  
**Note:** Read and Write.
UseDTD

Determines whether or not to use DTD. TRUE, if DTD is to be used.

**Data type:** LOGICAL  
**Note:** Read only.

**ValidateOnLoad**

Determines whether or not the document should be validated on load.

**Data type:** LOGICAL  
**Note:** Read and Write.

**Waiting**

Determines how long the adapter waits for a message.

**Data type:** LOGICAL  
**Note:** Read and Write.
Alphabetical Listing of WebSpeed-specific API Routines

The WebSpeed environment coexists with and makes use of HTML. In this respect, it is different than the standard ABL/ADM environment, and SmartObjects operating in it require a separate set of supporting routines.

The default paths to the files defining the SmartObjects for WebSpeed are:

- **Class SourcePath** — src/web2
- **Class RcodePath** — web2
- **Class TemplatePath** — src/web2/template

This chapter lists and describes all SmartObject API routines dedicated to the WebSpeed environment. For ADM2 routines not specific to the WebSpeed environment, see the other chapters in this guide. For lists of methods, procedures, and properties organized by object type, see the Index.
addColumnLink

Specifies that a column in the HTML table should appear with a hyperlink. The attributes needed to support this are specified in the other input parameters.

**Location:** wbtable.p

**Parameters:**

**INPUT pcColumn AS CHARACTER**

The name of the column you want hyperlinked.

**INPUT pcURL AS CHARACTER**

The linked object. Must be a valid URL reference.

**INPUT pcTarget AS CHARACTER**

The HTML frame reference that receives the response. The reference _self specifies that the current HTML frame should be used.

**INPUT pcMouseOver AS CHARACTER**

A function that returns the character string that should be displayed on the mouseOver event in the HTML page.

**INPUT pcJoinParam AS CHARACTER**

Specifies the required parameters to add to the URL to join this data-source to the linked object’s data-source. Valid values are:

- **ROWID** — Adds the parameters **ExternalRowids** with the current rowids as data to the URL, as well as **ExternalTables** with the Table property as data

- **blank** — No join needs to take place and no parameters except the default BackRowids are added to the URL—usually used to return to the calling object

**Returns:** LOGICAL

**Notes:**

- The Wizard creates a link for one selected column, but the function is able to add links to all the columns in the object.

- The Embedded SpeedScript (.htm) files created by the Report wizard show examples of this function call in use.

- The actual HTML code to generate the link is in urlLink with the logic that adds join parameters in urlJoinParams. If the linked object (pcURL) is unspecified, the link will not be generated in the HTML code.

- The parameters ExternalTables and BackRowids are always added to the specified URL, while ExternalObject is added when the data-source is a SmartDataObject.

- The Wizard creates a link for one selected column, but the function is able to add links to all the columns in the object.
• The Embedded SpeedScript (.htm) files created by the Report wizard show examples of this function call in use.

• The actual HTML code to generate the link is in urlLink with the logic that adds join parameters in urlJoinParams. If the linked object (pcURL) is unspecified, the link will not be generated in the HTML code.

• The parameters ExternalTables and BackRowids are always added to the specified URL, while ExternalObject is added when the data-source is a SmartDataObject.

• The linked object must be able to interpret the data specified in the pcJoinParams. This is usually done by specifying that the linked object should be able to use this object’s data-source as an External table or object when the object is created in the Wizard. This will generate a comma-separated ExternalTableList property in the linked object, with either a matching pipe-separated ForeignFieldList or two ExternalWhereList and ExternalJoinList properties. The ForeignFieldList property must have an entry that defines a ForeignFields property for the columns that are passed on this link, while the two others have matching entries that specify how the external tables are joined to the query.

• The list of columns is the only way to link objects that have SmartDataObjects as data-sources, but can also be used for database queries.

• When the ROWID option is used, the external tables are physically added to the receiving dynamic query if they are not already present, and the query--prepare is changed to use the corresponding rowids in the WHERE clause for these tables.

• The pcMouseOver needs to reference a function so that the mouse-over text can show current values for the actual row. This can be achieved by letting the function call columnProps in the data-source. The wizard will generate this function to return the text that is specified in the “Status” field in the wizard. You can refer to functions or properties in the actual data-source in this field inside a pair of back-ticks. The code generator will generate this into a valid run-time expression.

• All the URL link parameters, including the list of columns, will be added to the linked object’s contextFields property. This guarantees that the linked object stays joined on subsequent requests to perform navigation, transaction, or search.

• All the parameters passed to this function will be added to internal properties that will be used when the HTML code is generated. The column name will be added to the LinkColumns, which is a comma-separated property that holds the name of all the linked columns. The other parameter passed to this function is added to other internal properties the LinkURLs, LinkTargets, LinkTexts, and LinkJoins respectively. All of them are comma-separated except the last one, which is CHR(1)-separated.
Examples:

```java
/* Add two hyperlinks, one on the custNum to call the customer detail and one on the salesRep field to call the salesrep detail. */

addColumnLink('custNum', /* Column name */
    'detcust.html', /* WebObject */
    '_self', /* TargetFrame */
    'custStatusLabel', /* Function name for Status Line */
    'custNum'). /* column to use as foreign field */

addColumnLink('salesRep', /* Column name */
    'detsls.html', /* WebObject */
    '_self', /* TargetFrame */
    'salesStatusLabel', /* Function name for Status Line */
    'salesRep'). /* column to use as foreign field */

FUNCTION custStatusLabel RETURNS CHARACTER ():
    RETURN "Show detail for customer " + columnStringValue("custNum") + ".".
    END.

FUNCTION salesStatusLabel RETURNS CHARACTER ():
    RETURN "Show detail for salesrep " + columnStringValue("salesRep") + ".".
    END.
```

**addContextFields**

Adds fields to the list of fields that are used to keep context for the next request.

**Location:**  
webrep.p

**Parameters:**

INPUT pcNewContextFields AS CHARACTER
    List of new URL parameters to add to the list.

**Returns:** LOGICAL

**Notes:**

- The Property should be used whenever the HTML page needs to store the context.
- The Embedded SpeedScript templates already do this on all the URLs that are generated.
addSearchCriteria

Adds SearchName and SearchValue to the data-source query.

Location: webrep.p

Parameters:

INPUT pcColumn AS CHARACTER

The Column’s name in the data-source.

INPUT pcValue AS CHARACTER

Search value.

Returns: LOGICAL

Notes: None

addTDModifier

Adds one or more HTML attributes for the <TD> tag of a specific column.

Location: wbtable.p

Parameters:

INPUT pcColumn AS CHARACTER

The name of the column that will use the attribute.

INPUT pcModifier AS CHARACTER

One or more HTML attributes where the value is in double quoted HTML format.

Returns: LOGICAL

Notes:

• The pcModifier passed to this function will be added to any existing TD modifier attributes for this column. The actual data is stored in the internal TdModifier property. This is a comma-separated list that holds entries for each of the columns in the object.

• The HTML attributes must be in the format <attribute> = "<value>", which makes it necessary to use either single quotes around the character expression or a tilde before the double quote.

Examples:

/* Specify a HTML background color for the custNum column */
addTDModifier ("custnum"," align="left" bgcolor = "#FfA00"").
anyMessage

Determines whether there are any messages in the message queue.

**Location:** webrep.p

**Parameters:** None

**Returns:** LOGICAL

**Notes:**

- If it returns TRUE, something has generated an error and a corresponding message.
- If there is a handle for the data-source, check **both** there and internally, because WebSpeed-specific errors are always stored internally.

AddMode

ADDMode property. If set to TRUE, the assignFields procedure creates a new record.

**Note:** Write only.

assignColumnFormat

Sets a column’s format.

**Location:** webrep.p

**Parameters:**

INPUT pcColumn AS CHARACTER

The column’s name in the data-source.

INPUT pcFormat AS CHARACTER

The new format.

**Returns:** LOGICAL

**Note:** Currently this is **not** a local override when a SmartDataObject is used, unless the SmartDataObject is destroyed on each request.
assignColumnHelp

Overrides default HELP.

**Location:** webrep.p

**Parameters:**

INPUT `pcColumn` AS CHARACTER

The column’s name in the data-source.

INPUT `pcHelp` AS CHARACTER

The new help text.

**Returns:** LOGICAL

**Note:** Currently this is not a local override when a SmartDataObject is used, unless the SmartDataObject is destroyed on each request.

assignColumnLabel

Overrides the default label.

**Location:** webrep.p

**Parameters:**

INPUT `pcColumn` AS CHARACTER

The column’s name in the data-source.

INPUT `pcLabel` AS CHARACTER

The new label.

**Returns:** LOGICAL

**Note:** Currently this is not a local override when a SmartDataObject is used, unless the SmartDataObject is destroyed on each request.

assignColumnWidth

Unused function.

**Location:** webrep.p

**Parameters:**

INPUT `pColum` AS CHARACTER

INPUT `pWidth` AS DECIMAL

**Returns:** LOGICAL

**Note:** Currently not in use.
**assignExtentAttribute**

Enables the user to override field attributes for columns with extents.

**Location:** webrep.p

**Parameters:**

- **INPUT pcHandle AS HANDLE**
  
  Buffer–field handle.

- **INPUT piExtent AS INTEGER**
  
  Extent.

- **INPUT pcList AS CHARACTER**
  
  The columns attribute, used to store ALL entries if there are differences.

- **INPUT pcValue AS CHARACTER**
  
  The new value.

**Returns:** CHARACTER PRIVATE

**Notes:**

- The buffer handle stores one value for help, label, and width. This is used to be able to have different attributes for each extent.

- Currently used for HELP and LABEL.

- The function is currently private. This must change if needed for valexp inwbdata.p.
**assignFields**

Procedure that assigns the current form buffer values in the enabled fields/objects to the SmartDataObject, the database, and/or to local object variables.

**Location:**  html-map.p

**Parameters:**  None

**Note:**  Commonly used in a HTML Mapping object’s process-web-request procedure.

**Examples:**

```plaintext
PROCEDURE process-web-request:
  IF REQUEST_METHOD = "POST":U THEN DO:
    /* Copy HTML input field values to the form buffer fields. */
    RUN inputFields.
    /* Find the datasource record that needs to be assigned. */
    RUN findRecords.
    /* Assign form buffer field values to the datasource. */
    RUN assignFields.
    /* Display datasource field values to the form buffer fields. */
    RUN displayFields.
    /* Enable form buffer fields. */
    RUN enableFields.
    /* Output the static HTML page and form buffer field values to the web stream. */
    RUN outputFields.
  END.
END.
```

**assignFields**

Procedure that retrieves the object’s column values from the Web and saves them in the data-source. The AddMode property determines whether the data will be saved to the current record or to a new one.

**Location:**  wbdata.p

**Parameters:**  None

**Notes:**

- The DataColumn property defines the contents of the webObject and determines which columns to assign.
- The get-field with the name property as input parameter is used to retrieve the data value.
- This procedure is normally not called directly, but by ProcessWebRequest, which uses the values of the two Web fields MaintOption and AddMode to decide its actions. The web page usually has a set of transaction buttons that all share the name MaintOption. This procedure will be called when this value is submit. The web page will also have a hidden field, AddMode, that serves as a context keeper. This field would have been set to YES by the previous request, if the object now is in add mode.
- If the data-source is a SmartDataObject, all columns (unless the columnReadOnly property returns TRUE) will be passed along with their corresponding values using the SmartDataObject’s submitRow function.
• If the data-source is a database, this procedure starts the actual transaction when validateColumns() returns TRUE. The values retrieved from the Web will be assigned directly to the buffers by assigning the BUFFER–VALUE attribute.

• To create a new record, the AddMode property must be set to TRUE before calling this routine. When the data-source is a SmartDataObject, the SmartDataObject will be set in add mode by a call to the SmartDataObject’s addRow function. The returned RowObject ROWID will be used as the first parameter to the submitRow(). When the data-source is a database, the LockRow() function that is called within the transaction block to upgrade the lock, will create a new record when the AddMode is TRUE.

assignTDModifier

Assigns one or more HTML attributes for the <TD> tag of a specific column.

Location: wbtable.p

Parameters:

INPUT pcColumn AS CHARACTER

The name of the column that will use the attribute.

INPUT pcModifier AS CHARACTER

One or more HTML attributes where the value is in double-quoted HTML format.

Returns: LOGICAL

Notes:

• The pcModifier passed to this function will overwrite any existing TD modifier attributes for this column. The actual data is stored in the internal TdModifier property. This is a comma-separated list that holds entries for each of the columns in the object.

• The HTML attributes must be in the format <attribute> = "<value>", which makes it necessary to use either single quotes around the character expression or a tilde before the double quote.

Examples:

/* Specify a HTML background color for the custNum column */
assignTDModifier ("custnum","align="left" bgcolor = "#FFa00"").
bufferHandle

Gets the handle of a buffer by name.

**Location:** html-map.p

**Parameters:**

INPUT pcTableName AS CHARACTER

The name of a table in the query or object.

**Returns:** HANDLE

**Notes:** None

bufferHandle

Gets the handle of a buffer by table name.

**Location:** webrep.p

**Parameters:**

INPUT pcTableName AS CHARACTER

The name of a table in the query.

**Returns:** HANDLE

**Notes:** None

columnDataType

Returns a column’s data type from the data-source.

**Location:** webrep.p

**Parameters:**

INPUT pcColumn AS CHARACTER

The Column’s name in the data-source.

**Returns:** CHARACTER

**Notes:** None
columnFormat

Returns a column's format from the data-source.

Location: webrep.p
Parameters:
INPUT pcColumn AS CHARACTER

The column’s name in the data-source.

Returns: CHARACTER
Notes: None

columnHandle

Returns the buffer handle of a column in the internal query.

Location: webrep.p
Parameters:
INPUT pcColumn AS CHARACTER

The column’s name in the data-source.

Returns: HANDLE
Note: This function is not used if the DataSource is a SmartDataObject.

columnHelp

Return a column’s help text from the data-source.

Location: webrep.p
Parameters:
INPUT pcColumn AS CHARACTER

The column’s name in the data-source.

Returns: CHARACTER
Notes: None
columnHTMLName

Finds the HTML field name of a column.

**Location:** html-map.p

**Parameters:**

INPUT pcColumn AS CHARACTER

Column name.

**Returns:** CHARACTER

**Notes:** None

**Examples:**

```java
/* Loop through datasource columns. */
DO iFld = 1 TO NUM-ENTRIES(cColumns):
  cColName = ENTRY(iFld,cColumns).
  IF DYNAMIC-FUNCTION('columnReadOnly':U IN hDataSource, cColName) THEN NEXT.

/* Build CHR(1)-separated list of column and HTML names. */
ASSIGN
  cHTMLName  = DYNAMIC-FUNCTION('columnHTMLName':U IN TARGET-PROCEDURE,cColName)
  cColString = cColString + (IF cColString = "":U THEN "":U ELSE CHR(1))
                + cColName + CHR(1) + get-field(cHTMLName).
END.
```

columnHTMLName

Returns a unique valid HTML identifier/name for the column.

**Location:** webrep.p

**Parameters:**

INPUT pcColumn AS CHARACTER

The column’s name in the data-source.

**Returns:** CHARACTER

**Note:** Replaces "." and "," in field name so it can be used as valid HTML objects. JavaScript cannot operate on objects with dashes or periods in the name.
**columnLabel**

Returns the Column’s label.

**Location:**  webrep.p  

**Parameters:**

INPUT pcColumn AS CHARACTER  

The column’s name in the data-source.

**Returns:**  CHARACTER  

**Notes:**  None  

**columnReadOnly**

Returns TRUE if the column is non updatable.

**Location:**  webrep.p  

**Parameters:**

INPUT pcColumn AS CHARACTER  

The column’s name in the data-source.

**Returns:**  LOGICAL  

**Notes:**  None  

**columnStringValue**

Returns the character value of the column named in the input parameter, or the Initial Value from the data dictionary if the UpdateMode flag is set to ADD.

**Location:**  webrep.p  

**Parameters:**

INPUT pcColumn AS CHARACTER  

The column’s name in the data-source.

**Returns:**  CHARACTER  

**Notes:**

- The UpdateMode flag is set with the call: `setUpdateMode('ADD')`.  
- For additional information, see the “getUpdateMode” section on page 9–30.
columnTable

Overrides to handle HTML mapping objects with neither query nor SDO.

**Location:** html-map.p

**Parameters:**

`INPUT pcColumn AS CHARACTER`

**Returns:** CHARACTER

**Notes:** None

columnTDModifier

Returns the HTML attributes for the <TD> tag of a specific column.

**Location:** wbtable.p

**Parameters:**

`INPUT pcColumn AS CHARACTER`

The name of a column.

**Returns:** CHARACTER

**Notes:**

- This function is intended for internal use when the <TD> tags for the HTML columns are generated.
- The actual data is stored in the internal TdModifier property. This is a comma-separated list that holds entries for each of the columns in the object.

columnValMsg

Returns the validation message of a particular column. This is the text that serves as the error message when a validation fails.

**Location:** wbdata.p

**Parameters:**

`INPUT pcColumn`

The name of a column in the data-source. Can be qualified with table name and/or database name when the data-source is a database.

**Returns:** CHARACTER

**Notes:**

- The function is data-source transparent and calls the function with the same name in the data-source when the data-source is a SmartDataObject.
- The value returned by this function will be added to the error message when validateColumns encounters a column that fails validation.
**constructObject**

Procedure that runs from adm–create–objects to run a SmartObject and to establish its parent and initial property settings. This is used internally to start the SmartDataObject that is the dataSource and set the instance properties.

**Location:** html–map.p

**Parameters:**

- INPUT pcProcName AS CHARACTER
  
  Procedure name to run.

- INPUT phParent AS HANDLE
  
  Not used. INPUT pcPropList AS CHARACTER

  Property list to set.

- OUTPUT phObject AS HANDLE
  
  New procedure handle.

**Note:** Related routine: adm–create–objects.

**dataAvailable**

Procedure that overrides dataAvailable.

**Location:** html–map.p

**Parameters:**

- INPUT pcMode AS CHARACTER
  
  See query.p

**Note:** This is a workaround to avoid running query.p logic when this object uses a data-source.
deleteBuffer

Deletes the current record of a query’s buffer from the database. Returns TRUE when it succeeds and FALSE if it fails.

Location:    wbdata.p
Parameters:

INPUT Buffer AS HANDLE

The current record’s buffer handle.

Returns:     LOGICAL

Notes:
• This function is only used when the data-source is a database.
• It is called from deleteRow, inside of the transaction block, for each of the query buffers returned by the DeleteTables property.
• The default function uses the BUFFER–DELETE method on the passed handle.
• The main purpose of deleteBuffer is to override BUFFER–DELETE for the deletion of a particular table. This is necessary when a table has a schema validation. The BUFFER–DELETE that usually deletes dynamic buffer records does not delete these tables. The AppBuilder detail wizard will generate the necessary override function in the target–procedure’s source.
• A message will be added to the ADM 2 message queue if the delete fails.

deleteOffsets

Procedure that deletes all HTML field offset temp-table records for a HTML mapping procedure.

Location:    html-map.p
Parameters:  None
Note:        Intended for internal use only.
deleteRow

Delete the current row from the data-source.

Location:    wbdata.p
Parameters:  None
Returns:     LOGICAL
Notes:

• The function is data-source transparent and calls the function with the same name when the data-source is a SmartDataObject.

• If the data-source is a SmartDataObject, it will get its RowObject ROWID and use it as an input parameter to the SmartDataObject’s deleteRow.

• If the data-source is a database, it uses the table names returned from the DeleteTables property and passes the buffer’s handle found in the query to the deleteBuffer function.

destroy

Procedure that deletes this Web object’s associated offset records in memory and this object if it was run PERSISTENT.

Location:    admweb.p
Parameters:  None
Notes:       None

destroyDataObject

Shuts down the current data object.

Location:    webrep.p
Parameters:  None
Returns:     LOGICAL
Notes:       None

destroyObject

Procedure that destroys the procedure including the offset.

Location:    admweb.p
Parameters:  None
Notes:       None
**destroyObject**

Procedure that performs any necessary cleanup before the object is destroyed.

**Location:** webrep.p  
**Parameters:** None  
**Note:** The main purpose of this procedure is not to delete the TARGET–PROCEDURE, but to perform specified cleanup when the data-source is a SmartDataObject. The SmartDataObject Instance Properties DestroyStateless and DisconnectAppserver determine whether the SmartDataObject is to be destroyed or disconnected.

**disconnectObject**

Procedure that disconnects from the AppServer if there is one.

**Location:** webrep.p  
**Parameters:** None  
**Note:** First disconnectObject does an explicit destroyObject on the AppServer to give that object an opportunity to clean up. This procedure is invoked from destroyObject or can be run directly to disconnect without exiting.

**dispatchUtilityProc**

Procedure that calls the standard utility procedure, as defined in tagmap.dat, for the current Web object.

**Location:** html-map.p  
**Parameters:**

- **INPUT p_method** AS CHARACTER  
  The method procedure to run in the utility procedure (WEB.INPUT, WEB.OUTPUT).

- **INPUT p_field-hdl** AS HANDLE  
  OpenEdge object handle.

- **INPUT p_field-data** AS CHARACTER  
  Data to send to the procedure.

- **INPUT p_item-counter** AS INTEGER  
  Radio-set item to process.

- **OUTPUT p_result** AS LOGICAL  
  Indicates method ran successfully.

**Note:** Intended for internal use only.
**displayFields**

Procedure that copies SmartDataObject or database values to the displayed object and field form buffer screen values.

**Location:**  html-map.p

**Parameters:**  None

**Note:**  Commonly used in process-web-request procedure.

**Examples:**

```plaintext
PROCEDURE process-web-request:
  IF REQUEST_METHOD = "POST":U THEN DO:
    /* Copy HTML input field values to the form buffer fields. */
    RUN inputFields.
    /* Find the datasource record that needs to be assigned. */
    RUN findRecords.
    /* Assign form buffer field values to the datasource. */
    RUN assignFields.
    /* Display datasource field values to the form buffer fields. */
    RUN displayFields.
    /* Enable form buffer fields. */
    RUN enableFields.
    /* Output the static HTML page and form buffer field values to the web stream. */
    RUN outputFields.
  END.
END.
```

**enableFields**

Procedure that enables object and field form buffer widgets by setting their SENSITIVE attribute to TRUE.

**Location:**  html-map.p

**Parameters:**  None

**Note:**  Commonly used in process–web–request procedure.

**Examples:**

```plaintext
PROCEDURE process-web-request:
  IF REQUEST_METHOD = "POST":U THEN DO:
    /* Copy HTML input field values to the form buffer fields. */
    RUN inputFields.
    /* Find the datasource record that needs to be assigned. */
    RUN findRecords.
    /* Assign form buffer field values to the datasource. */
    RUN assignFields.
    /* Display datasource field values to the form buffer fields. */
    RUN displayFields.
    /* Enable form buffer fields. */
    RUN enableFields.
    /* Output the static HTML page and form buffer field values to the web stream. */
    RUN outputFields.
  END.
END.
```
**exclusiveLockBuffer**

Exclusively locks a buffer in the query.

**Location:** wbdata.p

**Parameters:**

INPUT phBuffer AS HANDLE

Buffer being locked.

**Returns:** LOGICAL PRIVATE

**Note:** Defined as private because its only used by deleteBuffer and lockRow, and there is no check whether this is a table in the query.

**extentAttribute**

Returns the attribute for a variable with extent.

**Location:** webrep.p

**Parameters:**

INPUT piExtent AS INTEGER

Extent.

INPUT pcList AS CHARACTER

The columns attribute, which is used to store ALL entries if any one is different.

**Returns:** CHARACTER PRIVATE

**Notes:**

- The buffer handle stores one value for help, label, and so forth. To have different attributes for each extent, they are stored with delimiter CHR(3).
- Used for LABEL and HELP.
- Currently private. This must change if it is needed for ValExp.

**extentValue**

Returns the extent number if a field name has brackets.

**Location:** webrep.p

**Parameters:**

INPUT pcColumn AS CHARACTER

The column’s name in the data-source.

**Returns:** INTEGER

**Note:** Returns 0 if no brackets in the name.
fetchCurrent
Procedure that repositions the data-source query to the rows stored in the CurrentRowids property.

Location:  webrep.p
Parameters:  None
Notes:  
•  This procedure is called from fetchNext and fetchPrev in order to re-establish context before the actual navigation takes place.
•  The Property CurrentRowids is immediately set from the Web field with the same name to keep the context between each request.

fetchFirst
Procedure that repositions the data-source query to the first row.

Location:  webrep.p
Parameters:  None
Notes:  None

fetchLast
Procedure that repositions the data-source query to the last row.

Location:  wbtable.p
Parameters:  None
Notes:  
•  This procedure is an override of fetchLast in webrep.p and contains the logic necessary to move the cursor backward to the row that should appear on the top of the last page. It does this by calling the PageBackward function after it has executed SUPER to reposition to what is the TRUE last row of the data-source.
•  The reason that this function is named fetchLast and not fetchLastPage to simplify the interface and conceal navigation details from the caller.

fetchLast
Procedure that repositions the data-source to the query’s last row.

Location:  webrep.p
Parameters:  None
Notes:  None
fetchNext

Procedure that repositions the query of the data-source to the first row of the next page.

Location:        wbtable.p
Parameters:      None
Notes:
• This procedure totally overrides the fetchNext in webrep.p and contains the logic necessary to move the cursor forward from the Web page’s current row to reposition to the row that appears on the top of the next page.
• The reason that this function is named fetchNext and not fetchNextPage is to simplify the interface and conceal navigation details from the caller.

fetchNext

Procedure that repositions the data-source query to the next row.

