

# lgTM enterprise



## LGTM Enterprise Installation Guide

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# Introduction

LGTM Enterprise is built on Semmle’s tried and tested analysis technology. The product is the on-premises twin of Semmle’s [LGTM.com](#) platform—a publicly available, free to use, cloud-based service that continuously analyzes over 70,000 open source projects worked on by over 500,000 developers, and containing data for more than 16 million commits.

## Note

“LGTM” is the most commonly posted comment on code review platforms (such as GitHub). It means: “looks good to me.”

Most notably, LGTM Enterprise offers the full power of LGTM.com analysis to customers in an on-premises version. LGTM allows developers to efficiently browse alerts in their source code (using either a web browser or a plugin for their IDE), while at the same time incorporating broader insights. It seamlessly integrates with platforms like GitHub Enterprise and Bitbucket Server for code review, authorization, and authentication.

## About this document

This guide provides instructions for installing a single-server LGTM Enterprise system and performing basic setup tasks. The resulting system can be used for demonstration or simple evaluation purposes, and provides the basis for a deployment consisting of multiple worker machines.

The guide also includes a tutorial for setting up three example projects using source code from GitHub.com.

## Important

If you are upgrading your existing installation of LGTM Enterprise, see the upgrade instructions in the administrator help at <https://help.semmle.com/lgtm-enterprise/admin/help/sys-admin/upgrading-lgtm.html>.

## Time required

You should allow an hour to perform the initial installation and setup.

If you choose to follow the tutorial and set up the example integrations and projects, you will need to leave the application to perform analysis on the example projects. After three or four hours you can come back and see the results that are available on the site. Alternatively, perform the installation and setup, then leave the application to run overnight before looking at the analysis results.

## Related documentation

- [LGTM Enterprise System Architecture](#) (PDF)
- [LGTM Enterprise System Requirements](#) (PDF)
- LGTM Enterprise administrator help

To access this, click **Admin help** at the top of the administration pages in LGTM Enterprise, or browse to [help.semmle.com/lgtm-enterprise/admin](https://help.semmle.com/lgtm-enterprise/admin).

# Prerequisites for installation

The LGTM Enterprise installer makes installation and configuration as easy as possible. It includes almost all of the components you need. For example, the packages that are installed include the nginx HTTP and reverse proxy server for serving pages from the LGTM Enterprise web application. Some prerequisites are, however, assumed and it is important you make sure these are all in place before proceeding with installation.

The instructions in this document assume that all of the following requirements have been met:

- You have a valid Semmler license for LGTM Enterprise.
- The computer used for this single-machine setup has a minimum of 8 cores, 16 GB of RAM, and 100 GB of free disk space.

## Note

This specification is suitable for demonstration or simple evaluation purposes. For a deployment of LGTM Enterprise see the separate [LGTM Enterprise System Requirements](#) PDF, or the "System requirements" topic in the [administrator help](#).

- You are installing on a computer that is running one of the supported operating systems. See the details in the [LGTM Enterprise System Requirements](#) PDF, or the [administrator help](#).

We recommend that you start with a fresh Linux installation (for example, on a virtual machine).

- The installing user must be able to run commands using sudo.
- Port 443 is available.

## Note

Alternatively, you can configure the bundled third-party nginx web proxy to use a different port for SSL connections. However, this is beyond the scope of this document. Please refer to the nginx documentation for further instructions.

## Worker prerequisites

To analyze projects with LGTM, the computer on which worker daemons will build and analyze projects must have all of the environment prerequisites to allow this to be done. These

prerequisites are likely to vary from project to project.

You can install the prerequisites for the projects you plan to build at any time, however, it's usually simplest to install LGTM Enterprise first, and then add any missing prerequisites. On Linux computers, this ensures that EPEL (Extra Packages for Enterprise Linux) is present and can be used to install the missing packages.

For full system requirement details for a deployment of LGTM Enterprise, see the separate [LGTM Enterprise System Requirements](#) PDF (or you can find the same information in the [administrator help](#)). For more information about worker host configuration, see the topic "[Configuring hosts to analyze code](#)" in the administrator help.

