



Ensemble Release Notes

Version 2010.2
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About This Book

Welcome and thank you for using Ensemble 2010.2.

This book describes the contents of this release of Ensemble and provides important tips for getting started. It contains the following chapters:

- [New Features](#)
- [Enhancements](#)
- [Known Issues](#)
- [Upgrade Compatibility Issues](#)
- [Upgrading Ensemble](#)
- [Installing Ensemble](#)
- [Adapter Library](#)
- [Release History](#)

There is also a detailed [Table of Contents](#).

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. The following books are the best places to start if you are new to Ensemble:

- [Introducing Ensemble](#) provides an overview of product features.
- [Ensemble Best Practices](#) describes best practices for designing, developing, and maintaining Ensemble productions.

For general information, see *Using InterSystems Documentation*.

1

New Features

Ensemble 2010.2 offers the following new features since Ensemble 2010.1:

- [DICOM Support](#)
- [Enterprise Monitor](#)
- [Enterprise Message Bank](#)
- [SFTP Support](#)
- [Ensemble and Mirroring](#)
- [Caché 2010.2 Features](#)

The next chapter, “[Enhancements](#),” describes changes in existing features since Ensemble 2010.1.

1.1 DICOM Support

Ensemble now provides support for the Digital Imaging and Communications in Medicine standard (DICOM). DICOM is a global information technology standard used in most hospitals worldwide. It is designed to ensure the interoperability of systems used to produce, store, display, process, send, retrieve, query, or print medical images and derived structured documents as well as to manage related workflow.

The DICOM standard is a product of the DICOM Standards Committee and its many international working groups. It is managed by the Medical Imaging & Technology Alliance, a division of the National Electrical Manufacturers Association (NEMA). For more information visit the organization’s web site at <http://dicom.nema.org/>.

Ensemble provides a bidirectional DICOM adapter to allow your production to receive DICOM messages and route them to and from modalities that understand the DICOM protocol.

Ensemble supports DICOM by providing a suite of built-in adapter, business service, and business operation classes that are specially designed to assist DICOM communications. These classes expose easy-to-configure settings that you can adjust to rapidly construct DICOM interfaces for Ensemble productions. Ensemble also provides a maintenance facility for defining associations critical to communicating with DICOM modalities.

See the [Ensemble DICOM Development Guide](#) for details.

1.2 Enterprise Monitor

This release of Ensemble provides access to the Enterprise Monitor which you can configure to monitor multiple Ensemble instances (local and remote) from a centralized location. Here you can see a list of monitored clients, browse the message bank, and perform a search of HL7 messages stored from the monitored clients. You can also interface with each instance of Ensemble that you are monitoring.

The following default URI provides access to the Enterprise Monitor:

<http://localhost:57772/csp/ensemble/Ens.Enterprise.Portal.MonitorStatus.cls>

The **Ensemble Enterprise Monitor** home page allows you to enter a list of server names and addresses that you are interested in monitoring and provides links to the following pages:

- **[Ensemble] > [Maintenance] > [Enterprise Message Bank]** — Client Systems List Manager, which shows the status of the listed systems
- **[Enterprise Status Monitor] > [Enterprise HL7 Message Browser]** — Multi Client HL7 Search, which allows you to query for HL7 messages across those systems.
- **[Enterprise Status Monitor] > [Message Bank Messages]** — Message Bank Browser, which the [following section](#) describes in more detail.

You must run the Enterprise Monitor on a separate machine or at least in a separate namespace from the monitored productions. However, there are links from the Enterprise Monitor status list to the management pages of the various Ensemble systems you are monitoring.

See the `Ens.Enterprise` package entry in the *InterSystems Class Reference* for details.

1.3 Enterprise Message Bank

This release of Ensemble introduces the Enterprise Message Bank — a remote archiving facility that acts as a central repository for messages gathered from multiple Ensemble clients. It is one of the functions of the Enterprise Monitor.

You access the message bank from the **Enterprise Message Bank** item on the **Maintenance** menu of the Ensemble Management Portal. This item also gives you access to the rest of the Enterprise Monitor.

The message bank can be used by multiple Ensemble clients. It comprises a client operation that can be added to any Ensemble production and configured with the address of a message bank server, and the message bank server (`Ens.Enterprise.MsgBank.Production`), which is a simple Ensemble production that consists of a message bank service (`Ens.Enterprise.MsgBank.TCPService`) that listens for submissions from any number of client productions.

The Message Bank production is for receiving and collating message bank submissions from one or more client Ensemble namespaces and for maintaining a local repository of production status information about each client namespace, for display on the Enterprise Monitor page.

See the [Enterprise Message Bank](#) section of the “Maintenance” chapter of *Managing Ensemble Productions* for more information.

1.4 SFTP Support

This release of Ensemble adds support for the SSH File Transfer Protocol (SFTP) as part of the FTP adapter framework for inbound and outbound transfers.

The `EnsLib.FTP.InboundAdapter` and `EnsLib.FTP.OutboundAdapter` classes now contain the following properties exposed as configuration settings on the **[Ensemble] > [Productions] > [Configuration]** page in the Ensemble Management Portal.

Property / Configuration setting	Description
<code>SFTPPrivateKeyFile</code>	File path to a file containing the SSH private key certificate
<code>SFTPPublicKeyFile</code>	File path to a file containing the SSH public key certificate

To use the SFTP mode enter `!SFTP` as the value for the existing **SSL Config** setting. For more information, see the description of the `SSLConfig` property in the following entries in the *InterSystems Class Reference*:

- `EnsLib.FTP.InboundAdapter`
- `EnsLib.FTP.OutboundAdapter`

Also see the [SFTP Mode Lacks FileSpec Support in FTP Inbound Adapter](#) section for a description of a known issue with this implementation.

1.5 Ensemble and Mirroring

With Ensemble 2010.2, InterSystems introduces mirroring technology. For general information about this high availability feature, see the “Mirroring” chapter of the *Caché High Availability Guide*.

Internally, Ensemble prevents a production from starting on a backup mirror member. If you try to manually start a production on a mirror member that is not the primary, Ensemble reports errors in the `cconsole.log`.

1.6 Caché 2010.2 Features

Ensemble 2010.2 runs on top of Caché 2010.2. This means that, in addition to changes in Ensemble between 2010.1 and 2010.2, the new Ensemble release includes a large number of updates in the underlying Caché technologies.

