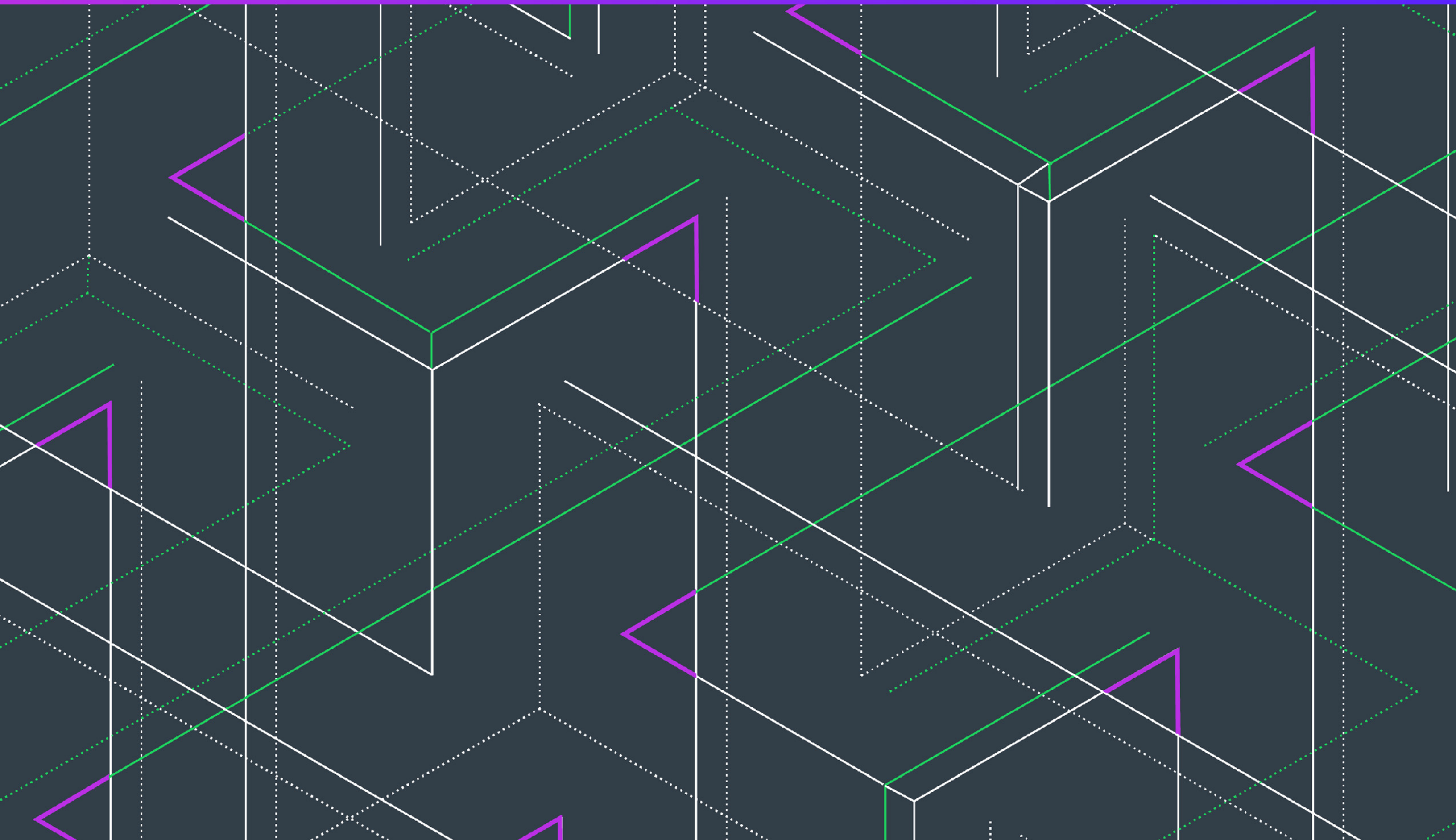
Code Insight 2021 R3

Installation & Configuration Guide



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Code Insight 2021 R3 Installation & Configuration Guide

Code Insight empowers organizations to take control of and manage their use of open source software (OSS) and third-party components. It helps development, legal, and security teams use automation to create a formal OSS strategy that balances business benefits and risk management.

The *Code Insight Installation & Configuration Guide* describes how to install and configure Code Insight for use at your site. The guide includes the following sections.

Table 1-1 ▪ Code Insight Installation & Configuration Guide Navigation Table

Topic	Content
Installing Code Insight	Instructions for preparing to install, installing, and starting Code Insight. The chapter also includes optional system administration tasks, such as how to run Code Insight as a Windows service, enable HTTPS, or enable a networking proxy server connection.
Configuring Code Insight	Instructions for Code Insight System Administrator tasks, such as scheduling Code Insight Electronic Updates, managing Code Insight users, defining global project defaults and the scan profiles associated with projects, specifying the CVSS version, and configuring an email server for Code Insight notifications. The chapter also provides optional administrative procedures such as configuring Code Insight for LDAP and single sign-on and more.
Integrating with Source Code Management	(Required if you intend to synchronize with a remote source-code management component, or SCM, to obtain data to scan) Steps to ensure that the SCM command-line client is properly installed on the Code Insight Scan Server and that connectivity between the SCM client and the SCM server is properly configured.

Table 1-1 ▪ Code Insight Installation & Configuration Guide Navigation Table (cont.)

Topic	Content
Integrating with Application Lifecycle Management	Description of how to create one or more Jira connector instances, enabling Code Insight users to create, manage, and track external Jira work items associated with OSS or third-party inventory directly from Code Insight.
Upgrading Code Insight	Steps on how to upgrade from a previous Code Insight version to the current version.
Code Insight User Roles and Permissions	A reference to the various user roles and permissions that Code Insight offers as a means to control user access to its functionality at your site.

Product Support Resources

The following resources are available to assist you with using this product:

- Revenera Product Documentation
- Revenera Community
- Revenera Learning Center
- Revenera Support

Revenera Product Documentation

You can find documentation for all Revenera products on the Revenera Product Documentation site:

https://docs.revenera.com

Revenera Community

On the Revenera Community site, you can quickly find answers to your questions by searching content from other customers, product experts, and thought leaders. You can also post questions on discussion forums for experts to answer. For each of Revenera's product solutions, you can access forums, blog posts, and knowledge base articles.

https://community.revenera.com

Revenera Learning Center

The Revenera Learning Center offers free, self-guided, online videos to help you quickly get the most out of your Revenera products. You can find a complete list of these training videos in the Learning Center.

https://learning.revenera.com

Revenera Support

For customers who have purchased a maintenance contract for their product(s), you can submit a support case or check the status of an existing case by making selections on the **Get Support** menu of the Revenera Community.

https://community.revenera.com

Contact Us

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http://www.revenera.com

You can also follow us on social media:

- Twitter
- Facebook
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Installing Code Insight

This section contains the following topics covering the installation and startup of Code Insight:

System Requirements

Before installing Code Insight, ensure that the following requirements are addressed for your system:

- A supported database instance and its associated connector. See Database Support for a description of supported databases and connectors.
- A Code Insight license key file (`codeinsight.key`)
- On Linux instances, ensure that the number of open file handles is greater than 50k, a value typically set with the `ulimit` command. For more information about the open file limit, see Setting the Open-File Limit for Linux/Unix.

Important ▪ *This requirement for the open file limit is absolutely essential for Code Insight to function properly on Unix and Linux platforms.*

- Any requirements specific to your Code Insight plugin and remote data source. Refer to the *Code Insight Plugins Guide* for details.

Note ▪ *The JRE is included in the installation; a separate download is not necessary. Only JRE 8 is supported.*

The following provides additional requirements:

- Platform Support
- Database Support
- Browser Support
- Recommended Hardware for Deployment Configurations
- Recommended Software

Platform Support

Code Insight supports the following platforms:

- Windows Server 2012
- Windows Server 2016
- RHEL 6.x, 7.*x*
- CentOS 6.x, 7.*x*
- Ubuntu 18.04.*x*

Database Support

Code Insight requires that either a MySQL or SQL Server database be installed. The following lists components required to install and configure a database for use by Code Insight:

- MySQL Required Components
- SQL Server Required Components

MySQL Required Components

The following describes the components needed to install and run MySQL as the Code Insight database:

- The community edition of MySQL 8.0 (also known as MySQL 5.8) or MySQL 5.7, downloaded from https://dev.mysql.com/downloads/mysql.

Note ▪ Code Insight does not support the Docker version of My SQL. (It supports the native version only.)

- The appropriate JDBC driver connector file:
    - For MySQL 8.0, use the latest version of `mysql-connector-java-8.0.x.jar`. You can download this file from https://dev.mysql.com/downloads/connector/j/.
    - For MySQL 5.7, use `mysql-connector-java-5.1.x-bin.jar`. You can download this file from http://dev.mysql.com/downloads/connector/j/5.1.html.

  The connector is required to enable Code Insight to connect to the MySQL database. It must reside in your `tomcat/lib` folder. (The Code Insight installer will automatically copy the file to this location.)
- An environment that can support the required size settings listed in Required MySQL Database Settings.
- A database instance configured with the settings described in Required MySQL Database Settings and Binary Logging Option for MySQL.

SQL Server Required Components

The following lists the required components needed to install and run SQL Server as the Code Insight database:

- SQL Server 2019 (recommended for best performance) or 2016 Sp2.
- The JDBC driver connector file, `mssql-jdbc-6.4.0.jre8.jar`, which you can download from https://www.microsoft.com/en-us/download/details.aspx?id=56615.

  The connector is required to enable Code Insight to connect to the SQL Server database. It must reside in your `tomcat/lib` folder. (The Code Insight installer will automatically copy the file to this location.)
- The package `sql_server_pre_install_scripts.zip` containing the scripts needed to set up the SQL Server database for Code Insight. See Downloading the Scripts Needed to Set Up the SQL Server Database for instructions on the download process.
- At least one disk (OS or non-OS) with 100 GB free space.

Downloading the Scripts Needed to Set Up the SQL Server Database

Use the following steps to download the package containing the script files needed to set up the SQL Server database for Code Insight.

Task ***To download the package containing the scripts, do the following:***

1. Log into the Customer Community page of the Revenera website:

   https://community.flexera.com/t5/Revenera-Community/ct-p/Revenera_Community
2. From the **Other Resources** dropdown, select the **Product and License Center** option.

   Note ▪ This option is available only if you are a Product and License Center user or administrator. See Revenera Support for obtaining appropriate Product and License Center permissions.

3. From the **Product and License Center** page, select **Downloads**; and, from the list of available downloads, select **Code Insight**. (Alternatively, you might be able to select **Code Insight** directly from the **My Downloads** list on the **Product and License Center** page.)
4. Select the version of Code Insight from the list. The **Downloads** page appears.
5. Click the **sql_server_pre_install_scripts.zip** link to download the SQL Server scripts.
6. When the download finishes, extract the following files to a location accessible for later execution using the SQL Server console, as described in Setting Up the SQL Server Database:

    - `codeinsight_serversettings.sql`
    - `codeinsight_db_creation_with_maintainenceplan.sql`

    A third script, `codeinsight_db_drop_with_maintainenceplan.sql`, is used to drop the database and is *not* used as part of the database setup. Instructions for dropping the database are found in Dropping the SQL Server Database.

Browser Support

Code Insight supports the following browsers:

- Chrome (latest stable version)
- Internet Explorer (latest stable version)
- Firefox (latest stable version)

Note *▪ Code Insight no longer allows uppercase or mixed case when entering the application's URL. To start Code Insight in a browser, you must enter* ***codeinsight*** *in lowercase.*

Recommended Hardware for Deployment Configurations

The recommended deployments and configurations are explained in this section:

- Deployment Entities
- Rules and Guidelines for Deployment Configurations
- Supported Deployment Configurations

Deployment Entities

Code Insight deployment can be configured on a single instance or on multiple instances. Each deployment consists of the following elements:

Table 2-1 ▪ Deployment Elements

Entity	Description
Core Server	Main interface to Code Insight.
Scan Server	(Required for local scans only, not for remote scans) Contains the Scan Server and the codebases to be scanned. Multiple Scan Servers are supported.
Database	Central database containing all library metadata supplied by the Electronic Update and all stored scan results.
Compliance Library (CL) (Optional)	Library containing all the data required to perform source-code fingerprint (snippet) matching and exact-file matching. The Scan Server must have access to the CL through a mapped or mounted drive.

Rules and Guidelines for Deployment Configurations

Your Code Insight configuration deployment should adhere to the following rules and guidelines. Keep these in mind as you determine the appropriate configuration for your site, as described in the next section, Supported Deployment Configurations:

- (Recommended) Use the Single Instance configuration (see the table), in which the Core Server, Scan Server, database, and Compliance Library (CL) are installed on the same instance.
- (Strongly recommended in a multiple-instance configuration) Use instances that are geographically close to each other. Otherwise, you might experience degradation in performance.
- If installing multiple Scan Servers, install only one Scan Server on a given instance. For exceptions, contact support for Code Insight through the Revenera Community (see Revenera Support).
- If installing multiple Scan Servers, consider installing the Core Server and the first Scan Server on the same instance and then each additional Scan Server on separate instances. This is a common configuration but not a required one.
- Ensure that the Core Server and each Scan Server belong to the same Code Insight version.
- Ensure that the instances hosting the Core Server and Scan Servers all use the same operating-system platform.
- If using the CL, install it on the same instance as the Scan Server, but on a drive or volume different from the one on which the Scan Server resides. When installing multiple Scan Servers, install the CL on each instance hosting a Scan Server.
- Installing on NFS/Shared drives is not recommended. Performance significantly degrades when Code Insight or the database is installed on an NFS/Shared drive. The recommendation is to install on a fast-spinning disk (minimum 7200 RPM) or a Solid State Drive (SSD) drive to optimize Code Insight scan performance.

Supported Deployment Configurations

The following table shows the various deployment configurations for various Code Insight entities.

Table 2-2 ▪ Supported Deployment Configurations

Configuration	CPU (Cores)	Memory	Disk Space
Single Instance (highly recommended): Core Server Scan Server Database Compliance Library (CL)	2-CPU (each at least 2 GHZ+) with 8+ cores on the instance	64 GB	**Server:** 500 GB High-speed Disk for the Database (SSD Recommended) 500 GB High-speed Disk for the Core/Scan Server to store the codebase 950 GB High-speed Disk for the CL
Instance 1: Core/Scan Server/Compliance Library (CL) **Instance 2:** Database	2-CPU (each at least 2 GHZ+) with 8+ cores on each server	**Instance 1:** 32 GB **Instance 2:** 32 GB	**Instance 1:** 500 GB High-speed Disk for Core/Scan Server to store the codebase 950 GB High-speed Disk for the CL **Instance 2:** 500 GB High-speed Disk for the Database (SSD Recommended)
Instance 1: Core Server **Instance 2:** Database **Instance 3:** Scan Server/ Compliance Library (CL)	2-CPU (each at least 2 GHZ+) with 8+ cores on each server	**Instance 1:** 32 GB **Instance2:** 32 GB **Instance 3:** 32GB	**Instance 1:** 250GB High-speed Disk for Core Server **Instance 2:** 500 GB High-speed Disk for the Database (SSD Recommended) **Instance 3:** 500 GB High-speed Disk for Scan Server to store the codebase 950 GB High-speed Disk for the CL

Table 2-2 ▪ Supported Deployment Configurations (cont.)

Configuration	CPU (Cores)	Memory	Disk Space
Instance 1: Single Instance configuration (see the first table entry) **Instances 2 through x:** Scan Server/Compliance Library (CL)	2-CPU (each at least 2 GHZ+) with 8+ cores on each server	**Instance 1:** 64 GB **Instances 2 through x:** 32 GB	**Instance 1:** 500 GB High-speed Disk for the Database (SSD Recommended) 500 GB High-speed Disk for the Core/Scan Server to store the codebase 950 GB High-speed Disk for the CL **Each Instance 2 through x:** 500 GB High-speed Disk for Scan Server to store the codebase 950 GB High-speed Disk for the CL
Instance 1: Core/Scan Server/Compliance Library (CL) **Instance 2:** Database **Instances 3 through x:** Scan Server/Compliance Library (CL)	2-CPU (each at least 2 GHZ+) with 8+ cores on each server	**Instance 1:** 32 GB **Instance 2:** 32 GB **Instances 3 through x:** 32 GB	**Instance 1:** 500 GB High-speed Disk for Core/Scan Server to store the codebase 950 GB High-speed Disk for the CL **Instance 2:** 500 GB High-speed Disk for the Database (SSD Recommended) **Each Instance 3 through x:** 500 GB High-speed Disk for Scan Server to store the codebase 950 GB High-speed Disk for the CL
Instance 1: Core Server **Instance 2:** Database **Instances 3 through x:** Scan Server/Compliance Library (CL)	2-CPU (each at least 2 GHZ+) with 8+ cores on each server	**Instance 1:** 32 GB **Instance 2:** 32 GB **Instances 3 through x:** 32GB	**Instance 1:** 250GB High-speed Disk for Core Server **Instance 2:** 500 GB High-speed Disk for the Database (SSD Recommended) **Each Instance 3 through x:** 500 GB High-speed Disk for Scan Server to store the codebase 950 GB High-speed Disk for the CL

Recommended Software

The following software is recommended for Code Insight.

Database Client

A SQL client or command-line interface is necessary to run database scripts. The following free SQL clients are available:

- HeidiSQL: http://www.heidisql.com/download.php
- MySQL Workbench: http://www.mysql.com/products/workbench/

Preparing to Install Code Insight

Installing Code Insight is a simple, prompt-driven process, but before beginning the installation, you will need to do the following:

- Ensure that you have met the prerequisites in System Requirements.
- Follow the procedure in Setting Up the Database.
- Perform any additional environmental and communication configuration for Code Insight, such as the following:
    - Network and Firewall Considerations
    - Setting the Open-File Limit for Linux/Unix

Setting Up the Database

Before you install Code Insight, a database administrator must set up the MySQL or SQL Server database for use by Code Insight:

- Setting Up the MySQL Database
- Setting Up the SQL Server Database

Setting Up the MySQL Database

The following topics describe how configure the MySQL database for Code Insight:

- Setting Up a MySQL Instance for Code Insight
- Required MySQL Database Settings
- Binary Logging Option for MySQL
- Sample Procedure for Creating an Appropriate Database Schema and User

Setting Up a MySQL Instance for Code Insight

The database administrator needs to perform the following steps to set up the MySQL database for Code Insight.

Task ***To set up the MySQL database for Code Insight, do the following:***

1. Install the MySQL instance.

   You might need to configure certain settings once the installation is complete.

   Note ▪ *Installing the instance on a machine other than the one on which the Code Insight Core Server is installed might cause performance degradation.*

2. Create a database schema (with a recommended name of *codeinsight*) and a user that has appropriate access privileges to install Code Insight and that Code Insight will internally use to access the database. At a minimum, this user requires these permissions: ALTER, DROP, CREATE, DELETE, INDEX, INSERT, and UPDATE. The procedure described in Sample Procedure for Creating an Appropriate Database Schema and User can be used to perform these tasks.

3. Configure the instance as described in Required MySQL Database Settings and Binary Logging Option for MySQL

Required MySQL Database Settings

Code Insight requires the MySQL database configuration described in this table to ensure best performance.

Table 2-3 ▪ Required MySQL Database Settings

Property	System Variable	Recommended Value
Storage Engine	default-storage-engine	**innodb**
Character Set	character-set-server	**utf8mb4** (required value for all supported MySQL versions)
Collation	collation-server	● **utf8mb4_unicode_ci** (required value for MySQL 5.7) ● **utf8mb4_0900_ai_ci** (required value for MySQL 8.0)
InnoDB Buffer Pool Size	innodb_buffer_pool_size	**12GB**
InnoDB Log File Size	innodb_log_file_size	**8GB**
Maximum Allowed Packets	max_allowed_packet	**100MB**

If you need to verify the current settings in your MySQL installation, click the appropriate **Property** link in the table for a description of the verification command. If you need to change a setting in your installation, use the following procedure.

Task ***To configure the MySQL database, do the following:***

1. Within your MySQL installation, do one of the following:
    - As root user in Linux, open the `my.cnf` file (typically located in `/etc/`).
    - As a Windows administrator, open `my.ini` file (typically located in `C:\ProgramData\MySQL\MySQL Server` *`version`*).
2. Edit the settings as shown in the previous table. (If necessary, click the appropriate **Property** link in the table for a description of how to configure a given setting.)
3. After you have updated the settings, restart the database server.

Storage Engine

Specify **InnoDB** for the **default-storage-engine** property. By default in MySQL, **InnodDB** is already specified for this property, so you most likely will not need to change it.

To verify the current default storage engine, use the following command:

```
SELECT * FROM INFORMATION_SCHEMA.ENGINES;
```

If you need to add the **default-storage-engine** property (or update the current value of this property), use the appropriate procedure:

- In Linux, add the following line to the `[mysqld]` section of the `my.cnf` file (or update the existing property value):

```
default-storage-engine=innodb
```

- In Windows, add the following line to the `[mysqld]` section of the `my.ini` file (or update the existing property value):

```
default-storage-engine=innodb
```

Character Set

Specify **utf8mb4** for the **character-set-server** property when installing the MySQL database server for Code Insight. (This value is applied at the database/schema level.)

Important ▪ *Ensure that the **character-set-server** value is set to **utf8mb4**. Any other value has been know to produce undesirable results during a scan, forcing users to have to set up the database again since no rollback options are available. As protection, the Code Insight installer will not proceed with the installation once it detects a value other than **utf8mb4** for the **character-set-server** property in the database.*

To verify the current character set, use the following command:

```
SELECT @@character_set_database;
```

If you need to add the **character-set-server** property (or update the current value to the required value), use the appropriate procedure:

- In Linux, add the following line to the `[mysqld]` section of the `my.cnf` file (or update the existing property to the required value):

  ```
  character-set-server=utf8mb4
  ```

- In Windows, add the following line to the`[mysqld]` section of the `my.ini` file (or update the existing property to the required value):

  ```
  character-set-server=utf8mb4
  ```

Collation

Select **utf8mb4_unicode_ci** for the **collation-server** property when installing the MySQL database server for Code Insight. (This value is applied at the database/schema level.)

Important *▪ Ensure that the **collation-server** value is set to **utf8mb4_0900_ai_ci** (for MySQL 8.0) or **utf8mb4_unicode_ci**.(for MySQL 5.7). Any other value has been know to produce undesirable results during a scan, forcing users to have to set up the database again since no rollback options are available. As protection, the Code Insight installer will not proceed with the installation once it detects a value other than **utf8mb4_unicode_ci** for the **collation-server** property in the database.*

To verify the current collation, use the following command:

```
SELECT @@collation_database;
```

If you need to add the **collation-server** property (or update the current value to the required value), use the appropriate procedure:

- In Linux, add the following line to the `[mysqld]` section of the `my.cnf` file (or update the existing property to the required value):

  ```
  collation-server=utf8mb4_unicode_ci
  ```

- In Windows, add the following line to the`[mysqld]` section of the `my.ini` file (or update the existing property to the required value):

  For MySQL 8.0: `collation-server=utf8mb4_0900_ai_ci`

  For MySQL 5.7: `collation-server=utf8mb4_unicode_ci`

InnoDB Buffer Pool Size

Set the **innodb_buffer_pool_size** property to *at least* 12G (gigabytes).

To verify the current InnoDB buffer pool size, use the following command. The returned value is in gigabyte (G) units.

```
SELECT @@innodb_buffer_pool_size/1024/1024/1024;
```

If you need to add the **innodb_buffer_pool_size** property (or update the current value of this property), use the appropriate procedure:

- In Linux, add the following line to the `[mysqld]` section of the `my.cnf` file (or update the existing property value):

  ```
  innodb_buffer_pool_size=12G
  ```

- In Windows, add the following line to the `[mysqld]` section of the `my.ini` file (or update the existing property value):

  ```
  innodb_buffer_pool_size=12G
  ```

InnoDB Log File Size

Set the **innodb_log_file_size** property to *at least* 8G (gigabytes).

To verify the current InnoDB log file size, use the following command. The returned value is in gigabyte (G) units.

```
show variables like 'innodb_log_file_size%';
```

If you need to add the **innodb_log_file_size** property (or update the current value of this property), use the appropriate procedure:

- In Linux, add the following line to the `[mysqld]` section of the `my.cnf` file (or update the existing property value):

  ```
  innodb_log_file_size=8G
  ```

- In Windows, add the following line to the `[mysqld]` section of the `my.ini` file (or update the existing property value):

  ```
  innodb_log_file_size=8G
  ```

Maximum Allowed Packets

Set the **max_allowed_packet** property to **100M** (megabytes).

To verify the current maximum packet size, use the following command. The returned value is in megabyte (M) units.

```
SHOW VARIABLES LIKE 'max_allowed_packet';
```

If you need to add the **max_allowed_packet** property (or update the current value of this property), use the appropriate procedure:

- In Linux, add the following line to the `[mysqld]` section of the `my.cnf` file (or update the existing property value):

  ```
  max_allowed_packet=100M
  ```

- In Windows, add the following line to the `[mysqld]` section of the `my.ini` file (or update the existing property value):

  ```
  max_allowed_packet=100M
  ```

Binary Logging Option for MySQL

MySQL offers Binary Logging, an advanced feature that captures changes between backups and stores this information in binary log files. The log files—containing information about each statement that modified (or might have modified) the database and the amount of time it took to make the change—are mainly used for data recovery and replication efforts. The files reside in either location:

- The `/var/lib/mysql` directory on Linux
- The program data directory on Windows (for example, `C\ProgramData\MySQL\MySQL Server 8.0\Data`)

Possible Issues with Binary Logging

Binary Logging can cause issues when a Code Insight Electronic Update or scan is run. During either of these processes, the database can be updated with a significant number of insert, update, and delete events. With Binary Logging enabled, details for each event are also written to rolling binary log files, with each file being about 1 GB in size. If these log files are not purged regularly, out-of-memory issues will occur.

The user can decide whether Binary Logging should be enabled.

Disabling or Enabling Binary Logging

By default, Binary Logging is enabled in MySQL8, but disabled in MySQL5.

Task ***To disable or enable Binary Logging, do the following:***

1. Within your MySQL installation, do one of the following:
   - As root user in Linux, open the `my.cnf` file (typically located in `/etc/`).
   - As a Windows administrator, open `my.ini` file (typically located in `C:\ProgramData\MySQL\MySQL Server` *`version`*).
2. To enable Binary Logging, add or uncomment the `log-bin` line:

   ```
   #Binary Logging
   log-bin="<binaryLogBaseName>"
   ```

   or

   To disable Binary Logging, comment-out the `log-bin` line:

   ```
   #Binary Logging
   #log-bin="<binaryLogBaseName>"
   ```

3. Restart the database server.

Sample Procedure for Creating an Appropriate Database Schema and User

The following is a sample procedure that the database administrator can use to create a Code Insight database schema and the database user who will install Code Insight. Additionally, at installation, this same user is automatically identified to Code Insight (in `core.db.properties`) as the user Code Insight will use internally to manage the database. At a minimum, this user requires these permissions: ALTER, DROP, CREATE, DELETE, INDEX, INSERT, and UPDATE.

Task ***To create a database schema and user, do the following:***

1. At the command line, log into MySQL as the root user:

```
mysql -u root -p
```

2. Type the MySQL root password, and press **Enter**.
3. To create a database and user, type the following command, replacing the username (*codeinsight_user)* with the user you want to create, and replace *codeInsight%1234* with the user's password:

```
CREATE DATABASE codeinsight;
CREATE USER codeinsight_user IDENTIFIED BY 'codeInsight%1234';
GRANT ALL ON codeinsight.* TO 'codeinsight_user'@'%';
```

4. Provide the database schema and user credentials to the person who will install Code Insight.

Setting Up the SQL Server Database

Setting up the SQL Server database for Code Insight involves two phases:

- Phase 1: Install the SQL Server Instance
- Phase 2: Set Up the SQL Server Database for Code Insight
- Note about Running the Code Insight Maintenance Jobs on SQL Server Databases

Phase 1: Install the SQL Server Instance

A database administrator can perform these steps.

