

What's New in Corticon

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Overview of Progress Corticon

Progress® Corticon® is the Business Rules Management System with the patented "no-coding" rules engine that automates sophisticated decision processes.

Progress Corticon products

Progress Corticon distinguishes its development toolsets from its server deployment environments.

- **Corticon Studio** is the Windows-based development environment for creating and testing business rules:
 - When installed as a standalone application, Corticon Studio provides the complete Eclipse development environment for Corticon as the **Corticon Designer** perspective. You can use this fresh Eclipse installation as the basis for adding other Eclipse toolsets.
 - When installed into an existing Eclipse such as the **Progress Developer Studio (PDS)**, our industry-standard Eclipse and Java development environment, the PDS enables development of Corticon applications in the **Corticon Designer** perspective that integrate with other products, such as Progress OpenEdge.

Note: Corticon Studio installers are available for 64-bit and 32-bit platforms. Typically, you use the 64-bit installer on a 64-bit machine, where that installer is not valid on a 32-bit machine. The 64-bit Studio is recommended because it provides better performance when working on large projects.

Note: When adding Corticon to an existing Eclipse, the target Eclipse must be an installation of the same bit width. Refer to the *Corticon Installation Guide* for details about integrating Corticon Studio into an existing Eclipse environment.

- **Corticon Servers** implement web services and in-process servers for deploying business rules defined in Corticon Studios:
 - **Corticon Server for Java** is supported on various application servers, and client web browsers. After installation on a supported Windows platform, that server installation's deployment artifacts can be redeployed on various UNIX and Linux web service platforms as Corticon Decision Services.
 - **Corticon Server for .NET** facilitates deployment of Corticon Decision Services on Windows .NET Framework and Microsoft Internet Information Services (IIS).

Use with other Progress Software products

Corticon releases coordinate with other Progress Software releases:

- [Progress OpenEdge](#) is available as a database connection. You can read from and write to an OpenEdge database from Corticon Decision Services. When Progress Developer Studio for OpenEdge and Progress Corticon Studio are integrated into a single Eclipse instance, you can use the capabilities of integrated business rules in Progress OpenEdge. See the OpenEdge document [OpenEdge Business Rules](#) for more information. OpenEdge is a separately licensed Progress Software product.
- [Progress DataDirect Cloud](#) (DDC) enables simple, fast connections to cloud data regardless of source. DataDirect Cloud is a separately licensed Progress Software product.
- [Progress RollBase](#) enables Corticon rules to be called from Progress Rollbase. Rollbase is a separately licensed Progress Software product.

What's new and changed in Corticon 5.5.1

This section summarizes the new, enhanced, and changed features in Progress[®] Corticon[®] 5.5.1, and provides links to those sections of the documentation.

For details, see the following topics:

- [Improved wizard to Package and Deploy Decision Services](#)
- [Server management utilities for building and testing Decision Services](#)
- [Introducing the ability to set deployment properties in a CDD file](#)
- [Database caching for Enterprise Data Connections](#)
- [Finding a series of items in a collection sequence](#)
- [Enhancements to the Corticon Web Console](#)
- [Server logs record Decision Service metadata](#)
- [User Role preference replaced with Simple/Advanced Vocabulary view](#)
- [EDC support for Postgres, and Amazon Redshift](#)
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Improved wizard to Package and Deploy Decision Services

What's new

The **Package and Deploy Decision Services** wizard performs compilations on the Studio machine, so you can choose to deploy to a server or save the Decision Service files on the Studio machine for later transfer to servers for deployment.

See *"Using Studio to compile and deploy Decision Services" in the Integration and Deployment Guide* for more information on using this feature.

What's changed

This feature, formerly known as the **Publish Wizard**, pushed required rule assets to the server where they were compiled and deployed.

Server management utilities for building and testing Decision Services

What's new

Users wanting to automate the building and testing of Decision Services will appreciate the addition of command line tools to compile Ruleflows into Decision Services ready for deployment, to create XSD & WSDL files for clients who will call the Decision Services, and to run Ruletests to validate that the Decision Services perform as expected. This can be used to script these processes and integrate them with other automated processes such as the "build" procedure for a larger project. To make this integration easier, a set of ANT macros are provided which make it easy to perform the build and testing of Decision Services within a custom ANT build script.

To run the command line utilities, just launch the **Corticon Command Prompt**, type `corticonManagement`, and then review the usage. The options are:

- `compile` - Compiles a Ruleflow into a Decision Service (.eds) file that can then be deployed to a Corticon server through the Web Console, .cdd file, or other supported tools.
- `test` - Executes one or more test sheets in a Corticon Ruletest (.ert) file, and produces an output file with the test results.
- `schema` - Generates XSD and WSDL schema files from either a Ruleflow (.erf) or Vocabulary (.ecore) file.
- `multicompile` - Compiles one or more Decision Services using directives defined in the specified XML file.

Note: When the target for deployment is the Corticon .NET server, you can use the `corticonManagement` utilities and ANT scripts to build .eds files and run tests. Then, running the IKVM utilities against the .eds file will generate the .NET bytecode.

See *"Using command line utilities to compile Decision Services" in the Integration and Deployment Guide* for more information. That section discusses all the `corticonManagement` utility options except `extractDiagnostics`. See *"Diagnosing runtime performance of server and Decision Services" in the Integration and Deployment Guide* for complete information on processing **diagnostic** data.

What's changed

This feature extends existing functionality. It does not require changes to any existing scripts or processes.

The `multiCompile.bat` utility is being replaced with the `multicompile` option of `corticonManagement.bat` and will be dropped in an upcoming release.

Introducing the ability to set deployment properties in a CDD file

What's new

When deploying with Corticon Deployment Descriptor (CDD) files, you might want to set deployment properties, such as controlling rule messages, in the CDD file so that the CDD fully describes the deployment configuration. In previous releases, you were constrained to properties that were set by the Deployment Console. Even if you edited the files or tried using the APIs, you could not get some properties specified in the CDD.

In this release, the format of the CDD file has been revised so that you can add all the available properties, and even add new ones as they are introduced in upcoming releases.

The new format adds an options section to a CDD where you list the name-value pairs of the available options you want and their respective values.

For more information, see the topics *"Setting deployment properties in a CDD file in a text editor"* and *"Setting deployment properties in a CDD file through APIs" in the Integration and Deployment Guide*.

What's changed

- The deployment console now writes `.cdd` files in the new format. To upgrade existing `.cdd` files that were created in a previous release, open an existing `.cdd` file in the Deployment Console, then choose **Save Deployment File**.
- Deployed `.cdd` files in the old format continue to be supported by Corticon Server.
- Deploying `.cdd` files in the old format will be supported by Corticon Server.

Database caching for Enterprise Data Connections

What's new

As you move Decision Services that use a database connection toward production, you might want to get the performance benefits of caching entities and queries used in Decision Services. Even though the first cache use takes some performance overhead, subsequent references that use that cached content will see excellent performance. There are two ways caching is used:

An *Entity cache* is appropriate when common database-enabled entities are used in the input messages sent to a Decision Service.

- **Case for using entity caching:** Consider a Decision Service that expedites shipping requests. The Decision Service might receive a Order entity that has a one-to-many association with Supplier entities. When the Decision Service receives an Order entity it would query the database to get the associated Supplier entities. When using an entity cache, the Suppliers could be queried once and used in expediting other Order entities.

A *Query cache* optimizes lookup (query) of database data, such as when a cached entity is extended to the database in a Rulesheet. A Query Cache is read-only -- a lock is put on the records (returned from the query) associated with that decision service. If an update is attempted on a entity contained in a query cache an exception occurs. A Query Cache is **optimistic** -- that means that updates from outside of the Decision Service will not modify or invalidate the cache contents.

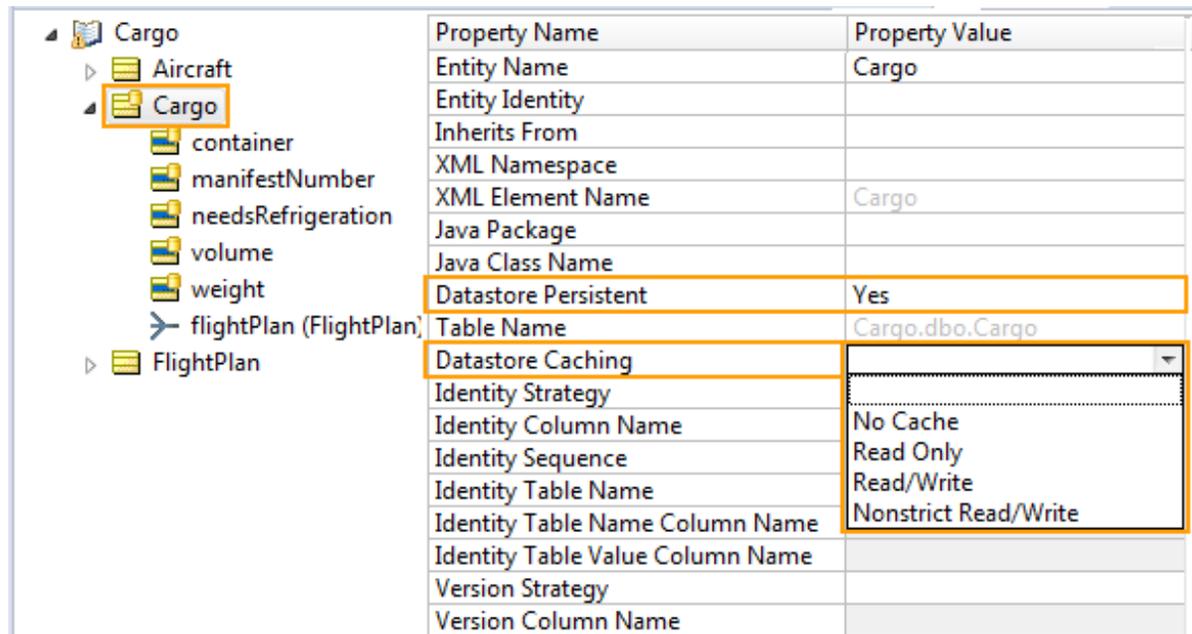
- **Case for using query caching:** Consider a Decision Service that prices online orders. With a query cache, it could query state sales tax rates once and use these when calculating the price of all orders it receives.
- **Case for using query caching:** Consider a Decision Service that prices insurance policies. With a query cache, it could query an actuarial table once and use the results in pricing multiple insurance policies.

