



# Installation Guide

Changepoint 2017

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# 1. Installation Requirements and Preparation

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## Introduction

The document provides instructions for installing and upgrading to the 2017 release of Changepoint. Upgrade instructions for service packs are in the service pack team folders.

Some of the information in this document is for the ongoing maintenance of a Changepoint installation.

### Changepoint components

A minimal Changepoint installation consists of the following required components:

- database (Changepoint database, CPTempDB, CPExtended)
- website
- scheduled jobs
- Redis (third-party caching component)

Optional applications, features, and services include Changepoint software and third-party software.

### About the secondary databases

CPTempDB and CPExtended are secondary databases that are on the same server as the main Changepoint database, and are installed automatically when you install the Changepoint database using the installer.

CPTempDB provides dedicated temporary storage and processes transient, session-based data and code. By design, the CPTempDB database is created using Simple Recovery Mode to minimize log space requirements. The session-based architecture virtually eliminates the need for dynamic SQL and schema level locks, thereby drastically minimizing time consuming recompilation within the SQL Server.

CPExtended provides storage for logging error messages and performance data as well as background job scheduling and management.

InfinitiDB is the storage location for Intelligent Forms. The database stores the forms as well as the administration and configuration data.

### File path conventions

Throughout this document, the following conventions are used for common paths:

| Convention  | Meaning  |
|-------------|--|
| <cp_root>   | The root path of the Changepoint installation.<br>The default is:<br>C:\Program Files (x86)\Changepoint\Changepoint\   |
| <cp_common> | The root location for common Changepoint utilities, such as the Login Settings utility.<br>The default is:<br>C:\Program Files (x86)\Common Files\Changepoint\Changepoint\ |

**Note:** The Login Settings utility is installed in

C:\Program Files\Common Files\Changepoint\Changepoint\LoginSettings\  
regardless of the root folder for Changepoint installation.

### Changepoint documentation

This guide contains references to the following documentation, which is available in the **2017 Release Notes and Patches** team folder in Client Portal, or from your client manager:

- *Changepoint Product Architecture and Technology Matrix*
- *Changepoint Hardware Recommendations Guide*
- *User Basics User Guide*
- *Changepoint API Installation Guide*
- *Microsoft Dynamics GP Toolkit Administration Guide*

### Hardware and software requirements

Changepoint server software can be deployed on a single server or on multiple servers.

Ensure that each server meets the following requirements:

- hardware requirements in the *Changepoint Hardware Recommendations Guide*.
- software requirements in the *Changepoint Product Architecture and Technology Matrix*

**Warning:** If the servers do not meet the hardware and software requirements, the installation might fail silently.

## Required skills

To install Changepoint, you must be familiar with administering the following software:

- Microsoft SQL Server
- Microsoft Windows Server
- Microsoft Internet Information Services (IIS)
- .NET

If you do not have these skills, or require assistance with implementing Changepoint, contact your Changepoint client services representative or client manager.

## Latest patches and service packs

Check the **2017 Release Notes and Patches** team folder, for service packs and for general patches that have been posted for this release.

You install service packs and general patches according to the instructions in the service pack or patch release notes.

## Required accounts and permissions

You require the following credentials on each host:

- All servers – local or domain administrator account
- The user account running the SQL server service must have write permission to the Changepoint data and log folders.
- Database server:
  - SQL administrator (sa) account, which is required to install and configure the Changepoint database
  - SQL account, which is required for the Changepoint applications to access the database

If the SQL account does not already exist on the SQL Server, it is created with the same password as the user ID during installation. Therefore it is strongly recommended that you create this account with an appropriate password before you start installation.

### Installation considerations

#### Installation using Remote Desktop Protocol (RDP)

Set the connection to more than 256 colors in the RDP dialog:

#### Remote Desktop Connection > Display > Colors

Otherwise installation fails with the message:

```
"Error Number: 0x80004005 Description: Unspecified error Setup will now terminate"
```

#### Enabling enhanced session management

Keep the following points in mind if you plan to enable enhanced session management, which restricts authenticated users to one active session per browser container.

- Report scheduling and security – the Changepoint Report Prerender service required for the report scheduling feature is incompatible with Enhanced session management.
- Web server name
- Client Portal website
- Mobile access to Changepoint
- Naming constraints for the web server name – ensure that the web server name does not contain an underscore, otherwise client workstations need to connect to the server using the IP address instead of server name to log into Changepoint.

#### Custom headers to emulate Internet Explorer 7 mode for Report Designer websites

The Report Designer website requires a custom HTTP response header to emulate Internet Explorer 7 mode. The Changepoint installer takes care of this configuration.

**Note:** The EmulateIE7 custom header is not required for the Changepoint website.

1. Select **Start > Administrative Tools > Internet Information Services (IIS) Manager**.

The IIS Manager opens.

2. Expand the tree view and locate the website under **Sites**.

The home page of the website appears.

3. In the **IIS** section, double-click the **HTTP Response Headers** icon.



4. On the **Actions** menu, click **Add**.
5. In the **Name** field, enter “X-UA-Compatible.”
6. In the **Value** field, enter “IE=EmulateIE7”.
7. Click **OK**.

### **Removing emulate Internet Explorer 7 mode**

On the Changepoint web server, if Emulate IE7 was added *at the server/system level in IIS*, it may cause the Report Designer websites to crash, and alter the layout in the UI in Changepoint.

To correct this problem, in IIS Manager, remove any existing *server/system-level* HTTP Response Header that has Name “X-UA-Compatible” and Value “IE=EmulateIE7”.

### **Perform a backup**

To prevent data loss, back up each host before installation.

### **Install on a test environment first**

It is strongly recommended that you install the Changepoint database and applications in a test environment before installing in a production environment.

### **Required components on the web server**

The following are required on the web server:

- You must enable the following roles/features on IIS:
  - NET Framework 3.5 Features
  - WebSocket Protocol

Microsoft SQL Server Native Client 2012 SP1

### **SQL Server services required**

Before installing Changepoint, ensure that the following SQL Server services are running on the database server:

- SQL Server (MSSQLSERVER)
- SQL Server Agent (MSSQLSERVER)
- SQL FullText Filter Daemon Launcher (MSSQLSERVER)

### Installation parameters

Before you start installation, determine the values in the following table. You are prompted for this information during installation.

| Information needed   | Notes  | Your installation value |
|--|--|-------------------------|
| Setup Language   | <ul style="list-style-type: none"><li>• Dutch</li><li>• English</li><li>• French</li><li>• German</li><li>• Spanish</li></ul>  |                         |
| New Instance, or<br>Maintain or update an<br>existing instance |  |                         |
| Setup type   | <p><b>Complete</b> – installs the entire Changepoint application including the database files, website files, and tools on a single server. This is the recommended option for a new installation when all features will be installed on a single server.</p> <p><b>Database Only</b> – Installs the required database files and scheduled jobs. The Login Settings utility is also installed.</p> <p><b>Website Only</b> – Installs and configures only the web application files. Use this option to install the web application files on a separate server from the SQL database.</p> <p><b>Custom</b> – Installs the features that you select.</p> <p><b>Note:</b> For an upgrade, the features are preselected based on the previous installation. Clearing the check box of a feature uninstalls the feature from the machine.</p> |                         |
| Destination folders for application files                      |  |                         |

| Information needed  | Notes   | Your installation value |
|---|---|-------------------------|
| Destination Location<br>(root folder for installation)      | Default:<br>C:\Program Files (x86)<br>\Changepoint\Changepoint\<br>Referred to throughout this document as <cp_root>.   |                         |
| Destination Location<br>(Changepoint web application files) | Default:<br><cp_root>\Enterprise\   |                         |
| Destination Location<br>(Report Designer files)             | Default:<br><cp_root>\ReportDesigner\   |                         |
| Destination Location<br>(Intelligent Forms web files)       | Default:<br><cp_root>\Intelligent Forms\Websites\   |                         |
| Destination Location<br>(Web Services API files)            | Default:<br><cp_root>\API\CP Web Services\  |                         |
| Destination Location<br>(Redis cache service)               | <cp_root>\Redis\<br>Note: The Redis cache service will use "RedisService" as the service name and 6379 as the port number. If either is already in use, the Redis service install and startup will fail. Refer to the RedisCacheService.log file under the Changepoint InstallLog folder for details. You will need to perform manual steps to install and start the Redis service with a unique service name and port number. For more information, see "Installing and Configuring Redis" on page 31. |                         |
| <b>Website names and ports</b>                              |   |                         |

## 1. Installation Requirements and Preparation

---

| Information needed  | Notes  | Your installation value |
|---|--|-------------------------|
| Name and port for the Changepoint website                               | Default: Enterprise, 8080<br><b>Note:</b> The name and port must be dedicated to the Changepoint website.  |                         |
| Name of the Intelligent Forms application pool                          | Default: CPInfiniti  |                         |
| Changepoint URL   | URL, including the protocol (http or https) for end users to access Changepoint.   |                         |
| <b>Destination locations for database files</b>                         |  |                         |
| Destination Location (Changepoint.mdf database file)                    | Default:<br><cp_root>\Database\Data\<br><br>For best performance, select a dedicated I/O channel (LUN, RAID set or physical disk) for each of the file types (.mdf, .ndf, and .ldf)<br>If only three channels are available, you can put the log and tempdb on the same channel. |                         |
| Destination Location (Changepoint2.ndf database file)                   |  |                         |
| Destination Location (Changepoint3.ndf database file)                   |  |                         |
| Destination Location (Changepoint4.ndf database file)                   |  |                         |
| Destination Location (database log file)                                | Default:<br><cp_root>\Database\Log\  |                         |
| Destination Location (Intelligent Forms database file - InfinitiDB.mdf) | Default: The same location as the Changepoint.mdf database file.   |                         |

| Information needed   | Notes  | Your installation value |
|--|--|-------------------------|
| Destination Location<br>(Intelligent Forms database log file - InfinitiDB.ldf) | Default: The same location as the Changepoint database log file.   |                         |
| <b>Database login information</b>  |  |                         |
| Database server  | Select the SQL Server name where the Changepoint database will be installed.   |                         |
| Login ID (SQL Server)  | sa   |                         |
| Password (SQL Server)  | password for the sa account  |                         |
| Database Name  | Recommended default: Changepoint   |                         |
| User ID for the SQL account that will be used for the database connection      | Used in the Login Settings (Connection settings) setup.  |                         |
| Intelligent Forms database name  | Recommended default: InfinitiDB  |                         |
| <b>Mode</b>  |  |                         |
| Mode   | <ul style="list-style-type: none"> <li>PSA – Changepoint PSA (Professional Services Automation)</li> <li>ITD – Changepoint PPM (Project Portfolio Management)</li> </ul> |                         |



## 2. Installing Required Changepoint Components

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### Installing Changepoint using the installer

The installer sets the Anonymous Authentication Credential to use Application Pool Identity. The Changepoint website is assigned to its own application pool (*sitename\_AppPool*).

1. Copy the contents of the product media to a location on the server.
2. Run the `setup.exe` file from the copied location.

The Changepoint 2017 window opens.

3. On the **Changepoint** tab, click the **Install Changepoint 2017** link.
4. At each prompt, select or type the appropriate parameter from the table in "Installation parameters" on page 18, and click **OK** or **Next** to move to the next prompt.
5. After you select the **Changepoint Application Mode**, click **Next**.

The **Start Copying Files** screen appears.

6. Review the current settings to ensure all information is correct.
7. If correct, click **Next** to continue with the installation.

When installation is complete, the **InstallShield Wizard Complete** screen displays.

8. To review the installation log for any errors or warnings, select **I would like to open the Installation Log file**. The installation log file provides details about the issues that were encountered and possible remedies that you can apply manually after the installation.
9. To run the Login Settings utility after the installation, select **I would like to launch Login Settings (Connection Settings)**. This utility is used to configure and encrypt the connection settings for security purposes. At this time, you can configure the connection settings for:
  - Changepoint
  - Enterprise\global.asa
  - Enterprise Report Server\global.asa
  - Enterprise\WebAPI\web.config
  - Enterprise\WebSocket\web.config

- Intelligent Forms\Websites\InfinitiLaunch\web.config
- Intelligent Forms\Websites\IntelledoxSchedulerIntelledoxScheduler.exe.config
- Intelligent Forms\Websites\ChangepointDataService\web.config
- Intelligent Forms\Websites\Manage\web.config
- Intelligent Forms\Websites\Product\web.config
- API\CP Web Services\web.config
- Intelligent Forms
- Web Services API
- the executables associated with Changepoint scheduled jobs

See "About configuring database connection settings" on page 65 for instructions.

10. Click **Finish**.

11. To install additional instances of Changepoint on this server, see "Installing multiple Changepoint instances" on page 24.

12. Configure Redis. For more information, see "About Redis" on page 31

13. Complete the post-installation instructions.

For more information, see "Configuring Changepoint" on page 47.

### Installing multiple Changepoint instances

You can run the InstallShield Wizard as many times as needed on the same servers to install multiple Changepoint websites and databases.

A common scenario for creating multiple databases on a server is setting up training and test environments. For more information, see "Creating a Test and Training Environment" on page 219.

Note the following:

- The Changepoint website names and database names must be unique for each instance on the server.
- The port number for each Changepoint website on the server must be unique.



- Scheduled jobs are created for each database with the database name prepended to the job names.
  - You must configure the database access settings for the appropriate database and the applicable .exe jobs
  - Because you can install only one instance of each Changepoint Windows service (for example, Report Prerender Service, Report Scheduler Service, and Changepoint Mail Service) on a server, Windows service instances for each database after the first must be set up on separate servers.
1. Install the first website instance using the procedure described in "Installing Changepoint using the installer" on page 23.
  2. Run the `setup.exe` file again.

The **Changepoint 2017** window opens.

3. On the **Changepoint** tab, click the **Install 2017** link.

The **Existing Installed Instances Detected** screen displays.

4. Select the **Install a new instance** option, and then click **Next**.
5. The remaining steps are the same as the standard procedure for installing using the wizard.

**Note:** The Redis cache service will use "RedisService" as the service name and 6379 as the port number. If either is already in use, the Redis service install and startup will fail. Refer to the RedisCacheService.log file under the Changepoint InstallLog folder for details. You will need to perform manual steps to install and start the Redis service with a unique service name and port number. For more information, see "Installing and Configuring Redis" on page 31.

## Modifying a Changepoint instance

To add or remove features, use the Windows Control Panel, or run the InstallShield Wizard again on an installed Changepoint instance.

**Note:** You must use SQL Server Management Studio to remove a database.

### Modifying Changepoint using the InstallShield Wizard

1. Run the `setup.exe` file again.

The **Changepoint 2017** window opens.

2. On the **Changepoint** tab, click the **Install Changepoint 2017** link.

The **Existing Installed Instances Detected** screen displays.

3. Do the following:
  - a. Select the **Maintain or update the instance of this application selected below** option.
  - b. Select the instance that you want to modify from the list of instances.
  - c. Click **Next**.

The **Welcome** screen appears.

4. Select the **Modify** option and click **Next**.

The **Select Features** screen displays.

5. Do the following:
  - To install a feature, select the check box.
  - To remove a feature, clear the check box.
6. The remaining steps are the same as the standard procedure for using the wizard.

## Uninstalling a Changepoint instance

You can uninstall Changepoint using the Windows Control Panel, or the InstallShield Wizard.

**Note:** All features are removed except the database. To remove the database you must use SQL Server.

If you uninstall Changepoint after an upgrade, the previous installation of Changepoint is not restored.

To uninstall a Changepoint instance using the InstallShield Wizard

1. Run the setup.exe file.

The **Changepoint** window appears.
2. On the **Changepoint** tab, click the **Install Changepoint** link.

The **Existing Installed Instances Detected** screen appears.
3. Do the following:

- a. Select the **Maintain or update the instance of this application selected below** option.
- b. Select the instance that you want to uninstall.
- c. Click **Next**.

The **Preparing Setup** screen appears, followed by the **Welcome** screen.

4. Select the **Remove** option, and then click **Next**.
5. Click **OK** to confirm.
6. Click **Finish**.

## Installing the Changepoint database manually

When you install the database manually, you must also install the scheduled jobs, CPTempDB, and CPExtendedDB.

The default name of the CPTempDB database is: <Changepoint database name>\_CPTempDb, and the default location is the location of the Changepoint database files (mdf, ldf). However, you can specify a different name and location, if necessary.

1. Review "Destination locations for database files" on page 20.
2. Copy the following database files for the appropriate language from the Changepoint product media to the target locations on the database server:

```
\Changepoint\Manual Install\New Database\<language>\Changepoint.mdf
\Changepoint\Manual Install\New Database\<language>\Changepoint2.ndf
\Changepoint\Manual Install\New Database\<language>\Changepoint3.ndf
\Changepoint\Manual Install\New Database\<language>\Changepoint4.ndf
\Changepoint\Manual Install\New Database\<language>\Changepoint_log.ldf
```

Ensure that the newly copied files are read-write.

3. From the Changepoint product media, copy the files from the following folder:

```
\Changepoint\Manual Install\New Database\
```

to:

```
<cp_root>
```

Ensure that the .sql files are read-write.

## 2. Installing Required Changepoint Components

---

**Note:** For the remaining steps in this procedure, use the files in the destination folder. After installation is complete you can delete the files in the destination folder.

4. Connect to the database server using the SQL server `sa` account or equivalent.
5. Edit `Setup_Changepoint.sql`:
  - a. Replace the path for the following files with the paths to these files on your database server:

```
D:\DataFiles\MSSQL\DATA\Changepoint.mdf
D:\DataFiles\MSSQL\INDEX\Changepoint2.ndf
D:\DataFiles\MSSQL\INDEX\Changepoint3.ndf
D:\DataFiles\MSSQL\DATA\Changepoint4.ndf
D:\DataFiles\MSSQL\LOG\Changepoint_log.ldf
```
  - b. If the database name is not “Changepoint”
    - replace “Changepoint” with the database name
    - rename the files you copied in step 2
  - c. Execute `Setup_Changepoint.sql`.
6. Execute: `Exec DBM_EnableSQLDependency 'webconfiguser'.`
7. To create `CPTempDB`, execute `DBM_SetupCPTempDB`.
  - a. Open `Setup_CPTempDB.sql` in an editor, and replace the variables with following:
    - `@CPTemp_DB` with the Changepoint database name
    - `@CPTempDB_MdfPath` with the path of the MDF file
    - `@CPTempDB_LdfPath` with the path of the LDF file
  - b. Run the script against the Changepoint database.
8. Execute `Setup_Full_Text.sql`. against the Changepoint database.
9. Execute stored procedure `DBM_SetupCPExtended` against the Changepoint database

### Installing the scheduled jobs manually

1. Open the following script:

```
<cp_root>\Manual Install\New Database\Setup_Scheduled_Jobs.sql
```

- a. Replace `@SCHEDULE_JOB_PATH` with the path for the scheduled jobs folder. The default folder is:

```
<cp_root>\ScheduledJobs\
```

- b. Replace @DATAARCHIVING\_JOB\_PATH with the path for the archiving scheduled jobs folder. The default folder is:

<cp\_root>\Changepoint\Data Archiving\

2. Do the following:

- a. Copy the Login Settings utility (Login Settings.exe) from:

<cp\_root>\Manual Install\Components\LoginSettings\

to:

<cp\_common>\LoginSettings\

- b. Run the Login Settings utility on CPEffectiveDates.exe.config to configure the database connection settings.
- c. Run the Login Settings utility on CPGuestLicenses.exe.config to configure the database connection settings.

For more information on the Login Settings utility, see "About configuring database connection settings" on page 65.



## 3. Installing and Configuring Redis

---

### About Redis

Redis is an open source (BSD licensed), in-memory data structure store, used as a database, cache and message broker. Redis also supports master-slave asynchronous replication and optionally provides high availability with Redis Sentinel.

Redis is designed to be accessed by trusted clients inside trusted environments. Therefore, the Redis instance must not be exposed directly to the Internet or to an environment where untrusted clients can directly access the Redis TCP port. Redis should be directly accessible only by authorized operators, and the computers that implement the application that uses Redis.

While Redis does not implement Access Control, it does provide a simple layer of authentication that you can enable by editing the `redis.windows.conf` file. When the authentication layer is enabled, Redis will refuse any query by clients that are not authenticated. A client can authenticate itself by sending the `AUTH` command followed by the password.

The goal of the authentication layer is to optionally provide a layer of redundancy. If firewalls or any other system that was implemented to protect Redis from external attackers fail, an external client will still not be able to access the Redis instance without providing the authentication password.

### About installing the Redis server

The Changepoint installer automatically creates a new Redis Server instance that is preconfigured for a single web server deployment. The installer also creates a new Redis service instance that has a temporary authentication password and is linked one-to-one with the Changepoint website instance that is being installed or upgraded on the web server.

The startup configuration for the Redis Server is in the `redis.windows.conf` file in the Redis Server folder, and the corresponding Redis cache settings are in the `web.config` file for the website.

The following are the default settings for the Redis service:

- name – RedisService
- port – 6379
- authentication password is required (temporary password is provided)

**Warning:** It is highly recommended that you use a strong password that is unique to your organization. For more information about the importance of using a strong password, see the `redis.windows.conf` file.

**Note:** This guide includes the basic information that is required to install and configure Redis for use with Changepoint. For more information, see the Redis website at <https://redis.io/>.

#### Multiple web servers

If you are setting up multiple Changepoint website instances that are load balanced across multiple web servers, then the Redis Server installed and preconfigured with the default service name, port, and authentication password on each instance. You must designate a master server and configure the remaining server instances as slave servers.

### Common Redis commands

Use these commands for Redis service installations.

#### Installing the Redis service manually

```
redis-server --service-install redis.windows.conf --service-name RedisService --port 6379
```

The service is configured as Autostart and will be launched as "NT AUTHORITY\NetworkService". Upon successful installation, a success message is displayed and Redis exits. Redis will listen on the specified port number.

This command does not start the service.

#### Uninstalling the Redis service

```
redis-server --service-uninstall --service-name RedisService
```

This command removes the Redis service configuration information from the registry. Upon successful uninstallation, a success message is displayed and Redis exits.

This command does not stop the service. To remove the service completely, stop the service first.

#### Starting the Redis service

```
redis-server --service-start --service-name RedisService
```



This command starts the Redis service. Upon successful startup, a success message is displayed. You can also start the service by using the Services dialog or the `net start` command.

### Stopping the Redis service

```
redis-server --service-stop --service-name RedisService
```

This command stops the Redis service. Upon successful termination, a success message is displayed and Redis exits. You can also stop the service by using the Services dialog or the `net stop` command.

### Naming the Redis service

```
--service-name name
```

This parameter can be used with any of the preceding commands to set the name of the installed service. This command is required if you plan on deploying multiple instances (for example, development, test, production) of Changepoint on the same server because each Changepoint instance requires a separate Redis instance. If there are only one instance of the Changepoint website on the machine, the service name change is not required.

### Specifying the Redis server port

```
--port 6379
```

You can use this parameter to configure the port that Redis listens on. If you do not configure a port, Redis uses the port that is specified in the `redis.windows.conf` file (default port is 6379). If you are accessing Redis from an external machine you must ensure that a firewall exception exists.

## Single web server deployment

This configuration is set up by default when you use the Changepoint installer to install or upgrade. A single web server deployment requires a single Redis master server, which is responsible for all requests (read/write).

You must do the following:

- Configure a single Changepoint web server: Web01
- Implement a single master Redis server with authentication enabled:
  - Redis service name: RedisService
  - Redis port: 6379

**Note:** To edit the Redis configuration file (`redis.windows.conf`), you require a text editor, such as Notepad++, that recognizes Unix-style line breaks. You cannot use Windows Notepad for this purpose.

1. Configure Redis authentication:

- a. Open the `redis.windows.config` and locate the following lines:

```
requirepass 6ed18d5c7df443940...
masterauth 6ed18d5c7df443940...
```

- b. Replace the temporary authentication password with a strong password that is unique to your organization. For more information see the note about `requirepass` in the configuration file.

**Warning:** It is strongly recommended that you use a strong password that is unique to your organization. For more information about the importance of using a strong password, see the `redis.windows.conf` file.

2. Install the Redis Server as a service:

```
redis-server --service-install redis.windows.conf --service-name RedisService --port 6379
```

After installation, the RedisService is available in the Windows Service Management Console.

3. Start the Redis Server service:

```
redis-server --service-start --service-name RedisService
```

The Redis master server configuration is complete and ready to accept connections.

4. Configure the Changepoint web site:

- a. In the Changepoint `web.config` file, locate the following lines:

```
<add key="cache.Password" value="6ed18d5c7df443940..." />
<add key="cache.Servers" value="servername:6379" />
```

- b. Replace the values of the authentication password, server and port number as specified in the Redis configuration file.

- c. Repeat for the WebAPI `web.config` file.

- d. Repeat for the WebSockets `web.config` file.

5. Configure the `global.asa` file:

- a. Locate the following lines:

```
Application("cache.Password") = "6ed18d5c7df443940..."  
Application("cache.Servers") = "servername:6379"
```

- b. Replace the values of the authentication password, server, and port number as specified in the Redis configuration file.

## Multiple web server deployment, without high availability

A multiple web server deployment requires a Redis server to be designated as the Redis master, and all additional servers to be configured as Redis slave servers. In this type of environment, all read/write requests are directed to the master, and read-only requests preferably target a Redis slave server.

**Note:** With this configuration, if the master server goes down, then an operator must intervene manually to promote a slave server to the master role.

The process for configuring this sample deployment includes the following:

- Two Changepoint web servers:
    - Web01 (Redis Master)
    - Web02 (Redis Slave)
  - A single master Redis server with authentication enabled:
    - Redis service name: RedisService\*
    - Redis port: 6379\*
  - A single slave server Redis server with authentication enabled:
    - Redis service name: RedisService
    - Redis port: 6379
1. Configure Web01 as the Redis master server by following the procedure in "Single web server deployment" on page 33, but do not configure the Changepoint web site.
  2. Configure Web02 as the Redis slave server:
    - a. Follow the procedure in "Single web server deployment" on page 33, but do not configure the Changepoint web site.
    - b. Navigate to the Redis installation path (default installation path is <cp\_root>\Redis).

- c. Configure Redis Replication. Open the `redis.windows.config` and locate the following lines:

```
# slaveof <masterip> <masterport>
# masterauth <master-password>
```

- d. Uncomment the lines, and configure the replication parameters:

```
slaveof Web01 6379
masterauth 6ed18d5c7df443940...
```

**Note:** The passwords used for `masterauth` and `requirepass` must all be the same within a master-slave configuration.

3. Install the Redis Service:

```
redis-server --service-install redis.windows.conf --service-name RedisService --port 6379
```

4. Start the Redis Server service:

```
redis-server --service-start --service-name RedisService
```

The Redis slave server configuration is complete, and ready to accept connections.

5. Configure the Changepoint web sites. Make the following edits to the `web.config` files on all web servers:

- a. In the Changepoint `web.config` file, locate the following line:

```
<add key="cache.Password" value="6ed18d5c7df443940..." />
```

- a. Replace the value of the authentication password.

- b. In the following line:

```
<add key="cache.Servers" value="Web01:6379;Web02:6379" />
```

- c. Add the values for all of the Redis servers and their port numbers as specified in the Redis configuration file.

- d. Make the same changes in the WebAPI `web.config` file.

- e. Make the same changes in the WebSockets `web.config` file.

6. Make the following edits to the `global.asa` files on all web servers:

- a. Locate the following lines:

```
Application("cache.Password") = "6ed18d5c7df443940..."
Application("cache.Servers") = "servername:6379"
```

- b. Replace the values of the authentication password
- c. Add the values for all of the Redis servers and their port number as specified in the Redis configuration file.

**Note:** The `cache.Servers` value must contain all Redis servers and their defined listening ports, separated by semicolons. For example:

```
Application("cache.Servers") = "Web01:6780;Web02:6781;Web03:6379;Web04:6379"
```

## Multiple web server deployment with high availability

Using Redis Sentinel, you can create a Redis deployment that handles service outages without manual intervention. Redis Sentinel provides monitoring of the Redis deployments, and automatic failover when failures occur.

The high availability configuration is based on a multiple server deployment to which Redis Sentinel is added. Therefore the starting point is to create a multiple server deployment as described in "Multiple web server deployment, without high availability" on page 35. The following diagram outlines the deployment.

The process for configuring this sample deployment includes the following:

- Configure three Changeport web servers:
  - Web01 (RedisMaster)
  - Web02 (RedisSlave1)
  - Web03 (RedisSlave2)
- Implement single master Redis server with authentication enabled
  - Redis service name: RedisMaster
  - Redis port: 6780
- Implement slave instance of Redis server with authentication enabled
  - Redis service name: RedisSlave1
  - Redis port: 6781
- Implement slave instance of Redis server with authentication enabled
  - Redis service name: RedisSlave2

- Redis port: 6782
- Implement Redis Sentinel

## Configure a multiple server deployment

Configure a multiple server deployment by following the procedures in "Multiple web server deployment, without high availability" on page 35

## Installing Redis Sentinel

1. On each of the web servers, copy the existing Redis folder to a folder named Sentinel.

**Note:** Each web server can have only one Sentinel instance, regardless of the number of websites that are installed on the server.

2. From the Sentinel folder, edit the following lines in the `sentinel.conf` file by replacing the port number and password with the appropriate values:

```
port <sentinel-port>
sentinel monitor <master-name> <ip> <redis-port> <quorum>
sentinel auth-pass <master-name> <password>
sentinel down-after-milliseconds <master-name> <milliseconds>
sentinel failover-timeout <master-name> <milliseconds>
sentinel parallel-syncs <master-name> <numslaves>
logfile "sentinel.log"
```

Based on the example in this guide, the values would be:

```
port 26380
sentinel monitor RedisMaster Web01 6780 2
sentinel auth-pass RedisMaster rx6RB2CHt1lYkQnm$2jc3#CgL
sentinel down-after-milliseconds RedisMaster 30000
sentinel failover-timeout RedisMaster 180000
sentinel parallel-syncs RedisMaster 1
logfile "sentinel.log"
```

### **port <sentinel-port>**

The port that the Sentinel instance will run on.

### **sentinel monitor <master-name> <ip> <redis-port> <quorum>**

Specifies the master server to be monitored, and to consider it in ODOWN (Objectively Down) state only if at least the number of Redis Sentinel servers specified in <quorum> agree.

**Warning:** The master name cannot include special characters or spaces. The valid characters are: A-z, 0-9, and the characters ".-\_" (period, dash, and underscore).

**Note:** Regardless of the number that is defined as the ODOWN quorum, the majority of Redis Sentinel servers must be online to start the failover process. In this example, if the quorum of two (2) Sentinel instances detect that the master Web01 is not available, the failover process begins the process of promoting one of the slave servers as the new master.

Slave servers are autodiscovered by Sentinel, therefore you do not have to specify slave servers in any way. Sentinel rewrites the configuration file by adding the slave servers using additional configuration options. The configuration file is also rewritten when a slave server is promoted to master.

### **sentinel auth-pass <master-name> <password>**

Set the password to use to authenticate with the master and slave servers. Useful if there is a password set in the Redis instances to monitor.

### **sentinel down-after-milliseconds <master-name> <milliseconds>**

Number of milliseconds that the master (or any attached slave server or Sentinel server) must be unavailable (as in, not accepting reply to PING, continuously) to be considered in S\_DOWN state (Subjectively Down).

### **sentinel failover-timeout <master-name> <milliseconds>**

Specifies the failover timeout in milliseconds.

### **sentinel parallel-syncs <master-name> <numslaves>**

The number of slave servers that can be reconfigured simultaneously to point to the new slave server during a failover. Use a low number to avoid all slave servers being unreachable while performing a synchronization with the master.

## **Starting Redis Sentinel (Console mode)**

From a command line prompt on each of the servers, go to the `Sentinel` folder, and issue the following command:

```
redis-server sentinel.conf --sentinel
```

As each Sentinel server comes online, you should receive output similar to the following:

### 3. Installing and Configuring Redis

---

```
[5372] 16 Jan 11:54:18.485 # Sentinel runid is 5b50429514954dab8f24a099aaf3e1442fe2f2ac
[5372] 16 Jan 11:54:18.486 # +monitor master RedisMaster 127.0.0.1 6780 quorum 2
[5372] 16 Jan 11:54:56.816 * -dup-sentinel master RedisMaster 127.0.0.1 6780 #duplicate of
127.0.0.1:26381 or 3b1854570beabaaac8551db88bb5dd51625424c2
[5372] 16 Jan 11:54:56.817 * +sentinel sentinel 127.0.0.1:26381 127.0.0.1 26381 @
RedisMaster 127.0.0.1 6780
[5372] 16 Jan 11:55:02.787 * -dup-sentinel master RedisMaster 127.0.0.1 6780 #duplicate of
127.0.0.1:26383 or 53525d1ebcbb8627ed3dcfbcb84b858e31626c2db
[5372] 16 Jan 11:55:02.788 * +sentinel sentinel 127.0.0.1:26383 127.0.0.1 26383 @
RedisMaster 127.0.0.1 6780
```

The output shows that each Sentinel server found the master server and autodiscovered the slaves. This particular configuration is hosted on the same machine, which is why there are multiple references to 127.0.0.1.

If the master were to go offline, you will receive output similar to the following:

```
[5372] 16 Jan 12:00:42.415 # +sdown master RedisMaster 127.0.0.1 6780
[5372] 16 Jan 12:00:42.475 # +odown master RedisMaster 127.0.0.1 6780 #quorum 2/2
[5372] 16 Jan 12:00:42.475 # +new-epoch 4
[5372] 16 Jan 12:00:42.475 # +try-failover master RedisMaster 127.0.0.1 6780
[5372] 16 Jan 12:00:42.476 # +vote-for-leader 5b50429514954dab8f24a099aaf3e1442fe2f2ac 4
[5372] 16 Jan 12:00:42.478 # 127.0.0.1:26383 voted for
5b50429514954dab8f24a099aaf3e1442fe2f2ac 4
[5372] 16 Jan 12:00:42.478 # 127.0.0.1:26381 voted for
5b50429514954dab8f24a099aaf3e1442fe2f2ac 4
[5372] 16 Jan 12:00:42.567 # +elected-leader master RedisMaster 127.0.0.1 6780
[5372] 16 Jan 12:00:42.571 # +failover-state-select-slave master RedisMaster 127.0.0.1
6780
[5372] 16 Jan 12:00:42.662 # +selected-slave slave 127.0.0.1:6781 127.0.0.1 6781 @
RedisMaster 127.0.0.1 6780
[5372] 16 Jan 12:00:42.662 * +failover-state-send-slaveof-noone slave 127.0.0.1:6781
127.0.0.1 6781 @ RedisMaster 127.0.0.1 6780
[5372] 16 Jan 12:00:42.726 * +failover-state-wait-promotion slave 127.0.0.1:6781 127.0.0.1
6781 @ RedisMaster 127.0.0.1 6780
[5372] 16 Jan 12:00:43.534 # +promoted-slave slave 127.0.0.1:6781 127.0.0.1 6781 @
RedisMaster 127.0.0.1 6780
[5372] 16 Jan 12:00:43.536 # +failover-state-reconf-slaves master RedisMaster 127.0.0.1
6780
[5372] 16 Jan 12:00:43.599 * +slave-reconf-sent slave 127.0.0.1:6782 127.0.0.1 6782 @
RedisMaster 127.0.0.1 6780
[5372] 16 Jan 12:00:44.562 * +slave-reconf-inprog slave 127.0.0.1:6782 127.0.0.1 6782 @
RedisMaster 127.0.0.1 6780
[5372] 16 Jan 12:00:44.562 * +slave-reconf-done slave 127.0.0.1:6782 127.0.0.1 6782 @
RedisMaster 127.0.0.1 6780
[5372] 16 Jan 12:00:44.628 # -odown master RedisMaster 127.0.0.1 6780
[5372] 16 Jan 12:00:44.628 # +failover-end master RedisMaster 127.0.0.1 6780
```



```
[5372] 16 Jan 12:00:44.628 # +switch-master RedisMaster 127.0.0.1 6780 127.0.0.1 6781
[5372] 16 Jan 12:00:44.629 * +slave slave 127.0.0.1:6782 127.0.0.1 6782 @ RedisMaster
127.0.0.1 6781
[5372] 16 Jan 12:00:44.629 * +slave slave 127.0.0.1:6780 127.0.0.1 6780 @ RedisMaster
127.0.0.1 6781
```

In this scenario, 2 Sentinel servers agreed that the master is not responding. Because the majority of Sentinel servers are online, a leader is agreed upon and a new master (6781) is elected and all remaining slaves are reconfigured accordingly. The Sentinels continue to monitor for the missing server.

If the old master comes back online you will see similar output to the following:

```
[5596] 16 Jan 12:05:55.564 * +convert-to-slave slave 127.0.0.1:6780 127.0.0.1 6780 @
RedisMaster 127.0.0.1 6781
```

**Note:** Sentinel does not promote the old master, but reconfigures it as a slave of the new master.

## Installing Redis Sentinel Service

From a command line prompt on each of the servers, go to the `Sentinel` folder and issue the following command:

```
redis-server --service-install sentinel.conf --service-name Sentinel --sentinel
```

The service is configured as Autostart and will be launched as "NT AUTHORITY\NetworkService". Upon successful installation, a success message is displayed and Redis exits. Sentinel will listen on the port number that is specified in the `sentinel.conf` file.

This command does not start the service.

## Uninstalling Redis Sentinel Service

From a command line prompt on each of the servers, go to the `Sentinel` folder and issue the following command:

```
redis-server --service-uninstall sentinel.conf --service-name Sentinel --
sentinel
```

This command removes the Sentinel service configuration information from the registry. Upon successful uninstallation, a success message is displayed and Redis exits.

This command does not stop the service.

## Starting the Redis Sentinel Service

```
redis-server --service-start --service-name Sentinel
```

This command starts the Redis Sentinel service. Upon successful startup, a success message is displayed and Redis service is started. You can also start the service by using the Services dialog or the net start command.

#### Stopping the Redis Sentinel Service

```
redis-server --service-stop --service-name Sentinel
```

This command stops the Redis Sentinel service. Upon successful termination, a success message is displayed and Redis exits. You can also stop the service by using the Windows Services Management Console or the net stop command.