Location:        webrep.p
Parameters:      None
Note:            The procedure re-establishes context with a call to fetchCurrent before the actual navigation takes place.

fetchPrev

Procedure that repositions the query of the data-source to the first row of the previous page.

Location:        wbtable.p
Parameters:      None
Note:            This procedure is an override of fetchPrev in webrep.p and contains the logic necessary to move the cursor backward to the row that should appear on the top of the previous page. It does this by calling the PageBackward function after it has executed SUPER to find the current row received from the Web page, and repositions to what is the current row’s TRUE previous row. The reason that this function is named fetchPrev and not fetchPrevPage is to simplify the interface and conceal navigation details from the caller.

fetchPrev

Procedure that repositions the data-source query to the previous row.

Location:        webrep.p
Parameters:      None
Note:            The procedure re-establishes context with a call to fetchCurrent before the actual navigation takes place.
**fieldExpression**

Creates an expression for a field.

**Location:** webrep.p

**Parameters:**

INPUT pColumn AS CHARACTER

INPUT pOperator AS CHARACTER

INPUT pValue AS CHARACTER

**Returns:** CHARACTER

**Notes:** None

**findRecords**

Procedure that opens the SmartDataObject or database query that finds the records in this frame.

**Location:** html-map.p

**Parameters:** None

**Note:** Commonly used in process–web–request procedure.

**Examples:**

```plaintext
PROCEDURE process-web-request:
    IF REQUEST_METHOD = "POST":U THEN DO:
        /* Copy HTML input field values to the form buffer fields. */
        RUN inputFields.
        /* Find the datasource record that needs to be assigned. */
        RUN findRecords.
        /* Assign form buffer field values to the datasource. */
        RUN assignFields.
        /* Display datasource field values to the form buffer fields. */
        RUN displayFields.
        /* Enable form buffer fields. */
        RUN enableFields.
        /* Output the static HTML page and form buffer field values to the
         * web stream. */
        RUN outputFields.
    END.
END.
```
**getAttribute**

Returns the value of a standard Web-related attribute.

**Location:** admweb.p

**Parameters:**

`INPUT p_attr-name AS CHARACTER`

The name of the attribute. Possible names are type, version, web–state, web–timeout, web–timeout–handler, web–time–remaining. Other names can be used, provided that the special–get–attribute procedure to handle them exists in the target procedure.

**Returns:** CHARACTER (value of the attribute).

**Notes:** None

**Examples:**

```speedscript
RUNgetAttribute("web-state").
cWebState = RETURN-VALUE.
```

**getContextFields**

Retrieves the ContextFields property (see webrprop.i), a comma-separated list of Fields for which URL parameters are needed to keep context for subsequent requests to this object.

**Location:** webrep.p

**Parameters:** None

**Returns:** CHARACTER

**Notes:**

- The Property should be used whenever the HTML page needs to append the context information to the URL being sent out as URL parameters. This can be seen in a Web report generated using the Report wizard in the following line:

```speedscript
ASSIGN TmpUrl= url-format(?,getContextFields(),?).
```

- The Embedded SpeedScript templates for both Report and Detail Web objects use this function. ExternalTables, ExternalRowIds, and Columns that are used as Foreignfields are examples of context fields.
getCurrentPage

Called by adm–create–objects. Checks the current page.

Location: html–map.p
Parameters: None
Returns: INTEGER
Note: Intended for internal use only.

getCurrentRowids

Returns the String of comma-delimited rowids in the CurrentRowid property. (See webrprop.i.)

Location: webr.p
Parameters: None
Returns: CHARACTER
Notes:
- The rowids stored in this property come from the URL parameter list and are requested in fetchCurrent.
- Rowids for the external tables are also stored in the CurrentRowid property. The function getTableRowids will return the rowids for the query’s original tables.

getDeleteTables

Retrieves a comma-separated list of tables to be deleted.

Location: wbdata.p
Parameters: None
Returns: CHARACTER
Note: The getTables is used if this attribute is not set.

getForeignFieldList

Retrieves the alternative list of foreign fields corresponding to the ExternalTableList.

Location: webr.p
Parameters: None
Returns: CHARACTER
Notes: None
**getFrameHandle**

Returns the frame handle of the object.

- **Location:** wbdata.p
- **Parameters:** None
- **Returns:** HANDLE
- **Notes:** None

**getNavigationMode**

Returns the current navigation mode. NOT IN USE.

- **Location:** webrep.p
- **Parameters:** None
- **Returns:** CHARACTER
- **Notes:** Not in use.

**getNextHtmlField**

Procedure that reads the HTML file one line at a time, sending each line to the Web stream, up to the next HTML field definition.

- **Location:** html-map.p
- **Parameters:**
  - INPUT-OUTPUT next-line AS CHARACTER
    - Full text of current line.
  - INPUT-OUTPUT line-no AS INTEGER
    - Line position counter.
  - INPUT-OUTPUT start-line-no AS INTEGER
    - Beginning field definition line.
  - INPUT-OUTPUT start-line-offset AS INTEGER
    - Beginning field definition column.
  - INPUT-OUTPUT end-line-no AS INTEGER
    - Ending field definition line.
  - INPUT-OUTPUT end-line-offset AS INTEGER
    - Ending field definition column.
INPUT-OUTPUT field-def AS CHARACTER

Field definition between <“ and “>.

INPUT-OUTPUT clip-bytes AS INTEGER)

Chars on line already processed.

**Note:** Internal use only. The field definition is extracted from the [row, column] offsets [start–line–no, start–line–offset] to [end–line–no, end–line–offset] and returned.

---

**getQueryEmpty**

Checks to verify whether or not the data source or query is empty.

- **Location:** webrep.p
- **Parameters:** None
- **Returns:** LOGICAL
- **Notes:** None

---

**getQueryWhere**

Gets the current WHERE clause for the query.

- **Location:** webrep.p
- **Parameters:** None
- **Returns:** CHARACTER
- **Notes:** None

---

**getRowids**

Gets the ROWID(s) of the current row or rows.

- **Location:** webrep.p
- **Parameters:** None
- **Returns:** CHARACTER
- **Notes:** None
**getSearchColumns**

Gets the SearchColumns property. (see webrprop.i.)

- **Location:** webrep.p
- **Parameters:** None
- **Returns:** CHARACTER
- **Note:** Contains a comma-delimited list of columns that are used to search in the current data-source. Currently supports only one column.

**getServerConnection**

Returns SESSION:SERVER-CONNECTION-ID through ServerConnection property.

- **Location:** webrep.p
- **Parameters:** None
- **Returns:** CHARACTER
- **Notes:** None

**getTableRowids**

Retrieves a list of current rowids by using getRowids, and then uses the ExternalTables property (see webrprop.i) to remove the External Tables from the list, returning a list of rowids for only the records requested by the current object.

- **Location:** webrep.p
- **Parameters:** None
- **Returns:** CHARACTER
- **Note:** Used to pass as external rowids to a called object.

**getTableRows**

Returns the number of rows in the table.

- **Location:** wbtable.p
- **Parameters:** None
- **Returns:** INTEGER
- **Notes:** None
getTables

Overrides to use the property for HTML mapping with no data-source.

Location: html1-map.p
Parameters: None
Returns: CHARACTER
Notes: None

getTables

Returns a comma-delimited list of tables from which data will be retrieved, either from a SmartDataObject or database.

Location: webrep.p
Parameters: None
Returns: CHARACTER
Notes: None

getUpdateMode

Returns the value of the updateMode flag, which governs the behavior of ColumnStringValue. If updateMode is set to Add, ColumnStringValue returns initial values of a column. If updateMode is not set to Add, ColumnStringValue returns the current value of the column.

Location: webrep.p
Parameters: None
Returns: CHARACTER
Notes: None

getWebState

Returns the Web state for a Web object.

Location: admweb.p
Parameters: None
Returns: CHARACTER (Possible values are state–aware, state–less, timed–out.)
Notes: None
Examples:

cWebState = getWebState().
getWebTimeout

Returns the timeout in minutes for a state–aware Web object.

Location: admweb.p
Parameters: None
Returns: DECIMAL (Timeout in minutes).
Notes: None
Examples:

\[ \text{dWebTimeout} = \text{getWebTimeout}(). \]

getWebTimeRemaining

Returns the time remaining for a state–aware Web object.

Location: admweb.p
Parameters: None
Returns: DECIMAL (Time remaining).
Notes: None
Examples:

\[ \text{dWebTimeout} = \text{getWebTimeRemaining}(). \]

getWebToHdlr

Returns the name of the Web object or procedure to run when the currently running state–aware Web object times out.

Location: admweb.p
Parameters: None
Returns: CHARACTER (Name of the object/procedure to run.)
Notes: None
Examples:

\[ \text{cWebToHdlr} = \text{getWebToHdlr}(). \]
htmAssociate

Procedure that maps HTML fields to their Web object widget counterparts.

**Location:** html-map.p

**Parameters:**

- **INPUT htmField AS CHARACTER**
  
  HTML field name.

- **INPUT wdtField AS CHARACTER**
  
  Web object field name.

- **INPUT widHandle AS HANDLE**
  
  Web object field handle.

**Note:** Internal use only. AppBuilder-maintained, read-only. The essential HTML mapping procedure.

HTMLAlert

Generates an alert-box in the HTML.

**Location:** webrep.p

**Parameters:**

- **INPUT pcMessage AS CHARACTER**
  
  The message to display.

**Returns:** LOGICAL

**Note:** The message is generated with JavaScript.
**HTMLColumn**

Outputs the columns value within an HTML `<TD>` tag, including the HREF definitions to create defined hyperlinks.

**Location:** wbtable.p

**Parameters:**

INPUT `pcColumn`

The name of the column to output.

**Returns:** LOGICAL

**Note:** Checks the LinkColumns property to see if any link attributes are defined. An HREF will be generated to create the hyperlink if an object is specified. If a function is defined for the status line, it will be called and the returned text will be generated in a mouse-over event. The urlLink function is called to add necessary link parameters to the HREF link.

**HTMLSetFocus**

Sets focus to a field in a WebPage.

**Location:** webrep.p

**Parameters:**

INPUT `pcForm` AS CHARACTER

The NAME of the HTML form of the field.

INPUT `pcColumn` AS CHARACTER

OpenEdge column name.

**Returns:** LOGICAL

**Notes:**

- The generated code is JavaScript.

- The `columnHTMLName` function returns a valid HTML field name for the passed Column.
**HTMLTable**

Outputs the entire HTML `<TABLE>`.

**Location:** wbtable.p  
**Parameters:** None  
**Returns:** LOGICAL  
**Notes:**

- Checks the data type of the column and adds the HTML attribute to right align decimals and integers with the help of the addTDModifier function.
- Adds labels to the HTML table if UseColumnLabels is set to TRUE.
- Calls the HTMLColumn function for each column. This is done as many times as specified in the TableRows property.

**initializeObject**

Procedure that sets the list of displayed and enabled objects, fields, or both.

**Location:** html-map.p  
**Parameters:** None  
**Note:** Intended for internal use only.
inputFields

Procedure that receives field input from the Web browser and populates the form buffer field values.

**Location:**  html-map.p

**Parameters:**  None

**Note:**  Runs the WEB.INPUT procedure for each HTML field in the offset (.off) file. Commonly used in process–web–request procedures.

**Examples:**

```plaintext
PROCEDURE process-web-request:
  IF REQUEST_METHOD = "POST" THEN DO:
    /* Copy HTML input field values to the form buffer fields. */
    RUN inputFields.
    /* Find the datasource record that needs to be assigned. */
    RUN findRecords.
    /* Assign form buffer field values to the datasource. */
    RUN assignFields.
    /* Display datasource field values to the form buffer fields. */
    RUN displayFields.
    /* Enable form buffer fields. */
    RUN enableFields.
    /* Output the static HTML page and form buffer field values to the web stream. */
    RUN outputFields.
  END.
END.
```
joinExternalTables

Adds external tables to the buffers in the database query.

**Location:** webrep.p

**Parameters:**

INPUT pcTables AS CHARACTER

A comma-separated list of tables to join.

INPUT pcRowids AS CHARACTER

The corresponding list of ROWIDS.

**Returns:** LOGICAL

**Notes:**

There are two ways to treat a list of external tables where one or more of the tables already are in the query:

- As a default, use the corresponding ExternalRowid in the where clause in the query. All other tables are disregarded.
- If the external table list is defined in the ExternalTables attribute, disregard the tables that are in the query and join to the OTHER tables. (ExternalJoinList and ExternalWhereList already have the right number of entries.)

joinForeignFields

Finds the foreign fields to use for the passed external tables or object and creates the new query statement in the data-source. Gets the values from the Web and adds the columns and values to the query.

**Location:** webrep.p

**Parameters:**

INPUT pcObject AS CHARACTER

A table or SmartDataObject name that has an entry in the ForeignFieldsList.

**Returns:** LOGICAL

**Notes:** None
**lockRow**

Locks all the records for the query or creates records for the tables in the query if the AddMode property is set to TRUE. Returns FALSE if it fails to lock the record for some reason.

**Location:** wbdata.p

**Parameters:**

INPUT pLock AS CHARACTER

If the option begins “EXCLUSIVE” the records will be locked exclusively. Otherwise the records will be NO-LOCKed.

**Returns:** LOGICAL

**Notes:**

- The function is only used for database data-sources.
- The function returns FALSE and adds the necessary error messages to the ADM 2 message queue if the record is unavailable or locked.
- Used internally by assignFields and deleteRow and not intended for external use.
- Also used internally to reset the lock to NO-LOCK when a transaction ends.

**openQuery**

Opens the database query in the data-source.

**Location:** webrep.p

**Parameters:** None

**Returns:** LOGICAL

**Notes:** None
outputFields

Procedure that replaces the tagged HTML field definition with the data values stored in the form buffer.

Location: html-map.p
Parameters: None
Note: Merges the HTML file with the results of running the WEB.OUTPUT procedure, if one exists, for each HTML field. Otherwise just the HTML field definition is output. When available, default utility procedures containing the WEB.OUTPUT procedure are run, based on HTML field type. Commonly used in process-web-request procedure.

Examples:

```
PROCEDURE process-web-request:
   IF REQUEST_METHOD = "POST":U THEN DO:
      /* Copy HTML input field values to form buffer fields. */
      RUN inputFields.
      /* Find datasource record that needs to be assigned. */
      RUN findRecords.
      /* Assign form buffer field values to datasource. */
      RUN assignFields.
      /* Display datasource field values to form buffer fields. */
      RUN displayFields.
      /* Enable form buffer fields. */
      RUN enableFields.
      /* Output static HTML page and form buffer field values to web stream. */
      RUN outputFields.
   END.
END.
```

pageBackward

Reads the previous record from the data-source the number of times required to find the row that should be the top row in the table in order to make the current record the last record.

Location: wbtable.p
Parameters: None
Returns: LOGICAL
Notes:

- This is all additional logic that makes fetchPrev and fetchLast override their SUPER.
- The function is called from fetchNext if the last row is encountered as fetchNext loops through the number of records specified in the TableRows property. It finds the row that should appear on the top of the next page.
**processWebRequest**

Procedure that processes the request from the Web. This is an override of the *webrep.p* version and has the additional logic necessary to handle transaction requests.

**Location:**  
*wbdata.p*

**Parameters:**  
None

**Notes:**

- The logic in this procedure is based on the values of the two Web fields `MaintOption` and `AddMode` which are maintained on the HTML page and received as part of the web request.

- The value of the Web field `AddMode` is passed to the object’s `AddMode` property to distinguish between the creation of a new record or a save of the current.

- When `MaintOption` is `submit`, the `assignFields` procedure is called. When `MaintOption` is `delete`, the `deleteRow` function is called.

- When “MaintOption” is “submit” or “delete” the value returned from the `Rowids` property is set to the `CurrentRowids` property after the request has been executed. This property is maintained in the HTML page as a context keeper and is usually maintained by the `SUPER` procedure. It needs to be updated here in case the current record was deleted or a new record has become the current.

- The procedure has logic to deal with the case of an empty query. It changes the mode of an object to `Add` by assigning the `UpdateMode` property’s value to `Add`. This change is accompanied by an `addMessage` call that results in a corresponding message being generated in the HTML page.

**processWebRequest**

Procedure that processes the request from the Web. This is an override of the *webrep.p* version and contains additional logic to be able to produce an HTML page with several rows in a table.

**Location:**  
*wbtable.p*

**Parameters:**  
None

**Notes:**

- The actual HTML page is generated in the `HTMLTable` function.

- Because the object is read-only it does not go into add mode when the query is empty. In this case, an error message is added to the ADM 2 message queue.

- The procedure ends with a `destroyObject` call, which is important when the data-source is a `SmartDataObject`, even if the `TARGET–PROCEDURE` is not run persistently. The reason is that `destroyObject` might destroy the `SmartDataObject` and/or disconnect any AppServer connection depending on the Instance Properties of the `SmartDataObject`.
**processWebRequest**

Procedure that processes the submitted request from the Web.

**Location:** webrep.p  
**Parameters:** None  
**Notes:**

- The following Web data are retrieved with get-field:
  
  - **CurrentRowids** — A list of the rowids that are currently in use for this object on the Web.
  
  - **Navigate** — Next,Prev,First,Last,Search.
  
  - **Maintoption** — Add,Delete,Submit.
  
  - **SearchValue** — Use when Navigate = Search.
  
  - **ExternalObjects** — Data-source objects to join to (comma separated).
  
  - **ExternalTables** — Tables to join to (comma separated).
  
  - **ExternalRowids** — ROWIDs that correspond to ExternalTables ROWIDs (comma separated).

- After the data-source query has been manipulated according to the received Web data and other properties, the data-source query is opened.

- If this is a search and the query is empty, the query is reopened and a message is added to the ADM 2 message queue to inform the user that no data was found.

- The last action that is performed is to set the CurrentRowids property from the Rowids property. This must be done last because the property is used in navigation and because, to keep context for the next request, the property must reflect the new current record as it is going to be passed back to the Web page.

**readOffsets**

Procedure wrapper that wraps a procedure that reads the HTML mapping offset file and populates internal AppBuilder temp-tables.

**Location:** html-map.p  
**Parameters:**

INPUT cWebFile AS CHARACTER

Name of offset file.

**Note:** Internal use only.
removeEntry

Removes an entry from a list.

Location: webrep.p
Parameters:
INPUT pNum AS INTEGER
INPUT pList AS CHARACTER
Returns: CHARACTER PRIVATE
Notes:
• PRIVATE, not recommended for use.
• Delimiter is always comma.

reOpenQuery

Resets the data-source query to its original state.

Location: webrep.p
Parameters: None
Returns: LOGICAL
Note: This is the state after context has been reset, but before a search or query has been performed.

rowidExpression

Creates ROWID expression for dynamic query Rowid(table) = to-rowid(rowidchar).

Location: webrep.p
Parameters:
INPUT pcBuffer AS CHARACTER
    Buffer name in the query.
INPUT pcRowid AS CHARACTER
    STRING of the Rowid.
Returns: CHARACTER PRIVATE
Notes: None
setAddMode

Sets the ADDMode property. If set to TRUE, the assignFields procedure will create a new record.

Location: wbdata.p
Parameters:

INPUT p1Add AS LOGICAL

The new value for the property.

Returns: LOGICAL
Notes: None

setAppService

Stores the AppService in which the SmartDataObject is to be started. This routine should be called before startDataObject. If the datasource is valid it must be disconnected if it is connected to a different partition.

Location: webrep.p
Parameters:

INPUT pAppService AS CHARACTER

The AppService in which the SDO will start.

Returns: LOGICAL
Note: This value will be passed to the SDO before initialization.
set-attribute-list

Accepts the value of the complete object attribute list and runs procedures to set individual attributes.

**Location:** admweb.p

**Parameters:**

INPUT p-attr-list AS CHARACTER

A comma-separated attribute list with the format `name=value`. Typical attributes are web–timeout, web–state, and web–timeout–handler. In addition, other names can be used provided that the special–get–attribute procedure to handle them exists in the target procedure.

**Returns:** None

**Note:** Not all attributes are settable. Those that are a part of an event such as enable/disable (which set ENABLED on/off) or hide/view (which set HIDDEN on/off), can be queried through getAttribute, but are read-only.

**Examples:**

```
RUN set-attribute-list ("web-state=persistent, web-timeout=60").
```

setBuffers

Sets the Buffers property (see `webrprop.i`), a comma-separated list of database tables (not SmartDataObject) to be retrieved by this object.

**Location:** webrep.p

**Parameters:**

INPUT pcTables AS CHARACTER

Tables to use in the database query.

**Returns:** LOGICAL

**Note:** This will clear all previously defined buffers.
setColumns

Sets the DataColumns property (see webprop.i), a comma-separated list of database tables (not SmartDataObject) to be retrieved by this object.

Location: webrep.p
Parameters:
INPUT pcColumns AS CHARACTER

A comma-separated list of column names.

Returns: LOGICAL
Note: The function is named setColumns instead of setDataColumns for backwards compatibility.

setContextFields

Sets the ContextFields property (see webrprop.i), a comma-separated list of fields for which URL parameters are needed to keep context for subsequent requests to this object.

Location: webrep.p
Parameters:
INPUT pcContextfield AS CHARACTER

The new property.

Returns: LOGICAL
Note: Use addContextFields to add to the list.

setCurrentRowids

Sets the String of comma-delimited rowids in the CurrentRowid property that will be used by fetchCurrent. (See webrprop.i.)

Location: webrep.p
Parameters:
INPUT pcRowids AS CHARACTER

A list of ROWIDS.

Returns: LOGICAL
Notes:
- Typically this would be set from a URL parameter or hidden field.
- The purpose of this property is to store the context of the current record received from the Web once, so that it only needs to RUN fetchCurrent whenever it is needed.
setDeleteTables
Sto res a comma-separated list of tables to be deleted.

Location: wbdata.p

Parameters:

INPUT pcDeleteTables AS CHARACTER

Returns: LOGICAL

Notes:

- This can be used to delete only one of the joined tables, it can also be useful to define the sequence of deletion.
- The empty string is treated as a "*": if the argument is a blank, then the deleteRow() will delete all the tables in the query.

setExternalJoinList

Sets the ExternalJoinList property (see webrprop.i), a comma-separated list of URL parameters that are needed to join an external table (supplied by the ExternalTables URL parameter) to retrieve data for this request. In report and detail Web objects, this is specified on the External Tables and Objects Page in the QueryBuilder.

Location: webrep.p

Parameters:

INPUT pcExternalJoinList AS CHARACTER

A pipe ( | )-separated list of OF phrases.

Returns: LOGICAL

Notes: None

Examples:

/*This example is from a report web object that is looking for an external table of customer, and will present orders, orderlines and items based on the ExternalJoinlist as shown.*/

setExternalJoinList('Order.CustNum = Customer.CustNum, OF Order, OF OrderLine').
setExternalTableList

Sets the ExternalTableList property (see webrprop.i), a pipe-separated list of comma-separated lists of External Tables that might be used to retrieve data for this request. In report and detail Web objects, this is specified on the External Tables and Objects Page in the QueryBuilder.

Location: webrep.p

Parameters:

INPUT pcExternalTableList AS CHARACTER

A pipe (|)-separated list of comma-separated tables.

Returns: LOGICAL

Note: The ExternalJoinList and ExternalWhereList and/or ForeignFieldList have corresponding entries.

Examples:

```c
/* If you have a report of orders called reord.html you might call that report from any of the following types of objects:

Objects that provide ExternalTables=customer in the URL, along with information (rowid or foreign fields) that allow this report to retrieve only orders for a particular customer.

Objects that provide ExternalTables=salesrep,customer in the URL, along with information (rowids or foreign fields) that allow this report to retrieve only orders for a particular customer sold by a particular salesrep.

Objects that provide ExternalTables=salesrep in the URL, along with information (rowid or foreign fields) that allow this report to retrieve only orders sold by a particular salesrep.

To allow external joins from any of these types of web objects, you would use the following call to setExternalTables: */
setExternalTableList ('customer|salesrep,customer|salesrep').

/* setForeignFieldList, setExternalJoinList and setExternalWhereList have corresponding pipe-delimited entries such as the following: */
setExternalJoinList ('OF customer|Order.CustNum = Customer.CustNum AND
Order.SalesRep = Salesrep|Order.SalesRep = Salesrep').
setForeignFieldList ('custnum|salesrep','custnum|salesrep').
setExternalWhereList ('|Order.PromiseDate < 12/12/99|').
```
**setExternalTables**

Sets the ExternalTables property (see `webrprop.i`), a comma-separated list of the current List of ExternalTables to use to retrieve data for this request.

**Location:** `webrep.p`

**Parameters:**

INPUT `pcExternalTables` AS CHARACTER

A comma-separated list of table names.

**Returns:** LOGICAL

**Notes:** None

**setExternalWhereList**

Sets the ExternalWhereList property (see `webrprop.i`), which contains an optional pipe-separated list of WHERE clause field expressions that correspond to the ExternalTableList Property.

**Location:** `webrep.p`

**Parameters:**

INPUT `pcExternalWhereList` AS CHARACTER

A pipe ( | )-separated list of field expressions.