First, you specify the caching settings in the Vocabulary and Rulesheets, and then enable caching in tests and deployed Decision Services.

Specifying Entity caching

To use entity caching:

1. Identify the Vocabulary entities that you want cached.
2. Edit the Vocabulary and then choose its **Advanced** view.
3. Confirm (or set) the entity's **Datastore Persistent** property to *Yes*
4. Choose the preferred **Datastore Caching** value:
 - *No Cache* or blank (default) - Disable caching.
 - *Read Only* - Caches data that is never updated.
 - *Read/Write* - Caches data that is sometimes updated while maintaining the semantics of "read committed" isolation level. If the database is set to "repeatable read," this concurrency strategy almost maintains the semantics. Repeatable read isolation is compromised in the case of concurrent writes.
 - *Nonstrict Read/Write* - Caches data that is sometimes updated without ever locking the cache. If concurrent access to an item is possible, this concurrency strategy makes no guarantee that the item returned from the cache is the latest version available in the database.



Specifying Query caching

There are two ways to use query caching: on an entity in a Rulesheet, and on a database filter in a Rulesheet. You can use either or both as needed once you have enabled the Vocabulary.

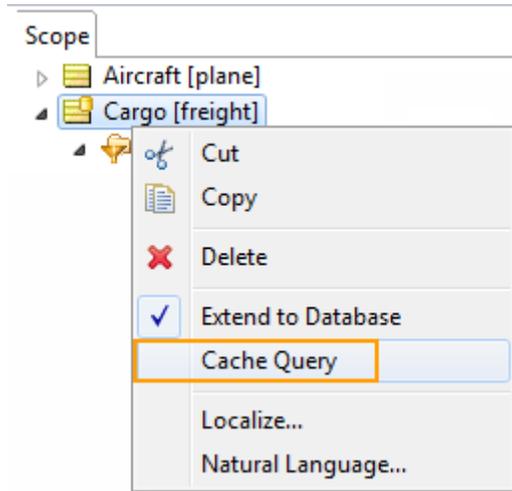
To enable query caching:

1. Identify the Vocabulary entities that you want cached.
2. Edit the Vocabulary and then choose its **Advanced** view.
3. Confirm (or set) the entity's **Datastore Persistent** property to *Yes*

Note: Query caching is independent of entity caching so the Datastore Caching setting is not relevant.

To use query caching on an entity in a Rulesheet:

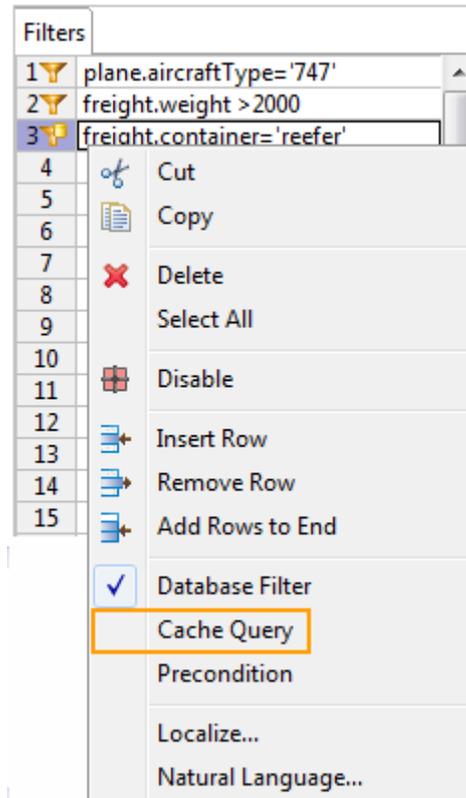
1. In a Rulesheet, choose **Advanced** view to show the **Scope** tab.
2. On the **Scope** tab, datastore-persistent entities show a database decoration, and each one offers the **Extend to Database** option in its dropdown menu. Choose that option to select it.
3. Once extended to database, the option to Cache Query is offered on the dropdown menu, as shown:



4. Choose the option to **Cache Query** on this entity in this Rulesheet.

To use query caching on a database filter in a Rulesheet:

1. In a Rulesheet, choose **Advanced** view to show the **Scope** tab.
2. On the **Scope** section, datastore-persistent entities show a database decoration, and each one offers the **Extend to Database** option in its dropdown menu. Choose that option to select it.
3. On the **Filters** tab, choose a filter that references an entity extended to database, the right-click to display its dropdown menu.
4. Choose **Database Filter**. The filter is decorated with a database symbol.
5. Dropdown the menu on that filter again. The option to **Cache Query** is now available, as shown:



6. Choose the option to **Cache Query** on this filter in this Rulesheet.

Enabling Caching on a Decision Service

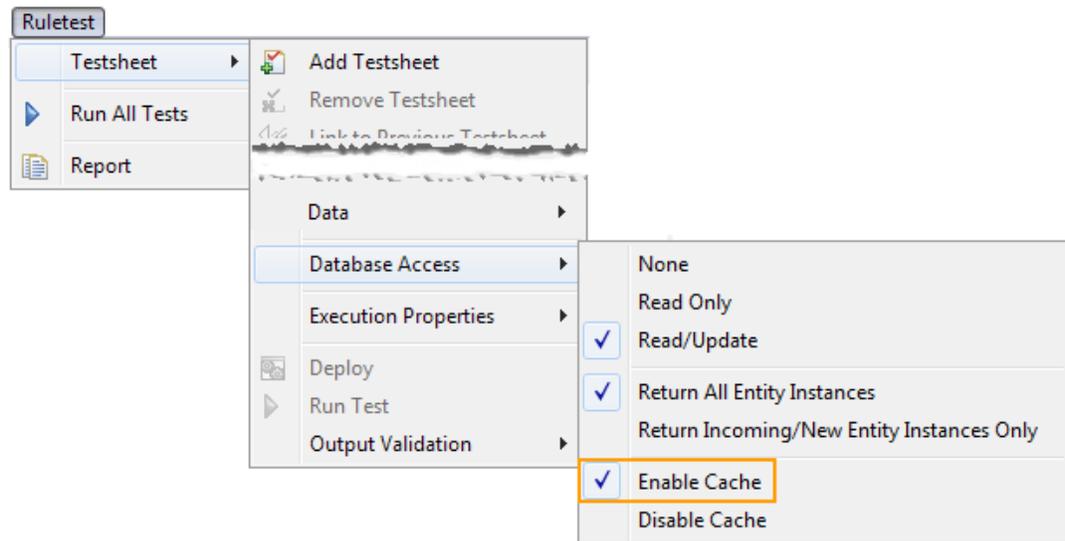
Once Rulesheets and the Vocabulary have enabled database caching, each Decision Service has to enable the caching. You can enable caching in Studio through options in Ruletests, and then set parameters that will enable caching on the Decision Services in deployment.

Enabling caching in Ruletests

Studio Ruletests are effectively a compiled Decision Service running on an embedded Corticon Server. As such, they can use the database connection and exercise caching behaviors that emulate deployment to remote servers.

To enable caching in Ruletests:

1. In Studio, use a Ruletest that specifies a test subject that is (or includes) a Rulesheet that specifies entity or query caching.
2. On the **Ruletest** menu, choose **Testsheet > Database Access > Enable Caching**, as shown:



Note: This material was added as the topic *"Using database caching"* in the *Rule Modeling Guide* as well as in related menu settings in the *Quick Reference Guide*.

Enabling caching in Decision Service deployment

Each Decision Service can be enabled at deployment time to implement its cache settings. Corticon Servers, by default, do not enable database caching. Each Decision Service will have its own cache, and cached data is never shared between Decision Services. When the cache size reaches memory limits, it is written to disk on the server. Undeploying a Decision Service immediately clears its cache in memory and on disk.

There are several techniques to enable caching when deploying a Decision Service:

- **Using Corticon Web Console** - Adding or editing a Decision service in an application.
- **Using Corticon Java Server Console** - Deploy Decision Service panel.
- **Using scripts testServerAxis and testServer** - Command 103 includes a parameter for enabling caching.
- **Manually maintaining Deployment Descriptor (CDD) files** - Add the option "PROPERTY_DATABASE_ACCESS_CACHING_ENABLED" with the value "true".
- **Using the Corticon Server APIs**

Note: This material was added as the topic "*Database caching*" in the *Integration and Deployment Guide*.

What's changed

The **Datastore Caching** setting on an entity, previously set to Yes|No with No as the permanent value, now enables and specifies the datastore caching technique.

Finding a series of items in a collection sequence

What's new

Corticon has always provided sequence operators that let you sort a collection by an attribute, and then access the value of another attribute of the one element in first, last, or a specified position in the sequence. Now you can find a *series* of elements -- such as the 'first three', the 'last three', or the 'second through fourth' -- elements in a collection sequence as a *subsequence*.

Three new operators have been added to Corticon to enable subsequence functionality:

- subSequence(from,to):** <Sequence> ->subSequence(*integer1*, *integer2*)
 Returns a Sequence containing all elements of <Sequence> between and including the positions *integer1* and *integer2*.
- first(number):** <Sequence> ->first(*integer*)
 Returns a subSequence of the first *integer* entities in the collection Sequence. In other words, ->first(*x*) is effectively ->subSequence(1, *x*)
- last(number):** <Sequence> ->last(*integer*)
 Returns a subSequence of the last *integer* entities in the collection Sequence. In other words, in a sequence of *n* elements, ->last(*x*) is effectively >subSequence(*n-x+1*, *n*)

The following table illustrates the results of subSequence operators against an INPUT sequence that was sorted into ascending order:

INPUT	first(3)	last(3)	subSequence(3,3)	subSequence(2,4)	subSequence(1,3)
A,B,C,D,E,F	A,B,C	D,E,F	C	B,C,D	A,B,C
A,B	A,B	A,B		B	A,B
A,B,C	A,B,C	A,B,C	C	B,C	A,B,C
A	A	A			A

For more information as well as examples of Rulesheets and Ruletests that use these operators, see:

- "*SubSequence*" in the *Rule Language Guide*.
- "*First(number)*" in the *Rule Language Guide*.
- "*Last(number)*" in the *Rule Language Guide*.

