

# Ensemble Release Notes

Version 2007.1.2  
18 September 2007

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# 1

## Getting Started

Welcome and thank you for using Ensemble 2007.1!

This book provides important tips for getting started with the new release:

- [Installing Ensemble](#)
- [Upgrading Ensemble](#)
- [New Features](#)
- [Enhancements](#)
- [Documentation](#)
- [Known Problems](#)
- [Release History](#)

InterSystems Ensemble shares many underlying core technologies with InterSystems Caché. This book refers you to books in both documentation sets. The Caché books are particularly important as you first set up the system. After initial configuration, the Ensemble books become your primary source of information.

### 1.1 First-Time Users

For an overview of product features, see the book *Introducing Ensemble*.

To prepare to work on an Ensemble project, see the book *Getting Started with Ensemble*. It outlines development tasks and identifies sources of information.

## 1.2 Installing Ensemble

This topic describes how to install Ensemble 2007.1.

To upgrade from previous releases of Ensemble, also see the next topic, [Upgrading Ensemble](#).

If you have any questions or encounter any problems while installing Ensemble, please contact the [InterSystems Worldwide Response Center](#) for support.

### 1.2.1 Supported Platforms

To double-check the list of supported platforms, browsers, web servers, and other technologies for use with InterSystems products, see the *Ensemble Supported Platforms* book provided with the Ensemble kit.

### 1.2.2 Installation Procedures

For installation instructions, see the *Caché Installation Guide* chapters for [Windows](#), [OpenVMS](#), [UNIX](#), or [Macintosh](#). The primary difference for Ensemble is that, where the Caché installation sequence offers a choice between 8-bit and Unicode, Ensemble automatically performs a Unicode installation.

There are additional considerations as described below:

- [Licenses](#)
- [Namespaces](#)
- [OpenVMS](#)
- [UNIX](#)
- [Failover clusters](#)

### 1.2.3 Licenses

Each started job in Ensemble 2007.1 consumes one license unit; therefore, be sure to install a license key with sufficient capacity for the number of background jobs required by your production.

When you start your production, multiple “Job failed to start” errors indicate that you have installed insufficient license units, or have failed to include the license key during installation. You can enter a license key after installation. Use the instructions in the *Caché System Administration Guide*, chapter [Managing Caché Licensing](#).

If you have questions or encounter any problems in this regard, please contact the [InterSystems Worldwide Response Center](#).

## 1.2.4 Namespaces

In InterSystems products, a **namespace** is a collection of data and programs in a virtual work space. InterSystems documentation provides a great deal of information about namespaces, including the *Caché System Administration Guide*, chapter [Configuring Caché](#), topic [Configuring Data](#).

**Important:** The Ensemble installation procedure creates several namespaces for internal use by the Ensemble engine. Each of these namespaces is entirely overwritten upon reinstallation or upgrade of Ensemble: %SYS, DOCBOOK, USER, SAMPLES, ENSLIB, ENSEMBLE, and ENSDEMO. InterSystems recommends that you always create new namespaces in which to work, rather than placing custom code in any of these system-provided namespaces where it could be overwritten and lost.

Ensemble documentation frequently refers to something called an **Ensemble namespace** or an **Ensemble-enabled namespace**. This is a namespace that has the Ensemble classes loaded into it. Of the system-provided namespaces, only the following are Ensemble-enabled: ENSLIB, ENSEMBLE, and ENSDEMO. Once you have successfully installed Ensemble, any new namespace that you create is automatically Ensemble-enabled.

You can create a new namespace by using the System Management Portal **[Home] > [Configuration] > [Namespaces] > [New Namespace]** page. For instructions, see the *Caché System Administration Guide* chapter [Configuring Caché](#), topic [Configuring Data](#).

## 1.2.5 OpenVMS Considerations

If you are running the Ensemble 2007.1 server on OpenVMS, extra steps are required. The following list provides an overview. InterSystems suggests that you use the instructions in the *Caché Installation Guide* chapter [Installing Caché on OpenVMS](#). Pay special attention to the [Post-Installation Tasks](#) topic, which guides you to the additional references listed below:

- When you install the Ensemble 2007.1 server on OpenVMS, you must install an Ensemble 2007.1 client (or a server, which includes the client) on a Windows system so that you can use browser-based interfaces such as the System Management Portal, Ensemble Management Portal, BPL Visual Editor, and DTL Visual Editor.

For instructions, see the *Caché System Administration Guide* chapter [Using Caché on OpenVMS](#), topic [Accessing the System Management Portal](#).

- There is no internal or private Web server installed with Ensemble 2007.1 on OpenVMS. Therefore, in order to use the System Management Portal and the Ensemble Management Portal, you must configure an external Web server.

Follow the instructions in the *Caché Installation Guide* chapter [Installing Caché on OpenVMS](#), topic [Install Caché on a Web Server](#).