To learn about the Caché changes that may relate to your Ensemble environment, begin with the InterSystems online documentation set called *Getting Started with Caché*. The “New and Enhanced Features for Caché 2010.2” chapter of the *Caché Release Notes* contains details of the Caché 2010.2 features.

If you are upgrading, see the “[Upgrading Ensemble](#)” chapter of this guide for a list of additional Caché resources to reference.

2

Enhancements

Ensemble 2010.2 offers enhancements to existing features as follows:

- [Visual Trace](#)
- [Improved HL7 and X12 Host Wizards](#)
- [Large Object \(LOB\) Support of Input Parameters for the SQL Outbound Adapter](#)
- [SSL/TLS Support on Inbound \(POP3\) and Outbound \(SMTP\) Email Adapters](#)
- [Additional Configuration Settings for Inbound Adapters](#)
- [Documentation Updates](#)

2.1 Visual Trace

This release contains an enhanced visual trace of a message through Ensemble; you can optionally include entries in the Ensemble I/O archive and ACK messages for EDI documents sent over the wire, even if these are not part of an Ensemble message sent between Ensemble business hosts.

The I/O log entries are enabled by default, but you can disable them using the search filters as you do for Event Log entries. Ensemble creates I/O log entries if **Archive IO** is True for business services or business operations.

By default, most virtual document operations (those inherited from `EnsLib.HL7.Operation.ReplyStandard`, for example) save acknowledgement messages if they are query results or errors. By subclassing these operations, you can save all ACKs by overriding the `SaveOKACKs` parameter and setting it to 1. Operations also save acknowledgement messages if **Archive IO** is True and you provide a value for **Search Table Class**, or if the acknowledgement messages are enqueued back to the item that invoked the operation.

By default, most virtual document services (those inherited from `EnsLib.HL7.Service.Standard`, for example) save acknowledgement messages if **Archive IO** is True or if it receives the acknowledgement messages from some other item that the service invoked. You can save all EDI ACKs by subclassing the service class and setting the `IndexReplies` parameter to 1 and specifying a value for **Search Table Class**. In the case of HL7 messages the `IndexReplies` parameter works in conjunction with the `IndexACKs` parameter, and ACKs which have not come from another component, or are not archived by **Archive IO**, are only saved and indexed if the `IndexACKs` parameter is also set to 1.

Note: The trace does not currently display ASTM ACK messages and responses in the diagram.

With proper **Archive IO** settings on business service and business operation components ACKs and NAKs now appear in message traces as directional arrows at either end of the trace from which associated content displays.

See the [Visual Trace](#) section of the “Message Browser” chapter of *Managing Ensemble Productions* for details.

2.2 Improved HL7 and X12 Host Wizards

This release of Ensemble contains enhanced wizards for adding new business services and business operations to a production for HL7 or X12, which make them easier to configure. For business services, the wizard now provides the options to automatically create a dedicated message router for this business service, in line with the recommendations in the [Ensemble Best Practices](#) guide.

2.3 Large Object (LOB) Support of Input Parameters for the SQL Outbound Adapter

This release adds support for large objects as input parameters to the SQL outbound adapter. When invoking an UPDATE or a stored procedure query, it is now possible to pass a Stream object in place of a literal string value.

2.4 SSL/TLS Support on Inbound (POP3) and Outbound (SMTP) Email Adapters

This release adds support for using SSL/TLS connections on both inbound and outbound email adapters. It provides this by adding SSLConfig as a SETTINGS property in both the EnsLib.Email.InboundAdapter and EnsLib.Email.OutboundAdapter classes.

It also implicitly adds a STARTTLS enabled/disabled flag; this is handled within the SSLConfig value rather than giving STARTTLS a field of its own. If you append an asterisk (*) to SSLConfig it enables STARTTLS and if you do not, it disables STARTTLS (the default). This aligns with a similar syntax convention used for similar reasons in FTP adapters. As a result, the default port numbers for the **POP3 Port** and **SMTP Port** settings no longer display. The default port used depends on the value of STARTTLS. Since this is determined by a value in another field, not the port field, Ensemble cannot determine which default to display in the port field, so it displays nothing by default.

For details, see the following sections in *Using Email Adapters with Ensemble*:

- [Specifying How to Log into a POP3 Server](#) in the “Using the Email Inbound Adapter” chapter.
- [Specifying How to Log Into the SMTP Server](#) in the “Using the Email Outbound Adapter” chapter.

2.5 Additional Configuration Settings for Inbound Adapters

The EnsLib.File.InboundAdapter and EnsLib.FTP.InboundAdapter classes now contain the following properties exposed as configuration settings on the **[Ensemble] > [Productions] > [Configuration]** page in the Ensemble Management Portal.

Property	Description
ConfirmComplete	Indicates what special measures Ensemble takes to confirm complete receipt of a file. The options differ for the file and FTP adapters; see the individual class reference entries for details.
SubdirectoryLevels	Number of levels of subdirectory depth under the File Path directory that should be searched for files matching the File Spec pattern.

See the following entries in the *InterSystems Class Reference* for more information:

- [EnsLib.File.InboundAdapter](#)
- [EnsLib.FTP.InboundAdapter](#)

For configuration details, see the following sections:

- [Adapter Settings for the Business Service](#) in the “File Inbound Adapter” chapter of *Using File Adapters with Ensemble*.
- [Adapter Settings for the Business Service](#) in the “FTP Inbound Adapter” chapter of *Using FTP Adapters with Ensemble*.

2.6 Documentation Updates

Ensemble 2010.2 introduces the following new books:

- [Ensemble 2010.2 Release Notes](#) (this book)
- [Ensemble DICOM Development Guide](#)

Ensemble 2010.2 offers significant updates to the following books:

- [Managing Ensemble Productions](#)
 - New section for [Enterprise Message Bank](#) added to “Maintenance” chapter
 - Minor corrections and updates to several topics
- [Developing Ensemble Productions](#)
 - Updates to the [Pool Size](#) section of the “Production Concepts” chapter
 - Updates to the wizard descriptions to reflect additional wizard processing
 - Minor corrections and updates to several topics

Ensemble 2010.2 contains a renamed book:

- [Using SOAP and Web Services with Ensemble](#) is now named [Creating Web Services and Web Clients with Ensemble](#)

Ensemble 2010.2 offers minor corrections and updates to the following books:

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

- [*Ensemble Best Practices*](#)
- [*Using SQL Adapters with Ensemble*](#)
- [*Using TCP Adapters with Ensemble*](#)
- [*Ensemble X12 Development Guide*](#)

3

Known Issues

Review the following issues carefully to determine if they affect your system:

- [“Upgrade Compatibility Issues”](#) described in the next chapter.
- [SFTP Mode Lacks FileSpec Support in FTP Inbound Adapter](#)
- [Storage Definition of Search Tables Changes on Upgrade](#)
- [Message Browser Search With TimeCreated Property](#)
- [Business Rule Export and Import](#)
- [HL7 Schema Errors](#)

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

3.1 SFTP Mode Lacks FileSpec Support in FTP Inbound Adapter

The current implementation of SSH File Transfer Protocol (SFTP) mode on the FTP inbound adapter does not support the FileSpec property.