**Returns:** LOGICAL

**Notes:**

- The expressions are defined when the QueryBuilder is called from the External Tables and Object page of Wizards for Embedded SpeedScript objects (report and detail objects).
- WHERE clauses that are set with the **Where** radio-set in the **Edit Join** query builder page on the External Tables and Objects Page of the Report and Detail Wizard are stored in this property.
- WHERE clauses that are in the ExternalJoinList are merged with the clauses in the ExternalWhereList Property. This is useful in cases in which WHERE clauses that reference more than one table need to be built, such as the following:

```
EACH Order WHERE Order.CustNum = Customer.CustNum
    AND Order.SalesRep = Salesrep.SalesRep NO-LOCK INDEXED-REPOSITION
```
setForeignFieldList

Sets the ForeignFieldList property (see webrprop.i), a pipe (|)-separated list of comma-separated lists of the use to format URL parameters to pass to the next Web object.

Location: webrep.p
Parameters:
INPUT pcForeignFieldList AS CHARACTER
Returns: LOGICAL
Notes: None

setFrameHandle

Stores the handle of the frame.

Location: wbdata.p
Parameters:
INPUT pHdl AS HANDLE
Returns: LOGICAL
Notes: None

setLinkColumns

Stores the columns that have hyperlinks as a comma-separated list in the LinkURLs property (see wbtaprop.i).

Location: wbtable.p
Parameters:
INPUT pLinkColumns AS CHARACTER
The comma-separated list of columns.
Returns: LOGICAL
Notes: None
Examples:

setLinkColumns ("custnum,salesrep")
**setLinkColumns**

Stores a comma-separated list of columns that have hyperlinks.

**Location:** webrep.p  
**Parameters:**

INPUT pcLinkColumns AS CHARACTER

A comma-separated list of column names.

**Returns:** LOGICAL  
**Notes:** None

**setQueryWhere**

Prepares the query with a new OPEN QUERY statement or a new expression.

**Location:** webrep.p  
**Parameters:**

INPUT pcMode AS CHARACTER

The new WHERE clause or expression.

**Returns:** LOGICAL  
**Notes:** None

**setSearchColumns**

Stores the SearchColumns value. (Currently one.)

**Location:** webrep.p  
**Parameters:**

INPUT pcSearchColumns AS CHARACTER

A column name in the data-source.

**Returns:** LOGICAL  
**Notes:** None

**setServerConnection**

Sets SERVER_CONNECTION_ID property from SESSION:SERVER-CONNECTION-ID.

**Location:** webrep.p  
**Parameters:** None  
**Returns:** LOGICAL  
**Notes:** None
**setTableModifier**

Stores the Specified HTML attributes for the `<table>` tag in TableModifier property (see `wbtaprop.i`).

**Location:** `wbtable.p`

**Parameters:**

- `INPUT pTableModifier AS CHARACTER`
  
  One or more HTML attributes that will be used in the TABLE tag.

**Returns:** LOGICAL

**Note:** The Embedded SpeedScript (.htm) files created by the Report wizard show examples of this function call in use.

**Examples:**

```plaintext
setTableModifier(' border="2" cellspacing=10')
```

**setTableRows**

Stores the specified number of rows for the HTML table in TableRows property (see `wbtaprop.i`).

**Location:** `wbtable.p`

**Parameters:**

- `INPUT PRows AS INTEGER`
  
  Number of rows to display in the HTML page.

**Returns:** INTEGER

**Note:** The Embedded SpeedScript (.htm) files created by the Report wizard show examples of this function call in use.

**Examples:**

```plaintext
setTableRows(10)
```
**setUpdateMode**

Sets the value of the updateMode flag, which governs the behavior of ColumnStringValue. If updateMode is set to *Add*, ColumnStringValue returns initial values of a column. If updateMode is not set to *Add*, ColumnStringValue returns the current value of the column.

**Location:** webrep.p

**Parameters:**

INPUT pcMode AS CHARACTER

Either *yes* or *no*.

**Returns:** LOGICAL

**Note:** This call is used in processWebRequest in web objects created using the report and detail wizards. In these objects, the hidden field AddMode is set to the value of UpdateMode when a page is sent to the WebBrowser, which is detected when the WebPage is returned.

**setUseColumnLabels**

Stores a logical specifying whether to use column labels for the HTML table in UseColumnLabels property (see wbtaprop.i).

**Location:** wbtable.p

**Parameters:**

INPUT pUseLabels AS LOGICAL

**Returns:** LOGICAL

**Note:** This is using the LABEL and not the COLUMN–LABEL of the field. (There is no logic to take care of the ! in column–labels).

**Examples:**

```
setUseColumnLabels(no)
```
**setWebState**

Sets the Web state to state-aware and the timeout for Web objects.

**Location:** admweb.p

**Parameters:**

*INPUT pdWebTimeout AS DECIMAL*

The number of minutes to remain state-aware.

**Returns:** LOGICAL

**Notes:** None

**Examples:**

\[\texttt{RETURN} = \texttt{setWebState}(5.0).\]

**setWebToHdlr**

Sets the name of the Web object or procedure to run when the currently running state-aware Web object times out.

**Location:** admweb.p

**Parameters:**

*INPUT pcWebToHdlr CHARACTER*

The Web-object name.

**Returns:** LOGICAL

**Note:** Web object must be on the Agent’s PROPATH.

**Examples:**

\[\texttt{RETURN} = \texttt{setWebToHdlr}("mytohdlr.w").\]
**showDataMessages**

Runs fetchMessages to retrieve all data-related messages (normally database update-related error messages) and calls the HTMLAlert function to show them in an alert box on the Web.

*Location:* webrep.p  
*Parameters:* None  
*Returns:* CHARACTER  
*Notes:*  
- Returns the name of the field (if any) from the first error message, to allow the caller to use it to position the cursor.  
- This procedure expects to receive back a single string from fetchMessages with one or more messages delimited by CHR(3), and within each message the message text, field name (or blank) + a table name (or blank), delimited by CHR(4), if present.

**startDataObject**

Starts or connects to the SmartDataObject. If the AppService attribute is set in this object, it must also be set in the SmartDataObject before that SmartDataObject is initialized.

*Location:* webrep.p  
*Parameters:*  
  - INPUT pcDataSource AS CHARACTER  
    Procedure name of the SmartDataObject to be started (for example, dcust.w).  
*Returns:* LOGICAL  
*Note:* The properties "OpenOnInit", "CheckLastOnOpen" and "RebuildOnRepos" are always set to TRUE.

**timingOut**

Procedure that sets the Web state to timed–out for a Web object.

*Location:* admweb.p  
*Parameters:* None  
*Note:* RUN timingOut is equivalent to setWebState (0).
urlJoinParams

Generate the URL parameter to use as join information for a linked object.

Location: webrep.p

Parameters:

INPUT pcJoinParam AS CHARACTER

Specifies which parameters must be added to the URL in order to join this data-source to the linked object’s data-source. The following are the valid values for this parameter:

- **ROWID** specifies that record information should be passed as rowids in the ExternalRowids URL parameter (only when using database as data-source).

- A comma-separated list of column names; for example, "custnum,state,salesrep".

- Blank. No link information is needed.

Returns: CHARACTER

Notes:

- This is called from urlLink with the correct entry from the CHR(3)-delimited JoinLinks attribute.

- Add "?" as the last entry to the parameter to specify that the first parameter should be separated with "?" (the FIRST URL parameter).

urlLink

Returns the necessary URL parameters to pass record information to a linked object.

Location: webrep.p

Parameters:

INPUT pcWebObject AS CHARACTER

The object to call (can have URL parameters).

INPUT pcJoinParam AS CHARACTER

Specifies which parameters must be added to the URL in order to join this data-source to the linked object’s data-source. The following are the valid values for this parameter:

- **ROWID** specifies that record information should be passed as rowids in the ExternalRowids URL parameter (only when using database as data-source).

- A comma-separated list of column names; for example, "custnum,state,salesrep".

- Blank. No link information is needed.

Returns: CHARACTER

Notes: None
**validateColumns**

Returns TRUE if all of the database columns in the optionally defined frame are validated. The frame is generated specifically for this purpose.

**Location:** wbdata.p  
**Parameters:** None  
**Returns:** LOGICAL  

**Notes:**
- The function is only used when the data-source is a database.
- The Embedded SpeedScript detail wizard optionally generates a frame containing all the database columns that have been specified to inherit data dictionary validation. This function does the actual parsing and validation of the database columns in that frame.
- The function retrieves the actual values to validate from the Web unless it finds fields in the EnabledFields Property. In that case, it assumes that the values already have been moved to the frame. The intention of this logic is to support HTML mapping objects.
- The HTML mapping object does not call this default. The use of EnabledFields to indicate whether the values should be retrieved from the Web or already are in the frame is very likely to change.

**validateColumnValue**

Verifies whether or not a value is the correct data type.

**Location:** webrep.p  
**Parameters:**
- **pcColumn** AS CHARACTER  
  The column’s name in the data-source.
- **pcValue** AS CHARACTER  
  Value to validate.

**Returns:** LOGICAL  
**Note:** Returns TRUE if Column Value is valid, FALSE if it is not.
Progress Dynamics Call Wrapper

The Progress Dynamics® Call Wrapper provides an efficient way to dynamically invoke code with parameter lists that are defined at run time. The wrapper supports all required calls and combinations of parameters so that you can make calls to your business logic. This wrapper operates both inside and outside the existing Progress Dynamics framework so that you can use the functionality when ADM2 is running in a non-Progress Dynamics environment.

If your application is a Web-based application, the call wrapper can obtain values to parameters from context that has been stored in the session. This context can be stored using either the setPropertyList or setSessionParam. The wrapper can also derive the parameters for a call from this context and can also write the return values from a call into this context. The wrapper can invoke procedures within the current session as well as on an AppServer.

You can invoke the call wrapper in the following using the dynlaunch.i include file, using a single-entry-point procedure, or by using the API. This appendix provides information about:

- Invoking the call wrapper using dynlaunch.i
- Invoking the call wrapper using a single-entry point
- Temp-table include files
- Temp-table types
- API reference
- Invoking the call wrapper at the API level
Invoking the call wrapper using dynlaunch.i

The `dynlaunch.i` include file provides the simplest and easiest way to invoke the Progress Dynamics® Call Wrapper. Progress Software Corporation recommends that you use `dynlaunch.i` when using an AppServer where the procedure handle is not needed after the call.

dynlaunch.i accepts a temp-table of call information, constructs the call using this information and then invokes the call. Although using `dynlaunch.i` is the simplest way to invoke the call wrapper, the performance overhead is greater than when invoking the call wrapper using the single-entry point or at the API level. Therefore, Progress Software Corporation recommends that you use `dynlaunch.i` as follows:

- When making calls across the AppServer and the benefits of reduced AppServer calls and an unbound connection outweigh the disadvantage of the overhead associated with the dynamic call
- When call parameters are only known at run time

dynlaunch.i supports calls to an internal procedure inside a server-side procedure that might or might not already be running. When you invoke the Progress Dynamics call wrapper using `dynlaunch.i`, it handles all of the following in a single AppServer call:

- Identifies whether the external procedure is already running on the server and starts the procedure if it is not running
- Runs the internal procedure inside the server-side persistent procedure
- Gets back the OUTPUT parameters from the internal procedure call
- Deletes the server-side procedure if it was started just for this call

The following list the include file arguments for `dynlaunch.i`:

- **&PLIP** — Named argument that names the external procedure needed on the server. Alternatively, it can be the logical name (the Manager Type name) of any registered Progress Dynamics® Manager, including a newly created manager
- **&Iproc** — Named argument that names the internal procedure to run
- **&clearHandle** — Deletes the TABLE-HANDLE or BUFFER after the call completes
- **&Define-only** — If set to Yes, you can define the variables that you need that require no action

There must also be three named arguments for each parameter in the internal procedure’s calling sequence. For each argument, the $n$ represents the order of the parameter in the call:

- **&moden** — Named argument is INPUT, OUTPUT, or INPUT-OUTPUT
- **&parmn** — Named argument that names the variable or table field storing the parameter
- **&datypen** — Named argument that holds the data type of the parameter

For more information about using `dynlaunch.i`, see the *OpenEdge Development: Progress Dynamics Basic Development* and *OpenEdge Development: Progress Dynamics Advanced Development*. 
Invoking the call wrapper using a single-entry point

Using a single-entry point to invoke the Progress Dynamics call wrapper requires more coding compared to using `dynlaunch.i`. However, using this method to invoke the Progress Dynamics call wrapper provides greater control of error handling and improved performance.

When you use a single-entry point, you can invoke the Progress Dynamics call wrapper using any of the single-entry-point procedures to make the appropriate call using a single RUN statement. These single-entry-point procedures act as containers that perform the tasks needed to make a dynamic call.

**Note:** Progress Software Corporation recommends that you use dynamic calls only in situations where signatures are unknown at run time and the number of calls is relatively small.

The following sections describe these single-entry point procedures:

- `callstring.p`
- `callstringtt.p`
- `calltable.p`
- `calltablett.p`

### callstring.p

The `callstring.p` procedure allows you to make a Progress Dynamics call by providing a minimal list of information. The procedure then evaluates the data needed to make the call and performs all the steps necessary to invoke the call. This is advantageous because `callstring.p` can be run from a client procedure in a single AppServer request.

The caller can invoke procedures and functions in a remote manager by providing mnemonics that are evaluated by the `callstring.p` on the server. These mnemonics map to handles to procedures that are not known to the client.

The procedure invokes calls using a string containing the parameters in the following form:

```
mode datatype parameter, mode datatype parameter,...
```

Each token in a group is separated by a space, and when the value of a parameter token is a constant, the value is enclosed in single quotes.

**Note:** The following examples illustrate code for use in a Progress Dynamics environment because they use the Connection Manager.
The following code example illustrates a valid callstring.p invocation:

```plaintext
RUN callstring.p
("disconnectService",          /* call to make */
 "ConnectionManager",           /* manager to use */
 "INPUT CHARACTER 'sports2000'"). /* parameter string */
```

The call results in a call to the disconnectService procedure in the Connection Manager in the local session and passes a single input parameter of data type character with the constant value of **sports2000**.

If the value of the parameter is determined from context, the constant value **sports2000** can be replaced with a context variable name, as shown:

```plaintext
RUN callstring.p
("disconnectService",          /* call to make */
 "ConnectionManager",           /* manager to use */
 "INPUT CHARACTER cDBName").    /* parameter string */
```

In this sample, **cDBName** is the name of a property or parameter that was previously set using `setPropertyList` or `setSessionParam`.

**callstringtt.p**

The `callstringtt.p` procedure is similar to `callstring.p`, except that it allows you to pass up to 64 temp-tables that function as parameters to the invokeCall procedure.

In addition to the behavior provided by `callstring.p`, `callstringtt.p` also allows the caller to provide a mapping between the 64 temp-tables being passed and the appropriate parameter to the call.

The code in **Example A–1** illustrates an example procedure that you might need to call in a server-side procedure.

**Example A–1: Example server-side procedure**

```plaintext
/* customerbl.p */
...
PROCEDURE obtainCustomerData:
  DEFINE INPUT PARAMETER phCustomerTempTable AS HANDLE NO-UNDO.
  DEFINE INPUT PARAMETER pcSessionID AS CHARACTER NO-UNDO.
  DEFINE INPUT PARAMETER phOrderBuffer AS HANDLE NO-UNDO.

  /* Process the customer temp-table and order buffer */
END.
```
The code in Example A–2 illustrates making a call to the obtainCustomerData procedure. In this example, the procedure passes the handle to the temp-table as the first parameter and the buffer handle for the order temp-table as the second parameter.

Example A–2: Making a call to the obtainCustomerData procedure

```
RUN adm2/callstringtt.p
("obtainCustomerData", /* call to make */
"customerbl.p", /* procedure to use */
"INPUT HANDLE 'T:01', INPUT CHARACTER cSessionID,
INPUT HANDLE 'B:02'", /* parameter list */
"", /* tables to skip */
INPUT-OUTPUT TABLE ttCust,
INPUT-OUTPUT TABLE ttOrder,
INPUT-OUTPUT TABLE-HANDLE hTT03,
INPUT-OUTPUT TABLE-HANDLE hTT04,
INPUT-OUTPUT TABLE-HANDLE hTT05,
INPUT-OUTPUT TABLE-HANDLE hTT06,
INPUT-OUTPUT TABLE-HANDLE hTT07,
INPUT-OUTPUT TABLE-HANDLE hTT08,
INPUT-OUTPUT TABLE-HANDLE hTT09,
INPUT-OUTPUT TABLE-HANDLE hTT10,
...
INPUT-OUTPUT TABLE-HANDLE hTT64
").
```

Note: Example A–2 illustrates code for use in a non-Progress Dynamics environment because it uses a procedure file.

You must specify each TABLE-HANDLE you want to pass in a remote call. As a result, to make a remote call to the AppServer, you must specify all 64 TABLE-HANDLES. To do this efficiently, you can specify the TABLE-HANDLE parameters using the include file callttparam.i located in the src/adm2/ directory. Before using this include file, you must define an array of handles with an extent of 64.

To do this, you could modify the code in Example A–2 as follows:

```
DEFINE VARIABLE hTT AS HANDLE EXTENT 64 NO-UNDO.
RUN adm2/callstringtt.p
("obtainCustomerData", /* call to make */
"customerbl.p", /* procedure to use */
"INPUT HANDLE 'T:01', INPUT CHARACTER cSessionID,
INPUT HANDLE 'B:02'", /* parameter list */
"", /* tables to skip */
{src/adm2/callttparam.i &ARRAYFIELD = "hTT"
 &T01 = "TABLE ttCust" &T02 = "TABLE ttOrder"}
").
```

The syntax highlighted in bold in the Example A–2 modified code deserves some additional explanation:

"INPUT HANDLE 'T:01', INPUT CHARACTER cSessionID, INPUT HANDLE 'B:02'"
The first and third parameters in the string correspond to the first and second temp-tables being passed as indicated by the 01 and 02 values after the colon. Note that the T: or B: that precedes the number indicates whether to pass a TEMP-TABLE (T) or BUFFER (B) handle to the procedure being called. As a result, the passing order of the temp-tables in the include file does not need to be the same order used by the call. The order used in the call is determined by the subscript that follows the T: or B:.

For more information, see the “Temp-table include files” section on page A–9 and the “Temp-table types” section on page A–12.

**calltable.p**

The calltable.p procedure allows invocation of a call by passing in a temp-table that contains the parameter values for each parameter. The temp-table must be in one of the forms supported in the calltables.i file located in the src/adm2/ directory, or from the signature of the procedure or function being invoked.

For more information, see the “Temp-table include files” section on page A–9 and the “Temp-table types” section on page A–12.

The code in Example A–3 illustrates using calltable.p to invoke a call.

**Example A–3: Using calltable.p to invoke a call**

```plaintext
DEFINE VARIABLE hTT AS HANDLE NO-UNDO.
/* Include the temp-table definition */
{src/adm2/calltables.i
 &PARAM-TABLE-TYPE = "1"
 &PARAM-TABLE-NAME = "ttCallParam"}
/* Create the parameter values into the parameter value table */
CREATE ttCallParam.
ASSIGN
  ttCallParam.iParamNo   = 1
  ttCallParam.cDataType  = "CHARACTER"
  ttCallParam.cIOMode    = "INPUT"
  ttCallParam.cCharacter = "aaa"
.
CREATE ttCallParam.
ASSIGN
  ttCallParam.iParamNo   = 2
  ttCallParam.cDataType  = "INTEGER"
  ttCallParam.cIOMode    = "INPUT-OUTPUT"
  ttCallParam.iInteger   = 12
.
CREATE ttCallParam.
ASSIGN
  ttCallParam.iParamNo   = 3
  ttCallParam.cDataType  = "HANDLE"
  ttCallParam.cIOMode    = "OUTPUT"
  ttCallParam.hHandle    = ?
.
RUN adm2/calltable.p
  ("emptyProcParam", /* procedure to call */
   "calls.p", /* containing procedure file */
   INPUT TEMP-TABLE ttCallParam:HANDLE, /* handle of temp-table */
   INPUT-OUTPUT TABLE-HANDLE hTT). /* unknown - no table handle */
```
After the call completes, the return values are available in output parameter records. In Example A–3, records 2 and 3 contain the output parameters from the call.

In addition, two extra records are appended to the table. The field $cParamName$ on these fields is set to $callReturnValue$ and $errReturnValue$. The $callReturnValue$ field contains the value of the return value from the function or procedures and the $errReturnValue$ field contains a value if an error condition occurs.

The code in Example A–4 illustrates using calltable.p with additional requirements for mappings. The difference between Example A–3 and Example A–4 is that the API is now forced to instantiate calls.p and obtain the signature to emptyProcParam to complete the mapping of values from ttCallParam to the values in the procedure. This is more expensive in terms of performance, but does however provide some options for specifying parameters.

As in Example A–3, the code in Example A–4 appends two extra records to the table after execution of the call. The field $cParamName$ on these fields is set to $callReturnValue$ and $errReturnValue$. The $callReturnValue$ field contains the value of the return value from the function or procedure, and the $errReturnValue$ field contains a value if an error condition occurs.

Example A–4: Using calltable.p to invoke a call and to instantiate calls.p

```plaintext
DEFINE VARIABLE hTT AS HANDLE NO-UNDO.
/* Include the temp-table definition */
{src/adm2/calltables.i
 &PARAM-TABLE-TYPE = "4"
 &PARAM-TABLE-NAME = "ttCallParam"}
/* Create the parameter values into the parameter value table */
CREATE ttCallParam.
ASSIGN
ttCallParam.cParamName = "pcChar"
ttCallParam.cValue = "aaa"
.
CREATE ttCallParam.
ASSIGN
ttCallParam.cParamName = "piInt"
ttCallParam.cValue = "12"
.
CREATE ttCallParam.
ASSIGN
ttCallParam.cParamName = "phHndl"
ttCallParam.cValue = ?
.
RUN adm2/calltable.p
("emptyProcParam", /* procedure to call */
 "calls.p", /* containing procedure file */
 INPUT TEMP-TABLE ttCallParam:HANDLE, /* handle of temp-table */
 INPUT-OUTPUT TABLE-HANDLE hTT). /* unknown - no table handle */
```
calltablett.p

The calltablett.p single-point entry call provides the functionality of calltable.p along with the ability to pass temp-tables. This is similar to using "callstringtt.p." As with callstringtt.p, you can use the callttparam.i include file to simplify passing temp-tables. The code in Example A–5 illustrates the call done using the callstringtt.p call and calltablett.p.

Example A–5: Using callstringtt.p to make a call

```plaintext
DEFINE VARIABLE hTT AS HANDLE EXTENT 64 NO-UNDO.

/* Include the temp-table definition */
{src/adm2/calltables.i
 &PARAM-TABLE-TYPE = "4"
 &PARAM-TABLE-NAME = "ttCallParam"}

/* Create the parameter values into the parameter value table */
CREATE ttCallParam.
ASSIGN
  ttCallParam.cParamName = "phCustomerTempTable"
  ttCallParam.cValue = "T:01"
.
CREATE ttCallParam.
ASSIGN
  ttCallParam.cParamName = "pcSessionID"
  ttCallParam.cValue = cSessionID
.
CREATE ttCallParam.
ASSIGN
  ttCallParam.cParamName = "phOrderBuffer"
  ttCallParam.cValue = "B:02"
.

hTT[01] = TEMP-TABLE ttCust:HANDLE.
HTT[02] = TEMP-TABLE ttOrder:HANDLE

RUN adm2/calltablett.p
  ("obtainCustomerData", /* call to make */
  "customerbl.p", /* manager to use */
  INPUT TEMP-TABLE ttCallParam:HANDLE, /* handle of temp-table */
  INPUT-OUTPUT TABLE-HANDLE hTT,  /* unknown - no table handle */
  "", /* tables to skip */
  {src/adm2/callttparam.i &ARRAYFIELD = "hTT"})
```
Temp-table include files

The include files contain definitions for temp-tables that you can use to provide call parameters. The following sections provide information about these include files:

- calltables.i
- callttparam.i

**calltables.i**

The `calltables.i` include file located in the `src/adm2/` directory contains the definition of four temp-tables that provide call parameters to the `setupTTfrom` functions. The following list, presented in order of efficiency, shows how tables provide call parameters to the `setupTTfrom` functions:

1. Parameters stored by parameter position where the value is in the native data type
2. Parameters stored by parameter position where the value is stored in a character field
3. Parameters stored by parameter name where the value is stored in the native data type
4. Parameters stored by parameter name where the value is stored in a character field

When storing parameters by position, the parameters are added to the temp-table in the order in which they are specified. You must specify all parameters. This form of the temp-table requires that the Parameter Holder temp-table structure be built using `setupTTfromTable`.

When storing parameters by name, the parameter name specified must match the name of the parameter as it is retrieved from a GET-SIGNATURE call on the internal entry being invoked. This temp-table format requires that the Parameter Holder temp-table structure be built using `setupTTfromSig`.

This include file takes the following optional parameters:

- **PARAM-TABLE-TYPE**
  
  Indicates the type of table to be used. Defaults to 1.

- **PARAM-TABLE-NAME**
  
  A name to apply to the temp-table. Defaults to `ttCallParam`.

For more information about temp-table types, see the “Temp-table types” section on page A–12.
**calltparam.i**

Although most AppServer calls require that no more than two or three temp-tables be passed between the AppServer and the client, some calls might require a larger number of temp-tables. For example, the Progress Dynamics Repository Manger FetchObject call or a call to a SmartBusinessObject can require 20 or more temp-tables. In this instance, the calltparam.i include file provides an easy way to include the temp-table handles required by callstringt.p. For more information, see the "callstringt.p" section on page A–4 and the "calltables.i" section on page A–9.