- After completing the Caché procedure, for Ensemble 2007.1 on OpenVMS you must complete configuration of the external Web server with the following steps:

- Copy all files and subdirectories found in this Ensemble server directory:

```
[ installDir . CSP . ENSEMBLE ]
```

To the physical directory on the Web server that corresponds to this virtual directory:

```
/csp/ENSEMBLE
```

- Copy all files and subdirectories found in this Ensemble server directory:

```
[ installDir . CSP . ENSDEMO ]
```

To the physical directory on the Web server that corresponds to this virtual directory:

```
/csp/ENSDEMO
```

Detailed background information about CSP, remote servers, and physical and virtual directories is available in the *Caché System Administration Guide* chapter [Connecting to Remote Servers](#), topic [Using Caché Server Pages with a Remote Web Server](#).

- Each time you create a new namespace on OpenVMS, the namespace is automatically Ensemble-enabled, but Ensemble user interfaces will not work properly in that namespace until you copy files and directories as described above for ENSEMBLE and ENSDEMO.

For each new namespace, copy from this Ensemble server directory:

```
[ installDir . CSP . newNamespace ]
```

To the physical directory on the Web server that corresponds to this virtual directory:

```
/csp/newNamespace
```

## 1.2.6 UNIX Considerations

If you are running the Ensemble 2007.1 server on UNIX, InterSystems suggests that you use the instructions in the *Caché Installation Guide* chapter [Installing Caché on UNIX and Linux](#), paying special attention to the [Post-Installation Tasks](#).

When you install the Ensemble 2007.1 server on UNIX, you must install an Ensemble 2007.1 client (or a server, which includes the client) on a Windows system so that you can use browser-based interfaces such as the Ensemble Management Portal, BPL Visual Editor, and DTL Visual Editor. For instructions, see the *Caché Installation Guide* chapter [Installing Caché on UNIX and Linux](#), topic [Install Caché Client on Windows for Development](#).

## 1.2.7 Failover Clusters

The *Caché High Availability Guide* explains how to install Ensemble 2007.1 on multiple clustered machines to provide failover capabilities in case of problems on the primary server. Chapters include:

- [Cluster Management](#)
- [Cluster Journaling](#)
- [Caché Clusters on Tru64 UNIX](#)
- [Caché and Windows Clusters](#)
- [ECP Failover](#)

## 1.3 Upgrading Ensemble

The supported upgrade path is from the released product Ensemble 4.0 or 4.0.1 to Ensemble 2007.1 only.

If you have an Ensemble version prior to 4.0, or if you have been using a field test version of Ensemble 2007.1 and you want to upgrade it to the released Ensemble 2007.1 product, contact the [InterSystems Worldwide Response Center](#) for guidance.

**WARNING!** The following files will be deleted upon upgrading Ensemble. If you want to preserve such files, export them before proceeding with the upgrade. You may reimport them to any namespace after the upgrade is complete:

- Any HL7 custom schema definitions (\*.HL7)
- Any user files in the ENSDEMO namespace
- Any user files in the packages normally reserved for Ensemble (CSPX, Demo, Ens, or EnsLib)

To upgrade an existing Ensemble 4.0 or 4.0.1 installation to Ensemble 2007.1:

1. Stop all running productions.
2. Perform exports as described in the warning above.
3. Prepare to upgrade Caché 5.2 to Caché 2007.1 as described in the *Caché Installation Guide* chapter, [Introduction](#).
4. Install Caché 2007.1 using the instructions in the appropriate platform-specific chapter of the *Caché Installation Guide*:

- [Installing Caché on Microsoft Windows](#)
- [Installing Caché on OpenVMS](#)
- [Installing Caché on UNIX and Linux](#)
- [Installing Caché on Macintosh](#)

Each chapter provides special instructions for upgrades.

5. Open a Terminal window in which to issue commands.
6. If you exported custom schemas or any other production components or classes from a previous Ensemble installation, you may now reimport them using Ensemble Studio. Be sure to import each item into the same namespace from which you exported it.
7. For each Ensemble-enabled namespace, run these commands from your Terminal session:

```
ZN "nextEnsembleNamespace"  
DO $system.OBJ.CompileAll()  
DO ##class(Ens.MessageHeader).%PurgeIndices()  
DO ##class(Ens.MessageHeader).%BuildIndices()  
DO ##class(EnsLib.HL7.Message).%PurgeIndices()  
DO ##class(EnsLib.HL7.Message).%BuildIndices()
```

These commands are required for the ENSDEMO and ENSEMBLE namespaces, and for any user-defined namespaces. They are not required for the ENSLIB namespace.

8. If you previously generated proxy classes using the Java Gateway, Web Services, or one of the Caché language bindings, regenerate them now. To generate proxy classes, see the appropriate documentation, such as:
  - [Using the Java Gateway](#)
  - [Using SOAP and Web Services with Caché](#)
  - [Using Caché Activate](#)
  - [Using C++ with Caché](#)
  - [Using Java with Caché](#)
  - [Using the Caché Managed Provider for .net](#)
  - Other books in the [Caché Language Bindings](#) set

# 2

## New Features

Ensemble 2007.1 offers the following new features since Ensemble 4.0:

- [Underlying Caché 2007.1 Features](#)
- [BPL Exception and Compensation Handling](#)
- [X12 Support](#)
- [Adapter SSL/TLS Support](#)

The next chapter describes [Enhancements](#) to existing features since Ensemble 4.0.