To use the SFTP mode enter `!SFTP` as the value for the existing **SSL Config** setting. For more information, see the description of the `EnsLib.FTP.InboundAdapter` class in the *InterSystems Class Reference*.

3.2 Storage Definition of Search Tables Changes on Upgrade

The Ensemble upgrade process overwrites the storage definition of search tables and it is possible that when you compile the search tables, the generated storage definition will be different. To guard against this, if you have customized search tables, export the storage definitions before upgrading and import them again after the upgrade.

Before the upgrade, from any Ensemble enabled namespace, export the following two globals:

- `^Ens.Config.SearchTablePropD`
- `^Ens.Config.SearchTablePropI`

After the upgrade and before recompiling all your classes, **Kill** these two globals and import them from the exported copy.

Recompile any standard search table applicable to the protocols used at your site:

- `EnsLib.EDI.X12.SearchTable`
- `EnsLib.HL7.SearchTable`
- `EnsLib.EDI.EDIFACT.Document`
- `EnsLib.EDI.ASTM.SearchTable`
- `EnsLib.XML.SearchTable`

If you have not developed any custom search tables, you do not need to take any action. If you complete the upgrade without saving the old storage definition, values in the search tables may be incorrect. You can correct this by rebuilding the search tables. For each search table, perform the following:

```
Set sc=##class(EnsLib.HL7.SearchTable).BuildIndex()
```

See the `EnsLib.HL7.SearchTable` entry in the *Class Reference* for details.

Note: Running the `EnsLib.HL7.SearchTable.BuildIndex()` class method generates journal entries and could take time. You can run it while messages are processing and you can run it in batches specifying a start and end ID. You do not need to include messages processed since the upgrade.

3.3 Message Browser Search With TimeCreated Property

When using the message browser after an upgrade and specifying a **Start Time**, exact matches against the start time are not shown in some circumstances. If the time you enter would end in one or more trailing zeroes when the seconds are expressed to three decimal places and there is a message created before upgrading at that exact time, that message is not included in the search result.

For example, Ensemble creates a message prior to the upgrade at `2009-12-02 15:16:44.710`. After the upgrade, if you enter `2009-12-02 15:16:44.710` or `2009-12-02 15:16:44.71` as the **Start Time** in your search criteria, the message is not found. To work around this issue, widen the search time slightly to `2009-12-02 15:16:44.709`.

You could resolve the problem by rebuilding the `TimeCreated` index of the `Ens.MessageHeader` class, but InterSystems does not recommend this for most customers. It requires the system to be idle during the rebuild, which can take several hours for message warehouses with 100 million messages. Since most searches are for recent messages, this is expected to only present a problem for a short period after upgrading. Similar behavior exists when using SQL searches against the `Ens.MessageHeader` class. This issue also exists in Ensemble release 2009.1.

3.4 Business Rule Export and Import

InterSystems has identified a known problem with the Xerces parser version used in the current and past releases for Ensemble. The symptom related to Ensemble business rules is that Ensemble wrongly reports errors when importing a previously exported production from an XML file. The symptom occurs only when the XML file contains definitions of general business rules that define “assign” actions in addition to simply returning a result.

There are two techniques for working around this problem. One makes import simple and places the burden on the person exporting the production. The other makes export simple and places the burden on the person importing the production. You only need to use one of the following equally effective techniques:

Import

Use the following approach to facilitate the import task:

1. Find each general business rule that defines “assign” actions in addition to returning a result.
2. Export each of these rules to a separate file. Make sure you are exporting one rule per file.
3. Export everything else in the production, including other rules, to a different file.
4. Import (and compile) each of the exported files individually.

Export

Use the following approach to facilitate the export task:

1. Export everything to one file.
2. Upon Import, do not use Studio. Instead, start Terminal, change to the namespace where you need to import, and enter one of the following commands (either works):

```
do $system.OBJ.Load("C:\MyDir\MyFile.xml", "-i")

do $system.OBJ.Load("C:\MyDir\MyFile.xml", "/checkschem=0")
```

3.5 HL7 Schema Errors

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, 2.5, 2.5.1, and 2.6). They replicate any errors, omissions, or discrepancies that exist in these standards as published by the Health Level Seven organization. There are a few known exceptions, as follows:

- 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.”
- In the HL7 2.5, 2.5.1, and 2.6 standards, the segment structure SUR_P09 refers to undefined segment type ED. The Ensemble schema definitions correct this by renaming the reference to type ED1 and defining a segment type ED1 that contains one field named “Data” with data structure type ED.
- In the HL7 2.3 standard, the ADT_A37 message type contains the incorrect message structure of ADT_A37 which does not exist in this HL7 version. The Ensemble schema definition for HL7 2.3 corrects the message structure to ADT_A24. In later HL7 versions there is a message structure ADT_A37 so no correction is necessary.
- In the HL7 2.4 standard, the OBR segment structure contains mislabeled data structures in Field 15; namely there are CE data structures that have their code table number appended to them (CE0070, for example). The Ensemble schema definition for HL7 2.4 changes the data structures named CE0070, CE0163, and CE0369 to CE.

4

Upgrade Compatibility Issues

Before upgrading Ensemble, first review the product changes in this release that could affect the operation of your existing system. The following sections list the compatibility issues for this and previous releases of Ensemble. In addition to the issues in this release, be sure to also review the issues for each intervening release since you last installed Ensemble:

- [Compatibility Issues for Upgrades to Ensemble \(this release\)](#)
- [Compatibility Issues for Upgrades to Ensemble 2010.1](#)
- [Compatibility Issues for Upgrades to Ensemble 2009.1](#)
- [Compatibility Issues for Upgrades to Ensemble 2008.2](#)
- [Compatibility Issues for Upgrades to Ensemble 2008.1](#)

The following releases did not include compatibility issues specific to Ensemble; therefore, you need only review the Caché documentation:

- *Caché 2007.1 Upgrade Checklist*
- *Caché 5.2 Upgrade Checklist*

4.1 Compatibility Issues for Upgrades to Ensemble (this release)

The following changes in this release may affect the operation of your existing system. Review the following issues before upgrading a previous instance of Ensemble:

- [Remove Support for HL7v2 Framing with XML Text](#)
- [Update Error Handling on HTTP Outbound Adapter](#)
- [Update Error Processing in File Outbound Adapter](#)
- [Change Return Status on HTTP Inbound Adapter](#)
- [Add Requirement to Subclass Message Bank Production](#)
- [Update Disable Behavior of Business Processes](#)

Also review the *Caché 2010.2 Upgrade Checklist*.

