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Preface

This Preface contains the following sections:

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

OpenEdge Getting Started: New and Revised Features briefly describes both new features and changes to existing features introduced in OpenEdge® Release 11.3, and directs you to where you can find more detailed information about these changes in the documentation set. The Release 11.3 documentation set references include:

- **Product manuals** — Identified by the Manual label in tables throughout this manual

- **HTML-based online help** — Identified by the Online help label in tables throughout this manual

- **Web papers** — Identified by the Web paper label in tables throughout this manual

Audience

This guide is primarily intended for OpenEdge application developers and system administrators who are upgrading their license to Release 11.3 from Release 11.2.

Organization

Chapter 1, “What’s New in 11.3”

Presents brief explanations of new and enhanced features introduced in Release 11.3 and references places within the documentation set where more detailed feature information can be found.

Chapter 2, “Release 11.3 Documentation”

Provides information about the OpenEdge Release 11.3 documentation set.
Using this manual

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 on PSDN: http://communities.progress.com/pcom/docs/DOC-16074.

References to ABL compiler and run-time features

ABL is both a compiled and an interpreted language that executes in a run-time engine. The documentation refers to this run-time engine as the ABL Virtual Machine (AVM). When the 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 the 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, built-in 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 character appears, this is a reference to the CHARACTER, LONGCHAR, or CLOB 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 built-in 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>SMALL, BOLD CAPITAL LETTERS</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, CTRL+X.</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, ESCAPE H.</td>
</tr>
<tr>
<td>Syntax:</td>
<td></td>
</tr>
<tr>
<td><strong>Fixed width</strong></td>
<td>A fixed-width font is used in syntax statements, code examples, system output, and filenames.</td>
</tr>
<tr>
<td><strong>Fixed-width italics</strong></td>
<td>Fixed-width italics indicate variables in syntax statements.</td>
</tr>
<tr>
<td><strong>Fixed-width bold</strong></td>
<td>Fixed-width bold indicates variables with special emphasis.</td>
</tr>
<tr>
<td><strong>UPPERCASE fixed width</strong></td>
<td>Uppercase words are ABL keywords. Although these are always shown in uppercase, you can type them in either uppercase or lowercase in a procedure.</td>
</tr>
<tr>
<td>![three arrows]</td>
<td>This icon (three arrows) introduces a multi-step procedure.</td>
</tr>
<tr>
<td>![one arrow]</td>
<td>This icon (one arrow) introduces a single-step procedure.</td>
</tr>
<tr>
<td><strong>Period (.) or colon (:)</strong></td>
<td>All statements except <strong>DO</strong>, <strong>FOR</strong>, <strong>FUNCTION</strong>, <strong>PROCEDURE</strong>, <strong>REPEAT</strong> end with a period. <strong>DO</strong>, <strong>FOR</strong>, <strong>FUNCTION</strong>, <strong>PROCEDURE</strong>, <strong>REPEAT</strong> statements can end with either a period or a colon.</td>
</tr>
<tr>
<td><strong>[]</strong></td>
<td>Large brackets indicate the items within them are optional.</td>
</tr>
<tr>
<td><strong>[]</strong></td>
<td>Small brackets are part of ABL.</td>
</tr>
<tr>
<td><strong>{}</strong></td>
<td>Large braces indicate the items within them are required. They are used to simplify complex syntax diagrams.</td>
</tr>
<tr>
<td><strong>{}</strong></td>
<td>Small braces are part of ABL. For example, a called external procedure must use braces when referencing arguments passed by a calling procedure.</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 **FOR** is one of the statements that can end with either a period or a colon, as in this example:

```
FOR EACH Customer NO-LOCK:
  DISPLAY Customer.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 of &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.

On UNIX platforms, use the OpenEdge pro command to start a single-user mode character OpenEdge client session and view a brief description of a message by providing its number.

To use the pro command to obtain a message description by message number:

1. Start the Procedure Editor:

   ```
   OpenEdge-install-dir/bin/pro
   ```

2. Press F3 to access the menu bar, then choose Help → Messages.

3. Type the message number and press ENTER. Details about that message number appear.

4. Press F4 to close the message, press F3 to access the Procedure Editor menu, and choose File → Exit.
What’s New in 11.3

This chapter summarizes new and enhanced features in OpenEdge® Release 11.3. For more detailed information about a feature, see the OpenEdge documentation that is referenced. This chapter contains the following sections:

- Installation and platform support
- OpenEdge security
- OpenEdge REST administration
- OpenEdge Mobile applications
- Progress Developer Studio for OpenEdge
- ABL enhancements
- OpenEdge RDBMS
- OpenEdge SQL
- OpenEdge Business Process Management
- OpenEdge DataServers
- OpenEdge Management and OpenEdge Explorer
- OpenEdge WebClient
Installation and platform support

OpenEdge Release 11.3 installation and platform support now includes the following:

- **Windows 64-bit** — In addition to 64-bit database servers, WebSpeed, AppServer, batch clients, and character clients, OpenEdge Release 11.3 on Windows now includes a 64-bit GUI client. All the components for OpenEdge except WebClient are supported on the 64-bit platform.

- **Infragistics** — OpenEdge Release 11.3 uses Infragistics NetAdvantage for .NET v2013 Vol 1 CLR 4.0. The Infragistics controls are upgraded to version 13.1.20131.2015. To access help online for NetAdvantage, available on the NetAdvantage site, press F1.

- **Eclipse** — Eclipse versions supported are 3.7.1 and 3.8. When you install 32-bit Windows for OpenEdge, you must use 32-bit Eclipse. When you install 64-bit Windows for OpenEdge, you must use 64-bit Eclipse.

- **Java JDK** — Supported JDK versions are as follows: for 1.6 up to 1.6 update 43, and for 1.7, up to 1.7 update 2, or both are supported depending on the component. Java 1.7 update 21 and higher and 1.6 update 45 and higher are not supported.

- **OpenEdge Business Process Management** — OpenEdge Business Process Management components (Business Process Modeler and Business Process Server) are seamlessly integrated with the OpenEdge installer. The OpenEdge Business Process Management plug-ins are added to Progress Developer Studio for OpenEdge and a unified installer is provided for both. You can download a separate installer for Business Process Modeler from the Progress Software Download Center at [http://www.progress.com/esd](http://www.progress.com/esd).

For more information, see:

<table>
<thead>
<tr>
<th>Manual:</th>
<th>OpenEdge Getting Started: Installation and Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OpenEdge Development: GUI for .NET Programming</td>
</tr>
</tbody>
</table>
OpenEdge security

OpenEdge Release 11.3 provides the new and updated security features for managing user identity described in the following sections:

- Authentication and Single Sign-On (SSO)
- Single Point of Authentication (SPA) interface

Authentication and Single Sign-On (SSO)

In previous releases, OpenEdge allowed an ABL client to pass user credentials to an AppServer configured as an authentication server. The AppServer would then authenticate the user identity against user accounts established in OpenEdge-managed domains, seal the authenticated identity in a client-principal, and return the client-principal to the ABL client. The ABL client could then single sign-on (SSO) to the user’s login session and send the client-principal to any application AppServer to do likewise. In this way, the authenticating AppServer served as a single point of authentication for all clients and application AppServers in a multi-tier ABL application.