### 2.1 Underlying Caché 2007.1 Features

Ensemble 2007.1 runs on top of Caché 2007.1. This means that, in addition to changes in Ensemble between 4.0 and 2007.1, the new Ensemble release includes a large number of changes in the underlying Caché technologies.

IF you are upgrading from...	THEN the underlying changes resemble...
Ensemble 3.0 to Ensemble 2007.1	Caché 5.0.5 to Caché 2007.1
Ensemble 3.1 to Ensemble 2007.1	Caché 5.0.16 to Caché 2007.1
Ensemble 4.0 to Ensemble 2007.1	Caché 5.2.2 to Caché 2007.1

To learn about the Ensemble changes relating to Caché, begin with the InterSystems online documentation set called [Getting Started with Caché](#). The following books and chapters are particularly helpful when you are upgrading from previous Ensemble versions:

- [Caché Release Notes](#)
  - [New and Enhanced Features for Caché 2007.1](#)
  - [New and Enhanced Features for Caché 5.2](#)
  - [New and Enhanced Features for Caché 5.1](#)
- [Caché Upgrade Checklists](#)
  - [Caché 2007.1 Upgrade Checklist](#)
  - [Caché 5.2 Upgrade Checklist](#)
  - [Caché 5.1 Upgrade Checklist](#)

## 2.2 BPL Exception and Compensation Handling

Try/catch exception handling, as has been recently made available in Caché, is now available to BPL. The relevant new tags are <scope>, <throw>, <catch>, <catchall>, <compensate>, <compensationhandlers>, <compensationhandler>, and <faulthandlers>. The [Ensemble Business Process Language Reference](#) provides details.

In addition to the BPL schema and language support described here, support for this feature has been added to the BPL graphical editor. It now has all the required activity shapes (such as <throw> and <catch>).

## 2.3 X12 Support

Ensemble now supports the routing and transformation of ASC X12 format messages.

The American National Standards Institute (ANSI) founded the Accredited Standards Committee (ASC) X12 as a cross-industry forum to build and support electronic data exchange standards, related documents and products intended for worldwide use. Thus, X12 is the ANSI standard for Electronic Data Interchange (EDI). There are more than 300 messages defined. No X12 message type is excluded from Ensemble support, but most of the focus at InterSystems has been on the 12 messages related to HIPAA.

For full details about X12 support, see the [Ensemble X12 Development Guide](#). Chapters include:

- [How Ensemble Supports X12](#)
- [Routing and Transformation](#)

- [Elements of a Routing Production](#)
- [Viewing and Transforming Messages](#)

## 2.4 Adapter SSL/TLS Support

Ensemble now supports Secure Socket Layer (SSL) or Transport Layer Security (TLS) communication using SSL 2, SSL 3, or TLS for TCP-based adapters, including HTTP and FTP. This capability is based on the device-level SSL and TLS support introduced with Caché version 5.2.

You can create and manage SSL/TLS configurations using the System Management Portal. Choose **[Home] > [Security Management] > [SSL/TLS Configurations]**. To create a new entry, click the Create New Configuration link. The **Edit SSL/TLS Configuration** form displays. For details about this form, see the *Caché Security Administration Guide* chapter [Using SSL/TLS with Caché](#).

This Ensemble version adds an SSL/TLS configuration setting to the relevant adapters: FTP, HTTP, TCP, and SOAP. The configuration setting is called **SSLConfig**. Its value is the **Configuration Name** of an SSL/TLS configuration that has already been created using the System Management Portal. The SSLConfig string may also add a | (vertical bar) character followed by the private key password. The | character is unique because it is not allowed as part of a **Configuration Name**.



# 3

## Enhancements

Ensemble 2007.1 offers enhancements to existing features as follows:

- [BPL and XSLT](#)
- [BPL Syntax Additions](#)
- [BPL Connect Elements](#)
- [DTL Syntax Additions](#)
- [DTL Visual Editor](#)
- [Studio Assist in BPL and DTL](#)
- [Utility Functions](#)
- [Time Stamp Specifiers](#)
- [Link to System Management Portal](#)
- [Alerts in the Configuration Diagram](#)
- [Message Filter and Search](#)
- [Message Browser Indices](#)
- [Message Resend](#)
- [HL7 Routing Productions](#)
- [HL7 Routing Rules](#)
- [HL7 Search Tables](#)
- [HL7 Batch Support](#)
- [HL7 Virtual Properties in Routing Rules](#)

- [HL7 Content in Error Messages](#)
- [HL7 Pages Removed](#)
- [Maintenance Purge Page](#)
- [Trace Messages in the Event Log](#)

## 3.1 BPL and XSLT

This release provides a new activity for BPL, `<xslt>`. The purpose is to provide a convenient means of performing an XSLT transformation on a source stream of XML. Here is an example of its use:

```
<process language='objectscript' request='Ens.Request' response='Ens.Response'>
  <sequence>
    <xslt name='jamie'
          xslurl="xdata://%XML.Transformer:ExampleXSL"
          source="context.source" target="context.target">
      <annotation>Useful example to show to customers</annotation>
      <parameters>
        <parameter name="surname" value='"some value"' />
        <parameter name="firstname" value='"jamie"' />
      </parameters>
    </xslt>
  </sequence>
</process>
```

The XSL stylesheet is provided by referencing a URL. In addition to the regular 'http' and file' schemes, an additional scheme has been implemented, 'xdata', which takes the name of the class and the xdata member name delimited by a colon (see example above).