4.1.1 Remove Support for HL7v2 Framing with XML Text

This release of Ensemble removes support for all HL7 framing options that involve XML text being detected or generated in between successive HL7 message bodies in an HL7 data stream. This is an undocumented feature InterSystems believes no one is using. If you are using any of these options, contact the [InterSystems Worldwide Response Center](#).

4.1.2 Update Error Handling on HTTP Outbound Adapter

This release of Ensemble updates HTTP outbound adapter processing to return an error status code (`<Ens>ErrHTTPStatus`) if the HTTP status it receives is something other than 200 (OK). Also, the adapter now sets the retry flag if it receives a status of 503 (Service unavailable due to a temporary overloading or maintenance of the server). The introduction of the new status code makes error handling more accessible to the **Reply Code Actions** setting feature. See the [Reply Code Actions Setting](#) section of the “Configuration” chapter of *Managing Ensemble Productions* for details.

This change also updates the HL7 HTTP outbound adapter to return the indicated ACK commit code according to the HTTP status conditions shown in the following table.

ACK commit code	HTTP status condition
AA	200 — OK code
AR	503 — Service Unavailable due to a temporary overloading or maintenance of the server
AE	All other non-OK codes

See the [HL7 ACK Configuration Settings for a Business Operation](#) section of the “Settings for a Routing Production” chapter of *Ensemble HL7 Version 2 Development Guide* for more information.

If you have code that expects a `$$$OK` status returned from methods of the HTTP outbound adapter even when the remote HTTP server returns a non-OK status, you may need to update the code to either change the error handling or configure the **Reply Code Actions** setting to recognize the new error code.

4.1.3 Update Error Processing in File Outbound Adapter

This release of Ensemble improves the error status checking and error trapping in the `PutStream()` method of the `EnsLib.File.OutboundAdapter`.

4.1.4 Change Return Status on HTTP Inbound Adapter

This release of Ensemble changes the HTTP inbound adapter return status to a server error instead of OK if the `ProcessInput()` method returns an error status.

If you have clients invoking an Ensemble service that uses the HTTP inbound adapter you may now see an HTTP error status code (500) when an error occurs in the Ensemble service, when formerly you saw an HTTP OK (200) status. This does not disrupt normal operation because it only affects behavior when the HTTP service fails. Additionally, Ensemble still returns its non-standard `<error>` block body. It is unlikely that your service has customized behavior based on this returned status; however, this change may trigger a different code path in your error handler and therefore you should review this code.

4.1.5 Add Requirement to Subclass Message Bank Production

This release of Ensemble changes the `Ens.Enterprise.MsgBank.Production` class to be an abstract class and adds a requirement that you must subclass it and copy the `ProductionDefinition` XData block, to run a Message Bank instance. This allows you to run multiple message banks in separate namespaces on the same instance, and it prevents future upgrades from deleting your configuration setting changes. It also removes an obstacle to allowing you to mark your ENSLIB database as read-only.

If you are an early adopter of the Message Bank from a previous release, you must copy your Message Bank production class (`Ens.Enterprise.MsgBank.Production`) to a subclass before upgrading. If you do not, the upgrade will overlay your configuration changes, and will not allow you to restart the common Message Bank production or reapply your configuration settings.

4.1.6 Update Disable Behavior of Business Processes

This release of Ensemble refines the behavior of disabling a business process. The behavior depends on the private **Pool Size** configuration setting of the business process:

- **Business process Pool Size > 0:**

The business process only uses jobs from its private pool; you can disable just this process by clearing the **Enabled** check box on the configuration page of the business process.

- **Business process Pool Size = 0:**

The business process shares the public actor pool job queue (**Actor Pool Size**) with all other business processes with a **Pool Size** = 0. Disabling one such business process, disables the `Ens.Actor` queue, effectively disabling all business processes that use the actor pool. If you clear the **Enabled** check box of a business process that has a **Pool Size** = 0, you receive the following message:

```
WARNING: 'Enabled' is not checked and 'PoolSize' is 0. If you save these
settings, the Ens.Actor shared actor queue will become disabled,
effectively disabling all other business processes that also use the shared
queue. If this is not what you want, you can still disable this business
process, but first set 'PoolSize' > 0 so that this business process uses its
own dedicated queue. Then you can safely disable it.
```

```
Are you sure you want to disable all business processes?
```

If you upgrade to this release and your production contains a business process with **Pool Size** = 0, disabling the process now has different behavior.

For a detailed discussion of pool sizes, see the “[Pool Size](#)” section in the “Production Concepts” chapter of *Developing Ensemble Productions*.

4.2 Compatibility Issues for Upgrades to Ensemble 2010.1

The following changes in the 2010.1 release may affect the operation of your existing system. Review the following issues before upgrading a previous instance of Ensemble:

- [Relocate RemoveItem\(\) Configuration Method](#)
- [Add Configuration Setting on TCP Outbound Adapter](#)
- [Correct Type Node in HL7 Sequence Manager Global](#)
- [Correct Behavior of HL7 Configuration Framing Setting](#)

- [Add Support for Legacy FTPS Protocol to FTP Adapters](#)
- [Changes in Mapping of Custom Schemas](#)

Also review the *Caché 2010.1 Upgrade Checklist*.

4.2.1 Relocate RemoveItem() Configuration Method

In this release, Ensemble moves the **RemoveItem()** method from the `CSPX.EnsConfigProperty` class to the `Ens.Config.Production` class; it is now available for general use and not exclusively from the Ensemble Management Portal configuration page.

Calls to the undocumented **CSPX.EnsConfigProperty.RemoveItem()** method in your code, receive a <METHOD NOT FOUND> error. In the unlikely event you use this method, update your code to now use the **Ens.Config.Production.RemoveItem()** method. Instead of passing your production object as an argument, the new method is an instance method of your production object.