As an alternative, an ABL client could manage its own user authentication, initialize and seal the client-principal, and send it to any application AppServer for SSO. Similarly, Mobile and REST Web applications (on behalf of Mobile Apps and REST clients, respectively), could authenticate users using Spring Security, which could also generate a sealed client-principal to send to the application AppServer for SSO.

In Release 11.3, OpenEdge expands user authentication and SSO support for Java Open Clients and ABL clients of OpenEdge BPM sessions as follows:

- Allows a Java Open Client to use the newly documented and updated com.progress.open4gl.javaproxy.ClientPrincipal and com.progress.open4gl.javaproxy.Connect classes to do one of the following:
  - Authenticate and seal user credentials in a ClientPrincipal object that the Open Client then sends to the application AppServer for SSO.
  - Initialize an unsealed ClientPrincipal object with user credentials that it sends to an authentication AppServer. The authentication AppServer then returns any successfully authenticated identity to the Open Client in a sealed ClientPrincipal object, which the Open Client then sends to the application AppServer for SSO.
Chapter 1: What’s New in 11.3

- Allows an ABL client to connect to an OpenEdge Business Process (BP) Server (through a Business Process Portal), either by passing an unsealed client-principal to authenticate against a user account managed by the BP Server, or by passing a sealed client-principal with a user identity authenticated by OpenEdge to SSO to the BP Server. Thus, for a connection using an unsealed client-principal, the user account does not have to be managed by OpenEdge, and for a connection using SSO, the user account does not have to be managed by the BP Server. (See also, the “Single Point of Authentication (SPA) interface” section on page 16.)

For more information, see:

<table>
<thead>
<tr>
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<tr>
<td>OpenEdge Development: Java Open Clients</td>
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<tr>
<td>OpenEdge Business Process Server: Customization Guide</td>
</tr>
<tr>
<td>OpenEdge Getting Started: Identity Management</td>
</tr>
<tr>
<td>OpenEdge Development: Programming Interfaces</td>
</tr>
<tr>
<td>OpenEdge Development: ABL Reference</td>
</tr>
</tbody>
</table>

Single Point of Authentication (SPA) interface

Release 11.3 introduces a service interface for Single Point of Authentication (SPA). This SPA service interface supports authentication for non-ABL (external) products both inside and outside of OpenEdge by allowing them to use a developer-written AppServer service interface as an authentication provider (a source of user account information). The OpenEdge SPA implementation relies on this AppServer service interface to implement an OpenEdge security realm, which allows these external products to access OpenEdge-managed user accounts and account information in much the same way that they access user accounts from other, non-OpenEdge, security realms.

Thus, as an OpenEdge realm service interface, it verifies that a given user account is known to OpenEdge and is a valid user to access particular features of the external product. An SPA server for the external product can then use this information to construct an appropriate security token to represent the user identity, which can be a sealed OpenEdge client-principal, for purposes of SSO and authorization, for example, on an OpenEdge application AppServer.
This OpenEdge SPA service interface is supported for the following OpenEdge server products:

- **Mobile and REST Web applications** — Using an OpenEdge realm service interface, together with new Spring OpenEdge realm security configurations, a Web application can send user credentials from an OpenEdge Mobile App or a client of an OpenEdge REST Web service to be authenticated by OpenEdge. For a successful OpenEdge authentication, the Web application’s Spring Security system can then create the sealed security token (client-principal) that the Web application can send to the application AppServer for SSO on behalf of the Mobile App or REST client.

- **OpenEdge Business Process Servers** — Using an OpenEdge realm service interface, together with a custom OpenEdge authentication realm configured on the Business Process (BP) Server, a Business Process Portal can send user credentials (possibly on behalf of an ABL client) to the BP Server. The BP Server can then authenticate the user against several realms, including the OpenEdge realm. As a result, both the BP Server and ABL clients and application services can work with user accounts from all of the realms that the BP Server supports. Special provision is made for OpenEdge to authorize users from non-OpenEdge realms on one hand, and for a BP Server to authorize users from the OpenEdge realm on the other hand.

OpenEdge server products can also be configured to seal a special SSO client-principal that is sent with each OpenEdge SPA service request that the implementing AppServer uses to verify that the request is coming from an authorized client of the OpenEdge realm, providing an additional check against potential hackers.

Also, with the addition of the OpenEdge SPA service interface in Release 11.3, the same AppServer can support user authentication against a common set of OpenEdge domains for the following OpenEdge-supported clients:

- ABL clients
- Java Open Clients
- OpenEdge Mobile Apps
- Clients of OpenEdge REST Web services
- OpenEdge Business Process Portals

For more information, see:

<table>
<thead>
<tr>
<th>Manuals:</th>
<th>OpenEdge Application Server: Administration</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>OpenEdge Business Process Server: Customization Guide</td>
</tr>
<tr>
<td></td>
<td>OpenEdge Development: ABL Reference</td>
</tr>
<tr>
<td></td>
<td>OpenEdge Application Server: Developing AppServer Applications</td>
</tr>
<tr>
<td></td>
<td>OpenEdge Development: Java Open Clients</td>
</tr>
<tr>
<td></td>
<td>OpenEdge Development: Mobile Applications</td>
</tr>
</tbody>
</table>
OpenEdge REST administration

OpenEdge Release 11.3 enhances OpenEdge REST administration by providing the ability to do the following:

- **Customize the Tomcat environment using the `Protc` utility** — The `Protc` utility, that is enhanced in this release, enables you to administer the Tomcat Web server that is installed with Progress Developer Studio for OpenEdge; it enables you to customize your Tomcat environment.

- **Secure a REST application** using the following security models:
  - **LDAP security configuration model** — This security model, that continues to be supported from OpenEdge 11.2.1, enables you to authenticate the user accounts stored in your distributed directory information services (LDAP services) for accessing a REST Web application residing in your Web server.
  - **Single Point of Authentication (SPA) security configuration model** — This security model enables you to authenticate the user accounts stored in an OpenEdge Database for accessing a REST Web application residing in your Web server.

- **Unpublish a REST Web application** — The RESTMAN utility’s `unpublish` command deletes a REST service (PAAR) from a REST Web application.

- **Republish a REST Web application** — The RESTMAN utility’s `republish` command redeploys (that is, republishes) a REST Web application deployed on a Web server.

  The RESTMAN `republish` command redeploy the files that you specify in the command to their corresponding locations in the REST Web application’s folder on the Web server. You can add, update, or delete files from a REST Web application using the `republish` command.

- **Generate Web applications and Web services** — OpenEdge provides a `RESTGEN` utility to generate a Web application (WAR) or a Web services (PAAR) file.

For more information, see:

| Manual: | OpenEdge Application Server: Administration |

---

Chapter 1: What's New in 11.3
OpenEdge Mobile applications

OpenEdge Release 11.3 includes enhanced support to build and deploy mobile applications using OpenEdge Mobile.

Updates to OpenEdge mobile application support include:

- Express setup option for creating a Mobile project
- JSDO enhancements for sorting and merging data
- Access to the XMLHttpRequest object for a login session
- New chapter on using JSDO Services

Express setup option for creating a Mobile project

In this release, you can create a Mobile project using an Express setup to rapidly generate a simple working Mobile App that you can develop into a more complex application, or use immediately for demo purposes.

When you use Express setup to create a Mobile project in the Progress Developer Studio for OpenEdge, OpenEdge automatically builds, deploys, and launches a complete Mobile application that accesses a single database table. This Express setup option guides you through the steps to configure prerequisite features as necessary (such as the default AppServer), and either uses the first database connection already setup in Developer Studio and the first table in that database (the default) or allows you to select a database connection and table to use.

Once you have completed any prerequisites and selections, OpenEdge automatically generates the ABL for the Business entity, builds the Mobile service and Mobile Web App, then deploys the Mobile Web application to the OE Web Server, and launches the Mobile App in your HTML 5 browser. The resulting Express Mobile application supports all of the built-in Mobile CRUD (create, read, update, delete) operations on the single database table.

<table>
<thead>
<tr>
<th>Manual:</th>
<th>OpenEdge Development: Mobile Applications</th>
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<tbody>
<tr>
<td>Online help</td>
<td>Progress Developer Studio for OpenEdge Guide</td>
</tr>
</tbody>
</table>
JSDO enhancements for sorting and merging data

In this release, the OpenEdge JavaScript `progress.data.JSDO` class includes the following enhancements:

- **sort()** — A new method to sort the record objects for a given table reference by selected sort fields or using a specified sort function to compare pairs of record objects.

- **autoSort** — A new property that when set to `true` for a specified sorting method, triggers an automatic sort of affected record objects when certain actions on a JSDO occur, such as calling the `fill()` method to load data into JSDO local storage, or calling the `add()` or `addRecords()` methods to add new record objects to local storage. Separate `setSortFields()` and `setSortFn()` methods allow you to specify a list of sort fields or a sort function that compares a pair of record objects as the sorting method for the automatic sort.

- **caseSensitive** — A new property that when set to `true` causes all JSDO sort operations on specified string sort fields to be case sensitive. This property also determines the case sensitivity of string key field comparisons when adding record objects using the JSDO `addRecords()` method.

- **addRecords()** — An existing method updated with two new add modes and one new merge object format:
  - `progress.data.JSDO.MODE_MERGE` — Does not add any record objects with the same key fields as existing record objects.
  - `progress.data.JSDO.MODE_REPLACE` — Replaces any existing record objects with new record objects that have the same key fields.
  - The merge object can now be a simple array of record objects instead of a temp-table object or ProDataSet object containing a single temp-table.

- **_id** — A previously undocumented, OpenEdge-reserved, field reference property with a number value (record ID) that uniquely identifies each record object in JSDO local storage. (This value has no relation to any `RECID` or `ROWID` value of a corresponding record in an OpenEdge database.)

Manual:  |  OpenEdge Development: Mobile Applications
Access to the XMLHttpRequest object for a login session

In this release, the OpenEdge JavaScript `progress.data.Session` class has a new property, `lastSessionXHR`, that returns the XMLHttpRequest object (XHR) used for the most recent `login()`, `addCatalog()`, or `logout()` method call on a given `Session` object. You can use this XHR to find out more information about the results of the method call.

For more information, see:

| Manual: | OpenEdge Development: Mobile Applications |

New chapter on using JSDO Services

The OpenEdge Mobile manual, *OpenEdge Development: Mobile Applications*, includes a new chapter on how to use JSDO Services to invoke Mobile operations on a Mobile resource and to visually map JSDO data to UI components with little need for additional JavaScript code.
Progress Developer Studio for OpenEdge

The following new and revised features are included in Release 11.3 of Progress Developer Studio for OpenEdge:

- **Express Mobile project** — Progress Developer Studio for OpenEdge now allows you to automatically build and deploy a complete Mobile application for a given database table and Mobile App template using the Express setup option. For more information, see the “Express setup option for creating a Mobile project” section on page 19.

- **OpenEdge Business Rules** — The OpenEdge and Corticon integration enables you to use ABL data structures (such as ProDataSets and temp-tables) as Corticon data structures (Vocabularies and entities). This integration supports OpenEdge Business Rules that provide tooling support for creating and updating Corticon Vocabularies, and runtime support for simple invocation of Corticon Decision Services.

  **Note:** For an introduction to OpenEdge Business Rules, see Web Paper: *Introducing OpenEdge Business Rules*, and for a step-by-step guide to the workflow involved in integrating OpenEdge Business Rules, see Web Paper: *Integrating OpenEdge Business Rules: An end-to-end workflow.*

- **Database table selection in the Business entity wizard** — Progress Developer Studio for OpenEdge now provides support for generating schema and implementing default CRUD (create, read, update, delete) operations dynamically while creating a Business entity. In addition to the current schema definition selection from the schema file, you can now select a connection profile and a database table from a connected database. The selected table is used for the temp-table definition dynamically and copied to the Business entity class.

- ** Infragistics controls update** — The Infragistics controls are upgraded to version 13.1.20131.2015.

- ** Infragistics controls help support** — You can now access the online help for Microsoft and Infragistics controls, which is available on their respective sites, by pressing F1.

- ** Win 64 support** — Progress Developer Studio for OpenEdge is now available on the Windows 64-bit platform.
• **Support for special contexts in mapper** — With this release, Progress Developer Studio for OpenEdge has added the following context parameters to the Input tab of the REST Expose Editor:
  
  – HTTP Headers
  – HTTP Servlet Request
  – HTTP Servlet Response
  – Servlet config and Servlet context

  These context parameters are grouped under the Server Contexts node.

• **Incremental .PAAR file support** — Progress Developer Studio for OpenEdge now allows you to export services incrementally by creating a .PAAR file for each REST or Mobile service in the project.

• **Seamless integration of OEBPM plugins in Progress Developer Studio for OpenEdge** — You can now use a unified installer for Progress Developer Studio for OpenEdge and OEBPM.

For more information, see:

| Online help: | Progress Developer Studio for OpenEdge Guide |

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ABL enhancements

OpenEdge Release 11.3 adds support for the following ABL features:

- PROCESS-ARCHITECTURE function
- Enhancements for the SINGLE-RUN and SINGLETON options
- Unicode filename support
- Private and protected class members change
- New DISPLAY-TYPE attribute for RCODE-INFO handle
- Dynamic access for built-in objects
- Support for SOAP 1.2 in the OpenEdge Web Service client

PROCESS-ARCHITECTURE function

The PROCESS-ARCHITECTURE function identifies the bit value of the AVM process at run-time and returns an INTEGER. Valid values are 32 for a 32-bit AVM and 64 for 64-bit AVM.

For more information, see:

| Manual: | OpenEdge Development: ABL Reference |

Enhancements for the SINGLE-RUN and SINGLETON options