Note: Another operator, such as `->sortedBy` or `->sortedByDesc`, must be used to transform a Collection into a Sequence before subSequence operators can be used. Sequence must be expressed as a unique alias. See the topic "*Advanced collection sorting syntax*" in the *Rule Modeling Guide* for more examples of sorting operations.

For more general information on this topic, see the section "*Collections*" in the *Rule Modeling Guide*.

What's changed

This feature has no impact on existing operators or Rulesheets.

Enhancements to the Corticon Web Console

What's new

Corticon 5.5.1 features the following enhancements to the Web Console:

- **On Screen Tips** - Users who log in to the Web Console for the first time will see *on screen tips* that provide an overview of the Web Console interface.
- **Language preferences and localization** - You can view the Web Console in different languages by setting your preferences in the Web Console. Doing this also localizes the format of dates and numbers.
- **Summary view** - The Server and Application pages provide a preview pane to the right of the page. This preview pane displays a summary of page components and recent activities on the page. For example, on the Server page, the pane displays the total number of Servers available, the number of Server groups, etc. When you select a component on the page, the pane displays information about that component. For example, for a selected Server, the pane displays execution metrics, a list of Decision Services deployed on the Server, etc.
- **Drilldown to Decision Services in Server Summary view** - After you select a Server, you can double-click a Decision Service in the preview pane to navigate to the Decision Service's details page.
- **Ability to download log files** - You can download log files for local as well as remote Servers, choosing from two options--download all log files or download log files that have been modified by the Server in the last 24 hours.
- **Undeploy unmanaged Decision Services** - You can undeploy Decision Services that have been published to a Server from Corticon Studio, from the Server's details page in the Web Console.
- **Enable Database Caching** - You can enable database caching on each Decision service that uses the Enterprise Data Connector.
- **LDAP support** - You can configure the Web Console to authenticate users using an LDAP server.
- **Technique to reset administrator password to default** - If you lose your administrator password, you can reset the password to the default `admin` using a command line utility.
- **Inactive users are logged out automatically** - Administrators can configure a time period beyond which inactive users will get logged out automatically.

- **Audit trail** - The Web Console now has an Activity Log page where you can see logs for user actions and system events in the Web Console. You can also filter log messages by users, components, message types, etc.

See the online [Corticon Server: Web Console Guide](#) for more information about these features.

Server logs record Decision Service metadata

What's new

Corticon log files now add metadata on each Decision Service as it is loaded so that users can confirm consistent loading of a Decision Service instance in different environments. For example, the log header will have lines similar to the following:

```
2015-08-20 14:39:52.784 INFO DIAGNOSTIC [localhost-startStop-1]
Cc com.corticon.eclipse.server.core.impl.CcServerPool -
ADD DECISION SERVICE ::: DecisionServiceName=Cargo,
Version=10,CompiledVersionNumber=5.5.1,
CompiledBuildNumber=7300,EDSTimestamp=08/03/15 4:04:03 PM,
RuleCount=2,MaxPoolSize=1,AutoReload=true,
CddPath=C:/_55x_install_dir/work_dir/Server/cdd/Cargo.cdd,
DatabaseAccessMode=null,ReturnEntities=ALL,ContainsServiceCallouts=false,
...
2015-08-20 14:39:52.815 INFO DIAGNOSTIC [localhost-startStop-1]
Cc com.corticon.eclipse.server.core.impl.CcServerPool -
ADD DECISION SERVICE ::: DecisionServiceName=ProcessOrder,
Version=1.10,CompiledVersionNumber=5.5.1,
CompiledBuildNumber=7300,EDSTimestamp=08/03/15 4:04:07 PM,
RuleCount=6,MaxPoolSize=1,AutoReload=true,
CddPath=C:/_55x_install_dir/work_dir/Server/cdd/OrderProcessing.cdd,
DatabaseAccessMode=null,ReturnEntities=ALL,ContainsServiceCallouts=false,
```

This information was added to the topic "*Troubleshooting Corticon Server problems*" in the *Integration and Deployment Guide*.

What's changed

Logs have additional DIAGNOSTIC entries.

User Role preference replaced with Simple/Advanced Vocabulary view

The User Role preference setting was replaced with a Simple/Advanced view toggle to make it easier to hide/show advanced vocabulary properties without the need to restart Studio.

What's new

The Vocabulary menu and toolbar provide a toggle between **Simple View** and **Advanced View**. In **Advanced View**, the vocabulary exposes the database access and Java object messaging properties for entities, attributes, and associations. The menu actions on the Vocabulary menu and the **Database Access** tab are still presented and active. Switching between views does not clear or change any data.

See "*Vocabulary menu commands*" in the *Quick Reference Guide* for more information on using this feature.

What's changed

- The Studio's **Window > Preferences > Progress Corticon > Rule Modeling** panel for **User Role** is no longer available.
- The terms for these Vocabulary settings changed to **Simple View** (Rule Modeling) and **Advanced View** (Integration and Deployment).
- The Vocabulary menu sections for **Database Access** and **Java Object Messaging** are not hidden in **Simple View**.
- The Rulesheet option to select an entity alias to **Extend to Database** is always available, provided that the entity was set to **Datastore Persistent** in the **Advanced View** of the Vocabulary.

EDC support for Postgres, and Amazon Redshift

This release introduces Enterprise Data Connection support for additional databases.

See the topics "*Postgres*", and "*Amazon Redshift*" in the *Using Enterprise Data Connector Guide* for more information.

Automatic refactoring of file names and file paths within Studio

What's new

Within Studio, you can now rename files or folders and move files to other folders -- all with assurance that the Studio refactors the file names referenced in other files. For example, if you relocate the project's Vocabulary to a new `Vocab` folder, Rulesheets, Ruletests, and Ruleflows that reference the Vocabulary are automatically updated.

IMPORTANT NOTES:

- Close all files that are active in editors before attempting to change or move files in the Project Explorer. You cannot move files that are open. If you try, Studio prompts you to close those files.
- Refactoring support applies **only** when changes are made *within* Corticon Studio's Project Explorer. Other techniques for file name and path changes, such as Windows Explorer or command line interface, are NOT handled by this refactoring functionality and would result in dependent file references becoming invalid.

- This functionality relates to Corticon asset names and paths. Renaming a Vocabulary's elements -- domains, entities, attributes, and associations -- is advisable only before you create assets based on the Vocabulary.

For more information, see the topic *"Renaming and relocating assets in the Project Explorer"* in the *Quick Reference Guide*.

Joining the Customer Experience Improvement Program

Corticon has implemented Progress Telerik Analytics to gather data that will help Progress Software determine product usage trends and improve product quality.

When you first launch Corticon Studio, the **Customer Experience Improvement Program** dialog box opens. Read through the information in the dialog. The option to sign up for the Customer Experience Improvement Program is pre-selected. Clicking **OK** accepts your participation in the program. To opt out, do one of the following:

- Clear the option, and then click **OK**,
- Click **Cancel**, or
- Click the close box

See *"Participating in the Customer Experience Improvement Program"* in the *Installation Guide* for more information.

What was new and changed in Corticon 5.5

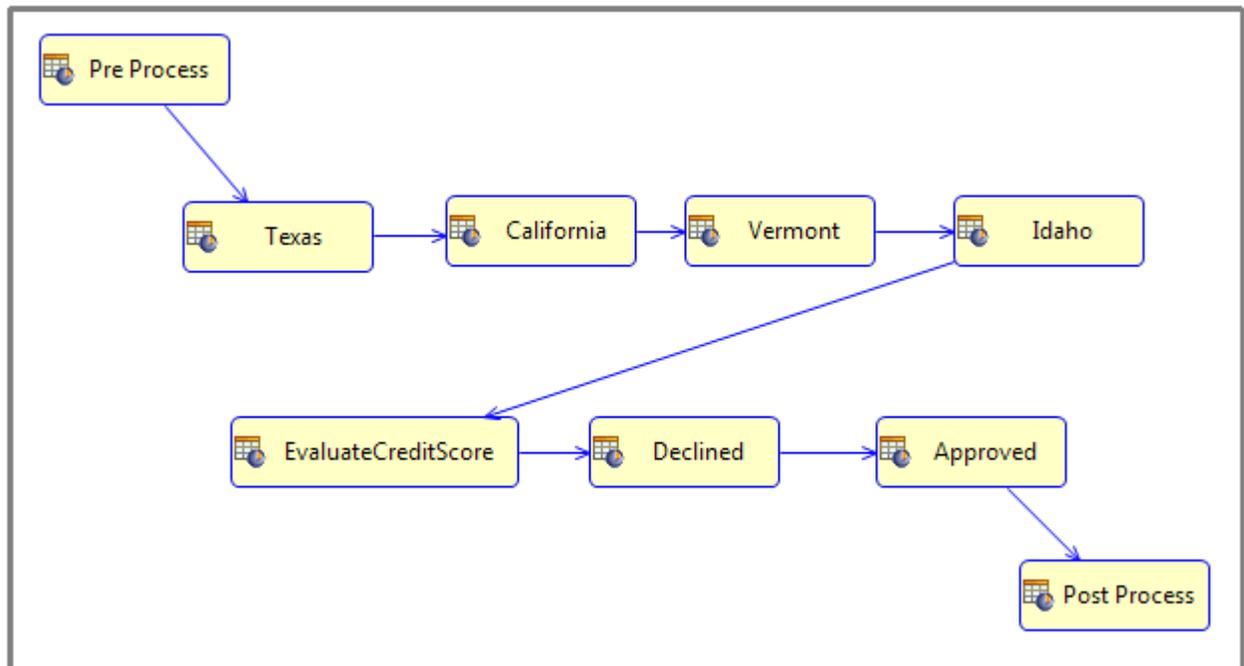
This section summarizes the new, enhanced, and changed features in Progress® Corticon® 5.5, and provides links to those sections of the documentation.