The source **MUST** be a stream containing the XML to be transformed. The target must be an object to receive the transformed XML.

XSL transformations can take parameters. This facility is provided by the `<parameters>` tag (see above). The parameters are named and have a value which will be available at run time within the transformation.

In addition to the BPL schema and language support described here, support for this feature has been added to the BPL graphical editor. It now has an `<xslt>` activity.

## 3.2 BPL Syntax Additions

`<process>` has the new attributes *contexts superclass*, *includes*, and *version*. `<sync>` has the new attribute *allowresync*. The variable *synctimeout* is now a three-valued integer (0, 1, 2), and not a Boolean value (0, 1). The [Ensemble Business Process Language Reference](#) provides details about these new features.

## 3.3 BPL Editor Connect Elements

If you select two unconnected shapes in the BPL graphical editor and right-click, you can select the **Connect Elements** option to cause the two elements to become connected sequentially in the order in which you selected them.

## 3.4 DTL Syntax Additions

Most elements within DTL now support the <annotation> sub-element. This allows you to associate a descriptive comment with a DTL element. Unlike BPL, the <annotation> text does not appear in the DTL diagram. The *Ensemble Data Transformation Language Reference* provides details.

## 3.5 DTL Visual Editor

DTL diagrams now provide the ability to scroll the source and target displays independently of each other. Simply click in the neutral background of the either column and drag the mouse up or down. The column contents follow the direction of the drag. Also, for fields in HL7 messages, the field number is now displayed in addition to the field name. For details, see *Developing Ensemble Productions*, chapter *Data Transformation, Abstraction, and Persistence*, topic *Using the DTL Visual Editor*.

## 3.6 Studio Assist in BPL and DTL

You can now use Studio Assist (word completion as you type) to assist with proper BPL and DTL syntax while editing these documents in Studio. Ensure that Studio Assist is enabled as follows. For BPL:

```
XData BPL [ XMLNamespace = "http://www.intersystems.com/bpl" ]
{
  <process>
    <!-- Your work goes here -->
  </process>
}
```

For DTL:

```
XData DTL [ XMLNamespace = "http://www.intersystems.com/dtl" ]
{
  <transform>
    <!-- Your work goes here -->
  </transform>
}
```

## 3.7 Utility Functions

This release adds the following utility functions for use in DTL data transformations and business rules:

- Matches and DoesNotMatch, for pattern matching
- Piece, Strip, and Pad, for manipulating strings
- ConvertDateTime, for converting from one [date-time format](#) to another

For full details about utility functions, see the *Developing Ensemble Productions* chapter [Creating a New Production](#), topic [Utility Functions](#).

## 3.8 Time Stamp Specifiers

If you used time stamps when configuring Ensemble adapters, business services, and business operations, you should be aware that there were significant changes to these conventions between Ensemble 3.1 and 4.0.

The current time stamp conventions include the following changes since 4.0:

- %C now indicates the century, not Caché format.
- %h is now equivalent to %b (month name). Its former meaning, 12-hour am/pm time, is now represented by %r
- %t is now a literal tab character. Its former meaning, 24-hour time of day, is now represented by %H:%M:%S
- %u(<day of week>) is now represented by %U(<day of week>).
- %u is now day of week, not week of year.
- Added these %q time format identifiers:
  - %q(0) HL7 format date and time; equivalent to %q
  - %q(3) Caché [\\$HOROLOG](#) format

- %q(4) Caché \$ZTIMESTAMP format

For full details about time stamp conventions, see the *Developing Ensemble Productions* chapter [Creating a New Production](#), topic [Time Stamps in Filenames](#).

## 3.9 Link to System Management Portal

On the Ensemble Home page, below the activity tables, there is a new link that you can click to **Return to System Management Portal**. Clicking it displays the System Management Portal **[Home]** page.

## 3.10 Alerts in the Configuration Diagram

This release improves rendering of Alerts in the Ensemble Configuration diagram. For any configuration item whose **AlertOnError** setting is set to True, the Ensemble Configuration diagram now displays a line from this item to the Ens.Alert configuration item.

**Note:** When you first change **AlertOnError** from False to True, you must refresh the diagram to view the line.

## 3.11 Message Filter and Search

The Message Browser now allows you to filter and search through the message archive based on fields in the message data. The message archive contains all messages of every type that have traveled through the currently-running production since the most recent purge. Even virtual properties can be searched, as long as you follow specific rules. You can:

- Apply basic filter criteria, such as the time of day when the message was sent.
- Apply detailed filter criteria, such as the presence of a specific field or value in the data.
- Archive a specific set of filter criteria and retrieve it for later use.
- Display a list of messages that match your filter criteria.
- View, compare, or resend the messages in the list.