The following capabilities have been added to the SINGLE-RUN and SINGLETON options:

- External procedures can run as single-run or singleton on the client using a SESSION handle.
- Single-run and singleton procedures can be added to the list of authorized procedures on the AppServer using the EXPORT() method on the SESSION handle.
- The reference information generated by the XREF option on the COMPILE statement includes single-run and singleton procedures.
- Single-run and singleton procedures can be invoked dynamically using the call object handle. The new PROCEDURE-TYPE attribute on the call handle determines whether a procedure will run as persistent, single-run, or singleton. The existing PERSISTENT attribute can still be used to run a persistent procedure, and it is automatically set to TRUE when PROCEDURE-TYPE is set to "PERSISTENT".
• Single-run and singleton procedures can be used in proxies generated in both the Java and .NET Open Clients using the ProxyGen tool.

• Single-run and singleton procedures can be run through both the Java and .NET OpenAPIs.

For more information, see:

| Manuals: | OpenEdge Development: ABL Reference  
|          | OpenEdge Development: Java Open Clients  
|          | OpenEdge Development: .NET Open Clients |

Unicode filename support

Many ABL constructs now support use of the full set of Unicode characters in filenames and pathnames. A complete listing of constructs that support the full Unicode character set is given in OpenEdge Development: Internationalizing Applications.

For more information, see:

| Manual: | OpenEdge Development: Internationalizing Applications |

Private and protected class members change

Private and protected class members have changed from instance based to class based. For example, in previous releases, a private data member could only be directly accessed in the defining class. In Release 11.3, an instance's private data member can be accessed from any other instance of the same class. Similarly, an instance can access a protected member of a second instance of a class that is at the same level or in a super class in the class hierarchy.

This change affects data members, properties, methods, and constructors.

For more information, see:

| Manual: | OpenEdge Development: Object-oriented Programming |

New DISPLAY-TYPE attribute for RCODE-INFO handle

The new DISPLAY-TYPE attribute on the RCODE-INFO handle allows developers to determine if r-code contains any UI-specific statements that make it only executable on the same display it was compiled on. The attribute returns a value of "GUI" for a graphical display, "TTY" for a character-mode display, or a blank string ("") for code that does not contain any UI-specific statements.

For more information, see:

| Manual: | OpenEdge Development: ABL Reference |
Chapter 1: What's New in 11.3

Dynamic access for built-in objects

The families of ABL built-in objects (Progress.BPM, Progress.Lang, Progress.Json, Progress.Database, and Progress.Security) can now be accessed dynamically, using either the DYNAMIC-NEW, DYNAMIC-INVOKE, and DYNAMIC-PROPERTY constructs or the New(), Invoke(), GetPropertyValue(), and SetPropertyValue() methods in Progress.Lang.Class.

For more information, see:

| Manual: | OpenEdge Development: ABL Reference |

Support for SOAP 1.2 in the OpenEdge Web Service client

The following capabilities have been added to support SOAP 1.2:

- The new SOAP-VERSION attribute on the server object handle returns the SOAP version number (for example, “1.1” or “1.2”) of the Web service connection associated with the server object handle.

- The new ROLE attribute on the SOAP-header-entryref object handle returns the URI of the recipient of the SOAP header. The attribute can be set using the SET-ROLE() method. The ROLE attribute and SET-ROLE() method are applicable only when the client is connected to SOAP 1.2. The previously existing ACTOR attribute is automatically set to the same value as ROLE when the client is connected to SOAP 1.2.

- Four new attributes have been added to the SOAP-fault object handle. These attributes are only applicable for SOAP 1.2:

  - SOAP-FAULT-NODE returns the URI of the Web service node that caused the fault.
  - SOAP-FAULT-ROLE returns the URI that identifies the role the node was operating in at the point the fault occurred.
  - SOAP-FAULT-SUBCODE returns a list of SOAP fault sub-code names for the fault.
  - SOAP-FAULT-MISUNDERSTOOD-HEADER returns a list of SOAP header names resulting from “MustUnderstand” faults.

For more information, see:

| Manual: | OpenEdge Development: Web Services |
In OpenEdge Release 11.3, the OpenEdge RDBMS enhanced by the following:

- Tenant Data Recovery
- Multi-tenant index rebuild
- Online backup performance improvement

**Tenant Data Recovery**

Tenant Data Recovery (TDR) is a process of ordered steps that enables database administrators to recover accidentally deleted table data and multi-tenant sequences for a tenant or group in a multi-tenant database without taking the entire database offline. TDR utilizes a combination of new and enhanced utilities to execute. The high-level recovery process is as follows:

1. Locally restore your most recent backup of your production database to a temporary location.
2. Roll forward the after-image files of your production database to your temporary database if your production database is enabled for after-imaging.
3. Move data from the temporary database to your production database.
4. Clean up.

Table 1 details the new and enhanced utilities.

<table>
<thead>
<tr>
<th>Utility</th>
<th>New or Enhanced</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROREST</td>
<td>Enhanced</td>
<td>A new parameter, -dbrestrict, allows the database to be placed in a restricted access mode at the conclusion of a restore.</td>
</tr>
<tr>
<td>PROUTIL DBRESTRICT</td>
<td>New</td>
<td>A new utility that restricts access to a database.</td>
</tr>
</tbody>
</table>
Table 1: Utility changes in support of Tenant Data Recovery

<table>
<thead>
<tr>
<th>Utility</th>
<th>New or Enhanced</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROUTIL DATAMOVE</td>
<td>New</td>
<td>A new utility that moves data or sequence values from one multi-tenant database to another.</td>
</tr>
<tr>
<td>RFUTIL</td>
<td>Enhanced</td>
<td>A new parameter, -ailist, enables database administrators to supply RFUTIL commands with a file containing a list of after-image files.</td>
</tr>
</tbody>
</table>

For more information, see: 

Manuals: OpenEdge Data Management: Database Administration

Multi-tenant index rebuild

For databases enabled for multi-tenancy, the MTIDXBUILD utilities allows database administrators to rebuild an index or indexes for a specific tenant or group while the database remains online in addition to offline. MTIDXBUILD only rebuilds indexes for multi-tenant tables.

The general process is as follows:

1. Enable database for multi-tenant index rebuild.
2. Perform the index rebuild with PROUTIL MTIDXBUILD (online or offline).
3. Disable the database for multi-tenant index rebuild.

Table 2 details the new utilities.

Table 2: New utilities in support of multi-tenant index rebuild

<table>
<thead>
<tr>
<th>Utility</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROUTIL ENABLEMTIDXBLD</td>
<td>A new utility that enables a multi-tenant database for multi-tenant index rebuild.</td>
</tr>
<tr>
<td>PROUTIL MTIDXBUILD</td>
<td>A new utility that performs an index rebuild for one tenant or group of a multi-tenant database.</td>
</tr>
<tr>
<td>PROUTIL DISABLEMTIDXBLD</td>
<td>A new utility that disables a multi-tenant index rebuild on a multi-tenant database.</td>
</tr>
</tbody>
</table>

For more information, see: 

Manuals: OpenEdge Data Management: Database Administration
Online backup performance improvement

Online backup is enhanced to improve performance. A new parameter, `bibbackup`, is provided to optimize the backup of BI clusters. The `bibbackup` parameter has two qualifiers:

- **active** — Backup only the active BI clusters. This is the default.
- **all** — Backup all the BI clusters.