Before using the calltparam.i file, you must define an array of handles. The following describes the parameters supplied in the calltparam.i file:

**ARRAYFIELD**

Required parameter that names an extent 64 variable of data type handle.

**MODE**

Optional parameter. One of INPUT, OUTPUT, or INPUT-OUTPUT. The default is INPUT-OUTPUT. The MODE applies to all 64 parameters. You cannot override the mode for individual parameters.

**T01 to T64**

Optional parameter. An include file parameter that evaluates to a valid ABL expression that follows the MODE. If not specified, the default is “TABLE-HANDLE {&ARRAYFIELD}[subscript]”. This form lets you specify each table differently. For example, &T01 = “TABLEttCustomer”, &T02 - “TABLE-HANDLEttOrder”.

In Example A–6, the temp-tables ttCust, ttOrder, and a dynamic temp-table with the handle httTest are being passed and the remaining 61 are empty. The three temp-tables being passed are passed differently. Note the following in the example code:

- An array (hTT) of 64 handles is defined and used with the include file. The array is reset so that all elements are the unknown value. This is done so that when no temp-table is provided, nothing is sent.
- In the lines of code after the array is cleared, table 2 and table 3 are set to the value of the handles for the ttOrder and httTest temp-tables.
• In the call that uses the include file, the array variable is specified as the variable for the &ARRAYFIELD include parameter.

• The code automatically passes the array field with the other two temp-tables. The &T01 parameter passes the ttCust temp-table using a TABLE rather than a TABLE-HANDLE parameter. Therefore, the only include parameter is &T01.

**Example A–6: Using the callttparam.i include file**

```plaintext
DEFINE VARIABLE hTT AS HANDLE NO-UNDO EXTENT 64.
DEFINE VARIABLE ix AS INTEGER NO-UNDO.

/* Pre-fill array with the Unknown Value (?). */
DO ix = 1 TO 64:
  hTT[ix] = ?.
END.

/* Table 2 must be the Order temp-table and table 3 is the test table */
hTT[2] = TEMP-TABLE ttOrder:HANDLE. /* handle to Order temp-table */
hTT[3] = httTest. /* handle to test temp-table */

RUN adm2/callstringtt.p
("obtainCustomerData", /* call to make */
  "customerbl.p", /* manager to use */

  /* Map the parameters to the table handles */
  "INPUT HANDLE 'T:01', INPUT CHARACTER cSessionID, INPUT HANDLE 'B:02',
  INPUT HANDLE 'T:03'", /* parameter list */
  """, /* tables to skip */

  /* Pass in all 64 table handles. 1 is the table structure. */
  {src/adm2/callttparam.i &ARRAYFIELD = "hTT" &T01 = "TABLE ttCust"}
).
```
Temp-table types

This section describes the different temp-tables types that you can use to provide call parameters for the setupTTFrom functions. The different temp-table types are:

- Position native data type table.
- Position character table.
- Name native data type table.
- Name character table.

Position native data type table

The Position Native data type table (table type 1), contains a record for each parameter with a sequence number that matches the ordinal position of the parameter in the call. The value of the parameter is stored in one of the value fields in the native data type of the parameter.

Figure A–1 shows the definition of the native position data type table.

![Figure A–1: Position native data type table definition](image)

```sql
DEFINE TEMP-TABLE ttCallParam NO-UNDO
    FIELD iParamNo       AS INTEGER
    FIELD cParamName     AS CHARACTER
    FIELD cDataType      AS CHARACTER
    FIELD cIOMode        AS CHARACTER
    FIELD cCharacter     AS CHARACTER
    FIELD tDate          AS DATE
    FIELD tLogical       AS LOGICAL
    FIELD tInteger       AS INTEGER
    FIELD dDecimal       AS DECIMAL
    FIELD aRaw           AS RAW
    FIELD hHandle        AS HANDLE
    FIELD rRowid         AS ROWID
INDEX pudx IS UNIQUE PRIMARY iParamNo.
```

Figure A–1: Position native data type table definition
Temp-table types

In Example A–7, the following parameters are added to the ttCallParam temp-table:

- A character input parameter with a value of aaa.
- An integer input-output parameter with a value of 12
- A handle output parameter

Example A–7: Parameters stored in a position native data type table

```cpp
/* Include the temp-table definition */
{src/adm2/calltables.i
 &PARAM-TABLE-TYPE = "1"}

/* Create the parameter values into the parameter value table */
CREATE ttCallParam.
ASSIGN
  ttCallParam.iParamNo   = 1
  ttCallParam.cDataType  = "CHARACTER"
  ttCallParam.cIOMode    = "INPUT"
  ttCallParam.cCharacter = "aaa"
.
CREATE ttCallParam.
ASSIGN
  ttCallParam.iParamNo   = 2
  ttCallParam.cDataType  = "INTEGER"
  ttCallParam.cIOMode    = "INPUT-OUTPUT"
  ttCallParam.iInteger   = 12
.
CREATE ttCallParam.
ASSIGN
  ttCallParam.iParamNo   = 3
  ttCallParam.cDataType  = "HANDLE"
  ttCallParam.cIOMode    = "OUTPUT"
  ttCallParam.hHandle    = ?
.
Example A–8: Parameters specified in iParamNo

DEFINE VARIABLE hHandle AS HANDLE NO-UNDO.
DEFINE VARIABLE iVal    AS INTEGER NO-UNDO.

ASSIGN
  iVal    = 12
  hHandle = ?.

RUN x.p (INPUT "aaa", INPUT-OUTPUT iVal, OUTPUT hHandle).
```

The parameter number specified in iParamNo indicates the order in which the parameters are specified. As a result, a RUN statement using these parameters would look something like the code in Example A–8. Note the order in which the parameters appear.
Position character table

The Position Character table (table type 2), provides the ordinal position of the parameter and stores the parameter value in a character field. As with the position native data type table, the ordinal position of the parameter is important.

Figure A–2 shows the definition of the position character type temp-table.

```
DEFINE TEMP-TABLE ttCallParam NO-UNDO
FIELD iParamNo     AS INTEGER
FIELD cParamName   AS CHARACTER
FIELD cDataType    AS CHARACTER
FIELD cIOMode      AS CHARACTER
FIELD cValue       AS CHARACTER
INDEX pudx IS UNIQUE PRIMARY iParamNo.
```

Figure A–2: Position character table type definition

The code in Example A–9 illustrates how to set up the same set of parameters as those in Example A–7 for the position native data type table.

Example A–9: Parameters stored in a position character table type

```
/* Include the temp-table definition */
{src/adm2/calltables.i
 &PARAM-TABLE-TYPE = "2"}
/* Create the parameter values into the parameter value table */
CREATE ttCallParam.
ASSIGN
  ttCallParam.iParamNo  = 1
  ttCallParam.cDataType = "CHARACTER"
  ttCallParam.cIOMode   = "INPUT"
  ttCallParam.cValue    = "aaa"
.
CREATE ttCallParam.
ASSIGN
  ttCallParam.iParamNo  = 2
  ttCallParam.cDataType = "INTEGER"
  ttCallParam.cIOMode   = "INPUT-OUTPUT"
  ttCallParam.cValue    = "12"
.
CREATE ttCallParam.
ASSIGN
  ttCallParam.iParamNo  = 3
  ttCallParam.cDataType = "HANDLE"
  ttCallParam.cIOMode   = "OUTPUT"
  ttCallParam.cValue    = ?
.
```

The conversion to the appropriate data type is done when the dynamic temp-table structure is built from this table.
Name native data type table

With a Name Native data type table (table type 3), the caller needs to know what the name of the parameter is that is being set. This temp-table type requires the use of the setupTTFromSig call to build the temp-table required to make the call.

Figure A–3 shows the definition of the Name native data type temp-table.

```sql
DEFINE TEMP-TABLE ttCallParam NO-UNDO
  FIELD cParamName      AS CHARACTER
  FIELD cCharacter      AS CHARACTER
  FIELD tDate           AS DATE
  FIELD tLogical        AS LOGICAL
  FIELD tInteger        AS INTEGER
  FIELD tDecimal        AS DECIMAL
  FIELD tRaw            AS RAW
  FIELD tHandle         AS HANDLE
  FIELD rRowid          AS ROWID
INDEX pudx IS UNIQUE PRIMARY cParamName.
```

Figure A–3: Name native data type table definition

The code in Example A–10 illustrates how to set up a Name native data type table (table type 3).

Example A–10: Name native data type table

```sql
/* Include the temp-table definition */
{src/adm2/calltables.i
  &PARAM-TABLE-TYPE = "3"}

/* Create the parameter values into the parameter value table */
CREATE ttCallParam.
  ASSIGN
    ttCallParam.cParamName = "pcChar"
    ttCallParam.cCharacter = "aaa"
  .
CREATE ttCallParam.
  ASSIGN
    ttCallParam.cParamName = "piInt"
    ttCallParam.iInteger   = 12
  .
CREATE ttCallParam.
  ASSIGN
    ttCallParam.cParamName = "phHndl"
    ttCallParam.hHandle    = ?
  .

Note: There is no need to specify the mode or data type of the parameter as these are derived from the signature of the call and placed in the appropriate field. However, when using this table type, the value of the parameter being set must be set in the correct data type field, otherwise the value is never retrieved.
Name character table

The Name Character table (table type 4) is similar to the Name native data type table. However, in the Name character table, the value of the parameter is provided in character format rather than in the native data type. Example A–11 illustrates the definition of the Name Character table.

Example A–11: Name character table definition

```
DEFINE TEMP-TABLE ttCallParam NO-UNDO
  FIELD cParamName     AS CHARACTER
  FIELD cValue         AS CHARACTER
  INDEX pudd IS UNIQUE PRIMARY cParamName.

/* This example illustrates setting up data in the name character table type. Include the temp-table definition. */
{src/adm2/calltables.i
 &PARAM-TABLE-TYPE = "4"}
/* Create the parameter values into the parameter value table */
CREATE ttCallParam.
  ASSIGN
    ttCallParam.cParamName = "pcChar"
    ttCallParam.cValue     = "aaa"
  .
CREATE ttCallParam.
  ASSIGN
    ttCallParam.cParamName = "piInt"
    ttCallParam.cValue     = "12"
  .
CREATE ttCallParam.
  ASSIGN
    ttCallParam.cParamName = "phHndl"
    ttCallParam.cValue     = ?
  .
```
Invoking the call wrapper at the API level

The call wrapper consists of several procedure files with most of the code contained in `caller.p`. The `caller.p` file is derived from `src/adm2/smart.p`, runs as a persistent procedure and is called as a library. A template procedure is provided as a starting point.

A call is broken down into the following phases:

1. **Setup** — consists of creating the Parameter Holder temp-table and populating it with new data. The Parameter Holder temp-table is created by a call to one of these functions:
   - `setupTTFromSig`
   - `setupTTFromString`
   - `setupTTFromTable`

2. **Invocation** — Before a call can be invoked, a DYNAMIC CALL object is created and properties of the call object are set. The values for these properties are derived from the `ttCall` temp-table that is defined in the definitions section of `caller.p`. `ttCall` is local to and is not exposed in any form to external procedures. When a call is added to `ttCall`, it is allocated a call number and this is passed as a parameter to the `invoke` procedure. The values in the `ttCall` temp-table record are set by a call during the `invokeCall` procedure from the input parameters to the procedure. As a result, all the attributes of the DYNAMIC CALL handle can be derived from the `ttCall` temp-table.

3. **Cleanup** — Deletes the `ttCall` record and the following handles:
   - The handle to the call object
   - The persistent procedure handle if the procedure was instantiated by the Progress Dynamics call
   - The handle to the asynchronous call object
   - The handle to the Parameter Holder temp-table
Figure A–4 shows the steps you must make to invoke a call at the API level.

The calls shown in Figure A–4 illustrate the API calls you need to make to invoke a call:

1. Create the Parameter Holder temp-table from the parameters using one of the following:
   setupTTFromSig, setupTTFromString, or setupTTFromTable.
2. Pass the handle to the Parameter Holder temp-table created in the Step 1, along with all
   the other parameters to invokeCall.
3. Use the obtainCallInfo function call to get the required information back on the call. The
   Parameter Holder temp-table created in Step 1 also contains output parameters and return
   values.
4. Use cleanupCall to delete the call handle and any other handles that were created during
   the invokeCall. Note that it is possible to only delete certain of the handles.
These steps are illustrated in code **Example A–12** through **Example A–15**. Each of the examples makes a call to the internal procedure PROCEDURE emptyProcParam.

Invoking the Progress Dynamics call wrapper at an API level requires that you write more code and is more complicated to implement. However, this method of invoking the dynamic call wrapper provides enhanced performance and more control of error handling and the call handle.

For more information about the APIs used to invoke the Progress Dynamics call wrapper, see the “API reference” section on page A–23.

The code in **Example A–12** illustrates the steps necessary to make Progress Dynamics calls.

### Example A–12: Steps for making Progress Dynamics calls

```procedure
PROCEDURE emptyProcParam:
  DEFINE INPUT     PARAMETER pcChar   AS CHARACTER  NO-UNDO.
  DEFINE INPUT-OUTPUT PARAMETER piInt    AS INTEGER    NO-UNDO.
  DEFINE OUTPUT    PARAMETER phHndl   AS HANDLE     NO-UNDO.

  ASSIGN
    piInt  = 35
    phHndl = THIS-PROCEDURE.

  RETURN "Hello":U.
END.
```

The Parameter Holder temp-table contains a field for each parameter you want to pass. The Parameter Holder temp-table structure contains a field for each parameter and two extra fields: `callReturnValue` that contains the return value from the function or procedure and `errReturnValue` that contains a value only when an error occurs. The data types for the fields are the same as the data type of the parameter being referenced. The `COLUMN-LABEL` for the field contains the data type to be used for the call and the mode of the parameter. For example, `INPUT`, `INPUT-OUTPUT`, `OUTPUT`, or `OUTPUT-APPEND`.

If source parameters are provided to the `setupTTFrom` call, the initial values of the temp-table fields are set to the values of the source parameters so that it is not necessary to create a temp-table record in the Parameter Holder temp-table until the call is made. When the record is created, the initial value is derived from whatever was set.
The code in Example A–13 builds the parameters into a temp-table that is then used to create a parameter temp-table.

### Example A–13: Creating the parameter holder temp-table

```verbatim
/* Include the temp-table for the call parameters */
{src/adm2/calltables.i}

/* Run the target procedure persistently */
RUN calls.p PERSISTENT SET hProc.

/* Create a record for each parameter */
DO TRANSACTION:
  CREATE ttCallParam.
  ASSIGN
    ttCallParam.iParamNo = 1
    ttCallParam.cDataType = "CHARACTER"
    ttCallParam.cIOMode = "INPUT"
    ttCallParam.cCharacter = "aaa"
  .
  CREATE ttCallParam.
  ASSIGN
    ttCallParam.iParamNo = 2
    ttCallParam.cDataType = "INTEGER"
    ttCallParam.cIOMode = "INPUT-OUTPUT"
    ttCallParam.iInteger = 12
  .
  CREATE ttCallParam.
  ASSIGN
    ttCallParam.iParamNo = 3
    ttCallParam.cDataType = "HANDLE"
    ttCallParam.cIOMode = "OUTPUT"
    ttCallParam.hHandle = ?
  .
END.

/* Step 1. Create a Parameter Holder temp-table for the call. */
hTable = DYNAMIC-FUNCTION("setupTTFromTable" IN THIS-PROCEDURE,
  "ttParameters", /* temp-table name */
  "CHARACTER", /* RETURN-VALUE data type */
  TEMP-TABLE ttCallParam:HANDLE).

/* Step 2. Invoke the call. */
RUN invokeCall IN THIS-PROCEDURE
  ("emptyProcParam", /* name of internal procedure */
    hProc, /* handle of the IN procedure */
    PROCEDURE-CALL-TYPE, /* we are calling a procedure */
    hTable, /* handle from setupTTFromTable */
    FALSE, /* persistent */
    ?, /* server */
    FALSE, /* async */
    ",", /* event procedure for Asynch */
    ?, /* event procedure context */
    OUTPUT iCall). /* call number */

/* Step 3. Obtain information about the call. */
hCall = obtainCallInfo(iCall, OUTPUT cReturnValue, OUTPUT hTable).

/* Process the call information. */
/* Step 4. Cleanup. Delete all the call information except the Parameter Holder temp-table. */
RUN cleanupCall IN THIS-PROCEDURE (iCall, "!T,*").

DELETE OBJECT hTable.
```
The code in Example A–14 illustrates how parameters are derived from the signature and then set.

**Example A–14: Deriving parameters from the signature**

```plaintext
/* Run the target procedure persistently. */
RUN calls.p PERSISTENT SET hProc.

/* Step 1. Create a Parameter Holder temp-table for the call from the signature of the call that we want to make. */

hTable = DYNAMIC-FUNCTION("setupTTFromSig" IN THIS-PROCEDURE,
  "ttParameters", /* temp-table name */
  hProc, /* persistent procedure */
  "emptyProcParam", /* internal procedure */
  "", /* signature */
  ? ). /* handle to TT with initial values */

/* Set the parameter values. */

hTable:DEFAULT-BUFFER:BUFFER-CREATE().
hTable:DEFAULT-BUFFER:BUFFER-FIELD("pcChar"):BUFFER-VALUE = "aaa".
hTable:DEFAULT-BUFFER:BUFFER-FIELD("pcInt"):BUFFER-VALUE = 12.
hTable:DEFAULT-BUFFER:BUFFER-FIELD("phHndl"):BUFFER-VALUE = ?.
hTable:DEFAULT-BUFFER:BUFFER-RELEASE().

/* Step 2. Invoke the call. */

RUN invokeCall IN THIS-PROCEDURE
  ("emptyProcParam", /* name of internal procedure */
   hProc, /* handle of the IN procedure */
   PROCEDURE-CALL-TYPE, /* we are calling a procedure */
   hTable, /* handle from setupTTFromTable */
   FALSE, /* persistent */
   ?, /* server */
   FALSE, /* async */
   "", /* event procedure for Async */
   ?, /* event procedure context */
   OUTPUT iCall). /* call number */

/* Step 3. Obtain information about the call. */

hCall = obtainCallInfo(iCall, OUTPUT cReturnValue, OUTPUT hTable).

/* Process the call information. */

/* Step 4. Cleanup. */

RUN cleanupCall IN THIS-PROCEDURE (iCall, " terrestrial").
```
In Example A–15, the parameters are derived from a string that is passed in to create the Progress Dynamics temp-table.

Example A–15: Deriving parameters from a string to create a temp-table

```plaintext
/* Run the target procedure persistently. */
RUN calls.p PERSISTENT SET hProc.

/* Step 1. Create a Parameter Holder temp-table for the call from the string that we pass into the call. */
hTable = DYNAMIC-FUNCTION("setupTTFromString" IN THIS-PROCEDURE,
    "ttParameters", /* temp-table name */
    "CHARACTER", /* RETURN-VALUE data type */
    "INPUT CHARACTER 'aaa',
    INPUT INTEGER '12',
    INPUT HANDLE '?'"). /* Parameter string */

/* Step 2. Invoke the call. */
RUN invokeCall IN THIS-PROCEDURE
    ("emptyProcParam", /* name of internal procedure */
     hProc, /* handle of the IN procedure */
     PROCEDURE-CALL-TYPE, /* we are calling a procedure */
     hTable, /* handle from setupTTFromTable */
     FALSE, /* persistent */
     ?, /* server */
     FALSE, /* async */
     "$", /* event procedure for Async */
     ?, /* event procedure context */
     OUTPUT iCall). /* call number */

/* Step 3. Obtain information about the call. */
hCall = obtainCallInfo(iCall, OUTPUT cReturnValue, OUTPUT hTable).