### Common Redis Sentinel commands

#### Querying the status of Redis Sentinel

Redis is installed with client application called `redis-cli.exe` that enables command line console to interact with and manage Redis and Redis Sentinel services.

```
redis-cli -p 26380
127.0.0.1:26380> ping
PONG
127.0.0.1:26380>
```

#### Show the state and information of a master

```
SENTINEL master <master name>
```

Example:

```
sentinel master MyRedisInstance
127.0.0.1:26380> SENTINEL master MyRedisInstance
1) "name"
2) "MyRedisInstance"
3) "ip"
4) "127.0.0.1"
5) "port"
6) "6781"
7) "runid"
8) "5a9d14a5a72c87e203a92650c4cd17dfe1f66394"
9) "flags"
10) "master"
11) "pending-commands"
12) "0"
13) "last-ping-sent"
14) "0"
15) "last-ok-ping-reply"
16) "117"
```

```
17) "last-ping-reply"
18) "117"
19) "down-after-milliseconds"
20) "60000"
21) "info-refresh"
22) "2113"
23) "role-reported"
24) "master"
25) "role-reported-time"
26) "815163"
27) "config-epoch"
28) "4"
29) "num-slaves"
30) "2"
31) "num-other-sentinels"
32) "2"
33) "quorum"
34) "2"
35) "failover-timeout"
36) "180000"
37) "parallel-syncs"
38) "1"
```

### **Return the IP address and port number of a master**

```
SENTINEL get-master-addr-by-name <master name>
```

#### **Example:**

```
127.0.0.1:26380> sentinel get-master-addr-by-name MyRedisInstance
1) "127.0.0.1"
2) "6781"
127.0.0.1:26380>
```

### **Show a list of slave servers and their states for a master**

```
SENTINEL slaves <master name>
```

#### **Example:**

```
127.0.0.1:26380> sentinel slaves MyRedisInstance
1) 1) "name"
2) "127.0.0.1:6782"
3) "ip"
4) "127.0.0.1"
5) "port"
6) "6782"
7) "runid"
8) "9925a92da3a3770684532dd77cdf687b72137b0d"
9) "flags"
```

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```
10) "slave"
11) "pending-commands"
12) "0"
13) "last-ping-sent"
14) "0"
15) "last-ok-ping-reply"
16) "582"
17) "last-ping-reply"
18) "582"
19) "down-after-milliseconds"
20) "60000"
21) "info-refresh"
22) "3686"
23) "role-reported"
24) "slave"
25) "role-reported-time"
26) "1228352"
27) "master-link-down-time"
28) "0"
29) "master-link-status"
30) "ok"
31) "master-host"
32) "127.0.0.1"
33) "master-port"
34) "6781"
35) "slave-priority"
36) "100"
37) "slave-repl-offset"
38) "1939136"
2) 1) "name"
2) "127.0.0.1:6780"
3) "ip"
4) "127.0.0.1"
5) "port"
6) "6780"
7) "runid"
8) "33c8446fd8218705843aac4f057aaf7812eb9699"
9) "flags"
10) "slave"
11) "pending-commands"
12) "0"
13) "last-ping-sent"
14) "0"
15) "last-ok-ping-reply"
16) "582"
17) "last-ping-reply"
18) "582"
19) "down-after-milliseconds"
```

```
20) "60000"
21) "info-refresh"
22) "3686"
23) "role-reported"
24) "slave"
25) "role-reported-time"
26) "1228352"
27) "master-link-down-time"
28) "0"
29) "master-link-status"
30) "err"
31) "master-host"
32) "127.0.0.1"
33) "master-port"
34) "6781"
35) "slave-priority"
36) "100"
37) "slave-repl-offset"
38) "1"
```

## Common Redis Sentinel scenarios

To view the complete set of Redis commands, go to: <https://redis.io/commands>.

**Scenario: Master server goes off line, need to promote a slave server to master.**

```
localhost:6781> SLAVEOF NO ONE
```

**Scenario: New master has been designated, need to attach existing slave servers to new master (localhost 6781).**

```
localhost:6782> SLAVEOF localhost 6781
localhost:6783> SLAVEOF localhost 6781
```

**Scenario: Query current replication settings**

```
localhost:6780> INFO Replication
# Replication
role:master
connected_slaves:1
slave0:ip=::f0f3:a200:0:0,port=6781,state=online,offset=3025,lag=0
master_repl_offset:3025
repl_backlog_active:1
repl_backlog_size:1048576
repl_backlog_first_byte_offset:2
repl_backlog_histlen:3024
```

**Scenario: Query information related to memory consumption**

```
localhost:6780> INFO Memory
```

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---

```
# Memory used_memory:2011808
used_memory_human:1.92M
used_memory_rss:1938032
used_memory_peak:2048576
used_memory_peak_human:1.95M
used_memory_lua:36864
mem_fragmentation_ratio:0.96
mem_allocator:jemalloc-3.6.0
```

#### **Using arguments to send a command to redis-cli**

```
C:\Redis>redis-cli -h localhost -p 6780 -a "rx6RB2CHt1lYkQnm$2jc3#CgL" PING
PONG
```

## 4. Configuring Changepoint

---

### Overview of configuration

After you have completed the installation, perform the following configuration steps:

1. Configure the settings for token authentication as follows:
  - a. Open the `Enterprise\Web.config` file, and then replace the default value of the `WebApiSecret` setting with a unique string of UTF-8 characters with a recommended size of 64 bytes. For example, you can use any combination of 64 single byte characters.
  - b. Open the `Enterprise\WebAPI\Web.config` file and then replace the value of `WebApiSecret` with the same unique string used above.
  - c. Open the `Enterprise\WebSockets\Web.config` file, and then replace the value of `WebApiSecret` with the same unique string used above.
  - d. In a load balanced environment, ensure that you use the same `WebAPISecret` value within the environment.

**Note:** For security reasons, it is strongly recommended that you use a different `WebAPISecret` value for each Changepoint instance that you deploy.

2. Set the permissions on the Changepoint folders.

For more information, see "Setting permissions on the Changepoint folders" on page 48.

3. Review the default settings for the Changepoint scheduled jobs, and change them as required.

For more information, see "Configuring Changepoint Scheduled Jobs" on page 83.

4. Install and set up the optional components as required. For more information, see:
  - "Installing Changepoint Windows Services" on page 53.
  - "Configuring an Archive database" on page 173
  - "Installing and Configuring Single Sign-on" on page 147
  - "Setting up mobile access to Changepoint" on page 179.
  - "Installing the Changepoint online help" on page 177.
  - "Setting up a Client Portal website" on page 179

- "Setting up a survey response website" on page 180.
  - "About Microsoft Exchange/Outlook synchronization" on page 181
  - "Configuring batch printing" on page 182.
  - "About installing Changepoint APIs" on page 183.
5. If you have not already done so, configure the database connection settings for the Changepoint websites, installed Windows services, and scheduled job executables.  
  
For more information, see "Configuring database connection settings" on page 65.
  6. To verify connectivity, sign into all websites.
  7. Review "Optimizing Performance" on page 211 for performance optimization recommendations.
  8. Run the chained scheduled jobs by starting Update Time Rate, and ensure that Resource Demand Calculation completes successfully.
  9. As required, enable or disable financial analysis record types. For more information, see "Enabling financial analysis record types" on page 249.
  10. As required, add fiscal periods to group data. For more information, see "Adding fiscal periods to group financial analysis data" on page 249.

### Setting permissions on the Changepoint folders

On the web server:

1. Set NTFS security for the Changepoint\tempimages folder to allow Full Control for all users and groups.
2. To allow users to export survey results, grant authenticated users **Modify** access to the `<cp_root>\Temp` folder.

### About setting up Changepoint websites for SSL

If Changepoint websites are set up for SSL in Changepoint Administration, then changes are needed in the Web.config files for Changepoint.

If you plan to install SSO, these changes are made when you run the PowerShell script for your chosen SSO endpoint type.



To use SSL with application authentication, follow the instructions in "About application authentication" on page 148.

## Enabling HTTP Compression

It is recommended that you enable both static and dynamic compression.

**Note:** You must be a member of the `Administrators` group on the local computer to run scripts and executables. As a security best practice, log onto your computer using an account that is not in the `Administrators` group, and then use the `runas` command to run your script or executable as an administrator. The script assumes that `inetpub\Admascripts` is located on the system drive. The script performs an IIS reset when the configuration is complete.

1. In IIS Manager, on the **Compression** page, select:
  - **Enable dynamic content compression**
  - **Enable static content compression**
2. Restart IIS.
3. To ensure proper content expiration on the client side, follow the instructions in the Microsoft Knowledge Base article 319384.

<http://support.microsoft.com/default.aspx?scid=kb;en-us;319384>

4. At a command prompt, run:

```
Changepoint\Utilities\HTTP Compression Utility\HTTPCompressionConfigIIS.bat
```

If you receive the following error message when you run the `.bat` file, you can safely ignore it:

```
ERROR ( message:New scheme object missing required attributes. Cannot add  
duplicate collection entry of type 'scheme' with unique key attribute  
'name' set to 'deflate'. )
```

### Tech Notes and Knowledge Base Articles

Search the Microsoft TechNet articles for more information on enabling HTTP compression.

## Setting Global IIS Parameters

Use IIS Manager to do the following for each Changepoint website:

1. On the **Connections** panel, select the website.

2. Double-click the ASP feature.
3. Expand **Limit Properties**.
  - a. Set the value of the **Maximum Requesting Entity Body Limit** to **10000000**
  - b. Set the value of the **Response Buffering Limit** to **10000000**
4. In the **Actions** panel, click **Apply**.
5. Restart IIS.

### Configuring IIS to allow plug-in and expense template downloads

To allow users to download .exe plug-ins from Changepoint Preferences, you must configure the appropriate permissions in IIS.

If you have added .exe files to the **deny** list on your IIS server, then in the **URL** tab of the Request Filter Module add the following URLs:

```
/ChangepointMSP.exe  
/ChangepointOutlookSetup.exe
```

To allow users to download the expense template, add the following URL:

```
/ChangepointExcelExpenses.exe
```

### Importing licences for a new installation

Use Changepoint Administration to import the licenses for granting users access to Changepoint. You need a user license file for each user.

**Note:** You must configure the login settings for Changepoint Administration before you can import licenses.

1. Open Changepoint Administration.
2. To sign into Changepoint Administration for the first time, use `cpadmin` for both the user ID and password.

If Changepoint is not registered, the **Import Licenses** dialog appears.

3. Click **Choose File** to locate and open the Changepoint license file (\*.lic).
4. Click **Import**.

The **License Management** view displays the license file information.

5. Click **Close**.

For more information about licensing, see the *Changepoint Administration Guide*.



## 5. Installing Changepoint Windows Services

---

### Installing a Changepoint Windows service

The Changepoint Windows services require access to the database server, but do not have to be installed on the same server as the database or websites.

For information about installing and configuring a specific Changepoint Windows service, see the topic for the service.

**Warning:** If you change the default installation path, then you must install all services in a separate folder and not in the `<cp_root>` folder.

1. Do one of the following:
  - From the Changepoint installer, click the **Services** tab and click the `<servicename>` **Service** link.
  - Run the service installation program from the product media:

`\Changepoint\Services\<installation program name>`

2. Follow the prompts until the installation completes.
3. Configure the database connection settings for the service.

For more information, see "About configuring database connection settings" on page 65.

4. If necessary, edit the service configuration file to configure the service. The service configuration file, by default, is located in the installation directory.

**Note:** This is the same file that you edit to configure the SQL connection settings for the service in step 3.

5. Start the service.

### Uninstalling a Changepoint Windows Service

Use the Windows Control Panel to uninstall the service.

### Changepoint Email Notification service

The Changepoint Email Notification service queues messages for the Changepoint Mail service.

If you enable any email notifications in Changepoint Administration, you must install the Changepoint Email Notification service and the Changepoint Mail service, and make sure that these services run at suitable intervals. If these services do not run often enough, the EmailAuditStaging, EmailAuditNotification, and EmailQueue tables in the Changepoint database can grow very large.

If you do not enable email notifications, then it is sufficient to install and run only the Changepoint Mail Service. If in doubt, install and run both services.

### Installation information

Use the following information with the generic procedure for installing and configuring a Changepoint Windows service:

| Information needed            | Notes  |
|-------------------------------|--|
| Installation Program name     | Changepoint Email Notification Service Installer.exe   |
| Installation path             | Default: <cp_root>\Changepoint Email Notification Service\   |
| Configuration file            | CPEmailNotification.exe.config   |
| <b>Configuration settings</b> |  |
| SendInterval                  | How often (in minutes) the service sends notifications.<br>Default value: 5<br>Recommended value: 5 or greater |

## Changepoint Exchange Synchronization Service

The Changepoint Exchange Synchronization service synchronizes Microsoft Exchange Server calendar entries with Changepoint calendars.

It is recommended that you install the service on the Changepoint Web Server. However, the service can be installed on any server that has network access both to the Changepoint database server and the server that runs Exchange Web Services.

### Note:

- The Exchange Autodiscover service must be running. For more information, see "Configuring the Microsoft Exchange Autodiscover Service" on page 58.

- Only the primary email account associated with each Exchange account can be synchronized with Changepoint.

### Using the AD/Exchange admin console

1. Create a domain user account to be used within Exchange to impersonate users. This account does not require a mailbox. Example: `CpExSyncService` (UPN = `CpExSyncService@example.domain.com`).
2. In the Exchange admin console permissions tab, create a new admin role with the following details:
  - Name: Changepoint Exchange Synchronization Service
  - Roles: ApplicationImpersonation
  - Members: The domain user account that you just created (`CpExSyncService`)

If you prefer to use PowerShell, you can issue the following statement:

```
New-ManagementRoleAssignment -Name: "Changepoint Exchange Synchronization Service" -  
Role:ApplicationImpersonation -User: " CpExSyncService"
```

### On the machine that will run the Changepoint Exchange Synchronization Service

1. Create a user account for the Changepoint Exchange Synchronization Service. Ensure that the user account has the “Log on as service” right.

**Note:** You must provide the credentials for this user account during the installation of the Changepoint Exchange Synchronization service.

2. Log in to the machine using the user account that you just created.
3. Create a generic Windows credential for the service:
  - a. In the **Windows Control Panel**, open the **Credential Manager** and select **Windows Credentials**.
  - b. Click **Add a generic credential**.
    - Internet or network address: Changepoint Exchange Synchronization Service
    - User name: The UPN of the domain user account that was created for Exchange impersonation, for example: `CpExSyncService@example.domain.com`.
    - Password: Password for the domain user account.
  - c. Click **OK** to save the credential.

**Note:** If you change the service login account, you must also create a new generic credential for the login.

### Installing the Changepoint Exchange Synchronization Service

Use the following information with the generic procedure for installing and configuring a Changepoint Windows service.

| Information needed                        | Notes   |
|---|---|
| Installation Program name                 | Exchange Synchronization Service.exe  |
| Installation path                         | Default: <cp_root>\Changepoint Exchange Synchronization Service\<br>  |
| Configuration file                        | CPSynchronizationService.exe.config   |
| User account and password for the service | User account and password for the Changepoint Exchange Synchronization Service.   |
| <b>Configuration settings</b>             |   |
| SynchSchedule                             | Interval in minutes for synchronizing between Changepoint and Exchange.<br>Default: 15  |
| NewUserHistory                            | Number of days from the current date to go back when synchronizing new users.<br>Default: 5   |
| SynchronizationDirection                  | 0 – synchronization is bidirectional<br>1 – synchronization is unidirectional from Changepoint to Exchange<br>2 – synchronization is unidirectional from Exchange to Changepoint.<br>Default: 0 |
| PurgeAutodiscoveryCache                   | Number of days to retain cache values before rediscovering resource CAS server settings.<br>Default: 1  |



| Information needed                          | Notes   |
|---|---|
| RetryAutodiscovery Failures                 | <p>0 – the Autodiscovery cache is filled once, and failed CAS server lookups are ignored until the next time the Autodiscovery cache is replenished</p> <p>1 – failed Autodiscovery CAS server lookups are re-evaluated each time the synchronization is executed</p> <p>Default: 0</p>   |
| ConflictResolutionMethod                    | <p>For bidirectional synchronization, defines which modification is accepted when a calendar entry has been edited in both Changepoint and Exchange.</p> <p>E – the Changepoint modification is ignored and the Exchange modification is applied</p> <p>C – the Exchange modification is ignored and the Changepoint modification is applied</p> <p>N – the earlier modification is ignored and the later modification is applied.</p> <p>Default: N</p> <p><b>Note:</b> The setting does not apply to unidirectional synchronization.</p> <p>If a conflict occurs between a deletion and an update, the deletion is applied regardless of the setting.</p> |
| LogInformativeEvents                        | <p>0 – informative messages are not logged to the event log</p> <p>1 – informative messages are logged to the event log</p> <p>Default: 1</p>   |
| ForcePersistenceInTarget                    | <p>0 – the target system in a unidirectional synchronization is overwritten by the source when changes occur in the target</p> <p>1 – the target system in a unidirectional synchronization is not overwritten by the source when changes occur in the target</p> <p>Default: 0</p>   |
| MaxOccurrencesToSyncWhenNoEndDate Specified | <p>Maximum number of recurring appointments going to Changepoint from Outlook on the Exchange synchronization.</p> <p>Default: 50</p>   |

### Configuring the Microsoft Exchange Autodiscover Service

The Changepoint Exchange Synchronization service depends on the Microsoft Exchange Server Autodiscover service. The Autodiscover service provides the Exchange Web Services URL for each user that is being synchronized.

Ensure that the Autodiscover service can be accessed by the user running the Changepoint Exchange Synchronization service. By default, communications to the Autodiscover service use SSL. The SSL certificate must be valid for the Autodiscover service.

Connections to the Autodiscover service are attempted in the following order:

1. Autodiscover service URLs found within the Active Directory (AD) Service Connection Point (SCP)
2. `https://<smtp-address-domain>/autodiscover/autodiscover.xml`
3. `https://autodiscover.<smtp-address-domain>/autodiscover/autodiscover.xml`

### Changepoint Mail Service

The Changepoint Mail service sends automated emails from Changepoint. You can install the service on any machine that has access to the SQL Server where the Changepoint database is hosted. The service also requires access to an SMTP server, either locally or through the network in order to relay mail.

If you are upgrading the Changepoint Mail Service, you must uninstall the old service first, and then install the new service.

**Note:** If you enable email notifications in Changepoint Administration, you must install the Changepoint Mail service and the Changepoint Email Notification service, and make sure that these services run at suitable intervals. If these services do not run often enough, the EmailAuditStaging, EmailAuditNotification, and EmailQueue tables in the Changepoint database can grow very large.

If you do not enable email notifications, then it is sufficient to install and run only the Changepoint Mail Service.

#### Error messages

The Changepoint Mail service removes badly formed email addresses from the To, Cc, and Bcc lines of the emails, and logs them in the Changepoint Mail service server as:

```
Unable to send email to malformed email address: address
```

See the Event Viewer, **Applications and Services Logs > Changepoint**.

### Installation information

Use the following information with the generic procedure for installing and configuring a Changepoint Windows service.

| Information needed            | Notes   |
|-------------------------------|---|
| Installation Program name     | Changepoint Mail Service Installer.exe  |
| Installation path             | Default: <cp_root>\Changepoint Mail Service\  |
| Configuration file            | CPMail.exe.config   |
| <b>Configuration settings</b> |   |
| SmtptServer                   | IP address or fully qualified domain name of the SMTP server that the Changepoint Mail service uses.<br>Default: 127.0.0.1<br>Ensure that the SMTP server allows mail to be relayed from the machine on which the Changepoint Mail service is hosted.<br><b>Note:</b> If virus protection is enabled on the server that hosts the Changepoint Mail service, consider adding a scanning exception for the Changepoint Mail service to prevent it from being falsely detected as a mass mailing worm. |
| SmtptPort                     | The port used to contact the SMTP server.<br>Default: 25  |
| FromAddress                   | Default <i>from</i> address to use when a <i>from</i> address is not supplied when the mail is queued.<br>Default: username@domain.com  |
| FromAddressDisplayName        | Default name to display in the email's <i>from</i> address when a <i>from</i> address is not supplied when the mail is queued.<br>Default: username   |
| SendInterval                  | How often (in minutes) the service sends new notifications.<br>Default value: 5<br>Recommended value: 5 or greater  |

### Changepoint Report Prerender Service

The Changepoint Report Prerender service is used with the Changepoint Report Scheduler service. It is responsible for advanced delivery option management and report object rendering of group and cross-tab tables.

The Changepoint Report Prerender service can be installed on any server that has access to the SQL Server where the Changepoint database is hosted. The service requires the following access:

- HTTP access to the URL configured in the Report Prerender service in the server integration page in Changepoint Administration (**General Setup > Server Integration**).
- Access to a Changepoint website that is configured with application authentication. If the Changepoint website is set up for Windows integrated authentication, see "Using both application authentication and SSO" on page 148.

**Note:** The service is incompatible with Enhanced session management, which is the option that restricts authenticated users to one active session per browser container.

#### Installation information

Use the following information with the generic procedure for installing and configuring a Changepoint Windows service.

| Information needed            | Notes   |
|-------------------------------|---|
| Installation Program name     | Report Prerender Service Installer.exe  |
| Installation path             | Default: <cp_root>\Changepoint Report Prerender Service\                                    |
| Configuration file            | ReportPrerenderService.exe.config   |
| <b>Configuration settings</b> |   |
| CompanyProfile                | Identifies whether to use PPM or PSA terminology. Valid values are ITD (PPM) and PSO (PSA). |

| Information needed | Notes   |
|--------------------|---|
| AccessCheck        | When set to <code>true</code> , access checks are done before a report is generated, but resources can design reports that bypasses security if they have the required permissions.<br>When set to <code>false</code> , access checks are not done.<br>The default setting is <code>True</code> . |
| CommandTimeout     | Number of seconds that the service queries the database for a call before timing out. The default is 600 seconds.   |
| ReportTimeout      | Number of minutes that a report takes to be generated before it times out. The default is 30 minutes.   |
| MaxReportThread    | Number of reports that can be generated concurrently. The default value is 5. The highest number of reports that can be processed concurrently is 25.   |

## Configuring the Report Prerender Service

You must configure the server where the Report Prerender Service is installed.

1. Disable the Internet Explorer enhanced security configuration.

Use the **Server Manager** to turn off **Configure IE ESC** for both Users and Administrators.

2. Enable the submission of non-encrypted form data.

For both **Computer Configuration** and **User Configuration**, use the **Group Policy Object Editor** to enable **Submit non-encrypted form data** in the Internet Explorer **Administrative Templates**

3. Assign the Changepoint site to the local intranet zone.

For both **Computer Configuration** and **User Configuration**:

- a. Use the **Group Policy Object Editor** to add the Report Prerender Service URL to the computer's Intranet zone.
  - b. If the server implements SSL, use the **Group Policy Object Editor** to enable the setting **Do not prompt for client certificate selection when no certificates or only one certificate exists**.
4. To use SSL with the Report Prerender website:

- a. Set the Report Prerender Service to **Log On As Administrator**.
  - b. In Internet Explorer **Tools > Options > Advanced**, clear the Security option to **Check for server certificate revocation**.
  - c. Edit `\Windows\System32\drivers\etc\hosts` to map the IP address of the website to the URL.
5. Sign in to Changepoint Administration:
- a. Disable enhanced session management (**General > Session Security**).
  - b. Set up the Report Prerender Service URL (**General > Server Integration**).
6. Restart the server.

### Upgrading Internet Explorer on the server

When the Report Prerender Service is installed, a value is written in the Windows registry according to the version of Internet Explorer installed on the server:

- Internet Explorer 11: Value = 9000
- You can modify the registry key value when applicable

```
Entry: HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Internet
Explorer\MAIN\FeatureControl\FEATURE_BROWSER_EMULATION
Name: ReportPrerenderService.exe
Value: 9000
```

Entry on 64-bit OS is:

```
HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\Microsoft\Internet
Explorer\Main\FeatureControl\FEATURE_BROWSER_EMULATION Value: 9000
```

## Changepoint Report Scheduler Service

The Changepoint Report Scheduler Service is a Windows Service that queries the Changepoint database to locate scheduled reports that require processing. It can be installed on any server that has access to the Changepoint database server.

### Installation information

Use the following information with the generic procedure for installing and configuring a Changepoint Windows service:

| Information needed            | Notes   |
|-------------------------------|---|
| Installation Program name     | Report Scheduler Service Installer.exe  |
| Installation path             | Default: <cp_root>\Changepoint Report Scheduler Service\  |
| Configuration file            | ReportSchedulerService.exe.config   |
| <b>Configuration settings</b> |   |
| CompanyProfile                | Determines whether the installation uses PPM terminology or PSA terminology. Valid values are ITD (PPM) and PSO (PSA).  |
| AccessCheck                   | Determines whether an access check is required before a report is generated. When True, access checks are done, but a resource can design a report that bypasses security if they have the required permissions. When False, access checks are not done. The default setting is True. |
| CommandTimeout                | Determines the maximum amount of time the service can take to query the database for a call before timing out. The default is 600 seconds.  |
| ReportTimeout                 | Number of minutes a report can take to generate before it times out. The default is 30 minutes.   |
| MaxReportThread               | Maximum number of reports that can be generated concurrently. The default value is 5. The highest possible value is 25.   |




## Using the Report Scheduler Service Controller

1. Click **Start** and select **Programs > Changepoint > Changepoint**.
2. Click **Report Scheduler Service Controller**.

The Report Scheduler Service Controller icon is added to the task bar. The service is stopped.

- To start the service, right-click the stopped  icon on the task bar and select **Start**.

The service runs in the background.

- To pause the service, right-click the started  icon and select **Pause**.
- To resume after pausing, right-click the paused  icon and select **Continue**.
- To stop the service, right-click the started  icon and select **Stop**.
- To check the product version number, right-click the icon and select **About**.

## Managing Changepoint Windows Services

You manage the Changepoint Windows Services the same way as other Windows services.

To start, stop, and set the startup type for services, use the **Administrative Tools > Component Services** in the Windows Control Panel.



## 6. Configuring Database Connection Settings

---

### About configuring database connection settings

To access the database, each Changepoint application requires an encrypted connection string, which is stored in a configuration file. To encrypt the database connection settings, you use the Login Settings utility.

The default path to the utility is:

```
<cp_common>\LoginSettings\Login Settings.exe
```

#### Default user ID and password

The configuration files that contain the connection strings are password protected. By default, the user ID is `USERID` and the password is `PASSWORD` (case-sensitive) in all of the configuration files.

The first time that you access a configuration file using the Login Settings utility, you must use the default user ID and password. You then specify the user ID and password that are used for database access, as described in "Required accounts and permissions" on page 15. The login settings utility encrypts these values and updates the configuration file with the encrypted values.

### Configuring database connection settings

These are the general instructions for using the Login Settings utility. For more information, see the database connection settings topic for the application.

1. Run:

```
<cp_common>\LoginSettings\Login Settings.exe
```

The **Changepoint Connection Settings** dialog box appears.

2. From the **Connection Settings** list, select the application.
3. In the **File Location** field, browse to the configuration file for the application.
4. Enter the user ID and password of the account for database access, then click **OK**.

**Note:** The first time you run the Login settings utility on a configuration file, use "USERID" and "PASSWORD" (case sensitive) for the User ID and Password.

5. In the **Connection Settings** section, specify the server name, database name, and time-out information to be used in the connection string.

Time-out is optional and can be left blank, or can be used to specify the ADO connection.timeout value (in seconds) used in the connection string.

The .asp implementations use the time-out values specified in the **Connection Settings** dialog. The .NET implementations (.aspx) use the CommandTimeout setting value specified in the application Web.config file instead.

6. In the **User ID** and **Password** fields, enter the user ID and password for the SQL account for accessing the Changepoint database.
7. To verify the connection string, click **Test**.
8. Click **Save**.

### Database connection settings for Batch Print

| Field                          | Notes  |
|--------------------------------|--|
| Connection Settings            | Changepoint Windows Services, Scheduled Jobs and Utilities |
| File location                  | Default: <cp_root>\BatchPrint\PrintInvoices.exe.config     |
| User ID (for file)             | Initial Default: USERID                                    |
| Password (for file)            | Initial Default: PASSWORD                                  |
| Server                         |  |
| Database                       |  |
| Time Out                       |  |
| User ID (for database access)  |  |
| Password (for database access) |  |

### Database connection settings for Changepoint

The Changepoint option updates the DSN, DataDSN, and DSN2 information in the Global.asa and Web.config files in the Changepoint folder. You only have to select the Global.asa file because the Web.config file inherits the same values that you input.

**Note:** To render reports in Changepoint, you must also configure the Changepoint Report Server. If your organization has a separate reporting database, then specify its server name and database name for the **Changepoint Report Server** settings; otherwise, use the same server name and database that you entered for Changepoint.

| Field                          | Notes                                    |
|--------------------------------|--|
| Connection Settings            | Enterprise                               |
| File location                  | Default: <cp_root>\Enterprise\Global.asa |
| User ID (for File)             | Initial Default: USERID                  |
| Password (for File)            | Initial Default: PASSWORD                |
| Server                         |  |
| Database                       |  |
| Time Out                       |  |
| User ID (for database access)  |  |
| Password (for database access) |  |

| Field               | Notes   |
|---------------------|---|
| Connection Settings | Enterprise Report Server  |
| File location       | Default: <cp_root>\Enterprise\Global.asa  |
| User ID (for File)  | Initial Default: USERID   |
| Password (for File) | Initial Default: PASSWORD   |
| Server              | Server for the separate reporting database, if used. Otherwise, the name of the main Changepoint database server. |

## 6. Configuring Database Connection Settings

---

| Field                          | Notes   |
|--------------------------------|---|
| Database                       | Name of the separate reporting database, if used. Otherwise, the name of the main Changepoint database. |
| Time Out                       | Time Out for the separate reporting database, if used.  |
| User ID (for database access)  | User ID for the separate reporting database, if used.   |
| Password (for database access) | Password for the separate reporting database, if used.  |

### Database connection settings for Changepoint Email Notification Service

| Field                          | Notes   |
|--------------------------------|---|
| Connection Settings            | Changepoint Windows Services, Scheduled Jobs and Utilities                                      |
| File location                  | Default:<br><cp_root>\Changepoint Email Notification Service<br>\CPEmailNotification.exe.config |
| User ID (for File)             | Initial Default: USERID   |
| Password (for File)            | Initial Default: PASSWORD   |
| Server                         |   |
| Database                       |   |
| Time Out                       |   |
| User ID (for database access)  |   |
| Password (for database access) |   |

## Database connection settings for Changepoint Exchange Synchronization Service

| Field                          | Notes  |
|--------------------------------|--|
| Connection Settings            | Changepoint Windows Services, Scheduled Jobs and Utilities   |
| File location                  | Default:<br><cp_root>\Changepoint Exchange Synchronization Service<br>\CPSynchronizationService.exe.config |
| User ID (for file)             | Initial Default: USERID  |
| Password (for file)            | Initial Default: PASSWORD  |
| Server                         |  |
| Database                       |  |
| Time Out                       |  |
| User ID (for database access)  |  |
| Password (for database access) |  |

## Database connection settings for Changepoint Export Publishing Service

| Field               | Notes   |
|---------------------|---|
| Connection Settings | Changepoint Windows Services, Scheduled Jobs and Utilities  |
| File location       | Default: <cp_root>\Changepoint Export Publishing Service<br>\CPExportPublishingService.exe.config |
| User ID (for File)  | Initial Default: USERID   |
| Password (for File) | Initial Default: PASSWORD   |
| Server              |   |
| Database            |   |
| Time Out            |   |

| Field                          | Notes |
|--------------------------------|-------|
| User ID (for database access)  |       |
| Password (for database access) |       |

### Database connection settings for Changepoint Mail Windows Service

| Field                          | Notes   |
|--------------------------------|---|
| Connection Settings            | Changepoint Windows Services, Scheduled Jobs and Utilities                |
| File location                  | Default: <cp_root>\Changepoint Mail Windows Service<br>\CPMail.exe.config |
| User ID (for File)             | Initial Default: USERID   |
| Password (for File)            | Initial Default: PASSWORD   |
| Server                         |   |
| Database                       |   |
| Time Out                       |   |
| User ID (for database access)  |   |
| Password (for database access) |   |

### Database connection settings for Changepoint Report Prerender Service

You must configure the connection settings for the Changepoint Report Prerender Service and for the Reports DSN information for the Report Designer Report Server, even if you are not deploying a separate report server.

If your organization has a separate reporting database, then specify its server name and database name for the **Report Designer Report Server** settings. Otherwise, use the same server name and database that you entered for **Changepoint Windows Services, Scheduled Jobs and Utilities**.

| Field                          | Notes   |
|--------------------------------|---|
| Connection Settings            | Changepoint Windows Services, Scheduled Jobs and Utilities                                    |
| File location                  | Default: <cp_root>\Changepoint Report Prerender Service<br>\ReportPrerenderService.exe.config |
| User ID (for File)             | Initial Default: USERID   |
| Password (for File)            | Initial Default: PASSWORD   |
| Server                         |   |
| Database                       |   |
| Time Out                       |   |
| User ID (for database access)  |   |
| Password (for database access) |   |

## Database connection settings for Changepoint Report Scheduler Service

You must configure the connection settings for the Changepoint Report Scheduler Service and for the Reports DSN information, even if you are not deploying a separate report server.

If your organization has a separate reporting database, then specify its server name and database name for the **Report Designer Report Server** settings. Otherwise, use the same server name and database that you entered for **Changepoint Windows Services, Scheduled Jobs and Utilities**.

| Field               | Notes   |
|---------------------|---|
| Connection Settings | Changepoint Windows Services, Scheduled Jobs and Utilities                                    |
| File location       | Default: <cp_root>\Changepoint Report Scheduler Service<br>\ReportSchedulerService.exe.config |
| User ID (for File)  | Initial Default: USERID   |
| Password (for File) | Initial Default: PASSWORD   |

## 6. Configuring Database Connection Settings

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| Field                          | Notes |
|--------------------------------|-------|
| Server                         |       |
| Database                       |       |
| Time Out                       |       |
| User ID (for database access)  |       |
| Password (for database access) |       |

| Field                          | Notes   |
|--------------------------------|---|
| Connection Settings            | Report Designer Report Server   |
| File location                  | Default: <cp_root>\Changepoint Report Scheduler Service<br>\ReportSchedulerService.exe.config                     |
| User ID (for File)             | Initial Default: USERID   |
| Password (for File)            | Initial Default: PASSWORD   |
| Server                         | Server for the separate reporting database, if used. Otherwise, the name of the main Changepoint database server. |
| Database                       | Name of the separate reporting database, if used. Otherwise, the name of the main Changepoint database.           |
| Time Out                       | Time Out for the separate reporting database, if used.  |
| User ID (for database access)  | User ID for the separate reporting database, if used.   |
| Password (for database access) | Password for the separate reporting database, if used.  |



## Database connection settings for Changepoint Report Server

| Field                          | Notes  |
|--------------------------------|--|
| Connection Settings            | Enterprise Report Server   |
| File location                  | Default: <cp_root>\Enterprise\Global.asa   |
| User ID (for File)             | Initial Default: USERID  |
| Password (for File)            | Initial Default: PASSWORD  |
| Server                         | Server for the separate reporting database, if used. Otherwise, the name of the Changepoint database server. |
| Database                       | Name of the separate reporting database, if used. Otherwise, the name of the Changepoint database.           |
| Time Out                       | Time Out for the separate reporting database, if used.   |
| User ID (for database access)  | User ID for the separate reporting database, if used.  |
| Password (for database access) | Password for the separate reporting database, if used.   |

## Database connection settings for Cognos Client Tools

| Field               | Notes   |
|---------------------|---|
| Connection Settings | Changepoint Windows Services, Scheduled Jobs and Utilitiesr |
| File location       | Default: <cp_root>\Cognos\CognosClientTools.exe.config      |
| User ID (for File)  | Initial Default: USERID                                     |
| Password (for File) | Initial Default: PASSWORD                                   |
| Server              |   |
| Database            |   |
| Time Out            |   |

## 6. Configuring Database Connection Settings

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| Field                          | Notes |
|--------------------------------|-------|
| User ID (for database access)  |       |
| Password (for database access) |       |

### Database connection settings for Data Archiving Source SQL server

| Field                          | Notes  |
|--------------------------------|--|
| Connection Settings            | Data Archiving (Source SQL Server)                   |
| File location                  | Default: <cp_root>\Data Archiving\Data Archiving.ini |
| User ID (for File)             | Initial Default: USERID                              |
| Password (for File)            | Initial Default: PASSWORD                            |
| Server                         |  |
| Database                       |  |
| Time Out                       |  |
| User ID (for database access)  |  |
| Password (for database access) |  |

### Database connection settings for Data Archiving Target SQL server

| Field               | Notes  |
|---------------------|--|
| Connection Settings | Data Archiving (Target SQL Server)                   |
| File location       | Default: <cp_root>\Data Archiving\Data Archiving.ini |
| User ID (for File)  | Initial Default: USERID                              |
| Password (for File) | Initial Default: PASSWORD                            |

| Field                          | Notes |
|--------------------------------|-------|
| Server                         |       |
| Database                       |       |
| Time Out                       |       |
| User ID (for database access)  |       |
| Password (for database access) |       |

## Database connection settings for Infiniti Launch

| Field                          | Notes   |
|--------------------------------|---|
| Connection Settings            | Infiniti Launch   |
| File location                  | <cp_root>Intelligent Forms\Websites\<br>InfinitiLaunch\Web.config     |
| User ID (for File)             | Initial Default: USERID   |
| Password (for File)            | Initial Default: PASSWORD   |
| Server                         | Infiniti Server value   |
| Database                       | InfinitiDB value  |
| Time Out                       |   |
| User ID (for database access)  | User ID that has dbo access to the InfinitiDB.                        |
| Password (for database access) | Password of User ID that has dbo access to the InfinitiDB.            |
| Changepoint Web Services URL   | http://{{WSAPIServer:port}}/CPWebService/VerifyUser.asmx              |
| Infiniti URL                   | http://{{InfinitiServer:port}}/Infiniti/produce/service/platform.asmx |

## Database connection settings for Infiniti Scheduler

| Field                          | Notes   |
|--------------------------------|---|
| Connection Settings            | Infiniti Scheduler  |
| File location                  | <cp_root>Intelligent Forms\<br>IntelledoxScheduler\<br>IntelledoxScheduler.exe.config |
| User ID (for File)             | Initial Default: USERID   |
| Password (for File)            | Initial Default: PASSWORD   |
| Server                         | Infiniti Server value   |
| Database                       | InfinitiDB value  |
| Time Out                       |   |
| User ID (for database access)  | User ID that has dbo access to the InfinitiDB   |
| Password (for database access) | Password of User ID that has dbo access to the InfinitiDB                             |

## Database connection settings for Intelligent Forms

You use the Login settings utility to update the settings for an Intelligent Forms instance or to configure an additional Intelligent Forms instance for example, a test instance.

1. Run: <cp\_common>\LoginSettings\Login Settings.exe.
2. In the **Connection Strings** field, select **Intelligent Forms Database Setup**.

### Intelligent Forms Setup dialog box options

| Field                    | Notes   |
|--------------------------|---|
| New Database Server      | Server that hosts the new Changepoint database and Infiniti database. |
| New Changepoint Database | Name of the new Changepoint database.                                 |

| Field                    | Notes   |
|--------------------------|---|
| New Changepoint User ID  | User ID for the new Changepoint database.             |
| New Changepoint Password | Password for the new Changepoint database.            |
| Infiniti Database        | Name of the Infiniti database.                        |
| Infiniti User ID         | User ID for the new Infiniti database.                |
| Infiniti Password        | Password for the new Infiniti database.               |
| Old Changepoint API URL  | URL for the previous Changepoint API.                 |
| New Changepoint API URL  | URL for the new Changepoint API.                      |
| Old Database Server      | Server that hosted the previous Changepoint database. |
| Old Changepoint Database | Name of the previous Changepoint database.            |
| Old Changepoint User ID  | SQL account for accessing the Changepoint database.   |
| Old Changepoint Password | Password for the SQL account.                         |
| Old Infiniti URL         | URL for the previous Infiniti instance.               |
| New Infiniti URL         | URL for the new Infiniti instance.                    |

## Database connection settings for Intelligent Forms (Changepoint Data Services, Manage, and Produce)

**Note:** You must configure the database connection settings for each of the Web.config files, that is for Changeponit Data Services, Manage, and Produce.

| Field               | Notes  |
|---------------------|--|
| Connection Settings | Intelligent Forms (Changepoint Data Services, Manage, and Produce)   |
| File location       | <code>&lt;cp_root&gt;\Enterprise\Intelligent Forms\<br/> ChangepointDataService\Web.config<br/> &lt;cp_root&gt;\Enterprise\Intelligent Forms\Manage\Web.config<br/> &lt;cp_root&gt;\Enterprise\Intelligent Forms\Produce\Web.config</code> |

## 6. Configuring Database Connection Settings

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| Field                          | Notes   |
|--------------------------------|---|
| User ID (for File)             | Initial Default: USERID                                   |
| Password (for File)            | Initial Default: PASSWORD                                 |
| Server                         | Infiniti Server value                                     |
| Database                       | InfinitiDB value  |
| Time Out                       |   |
| User ID (for database access)  | User ID that has dbo access to the InfinitiDB             |
| Password (for database access) | Password of User ID that has dbo access to the InfinitiDB |

### Database connection settings for Report Designer

You must configure the settings for both Report Designer and the Report Designer Report Server, even if you are not deploying a report server.

If your organization has a separate reporting database, then specify its server name and database name for the *Report Designer Report Server* settings; otherwise, use the same server name and database name that you entered for Report Designer.

| Field                          | Notes  |
|--------------------------------|--|
| Connection Settings            | Report Designer, Web Services                |
| File location                  | Default: <cp_root>\ReportDesigner\Web.config |
| User ID (for File)             | Initial Default: USERID                      |
| Password (for File)            | Initial Default: PASSWORD                    |
| Server                         |  |
| Database                       |  |
| Time Out                       |  |
| User ID (for database access)  |  |
| Password (for database access) |  |

| Field                          | Notes   |
|--------------------------------|---|
| Connection Settings            | Report Designer Report Server   |
| File location                  | Default: <cp_root>\ReportDesigner\Web.config  |
| User ID (for File)             | Initial Default: USERID   |
| Password (for File)            | Initial Default: PASSWORD   |
| Server                         | Server for the separate reporting database, if used. Otherwise, the name of the main Changepoint database server. |
| Database                       | Name of the separate reporting database, if used. Otherwise, the name of the main Changepoint database.           |
| Time Out                       | Time Out for the separate reporting database, if used.  |
| User ID (for database access)  | User ID for the separate reporting database, if used.   |
| Password (for database access) | Password for the separate reporting database, if used.  |

## Database connection settings for RESTful API

| Field               | Notes                                  |
|---------------------|--|
| Connection Settings | RESTful API                            |
| File location       | <cp_root>\Enterprise\WebAPI\Web.config |
| User ID (for File)  | Initial Default: USERID                |
| Password (for File) | Initial Default: PASSWORD              |
| Server              |  |
| Database            |  |
| Time Out            |  |

## 6. Configuring Database Connection Settings

---

| Field                          | Notes |
|--------------------------------|-------|
| User ID (for database access)  |       |
| Password (for database access) |       |

### Database connection settings for CPEffectiveDates scheduled job

| Field                          | Notes  |
|--------------------------------|--|
| Connection Settings            | Changepoint Windows Services, Scheduled Job, and Utilities       |
| File location                  | Default: <cp_root>\ScheduledJobs\<br>CPEffectiveDates.exe.config |
| User ID (for File)             | Initial Default: USERID  |
| Password (for File)            | Initial Default: PASSWORD  |
| Server                         |  |
| Database                       |  |
| Time Out                       |  |
| User ID (for database access)  |  |
| Password (for database access) |  |

### Database connection settings for Release Guest Licenses scheduled job

| Field               | Notes  |
|---------------------|--|
| Connection Settings | Changepoint Windows Services, Scheduled Job, and Utilities     |
| File location       | Default:<br><cp_root>\ScheduledJobs\CPGuestLicenses.exe.config |
| User ID (for File)  | Initial Default: USERID  |



| Field                          | Notes                     |
|--------------------------------|---------------------------|
| Password (for File)            | Initial Default: PASSWORD |
| Server                         |                           |
| Database                       |                           |
| Time Out                       |                           |
| User ID (for database access)  |                           |
| Password (for database access) |                           |

## Database connection settings for Transport Tool

| Field                          | Notes   |
|--------------------------------|---|
| Connection Settings            | Transport Tool  |
| File location                  | Default: <cp_root>\Enterprise\web.config                        |
| User ID (for file)             | Initial Default: USERID   |
| Password (for file)            | Initial Default: PASSWORD                                       |
| Server                         | Server that CPTransport database it installed on.               |
| Database                       | CPTransport   |
| Time Out                       |   |
| User ID (for database access)  | User ID that has dbo access to CPTransport Database             |
| Password (for database access) | Password of User ID that has dbo access to CPTransport Database |

### Database connection settings for Web Services API

| Field                          | Notes   |
|--------------------------------|---|
| Connection Settings            | Report Designer, Web Services                     |
| File location                  | Default: <cp_root>\API\CP Web Services\web.config |
| User ID (for file)             | Initial Default: USERID                           |
| Password (for file)            | Initial Default: PASSWORD                         |
| Server                         |   |
| Database                       |   |
| Time Out                       |   |
| User ID (for database access)  |   |
| Password (for database access) |   |

### Database connection settings for Web Sockets

| Field                          | Notes                                      |
|--------------------------------|--|
| Connection Settings            | WebSockets                                 |
| File location                  | <cp_root>\Enterprise\WebSockets\Web.config |
| User ID (for File)             | Initial Default: USERID                    |
| Password (for File)            | Initial Default: PASSWORD                  |
| Server                         |  |
| Database                       |  |
| Time Out                       |  |
| User ID (for database access)  |  |
| Password (for database access) |  |

## 7. Configuring Changepoint Scheduled Jobs

---

### About Changepoint scheduled jobs

Changepoint scheduled jobs run at various intervals to ensure that data is refreshed and up-to-date. Some of the scheduled jobs run individually and independently. Others have dependencies and are run as part of a sequence of scheduled jobs.

#### Chained scheduled jobs

Some scheduled jobs have dependencies on other scheduled jobs, and for this reason, a scheduling chain has been set up for these jobs.

The steps in the chain are:

1. Update Time Rate job
  - By default, the Update Time Rate job starts at 12.01 AM.
  - When it completes, whether it failed or succeeded, the Update Time Rate job starts the Resource Demand Calculation job.
2. Resource Demand Calculation job
  - If the Resource Demand Calculation job fails, none of the remaining jobs in the chain is started.
  - If the Resource Demand Calculation job succeeds, it starts the Financial Analysis Summary job.
3. Financial Analysis Summary job
  - Whether the Financial Analysis Summary job succeeds or fails, it starts the Calculate Project Costs and Portfolio Calculation Engine jobs (these jobs run in parallel).
4. Calculate Project Costs job
5. Portfolio Calculation Engine job
6. Populate Demand and Capacity job

#### Reasons for the Dependencies

All the jobs in step 2–step 5 of the chain have dependencies on step 1, which is the Update Time Rate job. The Resource Demand Calculation job runs upon completion of the Update

Time Rate job regardless of the pass/fail status of the Update Time Rate job.

Do not alter the sequence of jobs in the chain, because:

- The Update Time Rate jobs needs to run and finish successfully before the Financial Analysis Summary job starts to ensure that the most recent data from the Time table is retrieved and costs are updated in FinAnnSummary table.
- The Update Time Rate job needs to run and finish successfully before the Resource Demand Calculation job starts to ensure that a portfolio can retrieve the most recent data from the Time tables.
- Until the Update Time Rate job has finished running, no data is available for display in the portfolio for cost metrics.
- Bad data can cause some of the steps in the Portfolio Calculation Engine job to fail; however, it may not be necessary to fail the entire job. Go through the job history and Windows EventLog for more details.

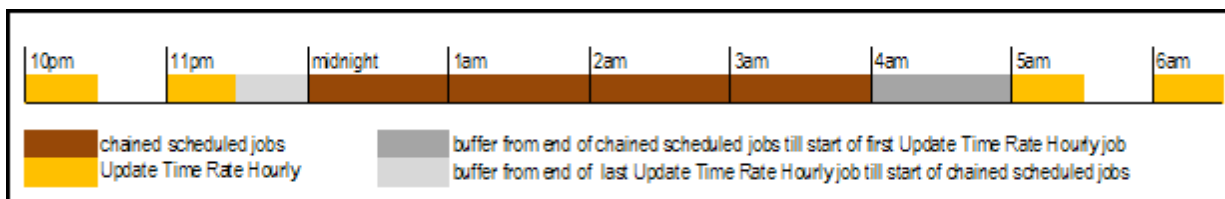
### Running the Update Time Rate job more frequently

To run the Update Time Rate job more frequently than once a day without initiating the chained scheduled jobs, create another scheduled job (for example, Update Time Rate Hourly) that does not launch the Resource Demand Calculation job. Schedule the new job to run at the chosen interval, but leave a gap when the chain of scheduled jobs is running.

For example, to run Update Time Rate Schedule every hour throughout the day, if:

- Update Time Rate is scheduled for 12:01AM, its default start time, and
- your job history tells you that the average time taken by the chained jobs is 4 hours, and that Update Time Rate takes, on average, 30 minutes

set the schedule for Update Time Rate Hourly to hourly, starting at 5:00 AM and ending at 11:00 PM.



This leaves a gap of 5 hours (4 hours for the chained jobs, plus an hour of a buffer) from the time that the chained jobs start until the first run of Update Time Rate Hourly job.

It also allows a buffer of 30 minutes from the end of the last run of Update Time Rate Hourly until the chained jobs start.

## Scheduled Jobs reference list

The following table lists the scheduled jobs that are included with Changepoint. The times and frequencies listed are the default settings. The statuses (enabled or disabled) are the recommended settings. For a new installation, all scheduled jobs are disabled. For an upgrade, the existing status of each job is maintained.

Review and reschedule the jobs as required according to the needs of your organization.

The names of the scheduled jobs that appear in SQL Server Manager are prepended by the database name and an underscore, for example “Changepoint\_Adjust Daylight Savings”.

### Adjust Daylight Saving scheduled job

Sets a flag in the time zone table to indicate which time zones are currently observing daylight savings time.

|                                 |                      |
|---------------------------------|----------------------|
| <b>File or Stored Procedure</b> | AdjustDaylightSaving |
| <b>Schedule</b>                 | Daily at 3:01 AM     |
| <b>Status</b>                   | Enabled              |

### Archive Aged Entities scheduled job

Validates all relevant entities (including those previously validated by the Archive Validation job), archives them into the archive database, then removes them from the Changepoint database.

Before running the job for the first time, create an empty archive database on the target server. The .dtsx file must exist on the source server; it is not required on the target archive server.

|                                 |   |
|---------------------------------|---|
| <b>File or Stored Procedure</b> | ARC_ValidateProjectRequests<br>ARC_ValidateProjects<br>ARC_ValidateEngagement<br>ARC_ValidateFinalization<br><cp_root>\Data Archiving\Data Archiving.dtsx |
| <b>Schedule</b>                 | Not scheduled   |
| <b>Status</b>                   | Enabled   |

### Archive Validation scheduled job

Validates entities to be archived and generates archive validation logs.

|                                 |   |
|---------------------------------|---|
| <b>File or Stored Procedure</b> | ARC_ValidateProjectRequests<br>ARC_ValidateProjects<br>ARC_ValidateEngagement<br>ARC_ValidateFinalization |
| <b>Schedule</b>                 | Not scheduled   |
| <b>Status</b>                   | Enabled   |

### Auto Dispatch Request to Queues scheduled job

For request types for which queues have been configured, sends qualifying requests to queues.

|                                 |                 |
|---------------------------------|-----------------|
| <b>File or Stored Procedure</b> | AutoDispatch    |
| <b>Schedule</b>                 | Every 5 minutes |
| <b>Status</b>                   | Enabled         |

### Auto Escalate Requests scheduled job

Escalates requests based on a Service Level Agreement.

---

|                                 |                  |
|---------------------------------|------------------|
| <b>File or Stored Procedure</b> | AutoEscalate     |
| <b>Schedule</b>                 | Every 30 minutes |
| <b>Status</b>                   | Enabled          |

### BatchCommit Invoices scheduled job

Commits batch invoices, which populates the necessary data for the Batch Invoice Process Report.

The batch invoice commit can also be done through the UI. Your organization's policies determine which method you use.

If you set up a schedule for this job, it is recommended that you set the job to run during off-peak hours and ensure that the job does not overlap other jobs.

|                                 |                    |
|---------------------------------|--------------------|
| <b>File or Stored Procedure</b> | BatchCommitInvoice |
| <b>Schedule</b>                 | Not scheduled      |
| <b>Status</b>                   | Enabled            |

### BatchInvoicingGetInvoiceDefaultList scheduled job

Starts the batch invoice/cross charge generation process, using selections previously saved from the Batch Invoice/Cross Charge report.

|                                 |                               |
|---------------------------------|-------------------------------|
| <b>File or Stored Procedure</b> | BI_BatchGetInvoiceDefaultList |
| <b>Schedule</b>                 | Daily at 3:30 AM              |
| <b>Status</b>                   | Enabled                       |

### Calculate Project Costs scheduled job

Calculates budget, planned costs and actual costs at the project, task and task assignment levels. This job populates the ProjectCostInfo table that is used to generate the earned value data providers

**Note:** Do not set an independent schedule for this job. The Calculate Project Costs job is called by the Financial Analysis Summary job, and both are included in the chained scheduled jobs. For more information, see "Chained scheduled jobs" on page 83.

|                                 |                                |
|---------------------------------|--------------------------------|
| <b>File or Stored Procedure</b> | dbo.EVR_Calculate ProjectCosts |
| <b>Schedule</b>                 | Not scheduled                  |
| <b>Status</b>                   | Enabled                        |

### CheckTimeToApprove scheduled job

Generates the **You have time to approve** email notification.

|                                 |                    |
|---------------------------------|--------------------|
| <b>File or Stored Procedure</b> | CheckTimeToApprove |
| <b>Schedule</b>                 | Daily at 5:00 AM   |
| <b>Status</b>                   | Enabled            |

### CleanResourceAvailability scheduled job

Removes availability calendar entries that are more than (default) 30 days old. This job is optional, but recommended if your organization has a large number of availability entries. Removing the old entries helps to minimize table size.

To change the default number of days, edit the job step to pass the `@ndays` parameter to the stored procedure.

To change the value to *n* days, add the parameter as follows:

```
CleanResourceAvailability @ndays = n
```

The larger the number of days, the larger the database size.

For more information, see "Editing parameters for scheduled jobs " on page 101.

|                                 |                           |
|---------------------------------|---------------------------|
| <b>File or Stored Procedure</b> | CleanResourceAvailability |
| <b>Schedule</b>                 | Daily at 12:00AM          |
| <b>Status</b>                   | Disabled                  |



## CPEffectivedates scheduled job

Activates effective dates for work history information about a resource.

You must encrypt the database connections settings for `CPEffectiveDates.exe`. For more information, see "About configuring database connection settings" on page 65.

`CPEffectiveDates.exe` uses both sets of server name and database name parameters (from the Login Settings utility and from the command line).

|                                 |   |
|---------------------------------|---|
| <b>File or Stored Procedure</b> | <code>&lt;cp_root&gt;\ScheduledJobs\ CPEffectiveDates.exe</code><br><code>[DATABASETYPE], [DATABASESERVER], [DATABASE]</code><br>Where:<br><code>[DATABASETYPE]</code> – SQL<br><code>[DATABASESERVER]</code> – name of Changepoint database server<br><code>[DATABASE]</code> – name of Changepoint database |
| <b>Schedule</b>                 | Daily at 12:00:01 AM.   |
| <b>Status</b>                   | Enabled   |

## CPExtended\_Compile stats and purge data scheduled job

Compiles statistics from Traces table in the CPExtended database, and purges old trace data. Default threshold is one month.

|                                 |                          |
|---------------------------------|--------------------------|
| <b>File or Stored Procedure</b> | CompileStatsAndPurgeData |
| <b>Schedule</b>                 | Every Sunday at 2:00 AM  |
| <b>Status</b>                   | Disabled                 |

## CPFullText scheduled job

Populates the full text catalogs for both knowledge management and request items. Items that have been created since the previous job run cannot be located until after the subsequent job run.

**Note:** Enable either `CPFullText` or `CPFullText` using background updates, but not both.

|                                 |                     |
|---------------------------------|---------------------|
| <b>File or Stored Procedure</b> | sp_fulltext_catalog |
| <b>Schedule</b>                 | Daily at 12:15 AM.  |
| <b>Status</b>                   | Enabled             |

### CPFullText using background updates scheduled job

Updates the catalog immediately using incremental updates. A full-text rebuild is performed weekly in case any of the incremental updates fails.

**Note:** Enable either CPFullText *or* CPFullText using background updates, but not both.

|                                 |                              |
|---------------------------------|------------------------------|
| <b>File or Stored Procedure</b> | sp_fulltext_catalog          |
| <b>Schedule</b>                 | Weekly on Sunday at 4:00 AM. |
| <b>Status</b>                   | Disabled                     |

### CPTempDB\_Clean up idle-orphaned schemas scheduled job

Removes schema for low use schemas. By default, schemas that have not been accessed for 14 days will be removed. Schemas will not be removed when the schema owner is currently logged into Changepoint.

|                                 |  |
|---------------------------------|--|
| <b>File or Stored Procedure</b> | exec CPTempDBCleanupOrphanedSchemas 14 |
| <b>Schedule</b>                 | Weekly on Sunday at 2:00 AM.           |
| <b>Status</b>                   | Enabled                                |

### Financial Analysis Summary scheduled job

Populates the tables used by the financial analysis data provider, for use in reporting and analysis.

Do not set a schedule for this job. The Financial Analysis Summary job is called by the Resource Demand Calculation job, and both are included in the chained scheduled jobs. For more information, see "Chained scheduled jobs" on page 83.

A step in the Financial Analysis Summary job detects if the Portfolio CalculationEngine job exists and is enabled. If not, it clears the portfolio recalculation table, which is normally processed and cleared by the portfolio job.

If you have re-named the portfolio calculation engine job, do one of the following:

- Re-enable it under the exact name "Portfolio Calculation Engine"
- Remove the step from the Financial Analysis Summary job to ensure the data is not truncated when portfolio information is being calculated.

**Note:** If you have multiple instances of the Financial Analysis Summary job and have renamed the jobs with unique names, remove the step.

|                                 |  |
|---------------------------------|--|
| <b>File or Stored Procedure</b> | FinAnnSummary_ToDate<br>FinAnnSummary_ToDateTwo<br>FinAnnSummary_Forecast<br>FinAnnSummary_Unbillable<br>RD_GetRDMonetaryData<br>msdb..sp_start_job @job_name = 'Calculate Project Costs'<br>msdb..sp_start_job @job_name = 'Portfolio Calculation Engine' |
| <b>Schedule</b>                 | Not scheduled  |
| <b>Status</b>                   | Enabled  |

## IPM Calculation Engine scheduled job

The Copy Assignments step copies the metric assignments (if the carry forward option is selected) from the previous IPM period to the current period. This step runs only on the first day of the period.

The Calculate Raw Data step gathers data from the Changepoint database, generates raw data and inserts it into the MetricRawData table. This calculation gathers only data that is required since the last time the calculation ran. If the raw data is from a previous period (refdate), the system inserts a record into the IPIReCalcuLastPeriod table. From this table, the calculation engine can re-calculate the data from the end of the day for a previous period.

In the Calculate Metric Data step, the IPM Calculation engine calculates raw data that is associated with a resource who is assigned to a metric. It inserts the results into the MetricData table. This calculation calculates only the raw data based on the current IPM period. The criteria are as follows:

- The resource is assigned to a metric and the assignment is not deleted
- The metric is not deleted
- The standard metric is not deleted
- The engine includes an IPM re-calculation step that re-calculates the last day of the previous period if metric data for the last period is detected.

The Clean up step clears the raw data tables of information that is no longer required.

|                                 |  |
|---------------------------------|--|
| <b>File or Stored Procedure</b> | IPI_periodcopy<br>IPICalculationEngine<br>IPI_ReCalcuLastPeriod<br>IPI_deleteRawData |
| <b>Schedule</b>                 | Daily at 10:30 PM.   |
| <b>Status</b>                   | Enabled  |

### PercentOfContractIncurred scheduled job

Notifies the Engagement/Initiative Manager if:

- the invoiced/cross-charged amount is near the threshold (80% of the contract approved amount), or
- the contract approved amount has been exceeded.

Generates the email notifications for “ContractApproved amount near threshold” and “ContractApproved amount has been exceeded”.

|                                 |                             |
|---------------------------------|-----------------------------|
| <b>File or Stored Procedure</b> | PercentOfContractIncurred   |
| <b>Schedule</b>                 | Weekly on Sunday at 7:00 PM |
| <b>Status</b>                   | Disabled                    |

## PerformanceCPGrowth scheduled job

Monitors the growth of Changepoint database files and tables.

For more information, see "Monitoring database growth" on page 102.

|                                 |  |
|---------------------------------|--|
| <b>File or Stored Procedure</b> | PerformanceCollectAndCalculateDbGrowth |
| <b>Schedule</b>                 | Daily at 11:50 PM                      |
| <b>Status</b>                   | Enabled                                |

## Populate Demand and Capacity scheduled job

Populates table tblDemandAndCapacity used by table Demand and Capacity data provider, for use in reporting and analysis.

|                                 |                           |
|---------------------------------|---------------------------|
| <b>File or Stored Procedure</b> | PopulateDemandAndCapacity |
| <b>Schedule</b>                 | Daily at 2:00AM           |
| <b>Status</b>                   | Enabled                   |

## Portfolio Calculate Report Cards

Calculates customer/client report card information used by the customer/client report card and customer/client radar reports.

All data is stored in a table on the Changepoint database server, and is displayed when the report card is generated for a specific customer/client profile, or when the Customer/Client Radar report is run.

**Note:** Financial information is displayed in the user's home currency.

Because the job normalizes all of its financial calculations to the most common currency specified in the global workgroups, at least one global workgroup must have a currency selected.

If you use Survey Management, enable this job.

|                                 |                         |
|---------------------------------|-------------------------|
| <b>File or Stored Procedure</b> | PF_CalculateReportCards |
| <b>Schedule</b>                 | Daily at 10:00 PM       |
| <b>Status</b>                   | Disabled                |

### Portfolio Calculation Engine scheduled job

This job performs all the calculations required by portfolio management. The parameter in the second step determines whether the step runs: set to 0 or greater to run, less than 0 to skip.

Do not set a schedule for this job. The Portfolio Calculation Engine job is called by the Financial Analysis Summary job, and both are included in the chained scheduled jobs. For more information, see "Chained scheduled jobs" on page 83.

|                                 |  |
|---------------------------------|--|
| <b>File or Stored Procedure</b> | ProjectToSubProjects<br>PF_AutomaticUpdate 1<br>PF_FiscalPeriodEndReCalc<br>PF_ReCalcuLastPeriod<br>PFRollupProjectNoBillingOffice<br>PopulateProjectCost<br>PF_BudgetvsActual<br>PFRequestCost<br>PFRequestEffort<br>PFPlanningHoursEffort<br>PFRemainingHoursCost<br>PFPlanningHoursCost<br>PFUninvoicedBillingAmount<br>PFPlanningHoursBillingAmt<br>PFRevRecAmount<br>PFRequestBillingAmount<br>PFRemaingBillingAmt<br>PF_RecalcuLastPeriod_UsrEntr<br>PF_CalculationEngine<br>PFPortfolioSummary<br>PF_Recalc_RollupPortfolios<br>PFRollup_CalcEngine |
| <b>Schedule</b>                 | Not scheduled  |
| <b>Status</b>                   | Enabled  |

## Process Expense Approval scheduled job

Processes expense approver records and updates the records with the approver and status in a table accessed by the standard Changepoint **You have expense reports to approve** notification.

If no engagement approver is defined, the expense record is updated with the line approver.

If no line approver is defined, this job automatically approves the record.

|                                 |                        |
|---------------------------------|------------------------|
| <b>File or Stored Procedure</b> | ProcessExpenseApproval |
| <b>Schedule</b>                 | Every 30 minutes       |
| <b>Status</b>                   | Enabled                |

## Process Time Entries for Approval scheduled job

Processes time records pending approval, and stores the records in a table accessed by the standard Changepoint **You have time to approve** notification.

|                                 |                            |
|---------------------------------|----------------------------|
| <b>File or Stored Procedure</b> | ProcessTimeApproverRecords |
| <b>Schedule</b>                 | Every 30 minutes           |
| <b>Status</b>                   | Enabled                    |

## Reindex and Update Statistics daily scheduled job

Calculate statistics for the indexes it updates in the Changepoint database for SQL Query Optimizer purposes.

|                                 |   |
|---------------------------------|---|
| <b>File or Stored Procedure</b> | (scripts)<br>Daily Reindex<br>Defrag Indexes<br>Daily Update Statistics |
| <b>Schedule</b>                 | Daily at 6:00AM.  |
| <b>Status</b>                   | Enabled   |

### Reindex and Update Statistics weekly scheduled job

Updates statistics for all rows in all tables in the Changepoint database for SQL Query Optimizer purposes.

|                                 |   |
|---------------------------------|---|
| <b>File or Stored Procedure</b> | (scripts)<br>Weekly Reindex<br>Weekly Update Statistics |
| <b>Schedule</b>                 | Weekly on Sunday at 3:00 AM                             |
| <b>Status</b>                   | Enabled   |

### Release Guest Licenses scheduled job

Releases licenses of Client Portal users whose access has expired.

You must encrypt the database connections settings for `CPGuestLicenses.exe`. For more information, see "About configuring database connection settings" on page 65.

`CPGuestLicenses.exe` uses both sets of server name and database name parameters (from the Login Settings utility and from the command line).

|                                 |  |
|---------------------------------|--|
| <b>File or Stored Procedure</b> | <code>&lt;cp_root&gt;\ScheduledJobs\CPGuestLicenses.exe [DATABASETYPE], [DATABASESERVER], [DATABASE]</code><br>Where:<br>[DATABASETYPE] – SQL<br>[DATABASESERVER] – name of the Changepoint database server<br>[DATABASE] – name of the Changepoint database |
| <b>Schedule</b>                 | Daily at 12:00 AM  |
| <b>Status</b>                   | Enabled  |

### Release Held Locks scheduled job

Releases system locks from the RecordLock table after there has been no activity for the designated time by deleting locks that belong to a Login session that has expired. Does not apply to PRJ or MSP. Default is 330 seconds.

The designated time can be set in the step.

For more information, see "Editing parameters for scheduled jobs " on page 101.



|                                 |                  |
|---------------------------------|------------------|
| <b>File or Stored Procedure</b> | ReleaseLocks 330 |
| <b>Schedule</b>                 | Every 6 minutes. |
| <b>Status</b>                   | Disabled         |

## Resource Demand Calculation scheduled job

Performs the updates to budgets for which the option to replace values in past periods with actual values has been enabled.

Updates the daily effort in the budgets based on changes made to fiscal period amounts.

Updates the working days table which is used by various parts of the application (such as resource demand analysis).

**Warning:** Do not set a schedule for this job. This Resource Demand Calculation job is called by the Update Time Rate job, and both are included in the chained scheduled jobs. For more information, see "Chained scheduled jobs" on page 83.

|                                 |   |
|---------------------------------|---|
| <b>File or Stored Procedure</b> | SetWorkingDays<br>UpdateRD_NonWorkingDaysTable<br>RollupProjectsByFiscalPeriods<br>BU_ReplacePastWithActuals<br>BU_SaveDailyEffort<br>msdb..sp_start_job @job_name = 'Financial Analysis Summary' |
| <b>Schedule</b>                 | Not scheduled   |
| <b>Status</b>                   | Enabled   |

## Resource Utilization scheduled job

Notifies the manager of a resource whose forecast hours related for the following week are less than 80% or more than 100% of a full week.

Generates the "Resource on Bench" and the "Resource Overloaded" email notifications.

|                                 |                                   |
|---------------------------------|-----------------------------------|
| <b>File or Stored Procedure</b> | ResourceLoad                      |
| <b>Schedule</b>                 | Once a week on Sunday at 7:20 PM. |
| <b>Status</b>                   | Disabled                          |

### Revenue Recognition Tentative scheduled job

Runs the revenue recognition tentative process with saved values as of the last time “start on schedule” was chosen in the process.

|                                 |                       |
|---------------------------------|-----------------------|
| <b>File or Stored Procedure</b> | RevRec_Tent_Schedule  |
| <b>Schedule</b>                 | Once a day at 5:30 AM |
| <b>Status</b>                   | Disabled              |

### Session Clean Up scheduled job

Disconnects user sessions under the following circumstances:

- The user did not sign out of Changepoint properly and the session has been inactive for more than 5.5 minutes (330 seconds). This can occur when the user closes the browser without signing out, or when the user’s computer shuts down unexpectedly.
- The user has been logged on for more than 1 day.
- The user is accessing Changepoint using a mobile device and has not interacted with Changepoint for more than 5.5 minutes (330 seconds).

**Note:** When the user accesses Changepoint through a computer, as long as the main window is open, a keep-alive is triggered every 5 minutes to update the user’s Session record to prevent being logged off. With mobile access, the behavior is different.

Deletes inactive Resource Management Worksheet session IDs, and temporary session data for Resource Management Worksheet and Project Worksheet.

The default value for the allowed period of inactivity is 5.5 minutes (330 seconds). To modify this time, change the optional seconds parameter that is passed to the SessionCleanup stored procedure called by the Session Clean Up scheduled job.

For more information, see "Editing parameters for scheduled jobs " on page 101.

To maintain performance for the Resource Management Worksheet, it is strongly recommended that you activate the Session Cleanup scheduled job.

|                                 |                 |
|---------------------------------|-----------------|
| <b>File or Stored Procedure</b> | SessionCleanup  |
| <b>Schedule</b>                 | Every 5 minutes |
| <b>Status</b>                   | Enabled         |

### Survey Set Expired Survey scheduled job

Changes the status of expired “Automated” surveys to “Inactive”.

Deletes all pending approval survey records from the SurveySanTrigger table when the associated project or opportunity is deleted.

|                                 |   |
|---------------------------------|---|
| <b>File or Stored Procedure</b> | SV_SetExpiredSurveyInactive<br>DeleteSurveySanTrigger |
| <b>Schedule</b>                 | Once a day at 1:00 AM                                 |
| <b>Status</b>                   | Disabled  |

### Task Slippage scheduled job

Sends the notification to Project Manager and Engagement/Initiative Manager when either of the following occurs:

- the resource forecasts a later date than the original plan on the task
- the resource forecasts a larger number of hours than the original planned hours

Used by the “Task slippage” email notification.

|                                 |                                   |
|---------------------------------|-----------------------------------|
| <b>File or Stored Procedure</b> | TaskSlippage                      |
| <b>Schedule</b>                 | Once a week on Sunday at 8:00 AM. |
| <b>Status</b>                   | Disabled                          |

### Time Conformance scheduled job

Sends email notices to resources whose total hours for the previous week were not in conformance with the required hours.

Generates the “Time sheet compliance report” email notification.

|                                 |                                   |
|---------------------------------|-----------------------------------|
| <b>File or Stored Procedure</b> | CheckTimeConformance              |
| <b>Schedule</b>                 | Once a week on Sunday at 8:00 PM. |
| <b>Status</b>                   | Disabled                          |

### Update Time Rate scheduled job

Updates the billing/cross charge rates, cost rates, fixed fee IDs and the billable/chargeable flag in the time tables based on resource/billing role/staffing level combinations and effective dates. Also updates the task actual cost into the task assignment table that is used by the Microsoft Project interface.

The Update Time Rate job is the first job in a chain of dependent scheduled jobs. For more information, see "Chained scheduled jobs" on page 83.

|                                 |  |
|---------------------------------|--|
| <b>File or Stored Procedure</b> | TI_UpdateTimeBillingRate<br>UpdateAssignmentCost<br>msdb..sp_start_job @job_name = 'Resource Demand Calculation' |
| <b>Schedule</b>                 | Once a day at 12:01 AM.  |
| <b>Status</b>                   | Enabled  |

### Validate UDFs scheduled job scheduled job

Calculates and populates calculated field values for all entities for which a calculated configurable field has been configured. Before the calculation occurs, the job checks that the calculation formula is valid. If the formula is invalid, the job bypasses the field and writes a message to the Windows event log.

|                                 |   |
|---------------------------------|---|
| <b>File or Stored Procedure</b> | ValidateFormulas<br>UpdateUDFCalculationField |
| <b>Schedule</b>                 | Once a day at 2:00 AM.                        |
| <b>Status</b>                   | Enabled                                       |

## Workflow Management scheduled job

Starts the workflow process, populates default configurable fields for system-generated resource requests, and processes workflow escalations for all records.

**Note:** WorkflowEscalation.exe requires a trusted connection.

|                                 |  |
|---------------------------------|--|
| <b>File or Stored Procedure</b> | <cp_root>\ScheduledJobs\ WorkflowEscalation.exe<br>[DATABASESERVER], [DATABASE]<br>Where:<br>[DATABASESERVER] – name of Changepoint database server<br>[DATABASE] – name of Changepoint database |
| <b>Schedule</b>                 | Every 30 minutes   |
| <b>Status</b>                   | Enabled  |

## Editing parameters for scheduled jobs

Some of the scheduled jobs call stored procedures or run .exe files using parameters.

1. Access SQL Server Management Studio.
1. In the **Object Explorer** tree view, expand the following nodes:

*ServerName* > **SQL Server Agent** > **Jobs**

2. Right-click the job, and then select **Properties**.

The **Job Properties** dialog appears.

3. Select the **Steps** page, and then double-click the step that contains the parameter.

The **Job Step Properties** dialog appears.

4. In the **Command** field on the **General** page, edit the parameter value as required.

5. Click **OK**.
6. Click **OK** again.

### Monitoring database growth

The PerformanceCPGrowth scheduled job monitors the growth of database files and tables. The job gathers information on table growth, file growth, and I/O statistics. By default, the job collects counter data once a day. The data is stored in the following database tables:

- perfCPFileGrowth – Stores daily details about file growth. Data is saved for 70 days.
- perfCPFileGrowthSum – Stores monthly aggregate data on file growth. Data is saved for 10 years.
- perfTableGrowth – Stores daily details about table growth. Data is saved for 70 days.
- perfTableGrowthSum – Stores monthly aggregate data on table growth. Data is saved for 10 years.
- CPstartuptimes – Stores the startup times. Some counters are cumulative from the last SQL Server start. At startup they are reset.

You can use the data in these tables to monitor database growth over time. Under normal use, the database will grow. The database tables and files may shrink if auto-shrink is enabled or if you use the archiving functionality to move old data from the database to an archive database.

Abnormal database file shrinkage or growth could result in the following issues:

- server resources consumption
- performance problems
- physical file fragmentation
- a need for more maintenance

Therefore it is recommended that you monitor the database growth to diagnose potential issues.

You can use the following sample queries in SQL Server Management Studio to access the data gathered by the PerformanceCPGrowth scheduled job.

### File Growth Details Query

The following query retrieves file growth details over the past 50 days based on the current server date and time.

```
declare @StartDate datetime, @EndDate datetime

set @StartDate = GetDate()-50
set @EndDate = GetDate()- 1

exec performanceCPfilesGrowthDetails @StartDate,@EndDate
GO
```

### File Growth Summary Query (for a range of months)

The following query retrieves file growth summary data for October 2012 – November 2012.

```
/*****
Parameters:
Start year
Start month
End year
End month
*****/

exec performanceCPfilesGrowthSum 2012,10,2012,11

GO
```

### File I/O Details Query

THE FOLLOWING QUERY RETRIEVES FILE I/O DETAILS (READS, WRITES, READS+WRITES) OVER THE PAST 50 DAYS BASED ON THE CURRENT SERVER DATE AND TIME.

```
declare @StartDate datetime, @EndDate datetime

set @StartDate = GetDate()-50
set @EndDate = GetDate()- 1

exec performanceCPFilesWritesDetail @StartDate,@EndDate
exec performanceCPFilesReadsDetail @StartDate,@EndDate
exec performanceCPFilesIODetail @StartDate,@EndDate

GO
```

### File I/O Summary Query

The following query retrieves file I/O summary data (reads, writes, reads+writes) for November 2012.

```
exec performanceCPfilesWriteSum 2012,11
exec performanceCPfilesReadSum 2012,11
exec performanceCPfilesIOSum 2012,11

GO
```

### Table Growth Details Query

The following query retrieves table growth details over the past 50 days based on the current server date and time.

This query contains two optional parameters for the column to order by (default: table name) and for the number of rows in the output list.

```
declare @StartDate datetime, @EndDate datetime

set @StartDate = GetDate()-50
set @EndDate = GetDate()- 1

/*****
parameters:
Start date
End date
Column to order by (optional)
Number of rows in the output list (optional)
*****/
exec performanceTableGrowthDetail @StartDate,@EndDate
exec performanceTableGrowthDetail @StartDate,@EndDate, 'RowsGrowth'
exec performanceTableGrowthDetail @StartDate,@EndDate, 'RowsGrowth', 30
exec performanceTableGrowthDetail @StartDate,@EndDate, NULL, 20

GO
```

### Table Growth Summary Query

The following query retrieves table growth summary data for the specified range of months. For a single month, set the start month and year parameters equal to the end month and year.

This query contains two optional parameters for the column to order by (default: table name) and for the number of rows in the output list.

```
/*****
```



```
parameters:
Start year
Start month
End year
End month
Column to order by (optional)
Number of rows in the output list (optional)
*****/

exec performanceTableGrowthSum 2011,10,2012,10
exec performanceTableGrowthSum 2011,10,2012,10,'InitialSize_kb'
exec performanceTableGrowthSum 2011,10,2012,10,'InitialSize_kb',10
exec performanceTableGrowthSum 2011,10,2012,10,NULL,10

GO
```

## Retaining daily demand distributions in past fiscal periods

By default, the daily distributions for demand are removed from past fiscal periods by the `Resource Demand Calculation` job. However, you can retain the daily distribution data by specifying a lag period in days after the fiscal period before the data is to be removed.

**Warning:** If you specify a lag period, then you must monitor the database to manage the database size and avoid performance degradation in certain areas.

The database administrator must run the following query to set the number of days for the lag period. The following query adds a 60 day lag after the end date of the fiscal period.