There are many new options for filtering messages on the Message Browser page. For detailed instructions, see *Managing Ensemble Productions*, chapter [Message Browser](#), topic [Message Filter](#).

## 3.12 Message Browser Indices

The Ensemble Management Portal, Message Browser page has been redesigned and optimized for better performance in Ensemble 2007.1. If you are upgrading from a previous Ensemble version, these changes require you to regenerate indices as described in the topic [Upgrading Ensemble](#).

## 3.13 Message Resend

This release adds support for resending messages from the list on the Message Browser page.

Previously, the only possible resend operation was to resend messages that were in a Suspended state, listed on the Maintenance, Suspended Messages page. Now, any message that you can view in the Message Browser can be resent to the target of your choice, as long as this target is a configured member of the currently-running production. This may be a different target than the one to which the message was originally sent.

The revised Message Browser page allows you to combine filter and resend in new ways. It is now possible to resend selected messages from the list of filter results, or to resend all messages that match certain filter criteria, even if they are not visible on the current page of filter results on the Message Browser page.

Each message listed on the Message Resend page offers a checkbox that, when checked, places the resent message at the front of its target queue. This helps to preserve FIFO (first in, first out) processing when the order of messages is important.

For detailed instructions, see *Managing Ensemble Productions*, chapter [Message Browser](#), topic [Message Resend](#).

## 3.14 HL7 Routing Productions

This release offers several changes in the conventions for building HL7 message routing productions. Some configuration settings for HL7 business services and HL7 business operations have changed, and many new settings have been added. There are also several new built-in business operations and business services. The previous release offered FTP, TCP, and File. The current release adds HTTP, plus these refinements:

- Customized acknowledgement handling using the **ReplyCodeActions** setting
- Built-in business operations and business services for pass-through data over FTP or File

- Dual acknowledgement sequences over TCP or HTTP

The revised *Ensemble HL7 Version 2 Development Guide* documents these changes.

## 3.15 HL7 Routing Rules

Conventions for ordinary business rules have not changed, but conventions for message routing rules have changed. The revised *Ensemble HL7 Version 2 Development Guide* documents these changes.

Highlights are as follows:

- Previously, Ensemble found the “best match” routing rule and executed the actions associated with that rule. It was not always clear to users which of several rules would turn out to be the “best match” if there were multiple likely candidates. The current release adopts the following convention for rule matching: Ensemble begins evaluating routing rules at **Rule 1** and evaluates all of the rules in sequence until it finds the first rule that evaluates to True. It then executes all the actions associated with that rule and stops. All subsequent rules in the set are skipped.
- A new check box, **Do All Rules**, is provided in the Message Routing Rule Editor. This check box controls an exception to the new convention for rule matching. If the **Do All Rules** box is checked, Ensemble begins at **Rule 1** and evaluates *all* the rules in the rule set, in sequence. The result is that Ensemble executes the actions associated with *every* rule that evaluates to True, rather than stopping after the first True rule.
- There is further functionality based on **Do All Rules**. Previously there were two possible actions for rules: `send` or `delete`. Now the actions `stop` and `continue` are available. These provide overrides for the **Do All Rules** setting as follows:
  - If **Do All Rules** is checked, Ensemble evaluates *every* rule in the set, and all rules that are True have their actions executed. On the other hand, if any rule that is True provides an final action of `stop`, this overrides the **Do All Rules** setting and causes Ensemble to stop evaluating rules. All subsequent rules in the set are skipped.
  - If **Do All Rules** is unchecked, Ensemble stops evaluating rules after executing the actions provided by the first rule that evaluates to True. However, if the last of the actions in the rule is the new action `continue`, this overrides the **Do All Rules** setting and causes Ensemble to continue evaluating more rules, in sequence, until it finds the *next* rule that evaluates to True. After executing the actions in this rule, Ensemble stops evaluating rules.
- The name for the rule on which other rules is based is now **Base**. It was **Default**.
- Previously, only one **Target** and **Transformation** could be identified for a message routing rule. This restriction is now relaxed. You can identify multiple items in either field, separated by commas. If you use the drop-down lists to select these items, Ensemble inserts the commas in the field automatically.

## 3.16 HL7 Search Tables

A search table is a specialized tool that you need to provide if you want to use virtual properties as the basis for filter and search operations in the Message Browser, Rules Editor, and other parts of the Ensemble Management Portal.

The book *Ensemble Virtual Documents* explains that a virtual document is efficient because it contains a large amount of raw data but no instantiated properties. Creating a search table enables Ensemble to efficiently index a few of the fields in a virtual document so that these fields are available to be searched *as if* they were properties in a standard message body. The search feature is not automatically available for all virtual properties. You must enable it for specific virtual properties, by creating a search table class for your Ensemble production. This search table class contains an XML document that identifies the virtual properties that you want developers and administrators to be able to search.

For instructions and technical details, see the *Ensemble HL7 Version 2 Development Guide* chapter [Elements of a Routing Production](#), topic [Search Tables](#).