/* Process the call information. */

/* Step 4. Cleanup. */
RUN cleanupCall IN THIS-PROCEDURE (iCall, "$").
```
API reference

This section provides details about the following APIs for the Progress Dynamics Call Wrapper and explains how each API procedure works:

- callstring.p procedure
- callstringtt.p procedure
- calltable.p procedure
- calltablett.p procedure
- cleanupCall procedure
- determineTableType function
- InvokeCall procedure
- obtainCallInfo function
- obtainParamPropValue function
- obtainProcHandle function
- setupTTFromSig function
- setupTTFromString function
- setupTTFromTable function

**callstring.p procedure**

External procedure that allows for a single RUN statement to invoke a call using a string that defines the parameters. The procedure is useful for minimizing the number of requests it takes to invoke a call on the AppServer.

All outputs and return values from the invoked procedure are available through the properties or parameters supplied as parameters.

**Parameters:**

**pcCallName** INPUT CHARACTER

Name of an external or internal procedure or function to be invoked.

**pcTarget** INPUT CHARACTER

The name of a manager procedure, the filename of a relatively or absolutely pathed procedure, or an integer value that evaluates to a procedure handle. If the value of this parameter is "" or the Unknown value (?), by default, pcCallName contains the name of a procedure that is to be run nonpersistently.

The parameter is optional. If nothing is specified, then "" or the Unknown value (?) is passed.
pcTargetFlags INPUT CHARACTER

This parameter can contain modifiers that are used to invoke the persistent procedure. A modifier can be a valid combination of the following:

- **P(ersistent)** — Indicates that a new instance of the procedure should be instantiated persistently and left running.
- **A(DM2)** — Indicates that a new instance of an ADM2 procedure should be invoked persistently and the initializeObject internal procedure called to initialize it. The ADM2 procedure is left running after the call is complete.
- **S(ingle)** — Indicates that a new instance of the procedure should be instantiated if a running version is not found and left running.
- **K(ill)** — Indicates that if a procedure was instantiated during the call, it should be deleted before control is returned.

The default is to apply the behavior of the S parameter. That is, a persistent procedure is started if it is not found by walking the procedure stack and left running after the call is complete.

You can specify any of the P, A, or S modifiers in combination with K to shut down the procedure. For example, PK instructs the caller to instantiate a new instance of the procedure persistently and delete it when it is complete.

The parameter is optional. If nothing is specified, then "" is passed.

pcCallParmString INPUT CHARACTER

A string that contains the parameters to pass to the procedure or function that is being invoked. The string is a comma-separated list of parameters. Each parameter is a string consisting of space-delimited values in the form "mode data type parameter" where:

- **mode** is one of INPUT, OUTPUT, INPUT-OUTPUT, or OUTPUT-APPEND.
- **data type** is one of CHARACTER, DATE, LOGICAL, INTEGER, DECIMAL, RAW, HANDLE, or ROWID.
- **parameter** is the name of either a property that was previously set using setPropertyList or setSessionParam, or a single quoted constant. If a property is specified, the procedure attempts to evaluate the property value by calling getPropertyList. If no property is available, or Progress Dynamics is not running, a call is made to getSessionParam for the property value. If neither call succeeds, the unknown value is passed.

If the mode of the parameter is either OUTPUT or INPUT-OUTPUT, the property that is specified contains the output value from the call after the call is complete.

The parameter is optional. If nothing is specified, then "" or the Unknown value (?) is passed.
Notes:

- Once the procedure finishes executing, all temporary handles are deleted and the ttCall record no longer exists for the call. As a result, the Progress Dynamics Call Wrapper has no information about this call so that there are no memory leaks created by calling callstring.p.

- If the mode of the parameter is OUTPUT or INPUT-OUTPUT and a property that was set using setPropertyList is specified, the value of the property is set on the server side. It is not synchronized with the client unless the entire call is executed on the client side.

callstringtt.p procedure

External procedure that allows a single RUN statement to invoke a call using a string that defines the parameters and pass up to 64 temp-tables. This procedure is useful for minimizing the number of request it takes to invoke a call on the AppServer.

All outputs and return values from the invoked procedure are available through the properties or parameters supplied as parameters.

Parameters:

pcCallName INPUT CHARACTER

Name of an external or internal procedure or function to be invoked.

pcTargetObjec INPUT CHARACTER

Name of a manager procedure, the filename of a relatively or absolutely pathed procedure, or an integer value that evaluates to a procedure handle. If the value of this parameter is "" or the Unknown value (?), by default, pcCallName contains the name of a procedure that is to be run nonpersistently.

The parameter is optional. If nothing is specified, then "" or the Unknown value (?) is passed.

pcTargetFlags INPUT CHARACTER

This parameter can contain modifiers that are used to invoke the persistent procedure. A modifier can be a valid combination of the following:

- **P(ersistent)** — Indicates that a new instance of the procedure should be instantiated persistently and left running.

- **A(DM2)** — Indicates that a new instance of an ADM2 procedure should be invoked persistently and the initializeObject internal procedure called to initialize it. The ADM2 procedure is left running after the call is complete.

- **S(ingle)** — Indicates that a new instance of the procedure should be instantiated if a running version is not found and left running.

- **K(ill)** — Indicates that if a procedure was instantiated during the call, it should be deleted before control is returned. The default is to apply the behavior of the S parameter. As a result, a persistent procedure is started if it is not found by walking the procedure stack and is left running after the call is complete.
You can specify any of the P, A, or S modifiers in combination with K to shut down the procedure. For example, PK instructs the caller to instantiate a new instance of the procedure persistently and delete it when it is complete.

The parameter is optional. If nothing is specified, then "" is passed.

**pcCallParmString INPUT CHARACTER**

A string containing the parameters to pass to the procedure or function that is being invoked. The string is a comma-separated list of parameters. Each parameter is a string consisting of space-delimited values in the form "mode data type parameter" where:

- **mode** is one of INPUT, OUTPUT, INPUT-OUTPUT, or OUTPUT-APPEND.
- **data type** is one of CHARACTER, DATE, LOGICAL, INTEGER, DECIMAL, RAW, HANDLE, TABLE-HANDLE, or ROWID.
- **parameter** is the name of either a property that was previously set using setPropertyList or setSessionParam, or a single quoted constant that does not contain spaces or commas. If a property is specified, the procedure attempts to evaluate the property value by calling getPropertyList. If no property is available, or Progress Dynamics is not running, a call is made to getSessionParam for the property value. If neither call succeeds, the unknown value is passed.

If the mode of the parameter is either OUTPUT or INPUT-OUTPUT, the property that is specified contains the output value of the call after the call is complete. If the **data type** is either HANDLE or TABLE-HANDLE, the **parameter** can also be an integer value between 1 and 32 that maps to one of the tables passed in with the call.

The parameter is optional. If nothing is specified, then "" or the Unknown value (?) is passed.

**pchHandlesToSkip INPUT CHARACTER**

By default, the call wrapper does a DELETE OBJECT on tables that are listed in phCallTableHandle01 through 64 before returning. This avoids memory leaks caused by the duplication of temp-tables. In some cases, this behavior might be undesirable, such as when the table being returned is a Progress Dynamics temp-table that should be retained in the cache on the server.

To address this issues, this parameter allows a comma- separated list of numbers between 1 and 64 corresponding to the handles below. If a number is found in the list, the corresponding handle is not deleted in the procedure prior to control returning to the caller.

**Note:** Using an * in a CAN-DO list indicates that none of the handles should be deleted.

The parameter is optional. If nothing is specified, then "" is passed.

**phCallTableHandle01 to phCallTableHandle64 INPUT-OUTPUT TABLE-HANDLE**

A table-handle that needs to be passed into the call.

The parameter is optional. If nothing is specified, then the Unknown value (?) is passed.
Notes:

• Once the procedure finishes executing, all temporary handles are deleted and the ttCall record no longer exists for the call. As a result, the Dynamic Call Wrapper has no information about this call so that there are no memory leaks created by calling callstring.p.

• The caller is responsible for cleaning up phCallParmTT and phCallParmTH and the phCallTempTable or phCallTableHandle objects.

• When execution passes to callstringtt.p, the procedure creates an array of 64 handles and stores the values of the handles passed into the array so that temp-table copying is done only when required to invoke the call.

• If the mode of the parameter is OUTPUT or INPUT-OUTPUT and a property that was set using setPropertyList is specified, the value of the property is set on the server side. It is not synchronized with the client unless the entire call is executed on the client side.

calltable.p procedure

External procedure that allows for a single RUN statement to invoke a call using a temp-table that defines the parameter values. The temp-table can be in any of the formats supported by the include file. If a temp-table of type 1 or 2 is used, the parameters to the called object are not type checked. If a temp-table of type 3 or 4 is used, the call must be to a function or an internal procedure in a persistent procedure, and the signature is checked against the internal entries before the call is made. All outputs and return values from the invoked procedure are available through the appropriate rows on the returned temp-table.

Parameters:

pcCallName INPUT CHARACTER

The name of an external or internal procedure or function to invoke.

pcTarget INPUT CHARACTER

Name of a manager procedure, the filename of a relatively or absolutely pathed procedure, or an integer value that evaluates to a procedure handle. If the value of this parameter is "" or the Unknown value (?), by default, pcCallName contains the name of a procedure that is to run nonpersistently.

The parameter is optional. If nothing is specified, then "" or the Unknown value (?) is passed.

pcTargetFlags INPUT CHARACTER

This parameter can contain modifiers that are used to invoke the persistent procedure. A modifier can be a valid combination of the following:

• P(ersistent) — Indicates that a new instance of the procedure should be instantiated persistently and left running.

• A(DM2) — Indicates that a new instance of an ADM2 procedure should be invoked persistently and the initializeObject internal procedure called to initialize it. The ADM2 procedure is left running after the call is complete.
• **S(ingle)** — Indicates that a new instance of the procedure should be instantiated if a running version is not found and left running.

• **K(ill)** — Indicates that if a procedure was instantiated during the call, it should be deleted before control is returned.

The default is to apply the behavior of the S parameter. That is, a persistent procedure is started if it is not found by walking the procedure stack and it is left running after the call is complete.

You can specify any of the P, A, or S modifiers in combination with K to shut down the procedure. For example, PK instructs the caller to instantiate a new instance of the procedure persistently and delete it when it is complete.

This parameter is optional. If nothing is specified, then "" is passed.

**phCallParmTT** INPUT HANDLE

Handle to a temp-table that could be either of the temp-tables defined in or a temp-table that was previously created by a call to one of the setupTTFrom functions. The output values from the call are written back into this table after the call has been invoked. If this parameter is not specified and there are parameters to the procedure or function, the parameters have to be specified in the phCallParmTH parameter.

This parameter is optional. If nothing is specified, then the Unknown value (?) is passed.

**phCallParmTH** INPUT-OUTPUT TABLE-HANDLE

Similar to phCallParmTT except that a TABLE-HANDLE is passed to support AppServer calls. The table is passed as an INPUT-OUTPUT parameter so that the return values can be returned to the client.

This parameter is optional. If nothing is specified, then the Unknown value (?) is passed.

**Notes:**

• Once the procedure finishes executing, all temporary handles are deleted and the ttCall record no longer exists for the call. As a result, the Dynamic Call Wrapper has no information about this call so that there are no memory leaks created by calling callstring.p.

• The caller is responsible for cleaning up phCallParmTT and phCallParmTH.

• If phCallParmTT is specified, it is used to determine the parameters to the call. Otherwise phCallParmTH is used. If neither are specified the call is attempted with no parameters.
**calltablett.p procedure**

External procedure that allows a single RUN statement to invoke a call using a temp-table that defines the parameter values. The temp-table can be in any of the formats supported by the include file. If a temp-table of type 1 or 2 is used, the parameters to the called object are not type checked. If a temp-table of type 3 or 4 is used, the call has to be to a function or an internal procedure in a persistent procedure, and the signature is checked against the internal entries before the call is made. This variation of adm2/calltablett.p supports the passing in of up to 64 temp-tables. For additional information, see the “callstringtt.p” section on page A–4, the “calltable.p” section on page A–6, and the “calltables.i” section on page A–9.

All outputs and return values from the invoked procedure are available through the rows in the returned temp-table.

**Parameters:**

- **pcCallNam** INPUT CHARACTER
  
  Name of an external or internal procedure or function to be invoked.

- **pcTarget** INPUT CHARACTER
  
  Name of a manager procedure, the filename of a relatively or absolutely pathed procedure, or an integer value that evaluates to a procedure handle. If the value of this parameter is "" or the Unknown value (?), by default, pcCallName contains the name of a procedure that is to be run nonpersistently.

  This parameter is optional. If nothing is specified, then "" or the Unknown value (?) is passed.

- **pcTargetFlags** INPUT CHARACTER
  
  This parameter can contain modifiers that are used to invoke the persistent procedure. A modifier can be a valid combination of the following:

  - P(ersistent) — Indicates that a new instance of the procedure should be instantiated persistently and left running.
  
  - A(DM2) — Indicates that a new instance of an ADM2 procedure should be invoked persistently and the initializeObject internal procedure called to initialize it. The ADM2 procedure is left running after the call is complete.
  
  - S(ingle) — Indicates that a new instance of the procedure should be instantiated if a running version is not found and left running.
  
  - K(ill) — Indicates that if a procedure was instantiated during the call, it should be deleted before control is returned.

  The default is to apply the behavior of the S parameter. That is, a persistent procedure is started if it is not found by walking the procedure stack and it is left running after the call is complete.
You can specify any of the P, A, or S modifiers in combination with K to shut down the procedure. For example, PK instructs the caller to instantiate a new instance of the procedure persistently and delete it when it is complete.

This parameter is optional. If nothing is specified, then "" is passed.

pcHandlesToSkip INPUT CHARACTER

By default the call wrapper runs DELETE OBJECT on tables that are listed in phCallTableHandle01 through 64 before returning. This avoids memory leaks caused by the duplication of temp-tables. In some cases this behavior might be undesirable, such as when the table being returned is a Progress Dynamics temp-table that should be retained in the cache on the server.

To address this issue, this parameter allows a comma-separated list of numbers between 1 and 64 corresponding to the handles below. If a number is found in the list, the corresponding handle is not deleted in the procedure prior to returning control to the caller.

**Note:** Using an * in a CAN-DO list indicates that none of the handles should be deleted.

This parameter is optional. If nothing is specified, then "" is passed.

phCallParmTT INPUT HANDLE

Handle to a temp-table that could be either of the temp-tables defined in a or a temp-table that was previously created by a call to one of the setupTTFrom functions. The output values from the call are written back into this table after the call has been invoked. If this parameter is not specified and there are parameters to the procedure or function, the parameters have to be specified in the phCallParmTH parameter.

This parameter is optional. If nothing is specified, then the Unknown value (?) is passed.

phCallParmTH INPUT-OUTPUT TABLE-HANDLE

Similar to phCallParmTT except that a TABLE-HANDLE is passed to support AppServer calls. The table is passed as an INPUT-OUTPUT parameter so that the return values can be returned to the client.

This parameter is optional. If nothing is specified, then the Unknown value (?) is passed.

phCallTableHandle01 to phCallTableHandle64 INPUT-OUTPUT TABLE-HANDLE

Table-handle that needs to be passed into the call.

This parameter is optional. If nothing is specified, then the Unknown value (?) is passed.

**Notes:**

- Once the procedure has finished executing, all temporary handles are deleted and the ttCall record no longer exists for the call. As a result, the Progress Dynamics Call Wrapper has no information about this call so that there are no memory leaks created by calling callstring.p.

- The caller is responsible for cleaning up phCallParmTT, phCallParmTH, and the phCallTempTable or phCallTableHandle objects.
• When the execution passes to `callstringtt.p`, the procedure creates an array of 64 handles and stores the values of the handles passed into the array. As a result, a temp-table is copied only when required to invoke the call.

• If `phCallParmTT` is specified, it is used to determine the parameters to the call. Otherwise `phCallParmTH` is used. If neither are specified, the call is attempted with no parameters.

cleanupCall procedure

Procedure used to delete any objects associated with a call that might be left inside the Progress Dynamics Call Wrapper after the call finishes executing.

**Parameters:**

- `piCall` INPUT INTEGER
  
  A call number returned from a previous `invokeCall` request. This call number identifies the call you want cleaned up.

- `pHandles` INPUT CHARACTER
  
  A comma-separated CAN-DO list used to indicate which handles to clean up. You can specify:
  
  • **A** — Asynchronous request handle.
  
  • **T** — Progress Dynamics temp-table associated with call.
  
  • **H** — Call Handle.

  This parameter is optional. If nothing is specified, then "" is passed.

**Notes:**

- By default, all three handles are deleted when `cleanupCall` is invoked. To have all handles except the Call Handle deleted, pass "!H".

- By default, the function appends an "*" to the end of the string so that all handles other than those explicitly specified are cleaned up.

determineTableType function

Function used to determine what type of table is contained in the handle passed as an input parameter.

**Parameters:**

- `phBuffer` INPUT HANDLE

  Handle to either a temp-table object or a buffer object that contains the parameter values that you want to set.
Returns:

The return values are:

- **99** — Identifies a table that was previously formatted using one of the setupTTFrom functions.

- **0** — Identifies a table that has no records in it. The 0 return value is also provided to indicate that there is no need to format the table using a setupTTFrom call.

- An integer value corresponding to one of the table types. This value can be:
  - **1** — Stores parameters by position using the native data type
  - **2** — Stores parameters by position using a character fields
  - **3** — Stores parameters by name using native data type
  - **4** — Stores parameters by name using a character field

**Note:** For more information, see the “calltables.i” section on page A–9.

- **Unknown value (?)** — If the table type is not recognized.

InvokeCall procedure

Procedure used to invoke a call.

Parameters:

- **pcProc** INPUT CHARACTER
  
  Name of the external or internal procedure, or function to be invoked.

- **phInHandle** INPUT HANDLE
  
  If pcProc is an internal procedure or function, this is the handle to the running persistent procedure that contains pcProc.

  This parameter is optional. If nothing is specified, then the Unknown value (?) is passed.

- **piType** INPUT INTEGER
  
  Type of call being invoked. Must be either PROCEDURE-CALL-TYPE or FUNCTION-CALL-TYPE. These are constants that are recognized by the ABL Virtual Machine (AVM).

- **phParamTable** INPUT HANDLE
  
  Handle to a temp-table previously created by a call to one of the setupTTFrom functions.

  This parameter is optional. If nothing is specified, then the Unknown value (?) is passed.
p1Persistent INPUT LOGICAL

Indicates whether the external procedure specified in pcProc should be invoked persistently.

phServer INPUT HANDLE

Handle to the AppServer where the call is to run.

This parameter is optional. If nothing is specified, then the Unknown value (?) is passed.

p1Asynch INPUT LOGICAL

If set to Yes, the call is invoked asynchronously.

pcEventProc INPUT CHARACTER

Applies only if p1Asynch is set to Yes. This parameter identifies the procedure to be invoked when the asynchronous call completes.