Task ***To install the SQL Server instance, do the following:***

1. Install the SQL Server instance, following the instructions included with the SQL Server installer. During the installation, select the appropriate options that do the following:
    - Set the character set (or collation) is to `SQL_Latin1_General_CP1_CI_AS`.
    - Enable the SQL Server Agent.
2. When the installation is complete, start up the SQL Server Agent using the instructions provided in the SQL Server documentation. This a required step for setting up the SQL Server database, described in the next section, Phase 2: Set Up the SQL Server Database for Code Insight.

Phase 2: Set Up the SQL Server Database for Code Insight

Once the SQL Server instance has been installed and the SQL Server Agent started, the DBO performs the following steps to set up the database for Code Insight.

Task ***To set up the SQL Server database for Code Insight, do the following:***

1. Ensure that you have downloaded and extracted the required the Code Insight scripts, as described in Downloading the Scripts Needed to Set Up the SQL Server Database.
2. Understand the purpose of the scripts before executing them:
   - **codeinsight_serversettings.sql**—This script configures the database server to enable the maximum performance for Code Insight. The script sets the following server parameters:
     - **Cost of parallelism**—15 (the threshold at which the optimizer chooses parallel processing)
     - **Max degree of parallelism**—Number of threads created specifically for this configuration.
     - **Max memory configuration**—The server's maximum utilization (60 percent) of total memory.
     - **TF**—Trace flags 111, 1118, 2371.

     You are strongly recommended to review existing configurations in this script and note their values in case a rollback is needed. However, do not edit this script.
   - **codeinsight_db_creation_with_maintainenceplan.sql**—This script creates the database and schedules maintenance jobs. Specifically, it performs the following operations:
     - Creates a database with 4 data files and 1 log file.
     - Creates a new folder called `MSSQLDATA` on a non-OS disk. If only one drive exists, the database is created on the OS drive itself.
     - Creates a subfolder with the database name under the `MSSQLDATA` folder.
     - Creates a daily maintenance job to perform an Update Statistics every 6 hours (no downtime needed).
     - Creates maintenance job to perform an Update Statistics and Index Reorg every two weeks (no downtime needed). The default is to run at 10 pm per server time zone every two weeks.

     You can edit some settings in this script as described in Step 5.
3. Ensure that the SQL Server Agent is running.
4. Open the `codeinsight_serversettings.sql` script, and execute it.

   Do not edit this script.
5. Open the `codeinsight_db_creation_with_maintainenceplan.sql` script, edit the `@dbname` setting if necessary, and then execute the script.

   The default value for `@dbname` is **`fnciv7`**. To edit this setting, simply overwrite the current value with the preferred database name. If you provide a database name that already exists, the script execution will fail.
6. Create the user who will install Code Insight. At installation, this same user is automatically identified to Code Insight (in `core.db.properties`) as the user Code Insight will use internally to manage the database.
7. Assign this user at least the minimally required permissions: ALTER, DROP, CREATE, DELETE, INDEX, INSERT, and UPDATE.

Note ▪ *Code Insight uses this same user to migrate the database during a Code Insight upgrade. If you intend to upgrade Code Insight in the future, this user must have the db_ddladmin role to perform the migration. However, you can add this role at the time of the upgrade and then revoke it once the it is complete.*

Note about Running the Code Insight Maintenance Jobs on SQL Server Databases

You are strongly recommended *not* to execute any service related to Code Insight (for example, an Electronic Update or a scan) or any other job against the SQL Server database while a Code Insight maintenance job is running on the database. If you do run another process at the same time as a Code Insight Maintenance job, expect some delay in that process. Additionally, Code Insight might experience performance-related issues or unexpected behavior.

Network and Firewall Considerations

If the Code Insight Core Server, Scan Server, or plugin is behind a firewall, you need to configure the firewall to ensure that each server or plugin has access to Code Insight:

- Server Identification
- Code Insight Ports
- External URLs

Server Identification

In all firewalls, specify either of the following to identify the instance on which you are installing the Code Insight Core Server, Scan Server, or plugin:

- A fully qualified domain name (for example, *hostname.domain.com*)
- An IP address (static IP address recommended)

Code Insight Ports

In all firewalls, enable port numbers used by Code Insight. You can use the default port numbers listed below or configure the application to use custom ports.

Table 2-4 ▪ Default Port Numbers Used by Code Insight

Port #	Details
3306	MySQL database server access port
1433	SQL Server database server access port
8888/443	Tomcat (http/https, respectively)

Table 2-4 ▪ Default Port Numbers Used by Code Insight (cont.)

Port #	Details
465	External SMTP (mail) server
389	External authentication directory server (Active Directory/LDAP)
8005 and 8009	Tomcat Connector and Tomcat shutdown ports, respectively (local access only)

External URLs

In all firewalls, provide access to the following external host URLs needed by Code Insight:

Table 2-5 ▪ External Host URLs Used by Code Insight

Code Insight Component/ Functionality	Hosts
CodeAware Analyzers	https://api.bintray.com https://api.nuget.org/v3-flatcontainer/ https://oss.sonatype.org https://packagist.org https://pypi.org/pypi/ https://registry.bower.io/packages/ https://registry.npmjs.org/ https://rubygems.org/api/v1/gems/ https://search.maven.org/ https://spdx.org/licenses/
Vulnerability database access	https://nvd.nist.gov https://web.nvd.nist.gov/ https://nvd.nist.gov/vuln-metrics/cvss/v2-calculator https://nvd.nist.gov/vuln-metrics/cvss/v3-calculator
Electronic Update	https://updates.palamida.com/
Remote file access	https://palamida-dp-nbhood.s3.amazonaws.com/

Setting the Open-File Limit for Linux/Unix

The open-file limit is a setting that controls the maximum number of open files for individual users. The default open-file limit is typically 1024, but can be set with the `ulimit` command by the root user. For Code Insight to function properly in a Linux or Unix environment, the open-file limit must be set to handle more than 50K files on each instance hosting the Core Server or a Scan Server.

***Important ▪** Increasing the open-file limit is absolutely essential for Code Insight to function properly on Unix/ Linux platforms.*

When *not* running Code Insight as a service, you must use the procedure described here to set the open-file limit for individual Code Insight users or groups. If you *do* intend to run Code Insight as a service, you must set the open-file limit at the service level, using the procedure described in Opening the Code Insight Web UI. Best practice is to also set the open-file limit at the user or group level, as described here, should situations arise where Code Insight is not run as a service.

The following are types of open-file limits:

- **soft limit**—Set in `/etc/security/limits.conf` by a normal user.
- **hard limit**—Set in `/etc/security/limits.conf` by root user.
- **system wide limit**—Set in `/etc/sysct1.conf` by root user.

Soft limits are the currently enforced limits; hard limits are the maximum limits on the system. The following procedure sets a soft and a hard open-file limit for user or group you specify. To run the procedure, you should log in as the root user so that you can set both limit types.

Task ***To set open file limits on a Linux RedHat system, do the following:***

1. In a terminal window, type **`ulimit -a`** to see a list of current file limits.
2. Locate the *open files (-n)* setting:
   - If the setting is less than 50K, continue to the next step.
   - If the setting is more than 50K, you do not need to perform this procedure.
3. Open the file `/etc/security/limits.conf`, and add the following entries for each specific user or group as needed:

   ```
   <userName> soft nofile 65536
   <userName> hard nofile 65536
   ```

   or

   ```
   @<groupName> soft nofile 65536
   @<groupName> hard nofile 65536
   ```

   Alternatively, you can substitute `<userName>` or `@<group name>` with the wildcard * for a default entry:

   ```
   * soft nofile 65536
   * hard nofile 65536
   ```
4. Save the file and log in again for the changes to take effect.

5. On the command line, type `ulimit -a`, and verify that the *open files (-n)* setting reads 65536.

Note ▪ *Other distributions, such as a Ubuntu and CentOS, might require a different setting. See instructions for your specific Linux distribution and shell type.*

Installing Code Insight

Use the following instructions to install Code Insight:

- Information to Have on Hand Before Running the Installer
- Launching the Code Insight Installer

Information to Have on Hand Before Running the Installer

When you have met the requirements listed in System Requirements and are ready to install Code Insight, best practice is to collect information required by the installer before starting the installation. The following is basic information you will need to provide the installer:

- Type of Installation You Intend to Perform
- License Key and JDBC Information

Type of Installation You Intend to Perform

The following are the types of installation you can run on a given instance:

- **Standalone**—Configure your instance as both the Core Server and a Scan Server. This is the recommended baseline configuration. If you are installing additional Scan Servers, the recommendation is to install the first scan server using the **Standalone** configuration. Then install the additional Scan Servers on separate instances using the **Scanner** configuration. All Scan Servers must point to the same database.
- **Core**—Configure your instance as the Core Server only.
- **Scanner**—Configure your instance as a Scan Server only. To install multiple Scan Servers, run this installation on each instance that you want to designate as a Scan Server. (The recommendation is that only one Scan Server be installed on a given a instance.) For more information about managing Scan Servers once they are installed, see Adding or Editing Scan Servers or Checking Server Status. All Scan Servers should point to the same database.

The Core Server controls the Code Insight Web UI Client. The Scan Server is where actual scanning is performed. (Note that a Scan Server has no Web UI capabilities.)

License Key and JDBC Information

The following is a list of information that the installer will require during a given installation.

- The license key file, `codeinsight.key`. If you do not have a license key file, see Revenera Support for instructions on obtaining support for Code Insight through the Revenera Community.

- The appropriate JDBC driver connector file for the database. For details, refer to either MySQL Required Components or SQL Server Required Components, depending on your database type.

  The driver will be copied to your `tomcat/lib` folder during installation.

Launching the Code Insight Installer

After you have met the System Requirements, including creating a database with remote access privileges, and have collected required installer information, you are ready to run the Code Insight Installer to install the Code Insight Core Server and one or more Scan Servers. You will need to run a separate installation on each instance on which you want to install the servers, depending on your server configuration, as described in Recommended Hardware for Deployment Configurations.

Note* ▪ *You can cancel the installation by clicking* **Cancel** *on any installation panel.

Task ***To install Code Insight, do the following:***

1. Download the Code Insight installer from the Product and License Center:
   - For Windows, `CodeInsight-<BUILD>.exe`
   - For Linux, `CodeInsight-<BUILD>.bin`
2. Navigate to the directory where you downloaded the installer, and launch the installer.
3. Follow the prompts to install Code Insight.
4. When the installation is complete, do the following:

   a. Start the Tomcat server if it is not already running. See Starting and Stopping Tomcat.

      The recommended best practice is *not* to run Tomcat under elevated privileges.

   b. Launch Code Insight by following the procedures in Opening the Code Insight Web UI.

   Important* ▪ *If the installation does not complete properly, contact support for Code Insight (see Revenera Support).

Opening the Code Insight Web UI

The Code Insight UI runs in your web browser. This section explains how to launch Code Insight Web UI for the first time.

Task ***To open Code Insight, do the following:***

1. Launch a web browser and navigate to the following URL, entering the server hostname. If necessary, check with your site's system administrator to obtain the correct hostname.

   ```
   http://<your_server_host_name>:PORTNUMBER/codeinsight/
   ```

   An example URL might be **`http://localhost:8888/codeinsight/`**.

   The Code Insight login page opens.

2. Enter your Code Insight credentials in the **Username** and **Password** fields.

   Note ▪ *The Code Insight default login name is* **`admin`***; the default password is* **`Password123`***.*

3. Click **Login**. The Code Insight dashboard is displayed.

   Important ▪ *For increased security, it is highly recommended that you change the default password for* **`admin`** *after the first login. For details, Creating or Editing Users in the "Configuring Code Insight" chapter.*

Roles and Permissions in Code Insight

Code Insight offers a set of user roles and permissions that enables your site to control access to Code Insight features and functionality.

The initial Code Insight System Administrator, identified during Code Insight installation, can assign users to system-level roles for managing Code Insight policies and creating Code Insight projects. The System Administrator can also create other System Administrators and define default Analysts and Reviewers that are automatically assigned to projects when they are created.

At the project level, a project creator automatically becomes the Project Contact as well as a Project Administrator (among other roles) for the project. A Project Administrator can assign users to project roles that enable these users to analyze and review project scan results. The administrator can also remove a user from any project role as needed, whether the user was manually assigned the role or inherited it.

For more about the management of Code Insight roles and permissions, refer to the following:

- The Managing Users section in this guide describes the management of user accounts and the assignment users to system roles.
- The "Assigning and Removing Project Users" section in the *Code Insight User Guide* describes the assignment of users to project roles.
- The Code Insight User Roles and Permissions appendix in this guide serves as a reference to the various Code Insight system and project roles available and the permissions granted to each role. As you prepare use the Code Insight, refer to this appendix to determine the roles required to perform certain Code Insight functionality and the permissions the roles enable.

Starting and Stopping Tomcat

A Tomcat server is automatically installed when you install Code Insight on an instance. When the Tomcat server is started on a given instance, the Core or Scan Server (or both) installed on that instance is automatically started as well. Additionally, on the Core Server, the connection to the Code Insight UI in a browser is enabled. (The Scan Server does not support a Web UI.)

From time to time, it is necessary to start and stop the Tomcat server. For example, you will need to start the Tomcat server after the initial Code Insight installation or stop and restart Tomcat during a Code Insight upgrade or for other reasons. This section provides the procedures for starting and shutting down the Tomcat server.

Note that, in a "standalone" installation where the Core Server and a Scan Server are installed on the same instance, a single Tomcat server is installed on the instance. When you install additional Scan Servers on separate instances, Tomcat is installed on each instance. You will need to start or stop the Tomcat server on each instance separately.

The recommended best practice is *not* to run Tomcat under elevated privileges.

Starting the Tomcat Server

Use this procedure to start the Tomcat server.

Task ***To start the Tomcat server, do the following:***

1. Ensure the appropriate JDBC database connector file resides in `tomcat\lib`. See Information to Have on Hand Before Running the Installer.
2. Navigate to the directory where Code Insight is installed and open the `tomcat\bin` directory (for example, `C:\codeInsight\tomcat\bin`).
3. Execute the `startup.bat file` for Windows or the `startup.sh` file for Linux. As the Tomcat startup runs, messages are displayed on the Tomcat console. The Tomcat startup may take several minutes to complete. When a startup message similar to the following appears in the Tomcat console, you can open Code Insight in your browser:

   ```
   10-Aug-2017 10:06:34.796 INFO [main] org.apache.catalina.startup.Catalina.start Server startup in 
   58823 ms
   ```

Stopping the Tomcat Server

Use this procedure to shut down the Tomcat server.

Task ***To shut down the Tomcat server, do the following:***

1. Navigate to the directory where Code Insight is installed and open the tomcat\bin directory. For example, `C:\codeInsight\tomcat\bin.`
2. Execute the shutdown.bat file for Windows or the shutdown.sh file for Linux.

Running Code Insight as a Service

Running Code Insight as a service whenever your system starts up can save time. This section provides the appropriate procedure to configure Code Insight as a service in either a Windows environment or a Linux (RedHat 7 or CentOS 7) environment. Repeat this procedure on each instance on which you have installed a Code Insight server (Core or Scan):

- In a Windows Environment
- In a Linux Environment

Recommended best practice is *not* to run Tomcat (automatically installed on each instance running a Code Insight server) under elevated privileges.

In a Windows Environment

Perform the following procedure to run Code Insight as a Windows service.

Task ***To run Code Insight as a Windows service, do the following:***

1. Using the command prompt, navigate to:

   ```
   <CODE_INSIGHT_ROOT_DIR>\tomcat\bin
   ```

2. Stop the Tomcat server. See Enabling Secure HTTP Over SSL.
3. Open the `service.bat` file with a text editor.
4. Set the `JRE_HOME` environment variable by adding this line at the beginning of the file. (You can copy this line from the `catalina.bat` file.)

   ```
   set JRE_HOME=C:\<CODE_INSIGHT_ROOT_DIR>\jre
   ```

5. Under the `Set default Service name` comment, set the following parameters:
   - SERVICE_NAME=`CodeInsight`
   - DISPLAYNAME=`Code Insight`
6. Change `Description` to reflect the name of the service, which is *Code Insight*.
7. In the `JvmOptions` line, add the following options to the existing list of options.

   Note *▪ Be sure to separate the options from each other with a semi-colon (;).*

   - `-Xms<minimum_heap_size_in_megabytes>m` (for example, `-Xms3276m`)
   - `-Xmx<maximum_heap_size_in_megabytes>m` (for example, `-Xmx12288m`)

     The recommendation is that the maximum heap size be no greater than 80 percent of your available memory.
   - `-Dcodeinsight.ssl=false`

- `-DcodeinsightInstallPath=<CODE_INSIGHT_ROOT_DIR>`

  `<CODE_INSIGHT_ROOT_DIR>` is the directory path where Code Insight is installed.

If Code Insight uses a proxy server, also add these options to the `JvmOptions` line to run the proxy server as a service:

Proxy Setting	Description
-Dhttps.proxyHost=<HOST>	`<HOST>` is the IP address or hostname for the proxy server.
-Dhttps.proxyPort=<PORT>	`<PORT>` is the port used by the proxy server.
-Dhttps.proxyUser=<UNAME>	`<UNAME>` is user ID used to log into the proxy server.
-Dhttps.proxyPassword=<PWD>	`<PWD>` is the password used to log into the proxy server.
-Djdk.http.auth.tunneling.disabledSchemes	Required as is.

8. Save the service.bat file and exit the text editor.
9. At a command prompt, enter the following command to add a system environment variable with name `CODEINSIGHT_ROOT`. In the command, replace `C:\<CODE_INSIGHT_ROOT_DIR>` with the path of your Code Insight installation directory.

   ```
   setx CODEINSIGHT_ROOT "C:\<CODE_INSIGHT_ROOT_DIR>"
   ```

10. Execute the `service.bat install` command to install the Apache Tomcat Windows service.
11. When the service is installed, open **Windows Services** and search for the Service name you specified in step 4 (in this case, *CodeInsight*).
12. Right-click the CodeInsight service and select **Start**.

In a Linux Environment

Perform the following procedure to run Code Insight as a service on Linux (RedHat 7, CentOS 7, or Ubuntu 18.04).

Task ***To run Code Insight as a service in Linux, do the following:***

1. Create a file named `CodeInsight.service` with the following content.

   ```
   [Unit]
   Description=Tomcat Service CodeInsight.service
   After=syslog.target network.target

   [Service]
   User=<userId>
   WorkingDirectory=<codeInsight_install_path>
   Type=forking
   ExecStart=<codeInsight_install_path>tomcat/bin/startup.sh
   ```

```
ExecStop=/bin/kill -15 $MAINPID
LimitNOFILE=65536

[Install]
WantedBy=multi-user.target
```

Note the following:

- The `CodeInsight.service` file name is case-sensitive when referenced in the file content.
- The `<userId>` value for the `User` property is the user ID that will run the Code Insight service. This user ID should not run under elevated privileges.
    - For Ubuntu, this should be the user ID that installed Code Insight (not the root user).
    - For RedHat and CentOS, this should be a user ID with non-elevated privileges. You can ensure that such a user ID is used by explicitly including the `User` property in this file and specifying the appropriate ID. As an alternative, especially for cases where the user ID starts with a number, you can omit this property from the `.service` file and instead specify the ID using the `login` argument in the `ExecStart` command, as in the example:

      ```
      ExecStart=/usr/bin/su --login <loginUserId> -c <codeInsight_install_path>tomcat/bin/
      startup.sh
      ```

2. Copy the `CodeInsight.service` file to the `/etc/systemd/system` directory:

   ```
   $ sudo cp CodeInsight.service /etc/systemd/system
   ```

3. Stop the Tomcat server. See Enabling Secure HTTP Over SSL.
4. Execute the following command to notify systemd that the Code Insight service has been added:

   ```
   $ sudo systemctl daemon-reload
   ```

5. Use the following commands to start, stop, or restart the Code Insight service. (The `CodeInsight.service` file name is case-sensitive in the commands.)

   ```
   $ sudo systemctl start CodeInsight.service
   $ sudo systemctl stop CodeInsight.service
   $ sudo systemctl restart CodeInsight.service
   ```

6. Execute the following command to enable the starting of Code Insight upon booting. (The `CodeInsight.service` file name is case-sensitive in this command.)

   ```
   systemctl enable CodeInsight.service
   ```

   From this point on, when you start your system, Code Insight will start up automatically.

Note *▪ The LimitNOFILE value* **65536***, defined in the `CodeInsight.service` file in step 1 above, is the open-file limit required by Code Insight. Best practice is to also set this value for individual Code Insight users or groups as a backup should situations arise when Code Insight is not run as a service. See Setting the Open-File Limit for Linux/Unix for details.*

Enabling Secure HTTP Over SSL

To implement SSL, a Secure Site SSL Certificate must exist on each instance that hosts the Code Insight Core Server or a Scan Server and that accepts secure connections. (When the Core Server and Scan Server are installed on the same instance, they share the same certificate.) Refer to http://en.wikipedia.org/wiki/HTTP_Secure and http://tomcat.apache.org/tomcat-8.0-doc/ssl-howto.html for more details about HTTPS.

Use these instructions for enabling an HTTPS connection, including how to procure a certificate:

- Enabling an HTTPS Connection
- Obtaining and Implementing a Purchased Secure Site SSL Certificate
- Generating and Implementing a Self-signed Certificate

***Note** ▪ For security, we recommend that Code Insight always be installed over SSH.*

Enabling an HTTPS Connection

Use these instructions to enable the HTTPS connection on each server.

Task ***To enable an HTTPS connection, do the following:***

1. Obtain and implement a Secure Site SSL certificate. You can purchase an SSL certificate or generate a self-signed certificate. Consult one of the following sections:

   - Obtaining and Implementing a Purchased Secure Site SSL Certificate
   - Generating and Implementing a Self-signed Certificate

2. Edit the `<CODEINSIGHT_ROOT_DIR>\tomcat\bin\catalina.bat` file (or the `catalina.sh` file depending on your operating system):

   `set -Dcodeinsight.ssl=true` (default value is `false`)

3. Back up the `<CODEINSIGHT_ROOT_DIR>\tomcat\conf\server.xml file` to another directory (outside of the `conf` directory).

4. Copy `server.xml` from `<CODEINSIGHT_ROOT_DIR>\tomcat\https` to `<CODEINSIGHT_ROOT_DIR>\tomcat\conf`.

   The new `server.xml` file contains a default configuration that references a keystore at `<CODEINSIGHT_ROOT_DIR>\tomcat\codeinsight.jks`. You will need to update this information as needed for your certificate, as described in step 7.

5. In the `server.xml` file, locate the following text, and ensure that the `SSLEngine` value is **on**:

   ```
   <Listener
   className="org.apache.catalina.core.AprLifecycleListener"
   SSLEngine="on" />
   ```

6. In the `server.xml` file, locate for the following text that introduces the section describing the SSL certificate:

   ```
   FNCI SSL: Edit this section to match your certificate information.
   ```

This section shows the default values for the certificate:

```
<!-- FNCI SSL: Edit this section to match your certificate information -->
<Connector protocol="org.apache.coyote.http11.Http11Protocol"
   port="8888"
   minSpareThreads="25"
   enableLookups="false"
   disableUploadTimeout="true"
   acceptCount="100"
   maxThreads="150"
   maxHttpHeaderSize="8192"
   scheme="https"
   secure="true"
   SSLEnabled="true"
   keystoreFile="codeinsight.jks"
   keystorePass="codeinsight"
   keyAlias="codeinsight"
   keyPass="codeinsight"
   clientAuth="false"
   sslProtocol="TLS"
   sslEnabledProtocols="TLSv1.2"
   ciphers="ECDHE-ECDSA-AES128-GCM-SHA256:ECDHE-RSA-AES128-GCM-SHA256:
   ECDHE-ECDSA-AES256-GCM-SHA384:ECDHE-RSA-AES256-GCM-SHA384:ECDHE-ECDSA-CHACHA20-POLY1305:
   ECDHE-RSA-CHACHA20-POLY1305:DHE-RSA-AES128-GCM-SHA256:DHE-RSA-AES256-GCM-SHA384"
   compressableMimeType="text/html,text/xml,text/css,text/javascript,
   application/x-javascript,application/javascript,application/json"
   compression="on"
   compressionMinSize="128"
   noCompressionUserAgents="gozilla, traviata"
/>
```

Note ▪ *For security purposes, do not change the default value "TSLV1.2" for the* ***sslEnabledProtocols*** *parameter in this SSL section. Additionally, the "ciphers" value in this section can change over time. Revenera will notify you of any changes to this value so that you can manually update the value here.*

7. Update the following parameters in this section to reflect your installed SSL certificate information:

   - **keystoreFile**—The file name of the keystore containing the certificate
   - **keystorePass**—The password of the keystore
   - **keyAlias**—The alias for the certificate entry in the keystore
   - **keyPass**—The password for the certificate entry

   Note ▪ *If the keystore and alias passwords are the same, you can specify keyPass, keystorePass or both.*

8. Ensure that the value for the `cipher` parameter is up to date. If a new set of ciphers is introduced in TLS v1.2, Revenera will notify you and provide you with the new set so that you can replace the current `cipher` value. (Update the `server.xml` file found only in `<CODEINSIGHT_ROOT_DIR>\tomcat\`**`https`**.)

9. Restart the Tomcat server after making changes to the `server.xml` file or to a keystore. For more information, see Enabling Secure HTTP Over SSL.

Obtaining and Implementing a Purchased Secure Site SSL Certificate

The following are two sources for purchasing a Secure Site SSL Certificate:

- http://www.verisign.com/ssl/buy-ssl-certificates/secure-site-ssl-certificates/index.html
- https://www.thawte.com/ssl-digital-certificates/ssl/index.html

Follow your vendor's instructions for generating a certificate signing request (CSR).

Importing the Purchased SSL Certificate into a Keystore

After you have obtained the purchased SSL certificate, you must import it into a keystore. The following is an example command that both creates a keystore on the Tomcat server (where it needs to reside) and imports the SSL certificate into this keystore. However, you should use the instructions provided by the certificate vendor to import your certificate into a keystore.

```
keytool -import -alias "<keyAlias>" -file <yourPurchasedCertificateFile> -keystore
    <CODEINSIGHT_ROOT_DIR>\tomcat\<keystoreFile> -storepass "<keypass>"
```

Importing the SSL Certificate into cacerts

Once the SSL certificate has been imported into a keystore, use the following steps to then import the certificate into cacerts.

Task ***To import a purchased SSL certificate to cacerts, do the following:***

1. Export the certificate from the keystore and import it into cacerts, located in `<CODEINSIGHT_ROOT_DIR>\jre\lib\security`. To do so, run the following commands in the order shown.

   ```
   keytool -export -alias "<keyAlias>" -file <file>.crt -keystore <file>.jks
   ```

   ```
   keytool -delete -alias "<keyAlias>" -keystore cacerts
   ```

   ```
   keytool -import -alias "<keyAlias>" -keystore cacerts -file <file>.crt
   ```

   Note *▪ The default password for cacerts is* `changeit`*.*

2. (Optional) To verify that the certificate has been imported into cacerts, run the following command to view the contents of cacerts:

   ```
   keytool -list -v -keystore cacerts
   ```

Enabling HTTPS

With the SSL certificate installed, you need to perform these final steps to enable HTTPS on the instance.

Task ***To enable HTTPS, do the following:***

1. If the keystore created for the SSL certificate does not already reside on the Tomcat server (see Importing the Purchased SSL Certificate into a Keystore), copy it to `<CODEINSIGHT_ROOT_DIR>\tomcat\`.
2. Follow the procedure in Enabling an HTTPS Connection to complete the configuration steps that enable HTTPS on the instance running Code Insight.