## 3.17 HL7 Batch Support

This release adds support for nested child documents in HL7. When viewed in the Ensemble Management Portal, HL7 batch messages show links to child documents from the parent document. The following HL7 batch formats are supported. The formats are described as a list of segment names:

- BHS MSH ... MSH ... BTS
- FHS MSH ... MSH ... FTS
- FHS BHS MSH ... MSH ... BTS BHS MSH ... MSH ... BTS FTS

BHS and FHS are batch header segments; BTS and FTS are batch trailer segments. Each MSH message header segment marks the beginning of a set of segments that comprise a complete HL7 message; this is a **child document**. As with regular HL7 messages, there is no message trailer segment for a child document.

There are several production settings that control HL7 batch processing. When the default settings are used:

- The HL7 business service forwards each child document in its own session; each session includes objects that represent the batch headers and trailers for the parent document.
- The HL7 business service replies with a batch document containing an ACK for each child document.

- The HL7 business operation outputs the child documents, but does not output the header and trailer objects.

For details, see the [Ensemble HL7 Version 2 Development Guide](#), chapter [Settings for a Routing Production](#), topic [HL7 Batch Messages](#).

## 3.18 HL7 Virtual Properties in Routing Rules

Business rules (including routing rules) now support an expanded set of syntax conventions for specifying virtual property paths. These conventions provide the equivalent of various method calls that are either not possible in certain contexts (business rules) or that are so frequently used in code that a shortcut is helpful. The conventions are as follows:

- Curly brackets `{segment:field}` equate to `msg.GetValueAt("segment:field")`. This returns the value of the specified virtual property. The specific message structure or document type must be known.
- Square brackets `[segment:field]` equate to `msg.FindSegmentValues("segment:field")`. This means to find values in named segments regardless of message structure. Numeric *field* identifiers must be used. If there is more than one instance of the *segment* type in the message, this syntax returns all matching values, each value enclosed in `<>` angle brackets, like this: `<a><b><c>`
- Parentheses (*multi-valued-property-path*) equate to `msg.GetValues("multi-valued-property-path")`. For example, `HL7.(NK1():1)` finds all of the multiple NK1 segments in the message. This returns all matching values, each value enclosed in `<>` angle brackets, like this: `<a><b><c>`
- Angle brackets `<context|expression>` equate to `GetXPathValues(msg.stream, "context|expression")`, a method of the rules engine. It operates on a message that contains a stream property whose contents are an XML document. The method applies an XPath expression to the XML document within the stream property, and returns all matching values. If the *context* | part of the XPath argument is missing, Ensemble searches the entire XML document. If there are multiple matching values, the returned string encloses each value in `<>` angle brackets, like this: `<a><b><c>`

As in the previous release, the current release supports curly bracket syntax in BPL, DTL, ObjectScript, business rules, search filters, and search tables. The current release adds square brackets in business rules, search filters, and search tables, plus parentheses and angle brackets in business rules only. For details and examples, see the [Ensemble HL7 Version 2 Development Guide](#), chapter [Syntax for a Routing Production](#), topic [Virtual Property Syntax](#).

## 3.19 HL7 Content in Error Messages

This release makes handling of HL7 NACKs conform to the standard business operation error, retry, and suspend conventions. It also includes the full content of the NACK message in the error, reject, and malformed ACK messages received by the TCP business operation. When a warning message is sent to the Event Log as the result of a NACK, the event log entry reports the entire text of the NACK that triggered the warning, up to the 1200 character limit for Event Log entries.

## 3.20 HL7 Pages Removed

This release removes specialized HL7 Search and HL7 Purge pages from the Ensemble Management Portal.

Now that the **[Ensemble] > [Maintenance] > [Purge]** page offers the **Include Message Bodies** option, the purge functionality in the **[Ensemble] > [Maintenance] > [Purge]** page is sufficient to purge HL7 messages. The specialized HL7 purge page has been removed.

Similarly, now that the **[Ensemble] > [Message Browser]** page offers enhanced filtering and search capabilities, its functionality encompasses the features of the former HL7 Search page. For this reason, the HL7 Search page has also been removed.

## 3.21 Maintenance Purge Page

This release provides a number of changes to the underlying functionality of the **[Ensemble] > [Maintenance] > [Purge]** page. Changes include:

- The page now uses a background job to do purges, and reports the results of the last-run purge, including a status code, or a notice if the background job is running or has failed to run.
- The algorithm for the **Keep data integrity** option now preserves all messages belonging to a session that has any incomplete messages. The algorithm considers messages to be complete if they are marked Complete, Error, Aborted or Discarded.
- When the option to **Purge message bodies** is selected, the algorithm checks that body classes exist and are persistent, before purging them. This release also fixes problems in the reporting of the number of deleted message bodies.
- This release generally improves error logging and reporting for purge operations.

The **[Ensemble] > [Maintenance] > [Purge]** and **[Ensemble] > [Event Log]** pages are now the only pages from which a purge may be performed. Other pages no longer support a partial purge, for example the Rule Log page. The HL7 Purge page no longer exists; see [HL7 Pages Removed](#)

## 3.22 Trace Messages in the Event Log

Some Trace messages have a category on which they can be filtered. This change adds that category (if present) to the user-visible display of each Trace event in the Ensemble Management Portal **[Ensemble] > [Event Log]** page.