This parameter is optional. If nothing is specified, then "" is passed.

phEventProcCtxte INPUT HANDLE

Contains the handle of the procedure that contains pcEventProc.

This parameter is optional. If nothing is specified, then the Unknown value (?) is passed.

piCal OUTPUT INTEGER

Unique identifier to the ttCall record that is created for this call. You can use this call number until cleanupCall is run to call either obtainCallInfo or cleanupCall.

Notes:

- By default, all three handles are deleted when cleanupCall is invoked. To have all handles except the Call Handle deleted, pass "!H".

- By default, the function appends an "*" to the end of the string. As a result, all handles other than those explicitly specified are cleaned up.
**obtainCallInfo function**

Function used to obtain all the information about a call.

**Parameters:**

- **piCall** INPUT INTEGER
  
  A call number returned from a previous invokeCall request. This call number identifies the call you want to obtain.

- **PcReturnValue** OUTPUT CHARACTER
  
  The return value from the invoked call.

- **PhParamTable** OUTPUT HANDLE
  
  Handle to the temp-table that contains the parameters to the call.

**Returns:**

A handle to the DYNAMIC CALL object.

**Note:**

If there is no call with the identifier specified, the unknown value (??) is returned.

**obtainParamPropValue function**

Function that obtains a property value or parameter value from the session.

**Parameters:**

- **pcProperty** INPUT CHARACTER
  
  Name of a property whose value you want to obtain.

**Returns:**

A character string containing the value of the property.

**Note:**

The function first tries to evaluate the property by calling getPropertyList. If this fails, the function attempts to obtain the value of the property by calling getSessionParam.
obtainProcHandle function

Function that obtains the handle to a procedure that was previously instantiated.

**Parameters:**

- **pcHandleName** INPUT CHARACTER
  
  Name of a handle to evaluate. The name can be one of the following:
  
  - Name of a manager. If this is the case, getManagerHandle is called to determine the handle.
  
  - Name of one of the predefined global variables that contain manager handles.
  
  - Name of a procedure that could be running in the session.

**Returns:**

A handle to the persistent procedure.

**Note:**

If the filename option is used and the filename is not found in the persistent procedure list, the unknown value (Unknown value (?)) is returned and the procedure is not instantiated.

setupTTFromSig function

Function used to create a dynamic temp-table that invokes a call from the signature of a procedure or function.

**Parameters:**

- **pcTableName** INPUT CHARACTER
  
  Name to assign to the newly created temp-table.

- **phPersProc** INPUT HANDLE
  
  Handle to the persistent procedure that contains the call needed to derive the signature. This parameter is optional. If nothing is specified, then the Unknown value (?) is passed.

- **pcIntEntry** INPUT CHARACTER
  
  Procedure used to derive the signature for which a temp-table structure is to be created. This parameter is optional. If nothing is specified, then the Unknown value (?) is passed.

- **pcSignature** INPUT CHARACTER
  
  Signature of the procedure or function to invoke. This parameter is optional. If nothing is specified, then "" or the Unknown value (?) is passed.

- **phInitValueTT** INPUT HANDLE
  
  Handle to a temp-table that contains the parameter values to use for the call. This parameter is optional. If nothing is specified, then the Unknown value (?) is passed.

**Returns:**

A handle to the created temp-table.
Notes:

- You can specify phPersProc and pcIntEntry together, or you can specify pcSignature. If you specify all three, the contents of pcSignature is used.

- If you do not specify phInitValueTT, the values of the parameters are the default value for the data type of the parameter.

- The temp-table is created with initial values derived from the property values. No records are added to the temp-table. Creating a record in the table results in a record with the default values specified.

**setupTTFromString function**

Function used to create a Progress Dynamics temp-table to invoke a call from a string containing the parameter definitions in the form *mode data type parameter*.

**Parameters:**

- `pcTableName` **INPUT CHARACTER**
  
  Name to assign the temp-table that you want to create.

- `pcRetValDT` **INPUT CHARACTER**
  
  Data type of the return value from the call. If left blank, the default is CHARACTER. This parameter is optional. If nothing is specified, the "" is passed.

- `pcParamString` **INPUT CHARACTER**
  
  A string in the form *mode data type parameter, mode data type parameter*. The string contains the parameters you want to pass to the procedure or function that is being invoked. The string is a comma-separated list of parameters. Each parameter is in the form "*mode data type parameter*" where:

  - *mode* is one of INPUT, OUTPUT, INPUT-OUTPUT, or OUTPUT-APPEND.
  
  - *data type* is one of CHARACTER, DATE, LOGICAL, INTEGER, DECIMAL, RAW, HANDLE, TABLE-HANDLE, or ROWID.
  
  - *parameter* is the name of either a property that was previously set using setPropertyList or setSessionParam, or a single quoted constant that does not contain spaces or commas. If you specify a property, the procedure attempts to evaluate the property value by calling getPropertyList. If no property is available, or Progress Dynamics is not running, a call is made to getSessionParam for the property value. If neither call succeeds, the unknown value is passed.
**Returns:** A handle to the created temp-table.

**Notes:**

- When the temp-table is constructed, the function attempts to find a property using `getPropertyList` with the same name as the parameter. If none is found, a similar attempt is made to call `getSessionParam`. If no properties or parameters are found in context, the initial value is set to the unknown value.

- The temp-table is created with initial values that are derived from the property values. No records are added to the temp-table. A create of a record in the table results in a record with the default values specified.

**setupTTFromTable function**

Function used to create a Progress Dynamics temp-table to invoke a call.

**Parameters:**

- `pcTableName` **INPUT CHARACTER**
  
  Name to assign the temp-table you want to create.

- `pcRetValDT` **INPUT CHARACTER**
  
  Data type of the return value from the call. If left blank, the default is CHARACTER. This parameter is optional. If nothing is specified, then "" is passed.

- `phParamTable` **INPUT HANDLE**
  
  Handle to a table that has the structure of either of the temp-tables in the `calltables.i` file located in the `adm2/` directory.

**Returns:** Handle to the created temp-table.

**Note:** The temp-table is created with initial values derived from the records in the input table. No records are added to the temp-table. A create of a record in the table results in a record with the default values specified.
Index

A

Action properties toolbar objects 6–34
actionCanRun (toolbar.p) 6–12
actionCaption (toolbar.p) 6–12
actionCategoryIsHidden (toolbar.p) 6–12
actionChecked (toolbar.p) 6–13
ActionEvent property 3–76
actionLabel (toolbar.p) 6–13
actionPublishCreate (toolbar.p) 6–13
actionTarget (toolbar.p) 6–14
actionTooltip (toolbar.p) 6–14
activeTarget (panel.p) 6–5
addColumnLink (wbtable.p) 9–2
addContextFields (webrep.p) 9–4
addForeignKey (dataquery.p) 5–2
addSearchCriteria (webrep.p) 9–5
addRow (data.p) 5–47
addRow (dataview.p) 5–17
addRow (sbo.p) 4–22
addNotFoundMessage (query.p) 5–33
addQueryWhere (query.p) 5–33
addQueryWhere (sbo.p) 4–21
addRecord (browser.p) 3–46
addRecord (viewer.p) 3–63
addRecord datavis.p) 3–22
addStyle (sbo.p) 4–21
adjustTabOrder (smart.p) 2–5
admweb.p
  destroy 9–18
  destroyObject 9–18
  getAttribute 9–25
  getWebState 9–30
  getWebTimeout 9–31
  getWebTimeRemaining 9–31
  set-attribute-list 9–43
  setWebState 9–52
  setWebToHdlr 9–52
  timingOut 9–53
AllFieldHandles property 3–76
AllFieldNames property 3–77
anyKey (combo.p) 7–10
Index

anyKey (lookup.p) 7–18
anyKey (select.p) 7–3
anyMessage (smart.p) 2–6
anyMessage (webrep.p) 9–6
appendContainedObjects (sbo.p) 4–22
appserver.p
disconnectObject 2–27
ApplyActionOnExit property 3–77
applyCellEntry (browser.p) 3–46
applyContextFromServer (containr.p) 4–2
applyContextFromServer (dataview.p) 5–17
applyEntry (browser.p) 3–47
applyEntry (smart.p) 2–6
ApplyExitOnAction property 3–77
applyFilter (filter.p) 3–37
applyLayout (visual.p) 3–2
appserver.p
bindServer 2–27
destroyObject 2–27
destroyServerObject 2–27
initializeServerObject 2–28
runServerObject 2–28
runServerProcedure 2–28
unbindServer 2–29
AppService property 2–30
ASBound property 2–30
ASDivision property 2–30
ASHandle property 2–31
ASHasStarted property 2–31
ASInitializeOnRun property 2–31
askQuestion (exportdata.p) 5–47
assignColumnFormat (webrep.p) 9–6
assignColumnHelp (webrep.p) 9–7
assignColumnLabel (webrep.p) 9–7
assignColumnWidth (webrep.p) 9–7
assignContents (sbo.p) 4–22
assignCurrentMappedObject (sbo.p) 4–22
assignDBRow (query.p) 5–34
assignExtentAttribute (webrep.p) 9–8
assignFields (html-map.p) 9–9
assignFields (wbdata.p) 9–9
assignFocusedWidget (visual.p) 3–2
assignLinkProperty (smart.p) 2–7
AssignList property 5–79
assignMaxGuess (browser.p) 3–47
assignMaxGuess (sbo.p) 4–23
assignNodeValue (xml.p) 8–9
assignPageProperty (containr.p) 4–3
assignQuerySelection (dataquery.p) 5–2
assignQuerySelection (sbo.p) 4–23
assignTDModifier (wbtable.p) 9–10
assignUnsubscribe (consumer.p) 8–3
assignWidgetValue (visual.p) 3–3
assignWidgetValueList (visual.p) 3–4
AuditEnabled property 5–79
AutoCommit property 5–80
AutoSort property 3–77
AvailMenuActions property 6–26
AvailToolbarActions property 6–26
AvailToolbarBands property 6–26

B
b2b.p
callOutParams 8–17
characterValue 8–17
createSchemaAttributes 8–17
createSchemaChildren 8–18
createSchemaPath 8–18
dataSource 8–18
defineMapping 8–19
destroyObject 8–19
doEndDocument 8–19
doEndElement 8–20
findDataRow 8–20
initializeObject 8–20
loadProducerSchema 8–21
loadSchema 8–21
mapNode 8–21
NotFoundError 8–22
numParameters 8–22
processMappings 8–22
processMessages 8–23
produceAttributes 8–23
produceChildren 8–23
produceDocument 8–24
receiveHandler 8–24
rowNotFoundError 8–24
schemaField 8–25
sendHandler 8–25
sendMessage 8–25
startDataRow 8–26
startElement 8–26
storeNodeValue 8–27
storeParameterNode 8–27
storeParameterValue 8–28
targetProcedure 8–28
BaseQueryString property 7–26
batchRowAvailable (data.p) 5–48
batchServices (data.p) 5–34
beginTransactionValidate (data.p) 5–48
bindServer (appserver.p) 2–27
blankField (filter.p) 3–38
blankFields (filter.p) 3–38
blankFillIn (filter.p) 3–38
blankWidget (visual.p) 3–5
BLOBColumns property 5–80
BlockDataAvailable property 4–44
BoxRectangle property 6–27
BoxRectangle2 property 6–27
BrowseFieldFormats property 7–26
BrowseFields property 7–26, 7–27
BrowseHandle property 3–77
browseHandler (select.p) 7–3
browser.p
addRecord 3–46
applyCellEntry 3–46
applyEntry 3–47
assignMaxGue 3–47
calcWidth 3–47
cancelNew 3–48
cancelRecord 3–48
colValues 3–49
copyRecord 3–49
createPopupMenu 3–50
dataAvailable 3–50
defaultAction 3–50
deleteComplete 3–51
deleteRecord 3–51
destroyObject 3–51
disableFields 3–52
displayFields 3–52
enableFields 3–53
enableObject 3–53
fetchDataSet 3–53
filterActive 3–54
hasActiveAudit 3–54
hasActiveComments 3–54
initializeColumnSettings 3–54
initializeObject 3–55
launchFolderWindow 3–55
linkStateHandler 3–55
offEnd 3–56
offHome 3–56
onEnd 3–56
onHome 3–56
onValueChanged 3–57
refreshBrowse 3–57
refreshQuery 3–57
resizeBrowse 3–57
resizeObject 3–58
rowDisplay 3–58
rowEntry 3–58
rowLeave 3–59
rowVisible 3–59
searchTrigger 3–59
showSort 3–59
startSearch 3–60
stripCales 3–60
toolbar 3–60
updateRecord 3–61
updateState 3–61
updateTitle 3–61
viewObject 3–62
BrowseTitle property 7–27
bufferCopyDBToRO (query.p) 5–35
bufferHandle (html-map.p) 9–11
bufferHandle (webrep.p) 9–11
buildAllMenus (toolbar.p) 6–14
buildList (select.p) 7–3
BuildSequence property 7–27
BusinessEntity property 5–80
ButtonCount property 6–27
C
CalculatedColumns property 5–80
calcWidth (browser.p) 3–47
CalcWidth property 3–78
<table>
<thead>
<tr>
<th>Property/Procedure/Function</th>
<th>Page(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CallerObject property</td>
<td>4–44</td>
</tr>
<tr>
<td>CallerProcedure property</td>
<td>4–44</td>
</tr>
<tr>
<td>CallerWindow property</td>
<td>4–45</td>
</tr>
<tr>
<td>callOutParams (b2b.p)</td>
<td>8–17</td>
</tr>
<tr>
<td>callstring.p procedure</td>
<td>A–23</td>
</tr>
<tr>
<td>callstringtt.p A–4</td>
<td></td>
</tr>
<tr>
<td>callstringtt.p procedure A–25</td>
<td></td>
</tr>
<tr>
<td>calltable.p A–6</td>
<td></td>
</tr>
<tr>
<td>calltable.p procedure A–27</td>
<td></td>
</tr>
<tr>
<td>calltables,i A–9</td>
<td></td>
</tr>
<tr>
<td>calltablett.p A–8</td>
<td></td>
</tr>
<tr>
<td>calltablett.p procedure A–29</td>
<td></td>
</tr>
<tr>
<td>callttparam.i A–10</td>
<td></td>
</tr>
<tr>
<td>CancelBrowseOnExit property</td>
<td>7–27</td>
</tr>
<tr>
<td>cancelNew (browser.p)</td>
<td>3–48</td>
</tr>
<tr>
<td>cancelNew (sbo.p)</td>
<td>4–23</td>
</tr>
<tr>
<td>cancelObject (containr.p)</td>
<td>4–3</td>
</tr>
<tr>
<td>cancelObject (datavis.p)</td>
<td>3–22</td>
</tr>
<tr>
<td>cancelRecord (browser.p)</td>
<td>3–48</td>
</tr>
<tr>
<td>cancelRecord (datavis.p)</td>
<td>3–23</td>
</tr>
<tr>
<td>cancelRecord (viewer.p)</td>
<td>3–64</td>
</tr>
<tr>
<td>cancelRow (data.p)</td>
<td>5–49</td>
</tr>
<tr>
<td>cancelRow (dataview.p)</td>
<td>5–17</td>
</tr>
<tr>
<td>cancelRow (sbo.p)</td>
<td>4–24</td>
</tr>
<tr>
<td>canFindAction (toolbar.p)</td>
<td>6–2</td>
</tr>
<tr>
<td>canFindCategory (toolbar.p)</td>
<td>6–2</td>
</tr>
<tr>
<td>canNavigate (data.p)</td>
<td>5–49</td>
</tr>
<tr>
<td>canNavigate (dataview.p)</td>
<td>5–18</td>
</tr>
<tr>
<td>canNavigate (datavis.p)</td>
<td>3–24</td>
</tr>
<tr>
<td>canNavigatre (sbo.p)</td>
<td>4–24</td>
</tr>
<tr>
<td>CanUndoChanges property</td>
<td>3–78</td>
</tr>
<tr>
<td>CascadeOnBrowse property</td>
<td>4–45</td>
</tr>
<tr>
<td>categoryActions (toolbar.p)</td>
<td>6–14</td>
</tr>
<tr>
<td>categoryLink (toolbar.p)</td>
<td>6–2</td>
</tr>
<tr>
<td>changeCursor (smart.p)</td>
<td>2–8</td>
</tr>
<tr>
<td>ChangedEvent property</td>
<td>7–27</td>
</tr>
<tr>
<td>changePage (containr.p)</td>
<td>4–4</td>
</tr>
<tr>
<td>characterValue (b2b.p)</td>
<td>8–17</td>
</tr>
<tr>
<td>CheckCurrentChanged property</td>
<td>5–81</td>
</tr>
<tr>
<td>CheckLastOnOpen property</td>
<td>5–81</td>
</tr>
<tr>
<td>checkRule (toolbar.p)</td>
<td>6–3</td>
</tr>
<tr>
<td>ChildDataKey property</td>
<td>2–31</td>
</tr>
<tr>
<td>cleanupCall procedure A–31</td>
<td></td>
</tr>
<tr>
<td>ClientID property</td>
<td>8–32</td>
</tr>
<tr>
<td>ClientProxyHandle property</td>
<td>5–81</td>
</tr>
<tr>
<td>ClientRect property</td>
<td>3–78</td>
</tr>
<tr>
<td>clientSendRows (data.p)</td>
<td>5–50</td>
</tr>
<tr>
<td>CLOBColumns property</td>
<td>5–81</td>
</tr>
<tr>
<td>closeQuery (data.p)</td>
<td>5–51</td>
</tr>
<tr>
<td>closeQuery (dataview.p)</td>
<td>5–18</td>
</tr>
<tr>
<td>closeQuery (query.p)</td>
<td>5–36</td>
</tr>
<tr>
<td>Col property</td>
<td>3–78</td>
</tr>
<tr>
<td>collectChanges (datavis.p)</td>
<td>3–24</td>
</tr>
<tr>
<td>colStringValues (data.p)</td>
<td>5–51</td>
</tr>
<tr>
<td>Column properties</td>
<td></td>
</tr>
<tr>
<td>container objects</td>
<td>4–55</td>
</tr>
<tr>
<td>field objects</td>
<td>7–41</td>
</tr>
<tr>
<td>query objects</td>
<td>5–108</td>
</tr>
<tr>
<td>visual objects</td>
<td>3–104</td>
</tr>
<tr>
<td>columnDataType (webrep.p)</td>
<td>9–11</td>
</tr>
<tr>
<td>columnFormat (webrep.p)</td>
<td>9–12</td>
</tr>
<tr>
<td>columnHandle (webrep.p)</td>
<td>9–12</td>
</tr>
<tr>
<td>columnHelp (webrep.p)</td>
<td>9–12</td>
</tr>
<tr>
<td>columnHTMLName (html-map.p)</td>
<td>9–13</td>
</tr>
<tr>
<td>columnHTMLName (webrep.p)</td>
<td>9–13</td>
</tr>
<tr>
<td>columnLabel (webrep.p)</td>
<td>9–14</td>
</tr>
<tr>
<td>ColumnPhysicalColumn</td>
<td>5–35</td>
</tr>
<tr>
<td>ColumnPhysicalTable</td>
<td>5–36</td>
</tr>
<tr>
<td>columnReadOnly (webrep.p)</td>
<td>9–14</td>
</tr>
<tr>
<td>ColumnsMovable property</td>
<td>3–79</td>
</tr>
</tbody>
</table>
ColumnsSortable property 3–79

columnStringValue (webrep.p) 9–14

columnTable (html-map.p) 9–15

columnTDMedifier (wbtable.p) 9–15

columnValMsg (wbdata.p) 9–15

colValues (browser.p) 3–49

colValues (data.p) 5–52

colValues (dataview.p) 5–18

colValues (query.p) 5–36

colValues (sbo.p) 4–24

combo.p
  anyKey 7–10
  createLabel 7–10
  destroyCombo 7–10
  destroyObject 7–10
  disable_UI 7–11
  disableField 7–11
  displayCombo 7–11
  enableField 7–11
  endMove 7–12
  enterCombo 7–12
  hideObject 7–12
  initializeCombo 7–12
  insertExpression 7–13
  leaveCombo 7–13
  newQueryString 7–14
  newWhereClause 7–15
  refreshChildDependancies 7–15
  refreshCombo 7–15
  resizeObject 7–16
  returnParentFieldValues 7–16
  showQuery 7–16
  valueChanged 7–16
  viewObject 7–17
  whereClauseBuffer 7–17

ComboDelimiter property 7–27

ComboFlag property 7–28

ComboFlagValue property 7–28

ComboHandle property 7–28

ComboQuery property 7–28

ComboSort property 7–29

Commit (data.p) 5–52

commitData (dataextapi.p) 5–52

CommitSource property 4–45, 5–82

CommitSourceEvents property 4–45, 5–82

CommitTarget property 4–45, 5–82

CommitTargetEvents property 4–46, 5–82

commitTransaction (data.p) 5–53

commitTransaction (dataview.p) 5–19

commitTransaction (sbo.p) 4–25

confirmCancel (container.p) 4–8

confirmCancel (datavis.p) 3–25

confirmCommit (dataquery.p) 5–3

confirmCommit (datavis.p) 3–25

confirmContinue (dataquery.p) 5–3

confirmContinue (datavis.p) 3–25

confirmContinue (sbo.p) 4–25

confirmDelete (datavis.p) 3–25

confirmExit (container.p) 4–5

confirmExit (datavis.p) 3–26

confirmOk (container.p) 4–5

confirmOk (datavis.p) 3–26

confirmUndo (dataquery.p) 5–4

confirmUndo (datavis.p) 3–26

constructMenu (toolbar.p) 6–15

constructObject (container.p) 4–5

constructObject (html-map.p) 9–16

constructToolbar (toolbar.p) 6–15

consumer.p
  assignUnsubscribe 8–3
  createConsumers 8–3
  defineDestination 8–3
  destroyObject 8–4
  errorHandler 8–4
  initializeObject 8–4
  messageHandler 8–4
  processDestinations 8–5
  startWaitFor 8–5
  stopHandler 8–5

ConsumerSchema property 8–32

ContainedDataColumns property 4–46

ContainedDataObjects property 4–46

containedProperties (sbo.p) 4–6
Container objects
  column properties 4–55
ContainerHandle property 2–32
ContainerHidden property 2–32
ContainerSource property 2–32
ContainerSourceEvents property 2–32, 4–46
ContainerTarget property 4–46
ContainerTargetEvents property 4–46, 4–47
ContainerType property 2–32
containr.p
  assignContainedProperties 4–2
  assignPageProperty 4–3
  cancelObject 4–3
  changePage 4–4
  confirmCancel 4–8
  confirmExit 4–5
  confirmOk 4–5
  constructObject 4–5
  ContextandDestroy 4–7
  createObjects 4–7
  deletePage 4–8
  destroyObject 4–9
  disablePageInFolder 4–9
  enablePagesInFolder 4–9
  fetchContainedData 4–10
  hidePage 4–10
  initializeObject 4–10
  initializeVisualContainer 4–11
  initPages 4–11
  IsUpdateActive 4–12
  notifyPage 4–13
  obtainContextForServer 4–13
  okObject 4–14
  pageNTargets 4–14
  passThrough 4–15
  removePageNTarget 4–15
  resizeWindow 4–15
  selectPage 4–16
  targetPage 4–16
  toolbar 4–17
  updateActive 4–18
  viewObject 4–18
  viewPage 4–18
ContextandDestroy (containr.p) 4–7
ContextAndInitialize property 4–47
ContextForServer property 8–32
copyRecord (browser.p) 3–49
copyRecord (datavis.p) 3–27
copyRecord (viewer.p) 3–64
  copyRow (data.p) 5–53
  copyRow (dataview.p) 5–19
  copyRow (sbo.p) 4–25
  containr.p
    applyContextFromServer 4–2
  countButtons (panel.p) 6–5
  createAttribute (xml.p) 8–10
  createConsumers (consumer.p) 8–3
  createControls (smart.p) 2–8
  createData (dataextapi.p) 5–54
  createDocument (router.p) 8–29
  createElement (xml.p) 8–10
  createField (filter.p) 3–39
CreateHandles property 3–79
createLabel (combo.p) 7–10
createLabel (filter.p) 3–40
createLabel (lookup.p) 7–18
createLabel (select.p) 7–4
createMenuTable (toolbar.p) 6–15
createMenuTable2 (toolbar.p) 6–16
createNode (xml.p) 8–11
createObjects (containr.p) 4–7
createObjects (data.p) 5–54
createObjects (dataview.p) 5–19
createObjects (query.p) 5–37
createOperator (filter.p) 3–40
createPopupMenu (browser.p) 3–50
createRow (data.p) 5–54
createSchemaAttributes (b2b.p) 8–17
createSchemaChildren (b2b.p) 8–18
createSchemaPath (b2b.p) 8–18
createText (xml.p) 8–11
createToolbar (toolbar.p) 6–16
CtrlFrameHandle 3–79
CurrentDescValue property 7–29
CurrentKeyValue property 7–29
currentMappedObject (sbo.p) 4–26
CurrentMessage property 8–33
CurrentMessageId property 8–33
CurrentPage property 4–47
CurrentRowModified property 5–82
CurrentUpdateSource property 5–83

data.p
  addRow 5–47
  batchRowAvailable 5–48
  batchServices 5–34
  beginTransactionValidate 5–48
  cancelRow 5–49
  canNavigate 5–49
  clientSendRows 5–50
  closeQuery 5–51
  colStringValues 5–51
  colValues 5–52
  Commit 5–52
  commitTransaction 5–53
  copyRow 5–53
  createObjects 5–54
  createRow 5–54
  dataAvailable 5–55
  dataContainerHandle 5–56
  deleteRow 5–57
  describeSchema 5–57
  destroyObject 5–57
  doBuildUpd 5–58
  doCreateUpdate 5–58
  doEmptyTempTable 5–59
  doReturnUpd 5–59
  doUndoDelete 5–59
  doUndoRow 5–60
  doUndoTrans 5–60
  doUndoUpdate 5–60
  endTransactionValidate 5–60
  fetchBatch 5–61
  fetchFirst 5–61
  fetchLast 5–62
  fetchNext 5–62
  fetchPrev 5–62
  fetchRow 5–63
  fetchRowIdent 5–63
  findRowWhere 5–64
  firstRowIds 5–65
  hasActiveAudit 5–65
  hasActiveComments 5–65
  hasForeignKeyChanged 5–65
  hasOneToOneTarget 5–66
  initializeLogicObject 5–66
  initializeObject 5–66
  isUpdatePending 5–66
  newRowObject 5–67
  obtainContextForServer 5–67
  openDataQuery 5–68
  openQuery 5–68
  postTransactionValidate 5–68
  prepareErrorsForReturn 5–69
  preTransactionValidate 5–69
  pushTableAndValidate 5–69
  refreshRow 5–70
  remoteCommit 5–70
  remoteSendRow 5–71
  saveContextAndDestroy 5–72
  sendRows 5–72
  serverCommit 5–73
  serverSendRows 5–74
  startServerObject 5–74
  submitCommit 5–75
  submitForeignKey 5–75
  submitRow 5–76
  undoClientUpdate 5–76
  updateAddQueryWhere 5–77
  updateQueryPosition 5–78
  updateRow 5–78
  updateState 5–16

  dataAvailable (browser.p) 3–50
  dataAvailable (data.p) 5–55
  dataAvailable (dataview.p) 5–20
  dataAvailable (datavis.p) 3–27
  dataAvailable (filter.p) 3–41
  dataAvailable (html-map.p) 9–16
  dataAvailable (query.p) 5–20, 5–37
  dataAvailable (sbo.p) 4–26
  dataAvailable (select.p) 7–4
  DataColumns ByTable (queryext.p) 5–83
  DataColumns property 4–47, 5–83
  dataContainerHandle (data.p) 5–56
  DataContainerHandle property 5–83
  DataDelimiter property 5–84
  DataFieldDefs property 5–84
  DataHandle property 4–47, 5–84
  DataIsFetched property 5–85
Index—8