## SSL certificates

To ensure that data transferred to and from servers is protected, LGTM Enterprise relies on SSL/TLS encryption. When you run the installation script, it generates self-signed certificates automatically to protect communication between internal components, for example, the web app and the file store.

By default, the web application is configured to use a self-signed certificate to communicate externally. Using this certificate initially can be useful for testing purposes. However, while it is possible to establish trust using the self-signed certificate, corporate policies often prevent this, which would require you to disable SSL verification in your repository management system. A true, trusted certificate is therefore required.

### Important

You should obtain an SSL certificate and private key for the server on which you are installing LGTM Enterprise. These should be in separate files, in PEM format. The certificate must be issued by a trusted certification authority.

For more information, see the topic "Installing an SSL certificate" in the [administrator help](#).

## Reasons to replace the self-signed certificate

The self-signed certificate is unsuitable for a deployment of LGTM Enterprise because:

- Pull request integration with Bitbucket Server will fail unless you configure Bitbucket to trust the automatically generated certificate.
- Users will see a browser security message when they attempt to access LGTM Enterprise. They may need to add a security exception for the site before they can view it (behavior varies for different browsers).
- Users will be unable to use the LGTM plugins to view alerts in their IDE.

## Third-party software requirements

LGTM Enterprise requires access to the following third-party packages.

- Java JRE 8
- PostgreSQL 9.5 or higher
- RabbitMQ Server
- Nginx
- Minio release 2018-07-23T18-34-49 (bundled with LGTM)
- Solr 7.1.0 (bundled with LGTM)
- Git
- Subversion
- Python 2 (version 2.7 or higher will be installed)

By default, these are installed automatically on the relevant machines during the installation of LGTM Enterprise. With the exception of Minio and Solr, the exact versions that are installed depends on the latest version available for your Linux distribution. Any dependencies of these packages are also installed.

## Access to third-party packages during installation

The simplest way to install LGTM Enterprise is to enable internet access and to run the installation script supplied with the application. This enables the installer to download and install the required packages from their official online package repositories using the standard utilities available in your Linux distribution. If you're using Red Hat Enterprise or CentOS, this will require access to the EPEL (Extra Packages for Enterprise Linux) repository. Once LGTM has been deployed, internet access can be closed down.

If internet access is not available, you can do either of the following:

- Configure the machine so that it can access an internally hosted mirror that contains these package repositories and their dependencies. The installer will download and install the required packages from your internal mirror.
- *For installations on Red Hat or CentOS:* Extract the third-party dependencies pack before you run the installer. Details for doing this are provided in the installation instructions.

# Installation overview

This Guide steps you through the installation process. It assumes that you have set up one or more machines for LGTM Enterprise to use and that these meet the prerequisites outlined above (described in greater detail in [LGTM Enterprise System Requirements](#) PDF and in the [administrator help](#)).

- ["Preparing to install" on the next page](#)—uploading the license file, SSL certificate and installer, and extracting the installer.
- ["Installing LGTM Enterprise" on page 12](#)—running the installation script and configuring the SSL certificate.
- ["Accessing the administration interface" on page 17](#)—logging in and viewing the administration pages.
- ["Checking the environment of the work pool" on page 18](#)—verifying that the work pool machines are correctly set up for analysis.
- ["Making IDE plugins available to users" on page 21](#)—ensuing that the integrated developer environment (IDE) plugins are available for developers to install. These can be used to download alerts from LGTM Enterprise and view them in their IDE.

After you finish installing LGTM Enterprise, you may wish to try out the [tutorial](#) and add some simple, open source projects.

## Tip

If you want to install LGTM Enterprise across a cluster of machines you will also need to refer to the [administrator help](#) for information about deploying LGTM Enterprise to multiple machines.

# Preparing to install

Before you install LGTM Enterprise, you need to perform the following tasks.

