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About This Book

This book provides information on the major features that have been added to Caché in this release.

It contains the following section:

• Caché 2017.1 Release Notes

The following books provide related information:

• Caché Upgrade Checklists discusses changes made to each release that may adversely affect existing Caché applications.
• Caché Release Notes and Upgrade Checklist Archive provides release notes describing new features for previous releases and the issue checklist for version prior to those covered in the Caché Upgrade Checklists.
• InterSystems Supported Platforms lists the technologies supported by this release of Caché.
• Caché Installation Guide describes the process of installing Caché on your system.
• Introduction to Caché provides an overview of the features and major components of Caché.

General Licensing Notes

InterSystems makes its products and features available under license to customers. While InterSystems may or may not enforce the use of said products or features consistent with the purchased license capabilities, customers are expected to comply with terms of their licenses. Moreover, InterSystems may tighten enforcement at any release without notice.

Developers must be aware that certain license types are required in order to use specific product features such as Multi-Server capability, Mirroring, and Web Services features. The specific requirements are noted in the InterSystems Price List and the Terms and Conditions for licensing. These are available from your local InterSystems representative.

Application Use Of InterSystems Web Server

InterSystems installs an Apache-based web server (often referred to as the "private web server") to assure that the management portals for its products are always available. The private web server is built and configured to meet the management needs of InterSystems administrative servers and is configured to only connect to InterSystems products. The options selected are not, in general, suitable for production use - in particular, security is minimal and the options used are generally unsuitable for a high volume of HTTP requests. Testing, by InterSystems, of the private webserver only covers use of the private web server for managing Caché, Ensemble, HealthShare, and other InterSystems products.

Customers are not required to use this web server to manage our products. You may also use a web server of your choice, located on whatever server you elect to use. The private web server is provided as a convenience to simplify installation and installation dependencies. Many developers also find it useful to use the private web server for unit testing.

UNIX®

The parameters used for the UNIX® build are:

```bash
--prefix=$installation_location
--disable-actions
--disable-asis
```
--disable-auth
--disable-autoindex
--disable-cgi
--disable-cgid
--disable-charset-lite
--disable-dir
--disable-env
--disable-imap
--disable-include
--disable-negotiation
--disable-setenvif
--disable-shared
--disable-status
--disable-userdir
--enable-access
--enable-alias
--enable-log-config
--enable-mime
--enable-so
--without-berkeley-db
--without-gdbm
--without-ndbm

The server produced has defaults using the Apache Group’s prefork Multi-Processing Module (MPM). This is the non-threaded server model. The number of requests that can be concurrently served is directly related to the number of Apache worker processes in the pool. The private web server is configured to occupy the smallest possible footprint by allowing a maximum of two worker processes to be created for the pool. The following settings will be found in the Apache configuration (httpd.conf) for the server:

- **MinSpareServers**: 1
- **MaxSpareServers**: 2

By contrast, the default Apache configuration for a production grade build is usually the following:

- **StartServers**: 5
- **MinSpareServers**: 2
- **MaxSpareServers**: 20
- **ServerLimit**: 256
- **MaxClients**: 256

This configuration will allow Apache to create 5 worker processes at start-up time, increasing to a maximum of 256 as the concurrent load increases. Because of these differences in configuration, the performance of the private web server will be noticeably inferior to that of a production grade Apache build as the concurrent load increases.

**Windows**

Windows-based Apache installations use the official binary distribution for Windows and a special multithreaded Multi-Processing Module (MPM) which is more suited to the way the operating system is optimized. However, since InterSystems installs and loads only a small subset of modules (mod_alias.so, mod_authz_host.so, mod_log_config.so and mod_mime.so.), their functionality is limited.

**Conclusion**

If you expect very low volume of HTTP traffic, have limited demands for high availability and secure operation, the private web server may be suitable for your deployment needs. However, if you expect a high amount of HTTP traffic, require high availability in your webservice, need to integrate with other sources of web information, or need a high degree of control over your web server, InterSystems recommends installing your own separate copy of Apache, ideally on its own server, and configuring it to use our CSP gateway to communicate with Cache, Ensemble, or HealthShare. Review the options above to determine if this is so.