Generating and Implementing a Self-signed Certificate

Use this procedure to generate a self-signed certificate.

Task ***To generate your own self-signed certificate with a keystore in place of a purchased one, do the following:***

1. Execute the following command found in the JDK:

```
keytool -genkey -keyalg RSA -sigalg SHA256withRSA -alias "<keyAlias>" -keystore <keystoreFile> -
    storepass "<keypass>" -validity <numDays> -keysize 2048 -ext
    san=<ip:ipAddress,dns:domainName...>
```

   Provide the following values in the command:

   - **keyAlias**—The alias for the certificate entry in the keystore
   - **keystoreFile**—The file name of the keystore containing the certificate
   - **keyPass**—The password for the certificate entry
   - **ip:*ipAddress*,dns:*domainName*...**—One or more values specified for the `san` (subject alternative name) parameter, each value indicating an IP address or domain name (hostname) secured by the certificate.

     Enter as many values as needed, separating each with a comma, to ensure that a given domain can be accessed during SSL communication. (For example, you might want to enter both the IP address and domain name for the instance containing a Scan Server to ensure that the instance can be accessed by whichever identifier is used during communication.) Enter each IP address in the format **`ip:`*`ipAddress`*** and each domain name in the format **`dns:`*`domainName`***. The following shows an example `san` parameter:

```
-ext san=ip:93.184.222.33,dns:localhost
```

2. Enter the server's hostname or IP address when prompted, *What is your first and last name?*
3. Leave the remainder of the prompts blank, except for the last one:

```
Is CN=<yourServerNameOrIPAddress>, OU=Unknown, O=Unknown, L=Unknown, ST=Unknown, C=Unknown correct?
```

   For this prompt, type **yes**.

4. Export the certificate from the keystore and import it into `cacerts`, located in `<CODEINSIGHT_ROOT_DIR>\jre\lib\security`. To do so, run the following commands in the order shown.

```
keytool -export -alias "<keyAlias>" -file <file>.crt -keystore <file>.jks

keytool -delete -alias "<keyAlias>" -keystore cacerts

keytool -import -alias "<keyAlias>" -keystore cacerts -file <file>.crt
```

5. Copy the generated keystore to `<CODEINSIGHT_ROOT_DIR>\tomcat\`.

6. Follow the procedure in Enabling an HTTPS Connection to complete the configuration steps that enable HTTPS on the instance running Code Insight.

   If a self-signed certificate is used on the Code Insight server, each client instance that is used to access Code Insight should add a certificate exception to the browser.

Example: Generating and Implementing a Self-signed Certificate

The following example demonstrates how to generate and store a self-signed certificate for use by Code Insight. The example assumes that Code Insight is installed on the C drive; and, for simplicity, it uses the name “codeinsight” to identify the keystore, alias, and password.

1. Create a working folder in which to generate a keystore and a self-signed certificate. This example uses the folder `mywork` on the C drive.

2. From a command line, navigate to the working folder:

   ```
   cd C:\mywork
   ```

3. Run the following command, which generates a keystore (`codeinsight.jks`) and a self-signed certificate and then imports the certificate into the keystore. The certificate is generated with the name of the keystore (`codeinsight.crt`).

   ```
   keytool -genkey -keyalg RSA -sigalg SHA256withRSA -alias codeinsight -keystore codeinsight.jks -
       storepass codeinsight -validity 3600 -keysize 2048
   ```

4. Import the new certificate into cacerts by running the following commands in the order shown. These commands will export the newly generated certificate from the keystore to the `mywork` folder, delete any existing “codeinsight” certificate in cacerts, and then import the certificate into cacerts.

   ```
   keytool -export -alias codeinsight -file codeinsight.crt -keystore codeinsight.jks
   ```

   ```
   keytool -delete -alias codeinsight -keystore C:\CodeInsight\jre\lib\security\cacerts
   ```

   ```
   keytool -import -alias codeinsight -keystore C:\CodeInsight\jre\lib\security\cacerts -file
       C:\mywork\codeinsight.crt
   ```

   To ensure that the certificate has been imported into cacerts, run the following command, which outputs a list of certificates stored in cacerts. The list should include `codeinsight.crt`.

   ```
   keytool -v -list -keystore C:\CodeInsight\jre\lib\security\cacerts -alias codeinsight
   ```

5. Copy the keystore created in Step 3 to Tomcat:

   ```
   copy c:\mywork\codeinsight.jks C:\CodeInsight\tomcat\
   ```

6. In `catalina.bat`, make the following changes, and then save the file:

   ```
   -Dcodeinsight.ssl=true
   ```

7. Replace `tomcat\conf\server.xml` with the `server.xml` in `tomcat\https`, and then make the changes to the replacement `server.xml` as described in Enabling an HTTPS Connection. Save the file.

8. Restart Tomcat. For more information, see Starting and Stopping Tomcat.

9. In a browser, open Code Insight using the HTTPS protocol:

   `https://<hostname>:8888/codeinsight`

10. To enable HTTPS communications between the Core Server and a Scan Server, perform these steps:

    a. On the **Code Insight Dashboard**, click **administration**. The **Administration** page appears with a list of side tabs.

    b. From the **Administration** page, select the **Scan Servers** tab.

    c. Add a new Scan Server, or select a Scan Server to edit.

    d. In the **Host** field, enter the hostname for the Scan Server.

    e. In the **Port** field, enter the HTTPS port for the Scan Server.

    ***Note** ▪ You might need to accept browser warnings the first time that the application comes up; these messages should go away after the initial session.*

Configuring a Networking Proxy Server Connection

By default, Code Insight uses automatic proxy server settings for any communications over the internet. However, Code Insight can be manually configured to an enterprise networking proxy compliant with your company's IT policies. Perform the following procedure if you want to configure Code Insight to use your enterprise's network proxy. This procedure must be performed on each instance hosting the Core Server or a Scan server.

Task ***To manually configure a proxy server connection, do the following:***

1. Navigate to the `tomcat/bin` folder. This folder resides in the directory where CodeInsight is installed.
2. Open `catalina.bat` or `catalina.sh` for editing.
3. Locate the following command and uncomment it:

```
rem set CATALINA_OPTS=%CATALINA_OPTS% -Dhttps.proxyHost=<HOST> -Dhttps.proxyPort=<PORT> -
Dhttps.proxyUser=<USER> -Dhttps.proxyPassword=<PASSWORD> -DproxyProtocol=<PROTOCOL> -
Djdk.http.auth.tunneling.disabledSchemes=
```

   Set the following values for the proxy server in the command:

   - **proxyHost**—IP address or Hostname of the proxy.
   - **proxyPort**—Port used for proxy.
   - **proxyUser**—User name used to authenticate the proxy. Omit this value for a transparent proxy connection.
   - **proxyPassword**—Password used to authenticate the proxy. Omit this value for a transparent proxy connection.
   - **proxyProtocol**—Either `http` or `https`.

4. Save the `catalina` file.

5. In the directory where Code Insight is installed, open `config/core/jets3t.properties`, edit the file as follows, and then save it. (This step ensures that the Analysis Workbench dual-pane feature, enabling users to download and compare remote files, directs its calls properly through the proxy.)

    - Set `httpclient.proxy-autodetect` parameter to **`false`** to ensure that the correct proxy is used (that is, the one defined for Code Insight here and in the `catalina` file).
    - Set the same proxy host, port, user ID, and password as described in step 3 above.
    - Provide the proxy domain name for `httpclient.proxy-domain`, if one is used.

6. Restart the Tomcat server so the proxy server changes take effect. For information about stopping and restarting Tomcat, see Enabling Secure HTTP Over SSL.

Installing the Compliance Library

The Code Insight Compliance Library (CL) is a library used by the codebase scan to perform exact-file and source-code fingerprint (snippet) matching. Code Insight compares elements of scanned codebase files with information contained in the CL to generate file-level evidence on which you can take action.

Using the CL is optional. The exact-file and source-code fingerprint (snippet) matching capabilities available with the CL are in addition to the Automated Analysis techniques basic to all scans to identify components, versions, licenses, and security vulnerabilities and to generate inventory.

Use the following instructions to install the CL on a drive accessible to the Code Insight Scan Server. For optimal performance, install the CL on the same instance as the Scan Server but on a different drive or volume from the one on which the Scan Server is installed.

Repeat this procedure on each instance hosting a Scan Server.

For more information about keeping the MD5 data used for exact-matching current, see Keeping Exact-Match Data Up to Date.

Task ***To install the Compliance Library, do the following:***

1. Download the Compliance Library (CL) installer from the Product and License Center:

    - For Windows, `CodeInsightComplianceLibrary-`*`version`*`.exe`
    - For Linux, `CodeInsightComplianceLibrary-`*`version`*`.bin`

2. Navigate to the directory where you downloaded the installer, and launch the installer.
3. Follow the prompts to install the CL.
4. When the installation is complete, navigate to the **Scan Servers** tab on the **Administration** page to configure the CL for use by future scans. Refer to Adding or Editing Scan Servers or Checking Server Status for instructions.

Keeping Exact-Match Data Up to Date

Starting with the 2020 R4 release, Code Insight began support for a secondary data source for digest matches as an overlay to the data in the Compliance Library. Updates to the second data source (NG-bridge) are planned on a regular basis and will keep the MD5 data for exact-file matching up to date. Each NG-bridge data update release is incremental, providing only changes since the last update release. For more information on how to manage these updates for your site, see Managing NG-bridge (Digest Data) Updates for Code Insight.

Uninstalling Code Insight

The following procedures describe how to uninstall Code Insight on a given instance. An uninstaller for Code Insight is available in the directory where the product is installed. Repeat this procedure for each instance on which you are want to uninstall the Code Insight server configuration currently deployed on the instance.

This section also includes instructions to drop the SQL Server database used as the Code Insight database, should this action be necessary.

- Uninstalling on Windows
- Uninstalling on Linux
- Dropping the SQL Server Database

Uninstalling on Windows

Use the following procedure to uninstall Code Insight on a Windows instance.

Task ***To uninstall Code Insight in Windows, do the following:***

1. Navigate to the directory where Code Insight is installed.
2. Open the **Uninstall_CodeInsight** folder.
3. Double-click **Uninstall CodeInsight.exe**.
4. Follow the on-screen prompts to uninstall Code Insight. The uninstall process will leave behind some files. Review them and delete as needed.

Uninstalling on Linux

Use the following procedure to uninstall Code Insight on a Linux instance.

Task ***To uninstall Code Insight in*** **Linux*****, do the following:***

1. Navigate to the directory where Code Insight is installed.
2. Open the **Uninstall_CodeInsight** folder.

3. Execute `Uninstall CodeInsight` command and follow the on-screen prompts to uninstall Code Insight. The uninstall process will leave behind some files. Review them and delete as needed.

Dropping the SQL Server Database

If you need to drop the SQL Server database used as the Code Insight database, follow this procedure. Dropping the database also drops its maintenance plans.

Task ***To drop the SQL Server database and its maintenance plans, do the following:***

1. If you have not already done so, download the `codeinsight_db_drop_with_maintainenceplan.sql` script. See Downloading the Scripts Needed to Set Up the SQL Server Database.
2. Open the script, and set the `@dbname` value to the name of the database to be dropped (if the value is not set to the correct name).
3. Execute the script.

3

Configuring Code Insight

After Code Insight had been installed, the Code Insight System Administrator must perform a number of configuration tasks before the user can begin using Code Insight. This chapter describes these configuration tasks:

- Adding or Editing Scan Servers or Checking Server Status
- Managing Users
- Setting Up Electronic Updates
- Managing NG-bridge (Digest Data) Updates for Code Insight
- Configuring an Email Server
- Configuring Code Insight for LDAP
- Configuring Code Insight to Use Single Sign-On
- Configuring Extended Logging
- Managing Scan Profiles
- Enabling Calculation of SHA-1 Digests for Scanned Files
- Setting Project Defaults
- Setting the Common Vulnerability Scoring System (CVSS) Version
- About Code Insight Server REST APIs
- Enabling Cross-Origin Resource Sharing
- Managing Authorization Tokens
- Configuring the Session Timeout

***Note** ▪ The first time you open Code Insight, an Electronic Update will begin. The update can take 4 or more hours to complete. You cannot use the application to scan files until the update finishes. However, you can configure Code Insight while the update is in progress.*

For information about the permissions granted to the Code Insight System Administrator role, see the Code Insight User Roles and Permissions appendix.

Optionally, see About Code Insight Server REST APIs in this chapter for information about Code Insight REST APIs that enable you to create your own administrative tool for managing scan operations and retrieving data from scan results.

Adding or Editing Scan Servers or Checking Server Status

A Code Insight Scan Server scans the source code and binary files that make up your codebases to help you identify open source code that can expose your applications to compliance issues and security vulnerabilities. The following sections provide instructions on managing these servers:

- Adding or Editing Scan Servers
- Checking the Current Status of a Scan Server
- About Scanning without the Compliance Library

Adding or Editing Scan Servers

Before users can assign project codebases to a Scan Server in order to scan them, the Scan Server must first be installed either on the same instance as the Code Insight Core Server or on a separate instance, as described in Installing Code Insight. (The Scan Server must have the same version as the Core Server.) As Code Insight System Administrator, you must then “add” the Scan Server to the Code Insight system—that is, identify the server to the Code Insight Core Server to make it available for scanning purposes, as described in this section.

If multiple Scan Servers have been installed, you can add more than one of these servers, thus providing the means for users to distribute codebase scans across servers. Keep in mind each of these Scan Servers should be installed on a separate instance with a unique host ID and port identification. The codebase for a given project can be assigned to only one Scan Server (but multiple project codebases can be assigned to a single Scan Server). All codebases assigned to a given Scan Server are stored on that server in a location that you specify.

The following procedure describes how to add an installed Scan Server to the Code Insight system and, once added, how to edit its properties as needed.

For information about Code Insight scans and their assignment to project codebases, see “About Code Insight Scans” in the “Using Code Insight” chapter in the *Code Insight User Guide*.

Task ***To add or edit your Scan Server, do the following:***

1. Ensure that the Scan Server that you want to add or edit is running. (The Scan Server starts when the Tomcat server is started, as described in Enabling Secure HTTP Over SSL.)

    - For a Scan Server whose properties you are editing, ensure its status is green in the list of Scan Servers on the **Scan Servers** tab, which you access using steps 2 and 3 below.
    - For a Scan Server whose status you want to change from disabled to enabled, manually determine whether Tomcat is running on the instance. (The gray status on the list of Scan Servers does not indicate whether Scan Server is running.)
    - For a Scan Server that you adding, manually determine whether Tomcat is running on the instance.

2. On the **Code Insight Dashboard**, click **administration**. The **Administration** page appears with a list of side tabs.
3. Select the **Scan Servers** tab. The tab displays a grid listing the Scan Servers that have been added.
4. Do either of the following:

    - To add a new Scan Server, click **Add**.
    - To edit an already-defined Scan Server, click the ✎ (**Edit**) button in its entry. The **Scan Server** dialog appears.

5. Complete or update the fields the following fields:

Field	Description
Alias	The user-defined name for the Scan Server. This value must be unique among all Scan Servers identified to the Code Insight system, including disabled ones. (See **Status** is this table for a description of enabled and disabled Scan Servers.)
Host	The hostname (such as `krl.eng.companyA.com`) or IP address of the instance hosting the Scan Server. If the Scan Server is on the same instance as the Core Server, enter `localhost`. The same host-and-port combination must be unique among the *enabled* Scan Servers. (See **Status** is this table for a description of enabled Scan Servers.)
Port	The port used by the Scan Server on the host instance. By default, the port is `8888`. The same host-and-port combination must be unique among the *enabled* Scan Servers. (See **Status** is this table for a description of enabled Scan Servers.)

Field	Description
CL Path	(Optional) The path for the Code Insight Compliance Library (CL), downloaded from the Product and License Center (see Enabling Secure HTTP Over SSL). If the path is specified, the CL is accessed as part of the scan to perform exact-file and source-code fingerprint (snippet) matching. Elements of scanned codebase files are compared with information contained in the CL to generate file-level evidence on which you can take action. The validity of the entered path is checked when you click **Save**. Alternatively, leave this field blank to scan your codebase *without using the CL*. (Code Insight provides the scan profile “Basic Scan Profile (without CL)” to perform the scan.) This type of scan generates inventory from Code Insight’s Automated Analysis feature but has limitations, as described in About Scanning without the Compliance Library. Keep in mind that, when you run a scan using the CL, you obtain a deeper, more comprehensive scan on your codebase.
Codebase Path	The path on the Scan Server where Code Insight will store and manage all uploaded code for projects that use this Scan Server. Ensure you have adequate disk space to store the codebases. The recommended starting size for this directory is 500GB. The directory must already exist. The validity of the entered path is checked when you click **Save**. Once the Scan Server is added to the Code Insight system, you cannot edit this field.
Status	By default, the Scan Server is enabled for scanning. However, if necessary for an existing Scan Server, select **Disabled** to make the Scan Server unavailable for further scans. Once disabled, the server is no longer displayed in the **Scan Server** dropdown during project creation or when setting global project defaults. Additionally, this field becomes read-only on the **Edit Project** dialog. Note the following when attempting to disable a Scan Server: ● If this Scan Server is the system default Scan Server (as defined on the **Project Defaults** tab), you must change this default to another server before you can disable the current server. See Setting Project Defaults for instructions on updating the default Scan Server. ● If this Scan Server is associated with one or more projects, a warning is displayed before you can disable the server. Once you click **Yes**, the **Start Scan** and **Upload Project Codebase** options are disabled on the **Summary** page for each project associated with the server. If you attempt to re-enable a disabled Scan Server when another currently *enabled* Scan Server has the same host-and-port combination or alias, you receive an error when you click **Save**.

6. Click **Save** to add the Scan Server to the Code Insight system. Errors are generated when the following conditions exist:
    - The Scan Server you are adding or editing is not running.
    - The version of the Scan Server you are adding is different from the Core Server version.
    - The codebase path or CL path is invalid.

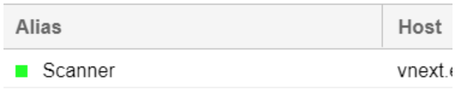
Checking the Current Status of a Scan Server

Use the following procedure to check on the status of the Scan Servers defined on your Code Insight system.

Task ***To check the current status of a Scan Server, do the following:***

1. On the **Code Insight Dashboard**, click **administration**. The **Administration** page appears with a list of side tabs.
2. Select the **Scan Servers** tab. The tab displays a grid listing the Scan Servers that have been added. (For a description of the grid columns identifying properties for each Scan Server entry, refer to the table in the previous section, Adding or Editing Scan Servers.)

    The color-code status for each Scan Server is displayed next to its alias name in the **Alias** column.



Alias	Host
🟩 Scanner	vnext.

The following describes color code for Scan Server status:

Table 3-1 ▪ Scan Server Statuses

Status Code	Description
🟩	The green icon indicates that the Scan Server is “enabled” for scanning and is currently running (turned on). Scans are run in queue order.
🟥	The red icon indicates that the Scan Server is “enabled” for scanning but is currently not running (that is, it is turned off). Any attempts to associate a project with the Scan Server or upload a codebase to the server generates an error. Additionally, any attempt to initiate a scan will result in the scan’s being queued. However, once the server is active, the scan will start based on queue order. (Users can click the **Past Scans** link on the project **Summary** page to view details about the scheduled scan.)
◼	Scan Server is “disabled” (that is, cannot be used for scanning). Whether the server is running or not has no effect on this status. If an enabled server is needed for scans on a project assigned to a disabled Scan Server, a new project must be created.

About Scanning without the Compliance Library

By default, when Code Insight scans a codebase, it uses the data in the Compliance Library (CL) to provide evidence of third-party code—exact-file matches and source-code fingerprint (snippet) matches—in your codebase.

However, if you do not have access to the CL—for example, you are running Code Insight on a virtual instance or have not yet installed the CL—or do not want to enable your installed CL, leave the **CL Path** field blank on the **Scan Servers** tab on the **Administration** page (see Adding or Editing Scan Servers or Checking Server Status). You must then use the “Basic Scan Profile (without CL)” scan profile to perform a basic scan on your codebase.

The basic scan uses Code Insight’s Automated Analysis feature to perform the following:

- Generates inventory and detect vulnerabilities
- Finds evidence based on emails, URLs, and pre-defined search terms
- Employs all automated detection techniques

In the absence of a CL, Code Insight will not detect exact-file matches and source-code fingerprint matches.

You can also create a custom basic scan profile with your own pre-defined search terms, as well as specify scan exclusions for folders or files to exclude from the codebase scan, such as **/.git or **/.hg.

For more information about the “Basic Scan Profile (without CL)” scan profile and about creating and managing scan profiles in general, see Managing Scan Profiles. For instructions on associating a scan profile with a project, see “Applying a Scan Profile to the Project” in the “Using Code Insight” chapter in *Code User Guid*e.

Managing Users

The following topics describe how to manage users in your Code Insight system:

- Creating or Editing Users
- Managing User Permissions for System Activities
- Finding Users
- Disabling User Accounts

At the system level, you can also assign users to project roles so that these assignments then default each time a project is created. This task is described in Setting Project Defaults.

Creating or Editing Users

The following procedure describes how to create or edit users for your-code Insight installation.

Note ▪ *If you are using an LDAP server to synchronize the user data, you can skip this procedure. To configure an LDAP server, see Configuring Code Insight for LDAP.*

Task ***To create or edit a user, do the following:***

1. As Code Insight System Administrator, click **administration** on the **Code Insight Dashboard**. The **Administration** page appears with a list of side tabs.
2. Select the **Users/Permissions** tab, which lists all current users in your Code Insight system.
3. To create a new user, click **Add User**; or to edit an existing user, click the Edit icon ✎ .

   The **Add User** or **Edit User** dialog appears.
4. Enter information in the fields to create or edit the user:
   - **Login**—The user's login name.
   - **First Name**—The user's first name.
   - **Last Name**—The user's last name.
   - **Email**—The user's email address.
   - **Password**—The user's password, which should be a minimum of 8 characters with no spaces and have at least one number and one capital letter.
   - **Password Confirm**—Reenter the password from the field above.
   - **Question**—A security question that can be answered by the user to retrieve a lost password. The question must be a minimum of 3 characters.
   - **Answer**—The answer to the security question.
5. When you finish entering information for the user, click **Submit** to add the user to the list.
6. To assign permissions to administrate Code Insight, manage policies, and create projects, see the next section, Managing User Permissions for System Activities.

Managing User Permissions for System Activities

Use the procedures described in this section to grant or revoke the following types to user permissions used to manage system-wide activities:

- **System Administrators**—Grants permissions to configure Code Insight at the system level—scheduling Code Insight Electronic Updates, managing Code Insight user accounts and permissions, defining global project defaults and the scan profiles associated with projects, specifying the CVSS version for vulnerability reporting, configuring an email server for Code Insight notifications, and setting up Code Insight for LDAP and single sign-on.
- **Manage Policy**—Grants the user permission to manage policies that automate the inventory review process—that is, automatically mark published inventory items as approved, rejected, or requiring a manual review—without the need for manual reviews.

  Policy details are described in "Managing Policies" in the "Using Code Insight" chapter in *Code User Guid*e.

- **Create Project**—(Displayed only if you selected **No** for **Allow all users to create projects?**) Grants the user permission to create projects and project folders. Users automatically become the Project Contact for each project they create and are assigned to the Project Administrator role as well as other project roles.

  A **Create New** button, enabling users to create projects and project folders, is visible on the **Projects** page for only those users granted this permission. Project and folder creation is described in “Creating a Project” and “Managing Items in the Project List” in the “Using Code Insight” chapter in *Code Insight User Guid*e.

Note ▪ *In addition to these permissions, roles can be assigned to users at the individual project level, as described in the Code Insight User Guide.*

See the topics in this section for more information:

- Grant System Permissions to Users
- Revoke User Permissions

Grant System Permissions to Users

Follow these steps to grant one or more permissions to individual users.

Task ***To grant permissions to users, do the following:***

1. As Code Insight System Administrator, navigate to the **Users/Permissions** tab on the **Administration** page. (For instructions on getting to this tab, see the initial steps in Creating or Editing Users.)
2. Click **Manage Permissions** to open the **Manage Permissions** dialog.

   Note that all users assigned to a given role are shown on this tab, whether the user was manually assigned the role or had inherited the role (for example, through project migration).
3. Select the **Yes** or **No** option for **Allow all users to create projects?** to determine whether all or selected users will have permission to create projects. If you select **No**, a **Create Project** pane is added to the dialog to enable you to select the users to which to grant this permission. (The default is **Yes**, allowing any user to create projects.)
4. To assign users to a given role, drag and drop one or more user names from the **Select Users** list to the desired “role” pane (**System Administrators**, **Manage Policy**, or **Create Project**). Repeat this step a necessary. (A user can be assigned to multiple roles.)
5. Click **Close** to return to the **Users/Permissions** tab.

Revoke User Permissions

Follow these steps to revoke a user’s permissions.

Task ***To revoke user permissions, do the following:***

1. Navigate to the **Users/Permissions** tab on the **Administration** page. (For instructions on getting to this tab, see the initial steps in Creating or Editing Users.)
2. Click **Manage Permissions** to open the **Manage Permissions** dialog.
3. To remove a user from a role, click ✖ next to the user’s name in the appropriate “role” pane. You can remove any user from a role, even those who inherited the role.
4. Once you have revoked the necessary permissions, click **Close** to return to the **Users/Permissions** tab.

Finding Users

As a Code Insight System Administrator, you might need to search for Code Insight users to manage their permissions. You can search for users on the **Users** tab or on the **Summary** tab for the project.

Task ***To find users, do the following:***

1. On the **Code Insight Dashboard**, click **administration**. The **Administration** page appears with a list of side tabs.
2. Select the **Users** tab.
3. In the **Enter Search Criteria** field, enter a character string by which to search user information in any of the fields.
4. Click **Search**.

Disabling User Accounts

Code Insight supports disabling user accounts in the browser.

Note ▪ *The Admin user account is created automatically; it cannot be disabled.*

Task ***To disable user accounts, do the following:***

1. On the **Code Insight Dashboard**, click **administration**. The **Administration** page appears with a list of side tabs.
2. Select the **Users** tab.

3. Click the **Edit** icon (✎) in the **Actions** column for the user account you want to disable. The **Edit User** dialog appears.
4. Select the **Disable Account** checkbox, and click **Submit**. The **Success** dialog appears.
5. Click **OK**. The user account is now disabled. The user will receive the message, “`Invalid Username and/or Password. If you believe you entered a valid user, please contact your System Administrator`” when attempting to log into Code Insight.

Setting Up Electronic Updates

An initial full Electronic Update is run automatically after your initial startup of Code Insight. It provides the basis of a local data library used by Code Insight to identify OSS and third-party code in your codebase. After this initial update, Code Insight provides a means for you to schedule additional Electronic Updates to keep the library up to date, helping to ensure that the latest component, version, license, and vulnerability information is available for your product. You can schedule these updates to execute automatically at a regular frequency or manually through the Administration interface.

At a basic level, an Electronic Update is executed as either a *server* or a *local* update, depending on the method used to retrieve the Electronic Update files from Revenera. You configure the type of update to run based on your site requirements.

By default, scheduled Electronic Updates are *incremental*—that is, each update applies only changes that have occurred since the previous update. However, when necessary, you can force a *full* update, which overwrites all data from the previous update. Full updates should be run manually only and with the understanding that they require considerable overhead.