For details, see the following topics:

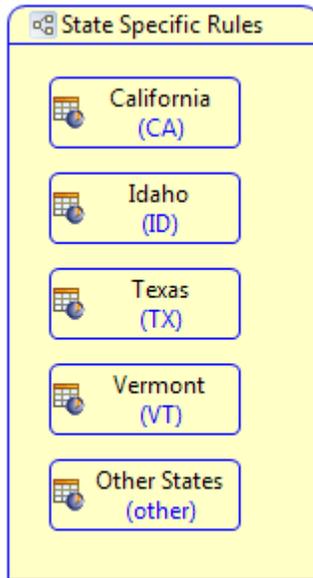
- [Introducing conditional branching in Ruleflows](#)
- [Introducing the ability to use a Ruleflow in another Ruleflow](#)
- [Introducing colors and comments on Ruleflow objects](#)
- [Improved Server Logging](#)
- [Execution thread pooling queue](#)
- [Consolidated Server installer](#)
- [Introducing the Corticon Web Console](#)
- [Introducing the Corticon REST Management API](#)
- [Improved JSON import and export](#)
- [Enhanced REST test server options](#)
- [New operator for set membership test](#)
- [Option to return just rule messages in Ruletests](#)
- [Other additions and changes in 5.5.0](#)

Introducing conditional branching in Ruleflows

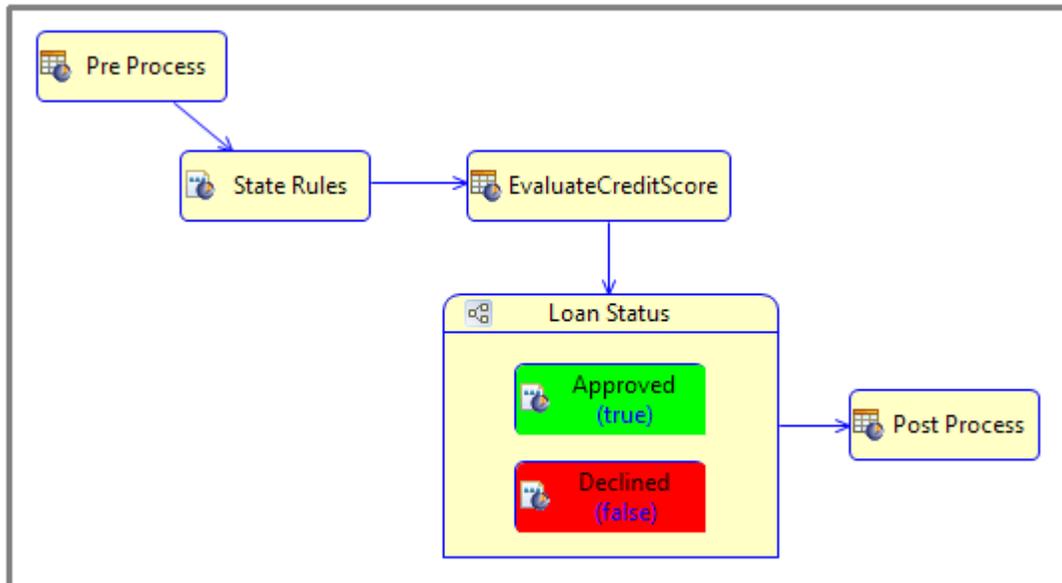
In a Ruleflow, you often have steps which should only process an entity with a specific attribute value. You can accomplish this by using *preconditions* on a Rulesheet, but the resulting logic, or flow, is difficult to perceive when looking at the Ruleflow. The following Ruleflow shows a progression of processing from the upper left to the lower right. But the rules to decide whether a loan is approved or declined are one-or-the-other, and the Rulesheets for the US states do not really represent a progression because the applicant's state is going to trigger only one of these Rulesheets to fire its rules:



Looking at this Ruleflow the real flow is somewhat hidden. If the Rulesheets for Texas, California, Vermont, and Idaho each had a precondition such that only matching states were processed, then they represent a set of mutually exclusive options, not the linear flow depicted in the Ruleflow. We'll see how we can create a branch in a Ruleflow like this:



And then bring that Ruleflow into another Ruleflow where we will also create a branch for the Declined and Approved Rulesheets that also might have needed to use preconditions. The completed Ruleflow looks like this:



A branch node can be Rulesheet, Ruleflow, Service Call Out, Subflow, or another Branch container.

Note: Multiple branches can be assigned to the same target activity. These values are shown as a set in the Ruleflow canvas.

Branching can occur on either enumerated or boolean attribute types. Only these are allowed because they have a set of known possible values. These possible values can be used to identify a branch. Using branches in a Ruleflow lets you clearly identify the set of options, or branches, for processing an entity based on an attribute value. In our example, using branching for the set of state options and whether the loan is approved or declined makes the flow more apparent. It will also be easier to create and maintain.

This material is the first section of the new topic "*Conditional Branching in Ruleflows*" in the *Rule Modeling Guide*. That topic also provides a refresher on enumerations and Booleans.

See also:

- "*Example of Branching based on a Boolean*" in the *Rule Modeling Guide*.
- "*Example of Branching based on an Enumeration*" in the *Rule Modeling Guide*.
- the "*Ruleflows*" section of the *Quick Reference Guide*
- "*Enumerations*" in the *Rule Modeling Guide*.

What's changed

These techniques and features do not change any existing behaviors or features of Ruleflows. Existing Ruleflows created in previous releases will update without issues, and can then add branches based on existing attributes that are Boolean or Enumerated data types.

Introducing the ability to use a Ruleflow in another Ruleflow

Until now, a Ruleflow had to contain each individual Rulesheet and Service Callout that made up the entire rule set for the Decision Service. The resulting Ruleflows often became unwieldy canvases where the only mechanisms for simplification were layout and enclosing multiple nodes into Subflows that had minimal success in reducing complexity.

Now, a Ruleflow can be brought onto the canvas of another Ruleflow, simply by dragging the `.erf` file onto the canvas. If you have a Ruleflow that calculates shipping costs and methods, you can use it in multiple other Ruleflows under the same Vocabulary. This ability to construct a Ruleflow from multiple other Ruleflows facilitates modularity, easier unit testing, collaboration, and management of complexity.

This nesting of a Ruleflow in another Ruleflow can be done multiple times in a Ruleflow (A includes B and C) or to arbitrary depth (A includes B which includes C). The imported Ruleflows are compiled into the parent Ruleflow when the Decision Service is generated. If A includes B and `A.eds` is generated, subsequent changes to B are not reflected until `A.eds` is regenerated. Even though B is included in A you can still generate a `B.eds` as needed.

This technique allows any Ruleflow to be included in another Ruleflow that uses the same Vocabulary -- it is not a *type* of Ruleflow.

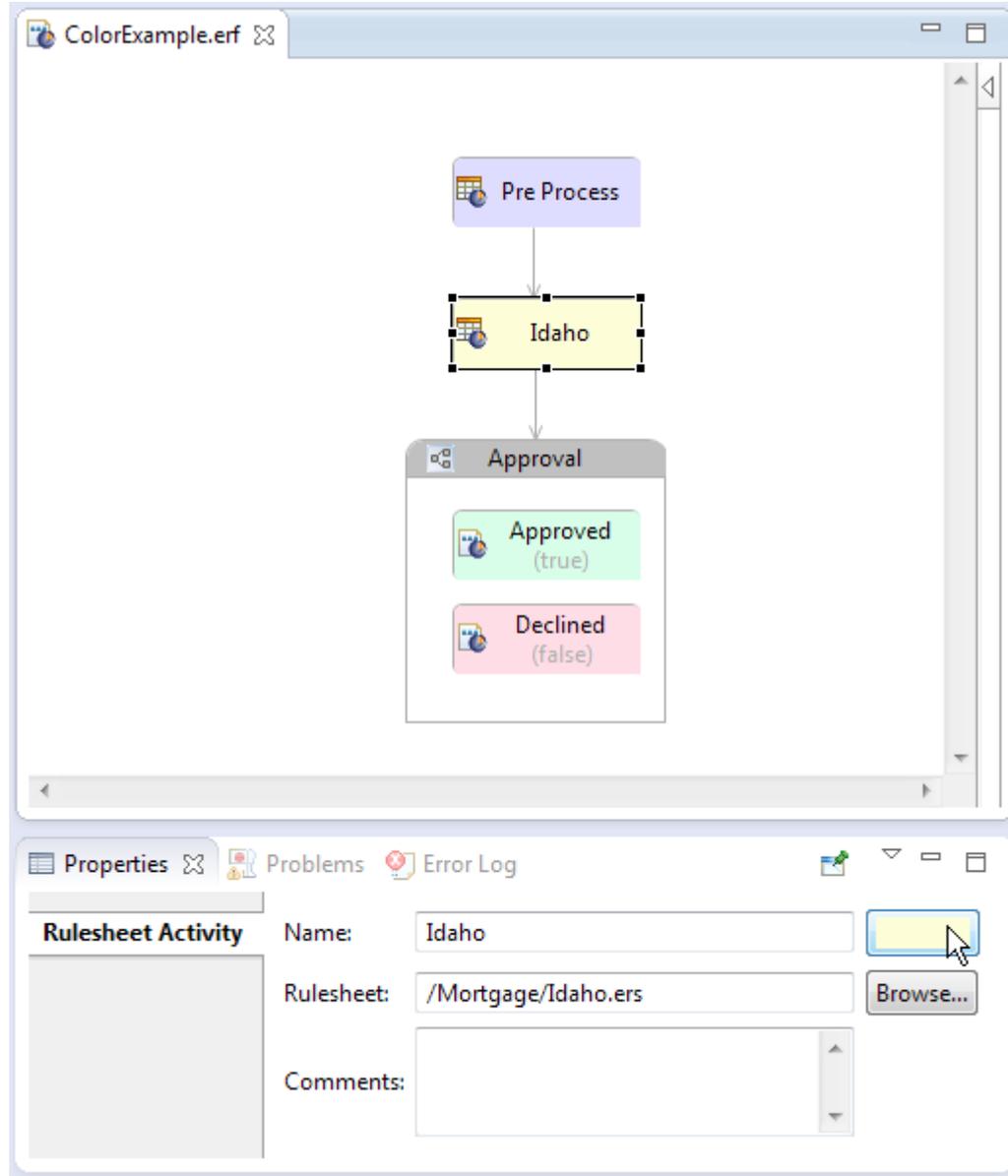
For more information, see *Using a Ruleflow in another Ruleflow in the Corticon Rule Modeling Guide* and the "*Ruleflows*" section of the *Quick Reference Guide*

What's changed

This technique does not change any existing behaviors or features of Ruleflows. Existing Ruleflows created in previous releases will update without issues, and then can be included in other Ruleflows as well bring other Ruleflows onto their canvas.