**Note:** This applies to Unix®, Linux, Mac OS X and Windows systems. A private web server is not installed on OpenVMS.
New and Enhanced Features for Caché 2017.1

This section includes:

- FIPS 140-2 Validated Cryptography for Caché Database Encryption
- Enhancements to Support for OAuth 2.0 and OpenID Connect
- DeepSee Improvements
- Mirroring Improvements
- Improved DocBook Search
- Feature Tracker
- iKnow REST API and Other Enhancements
- New Features in Atelier, the Eclipse-Based IDE
- Other Items of Note

1.1 FIPS 140-2 Validated Cryptography for Caché Data-at-Rest Encryption

This release allows you to configure Caché running on Red Hat Enterprise Linux 64-bit to use a FIPS 140-2 validated library for Caché data-at-rest encryption. For details, see the article “FIPS 140-2 Compliance for Caché Database Encryption”.

1.2 Enhancements to Support for OAuth 2.0 and OpenID Connect

Caché support for OAuth 2.0 and OpenID Connect now includes the following features:
• Support for discovery (OpenID Connect Discovery 1.0), as described in https://openid.net/specs/openid-connect-discovery-1_0.html. When you configure a client, the Management Portal provides a new discovery option that you can use rather than manually entering all the information about the authorization server. The %SYS.OAuth2.Registration class now provides the **Discover()** method.

• Support for dynamic client registration (OpenID Connect Dynamic Client Registration), as described in http://openid.net/specs/openid-connect-registration-1_0-19.html. When you configure a client, the Management Portal provides a new registration option that you can use rather than manually entering all the information about the client on the authorization server. The %SYS.OAuth2.Registration class now provides the **RegisterClient()** method.

• Support for JSON Web Key (JWK) and JSON Web Key Sets (JWKS), as described in https://tools.ietf.org/html/rfc7517, for encrypting, decrypting, signing, and verifying signatures of JSON web tokens (JWTs). Because JWKS provides a means of representing a public/private key pair, it is no longer necessary to use certificate/private key pairs for these purposes. The option to use certificate/private key pairs is still included for backward compatibility.

• Key rotation (in the cases when you are using JWKS). The OAuth 2.0 configuration pages of the Management Portal provide options to rotate keys; these options add a new key pair to the JWKS and save the JWKS.

• Management Portal option to revoke tokens for a given user. This option is provided for convenience; it supplements the existing client API.

All features that are supported in 2016.2 will interoperate with 2017.1. For example, you can have a client and an authorization server at different Caché versions. The new features, however, will not work with a partner that is at version 2016.2.

In release 2017.1, there are changes in the configuration classes for OAuth 2.0 and OpenID Connect. Caché automatically updates your saved configurations.

### 1.3 DeepSee Improvements

This release includes the following DeepSee improvements:

• New controls widget for dashboard.

• Improved export of DeepSee components.

• New DayOfWeek time function.

• New CreateTable plug-in.

• Improvements to setting default filter values.

• Improvements to setting advanced filter values.

• Drilldown expression now uses expressionBuilder.

• SQL-based listings now support dynamic sorting.

### 1.4 Mirroring Improvements

This release includes the following Mirroring improvements:

• Significant performance enhancement on backup and async members for writes to the local copy of mirror journal files for updates received from the primary. This has shown as much as a 10 times improvement in journal transfer...
throughput, thereby extending scalability of mirrored systems. Systems utilizing a backup failover member may also see improved application performance and responsiveness on the primary as a result of these improvements.

- Promotion for Disaster Recovery async members has been enhanced. When promoting a Disaster Recovery member in a disaster scenario, before becoming primary, the promoted member now surveys all other reachable mirror members to retrieve any newer journal data that those members may have retrieved just prior to the disaster. This ensures that the Disaster Recovery cutover includes all available data and that other surviving async members can rejoin the new primary. Additionally, an operational step is supported to allow you to perform any manual validation you wish on the promoted member before allowing it to become primary.

- `ccontrol` list and `ccontrol qlist` now include mirror member type and status.

### 1.5 Improved DocBook Search

DocBook search has improvements that can help you find information faster. Search now puts matches found in the most commonly used documents first. The DocBook search page has new options that allow you to limit the scope of your search. To reach the DocBook search page, select **Search Page** from the documentation home page. It has the following new filters:

- Find topics with *all* or *any* of the specified words. In previous releases, search was always for *all* words.
- Use free-text search or exact match with or without case sensitivity. In previous releases, search always used free-text search, which removed some special symbols and searched for all words that shared the same root. Exact match retains special symbols and only finds the exact word specified. For example, with the search word “^global”, free text search finds all occurrences of the word “global”, but exact match searches will only find “^global” with the caret character.
- Limit search to product allows you to search for words in either the Caché or Ensemble documentation.
- Search in a specific book.
- Search for items associated with a tag. This allows you to search for words tagged with terms such as DeepSee, Zen, HL7, and BPL.