Ensemble now logs a new Trace message with the category "rule" each time a rule is successfully executed.



# 4

## Documentation

Ensemble 2007.1 provides documentation in HTML format and in Adobe Page Description Format (PDF). The [HTML files](#) can be served up any time Ensemble is running. The [PDF files](#) can be viewed or printed as you choose. In either format, the contents are identical.

### 4.1 Documentation Changes

Ensemble 2007.1 introduces the following new books:

- *Ensemble 2007.1 Release Notes* (this book)
- *Ensemble Virtual Documents*
- *Ensemble XI2 Development Guide*
- *Using FTP Adapters with Ensemble*
- *Using HTTP Adapters with Ensemble*
- *Using SOAP and Web Services with Ensemble*
- *Using SQL Adapters with Ensemble*

Ensemble 2007.1 updates the following existing books:

- *Developing Ensemble Productions*
- *Managing Ensemble Productions*
- *Ensemble Business Process Language Reference*
- *Ensemble Data Transformation Language Reference*

- [Ensemble HL7 Version 2 Development Guide](#)

This book has seen significant development since the previous release. It now includes a new chapter, [Design Model for a Routing Production](#), which describes a sample implementation strategy for an Ensemble message routing production. This chapter suggests best practices, such as naming conventions, and describes how to rephrase your existing knowledge about the information system in Ensemble terms.


This book also now includes the contents of these deleted books:

- [Ensemble HL7v2 User Interface Guide](#)
- [Ensemble HL7v2 Technical Reference](#)
- [Ensemble HL7 Version 3 Development Guide](#)
- [Using TCP Adapters with Ensemble](#)
- [Using File Adapters with Ensemble](#)

## 4.2 Online Documentation

When the local Ensemble server is online, it serves documentation in HTML format via a Web browser. The online documentation system gives access to information about core InterSystems technologies and the InterSystems products Ensemble and Caché.



You can access the online documentation in any of the following ways:

- Find the  Ensemble cube in the Windows system tray. Click on it to display the Ensemble cube menu. If Ensemble is stopped, start it. Then choose **Documentation** from the menu.
- Entering the following URL into a browser page on the local Ensemble system, where 57772 is the port number for which your Ensemble server is configured:

```
http://localhost:57772/csp/docbook/DocBook.csp
```

- When running Ensemble Studio, choose the **Help** menu **On-line Documentation** option.

The online documentation home page lists information organized by topic and provides navigational aids that you can use to find information easily. For example:

Link or Icon	Purpose
	View an alphabetical index of topics
	Perform a keyword search across the entire formal documentation set
<i>Class Reference Information</i>	View class documentation

## 4.3 Printed Documentation

InterSystems strongly recommends that if you want printed documentation, you *do not* print HTML pages from the browser, but instead take advantage of the pre-formatted PDF files, whose content is identical to the HTML.

### 4.3.1 Ensemble Documentation

The PDF files for Ensemble books are found in a subdirectory under the directory where you installed Ensemble, usually C:\InterSystems\Ensemble\Docs\Ensemble\\*.pdf or similar.

### 4.3.2 Other InterSystems Documentation

Other InterSystems documents that appear in the Ensemble online documentation set are also available in PDF format. If you discover there is an InterSystems document that you want, and that does not appear in your Ensemble kit, contact the [InterSystems Worldwide Response Center](#).



# 5

## Adapter Library

Ensemble 2007.1 provides the following built-in adapters:

### **Email**

Receives email messages via POP3 and sends email messages via the Simple Mail Transfer Protocol (SMTP).

### **File**

Reads and writes files on the local network. Able to open, create, delete, modify, and move files. File content can be characters or binary data.

### **FTP**

Receives and sends files between local and remote systems via the File Transfer Protocol (FTP). File content can be characters or binary data.

### **HL7**

Receives and sends messages in the HL7 data format, which is often used to hold patient data for medical systems.

### **HTTP**

Provides an HTTP listener for custom port listening, XML listening, or raw HTML handling. Supports the standard HTTP operations Post, Get, and Put. Allows the use of proxy servers.

### **iWay**

The iWay XTE server is the gateway to more than 250 different adapters that connect Ensemble with diverse enterprise application and database systems and data formats. Ensemble provides three adapters for use with the iWay XTE server:

- The iWay adapter sends application service requests to external systems via an iWay XTE server that is listening on a TCP port. The iWay adapter handles inbound service requests from external systems by acting as a TCP listener for an XTE server.
- The iWay.DSN adapter sends database service (DSN) requests to external systems via an iWay XTE server that is listening on a TCP port.
- The iWay.IBO adapter sends iWay Business Object (IBO) invocation requests to an iWay XTE server that is listening on a TCP port.

### **LDAP**

The outbound LDAP adapter can send requests to an LDAP server and receive responses.

### **MQSeries**

Receives and sends messages in IBM WebSphere MQ (MQ Series) format. Message content can be a specific data type or a binary data stream. The adapter can simply send the message, or send it and then pull the corresponding response from the message queue.