Refer to the following for more information:

- Server vs Local Electronic Updates
- Running Server Electronic Updates
- Running Local Electronic Updates
- Configuring the Use of SFTP for Obtaining Update Files

Server vs Local Electronic Updates

Code Insight enables you to configure the Electronic Update to run as either a server or local update. The difference between the two methods is the means by which the Code Insight server obtains the files required to run the update:

- During a **server** Electronic Update, the most recent Electronic Update files are automatically downloaded from Revenera to the Code Insight server as part of the update process. The default protocol for a server Electronic Update is HTTPS but can be configured to be SFTP if needed (see Configuring the Use of SFTP for Obtaining Update Files for instructions). For additional information on configuring and triggering updates, see Running Server Electronic Updates.

- For a **local** Electronic Update, you must manually download the Electronic Update files from Revenera to your machine or to a local SFTP server. In both cases, the location should be locally accessible to the Code Insight server so that Code Insight can access the downloaded files, unpack them, and apply the data to the Code Insight database schema. This type of Electronic Update is useful when the Code Insight server has no external Internet access or when a specific Electronic Update version is needed for testing or demonstration purposes. For additional information, see Running Local Electronic Updates.

You can switch between running server and local updates as needed. You can also configure either of the two types of updates to download over SFTP, such that Electronic Update files are downloaded either from Revenera's SFTP server or from your own local SFTP server. For more information, see Configuring the Use of SFTP for Obtaining Update Files.

Running Server Electronic Updates

Code Insight lets you run an Electronic Update as either a server or local update (see Server vs Local Electronic Updates for descriptions of the two update types). The following topics describe the various ways in which to manage *server* Electronic Updates.

- Scheduling Server Electronic Updates That Run Automatically
- Disabling Automatic Server Electronic Updates
- Running a Server Electronic Update Manually

By default, the Electronic Update process downloads the update files from Revenera using HTTPS. If you want the Electronic Update to use SFTP instead, see Configuring the Use of SFTP for Obtaining Update Files. This configuration must be performed prior to running updates.

Scheduling Server Electronic Updates That Run Automatically

For server Electronic Updates, Code Insight enables you to configure updates to run automatically at a specified frequency as described in this section. (Note that you can always force a server or local update between the scheduled updates. See Running a Server Electronic Update Manually or Running Local Electronic Updates for details.)

Alternatively, you can disable regularly-scheduled automatic updates altogether and manually run the updates as needed. (See Disabling Automatic Server Electronic Updates for details.)

Note ▪ *Codebase scans cannot be performed during the Electronic Update process, but a scan that is already underway will not be interrupted when an automatic update process is scheduled to begin. The update will be queued and automatically run based on queue order.*

Task ***To schedule an automatic server Electronic Update, do the following:***

1. On the **Code Insight Dashboard**, click **administration**. The **Administration** page appears with a list of side tabs.
2. Select the **Electronic Updates** tab.
3. Click **Server** for **Electronic Update Type**.

4. From the **Update Frequency** dropdown, select the frequency at which to run the Electronic Update:
    - **Never**—If you select **Never**, Electronic Updates will not run automatically. (Selection of this option hides any further dropdowns.)

      If you need to run an update, you can do so manually as needed. See Running a Server Electronic Update Manually for details.
    - **Daily**—If you select **Daily**, a second dropdown is displayed, prompting you to choose the time of day when you want the Electronic Update to occur.
    - **Weekly**—If you select **Weekly**, both the “time of day” and **Select a day...** dropdowns are displayed. Select both the time of day and the day of the week when you want the Electronic Update to occur.
5. When you have finished setting the execution frequency for the update, select **Save**. A prompt appears to notify you that your edits have been saved.

Electronic Updates will run automatically based on the schedule you have set.

Disabling Automatic Server Electronic Updates

Use this procedure to disable the automatic triggering of Electronic Updates. Once you disable the execution of the scheduled updates, an Electronic Update will no longer run automatically. However, you can run updates manually as needed (see Running a Server Electronic Update Manually for details).

Task ***Tao disable automatic server Electronic Updates, do the following:***

1. On the **Code Insight Dashboard**, click **administration**. The **Administration** page appears with a list of side tabs.
2. Select the **Electronic Updates** tab.
3. Click **Server** for **Electronic Update Type**.
4. From the first dropdown in the **Update Frequency** section, select **Never** to disable automatic updates.
5. Click **Save Schedule**.

Running a Server Electronic Update Manually

You can trigger a server Electronic Update any time. For example, you might need to run an update between automatic updates if you cannot wait for the next update to determine critical information, such as the impact of new vulnerabilities on your product. Or you might need to force a full update if the most recent update did not complete properly.

If automatic server Electronic Updates are disabled (see Disabling Automatic Server Electronic Updates), you can use this procedure to request a server update whenever needed or to run a local update if necessary.

When you manually run an Electronic Update, it is initiated immediately or once any pending scans complete.

***Note** ▪ Running an Electronic Update might cause an unexpected delay in starting a codebase scan. However, if a scan is already underway when the update process is triggered, the update is queued and automatically run based on queue order.*

Task ***To run a server Electronic Update manually, do the following:***

1. On the **Code Insight Dashboard**, click **administration**. The **Administration** page appears with a list of side tabs.
2. Select the **Electronic Updates** tab.
3. Click **Server** for **Electronic Update Type**.
4. For the **Run Update Now** option, select the update scope:
    - **Incremental Update**—Schedule an incremental Electronic Update. However, if no changes have occurred in the Electronic Update data since it was last run, the update is *not* initiated.
    - **Full Update**—Force a full Electronic Update whether or not changes have occurred in the Electronic Update data since it was last run. Use this option judiciously as a full Electronic Update takes several hours to complete, similar to the time required to run the initial update when Code Insight was installed.
5. Click **Update** to initiate the Electronic Update immediately or once pending scans have completed.

Running Local Electronic Updates

Code Insight lets you run an Electronic Update as either a server or local update (see Server vs Local Electronic Updates for descriptions of the two update types). The following topics describe how to run a *local* Electronic Update.

- Files Required for a Local Electronic Update
- Running the Local Electronic Update from Your Machine
- Configuring SFTP to Obtain Update Files Using Your Own SFTP Server

For a description of the local Electronic Update and its comparison to the server Electronic Update, see Server vs Local Electronic Updates.

Files Required for a Local Electronic Update

Before running a local Electronic Update, you must manually download the Electronic Update files from Revenera to your machine or to a local SFTP server. In both cases, the location should be accessible to the Code Insight server, so that Code Insight can access the downloaded files, unpack them and apply the data to the Code Insight database schema.

Work with your Revenera representative to determine the best way for your site to receive notifications from Revenera when a new Electronic Update is available and to obtain download details.

The following files must be manually downloaded from Revenera to run the local Electronic Update:

- **Update Manifest file**—The manifest file, `update_manifest.txt`, which contains the following:
    - Information that Code Insight uses to determine whether to perform the update.
    - The expected hash value for each data file in the `update.zip` file (see the next bullet). This information is compared with the hash values of the actual files in the archive to ensure that the files have not changed.
- **Update Data file**—The `update.zip` file, an archive of the data files containing the CVSS information used by Code Insight to perform the Electronic Update.

    Code Insight uses the hash information in the manifest file (see the previous bullet) to ensure that the data files are the expected ones and that they have not changed or been tampered with.

Running the Local Electronic Update from Your Machine

Use the following procedure to run a local Electronic Update from your machine after you have obtained the `update_manifest.txt` file and `update.zip` files.

Task ***To run a local Electronic Update, do the following:***

1. On the **Code Insight Dashboard**, click **administration**. The **Administration** page appears with a list of side tabs.
2. Select the **Electronic Updates** tab.
3. Click **Local** for **Electronic Update Type**.
4. Click **Select File** next to the **Update Manifest File** field to select the `update_manifest.txt` that Code Insight will upload to perform the update. (This file was manually downloaded from Revenera prior to this request for an update. You can locate this file at the locally accessible location to which it was saved.)
5. Click **Select File** next to the **Update Data File** field to select the `update.zip` file that Code Insight will upload to perform the update. (This file was manually downloaded from Revenera prior to this request for an update. You can locate this file at the locally accessible location to which it was saved.)
6. For **Run Update Now**, select the update scope:
    - **Incremental Update**—Schedule an incremental Electronic Update. However, if no changes have occurred in the Electronic Update data since it was last run, the update is *not* initiated.
    - **Full Update**—Force a full Electronic Update whether or not changes have occurred in the Electronic Update data since it was last run. Use this option judiciously as a full Electronic Update takes several hours to complete, similar to the time required to run the initial update when Code Insight was installed. (You might need to force a full update, for example, if the most recent update did not complete properly.)
7. Click **Update** to initiate the Electronic Update immediately or once pending scans have completed.

Running the Local Electronic Update from Your Own SFTP Server

The instructions for running a local Electronic Update from your own SFTP Server are similar to those for running from a Revenera server (see Running Server Electronic Updates for more information), with the following two exceptions:

- Instead of downloading the files from the Revenera server, Electronic Update downloads the files from your own local SFTP server, configured using instructions in the Configuring SFTP to Obtain Update Files Using Your Own SFTP Server section.
- As a prerequisite step for the use of a local SFTP server, ensure that the update files (`update_manifest.txt` and `update.zip`) are downloaded from Revenera to the SFTP server before each Electronic Update. This step can either be done manually or, for example, by using a script to automate the download of the update files based on your update schedule.

Configuring the Use of SFTP for Obtaining Update Files

By default, the Electronic Update files are downloaded over HTTP. However, you can configure the process to use SFTP instead, so that the update files are downloaded either from Revenera's SFTP server or from your own local SFTP server.

For additional security, you can also configure a proxy server to handle communications between the SFTP server and Code Insight.

Refer to the following sections for more information:

- Configuring SFTP to Obtain Update Files Using the Revenera SFTP Server
- Configuring SFTP to Obtain Update Files Using Your Own SFTP Server
- Configuring the Use of an SFTP Proxy Server

Configuring SFTP to Obtain Update Files Using the Revenera SFTP Server

To enable the Electronic Update to download update files from the Revenera SFTP server, the Code Insight database administrator must add the `update.sftp.enable` property to the `pas_global_properties` table, setting the property to **`true`**.

After SFTP is enabled, Code Insight will automatically retrieve the default information about the Revenera SFTP server to establish the necessary connection needed to download the update files, unpack them, and apply the data to the Code Insight database schema whenever a server Electronic Update occurs.

Task ***To configure the use of SFTP for Electronic Updates using the Revenera SFTP server, do the following:***

Execute this command against the Code Insight database:

```
INSERT INTO PAS_GLOBAL_PROPERTIES (SERVER_ID_, KEY_, VALUE_, ENCRYPTED_) VALUES ('0',
    'update.sftp.enable', 'true', 0);
```

Configuring SFTP to Obtain Update Files Using Your Own SFTP Server

To configure the use of your own SFTP server for Electronic Updates communications, the Code Insight database administrator needs to insert new rows in the pas_global_properties table that both enable SFTP and identify the SFTP server and its credentials to Code Insight.

After SFTP is configured, Code Insight automatically retrieves information about your SFTP server from the database to establish the connections needed to download the update files, unpack them, and apply the data to the Code Insight database schema whenever Electronic Update occurs.

As a prerequisite step for the use of a local SFTP server, ensure that the update files (update_manifest.txt and update.zip) are downloaded from Revenera to the SFTP server before each Electronic Update. This step can either be done manually or, for example, using a script to automate the download of the update files based on your update schedule.

Task ***To configure the use of SFTP for Electronic Updates using your own SFTP server, do the following:***

Execute this command against the Code Insight database, replacing variables with information about your SFTP server:

```
INSERT INTO PAS_GLOBAL_PROPERTIES
(SERVER_ID_, KEY_, VALUE_, ENCRYPTED_) VALUES
('0', 'update.sftp.enable', 'true', 0),
('0', 'sftp.server.url', '<hostname>', 0),
('0', 'sftp.server.port', '<port>', 0),
('0', 'sftp.server.username', '<username>', 0),
('0', 'sftp.server.password', '<password>', 0),
('0', 'update.file.name', '<path_to_update.zip>', 0),
('0', 'update.manifest.file.name', '<path_to_manifest.txt>', 0);
```

The following describes the variables that the database administrator needs to define in the command:

- **hostname**—The IP address or URL of the SFTP server.
- **port**—The port used for the SFTP server
- **username**—The username used to authenticate the SFTP server.
- **password**—The password used to authenticate the SFTP server.
- **path_to_update.zip**—The path of the update.zip file on your SFTP server.
- **path_to_manifest.txt**—The path of the manifest.txt file on your SFTP server.

Configuring the Use of an SFTP Proxy Server

For additional security, you can configure a proxy server to handle communications between the SFTP server (Revenera's or your own local server) and Code Insight.

To use a proxy server, the Code Insight database administrator needs to insert new rows in the pas_global_properties table in the Code Insight database to provide the information needed to communicate with the proxy.

Task ***To configure the use of a proxy server between the SFTP server and Code Insight, do the following:***

Execute this command against the Code Insight database, replacing variables with information about your SFTP server:

```
INSERT INTO PAS_GLOBAL_PROPERTIES
(SERVER_ID_, KEY_, VALUE_, ENCRYPTED_) VALUES
('0', 'update.socks.proxy-host', '{host}', 0),
('0', 'update.socks.proxy-port', '{port}', 0),
('0', 'update.socks.proxy-user', '{username}', 0),
('0', 'update.socks.proxy-password', '{password}', 0),
('0', 'update.socks.proxy-type', '{SOCKS4/SOCKS5}', 0);
```

The following describes the variables that the database administrator needs to define in the command:

- **host**—IP address or Hostname of the proxy.
- **port**—Port used for proxy.
- **username**—User name used to authenticate the proxy. Omit this value for a transparent proxy connection.
- **password**—Password used to authenticate the proxy. Omit this value for a transparent proxy connection.
- **SOCKS4/SOCKS5**—The type of SOCKS Internet protocol used by the proxy. Specify one. (These are protocols currently supported.)

Managing NG-bridge (Digest Data) Updates for Code Insight

The NG-bridge module delivers digest-match data to Code Insight that is used to perform exact matching by the scanner. NG-bridge is Code Insight's next generation bridge solution that complements the Compliance Library (CL) with digest-match data beyond that provided in CL 2.43. The NG-bridge component is included with Code Insight and is a separate module that runs along-side the product to support "exact match" functionality.

Background

During exact-file matching, the scanner compares each scanned codebase file with the data set across the CL and NG-bridge and reports on any exact matches to open-source software (OSS) files or third-party files in the collection. This matching process compares the MD5s of codebase files against the MD5s stored in the CL and the NG-bridge index for OSS or third-party files.

Automatic Updates Managed by an Internal Update Facility

Starting with the 2020 R4 release, Code Insight began support for a secondary data source for digest matches as an overlay to the data in the CL. Updates to the second data source (NG-bridge) are planned on a regular basis and will keep the MD5 data for exact-file matching up to date. Each NG-bridge data update release is incremental, providing only changes since the last update release. During a Comprehensive scan, the MD5 of a codebase file is checked against both the CL and the NG-bridge index to search for a match. If a match is found in any location, it is recorded in the Analysis Workbench as evidence.

Code Insight provides an internal NG-bridge data update facility that automatically checks for, downloads, and processes update releases on your machine at a regularly scheduled time.

If your site does not have Internet access, Code Insight offers a manual download option for the NG-bridge data update releases. After you have downloaded the update files, the internal update facility will process these files at the next scheduled update time. (Without Internet access, automatic NG-bridge downloads will continue to trigger at the scheduled time but fail with an error message. These attempts do not impact your system nor the processing of the files you have manually downloaded.)

By default, the NG-bridge data update facility is initially disabled. To enable it so that you can obtain NG-bridge data updates, follow the procedure described in Enabling/Disabling NG-bridge Data Updates. (If you do not have the CL installed or are not performing exact-file matching, you can keep the facility disabled.) Once enabled, the facility can always be disabled as necessary for your site.

Configuring the Update Process for Your Site

The following procedures can be used to configure NG-bridge data updates for your site:

- Changing the Scheduled Time for NG-bridge Data Updates
- Enabling/Disabling NG-bridge Data Updates
- Downloading NG-bridge Data Updates Releases Manually

Changing the Scheduled Time for NG-bridge Data Updates

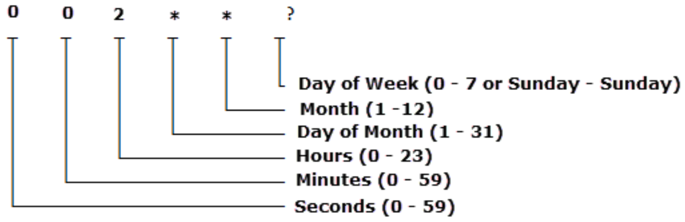
By default, the NG-bridge is configured to check for updates daily at 2 am. However, the Code Insight System Administrator or the database administrator can use the following procedure to change this scheduled time to suit your site's requirements.

Task ***To change the scheduled time NG-bridge data updates, do the following:***

1. Open the `<codeInsightInstallPath>\config\scanEngine\ngbridge.properties` file.
2. Change the current `bridge.cronexpression` property to reflect the new time. The following shows the default value, which triggers a daily CL update process at 2 am:

    ```
    bridge.cronexpression= 0 0 2 * * ?
    ```

    This diagram defines the parts of the cron expression representing **2 am** to help you understand how to set the value you want:



Enabling/Disabling NG-bridge Data Updates

The Code Insight System Administrator or the database administrator can use these procedures to enable or disable the internal NG-bridge data update facility that downloads and processes the updates. By default, this update facility is initially disabled. Your site does not need to enable the facility if the scans at your site do not perform exact-file matching or if the CL is not installed.

Enabling NG-Bridge Data Updates

The Code Insight System Administrator or database administrator can use this procedure to enable the NG-bridge data updates to establish the automatic download and processing of the digest-match data used by Code Insight.

Task ***To re-enable internal NG-bridge data update facility, do the following:***

In the PAS_GLOBAL_PROPERTIES table in the Code Insight database, change the `enable.ngbridge` property to `true`.

Disabling the NG-Data Bridge Updates

This procedure disables the internal NG-bridge data update facility. Disablement might be necessary to control the cadence at which digest match data is updated in Code insight or to accommodate changes in your site's scan requirements (for example, exact-file matching is no longer used during scans).

Important ▪ *If you intend to manually download the NG-bridge data updates, do not disable the internal NG-bridge data update facility. You will still need to have this facility enabled to process the manually downloaded data file for digest-match data.*

Task ***To disable internal NG-bridge data update facility, do the following:***

In the PAS_GLOBAL_PROPERTIES table in the Code Insight database, change the `enable.ngbridge` property to `false`.

Downloading NG-bridge Data Updates Releases Manually

If the Code Insight Scan Server does not have Internet access, you can use the following procedure to manually download the files for the NG-bridge digest-match data updates to the proper location on the server. Once the files are downloaded and properly placed on your instance, the NG-bridge data update can be processed.

Task ***To download the NG-bridge data update files manually and initiate processing, do the following:***

1. From a machine that has Internet connectivity, open the Flexera Product and License Center.
2. Locate the `ngdownloader-1.0.0.zip` file under the current Code Insight version, and download the appropriate archive format (Linux or Windows).

3. Extract the archive to any location. However, if want to download the actual NG-bridge data update files to this same location, make sure the location is locally accessible to the Code Insight server—for example, on a shared drive or a local USB drive. (You also have the option to change the download location in step 4.)

   The following files are included in the archive:

   - `ngdownloader-1.0.0.jar`
   - `run.sh` (or `run.bat`)

4. Set up the `run` script to download the files for the NG-bridge data update. Use any of the following arguments to configure the download. When including arguments, use the format shown in this example:

   ```
   run.bat file.download.path=custompath delete.previous.downloads=true
   ```

Table 3-2 ▪ Arguments for Script Used to Download NG-Bridge Data Update Files

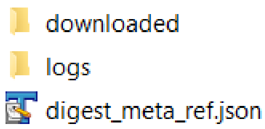
	Argument	Description
Argument with defaults	Explicitly providing the following arguments is optional. If the argument is omitted, its default is used during execution.	
	delete.previous.downloads	The `true` or `false` boolean for deleting any previously downloaded NG-bridge data update files found in the location specified by `file.download.path`. The default for this argument is `false` so that these files are retained. If you choose to delete previously downloaded update files, note that the `diget.meta.ref.json` is always retained.
Argument with defaults (continued)	file.download.path	The path identifying the location to which to download the NG-bridge data update files. The path should be relative to the current location and must be locally accessible to the Code Insight server, such as on a shared drive or a local USB drive. The default for this argument is a “downloads” folder in the current location (that is, the location which you extracted the `ngdownloader.jar` and `run` script files).
	update.https.url	The URL for the Revenera site (`https://updates.palamida.com/`) from which the NG-bridge data update files will be downloaded. Best practice is to omit this argument so that the correct Revenera location defaults for command.
Required credentials	You must enter a value for each of the following credentials to access the Revenera URL.	
	update.https.username	The user ID authorized to connect to the Revenera site.
	update.https.password	The password authorized to connect to the Revenera site.

Table 3-2 ▪ Arguments for Script Used to Download NG-Bridge Data Update Files (cont.)

	Argument	Description
Arguments when using a proxy	You must enter value for each of the following arguments if you are using a proxy server to access the Revenera site from which the NG-bridge data update files will be downloaded.	
	Dhttps.proxyHost	The hostname or IP address of the proxy server.
	Dhttps.proxyPort	The port used by the proxy server.
	Dhttps.proxyUser	The user ID authorized to access the proxy server.
	Dhttps.proxyPassword	The password authorized to access the proxy server.

5. Execute the run command.

   The following folders and files are created in the download path you specified.



downloaded
logs
digest_meta_ref.json

- **digest_meta_ref.json**—Used to determine which NG-bridge data update files need to be downloaded. Only files for new or missing updates are downloaded. Previous updates are not re-downloaded. Once all appropriate update files have been downloaded, the contents of the digest_meta_ref.json file are updated with the current list of all update releases that have been downloaded to this location up to this point. This same file is then used again to determine what new updates need to be downloaded in the next update process.
- **downloaded**—The folder containing all the NG-bridge data update files downloaded during the run script execution. You can use the file.download.path argument in the run command to change this folder name (or the entire URL or path) for the download.
- **logs**—The folder containing the log files generated during the download process.

6. Once the download is complete, copy the contents of the “downloaded” folder to the following location:

```
<codeInsightInstallPath>\tomcat\temp\ngbridge_updates\meta
```

   At the next scheduled time for an NG-bridge data update, the internal update facility determines that update files have been downloaded and processes the files so that their data is ready to be used with the CL during Comprehensive scans.

Configuring an Email Server

Code Insight can send email alerts that are triggered by certain events. For example, when a scan completes or when a new vulnerability is detected in the project inventory. It is highly recommended that the email server configuration be set up for the application. Email server configuration is available in Code Insight in the Administration tabs. This section provides the procedure for configuring email.

Task ***To configure your email server, do the following:***

1. On the **Code Insight Dashboard**, click **administration**. The **Administration** page appears with a list of side tabs.
2. Select the **Email Server** tab.
3. Enter information and make selections in the fields:
    - **Enable Email Server**—Select **Yes** to enable Code Insight to use the email server or **No** to leave it disabled. The default is **No**. The rest of the fields on this page are not available until you select **Yes**.
    - **Sender's Email Address**— Enter the email address of the sender.
    - **SMTP Host Name**—Enter the SMTP hostname.
    - **SMTP Host Port**—Enter the port number of the SMTP host.
    - **SMTP User Name**—Enter the SMTP user name. This field can be left blank for anonymous SMTP configuration.
    - **SMTP User Password**—Enter the SMTP user password. This field can be left blank for anonymous SMTP configuration.
    - **Enable SMTP over TLS**—Select **Yes** to use Transport Layer Security (TLS) to secure email over SMTP or select **No** to leave this option disabled.
4. Click **Save** to save your settings.

Configuring Code Insight for LDAP

Code Insight supports user authentication and authorization through LDAP (Lightweight Directory Access Protocol). The following topics describe how to configure the synchronization of user identification data from LDAP to Code Insight and thus enable LDAP user authentication for Code Insight:

- Synchronizing User Identification Data
- About the LDAP Directory Structure
- Setting Up a User Search
- Implementing LDAP in Code Insight
- LDAP Tab Field Descriptions

Synchronizing User Identification Data

Code Insight provides the ability to import user identification data from LDAP. This section explains the type of user identification data that is imported.

- User Metadata
- User Email Requirement

- Disabled Users

User Metadata

The metadata for each user (name, email, and so forth) is pulled from LDAP and refreshed in the Code Insight database at a regular frequency via a scheduler module running within Code Insight. The data synchronization is a one-way pull from LDAP into the Code Insight database. This action overwrites the existing data in the database. User data for those users that do not exist in LDAP is not affected by this process.

The LDAP passwords for users are not stored the Code Insight database. All user authentication occurs on the LDAP server once a user enters a user name and password to access Code Insight.

User Email Requirement

Code Insight requires that all users have an email address. Therefore, only those users with a valid email address specified as a user attribute on the LDAP server will be synchronized. For more information, see LDAP Search Query.

Disabled Users

Users who are disabled in Code Insight will still have their data synchronized with LDAP, but will have the disabled flag set to “true” and will not be granted access to the application.

About the LDAP Directory Structure

An LDAP server stores attribute-based data in a hierarchical branching structure called a Directory Information Tree (DIT). A DIT can contains a broad range of information about different type of data objects, including users, account groups, and resources such as printers or applications. The following topics provide insight into a DIT:

- DIT Hierarchy
- Sample Directory Information Tree
- Distinguished Name for an Object
- LDAP Base

DIT Hierarchy

DIT data is arranged in directory levels, some of which include:

- Domain component (DC) or organization (O)
- Organizational unit (OU)
- Common name (CN)

Before configuring Code Insight for LDAP, you are strongly recommended to understand the LDAP directory structure at your site. A complete description of possible LDAP directory hierarchies is beyond the scope of this document. Consult with your site's LDAP administrator for more information about your account's specific LDAP configuration and directory structure.

Sample Directory Information Tree

A typical LDAP directory structure can contain thousands of entries arranged in a complex structure. An example of a DIT is illustrated here. In the example, the DIT contains 4 levels of entries, including 2 domain components, 2 organizational units, and 8 common names (3 of which are groups and 5 of which are users).