```
DECLARE @DailyAllocationCleanUpLag INT = 60--- Number of lag days
UPDATE ServerSettings SET DailyAllocationCleanUpLag = @DailyAllocationCleanUpLag
```



## 8. Installing and Configuring Cognos BI

---

### Overview of Cognos BI installation and configuration

Installation and configuration of Cognos BI takes place in several stages, which are described in the following sections:

- "Stage 1. Creating the Cognos Content Store database" on page 109
- "Stage 2. Installing the Cognos App Tier" on page 110
- "Stage 3. Configuring the Cognos App Tier" on page 111
- "Stage 4. Installing the Cognos gateway" on page 114
- "Stage 5. Configuring Changepoint server integration for Cognos BI " on page 115
- "Stage 6. Assigning Changepoint security features for access to Cognos functionality" on page 115
- "Stage 7. Importing the Changepoint metadata package" on page 116
- "Stage 8. Setting up the data source for IBM Cognos" on page 117
- "Stage 9. Setting the security settings in Cognos" on page 119

For information about installing the Changepoint-Cognos Sync Utility, see "About the Changepoint-Cognos Sync Utility " on page 120.

#### About installing multiple instances of Cognos BI

For information about installing multiple App Tier and Gateway instances, see "Installing Additional Instances of Cognos App Tier and Gateway" on page 131.

You can configure Cognos BI to use multiple databases, for example to implement a Test and Training setup. For more information, see "Installing Additional Instances of Cognos App Tier and Gateway" on page 131.

To configure Cognos for reports from more than one database, you must create and configure a separate connection to the data source for each database. For more information, see the IBM Cognos *Business Intelligence Administration and Security Guide*.

**Note:** For more information about the IBM Cognos software, see the IBM Cognos product documentation.

### Preparing to install Cognos BI

In addition to the standard Changepoint requirements, you require an overall understanding of the following:

- architecture of a Cognos BI solution
- TCP/IP port assignments within the deployment environment (multiple App Tier and gateway instances)

### About roles and feature mapping between Cognos and Changepoint

Access to Cognos functionality is based on resource roles and features in Changepoint. During installation, Changepoint roles are mapped to Cognos groups, and Changepoint features are mapped to Cognos roles. The Cognos groups and roles control resources' access permissions to objects, such as directories, folders, and content in the Cognos software.

Each Cognos role has a specific set of access permissions. For a description of these roles, see the IBM Cognos *Business Intelligence Administration and Security Guide*.

The following table shows how the predefined Cognos roles are mapped to Changepoint features.

| Cognos role              | Changepoint feature        |
|--------------------------|----------------------------|
| Authors                  | Cognos Professional Author |
| Consumers                | Base User License          |
| Directory Administrators | Cognos Administrator       |
| Portal Administrators    | Cognos Administrator       |
| Query Users              | Cognos Business Author     |
| Report Administrators    | Cognos Professional Author |
| Server Administrators    | Cognos Administrator       |
| Systems Administrator    | Cognos Administrator       |

## Installation parameters for Cognos BI

Before you start the installation, use the following table to determine the parameter values for your installation. You are prompted for this information during installation and configuration.

**Note:** For server names, always use the *fully-qualified domain name*.

| Field   | Description  |
|---|--|
| Changepoint database server name, and port or instance name |  |
| Changepoint database name                                   |  |
| Changepoint database connections account ID and password    | SQL account and password used to give the Changepoint applications access to the database. |
| SQL server administrator ID and password                    | “sa” or equivalent account   |
| Cognos dispatcher port (optional)                           | If required, port to use in place of “9300”.   |
| SMTP mail server name and port                              | Used to send notifications from Cognos   |
| Email account and password                                  | Used to send notifications from Cognos   |
| Email address of default sender                             | Used as the “From” address on notifications from Cognos                                    |
| Changepoint website URL and port                            |  |
| Changepoint website name                                    |  |
| Whether Changepoint website uses SSL                        |  |
| Cognos App Tier server name                                 |  |

## Stage 1. Creating the Cognos Content Store database

**Note:** If you are upgrading Cognos BI, do not perform this stage.

1. On the Changepoint database server, log in as a system administrator.
2. From the root of the Cognos BI media, run `setup.exe`.

3. Click **Step 1: Create Content Store Database**.

The **Select Database** appears.

4. In the **Select the SQL Server that Changepoint is installed on** field, enter the name of the Changepoint database server.
5. In the **Changepoint Database Name** field, enter the name of the Changepoint database. The default name is Changepoint.
6. In the **Changepoint Id** field, enter the login ID of the SQL account used to give the Changepoint applications access to the database.
7. In the **Login ID** and **Password** fields, enter the SQL server administrator (sa) user ID and password.
8. Click **Start**.

### Stage 2. Installing the Cognos App Tier

1. Log into the Cognos App Tier server as system administrator.
2. Disable the server's antivirus software, or exclude %ProgramFiles%\IBM.

**Note:** If you choose to keep your antivirus software running, the installation will take much longer because the antivirus software scans each file that is installed.

3. From the root of the Cognos BI media, run `setup.exe`.
4. Click **Step 2: Install and Configure Cognos App Tier**.

The **CAP Configuration** dialog box appears.

5. In the **SQL Server that Content Store and Changepoint is installed on** field, enter the name of the Changepoint database server.
6. In the **Changepoint Database Name** field, enter the name of the Changepoint database. The default name is Changepoint.
7. In the **Changepoint Id** and **Password** fields, enter the SQL account and password used to give the Changepoint applications access to the database.
8. Click **Start**.
9. Right-click **Computer**, and select **Properties > Advanced system settings > Performance > Settings > Data execution prevention**.

10. In the **Data Execution Prevention** tab, do one of the following:

- Select **Turn on DEP for essential Windows programs and services only**
- Select **Turn on DEP for all programs and services except those I select**, then add as exceptions all Cognos executables in the Cognos directories, for example, java.exe, cogbootstrap.exe, etc.

The default Cognos root directory is: %programfiles%\ibm\cognos\c10\

11. If you changed the selected option in step 10, restart the server.


## Stage 3. Configuring the Cognos App Tier

The Cognos Application Tier components are configured using the IBM Cognos Configuration application.

1. On the Cognos App Tier server, log in as administrator.
2. From the **Start** menu, launch **IBM Cognos Configuration**.
3. Click **OK** to acknowledge that the configuration files have been updated.

To configure environment properties

1. In the **Explorer** pane, select **Environment**.
2. Complete the following fields in the **Environment - Group Properties** pane:

| Field   | Description   |
|---|---|
| Each URI field that includes localhost:9300, for example, External dispatcher URI | Change localhost to the name of the Cognos App Tier server (that is, the name of the local machine). Some URI fields, for example, Content Manager URIs, have an <b>Edit</b>  button that opens a dialog box to edit multiple URIs |
| <b>Gateway Settings &gt; Gateway URI field</b>                                    | Enter the URI and port of the Changeport website, and append: /ibmcognos/cgi-bin/cognosisapi.dll<br>For example:<br>http://cp.domain.com.localcp:80/ibmcognos/cgi-bin/cognosisapi.dll   |

**Note:** By default, Cognos BI uses port 9300 for the dispatcher. To change the dispatcher port, replace 9300 with the new port number in all dispatcher and Content Manager URIs. You must provide the URIs of the Internal and External dispatchers in Stages 4 and 5 respectively.

To configure authentication properties

1. In the **Explorer** pane, select **Security > Authentication**.
2. In the **Authentication - Component Properties** pane, **Inactivity timeout in seconds** field, enter 43200.
3. In the **Explorer** pane, select **Security > Authentication > Cognos**.
4. In the **Cognos - Namespace - Resource Properties** pane, **Allow anonymous access?** list, select **False**.

**Note:** Set this parameter to **False** regardless of whether you use Single Sign-on (SSO) for Changepoint.

5. In the **Explorer** pane, right click **Security > Authentication**, and select **New resource > Namespace**.

The **New Resource - Namespace** dialog box appears.

6. In the **Name** field, enter **Changepoint**.
7. In the **Type** list, select **Custom Java Provider**.
8. Click **OK**.
9. In the **Explorer** pane, select **Security > Authentication > Changepoint**.
10. Complete the following fields in the **Changepoint - Namespace - Resource Properties** pane:
  - a. In the **Namespace ID** field, enter **Changepoint**.
  - b. In the **Java class name** field, enter **com.changepoint.cap.CapControl**. The Java class name is case-sensitive.
  - c. In the **Selectable for authentication** list, select **True**.

To configure Content Manager properties



1. In the **Explorer** pane, right click **Data Access > Content Manager > Content Store**, and select **Delete**.
2. In the **Explorer** pane, right click **Data Access > Content Manager**, and select **New resource > Database**.

The **New resource - Database** dialog box appears.

3. In the **Name** field, enter **Content Store**.
4. In the **Type** list, select **Microsoft SQL Server database**.
5. Click **OK**.
6. In the **Explorer** pane, select **Data Access > Content Manager > Content Store**.
7. Complete the following fields in the **Content Store - Database - Resource Properties** pane:
  - a. In the **Database server with port number or instance name** field, enter the name and port or instance name of the Changepoint database server.
  - b. In the **Database name** field, enter **ContentStore**.


**Note:** This is the default name of the content store database that was created in "Creating the Cognos Content Store database" on page 109.

8. Click in the **User ID and password** field, then click the **Edit** button.
9. In the **User ID** field and **Password** and **Confirm Password** fields, enter the SQL account and password used to give the Changepoint applications access to the database.
10. To test the Content Manager database connection, right click **Data Access > Content Manager > Content Store**, and select **Test**.

To send Cognos workflow notifications by email


1. In the **Explorer** pane, select **Data Access > Notification**.
2. Complete the following fields in the **Notification - Component Properties** pane:
  - a. In the **SMTP mail server** field, enter the name and port of the mail server to use to send notifications.
  - b. In the **Default sender** field, enter the email address to use as the "From" address on email notifications.

**Note:** This does not have to be the same account that is in the **Account and password** field

3. Click in the **Account and password** field, then click the **Edit**  button, and complete the **Value - User ID and password** dialog box:
  - a. In the **User ID** field, enter the user ID for any valid account on the mail server. This is the account that notifications are sent from.
  - b. In the **Password** and **Confirm Password** fields, enter the password of the user ID account.

**Note:** If you do not configure a mail server, when you start the IBM Cognos service, a warning message appears when the mail server connection is tested. You can ignore the warning.

To save the Cognos App Tier configuration

1. Click **Save**.
2. When the **Close** button is enabled, click it.
3. To start the IBM Cognos service, click the **Start**  button.

### Stage 4. Installing the Cognos gateway

1. On each Changepoint web server, sign in as administrator.
2. Disable the server's antivirus software, or exclude %ProgramFiles%\IBM.

**Note:** If you choose to keep your antivirus software running, the installation will take much longer because the antivirus software scans each file that is installed.

3. From the root of the Cognos BI media, run setup.exe.
4. Click **Step 3: Install and Configure Cognos Gateway**.
5. Complete the **CP\_CognosGateway** dialog box:
  - a. In the **Cognos Dispatcher URI** field, enter the server name from the Internal dispatcher URI of the Cognos App Tier server. For example:

`cognos.domain.com.changepoint`

**Note:** Do not include the port, or the path `/p2pd/servlet/dispatch`.

- b. In the **Dispatcher Port** field, enter the port assigned to the internal dispatcher: default 9300, or the value you set in Stage 3.
- c. If the Cognos App Tier uses SSL, select the **Use SSL for Dispatcher URI** check box.
6. Click **Next**.
7. Select the name of your Changepoint website in the **Choose the Changepoint Enterprise website** list.
8. Click **Next**, then click **Install**.

## Stage 5. Configuring Changepoint server integration for Cognos BI

1. Sign in to Changepoint Administration.
2. Select **General > Server Integration**.
3. Select the **Enable Cognos integration** check box.
4. In the **Cognos application tier URL** field, enter the External dispatcher URI of the Cognos App Tier server. For example:

`http://cognos.apptier.ext.changepoint.local:9300/p2pd/servlet/dispatch`

5. Click **Save**.

## Stage 6. Assigning Changepoint security features for access to Cognos functionality

By default, all Changepoint resources can access Cognos Connection and Cognos Workspace and do the following:

- run reports
- set up report schedules

You can enable Changepoint resources to create their own portals in Cognos Workspace. For more information, see "Setting the security settings in Cognos" on page 119

The **Base User** security feature controls the general access granted to all resources. To allow resources to access other Cognos reporting functionality, you must assign the following Cognos-related features to resources or roles:


- **View Reports** feature – View Cognos reports and/or workspaces in the **Reports** tree view in Changepoint.

- **Cognos Business Author** feature – Create or edit a report using Analysis Studio, Query Studio or Cognos Workspace Advanced.
- **Cognos Professional Author** feature – Create or edit a report using Report Studio, Analysis Studio, Query Studio or Cognos Workspace Advanced, and manage report scheduling.
- **Cognos Administrator** feature – Administer IBM Cognos software configuration, server settings, and all security aspects; install and run the Changepoint-Cognos Sync Utility.

For more information about assigning the security features to resources and roles, see the *Changepoint Administration Guide*.

### Stage 7. Importing the Changepoint metadata package

If you have more than one Changepoint website, apply this procedure on only one.

1. Sign in to Changepoint as Changepoint administrator.
2. Click **Cognos > Cognos Connection**.
3. Click **Launch > IBM Cognos Administration**.
4. Click **Configuration > Content Administration**, and click the **New Import**  button.
5. In the **Deployment archive** section, select ContentStore, then click **Next**.
6. In the **Password** field, enter Changepoint, then click **OK**.
7. In the **Specify a name and description - New Import Wizard** pane, in the **Name** field, change the default from Export ContentStore to Import ContentStore.
8. Click **Next**, then click **Next** again.
9. In the **Select an action - New Import Wizard** pane, select the **Save and run once** option, and click **Finish**.
10. Complete the **Run with options - Import ContentStore** pane:
  - a. In the **Time** option section, select **Now**
  - b. Select all the **Content** check boxes.
  - c. In the **Report specification upgrade** option section, select **Keep the existing report specification versions**.

- d. In the **Store IDs** option section, select **Do not assign new IDs during import**. Ignore the warning message.
11. Click **Run**, then click **OK**.
12. To view run history and confirm that the package was imported successfully, click **More**, and then click **View run history**.
13. Click **Close**.


The **Configuration > Administration** pane displays two packages: Import ContentStore, and Export ContentStore. These packages are not required.

14. Select the check boxes for both packages, and click the **Delete** button.
15. Click **Log off**.

**Note:** If a base user needs to run a report that contains a link to a profile page, you must grant “Execute” permissions to the **HTML Items in Report capability** to the base user. For more information, see the IBM Cognos *Business Intelligence Administration and Security Guide*.

## Stage 8. Setting up the data source for IBM Cognos

**Note:** If you have more than one Changepoint web site, apply this procedure on only one.

1. Sign in to Changepoint as Changepoint administrator.
2. Click **Cognos > Cognos Connection**.
3. Click **Launch > IBM Cognos Administration**.
4. Click **Configuration > Data Source Connections**.
5. Click **New Data Source** .
6. In the **Name field**, enter “Changepoint,” and then click **Next**.
7. Complete the **Specify the connection - New Data Source** pane:
  - a. In the **Type** list, select Microsoft SQL Server (SQL 20XX Native Client) version that matches the SQL Server version of the database server.
  - b. In the **Isolation level** options, select **Specify a value**.
  - c. In the **Specify a value** list, select **Read Uncommitted**.

- d. Select the **Configure JDBC connection** check box.
8. Click **Next**.
9. Complete the **Specify the Microsoft SQL Server (SQL 20XX Native Client) connection string** dialog box (version matches the SQL Server version of the database server):
  - a. In the **Server name** field, enter the name of the database server.
  - b. In the **Database name** field, enter the name of the database.
  - c. Select the **Signons** option.
  - d. Select the **Password** check box.
  - e. Select the **Create signon that the Everyone group can use** check box.
  - f. In the **User ID** field, and **Password** and **Confirm Password** fields, enter the SQL account and password used to give the Changepoint applications access to the database.
10. Click the **Test the connection** link:
  - a. Click **Test**, then click **Close**.
  - b. Click **Close** again.
11. Complete the following fields in the **Specify the Microsoft SQL Server (JDBC) connection string** dialog box:
  - a. In the **Server name** field, enter the name of the Changepoint database server.
  - b. In the **Database name** field, enter the name of the Changepoint database.
12. Click the **Test the connection** link:
  - a. Click **Test**, then click **Close**.
  - b. Click **Close** again.
13. Click **Next**, then click **Finish**.

The **Configuration** tab now displays the Changepoint data source under **Directory > Cognos**.

14. Click the Changepoint data source link to show the data source connection – also named Changepoint.
15. Restart Cognos Services on the Cognos AppTier.

## Stage 9. Setting the security settings in Cognos

When Cognos imports user information from Changepoint, every user is given the Cognos administrator role. This procedure removes that role from all users, except for those users that have specifically been assigned the Cognos Administrator feature.

Optionally, you can grant Changepoint users the access rights to create their own portals in Cognos Workspace.

To remove the administrator role from Changepoint users

1. Sign in to Changepoint as Changepoint administrator.
2. Click **Cognos > Cognos Connection**.
3. Click **Launch > IBM Cognos Administration**.
4. Click **Security**, then click **Cognos**.
5. Scroll to the System Administrator role, and then click **More**.
6. Click **Set Members**, and select **Everyone**.
7. Click the **Remove** link.
8. Click **OK**.

To grant Changepoint users the access rights to create portals in Cognos Workspace

Changepoint users require the Assemble capability to create portals in Cognos Workspace, which you must set up in Cognos Connection. You grant **Execute** permissions on the **Use Advanced Dashboard Features** permission (in the **Executive Dashboards** section) for the **Consumers** group.

1. Sign in to Changepoint as Changepoint administrator.
2. Click **Cognos > Cognos Connection**.
3. Click **Launch > IBM Cognos Administration**.
4. Click **Security**, then click **Cognos**.

5. In the left pane, click **Capabilities**.
6. In the **Capabilities** section, click **Executive Dashboards**.
7. Click the down arrow beside **Use Advanced Dashboard Features**, and then select **Set Properties**.
8. Click the **Permissions** tab.
9. Click **Add**.
10. Click **Cognos**, then select the **Consumers** check box.
11. Click the arrow button to add **Consumers** to the **Selected entries**, and then click **OK**.
12. Click the **Consumers** check box, and then in the **Execute** row, click the check box in the **Grant** column.
13. Click **OK**.

### About the Changepoint-Cognos Sync Utility

The Changepoint-Cognos Sync Utility synchronizes the Changepoint-Cognos data model of the database with Changepoint. You must synchronize the data model when:

- you import a base data model that you received from Changepoint Canada ULC. The base data model contains the default field labels for the standard fields in the supported languages.
- you make one or more of the following changes in Changepoint Administration:
  - create a configurable field
  - modify a configurable field label
  - modify the field label of a standard field that is included in the model.

#### Hardware and software requirements

For details of the hardware and software requirements of the workstation that is used to run the Changepoint-Cognos Sync Utility, see the *Changepoint Product Architecture and Technology Matrix* and the *Changepoint Hardware Recommendations Guide*.



## Synchronization process overview

After you upgrade to 2017 and install and configure Cognos BI, you must import the base data model supplied with 2017, and then synchronize the model. This initial synchronization creates a new revision with your configurable fields, and labels that you modified before you upgraded.

New revisions are incremental, which means that only configurable fields that have been added and field label changes that have been made since the previous revision are synchronized.

The length of time for the synchronization depends on the number of configurable fields that you have, and the number of field labels that have been changed in Changepoint Administration since the last time that a revision was created. Only fields that have values in Changepoint are synchronized. That is, if you create a new configurable field for which there are no values, the field and the label for that configurable field are not synchronized.

**Tip:** Record the length of time that it takes to import the base data model and create the initial revision during testing. This information will help you to plan the production implementation.

**Note:** Use the fully-qualified domain name for server names.

## About the Changepoint-Cognos Sync Utility log file

The log file `CognosUILog.txt` is located in:

```
<application data directory>\Local\Changepoint\Changepoint\Cognos  
Automation\Logs
```

**Warning:** The Sync Utility does not monitor the size of the log file. You must manually delete or truncate the log file.

## Ad hoc changes to field labels in reports

To make a one-time field label change in a report without changing the Changepoint-Cognos data model, either set the Text Source **Source type** to text for the field label and manually override the value in a single language, or set a text source variable for the field label, then use the Cognos Condition Explorer to set the value. For more information, see the *IBM Cognos Report Studio User Guide*.

## About using the Sync Utility with multiple App Tier and gateway instances

When you install the Changepoint-Cognos Sync Utility, it is configured for a specific database on a specific database server.

Therefore, if you have multiple databases (for example, separate databases for production, test, and training), then you require a separate administrator workstation with the Sync Utility installed on it for each database, even if all of the databases use the same SQL Server version.

### Upgrading the Sync Utility

You must always use the version of the Sync Utility that corresponds to the Changepoint version.

To upgrade the Sync Utility, you must uninstall the previous release sync prerequisite and Sync Utility from the Windows Control Panel, and then install the current release version.

### Installing the Sync Utility

By default, the Changepoint-Cognos Sync Utility is installed and configured for the PSA version of Changepoint. To configure the Sync Utility for Changepoint PPM, see step 11.

To install the prerequisites for the sync utility

1. Disable User Access Control.
2. From the root of the Cognos BI media, run `setup.exe`.
3. Click the **Cognos Sync Utility** Tab and select **Step 1: Install Changepoint Sync Tool Prerequisites**. The Sync Tool prerequisites must be reinstalled on each client.
4. Click **Next**, then click **Install**.

To install the sync utility

1. As administrator, from the root of the Cognos BI media, run `setup.exe`.
2. Click on the Cognos Sync Utility Tab and select **Step 2: Install Changepoint Sync Utility**.
3. In the **Cognos Dispatcher Server Name** field, enter the name of the Cognos App Tier server.
4. In the **Dispatcher Port** field, enter the port used for the Cognos dispatcher.
5. If the Cognos App Tier uses SSL, select the **SSL Enabled** check box.
6. In the **Enterprise Website Server Name** field, enter the name of the Changepoint web server.
7. In the **Enterprise Port** field, enter the port used by the Changepoint website.

8. If the Changepoint website uses SSL, select the **SSL Enabled** check box.
9. Click **Next**, then click **Install**, then click **Finish**.
10. In the **Changepoint Connection Settings** dialog box:
  - a. In the **Connection Settings** list, select **Changepoint Window Service, Scheduled jobs and Utilities**.
  - b. In the **File location** field, browse to:

<cp\_common>\Cognos Client Tools\CognosClientTools.exe.config

For more information, see "Configuring database connection settings" on page 65.

A shortcut named **Changepoint Cognos Sync Utility** is added to the **Start** menu.

11. To configure the Sync Utility for Changepoint PPM:
  - a. Open the `CognosClientTools.exe.config` file in a text editor.
  - b. Search for the `CompanyProfile` key, and change its value from `PSO` to `ITD`.
  - c. Save and close the file.
12. Import the initial base data model from the Cognos BI media Setup/Model folder.

### Uninstalling the Sync Utility

You uninstall the Sync Utility from the **Windows Control Panel**.

## Importing the base data model

When you import a base data model, the previously imported base data model and later revisions are replaced by the newly imported base data model.

**Note:** To include configurable fields and modified field labels in the model, you must create a new revision after importing a base data model.

1. Launch the Changepoint-Cognos Sync Utility, and sign in with your user ID and password.
2. In the **Changepoint-Cognos Sync Utility** dialog box, click **Import Revision**.
3. Select the zip file that corresponds to the Changepoint version:
  - Model.zip (Changepoint PSA)
  - Model-ITD.zip (Changepoint PPM)

4. Click **OK**.

### Adding customized field labels and configurable fields to the data model

To add configurable fields and field label changes to the data model, you must create a new revision after importing the base data model.

1. Launch the Changepoint-Cognos Sync Utility, and sign in with your user ID and password.
2. In the **Changepoint-Cognos Sync Utility** dialog box, click **New Revision**.

The **New Revision** dialog box appears.

3. In the **Comments** field, enter a comment.
4. Do the following:
  - To import configurable fields, select the **Include configurable field delta** check box.
  - To import new or changed field labels or page content strings, select the **Include language string delta** check box.
5. Click **Publish Model**.
6. Advise report creators to open each of their reports in the Cognos report design tool and follow the prompts to accept the changed package.

### Reverting to a previous version of the base data model

You can revert to the imported base data model, or to a previous revision. All revisions that were published after the one you revert to are deleted.

1. Launch the Changepoint-Cognos Sync Utility, and sign in with your user ID and password.
2. In the **Changepoint-Cognos Sync Utility** dialog box, double-click the version you want to revert to.
3. In the **Model Detail** dialog box, click **Revert model**.
4. Advise report creators to open each of their reports in the Cognos report design tool and follow the prompts to accept the changed package.

### About publishing an unsecured Changepoint-Cognos data model

You can create a Changepoint-Cognos data model that is not bound to normal access restrictions within Changepoint by publishing an unsecured version of the latest data model.

The unsecured model is published to a data package called **ChangepointUnsecured** by default.

The reports that use the **ChangepointUnsecured** package include all of the data that complies with the report criteria, regardless of whether the resource who creates or generates the report has access to the data. In contrast, the access to profile pages in Changepoint from links in reports still requires that the resource has security access to the data.

**Note:** You can publish an unsecured data model of the latest data model only. Each time you create a revision of the data model (for example, to add configurable fields to the model), you must also publish the unsecured model to keep them both in sync.

The basic steps for creating an unsecured data model are:

1. Publishing an unsecured version of the Changepoint-Cognos data model.
2. Restricting access to the resulting **ChangepointUnsecured** package.

## Publishing an unsecured Changepoint-Cognos data model

1. Sign into the Changepoint-Cognos Sync Utility.
2. In the **Changepoint-Cognos Sync Utility** dialog box, double-click the latest revision.
3. In the **Model Detail** dialog box, click **Publish unsecured model**.

The unsecured model is published to the a package with the default name of **ChangepointUnsecured**.

To change the default name of the **ChangepointUnsecured** package

1. Open the following file in an editor:

```
<cp_common>\Cognos Client Tools\CognosClientTools.exe.config
```

2. Change the value of the "Cognos.UnsecuredPackage" parameter to the desired default name for the package.

## Tips for using the ChangepointUnsecured package

You use the **ChangepointUnsecured** package the same way as any other package in Cognos. For more information about using packages, see the IBM Cognos product documentation.

### Changing a report to the unsecured package:

In Report Studio, open the report and select **File > Report Package**. Select the **ChangepointUnsecured** package. Save the report.

**Tip:** You can create a copy of a report, and then change the copied report to use the **ChangepointUnsecured** package.

If you are using ‘copy report from clipboard’, double-check which package the report is using. It will use the package from the source report, which may not be the intended package.

- You can also change the package in Cognos Connection, Report properties.

### Best practices

Save reports into folders under their respective packages (Changepoint or ChangepointUnsecured) so that they can be easily distinguished and secured.

### Deleted records are not filtered

Deleted records are not automatically filtered out of the **ChangepointUnsecured** package. Most query subjects have a deleted flag that you can add to reports to filter out deleted data. The exceptions are global workgroups and materials. To filter out deleted data in query subjects that do not have a deleted flag, add a small SQL query and join it to the query subject.

### Cognos infers data relationships based on predefined inter-model relationships

In some cases, Cognos infers a data relationship between two query subjects by using the predefined inter-model relationships and determines its own path for joining the two, which might provide unexpected results and can make queries inefficient.

For example, for `Task` and `Request` query subjects, Cognos uses the relationship between `Task` and `Time Combined`, and `Request` and `Time Combined` to infer a relationship between `Task` and `Request`. The common expectation would be it would use a direct relationship between `Task` and `Request`.

In the Changepoint-Cognos data model, the access checking that is included in query subjects is sometimes used by Cognos to infer data relationships. However, because the unsecured data model does not include that access checking, some relationships cannot be inferred, which might cause errors in reports that do not have errors when using the Changepoint package. Therefore it may be necessary to include more fields or filters in the queries to allow Cognos to determine a relationship in the unsecured model.

Some examples from the accelerator reports package:

There are cascading prompts for customer, engagement and project in the following reports:

- Actual vs planned Recognition billing effort and cost amounts by project
- Actual vs planned Recognition effort cost and margin amounts summary by project

The solution was to do the following:

1. Create a separate query using the `Project` query subject for each of the customer, engagement and project prompts.
2. Use the queries in the respective 'Customer', 'Engagement' and 'Project' prompts on the prompt page.
3. For the project query, add the filters (the same filters and parameters that are in the main query used in the report tables):

'[CustomerId] in ?Customer?'

'[AssociatedEngagementId] in ?Engagement?'

Cascading prompts for Project/Budget Revision number in the following reports:

- Budget revision comparison by fiscal period
- Budget vs Actual by fiscal period

The solution was to create separate queries using the `budget details` query subject for each of the project and revision number prompts.

Use the queries in the respective prompts on the prompt page.

For the revision number query, add the filter (the same filter and parameter that is in the main query used in the report tables):

'[ProjectId] = ?Project?'

## Restricting access to the ChangepointUnsecured package

To limit the access that resources have to the **ChangepointUnsecured** package, you can create a role in Changepoint and then restrict access to the package in Cognos Connection to the group that is mapped to the role.

**Note:** You can similarly restrict access to the package based on a IBM Cognosrole that is mapped to a Changepoint feature. Keep in mind however that some Changepoint features

map to multiple IBM Cognos roles. For more information, see "About roles and feature mapping between Cognos and Changepoint" on page 108.

To restrict access to a **ChangepointUnsecured** package using a Changepoint role

1. In Changepoint Administration:

- a. Create a role, but do not map it to any security features.
- b. Assign the role to the resources who require access to the **ChangepointUnsecured** package for creating reports.

**Tip:** To ensure that the role is immediately visible in Cognos Connection, assign the role to yourself, at least temporarily, then access IBM Cognos connection.

2. In Cognos Connection:

- a. Remove access to all the Report Studio capabilities from the **Everyone** group.
- b. Set up access to all the Report Studio capabilities for the group that corresponds to the Changepoint role that you created.
- c. Select the **Delete the capabilities of all child entries** check box at the bottom of the view.

For more information, see "Set Up Object Capabilities for a Package" in the Cognos Connection online help or the *IBM Cognos Business Intelligence Administration and Security Guide*.

### Restricting access to the reports in the **ChangepointUnsecured** package

1. In Changepoint:

- a. Create a Changepoint role. You can use the same role that was created to restrict access in Report Studio to the package.
- b. Assign the role to the resource who require access to the reports in the **ChangepointUnsecured** package. You can temporarily assign the role to yourself to ensure it appears immediately in Cognos Connection.

2. In Cognos Connection:

- a. Edit the properties for the **ChangepointUnsecured** package.
- b. On the **Permissions** tab, remove all existing entries.



- c. Add the Cognos group that corresponds to the role you wish to have access to reports in the package.
  - d. Select the **Delete the capabilities of all child entries** check box at the bottom of the view.
3. To set up access for different folders in the **ChangepointUnsecured** package to different sets of users, you can create multiple roles and set permissions on the individual folders or reports. Ensure that you grant 'traverse' access to the package and any higher-level folders to the role.



## 9. Installing Additional Instances of Cognos App Tier and Gateway

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### About installing additional instances of Cognos App Tier and gateway

You can install additional instances of the Cognos App Tier on a server and the Cognos gateway on a web server. For example, you could create a combined Test and Training environment using a single physical server for the Cognos App Tier instances, and a single physical web server for the Changepoint websites.

**Note:** The initial instances of the Cognos App Tier, content store database, and gateway must be installed using the installer supplied by Changepoint Canada ULC.

**Warning:** The only configuration that is supported is a single Cognos App Tier instance on a dedicated server, and a single Cognos Gateway instance on each server that hosts an Changepoint website.

All procedures must be executed using administrative privileges.

### Installation parameters for additional instances of Cognos App Tier and gateway

The following table lists the parameter values that you will require during installation and configuration.

**Note:** Use the fully-qualified domain name for server names.

| Field   | Description  |
|---|--|
| Changepoint database server name, and port or instance name |  |
| Changepoint database name                                   |  |
| Changepoint database connections account ID and password    | SQL account and password used to give the Changepoint applications access to the database. |
| Changepoint website URL and port                            |  |
| Changepoint website name                                    |  |

| Field                                | Description   |
|--------------------------------------|---|
| Cognos App Tier server name          |   |
| Port to use for new Cognos instances | Default port for the initial instance is 9300           |
| Local log server port                | Default port for the initial instance is 9362           |
| Local shutdown port                  | Default port for the initial instance is 9399           |
| SMTP mail server name and port       | Used to send notifications from Cognos                  |
| Email account and password           | Used to send notifications from Cognos                  |
| Email address of default sender      | Used as the "From" address on notifications from Cognos |

### Installing an additional Cognos App Tier instance

The content store database is installed on the Changepoint database server. Each App Tier instance requires a separate content store database.

**Warning:** Do not run the setup program from the root of the Cognos BI media because you will damage the existing installations.

#### Installing an additional content store database

1. Log into the SQL server as system administrator.
2. From the Cognos BI media, open `\Setup\ContentStore\ContentStore.sql` in SQL Server Management Studio.
3. If the SQL server already contains a content store database, edit the script to give a unique name to the database being created (for example, `ContentStore_CS2`).
4. Replace `CPSQLUser` with the SQL account used to give the Changepoint applications access to the database.
5. Execute the script.

#### Installing an additional Cognos App Tier component

1. Log into the Cognos App Tier server as system administrator.
2. From the Cognos BI media, execute the Cognos BI installer:

`\Setup\Cognos\64b\winx64h\issetup.exe`

3. In the **Installation Directory** field, enter a unique directory name (for example, `c10_at2`).
4. In the **Component selection** section, select the **Application Tier Components** and **Content Manager** check boxes.
5. In the **Shortcut Folder** field, enter a unique name for the application instance (for example, `IBM Cognos 10 - AppTier2`).
6. When the installer completes, clear the **Start the IBM Cognos Configuration** check box, and then click **Finish**.
7. From the Cognos BI media, execute the Cognos BI Fix Pack installer:

`\Setup\CognosFixPack\x64\winx64h\issetup.exe`

8. In the **Installation Directory** field, select the directory:

`C:\Program Files\ibm\cognos\c10_at2`

9. Copy the following files from the first application tier instance to the new application tier instance:

```
%programfiles%\ibm\cognos\c10\webapps\p2pd\WEB-INF\lib\ChangepointCap.jar
%programfiles%\ibm\cognos\c10\webapps\p2pd\WEB-INF\lib\log4j.xml
%programfiles%\ibm\cognos\c10\webapps\p2pd\WEB-INF\lib\sqljdbc4.jar
%programfiles%\ibm\cognos\c10\configuration\CAP.properties
%programfiles%\ibm\cognos\c10\deployment\ContentStore.zip
```

10. Open the `log4j.xml` file, and change the path to `changepointCAP.log` to refer to the directory of the new instance.

## Configuring the Custom Authentication Provider (CAP)

The following procedure configures the Changepoint database that is used by Cognos for login authentication.

1. You must use the instance of `java.exe` that is installed with Cognos to configure the CAP. It is strongly recommended that you include the path to the `java.exe` instance in the **path** system environment variable:

`C:\Program Files\ibm\cognos\c10\bin64\jre\7.0\bin;`

2. Run the following statements from a command line in the  
`<new cognos instance>\webapps\p2pd\WEB-INF\lib` directory. For example:

```
%programfiles%\ibm\cognos\c10_at2\webapps\p2pd\WEB-INF\lib
```

where c10\_at2 is the unique installation directory name that you entered in "Installing an additional Cognos App Tier component" on page 132.

### 3. Encrypt the database connection parameters:

```
java -jar changepointCAP.jar file ..\..\..\..\configuration\CAP.properties  
<sqlserver> <userid> <password> <ChangepointDB>
```

where:

- sqlserver – name of the Changepoint database server. If required, include the instance name.
- userid – SQL account used to give the Changepoint applications access to the database.
- password – password for the SQL account.
- ChangepointDB – name of the database.

### 4. Test the Encrypted Database Connection Parameters:

```
java -jar changepointCAP.jar ..\..\..\..\configuration\CAP.properties
```

## Configuring an additional Cognos App Tier component

The Cognos App Tier components are configured using the IBM Cognos Configuration application.

Launch the newly installed instance, for example:

```
All Programs > IBM Cognos 10 - AppTier2 > IBM Cognos Configuration
```

where IBM Cognos 10 - AppTier2 is the unique shortcut folder name you entered in "Installing an additional Cognos App Tier component" on page 132.

To configure environment properties

1. In the **Explorer** pane, select **Environment**.
2. Complete the following fields in the **Environment - Group Properties** pane:
3. For each URI field that includes localhost:9300, replace:
  - localhost with the name of the Cognos App Tier server
  - 9300 with the port for the new application instance

4. In the **Gateway Settings > Gateway URI** field, enter the URI and port of the primary gateway, and append:

`/ibmcognos/cgi-bin/cognosisapi.dll`

For example:

`http://changeport:80/ibmcognos/cgi-bin/cognosisapi.dll`

5. In the **Explorer** pane, select **Logging**.
6. Complete the following fields in the **Logging - Component Properties** pane:
  - a. In the **Enable TCP?** field, select **True**.
  - b. In the **Local log server port** field, change **9362** to the port for the new application instance.
7. In the **Explorer** pane, select **IBM Cognos**.
8. In the **IBM Cognos - Configuration - Resource Properties** pane, in the **Shutdown port** field, enter the port for the new application instance.

To configure notification properties


1. In the **Explorer** pane, select **Notification**.
2. In the **Notification - Component Properties** pane, in the **SMTP mail server** field, enter the name and port of the mail server to use to send notifications.

To configure IBM Cognos Services properties

1. In the **Explorer** pane, select **IBM Cognos services**.
2. In the **Component Properties** list, find the row for **Query Service Enabled** and set it to **False**.

To configure Content Manager properties

1. In the **Explorer** pane, right-click **Content Store** and select **Delete**.
2. In the **Explorer** pane, right click **Data Access > Content Manager**, and select **New resource > Database**.
3. Complete the **New resource - Database** dialog box:

- a. In the **Name** field, enter the name of the content store database you created earlier, for example, ContentStore\_CS2.
  - b. In the **Type** list, select **Microsoft SQL Server database**.
  - c. Click **OK**.
4. In the **Explorer** pane, select **Data Access > Content Manager > Content Store**.
5. Complete the following fields in the **Content Store - Database - Resource Properties** pane:
  - a. In the **Database server with port number or instance name** field, enter the name and port or instance name of the Changepoint database server.
  - b. In the **Database name** field, enter the name of the content store database you created earlier, for example, ContentStore\_CS2.
6. Click in the **User ID and password** field, then click the **Edit**  button, and complete the **Value - User ID and password** dialog box:
  - a. In the **User ID** field, enter the SQL account used to give the Changepoint applications access to the database.
  - b. In the **Password** and **Confirm Password** fields, enter the password of the SQL account.
7. Click **OK**.

To configure authentication properties

1. In the **Explorer** pane, select **Security > Authentication**.
2. In the **Authentication - Component Properties** pane, in the **Inactivity timeout in seconds** field, enter 43200.
3. In the **Explorer** pane, select **Security > Authentication > Cognos**.
4. In the **Cognos - Namespace - Resource Properties** pane, in the **Allow anonymous access?** list, select **False**.

**Note:** Set this parameter to **False** regardless of whether you use Single Sign-on (SSO) for Changepoint.



5. In the **Explorer** pane, right click **Security > Authentication**, and select **New resource > Namespace**.
6. Complete the **New Resource - Namespace** dialog box:
  - a. In the **Name** field, enter **Changepoint**.
  - b. In the **Type** list, select **Custom Java Provider**.
  - c. Click **OK**.
7. In the **Explorer** pane, select **Security > Authentication > Changepoint**.
8. Complete the following fields in the **Changepoint - Namespace - Resource Properties** pane:
  - a. In the **Namespace ID** field, enter **Changepoint**.
  - b. In **Java class name** field, enter `com.changepoint.cap.CapControl`. The Java class name is case sensitive.
  - c. In the **Selectable for authentication** list, select **True**.
9. Click **Test**.
10. Save the configuration file.
11. Click **Start**.

## Installing additional Cognos gateway instances on a single server

**Warning:** Do not run the setup program from the root of the Cognos BI media. If you do so you will damage the existing installations.

### Installing an additional Cognos Gateway component

1. From the Cognos BI media, run the Cognos BI installer:  
`\Setup\Cognos\64b\winx64h\issetup.exe`
2. In the **Installation Directory** field, enter a unique directory name, for example, **gway2**.
3. In the **Component selection** section, select the **Gateway** check box.
4. In the **Shortcut Folder** field, enter a unique name for the application instance, for example, **IBM Cognos 10 G2**.

5. When the installer completes, uncheck the **Start the IBM Cognos Configuration** check box, and click **Finish**.

6. From the Cognos BI media, execute the Cognos BI Fix Pack installer:

`\Setup\CognosFixPack\x64\winx64h\issetup.exe`

7. In the Installation Directory field, select the directory:

`C:\Program Files\ibm\cognos\c10_at2`

8. Copy the following files from the first gateway instance to the new gateway instance:

`%programfiles%\ibm\cognos\c10\webcontent\cognoslaunch.js`

`%programfiles%\ibm\cognos\c10\webcontent\default.htm`

`%programfiles%\ibm\cognos\c10\webcontent\index.html`

`%programfiles%\ibm\cognos\c10\webcontent\web.config`

9. Edit the Web.config and change to the new gateway directory path. For example

`C:\Program Files\ibm\cognos\c10g2\cgi-bin\cognosisapi.dll`

## Configuring Microsoft Internet Information Services (IIS) for IBM Cognos

### Creating an application pool

1. Launch IIS Manager.
2. In the **Connections** pane, expand the local server node, and select **Application Pools**.
3. In the **Actions** pane, click **Add Application Pool**.
  - a. In the **Name** field, enter the name of the new instance, for example, IBM Cognos 10 G2.
  - b. From the **.NET Framework version** list, select .NET Framework v4.0.30319.
4. Click **OK**.
5. If users will create reports that embed graphics that are hosted on the web server:
  - a. If necessary, install WebDAV.
  - b. In IIS Manager, enable WebDAV.
  - c. Configure the WebDAV settings at the website level to set **Allow Anonymous Property Queries** to True.

### Creating the IBM Cognos 10 Virtual Directory

1. In the **Connections** pane, right-click the Changeport website for the new gateway, and select **Add Virtual Directory**.
2. Complete the following fields in the **Add Virtual Directory** dialog box:
  - a. In the **Alias** field, enter **ibmcognos**.
  - b. In the **Physical path** field, enter the location of the web content sub-directory in the new gateway, for example:

`C:\Program Files\ibm\cognos\c10g2\webcontent`

3. Click **OK**.

### Creating an application for cgi-bin

1. In the **Connections** pane, right-click the new virtual directory, and select **Add Application**.
2. In the **Add Application** dialog box, complete the following fields:
  - a. In the **Alias** field, enter **cgi-bin**.
  - b. In the **Application Pool** list, select the new application pool.
  - c. In the **Physical path** field, enter the location of the cgi-bin sub-directory in the new gateway, for example:

`C:\Program Files\ibm\cognos\c10g2\cgi-bin`

3. Click **OK**.

### Configuring IIS for IBM Cognos ISAPI

1. In the **Connection** pane, select the IBM Cognos virtual directory that the Cognos gateway is being installed for.
2. In the **Features View**, double-click **Handler Mappings**.
3. If **IBMCOGNOS-IMAPI** is in the list, right-click it and then select **Remove**.
4. In the **Actions** pane, click **Add Module Mapping**.
5. Complete the following fields in the **Add Module Mapping** dialog box:
  - a. In the **Request path** field, enter **cognosisapi.dll**.

- b. In the **Module** list, select **IsapiModule**.
  - c. In the **Executable** field, enter the path to `cognosisapi.dll`, for example:  
`C:\Program Files\ibm\cognos\c10g2\cgi-bin\cognosisapi.dll`
  - d. In the **Name** field, enter **IBMCOGNOS-ISAPI**.
6. Click **OK**, then click **Yes**.

### Configuring an additional Cognos gateway instance

1. To launch IBM Cognos Configuration, use the shortcut to the new instance, for example:  
**All Programs > IBM Cognos 10 G2 > IBM Cognos Configuration**
2. From the **Explorer** pane select **Environment**.
3. Complete the following fields in the **Environment - Group Properties** pane:
  - a. In the **Dispatcher URIs for gateway** field, replace `localhost` with the name of the Cognos App Tier server you want this gateway to work with. Ensure that the URIs use the same port number as the dispatcher.
  - b. In the **Controller URI for gateway** field, replace `localhost` with the name of the local machine. Ensure that the URI uses the same port number as the new Changeport web site.
4. Click **Save**, then click **Close**.

## 10. Configuring Intelligent Forms

---

### About Intelligent Forms

Intelligent Forms is a wizard-driven solution for entering data and generating documents. You use Intelligent Forms to simplify work for resources by streamlining complex tasks and automating data entry processes.

The Changepoint Intelligent Forms connector integrates Intelledox Infiniti with Changepoint. After the connector is installed and the standard form templates are configured, resources can access the standard forms from the Changepoint interface. The forms guide resources through the process of creating or updating an entity record or creating a document. Resources with Infiniti administrator access can access Infiniti Manage from the **Intelligent Forms** menu in Changepoint Administration.

This document includes instructions that are specific to using Infiniti Manage with Changepoint. For general information about using Infiniti Manage, please refer to the Intelledox Knowledge Base, which is available at:

<http://ixsupport.intelledox.com/kb/root.aspx>.

### Standard form templates

Changepoint includes seven standard form templates, which can be used as-is, or which can be used as templates and enhanced to meet business requirements. The standard form templates that create entity records include all of the standard fields that are mandatory by default.

**Note:** The Create Project Request form is preconfigured to support three request types in Changepoint: Issue, Risk, and Change Request. If you use different request types then you must update the form with the appropriate request types. If you require any assistance in applying this change, please contact Changepoint services.

**Note:** Before you can use the standard form templates in your Changepoint installation, you must add all of the mandatory fields that are specific to your organization. This includes both standard Changepoint fields and configurable fields that have been set as mandatory in metadata.

| Form Purpose   | How to access the form   |
|--|--|
| <b>Create Engagement</b><br>Create a company and contacts, engagement, project, tasks, and knowledge management items. | Services > Create Engagement   |
| <b>Create Opportunity</b><br>Create an opportunity from a company profile.   | Company profile > Actions menu > View > Intelligent Forms > Create Opportunity         |
| <b>Create Project</b><br>Create a project from an engagement profile.  | Engagement profile > Actions menu > View > Intelligent Forms > Create Project          |
| <b>Create Project Request</b><br>Create a request from a project profile.  | Project profile > Actions menu > View > Intelligent Forms > Create Project Request     |
| <b>Project Status Report</b><br>Create a status report from a project profile.   | Project profile > Actions menu > Project Status Report                                 |
| <b>Statement of Work (SOW)</b><br>Create a statement of work from an engagement profile.                               | Engagement profile > Actions menu > View > Intelligent Forms > Statement of Work (SOW) |
| <b>Generate Invoice Document</b><br>Generate an invoice document in PDF format.  | Invoice profile > Actions menu > View > Intelligent Forms > Invoice Document           |

## Configuring Intelligent Forms

After installing Intelligent Forms, you must do the following.

1. Install the Intelligent Forms general patch 18.00.118.402 according to the instructions in the patch release notes.
2. Sign into Changepoint Administration.
3. Import the Changepoint license file (.lic) for Intelligent Forms (**Tools > License Management**).
4. In user setup (**Resources > User Setup**), assign either the security feature **Access Forms Administration** or **Access Document Administration** to your user. These security features allow you to access Infiniti Manage from Changepoint Administration.
5. Sign out of Changepoint and then sign back in to trigger the security feature changes.

6. In Changepoint Administration, click **Intelligent Forms > Infiniti Manage**.
7. Sign in to Infiniti Manage using "admin" for both the user name and password.
8. Enter all of the license keys for the Intelledox Infiniti software
  - a. In the License Holder field, enter your company name as provided with your licenses.
  - b. In the Product License field, enter your product license.
  - c. Click **Save**.
  - d. Enter each additional license into the Key field and click **Add** after each one.
  - e. Click **Save**.
9. Click **Data Sources** and then update the connection strings for each of the data sources as follows:
  - a. In the **Connection String** field, replace {{ChangepointDB}} with the name of the Changepoint database and {{ChangepointDBServer}} with the database server.
  - b. In the **Connect with these credentials** field, enter the user ID and password to be the same as used in the Changepoint web.config connection string.
10. Republish the document form projects in PDF format:
  - a. Click **Folders**, then select the **Project** folder.
  - b. Click **Project Status Report**.
  - c. In the **Format** section, clear the “**Microsoft Word Document (docx, docm)**” check box.
  - d. Select the **Portable Document Format(pdf)** check box.,
  - e. Click **Save**.
  - f. Repeat this procedure for the following form projects:
    - Statement of Work (SOW) in the **Engagement** folder
    - Generate Invoice Document in the **Invoice** folder
11. Access each form project, click **Design App** and then add the user-defined mandatory fields for the entities:
  - Create Engagement (company, contact, engagement, project, task, task assignment)

- Create Opportunity (company, opportunity)
- Create Project (project, task, task assignment)
- Create Project Request (request)

**Note:** For more information about using **Design**, see the Intelledox knowledge base or contact Changepoint support to engage professional services

12. In Changepoint Administration, assign the security features for Intelligent Forms to resources as required. For more information about the security features, see the *Security Access Reference Guide* or the online help.

13. Advise resources to add the **Intelligent Forms in Progress** portlet to their default portal on the home page (**Preferences > Portals**). Resources require the portlet to access the partially completed forms that they have saved to continue working on later.

**Tip:** If all resources have access to the forms, then you can make the portlet mandatory in personal portals (**User Interface > Portlet Management**).

### Configuring Intelligent Forms on an SSO environment

To enable Intelligent Forms to work on a Changepoint SSO environment, you must enter the email address (**Email**) and password (**Web password**) for each resource into their user account in Changepoint. The email and password is required by the API for forms authentication.

**Note:** The WebServicesAPI site under Enterprise must be set as Application Authentication.

### Configuring Intelligent Forms in a load-balanced environment

If you are installing Intelligent Forms in a load-balanced environment, you must ensure that all of the URLs are configured to point to the same instance of a website and not to the Load Balancer URL because the underlying security token must always be generated from the same website.

1. Sign in to Infiniti Manage.
2. Click **Settings > Connector Settings**.
3. Select **Changepoint**.



4. Ensure that all of the URLs are configured to point to the same instance of a website and not to the Load Balancer URL.
5. In each instance of the InfinitiLaunch `Web.config` file, configure the following platform keys to point to the same instance of a web server in the farm as chosen earlier and not to the Load Balancer:
  - `CP_VerifyService.VerifyUser`
  - `INFIN_PlatformService`



# 11. Installing and Configuring Single Sign-on

---

## About Changepoint and SSO

You can implement Single Sign-On (SSO) capabilities for Changepoint users.

The following implementation options are available using Secure Token Service (STS):

- SSO using ISAPI
  - SSO using ISAPI – SSL optional
- SSO using WS-Federation
  - SSO using ADFS – SSL required
  - SSO using Azure Active Directory – SSL required
- SSO using SAML
  - SSO using SAML (ADFS) – SSL required
  - SSO using SAML (PingFederate) – SSL required

The configuration scripts for ISAPI and application authentication can optionally enable SSL.

**Note:** Information on additional unsupported SSO providers are available as tech notes from your customer support representative or client manager.

### SSL

If you are using SSL with SSO, the SSO scripts enable SSL in the configuration files.

If you are using SSL with application authentication, the application authentication script has an option to enable SSL.

### Configuration of scripts and certificates

In each of the procedures that follow, you run one or more PowerShell scripts. These scripts are used to install required certificates and to modify Changepoint configuration files.

Copy the contents of the `\Changepoint\Utilities\Configuration\` folder on the Changepoint product media to `\<cp_common>\Configuration\`.

### Changepoint add-ins and SSO

The type of authentication used on the Changepoint website determines whether end-users are required to sign in when they use an add-in for the first time in a Changepoint session.

| Changepoint authentication type | End-users required to sign in |
|---------------------------------|-------------------------------|
| Application authentication      | No                            |
| ISAPI                           | No                            |
| ADFS 2.0                        | Yes                           |
| SAML 2.0 / ADFS 2.0             | Yes                           |

### About application authentication

By default, Changepoint websites are installed with application authentication for end-user sign in. Some websites and features require application authentication, and some require integrated Windows authentication. The following websites and features require application authentication:

- Client Portal website
- Survey Response website

For more information, see "Setting up a survey response website" on page 180.

- Changepoint website accessed by the Report Prerender Service

### Using both application authentication and SSO

You can configure a Changepoint website for either application authentication or SSO, but not both. However, to use both application authentication and SSO, you can do the following:

1. Create two website instances that point to the same Changepoint database.
2. Configure one website instance for SSO and the other for application authentication.
3. Distribute the URLs for the website instances to users according to the type of access you want to give them.

## Implementing application authentication

You can use these procedures to do either of the following:

- revert a website to application authentication after having implemented one of the SSO implementations
- configure Changepoint to use application authentication with SSL

### Configure PowerShell

1. Open a Windows PowerShell prompt.
2. Modify the execution policy:

```
Set-ExecutionPolicy Unrestricted
```

### Stage 1 – Collect configuration parameters

Determine the actual values for the following items. They are used as replacement parameters during configuration.

| Parameter       | Description   |
|-----------------|---|
| Enterprise_URI  | The domain identifier that you use for Changepoint, for example:<br><code>https://changepoint.abc.corp</code> |
| Enterprise_Path | The location of the Changepoint web application files.<br>Default: <code>&lt;cp_root&gt;\Enterprise\</code>   |
| RequireHTTPS    | Require HTTPS (True/False)<br>Default: <code>False</code> .   |

### Stage 2 – Execute configuration scripts

Use the information collected in stage 1 to modify the configuration of the websites.

1. Open a PowerShell prompt.

**Note:** If the server has User Account Control enabled, you must open the PowerShell prompt using elevated administrator permissions.

2. Navigate to the Web Service configuration directory, default:

```
<cp_common>\Configuration\Enterprise
```

3. Execute:

```
./Configuration_AppAuth.ps1
```

4. Follow the prompts.

### Pre-installation steps for Single sign-on (SSO)

#### Configure PowerShell

1. Open a Windows PowerShell prompt.
2. Modify the execution policy:

```
Set-ExecutionPolicy Unrestricted
```

#### Install certificates

On each Changepoint web server, install and configure certificates for use with SSO.

**Note:** The worker process for IIS needs to read the private key of the Sign-in and Cookie certificates. By default, this is the IIS\_IUSRS group. The certificate installation scripts prompt you for this information at the appropriate time.

1. Open a PowerShell prompt.

**Note:** If the server has User Account Control enabled, you must open the PowerShell prompt using elevated administrator permissions.

2. Navigate to the Changepoint configuration directory, default:

```
<cp_common>\Configuration\Common
```

3. Execute:

```
./InstallChangepointCookieCertificate.ps1
```

4. Execute:

```
./InstallChangepointSigningCertificate.ps1
```

### Installing SSO using ISAPI

#### Stage 1. Collect configuration parameters

Determine the actual values for the following items. They are used as replacement parameters during configuration.

| Parameter                                | Description   |
|--|---|
| Enterprise_URI                           | The domain identifier that you use for Changepoint, for example:<br><code>https://changepoint.abc.corp</code>                               |
| Enterprise_Path                          | The location of the Changepoint web application files.<br>Default: <code>&lt;cp_root&gt;\Enterprise\</code>                                 |
| RequireHTTPS                             | Require HTTPS (True/False)<br>Default: <code>False</code> .   |
| Changepoint_RSA_Cookie_Transform         | The name of the certificate that you use for Cookie encryption.<br>Default: the "CN=ChangepointCookieCertificate" Certificate Name.         |
| Enterprise_SigningCertificate_Name       | The name of the certificate that you use for signing messages.<br>Default: the "CN=ChangepointSigningCertificate" Certificate Name.         |
| Enterprise_SigningCertificate_Thumbprint | The thumbprint of the certificate that you use for signing messages.<br>Default:<br><code>"78794E4FF1BB0F5D9A53DC7B8C0B799A1FBC1BB5"</code> |
| ISAPI_Mode                               | The ISAPI mode<br>Default: <code>NT</code>  |
| ISAPI_Header                             | The header used when ISAPI_Mode is "HEADER", for example:<br><code>blank</code>   |

## Stage 2. Create application

1. In IIS, under Enterprise, convert the RP-STs\_ISAPI folder to an application:

- Alias name: RP-STs\_ISAPI

- Physical path:

`<cp_root>\Enterprise\RP-STs_ISAPI`

- Authentication: Only Windows Authentication

- Application pool: Changepoint Application Pool
2. Add `Default.aspx` to the Default Documents for the application.

### Stage 3. Execute configuration scripts

1. Open a PowerShell prompt.

**Note:** If the server has User Account Control enabled, you must open the PowerShell prompt using elevated administrator permissions.

2. Navigate to the Changepoint configuration directory, default:

```
<cp_common>\Configuration\Enterprise
```

3. Execute:

```
./Configuration_SSO_ISAPI.ps1
```

4. Follow the prompts.

## Installing SSO using WS-Federation – ADFS

### Stage 1. Collect configuration parameters

Determine the actual values for the following items; these will be used as replacement parameters during configuration.

Ensure that the `ADFS_Server_URI` is in the Intranet zone of the end-user's browser

**Note:** By default Changepoint is configured to automatically update the public keys that are used to sign security tokens by using the published federation metadata document. In ADFS this is `https://ADFS_FederationServiceName/FederationMetadata/2007-06/FederationMetadata.xml`. If the ADFS server cannot be reached from the Changepoint web server, you must manually update the configuration after running the configuration script. For details see "Updating the public keys for Azure Active Directory manually" on page 160.



| Parameter                                | Description   |
|--|---|
| Enterprise_URI                           | The domain identifier that you use for Changepoint, for example:<br><code>https://changepoint.abc.corp</code>                               |
| Enterprise_Path                          | The location of the Changepoint web application files.<br>Default: <code>&lt;cp_root&gt;\Enterprise\</code>                                 |
| Account                                  | The name of the account that IIS runs under.<br>Default: <code>IIS_IUSRS</code>   |
| Changepoint_RSA_Cookie_Transform         | The name of the certificate that you use for Cookie encryption.<br>Default: the "CN=ChangepointCookieCertificate" Certificate Name.         |
| Enterprise_SigningCertificate_Name       | The name of the certificate that you use for signing messages.<br>Default: the "CN=ChangepointSigningCertificate" Certificate Name is used. |
| Enterprise_SigningCertificate_Thumbprint | The thumbprint of the certificate that you use for signing messages.<br>Default: "78794E4FF1BB0F5D9A53DC7B8C0B799A1FBC1BB5"                 |
| ADFS_FederationServiceName               | Enter the Federation Service Name, for example:<br><code>FederationServiceName</code>   |
| ClaimType                                | Enter the SSO Claim Type.<br>Default:<br><code>http://schemas.xmlsoap.org/ws/2005/05/identity/claims/upn</code>                             |

### Getting the federation service name

1. From the ADFS server, Launch ADFS 2.0 Management console.
2. From the left menu, select "ADFS 2.0".
3. From the **Action** pane select **Edit Federation Service Properties**.
4. The **Federation Service Name** can be found on the **General** tab.

### Stage 2. Create application

1. In IIS, under Enterprise, convert the RP-STs\_ADFS folder to an application:

- Alias name: RP-STC\_ADFS
  - Physical path:  
`<cp_root>\Enterprise\RP-STC_ADFS`
  - Authentication: Only Anonymous Authentication
  - Application pool: ChangePoint Application Pool
2. Add `Default.aspx` to the Default Documents for the application.

### Stage 3. Execute configuration scripts

Using the information collected from stage 1 modify the configuration of the websites.

1. Open a PowerShell prompt.

**Note:** If the server has User Account Control enabled, you must open the PowerShell prompt using elevated administrator permissions.

2. Navigate to the ChangePoint configuration directory, default:

```
<cp_common>/Configuration/Enterprise
```

3. Execute:

```
./Configuration_SSO_ADFS.ps1
```

4. Follow the prompts.

### Stage 4. Create relying party trust

1. On the ADFS server, launch the ADFS 2.0 console.
2. Select **Action > Add Relying Party Trust**.
3. Click **Start**.
4. Select **Enter data about the relying party manually**, then click **Next**.
5. in the **Display name** field, enter a name for the relying party trust, for example: RP-STC\_ADFS, and then click **Next**.
6. Select **ADFS 2.0 profile**, and then click **Next**, then **Next** again.
7. Select **Enable support for the WS-Federation Passive protocol**, and then enter the **Relying party WS-Federation Passive protocol URL**.

`https://Enterprise_URI/RP-STs_ADFS/`

Replace `Enterprise_URI` with the domain identifier for Changepoint.

8. Click **Next**, **Next**, **Next**, **Next**, then **Close**.
9. Add a **Claim Rule** for the Changepoint Relying Party.

For Changepoint, the default Claim rule name is "UPN".

10. Map the LDAP Attribute "User-Principal-Name" to Outgoing Claim Type "\* UPN" or "UPN".

## Stage 5. Increase lifetime of security token

Increase the value of TokenLifetime property for the above relying party object to prevent users from getting a popup message and having to re-launch the Changepoint session when the security token using ADFS 2.0 expires. The default lifetime of a security token using ADFS 2.0 is 60 minutes.

Set the default lifetime of a security token to 8 hours (480 minutes):

1. On the ADFS server, open a Windows PowerShell prompt.
2. Add the ADFS 2.0 snap-in:

```
Add-PSSnapin Microsoft.Adfs.PowerShell
```

3. Display the relying party TokenLifetime.

```
Get-ADFSRelyingPartyTrust -Name "relying_party"
```

where "relying\_party" is the display name that you created, above.

4. Set the TokenLifetime value to 480 minutes:

```
Set-ADFSRelyingPartyTrust -Targetname "relying_party" -TokenLifetime 480
```

## Updating the public keys for ADFS manually

Updating the public keys for ADFS manually includes the following steps:

- Getting the ADFS server token signing thumbprint
- Updating the Web.config file

### Getting the ADFS server token signing thumbprint

1. From the ADFS server, launch ADFS 2.0 Management console.
2. Select **Service > Certificates**, and then double-click the Token-signing certificate.
3. Select the **Details** tab.
4. Select the **Thumbprint** field.
5. To get the thumbprint value, remove all the spaces including the first space.

### Updating the Web.config file

1. Edit `<cp_root>\Enterprise\RP-STs_ADFS\web.config`.
2. Find the `ida:FederationMetadataLocation` key under the `<appSettings>` element and clear its value:

```
<add key="ida:FederationMetadataLocation" value="" />
```

3. Find the `<issuerNameRegistry>` element under `<system.identityModel>` and replace it with the following:

```
<issuerNameRegistry
type="System.IdentityModel.Tokens.ValidatingIssuerNameRegistry,
System.IdentityModel.Tokens.ValidatingIssuerNameRegistry">
<authority name="https://ADFS_FederationServiceName/adfs/services/trust">
<keys>
<add thumbprint="ADFS_Server-Token-Signing-Thumbprint" />
</keys>
<validIssuers>
<add name="https://ADFS_FederationServiceName/adfs/services/trust" />
</validIssuers>
</authority>
</issuerNameRegistry>
```

## Installing SSO using WS-Federation – Azure Active Directory

### Stage 1. Collect configuration parameters

Determine the actual values for the following items. These will be used as replacement parameters during configuration.

Ensure that the `ADFS_Server_URI` is in the Intranet zone of the end-user's browser.

**Note:** By default Changepoint is configured to automatically update the public keys that are used by Azure Active Directory to sign security tokens. These keys rollover on a 6 week schedule, but in an emergency may rollover sooner. If the Azure Active Directory cannot be reached from the Changepoint web server, you must manually update the configuration after running the configuration script. For details see "Updating the public keys for Azure Active Directory manually" on page 160

| Parameter                                | Description   |
|--|---|
| Enterprise_URI                           | The domain identifier that you use for Changepoint, for example:<br><code>https://changepoint.abc.corp</code>                               |
| Enterprise_Path                          | The location of the Changepoint web application files.<br>Default: <code>&lt;cp_root&gt;\Enterprise\</code>                                 |
| Account                                  | Enter the account that IIS runs under.<br>Default: <code>IIS_IUSRS</code>   |
| Changepoint_RSA_Cookie_Transform         | The name of the certificate that you use for Cookie encryption.<br>Default: the "CN=ChangepointCookieCertificate" Certificate Name.         |
| Enterprise_SigningCertificate_Name       | The name of the certificate that you use for signing messages.<br>Default: the "CN=ChangepointSigningCertificate" Certificate Name is used. |
| Enterprise_SigningCertificate_Thumbprint | The thumbprint of the certificate that you use for signing messages.<br>Default:<br><code>"78794E4FF1BB0F5D9A53DC7B8C0B799A1FBC1BB5"</code> |

| Parameter       | Description   |
|-----------------|---|
| Azure_Login_URI | The WS-Federation Sign-On Endpoint, for example:<br><code>https://login.windows.net/893e9ba3-1b78-44d8-aca9-105fab957fed/wsfed</code><br>Get this value from Stage 4 below. |
| ClaimType       | Enter the SSO Claim Type.<br>Default:<br><code>http://schemas.xmlsoap.org/ws/2005/05/identity/claims/name</code>  |

### Stage 2. Create application

1. In IIS, under Enterprise, convert the RP-STS\_ADFS folder to an application:
  - Alias name: RP-STS\_ADFS
  - Physical path: \<cp\_root>\Enterprise\RP-STS\_ADFS
  - Authentication: Only Anonymous Authentication
  - Application pool: Changepoint Application Pool
2. Add Default.aspx to the Default Documents for the application.

### Stage 3. Create relying party trust

1. Log in to the Windows Azure Management Portal at <https://manage.windowsazure.com> with sufficient permissions to add an application (relying party) to the Directory.
2. From the left menu select **Active Directory**.
3. From the main content area select the Directory you want to configure.
4. Select **Applications**.
5. Click the **Add** button at the bottom of the page.
6. Select **Add an Application my organization is developing**.
  - **Name:** Changepoint (friendly name)
  - **Type:** Web Application and/or Web API
7. Select **Single Sign-On**.

- Sign-on URL: `https://Enterprise_URI/RP-STS_ADFS/`
  - App ID URI: `https://Enterprise_URI/RP-STS_ADFS/`
8. Click the **Complete** button.

## Stage 4. Determine the WS-Federation sign-on endpoint

1. Log in to the Windows Azure Management Portal at `https://manage.windowsazure.com` with sufficient permissions to view the Directory.
2. From the left menu select **Active Directory**.
3. From the main content area select the Directory you want to configure.
4. Select **Applications**.
5. Click the **View Endpoints** button at the bottom of the page.
6. Note the value of **WS-Federation Sign-On Endpoint**.

## Stage 5. Execute configuration scripts

Using the information collected from stage 1 modify the configuration of the websites.

1. Open a PowerShell prompt.

**Note:** If the server has User Account Control enabled, you must open the PowerShell prompt using elevated administrator permissions.

2. Navigate to the ChangePoint configuration directory, default:

```
<cp_common>\Configuration\Enterprise
```

3. Execute:

```
./Configuration_SSO_AAD.ps1
```

4. Follow the prompts.
5. Ensure that the WS-Federation Sign-On Endpoint value in `\ChangePoint\RP-STS_ADFS\.web.config` matches the value that was determined in "Stage 4. Determine the WS-Federation sign-on endpoint" on page 159.

For example:

```
< add key="ida:FederationMetadataLocation" value="https://login.microsoftonline.com/xxxxxxxxxx/federationmetadata/2007-06/federationmetadata.xml" />
```

### Updating the public keys for Azure Active Directory manually

Updating the public keys for ADFS manually includes the following steps:

- Getting the token signing thumbprint
- Getting the Azure Active Directory Issuer
- Updating the Web.config file

#### Getting the Azure Active Directory token signing thumbprint

1. Log in to the Windows Azure Management Portal at <https://manage.windowsazure.com>.
2. From the left menu select **Active Directory**.
3. From the main content area select the Directory you want to configure.
4. Select **Applications**.
5. Click on the **View Endpoints** link on the command bar.
6. From the list of single sign-on and directory endpoints, copy the **Federation Metadata Document** link.
7. Open a new tab in the browser, and go to the URL that you just copied. You will see the contents of the Federation Metadata XML document.
8. For the purposes of updating an application to use a new key, locate each `<RoleDescriptor>` block, and then copy the value of each block's `<X509Certificate>` element. For example:

```
<RoleDescriptor xmlns:fed="http://docs.oasis-open.org/wsfed/federation/200706" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
protocolSupportEnumeration="http://docs.oasis-open.org/wsfed/federation/200706" xsi:type="fed:SecurityTokenServiceType">
  <KeyDescriptor use="signing">
    <KeyInfo xmlns="http://www.w3.org/2000/09/xmldsig#">
      <X509Data>
        <X509Certificate>MIIDPjC...BcXwLAiarZ</X509Certificate>
```

9. Paste the value of the `<X509Certificate>` element into a text editor, remove trailing whitespace, and then save the file with a `.cer` extension.
10. Double-click the Token-signing certificate that you just created.
11. Select the **Details** tab.
12. Select the **Thumbprint** field.
13. To get the thumbprint value, remove all the spaces including the first space.



## Getting the Azure Active Directory Issuer

1. Log in to the Windows Azure Management Portal at <https://manage.windowsazure.com>
2. From the left menu select **Active Directory**.
3. From the main content area select the Directory you want to configure.
4. Select **Applications**.
5. Click on the **View Endpoints** link on the command bar.
6. From the list of single sign-on and directory endpoints, copy the **Federation Metadata Document** link.
7. Open a new tab in the browser, and go to the URL that you just copied. You will see the contents of the Federation Metadata XML document.
8. The EntityDescriptor element contains an EntityID attribute. The value of the EntityID attribute represents the issuer. For example:

<https://sts.windows.net/72f988bf-86f1-41af-91ab-2d7cd011db45/>

## Updating the Web.config file

1. Edit `<cp_root>\Enterprise\RP-STs_ADFS\web.config`.
2. Find the `ida:FederationMetadataLocation` key under the `<appSettings>` element and clear its value.

```
<add key="ida:FederationMetadataLocation" value="" />
```

3. Find the `<issuerNameRegistry>` element under `<system.identityModel><identityConfiguration>` and replace it with the following

```
<issuerNameRegistry
type="System.IdentityModel.Tokens.ValidatingIssuerNameRegistry,
System.IdentityModel.Tokens.ValidatingIssuerNameRegistry">
<authority name="https://sts.windows.net/blbfcac8-b7d1-4630-8992-
39faelc36363/AzureAD_Issuer">
<keys>
<add thumbprint="AzureAD_TokenSigning_Thumbprint" />
</keys>
<validIssuers>
<add name="AzureAD_Issuerhttps://sts.windows.net/blbfcac8-b7d1-4630-8992-
39faelc36363/https://ADFS_FederationServiceName/adfs/services/trust" />
</validIssuers>
```

```
</authority>  
</issuerNameRegistry>
```

# Installing SSO using SAML – ADFS

## Stage 1. Collect configuration parameters

Determine the actual values for the following items; these will be used as replacement parameters during configuration.

Ensure that the SAML\_Identity\_Provider is in the Intranet zone of the end-user's browser.

| Parameter                                | Description  |
|--|--|
| Enterprise_URI                           | The domain identifier that you use for Changepoint, for example:<br><code>https://changepoint.abc.corp</code>                              |
| Enterprise_Path                          | The location of the Changepoint web application files.<br>Default: <code>&lt;cp_root&gt;\Enterprise\</code>                                |
| Changepoint_RSA_Cookie_Transform         | The name of the certificate that you use for Cookie encryption.<br>Default: the "CN=ChangepointCookieCertificate" Certificate Name         |
| Enterprise_SigningCertificate_Name       | This is the name of the certificate that you use for signing messages.<br>Default: the "CN=ChangepointSigningCertificate" Certificate Name |
| Enterprise_SigningCertificate_Thumbprint | The thumbprint of the certificate that you use for signing messages.<br>Default: "78794E4FF1BB0F5D9A53DC7B8C0B799A1FBC1BB5"                |
| SAML_Identity_Provider                   | The SAML Identity Provider URI, for example:<br><code>https://adfsserver/adfs/ls/</code>   |
| SAML_Identity_Provider_Type              | The type of the SAML Identity Provider:<br>ADFS20  |
| SAML_Issuer                              | The SAML Issuer required by the IDP.<br>Leave blank.   |

| Parameter                          | Description   |
|------------------------------------|---|
| SAML_Identity_Provider_Signing_Key | This is the SAML Identity Provider Signing Key required by the IDP. Leave blank.                                |
| ClaimType                          | Enter the SSO Claim Type.<br>Default:<br><code>http://schemas.xmlsoap.org/ws/2005/05/identity/claims/upn</code> |

## Stage 2. Create application

1. In IIS, under Enterprise, convert the RP-STS\_SAML folder to an application:
  - Alias name: RP-STS\_SAML
  - Physical path: `<cp_root>\Enterprise\RP-STS_SAML`
  - Authentication: Anonymous and Forms Authentication
  - Application pool: Changepoint Application Pool
2. Add Default.aspx to the Default Documents for the application.

## Stage 3. Execute configuration scripts

Using the information collected from stage 1 modify the configuration of the websites

1. Open a PowerShell prompt.

**Note:** If the server has User Account Control enabled, you must open the PowerShell prompt using elevated administrator permissions.
2. Navigate to the Changepoint configuration directory, default:  
`<cp_common>\Configuration\Enterprise`
3. Execute:  
`./Configuration_SSO_SAML.ps1`
4. Follow the prompts.

## Stage 4. Create relying party trust

1. On the ADFS server, launch the ADFS 2.0 console

2. Select **Action > Add Relying Party Trust**.
3. Click **Start**.
4. Select **Enter data about the relying party manually**, then click **Next**.
5. Enter a **Display name**, for example, RP-STTS\_SAML, and then click **Next**.
6. Select "ADFS 2.0 profile" and click **Next**, then **Next**.
7. Select **Enable support** for the SAML 2.0 WEBSSO protocol and enter the **Relying party SAML 2.0 SSO service URL**

`https://Enterprise_URI/RP-STTS_SAML/`

Replace `Enterprise_URI` with the domain identifier for Changepoint.

8. Click **Next**.
9. Add a **Relying party trust identifier**.

`https://Enterprise_URI/RP-STTS_SAML/`

Replace `Enterprise_URI` with the domain identifier for Changepoint.

10. Click **Next**, **Next**, **Next**, then **Close**.
11. Add a **Claim Rule** for the above Changepoint Relying Party.

For Changepoint, the default Claim rule name is "UPN".

  - a. Select **Claim rule template** "Send LDAP Attributes as Claims".
  - b. Select **Attribute store** "Active Directory".
12. Map the LDAP Attribute "User-Principal-Name" to Outgoing Claim Type "UPN".
13. Specify that the **Secure Hash Algorithm for this Relying Party Trust** uses 'SHA-256':
  - a. Double-click the newly created relying party and select the **Advanced** tab.
  - b. Select the SHA-256 secure hash algorithm.
  - c. Click **OK**.

### Stage 5. Increase security token lifetime

Increase the value of TokenLifetime property for the above relying party object to prevent user from getting a popup message and having to re-launch the Changepoint session when the

security token using ADFS 2.0 expires. The default lifetime of a security token using ADFS 2.0 is 60 minutes.

Set the default lifetime of a security token to 8 hours (480 minutes):

1. On the ADFS server, open a Windows PowerShell prompt.
2. Add the ADFS 2.0 snap-in:

```
Add-PSSnapin Microsoft.Adfs.PowerShell
```

3. Display the relying party TokenLifetime:

```
Get-ADFSRelyingPartyTrust -Name "relying_party"
```

where "relying\_party" is the display name from step 5 of "Create relying party trust" on page 163 above.

4. Set the TokenLifetime value to 480 minutes:

```
Set-ADFSRelyingPartyTrust -Targetname "relying_party" -TokenLifetime 480
```

5. Set the signing certificate revocation check to none:

```
Set-ADFSRelyingPartyTrust -Targetname "relying-party"  
-SigningCertificateRevocationCheck none
```

6. Set the encryption certificate revocation check to none:

```
Set-ADFSRelyingPartyTrust -Targetname "relying-party"  
-EncryptionCertificateRevocationCheck none
```

## Stage 6. Encrypt messages from identity provider (optional)

1. Determine the actual values for the following items. These will be used as replacement parameters during configuration.
  - Enterprise\_EncryptingCertificate\_Name – The name of the certificate that you use for signing messages. Default: the "CN=ChangepointSigningCertificate" Certificate.
2. Edit \RP-STs\_SAML\Web.config .  
  
Replace Enterprise\_EncryptingCertificate\_Name with the actual value.
3. Specify the Encrypting Certificate used for this Relying Party Trust:
  - a. Copy ChangepointSigningCertificate.cer from the Changepoint configuration directory to a local folder on the SAML Provider Server.

- b. Double-click the newly created relying party and select the **Encryption** tab.
- c. Click the **Browse** button and select the certificate that you copied in step 3step a.
- d. Click **OK**.

## Installing SSO using SAML – PingFederate

### Stage 1. Collect configuration parameters

Determine the actual values for the following items; these will be used as replacement parameters during configuration.

Ensure that the SAML\_Identity\_Provider is in the Intranet zone of the end user's browser.

| Parameter                                 | Description  |
|---|--|
| Enterprise_URI                            | The domain identifier that you use for Changepoint e.g.,<br><code>https://changepoint.abc.corp</code>                                    |
| Enterprise_Path                           | The location of the Changepoint web application files.Default:<br><code>&lt;cp_root&gt;\Enterprise\</code>                               |
| Changepoint_RSA_Cookie_Transform          | The name of the certificate that you use for Cookie encryption. Default:<br><code>"CN=ChangepointCookieCertificate"</code>               |
| Enterprise_Signing Certificate_Name       | The name of the certificate that you use for signing messages.Default:<br><code>"CN=ChangepointSigningCertificate"</code>                |
| Enterprise_Signing Certificate_Thumbprint | The thumbprint of the certificate that you use for signing messages. Default:<br><code>"78794E4FF1BB0F5D9A53DC7B8C0B799A1FBC1BB5"</code> |
| SAML_Identity_Provider                    | The SAML Identity Provider URI, for<br>example: <code>https://pingfederateserver/idp/SSO.saml2</code>                                    |
| SAML_Identity_Provider_Type               | The type of the SAML Identity Provider:<br>PingFederate.   |

| Parameter                          | Description  |
|------------------------------------|--|
| SAML_Issuer                        | The SAML Issuer required by the IDP<br>Leave blank.  |
| SAML_Identity_Provider_Signing_Key | This is the SAML Identity Provider Signing Key required by the IDP.<br>Leave blank.                          |
| ClaimType                          | Enter the SSO Claim Type. Default:<br><code>http://schemas.xmlsoap.org/ws/2005/05/identity/claims/upn</code> |

## Stage 2. Create application

1. In IIS, under Enterprise, convert the RP-STS\_SAML folder to an application:
  - Alias name: RP-STS\_SAML
  - Physical path: `<cp_root>\Enterprise\RP-STS_SAML`
  - Authentication: Anonymous and Forms Authentication
  - Application pool: Changepoint Application Pool
2. Add `Default.aspx` to the Default Documents for the application.

## Stage 3. Execute configuration scripts

Using the information collected from stage 1 modify the configuration of the websites.

1. Open a PowerShell prompt.

**Note:** If the server has User Account Control enabled, you must open the PowerShell prompt using elevated administrator permissions.

2. Navigate to the Changepoint configuration directory, default:

```
<cp_common>\Configuration\Enterprise
```

3. Execute:

```
./Configuration_SSO_SAML.ps1
```

4. Follow the prompts.

### Stage 4. Create relying party trust

Create the SP Connection (relying party trust) from the PingFederate Admin Console:

1. Log in to the PingFederate Admin Console, e.g.,

`https://pingfederateserver/pingfederate/app`

2. In the **SP Connections** group, click **Create New**.
3. Select **Do not use a template for this connection**, then click **Next**.
4. Select **Browser SSO Profiles > SAML 2.0 protocol**, then click **Next**.
5. Select **Browser SSO**, then click **Next, Next**.
6. Enter **Partner's Entity ID** - `https://Enterprise_URI/RP-STES_SAML/`

Replace `Enterprise_URI` with the domain identifier that you use for Changepoint.

7. Enter **Connection Name** - "RP-STES\_SAML" - then click **Next**.
8. Click **Configure Browser SSO**.
9. Select **SP-Initiated SSO**, then click **Next, Next**.
10. Select **Configure Assertion Creation**.
11. Select **Standard**, then click **Next**.
12. Select **Subject Name Format**:

`"urn:oasis:names:tc:SAML:1.1:nameid-format:emailAddress"`

then click **Next**.

13. Select **Map New Adapter Instance**.
14. Select the Adapter Instance (this is configured by the system administrator and not included in these instructions) e.g. "LDAPIdP", then click **Next, Next**.
15. Select **Source** - "Adapter".
16. Select **Value** - "username", then click **Next, Done, Next, Done, Next**.

**Note:** The value that you select depends on the Adapter that the system administrator has set up. Typically the value is Username or Subject.

17. Select **Configure Protocol Settings**.



18. Select **Default** - "default".

19. Select **Binding** - "POST".

20. Enter **Endpoint URL**.

`https://Enterprise_URI/RP-STS_SAML/SAML/AssertionConsumerService.aspx`

then click **Add**.

Replace `Enterprise_URI` with the domain identifier that you use for Changepoint.

21. Click **Next**.

22. Select "POST", then click **Next**.

23. Select **Always sign the SAML Assertion**, then click **Next**.

24. Select **None**, then **Next**, **Done**, **Next**, **Done**, **Next**.

25. Select **Configure Credentials**.

26. Select a certificate to digitally sign SAML messages or security tokens.

27. Select **Include the certificate** in the signature <KeyInfo> element.

28. Click **Next**, **Done**, **Next**.

29. Select Connection Status - "Active".

30. Click **Save**.

## Stage 5. Encrypt messages from identity provider (optional)

1. Determine the actual values for the following items, which will be used as replacement parameters during configuration:

- **Enterprise\_EncryptingCertificate\_Name:** The certificate that you use for signing messages. Default: the "CN=ChangepointSigningCertificate" Certificate

2. Modify `\RP-STS_SAML\Web.config`.

Replace `Enterprise_EncryptingCertificate_Name` with the actual value.

3. Modify the SP Connection (Relying Party Trust) that you created earlier from the PingFederate Admin Console.

a. Copy `ChangepointSigningCertificate.cer` from the configuration directory of Changepoint to a local folder on the SAML Provider Server.

b. Log in to the PingFederate Admin Console, e.g.,

`https://pingfederateserver/pingfederate/app`

c. Select the SP Connection that you created earlier.

d. Select **Encryption Policy**.

e. Select **The entire assertion**, then click **Done, Done, Save**.

f. Select "Configure Credentials".

g. Select "Manage Certificates".

h. Select "Import".

i. Browse to the location of the certificate that you copied above, and then click **Next**.

j. Select **Make this the active certificate** and click **Done, Done, Done, Save**.

## Authentication configuration scenarios

### Scenario 1

IF a user is authenticated on the domain (for example, a user who is physically in the office and logged on to the domain/network with AD credentials)

AND the IdP site (somename.yourdomain.com) is part of the user's trusted sites in IE

AND the user's AD account is valid/active

AND SSO has been configured on both the Changepoint site and the IdP site

AND the user's UPN is specified in Changepoint

THEN the user will automatically be signed into Changepoint.

### Scenario 2

IF a user is authenticated on the domain (for example, a user who is physically in the office and logged on to the domain/network with AD credentials)

AND the IdP site (somename.yourdomain.com) is part of the user's trusted sites in IE

AND the user's AD account is valid/active

AND SSO has been configured on both the Changepoint site and the IdP site

AND the user's UPN is NOT specified in Changepoint

THEN the user will be presented with the native Changepoint sign-in AFTER they have been authenticated against the IdP.

### **Scenario 3**

IF a user is authenticated on the domain (for example, a user who is physically in the office and logged on to the domain/network with AD credentials)

AND the IdP site (somename.yourdomain.com) is NOT part of the user's trusted sites in IE

AND the user's AD account is valid/active

AND SSO has been configured on both the Changepoint site and the IdP site

AND the user's UPN is specified in Changepoint

THEN the user will be prompted with an AD login dialog box when accessing Changepoint

The user MUST authenticate via the IdP BEFORE they are signed into Changepoint.

### **Scenario 4**

IF a user is authenticated on the domain (for example, a user who is physically in the office and logged on to the domain/network with AD credentials)

AND the IdP site (somename.yourdomain.com) is NOT part of the user's trusted sites in IE

AND the user's AD account is valid/active

AND SSO has been configured on both the Changepoint site and the IdP site

AND the user's UPN is NOT specified in Changepoint

THEN the user will be prompted with an AD login dialog box when accessing Changepoint

The user MUST authenticate via the IdP BEFORE they are presented with the native Changepoint sign-in dialog box.

### **Scenario 5**

IF a user is NOT authenticated on the domain (for example, a user who is on the public internet, such as a subcontractor, an employee using a home computer, and so on)

AND SSO has been configured on both the Changepoint site and the IdP site

AND the user's UPN is specified in Changepoint

THEN the user will be prompted with an AD login dialog box when accessing Changepoint

The user **MUST** authenticate via the IdP **BEFORE** they are signed into Changepoint.

### **Scenario 6**

IF a user is **NOT** authenticated on the domain (for example, a user who is on the public internet, such as a subcontractor, an employee using a home computer, and so on)

AND SSO has been configured on both the Changepoint site and the IdP site

AND the user's UPN is **NOT** specified in Changepoint

THEN the user will be prompted with an AD login dialog box when accessing Changepoint

The user **MUST** authenticate via the IdP **BEFORE** they are presented with the native Changepoint sign-in dialog box.

## 12. Configuring an Archive database

---

### About configuring an archive database

For more information on archive management and archive jobs, see the *Changepoint Administration Guide*.

Before entities can be archived in Changepoint, you must configure an archive database. The archive database does not have to be on the same server as the source database; however, you must configure the archive database by running the `GenerateEmptyArcDestDB.dtsx` on the server where the source database is located. This `.dtsx` package only needs to be run once.

**Warning:** The `GenerateEmptyArcDestDB.dtsx` file drops the existing archive database (if any) and recreates it. You are responsible for backing up existing databases on the archive server before running the `.dtsx` file.

The minimum recommended size for the archiving processing on the source database is the *larger* of the following amounts:

- 10 GB, with an auto-growth rate of 10%
- three times the amount of data to be archived, with an auto-growth rate of 10%

This space is required for the transaction log of the Archive Aged Entities job.

### Configuring an archive database

1. On the source database server, install or upgrade to 2017.
2. Copy the Data Archiving folder and its contents from the Changepoint product media:

```
\Changepoint\Manual Install\Data Archiving
```

to the following location on the source database server:

```
<cp_root>\Data Archiving
```

**Note:** Because this path is hard-coded in some of the required setup files, it is not recommended that you use a different path. However, if you must use a different path, see "Changing the default location of the data archiving folder" on page 174.

3. Update the following file with the database information for the source production server and the destination archive server:

```
<cp_root>\Data Archiving\Data Archiving.ini
```

For example:

```
[CPSQLServer]
ConnectionString=server=ServerName;database=Changepoint;uid=USERID;pwd=PASSWORD;
```

```
[ARCSQLServer]
ConnectionString=server=ServerName;database=Changepoint;uid=USERID;pwd=PASSWORD;
```

**Note:** The connection settings for generating a new archive database are not encrypted.

4. Double-click the following file:

```
<cp_root>\Data Archiving\GenerateEmptyArcDestDB.dtsx
```

The **Execute Package Utility** dialog opens.

5. Do the following:
  - a. Click the **Connection Managers** page.
  - b. Select the check boxes for the Data Archiving.ini file and the GenerateEmptyArcDestDB.dtsx.log file.
  - c. Change the **Connection String** values for the selected files to the required path.
6. Click **Execute**.

On successful completion, an empty archive database is created.

7. On completion, examine the following log file for any errors:

```
<cp_root>\Data Archiving\GenerateEmptyArcDestDB.dtsx.log
```

Common errors are incorrect settings in the Data Archiving.ini file, and insufficient space.

8. Import the SQL code. For more information, see [Creating a new archive database after upgrading](#).

For troubleshooting issues related to archiving, see "Archive database troubleshooting" on page 243.

### Changing the default location of the data archiving folder

It is recommended that you use the default path (<cp\_root>\Data Archiving) as the path for the Data Archiving folder on the source database server. However, if you must use a different path, the following are the changes that need to be made on the source database server to configure the path.

1. In SQL Server Management Studio, connect to the source database server.
2. In the **Object Explorer** tree view, expand:  
**ServerName > SQL Server Agent > Jobs**
3. Right-click the **Archive Aged Entities** job and select **Properties**.  
The **Job Properties - Archive Aged Entities** dialog displays.
4. Select the **Steps** page and double-click the **Delete DTSX Log** step.  
The **Job Step Properties - Delete DTSX Log** dialog displays.
5. In the **Command** field on the **General** page, replace the argument of the DEL command with the required path and click **OK**.
6. Double-click the **Run Archive DTSX** step.  
The **Job Step Properties - Run Archive DTSX** dialog displays.
7. On the **General** page, do the following:
  - a. Click the **General** tab.
  - b. In the **Package** field, select Data Archiving.dtsx.
8. Do the following:
  - a. Click the **Data sources** tab.
  - b. Select the check boxes for the Data Archive.dtsx.log and Data Archive.ini files.
  - c. Change the Connection String values for the selected files to the required path.
  - d. Click **OK**.
9. Click **OK**.

## Setting up websites on the archive database

You can set up new archive websites or upgrade existing archive websites to point to the archive database and run reports from there. Use the InstallShield Wizard and when prompted for details, enter the details for the archive websites instead of the standard ChangePoint websites.

After running the InstallShield Wizard, use the Login Settings utility to configure the connection settings to the archive database, using the following configuration files:

- Global.asa for the archive Changepoint website.
- Global.asa for the archive Changepoint Administration website.
- Web.config file for the archive Report Designer website
- WebAPI\web.config file
- WebSocket\web.config file



## 13. Installing and Configuring Other Optional Applications, Features, and Services

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### Installing the Changepoint online help

You install the English online help from the Changepoint product media. The German and French versions of the online help are on separate media. For more information on installing the German and French online help, contact your client services representative or client manager.

The version of help (PSA or PPM) that appears when launched from the interface is determined by the mode that was selected when the websites were installed. You must install the online help on each Changepoint instance.

1. On the Changepoint product media, run:

```
\Changepoint\Help\Online Help\setup.exe
```

2. Click **Next**, accept the license terms, then click **Next** again.

The **Select Features** screen displays.

3. Select the check boxes for the type of online help to install.
4. Click **Next**.
5. Select the folders for the Changepoint applications (not the Help subfolder) that you are installing. Client Portal help is installed with the Changepoint help.
6. Click **Next**.

When the installation is complete, the **InstallShield Wizard Complete** screen displays.

7. Click **Finish**.
8. If you have multiple Changepoint websites, install the help on the remaining websites.
9. Confirm that the online help launches by signing in to each of the websites and selecting the **Help** menu option.

Once the online help is installed, it becomes part of the Changepoint website and is removed only if the website is uninstalled.

## Installing Changepoint eLearning

This section applies to Changepoint only. You must install the eLearning on each Changepoint website instance.

The eLearning is on its own media, and the installation instructions are in the eLearning release notes for the current release.

Once the eLearning is installed, it becomes part of the Changepoint website and is removed only if the website is uninstalled.

## Setting up the Changepoint Mobile app

The topic covers the setup required to enable users to use the Changepoint Mobile app.

1. Obtain the license for the Access Mobile Application (AMA) security feature, which includes the values for the keys:
  - NotificationProvider.Key1
  - NotificationProvider.Key2
2. Uncomment the keys and add the values for them into the following configuration files:
  - Enterprise\WebApi\web.config
  - Changepoint\Changepoint Mail Service\CPMail.exe.config
3. Set up Changepoint and the Changepoint Mail Service to communicate with Amazon Web Services over https (port 443). The SNS access point for Amazon is:  
  
`https://sns.us-west-2.amazonaws.com`
4. Advise users of the following information:
  - Changepoint Mobile app is available at the online app stores.
  - Changepoint URL or domain, and the user ID and password that are required to sign in to the app.
  - Changepoint functionality that is available in the app.

**Note:** The Changepoint Mobile app is designed to be intuitive and easy to use, and it supports a subset of the functionality of the desktop Changepoint application. Therefore there is no end user documentation for the app.

## Setting up mobile access to Changepoint

**Note:** This topic refers to setting up the use of mobile devices to access the Changepoint website. For information about setting up the Changepoint mobile app, see "Setting up the Changepoint Mobile app" on the previous page.

The Changepoint start page automatically detects mobile browsers and redirects them to the mobile login page.

For information on supported mobile devices, see the *Changepoint Product Architecture and Technology Matrix*.

Review the default period of inactivity for the Session Clean Up scheduled job, and change if necessary. For information on the Session Clean Up scheduled job, see "Session Clean Up scheduled job" on page 98.

For information on configuration settings for mobile access, see "Mobile access settings" on page 226.

## Setting up a Client Portal website

If enhanced session management has been enabled in Changepoint Administration, you must create a separate Client Portal website.

1. Use the InstallShield Wizard to create a new Changepoint website on the target server.
  - For information on using the wizard, see "Installing Changepoint using the installer" on page 23.
  - If you already have a Changepoint website on this server, see "Installing multiple Changepoint instances" on page 24.
2. Do not install SSO, but allow the website to default to application authentication.
3. Use the Login Settings utility to configure the database connection settings. For more information, see "About configuring database connection settings" on page 65.
4. Remove the following login file from the root level of the website:

`fclogin.aspx`

5. In IIS, change the default document to the following login file, which is located at the root level of the website:

`fclogin.asp`

6. In Changepoint Administration, do the following:
  - a. Define the Client Portal login URL that will be included in the email notifications (**General > Email Integration**).
  - b. Enable the standard Client Portal email templates (**General > Email Templates**.)
  - c. Set up Client Portal (**Client Portal Management**).
7. To set up the Client Portal website for SSL, see "About setting up Changepoint websites for SSL" on page 48.

### Setting up a survey response website

A survey response website is required to allow clients, customers and internal resources to access the Survey system and respond to surveys.

1. Use the InstallShield Wizard to create a new Changepoint website on the target server.
  - For information on using the wizard, see "Installing Changepoint using the installer" on page 23.
  - If you already have a Changepoint website on this server, see "Installing multiple Changepoint instances" on page 24.
2. Do not install SSO: allow the website to default to application authentication.
3. Use the Login Settings utility to configure the database connection settings. For more information, see "About configuring database connection settings" on page 65
4. Remove the following login files from the root level of the new Changepoint website:  
  
`fclogin.aspx`  
`fclogin.asp`
5. In IIS, change the default document for the new Changepoint website to the following file, which is located at the root level of the new Changepoint website:  
  
`sredir.asp`
6. In Changepoint Administration, define the URL that will be included in the Changepoint email notifications to survey recipients (**General > Email Integration**).
7. To set up the Survey Response website for SSL, see "About setting up Changepoint websites for SSL" on page 48.

## About Microsoft Exchange/Outlook synchronization

The following calendar synchronization options are available:

- Server-side (Exchange) – Server-side synchronization is handled through the Changepoint Exchange Synchronization Service, and supports the synchronization of calendar entries only. Each user must select one synchronization method in the **Preferences** view of Changepoint. No client-side installation is required.
- Client-side (Outlook) – The Changepoint Outlook Tools must be installed on the users' desktops. For more information, see the *User Basics User Guide* or the Changepoint online help. No server-side installation is required.

Changepoint supports running a server-side synchronization and client-side synchronization deployment in one environment. Each user must select one synchronization method in their Changepoint preferences.

Users are discouraged from switching back and forth between the synchronization methods, which can result in duplicate entries. During a switch, the ability to completely restore data is dependent on the synchronization direction selected in the Changepoint Exchange Synchronization service configuration file. The synchronization direction is controlled at the server level and cannot be directly controlled by the end user.

If a user changes from Outlook to Exchange synchronization, the resynchronization repopulates the cleared Changepoint calendar entries based on the Exchange data. If the user changes from Exchange to Outlook synchronization, the cleared Changepoint calendar entries are repopulated based on the Outlook data that is in the date range specified when the batch synchronization is run from Outlook.

### Synchronization direction

Calendar synchronization is either one-way or two-way depending on whether the process is real-time or batch. Calendar synchronization requires that the calendar items in Outlook match the General Calendar Synchronization Options settings (Daily Start Time, Daily End Time and Time Zone) in the **Preferences** view in Changepoint.

## About Microsoft Project Desktop integration

No server-side configuration is required. Users must install the Changepoint Microsoft Project (MSP) COM Add-in on their desktops in order to link a Changepoint project to MSP through the MSP interface. For more information, see the *Changepoint User Basics User Guide* or online help.

### Configuring batch printing

You can create different print directories and use different printers for different workgroups by using the `htmlprint` utility. All invoices, cross charges, and credit notes generated by the batch printing report will be saved to the appropriate directory according to the workgroup of the resource who runs the report.

**Note:** The BatchPrint directory is automatically installed if you selected the **Complete** option when installing Changepoint.

1. If you upgraded Changepoint, delete the BatchPrint directory.
2. Install the BatchPrint directory on the web server by doing one of the following:
  - Use the Changepoint installer to install BatchPrint (**Custom** > **Select Features** page > **Batch Print** check box).
  - Copy the BatchPrint directory and its contents from the Changepoint product media:

```
\Changepoint\Manual Install\Components\BatchPrint
```

3. On the web server, run:

```
<cp_root>\BatchPrint\htmlprint.exe
```

4. Review the license, and then close the Bersoft HTMLPrint window.

The `htmlprint.ini` file is added to the BatchPrint directory.

5. Open the `htmlprint.ini` file:

- a. Record the information in the [Printers] section, for example:

```
[Printers]
0=\\printserver\printerA
1=\\printserver\printerB
2=local printer
```

- b. Close the file.

6. Configure the database connection settings for the Batch Print configuration file (`PrintInvoices.exe.config`) using the Login Settings utility (`Login Settings.exe`).

For more information, see "Configuring database connection settings" on page 65.

7. Open the `PrintInvoices.exe.config` file in the BatchPrint directory, and locate the following entry.

```
<add key="PrintServername" value=""/>
```

In the `value` attribute, insert the printer name (from the `[Printers]` section) for the printer that you want to use as the default printer for batch printing. For example:

```
<add key="PrintServername" value="\\printerserver\printerA"/>
```

8. To set up different print directories and use different printers for different workgroups:

- a. Under the `BatchPrint` directory, create subdirectories for the workgroups. Do not use spaces in the subdirectory names. For example:

```
<cp_root>\BatchPrint\Finance  
<cp_root>\BatchPrint\Sales  
<cp_root>\BatchPrint\Marketing
```

- b. For each workgroup subdirectory, create a `utility` subdirectory for the batch print files for the workgroup. For example:

```
<cp_root>\BatchPrint\Finance\utility  
<cp_root>\BatchPrint\Sales\utility  
<cp_root>\BatchPrint\Marketing\utility
```

- c. Set the permissions on the workgroup subdirectories to allow new files to be added and existing files to be deleted.
- d. Copy the files from the `BatchPrint` directory into each of the `utility` subdirectories.
- e. Open the `PrintInvoices.exe.config` file in each `utility` subdirectory. Set the `PrintServername` key to the name of the printer (from the `htmlprint.ini` file) for the workgroup. For example:

```
<add key="PrintServername" value="\\printerserver\printerB"/>
```

- f. Save the file.

9. In Changepoint Administration, set up batch printing:

- a. Assign the `BatchPrint` directory to workgroups.
- b. Set up access to the Batch Printing Report.

## About installing Changepoint APIs

For information about installing the COM API and Web Services API, see the *Changepoint API Installation Guide*.

### Installing the connection string decryption utility

1. Uninstall any previous versions of the utility using Windows Control Panel.
2. Run the following file from the 2017 product media:

```
\Changepoint\Utilities\Connection String Decryption\setup.exe
```

3. Follow the prompts.
4. In the **Setup Status** screen, click **Finish**.

The installation location now contains:

```
Changepoint.CommonServices.Crypto.dll  
CPPubUtility.dll
```

### Uninstalling the Connection String Decryption Utility

To uninstall the connection string decryption utility, use Windows Control Panel.

### Browser settings for end users

Ensure that users configure their web browsers as follows:

- Browser popup settings – Browsers must be set to allow pop-ups from the Changepoint website URLs.
- Internet Explorer Compatibility mode – compatibility mode in Internet Explorer must be disabled by clearing the **Display intranet sites in Compatibility View** check box.
- Browser cache – users must clear their browser cache before logging into an upgraded version of Changepoint. If the browser has the option to preserve data from websites that have been added to favorites, ensure that the **Favorites website data** is cleared.



## 14. Upgrading to Changepoint 2017

---

### About upgrading

You can upgrade to 2017 from the following Changepoint versions only:

- Changepoint 2014
- Changepoint 2014 Service Pack 1
- Changepoint 2014 Service Pack 2

**Note:** Unless otherwise stated, information in this chapter concerning Changepoint websites applies to websites that were set up for mobile access, Client Portal, and Survey Response.

### Requirements for upgrading

For all software, hardware, skills and experience requirements, see "Installation Requirements and Preparation" on page 13.

#### Obtain the latest patches

Check the **2017 Release Notes and Patches** team folder, which is accessible through the Client Portal, for general patches and upgrade patches that have been posted for this release.

**Warning:** You must apply pre-upgrade patches *before doing the upgrade*, otherwise the upgrade will not be successful.

### Preparing for the upgrade

#### Review customizations and product extensions

Upgrading can affect your customizations. Review your customizations prior to upgrading and test them after upgrading.

If you are unsure whether any of the following information applies to you, contact your Changepoint Canada ULC client services representative or client manager to confirm before attempting the upgrade.

For information, see "Identifying nonstandard database objects" on page 189.

#### Database customizations

During an upgrade, all custom code is removed from the database, which affects existing customizations (reports, pages, triggers, stored procedures, etc.), extensions, and

accelerators.

Therefore, you must review and edit all custom code to account for changes in table names and any use of user-defined data types. If you use the accelerator databases, there are custom stored procedures and views that must be reviewed and re-applied after the upgrade.

### Upgrading Intelligent Forms

The standard form templates have been revised for this release. The updated forms are on the Changepoint media in the `Changepoint\Intelligent Forms\Forms` folder. You can import these form templates using Infiniti Manage.

**Warning:** If you upgrading from Changepoint 2014 Service Pack 2 with the Intelligent Forms feature installed, importing the Changepoint 2017 form templates will replace the existing templates.

### Client-side SQL Server Database Driver update

Microsoft has reported that there are vulnerabilities in the communication protocol that uses SSL on earlier versions of Transport Layer Security (TLS) between the SQL Server client and SQL Server database engine. Microsoft recommends upgrading to TLS 1.2 for secure communication. For more information see [Article ID: 3135244](#) on the Microsoft website.

In Changepoint 2017, the limited areas of Changepoint that used the Microsoft OLE DB Provider for SQL Server (SQLOLEDB) as the client-side driver have been modified to use the SQL Server Native Client to provide support for TLS 1.2.

After upgrading Changepoint, you must reset the SQL Server connection string using the Login Setting utility on all Changepoint web server instances for the `global.asa` file for Enterprise and Enterprise Report Server. Failure to make this change will result in users not being able to log into Changepoint.

1. Perform the following steps on each Changepoint web server instances:
  - a. Start the Login Settings utility. The utility is located in the `<cp_common>\LoginSettings` folder.
  - b. From the Coconnection Settings list, select "Enterprise".
  - c. In the File Location field, browse to the `Global.asa` file for the Changepoint website.
  - d. Enter `USERID` and `PASSWORD` as the user ID and password of the account for database access, then click OK.

- e. In the Connection Settings section, specify the server name, database name, and time-out information that was used in the previous connection string.
- f. In the User ID and Password fields, enter the user ID and password for the SQL account for accessing the Changepoint database.
- g. To verify the connection string, click Test.
- h. Click Save.
- i. If your environment includes a Report Server, repeat the steps 2 to 8 for the "Enterprise Report Server" as the Connection Settings.
- j. Restart the Internet Information Services (IIS) to complete the process.

### **CPEExtended database**

CPEExtended is a secondary database introduced in Changepoint 2014 SP2 that resides on the same server as the main Changepoint database. CPEExtended provides storage for logging error messages and performance data as well as background job scheduling and management. CPEExtended is installed and configured automatically when you upgrade.

The new RESTful API is automatically installed and configured on the Changepoint website at `<cp_root>\Changepoint\WebAPI`. If you move or change the Changepoint database, then you must run the Login Settings utility using the **RESTful API** option to configure the database connection settings for the RESTful API accordingly.

If you plan to restore your database in a different environment, see the porting instructions in "Porting the Changepoint database" on page 207.

### **Website customizations**

During an upgrade, the existing Changepoint websites are completely removed and new websites are created.

You must reapply all custom pages or files that were added to the Changepoint, Report Designer or Changepoint Administration folders after the upgrade has completed.

The configuration settings for all websites are reset to the default values, including websites that were set up for mobile access, Client Portal, and Survey Response. Most database connection settings are preserved.

- If you deploy Changepoint Product Extensions (any code that has been added, modified or customized in any way), it is strongly recommended that you review the list of files in the

*Differences* document for the upgrade path to assess whether there is any impact. If it appears that any of the code associated with a product extension is at risk, contact your client services representative or client manager before upgrading. Failure to do so may result in the files being overwritten or deleted, and the extended functionality failing.

- If any custom pages use style sheets, a best practice is to add `type_9pt.css` as the first style sheet and update existing style sheets from those with "E\_" prefixes to "DEF\_" prefixes.

### **Assess the impact on scheduled jobs**

The connections settings for the scheduled job executables are not preserved.

### **Upgrade to a test environment first**

It is strongly recommended that you upgrade your production Changepoint database and websites in a test environment before upgrading the production environment. If any errors occur, report them to Changepoint Canada ULC immediately. Do not create any test environments on your production environment.

To upgrade the Changepoint database in a test environment, back up the database and full text catalogs on the production environment, and then restore them on the test environment.

If the test environment and production environment use the same version and edition of SQL Server, see "Creating a test and training environment on the same server" on page 219.

If the test environment and production environment use different versions or editions of SQL Server, see "Porting the Changepoint database" on page 207.

### **Database considerations**

Upgrade and certification is performed using SIMPLE recovery model in the Changepoint SQL database. For more information refer to *Using Recovery Models* in SQL Books Online.

### **Optional components and features**

#### **API**

If you use the API, you must upgrade to the 2017 version of the API.

#### **Manual use of Login Settings utility**

If you run the Login Settings utility manually, be sure to use the 2017 version of the utility.

## Microsoft Dynamics GP Toolkit

If you already have the Microsoft Dynamics GP Toolkit installed, you must reinstall it after you upgrade.

## Identifying nonstandard database objects

You can create a database inventory report that identifies all nonstandard database objects that exist in your current Changepoint database. Nonstandard database objects include all database objects (table, view, stored procedure, functions, trigger, index, primary and foreign key constraints) that were created by customizations, accelerators, and third-party integrations.

The database inventory report allows you to catalog existing customizations in the current database, identify the affected customizations, and plan the migration work for the upgrade.

**Note:** The database inventory report does not replace any change tracking procedures or processes that you may already have in place to track customizations, accelerators, or third-party integrations.

### Creating the database inventory report

To create the database inventory report, execute the following query against the Changepoint database:

```
SELECT * FROM CPObjectsModified
```

The result of the query includes the following:

- custom database objects show as **Added**.
- standard objects that no longer exist show as **Deleted**.
- if a customization has been made directly to a standard database object, the object is not identified as a customized object in the report.
- the report does not report on all CHECK\_CONSTRAINTS.

## Upgrade overview

There are two ways to upgrade the Changepoint database and websites:

- Use the installer.

You can upgrade the database, website files, or both. For instructions, see "Upgrading Changepoint using the installer" on page 192.

- Upgrade manually (database only)

You can upgrade the database manually and then use the installer to update the websites. For instructions, see "Upgrading the database manually" on page 195.

After you upgrade the database and websites, you can upgrade the other components that you use. For more information, see the following:

- "Installing a Changepoint Windows service" on page 53
- "About Changepoint scheduled jobs" on page 83
- "About configuring an archive database" on page 173
- "About Changepoint and SSO" on page 147
- "Installing and Configuring Other Optional Applications, Features, and Services" on page 177

## Pre-upgrade steps

### 30 to 35 days before upgrading

On the Changepoint web server, change the content expiry of the Changepoint folders to expire in 1 day:

```
\images  
\css  
\Help  
\External\Help  
\External\images  
\Js
```

### Changing content expiry settings and enabling caching of static files

You set content expiry in IIS Manager by changing the expiry options of the HTTP Response Headers for the Enterprise websites.

1. In IIS Manager, expand **servername** > **Sites** > **Enterprise**.
2. Select the folder.
3. In the **Home** screen, double-click the **HTTP Response Headers** icon.
4. Select **Actions** > **Set Common Headers**.
5. Change the settings as required.
6. Click **OK**.

**One to two weeks before upgrading**

Send an email message to users to notify them about the upgrade.

**One day before upgrading**

On the Changepoint web server, change the content expiry of the Changepoint folders to expire immediately.

**Immediately before upgrading**

1. Print any spooled files in the BatchPrint folders.
2. Apply the applicable pre-upgrade patches according to the instructions in the patch release notes.
3. In Changepoint Administration, lock Changepoint.
4. On the web server:
  - a. Back up the Changepoint files.
  - b. Disable IIS caching. For more information on enabling and disabling caching, see "Changing content expiry settings and enabling caching of static files" on page 190.
  - c. Stop the Changepoint websites that you are upgrading.

**Warning:** The site names and ports that you specify during the upgrade must be unique in IIS. If you have additional sites using the same name and/or port (in addition to the one you are upgrading), revise or delete them in IIS before continuing. This is true even if the additional sites are stopped or paused.

5. On the database server:
  - a. Stop all scheduled jobs from running during the upgrade.
  - b. Back up the database just before performing the upgrade.
  - c. Back up the Cognos content store database.
  - d. Back up the InfinitiDB database.
  - e. Drop custom full-text catalogs before the upgrade.
  - f. Run any database pre-upgrade scripts.
  - g. Apply any pre-upgrade patches.

- h. Ensure that the autogrowth property on the primary file group (which contains Changepoint.mdf) is set to “By 100 MB, unrestricted growth” and the free space on the disk drive of the database server is no less than 5 GB.
    - i. If required, port the database.
6. Create a backup copy of the `Global.asa` file and the `Web.config` files in the Enterprise folder and WebAPI folder to use as a reference when reconfiguring after the upgrade. The upgrade resets some of the configuration settings in the `Global.asa` and `Web.config` files to the default values.
7. Copy the `Web.config` files under each folder under `<cp_root>\Intelligent Forms\Websites`, as applicable:
  - `ChangepointDataService`
  - `InfinitiLaunch`
  - `IntelledoxScheduler\IntelledoxScheduler.exe.config`
  - `Manage`
  - `Produce`
8. Create a backup copy of the configuration files for the Changepoint Windows Services.
9. If you use the Salesforce.com integration:
  - a. Create a backup copy of the configuration files:
    - `ExternalEndPoint\Web.config`
    - `ExternalEndPoint\Configuration\Adapter.xml`
  - b. On the SFDC Integration Toolkit media, copy the contents of the `Salesforce\ExternalEndPoint` folder.
  - c. Paste the contents under the `ExternalEndpoint` folder.
  - d. Move the backup copies of the configuration files back to the `ExternalEndpoint` folder.

### Upgrading Changepoint using the installer

If you are upgrading the database and websites separately, it is best to upgrade the database first because it is easier to restore the database than to roll back the website files.



When you upgrade using the installer, the database connection settings for only the following components are preserved under the following conditions:

- Report Designer and Report DSN, provided that you specify the existing locations of the websites

**Note:** To upgrade multiple instances, you can run the installer multiple times.

1. Follow the instructions in "Pre-upgrade steps" on page 190.
2. Copy the contents of the Changepoint product media to a location on the server.
3. Run the `setup.exe` file from the server location.
4. If the **Existing Installed Instances Detected** screen appears, select **Maintain or upgrade the instance of this application selected below**.
5. If the database to be upgraded was not detected because it was installed manually, or if you ported the database before upgrading:
  - a. Select **Install a new instance of this application**, then select the language on the **Choose Setup Language** screen.
  - b. Follow the prompts, then select **Custom setup type**.
  - c. On the **Select Features** screen, select the following options:
    - Scheduled Jobs
    - Upgrade Changepoint Database
    - other options as required

**Note:** If you ported the database before upgrading, *and the websites are on the same server as the database*, you must run the installation program again, and select **Websites Only** the second time, to upgrade the websites.

6. Follow the prompts, then select **Upgrade Changepoint database** and select **Install Infiniti database for Intelligent Forms** when applicable.
7. If Install Infiniti database is selected, enter the Changepoint URL on the **Changepoint URL** information screen.

**Note:** This Enterprise URL entry assists with Infiniti integration, and sets values for the Changepoint Infiniti Connector.

8. In the **SQL Connection Setting** screen, enter the User ID and Password that is used by the Changepoint web application to communicate with the Changepoint database.
9. In the **Database Configuration** screens, complete the fields as follows:

**In the Database Server list, select the SQL Server name where the database is installed.**

- d. In the **Login ID** field, enter the SQL server `sa` login.
  - e. In the **Password** field, enter the SQL server `sa` password.
10. Enter the Changepoint Database name.
  11. Enter the Intelligent Forms Database name, when the feature is selected. Default name is InfinitiDB.
  12. Click **Next**, and follow the prompts.
  13. When the upgrade is complete, click **Finish**.
  14. Complete the post-upgrade instructions.  
  
See "After upgrading" on page 205.
  15. Install and configure Redis, if required. If your Changepoint environment consists of a simple web instance on a web server, then Redis is configured automatically by the installer.

### Upgrading the website using the installer

1. Copy the contents of the Changepoint product media to a location on the server.
2. Run the `setup.exe` file from the server location.
3. If the Existing Installed Instances Detected screen appears, select **Maintain or update the instance of this application selected below**:
4. Click **Next**, and then follow the prompts.
5. On the **Select Features** screen, select the features to be installed on the web server, including the **Login Settings** feature.
6. Select **Install Infiniti web application for Intelligent Forms** feature when applicable.
7. On the **Choose Destination Location** screen, browse the folder where Changepoint Enterprise and Report Designer are installed.

8. When applicable, select the destination location for Intelligent Forms. Default path is `<cp_root>\Intelligent Forms\Websites`.
9. When applicable, select the destination location where the Changepoint Web Services API is installed. The API is mandatory for Intelligent Forms. Default path is `<cp_root>\API`.
10. Click **Next**.
11. On the **Choose Destination Location** screen, select folder where the Redis cache service is installed.
12. In the **Create the Intelligent Forms Application Pool** screen, enter the Application Pool name for Intelligent Forms. Default name is CPInfiniti.
13. On the **Changepoint URL** information screen, enter the Changepoint URL.
14. On the **SQL Connection Setting** screen, specify the SQL user ID and password that will be used by the Changepoint web application to communicate with the Changepoint database.
15. Click **Next** and follow the prompts to complete the install.
16. Launch `LoginSettings.exe` to configure the database connection strings. See the list in "Installing Changepoint using the installer" on page 23.

## Upgrading the database manually

It is important to perform the procedures in this section in the following order.

**Note:** There is no manual option for installing the InfinitiDB. To install or upgrade the InfinitiDB, you must use the Changepoint installer.

1. Follow the pre-upgrade instructions described in "Pre-upgrade steps" on page 190.
2. Copy the contents of the following folder from the Changepoint product media to a location on the database server.

`\Changepoint\Manual Install\Upgrade\`

3. "Importing the database migration file" on page 195.

### Importing the database migration file

1. Run the SQL import utility:

`<cp_root>\Upgrade\SQLImport.exe`

**Warning:** You must use the SQL import utility from the new release version of Changepoint.

The **Encrypted SQL Import Utility** dialog opens.

2. In the **Select the Migration file to import** field, select:

`Changepoint.DatabaseServices.DBMigrations.dll`

3. **Complete the following fields:**

- a. In the **SQL Server** field, enter the name of the SQL server.
- b. In the **Database** field, enter the name of your Changepoint database.
- c. In the **Login name** field, enter the user ID for the SQL administrator sa account.
- d. In the **Password** field, enter the password for the SQL administrator sa account.

4. Click **Start Update**.

5. Click **OK** to confirm.

6. Review the `Changepoint.DatabaseServices.DBMigrations.log` file to confirm that the upgrade completed successfully..

## Completing the upgrade on the database server

1. Check the log file for errors:

`<cp_root>\InstallLog\CPInstaller.log`

2. Confirm that the VersionHistory table contains the following entry:

`Upgrading Changepoint database with migration package 18.00.118.000 completed`

3. Apply the applicable patches. Patches are available in the 2017 Release Notes and Patches team folders.
4. Restore and test customizations (.asp pages, custom SQL code, accelerators, and extensions). If you started with an accelerator database, re-apply the custom views and stored procedures.
5. To optimize performance, follow the recommendations in "Changepoint performance guidelines" on page 211.

6. Adjust the size of the Changepoint and tempdb databases back to the limits and settings according to your internal administration policies. The size of the databases may have increased due to the processing done during the upgrade.
7. Review the scheduled job settings.
8. Run the following scheduled jobs:
  - a. Reindex and Update Statistics daily
  - b. Chained scheduled jobs by starting the Update Time Rate job. Ensure that Resource Demand Calculation completes successfully.

**Note:** It is recommended that you run the scheduled jobs immediately after upgrading, and before end users sign in. For more information about scheduled jobs, see the *Changepoint Installation Guide*.

**Tip:** The chained scheduled jobs can take a long time to run. Record the duration of the job in the test environment so that you can plan for the initial scheduled job run on the production database.

9. Recreate the custom full-text catalogs.
10. Restart the database server.

## Completing the upgrade on the web servers

1. Apply the applicable patches.
2. Restore and test customizations (.asp pages, custom SQL code, accelerators, and extensions). Reapply application pool customizations to the new application pools.
3. Configure the settings for token authentication as follows:
  - a. Open the `Enterprise\Web.config` file.
  - b. Replace the default value of the `WebApiSecret` setting with a unique string of UTF-8 characters with a recommended size of 64 bytes. For example, you can use any combination of 64 single byte characters.
  - c. Open the `Enterprise\WebAPI\Web.config` file
  - d. Replace the value of `WebApiSecret` with the same unique string used above.

- e. In a load balanced environment, ensure that you use the same WebAPISecret value within the environment.

**Note:** For security reasons, it is strongly recommended that you use a different WebAPISecret value for each Changepoint instance that you deploy.

4. On each web server, do the following:
  - a. Start the Login Settings utility (cp\_common>\LoginSettings).
  - b. From the **Connection Settings** list, select "Enterprise".
  - c. In the **File Location** field, browse to the Global.asa file for the website.
  - d. For the user ID and password of the account for database access, enter USERID and PASSWORD, and then click **OK**.
  - e. In the **Connection Settings** section, specify the server name, database name, and time-out information that was used in the connection string before the upgrade.
  - f. In the **User ID** and **Password** fields, enter the user ID and password for the SQL account for **Changepoint** applications to access the database.
  - g. To verify the connection string, click **Test**.
  - h. Click **Save**.
  - i. If your environment includes a Report Server, repeat this procedure for the "Enterprise Report Server" connection string.
5. Configure the database connection settings for Intelligent Forms.
6. To optimize performance, follow the recommendations in "Changepoint performance guidelines" on page 211.
7. After upgrading, most of the configuration settings in the Global.asa and Web.config files are reset to their default values. Change the defaults if required.
8. Restart the Changepoint website, sign into Changepoint Administration, and perform these initial checks:
  - If you purchased additional licenses, import the licenses (**Tools > License Management**).

- Assign the new security features if required. See the “Assigning new security features” section on page 109.
  - Check the server integration settings (**General > Server Integration**).
  - Set the password complexity rules for your organization (**Resources > Sign in and Password Validation**).
9. Restart all websites. To check connectivity, sign in to each website.
  10. Application authentication is enabled on the Changepoint websites by default. For information on changing the default authentication, see "About setting up Changepoint websites for SSL" on page 48.
  11. Restore the content expiry settings of the Changepoint folders to the values before the upgrade. For more information, see "Changing content expiry settings and enabling caching of static files" on page 190.
  12. Enable IIS caching of static files.
  13. Restart IIS.

## About upgrading the archive database and websites

If you have an archive database and websites, follow the same procedure as for upgrading the Changepoint database and websites. When prompted, substitute the details for the archive database and websites in place of the Changepoint database and websites.

**Note:** The archive environment must always be at the same patch level as the production environment, otherwise the Archive Aged Entities scheduled job might fail.

1. Upgrade the archive database and websites.
2. Copy all files except the `Data Archiving.ini` file from the following folder on the Changepoint media:

`\Changepoint\Manual Install\Data Archiving`

**Note:** The `Data Archiving.ini` file contains the current configuration settings.

3. Paste the files into the `Data Archiving` folder on the archive environment.

## Upgrading the archive database and websites

If you have an archive database and websites, follow the same procedure as for upgrading the Changepoint database and websites. When prompted, substitute the details for the archive

database and websites in place of the Changepoint database and websites.

**Note:** The archive environment must always be at the same patch level as the production environment, otherwise the Archive scheduled jobs might fail.

1. Upgrade the archive database and websites.
2. Copy all files except the `Data Archiving.ini` file from the following folder on the Changepoint media:

`\Changepoint\Manual Install\Data Archiving`

**Note:** The `Data Archiving.ini` file contains the current configuration settings.

3. Paste the files into the `Data Archiving` folder on the archive environment.

### Configuring the archive database

If you have a website set up to access the archive database, execute the following commands against the archiving database:

```
exec DBM_SetupCPTempDB
exec DBM_SetupCPExtended
exec DBM_EnableSqlDependency (with the user used in the Web.config files)
```

### Upgrading the archive database manually

1. Follow the same procedures as for upgrading a Changepoint database to upgrade the archiving database.
2. Run the Login Settings utility for the upgraded archive websites to connect them to the upgraded archive database. For more information, see "Configuring database connection settings" on page 65.

## Upgrading Cognos BI

You can upgrade Cognos BI from the following versions:

- Changepoint 2014
- Changepoint 2014 SP1
- Changepoint 2014 SP2

Upgrading includes the following steps:

**Note:** Before you upgrade Cognos BI, ensure that Changepoint has been upgraded.



**Note:** All Cognos BI configuration is preserved for both the Cognos AppTier and Gateway.

1. Backing up the content store database. The recommended method for backing up a content store database is to create a deployment archive by using IBM Cognos Administration. For more information, see [Creating a deployment archive](#) on the IBM Knowledge Center website
2. [Upgrade from Changepoint 2014 or Changepoint 2014 SP1 only] Uninstalling the previous version of Cognos BI. For more information, see the "Uninstalling Cognos BI" section on page 201.
3. Installing the current version. Perform the following steps:
  - "Stage 2. Installing the Cognos App Tier" on page 110.
  - "Stage 3. Configuring the Cognos App Tier" on page 111
  - "Stage 4. Installing the Cognos gateway" on page 114
  - "Stage 5. Configuring Changepoint server integration for Cognos BI " on page 115
  - "Stage 6. Assigning Changepoint security features for access to Cognos functionality" on page 115
4. Upgrade the Sync Utility and import the new base data model. For more information, see "About the Changepoint-Cognos Sync Utility " on page 120.
5. Restart the Cognos App Tier server.

## Uninstalling Cognos BI

You must uninstall Cognos BI from each of the locations where it has been installed:

- App Tier server
- Cognos Gateway on each Changepoint web server
- Sync Utility client workstation

1. On each of the servers, go to the following folder:

```
C:\Program Files\ibm\cognos\c10\uninstall
```

2. Uninstall Cognos BI by double-clicking:

```
Uninstall IBM Cognos.exe
```

3. Delete the Cognos IBM directory:

C:\Program Files\IBM

### About upgrading Intelligent Forms

The standard form templates have been revised for Changepoint 2017. The updated forms are on the Changepoint media in the `Changepoint\Intelligent Forms\Forms` folder. You can import these form templates using Infiniti Manage.

**Warning:** If you upgrading from Changepoint 2014 Service Pack 2 with the Intelligent Forms feature installed, importing the Changepoint 2017 form templates will replace the existing templates.

#### Previous versions of forms

The standard form templates are based on previous versions of the forms. Compare your existing form project names and project IDs with the names and IDs of the standard form templates in the following table carefully. If any existing form projects have the same name and project ID as a standard form template, do one of the following:

To keep an existing form project

1. Open the project in Infiniti Manage (Design App).
2. Use **Save As** to save the project with a different name, which generates a new project ID.
3. Delete the old projects because they will cause problems when you import the new projects.
4. Create or update the **Actions** menu headers and submenu items that correspond to the forms as required.

To override an existing form project

1. Ensure that the project name and the project ID matches the ones in the table exactly.
2. Select the overwrite existing project option when importing the form.

| Standard form template    | Project ID                           |
|---------------------------|--------------------------------------|
| Create Engagement         | 5c26f4ef-2c26-4640-b9f1-6861b8610351 |
| Create Opportunity        | b171a117-79b0-445c-8d94-1cbc5908f696 |
| Create Project            | acdc15a6-ea63-4641-b439-b31deb439ff6 |
| Create Project Request    | 9a6ccb87-a6b3-4fe1-8b01-22121d4d8311 |
| Project Status Report     | 50565368-d71b-426b-b4a4-892a356b563e |
| Statement of Work (SOW)   | 66b710d6-667d-42fd-b760-59d9b80fcd57 |
| Generate Invoice Document | 4fe2c7f7-c162-45bc-92e6-b6d3dff05ff1 |

## Configuring Infiniti Manage after upgrading

1. Install the Intelligent Forms general patch 18.00.118.402 according to the instructions in the patch release notes.
2. Sign into Infiniti Manage.
3. Add the authenticated user license and the seven authenticated project licenses for the standard form templates.
4. If your Infiniti version is Intelledox Infiniti 9.5.9.0, click **Produce**. This is to synchronize the version between the InfinitiDB database and the Intelligent Forms websites.
5. Create the following folders (one for each main Changepoint entity):
  - a. Company
  - b. Contact
  - c. Engagement
  - d. Invoice
  - e. Opportunity
  - f. Project
  - g. Request
  - h. Resource

**Tip:** It is good practice to organize form projects under the folder that corresponds to the related Changepoint entity.

6. Import the seven Intelligent Forms project packages from the product media into Infiniti Manage.
7. Publish each form into its corresponding folder:
  - a. Create Engagement – Engagement folder
  - b. Statement of Work (SOW) – Engagement folder
  - c. Create Project – Project folder
  - d. Project Status Report – Project Folder
  - e. Generate Invoice Document – Invoice folder
  - f. Create Opportunity – Opportunity folder
  - g. Create Project Request – Request folder
8. Republish the document form projects in PDF format:
  - a. Click **Folders**, then select the **Project** folder.
  - b. Click **Project Status Report**.
  - c. In the **Format** section, clear the “**Microsoft Word Document (docx, docm)**” check box.
  - d. Select the **Portable Document Format(pdf)** check box.,
  - e. Click **Save**.
  - f. Repeat this procedure for the following form projects:
    - Statement of Work (SOW) in the **Engagement** folder
    - Generate Invoice Document in the **Invoice** folder
9. Click **Data Sources** and then update the connection strings for each of the following data sources:
  - Changepoint DB (DS Views and UDFs)
  - Changepoint DB (Tables)
  - Invoice

- a. In the **Connection String** field, remove `Provider=SQLOLEDB.1;Persist Security Info=True;` from the beginning of the string.
- b. Then replace `{{ChangepointDB}}` with the name of the Changepoint database, and `{{ChangepointDBServer}}` with the database server.
- c. In the **Connect with these credentials** field, enter the user ID and password to be the same as used in the Changepoint web.config connection string.

### Configuring Intelligent Forms in a load-balanced environment

If you are installing Intelligent Forms in a load-balanced environment, you must ensure that all of the URLs point the same instance of a web server in the farm and not to the Load Balancer because the underlying security token must always be generated from the same website.

1. Sign in to Infiniti Manage.
2. Click **Settings > Connector Settings**.
3. Select **Changepoint**.
4. In each instance of the InfinitiLaunch `Web.config` file, configure the following platform keys to point to the same instance of a web server in the farm as chosen earlier and not to the Load Balancer:
  - `CP_VerifyService.VerifyUser`
  - `INFIN_PlatformService`

## After upgrading

1. Install the Changepoint online help. For more information, see "Installing the Changepoint online help" on page 177.
2. Install Changepoint eLearning. For more information, see "Installing Changepoint eLearning" on page 178.
3. Upgrade or install the Changepoint 2017 Windows Services.

If you previously installed Windows services, you must uninstall the previous versions first. For installation instructions, see "Installing a Changepoint Windows service" on page 53.

4. If required, install BatchPrint for batch printing of invoices/cross charges.

For setup information, see "Configuring batch printing" on page 182.

5. To upgrade COM API and Web Services, see the *Changepoint API Installation Guide*.
6. To reinstall the Microsoft Dynamics GP Toolkit, see the *Microsoft Dynamics GP Toolkit Administration Guide*.
7. Advise users to delete the browser history before signing in to the Changepoint websites for the first time. Refer users to the browser help for instructions.

### Importing User Licenses

If your organization has obtained an additional license file, use Changepoint Administration (**Tools > License Management**) to import the licenses after the upgrade is complete.

**Note:** You require the Manage Licenses security feature to import user licenses.

## 15. Porting the Changepoint database

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### Overview

This section describes how to port the Changepoint database between different versions or editions of SQL Server.

**Note:** If the version of SQL server you are currently using is not supported in the new version of Changepoint, then you must port the database first before upgrading it. Otherwise, the order is not important.

### Porting the Changepoint database

**Note:** Changepoint does not support SQL Server partitions.

#### On the source database server

1. Log in as `sa` to SQL Server Management Studio.
2. Disconnect all users from the database and set it to “Restricted Access to `db_owner`, `dbcreator` or `sysadmins`” only.
3. Issue a `CHECKPOINT`.
4. Detach the database.
5. Copy only the `.mdf` and `.ndf` database files to the target SQL server.
6. Repeat this procedure for the `CPEExtended` database.

#### On the target database server

1. Copy the following folder from the Changepoint product media to any location on the target SQL server:

```
\Changepoint\Utilities\Porting SQL Databases\
```

2. Remove the read-only attributes from the copied files.
3. Log in as `sa` to SQL Server Management Studio.
4. Open the following script in an editor:

```
<TargetServerPath>\Porting Changepoint.sql
```

5. If you did not use the default database name, replace “Changepoint” with the database name.

6. Update the full path and file names of all the .mdf and .ndf files in the script.
7. Scroll to the bottom of the script, and then edit the input value for the stored procedure `DBM_EnableSqlDependency`. For more information, see the comments in the script for details.
8. Replace the `CPSQLUser` string in the script with the SQL account on the target server that will be used for the Changepoint database connection.
9. (Optional) Edit the value of the input parameter for the stored procedure `DBM_SetupCPTempDB`. For details, see the comments in the script.
10. Edit the value of the input parameter for the stored procedure `DBM_SetupFullText`. Do one of the following:
  - To populate the full text indexes immediately: set `@Populate = 0x1`
  - For a large sized database, it is recommended to set `@Populate = 0x0`, and run the `CPFullText` scheduled job later.
11. Edit the value of the input parameter for the stored procedure `DBM_SetupScheduledJob`. For details, see the comments in the script.
  - a. If you are not using the default `ScheduledJobs` path, replace the value of the following variable with the path used:

```
@SCHEDULE_JOB_PATH = '<cp_root>\ScheduledJobs\'
```
  - b. If you are not using the default `Data Archiving` path, replace the value of the following variable with the path used:

```
@DATAARCHIVING_JOB_PATH = '<cp_root>\Data Archiving\'
```
12. Update the full path and file names of all the .mdf and .ndf files in the script for the `CPExtended` database.
13. Run the script against the Changepoint database.

### After porting the Changepoint database

After you port the Changepoint database to the target SQL server, perform the following steps.

1. Copy the contents of the `Scheduled Jobs` directory from the source SQL server, for example:

```
<SourceServerPath>:\<cp_root>\ScheduledJobs\*.*
```



to the Scheduled Jobs location on the target SQL server:

```
<TargetServerPath>:\<cp_root>\ScheduledJobs\
```

2. After porting the database, the size of the Changepoint and tempdb databases may have increased due to the processing done during the porting. Adjust them back to the limits and settings as per your internal policies.
3. Run the Login Settings utility on all the applicable applications and services to change the **Server** field to the correct value for the target SQL server.

For more information about using the Login Settings utility, see the *Changepoint Installation Guide*.

4. If you have an archive database and you are porting the source database, do the following:
  - a. Copy the contents of the Data Archiving directory from the source SQL server:

```
<SourceServerPath>:\<cp_root>\Data Archiving\*.*
```

to the Data Archiving location on the target SQL server:

```
<TargetServerPath>:\<cp_root>\Data Archiving
```

- b. Edit the following file:

```
<TargetServerPath>:\<cp_root>\Data Archiving\Data Archiving.ini
```

- c. Change the server name in the following section and save the file:

```
[CPSQLServer]  
Name=TargetServerName
```

## Porting an archive database

The procedure for porting an archive database is similar to the procedure for porting a Changepoint database, except for the following:

- Do not set up scheduled jobs on the archive database
- If the source database remains on the same server, and only the archive database is ported to a new server, change the [ARCSQLServer] section instead of the [CPSQLServer] section of the <TargetServerPath>:\<cp\_root>\Data Archiving\Data Archiving.ini file. Change the server name in the following section and save the file:

```
[ARCSQLServer]  
Name=ArcSQLName
```



## 16. Optimizing Performance

---

### Changepoint performance guidelines

You can improve the overall performance of the Changepoint application by making the following adjustments to the default configuration of the Changepoint website.

#### **Enable Session Cleanup scheduled job for RMW performance**

If you are using Resource Management Worksheet (RMW), it is strongly recommended that you activate the Session Cleanup scheduled job to maintain performance.

### Configuring the antivirus exclusion list

To prevent performance issues caused by virus scans, you must configure the exclusion list in the antivirus software.

#### **Exclusion list for the database server**

To determine the exclusion list for the SQL server, refer to the following information on the Microsoft website:

<https://support.microsoft.com/en-ca/help/309422/how-to-choose-antivirus-software-to-run-on-computers-that-are-running-sql-server>

#### **Exclusion list for the web server**

Include the subdirectories as well for all the excluded directories.

1. Changepoint installation directory: <cp\_root>

2. .NET Framework files:

- C:\Windows\Microsoft.NET\assembly
- C:\Windows\Microsoft.NET\Framework\v4.0.30319
- C:\Windows\Microsoft.NET\Framework64\v4.0.30319

3. IIS config folder:

%SystemDrive%\Windows\System32\inetsrv\config\

4. IIS Temporary Compressed Files

%SystemDrive%\inetpub\temp\IIS Temporary Compressed Files

5. Pagefile.sys

6. IIS Logs files, if IIS logging is enabled. The default is:

`C:\inetpub\logs\LogFiles`

### Performance guidelines for the Changepoint database server

The performance of the database server is particularly important when you are preparing an environment for high user loads. High performance is achieved by splitting as many I/O calls as possible across multiple I/O channels, disks, and spindles in order to keep I/O queuing to a minimum while using the entire available memory in the most efficient way.

#### Adjust maximum SQL server memory

By default, SQL Server configured with maximum server memory set to 2147483647 MB, which in effect is all of the server memory that is available. The default setting can result in insufficient memory for the operating system and other applications, which can cause instability and performance issues.

Therefore, you must adjust the value for the default setting to allow some of the server memory for the operating system and other applications. Use the following formula:

Maximum SQL Server Memory = Maximum Physical Memory – Memory for OS

Memory for the OS is between 1 GB and 4 GB, depending on the total physical memory of the server.

#### Virtualized SQL server using VMware

If you have virtualized the SQL server using VMware, review the guidelines in the *Architecting Microsoft SQL Server on VMware vSphere*, best practices guide, which is available on the VMware website:

<http://www.vmware.com/content/dam/digitalmarketing/vmware/en/pdf/solutions/sql-server-on-vmware-best-practices-guide.pdf>

#### Dedicated I/O channels for database file types

Each database file type should have its own dedicated I/O channel (LUN, RAID set or physical disk):

- Database log file on a RAID 10 array
- Database ndf files on a RAID 10 array
- Database mdf file on a RAID 10 array

- tempdb database on RAID 0

If only three channels are available, the log file and tempdb can be on one channel. Use multiple data files for tempdb (one per CPU-Core), set the initial size to 1 GB, and set the auto-grow to 1 GB.



## 17. Changepoint Connection String Decryption Utility

---

### About the decrypting connection strings

This document provides code samples for using the Changepoint Public Utility (CPPubUtility) to decrypt the reportsdsn connection string in the Global.asa for use in customizations. For additional information, contact your client services representative or client manager.

CPPubUtility runs under the .NET Framework. This utility provides a single method interface, which can be used to decrypt the connection string information that is stored in an encrypted format in the Global.asa and Web.config files.

Typically, the CPPubUtility is installed on the web server, but it can also be installed on the database server if needed.

#### Changepoint Public Utility Object Interfaces

Object: CPPubUtility.Decrypt

Method: DecryptString

```
Public Function DecryptString(ByVal sConnectionString As String) As String
```

#### Time-out Limits for Decrypted Connection Strings

Time-out periods are enforced for the decrypted connection strings. If a time-out is set, the decrypted connection string includes the time-out value in seconds. For example:

```
provider=SQLOLEDB; Server=SERVER; database=Changepoint; uid=xxj; password=xxj;  
Trusted_Connection=No; Timeout=900
```

If there is no time-out limit, the decrypted connection string does not include a time-out value. For example:

```
provider=SQLOLEDB; Server=SERVER; database=Changepoint; uid=xxj; password=xxj;  
Trusted_Connection=No
```

### Code examples for decrypting connection strings

#### VB

```
Dim cmdSQL As ADODB.Command  
Dim oCPDecrypt as CPPubUtility.Decrypt  
Dim sConnectionString as String  
Set cmdSQL = New ADODB.Command  
Set oCPDecrypt = New CPPubUtility.Decrypt
```

```
sConnectionString = GetObjectContext("Session").Contents("DSN")
With cmdSQL
.ActiveConnection = oCPDecrypt.DecryptString(sConnectionString)

...
```

### VBScript

```
Dim cmdSQL
Dim oCPDecrypt
Dim sConnectionString
set cmdSQL = server.CreateObject("Adodb.Command")
set oCPDecrypt = server.CreateObject("CPPubUtility.Decrypt")
sConnectionString = Session("dsn")
With cmdSQL
.ActiveConnection = oCPDecrypt.DecryptString(sConnectionString)
```

### .NET

```
Dim cmdSQL As SqlCommand
Dim oCPDecrypt As New CPPubUtility.Decrypt()
Dim sConnectionString As String
' Get connection string from configure file
sConnectionString = ConfigurationSettings.AppSettings("SQLSettings")
' Decrypt the connection string
sConnectionString = oCPDecrypt.DecryptString(sConnectionString)
If sConnectionString <> "" Then
cmdSQL = New SqlCommand()
cmdSQL.Connection = New SqlConnection(sConnectionString)
....
```

## Report example for using CP Decrypt Interface

This report uses the CPDecrypt Interface to display a list of resource names and email addresses on any Changepoint customer database.

```
<!--#include virtual="/IncludeFiles/inSession.asp"-->

<html>
<head>
<meta HTTP-EQUIV="PRAGMA" CONTENT="NO-CACHE"
<link rel="stylesheet" type="text/css" href="/css/<%=strLCID%>_documents.css
media="screen">
<link rel="stylesheet" type="text/css" href="/css/<%=strLCID%>_docPRINT.css
media="print">
</head>
<body>
<table cellpadding=0 cellspacing=2 width='98%' border=0>
<tr>
```



```
<td class=head style="width:80%;" valign=top>Sample Report</td>
</tr>
<tr>
<td colspan=2 class=fadeline>&nbsp;</td>
</tr>
<td>v0.1<td>
</tr>
</table>
<p><span class="SummaryHead">Date & Time run:</span>&nbsp;&nbsp;&nbsp;</p>
<%=FormatDateTime(date(),1)%></p>
<%
dim sSQL, rst
Dim cmdSQL
Dim oCPDecrypt
Dim sConnectionString
set cmdSQL = server.CreateObject("Adodb.Command")
set oCPDecrypt = server.CreateObject("CPPubUtility.Decrypt")
sConnectionString = Session("reportsdsn")
With cmdSQL
.ActiveConnection = oCPDecrypt.DecryptString(sConnectionString)
.CommandType = AdCmdText
End With

sSQL="SELECT Resources.Name AS ResourceName,
ResourceAddress.EmailAddress AS ResourceEmailAddress" &_
"FROM Resources, ResourceAddress" &_
"WHERE Resources.ResourceID = ResourceAddress.Resourceid"
cmdSQL.CommandText = sSQL
set rst = cmdSQL.Execute
if not rst.EOF then
Response.Write("<table cellpadding='0' cellspacing='0' border='0'
width='100%'>")
Response.Write("<tr><td class='TableHead'>Resource Name</td>")
Response.Write("<td class='TableHead'>Resource Email Address</td>")
while not rst.EOF
Response.Write("<tr><td class='rowUnderline'>" &
rst("ResourceName").Value & "</td>")
Response.Write("<tr><td class='rowUnderline'>" &
rst("ResourceEmailAddress").Value & "</td>")
rst.MoveNext
wend
rst.Close
Response.Write("</table>")
else
Response.Write("<p><span class='SummaryHead'>No data to display</p>")
end if
set rst = nothing
%>
```

---

```
</body>  
</html>
```

## 18. Creating a Test and Training Environment

---

You can install both a test and training environment on the same server. For illustration purposes, the test and training environments in these topics are called TEST and TRAIN.

For each environment, the database and full text catalogs are backed up on the production environment and restored on the test/train server.

**Warning:** Do not install the TEST and TRAIN instances on the Changepoint production server. It is recommended that the production server have only one instance of the Changepoint database.

Backing up and restoring your production database to a different server still requires backing up the full text catalogs and running the SQL Dependencies script for each server, as outlined in step 3 to step 4 below.

### Creating a test and training environment on the same server

1. For the first database instance, run the installer on the test/train database server. When prompted, do the following:
  - Select the **Database only** setup type.
  - For the database name, enter a name for the test database, for example, TEST.
2. For the second database instance, run the installer again on the test/train database server. When prompted, do the following:
  - Select the **Database only** setup type.
  - Select a different <cp\_root> location than the first instance.
  - For the database name, enter a name for the training database, for example, TRAIN.
3. Back up the database and full text catalogs on the production environment and restore them on the TEST and TRAIN database instances.
4. In the EnableSQLDependency.sql script (located on the Changepoint product media in the \Changepoint\Manual Install\Upgrade folder), replace all occurrences of the CPSQLUser string with the SQL user ID you used when running the installer to create the test and train database instances for each database that you restored.
5. Run EnableSQLDependency.sql.
6. Run the following scripts:

- a. Setup\_Full\_Text.sql
  - b. Setup\_Scheduled\_jobs.sql
  - c. Setup-CPEExtended.sql
  - d. Setup-CPTempDB.sql (Ensure that the value for @CPTemp\_DB is different from the name of the original CPTempDB.)
7. Run the installer on the web server for each instance you want to create (TEST and TRAIN, for example). Each website must have a unique name and port number. Configure the Global.asa and Web.config files using the SQL accounts you created for each database.
  8. As required, run the installer on the same server or another server to install the required Changepoint Windows services. For more information on installing and configuring the services, see "Installing a Changepoint Windows service" on page 53.
  9. In order for users to readily distinguish between the TEST Changepoint Administration and the TRAIN Changepoint Administration versions, do one of the following:
    - Create a Corporate News Knowledge Item with an expiry several years from now indicating that this is a test/training environment.
    - Update the Registration table and add "\*\*\*TRAIN\*\*\*" OR "\*\*\*TEST\*\*\*" to the company name, which appears at the top of the Changepoint interface when users sign in to Changepoint.
  10. Install and configure Redis.
  11. Sign in to Changepoint Administration and update the server integration and email integration settings with the appropriate URLs for each instance.
  12. If you use IBM Cognos, you must port the Cognos content store database. For more information, see "Porting the Cognos content store database" on page 220.

### Porting the Cognos content store database

Porting the Cognos content store database includes the following steps:

1. Export the Cognos content store database.
2. Import the Cognos metadata package.
3. Set up the Cognos data source for the testing site.

## Export the Cognos content store database

1. Sign in to Changepoint as Changepoint administrator.
2. Click **Cognos > Cognos Connection**.
3. Click **Launch > IBM Cognos Administration**.
4. Click **Content Administration**, and then select the export icon.
5. Enter a name for the deployment specification (for example Changepoint, and then click **Next**.
6. In the **Deployment method** section, click **Select the entire Content Store** and then click **Next**.
7. In the **New archive** option, enter a name for the deployment archive (for example, Changepoint\_Export) and then click **Next**.
8. Enter an encryption password for the archive and then click **OK**.
9. Review the summary and then click **Next**.
10. Click **Save and run once**, and then click **Finish**.
11. Select **Now**, and then click **Run**.
12. Click **OK**.

## Import the Cognos metadata package

Import the Cognos metadata package for the testing site by following the instructions in "Importing the Changepoint metadata package" on page 116.

## Set up the Cognos data source for the testing site

1. Delete the production Changepoint data source.
2. Recreate the data source following the instructions in "Setting up the data source for IBM Cognos" on page 117.

## Setting up Client Portal in a training environment

For users to access Client Portal in a training environment, you can either set up a separate Client Portal website, or users can specify a different login page in the URL of an existing Changepoint website, for example:

`http://servername:port/fcelogin.asp`

**Note:** If enhanced session management is enabled in Changepoint Administration, you must create a separate Client Portal website. For more information, see "Setting up a Client Portal website" on page 179.

## A. Configuration file settings

---

### About Changepoint configuration files

There are two types of files that contain configuration settings for Changepoint.

#### Web.config files

Web.config files are application configuration files that contain settings that apply to the areas of Changepoint that were developed using ASP .NET web application technology (.aspx).

There is a configuration file for each application (Changepoint, Report Designer, and Web Services). The default locations are:

```
<cp_root>\Enterprise\Web.config  
<cp_root>\ReportDesigner\Web.config  
<cp_root>\CP Web Services\Web.config  
<cp_root>\API\CP Web Services\Web.config  
<cp_root>\Enterprise\WebAPI\Web.config  
<cp_root>\Enterprise\WebSockets\Web.config
```

#### Global.asa file

The Global.asa file is a centralized file that contains settings that apply to areas of Changepoint that were developed using the ASP web application technology.

The default location is:

```
<cp_root>\Enterprise\Global.asa
```

### Web.config configuration file settings

#### Authentication settings

By default, all Changepoint website folders and files are set to application authentication. If you set up your websites for SSL, you must change settings in the corresponding Web.config files. To use SSL with application authentication, see "About application authentication" on page 148.

#### Caching settings

- EnableSQLDependency

If set to 1, the Changepoint SQL dependency cache is enabled. Resource feature information will be cached as resources sign into the application. The default value is 1.

- `SQLDependencyCacheDuration`

The elapsed time required in minutes before the Changepoint SQL dependency cache is cleared. The default is 240.

### Cognos BI settings

#### Launch Cognos portlets and portals in new browser window

By default, Cognos portlets and portals are launched within the Changepoint container. However, you can configure Cognos portlets and portals to open in a new browser window.

- `Cognos.IE.LaunchPortletsInNewWindow`

When set to “true”, Cognos portlets and portals are launched in a new browser window.

### Cookie settings

By default, cookies are enabled. To disable cookies, edit the `sessionState` element and set `cookieless="true"`.

### Export Publishing settings

These settings in the Changepoint Web.config file apply only to the export publishing resend option in Changepoint Administration.

- `Microsoft.ServiceBus.ConnectionString`

The connection string that is used to access Microsoft Service Bus.

- `EnableEmail`

If set to 1, email notifications are enabled for export publishing errors. The Changepoint Mail Service must be installed in order to send notifications. The default is 0.

- `EmailAddress`

A semicolon-separated list of email addresses to which notifications of export publishing errors are sent. The `EnableEmail` setting must be enabled and the Changepoint Mail Service must be installed in order to send notifications to the specified addresses.

### Field settings

The `Fields.MaxSearchResult` setting defines the maximum number of records that can be returned for certain type-ahead fields. When the maximum is exceeded, the user is prompted



to narrow the search criteria. The default is 500.

The `Fields.MaxSearchResult` setting applies to the following type-ahead fields:

- new type-ahead fields (excluding the tree view type-ahead fields), which are identified by the yellow background when the user starts entering data in the field
- new type-ahead fields for configurable fields
- scenarios comparisons
- project worksheet

There are no configuration settings for the old type-ahead fields with the clear fields icons. The maximum search results for these fields are hard coded and vary depending on the field.

Type-ahead configurable fields on projects and requests have an internal limit of 1000 for the maximum number of records that can be returned. The imposed limit is the lesser of 1000 or the value of the `Fields.MaxSearchResult` setting.

There is a separate setting for mobile access. For more information, see "Mobile access settings" on page 226.

## File type filter settings

The `upload.FileExtensionNameExcludeFilter` setting defines the file types that are blocked from being uploaded through File Upload dialogs. The default list is "exe,bat,com."

## HTTP runtime settings

If required, you can modify the values of these attributes of the `httpRuntime` setting:

```
<httpRuntime executionTimeout="900" maxRequestLength="40960" ... />
```

The descriptions of the attributes are as follows:

- `executionTimeout`

The maximum number of seconds that a request is allowed to execute before being timed out. The default is 900.

- `maxRequestLength`

The input buffering threshold in KB when uploading files. The default is 40960.

### Mobile access settings

The following settings are related to mobile access:

- `MobileFields.MaxSearchResult`

The maximum number of records that can be returned for type-ahead fields when Changepoint is accessed using a mobile device. The default value is 25.

- `SupportedMobileDevice`

A semicolon-separated list of supported mobile devices as referenced in the browser's user-agent string. You can add unsupported mobile devices to allow them access, if required.

### Page Content IDs (PCIDs)

Each string on the user interface is associated with a page content ID (PCID). There is a setting that you can use to display the PCIDs instead of the strings, which can be helpful if you want to identify certain strings.

**Warning:** It is strongly recommended that you enable this setting only in a test environment.

- `GlobalDebug`

When set to 1, the PCIDs are displayed on the user interface instead of the strings.

### Page Size

The default page size used in some areas of Changepoint (for example, project portfolio and advanced search) is controlled by the following setting:

- `PageSize`

The number of records to display before paging. The default is 100.

### Projects tree view settings – Web.config

The **Projects** tree view display is controlled by several parameters, some of which are set in Web.config. Other parameters are set in Global.asa.

#### Number of projects in the Projects tree view

- `tvProject.Project.RecordAmount`

Determines the number of projects (default 500) that are displayed initially in the **Projects** tree view.

- `tvProject.Project.PackAmount`

Determines the number of projects (default 50) by which the **Projects** tree view is incremented on demand.

### **Refresh of the Projects tree view**

- `tvProject.Project.AutoRefresh`

When enabled (`tvProject.Project.AutoRefresh=1`, default), the **Projects** tree view is refreshed automatically when a project is created or deleted, or when the project name is modified.

When disabled (`tvProject.Project.AutoRefresh=0`), the **Projects** tree view is not refreshed when a project is created or deleted, or when the project name is modified, until the **Filter** button is clicked.

- `tvProject.Task.AutoRefresh`

When enabled (`tvProject.Task.AutoRefresh=1`, default), the **Projects** tree view is refreshed automatically when a task is created or deleted, or when the task name is modified using the **Edit Task** dialog.

When disabled (`tvProject.Task.AutoRefresh=0`), the **Projects** tree view is not refreshed when a task is created or deleted, or when the task name is modified using the **Edit Task** dialog, until the **Filter** button is clicked.

**Note:** When you create or delete a task in the project worksheet, the **Projects** tree view is not refreshed, regardless of the value of `tvProject.Task.AutoRefresh`.

### **Initial loading when a project is selected in the tree**

See "Projects tree view settings – Global.asa" on page 230.

### **Copy project**

See "Projects tree view settings – Global.asa" on page 230.

## **Scenario comparisons worksheet (SCW) settings**

The following settings apply to scenario comparisons:

- `ScenarioComparison.MaxViewColumnCount`

The maximum number of columns that can be selected in a view. The default is 100.

- ScenarioComparison.MaxFilterColumnCount

The maximum number of columns that can be displayed in the filter column of the **Manage Filter** dialog. The default is 5000.

- ScenarioComparison.MaxFilterScenarioCount

The maximum number of items that can be selected in the **Selected items** list on the **Other Criteria** tab of the **Manage Filter** dialog. The default is 50.

### Resource management worksheet (RMW) settings

The following setting applies to the Resource Management Worksheet:

- ResourceManagementView.MaxRecord

The maximum number of records that can be returned for any given type-ahead field in the Resource Management Worksheet. When the maximum is exceeded, the user is prompted to narrow the criteria in the type-ahead field.

Some of the Resource Management Worksheet filter pages have an Engagement/Initiative list that is populated based on selections in other fields. The maximum record setting also applies to these Engagement/Initiative lists. The default is 200.

### Time-out settings

The ASP .NET implementations (.aspx) in Changepoint use the following setting:

- CommandTimeOut

The default value is 600 seconds for Changepoint, and 30 seconds for Report Designer.

### Terminology mode settings

The mode is selected when Changepoint is installed or upgraded. The only reason for changing this setting after installation is to switch terminology.

For Changepoint PPM (Project Portfolio Management):

```
Application("CompanyProfile") = "ITD"
```

For Changepoint PSA (Professional Services Automation):

```
Application("CompanyProfile") = "PSO"
```

**Note:** Other changes are required to switch terminology. For more information, see "Switching between PSA mode and PPM mode" on page 255.

## Tree view settings

The naming pattern for the tree view settings in the Web.config file is:

```
<add key="treeview.node.property" value="n"/>
```

For example, the following is a typical pair of tree view settings:

```
<add key="tvMyContact.Contact.RecordAmount" value="500"/>
<add key="tvMyContact.Contact.PackAmount" value="50"/>
```

This example sets the RecordAmount and PackAmount properties for the Contact node of the MyContact tree view. The RecordAmount property defines the maximum the number of records to load when the node is first expanded. The PackAmount property defines the size of the next lot of records to load for this node. Using the above example, if there are more than 500 contacts in the database, the first expansion shows the first 500 contacts, with a “next” link at the bottom of the list. Clicking the “next” link retrieves the next 50.

**Note:** You cannot use `tvOpportunity.Engagement` as a `treeview.node` pair for this purpose.

## Workflow settings

The following settings control when a filter appears in the workflow view:

- `Workflow.Layout.StateShapeThreshold`

The maximum number of states that can be displayed in the workflow view before a filter appears.

- `Workflow.Layout.StateTransitionThreshold`

The maximum number of transitions that can be displayed in the workflow view before a filter appears.

The filter will also appear if the total number of states and transitions in the workflow is greater than the sum of these two settings.

## Global.asa configuration file settings

### Caching settings

- `Application("EnableSQLDependency") = 1`

If set to 1, the Changepoint SQL dependency cache is enabled. Resource feature information will be cached as users log onto the application.

- `Application("SQLDependencyCacheDuration") = 240`

The Changepoint SQL dependency cache is cleared after 240 minutes.

### Cookie settings

By default, the `AgentlessCookie` setting is enabled:

```
Application("AgentlessCookie") = 1
```

When enabled (set to 1), a cookie will be returned to the client machine with the user's logon ID. The cookie can be used by monitoring software to identify a user for reporting purposes. You can disable the setting by changing the value to 0.

### Page Content ID (PCID) settings

```
Application("GlobalDebug")=0
```

When enabled, the page content IDs (PCIDs) are displayed in the user interface instead of the PCID strings (field labels). This can be helpful to debug changes to the labels, but should only be done in a test environment. The setting is disabled by default.

### Page size

The default page size used in some areas of Changepoint (for example, project portfolio and advanced search) is controlled by the following setting:

```
Application("PageSize") = 100
```

The value is the number of records to be displayed before paging.

### Projects tree view settings – `Global.asa`

The **Projects** tree view display is controlled by several parameters, some of which are set in `Global.asa`. Other parameters are set in `Web.config`.

#### Initial loading when a project is selected in the tree view

- `tvProject.SkipAutoLoad`

When enabled (`tvProject.SkipAutoLoad=1`), the **Projects** tree view is displayed only after a resource clicks the **Filter** button.

When disabled (tvProject.SkipAutoLoad=0, default), the **Projects** tree view is displayed when the resource selects the project in the tree.

### **Refresh project tree after copying a project**

- tvProject.CopyProject.AutoRefresh

When enabled (tvProject.CopyProject.AutoRefresh=1, default), the project tree view is refreshed automatically when copy project is used to create a new project.

When disabled (tvProject.CopyProject.AutoRefresh=0), the project tree view is not refreshed after a project is copied, until the **Filter** button is clicked.

### **Number of projects in the project tree view**

See "Web.config configuration file settings " on page 223.

### **Refresh of the project tree view**

See "Web.config configuration file settings " on page 223.

## **Reporting**

The following configuration settings relate to reporting:

- Application("VacationTrackStartDate") = "YYYY-MM-DD"

The start date for reports that track vacation.

- Application("rsNotificationInterval") = 5

The interval, in minutes, that the Changepoint UI checks to see if the user has any report schedules that have completed. If reports have completed, then a small, informational window is displayed in the Changepoint interface.

- Application("OpenRequestsByCustomerRecordAmount") = 500

The maximum number of customer records that are returned in the customer drop-down list on the filter page for the Open Requests by Company report.

## **Terminology mode**

The mode is selected when Changepoint is installed or upgraded. The only reason for changing this setting after installation is to switch terminology.

For Changepoint PPM (Project Portfolio Management):

```
Application("CompanyProfile") = "ITD"
```

For Changepoint PSA (Professional Services Automation):

```
Application("CompanyProfile") = "PSO"
```

**Note:** Other changes are required to switch terminology. For more information, see "Running both PSA mode and PPM mode on the same database" on page 256.

### Time-out (ADO Commands)

To enable a global time-out value that will be used for all ADO commands, change "0" in the following setting to the number of seconds that you want to assign to the global time-out value:

```
Application("GlobalCommandTimeout") = 0
```

When set to zero, which is the default, the global time-out setting is disabled. In this case, the time-out utilized is either the ADO command value or the value that is supplied in connection string.



## B. Troubleshooting

---

### Changepoint installer issues

**\* WARNING: Redis cache service could not be installed. Ensure that service (RedisService) and port (6379) is not in use. Please review the RedisCacheService.log file under the InstallLog folder and install and start the service manually.**

During the Changepoint 2017 installation, Redis cache service could not be installed and started. This would typically occur if there is already a Windows service, including an existing instance of Redis, that is using the Redis service name (RedisService), or the Redis port (6379) is currently assigned to another process.

To properly install the Redis service, you must assign a unique service and a port that is not currently assigned. Please refer to the "Installing and Configuring Redis" on page 31 for the manual Redis service installation and start up commands.

#### Database upgrade error

If the database upgrade fails, an error message appears. Do the following:

1. Check the log file for details. The log file path is specified in the error message.
2. Restore the database from the backup you made before upgrading.
3. Resolve the issues detailed in the log file.
4. Perform a manual database upgrade.

#### IIS error when installing Changepoint websites

If you attempt to install the Changepoint websites on a web server, but Internet Information Services (IIS) is missing, or the wrong version of IIS is installed, an error message appears.

Make sure that a supported version of IIS is installed on the web server and then try again.

#### **Error: Operation failed with #X#####X An attempt was made to load a program with an incorrect format**

If this error occurs during the installation of the Changepoint websites, ensure that the required components and roles have been installed on the web server. For more information, see the *Changepoint Product Architecture and Technology Matrix*.

**Error Number: 0x80004005 Description: Unspecified error Setup will now terminate**

This error might occur if you use Remote Desktop Protocol (RDP) to install Changepoint.

Increase the colors setting to more than 256 colors (**Remote Desktop Connection > Display > Colors.**)

## Changepoint troubleshooting issues

### Empty keys error in Event log

The NotificationProvider.Key1 and NotificationProvider.Key2 keys must be configured with valid license values to enable use of the Changepoint Mobile app.

If you have not set up Changepoint to use the Mobile app, then you must comment out the NotificationProvider.Key1 and NotificationProvider.Key2 keys in the `CPMail.exe.config` file.

### HTTP 403 error Project Planning Worksheet fails to save Preferred resources cannot be edited

If you have enabled Request Filtering on the Changepoint website or use tools such as URLScan to restrict HTTP verbs in HTTP traffic, you must do the following:

1. Add the following verbs to the [AllowVerbs] section:

- PUT
- PATCH
- DELETE

2. Remove the same verbs from the [DenyVerbs] section.

Blocking these verbs can result in unexpected HTTP errors and functional issues in Changepoint. As of this service pack, Changepoint deploys the new Changepoint REST API internally (and externally as an option) to enable mobile app support and some internal product functionality. The REST API uses the HTTP verbs in its transactions.

3. Restart the web server or web application.

### Project planning worksheet does not load Error when accessing Manage Preferred Resources "Access to registry key 'Global' is denied" in Changepoint event log

Restart the web server. These errors can occur when registry permissions have been changed.

### **Users cannot upload large attachments**

In order to upload attachments up to 40 MB in size to team folders, requests, and knowledge items, you might have to set the following in IIS Request Filtering and/or in URLScan.ini, depending on the versions of Windows Server and IIS that you are using:

```
maxAllowedContentLength=40000000
```

### **Changepoint web pages do not render**

Ensure that the required Windows components have been installed.

### **Browser not supported message in Internet Explorer (IE)**

If users try to access Changepoint using Internet Explorer and receive a message that the browser is not supported, they must do the following:

1. Disable the compatibility view setting.
2. Ensure that the Changepoint website is not in the “Websites you’ve added to Compatibility View” list.

For more information about disabling the compatibility view setting, see the Internet Explorer online help.

### **Changepoint web pages take a long time to render**

The first time you access a page in Changepoint, the page is compiled and takes longer than usual to render. If your antivirus software interferes with the compilation, a page error might occur. If a page error occurs, navigate to the page again. Some larger pages require re-navigating more than once. After the compilation is complete, the pages render more quickly.

### **Error message appears instead of the Changepoint sign-in dialog box**

Ensure that the Login Settings utility has been run to configure the Changepoint configuration files and that the database server, database name and SQL account information entered is correct. For more information using the Login Settings utility, see "About configuring database connection settings" on page 65.

### **Error message: Please contact your system admin for this error!**

Refer to the Changepoint Section in the Event Viewer for the actual error message.

### **Error message: Changepoint is not correctly registered**

Ensure that the license file has been imported using Changepoint Administration.

### **Application is restarting error in the web browser**

Ensure that the Changepoint application folder (<cp\_root>) is excluded from antivirus scans.

For more information, see:

### **JavaScript errors in Internet Explorer**

After an upgrade, users must delete all browsing history in Internet Explorer. If users still encounter JavaScript errors after they have deleted the browsing history, they must delete the temporary Internet files manually. For more information about deleting browsing history and temporary Internet files, see the Internet Explorer online help.

### **Ajax errors**

Ajax errors are typically a result of a configuration mismatch between the authentication configured for the website in IIS and the authentication settings configured in the Web.config file.

To resolve the errors, correct the mismatch. For more information, see the authentication sections in "Overview of configuration" on page 47 and "Web.config configuration file settings" on page 223.

### **Changepoint Windows Services errors in the Event Viewer**

Ensure that the database connection settings have been configured properly for the Changepoint Windows Services. For more information, see "About configuring database connection settings" on page 65.

### **Repeated logon failures with “Your session is no longer active” message**

This error can occur if the Changepoint websites are sharing the same application pool, or if you attempted to install multiple website instances without specifying a unique name and port number for each website. To resolve the issue, ensure that the application pool, website name, and port number are unique for each website instance.

### **Knowledge search returns “No matches found” message**

Do the following:

1. Verify that the user has the required permissions to view the records.

2. Verify that the “CPFullText” or “CPFullText using background updates” scheduled jobs are enabled and ran successfully.

If the user has the required permissions and the scheduled jobs ran successfully, then there might be a full text issue. Refer to the Microsoft website for information on troubleshooting full text issues.

### **Child workgroups not sorted correctly in standard reports that contain a Resource Workgroup selection field**

#### **Cannot expand workgroups in the User Setup tree view**

If one or both of the above issues occur, you must regenerate the object breakdown structure (OBS) for workgroups:

1. From the **2017 Release Notes and Patches** team folder, download the **Workgroup OBS Utility.zip** file from the **Utility** subfolder
2. From the **Workgroup OBS Utility.zip** file, extract the CPRegenerateWGOBS.exe to any client machine that has a connection to the Changepoint database server.
3. Execute CPRegenerateWGOBS.exe.
4. Enter the SQL server name, database name, SQL login, and password.
5. Click **Connect**.
6. From the **Global Workgroup** list, select the global workgroup.
7. Click **Generate OBS**.

## **SSO ADFS issues**

### **Server Error in '/RP-STs\_ADFS' Application**

If users encounter an error similar to the following:

Server Error in '/RP-STs\_ADFS' Application.

The data protection operation was unsuccessful. This may have been caused by not having the user profile loaded for the current thread's user context, which may be the case when the thread is impersonating.

Do the following on the Changepoint web server:

1. In Internet Information Services (IIS) Manager, click **Application Pools**

2. Select the Application Pool used by the Changepoint web site.
3. Click **Advanced Settings**
4. Set **Load User Profile** to True, then click **OK** to save and close **Advanced Settings**
5. Re-open **Advanced Settings**, set **Load User Profile** back to False, then click **OK**

## Changepoint Web Services API Issues

### Errors related to .Net version when accessing Web Services API

If users encounter .Net version-related errors when accessing the Web Services API, and the API is installed on a web server other than the Changepoint web server, ensure that the application pool for the hosting website is using the required version of the .NET framework.

## Changepoint Windows Services Issues

### Changepoint Windows Service does not appear in Add/Remove program in Windows Control Panel

If the Windows service you want to remove does not appear in the **Add/Remove Programs** in the Windows Control Panel, then you must do the following:

1. Run the installation program for the service from the Changepoint media for *the previous release*, and select **Repair**.
2. After the installation is repaired, you can remove the service using **Add/Remove Programs**.

### Changepoint Windows Service does not start

All Changepoint Windows Services validate their version numbers against the version table in Changepoint. The version numbers must match, otherwise the service will not start, and a message is recorded in the event log.

### Emails remain queued

Due to startup timing issues, it is possible that services have been started but are not functioning properly, which may cause emails to remain queued instead of being sent.

You can fix this problem by creating a dependency for the Changepoint Windows Services on the MSSQLServer service. For more information, see the Microsoft knowledge base article 193888 at: <http://support.microsoft.com/kb/193888>.

---

## Exchange Server troubleshooting

### Calendar items do not synchronize from Changepoint to Outlook

- Ensure that the user has the Enable Calendar Synchronization feature.
- Ensure that the user has selected the correct calendar synchronization option in the **Preferences** view in Changepoint.

### Calendar items do not synchronize from Outlook to Changepoint

- Ensure the Changepoint Exchange Synchronization Service is running.
- Ensure that calendar items match the General Calendar Synchronization Options settings (Daily Start Time, Daily End Time and Time Zone) in the **Preferences** view in Changepoint.

### Event log

Check the event log for messages and errors. The following table lists the common events (EWS refers to the Exchange Web Service).

| Event   | Comments  |
|---|---|
| <i>Description:</i> The primary SMTP address must be specified when referencing a mailbox.  | <i>Error.</i> The message is returned via EWS. Users must have an Exchange primary email address in Changepoint.  |
| <i>Description:</i> Unable to create calendar item in Exchange for user: user@domain.com    | <i>Error.</i> The message is returned via EWS. Calendar item add failed. This can happen for a number of reasons, for example, a user is synchronizing with an alternate email address.       |
| <i>Description:</i> Unable to update calendar item in Exchange for user: user@domain.com    | <i>Error.</i> The message is returned via EWS. Update to calendar item failed. This can happen for a number of reasons, for example, a user is synchronizing with an alternate email address. |
| <i>Description:</i> Unable to update calendar item in Changepoint for user: user@domain.com | <i>Error.</i> The message is returned via Changepoint. Update to calendar item failed.  |

| Event  | Comments  |
|--|---|
| <i>Description:</i> Unable to add calendar item in Changepoint for user: user@domain.com   | <i>Error.</i> The message is returned via Changepoint. Calendar item add failed.  |
| <i>Description:</i> Autodiscover exception occurred in DiscoverTryUrls.<br><i>Email Address:</i> user@domain.com<br><i>Exception:</i> The email address cannot be found.                             | <i>Warning.</i> The email address cannot be found.  |
| <i>Description:</i> Autodiscover exception occurred in DiscoveryTryUrl.<br><i>Target url:</i><br>https://servername.domainname<br>/autodiscover/autodiscover.xml                                     | <i>Warning.</i> Autodiscovery failed when targeting the indicated URL.  |
| <i>Description:</i> Autodiscover exception occurred in GetRedirectUrl.<br><i>Target url:</i><br>https://servername.domainname<br>/autodiscover/autodiscover.xml                                      | <i>Warning.</i> Autodiscovery failed when targeting the indicated URL.  |
| <i>Description:</i> Autodiscovery failed for user: user@domain.com   | <i>Warning.</i> Autodiscovery failed for the indicated user.  |
| <i>Description:</i> Calendar Synchronization Started - Version: XX.XX.XXX.XXX  | <i>Information.</i> Documents the start of a synchronization cycle.   |
| <i>Description:</i> Calendar Synchronization Finished  | <i>Information.</i> Documents the completion of a synchronization cycle.  |
| <i>Function:</i><br>Changepoint.Synchronization.Exchange<br>.CreateCalendarItem<br><i>Response:</i> ErrorCalendarDurationIsTooLong<br><i>Extended Information:</i> Email address:<br>user@domain.com | <i>Error.</i> EWS prevents calendar items from being created when duration is greater than five years. This is a limitation in Exchange . |



| Event  | Comments  |
|--|---|
| <p><i>Function:</i><br/> Changepoint.Synchronization.Exchange<br/> .UpdateCalendarItem<br/> <i>Response:</i> ErrorCalendarDurationIsTooLong<br/> <i>Extended Information:</i> Email address:<br/> user@domain.com</p>  | <p><i>Error.</i> EWS prevents calendar items from being updated when duration is greater than five years. This is a limitation in Exchange .</p>                            |
| <p><i>Function:</i><br/> Changepoint.Synchronization.Exchange<br/> .GetItem<br/> <i>Response:</i> ErrorItemNotFound<br/> <i>Extended Information:</i> Id:<br/> AAMkADUxOWVINTdjLWE2OW<br/> QtNDQwMC1hMTZmLTUyMWFK<br/> N2RmNDk4OQBGAIAAAAIhrFE<br/> 5hKpSK2C4OPkOtc/BwAAOrm5Pd<br/> RuTI2+olSwbXC4AAAAATSrAAD<br/> Bake3jpVuTLttXQS5sS3xAAzFdNI5AAA=</p> | <p><i>Error.</i> An attempt was made to retrieve a deleted item from Exchange. This message can be ignored as the code responds by recreating the deleted item.</p>         |
| <p><i>Function:</i><br/> Changepoint.Synchronization.Exchange<br/> .UpdateCalendarItem<br/> <i>Response:</i><br/> ErrorOccurrenceTimeSpanTooBig<br/> <i>Extended Information:</i> Email address:<br/> user@domain.com</p>  | <p><i>Error.</i> The message is returned via EWS. Indicates that the time allotment for a given occurrence overlaps with another occurrence of the same recurring item.</p> |

## SQL Server troubleshooting

### SQL Server setup issues

The System Information script (SQLEnvironmentReport.sql) provides information that you can use to troubleshoot system setup issues.

1. Log on to the SQL server machine with the local administrator account.
2. Run the following script from the Changepoint product media:

```
\Changepoint\Utilities\Changepoint System Information Script
\SQLEnvironmentReport.sql
```

The following information is reported:

- General system information:

Host Name  
OS Name  
OS Version  
OS Configuration  
System Up Time  
System Manufacturer  
System Model  
System Type  
Processor(s)  
BIOS Version  
Windows Directory  
Boot Device  
System Locale  
Input Locale  
Time Zone  
Total Physical Memory  
Available Physical Memory  
Page File  
Page File Location(s)  
Hotfix(s)  
Network Card(s)  
All Services Status  
SQL Service Status

- Current SQL Instance information

Current SQL Instance  
SQL Server Version  
SQL Server Property  
SQL Server Configure

- Database information (will list information for each database)

Database Name  
Database Property  
Database Files

## Changepoint database troubleshooting

### Password validation error when running Porting Changepoint.sql

If you receive a password validation error when running the `Porting Changepoint.sql` script, reset the password to a password that conforms to your Windows security policy. If the database has already been attached successfully, run the script again starting from:

```
USE Changepoint
GO
```

Similarly, if you receive any other errors with this script and the database is already attached, fix the problem and be sure to choose an appropriate starting point beyond the attachment section when rerunning the script.

### **Restoring the database from a backup**

When you restore the Changepoint database on a server, the service broker is disabled. Run the following on the restored database to enable the service broker:

```
ALTER DATABASE <DatabaseName> SET SINGLE_USER WITH ROLLBACK IMMEDIATE
ALTER DATABASE <DatabaseName> SET ENABLE_BROKER
ALTER DATABASE <DatabaseName> SET MULTI_USER
```

### **Excessive table growth issues**

If email notifications have been enabled in Changepoint Administration, verify that both the Changepoint Email Notification Service and the Changepoint Mail service have been installed and configured to run at regular intervals. Otherwise, the EmailAuditStaging, EmailAuditNotification, and EmailQueue tables in the database can potentially grow to a very large size.

## **Archive database troubleshooting**

### **Archive Aged Entities Job or Data archiving[200x].dtsx fails**

If the Archive Aged Entities job or Data Archiving 2005.dtsx or Data Archiving 2008.dtsx fails for any reason, and you do not want to proceed with the archiving, you must run the following script to re-enable triggers and foreign keys on the Changepoint source database:

```
C:\Program Files\Changepoint\Changepoint\Data Archiving\EnableAllTRsNFKs.sql
```

If required, restore the archive database from backup.

### **Error running Archive Aged Entities Job on Windows 2008/.NET 3.5 SP1/SQL2008**

To be able to run the Archive Aged Entities job on a Windows 2008/.NET 3.5 SP1/SQL2008 environment, you must log in using a user account with local admin privileges instead of a system account. In other words, you cannot use an account such as LocalService/NetworkService/LocalSystem.

### Temporary Database available for troubleshooting

The Archive Aged Entities job automatically creates a temporary database named <database name>\_ArcDistribution on the source database server. The temporary database is available for troubleshooting purposes until the next time that the job is run, when it is dropped and recreated.

### Archive database performance issues

The following performance issues have opposing solutions:

- To improve performance of the archive database for end users, you can add indexes to the Archiving database.
- To improve the speed of the Archiving Aged Entities scheduled job, you can remove indexes from the Archiving database.

You can add indexes by applying the `Adding archiving indexes.sql` script, or remove indexes by applying the `Removing archiving indexes.sql` script from the following location on the Changepoint media:

`\Changepoint\Manual Install\Data Archiving\`

## Cognos BI installation troubleshooting

### Error: RQP-DEF-0177 appears in report or workspace area

Error: “RQP-DEF-0177 An error occurred while performing operation 'sqlPrepareWithOptions' status='-201'” in the report or workspace area, likely means that the database name in the SQL connection string for Cognos was not specified during installation.

### Error: Invalid Web Content URI when configuring the App Tier

If you get this error when trying to save the configuration of the Environment node in the **Explorer** pane during the configuration of the App Tier, then you must reset the Web Content URI to the default as follows:

1. In the **Explorer** pane, select the Portal Services node.
2. Click in the Web Content URI field.
3. From the Cognos menu, select **Edit > Reset to Default**.

### Connection test fails when testing the data source configuration

If the connection test fails for either SQL or the JDBC, it likely means that no SQL Server Native Client was installed on App Tier server, or the wrong native client was installed.

On the App Tier server, install the version of SQL Server Native Client that matches the SQL version on the server that hosts the Cognos content store. For more information, see the "Setting up the data source for IBM Cognos" on page 117.

### Error: AAA-CFG-0008 in AppTier configuration

If the following message appears during the start of the Cognos service on App Tier:

```
Error: "AAA-CFG-0008 The handler class 'com.changepoint.cap.CapControl ' cannot be loaded".
```

```
Error: "java.lang.ClassNotFoundException: com.changepoint.cap.CapControl".
```

Retest the Changepoint namespace connection.

If the test passes, restart the service.

If the test fails, delete and recreate the Changepoint namespace, then test again.

### Web server error when embedding graphics that are hosted on a web server in reports

To embed graphics that are hosted on a web server in your reports, refer to the IBM Cognos product documentation.

If you are using URLScan, WebRequest Filtering or Application Filtering at your firewall to block WebDAV traffic, you must make the necessary security configuration changes.

## Changepoint-Cognos Sync utility troubleshooting

### Timeout error when updating the model with a new revision

If there are a large number of configurable fields in the database, one or both of the following might occur when you update the Cognos model with a new revision:

- **New Revision** dialog box takes a long time to appear
- "Message: Timeout expired" error in the Cognos UI log file

You can increase the timeout setting in the CognosClientTools.exe.config file:

1. As administrator, open the CognosClientTools.exe.config file:

```
%programfiles%\Changepoint\Cognos Client Tools\CognosClientTools.exe.config
```

2. Edit the following key, then save the file. The default value is 300.

```
<add key="CommandTimeOut" value="1800" />
```

### **Error: BME-SP-0007 An unknown error occurred during execution**

This error appears on the **Details** dialog box of the Sync Utility during the updating of the delta page content and configurable fields to create a new revision of the Cognos model.

Ensure that the same version of the SQL Server Native Client is installed on the Changepoint Cognos administrator workstation, and the server that hosts the Cognos content store.

### **Error: BME-SP-0032 Your user id or password is incorrect. Re-enter your logon credentials**

If you see this message when running the Sync Utility, ensure that the Changepoint database is online by restarting the Cognos service on the App Tier.

### **Error: QE-DEF-0368 Unable to decrypt user name and password credentials from the content store ...**

Complete message: QE-DEF-0368 Unable to decrypt user name and password credentials from the content store. Review and save the Cognos Configuration settings to configure your reporting environment.

This error appears on the **Details** dialog box of the Sync Utility during the updating of the delta page content and configurable fields to create a new revision of the Cognos model.

1. Exit the Sync Utility.
2. In the `<install location>\ibm\cognos\configuration` directory, delete the following folders:
  - csk
  - encryptkeypair
  - signkeypair
3. Launch **IBM Cognos 10 > IBM Cognos Configuration**, then click **Save**.
4. Launch the Sync Utility.

## Troubleshooting scheduled jobs

### Resource Demand Calculation scheduled job – performance issues or failure

By default, the Resource Demand Calculation scheduled job rolls up projects in batch processing mode.

However, if the job was not scheduled to be run daily, batch mode may not handle the load from accumulated changes. Or if there is an issue with one or more projects, the job might fail. In both cases you can switch the job to single mode processing as a workaround to roll up projects manually until the issues have been addressed.

To switch the Resource Demand Calculation job to single mode processing

1. In SQL Server Management Studio, append “0” to the step that calls the stored procedure RollupProjectsByFiscalPeriods as follows:

```
exec RollupProjectsByFiscalPeriods 0
```

2. You can then start and stop the job manually multiple times until all projects have been rolled up.

To revert to batch processing mode, either remove the “0”, or change the “0” to “1”.

## Troubleshooting Intelligent Forms

### How do I troubleshoot issues that I encounter while using forms?

The errors that are generated while using forms are listed in the **Management** tab of Infiniti Manage. If you do not have access to Infiniti Manage, contact your Infiniti administrator to do this for you.

### When I access a submenu item in the Actions menu, a sign-in for Infiniti appears

To enable single-sign on for Intelligent Forms, the resource's email and password must be entered into their Changepoint user account.

### When I click Intelligent Forms > Infiniti Manage, an "Access denied" error appears

To access Infiniti Manage from Changepoint Administration, a resource must be assigned the Global administrator role in Infiniti Manage. For more information, see "About security features for Intelligent Forms" on page 1.





## C. Financial Analysis Information

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### Adding fiscal periods to group financial analysis data

Data in the Financial Analysis Data Providers is grouped by the default set of fiscal periods selected in the Funding and Scenario Comparison Setup in Changepoint Administration.

To add other fiscal periods, insert a row into the database table `FinAnnFiscalPeriod` that contains the `billingofficeid` of the fiscal periods.

**Note:** These changes must be done directly in the database table: there is no UI.

**Note:** It is not necessary to add every billing office or every set of fiscal periods. It is only necessary to add one for each frequency (for example, weekly, monthly or quarterly) that is to be reported on.

### Enabling financial analysis record types

The underlying financial analysis views rely on data that is calculated by the Financial Analysis Summary scheduled job and Calculate Project Costs scheduled jobs for specific record types. `FinAnnRecType` contains all the record types. The "enabled" field indicates which record types are enabled for calculation.

By default, only part of the record types are enabled.

Additional record types can be enabled. Existing record types can be disabled if they are not being used (for example, the types for forecast may be disabled if status updates are not being done and the information is not needed for reporting).

**Note:** These changes must be made directly in the database table: there is no UI.

To enable a record type, mark the row as "enabled" in the `FinAnnRecType` table in the database.

**Warning:** The more record types that are enabled, the longer the processing of the two jobs will take. This applies particularly to record types that group data at the task assignment level. For large databases, reporting at the task assignment level may result in performance issues. Ensure the grouped data providers are used (by month or fiscal period) and that the report is filtered sufficiently.

### **Dependencies among record types**

- Types 0-26, which are enabled by default, should be left as enabled if the scenario comparisons functionality is being used.
- If you use funding sources, leave existing record types enabled. To start using funding sources after the upgrade, enable the appropriate record types:
  - If Projects are associated with funding sources, enable record types 28, 29, 42, 43.
  - If Requests are associated with funding sources, enable types 1, 3, 7, 9, 21, 22, 23.
  - If Opportunities (Candidates) are associated with funding sources, enable types 11, 12, 13, 14.
  - If any type that is related to invoiced items (type 1, 2, 20, 32, 37, 38, 39, 40, 41, 46) is enabled, enable type 0.
  - If type 12 is used, enable type 11.
  - If type 14 is used, enable type 13.

## D. Administrator Information

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### Creating a custom form

You can create a custom form by doing the following.

1. In Infiniti Manage:
  - a. Create the form project.
  - b. Configure the form project to use Changepoint data.
  - c. To create a form that creates or updates entities, configure the form project to push and pull Changepoint data.
2. Make the form available to resources in Changepoint. In Changepoint Administration, create the **Actions** menu subheader and submenu item to make the form available to users in Changepoint.

### Configuring a form project to push and pull Changepoint data

To enable a form project to push data to and pull data from Changepoint, you must add three label questions to the form project in Infiniti Manage. The answer to the questions are parameters that are populated at run time and provide the information that is required for authentication and handshaking between Infiniti Launch and Changepoint.

| Question    | Answer      | Save by unique label |
|-------------|-------------|----------------------|
| Session ID  | Session ID  | sno                  |
| Resource ID | Resource ID | rid                  |
| Entity ID   | Entity ID   | cpguid               |

1. In Changepoint, click **Intelligent Forms > Manage**.
2. Click the **Projects** tab, and then select the project.
3. Add a question for each of the following IDs. Enter the same ID text for both the question and the answer:
  - Session ID
  - Resource ID

- Entity ID
4. For each of the questions, do the following:
    - a. Expand the question and then select the answer.
    - b. In the **Properties** tab, expand the **Answer File Properties** section.
    - c. Select the **Save to answer file** check box.
    - d. Click the **Save by unique label** option.
    - e. In the text field, enter the text as follows:
      - For Session ID, enter `sno`
      - For Resource ID, enter `rid`
      - For Entity ID, enter `cpguid`

### About creating form projects that create or update entities

You can create an intelligent form that creates an entity record or updates an existing entity record. For example, you can create a form that guides resources through the process of creating or updating a request record.

You create a form project in Infiniti Manage (**Infiniti Manage > Design App**), where there is a default set of Changepoint actions for creating and updating each of the main entities. The actions include the standard fields and configurable fields for the entity. For each field you can specify a fixed value or a reference to an answer value.

You add the actions to the final page in a forms project, and the actions are triggered when the form is submitted. When the forms project is complete, you can configure it to be used in Changepoint.

### Adding an Intelligent Forms form to the Actions menu

To make a forms project available to resources in Changepoint, you must create a submenu header and submenu item for it to appear in the **Actions** menu.

**Note:** The following instructions are specific to creating a submenu header and submenu item for an Intelligent Forms form.

1. In Changepoint Administration, create the submenu header (**User Interface > Actions Menu Integration**).

2. From the submenu header, create the submenu item. In the **Parameter** field, you must enter the ID of the form project, which you obtain from the initial view of the form project in Infiniti Manage.
3. In the **Access control** section, you must restrict access to the form by security feature as follows:
  - If the form creates or updates an entity record, restrict access to the **Access Forms Generation** security feature that is in the **Intelligent Forms** category.
  - If the form creates a document, restrict access to the **Access Document Generation** security feature
4. In **User setup**, assign the security feature to each of the resources who require access to the form.

## Adding logos for invoices/cross charges

Before a logo can be added to invoices for a billing office or cross charges for a cost structure, the image file for the logo must be placed in the `C:\Changepoint\Images\` folder on the Changepoint web server.

Advise users that when they enter the path to the logo in Changepoint Administration, they must exclude the default folder. For example, if the image file is located at:

`C:\Changepoint\Images\invoicelogo.jpg`

Users would enter:

`/Images/invoicelogo.jpg`

## Adding a custom invoice/cross charge format

Before a custom invoice/cross charge format can be set up in Changepoint Administration, the format must be created and then placed under `<cp_root>`.

1. Create the custom invoice/cross charge format in an ASP file.
2. Place the ASP file in the `<cp_root>\core\report` folder or another location under `<cp_root>`.
3. Advise users that when they enter the path to the logo in Changepoint Administration, they must exclude `<cp_root>`.

## Adding a custom ASP report

Before a custom ASP report can be set up in Changepoint Administration, you must add the report file to the Changepoint web server.

As a best practice, add a `Custom` folder to the `Changepoint/Core/Report/` path for storing custom reports.

Advise users that when they specify the report URL in Changepoint Administration, they must leave out the Changepoint domain, but include the file name, for example:

`Core\Report\Custom\MyReport.asp.`

## Changing printers for batch printing

If you add or remove printers on the web server, you will likely need to reconfigure batch printing.

1. Run the `htmlprint.exe` file in the `BatchPrint` directory on the web server.
2. Make the necessary changes to the values of the `PrintServername` keys in the `PrintInvoices.exe.config` files.
3. In Changepoint Administration, make the necessary changes to the following workgroup fields:
  - **Print Server Name** field
  - **Default Printer** field

For more information, see "Configuring batch printing" on page 182.

## About changing between PSA and PPM modes

Changepoint runs in one of two modes: Changepoint PPM (Project Portfolio Management) and Changepoint PSA (Professional Services Automation). The mode is selected during installation, but you can switch modes after installation.

### Database tables modified by the `UpdateSystemDefaults` stored procedure

For reference, the following is a list of the database tables that are modified when you run the `UpdateSystemDefaults` stored procedure.

`AccountType`  
`AutoNumberingSetup`  
`CategoryDescription`  
`Chart`

ContactType  
ContractType  
CriteriaType  
Dashboard  
DialogDefault  
Email  
EmailParameters  
ExchangeApplied  
ExpenseCategory  
ExpenseGLACenter  
ExpPubTopic  
FeatureDescription  
GlobalWorkgroup  
HelpDesk  
InvoiceFormats  
IPICategoryType  
IPIMetricCalc  
IPIMetricType  
KMCategory  
LineOfBusiness  
LockType  
OpportunityType  
Report  
ReportCategoryDescription  
ReportDefinitionDescription  
RequestBillingType  
RequestStatus  
RequestType  
ResourceRequestType  
ResourcesRequestInitiateLevel  
RevenueTypeGLA  
Role  
SalesStatus  
Section  
SectionItem  
SurveyTemplateS  
SurveyTriggerType  
TitleDefinitionDescription  
Version  
WorkflowEntity  
WorkflowParticipants  
WriteOffReasons

## Switching between PSA mode and PPM mode

If you installed one mode but later decide to switch to the other mode, you can do this by running a stored procedure and changing the appropriate configuration settings.

1. Open Microsoft SQL Server Management Studio and connect to the Changepoint database using the sa account.
2. Run the UpdateSystemDefaults stored procedure using the ITDFlag value to set the mode:
  - To switch to PSA mode:

```
exec UpdateSystemDefaults @ITDFlag = 0
```
  - To switch to PPM mode:

```
exec UpdateSystemDefaults @ITDFlag = 1
```
3. In the Global.asa file, do the following:
  - For PSA mode, set CompanyProfile to "PSO"
  - For PPM mode, set CompanyProfile to "ITD"
4. In the Web.config files for each application (Changepoint, WebAPI, and Report Designer) do the following:
  - For PSA mode, set CompanyProfile to "PSO"
  - For PPM mode, set CompanyProfile to "ITD"

## Running both PSA mode and PPM mode on the same database

You can run both PSA and PPM websites using the same Changepoint database.

1. Start with a **PSA** mode installation.
2. Run the InstallShield Wizard to create another set of Changepoint websites. When prompted, select the **Websites only** setup type, and select the **ITD** mode.

For more information, see "Installing multiple Changepoint instances" on page 24.

3. Distribute the URLs for the PSA and PPM websites to your users according to the version that they require.

**Note:** Most terms such as field and dialog box names in the Changepoint websites display the correct values according to the specified mode. However, some terms (for example, report names, feature names, and drop-down values in some lists) may not match the ITDFlag setting.

## ASP-based reports that support DSN

The ASP reports that can use a separate report server are:



- All Companies/Clients
- Campaign Profitability
- Competition by Frequency
- Customer Radar
- Employee Vacation Tracking
- Engagement/Initiative Grid By Owner
- Engagement/Initiative Profitability by Month
- Engagement/Initiative Workload
- Expense Reports Approved By Me
- Expense Reports by Resource
- Expense Reports by Status
- Features Assigned to a User
- Invoice/Cross Charge Details with Net Write-offs
- Invoiced/Cross Charged Hours by Resource
- List of All Engagements/Initiatives by Company
- Losses by Competitor
- Management Responsibility By Resource
- My Contacts
- My Expense Reports
- My Knowledge Items
- My Task List
- Non-Invoiced/Non-Cross Charged Time & Expenses
- Opportunities Won/Candidates Approved
- Personal Vacation Time
- Planned Revenue Booked By Company

- Project Completion
- Project Progress
- Project Progress All
- Project Slippage
- Project Summary by Resource
- Projects by Status by Customer
- Projects by Status by Project Manager
- Reference Customers
- Resource by Task
- Resource History
- Resource Workload
- Resources By Approver
- Resources by Function
- Task Status Compliance
- Tasks in Progress or Scheduled to Start
- Tasks Scheduled to Finish in Two Weeks
- Time & Expense by Billing Office/Cost Center
- Time & Expense by Invoice/Cross Charge Number
- Time & Expenses by Employee
- Time Submission Conformance
- Time Summary Report by Resource
- Weekly Time Sheet
- Work Performed for
- Workgroup Record History

## Setting up access to Changeport portlets and reports in third-party portals

Changeport portlets and other specifically-enabled pages can be rendered directly in a browser or in third-party portal solutions such as IBM WebSphere, CA CleverPath, and Microsoft SharePoint, using a portlet-specific URL that is based on a common entry point.

To access portlets and reports from outside Changeport, use the common entry point, and pass additional parameters as required in the querystring:

The URL format is:

```
http://<entrypoint>&portletid=<PortletId>&params=<Params> ...&url=<URL>
```

where:

- entrypoint – <ChangeportURL:port>/core/portlet.aspx?ui=p
  - ChangeportURL:port – the URL and port number of your Changeport website
- PortletId (required) – Id of the portlet to display (see list below)
- Params (optional) – Additional querystring parameters separated by ";"
- URL (optional) – Custom portlet URL

### Notes

- If the website uses SSL, use the https protocol in place of http.
- If the website uses application authentication, portlet users are prompted for a user name and password for access to the portlet.
- If the website uses integrated Windows authentication, or one of the other Single Sign On (SSO) methods supported by Changeport, portlets are displayed to authenticated users without requiring further sign on.
- Links from a portlet to other areas of Changeport are not supported. For example, if you display the **My Reminders** portlet, then click on one of the links within the portlet (for example, "You have time to approve"), the link target might not render or function correctly.
- You are responsible for ensuring that the custom page renders correctly using UI=P.

## Changepoint portlet names and IDs

| Portlet name                              | PortletId                   |
|---|-----------------------------|
| Custom portlet url                        | *Custom<br>See notes below. |
| <b>Campaign/ Source</b>                   |                             |
| Source/ Campaign Results                  | dshCampaign                 |
| Upcoming Sources / Campaigns              | dshUpcomingCampaign         |
| <b>Client/ Customer &amp; Contact</b>     |                             |
| Find Person                               | dshFindPerson               |
| <b>Engagement/ Initiative</b>             |                             |
| Initiative / Engagement Warnings          | dshEngagement               |
| <b>Expense</b>                            |                             |
| Expense                                   | Expense                     |
| ExpenseReport                             | ExpenseReport               |
| <b>Financial Management</b>               |                             |
| Financial Reminders                       | dshFinancialReminder        |
| <b>Invoice/ Cross Charge</b>              |                             |
| Approved Cross Charges / Invoices         | dshApprovedInvoice          |
| Cross Charges / Invoices Pending Approval | dshPendingInvoice           |
| Draft Cross Charges / Invoices            | dshDraftInvoice             |
| Rejected Cross Charges / Invoices         | dshRejectedInvoice          |
| <b>Knowledge Management</b>               |                             |
| Create Knowledge item                     | dcSubmitKM                  |

| Portlet name                               | PortletId             |
|--|-----------------------|
| Knowledge Management                       | dshKM                 |
| <b>Opportunity/ Candidate</b>              |                       |
| Active Candidates / Opportunities          | dshActiveOpportunity  |
| Approved Candidates / Opportunities        | dshOpportunityWin     |
| Candidate / Opportunity Decision Summary   | dshOpportunityOutcome |
| Candidate / Opportunity Decisions          | dshCompetitiveOutcome |
| Candidate / Opportunity Rollups            | dshOpportunityRollup  |
| Initiate Candidate / Opportunity screening | rpOppScreening        |
| <b>Personal portlets</b>                   |                       |
| My Activities                              | dshActivity           |
| Activity List                              | uiActFrames           |
| My Favorite Reports                        | dshFavoriteReport     |
| My Links                                   | dshMyLink             |
| My Performance                             | dshMyPerformanceChart |
| My Reminders                               | dshReminder           |
| My Utilization                             | dshMyUtilization      |
| Requests Assigned To Me                    | dshRequestToMe        |
| Requests Initiated By Me                   | dshRequestByMe        |
| <b>Performance Management</b>              |                       |
| Performance Management                     | dshPerformanceChart   |

| Portlet name                             | PortletId   |
|--|---|
| <b>Project Management</b>                |   |
| Project Status by Project Manager Report | rpProjectByStatus_PM                                    |
| <b>Reporting</b>                         |   |
| Cognos reports                           | Cognos<br>See notes and examples, below.                |
| Report Detail                            | ReportDetail<br>See notes and examples, below.          |
| Report with filter page                  | ReportDetailContainer<br>See notes and examples, below. |
| <b>Requests</b>                          |   |
| Create request                           | dcrequest<br>See notes below.                           |
| Edit Request                             | dcrequest<br>See notes below.                           |
| Requests Summary                         | dshRequestSummary                                       |
| Initiate Planning Request screening      | rpReqScreening  |
| <b>Resource Management</b>               |   |
| Find Person                              | dshFindPerson   |
| Underutilized Resources                  | dshUnderutilizedResource                                |
| Workgroup Utilization                    | dshWkgpUtilization                                      |
| <b>Surveys</b>                           |   |
| Survey Management                        | dshSurveyManagement                                     |
| <b>Timesheet</b>                         |   |
| Timesheet                                | Timesheet   |

## Examples

My reminders:

```
http://<ChangepointURL:port>/core/portlet.aspx?ui=p&portletid=dshReminder
```

Create Request:

```
http://<ChangepointURL:port>/core/portlet.aspx?ui=p&portletid=dcrequest
```

## Notes

Custom

To use a custom url:

- PortletId = "\*Custom"
- Url = ~/Custom/Reports/{*your custom report here*}.asp

Example:

```
http://<ChangepointURL:port>/core/portlet.aspx?ui=p&portletid=*custom&url=~/Custom/Reports/rpCustomRequestReport.asp
```

## Cognos reports

ReportID is required.

- PortletID=Cognos
- Params = reportid=<ReportID>

You can find the *ReportId* using Changepoint Administration (see "Using Changepoint Administration to get Report IDs" on page 265). For reports that are not in portlet format, you can use an SQL query or IE properties.

Example:

```
http://<ChangepointUrl:port>/core/portlet.aspx?ui=p&portletid=Cognos&Params=reportid=<ReportId>
```

## Reports (ReportDetail and ReportDetailContainer)

ReportId is required.

- PortletId=ReportDetail

or

- PortletId=ReportDetailContainer
- Params = reportid=<ReportId>

You can find the *ReportId* using Changepoint Administration (see "Using Changepoint Administration to get Report IDs" on page 265). For reports that are not in portlet format, you can use an SQL query or IE properties.

Example:

```
http://<ChangepointURL:port>/core/portlet.aspx?ui=p&portletid=ReportDetail&Params=reportid=D2AD8CC6-FFE9-4E2A-8980-8AFE8C766059
```

### Requests (dcrequest)

Create Request with a tabbed layout (default is inline):

If no template is specified, the default template is used. See "Create a request using a template" on page 264.

- PortletId = dcrequest
- Params = layout=tabbed

Example:

```
http://<ChangepointURL:port>/core/portlet.aspx?ui=p&portletid=dcrequest&Params=layout=tabbed
```

### Create a request using a template

- PortletId = dcrequest
- Params = templateid=<TemplateId>

You can find the TemplateId using a SQL query or IE properties.

Example:

```
http://<ChangepointURL:port>/core/portlet.aspx?ui=p&portletid=dcrequest&Params=templateid=ff7e7079-9e0b-4856-9d7c-f9721437f737
```

### Edit a request

RequestId is required

- PortletId = dcrequest



- Params = action=edit; reqnum=<request number>

Example:

```
http://<ChangeportURL:port>/core/portlet.aspx?ui=p&portletid=
dcrequest&Params=action=edit;reqnum=SR-2012-00157
```

### Edit a request using a template

RequestId is required.

- PortletId = dcrequest
- Params = action=edit; reqnum=<request number>;selectedtemplateid=<EditTemplateId>

You can find the EditTemplateId using a SQL query or IE properties.

Example:

```
http://<ChangeportURL:port>/core/
portlet.aspx?ui=p&portletid=dcrequest&Params=action=edit;reqnum=SR-2012-
00157;selectedtemplateid= ff7e7079-9e0b-4856-9d7c-f9721437f773
```

### Using Changeport Administration to get Report IDs

To get a report ID:

1. In Changeport Administration, go to **User Interface > Portlet Management**.
2. In the **Category** list, select **All portlets**.
3. From the list of portlets, select the report.
4. In the **URL** field, copy the reportid=<ReportId> from the end of the URL.



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