Introducing colors and comments on Ruleflow objects

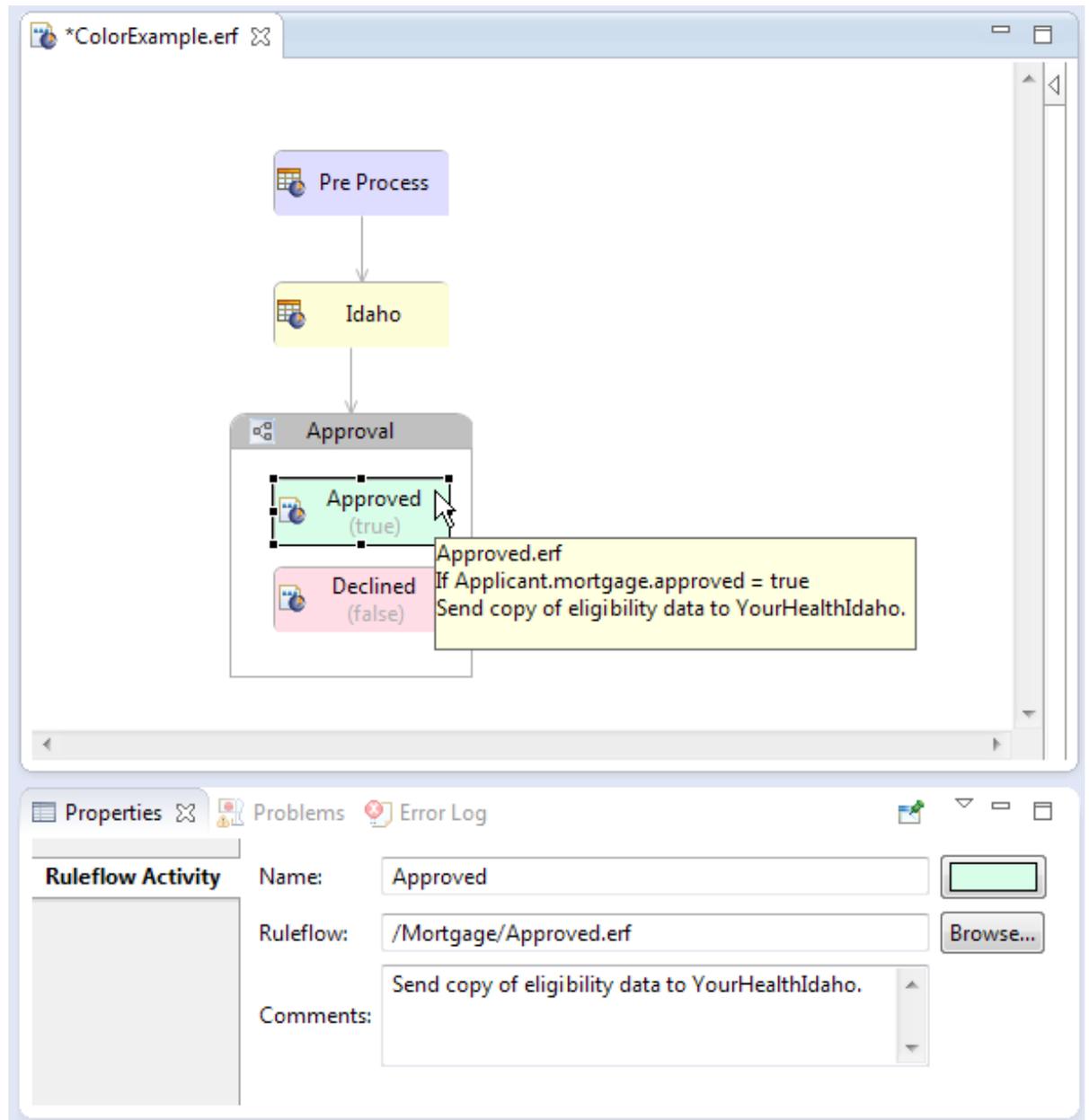
You can now add color to objects on the Ruleflow canvas to enhance the look and feel of the set of objects. Each object on the canvas provides a color button to set that objects color, as illustrated:



The color palette is the standard Windows basic 48-color palette that lets you choose to create custom colors.

Adding comments to Ruleflow objects

Each object on the Ruleflow palette can also have text that you add to its Property tab Comments. The following illustration shows that the text is displayed when you hover over the object.



In this example, the selected item is a Ruleflow that is the node for a branch activity. The info box first lists the asset name, then the branch attribute condition that assigned it to the node, and then the comment text.

This material was added as the topic *"Adding colors and comments to Ruleflow objects"* in the *Corticon Quick Reference Guide*.

Improved Server Logging

What's new

Corticon now implements logging features that provide faster, more flexible logging functionality for production Servers and Studio tests. Features include:

- **Distinct logging of Decision Service actions** - Filters let you mix your preferences for logging rule tracing, diagnostics, timing, invocations, and violations.
- **Simplified management of log files** - Configurations can specify time and size thresholds for log rotation, retention time of automatically compressed logs, and logging of individual Decision Services.
- **Focused logging configuration** - The `brms.properties` file defines overrides for all the exposed logging properties.

See a graphic presentation of the log settings and a look at actual logging runs in the technical video [Corticon Logging](#).

Log settings

The default log settings produce substantially the same output as previously (although much faster), and adds automatic rollover and retention. You can override all the default log settings by editing the `brms.properties` file.

- `loglevel` - The depth of detail in standard system logging. Values range from `OFF` through `ERROR`, `WARN`, to `INFO`, the default level. At this level, the survivors of processing-related log filters are also logged and will be included in higher log levels: `DEBUG`, `TRACE`, and `ALL`, the maximum system detail.
- `logFiltersAccept` - Log filters determine the types of processing log entries that will be recorded. By listing the `logFiltersAccept`, you can pick and choose just the entry types you want logged. The filter values that can be in the comma-separated list are:
 - `RULETRACE` - Records performance statistics on rules
 - `DIAGNOSTIC` - Records service performance diagnostics at a defined interval (default is 30 seconds).
 - `TIMING` - Records timing events.
 - `INVOCATION` - Records invocation events.
 - `VIOLATION` - Records exceptions.
 - `INTERNAL` - Records internal debug events
 - `SYSTEM` - Records low-level errors and fatal events.

The default `logFiltersAccept` setting is: `DIAGNOSTIC,SYSTEM`

- `logpath` - The directory where logs are written. Default value is `%CORTICON_WORK_DIR%/logs`. Note: Use forward slashes as path separator, as in `c:/Users/me/logs`
- `logDailyRollover` - Specifies whether to rollover the logs on a daily basis. Default value is `true`.

- `logRolloverMaxHistory` - Specifies the number of rollover logs to keep. Default value is 5.

The `loglevel` and `logpath` can be changed using following methods, which will override this setting:

```
ICcServer.setLogLevel(String)
ICcServer.setLogPath(String)
```

For more information, see *Using Corticon Server logs in the Integration and Deployment Guide*

Topics in that section include:

- *How users typically use logs* - Links to logging topics that demonstrate use cases.
- *Changing logging configuration* - Discusses the settings and options defined in the logging configuration properties (listed here.)
 - *Configuring log content* - Describes how log levels and info filters control the volume and type of log content.
 - *Configuring log files* - Shows how to configure log locations, archiving, and logging for each Decision Service.
- *Troubleshooting Corticon Server problems* - Describes several common problems that are revealed in logs.

What's changed

The features and details that are logged are substantially unchanged. However, the performance of logging and the way that logging is configured, filtered, stored, and archived have been completely revised. The performance of logging has improved dramatically over previous releases, so that production deployments can use detailed logging without significant impact.

Previously in Corticon logging, the incremental detail level of system log entries were intertwined with processing log levels. If you wanted a high level of system log data, such as `DEBUG`, you would get all the preceding processing log settings -- `INTERNAL`, `RULETRACE`, `DIAGNOSTIC`, `TIMING`, `INVOCATION`, `VIOLATION`, `SYSTEM`. Now you can set the log level to `DEBUG`, but set `logFiltersAccept=` (no value) in `brms.properties` to filter out processing log entries.

Logging per thread is no longer supported.

Some logging properties from prior versions are now ignored:

- `CcCommon.properties`:

```
logverbosity
com.corticon.logging.thirdparty.logger.class
```

- `CcServer.properties`:

```
com.corticon.server.execution.logperthread
```

Execution thread pooling queue

In prior releases, Decision Service instances executed using Decision Service-level thread pools. When multiple Decision Services were executing on a Server, this could overload the server and cause poor performance.

In this release, Server-level thread pooling is implemented by default, and multiple Decision Services place their requests in a queue for processing. That allows the server to determine how many concurrent requests are to be processed at any one time. The Corticon Server uses built-in Java concurrent pooling mechanisms to control the number of concurrent executions.

Implementation of an Execution Queue

Each thread coming into the Server gets an available Reactor from the Decision Service, and then the thread is added to the Server's Execution Thread Pooling Queue, or, simply put, in the **Execution Queue**. The Execution Queue guarantees that threads do not overload the cores of the machine by allowing a specified number of threads in the Execution Queue to start executing, while holding back the other threads. Once an executing thread completes, the next thread in the Execution Queue starts executing.

The Server will discover the number of cores on a machine and, by default, limit the number of concurrent executions to that many cores, but a property can be set to specify the number of concurrent executions. Most use cases will not need to set this property. However, if you have multiple applications running on the same machine as Corticon Server, you might want to set this property lower to limit the system resources Corticon uses. While this tactic might slow down Corticon processing when there is a heavy load of incoming threads, it will help ensure Corticon does not monopolize the system. Conversely, if you have Decision Services which make calls to external services (such as EDC to a database) you may want to set this property higher so that a core is not idle while a thread is waiting for a response.