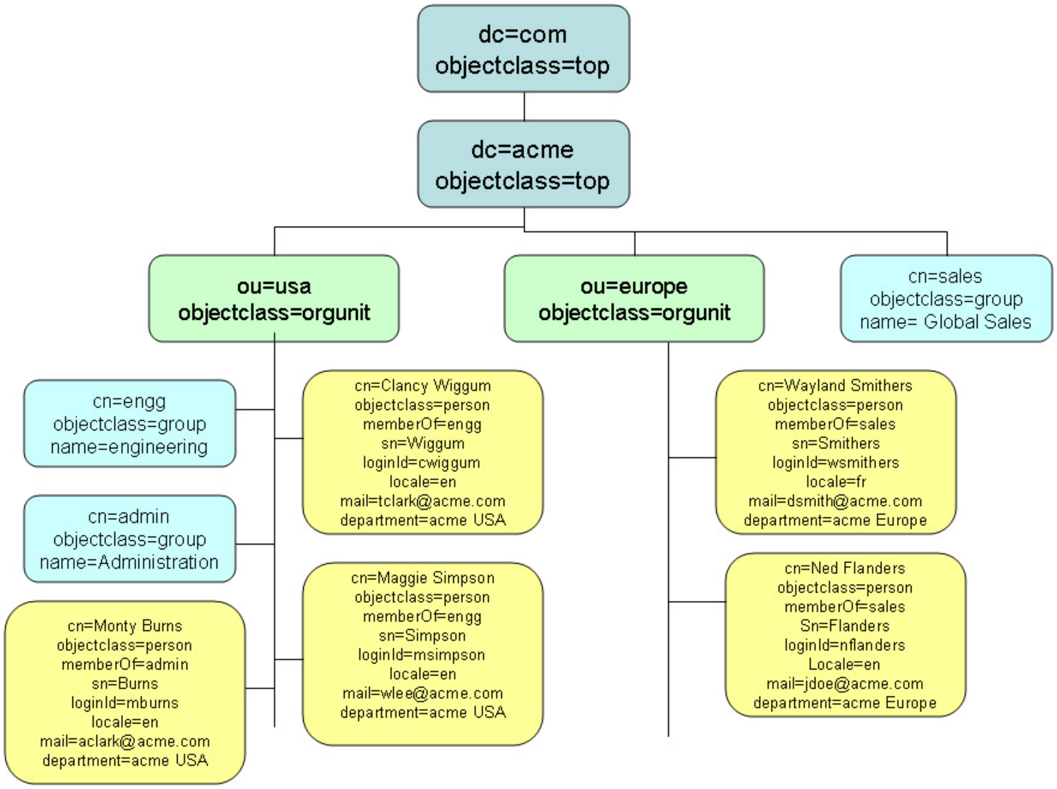


Figure 3-1: Example DIT in LDAP

Distinguished Name for an Object

Every object in the LDAP directory structure has a unique path to its place in the directory. This path is the object's Distinguished Name, or DN. For example, based on the example DIT in Figure 2-1, the DN for the organizational unit "usa" is the following:

```
OU=usa,DC=acme,DC=com
```

The DN for the user "Monty Burns" is the following:

```
CN=Monty Burns,OU=usa,DC=acme,DC=com
```

The DN for the group “engg” is the following:

```
CN=engG,OU=usa,DC=acme,DC=com
```

The DN can contain spaces within an attribute value and between attributes (for example, after the comma separating two attributes).

LDAP Base

The **LDAP** tab on the **Administration** page provides the **LDAP Base** field to identify the Distinguished Name (DN) of the base domain for LDAP synchronization at your site.

The LDAP base domain is the top-level directory to which all other objects in your LDAP directory belong. In essence, the base domain represents your organization. This directory is identified by domain components (DCs), which make up its Distinguished Name (DN). For example, based on the example DIT in Figure 2-1, you would enter the following DN in the **LDAP Base** field as the base domain for the Acme organization:

```
DC=acme,DC=com
```

In some cases, sub-domains are set up in the LDAP directory structure. For example, the Acme organization might have two major divisions, Hardware and Software (not shown in the example), identified as sub-domain components in the directory structure. If Code Insight synchronizes with the Software sub-domain only, the DN for the LDAP base would be the following:

```
DC=software,DC=acme,DC=com
```

Setting Up a User Search

To synchronize only Code Insight users in LDAP to Code Insight, you must set up a user search query that retrieves the users to synchronize from the LDAP server. This process involves properly configuring the **LDAP Base** (described previously in LDAP Base), the **LDAP Search Base**, and **LDAP Search Query** fields on the **LDAP** tab on the **Administration** page. The following topics provide more information about these components used to set up the query:

- LDAP Search Base
- LDAP Search Query

LDAP Search Base

The **LDAP Search Base** value is typically the directory, relative to the LDAP base directory, under which you store all Code Insight objects on the LDAP server. For example, based on the example DIT in Figure 2-1, the **LDAP Search Base** value might be the following, which searches for Code Insight objects belonging only to the “usa” organizational unit under the LDAP base:

```
OU=usa
```

LDAP internally identifies the Distinguished Name, or DN, for the LDAP search base as the **LDAP Base + LDAP Search Base** value. In this example, LDAP recognizes the DN for the search base as `OU=usa,DC=acme,DC=com`.

As another example, to search for all Code Insight objects in the “usa”, “europe”, and “sales” organizational units, you would leave the **LDAP Search Base** field blank so that your search base defaults to the **LDAP Base** directory. In this case, LDAP recognizes the search base as `DC=acme,DC=com`.

If you leave this field blank, the search is performed at the LDAP base level.

LDAP Search Query

The **LDAP Search Query** uses one or more user attributes to define a subset of the LDAP search base directory; and only the users in this subset are synchronized with Code Insight. Best practice is to create a DIT object in the search base directory, such as a group, that is specific to Code Insight and then make all Code Insight users a part of that object.

Important ▪ *Code Insight requires that all users have a valid email address. Even if users meet all the criteria of the LDAP search query, only those users with a valid email address specified as a user attribute on the LDAP server will be synchronized. Consequently, ensure that all Code Insight users have their email address assigned to this attribute on the server and that, on the* ***LDAP*** *tab, you have designated the correct label for the attribute as defined on the server (see the "Email" field description in LDAP Tab Field Descriptions).*

The following topics describe more about defining the user search query:

- Sample Search Query
- Sub-tree Search
- Server Paging

Sample Search Query

LDAP search query is entered in the **LDAP Search Query** field on the **LDAP** tab. This query is used to search the **LDAP Search Base** directory on the LDAP server to retrieve only those users that you want to synchronize to Code Insight. Each attribute in a query is listed in parenthesis in the format (*attribute*=*value*).

For example, based on the sample DIT described in the previous section, suppose all (and only) Code Insight users belong to the "usa" organizational unit. The **LDAP Search Base** node should then be set to `usa`; and the following query can be used for **LDAP Search Query** to retrieve and synchronize users (entities with the object class of "person") to Code Insight:

```
(objectClass=person)
```

However, suppose that Code Insight users are only those users belonging to the "engineering" group under the "usa" node. The following query can then be used to retrieve and synchronize the appropriate users to Code Insight:

```
(&(objectClass=person)(memberOf=CN=engg,OU=usa,DC=acme,DC=com))
```

Although `objectClass` and `memberOf` are the most commonly used filters, a query can filter objects by other attributes, such as "department" in the following example:

```
(&(objectClass=person)(department=acme USA))
```

Sub-tree Search

The **Search Sub-tree** option on the **LDAP** tab controls whether to enable deep searches through subtrees of the path defined by **LDAP Base** + **LDAP Search Base**. While helpful in locating users in certain cases, a deep search can negatively affect performance (and therefore, by default, is not enabled).

Subtree examples in the DIT in Figure 2-1 are the organizational units “usa” and “europe” belonging to `DC=acme,DC=com`. Suppose that the “usa” subtree also has a subtree called “California” (not shown in the example), which contains users. If the **LDAP Base** is `DC=acme,DC=com` and the **LDAP Search Base** is `usa`, the following would occur when a query is executed, depending on the status of the **Search Sub-tree** option:

- If the option is enabled, the query searches for users in both the sub-tree “usa” (the search base) and its subtree “California”.
- If the option is disabled, the query searches for users in “usa” but not in its subtree “California”.

If a synchronization was previously run with the **Search Sub-tree** option enabled and is then run again with the option disabled, any users previously synchronized from subtrees under the base are assigned a “disabled” status. For example, suppose user “Monty Burns” belongs to “usa” (the search base) and “Karen Smith” belongs to “California” (a sub-tree of the base). When a synchronization is run with **Search Sub-tree** enabled, both “Monty Burns” and “Karen Smith” are synchronized and are active. However, if the option is then disabled and another synchronization is run, both users are synchronized but only “Marty Burns” remains active; “Karen Smith” is flagged as “disabled”.

Users who are not LDAP users are not affected by this option. See also Disabled Users.

Server Paging

LDAP and Active Directory support server paging controls the number of records the system is pulling at any given time. Configure the **LDAP Page Size** entries as desired. The default page size is 1000.

Note *▪ SunOne Directory Server does not support server paging in certain releases http://kb.globalscape.com/KnowledgebaseArticle10218.aspx. If you are using SunOne Directory Server, ensure that server paging is disabled.*

Implementing LDAP in Code Insight

This section explains the basic procedure for implementing LDAP in Code Insight. For detailed descriptions of the fields on the LDAP tab, see LDAP Tab Field Descriptions.

Task ***To configure Code Insight for LDAP, do the following:***

1. On the **Code Insight Dashboard**, click **administration**. The **Administration** page appears with a list of side tabs.
2. Select the **LDAP** tab.
3. Select **Yes** in the **Enable LDAP** field and then complete the remaining fields on the **LDAP** tab. See LDAP Tab Field Descriptions for descriptions of all the fields.
4. (Optional) Select **Test LDAP Server Connection** to ensure that Code Insight is properly connected to the LDAP server. The connection will be tested with the values displayed in the fields on the **LDAP** tab.
5. Do either:
    - Select **Save** to save the LDAP configuration.

- Select **Sync Now** to save your settings and synchronize Code Insight with user data from the LDAP server. If you do not select **Sync Now**, the user synchronization is performed at the time specified in the **LDAP User Sync Frequency** field.

LDAP Tab Field Descriptions

The **LDAP** tab on the **Administration** page enables LDAP user authentication for Code Insight. The tab contains the following columns and fields:

Table 3-3 ▪ LDAP tab Field Descriptions

Section	Column/Field	Description
[LDAP enablement]	This option enables the use of LDAP for your Code Insight system. When LDAP is enabled, the settings used to configure Code Insight for LDAP are made available for editing on this tab. You can use this option to turn off LDAP whenever necessary.	
	Enable LDAP	Select **Yes** or **No** to determine if LDAP will be used for user authentication. The default is **No**.
LDAP Connection Details	These settings configure the Code Insight connection to the LDAP server. This connection is required for each synchronization process of LDAP user information to Code Insight and for authentication each time a user logs into Code Insight.	
	LDAP URL	Specify the URL of the LDAP server in the following format: `ldap://<ldap_server_host>:<ldap_port>` where `<ldap_server_host>` is either the hostname or IP address of the LDAP server; and `<ldap_port>` is the port on which the server listens for requests. The following is an example URL, which uses the default LDAP server port 389: **`ldap://acme.com:389`** If using SSL to provide data encryption security for user information passed over the network, specify the `ldaps://` protocol with the port 636, which is the default dedicated port for SSL: **`ldaps://acme.com:636`** ***Note ▪*** *When the LDAP directory service is Active Directory, requests from users located outside the global catalog's base domain will fail to authenticate if you use the port specified above. This occurs because requests sent to the default LDAP port 389 (or 636 if SSL is used) search for objects only within the global catalog's base domain. To authenticate users from outside the base domain, change the LDAP port to 3268 (or 3269 if SSL is used). Requests sent to this port search for objects in the entire forest.*

Table 3-3 ▪ LDAP tab Field Descriptions (cont.)

Section	Column/Field	Description
LDAP Connection Details (continued)	**Authentication Type**	Select the type of LDAP authentication used to establish a connection with the LDAP server: ● **Anonymous**—Code Insight will establish a connection with the LDAP server without the use of user credentials. (When this option is selected, the **LDAP Username** and **LDAP Password** fields in this section are disabled.) This authentication type is generally used for testing purposes. ● **Authenticated**—Code Insight requires the user credentials provided in the **LDAP Username** and **LDAP Password** fields to authenticate and establish a connection with the LDAP server.
	LDAP Username	Depending on your LDAP setup, enter either of the following to identify the user used connect to the LDAP server: ● The user's login ID, such as `mburns` ● The user's Distinguished Name (DN), such as: `CN=Monty Burns,OU=usa,DC=acme,DC=com` For more information about providing the DN, see Distinguished Name for an Object. This identification, along with the associated password (see the next field), is used to authenticate the connection to the LDAP server. Note that the user must have READ permissions to query the LDAP server (and therefore does not need to be an LDAP administrator). This field is disabled if **Anonymous** is selected for **Authentication Type**.
	LDAP Password	Enter the password associated with the user specified for **LDAP Username**. This field is disabled if **Anonymous** is selected for **Authentication Type**.
LDAP Query Details	The following fields define the query that identifies the subset of users on the LDAP server to be synchronized to Code Insight. This query is used for the initial synchronization process and for each subsequent synchronization performed per the **LDAP User Sync Frequency** value.	

Table 3-3 ▪ LDAP tab Field Descriptions (cont.)

Section	Column/Field	Description

LDAP Query Details (continued)	**LDAP Base**	Specify the Distinguished Name (DN) of the LDAP base domain in the Directory Information Tree (DIT) on your LDAP server. This domain is the top-level directory to which all other objects in the directory structure belong; it typically represents your organization. The base domain is identified by domain components (DCs), which make up its DN. For example, the base domain in the example DIT in Figure 2-1 is the following:
		`DC=acme,DC=com`
		In some cases, a sub-domain can be a part of the base domain:
		`DC=software,DC=acme,DC=com`
		For more information, see LDAP Base.

	LDAP Search Base	Specify the DIT directory, relative to the LDAP base directory, under which you store all Code Insight objects on the LDAP server and from which you search for Code Insight users. In reference to the example DIT in Figure 2-1, if you enter `OU=usa` for the search base, all searches for user information will be performed below the directory “usa”. (LDAP internally identifies the DN for this directory as the **LDAP Base** + **LDAP Search Base** value.) For more information, see LDAP Search Base. If you leave this field blank, the search is performed at the LDAP base level.
	LDAP Search Query	Specify the search query used to retrieve the users from **LDAP Search Base** directory to synchronize to Code Insight. Each attribute in a query is listed in parenthesis in the format (*attribute=value*), such as in the following, which searches for only those users belonging to the “engineering” group under the “usa” node: `(&(objectClass=person)(memberOf=CN=engg,OU=usa,DC=acme,DC=com))` For other search query examples, see LDAP Search Query.
	Use Paging	Select **Yes** if the LDAP server has paging enabled for synchronization results. If you select **Yes**, the **LDAP Page Size** field is enabled, enabling you to customize the page size. Select **No** if the server does not have paging enabled. If you select **No**, the server sends 1000 elements per page by default unless this behavior is changed at the organization level on the LDAP server.
	LDAP Page Size	Indicate the page size you want for the synchronization results. The default page size is 1000 elements.

Table 3-3 ▪ LDAP tab Field Descriptions (cont.)

Section	Column/Field	Description
LDAP Query Details (continued)	**LDAP User Sync Frequency**	Specify the frequency at which Code Insight will synchronize user data with the LDAP server: ● **Never**—Select this option to disable the automatic user synchronization. A synchronization occurs only if the user clicks the **Sync Now** button. For all other values, automatic user synchronization is enabled per the configured frequency. (This is the default value.) ● **Hourly**—Enter an integer value representing the number of hours between user synchronizations. ● **Daily**— Select a time at which the user synchronization will run every day. ● **Weekly**—Select a day of the week and a time of the day when the user synchronization will run each week.
	Search Sub-tree	Select this checkbox to enable deep searches through the subtrees of the path defined by **LDAP Base** + **LDAP Search Base**. Note that, while helpful in locating users in certain cases, a deep search can negatively affect performance (and therefore, by default, is not enabled). For more information, see Sub-tree Search.
LDAP User Property Mappings	The following information maps LDAP attribute labels to their corresponding labels in Code Insight (the field names shown below). These mappings are used for LDAP synchronization to Code Insight and for user authentication each time a user logs into Code Insight.	
	Login	Enter the user attribute label on your LDAP server corresponding to the user **Login** field in Code Insight. This is the same attribute that the user will use to log into Code Insight.
	First Name	Enter the user attribute label on your LDAP server corresponding to the user **First Name** field in Code Insight.
	Last Name	Enter the user attribute label on your LDAP server corresponding to the user **Last Name** field in Code Insight.
	Email	Enter the user attribute label on your LDAP server corresponding to the user **Email** field in Code Insight. ***Note ▪*** *Only those users with a valid email address specified as a user attribute on the LDAP server will be synchronized. Therefore, ensure that you have entered the correct label here for the email attribute on your LDAP server and that each user has valid email for this attribute on the server. See LDAP Search Query for more information.*

Table 3-3 ▪ LDAP tab Field Descriptions (cont.)

Section	Column/Field	Description
LDAP User Property Mappings (continued)	**Login Filter**	Specify a filter for the user-login search performed in the LDAP search base location. For example, the value `(sAMAccountName={0})`, when used against the **LDAP Search Query** results, searches for each entry where the `sAMAccountName` is equal to the user login name.

Configuring Code Insight to Use Single Sign-On

Single sign-on (SSO) is an authentication service that enables a user to use one set of credentials (usually a name and password) to access multiple applications. This service involves an exchange of SAML (Security Assertion Markup Language) protocol messages between the user, the identity provider, and the service provider.

The Identity Provider (also called an IdP) is any SSO service, such as Okta, Ping Federate, and others, offering SAML authentication services. The Service Provider (also called an SP) is an application, such as Code Insight, that is configured to participate in the SSO service. When a Service Provider user logs in using credentials for an SSO session, a SAML message is sent to the Identity Provider, requesting user authentication. If the user password is valid, the Identity Provider returns a SAML message, stating that the user is logged in at the Identity Provider. The user, in turn, is logged into the Service Provider.

A Code Insight System Administrator can configure Code Insight as a Service Provider in an SSO session. The following sections provide instructions for doing so:

- Prerequisite Tasks for Configuring Code Insight for SSO
- Configuring Code Insight for SSO
- Log In Using SSO Credentials

Prerequisite Tasks for Configuring Code Insight for SSO

Perform the following tasks before configuring Code Insight for SSO:

- Configure HTTPS on the Code Insight Server
- Set Up SSO Users

Configure HTTPS on the Code Insight Server

The HTTPS communication protocol must be used to exchange SAML messages between the SP and IdP. For instructions on configuring HTTPS on the Code Insight server, see Enabling Secure HTTP Over SSL in the “Installing Code Insight” chapter.

The keystore that you use to configure HTTPS can be used for SSO configuration. Alternatively, you can create a separate keystore for SSO, using the same instructions found in Enabling Secure HTTP Over SSL.

Set Up SSO Users

You can define SSO users for Code Insight with or without LDAP.

With LDAP

If you intend for SSO to integrate with your LDAP server for user access to Code Insight, follow these rules:

- Make sure that Code Insight and the Service Provider are configured for the LDAP server. For instructions to configure Code Insight, see Configuring Code Insight for LDAP.

  To configure the Service Provider, follow the Service Provider instructions.
- When setting up users on the LDAP server, ensure that the user's login is the user's email address.
- Synchronize users from the LDAP server to the Identity Provider first, using the Identity Provider's instructions. Then synchronize the users from the LDAP server to Code Insight. See Configuring Code Insight for LDAP.

Without LDAP

If you do not use LDAP, you must manually create the SSO users both in Code Insight (see Managing Users) and at the Identity Provider site, ensuring that the user information is the same in both locations.

Ensure that the user's login is the user's email address.

Configuring Code Insight for SSO

Follow these steps for configuring Code Insight for SSO:

- Step 1: Copy the Directory That Will Contain Provider Metadata
- Step 2: Prepare the Environment Properties File
- Step 3: Configure the SSO Common Properties File
- Step 4: Customize the Sample Service Provider Metadata File
- Step 5: Obtain the Identity Provider Metadata File

Note that, in these instructions, `SCA_install_home` refers to the Code Insight installation location.

Step 1: Copy the Directory That Will Contain Provider Metadata

Copy the `security` directory from `SCA_install_home/samples/sso/config/core` to `SCA_install_home/config/core`.

This directory will serve as the storage location for the Service Provider and Identity Provider metadata files, as described in Step 4: Customize the Sample Service Provider Metadata File and Step 5: Obtain the Identity Provider Metadata File.

Step 2: Prepare the Environment Properties File

This step prepares the `env.properties` file to enable SSO on the Code Insight server.

Task ***To prepare the "env.properties" file, do the following:***

1. Copy the `env.properties` file from *SCA_install_home*/samples/sso/config to *SCA_install_home*/config/core.
2. In a text editor, open the *SCA_install_home*/config/core/env.properties file, and ensure that the value of the following property to **sso**.

   ```
   spring.profiles.active=sso
   ```

3. Save the file.

Step 3: Configure the SSO Common Properties File

This step configures the `core.sso.common.properties` file to enable SSO on the Code Insight server.

Task ***To prepare the "core.sso.common.properties" file, do the following:***

1. Copy the `core.sso.common.properties` file from *SCA_install_home*/samples/sso/config to *SCA_install_home*/config/core.
2. In a text editor, open the *SCA_install_home*/config/core/core.sso.common.properties file. The following shows the file contents:

   ```
   ## this file contains all sso placeholder values.
   saml.keystore=file:///c:/<path>/keystore.jks
   saml.keystore.password=keysore_password
   saml.keystore.alias=keystore_alias
   saml.keystore.alias.password=keystore_alias_password

   # for extendedMetadata configuration
   saml.metadata.local=true
   saml.metadata.alias=
   saml.metadata.idpDiscoveryEnabled=false
   saml.metadata.idpDiscoveryURL=
   saml.metadata.idpDiscoveryResponseURL=
   saml.metadata.ecpEnabled=false
   saml.metadata.securityProfile=metaiop
   saml.metadata.sslSecurityProfile=pkix
   saml.metadata.sslHostnameVerification=default
   saml.metadata.signingKey=keystore_alias_password
   saml.metadata.signingAlgorithm=null
   saml.metadata.signMetadata=false
   saml.metadata.encryptionKey=keystore_alias
   saml.metadata.tlsKey=
   #private Set<String> trustedKeys=
   saml.metadata.requireLogoutRequestSigned=false
   saml.metadata.requireLogoutResponseSigned=false
   saml.metadata.requireArtifactResolveSigned=false
   saml.metadata.supportUnsolicitedResponse=true
   #for SP
   saml.entity.id=ww:xx:yy:zz
   saml.base.url=https://myhost.mycompany.com:8443
   ```

3. Update the properties (highlighted above) required for Service Provider security and identification, and then save the file. The properties that you need to edit or that require explicit configuration are described in this table:

SSO Property	Description
saml.keystore	Enter the path and name of the keystore that you created for SSO. This can be the same keystore that you are using for HTTPS or a different one. See Configure HTTPS on the Code Insight Server in the “Installing Code Insight” chapter for more information.
saml.keystore.password	Enter the password for the keystore.
saml.keystore.alias	Enter the alias defined for the private key contained in the keystore.
saml.keystore.alias.password	Enter the password for the private key alias.
saml.metadata.alias	Provide your metadata alias, if one exists; or leave this field blank (or enter `defaultAlias`) to use the default metadata alias.
saml.metadata.idpDiscovery URL	Leave this field blank. Do not enter `null`.
saml.metadata.idpDiscovery ResponseURL	Leave this field blank. Do not enter `null`.
saml.metadata.signingKey	Enter the password for the private key alias.
saml.metadata.encryptionKey	Enter the alias defined for the private key contained in the keystore.
saml.metadata.tlsKey	Enter the alias of private key generated for SSL/TLS client authentication, if one exists; or leave this field blank to use the default TLS key alias.
saml.entity.id	Enter a unique identifier for your Code Insight server as a Service Provider. The recommended value is the hostname for the Code Insight server. Note that, even though the server’s hostname is the recommended value, the entity ID is an immutable value identifying the Service Provider in an SSO session; it is not used to identify a location.
saml.base.url	The HTTPS URL handling the Service Provider’s user sign-in requests. This is usually the URL for your Code Insight server in `HTTPS://`*`myhost.mycompany.com`*`:`*`port`* format. Note that the default port for the Code Insight server is 8443.

Step 4: Customize the Sample Service Provider Metadata File

This step customizes the sample Service Provider metadata file for your Code Insight server.

Task ***To customize the sample Service Provider metadata file, do the following:***

1. In a text editor, open the *SCA_install_home*/config/core/security/SPMetadata.xml file.
2. Update the following properties, and save the file:

SSO Property	Description
entityID="*ENTITY_VALUE*"	Replace ENTITY_VALUE with the same entity ID as the one you provided the env.properties file in Step 2: Prepare the Environment Properties File.
SingleLogoutService...*FULLY_QUALIFIEDHOSTNAME*...	Replace *FULLY_QUALIFIEDHOSTNAME* with the fully qualified hostname of the Code Insight server.
AssertionConsumerService...*FULLY_QUALIFIEDHOSTNAME*...	Replace *FULLY_QUALIFIEDHOSTNAME* with the fully qualified hostname of the Code Insight server.
requestSigned	Set to true to indicate that the Service Provider must sign authentication requests.
wantAssertionSigned	Set to true to indicate that the Service Provider requires signed assertions received from Identity Provider.

Step 5: Obtain the Identity Provider Metadata File

This final step in setting up SSO for Code Insight is to obtain the Identity Provider metadata file. The Identity Provider might require that you send the Code Insight SPMetadata.xml file (set up in Step 4: Customize the Sample Service Provider Metadata File) in order to provide the Identity Provider metadata file.

Alternatively, you might be required to generate the Identity Provider metadata file using the Identity Provider UI. You will need to provide the single-sign-on URL for Code Insight (also specified in the SPMetadata.xml):

```
https://myhost.mycompany.com:8443/codeinsight/saml/SSO
```

Task ***To obtain the Identity Provider metadata, do the following:***

1. Follow the Identity Provider’s instructions for obtaining the Identity Provider metadata.
2. Once you obtain the Identity Provider metadata, save it as IDPMetadata.xml in the *SCA_install_home*/config/core/security directory.

Log In Using SSO Credentials

Once you complete the steps described in this section, Code Insight users defined as SSO users should be able to log in to an SSO session managed by the Identity Provider and obtain access to Code Insight.

Configuring Extended Logging

Code Insight integrates with the Splunk Enterprise to provide extended logging capabilities. Splunk has the ability to capture, index, and correlate real-time Code Insight log data in a searchable repository and, using this repository, generate graphs, reports, alerts, dashboards, and visualizations. These interpretations of log data enable you to identify operational and security issues quickly and efficiently.

For details on how to integrate Code Insight with Splunk, refer to the following KB article in the Revenera Community:

https://community.flexera.com/t5/FlexNet-Code-Insight-Customer/FlexNet-Code-Insight-v7-Integration-with-Splunk/ta-p/133655

Managing Scan Profiles

The following topics describe how to manage scan profiles:

- Creating or Editing Scan Profiles
- Scan Profile Fields
- Creating Exclusion Patterns for Scan Profiles

Creating or Editing Scan Profiles

A scan profile is a set of predefined scan settings that are grouped together and then applied at scan time. (To enable this application, the Project Administrator associates the scan profile with a project, as described in “Applying a Scan Profile to the Project” in the “Using Code Insight” chapter in the *Code User Guide*.)

Code Insight provides the following pre-defined scan profiles. (See Scan Profile Fields section for a summary of the scan functions included in each of these profiles.)

- **Basic Scan Profile (without CL)**—Defines a scan that uses Automated Analysis to detect evidence of open-source software (OSS) and third-party code in your codebase and generate an inventory of the findings. This scan does not perform exact-file or source-code matching and therefore does not use the Compliance Library (CL).
- **Standard Scan Profile**—Defines a scan that includes the basic scan features but also performs exact-file matching (that is, identifies codebase files that have an exact MD5 match in the CL). This scan requires the CL.

  ***Note ▪** This scan profile cannot be modified.*
- **Comprehensive Scan Profile**—Defines a scan that includes the basic scan features but also performs exact-file and source-code matching. (Source-code matches are strings in the codebase files that have an exact match to content in files in the CL). This scan requires the CL.

In most cases, the pre-defined scan profiles are enough to get started. However, if they do not meet your needs, you can create your own custom scan profiles. When a scan profile is created, the data from the Standard Scan Profile is copied, including any search terms and exclusions. However, you can update any of this information for the scan profile you are creating.

You can also edit information in existing scan profiles (except the Standard Scan Profile). Note the following:

- Scan profiles changes can result in costly rescans, especially when settings involved with source-code matching change. For details, refer to the “Rescanning Your Codebase” in the “Using Code Insight” chapter in the *Code User Guid*e.
- Scan profiles changes do not affect the current scan. Changes are applied to the next scheduled scan.

The following procedure describes how to create or edit a scan profile.