4.2.2 Add Configuration Setting on TCP Counted Outbound Adapter

This release adds a new `FlushBeforeSend` configuration setting to the TCP Counted Outbound Adapter. When set to `True`, this option causes the **SendMessageStream()** adapter method to do a zero-timeout read of all data pending in the inbound TCP buffer before writing its outbound data and optionally reading any subsequent returning data.

If you had implemented a block protocol using the TCP Counted Outbound Adapter in previous releases of Ensemble, you must override the default setting.

4.2.3 Correct Type Node in HL7 Sequence Manager Global

In previous releases, the Type subscript `^EnsHL7.SM("output",type)` incorrectly used `PerformOutputTransformationOn`. The class documentation for `EnsLib.HL7.SM.RuntimeData` has been updated. See the entry in the *Class Reference* for details.

Existing applications will encounter problems if they have `PerformOutputTransformationOn` set to `SequenceNumberOnly`. If so, and you want to keep the existing output sequence number, perform the following:

```
Merge ^EnsLib.SM("output", "Sender") = ^EnsLib.SM("output", "SequenceNumberOnly")
```

Also verify that your `PerformOutputTransformationOn` and `OutputSequenceNumberIndexField` are consistent.

4.2.4 Correct Behavior of HL7 Configuration Framing Setting

This release corrects the behavior of HL7 business services and business operations when you configure the *Framing* setting to have a value of `None`. This value now results in no framing characters being generated between HL7 messages as opposed to the previous behavior that used whatever framing was declared as the default in the relevant context.

Productions configured with `Framing=None` for various configuration items may be experiencing incorrect framing behavior that works in your context. This change corrects the behavior which may cause your production to stop working. For example, you may be sending outbound files to an entity expecting an ASCII LF between messages; even though the file operation is configured to put nothing between messages because previously it had been erroneously generating the LF between messages.

4.2.5 Add Support for Legacy FTPS Protocol to FTP Adapters

Release 2009.1 of Caché implemented the RFC4217 standard method of creating a secure FTP transfer, and it also removed the previous legacy mode which assumed that the command channel was to use TLS. However, some Ensemble implemen-

tations using FTP adapters were using this mode. The current release reintroduces this legacy connection mode with a special way in the FTP adapter configuration to indicate its use.

If you have been using the old non-standard FTPS protocol first implemented in the %Net.FtpSession class, you may find that your FTP adapters no longer work with the FTP servers to which they have been connecting. To restore proper functioning of the adapter, append an asterisk (*) to the SSLConfig property of the appropriate EnsLib.FTP.InboundAdapter or EnsLib.FTP.OutboundAdapter class.

See the SSLConfig property description in the EnsLib.FTP.Common entry of the *Class Reference* for details.

4.2.6 Changes in Mapping of Custom Schemas

In previous releases, your custom HL7 and EDI schemas were stored in the ENSLIB namespace; therefore, they were mapped to every namespace. However, the Ensemble upgrade procedure replaces everything in the ENSLIB namespace, so you would have to export and then import your defined schemas to save them when you upgraded.

Beginning with Ensemble 2007.1, only the standard schemas are available in all namespaces. Ensemble now stores all custom HL7 and EDI schemas in the namespace where you define them. If you depended on centrally located schemas in your previous Ensemble version, you must now compile your user-defined schemas in each namespace where you use them.

4.3 Compatibility Issues for Upgrades to Ensemble 2009.1

The following changes in the 2009.1 release may affect the operation of your existing system. Review the following issues before upgrading a previous instance of Ensemble:

- [Changes in HL7 Storage Structure](#)
- [New ReplyCodeActions Property in Process and Operation Classes](#)
- [New Mechanism for Editing Messages Replaces the %DrawEditForm\(\) Method](#)
- [Increased Alert Level for Data Transformation Errors](#)
- [Changes to Pool Size Configuration Behavior on TCP Service](#)
- [Renamed Column in Statistics Queries](#)
- [Alert Support for Services Invoked Outside Ensemble](#)
- [Changes in Empty Schema Category Behavior](#)

Also review the *Caché 2009.1 Upgrade Checklist*.

4.3.1 Changes in HL7 Storage Structure

This release of Ensemble changes the storage structure for HL7 message segments to avoid block contention and improve throughput of large systems.

Ensemble now stores message segments in the new format and converts old message segments to the new format the first time it opens the message as an object. Access to HL7 messages from SQL and from the Management Portal is compatible with both formats.

This change is transparent to most applications; however, if you have code that directly accesses or manipulates the segment globals, you must modify it to be compatible with the new structure. Contact the [InterSystems Worldwide Response Center](#) (WRC) for advice and guidance if you need to make such changes.

4.3.2 New ReplyCodeActions Property in Process and Operation Classes

This release introduces a new property, `ReplyCodeActions`, for all business process and business operation classes. Formerly, this setting was available only on HL7 TCP business operations. This property allows you to specify how the host should handle each kind of response it receives from the remote system.

This change adds a boolean return value to the existing business operation callback method **OnFailureTimeout**. If you added an override of this method to your business operation classes, you must add `Quit 0` to your implementation to preserve your custom behavior, and `As %Boolean` to your method signature for it to compile.

This update also changes the format and default behavior of the existing `ReplyCodeActions` property for HL7 business operations. If you are indicating a literal value found in field MSA:1 or using one of the described special values, you must start your reply code with a colon (:). See the description of the `ReplyCodeActions` property in the `EnLib.HL7.Operation.ReplyStandard` entry in the *Class Reference* for details.

If you upgrade to this release and your production configuration has existing reply codes of this type that do not begin with a colon (:), Ensemble logs warnings in the Event Log for the item by the **OnGetReplyAction()** when the production starts. For example:

```
Unrecognized reply code: '?E'
Unrecognized reply code: '?R'
Unrecognized reply code: '~'
```

There were also other changes to the default behavior of properties that may affect your production:

Changes to Default Behavior of HL7 Business Operation Reply Code Actions

A previous release updated and expanded the default behavior of the `ReplyCodeActions` property with a value of:

```
:?R=RF, :?E=S, :~=S, :?A=C, :*=S, :I?=W, :T?=C
```

This default indicates that Ensemble retries messages with acknowledgment codes AR or CR; for those with codes AE or CE, it suspends the current message, logs an error, and moves on to the next message. This behavior is more consistent with common HL7 processing. The new default also treats any message with codes AA or CA as *Completed OK* and suspends messages that have a value in field MSA:1 that is not matched by any other listed reply code.