Ability to Allocate Execution Threads

The Corticon Server takes each thread (regardless of which Decision Service the Thread is executing against), and then adds the thread to the Execution Queue in a first-in-first-out strategy. While that generally satisfies most use cases, you might want more control over which Decision Services get priority over other Decision Services. For that, you first set the Server property `com.corticon.server.decisionservice.allocation.enabled` to `true`, and then set the maximum number of execution threads (`maxPoolSize`) for each specified Decision Service in the Execution Queue. Once you set the allocation on every Decision Service, the Server will try to maintain corresponding allocations of execution threads from the Decision Services inside the Execution Queue.

When you have allocation enabled, you can dynamically change a Decision Service's `maxPoolSize`, depending on how you deployed that Decision Service:

- If deployed using the API method `ICcServer.addDecisionService(..., int aiMaxPoolSize, ...)`, then the `maxPoolSize` can be updated using `ICcServer.modifyDecisionServicePoolSizes(int aiMinPoolSize, int aiMaxPoolSize)`.
- If deployed using a CDD file, then change the value of `max-size` in the CDD. When the `CcServerMaintenanceThread` detects the change, it will update the Decision Service.

Better memory management

In prior releases, you were advised to set the minimum and maximum pool sizes to equal to the number of cores on the machine, in an effort to limit the number of concurrent threads that would be executing. Now, the ability to do allocation means that you could allocate hundreds of execution threads for one Decision Service. But in the old paradigm that would take a lot of memory. By refactoring how Reactors are maintained in each Decision Service, the Server can now re-use cached data across all Reactors for a Decision Service. As a result, runtime performance should reveal only modest differences in memory utilization between a Decision Service that contains just one Reactor and another that contains hundreds of Reactors.

In prior releases, you set minimum and maximum pool sizes that the Server would use based on load. As load increased, the Server would allocate more Reactors to the Decision Service Pool (up to Max Pool Size), then, as load decreased, the Server would remove Reactors (down to Min Pool Size). This mechanism attempted to throttle the Server so that it would not run out of memory. In this release, there is no need to decrease the number of Reactors in the Pool because extra Reactors are not actually sitting in the Pool. A new Reactor is created for every execution thread, and -- when the execution is done -- the Reactor is not put back into the Pool for reuse (as it was in previous versions), it just drops out of scope and garbage collection releases its memory.

With better memory management, large request payloads are more of a concern than the number of concurrent executions or the number of Reactors.

Take a deep dive into this feature in the technical video [Server Level Thread Pooling](#).

New Server properties

- Determines how many concurrent executions can occur across the Server. Ideally, this value is set to the number of Cores on the machine. By default, this value is set to 0, which means the Server will auto-detect the number of Cores on the server.

```
com.corticon.server.execution.processors.available=0
```

- Specifies the timeout setting for how long an execution thread can be inside the Execution Queue. The time starts when the execution thread enters the Execution Queue and ends when it completes executing against a Decision Service. A `CcServerTimeoutException` will be thrown if the execution thread fails to complete in the allotted time. The value is in milliseconds. Default value is 180000 (180000ms = 3 minutes)

```
com.corticon.server.execution.queue.timeout=180000
```

- In some cases, you might want to cause prioritizing of one Decision Service over another, making more resources available to that type. Setting this property's value to `true` enables Decision Service level allocations to control the number of Decision Service instances that can be added to the queue at a particular time. Default value is `false`

```
com.corticon.server.decisionservice.allocation.enabled=false
```

New API methods: `addDecisionService` with `aiQueueAllocation` parameter

```
void addDecisionService(String astrDecisionServiceName,  
    String astrRuleAssetPath,  
    boolean abAutoReload,  
    int aiMaxPoolSize,  
    String astrMsgStructStyle)
```

```
void addDecisionService(String astrDecisionServiceName,  
    String astrRuleAssetPath,  
    boolean abAutoReload,
```

```
    int aiMaxPoolSize,  
    String astrMsgStructStyle,  
    boolean abDeployAsTestDecisionService)  
  
void addDecisionService(String astrDecisionServiceName,  
    String astrRuleAssetPath,  
    boolean abAutoReload,  
    int aiMaxPoolSize,  
    String astrMsgStructStyle,  
    String astrDatabaseAccessMode,  
    String astrDatabaseAccessReturnEntities,  
    String astrDatabaseAccessPropertiesPath)  
  
void addDecisionService(String astrDecisionServiceName,  
    String astrRuleAssetPath,  
    boolean abAutoReload,  
    int aiMaxPoolSize,  
    String astrMsgStructStyle,  
    String astrDatabaseAccessMode,  
    String astrDatabaseAccessReturnEntities,  
    String astrDatabaseAccessPropertiesPath,  
    boolean abDeployAsTestDecisionService)
```

New API methods: modifyDecisionServicePoolSize

```
void modifyDecisionServiceQueueAllocation(String astrDecisionServiceName,  
    int aiMaxPoolSize,)  
  
void modifyDecisionServiceQueueAllocation(String astrDecisionServiceName,  
    int aiDecisionServiceMajorVersion,  
    int aiMaxPoolSize,)  
  
void modifyDecisionServiceQueueAllocation(String astrDecisionServiceName,  
    int aiDecisionServiceMajorVersion,  
    int aiDecisionServiceMinorVersion,  
    int aiMaxPoolSize,)
```

For more information, see the topic *Multi-threading, concurrency reactors, and server pools in the "Inside Corticon Server" section of the Corticon Integration and Deployment Guide.*

What's changed

The revisions to Corticon Server thread pooling have caused several Server properties and API methods to be dropped.

Dropped Server properties

The following CcServer properties have been removed:

```
com.corticon.server.pool.expansion.percentage  
com.corticon.server.serverpool.timeout  
com.corticon.server.pool.expansion.percentage
```

Deprecated API methods: The addDecisionService methods with minPoolSize and MaxPoolSize parameters in their signature.

```
void addDecisionService(String astrDecisionServiceName,  
    String astrRuleAssetPath,  
    boolean abAutoReload,  
    int aiMinPoolSize,  
    int aiMaxPoolSize,  
    String astrMsgStructStyle)
```

```
void addDecisionService(String astrDecisionServiceName,
    String astrRuleAssetPath,
    boolean abAutoReload,
    int aiMinPoolSize,
    int aiMaxPoolSize,
    String astrMsgStructStyle,
    boolean abDeployAsTestDecisionService)

void addDecisionService(String astrDecisionServiceName,
    String astrRuleAssetPath,
    boolean abAutoReload,
    int aiMinPoolSize,
    int aiMaxPoolSize,
    String astrMsgStructStyle,
    String astrDatabaseAccessMode,
    String astrDatabaseAccessReturnEntities,
    String astrDatabaseAccessPropertiesPath)

void addDecisionService(String astrDecisionServiceName,
    String astrRuleAssetPath,
    boolean abAutoReload,
    int aiMinPoolSize,
    int aiMaxPoolSize,
    String astrMsgStructStyle,
    String astrDatabaseAccessMode,
    String astrDatabaseAccessReturnEntities,
    String astrDatabaseAccessPropertiesPath,
    boolean abDeployAsTestDecisionService)
```

Dropped API methods: All `modifyDecisionServicePoolSizes` methods

```
void modifyDecisionServicePoolSizes(String astrDecisionServiceName,
    int aiNewMinPoolSize,
    int aiNewMaxPoolSize)

void modifyDecisionServicePoolSizes(String astrDecisionServiceName,
    int aiDecisionServiceMajorVersion,
    int aiNewMinPoolSize,
    int aiNewMaxPoolSize)

void modifyDecisionServicePoolSizes(String astrDecisionServiceName,
    int aiDecisionServiceMajorVersion,
    int aiDecisionServiceMinorVersion,
    int aiNewMinPoolSize,
    int aiNewMaxPoolSize)
```

Consolidated Server installer

Corticon now provides one download package to install Corticon Server for Java, Corticon Server for .NET, and the Corticon Web Console - any one of these components or even all three. The installer colocates the selected components into the specified target home and work directory.

These server installations can gather installation information so that the installer can perform silent installations on other machines.

For more information, see *Installing Corticon Servers and the Web Console in the Corticon Installation Guide*

What's changed

In prior releases, the EAR/WAR containers for deployment on other platforms and application servers were bundled into the Java Server installer. Those containers are available as a separate download. This impacts users in two ways:

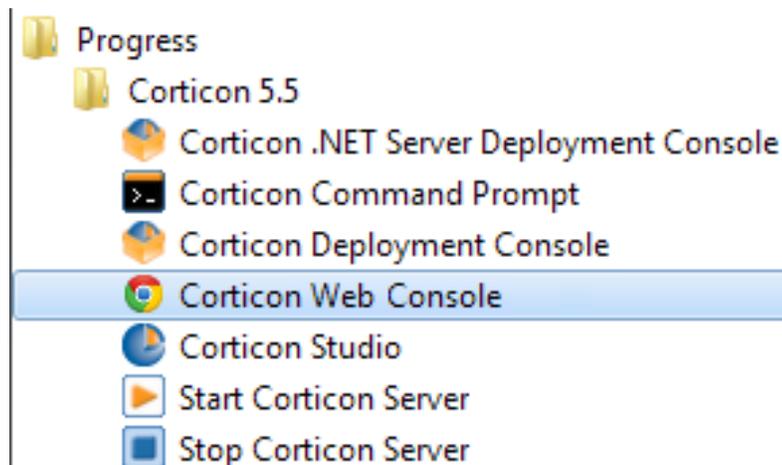
- If you want to deploy to JBoss or as an EAR file, download the server archive, and then extract the appropriate files.
- If you want to deploy `axis.war` to your own appserver, copy it from `[CORTICON_WORK]/pas/server/webapps`. (Note that this path was `[CORTICON_HOME]/pas/webapps` in 5.4 releases.)