DataLinksEnabled property 2–33
DataLogicObject property 5–84
DataLogicProcedure property 5–85
DataModified property 3–80, 5–84, 7–29
DataObject property 3–80
dataObjectHandle (sbo.p) 4–26
DataObjectHandle property 3–80
DataObjectNames property 4–47
DataObjectOrdering property 4–47
dataquery.p
addForeignKey 5–2
assignQuerySelection 5–2
confirmCommit 5–3
confirmContinue 5–3
confirmUndo 5–4
exportData 5–4
filterContainerHandler 5–5
findRow 5–5
indexInformation 5–6
insertExpression 5–7
isUpdateActive 5–7
isUpdatePending 5–8
linkState 5–8
newQueryString 5–9
newWhereClause 5–10
printToCrystal 5–10
removeForeignKey 5–11
removeQuerySelection 5–11
resetQueryString 5–11
resolveColumn 5–12
rowAvailable 5–12
rowValues 5–13
sortExpression 5–14
startFilter 5–14
tableOut 5–14
transferToExcel 5–15
updateQueryPosition 5–15
updateState 5–16
DataQueryBrowsed property 4–48, 5–85
DataQueryString property 5–85
DataReadBuffer property 5–85
DataReadColumns property 5–86
DataReadHandler property 5–86
DatasetName property 5–86
DatasetSource property 5–86
DataSignature property 3–80, 5–86
dataSource (b2b.p) 8–18
DataSource property 2–33
DataSourceEvents property 2–33
DataSourceFilter property 7–29
DataSourceNames property 2–33
DataTable property 5–87
DataTarget property 2–33
DataTargetEvents property 2–33
dataValue
filter.p 3–41
dataValue (filter.p) 3–41
DataValue property 7–30
dataview.p
addRow 5–17
applyContextFromServer 5–17
cancelRow 5–17
canNavigate 5–18
closeQuery 5–18
colValues 5–18
commitTransaction 5–19
copyRow 5–19
createObjects 5–19
dataAvailable 5–20
deleteRow 5–20
destroyObject 5–20
fetchBatch 5–21
fetchFirst 5–21
fetchLast 5–21
fetchNext 5–22
fetchPrev 5–22
findRow Where 5–22
hasActiveAudit 5–23
hasActiveComments 5–23
hasForeignKeyChanged 5–23
initializeObject 5–24
isDataQueryComplete 5–24
keyWhere 5–24
linkStateHandle 5–25
obtainContextForServer 5–25
openDataQuery 5–26
openDataView 5–26
openQuery 5–26
openQueryAtPosition 5–27
refreshQuery 5–27
refreshRow 5–27
resetRow 5–28
resolveBuffer 5–28
sortQuery 5–28
retrieveData 5–29
rowChanged 5–30
submitData 5–30
submitRow 5–31
undoRow 5–31
undoTransaction 5–31
whereClauseBuffer 5–32
datavis.p
  addRecord 3–22
  cancelObject 3–22
  cancelRecord 3–23
  canNavigate 3–24
  collectChanges 3–24
  confirmCancel 3–25
  confirmCommit 3–25
  confirmContinue 3–25
  confirmDelete 3–25
  confirmExit 3–26
  confirmOk 3–26
  confirmUndo 3–26
  copyRecord 3–27
  dataAvailable 3–27
  deleteRecord 3–28
  disableFields 3–28
  displayObjects 3–29
  displayRecord 3–29
  enableFields 3–29
  fieldModified 3–30
  initializeObject 3–30
  IsUpdateActive 3–31
  linkStateHandler 3–31
  okObject 3–31
  okToContinueProcedure 3–32
  queryPosition 3–32
  resetRecord 3–33
  showDataMessages 3–33
  showDataMessagesProcedure 3–33
  undoChange 3–34
  updateMode 3–34
  updateRecord 3–35
  updateState 3–35
  validateFields 3–35
  valueChanged 3–36

DBAware property 2–34

dbColumnDataName (query.p) 5–38

dbColumnHandle (query.p) 5–38

DbNames property 5–87

defaultAction (browser.p) 3–50

DefaultCharWidth property 3–81

DefaultEditorLines property 3–81

DefaultLayout property 3–81

DefaultWidth property 3–81

defineAction (toolbar.p) 6–3

DefineAnyKeyTrigger property 7–30

defineDataObject (query.p) 5–38

defineDestination (consumer.p) 8–3

defineMapping (b2b.p) 8–19

deleteBuffer (wbdata.p) 9–17

deleteComplete (browser.p) 3–51

deleteComplete (sbo.p) 4–26

deleteData (dataextapi.p) 5–56

deleteDocument (xml.p) 8–11

deleteNode (treeview.p) 3–71

deleteObjects (filter.p) 3–41

deleteOffsets (html-map.p) 9–17

deletePage (containr.p) 4–8

deleteRecord (browser.p) 3–51

deleteRecord (datavis.p) 3–28

deleteRecordStatic (query.i) 5–39

deleteRow (data.p) 5–57

deleteRow (dataview.p) 5–57

deleteRow (sbo.p) 4–27

deleteRow (wbdata.p) 9–18

deleteTree (treeview.p) 3–71

describeSchema (data.p) 5–57

DescSubstitute property 7–30

Destination property 8–33

DestinationList property 8–33

Destinations property 8–33

destroy (admweb.p) 9–18

destroyCombo (combo.p) 7–10

destroyDataObject (webrep.p) 9–18

destroyLookup (lookup.p) 7–18

destroyObject (admweb.p) 9–18

destroyObject (appserver.p) 2–27

destroyObject (b2b.p) 8–19

destroyObject (browser.p) 3–51

destroyObject (combo.p) 7–10

destroyObject (consumer.p) 8–4

destroyObject (containr.p) 4–9

destroyObject (data.p) 5–57
destroyObject (dataview.p) 5–20  
destroyObject (lookup.p) 7–18  
destroyObject (messaging.p) 8–2  
destroyObject (producer.p) 8–6  
destroyObject (query.p) 5–40  
destroyObject (select.p) 7–4  
destroyObject (smart.p) 2–8  
destroyObject (webrep.p) 9–19  
destroyObject (xml.p) 8–12  
destroySelection (select.p) 7–5  
destroyServerObject (appserver.p) 2–27  
destroyServerObject (sbo.p) 4–27  
DestroyStateless property 5–87  
determineTableType function A–31  
DirectionList property 8–34  
disable/UI (combo.p) 7–11  
disable/UI (lookup.p) 7–19  
disable/UI (select.p) 7–5  
disableActions (panel.p) 6–5  
disableActions (browser.p) 3–52  
disableActions (datavis.p) 3–28  
disableActions (filter.p) 3–41  
disableButtons (smart.p) 2–9  
DisconnectedAppServer property 5–87  
disableField (visual.p) 3–6  
disableField (browser.p) 3–52  
disableField (viewer.p) 3–65  
disableField (combo.p) 7–11  
disableField (lookup.p) 7–19  
disableField (select.p) 7–5  
disableFields (browser.p) 3–52  
disableFields (datavis.p) 3–28  
disableFields (filter.p) 3–41  
disableFields (viewer.p) 3–65  
DisplayActions (toolbar.p) 6–3  
DisplayDataObject (select.p) 7–5  
DisplayDataObject (browser.p) 3–52  
DisplayDataObject (datavis.p) 3–28  
DisplayDataObject (filter.p) 3–41  
DisplayDataObject (viewer.p) 3–65  
DisplayField property 7–30  
DisplayedField property 3–81  
DisplayedTables property 3–82  
DisplayField property 7–30  
displayFields (browser.p) 3–52  
displayFields (datavis.p) 3–28  
displayFields (filter.p) 3–41  
displayFields (viewer.p) 3–65  
DisplayField property 7–30  
DisplayFormat property 7–31  
displayValues (smart.p) 2–9  
displayFields (html-map.p) 9–20  
DisplayFormat property 7–31  
displayFields (viewer.p) 3–65  
DisplayFieldsSecurity property 3–82  
doBuildUpd (data.p) 5–58  
doCreateUpdate (data.p) 5–58  
doBuildUpd (data.p) 5–58  
doCreateUpdate (data.p) 5–58  
doBuildUpd (data.p) 5–58  
doCreateUpdate (data.p) 5–58  
doReturnUpd (data.p) 5–59  
doReturnUpd (data.p) 5–59  
doUndoDelete (data.p) 5–59  
doUndoDelete (data.p) 5–59  
doUndoRow (data.p) 5–60  
doUndoRow (data.p) 5–60  
doUndoTrans (data.p) 5–60  
doUndoTrans (data.p) 5–60  
doUndoUpdate (data.p) 5–60  
doUndoUpdate (data.p) 5–60  
Down property 3–82  
DisplayFieldsSecurity property 3–82  
DisplayValue property 7–31  
DisplayValue property 7–31  
DisplayValue property 7–31  
DisplayValue property 7–31  
DocumentElement property 8–34  
DocumentElement property 8–34  
DocumentElement property 8–34  
DocumentElement property 8–34  
DocumentElement property 8–34  
DocumentElement property 8–34  
DocumentHandle property 8–34  
DocumentHandle property 8–34  
DocumentHandle property 8–34  
DocumentHandle property 8–34  
DocumentHandle property 8–34  
DocumentHandle property 8–34  
DocumentInitialized property 8–34  
DocumentInitialized property 8–34  
DocumentInitialized property 8–34  
DocumentInitialized property 8–34  
DocumentInitialized property 8–34  
DocumentInitialized property 8–34  
Domain property 8–34  
Domain property 8–34  
Domain property 8–34  
Domain property 8–34  
Domain property 8–34  
Domain property 8–34  
Domain property 8–34  
DocumentOnInitialized property 8–34  
DocumentOnInitialized property 8–34  
DocumentOnInitialized property 8–34  
DocumentOnInitialized property 8–34  
DocumentOnInitialized property 8–34  
DocumentOnInitialized property 8–34  
DocumentOnInitialized property 8–34  
Down property 3–82
<table>
<thead>
<tr>
<th>Property/Method</th>
<th>Page(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTDPublicIdList</td>
<td>8–35</td>
</tr>
<tr>
<td>DTDSYSTEMID</td>
<td>8–35</td>
</tr>
<tr>
<td>DTDSYSTEMIDLIST</td>
<td>8–35</td>
</tr>
<tr>
<td>DynamicSDOPerProcedure</td>
<td>4–48</td>
</tr>
<tr>
<td>dynlaunch.i</td>
<td>A–2</td>
</tr>
<tr>
<td>AppServer calls</td>
<td>A–2</td>
</tr>
<tr>
<td>file arguments</td>
<td>A–2</td>
</tr>
<tr>
<td>include file</td>
<td>A–2</td>
</tr>
<tr>
<td>when to use</td>
<td>A–2</td>
</tr>
<tr>
<td>EdgePixels</td>
<td>6–28, 7–31</td>
</tr>
<tr>
<td>Editable</td>
<td>3–82</td>
</tr>
<tr>
<td>editInstanceProperties</td>
<td>(smart.p) 2–9</td>
</tr>
<tr>
<td>emptyTree</td>
<td>3–72</td>
</tr>
<tr>
<td>enableActions</td>
<td>panel.p 6–6</td>
</tr>
<tr>
<td>enableButton</td>
<td>lookup.p 7–20</td>
</tr>
<tr>
<td>enableButton</td>
<td>select.p 7–5</td>
</tr>
<tr>
<td>enabledField</td>
<td>lookup.p 7–20</td>
</tr>
<tr>
<td>EnabledFields</td>
<td>property 3–83</td>
</tr>
<tr>
<td>EnabledHandles</td>
<td>property 3–83</td>
</tr>
<tr>
<td>EnabledObjFlds</td>
<td>property 3–83</td>
</tr>
<tr>
<td>EnabledObjFldsToDisable</td>
<td>property 3–83, 5–88</td>
</tr>
<tr>
<td>EnabledObjHdls</td>
<td>property 3–83</td>
</tr>
<tr>
<td>EnabledTables</td>
<td>property 5–88</td>
</tr>
<tr>
<td>enableField</td>
<td>combo.p 7–11</td>
</tr>
<tr>
<td>enableField</td>
<td>select.p 7–6</td>
</tr>
<tr>
<td>EnableField</td>
<td>property 7–31</td>
</tr>
<tr>
<td>enableFields</td>
<td>(browser.p) 3–53</td>
</tr>
<tr>
<td>enableFields</td>
<td>(datavis.p) 3–29</td>
</tr>
<tr>
<td>enableFields</td>
<td>(filter.p) 3–42</td>
</tr>
<tr>
<td>enableFields</td>
<td>(html-map.p) 9–20</td>
</tr>
<tr>
<td>enableFields</td>
<td>(viewer.p) 3–67</td>
</tr>
<tr>
<td>enableObject</td>
<td>(browser.p) 3–53</td>
</tr>
<tr>
<td>enableObject</td>
<td>(panel.p) 6–6</td>
</tr>
<tr>
<td>enableObject</td>
<td>(treeview.p) 3–72</td>
</tr>
<tr>
<td>enableObject</td>
<td>(visual.p) 3–8</td>
</tr>
<tr>
<td>EnableOnAdd</td>
<td>property 7–31</td>
</tr>
<tr>
<td>enablePagesInFolder</td>
<td>(container.p) 4–9</td>
</tr>
<tr>
<td>enableRadioButton</td>
<td>(visual.p) 3–8</td>
</tr>
<tr>
<td>enableWidget</td>
<td>(visual.p) 3–9</td>
</tr>
<tr>
<td>endClientDataRequest</td>
<td>(sbo.p) 4–27</td>
</tr>
<tr>
<td>endDocument</td>
<td>(b2b.p) 8–19</td>
</tr>
<tr>
<td>endElement</td>
<td>(b2b.p) 8–20</td>
</tr>
<tr>
<td>endMove</td>
<td>combo.p 7–12</td>
</tr>
<tr>
<td>endMove</td>
<td>lookup.p 7–20</td>
</tr>
<tr>
<td>endMove</td>
<td>select.p 7–6</td>
</tr>
<tr>
<td>endTransactionValidate</td>
<td>(data.p) 5–60</td>
</tr>
<tr>
<td>enterCombo</td>
<td>combo.p 7–12</td>
</tr>
<tr>
<td>enterLookup</td>
<td>combo.p 7–20</td>
</tr>
<tr>
<td>enterSelect</td>
<td>select.p 7–6</td>
</tr>
<tr>
<td>errorHandler</td>
<td>consumer.p 8–4</td>
</tr>
<tr>
<td>errorHandler</td>
<td>messaging.p 8–2</td>
</tr>
<tr>
<td>exclusiveLockBuffer</td>
<td>(wbdata.p) 9–21</td>
</tr>
<tr>
<td>ExitBrowseOnAction</td>
<td>property 7–32</td>
</tr>
<tr>
<td>exitObject</td>
<td>smart.p 2–10</td>
</tr>
<tr>
<td>ExpandOnAdd</td>
<td>property 3–84</td>
</tr>
<tr>
<td>exportData</td>
<td>(dataquery.p) 5–4</td>
</tr>
<tr>
<td>exportdata.p</td>
<td>askQuestion 5–47</td>
</tr>
<tr>
<td>extentAttribute</td>
<td>(webrep.p) 9–21</td>
</tr>
<tr>
<td>extentValue</td>
<td>(webrep.p) 9–21</td>
</tr>
<tr>
<td>ExternalRefList</td>
<td>property 8–35</td>
</tr>
<tr>
<td>fetchBatch</td>
<td>(data.p) 5–61</td>
</tr>
<tr>
<td>fetchBatch</td>
<td>(dataview.p) 5–21</td>
</tr>
<tr>
<td>fetchBatch</td>
<td>(sbo.p) 4–27</td>
</tr>
<tr>
<td>fetchContainedData</td>
<td>(container.p) 4–10</td>
</tr>
<tr>
<td>fetchContainedData</td>
<td>(sbo.p) 4–28</td>
</tr>
<tr>
<td>fetchContainedRows</td>
<td>(sbo.p) 4–28</td>
</tr>
</tbody>
</table>
fetchCurrent (webrep.p) 9–22
fetchCurrentBatch (query.p) 5–41
fetchDataSet (browser.p) 3–53
fetchDOProperties (sbo.p) 4–28
fetchFirst (data.p) 5–61
fetchFirst (dataview.p) 5–21
fetchFirst (query.p) 5–40
fetchFirst (sbo.p) 4–29
fetchFirst (webrep.p) 9–22
fetchFirstBatch (query.p) 5–41
fetchLast (data.p) 5–62
fetchLast (dataview.p) 5–21
fetchLast (query.p) 5–40
fetchLast (sbo.p) 4–29
fetchLast (wtable.p) 9–22
fetchLast (webrep.p) 9–22
fetchLastBatch (query.p) 5–41
fetchMessages (smart.p) 2–11
fetchNext (data.p) 5–62
fetchNext (dataview.p) 5–22
fetchNext (query.p) 5–40
fetchNext (sbo.p) 4–29
fetchNext (wtable.p) 9–23
fetchNext (webrep.p) 9–23
fetchNextBatch (query.p) 5–41
FetchOnOpen property 4–48, 5–88
FetchOnRepToEnd property 3–84
fetchPrev (data.p) 5–62
fetchPrev (dataview.p) 5–22
fetchPrev (query.p) 5–40
fetchPrev (sbo.p) 4–30
fetchPrev (wtable.p) 9–23
fetchPrev (webrep.p) 9–23
fetchPrevBatch (query.p) 5–41
fetchRow (data.p) 5–63
fetchRowIdent (data.p) 5–63
Field objects
  column properties 7–41
field.p
  initializeObject 7–2
  resizeObject 7–2
FieldColumn property 3–84
FieldEnabled property 7–32
fieldExpression (webrep.p) 9–24
FieldFormats property 3–84
FieldHandles property 3–84
FieldHelpIds property 3–85
FieldHidden property 7–32
FieldLabel property 7–32
FieldLabels property 3–85
fieldLookup (filter.p) 3–42
fieldModified (datavis.p) 3–30
fieldModified (viewer.p) 3–67
FieldName property 7–32
FieldOperatorStyles property 3–85
fieldProperty (filter.p) 3–42
FieldsEnabled property 3–85
FieldToolTip property 7–32
FieldToolTips property 3–85
FieldWidths property 3–85
FillBatchOnRepos property 5–89
filter.p
  applyFilter.p 3–37
  blankField 3–38
  blankFields 3–38
  blankFillIn 3–38
  createField 3–39
  createLabel 3–40
  createOperator 3–40
  dataAvailable 3–41
  deleteObjects 3–41
  disableFields 3–41
  enableFields 3–42
  fieldLookup 3–42
  fieldProperty 3–42
initializeObject 3–43
insertFieldProperty 3–43
removeSpace 3–43
resetFields 3–44
showDataMessages 3–44
unBlankFillin 3–44
unBlankLogical 3–45
filterActive (browser.p) 3–54
FilterActive property 3–86, 5–89
FilterAvailable property 5–89
filterContainerHandler (dataquery.p) 5–5
FilterSource property 4–48, 5–89
filterState (toolbar.p) 6–17
FilterTarget property 3–86
FilterTargetEvents property 3–86
FilterWindow property 5–89
findDataRow (b2b.p) 8–20
findRecords (html-map.p) 9–24
findRow (dataquery.p) 5–5
findRowWhere (data.p) 5–64
findRowWhere (dataview.p) 5–22
findRowWhere (sbo.p) 4–30
firstBufferName (query.p) 5–42
FirstResultRow property 5–89
firstRowIds (data.p) 5–65
firstRowIds (query.p) 5–42
FirstRowNum property 5–90
fixQueryString (smart.p) 2–11
FlagValue property 7–33
FolderWindowToLaunch property 3–86
ForeignFields property 5–90
ForeignValues property 5–90
Format property 7–33
formattedValue (select.p) 7–6
formattedWidgetValue (visual.p) 3–10
formattedWidgetValueList (visual.p) 3–11
FrameMinHeightChars property 3–86
FrameMinWidthChars property 3–87
FullRowSelect property 3–87
getServerConnection (webrep.p) 9–29
getSearchColumns (webrep.p) 9–29
getServerState (webrep.p) 9–30
getServerTimeout (admweb.p) 9–31
getServerTimeRemaining (admweb.p) 9–31
getUpdateMode (webrep.p) 9–30
getWebState (admweb.p) 9–30
getWebTimeout (admweb.p) 9–31
getWebTimeRemaining (admweb.p) 9–31
GroupAssignHidden property 3–87
GroupAssignSource property 3–87, 5–90
GroupAssignSourceEvents property 3–87, 5–90
GroupAssignTarget property 3–88, 5–90
GroupAssignTargetEvents property 3–88, 5–91

H

hasActiveAudit (browser.p) 3–54
hasActiveAudit (data.p) 5–65
hasActiveAudit (dataview.p) 5–23
hasActiveComments (browser.p) 3–54
hasActiveComments (data.p) 5–65
hasActiveComments (dataview.p) 5–23
hasActiveGaTarget (panel.p) 6–6
HasFirst property 5–91
hasOneToOneTarget (data.p) 5–66
HasLast property 5–91
Height property 3–88
HelpId property 7–33
HiddenActions property 6–28
HiddenMenuBands property 6–28
HiddenToolbarBands property 6–28
hideObject (combo.p) 7–12
hideObject (lookup.p) 7–20
hideObject (select.p) 7–7
hideObject (smart.p) 2–14
hideObject (toolbar.p) 6–17
HideOnInit property 3–88
hidePage (containr.p) 4–10
HideSelection property 3–88
hideWidget (visual.p) 3–12
highlightWidget (visual.p) 3–13
htmAssociate (html-map.p) 9–32
HTMLAlert (webrep.p) 9–32
HTMLColumn (wbtable.p) 9–33
html-map.p
assignField 9–9
bufferHandle 9–11
columnHTMLName 9–13
columnTable 9–15
constructObject 9–16
dataAvailable 9–16
deleteOffsets 9–17
displayFields 9–20
enableFields 9–20
findRecords 9–24
getCurrentPage 9–26
getNextHtmlField 9–27
getTable 9–30
htmAssociate 9–32
initializeObject 9–34
inputFields 9–35
outputFields 9–38
readOffsets 9–40
HTMLSetFocus (wbrep.p) 9–33
HTMLTable (wbtable.p) 9–34

I

ILComHandle property 3–89
Image property 6–28
ImageHeight property 3–88
imageName (toolbar.p) 6–17
ImagePath property 6–28
ImageWidth property 3–89
inactiveLinks property 2–34
Indentation property 3–89
indexInformation (dataquery.p) 5–6
IndexInformation property 5–91
initAction (toolbar.p) 6–4
initDataObjectOrdering (sbo.i) 4–29
initializeBrowse 7–7
initializeBrowse (lookup.p) 7–21
initializeColumnSettings (browser.p) 3–54
initializeCombo (combo.p) 7–12
initializeLogicObject (data.p) 5–66
initializeLookup (lookup.p) 7–21
initializeObject (b2b.p) 8–20
initializeObject (browser.p) 3–55
initializeObject (consumer.p) 8–4
initializeObject (containr.p) 4–10
initializeObject (data.) 5–66
initializeObject (dataview.p) 5–24
initializeObject (datavis.p) 3–30
initializeObject (field.p) 7–2
initializeObject (filter.p) 3–43
initializeObject (html-map.p) 9–34
initializeObject (messaging.p) 8–2
initializeObject (panel.p) 6–7
initializeObject (producer.p) 8–6
initializeObject (router.p) 8–29
initializeObject (sbo.p) 4–31
initializeObject (select.p) 7–7
initializeObject (smart.p) 2–12
initializeObject (toolbar.p) 6–4, 6–18
initializeObject (tvcontroller.p) 4–43
initializeObject (viewer.p) 3–68
initializeObject (visual.p) 3–14
initializeSelection (select.p) 7–7
initializeServerObject (appserver.p) 2–28
initializeServerObject (sbo.p) 4–31
initializeVisualContainer (containr.p) 4–11
InitialPageList property 4–48
initPages (containr.p) 4–11
initProp (query.i) 5–42
InMessageSource property 8–35
InMessageTarget property 4–48
InnerLines property 7–33
inputFields (html-map.p) 9–35
insertExpression (combo.p) 7–13
insertExpression (dataquery.p) 5–7
insertExpression (lookup.p) 7–21
insertFieldProperty (filter.p) 3–43
insertMenu (toolbar.p) 6–18
instanceOf (smart.p) 2–13
InstanceProperties property 2–34
instancePropertyList (smart.p) 2–13
InternalEntries property 5–91
InternalRefList property 8–35
internalSchemaFile (router.p) 8–29
InvokeCall procedure A–32
isDataQueryComplete (dataview.p) 5–24
isNodeExpanded (treeview.p) 3–72
IsUpdateActive (containr.p) 4–12
IsUpdateActive (dataquery.p) 5–7
IsUpdateActive (datavis.p) 3–31
isUpdatePending (data.p) 5–66
isUpdatePending (dataquery.p) 5–8
isUpdatePending (sbo.p) 4–31

J
JMSpartition property 8–36
JMSpassword property 8–36
JMSsession property 8–36
JMSuser property 8–36
joinExternalTables (webrep.p) 9–36
joinForeignFields (webrep.p) 9–36

K
KeyDataType property 7–33
KeyField property 7–33
KeyFields property 5–92, 7–34
KeyFormat property 7–34
KeyTableId property 5–92
keyWhere (dataview.p) 5–24
KeyWhere property 5–92
Index

L
Label property 7–34
LabelEdit property 3–89
LabelHandle property 7–34
LargeColumns property 5–92
LastCommitErrorKeys property 4–49, 5–93
LastCommitErrorType 4–49, 5–93
LastCommitErrorType property 5–94
LastDbRowIdent property 5–93
LastResultRow property 5–94
LastRowNum property 5–94
launchFolderWindow (browser.p) 3–55
LayoutOptions property 3–89
LayoutVariable property 3–89
leaveCombo (combo.p) 7–13
leaveLookup (lookup.p) 7–22
leaveSelect 7–7
LineStyle property 3–90
LinkedFieldDataTypes property 7–34
LinkedFieldFormats property 7–34
linkHandles (smart.p) 2–15
linkProperty (smart.p) 2–16
linkRuleBuffer (toolbar.p) 6–18
linkState (dataquery.p) 5–8
linkState (panel.p) 6–7
linkState (toolbar.p) 6–19
linkStateHandler (browser.p) 3–55
linkStateHandler (dataview.p) 5–25
linkStateHandler (datavis.p) 3–31
linkStateHandler (smart.p) 2–17
ListItemPairs property 7–34
LoadedByRouter property 8–36
loadImage (treeview.p) 3–72
loadPanel (panel.p) 6–8
loadProducerSchema (b2b.p) 8–21
loadSchema (b2b.p) 8–21
lockRow (wbdata.p) 9–37
LogFile property 8–37
LogicalObjectName property 2–34
LogicalVersion property 2–34
LogicBuffer property 5–94
lookup.p
anyKey 7–18
createLabel 7–18
destroyLookup 7–18
destroyObject 7–18
disable_UI 7–19
disableButton 7–19
disableField 7–19
displayLookup 7–19
enableButton 7–20
enableField 7–20
dDispmove 7–20
enterLookup 7–20
hideObject 7–20
initializeBrowse 7–21
initializeLookup 7–21
insertExpression 7–21
leaveLookup 7–22
newQueryString 7–22
newWhereClause 7–23
resizeObject 7–23
returnParentFieldValues 7–23
rowSelected 7–24
valueChanged 7–24
viewObject 7–25
whereClauseBuffer 7–25
LookupFilterValue property 7–35
LookupHandle property 7–35
LookupImage property 7–35
LookupQuery property 7–35
M
MaintenanceObject property 7–35
MaintenanceSDO property 7–36
ManualAddQueryWhere property 5–95
ManualAssignQuerySelection property 5–95
ManualSetQuerySort property 5–95
MapNameProducer property 8–37
mapNode (b2b.p) 8–21
MapObjectProducer property 8–37
mappedEntry (smart.p) 2–18
MapTypeProducer property 8–37
MarginPixels property 6–29
MasterDataObject property 4–50
MaxWidth property 3–90
Menu property 6–29
MenuMergeOrder property 6–29
messageHandler (consumer.p) 8–4
messageNumber (smart.p) 2–18
MessageType property 8–37
messaging.p
destroyObject 8–2
tmessage 8–2
initializeObject 8–2
MinHeight property 3–90, 6–29
MinWidth property 3–90, 6–29
modifyDisabledActions (toolbar.p) 6–19
ModifyFields property 3–90
modifyListProperty (smart.p) 2–19
modifyUserLinks (smart.p) 2–20
msghandler.p
sendMessage 8–8
MultiInstanceActivated property 4–50
MultiInstanceSupported property 4–50

N
NameList property 8–37
NameSpaceHandle property 8–38
NavigationSource property 4–50, 5–95
NavigationSourceEvents property 4–50, 5–95
NavigationTarget property 4–50
NavigationTargetEvents property 6–29
NavigationTargetName property 6–30
newDataObjectRow (sbo.p) 4–32
NewMode property 5–96
NewNode property 8–38
newQueryString (combo.p) 7–14
newQueryString (dataquery.p) 5–9
newQueryString (lookup.p) 7–22
newQueryValidate (query.p) 5–43
newQueryWhere (query.p) 5–43
NewRow property 5–96
newRowObject (data.p) 5–67
newWhereClause (combo.p) 7–15
newWhereClause (dataquery.p) 5–10
newWhereClause (lookup.p) 7–23
NextNodeKey property 3–91
NodeExpanded property 3–91
nodeHandle (xml.p) 8–12
nodeType (xml.p) 8–12
NotFoundError (b2b.p) 8–22
notifyPage (containr.p) 4–13
NumDown property 3–91
numParameters (b2b.p) 8–22
NumRows property 7–36

O
ObjectEnabled property 3–92
ObjectHidden property 2–35
ObjectInitialized property 2–35
ObjectLayout property 3–92
ObjectMapping property 4–51
ObjectName property 2–35
ObjectPage property 2–35
ObjectParent property 2–35
ObjectType property 2–36
ObjectVersion property 2–36
obtainCallInfo function A–34

Index–17
obtainContextForServer (containr.p) 4–13
obtainContextForServer (data.p) 5–67
obtainContextForServer (dataview.p) 5–25
obtainInMsgTarget (router.p) 8–30
obtainParamPropValue function A–37
obtainProcHandle function A–35
offEnd (browser.p) 3–56
offHome (browser.p) 3–56
okObject (containr.p) 4–14
okObject (datavis.p) 3–31
okToContinueProcedure (datavis.p) 3–32
OLEDrag property 3–92
OLEDrop property 3–92