Changes to Default Behavior of Business Operation Retry Count

This release redefined the meaning of the `RetryCount` property from “the number of the current try not counting the first try” to “the number of the current try” by setting the default in the business operation class to a value of 1.

4.3.3 New Mechanism for Editing Messages Replaces the %DrawEditForm() Method

This release removes the `Ens.Util.MessageBodyMethods.%DrawEditForm()` method, which the Ensemble Management Portal called to display a message-specific content editor. A different mechanism now provides this functionality. See the following sections in *Managing Ensemble Productions* for details:

- [Resend Messages](#) section of the “Message Browser” chapter
- [Suspended Messages](#) section of the “Maintenance” chapter

4.3.4 Increased Alert Level for Data Transformation Errors

In previous releases, Ensemble did not trigger an alert when it encountered an error in a data transformation; errors were only logged in the Event Log. Ensemble now reports such errors as alerts if you enable the **Alert On Error** setting for the routing engine configuration item.

4.3.5 Changes to Pool Size Configuration Behavior on TCP Service

For TCP services, when **Job Per Connection** is True, a freshly spawned job handles each new incoming socket connection rather than the listener job itself. Only one job at a time can be the listener, and one job must be the listener, so a TCP service configured with a **Pool Size** greater than 1 still only starts one listener job. However, this listener can spawn an unlimited number of connection jobs if **Job Per Connection** is set to True. If you set the **Pool Size** to a value greater than 1, it serves as a limit on the number of simultaneous connection jobs that can exist. When this limit is reached, the listener does not accept any more connections until one or more of the existing connection jobs quits or dies. An Event Log warning appears when it first reaches the limit.

4.3.6 Renamed Column in Statistics Queries

This release of Ensemble renames a column in the **EnumerateHostStatus** and **EnumerateJobStatus** queries in the `Ens.Util.Statistics` class from *LastAction* to *LastActivity*. If your application refers to the column by name, you must update it.

4.3.7 Alert Support for Services Invoked Outside Ensemble

This Ensemble release adds error alerting and logging to the **ProcessInput()** method of Business Service classes when you invoke the service from a job not started by Ensemble and, therefore, not running in its **OnTask()** loop. The main examples of Services invoked in this way are SOAP services and CSP Web pages, but may also include Language Binding and Stored Procedure calls.

4.3.8 Changes in Empty Schema Category Behavior

In previous releases, if a data transformation processed an HL7 message that had no schema category associated with it, Ensemble modified the source message to have the schema category expected by the data transformation. In this release, the schema category remains empty. It is possible that if a message passed through multiple data transformations or routing engines, it may now fail in subsequent transformations or routing engines. To avoid this problem, specify the schema category in the business service.

4.4 Compatibility Issues for Upgrades to Ensemble 2008.2

Review the *Caché 2008.2 Upgrade Checklist*.

4.5 Compatibility Issues for Upgrades to Ensemble 2008.1

The following changes in the 2008.1 release may affect the operation of your existing system. Review the following issues before upgrading a previous instance of Ensemble:

- [DTL Validation Errors](#)
- [AllowSessions Setting Removed from EnsLib.SOAP.Service](#)

Also review the *Caché 2008.1 Upgrade Checklist*.

4.5.1 DTL Validation Errors

In Ensemble 2008.1 and later, including this release, DTL validation is more strict than in the past. As a result, if a DTL code block contains an `<assign>` element with `value= ''` and any of the following action values:

```
action='append'  
action='insert'  
action='set'
```

The code fails to compile, because a non-empty value is mandatory in these cases. Upon upgrade from a previous version to Ensemble 2008.1 and later, errors appear when user classes are recompiled. The error message is:

```
ERROR <Ens>ErrDTLNodeValidation: 'value' must NOT be empty string for action 'Assign'
```

If you have any DTL `<assign>` elements with `value= ''` you must change this text to:

```
value=''''
```

This convention adds a pair of double quotes to indicate the null string.

4.5.2 AllowSessions Setting Removed from EnsLib.SOAP.Service

In the 2008.1 Ensemble release, the `AllowSessions` setting was removed from the `EnsLib.SOAP.Service` class. It is no longer configurable; instead, you must choose whether the service should use CSP/SOAP sessions at compile time using the `SOAPSESSION` class parameter. The default for the parameter is now `SOAPSESSION = 0`.

If your subclass of `EnsLib.SOAP.Service` relies on the `AllowSessions` setting to control session behavior, you must rewrite it to use the `SOAPSESSION` class parameter. If you are using sessions you must override it to `SOAPSESSION = 1`. If you do not use sessions, do not override the `SOAPSESSION` class parameter; you can rely on the default setting.

See the [Enabling SOAP Sessions](#) section of the “Creating an Ensemble Web Service” chapter of *Creating Web Services and Web Clients with Ensemble*.

5

Upgrading Ensemble

When deciding to upgrade to the current release of Ensemble you may want to review the new features and enhancements as well as any compatibility issues of this and any intervening releases since you last installed Ensemble. The following chapters contain such information:

- [New Features](#)
- [Enhancements](#)
- [Upgrade Compatibility Issues](#)
- [Release History](#)

Ensemble runs on top of Caché. This means that, in addition to changes in Ensemble, the new Ensemble release includes a large number of changes in the underlying Caché technologies as outlined in the following table.

IF you are upgrading from ...	THEN the underlying changes resemble ...
Ensemble 2010.1 to Ensemble 2010.2	Caché 2010.1 to Caché 2010.2
Ensemble 2009.1 to Ensemble 2010.2	Caché 2009.1 to Caché 2010.2
Ensemble 2008.2 to Ensemble 2010.2	Caché 2008.2 to Caché 2010.2
Ensemble 2008.1 to Ensemble 2010.2	Caché 2008.1 to Caché 2010.2
Ensemble 2007.1 to Ensemble 2010.2	Caché 2007.1 to Caché 2010.2
Ensemble 4.0.1 to Ensemble 2010.2	Caché 5.2.3 to Caché 2010.2
Ensemble 4.0 to Ensemble 2010.2	Caché 5.2.1 to Caché 2010.2

The following books in the Caché documentation are helpful when you are upgrading from previous Ensemble versions:

- *Caché Release Notes*
- *Caché Upgrade Checklists*

Beginning with Ensemble 2007.1, Ensemble runs on top of the same numbered version of Caché.