### **MSMQ**

Receives and sends messages in Microsoft Message Queue (MSMQ) format. Message content can be a specific data type or a binary data stream.

### **PeopleSoft**

Sends requests to the iWay adapter for PeopleSoft and returns responses.

### **Pipe**

Able to execute a shell command and communicate with it via pipes. Capable of handling character data or a binary data stream.

### **SAP**

Sends requests to the iWay adapter for SAP and returns responses.

### **Siebel**

A subclass of the HTTP adapter that sends requests to a Siebel server and returns responses.

### **SOAP**

Listens for SOAP requests on a local TCP port or via a standard Web Server. Dispatches outbound requests by acting as a SOAP client to an external SOAP server.

**SQL**

Executes SQL statements against a remote database via an ODBC-defined Data Source Name (DSN).

**TCP**

Manages an incoming or outgoing TCP connection. Allows simultaneous handling of multiple connections. Supports character and binary data streams, and counted data blocks.

**Telnet**

Directly initiates and manages a Telnet connection. Uses a lower level interface than the iWay Telnet adapter.

**TN3270**

Initiates a Telnet connection via the iWay 3270/5250 Telnet adapter. Also known as a “screen-scraping” adapter for interactions with character-based terminals.



# 6

## Known Problems

To avoid problems during an upgrade to Ensemble 2007.1 from a previous Ensemble version, carefully follow the instructions in the following topics, which appear at the beginning of this book:

- [Installing Ensemble](#)
- [Upgrading Ensemble](#)

The HL7 schema definitions loaded into Ensemble were generated directly from the respective standards (HL7 2.1, 2.2, 2.3, 2.3.1, 2.4, and 2.5). They faithfully replicate any errors, omissions, or discrepancies that exist in these standards as published by the Health Level Seven organization.

There is one exception to this rule: In the HL7 2.3.1 standard, the data structure XCN is the “extended composite ID number and name for persons.” The standard leaves XCN field 3 undefined by mistake. The Ensemble schema definition for HL7 2.3.1 corrects this so that XCN field 3 is correctly identified as “given name.”

**Important:** For an updated list of known problems in this release, contact the [InterSystems Worldwide Response Center](#).



# 7

## Release History

The Ensemble product was developed to meet the need for a comprehensive, high-performance enterprise application and data integration platform with tightly integrated development, management, and supervisory tools.

A brief history of Ensemble releases is outlined below. If you are viewing this document online, you can display a description of a feature by clicking on its name in the list.

### 7.1 Ensemble 1.0

Ensemble 1.0 was released to InterSystems customers in 2002.

This release introduced the following features:

- Application Integration
- Data Integration
- Data Abstraction
- Persistence Engine
- Storage Engine
- SQL Gateway
- Studio

## 7.2 Ensemble 2.0

Ensemble 2.0 was released to InterSystems customers in August 2003.

This release enhanced existing features and introduced the following new features:

- Universal Services Architecture
- Business Hosts
- Messaging Engine
- Adapter Library
- Business Process Language
- Data Transformation Language
- Management Portal
- Message Visual Trace
- Code Generation Wizards
- BPL Visual Editor
- DTL Visual Editor
- Event Log
- Monitoring Service
- Testing Service
- Documentation
- Sample Code

## 7.3 Ensemble 2.1

Ensemble 2.1 was released to InterSystems customers in November 2003.

This release enhanced the following existing features:

- Business Process Language
- BPL Visual Editor
- Management Portal

- 
- [Adapter Library](#)

## 7.4 Ensemble 3.0

Ensemble 3.0, November 2004, was the first public release of Ensemble.

The essentials of the release are described in *Introducing Ensemble*

Ensemble 3.0 introduced the following new features:

- Business Activity Monitoring — see *Using Dashboards with Ensemble*
- Workflow Management — see *Using Workflow with Ensemble*
- Business Rules — see *Using Business Rules with Ensemble*
- Java Gateway — see *Using the Java Gateway*

Ensemble 3.0 enhanced the following existing features:

- Business Hosts
- Business Process Language
- BPL Visual Editor
- Management Portal

## 7.5 Ensemble 3.1

Ensemble 3.1 was released in April 2006.

Ensemble 3.1 introduced the following new features:

- HL7 Support — see the *Ensemble HL7 Version 2 Development Guide* and *Ensemble HL7 Version 3 Development Guide*.

Ensemble 3.1 offered the following major enhancements:

- Message Contents
- How Data is Purged
- Business Process Context
- Business Process Actor Pools

- Business Hosts
- Ensemble Management Portal
- Configuration Page
- Dashboards
- Business Rules
- Java Gateway
- DTL Visual Editor
- DTL Syntax
- BPL Visual Editor
- BPL Syntax
- Adapters
- Workflow

## 7.6 Ensemble 4.0

Ensemble 4.0 was released in June 2006.

Ensemble 4.0 introduced the following new features:

- Caché 5.2 underlying technologies

Ensemble 4.0 offered enhancements to the following features:

- Namespaces
- Default Login
- Command Line
- Management Portals
- BPL Syntax
- BPL Visual Editor
- BPL Components
- Utility Functions
- DTL Visual Editor

- Adapters