## Upload and extract the installer

1. Open a command console for the server on which you are going to install LGTM Enterprise. If you are installing across multiple servers, open a command console for the server that will host the coordinator (part of the control pool). For example, connect to the server using an SSH client.
2. Create a directory to store the main LGTM Enterprise installation and configuration files. In this guide, the commands use an example directory of `lgtm-releases`, but you can use any directory for this purpose.
3. Upload the supplied `lgtm-<version>.tar.gz` file into the newly created directory on the server.
4. *For Red Hat and CentOS only:* If internet access is not available and you want to perform an offline installation, upload the supplied `lgtm-third-party-rpms-<yyyy-mm-dd>.tar.gz` file into the same directory.
5. In the command console, change to the `lgtm-releases` directory and extract the contents of the LGTM distribution package by entering:

```
tar -xvf lgtm-<version>.tar.gz
```

The directory now contains an `lgtm-<version>` directory, within which are directories called `generated` and `lgtm`.

6. *For Red Hat and CentOS only:* If you are performing an offline installation, extract the contents of the dependencies package into the `lgtm-<version>/lgtm` directory:

```
tar -xvf lgtm-third-party-rpms-<yyyy-mm-dd>.tar.gz -C lgtm-<version>/lgtm
```

This adds the directories: `database`, `queue`, and `web`.

## Upload a license file and SSL certificate

1. Upload your LGTM license file to the `lgtm-releases/lgtm-<version>/lgtm` directory.
2. Change the file name to `license.dat` if it is not already called this.
3. Within the `lgtm-releases` directory, create a subdirectory called `state`.
4. Upload the SSL certificate and key file for the LGTM web application to the `lgtm-releases/state` directory.

# Installing LGTM Enterprise

You're now ready to run the installation script and answer the installer prompts.

The installation script is stored in the `lgtm` directory of the `lgtm-<version>` directory you extracted earlier, for example: `lgtm-releases/lgtm-<version>/lgtm/install.sh`. Typically, you will need to use the `sudo` command to run the script—this grants the elevated permissions required to create the required directories and install the application.

From the `lgtm` directory enter: `sudo ./install.sh`

1. What is the fully qualified domain name of this machine (this will be used for internal communication between different cluster machines)?

The text in square brackets gives the fully qualified domain name (FQDN) of the current machine. This value is used for internal communication between different machines in the LGTM cluster.

Press `Enter` to use this name, or provide an alternative FQDN.

## Note

If the server has both private and public FQDNs, specify the private FQDN here. The next prompt requests the user URL, this URL should usually include the public FQDN. For example:

- **Google Cloud Platform**  
Private FQDN: `vm-name.c.project.internal`  
User URL: `https://<ip-reversed>.bc.googleusercontent.com/`
- **Amazon Web Services**  
Private FQDN: `<ip>.zone.compute.internal`  
User URL: `https://vm-id.compute-1.amazonaws.com`
- **Microsoft Azure**  
Private FQDN: `instance.project.ax.internal.cloudapp.net`  
User URL: `https://label.location.cloudapp.azure.com`

2. What URL will users use to access LGTM?

The text in square brackets gives a URL that uses the FQDN you just entered.

If necessary, provide the URL that users will use in their browsers to access LGTM. Otherwise press `Enter` to accept the default.

3. A cluster configuration for a single machine installation has been created. Do you want to edit it manually before continuing?

The cluster configuration file specifies where all the LGTM services should run. In addition, you can specify a custom SSL certificate and key file for the LGTM web application to use. For more information about editing the configuration file, see the topic "Editing the cluster configuration" in the [administrator help](#).

If you have an SSL certificate and key file for LGTM to use, type `y` and press `Enter` to edit the file. Alternatively, press `Enter` to continue to the next step.

If a local text editor is available, the cluster configuration file is opened for editing. Otherwise, you are prompted to edit the `lgtm-cluster-config.yml` file manually.

- a. In the cluster configuration file, find the `ssl` block.
- b. Within this block, add entries for `certificate_path` and `key_path`, specifying the names of the files.

```
ssl:
  hsts: false
  certificate_path: <certificate file>
  key_path: <key file>
```

### Note

The cluster configuration file is located in the `lgtm-releases/state` directory. This is the same place that you saved the certificate file and the key file, so you can specify their location by just giving the file names, without a path.

- c. Check that the configuration is still valid YAML.
  - d. Save your changes to the configuration and close the file.
  - e. Return to the console where the LGTM installer is running.
  - f. If necessary, press `Enter` to continue the installation process.
4. Please provide a password for encrypting the installation manifest:

The LGTM manifest file contains authentication details and is therefore encrypted. You are prompted to enter a password for encrypting/decrypting the file. You will need this password whenever the manifest is changed, for example, when you upgrade LGTM.