Ensemble Upgrade Paths

Before running an upgrade installation, review the information referenced in this chapter to determine if there are any tasks to complete before upgrading. The following upgrade paths to this release of Ensemble are supported:

- Ensemble 2010.1
- Ensemble 2009.1

- Ensemble 2008.2
- Ensemble 2008.1
- Ensemble 2007.1

To upgrade to this release of Ensemble, follow the instructions in [Upgrading from Ensemble 2007.1 or Later](#).

The following upgrade paths to this release of Ensemble require additional steps in the upgrade procedure:

- Ensemble 4.0.1
- Ensemble 4.0

Additionally follow the instructions in [Upgrading from Ensemble 4.0 or 4.0.1](#).

If you have an Ensemble version prior to 4.0, or if you have been using a field test version of Ensemble and you want to upgrade it to the released Ensemble 2010.2 product, contact the [InterSystems Worldwide Response Center \(WRC\)](#) for guidance.

5.1 Upgrading from Ensemble 2007.1 or Later

If you are upgrading from Ensemble 2007.1 or later to this release of Ensemble, in addition to deleting the files outlined in the Caché upgrade documentation, the upgrade procedure deletes the following Ensemble files:

- Any user files in the ENSDEMO namespace
- Any user files in the packages normally reserved for Ensemble (CSPX, Demo, Ens, or EnsLib)

To preserve such files, export them before proceeding with the upgrade. You may import them to any namespace after the upgrade is complete.

Important: You cannot upgrade an Ensemble instance that has a running production; in fact, the upgrade procedure shuts down Ensemble if it is running. It is best to stop any running productions and then cleanly shutdown Ensemble before you begin the upgrade installation.

To upgrade an existing Ensemble installation to this release of Ensemble:

1. Stop all running productions.
2. Perform exports to preserve files that are deleted on upgrade.
3. Prepare for an upgrade to Ensemble as described in the “Upgrading Caché” chapter of the *Caché Installation Guide*.
4. Install Ensemble 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 Mac

Each chapter provides special instructions for upgrades.

5. If you exported custom schemas or any other production components or classes from a previous Ensemble installation, you may now import them using Ensemble Studio or the Caché System Management Portal. Be sure to import each item into the same namespace from which you exported it.

- After upgrading Ensemble, open a Terminal window and issue the following command to recompile objects in all namespaces:

```
Do $system.OBJ.CompileAllNamespaces("u")
```

This method both upgrades and then compiles the class dictionaries in every namespace.

- The Ensemble upgrade process reports important information regarding upgrades into a log file. After upgrading, review the contents of the `ensinstall.log` file in the `\mgr` subdirectory of your Ensemble instance to review the results of your upgrade.
- Regenerate proxy classes if you previously generated them using the Java Gateway, Web Services, or one of the Caché language bindings, by following the instructions in the appropriate guides:
 - [Using the Java Gateway](#)
 - [Creating Web Services and Web Clients in Caché](#)
 - Other books in the Caché Language Bindings set
- Remove all Ensemble-related code from the user startup routine `^%ZSTART`; there are replacement mechanisms for providing the same functionality:
 - Replace any production startup code by configuring the **Auto-Start Production** setting to control the automatic startup of Ensemble productions. The **EnsembleAutoStart** setting enables (default) and disables this feature.
 - Move any code that is dependent on Ensemble being started when it executes by overriding the **OnStart** method in the production class and placing these code statements into this method.
 - Move any code that is designed to act on specific business hosts upon production startup by overriding the **OnProductionStart** method in the corresponding business service, business process, or business operation class and placing these code statements into this method.

See the [Production Life Cycle](#) section of the “Production Concepts” chapter of *Developing Ensemble Productions* for details.

5.2 Upgrading from Ensemble 4.0 or 4.0.1

Upgrading from Ensemble 4.0 or 4.0.1 to Ensemble 2010.2 uses the same procedure as upgrading from later versions of Ensemble, but with some additional considerations. These are:

- The upgrade procedure deletes any HL7 custom schema definitions (*.HL7).

CAUTION: To preserve such files, export them before proceeding with the upgrade. You may import them to any namespace after the upgrade is complete.

- For each Ensemble-enabled namespace, run these commands from your Terminal session:

```
ZN "nextEnsembleNamespace"
DO ##class(Ens.MessageHeader).%PurgeIndices()
DO ##class(Ens.MessageHeader).%BuildIndices()
DO ##class(EnsLib.HL7.Message).%PurgeIndices()
DO ##class(EnsLib.HL7.Message).%BuildIndices()
DO ##class(EnsLib.HL7.Message).%BuildIndices(($LB("Extent")))
```

These commands are required for the `ENSDemo` and `ENSEMBLE` namespaces, and for any user-defined Ensemble-enabled namespaces. They are not required for the `ENSLIB` namespace.

6

Installing Ensemble

Ensemble runs on several different platforms. Before installing, check the *Supported Platforms* document provided with the Ensemble kit to verify it runs on your particular version of the supported operating system. The document also lists browsers, Web servers, and other technologies for use with InterSystems products. To upgrade from previous releases of Ensemble, see the “[Upgrading Ensemble](#)” chapter.

For installation instructions, see the appropriate *Caché Installation Guide* chapter for Windows, OpenVMS, UNIX®, or Mac. 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 in the following topics:

- [Licenses](#)
- [Namespaces](#)
- [OpenVMS](#)
- [UNIX®](#)
- [Failover Configurations](#)

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

6.1 Licenses

You can enter an Ensemble 2010.2 license key during installation, or at any time after installation. Use the instructions in the “[Managing Caché Licensing](#)” chapter of the *Caché System Administration Guide*.

If you have questions or encounter any problems in this regard, contact the [WRC](#).

6.2 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.

Important: The Ensemble installation procedure creates several namespaces: %SYS, DOCBOOK, USER, SAMPLES, ENSLIB, ENSEMBLE, and ENSDEMO. A reinstall or upgrade of Ensemble overwrites all system-provided namespaces except ENSEMBLE and USER. For this reason, InterSystems recommends that you always create new namespaces in which to work, rather than placing custom code in any of these system-provided namespaces.

This book 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 ENSLIB, ENSEMBLE, and ENSDEMO are Ensemble-enabled. Only ENSEMBLE is intended for your use; the other system-provided namespaces are reserved.

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 **[Home] > [Configuration] > [Namespaces] > [New Namespace]** page of the System Management Portal. For instructions, see the Configuring Data section in the “Configuring Caché” chapter of the *Caché System Administration Guide*.