Introducing the Corticon Web Console

What's new

The Web Console provides for a central point of managing and monitoring Corticon Java and .NET Servers. It supports deploying of Decision Services and provides a variety of metrics on both the performance of Decision Services and Servers. The Web Console can be installed in the same application server as the Corticon Java Server or installed, by itself, in a separate application server and used to manage and monitor multiple Corticon servers.

On the installation machine, a **Start** menu command (as shown, where all 5.5 components and products were also installed) launches the Web Console in your default browser:



For more information, see *Installing Corticon Servers and the Web Console in the Corticon Installation Guide* and the online [Corticon Server: Web Console Guide](#).

What's changed

The previous console implementation, Java Server Console, that was enabled in a Java Server installation is still available. This tool will be phased out in upcoming releases as the new Web Console replaces the Java Server Console's functionality.

Introducing the Corticon REST Management API

The introduction of the REST management API in the *Integration and Deployment Guide* provides information about this API's common request/response types, metrics, status codes, and error handling. See the section "*REST Management API*" in the *Integration and Deployment Guide*.

Method	Type	Syntax and function
API ListDecisionServices	HTTP GET	<code><base>/decisionService/list</code> Returns a list of Decision Services deployed on the server. The resulting payload will be enclosed in the response's body in JSON object form.
API Deploy Decision Service	HTTP POST	<code><base>/decisionService/deploy</code> Attempts to add a Decision Service to the server. Request objects will be sent as the content.
API Undeploy Decision Service	HTTP POST	<code><base>/decisionService/undeploy</code> Attempts to remove the Decision Service from the server and delete the EDS file associated with it. The request will take HTTP headers that provides the Decision Service name, and, optionally the Major and Minor version Number.
API Get Decision Service Properties	HTTP GET	<code><base>/decisionService/getProperties</code> Returns the properties pertaining to the Decision Service. The request gets the properties for the Decision Service passed in its header. The request will take HTTP headers that provide the Decision Service name, and, optionally the Major and Minor version Number.
API Set Decision Service Properties	HTTP POST	<code><base>/decisionService/setProperties</code> Attempts to modify the properties of a specified Decision Service.
API Ping Server	HTTP GET	<code><base>/server/ping</code> Returns an object containing the current uptime of the server, which confirms that the server is reachable and running.

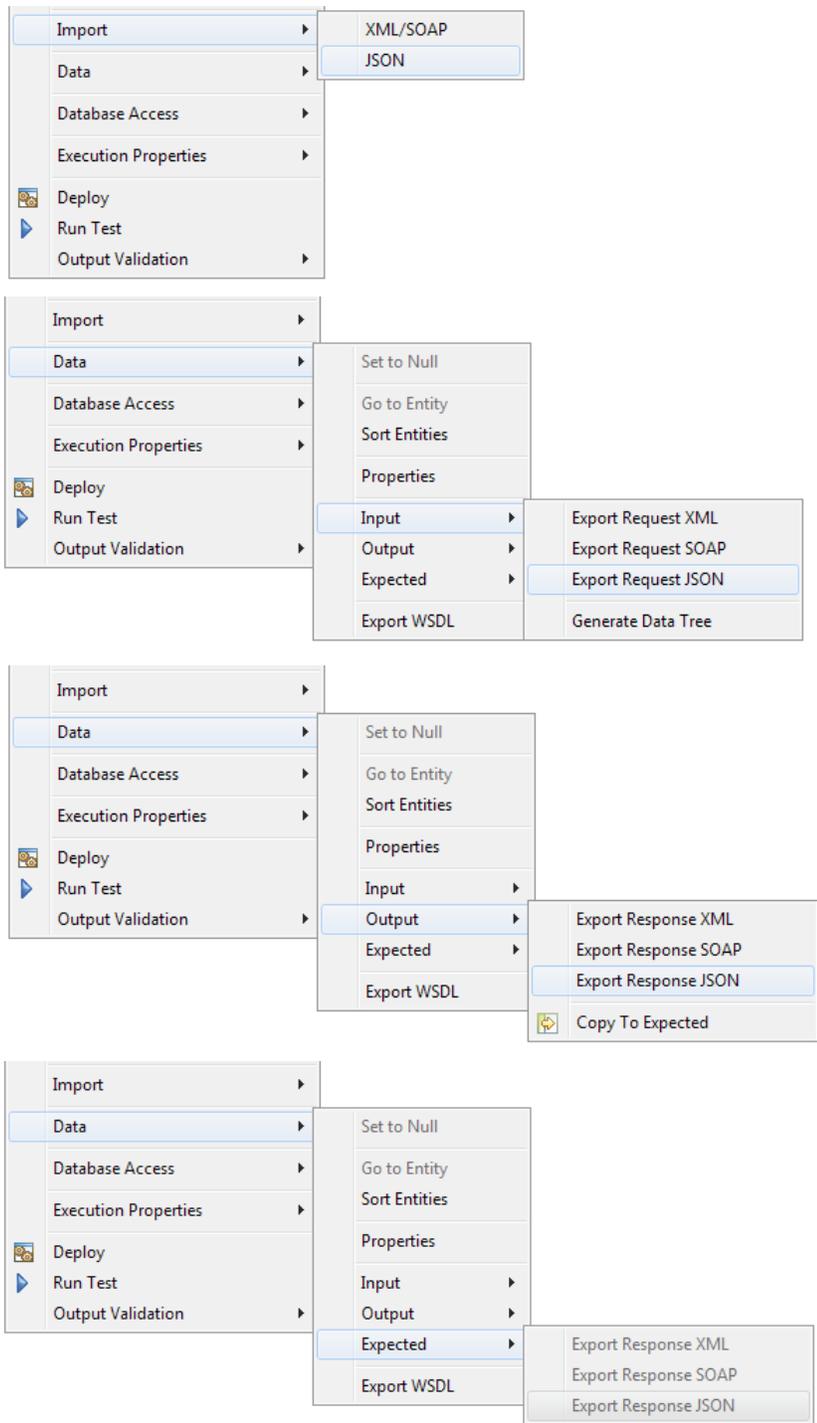
Method	Type	Syntax and function
API Retrieve Metrics	HTTP POST	<code><base>/server/metrics</code> Retrieves metrics for the server. The request can pass in a Decision Service (or a list of Decision Services as an array), and a timestamp showing when the windowed metrics will begin. If the JSON object does not contain any Decision Service, metrics are returned for all the Decision Services in the server along with the server metrics.
API Get Server Info	HTTP GET	<code><base>/server/info</code> Returns information about the server. The returned object will contain information about both the server and the Decision Services deployed on the server.
API Get Server Log	HTTP GET	<code><base>/server/log</code> Returns the server log entries after the specified timestamp.
API Get Server Properties	HTTP GET	<code><base>/server/getProperties</code> Returns the properties pertaining to the server. The returned object will be a list of key/value pairs consisting of key: <i>propertyName</i> value: <i>value</i> with information about the property.
API Set Server Properties	HTTP POST	<code><base>/server/setProperties</code> Sets properties on the server using a JSON object. The object will contain a key/value format system: <i>propertyName</i> value: <i>value</i> intended to be set for this property.
API Set Server License	HTTP POST	<code><base>/server/setLicense</code> Sets the license file for the server. This can be used to add a license in the event the current one is not usable.

For more information, see *REST management API in the Corticon Integration and Deployment Guide*.

Improved JSON import and export

Corticon Studio's Ruletest menus now enable easy import and export of JSON formatted requests and responses.

The Ruletest's Testsheet menu offers options specific to JSON while maintaining the familiar SOAP and XML options, as shown:



For more information, see *Ruletest menu commands*, *Importing a JSON document to a testsheet*, and *Exporting a testsheet to a JSON document* in the *Quick Reference Guide*.

Enhanced REST test server options

What's new

The `testServerREST` script has new test options:

- 142 - Execute JSON REST request
- 143 - Execute JSON REST request (by specific Decision Service Major Version)
- 144 - Execute JSON REST request (by specific Decision Service Major and Minor Version)
- 145 - Execute JSON REST request (by specific execution Date)
- 146 - Execute JSON REST request (by specific execution Date and Decision Service Major Version)

For more information, see the topic *Running the Sample JSON Request in the guide Corticon Server: Deploying Web Services on .NET* and *Running the Sample JSON Request in the guide Corticon Server: Deploying Web Services on Java*

What's changed

The `testServerREST` script on both servers previously had only one test:

- 132 - Execute JSON REST request

That test number is no longer available for RESTful JSON formatted requests.

New operator for set membership test

A new operator has been added to the Corticon Studio to simplify the qualification of set membership in a test. When the values, particularly ones in an enumerated list, are not structured for range value tests, the workaround has been to use a long list of logical OR operations, such as:

```
candidate.State='MA' or candidate.State='NH' or candidate.State='VT' or
candidate.State='RI' or candidate.State='ME' or candidate.State='CT'
```

Now, that can be expressed as:

```
candidate.State in {'MA','NH','VT','RI','ME','CT'}
```

When you are using enumerations, such as...

Data Type Na...	Base Data Type	Enumerati...	...	Label	Value
state	String	Yes		MA	'Massachusetts'
				NH	'New Hampshire'
				VT	'Vermont'
				RI	'Rhode Island'
				ME	'Maine'
				CT	'Connecticut'

... the String labels do not require quotes in the list. For example:

```
candidate.State in {MA,NH,VT,RI,ME,CT}
```

For more information, see the section *Qualifying rules with ranges and lists in the Corticon Studio: Modeling Guide* and *the operator topic "In {List}" in Corticon Studio: Rule Language Guide*

What's changed

The `in` operator is now listed in the **Rule Operators** view.