Task ***To create or edit a new scan profile, do the following:***

1. On the **Code Insight Dashboard**, click **administration**. The **Administration** page appears with a list of side tabs.
2. Select the **Scan Profiles** tab to open the list of existing scan profiles.
3. To create a new scan profile, click **Add Scan Profile** at the top of the list; to edit an existing scan profile, click the **Edit** icon in the **Actions** column of the profile entry. The **Create** (or **Edit**) **Scan Profile** dialog is displayed.
4. Complete the fields on the dialog. See the next section, Scan Profile Fields.
5. Click **Save** to save the scan profile.

Scan Profile Fields

The following table summarizes the function of each setting in the scan profile. It also indicates which scan settings are enabled for each pre-defined profile provide by Code Insight. For example, to view the settings enabled for:

- The **Basic Scan Profile (without CL)**, see the Basic column in the table.
- The **Standard Scan Profile**, see the Standard column.
- The **Comprehensive Scan Profile**, see the Comprehensive column.

Note *▪ The Comprehensive and Standard Scan Profiles rely on data stored in the Compliance Library (CL) to detect evidence for Exact Matches and Source Code Matches.*

Table 3-4 ▪ Scan Field Descriptions and Default Scan Profile Support

Field	Description	Basic	Standard	Comprehensive
Name	Enter or edit the profile name.	X	X	X

Table 3-4 ▪ Scan Field Descriptions and Default Scan Profile Support (cont.)

Field	Description	Basic	Standard	Comprehensive
Perform Package/ License Discovery in Archives	Select this option to have the Scan Server recursively perform package discovery and license detection within all archive files encountered in the project codebase. By default, this option is selected.	X	X	X
Dependency Support	Determine the level of dependency scanning to be performed by the Scan Server. The available options include: ● **No Dependencies**: Only top-level inventory items are reported without any dependencies. (Default) ● **Only First Level Dependencies**: Only first-level (or direct) dependencies are reported along with top-level inventory items. ● **All Transitive Dependencies**: All first-level and transitive dependencies are reported along with top-level inventory items. The Scan Server calls out to the relevant package management repository to obtain transitive dependency information. For a description of Code Insight dependency support for supported ecosystems, see the “Automated Analysis” chapter in the *Code Insight User Guide*.	X	X	X
Automatically Add Related Files to Inventory	Select this option to have the system associate additional files to existing inventory items based on the data available in automatic detection rules.	X	X	X

Table 3-4 ▪ Scan Field Descriptions and Default Scan Profile Support (cont.)

Field	Description		Basic	Standard	Comprehensive
Rescan Options	By default, when a user initiates a regular rescan (that is, not a forced full rescan), only those files that have changed since the last scan are scanned. However, certain Code Insight events that have occurred since the previous scan can result in a rescan of all files (a full rescan). For a description of these events, see “Default Scan Behavior” in the *Code Insight User Guide*. These options are used to override this default rescan behavior so that, even if any of the events that would normally call for a full rescan have occurred, all rescans will skip unchanged files and scan changed files only.				
	Do not rescan files that have not changed since previous scan	Select this option so that rescans always skip unchanged files and scan only those files that have changed since the last scan (even if events have occurred since the last scan that call for a full rescan).			
	Apply this option to:	If the **Do not rescan files...** option is selected, further clarify *which* unchanged files to skip during the rescan: ● All unchanged files ● Only unchanged files marked as reviewed ● Only unchanged files associated with inventory ● Only unchanged files that are both marked as reviewed and associated with inventory			
Exact Matches	Select this option to enable the detection and recording of scanned files that exactly match MD5 digest data in the Compliance Library (CL) and in the NG- bridge data update indexes (see Managing NG-bridge (Digest Data) Updates for Code Insight).			X	X
Source Code Matches	Select this option to enable the detection and recording of any source-code snippets in the scanned files that match data in the Compliance Library (CL).				X
	Include System-Identified Files	Select this option if you want the Scan Server to perform source-code matching for files that have already been associated with one or more inventory items during automated analysis.			X
	Include Files with Exact Matches	Select this option if you want the Scan Server to perform source-code matching for files that have already been identified as having exact-file matches in the CL.			X

Table 3-4 ▪ Scan Field Descriptions and Default Scan Profile Support (cont.)

Field		Description	Basic	Standard	Comprehensive
Source Code Matches (continued)	**Minimum Source Code Matches**	Enter the minimum number of source-code matches that the scan needs to detect in a given codebase file before reporting the file as having such matches. (A *source-code match* is a snippet of code in a codebase file that matches an open-source code snippet found in the CL data.) Enter a new minimum value from 1 to 32767. (The default is 3.) For example, if this value is increased to `10`, ten code snippets in a given codebase file must match data in the CL before the scan reports the file as having source-code matches. In general, the higher this value, the fewer source-code matches an analyzer has to review.			X
Search Terms		Provide a list of search terms to be used in the scan. Use the **+** button to add a term and the **-** button to remove a term.	X	X	X
Scan Exclusions		Provide a list of file extensions to be excluded from the scan. Use the **+** button to add an exclusion term and the **-** button to remove an exclusion. Also see Creating Exclusion Patterns for Scan Profiles.	X	X	X

Creating Exclusion Patterns for Scan Profiles

Code Insight provides the ability to create exclusion patterns for use in your scans and to add them to your scan profile in **Create** (or **Edit**) **Scan Profile** page. This section provides information about the syntax required when creating exclusion patters and examples of valid exclusion patterns.

Code Insight uses Apache Ant path-style syntax to exclude files during scanning. Patterns are paths that are relative to a base directory. Only files found in or below the base directory are considered for exclusion. For in-depth information about *ant* exclusion patterns, see `https://ant.apache.org/manual/dirtasks.html`.

***Note ▪** Exclusion patterns are not validated.*

Using the Single Asterisk (*) and Question Mark (?)

Using a single asterisk (*) matches zero or more characters in a single file name or directory name. Using the question mark (?) matches one character.

If you create an exclusion pattern of **`*.xml`**, and add it to the list of **Scan Exclusions**, your scan will exclude files such as `x.xml`, `FooBar.xml`, and `codeinsight.xml`, but not `codeinsight.jar` because it does not end with `.xml`. In other words, `codeinsight.jar` will display in scan results (if it is in your codebase) because it does not match **`*.xml`**.

If you add the exclusion pattern **`aa/*`**, your scan will exclude files such as `aa/x.xml` or `aa/bb` but will include `aa/bb/x.xml` because it does not match **`aa/*`**. That is, the * can match only a single name—that of a directory (one directory deep) *or* a file— not both names, as in `bb/x.xml`, which includes a directory name (`bb`) and a file name (`x.xml`).

If you create an exclusion pattern of **`?.codeinsight`**, your scan will exclude files such as `x.codeinsight` and `A.codeinsight`, but will include `xx.codeinsight` or `aaa.codeinsight` because neither has just one character before `.codeinsight`.

Note ▪ *You can combine asterisks (*) and question marks (?) in your exclusion patterns.*

Using Double Asterisks

Double asterisks (**) span multiple directory paths. If you create an exclusion pattern of **`**/codeinsight`**, the files in the `aa/bb/cc/codeinsight` directory structure will be excluded from the scan.

Example Exclusion Patterns

The following shows some example patterns used to exclude files from scans.

Table 3-5 ▪ Example Exclusion Patterns

Example Pattern	Description
`**/SVN/*`	Excludes all the files in the `SVN` directories that are located anywhere in the directory tree (for example, `SVN/Repository` and `apache/SVN/Entries`). However, `org/apache/SVN/foo/bar/Entries` will be included in the scan because the `/foo/bar/Entries` component is not matched by `/*`, which represents only a single directory name (one directory deep) or a single file name.
`/ePortal-2.0/src/**`	Excludes all the files in the `/ePortal-2.0/src/**` directory tree (for example, `/ePortal-2.0/src/index.html` and `/ePortal-2.0/src/test.xml`). However, `/ePortal-2.0/xyz.java` will be included in the scan because the `/src` component is missing.
`**/images`	Excludes all files in `images` directories located anywhere in the directory tree. The exception to this pattern is `**/.git`. See Note About Excluding the .git Directory from Scans for more information.

Keep the following in mind as you specify exclusion patterns:

- If a pattern ends with / or \, double asterisks (**) are appended. For example, `codeinsight/data/` is interpreted as `codeinsight/data/**`.
- Exclusion patterns are not validated by Code Insight. You must test your patterns externally.

Note About Excluding the .git Directory from Scans

Basically, the configuration file (`config` or `gitconfig`) contained in a `.git` directory for a Git repository is always scanned—and is the only file scanned—whether or not you exclude the `.git` directory from scans. The following explains this behavior:

- If you add the `.git` directory to the **Scan Exclusion** list to prevent it from being scanned, the configuration file contained in the folder is still scanned because it is required by Automated Analysis to detect components in the Git repository.
- If the `.git` directory is not included in the **Scan Exclusion** list (that is, you intend for the files in the `.git` directory to be scanned), the configuration file is scanned, but no other files in the directory are scanned. Scans ignore the remaining files in the directory because they contain data that is not required in the detection of components and evidence in the Git repository—data such as the repository's commit history as well as its log information and metadata.

Enabling Calculation of SHA-1 Digests for Scanned Files

Code Insight automatically calculates the MD5 digest for project files during a scan as a means to determine which files have changed between scans and to "exact match" scanned files with OSS or third-party files (whose digests are stored in the Code Insight Compliance Library).

However, Code Insight can be configured to also calculate file SHA-1 digests during scans should your site want these digests.

***Note** ▪ MD5 digests are always calculated whether or not SHA-1 support is enabled.*

The enablement or disablement of SHA-1 support requires that a database administrator set a global property in the Code Insight database. (By default, this support is disabled when a customer site first installs Code Insight 2021 R3 or later or migrates from a pre-2021 R3 version.)

The following topics describe how the database administrator enables or disables SHA-1 support for Code Insight and, if it is enabled, how users can view the latest digest values for scanned files.

- Enabling the SHA-1 Support
- Disabling SHA-1 Support
- Viewing the SHA-1 Value for Project Files
- SHA-1 Support When Installing or Migrating to a New Code Insight Version

Enabling the SHA-1 Support

Code Insight's ability to calculate SHA-1 digests for files during project scans is controlled by the `scan.digest.sha1.enabled` property located in the `pas_global_properties` table in the Code Insight database. This section describes how the database administrator enables SHA-1 support so that SHA-1 digests are automatically calculated for all files during scans (standard or remote).

Note ▪ *If you have installed a new instance of the current Code Insight version or have migrated from a pre-2021 R3 instance to the current version, SHA-1 support is disabled by default in the new instance. See SHA-1 Support When Installing or Migrating to a New Code Insight Version for additional details.*

Task ***To enable SHA-1 support for your Code Insight instance, do the following:***

Execute this command against the Code Insight database:

```
UPDATE PAS_GLOBAL_PROPERTIES SET VALUE_ = 'true' WHERE KEY_ = 'scan.digest.sha1.enabled';
```

Refer to the next sections for describe how SHA-1 digests for files are handled during scans after SHA-1 support is enabled.

Standard scans with SHA-1 support enabled

The following occurs when a Code Insight standard scan is run after SHA-1 support is enabled. (A *standard scan* is performed by a Scan Server on a project codebase that is uploaded to the Scan Server itself.)

- **When SHA-1 support is enabled before the initial scan of a codebase**—During the initial scan, SHA-1 values are calculated for all files and updated to the `PSE_SCANNED_FILES` table in Code Insight database. Additionally, all files are scanned.
- **When SHA-1 support is enabled anytime after the initial scan of an existing codebase**—During the first scan after SHA-1 enablement, SHA-1 values are calculated for all files (new and existing) and updated to the `PSE_SCANNED_FILES` table. (While SHA-1 values are calculated and updated to the database for all files, only new files and those files that were modified since the last scan are actually scanned.)
- **For each rescan thereafter**—SHA-1 digests are calculated for only new files and those existing files that were modified since the last scan. Additionally, only new files and modified existing files are (re)scanned.

Remote scans with SHA-1 support enabled

The following occurs when a Code Insight remote scan is run after SHA-1 support is enabled. (A *remote scan* is performed by a Code Insight scan-agent plugin on a remote file system. Scan results, including file information, are sent to an associated project on the Core Server.)

- **When SHA-1 support is enabled before the initial scan of new file system**—During the initial scan, SHA-1 values are calculated for all files and updated to the `PSE_REMOTE_SCANNED_FILES` table in the Code Insight database. Additionally, all files are scanned.
- **When SHA-1 support is enabled at a time after the initial scan of an existing project**—During the first scan after SHA-1 enablement, SHA-1 values are calculated for all files—every existing file (modified or not) and every new file—and updated to the `PSE_REMOTE_SCANNED_FILES` table. Additionally, all files are (re)scanned.

- **For each rescan thereafter**—SHA-1 digests are re-calculated for all existing files (modified or not), calculated for any new files, and then updated to the `PSE_REMOTE_SCANNED_FILES` table. Additionally, all files are (re)scanned.

Disabling SHA-1 Support

This section describes how the Code Insight database administrator configures the `scan.digest.sha1.enabled` property (located in the `PAS_GLOABL_PROPERTIES` table in the Code Insight database) to disable SHA-1 support. When support is disabled, SHA-1 digests are no longer calculated for files during the scans.

Task ***To disable SHA-1 support for your Code Insight instance, do the following:***

Execute this command against the Code Insight database:

```
UPDATE PAS_GLOBAL_PROPERTIES SET VALUE_ = 'false' WHERE KEY_ = 'scan.digest.sha1.enabled';
```

The following describes how SHA-1 digests for files are handled during scans after SHA-1 support is switched from enabled to disabled. (For a description of standard and remote scans, see Enabling the SHA-1 Support.)

- **Each time a *standard* rescan is run on a codebase**—Any existing file that has been modified since the previous scan (or is a new file) has its SHA-1 value set to `NULL` in the `PSE_SCANNED_FILES` table and is (re)scanned. Existing files that have *not* been modified since the previous scan retain their current SHA-1 value (either a digest or `NULL`) in the table and are not rescanned.
- **Each time a *remote* rescan is run on a file system**—The SHA-1 values for all files—all existing files, modified or not, and any new files— are set to `NULL` in the `PSE_REMOTE_SCANNED_FILES` table. Additionally, all files are scanned.

Viewing the SHA-1 Value for Project Files

Users can use the following Code Insight APIs to view the SHA-1 digest for a file:

- **Get details of a file by ID** (`files/{fileId}`)—Retrieves attributes for the specified file.
- **Fetch all scanned files for a project** (`/projects/{projectId}/allscannedfiles`)—Retrieves attributes for every file scanned in the specified project.

For more information about Code Insight REST interface, see the *Rest API Guide* Swagger documentation available from the **Help** menu.

Note ▪ *Currently, SHA-1 digests for files are not shown in the Code Insight Web UI.*

SHA-1 Support When Installing or Migrating to a New Code Insight Version

Support for the calculation of SHA-1 digests for project files was first made available in Code Insight 2021 R3. The following sections describe how SHA-1 support is handled when a new Code Insight version is installed or a previous Code Insight version is migrated.

Installing a New Instance of the Current Code Insight Version

When you install a new instance of the current Code Insight version, SHA-1 support will be disabled by default. The initial standard or remote scan of files in projects created in the new instance will set the SHA-1 values for files to NULL in the Code Insight database. However, if SHA-1 support is enabled at some point before the initial scan, SHA-1 digests will be calculated during the scan and updated to the database.

Migrating a pre-2021 R3 Version

When you migrate a from a pre-2021 R3 instance to the current version, SHA-1 support is disabled by default in the upgraded instance, and SHA-1 values for all migrated files are automatically set to NULL in the Code Insight database.

Migrating a post-2021 R3 Version

When you migrate from a post-2021 R3 instance to the current version, the SHA-1 support configuration (enabled or disabled) of your previous instance will be maintained in the new instance, as will the digest values for the migrated project files.

Setting Project Defaults

The settings on the **Project Defaults** tab on the **Administration** page work provide a convenient way to default fields used to configure new projects to ensure consistency and enable an easier project creation experience for users.

Task ***To set project defaults, do the following:***

1. On the **Code Insight Dashboard**, click **administration**. The **Administration** page appears with a list of side tabs.
2. Select the **Project Defaults** tab.
3. Update global default values as needed, using the information in the Project Default Descriptions table.

Project Default Descriptions

The following table lists the project default descriptions.

Table 3-6 ▪ Project Defaults

Category	Field	
General Options	These options set defaults for project creation and assign default users to project roles. Users can change these defaults when creating a project or when editing a project or its users using **Manage Project | Edit Project | General** or **Manage Project | Edit Project | Edit Project Users** on the project **Summary** tab.	
	Project Visibility	Select the default for visibility status—**Public** or **Private**—for projects. (The initial system default is **Public**.) Any user in the system read-only access to a public project. To what degree a user can interact with the project depends on whether the user has a project role and what the role is—Project Administrator, Analyst, or Reviewer. However, private projects are hidden from all users except the Project Contact and those users assigned as Project Administrators, Analysts, Reviewers, or Observers of the project. Additionally, project and vulnerability ID searches will not return private projects unless the user performing the search has the permissions to see a given private project.
	Project Risk	Select the default risk value (**Low**, **Medium**, or **High**) for projects. To edit, select another value from the dropdown. The initial system default is **Medium**.
	Project Users	Click the **Edit Project Users** link to open the **Edit Default Project Users** page. From here you assign project roles—Analysts, Reviewers, and Observers—that will default for any new project created (but which can then be edited at the project level). See the “Edit (Default) Project Users Page” in the in the online help or the *Code Insight User Guide* for details.

Table 3-6 ▪ Project Defaults (cont.)

Category	Field	
General Options (continued)	**On the data import or rescan, delete inventory with no associated files**	This option determines whether “empty” system-generated inventory items are deleted in the target project during project imports and rescans. Empty inventory items have no associated files. ● **Selected**—Deletes empty inventory items from the target project during project imports and rescans. Only inventory items with associated files are retained/created. ● **Unselected**—Retains/creates all inventory items—with or without matching associated files in the target codebase—in the target project during imports and rescans. For example, you might want to retain inventory items to save their analysis details. (Users will need to manually delete inventory that is not applicable in the current project.) This configuration (unselected) is required when importing a scanned codebase into an inventory-only project, which has no codebase, to ensure inventory is generated in the target project.
Scan Settings	These options identify the default Scan Server and scan profile for projects. Users can change these settings when creating a project or when editing a project using **Manage Project | Edit Project | Scan Settings** from the project **Summary** tab.	
	Scan Profile	Select the scan profile to default for projects. Click ⓘ to view the details of the scan profile.
	Scan Server	Select the Scan Server to default for projects. Note that only those Scan Servers in an “enabled” state are available for selection (see Adding or Editing Scan Servers or Checking Server Status). If only one Scan Server has been identified to the system, this server is automatically selected as the default.
Automated Inventory Publish Options	These options configure defaults for automatically publishing project inventory as part of the project scan process. Users can change these settings at the project level by navigating to the project **Summary** tab and selecting **Manage Project | Edit Project | Scan Settings**. If the **Auto-publish system-created inventory items meeting this minimum Confidence Level** is selected to enable auto-publication, the other auto-publish options are made available.	

Table 3-6 ▪ Project Defaults (cont.)

Category	Field	
Automated Inventory Publish Options (continued)	**Auto-publish system-created inventory items meeting this minimum Confidence Level**	Select this option to enable the auto-publication of system-generated inventory items. (By default, the option is selected.) Then select the minimum Inventory Confidence level required to determine which items to auto-publish: ● **Low**—Automatically publish all system-generated inventory. ● **Medium**—Automatically publish only those system-generated inventory items with Medium and High confidence levels. ● **High**—Automatically publish only those system-generated inventory items with a High confidence level. For a description of the Confidence levels and how they are used, see Inventory Confidence.
	Do not auto-publish inventory items with an undetermined license	Select this option to *not* auto-publish any system-generated inventory item with an undetermined license (that is, an inventory item whose **License** value is **I don’t know**). An undetermined license can occur under the following conditions: ● The scan was not able to identify a license for the given component during the scan and therefore set the **I don’t know** license value. ● The inventory item has multiple possible disjunctive licenses (for example, “GPLV2 or MIT”). However, the scan could find no evidence of the desired selected license and therefore set the **I don’t know** license value. ● The inventory item has multiple possible conjunctive licenses (for example, “GPLv2 and MIT”). However, since Code Insight currently supports only a single selected license, the scan automatically set the **I don’t know** value for the inventory item. This option is available only if **Auto-publish system-created inventory items meeting this minimum Confidence level** is selected. By default, when you first open Code Insight instance after it has been installed or migrated, this option is unselected, allowing the auto-publication of inventory with undetermined licenses.
	Mark associated file as reviewed	Select this option if you want Code Insight to automatically mark the files associated with each automatically published inventory item as “reviewed”. This option is available only if **Auto-publish system-created inventory items meeting this minimum Confidence level** is selected.

Table 3-6 ▪ Project Defaults (cont.)

Category	Field	
Automated Review Options	These options configure defaults for enabling policies that automatically accept or reject inventory when it is published. Users can change these settings when creating a project or when editing a project using **Manage Project | Edit Project | Review and Remediation Settings** from the project **Summary** tab.	
	Policy Profile	Select the default policy profile to associate with all new projects. (The system default is **Default License Policy Profile**.) The policy profile contains a set of policies that use components, versions, licenses, and vulnerability scores and severities as criteria to automatically reject or approve inventory items during a codebase scan (or post-scan). For more information about policy profiles in general, see “Managing Policy Profiles” in the online help or the *Code Insight User Guide*.
	automatically reject inventory items impacted by a new vulnerability that violates your policy	Indicate the default action to take for published inventory affected by a new security vulnerability downloaded as part of an Electronic Update. The selected action applies to both non-reviewed and previously approved inventory items on the **Project Inventory** tab. ● Select this checkbox to automatically reject those project inventory items impacted by a new security vulnerability only if this vulnerability has a CVSS score or severity *greater than* the thresholds configured as policy for the Code Insight project. For each inventory item rejected due to a new security vulnerability, the ⚑ icon and a tip are added to indicate the status change and its reason. If a new vulnerability does not exceed policy thresholds, the current status of the inventory item is not affected. ● Leave the checkbox unselected to retain the current status of inventory items impacted by the new vulnerability. For information about setting policies that define CVSS-score and severity thresholds used to reject or approve inventory items automatically, see “Policies Page” and “Policy Details Page” in the online help or the *Code Insight User Guide*. For information about associating these policies with a project, see “Managing Policy Profiles” in either of these same resources.
Manual Review Options	These options configure defaults for project inventory not automatically reviewed by policy. Users can change these settings at the project level by navigating to **Manage Project | Edit Project | Review and Remediation Settings** from the project **Summary** tab.	

Table 3-6 ▪ Project Defaults (cont.)

Category	Field	
Manual Review Options (continued)	**What should happen if inventory items are not reviewed by policy?**	Indicate the default action to trigger for those inventory items that are *not* affected by policy (and therefore have a **Not Reviewed** status) during the publication of inventory either as part of a scan or manually by a user: ● **do nothing**—Simply show the status of the inventory item as **Not Reviewed** on the **Project Inventory** tab. ● **send an email notification to the project contact**—Automatically send an email to the Project Contact, stating the need for a manual review of the item. The value for **Select the minimum priority...** (described in the next table entry) affects this option. ● **automatically create a manual review task**—Automatically create a manual review task assigned to the default legal or security reviewer (or both reviewers), and send an email, notifying the reviewer(s) about assigned task. Information about managing such a task to track the progress of a manual review is found in “Creating and Managing Tasks for Project Inventory” in the online help or the *Code Insight User Guide*. The value for **Select the minimum priority...** (described in the next table entry) affects this option.
	Select the minimum priority to perform the action selected above	(Enabled when an option other than **do nothing** is selected for the previous field.) Select the default minimum inventory priority (**P1**, **P2**, **P3**, or **P4**) to which the value for the previous field applies. For example, if the previous field is set to **send an email notification to the project contact** and minimum priority is set to **P3**, then the email notification will be sent for only those non-reviewed inventory items with a P1, P2, or P3 priority. No email notification will be sent for P4 inventory items. ***Note ▪** This option has no effect when the **do nothing** value is selected.*

Table 3-6 ▪ Project Defaults (cont.)

Category	Field	
Manual Review Options (continued)	**What type of manual reviews will be performed on this project?**	Set the default type of manual review tasks to be generated: ● **Legal Only**—Review tasks are generated for those non-reviewed inventory items that so not meet legal policy criteria. The tasks are automatically assigned to the default Legal reviewer. ● **Security Only**—Review tasks are generated for only those non-reviewed inventory items that have security vulnerabilities. The tasks are automatically assigned to the default Security reviewer. ● **both Legal and Security**—Review tasks are generated for all non-reviewed inventory items that do *not* meet legal policy criteria; these are assigned to the default Legal reviewer. Additionally, review tasks are generated for those non-reviewed inventory tasks associated with security vulnerabilities and are assigned to the default Security reviewer. With this value, a single inventory item might have both a legal review task and security review task generated. However, if the default reviewers are the same user, a single task is created, describing the requirement for both a legal and security manual review.
	Select reviewers for this project	If desired, designate a new default Legal reviewer or Security reviewer (or both) to which to assign manual review tasks. (The Project Contact is the designated as the initial system default for both reviewers.) Then, depending on the type of manual review selected for the project (see the **What type of manual reviews will be performed...** option described previously), Code Insight determines which reviewer (Legal or Security or both) is assigned the task and then notified of the task by email. The reviewer(s) can then manage the task accordingly, possibly reassigning it to another user. For details about managing and reassigning tasks, see "Creating and Managing Tasks for Project Inventory" in the online help or the *Code Insight User Guide*. To select a new default reviewer, click **Change User** next to the name of the current **Legal reviewer** or **Security reviewer** assignee, then select a user from the **Select new...contact** dialog, and click **Apply**. (To reset the reviewer to the Project Contact, click **Reset**.) When a new default reviewer is selected, that user is automatically given the role of project "reviewer" should the user not currently have this role. However, should the current reviewer reassign a specific task to another user, the "reviewer" role is not automatically assigned to that user. If "Project Contact" is specified as a default reviewer, the Project Contact's actual user name is displayed for the reviewer in the project.

Table 3-6 ▪ Project Defaults (cont.)

Category	Field	
Remediation Options	These options configure defaults for rejected project inventory. Users can change these settings at the project level by navigating to **Manage Project | Edit Project | Review and Remediation Settings** from the project **Summary** tab.	
	What should happen if inventory items are rejected?	Indicate the default action to trigger for those inventory items that are automatically rejected by policy during the publication of inventory either as part of a scan or manually by a user: ● **do nothing**—Simply show the status of the inventory item as Reject on the Project Inventory tab. ● **send an email notification to the project contact**—Automatically send an email to the Project Contact, stating the need for remediation work on the inventory item. ● **automatically create a remediation task**—Automatically create a remediation task assigned to the default development contact (see the **Assignee for remediation work** option) and send an email, notifying the contact about the assigned task. ● **automatically create a remediation task and an external work item**—Automatically do the following: ● Create a remediation task assigned to the default development contact (see the **Assignee for remediation work** option) and send an email, notifying the contact about the assigned task. (See the previous bulleted item for more information.) ● Associate a work item with the task, creating the work item in an Application Lifecycle Management (ALM) system (such as an issue in Jira). The work item is created and assigned using the settings defined for the ALM instance to which the Code Insight project is associated. For more information about configuring an ALM instance for the project, see “ALM Settings” in the online help or the *Code Insight User Guide*.
	Assignee for remediation work	If desired, designate a new default development contact—for example, an engineering manager—to which to assign remediation tasks. (The Project Contact is the initial system default.) This contact can then manage the task accordingly—for example, reassigning it to another user or manually creating an external work item and assigning it to someone on the development team. For details about managing and reassigning tasks, see “Creating and Managing Tasks for Project Inventory” in the online help or the *Code Insight User Guide*. To select a new contact, click **Change User** next to the name of the current assignee, select a user from the **Select new...contact** dialog, and click **Apply**. (To reset the reviewer to the Project Contact, click **Reset**.) If “Project Contact” is specified as the default, the Project Contact’s actual user name is displayed as the remediation assignee in the project.