PROREST restores the backup containing only active BI clusters without any changes to the command line, however if you do not specify `bibbackup all`, online backup is not backward compatible to releases prior to OpenEdge Release 11.3.0.

For more information, see:

| Manuals: | OpenEdge Data Management: Database Administration |

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**OpenEdge RDBMS**

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**OpenEdge® Getting Started: New and Revised Features** 29
OpenEdge SQL

OpenEdge SQL Release 11.3 includes the following new and enhanced features:

- The DROP PROCEDURE statement is now an online operation except for those databases that are enabled for OpenEdge Replication.

- Prior to Release 11.3, OpenEdge SQL supported scalar subqueries in either the left-hand side (LHS) or the right-hand side (RHS) of a predicate in a WHERE clause, ON clause, and HAVING clause. This support is now extended to the other parts of DML statements in compliance with SQL standards specifications.

  **Note:** OpenEdge SQL has not yet extended the new scalar subquery support to the UPDATE statement. So, the UPDATE statement still has the pre-existing limited subquery support.

- OpenEdge SQL now provides support for limiting the result set of queries through a session wide parameter ROWCOUNT. Accordingly, support for two new statements, SET ROWCOUNT and SHOW ROWCOUNT, is added to OpenEdge SQL.

- The ODBC drivers are upgraded to version: 07.12.0048 (B0066, U0042) and the JDBC drivers are upgraded to version: 5.1.0.000017 (F000026.U000003).

For more information, see:

<table>
<thead>
<tr>
<th>Manuals:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OpenEdge Data Management: SQL Development</strong></td>
<td></td>
</tr>
<tr>
<td><strong>OpenEdge Data Management: SQL Reference</strong></td>
<td></td>
</tr>
</tbody>
</table>
OpenEdge Business Process Management

In Release 11.3, the OpenEdge Business Process Management (BPM) is seamlessly integrated with Progress Developer Studio for OpenEdge (Developer Studio). With this integration, the OpenEdge Business Process Management capabilities can be accessed from within the Developer Studio. The new, improved, and seamless OpenEdge BPM integration makes Developer Studio a one-stop solution for automating the business process workflows.

This section lists the new features added, enhancements made, and features not supported in OpenEdge BPM Release 11.3:

- **Rebranded OpenEdge BPM components** — OpenEdge BPM components are rebranded to be consistent with Developer Studio. Table 3 lists the rebranded terms. Also as part of the OpenEdge BPM rebranding, the folder names, log file names, and command line file names are changed as per the listed new OpenEdge BPM terms.

Table 3: Rebranded OpenEdge BPM components

<table>
<thead>
<tr>
<th>Old BPM term</th>
<th>New OpenEdge BPM term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Savvion Business Manager</td>
<td>OpenEdge Business Process Server</td>
</tr>
<tr>
<td>Process Modeler</td>
<td>Business Process Modeler</td>
</tr>
<tr>
<td>BPM Studio</td>
<td>Progress Developer Studio for OpenEdge</td>
</tr>
<tr>
<td>Business Manager</td>
<td>Business Process Server</td>
</tr>
<tr>
<td>Business Manager Portal</td>
<td>Business Process Portal</td>
</tr>
<tr>
<td>BPM Portal</td>
<td>Business Process Portal</td>
</tr>
<tr>
<td>BM Server</td>
<td>BP Server</td>
</tr>
<tr>
<td>BizLogic</td>
<td>BP Server</td>
</tr>
<tr>
<td>BizPulse</td>
<td>BPM Events</td>
</tr>
<tr>
<td>BizSolo</td>
<td>BPM Workflow</td>
</tr>
<tr>
<td>BizStore</td>
<td>BPM Process Store</td>
</tr>
<tr>
<td>BizManage</td>
<td>BPM Manage API</td>
</tr>
<tr>
<td>BizPass</td>
<td>BPM Sign-on API</td>
</tr>
<tr>
<td>BizSite</td>
<td>BPM Custom UI API</td>
</tr>
<tr>
<td>BizSQL</td>
<td>BPM SQL</td>
</tr>
<tr>
<td>SBM</td>
<td>BP Server</td>
</tr>
<tr>
<td>Savvion Process Template</td>
<td>Business Process Template</td>
</tr>
</tbody>
</table>
• **Support for native OpenEdge ABL datatypes** — OpenEdge BPM supports the following native ABL datatypes:
  – CHARACTER
  – DATETIME-TZ
  – DECIMAL
  – INTEGER
  – INT64
  – LOGICAL
  – Handle
  – Memptr
  – Raw
  – DataSet
  – Table
  – Rowid

• **Support of TempTable and ProDataSet in a process as dataslot** — TempTables and ProDataSets in a process as dataslot are supported using ABL APIs `GetDataSlots()` and `UpdateDataSlots()`. These APIs are public methods of the `Progress.BPM.Process` class.

• **Support for single sign-on in BP Server** — OpenEdge provides user authentication and SSO support for the BP Server.

  Two new ABL methods, `Connect(hCP)` and `GetClientPrincipal()`, enable a user of an OpenEdge ABL client to perform a single sign-on to the BP Server either by passing an unsealed `Client-Principal` object to authenticate against the user’s account managed by the BP Server, or by passing a sealed client-principal with the user’s identity authenticated by OpenEdge to SSO to the BP Server. These new methods are public methods of the `Progress.BPM.UserSession` class.

  For more information, see the "Authentication and Single Sign-On (SSO)" section on page 15.

• **Support for single point of authentication** — Business Process Server supports single point of authentication (SPA) using the OEHybrid realm. The OEHybrid realm uses a combination of the JDBC realm and an OpenEdge AppServer-based SPA service.

  Users can create the SPA service by implementing the built-in `Progress.Security.Realm.IHybridRealm` interface. The interface must be implemented as a SINGLETON class. The reference implementation uses the `_User` table of the OpenEdge database to which the AppServer is connected to access a user’s account information.
For more information on SPA, see the “Single Point of Authentication (SPA) interface” section on page 16, and also see the SPAInstructions.pdf document available in your OpenEdge installation directory $dlc\src\samples\security.

- **Support for Monitoring Process using ABL APIs** — In previous releases, Monitoring Process of an external applications was supported by Java Message Service (JMS). In this release, new ABL APIs are added to support the Monitoring Process on BP Server.


- **Support for multiple presentation types** — OpenEdge BPM allows users to associate multiple presentation types such as Portal, Mobile, GUI, Tablet, and Other with a single activity workstep. This enables users to complete the activity from a browser, a Mobile device, a GUI for .NET application, or a Tablet device.

  Two new ABL methods, `GetAvailablePresentationTypes()` and `GetPresentationUI()`, enable users to work with the presentation types metadata associated with an activity on BP Server. These new methods are public methods of the `Progress.BPM.Task.Class`.

- **Support of GEL (Graphical Event Logic)** — You can use the GEL editor to drag and drop conditional scriptlets to define logic actions without scripting and then execute the logic statements. This is useful for business users, who do not have knowledge of Java (or JavaScript) languages.

- **Alert enhancement** — You can now send an alert message as an SMS to a recipient using the new `Send SMS` option. To enable the use of SMS for sending alerts, the BP Server property `oebps.sms.enable` must be set to TRUE in the `oebps.conf` configuration file.

- **Business Process Portal UI improvements** — The current version of Business Process Portal provides the following enhancements:
  
  - Export grid data to Microsoft Excel
  - Upgrade to Ext JS 4
  - Filter process instances based on instance ID
• **Process improvements** — The current version of the BP Server provides the following performance improvements:

  – Purge events for active instances
  – Process metadata caching
  – Reduced memory footprint/area for OpenEdge Adapter


For more information, see:

<table>
<thead>
<tr>
<th>Manuals:</th>
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<tbody>
<tr>
<td>OpenEdge Getting Started: Developing BPM Applications with Developer Studio</td>
<td></td>
</tr>
<tr>
<td>Business Process Server: First Steps Guide</td>
<td></td>
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<tr>
<td>Business Process Server: Terminology Guide</td>
<td></td>
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<tr>
<td>Business Process Server: Server Administrator’s Guide</td>