onChoose (panel.p) 6–8
onChoose (toolbar.p) 6–20
onEnd (browser.p) 3–56
oneObjectLinks (smart.p) 2–21
onHome (browser.p) 3–56
onMenuDrop (toolbar.p) 6–20
onValueChanged (browser.p) 3–57
onValueChanged (toolbar.p) 6–20
openDataQuery (data.p) 5–68
openDataQuery (dataview.p) 5–26
openDataView (dataview.p) 5–26
OpenOnInit property 5–96
openQuery (data.p) 5–68
openQuery (dataview.p) 5–26
openQuery (query.p) 5–44
openQuery (sbo.p) 4–32
openQuery (webrep.p) 9–37
OpenQuery property 5–97
openQueryAtPosition (dataview.p) 5–27
Operator property 3–92
OperatorStyle property 3–93
OperatorViewAs property 3–93
Optional property 7–36
OptionalBlank property 7–36
OptionalString property 7–36
OutMessageSource property 8–38
OutMessageTarget property 4–51
outputFields (html-map.p) 9–38
ownerElement (xml.p) 8–12

P

pageBackward (wbtable.p) 9–38
PageNTarget property 4–51
pageNTargets (containr.p) 4–14
PageSource property 4–51

panel.p
activeTarget 6–5
countButtons 6–5
disableActions 6–5
enableActions 6–6
enableObject 6–6
hasActiveGaTarget 6–6
initializeObject 6–7
linkState 6–7
loadPanel 6–8
onChoose 6–8
queryPosition 6–8
resetCommit 6–8
resetNavigation 6–9
resetTableio 6–9
resetTargetActions 6–9
resizeObject 6–10
sensitizeActions 6–10
targetActions 6–10
updateState 6–11
viewHideActions 6–11

PanelFrame property 6–30
PanelLabel property 6–30
PanelState property 6–30
PanelType property 6–30
ParentDataKey property 2–36
ParentField property 7–36
ParentFilterQuery property 7–37
parentNode (xml.p) 8–13
passThrough (container.p) 4–15
PassThroughLinks property 2–36
Persistency property 8–38
PhysicalObjectName property 2–36
PhysicalTable (query.p) 5–97
PhysicalVersion property 2–37
PingInterval property 8–38
populateTree (treeview.p) 3–73
PopupOnAmbiguous property 7–37
PopupOnNotAvail property 7–37
PopupOnUniqueAmbiguous property 7–37
Position character datatype
  table type 2 A–14
Position character table type A–14
Position native datatype
  Table type A–12
  table type 1 A–12
PositionSource property 5–97
postCreateObjects (sbo.p) 4–32
postTransactionValidate (data.p) 5–68
prepareErrorsForReturn (data.p) 5–69
prepareErrorsForReturn (sbo.p) 4–33
prepareQueriesForFetch (sbo.p) 4–33
prepareQuery (query.p) 5–44
preTransactionValidate (data.p) 5–69
PrimarySDOSource property 5–97
PrimarySdoTarget property 4–51
printToCrystal (dataquery.p) 5–10
Priority property 8–39
processCDataSection (xml.p) 8–13
processComment (xml.p) 8–13
processDestinations (consumer.p) 8–5
processDocument (xml.p) 8–13
processElement (xml.p) 8–14
processFileRefs (router.p) 8–30
processMappings (b2b.p) 8–22
processMessages (b2b.p) 8–23
processRoot (xml.p) 8–14
processText (xml.p) 8–14
processWebRequest (wbdata.p) 9–39
processWebRequest (wtable.p) 9–39
processWebRequest (webrep.p) 9–40
produceAttributes (b2b.p) 8–23
produceChildren (b2b.p) 8–23
produceDocument (b2b.p) 8–24
producer.p
destroyObject 8–6
initializeObject 8–6
replyHandler 8–6
sendMessage 8–7
PromptColumns property 5–98
PromptLogin property 8–39
PromptOnDelete property 5–98
Property property 3–93
PropertyDialog property 2–37
PropertyList property 5–98
propertyType (smart.p) 2–21
pushTableAndValidate (data.p) 5–69
Q
Query objects
column properties 5–108
query.i
deleteRecordStatic 5–39
initProp 5–42
query.p
addNotFoundMessage 5–33
addQueryWhere 5–33
assignDBRow 5–34
bufferCopyDBToRO 5–35
closeQuery 5–36
ColumnPhysicalColumn 5–35
ColumnPhysicalTable 5–36
colValues 5–36
createObjects 5–37
dataAvailable 5–20, 5–37
dbColumnDataName 5–38
dbColumnHandle 5–38
defineDataObject 5–38
destroyObject 5–40
fetchCurrentBatch 5–41
fetchFirst 5–40
fetchFirstBatch 5–41
fetchLast 5–40
fetchLastBatch 5–41
fetchNext 5–40
fetchNextBatch 5–41
fetchPrev 5–40
fetchPrevBatch 5–41
firstBufferName 5–42
firstRowId 5–42
newQueryValidate 5–43
newQueryWhere 5–43
openQuery 5–44
PhysicalTable 5–97
prepareQuery 5–44
resolveBuffer 5–44
rowidWhere 5–45
rowidWhereCols 5–46
transferDBRow 5–46
QueryColumns property 5–98
QueryContainer property 5–98
queryext.p
DataColumnsByTables 5–83
QueryHandle property 5–99
QueryObject property 2–37
QueryOpen property 5–99
queryOpened (select.p) 7–8
queryPosition (datavis.p) 3–32
queryPosition (panel.p) 6–8
queryPosition (sbo.p) 4–33
queryPosition (toolbar.p) 6–21
QueryPosition property 4–51, 5–99
QueryRowIden 5–99
QueryRowObject property 3–94
QuerySort property 5–100
QuerySortDefault property 5–100
QueryString property 5–101
QueryStringDefault property 5–101
QueryTables property 5–101, 7–37
QueryWhere property 5–102

R
readOffsets (html-map.p) 9–40
RebuildOnRepos property 5–102
receiveHandler (b2b.p) 8–24
receiveHandler (xml.p) 8–15
receiveReplyHandler (xml.p) 8–15
RecordState property 3–94
Refresh property 3–94
refreshBrowse (browser.p) 3–57
refreshBrowse (sbo.p) 4–34
refreshChildDependancies (combo.p) 7–15
refreshCombo (combo.p) 7–15
RefreshList property 7–38
refreshObject (select.p) 7–8
refreshQuery (browser.p) 3–57
refreshQuery (dataview.p) 5–27
refreshRow (data.p) 5–70
refreshRow (dataview.p) 5–27
registerLinkedObjects (sbo.p) 4–34
registerObject (sbo.p) 4–34
remoteCommit (data.p) 5–70
remoteCommitTransaction (sbo.i) 4–35
remoteFetchContainedData (sbo.p) 4–35
remoteSendRows (data.p) 5–71
remoteSendRows (sbo.p) 4–36
removeAllLinks (smart.p) 2–21
removeEntry (webrep.p) 9–41
removeForeignKey (dataquery.p) 5–11
removeLink (smart.p) 2–22
removePageNTarget (containr.p) 4–15
removeQuerySelection (dataquery.p) 5–11
removeQuerySelection (sbo.p) 4–37
removeSpace (filter.p) 3–43
reOpenQuery (webrep.p) 9–41
replyHandler (producer.p) 8–6
ReplyReqList property 8–39
ReplyRequired property 8–39
ReplySelector property 8–39
ReplySelectorList property 8–40
repositionDataSource (select.p) 7–8
RepositionDataSource property 7–38
repositionObject (smart.p) 2–22
repositionObject (toolbar.p) 6–21
repositionRowObject (treeview.p) 3–74
RequestHandle property 5–102
resetCommit (panel.p) 6–102
resetFields (filter.p) 3–44
resetNavigation (panel.p) 6–9
resetQuery (sbo.p) 4–38
resetQueryString (dataquery.p) 5–11
resetRecord (datavis.p) 3–33
resetRow (dataview.p) 5–28
resetTableio (panel.p) 6–9
resetTargetActions (panels.p) 6–9
resetTargetActions (toolbar.p) 6–21
resetToolbar (toolbar.p) 6–21
resetWidgetValue (visual.p) 3–15
resizeBrowse (browser.p) 3–57
resizeObject (browser.p) 3–58
resizeObject (combo.p) 7–16
resizeObject (field.p) 7–2
resizeObject (lookup.p) 7–23
resizeObject (panel.p) 6–10
resizeObject (select.p) 7–8
resizeObject (toolbar.p) 6–22
resizeObject (treeview.p) 3–74
ResizeVertical property 3–95
resizeWindow (container.p) 4–15
resolveBuffer (dataview.p) 5–28
resolveBuffer (query.p) 5–44
resolveColumn (dataquery.p) 5–12
recreateQuery (dataview.p) 5–28
restartServerObject (sbo.p) 4–38
retrieveData (dataview.p) 5–29
returnFocus (smart.p) 2–23
returnParentFieldValues (combo.p) 7–16
returnParentFieldValues (lookup.p) 7–23
reviewMessages (smart.p) 2–23
RootNodeParentKey property 3–95
routeBytesMessage (router.p) 8–30
routeDocument (router.p) 8–31
routeMessage (router.p) 8–31
router.p
createDocument 8–29
initializeObject 8–29
internalSchemaFile 8–29
obtainInMsgTarget 8–30
processFileRefs 8–30
routeBytesMessage 8–30
routeDocument 8–31
routeMessage 8–31
startB2BObject 8–31
RouterSource property 8–40
RouterTarget property 4–52
Row property 3–95
rowAvailable (dataquery.p) 5–12
rowChanged (dataview.p) 5–30
rowDisplay (browser.p) 3–58
rowEntry (browser.p) 3–58
RowIdent property 3–95, 5–103
rowidExpression (webrep.p) 9–41
rowidWhere (query.p) 5–45
rowidWhereCols (query.p) 5–46
rowLeave (browser.p) 3–59
rowNotFoundError (b2b.p) 8–24
Index

RowObject property 3–96, 5–103
rowObjectState (toolbar.p) 6–22
RowObjectState property 4–52, 5–103
RowObjectTable property 5–103
RowObjUpd property 5–103
RowObjUpdTable property 5–103
rowSelected (lookup.p) 7–24
rowSelected (select.p) 7–9
RowsToBatch property 5–104, 7–38
RowUpdated property 3–96, 5–104
rowValues (dataquery.p) 5–13
rowVisible (browser.p) 3–59
RunAttribute property 2–38
RunDataLogicProxy property 4–52
RunDOOptions property 4–53
runInfo (toolbar.p) 6–22
runServerObject (appserver.p) 2–28
runServerProcedure (appserver.p) 2–28

S
saveContextAndDestroy (data.p) 5–72
SavedScreenValue property 7–38
SaveSource property 3–96
sbo.i
  initDataObjectOrdering 4–29
  remoteCommitTransaction 4–35
  serverCommitTransaction 4–39
sbo.p
  addDataTarget 4–20
  addNavigationSource 4–21
  addQueryWhere 4–21
  addRow 4–22
  appendContainedObjects 4–22
  assignCurrentMappedObject 4–22
  assignMaxGuess 4–23
  assignQuerySelection 4–23
  cancelNew 4–23
  cancelRow 4–24
  canNavigate 4–24
  colValues 4–24
  commitTransaction 4–25
  confirmContinue 4–25
  containedProperties 4–6
  copyRow 4–25
  currentMappedObject 4–26
  dataAvailable 4–26
  dataObjectHandle 4–26
  deleteComplete 4–26
  deleteRow 4–27
  destroyServerObject 4–27
  endClientDataRequest 4–27
  fetchBatch 4–27
  fetchContainedData 4–28
  fetchContainedRows 4–28
  fetchDOProperties 4–28
  fetchFirst 4–29
  fetchLast 4–29
  fetchNext 4–29
  fetchPrev 4–30
  findRowWhere 4–30
  initializeObject 4–31
  initializeServerObject 4–31
  isUpdatePending 4–31
  newDataObjectRow 4–32
  openQuery 4–32
  postCreateObjects 4–32
  prepareErrorsForReturn 4–33
  prepareQueriesForFetch 4–33
  queryPosition 4–33
  refreshBrowse 4–34
  registerLinkedObjects 4–34
  registerObject 4–34
  remoteFetchContainedData 4–35
  remoteSendRow 4–36
  removeQuerySelection 4–37
  repositionRowObject 4–37
  resetQuery 4–38
  restartServerObject 4–38
  serverContainedSendRows 4–39
  serverFetchContainedData 4–40
  serverFetchContainedRows 4–40
  serverFetchDOProperties 4–41
  setPropertyList 4–41
  startServerObject 4–41
  submitRow 4–41
  undoTransaction 4–42
  updateState 4–42
schemaField (b2b.p) 8–25

SchemaHandle property 8–40
SchemaList property 8–40
SchemaManager property 8–40
Scroll property 3–96
Scrollable property 5–104
ScrollRemote property 3–97
SDFFilename property 7–38
SDFTemplate property 7–39
SdoForeignFields property 4–53
SearchField property 3–97
searchTrigger (browser.p) 3–59
Secured property 7–39
SecuredTokens property 6–30
select.p
  anyKey 7–3
  browseHandler 7–3
  buildList 7–3
  createLabel 7–4
  dataAvailable 7–4
  destroyObject 7–4
  destroySelection 7–5
  disable_UI 7–5
  disableButton 7–5
  disableField 7–5
  enableButton 7–5
  enableField 7–6
  endMove 7–6
  enterSelect 7–6
  formattedValue 7–6
  hideObject 7–7
  initializeBrowse 7–7
  initializeObject 7–7
  initializeSelection 7–7
  queryOpened 7–8
  refreshObject 7–8
  repositionDataSource 7–8
  resizeObject 7–8
  rowSelected 7–9
  valueChanged 7–9
  viewObject 7–9

SelectedNode property 3–97
selectFirstNode (treeview.p) 3–74
selectNode (treeview.p) 3–75
Selectors property 8–40
selectPage (containr.p) 4–16
sendHandler (b2b.p) 8–25
sendHandler (xml.p) 8–15
sendMessage (b2b.p) 8–25
sendMessage (msghandler.p) 8–8
sendMessage (producer.p) 8–7
sendReplyHandler (xml.p) 8–16
sendRows (data.p) 5–72
sensitizeActions (panel.p) 6–10
serverCommit (data.p) 5–73
serverCommitTransaction (sbo.i) 4–39
serverContainedSendRows (sbo.p) 4–39
serverFetchContainedData (sbo.p) 4–40
serverFetchContainedRows (sbo.p) 4–40
serverFetchDOProperties (sbo.p) 4–41
ServerFileName property 2–38
ServerOperatingMode property 2–38
serverSendRows (data.p) 5–74
ServerSubmitValidation property 5–104
setAppService (webrep.p) 9–42
set-attribute-list (admweb.p) 9–43
setBuffers (webrep.p) 9–43
setColumns (webrep.p) 9–44
setContextFields (wbrep.p) 9–44
setContextFields (webrep.p) 9–44
setCurrentRowids (webrep.p) 9–44
setDeleteTables (wbdata.p) 9–45
setExternalJoinList (webrep.p) 9–45
setExternalTableList (webrep.p) 9–46
setExternalTables (wbrep.p) 9–47
setExternalTables (webrep.p) 9–47
setExternalWhereList (webrep.p) 9–47
setForeignFieldList (webrep.p) 9–48
setFrameHandle (wbdata.p) 9–48
setLinkColumns (wbtable.p) 9–48
setLinkColumns (webrep.p) 9–49
setPropertyList (sbo.p) 4–41
setQueryWhere (webrep.p) 9–49
setSearchColumns (webrep.p) 9–49
setServerConnection (webrep.p) 9–49
setTableModifier (wbtable.p) 9–50
setTableRows (wbtable.p) 9–50
setUpdateMode (wbtable.p) 9–51
setupTTFromSig function A–35
setupTTFromString function A–36

Index
setupTTFromTable function A–37
setUseColumnLabels (wbtables.p) 9–51
setWebState (admweb.p) 9–52
setWebToHdr (admweb.p) 9–52
ShowBorder property 6–31
ShowCheckBoxes property 3–97
showDataMessages (datavis.p) 3–33
showDataMessages (filter.p) 3–44
showDataMessages (webrep.p) 9–53
showDataMessagesProcedure (datavis.p) 3–33
showMessage (smart.p) 2–24
showMessageProcedure (smart.p) 2–24
showQuery (combo.p) 7–16
ShowRootLines property 3–97
showSort (browser.p) 3–59
showTVCError (tvcontroller.p) 4–43
showTVErrror (treeview.p) 3–75
ShutDownDest property 8–41
Signature (smart.p) 2–25
SingleSel property 3–97
smart.i
  start-super-proc 2–25
smart.p
  addLink 2–2
  addMessage 2–4
  adjustTabOrder 2–5
  anyMessage 2–6
  applyEntry 2–6
  assignLinkProperty 2–7
  changeCursor 2–8
  createControls 2–8
  destroyObject 2–8
  displayLinks 2–9
  editInstanceProperties 2–9
  exitObject 2–10
  fetchMessages 2–11
  fixQueryString 2–11
  hideObject 2–14
  initializeObject 2–12
  instanceOf 2–13
  instancePropertyList 2–13
  linkHandles 2–15
  linkProperty 2–16
linkStateHandler 2–17
mappedEntry 2–18
messageNumber 2–18
modifyListProperty 2–19
modifyUserLinks 2–20
oneObjectLinks 2–21
propertyType 2–21
removeAllLinks 2–21
removeLink 2–22
repositionObject 2–22
returnFocus 2–23
reviewMessages 2–23
showMessage 2–24
showMessageProcedure 2–24
Signature 2–25
viewObject 2–25
Sort property 3–98
sortExpression (dataquery.p) 5–14
startB2BOBJECT (router.p) 8–31
StartBrowseKeys property 7–39
startDataObject (webrep.p) 9–53
startDataRow (b2b.p) 8–26
startElement (b2b.p) 8–26
startFilter (dataquery.p) 5–14
startSearch (browser.p) 3–60
startServerObject (data.p) 5–74
startServerObject (sbo.p) 4–41
start-super-proc (smart.i) 2–25
startWaitFor (consumer.p) 8–5
StaticPrefix 6–31
stopHandler (consumer.p) 8–5
storeNodeValue (b2b.p) 8–27
storeParameterNode (b2b.p) 8–27
storeParameterValue (b2b.p) 8–28
storePendingSensitivity (toolbar.p) 6–23
stripCalcs (browser.p) 3–60
submitCommit (data.p) 5–75
submitData (dataview.p) 5–30
submitForeignKey (data.p) 5–75
SubmitParent property 5–104
submitRow (data.p) 5–76
submitRow (dataview.p) 5–31
submitRow (sbo.p) 4–41
Subscriptions property 8–41
SupportedLinks property 2–38
SupportedMessageTypes property 8–41

T

Table Type
  position character datatype table A–14
  position native datatype A–12
Table type1
  position native datatype table A–12
Table type2
  position character datatype table A–14
TableIOSource property 3–98
TableIOSourceEvents property 3–98
TableioTarget property 6–31
TableioTargetEvents property 6–31
TableioType property 6–31
tableOut (dataquery.p) 5–14
Tables property 5–105
targetActions (panel.p) 6–10
targetActions (toolbar.p) 6–23
TargetNameSpace property 8–41
targetPage (containr.p) 4–16
targetProcedure (b2b.p) 8–28
Temp-table types A–12
TimeToLive property 8–41
timingOut (admweb.p) 9–53
ToggleDataTargets property 3–98, 5–105
toggleWidget (visual.p) 3–15
toolbar (browser.p) 3–60
toolbar (containr.p) 4–17
toolbar (viewer.p) 3–68
Toolbar objects
  action properties 6–34
Toolbar property 6–31

toolbar.p
  actionCanRun 6–12
  actionCaption 6–12
  actionCategoryIsHidden 6–12
  actionChecked 6–13
  actionLabel 6–13
  actionPublishCreate 6–13
  actionTarget 6–14
  actionTooltip 6–14
  buildAllMenus 6–14
  canFindAction 6–2
  canFindCategory 6–2
  categoryActions 6–14
  categoryLink 6–2
  checkRule 6–3
  constructMenu 6–15
  constructToolbar 6–15
  createMenuTable 6–15
  createMenuTable2 6–16
  createToolbar 6–16
  defineAction 6–3
  displayActions 6–3
  filterState 6–17
  hideObject 6–17
  imageName 6–17
  initAction 6–4
  initializeObject 6–4, 6–18
  insertMenu 6–18
  linkRuleBuffer 6–18
  linkState 6–19
  modifyDisabledActions 6–19
  onChoose 6–20
  onMenuDrop 6–20
  onValueChanged 6–20
  queryPosition 6–21
  repositionObject 6–21
  resetTargetActions 6–21
  resetToolbar 6–21
  resizeObject 6–22
  rowObjectState 6–22
  runInfo 6–22
  storePendingSensitivity 6–23
  targetActions 6–23
  updateActive 6–23
  updateCategoryLists 6–24
  updateState 6–24
  updateStates 6–24
  viewHideActions 6–25
  viewObject 6–25

ToolbarAutoSize property 6–32
ToolbarBands property 6–32
ToolbarDrawDirection property 6–32
ToolbarHeightPxl property 6–32
ToolbarInitialState property 6–32
ToolbarSource property 3–98
ToolbarSourceEvents property 3–99, 6–32
<table>
<thead>
<tr>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>ToolbarTargetEvents property 6–32</td>
</tr>
<tr>
<td>ToolbarWidthPx1 property 6–33</td>
</tr>
<tr>
<td>ToolMarginPx1 property 6–33</td>
</tr>
<tr>
<td>ToolTip property 7–39</td>
</tr>
<tr>
<td>Tooltip property 3–99</td>
</tr>
<tr>
<td>TopOnly property 4–54</td>
</tr>
<tr>
<td>TransferChildrenForAll property 5–105</td>
</tr>
<tr>
<td>transferDBRow (query.p) 5–46</td>
</tr>
<tr>
<td>transferToExcel (dataquery.p) 5–15</td>
</tr>
<tr>
<td>TranslatableProperties property 2–39</td>
</tr>
<tr>
<td>TreeDataTable property 3–99</td>
</tr>
<tr>
<td>TreeStyle property 3–99</td>
</tr>
<tr>
<td>treeview</td>
</tr>
<tr>
<td>repositionObject 3–74</td>
</tr>
<tr>
<td>treeview.p</td>
</tr>
<tr>
<td>addNode 3–70</td>
</tr>
<tr>
<td>deleteNode 3–71</td>
</tr>
<tr>
<td>deleteTree 3–71</td>
</tr>
<tr>
<td>disableObject 3–71</td>
</tr>
<tr>
<td>emptyTree 3–72</td>
</tr>
<tr>
<td>enableObject 3–72</td>
</tr>
<tr>
<td>isNodeExpanded 3–72</td>
</tr>
<tr>
<td>loadImage 3–72</td>
</tr>
<tr>
<td>populateTree 3–73</td>
</tr>
<tr>
<td>resizeObject 3–74</td>
</tr>
<tr>
<td>selectFirstNode 3–74</td>
</tr>
<tr>
<td>selectNode 3–75</td>
</tr>
<tr>
<td>showTVSError 3–75</td>
</tr>
<tr>
<td>updateTree 3–75</td>
</tr>
<tr>
<td>tvcontroller.p</td>
</tr>
<tr>
<td>initializeObject 4–43</td>
</tr>
<tr>
<td>showTVSError 4–43</td>
</tr>
<tr>
<td>updateState 4–43</td>
</tr>
</tbody>
</table>

**U**

UIBMode property 2–39

unbindServer (appserver.p) 2–29
UpdateTargetNames property 3–101
updateTitle (browser.p) 3–61
updateTree (treeview.p) 3–75
urlJoinParams (webrep.p) 9–54
urlLink (webrep.p) 9–54
UseBegins property 3–101
UseContains property 3–101
UseDBQualifier property 5–106
UseDTD property 8–42
UsePairedList property 7–39
UseRepository property 2–39
UserProperty property 2–39
UseSortIndicator property 3–101

V

validateColumns (wbdata.p) 9–55
validateColumnValue (webrep.p) 9–55
validateFields (datavis.p) 3–35
ValidateOnLoad property 8–42
ValidKey property 3–101
valueChanged (combo.p) 7–16
valueChanged (datavis.p) 3–36
valueChanged (lookup.p) 7–24
valueChanged (select.p) 7–9
valueChanged (viewer.p) 3–69
ViewAs property 7–39
viewer.p
  addRecord 3–63
cancelRecord 3–64
copyRecord 3–64
disableFields 3–65
displayFields 3–65
enableFields 3–67
fieldModified 3–67
initializeObject 3–68
toolbar 3–68
updateState 3–69
valueChanged 3–69
viewRecord 3–69
ViewerLinkedFields property 7–40
ViewerLinkedWidgets property 7–40
viewHideActions (panel.p) 6–11
viewHideActions (toolbar.p) 6–25
viewObject (browser.p) 3–62
viewObject (combo.p) 7–17
viewObject (containr.p) 4–18
viewObject (lookup.p) 7–25
viewObject (select.p) 7–9
viewObject (smart.p) 2–25
viewObject (toolbar.p) 6–25
viewPage (containr.p) 4–18
viewRecord (viewer.p) 3–69
ViewTables property 5–107
viewWidget (visual.p) 3–16
Visual objects
column properties 3–104
visual.p
  applyLayout 3–2
  assignFocusedWidget 3–2
  assignWidgetValue 3–3
  assignWidgetValueList 3–4
  blankWidget 3–5
  disableObject 3–6
  disableRadioButton 3–6
  disableWidget 3–7
  enableObject 3–8
  enableRadioButton 3–8
  enableWidget 3–9
  formattedWidgetValue 3–10
  formattedWidgetValueList 3–11
  hideWidget 3–12
  highlightWidget 3–13
  initializeObject 3–14
  resetWidgetValue 3–15
  toggleWidget 3–15
  viewWidget 3–16
  widgetHandle 3–17
  widgetIsBlank 3–17
  widgetIsFocused 3–18
  widgetIsModified 3–18
  widgetIsTrue 3–19
  widgetValue 3–20
  widgetValueList 3–20
  VisualBlank property 3–101
Index

W

WaitForObject property 4–54
Waiting property 8–42

wbdata.p
  assignFields 9–9
  columnValMsg 9–15
  deleteBuffer 9–17
  deleteRow 9–18
  exclusiveLockBuffer 9–21
  getDeleteTables 9–26
  getFrameHandle 9–27
  lockRow 9–37
  processWebRequest 9–39
  setDeleteTables 9–45
  setFrameHandle 9–48
  validateColumns 9–55

wbrep.p
  HTMLSetFocus 9–33
  setContextFields 9–44
  setExternalTables 9–47

wbtable.p
  addColumnLink 9–2
  addTDModifier 9–5
  assignTDModifier 9–10
  columnTDModifier 9–15
  fetchLast 9–22
  fetchNext 9–23
  fetchPrev 9–23
  getTableRows 9–29
  HTMLColumn 9–33
  HTMLTable 9–34
  pageBackward 9–38
  processWebRequest 9–39
  setLinkColumns 9–48
  setTableModifier 9–50
  setTableRowids 9–50
  setUseColumnLabels 9–51

webrep.p
  addContextFields 9–4
  addSearchCriteria 9–5
  anyMessage 9–6
  assignColumnForma 9–6
  assignColumnHelp 9–7
  assignColumnLabel 9–7
  assignColumnWidth 9–7
  assignExtentAttribute 9–8
  bufferHandle 9–11
  columnDataType 9–11
  columnFormat 9–12
  columnHandle 9–12
  columnHelp 9–12
  columnHTMLName 9–13
  columnLabel 9–14
  columnReadOnly 9–14
  columnStringValue 9–14
  destroyDataValue 9–18
  destroyObject 9–19
  disconnectObject 9–19
  extentAttribute 9–21
  extentValue 9–21
  fetchCurrent 9–22
  fetchFirst 9–22
  fetchLast 9–22
  fetchNext 9–23
  fetchPrev 9–23
  fieldExpression 9–24
  getExtentFields 9–25
  getForeignFieldList 9–26
  getNavigationMode 9–27
  getQueryEmpty 9–28
  getQueryWhere 9–28
  getRowids 9–28
  getServerConnection 9–29
  getTableRows 9–29
  getTables 9–30
  getUpdateMode 9–30
  HTMLAlert 9–32
  joinExternalTables 9–36
  joinForeignFields 9–36
  openQuery 9–37
  processWebRequest 9–40
  removeEntry 9–41
  reOpenQuery 9–41
  rowidExpression 9–41
  setAppService 9–42
  setBuffers 9–43
  setColumns 9–44
  setContextFields 9–44
  setCurrentRowids 9–44
  setExternalJoinList 9–45
  setExternalTableList 9–46
  setExternalTables 9–47
  setExternalWhereList 9–47
  setForeignFieldList 9–48
  setLinkColumns 9–49
  setQueryWhere 9–49
  setSearchColumns 9–49
  setServerConnection 9–49
  setUpdateMode 9–51
  showDataMessages 9–53
  startDataObject 9–53
  urlJoinParams 9–54
  urlLink 9–54
  validateColumnValue 9–55

whereClauseBuffer (combo.p) 7–17
whereClauseBuffer (dataview.p) 5–32
whereClauseBuffer (lookup.p) 7–25
widgetBlank (visual.p) 3–17
widgetFocused (visual.p) 3–18
widgetHandle (visual.p) 3–17
widgetIsModified (visual.p) 3–18
widgetIsTrue (visual.p) 3–19
widgetValue (visual.p) 3–20
widgetValueList (visual.p) 3–20
Width property 3–102
WindowFrameHandle property 4–54
WindowTitleField property 3–102
WordIndexedFields property 5–107

xml.p
  assignNodeValue 8–9
  createAttribute 8–10
  createElement 8–10
  createNode 8–11
  createText 8–11
  deleteDocument 8–11
  destroyObject 8–12
  nodeHandle 8–12
  nodeType 8–12
  ownerElement 8–12
  parentNode 8–13
  processCDataSection 8–13
  processComment 8–13
  processDocument 8–13
  processElement 8–14
  processRoot 8–14
  processText 8–14
  receiveHandler 8–15
  receiveReplyHandler 8–15
  sendHandler 8–15
  sendReplyHandler 8–16