Setting the Common Vulnerability Scoring System (CVSS) Version

Code Insight can be configured to use either CVSS v2.0 or CVSS v3.x (3.1 and 3.0) for security vulnerability CVSS scores and severities. Initially, the system defaults to CVSS v2.0.

Switching between CVSS versions will affect CVSS scores and severity values for vulnerabilities, as displayed in the Web UI (see “Security Vulnerabilities Associated with Inventory” in the *Code Insight User Guide*). The change also has an impact on policies based on CVSS scores and vulnerability severities (see “Managing Policies” in the *Code Insight User Guide*).

Refer to the following topics for more information about setting the CVSS version:

- Differences in Vulnerability Severities Between Scoring Systems
- Setting the CVSS Version

Differences in Vulnerability Severities Between Scoring Systems

For insight into differences between the two scoring systems, the following table shows the severity levels available in the two CVSS versions and the range of scores that define each severity:

Table 3-7 ▪ Vulnerability Severity Differences Between CVSS Versions

Severity	CVSS v3.x Score Range	CVSS v2.0 Score Range
Critical	9.0 - 10.0	--
High	7.0 - 8.9	7.0 - 10.0
Medium	4.0 - 6.9	4.0 - 6.9
Low	0.1 - 3.9	0.1 - 3.9
Unknown (v3.x) **None (v2.0)**	N/A	N/A

For information on how switching CVSS versions can impact policies, see “Policy Details Page” in the *Code Insight User Guide*.

Setting the CVSS Version

Use the following procedure to configure the CVSS version for Code Insight.

Task ***To set the CVSS version, follow these steps:***

1. On the **Code Insight Dashboard**, click **administration**. The **Administration** page appears with a list of side tabs.
2. Select the **System Settings** tab.
3. In the Security Vulnerability Options pane, select either **CVSS v2.0** or **CVSS v3.x**.
4. Click **Save**.

About Code Insight Server REST APIs

You can create an administration client (tool) that communicates with the Code Insight server using Code Insight public REST APIs to manage scan operations and to retrieve inventory information. These APIs use a REST-style interface and JSON. For more information about this REST interface, see the *Rest API Guide* Swagger documentation available from the **Help** menu.

For information about obtaining the JSON Web Token (JWT) required to access the REST interface, see Managing Authorization Tokens.

Task ***To view REST API documentation, do the following:***

1. From any page in Code Insight, click ☰ and select **Help** from the menu. The **Documentation** menu appears.
2. Click **Rest API Guide**. The REST API documentation appears in a tab in your browser.
3. To view details about a particular item, click the arrow (›) next to the item. Additional information, if available, appears under the selected item.
4. (Optional) With the details about the API visible, click the API type (GET, POST). More information about the API appears. Click **Try it out** and then click **Execute**. The application will generate cURL, make the Rest API call and display a response.

Enabling Cross-Origin Resource Sharing

CORS (Cross-Origin Resource Sharing) is an HTTP-header-based tool that allows secure cross-origin requests and data transfers between browsers and servers. Cross-origin situations occur when the Web location from which a request originates is different from the Web location of the server to which the request is sent. Cross-origin locations can differ in scheme (HTTP or HTTPS), domain (such as `mylocation.com` versus `yourlocation.com`), or port.

For example, if you have created a script or application that makes Code Insight REST API calls, these calls will most likely result in errors if the script resides at a Web location different from Code Insight Core Server web location.

To enable a secure, successful exchange of requests and responses in a cross-origin scenario, you need to set up a CORS filter on the Code Insight Core Server. This filter identifies the origins (clients) from which the Core Server (server) will accept requests and specifies the types of headers and HTTPS methods that the server will support in the requests.

The following sections describe how to configure the CORS filter:

- Configuring the CORS Filter
- CORS Initialization Parameters
- Identifying Origins for the cors.allowed.origins Initialization Parameter
- About HTTP Headers

Configuring the CORS Filter

By default, the CORS filter is not configured on the Code Insight Core Server. To configure the filter, you must add the following code snippet to the `Built-in Filter Mappings` section in the `<codeInsightInstallation>/tomcat/conf/web.xml` file. See CORS Initialization Parameters for more information about the filter parameters.

Once you have configured the CORS filter, you must restart the Core Server.

```
<filter>
        <filter-name>CorsFilter</filter-name>
        <filter-class>org.apache.catalina.filters.CorsFilter</filter-class>
        <init-param>
            <param-name>cors.allowed.origins</param-name>
            <param-value>*</param-value>
        </init-param>
        <init-param>
            <param-name>cors.allowed.methods</param-name>
            <param-value>GET,POST,HEAD,PUT,DELETE,OPTIONS,PATCH</param-value>
        </init-param>
        <init-param>
            <param-name>cors.allowed.headers</param-name>
            <param-value>Access-Control-Allow-Origin,Access-Control-Request-
Method,Authorization,Content-Type</param-value>
        </init-param>
        <init-param>
            <param-name>cors.preflight.maxage</param-name>
            <param-value>86400</param-value>
        </init-param>
    </filter>
    <filter-mapping>
        <filter-name>CorsFilter</filter-name>
        <url-pattern>/api/*</url-pattern>
    </filter-mapping>
```

CORS Initialization Parameters

The following provides more information about the initialization parameters used to define in the CORS filter set up for use by Code Insight. These parameters can be adjusted for Code Insight installed at your site.

Table 3-8 ▪ CORS Initialization Parameters

Initialization Parameter	Definition

`<filter>`
`<filter-name>CorsFilter</filter-name>`
`<filter-class>`
`   org.apache.catalina.filters.CorsFilter`
` </filter-class>`
` </filter>`
` ...`
` <filter-mapping>`
` <filter-name>CorsFilter</filter-name>`
` <url-pattern>/*</url-pattern>`
` </filter-mapping>`
	The basic code that enables the CORS filter. The filter adds the appropriate `Access-Control-*` headers to responses and issues the 403 return code when a request is invalid or not permitted.

`cors.allowed.origins`	The origins (clients) whose requests the server will accept. For security purposes, you should replace the asterisk * value (shown for this parameter in the code snippet provided in Configuring the CORS Filter) with the URL for each specific origin accepted by the server. For details, see Identifying Origins for the cors.allowed.origins Initialization Parameter.
`cors.allowed.methods`	The HTTP methods that are allowed in cross-origin requests to access Code Insight data. The value in the provided code snippet (see Configuring the CORS Filter) permits all methods, but you can adjust this list according to your site's requirements. (The default methods include GET, POST, and HEAD.) ***Note ▪*** *The HEAD method is used to retrieve only headers from the server, similar to a GET but with no message body returned.* The listed methods are included as part of the `Access-Control-Allow-Methods` header in the pre-flight response so that the client knows which methods are allowed.

Table 3-8 ▪ CORS Initialization Parameters (cont.)

Initialization Parameter	Definition
`cors.allowed.headers`	The HTTP request headers allowed in actual requests. Be sure to include the `Authorization` header, which is required for Code Insight REST API calls. Additionally, for POST or PUT requests, the `Content-Type` header needs to be passed along with `Authorization` header. The headers specified here are returned as part of the `Access-Control-Allowed-Headers` header in the server's response to a pre-flight request, informing the client which headers are allowed in requests.
`cors.exposed.headers`	(Not shown in the code snippet) The specific headers that can be exposed to the client as part of the response, enabling the client to then use these headers. These headers are returned as part of the `Access-Control-Expose-Headers` header in the Core Server's response to a pre-flight request.
`cors.preflight.maxage`	The maximum number of seconds that the results of the pre-flight request can be cached. (The results include the information contained in the `Access-Control-Allow-Methods` and `Access-Control-Allow-Headers` headers.) The provided code snippet (see Configuring the CORS Filter) uses the value 86400, representing 24 hours, but you can adjust this value as needed. The CORS default value is 1800.

Identifying Origins for the cors.allowed.origins Initialization Parameter

The `cors.allowed.origin` parameter, used to configure the CORS filter, identifies the clients (origins) that are allowed to issue requests to the server. The code snippet provided in Configuring the CORS Filter shows an asterisk * as the value for this parameter, indicating that a request can come from any origin. For security purposes, this value should be set to the one or more specific request origins that the server supports.

Defining an Origin

Use the following format for each origin added:

```
Origin: <scheme> "://" <hostname> [ ":" <port> ]
```

Note the following:

- Use all lower case in the URL. The value is case-sensitive.
- Be sure to include the port number, as it is required. However, you do not have to include the port number if it is known to be configured as part of host name.
- The host name can be the fully qualified domain name (FQDN).

- When specifying multiple origins, separate them with commas, as in this example:

  ```
  Origin: http://www.machine123.org:8080, http://www.machine1000.smc.com:8080
  ```

Example Origin Formats

The following are examples of origin formats:

- `http://www.w3.org` (port known to be configured with hostname)
- `https://www.apache.org` (port known to be configured with hostname)
- `http://www.abc.domain.com` (port known to be configured with hostname)
- `http://<origin_Machine_hostName>:8080`
- `https://<FQDN(fully_qualified_domain_name)>:8080`
- `http://<origin_host_IP_address>:8080`

About HTTP Headers

The following table provides information about some of the HTTP headers used in requests and responses.

Table 3-9 ▪ HTTP Headers

Header	Type	Definition
`Access-Control-Request-Method`	Request	Used by browsers when issuing a pre-flight request inform the server which HTTP method will be used when the actual request is made.
`Origin`	Request	Identifies the URL from which the request originated.
`Access-Control-Request-Headers`	Request	Used by browsers when issuing a pre-flight request to inform the server which HTTP headers the client intends to send in the actual request. The server's response to this header is the `Access-Control-Allowed-Headers` header, informing the client which headers are allowed in the request.
`Access-Control-Allow-Origin`	Response	Indicates that the origin of the request can access the response. If the origin is not permitted to send the request, a 403 code is returned for a pre-flight request, while an actual request fails with a CORS error.

Managing Authorization Tokens

Code Insight uses a JSON Web Token (JWT) to authorize user access to the Code Insight public REST API interface (see the previous section, About Code Insight Server REST APIs). Code Insight enables you to generate and manage one or more of these authorization tokens.

An authorization token is for use by the Code Insight user account that creates it. Thus, an authorization token that your user account generates will give you REST access to only the Code Insight functionality for which your account has permissions. Additionally, you can view and manage only those authorization tokens for the user account under which you are logged in.

Authorization tokens are created and managed from **Preferences** page, as described in the following procedures:

- Accessing the Preferences Page
- Generating an Authorization Token
- Copying the Authorization Token to the Clipboard
- Editing the Token Name
- Deleting an Authorization Token

Accessing the Preferences Page

Use these steps to open the **Preferences** page.

Task ***To open the Preference page, use these steps:***

1. Click the **Open Menu** icon in the upper right of any Code Insight page:

   ☰

2. Select **Preferences** to open the **Preferences** page.

Generating an Authorization Token

Use the following procedure to generate an authorization token.

Task ***To generate an authorization token, do the following:***

1. Access the **Preferences** page (see Accessing the Preferences Page).
2. From the **AUTH Tokens** pane, click **Add Token**.
3. Enter a name for the new token and specify an expiration date (or choose **Never Expires**).
4. Click **Save**.

Copying the Authorization Token to the Clipboard

Use the following procedure to copy an authorization token to the clipboard so that you can paste it in your REST API interface.

Task ***To copy an authorization token to the Clipboard, do the following:***

1. Access the **Preferences** page (see Accessing the Preferences Page).
2. From the **AUTH Tokens** pane, locate the token you want to copy, and click the **Copy to clipboard** icon (📋) in the **Actions** column.
3. Click **Select Token Text** to select the entire token value, and then press Ctrl + C to copy it.
4. Paste token in the appropriate location for use by the REST interface.

Editing the Token Name

You can edit only the name of an authorization token, not its expiration date or value.

Task ***To edit the token name, do the following:***

1. Access the **Preferences** page (see Accessing the Preferences Page).
2. From the **AUTH Tokens** pane, locate the token you want to edit, and click the Edit icon (✏).
3. Update the token name as needed.
4. (Optional) To copy the token value to the Clipboard for pasting into the REST interface, click **Select Token Text** to select the entire token value, and then press Ctrl + C to copy it.

Deleting an Authorization Token

Use the following procedure to delete an authorization token.

Task ***To delete an authorization token, do the following:***

1. Access the **Preferences** page (see Accessing the Preferences Page).
2. From the **AUTH Tokens** pane, locate the token you want to edit, and click the Edit icon (✖).

Configuring the Session Timeout

Use this procedure to configure the timeout session for Code Insight. The default is 240 minutes.

Task ***To set the timeout session for Code Insight, do the following:***

1. Open the `\tomcat\webapps\codeinsight\WEB-INF\web.xml` file in your Code Insight installation.
2. Locate the **Session configuration** section.

```
<!-- Session configuration -->
<session-config>
<session-timeout>240</session-timeout>
</session-config>
```

3. Adjust the session value (in minutes) and save the file.

4

Integrating with Source Code Management

The following topics are covered in this section:

- Obtaining Codebase Files for Scanning
- SCM Support
- SCM Command-Line Client
- Git Protocol Configuration
- Perforce Authentication
- Subversion Configuration
- TFS Protocol and Credentials Configuration

Obtaining Codebase Files for Scanning

To support deep scanning, it is necessary to bring the project codebase files to the Scan Server. Code Insight provides the following ways to bring codebase files into the system:

- **Upload a codebase into Code Insight**—Uploading a codebase is useful to analysts who typically perform ad-hoc scans on an arbitrary snapshot of code provided by the product team.
- **Use a version control SCM connector**—SCM connectors provide an automated way to fetch the code based on criteria, such as build, release, calendar, checkin, and other information. SCM connectors support various authentication mechanisms, including anonymous, username and password, and token, key, or ticket on a Scan Server.

  See the next section, SCM Support, for information about the SCM systems for which Code Insight provides connector support.

SCM Support

Code Insight provides connector support for the following SCM systems, enabling remote codebases in these systems to be obtained before a scan:

- Git
- Perforce
- SVN (Subversion)
- TFS (Team Foundation Server)

The next sections describe the prerequisites that need to be in place before the Code Insight Scan Server can integrate with any of the supported SCM systems:

- SCM Command-Line Client
- Git Protocol Configuration
- Perforce Authentication
- Subversion Configuration
- TFS Protocol and Credentials Configuration

For information about configuring a synchronization instance to a specific codebase in the SCM system, see the “Configuring Source Code Management” chapter in the *Code Insight User Guide*.

SCM Command-Line Client

Before you proceed, ensure that an SCM command-line client is installed and configured on the Code Insight Scan Server as this is necessary for Code Insight to be able to connect to and synchronize with an SCM repository. See the following topics for information:

- Recommended Clients
- Verifying SCM Client Installation
- Setting the Environment Variable on Windows
- Prerequisite If Running Code Insight as a Service

Recommended Clients

The following is a list of clients known to work effectively with Code Insight.

Note *▪ Download site links are subject to change.*

SCM	Client	Download Site
Git	Git *	http://git-scm.com/downloads

SCM	Client	Download Site
Perforce	Perforce	https://www.perforce.com/downloads
Subversion	Two clients to choose from:	
	TortoiseSVN	https://tortoisesvn.net/downloads.html
	Apache Subversion	https://subversion.apache.org/download.cgi or https://subversion.apache.org/packages.html
Team Foundation Server (TFS)	Team Explore Everywhere Command Line Client (TEE-CLC)	https://github.com/Microsoft/team-explorer-everywhere/releases

* Code Insight supports the Git client version 2.17 (minimum) through the latest version.

TEE-CLC Requirement for a TFS Connection

TEE-CLC is the TFS client required by Code Insight to connect to and synchronize with an TFS collection. Once this client is installed on the same instance where the Code Insight Scan Server resides, run the following command to accept the end-user license agreement:

```
tfs -eula
```

If Code Insight attempts to connect to TFS before this command is run, the connection fails.

Verifying SCM Client Installation

To verify that the SCM client is installed and available to Code Insight, open a command prompt and navigate to the Code Insight root directory. Execute a command specific to your SCM, such as:

- `git help`
- `p4 help`
- `svn help` or `svn --version`
- `tf help`

If the system cannot find the command specified, verify that the SCM client directory is part of the PATH variable on this server. Consult your SCM documentation for more information on how to install and configure the client.

Additionally, best practice is to actually check out a sample repository on the SCM server to ensure that connectivity between the SCM client and SCM server is configured appropriately.

Setting the Environment Variable on Windows

If you run the SCM command line client from a Windows instance, add your SCM client location to the PATH environment variable.

Note ▪ *Your SCM may require other environment variables to be set. Consult your SCM documentation.*

Task ***To set the environment variable, do the following:***

1. To find your PATH environment variable settings, navigate to **Control Panel > System > Advanced System Settings**.
2. Click **Environment Variables**.
3. Look for the PATH system variable and make sure that it is set to the location of your SCM bin directory.
4. If you edit the system variable, ensure that you save your changes.

Prerequisite If Running Code Insight as a Service

If Code Insight is configured to run as a service, the user context under which the service runs must have the appropriate permissions to run the given SCM client.

Git Protocol Configuration

Git repositories reside on public servers, such as GitHub and Bitbucket, or on Git servers within a corporate network. The Git URL used to clone the repository into your SCM destination folder will vary depending on your desired protocol. The following are the available protocol options. You will enter then enter the URL using the desired protocol when you configure the SCM instance in Code Insight to connect to repository you want to clone in Code Insight.

- Anonymous HTTP
- Authenticated HTTP
- HTTPS
- SSH

Note ▪ *Ensure that you are able to run the Git client on the machine where the Code Insight Scan Server resides.*

Anonymous HTTP

This protocol can be used for a public repository. Public repositories can be cloned without providing an account and password.

Type	Example
GitHub Example	`http://github.com/myacct/Spoon-Knife.git`
Bitbucket Example	`http://bitbucket.org/myacct/myquotefork.git`

Authenticated HTTP

This protocol can be used for a private repository. Provide an account and password as shown in the URL format below. Use a colon between the account and password.

Type	Example
GitHub Example	`http://myacct:password@github.com/myacct/Hello-World.git`
Bitbucket Example	`http://myacct:password@bitbucket.org/myacct/bb101repo.git`

HTTPS

Code Insight supports an anonymous or authenticated HTTPS protocol between the Git client (installed on the same machine as the Code Insight Scan Server) and the Git server, such as GitHub and Bitbucket, containing the repository to be synchronized to Code Insight.

HTTPS Configuration

Ensure that the SSL certificate verification between the Git client, installed on the same machine as the Code Insight Scan Server, and the Git server is successful. This verification might include importing the Git server certificate into the local cacert authority. Because the details of this process is outside the scope of Code Insight documentation, refer to the appropriate Git server or client documentation for further details.

In a trusted environment, one option to ease the integration process is to skip the SSL certificate validation step by running the following step from the machine running the Scan Server:

```
git config --global http.sslVerify false
```

URL Format

For an anonymous HTTPS protocol, use a URL similar to one of these:

Type	Example
GitHub Example	`https://github.com/myacct/Spoon-Knife.git`

Type	Example
Bitbucket Example	`https://bitbucket.org/myacct/myquotefork.git`

For authenticated HTTPS protocol, provide an account and password, separating them with a colon as shown in these examples:

Type	Example
GitHub Example	`https://myacct:password@github.com/myacct/Hello-World.git`
Bitbucket Example	`https://myacct:password@bitbucket.org/myacct/bb101repo.git`

SSH

Code Insight supports SSH authentication between the Git client (running on the same machine as the Code Insight Scan Server) and the Git server, such as GitHub and Bitbucket, containing the repository to be synchronized to Code Insight.

Setting Up SSH Authentication

For instructions on how to set up an SSH authentication for communication between a Git client and the GitHub server, refer to the GitHub documentation (such as https://docs.github.com/en/github/authenticating-to-github/connecting-to-github-with-ssh).

If you want to use HTTPS along with SSH for communication between the Git client and the Git server, you must perform the additional steps described in the next section.

Configuring the Use of HTTPS Along with SSH

Use the appropriate procedure to configure use of HTTPS along with SSH for communications between the Git client and the Git server:

- Configuration in a Linux Environment
- Configuration in a Windows Environment

These procedures assume the following:

- SSH authentication between Git client and the Git server has already been set up.
- The Git server containing the repository to be synchronized to Code Insight is configured for HTTPS.

Depending on your Git version, the paths referenced in these procedures might be different from the paths used in your version.

Configuration in a Linux Environment

Use this procedure to configure the use of HTTPS along with SSH when the Git client and Git server run in a Linux environment.

Task ***To configure the use of HTTPS along with SSH in a Linux environment, do the following:***

1. As the user who will need to establish a connection between the Git client and the Git server for synchronization purposes, log on to the machine running both the Git client and the Scan Server.
2. Execute the following command:

   ```
   git config --global http.sslCAPath /etc/pki/tls/certs
   ```

   This command establishes a secure connection between the Git client and the Git server.
3. On the machine running the Git server, locate the file containing the Git HTTPS root certificate signed by CA.
4. Copy the certificate file to the `/etc/pki/tls/certs` folder on the machine running both the Git client and the Scan Server.

Configuration in a Windows Environment

Use this procedure to configure the use of HTTPS along SSH when the Git client and Git server run in a Windows environment.

Task ***To configure the use of HTTPS along with SSH in a Windows environment, do the following:***

1. On the machine running the Git server, export the Git HTTPS root certificate to a file. You can do this from within your browser.
2. On the machine running both the Git client and the Scan Server, locate the `ca-bundle.crt` file in the appropriate Git folder (for example, `C:\Program Files\Git\usr\ssl\certs`).
3. Open `ca-bundle.crt` in a text editor.
4. Copy the content of the certificate file that you exported, and paste it at the end of the content in the `ca-bundle.crt` file.
5. From the machine running both the Git client and the Scan Server, execute the following command to establish a secure connection between the Git server and the Git client:

   ```
   git config --global http.sslCAInfo C:\Program Files\Git\usr\ssl\certs\ca-bundle.crt
   ```

Perforce Authentication

Perforce repositories reside on an enterprise Perforce server. The Code Insight Perforce connector supports the following types of authentication to access a repository on the Perforce server and synchronize it with Code Insight:

- **Perforce authentication**—An authenticated TCP or SSL protocol is supported for communication between the Code Insight connector and the Perforce server.

  Note that the Code Insight Perforce connector supports access to repositories that reside only on a Perforce server configured with Security Level 1, 2, or 3. The connector does not support access to repositories on a Perforce server configured with Security Level 0, in which users are created without passwords.

- **LDAP authentication**—The Code Insight Perforce connector supports LDAP authentication on the Perforce server. If Perforce is configured with LDAP, the Perforce SCM instance set up in Code Insight must include the LDAP credentials to access the repository.

Subversion Configuration

The following describes configuration you might need for Code Insight synchronization with Subversion:

- Anonymous HTTP
- Subversion Authentication

Anonymous HTTP and HTTPS

Either of these protocols can be used for a public repository. Public repositories can be cloned without providing a user name and password. The following is an example of a repository URL using an anonymous HTTP protocol:

```
http://svn.eionet.europa.eu/repositories/Python/
```

The following is an example of a repository using an anonymous HTTPS protocol:

```
https://svn.apache.org/repos/asf/abdera/
```

Subversion Authentication

Subversion repositories reside on an enterprise VisualSVN server or a comparable server on Linux. The Code Insight Subversion connector supports the following types of authentication to access a repository on the given server and synchronize it with Code Insight:

- **Subversion authentication**—An authenticated TCP or SSL protocol is supported for communication between the Code Insight connector and the server where the repository resides.
- **LDAP authentication**—The Code Insight Subversion connector supports LDAP authentication on the server where the repository resides. If the server is configured with LDAP, the Subversion SCM instance set up in Code Insight must include the LDAP credentials to access the repository.

TFS Protocol and Credentials Configuration

The following describes configuration you might need for Code Insight synchronization with TFS:

- HTTPS Protocol Support
- Special Requirement for VSTS Projects in TFS

HTTPS Protocol Support

HTTPS is supported for communication between Code Insight and TFS. Perform the following steps to enable the SSL configuration for HTTPS.

Task ***To enable SSL configuration, do the following:***

1. Export the Secure Site SSL certificate from the browser location (shown here) for the given TFS instance:

   ```
   https://<TFS-Host>/tfs/DefaultCollection/<Project>
   ```

2. Import the certificate in the Java (JRE) keystore, using the following command (replacing `tfs.cer` with the actual certificate file name). The certificate should be imported to the same machine where the TEE-CLC and Code Insight Scan Server reside (see TEE-CLC Requirement for a TFS Connection).

   ```
   keytool -import -trustcacerts -keystore cacerts -storepass changeit -noprompt -alias tfs -file
       tfs.cer
   ```

Requirements for Synchronization with TFS

Note the following requirements for synchronization with TFS:

- Minimum Team Explorer Everywhere (TEE) Version
- Special Requirement for VSTS Projects in TFS

Minimum Team Explorer Everywhere (TEE) Version

The command-line client installed on the Code Insight server must be TEE-CLC-14 or greater.

Special Requirement for VSTS Projects in TFS

If Code Insight is synchronizing with a VSTS (Visual Studio Team Services) project in TFS, alternate VSTS authentication credentials are required for the synchronization.

Task ***To enable alternate authentication credentials needed for Code Insight synchronization with a VSTS project in TFS, do the following:***

1. In Visual Studio, enable a set of alternate authentication credentials. (See the Visual Studio documentation for instructions.)
2. Specify these alternate credentials for the **Username** and **Password** in the TFS SCM instance configuration in Code Insight. See “Adding a TFS SCM Instance to the Code Insight Project” in the “Configuring Source Code Management” chapter in the *Code Insight User Guide*.

5

Integrating with Application Lifecycle Management

This chapter covers the following topics:

- About Integration with Application Lifecycle Management (ALM) Systems
- The Jira Connector

About Integration with Application Lifecycle Management (ALM) Systems

Code Insight integrates with application lifecycle management (ALM) systems, enabling Code Insight users to create and manage external work items associated with inventory directly from Code Insight. In this way, inventory requiring further review and remediation can be tracked externally as part of the user's existing issue-tracking system.

For example, a Code Insight scan might uncover security vulnerabilities or copyleft licenses requiring further review by the Security and Legal teams. With an ALM integration, these issues can be quickly converted into work items that point to corresponding issues in the ALM instance.

Integration with a specific ALM system is enabled through a corresponding Code Insight connector that supports pre-populated data (in the form of one or more ALM *instances*) used to connect to the ALM system and to set up work items. Additionally, a given ALM instance controls the synchronization of data between Code Insight and the server based on a configured synchronization frequency. To configure an ALM connector, the Code Insight System Administrator defines one or more of these instances in Code Insight, as described in this chapter.

A given project can then be associated with one of the instances, enabling project integration with the ALM system so that users can create and manage the project's work items. (See "Using Code Insight" chapter in the *Code Insight User Guide* for a description of this process.

Currently, Code Insight provides a Jira connector only (see the next section, The Jira Connector). Future releases will provide additional integrations with other ALM systems.

The Jira Connector

The Jira connector provided by Code Insight can be used to create new Jira work items directly from Code Insight. These work items allow management of external remediation work associated with inventory items in Code Insight.

The following sections describe how to configure the Jira connector for Code Insight integration with your Jira instances:

- Prerequisites for the Jira Connector
- Configuring the Jira Connector

Prerequisites for the Jira Connector

The Jira connector is included with Code Insight, is located on the core server in the `config/core/plugins` directory. Ensure that this directory contains the latest Jira connector, particularly after migrating to the latest Code Insight version.