Option to return just rule messages in Ruletests

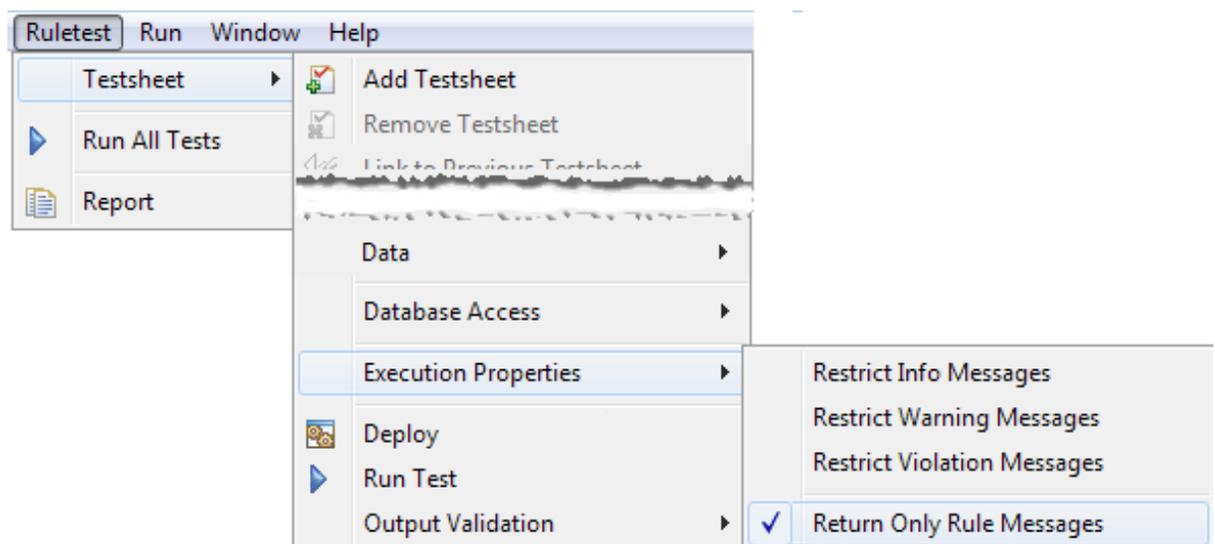
In some rule model designs, the rules create many new entities that generate database entries through the Enterprise Data Connection (EDC), and corresponding rule messages in the Corticon output. The generation of output in the Ruletest slows down the test process. You can choose to suppress the work document output in server output and logs, and you can test that same behavior in your Ruletests first. This feature lets you tell each Decision Service or each execution whether to return the Entities under the WorkDocuments section in the CorticonResponse, which results in much smaller -- and faster -- CorticonResponse.

The new execution property that suppresses the creation of the output pane, and displays just rule messages is:

```
com.corticon.server.restrict.response.rulemessages.only
```

Note: You can also suppress any of the three types of Rule Messages (info, warning, and violation) from being posted to the output of an execution.

You can see the impact of these restrictions in testsheets by engaging the option toggle under **Execution Properties** on the **Ruletest > Testsheet** menu. When the option is checked, output presentation is suppressed:



Clicking the option again clears it, and that output is presented in the next test run.

Importing and exporting SOAP/XML messages will carry these settings:

- On import, a payload that includes (for example)

```
<ExecutionProperties>
  <ExecutionProperty
    value="true"
    name="PROPERTY_EXECUTION_RESTRICT_RESPONSE_TO_RULEMESSAGES_ONLY"/>
</ExecutionProperties>
```

will select the testsheet option **Return Only Rule Messages**.

- On export, the checked **Execution Property** option generates an `ExecutionProperty` line set to `true`.

This information was added to *"Ruletest menu commands" in the Quick Reference Guide*.

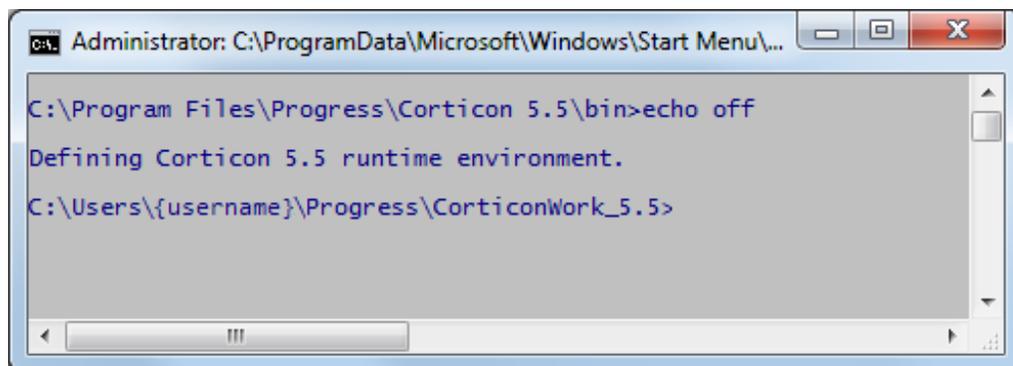
Other additions and changes in 5.5.0

What's new

- **Corticon Command Prompt** - The **Start** menu on a Server installation now offers a command to launch a Windows Command Prompt:



The command opens a Command Prompt window, calls `corticon_env.bat`, and then locates the prompt at the root of the Corticon work directory:



It adds several `[CORTICON_HOME]` script paths to the `PATH` so that you can launch scripts by name from the following Server installation locations:

- `\bin`
- `\Server\bin`
- `\Server\pas\bin`
- **New server property for names on complexTypes** - A server property lets you choose whether the XSD and WSDL generators append the word "Type" at the end of each `complexType` in the related XSD or WSDL file. This was the standard in earlier versions of the generators. Default value is `false`.

```
com.corticon.servicecontracts.append.typeLabel=false
```

What's changed

- **Savvion material dropped** - The topics "Building a Vocabulary based on Savvion Dataslots", "Generating the Vocabulary file", and "Dataslot to Vocabulary Mapping" have been dropped.
- **Basic and Advanced Tutorials are revised and available in the cloud** - The two introductory modeling tutorials have been reformatted into a new style and access point. The content of these tutorials is no longer in the online help or accessible in ESD downloads.

Progress Corticon documentation - Where and What

Corticon provides its documentation in various online and installed components.

Access to Corticon tutorials and documentation

Corticon Online Tutorials	
Tutorial: Basic Rule Modeling in Corticon Studio	Online only. Uses samples packaged in the Corticon Studio.
Tutorial: Advanced Rule Modeling in Corticon Studio	Online only.
Corticon Online Documentation	
Progress Corticon User Assistance	Updated online help for the current release.
Introducing the Progress® Pacific Application Server	The Progress Pacific Application Server (PAS) is the Web application server based on Apache Tomcat installed as the default Corticon Server. TCMAN, the command-line utility, manages and administers the Pacific Application Server.
Progress Corticon Documentation site	Access to all guides in the Corticon documentation set in PDF format and JavaDocs.
Corticon Documentation on the Progress download site	

Documentation	Package of all guides in PDF format.
What's New Guide	PDF format.
Installation Guide	PDF format.
Corticon Studio Installers	Include Eclipse help for all guides except Web Console.

Components of the Corticon tutorials and documentation set

The components of the Progress Corticon documentation set are the following tutorials and guides:

Corticon Online Tutorials	
Tutorial: Basic Rule Modeling in Corticon Studio	An introduction to the Corticon Business Rules Modeling Studio. Learn how to capture rules from business specifications, model the rules, analyze them for logical errors, and test the execution of your rules -- all without any programming.
Tutorial: Advanced Rule Modeling in Corticon Studio	An introduction to complex and powerful functions in Corticon Business Rules Modeling Studio. Learn the concepts underlying some of Studio's more complex and powerful functions such as ruleflows, scope and defining aliases in rules, understanding collections, using String/DateTime/Collection operators, modeling formulas and equations in rules, and using filters.
Release and Installation Information	
<i>What's New in Corticon</i>	Describes the enhancements and changes to the product since its last point release.
<i>Corticon Installation Guide</i>	Step-by-step procedures for installing all Corticon products in this release.
Corticon Studio Documentation: Defining and Modeling Business Rules	
<i>Corticon Studio: Rule Modeling Guide</i>	Presents the concepts and purposes the Corticon Vocabulary, then shows how to work with it in Rulesheets by using scope, filters, conditions, collections, and calculations. Discusses chaining, looping, dependencies, filters and preconditions in rules. Presents the Enterprise Data Connector from a rules viewpoint, and then shows how database queries work. Provides information on versioning, natural language, reporting, and localizing. Provides troubleshooting of Rulesheets and Ruleflows. Includes <i>Test Yourself</i> exercises and answers.

<i>Corticon Studio: Quick Reference Guide</i>	Reference guide to the Corticon Studio user interface and its mechanics, including descriptions of all menu options, buttons, and actions.
<i>Corticon Studio: Rule Language Guide</i>	Reference information for all operators available in the Corticon Studio Vocabulary. Rulesheet and Ruletest examples are provided for many of the operators.
<i>Corticon Studio: Extensions Guide</i>	Detailed technical information about the Corticon extension framework for extended operators and service call-outs. Describes several types of operator extensions, and how to create a custom extension plug-in.
Corticon Enterprise Data Connector (EDC)	
<i>Corticon Tutorial: Using Enterprise Data Connector (EDC)</i>	Introduces Corticon's direct database access with a detailed walkthrough from development in Studio to deployment on Server. Uses Microsoft SQL Server to demonstrate database read-only and read-update functions.
Corticon Server Documentation: Deploying Rules as Decision Services	
<i>Corticon Server: Integration and Deployment Guide</i>	An in-depth, technical description of Corticon Server deployment methods, including preparation and deployment of Decision Services and Service Contracts through the Deployment Console tool. Describes JSON request syntax and REST calls. Discusses relational database concepts and implementation of the Enterprise Data Connector. Goes deep into the server to discuss state, persistence, and invocations by version or effective date. Includes troubleshooting servers through logs, server monitoring techniques, performance diagnostics, and recommendations for performance tuning.
<i>Corticon Server: Deploying Web Services with Java</i>	Details setting up an installed Corticon Server as a Web Services Server, and then deploying and exposing Decision Services as Web Services on the Progress Pacific Application Server (PAS) and other Java-based servers. Includes samples of XML and JSON requests.

<i>Corticon Server: Deploying Web Services with .NET</i>	Details setting up an installed Corticon Server as a Web Services Server, and then deploying and exposing decisions as Web Services with .NET. Includes samples of XML and JSON requests.
Corticon Server: Web Console Guide	Presents the features and functions of remote connection to a Web Console installation to enable manage Java and .NET servers in groups, manage Decision Services as applications, and monitor performance metrics of managed servers.