<td></td>
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<tr>
<td>Business Process Server: Application Developer’s Guide</td>
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<tr>
<td>Business Process Server: Customization Guide</td>
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<tr>
<td>Business Process Server: Managed Adapter Guide</td>
<td></td>
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<tr>
<td>Business Process Server: Troubleshooting Guide</td>
<td></td>
</tr>
<tr>
<td>OpenEdge Getting Started: Installation and Configuration</td>
<td></td>
</tr>
<tr>
<td>OpenEdge Development: ABL Reference</td>
<td></td>
</tr>
</tbody>
</table>
OpenEdge DataServers

This release of OpenEdge DataServers supports:

- **SQL Native Client 11 (SNAC 11.0) drivers** — Beginning with OpenEdge Release 11.3, you can migrate or pull objects between OpenEdge and Microsoft SQL Server 2008 (or later versions) connected to SNAC 10.0 driver (or later versions).

  Date-time related data types, introduced with Microsoft SQL Server 2008, work only with the SNAC 10.0 driver (or later versions), but not with older drivers.

- **Firehose block cursors** — The new firehose block cursor has the functionalities of firehose cursor and block cursors combined. The firehose block cursor fetches blocks of records from the cached result-set at the client-side. At the client side, the DataServer processes blocks of records, as opposed to individual records. The DataServer implements the firehose block cursors for faster cursor-processing. The firehose block cursor is the default mechanism to process NO-LOCK queries on the client-side.

- **Aggregate logging using PERFORMANCE and INTERFACE log entry types at run time** — You can diagnose ABL code at run time using the PERFORMANCE and INTERFACE log entry types. Collecting information with logging level 3 (Verbose) using the log entry type PERFORMANCE is called aggregate logging. Placing the PERFORMANCE log entry type around a section of ABL code helps you measure performance for that section of code.

- **Delta df to Microsoft SQL Server Incremental Schema Migration batch utility** — This batch utility enables you to migrate schema changes from OpenEdge to a Microsoft SQL Server database in batch mode. The utility reads an OpenEdge delta.df file created using the standard incremental dump procedure (or using the batch utility), and then creates a delta.sql file that contains the SQL DDL for making the changes, and optionally, the utility generates the new delta.df file that you can load into the schema holder after applying the SQL changes.

  You can then apply the delta.sql file to the Microsoft SQL Server database to complete the migration process. You can perform schema pull interactively or run it silently (batch mode).
• **Independent OpenEdge Microsoft SQL Server Schema Pull utility** — The Independent schema pull utility allows you to copy an existing server database schema into a target schema holder in batch mode. The utility connects to the Microsoft SQL Server database, it establishes the schema pull criteria, using the environment variables, and imports tables from Microsoft SQL Server.

You can use this utility from the command line to pull a schema interactively or run it silently (batch mode).

• **Improving join performance in DataServers for Oracle, for queries with FIRST or LAST criteria** — In versions prior to OpenEdge Release 11.3, processing an ABL query with multiple tables using the ABL FIRST and LAST keywords was significantly slower when compared to processing a similar ABL query against a single table or against a join query that did not use FIRST or LAST criteria. The performance degradation was because the server join was unable to reduce the FIRST or LAST criteria to a single server join record during ABL to SQL translation. This widened the result set and forced client selection, or the client was forced to retrieve server records key by key using multiple queries.

In OpenEdge Release 11.3, the join performance is improved by ensuring that all joins with FIRST or LAST criteria translate ABL to a single server join SQL statement, maximizing server optimization, minimizing client selection, and reducing round trips to the foreign data source.

The OpenEdge DataServers documentation is updated with detailed descriptions of the several DataServer configurations that you can use to set up your DataServer.

For more information, see:

<table>
<thead>
<tr>
<th>Manual:</th>
<th>OpenEdge Data Management: DataServer for Microsoft SQL Server</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OpenEdge Data Management: DataServer for Oracle</td>
</tr>
</tbody>
</table>
OpenEdge Management and OpenEdge Explorer

This release of OpenEdge Management and OpenEdge Explorer supports the following:

- **Remote Management Upgrade** — OpenEdge Management (OEM) and OpenEdge Explorer (OEE) use Apache Active MQ and Apache Camel to communicate with remote instances of the OpenEdge AdminServer. Earlier versions used SonicMQ. Some of the key benefits of this change include:
  - Configuring a remote AdminServer configuration is easier than before.
  - Active MQ is an open-source, enterprise-class, JMS implementation. It provides a reliable and secure transport mechanism for messages sent between hosts.
  - AdminServer now has an auto-discovery feature that makes it easy for OEM to identify other remote AdminServers in the network.
  - Remote AdminServer authentication can be performed against the local operating system logins or against a configured list of credentials or both.

  **Caution:** This feature is not backward compatible with earlier versions of OEM, so you can only monitor a remote AdminServer configured using OEM Release 11.3. To monitor a remote AdminServer configured in an earlier version of OEM, you must use the earlier version of OEM.

- **Remote AdminServers Management** — A new page, **Manage Remote AdminServer**, is added to OEM to add, configure, and monitor remote AdminServers. You can access this page from the Management Console Bar using **Options > Configuration > Remote AdminServer Configuration**. You can also use this page to view configured remote AdminServers based on the following criterion: online, offline, or auto-discovered.

- **OrientDB database Version 1.3.0 replaces PSEPro database** — Beginning in this release, the OpenEdge Management and OpenEdge Explorer PSEPro database is replaced by OrientDB database Version 1.3.0 to store monitoring plans and resource definitions. A key benefit of using the OrientDB database is that the configuration and cache databases no longer have size limits.

For more information, see:

| Manual: | OpenEdge Management and OpenEdge Explorer: Getting Started  
|         | OpenEdge Management and OpenEdge Explorer: Configuration  
|         | OpenEdge Management: Alerts Guide and Reference  
|         | OpenEdge Management: Database Management |
OpenEdge WebClient

OpenEdge WebClient Release 11.3 includes the following new and enhanced features:

**Signing WebClient applications**

The WebClient Application Assembler uses Microsoft Authenticode technology to digitally sign the applications. The WebClient Application Assembler requires you to download Microsoft's signing tools (part of the Windows SDK), and make these tools available to OpenEdge to digitally sign your application. This allows you to keep the signing tools up-to-date.

Specifically, OpenEdge requires access to the `signtool.exe`, `pvk2pfx.exe`, and optionally `makecert.exe` signing tools from the Windows SDK. It requires the `makecert.exe` tool if you want to create a mock public-key certificate for testing.

Follow these steps to complete the process for signing cabinet files:

- Download and install the latest Microsoft Windows SDK.
- Make Microsoft signing tools available to OpenEdge.
- Sign the cabinet files digitally.

For more information, see:

| Manuals: | OpenEdge Deployment: WebClient Applications |

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```
OpenEdge® Getting Started: New and Revised Features
```
This chapter describes the product documentation provided for OpenEdge Release 11.3. It includes the following sections:

- Changes to the documentation set
- Release 11.3 documentation set
- Accessing OpenEdge documentation
Changes to the documentation set

For this release, the documentation set includes the following new materials:

- A new collection set of OpenEdge Business Process Management documentation
- A Web Paper for migrating Savvion 7.6.x/8.0 projects to OpenEdge 11.3
- A new chapter on using JSDO Services in *OpenEdge Development: Mobile Applications*
Table 4 lists the 11.3 documentation available for each technology area. You can access the entire OpenEdge 11.3 product documentation set from the following Web site: http://communities.progress.com/pcom/docs/DOC-16074.

### Table 4: Release 11.3 documentation map arranged by technology (1 of 7)

<table>
<thead>
<tr>
<th>To learn about . . .</th>
<th>See . . .</th>
</tr>
</thead>
</table>
| ABL application development | **OpenEdge Getting Started: ABL Essentials**  
**OpenEdge Development: ABL Reference**  
**OpenEdge Development: Debugging and Troubleshooting**  
**OpenEdge Development: Error Handling**  
**OpenEdge Development: Object-oriented Programming**  
**OpenEdge Development: ProDataSets**  
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Accessing OpenEdge documentation

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We provide a set of library routines for reading and writing JPEG image files, plus two sample applications "cjpeg" and "djjpeg", which use the library to perform conversion between JPEG and some other popular image file formats. The library is intended to be reused in other applications.

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It appears that the arithmetic coding option of the JPEG spec is covered by patents owned by IBM, AT&T, and Mitsubishi. Hence arithmetic coding cannot legally be used without obtaining one or more licenses. For this reason, support for arithmetic coding has been removed from the free JPEG software. (Since arithmetic coding provides only a marginal gain over the unpatented Huffman mode, it is unlikely that very many implementations will support it.)