6.3 OpenVMS Considerations

If you are running the Ensemble 2010.2 server on OpenVMS, the installation requires extra steps. Follow the instructions in the “Installing Caché on OpenVMS” chapter of the *Caché Installation Guide*, paying special attention to the “Post-installation Tasks” section, which guides you to the additional references listed below:

- When you install the Ensemble 2010.2 server on OpenVMS, you must install an Ensemble 2010.2 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 “Accessing the System Management Portal” section in the “Using Caché on OpenVMS” chapter of the *Caché System Administration Guide*.

- There is no internal or private Web server installed with Ensemble 2010.2 on OpenVMS. Therefore, to use the System Management Portal and the Ensemble Management Portal, you must configure an external Web server.

For instructions, see the “Install Caché on a Web Server” section in the “Installing Caché on OpenVMS” chapter of the *Caché Installation Guide*.

6.4 UNIX® Considerations

If you are running the Ensemble 2010.2 server on a UNIX® platform, follow the instructions in the “Installing Caché on UNIX® and Linux” chapter of the *Caché Installation Guide*, paying special attention to the “Post-installation Tasks” section.

When you install the Ensemble 2010.2 server on UNIX®, you must install an Ensemble 2010.2 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 “Install Caché Client on Windows for Development” section in the “Installing Caché on UNIX® and Linux” chapter of the *Caché Installation Guide*.

6.5 Failover Configurations

The following Caché books contain information on how to install Ensemble on multiple clustered machines to provide failover capabilities in case of problems on the primary server:

- *Caché System Administration Guide*
- *Caché High Availability Guide*
- *Caché Distributed Data Management Guide*

If you require further information to help you develop a failover and backup strategy tailored for your environment, or to review your current practices, please contact the [InterSystems Worldwide Response Center](#) (WRC).

7

Adapter Library

Ensemble 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.

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.

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.

Pipe

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

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 or JDBC-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.

8

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.

The following sections outline a brief history of Ensemble releases starting with the most recent:

- [Ensemble 2010.1](#)
- [Ensemble 2009.1](#)
- [Ensemble 2008.2](#)
- [Ensemble 2008.1](#)
- [Ensemble 2007.1](#)
- [Ensemble 4.0](#)
- [Ensemble 3.1](#)
- [Ensemble 3.0](#)
- [Ensemble 2.1](#)
- [Ensemble 2.0](#)
- [Ensemble 1.0](#)

8.1 Ensemble 2010.1

Ensemble 2010.1 was released in February 2010 and introduced the following new features:

- Configuration Default Settings
- EDIFACT Support
- Caché 2010.1 Features

Also see the *New and Enhanced Features for Caché 2010.1* in the *Caché Release Notes*.

8.2 Ensemble 2009.1

Ensemble 2009.1 was released in July 2009 and introduced the following new features:

- Ability to Edit and Resend Messages
- Object Gateway for .NET Services and Operations
- Ability to Create a Studio Project from a Production
- Automatic Documentation of a Production
- Support for ebXML
- Caché 2009.1 Features

Ensemble 2009.1 offered enhancements to the following features:

- Testing Service for Virtual Document Messages
- Sequence Manager Support for Non-HL7 Messages
- SQL Adapter
- Java Gateway Adapters
- Additional HL7 Schema Definitions
- Visual Trace
- Ensemble Automatic Start Setting

Also see the *New and Enhanced Features for Caché 2009.1* in the *Caché Release Notes*.

8.3 Ensemble 2008.2

Ensemble 2008.2 was released in October 2008 and introduced the following new features:

- Digital Signatures and WS-Security
- Ensemble Recovery and Auto-Start
- Caché 2008.2 Features

Ensemble 2008.2 offered enhancements to the following features:

- Licenses and Jobs
- BPL <xpath> Element
- Production-Wide Settings
- Support for Rule Notification
- Default Security Settings for Ensemble CSP Applications
- Revised Error Logging and Handling
- Refinements to ACK and NACK Message Handling
- HTTP Options on HL7 Wizard Pages

- Forced Shutdown Option
- Abort All on Queue Contents Page
- Ensemble Monitoring Using SNMP
- Archive Manager Improvements
- Lookup Table Improvements
- Sequence Manager Improvements

Also see the *New and Enhanced Features for Caché 2008.2* in the *Caché Release Notes*.

8.4 Ensemble 2008.1

Ensemble 2008.1 was released in July 2008 and introduced the following new features:

- MultiValue
- ASTM E 1394–97 Support
- Caché 2008.1 Features

Ensemble 2008.1 offered enhancements to the following features:

- HL7 Segment Architecture Changes
- DTL <subtransform> Element
- Publish and Subscribe Messaging
- HL7 Sequence Manager
- Ensemble Archive Manager
- Ensemble Lookup Settings
- Ensemble System Monitor
- HL7 Version 2 Message Routing
- X12 Message Routing
- Ensemble Monitoring Using WMI
- Ensemble Diagnostic Report
- Ensemble Management Portal Style
- Time Stamp Specifiers

Also see the *New and Enhanced Features for Caché 2008.1* in the *Caché Release Notes*.

8.5 Ensemble 2007.1

Ensemble 2007.1 was released in October 2007 and introduced the following new features:

- Underlying Caché 2007.1 Technologies

- BPL Exception and Compensation Handling
- X12 Support
- Adapter SSL/TLS Support

Ensemble 2007.1 offered enhancements to the following features:

- 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

Also see the *New and Enhanced Features for Caché 2007.1* in the *Caché Release Notes*.

8.6 Ensemble 4.0

Ensemble 4.0 was released in June 2006 and introduced the following new features:

- Underlying Caché 5.2 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

Also see the *New and Enhanced Features for Caché 5.2* in the *Caché Release Notes*.

8.7 Ensemble 3.1

Ensemble 3.1 was released in April 2006 and introduced the following new features:

- HL7 Support

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

8.8 Ensemble 3.0

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

Ensemble 3.0 introduced the following new features:

- Business Activity Monitoring
- Workflow Management
- Business Rules
- Java Gateway

Ensemble 3.0 enhanced the following existing features:

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

8.9 Ensemble 2.1

Ensemble 2.1 was released to InterSystems customers in November 2003; it enhanced the following existing features:

- Business Process Language
- BPL Visual Editor
- Management Portal
- Adapter Library

8.10 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

8.11 Ensemble 1.0

Ensemble 1.0 was released to InterSystems customers in 2002 and introduced the following features:

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