### 1.6 Feature Tracker

In 2017.1 we are introducing a safe and trustworthy approach for InterSystems to periodically collect information about the Caché features being used while maintaining the integrity of our relationship with our clients. The Feature Tracker is controlled by a task. By default the task is suspended and Feature Tracker is disabled, but you can easily resume the task. Feature Tracker will help us prioritize which Caché features to enhance based on the features that are used by customers.

The Feature Tracker collects information about instance attributes (product type, version, license, platform, etc.) and use of technology, including ECP, Mirroring, DB Encryption, and SQL. It does not collect information about license utilization, database attributes, applications, errors, authentication, client data, client-specific configuration. Weekly, the Feature Tracker sends the collected data (XML file) to an InterSystems Caché instance using SSL. You may view the most recent collected data to see that this information is trustworthy. If for any reason the Feature Tracker cannot transmit, it fails silently with no impact to the instance.

More information about Feature Tracker can be found in **Feature Tracker Collects Usage Statistics**, in the **Caché System Administration Guide**.

**Note:** During field test, the Feature Tracker task is active and Feature Tracker is enabled.
1.7 iKnow REST API and Other Enhancements

This release introduces a REST API to access iKnow domain information directly from a RESTful client. Many common query API methods are supported through a simple, consistent interface where individual requests can be configured to retrieve rich query results or just the basic data, depending on your application requirements. The iKnow REST API provides reference documentation using the Swagger Specification, which is the foundation of the OpenAPI Specification.

Note: One method to view the iKnow REST API documentation, is to use Swagger UI, either by directing a web browser to http://petstore.swagger.io/ or by downloading the Swagger UI toolkit. Enter one of the following URLs in the Swagger UI form and then select the Explore button. For a Caché development instance with minimal security, you can enter:

http://localhost:port-number/api/iknow/v1/user/swagger

For a Caché instance with password security, you can enter:

http://localhost:port-number/api/iknow/v1/user/swagger?CacheUserName=user-name&CachePassword=password

In addition, this release includes a significant overhaul of our Knowledge Portal demo interface for exploring your domain’s contents and a number of extensions to the iKnow Architect interface for managing a domain definition.

1.8 New Features in Atelier, the Eclipse-Based IDE

Atelier, the Eclipse-Based IDE for Caché, is available on an independent release cycle from Caché. Consequently, new features are described in the Atelier documentation provided with each new Atelier release. The Atelier IDE brings together the powerful and popular Eclipse development environment and the InterSystems Caché database. Atelier allows you to develop Caché applications using a modern file-based IDE on a client system. Atelier handles uploading the application to the Caché server where it can be run and debugged.

The focus of future development will be on the new Eclipse based IDE. Studio will remain an option to install and developers can continue to develop code with it. However, it will be treated as a maintenance product and will not see new functionality added as we move forward with Atelier. Some minor bugs may not be addressed either depending on resources required versus the severity of the issue.

Atelier is available as a separate download in addition to Caché or Ensemble. You can choose to install either a stand-alone Rich Client Platform (RCP) application, or a plug-in that can be added to an existing Eclipse installation. Users of the RCP application can add additional Eclipse plug-ins. Atelier uses the Eclipse auto-update mechanism to help users get the latest changes. For information on downloading Atelier and for the Atelier documentation, see http://www.intersystems.com/atelier, the Atelier home page.

1.9 Other Items of Note

In addition, many more minor improvements and corrections are also included. In particular, if you are upgrading an existing installation, please review the detailed list of changes in the Upgrade Checklist.

Areas of improvement include:

• OpenSSL library—In this release the OpenSSL library has been upgraded to v1.0.2h.
Thai (Buddhist Era) date format support extended and enhanced. Please consult the Reference guide for the functions $ZDATEH() and $ZDATETIMEH() for details.

Lightweight statistics provide information on SQL query performance.

SQL Read Verified provides access to uncommitted changes as Read Uncommitted does but also rechecks query conditions to verify that they are still met.

Improved work queue manager.

Improvements to the XSLT Gateway.

Improvements to the JDBC driver including a faster and more robust preparser.

Support for .NET 4.5 in .NET Gateway, Caché eXtreme, and ADO.NET.