Additional requirements include the following:

- The Jira connector requires access to a Jira server with credentials for a valid user on this server. The designated user will be used to authenticate Code Insight on the Jira server and will also be listed as the reporter on the issue created from Code Insight.
- The specified use must have full access to the Jira instance, particularly if Captcha or Single Sign-On are enabled on the Jira server.

You can use the **Test Connection** button on the ALM configuration page for the Jira instance to validate a successful connection to the Jira server. (See Adding a Jira Instance in the next section, *Configuring the Jira Connector*.)

Configuring the Jira Connector

The Jira connector can be configured to connect to multiple Jira instances and to display default values for each field in the configured instance. Projects can then be individually assigned to connect to and synchronize to one the configured instances.

The following topics describe how to configure and maintain a Jira instance:

- Adding a Jira Instance
- Using Code Insight Variables
- Synchronizing Work Items
- Deleting an ALM Instance

Adding a Jira Instance

The Code Insight System Administrator can configure one or more Jira instances and their default field values globally at the application level using the **Administration** menu. Once configured, the Jira instances are available in the **Edit Project** section so that they can be associated to a specific project.

Task ***To add a Jira instance, do the following:***

1. As System Administrator, select **Administration** from the main menu.
2. Select the **ALM** tile on the left.
3. Select **Jira** from the **Application** dropdown list.
4. Click **Add Instance**. The **Instance** configuration tab is displayed.
5. Enter values for the required fields based on your Jira server information. The following fields are required. (See the inline help for explanations of the fields.)
    - **ALM Instance Name**
    - **JIRA Server URL**
    - **JIRA Username**
    - **JIRA Password**
6. Once you have completed the required fields, click the **Test Connection** button on the right to validate that Code Insight can connect to the specified Jira server.

    If the connection is successful, a “connection successful” message is displayed. Otherwise, reenter the credentials and try again. Ensure that the specified user has full access to the Jira instance, particularly if Captcha or Single Sign-On are enabled on this Jira server.
7. Complete the remaining fields. See the inline help for explanations of the fields.

    You can include inventory variables in the **Default Summary** and **Default Description** fields that will be replaced by actual values in the newly created Jira issue and work item. For a list of supported variables, see the next section, Using Code Insight Variables.
8. Click **Save** to save the Jira instance. The Jira sever settings and mandatory values are validated.

Using Code Insight Variables

The **Default Summary Text** and **Default Description Text** fields support Code Insight variables that can communicate details about the Code Insight project, inventory item, and other relevant information in the work item and associated Jira issue.

Supported Variables

The following table lists the available variables for use in the text entered in the **Default Summary Text** and **Default Description Text** fields:

Table 5-1 ▪ Supported Code Insight Variables For Use in Work Item Summary and Description Text

$PROJECT_NAME	Name of the Code Insight project containing the issue
$INVENTORY_ITEM_NAME	Name of the inventory item containing the issue
$COMPONENT_NAME	Name of the component associated with the inventory item
$VERSION_NAME	Version of the component associated with the inventory item
$LICENSE_NAME	Name of the selected license for the inventory item
$NUMBER_VULNERABILITIES	Total number of security vulnerabilities associated with the inventory item
$NUMBER_FILES	Total number of files associated with the inventory item
$INVENTORY_URL	Link to the inventory item

When the work item is created, the included variables are replaced by their respective values.

Example Use of Variables

The following is example text you might enter in the **Default Summary Text** field. The text includes some of the available variables:

```
The $INVENTORY_ITEM_NAME inventory item in the project $PROJECT_NAME contains
$NUMBER_VULNERABILITIES vulnerabilities that require review. Go to $INVENTORY_URL to see the
vulnerable inventory item.
```

If your Code Insight project name is *MySampleProject* and the name of the inventory item name for which you create a work item is *Apache Commons BeanUtils*, the work item and Jira issue will display the following summary:

```
The Apache Commons BeanUtils 1.7.0 (Apache 2.0) inventory item in the project MySampleProject
contains 18 vulnerabilities that require review. Go to https://my.sample.server:8888/codeinsight to
see the vulnerable inventory item
```

Synchronizing Work Items

Code Insight provides the ability to synchronize work items between Code Insight and the ALM system so that Code Insight always reflects the most current state of each work item. The one-way synchronization updates the following fields for the work item in Code Insight: **Status**, **Type**, **Priority**, **Assignee**, **Summary**.

The following procedure describes how to set the frequency of this synchronization process (labeled **Existing Issues Sync Frequency** on the ALM tab).

***Note** ▪ The Sync Frequency configuration applies to all the ALM instances. If not explicitly set, the sync frequency defaults to Daily.*

Task ***To configure the issue sync frequency, do the following:***

1. As System Administrator, select **Administration** from the main menu.
2. Click the **ALM** tab.
3. Click the **Edit Sync Frequency** icon on the right (to the right of the **Existing Issues Sync Frequency** value).
4. Select one of the frequency options—**Never**, **Hourly**, **Daily**, or **Weekly**—and complete their respective sub-options.
5. Click the **Save Changes** icon to save or **Cancel** to discard the setting.

Work Item Status Updates

If the status of the work item in the ALM system changes, the status of the work item in Code Insight will reflect the change after the synchronization completes.This can result in a change to the **# Open Work Items** and **# Closed Work Items** for each inventory item. These links and the **Open Work Items** information alert link will be updated to reflect the change. Additionally, the **Inventory with Open Work Items** selection in **Advanced Search** may return a different number of results.

The following lists the default status values:

- The default Open status values for Jira include **Open**, **Reopen**, **New**, **To Do**, **In Progress**, and **Backlog**.
- The default Closed status values for Jira include **Done**, **Resolved**, **Verified**, and **Closed**.

Custom statuses are not currently supported.

Deleting an ALM Instance

The Code Insight System Administrator can delete an ALM instance as long as no projects currently reference the instance.

If the instance that you want to delete is referenced by a project, it cannot be deleted until the instance is unassociated from the project. See the *Code Insight User Guide* for instructions on how unassociate an instance from a project.

Task ***To delete an ALM instance, do the following:***

1. As the System Administrator, select **Administration** from the main menu.
2. Select the **ALM** tab.
3. Select the **Instance** tab for the instance you want to delete.
4. Click the **Delete Instance** button.

6

Upgrading Code Insight

The information in this chapter applies to Code Insight version 7 (Code Insight v7) upgrades only. Use the procedures described to upgrade from **Code Insight 2017 R2** or later to **Code Insight 2021 R3**. Do not use the procedures to upgrade from **Code Insight v6** to **Code Insight v7**.

This chapter contains the following information about the upgrade process:

- Upgrade Considerations
- Upgrade Steps
- Other Upgrade Tasks

Upgrade Considerations

Definitions Used in the Upgrade Description

The following definitions are used in the upgrade procedure (in Upgrade Steps):

- **vCurrent** refers to the currently installed version of Code Insight (for example, Code Insight 2020 R4).
- **vNew** refers to the Code Insight version to which you are upgrading (for example, Code Insight 2021 R3).
- `catalina.*` refers to the `catalina.bat` file on Windows systems or `catalina.sh` file on Linux systems

Instance Upgrade

The Code Insight 2021 R3 instance (**vNew**) is installed in parallel to your current instance (**vCurrent**) such that no files are overwritten.

Database Upgrade

Important *▪ Ensure that you perform a full backup of the database schema prior to upgrade.*

Note the following about the database upgrade:

- The Code Insight 2021 R3 instance will use your **vCurrent** database schema.
- Database schema changes have occurred beginning with Code Insight 2020 R2 up to and including the current release, Code Insight 2021 R3.
- As of Code Insight 2019 R1, all database migration is performed automatically when you start Tomcat. Manual execution of database migration scripts is required only if you are migrating from Code Insight 2018 R2 (or earlier) to the current release.
- Code Insight uses the database user assigned to Code Insight in `core.db.properties` to migrate the database during an upgrade. This user already has the minimum permissions required to manage (and initially install) Code Insight. While these permissions are sufficient for migrating a MySQL database, the migration of a SQL Server database requires that the user have the db_ddladmin role. If the user in `core.db.properties` is not currently assigned this role, add the role before the performing the upgrade. If necessary, you can revoke this role once the upgrade completes.

Upgrade Limitations

For any limitations or known issues related to the upgrade process, refer to the latest version of the *Code Insight Release Notes*.

Upgrade Steps

Use the following instructions to upgrade from a previous Code Insight release to Code Insight 2021 R3. Each step includes the Code Insight server on which step is performed. The servers are identified as such:

- **Core**—Code Insight Core Server
- **Scan**—Code Insight Scan Server
- **Database**—Database server used by Code Insight

If a step applies to both the Core Server and Scan Server and both servers are installed on the same instance, you need to perform the step once on the instance.

Table 6-1 ▪ Steps to Upgrade from a Previous Code Insight Release

Step	Server	Summary	Description	Required / Optional
1	Core/ Scan	Download & install Code Insight 2021 R3	Download the `.zip` archive of the Code Insight 2021 R3 release from the Product and License Center in the Customer Community portal. Unzip the archive into the **vNew** directory, parallel to the **vCurrent** directory. For example, if your **vCurrent** directory is `D:/codeInsight/2020R4`, your **vNew** directory will be `D:/codeInsight/2021R1`.	Required
2	Core/ Scan	Shut down Tomcat	Shut down Tomcat to stop your **vCurrent** instance by executing `shutdown.bat` or `shutdown.sh` in **vCurrent**`/tomcat/bin/`.	Required

Table 6-1 ▪ Steps to Upgrade from a Previous Code Insight Release (cont.)

Step	Server	Summary	Description	Required / Optional
3	Database	Back up database	Back up your **vCurrent** database schema.	Required
4	Database	Migrate database	If migrating from 2018 R3 or later, skip this step since the database schema will be migrated automatically when you first start up the application after the upgrade. If migrating from 2018 R2 or earlier, you must manually migrate the **vCurrent** database schema. To do so, apply the database migration script(s) located in **vNew**`/dbScripts/install/<database_type>/` in consecutive order from earliest to latest. For example, if upgrading from Code Insight 2017 R1 to Code Insight 2021 R3, you should run all the migration scripts, starting with `migrateTo2017R1SP1.sql` and ending with `migrateTo2018R3.sql`. After 2018 R3, the database schema will be migrated automatically when you first start the application after the upgrade. For the privileges required to migrate the database, see Database Upgrade.	Required for Code Insight 2018 R2 or earlier versions only
5	Copy specific files from the **vCurrent** home directory to the **vNew** directory as directed in Steps 5a-5j.			
5a	Core/ Scan	License key	Copy **vCurrent**`/codeinsight.key` to **vNew**`/`. ***Note ▪*** *If you have a new license key provided by Revenera, copy the new license key file to **vNew/** instead.*	Required
5b	Core/ Scan	Database connector	Copy the appropriate database connector to **vNew**`/tomcat/lib/`: • **MySQL 5.7**—**vCurrent**`/tomcat/lib/mysql-connector-java-5.*-bin.jar` • **MySQL 8.0**—**vCurrent**`/tomcat/lib/mysql-connector-java-8.0.*.jar` • **SQL Server**—**vCurrent**`/tomcat/lib/sql*.jar`	Required
5c	Core/ Scan	Server and database properties	Copy the following property files to **vNew**`/config/core/`: **vCurrent**`/config/core/internal.properties` **vCurrent**`/config/code/core.db.properties` ***Note ▪*** *If you are using a new license key file, change the encrypted password in the `core.db.properties` file to its “plaintext” form and save the file.*	Required

Table 6-1 ▪ Steps to Upgrade from a Previous Code Insight Release (cont.)

Step	Server	Summary	Description	Required / Optional
5d	Core/ Scan	Project data indexes	Copy the **vCurrent**/`proj_indexes/` folder to **vNew**/. If you are migrating from a version prior to Code Insight 2018 R1, skip this step as the index format has changed. Instead, rescan the projects to re-create the indexes.	Required
5e	Core	Data library indexes	Copy the **vCurrent**/`pdl_indexes/` folder to **vNew**/.	Required Scan Server only instance: Not required
5f	Core/ Scan	JRE	To use the JRE embedded with Code Insight, copy the **vCurrent**/`jre/` folder to **vNew**/. To use the system JRE, skip this step. ***Note ▪*** *If your JRE version is older than JRE 8u192, please consider upgrading. The download is available here.* ***Note ▪*** *Note the location of your JRE. You will need to supply this information in Step 6 when configuring the JAVA_HOME and JRE_HOME variables in the `catalina.*` file.*	Required
5g	Core	Reports	If you want to retain the Code Insight reports you have generated, copy the `reports` folder from **vCurrent** to **vNew**.	Optional
5h	Core	Custom reports	If you have created custom reports and want to retain them, copy the `custom_report_scripts` folder from **vCurrent** to **vNew**.	Optional
5i	Core/ Scan	Custom properties	If you manually configured advanced auto discovery settings in the `codeaware.properties` file and want to retain the settings, copy **vCurrent**/`config/codeaware.properties` to **vNew**/`config/`. ***Note ▪*** *If you do not have the file in your **vCurrent** instance or do not need to retain the settings, skip this step.* ***Note ▪*** *The majority of the settings previously configurable using the `codeaware.properties` file are now available in the Web UI.*	Optional

Table 6-1 ▪ Steps to Upgrade from a Previous Code Insight Release (cont.)

Step	Server	Summary	Description	Required / Optional
5j	Core/ Scan	jet3st properties	Copy **vCurrent**`/config/core/jets3t.properties` to **vNew**`/config/`. if you have made any changes to this file as part of configuring a proxy server.	Optional
6	Core/ Scan	Configure Tomcat	Edit the **vNew**`/tomcat/bin/catalina.*` file as follows: ● Set `JAVA_HOME` to the absolute path of your JRE. This is either the system JRE path or the embedded JRE path if you followed step 5 (**vCurrent**`/jre/`). ● Set `JRE_HOME` to the absolute path of your JRE. This is either the system JRE path or the embedded JRE path if you followed step 5 (**vCurrent**`/jre/`). ● Set `CATALINA_OPTS` to the same value as set in **vCurrent/**`tomcat/bin/catalina.*` (for example, `CATALINA_OPTS=` **`-Xms12288m -Xmx12288m`**). ● Set `-DcodeinsightInstallPath=<`**vNew**`>` (for example, `-DcodeinsightInstallPath=`**`"D:/codeInsight/2021R4"`**). ***Note ▪*** *For proxy and SSL configuration, additional edits to the `catalina.*` file are necessary. See the next steps.*	Required

7	Core/ Scan	Configure your proxy	If your current Code Insight instance is running over a proxy, copy the following values from the **vCurrent**`/tomcat/bin/catalina.*` to **vNew**`/tomcat/bin/catalina.*`:
			`-Dhttps.proxyHost=<PROXY_HOST>`
			`-Dhttps.proxyPort=<PROXY_PORT>`
			`-Dhttps.proxyUser=<USERID>`
			`-Dhttps.proxyPassword=<PASSWORD>`
			-Djdk.http.auth.tunneling.disabledSchemes=
			To configure a proxy for the first time, see Enabling Secure HTTP Over SSL in the “Installing Code Insight” chapter.
				Optional

Table 6-1 ▪ Steps to Upgrade from a Previous Code Insight Release (cont.)

Step	Server	Summary	Description	Required / Optional
8	Core/ Scan	Configure SSL	If your current Code Insight instance is running over SSL, perform these steps: ● Copy the following file from **vCurrent** to **vNew**: **vCurrent**`/tomcat/conf/server.xml` ● If the `codeinsight.jks` file is present in **vCurrent**, copy it to **vNew**. If its location is *other than* under **vCurrent**`/tomcat` (and subsequently **vNew**`/tomcat`), ensure that `server.xml` reflects the correct keystore path. ● In the **vNew**`/tomcat/bin/catalina.*` file, set the following property: `-Dcodeinsight.ssl=true` To configure SSL for the first time, see Enabling Secure HTTP Over SSL in the “Installing Code Insight” chapter.	Optional
9	Core	Configure SSO	If your current Code Insight instance is running over SSO, copy the following files and folders from **vCurrent** to **vNew**: **vCurrent**`/config/core/core.sso.common.properties` **vCurrent**`/core/security/` **vCurrent**`/config/core/env.properties` **vCurrent**`/config/core/security/SPMetadata.xml` **vCurrent**`/config/core/security/IDPMetadata.xml` To configure SSO for the first time, see Configuring Code Insight to Use Single Sign-On in the “Configuring Code Insight” chapter.	Optional

Table 6-1 ▪ Steps to Upgrade from a Previous Code Insight Release (cont.)

Step	Server	Summary	Description	Required / Optional

10	Core/ Scan	Configure service	If your current Code Insight instance is running as a service, use the following procedures to migrate the service according to your platform requirements:
			On Windows:
			1. Copy **vCurrent**`\tomcat\bin\service.bat` to **vNew**`\tomcat\bin\`.
			2. In **vNew**`\tomcat\bin\service.bat`, update these properties:
			`set JRE_HOME=`**vNew**`\jre`
			`-DcodeinsightInstallPath=`**vNew**
			`setx CODEINSIGHT_ROOT` **"vNew"**
			On Linux (RedHat and CentOS):
			Update the following properties in the `CodeInsight.service` file under the `/etc/systemd/system` directory:
			`WorkingDirectory=`**vNew**
			`ExecStart=/usr/bin/su --login <loginUserId> -c` **vNew**`/tomcat/bin/startup.sh`
			(`<loginUserId>` is the user ID running the Code Insight service.)
			On Ubuntu:
			Update the following properties in the `CodeInsight.service` file under the `/etc/systemd/system` directory:
			`WorkingDirectory=`**vNew**
			`ExecStart=*`**vNew**`*tomcat/bin/startup.sh`
				Optional

11	Core/ Scan	Remove specific `webapps` files from Tomcat	Delete the following files. **For an instance running the Core Server only:** **vNew**`/tomcat/webapps/codeinsightScanner` (folder) **vNew**`/tomcat/webapps/codeaware.war` **For an instance running the Scan Server only:** **vNew**`/tomcat/webapps/codeinsight` (folder) **For an instance running both the Core Server and a Scan Server:** Do not delete any files.	Required

Table 6-1 ▪ Steps to Upgrade from a Previous Code Insight Release (cont.)

Step	Server	Summary	Description	Required / Optional
12	Core/ Scan	Start Tomcat	To start Tomcat in the **vNew** instance, execute `startup.bat` or `startup.sh` in **vNew**`/tomcat/bin/`. ***Note ▪*** *The database schema is automatically migrated when you start Tomcat.*	Required
13	Core	Launch Code Insight	Open a web browser and navigate to `http://<SERVER_HOST_NAME>:<PORT>/codeinsight/` (for example, `http://localhost:8888/codeinsight/`.	Required
14	Core	Run Electronic Update	Go to **Administration > Electronic Updates** to run the update to obtain the latest compliance library and automated discovery rules data.	Required
16	Scan	Rescan	(Recommended) To benefit from the latest automated detection rules and updates to the data library, rescan the existing projects. Alternatively, you can create and scan the same codebase in a new project.	Optional

Other Upgrade Tasks

Once you have completed the Code Insight upgrade steps, you might need to perform these tasks to complete the upgrade for your Code Insight system.

Table 6-2 ▪ Other Possible Upgrade Tasks

Server	Summary	Description	Required / Optional
Core	Migrate of inventory-only projects to the new single-project type	Starting in 2020 R3, all Scan Server and remote scans began using the same project type, enabling the results of both types of scans to co-exist in a single project when needed. No new inventory-only projects are supported. ● Existing standard projects from 2020 R2 or earlier are automatically migrated to support the results from both server and remote scans. ● Existing inventory-only projects will be migrated as they are; they will continue to be supported for use with 2020 R2 or earlier projects and plugins (but will be deprecated in the future). For information about project migration in general and how to manually migrate an inventory-only project to the new project type, see the following KB article in the Revenera Community for instructions: https://community.flexera.com/t5/FlexNet-Code-Insight-Customer/Code-Insight-2020-R3-Changes-to-Projects/ta-p/160059	Optional

Table 6-2 ▪ Other Possible Upgrade Tasks (cont.)

Server	Summary	Description	Required / Optional
Remote	Update scan-agent plugins	If you are using one or more Code Insight scan agent plugins to perform remote scans, you might need to upgrade the plugins to be compatible with Code Insight 2021 R3. (The new, single project type introduced in 2020 R3 requires upgraded plugins.) To perform the upgrade, follow these steps: **1.** Obtain the latest plugins `.zip` file from the Product and License Center accessed from the Customer Community portal. **2.** Install and configure the plugin on the remote server according to the instructions in the *Code Insight Plugins Guide*. **3.** Delete the scan agent index from the remote server (typically located in `<user_home>/.codeaware` on the remote server) so that the index will be rebuilt using the new plugin. **4.** Ensure that the environment variable `CODEINSIGHT_ROOT` is set on the remote server. **5.** Verify that the 7-zip tool is installed on the remote server. If it is missing, copy it from **vNew**`/7-zip`. **6.** Rescan the codebase.	Optional
Remote	Rescan remote codebases to see license evidence in Code Insight	In the previous 2021 R1 release, the Code Insight began reporting license evidence found in files scanned by a scan agent on a remote system. (Previously, no evidence of any type was reported for these files.) If you have migrated from a pre-2021 R1 release and want to see the license evidence for these files in the Code Insight Web UI, you must rescan the remote codebase.	Optional

A

Code Insight User Roles and Permissions

This appendix serves as a reference to the various user roles and permissions that Code Insight offers as a means to control user access to its functionality at your site:

- System Roles and Permissions
- Project Roles and Permissions
- Roles and Permissions to Manage Project Task Flow

System Roles and Permissions

The following table lists the roles and associated permissions used to manage Code Insight at the system level. The initial Code Insight System Administrator (and any subsequent System Administrators) manages user accounts and assigns system-level roles to any of these users as needed. For more information, see Managing Users in the “Configuring Code Insight” chapter.

One user can be assigned multiple roles.

Table A-1 ▪ System Roles and Permissions

			Roles		
			System Admin	**Policy Manager**	**Project Creator**
Responsibility	**Permissions**	**Notes**			
Administer Code Insight	Manage user accounts and permissions, create other system administrators, create policy managers, and allow all/or specified users to create projects		✓	—	—
	Schedule or force Electronic Updates		✓	—	—
	Configure an email server workflow notifications		✓	—	—
	Configure LDAP users		✓	—	—
	Configure Application Lifecycle (ALM) instances to manage inventory review tasks		✓	—	—
	Configure Scan Servers and scan profiles		✓	—	—
	Define global project defaults		✓	—	—
	Determine the CVSS version used for security vulnerability reporting		✓	—	—
	View Code Insight logs		✓	—	—
	Suppress security vulnerabilities		✓		
Manage polices for automating inventory review processes			—	✓	—

Table A-1 ▪ System Roles and Permissions (cont.)

			Roles		
			System Admin	**Policy Manager**	**Project Creator**
Create projects	Create public and private projects	The user who creates a project automatically becomes the Project Contact for that project. (See Project Roles and Permissions for additional Project Contacts permissions.)	—	—	✓
	Manage project folders (in **Projects** pane)		—	—	✓

Project Roles and Permissions

The following table lists the various roles and associated permissions used to manage a given project in Code Insight. The project creator automatically becomes the initial Project Contact and Project Administrator. In turn, a Project Administrator can assign Analyst, Reviewer, and Observer roles to Code Insight users, as well as create other Project Administrators. The Project Administrator can also remove users from any of these roles.

For details about these roles and the procedure for assigning them, see “Assigning Project Roles to Users” in the “Using Code Insight” chapter in the *Code Insight User Guide*.

Users can be assigned multiple project roles.

Table A-2 ▪ Project Roles and Permissions

			Roles					
			Analyst	Reviewer	Observer*	Proj. Contact	Proj. Admin	Sys. Admin
Responsibility	**Permissions**	**Notes**						
Manage project	Reassign the project contact		—	—	—	✓	✓	✓
	Manage project users		—	—	—	—	✓	—
	Rename the project		—	—	—	—	✓	—
	Move projects in **Projects** pane		—	—	—	—	✓	—
	Manage scan settings		—	—	—	—	✓	—
	Manage review/ remediation settings		—	—	—	—	✓	—
	Manage Source Control Management (SCM) and Application Lifecycle (ALM) instances		—	—	—	—	✓	—
	Delete the project		—	—	—	—	✓	—
	Branch the project		—	—	—	—	✓	—
Invoke/stop scans			✓	—	—	—	✓	—
Upload codebases			✓	—	—	—	✓	—
Import/export project data			✓	—	—	—	✓	—
View project inventory			✓	✓	✓	✓	✓	✓**

Table A-2 ▪ Project Roles and Permissions (cont.)

			Roles					
			Analyst	Reviewer	Observer*	Proj. Contact	Proj. Admin	Sys. Admin
Review project inventory	Recall inventory		✓	✓	—	—	—	—
	Approve/reject inventory		—	✓	—	—	—	—
	Set inventory priority		—	✓	—	—	—	—
	Edit/create inventory	Only Analysts have access to the **Add Item** and **Edit Item** buttons to create/ edit project inventory properties.	✓	—	—	—	—	—
	Update Notices text and notes	This permission refers to inventory's **Notices Text** field (on the **Notices Text** tab) and the information on the **Notes & Guidance** tab (except **Detection Notes**).	✓	✓	—	—	—	—
	View evidence found in files listed on the **Associated Files** tab and manage the inventory's file associations	For Analysts only, the file path for an associated file is hyperlinked, enabling them to open to the file's **File Details** tab in **Analysis Workbench** to view evidence. In **Analysis Workbench**, Analysts can also add/remove files associated with inventory.	✓	—	—	—	—	—

Table A-2 ▪ Project Roles and Permissions (cont.)

			Roles					
			Analyst	**Reviewer**	**Observer***	**Proj. Contact**	**Proj. Admin**	**Sys. Admin**
Use Analysis Workbench	View/analyze codebase files		✓	—	—	—	—	—
	Edit alerts		✓	—	—	—	—	—
	Create, edit, and recall inventory and manage custom detection rules		✓	—	—	—	—	—
	Edit **Notices Tex**t field on **Notices Text** tab		✓	—	—	—	—	—
	Edit **Audit Notes** field on the **Notes** tab		✓	—	—	—	—	—
Generate reports		Any user (not just one with a project role) can generate reports. For a “private” project, the Observer is considered an “any user”, restricted to viewing project inventory and generating reports.	✓	✓	✓	✓	✓	✓

* The Observer role is available for only projects defined as “Private”. Private projects are hidden from all users except the Project Contact, the System Administrator (restricted to **Summary** tab only), and those users assigned as Project Administrators, Analysts, Reviewers, and Observers of the project. An Observer is limited to viewing project inventory and generating reports for the “Private Project”.

** In general, a System Administrator has permission to access both public and private projects. However, the **Project Inventory** tab for a private project is visible to a System Administrator only if the user assigned to the System Administrator role is also assigned to a role in the project (Project Administrator, Project Contact, Observer, Analyst, or Reviewer).

Roles and Permissions to Manage Project Task Flow

The following table lists the project roles and permissions used to manage tasks to review or remediate inventory items in a project.

Table A-3 ▪ Project Task-Flow Roles and Permissions

		Roles					
		Analyst	**Reviewer**	**Observer**	**Project Contact**	**Task Assignee**	**Project Admin**
Permissions	**Notes**						
Create/edit tasks	Any user assigned to a project role can create and edit tasks.	✓	✓	✓	✓	✓	✓
Reassign tasks		—	—	—	—	✓	✓
Close manual review tasks		—	✓	—	—	—	—
Close remediation tasks		—	—	—	—	✓	✓
Close miscellaneous tasks	Any user assigned to a project role can close a miscellaneous task.	✓	✓	✓	✓	✓	✓