So far as we are aware, there are no patent restrictions on the remaining code.

The IJG distribution formerly included code to read and write GIF files.

To avoid entanglement with the Unisys LZW patent, GIF reading support has been removed altogether, and the GIF writer has been simplified to produce "uncompressed GIFs". This technique does not use the LZW algorithm; the resulting GIF files are larger than usual, but are readable by all standard GIF decoders.

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A "png_get_copyright" function is available, for convenient use in "about" boxes and the like:

    printf("%s",png_get_copyright(NULL));

Also, the PNG logo (in PNG format, of course) is supplied in the files "pngbar.png" and "pngbar.jpg (88x31) and "pngnow.png" (98x31).

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Glenn Randers-Pehrson
randeg@alum.rpi.edu
September 1, 2001

Contents of tiff.txt file (from GraphicsMagick):

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Contents of zlib.txt file (from GraphicsMagick):

zlib 1.1.3 is a general purpose data compression library. All the code is thread safe. The data format used by the zlib library is described by RFCs (Request for Comments) 1950 to 1952 in the files ftp://ds.internic.net/rfc/rfc1950.txt (zlib format), rfc1951.txt (deflate format) and rfc1952.txt (gzip format). These documents are also available in other formats from ftp://ftp.uu.net/graphics/png/documents/zlib/zdoc-index.html

All functions of the compression library are documented in the file zlib.h (volunteer to write man pages welcome, contact jloup@gzip.org). A usage example of the library is
given in the file example.c which also tests that the library is working correctly. Another example is given in the file minigzip.c. The compression library itself is composed of all source files except example.c and minigzip.c.

To compile all files and run the test program, follow the instructions given at the top of Makefile. In short "make test; make install" should work for most machines. For Unix: "configure; make test; make install"

For MSDOS, use one of the special makefiles such as Makefile.msc.

For VMS, use Make_vms.com or descrip.mms.

Questions about zlib should be sent to <zlib@quest.jpl.nasa.gov>, or to Gilles Vollant <info@winimage.com> for the Windows DLL version.

The zlib home page is http://www.cdrom.com/pub/infozip/zlib/

The official zlib ftp site is ftp://ftp.cdrom.com/pub/infozip/zlib/

Before reporting a problem, please check those sites to verify that you have the latest version of zlib; otherwise get the latest version and check whether the problem still exists or not.

Mark Nelson <markn@tiny.com> wrote an article about zlib for the Jan. 1997 issue of Dr. Dobb's Journal; a copy of the article is available in http://web2.airmail.net/markn/articles/zlibtool/zlibtool.htm

The changes made in version 1.1.3 are documented in the file ChangeLog.

The main changes since 1.1.2 are:

- fix "an inflate input buffer bug that shows up on rare but persistent occasions" (Mark)
- fix gzread and gztell for concatenated .gz files (Didier Le Botlan)
- fix gzseek(..., SEEK_SET) in write mode
- fix crc check after a gzeek (Frank Faubert)
- fix miniunzip when the last entry in a zip file is itself a zip file
  (J Lilge)
- add contrib/asm586 and contrib/asm686 (Brian Raiter)
  See http://www.muppetlabs.com/~breadbox/software/assembly.html
- add support for Delphi 3 in contrib/delphi (Bob Dellaca)
- add support for C++Builder 3 and Delphi 3 in contrib/delphi2 (Davide Moretti)
- do not exit prematurely in untgz if 0 at start of block (Magnus Holmgren)
- use macro EXTERN instead of extern to support DLL for BeOS (Sander Stoks)
- added a FAQ file

plus many changes for portability.
Unsupported third party contributions are provided in directory "contrib". A Java implementation of zlib is available in the Java Development Kit 1.1
http://www.javasoft.com/products/JDK/1.1/docs/api/Package-java.util.zip.html

See the zlib home page http://www.cddrom.com/pub/infozip/zlib/ for details.

A Perl interface to zlib written by Paul Marquess <pmarquess@bfsec.bt.co.uk> is in the CPAN (Comprehensive Perl Archive Network) sites, such as:

A Python interface to zlib written by A.M. Kuchling <amk@magnet.com> is available in Python 1.5 and later versions, see
http://www.python.org/doc/lib/module-zlib.html

A zlib binding for TCL written by Andreas Kupries <a.kupries@westend.com> is available at http://www.westend.com/~kupries/doc/trf/man/man.html

An experimental package to read and write files in .zip format, written on top of zlib by Gilles Vollant <info@winimage.com>, is available at http://www.winimage.com/zLibDll/unzip.html and also in the contrib/minizip directory of zlib.

Notes for some targets:

- To build a Windows DLL version, include in a DLL project zlib.def, zlib.rc and all .c files except example.c and minigzip.c; compile with -DZLIB_DLL

  The zlib DLL support was initially done by Alessandro Iacopetti and is now maintained by Gilles Vollant <info@winimage.com>. Check the zlib DLL home page at http://www.winimage.com/zLibDll

  From Visual Basic, you can call the DLL functions which do not take a structure as argument: compress, uncompress and all gz* functions.

  See contrib/visual-basic.txt for more information, or get http://www.tcfb.com/dowseware/cmp-z-it.zip

- For 64-bit Irix, deflate.c must be compiled without any optimization. With -O, one libpng test fails. The test works in 32 bit mode (with the -n32 compiler flag). The compiler bug has been reported to SGI.

- zlib doesn't work with gcc 2.6.3 on a DEC 3000/300LX under OSF/1 2.1 it works when compiled with cc.

- on Digital Unix 4.0D (formely OSF/1) on AlphaServer, the cc option -std1 is necessary to get gzprintf working correctly. This is done by configure.

- zlib doesn't work on HP-UX 9.05 with some versions of /bin/cc. It works with other compilers. Use "make test" to check your compiler.

- gzdopen is not supported on RISCOS, BEOS and by some Mac compilers.

- For Turbo C the small model is supported only with reduced performance to avoid any far allocation; it was tested with -DMAX_WBITS=11 -DMAX_MEM_LEVEL=3

- For PalmOs, see http://www.cs.uit.no/~perm/PASTA/pilot/software.html

  Per Harald Myrvang <perm@stud.cs.uit.no>

Acknowledgments:
The deflate format used by zlib was defined by Phil Katz. The deflate and zlib specifications were written by L. Peter Deutsch. Thanks to all the people who reported problems and suggested various improvements in zlib; they are too numerous to cite here.

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jloup@gzip.org          madler@alumni.caltech.edu

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