### Note

Defining a password is optional. If control of the credentials stored in the manifest is not a concern, or if the file is protected by some other means, then you do not need to enter a password.

If you press `Enter` without giving a password, the manifest is encrypted with a fixed password, which only prevents leaking the credentials via “shoulder surfing,” and does not provide real security.

If you define a password, make sure you store it securely as you will need it to upgrade the system in future.

Enter a password for encrypting/decrypting the file. This is not displayed on the screen. You are asked to confirm this password before the script continues.

5. If you want to create a new admin account, please enter the email address to be used for logging in now. Otherwise, leave blank.

Enter a valid email address.

### Important

You should create an LGTM Enterprise administrator now, to allow you to log in to LGTM when the installation is complete. If you do not do so now you will need to create a user from the command line after installation. For details of how to do this, see the reference topics for the [create-user](#) and [grant-admin](#) actions in the LGTM Enterprise [administrator help](#).

6. And what should the password be?

Enter a password. This is not displayed on the screen. You are asked to confirm this password before the script continues.

The installer will proceed with the installation for a few minutes before the next prompt is displayed.

7. Before completing the installation the database, file storage and queue services must be started. This can be done automatically if they are located

on this machine. Is this the case? [Y/n]

Usually, you should press `Enter` to continue. If you edited the cluster configuration in step 3 above and moved these services to different host machines, enter `n` and follow the prompts.

The installer completes after displaying messages about various services being started. By default, the LGTM work pool has two workers. The script ends by prompting you to deploy LGTM Enterprise to any other machines in the LGTM cluster, see below:

```
[info] Starting LGTM...
[info] Starting postgres-lgtm...
Created symlink from /etc/systemd/system/multi-user.target.wants/postgres-
lgtm.service to /usr/lib/systemd/system/postgres-lgtm.service.
[success] Started postgres-lgtm.
[info] Starting minio...
Created symlink from /etc/systemd/system/multi-user.target.wants/minio.service to
/usr/lib/systemd/system/minio.service.
[success] Started minio.
[info] Starting rabbitmq-server-lgtm...
Created symlink from /etc/systemd/system/multi-user.target.wants/rabbitmq-server-
lgtm.service to /usr/lib/systemd/system/rabbitmq-server-lgtm.service.
[success] Started rabbitmq-server-lgtm.
[info] Starting solr...
Created symlink from /etc/systemd/system/multi-user.target.wants/solr.service to
/usr/lib/systemd/system/solr.service.
[success] Started solr.
[info] Starting lgtm-scheduler...
Created symlink from /etc/systemd/system/multi-user.target.wants/lgtm-
scheduler.service to /usr/lib/systemd/system/lgtm-scheduler.service.
[success] Started lgtm-scheduler.
[info] Starting lgtm-jobdealer...
Created symlink from /etc/systemd/system/multi-user.target.wants/lgtm-
jobdealer.service to /usr/lib/systemd/system/lgtm-jobdealer.service.
[success] Started lgtm-jobdealer.
[info] Starting nginx-lgtm...
Created symlink from /etc/systemd/system/multi-user.target.wants/nginx-lgtm.service
to /usr/lib/systemd/system/nginx-lgtm.service.
[success] Started nginx-lgtm.
[info] Starting lgtm-webapp...
Created symlink from /etc/systemd/system/multi-user.target.wants/lgtm-webapp.service
to /usr/lib/systemd/system/lgtm-webapp.service.
[success] Started lgtm-webapp.
[info] Starting lgtm-worker@1...
Created symlink from /etc/systemd/system/multi-user.target.wants/lgtm-
worker@1.service to /usr/lib/systemd/system/lgtm-worker@.service.
[success] Started lgtm-worker@1.
```

```
[info] Starting lgdm-worker@2...
Created symlink from /etc/systemd/system/multi-user.target.wants/lgdm-
worker@2.service to /usr/lib/systemd/system/lgdm-worker@.service.
[success] Started lgdm-worker@2.
[success] All LGTM services on this machine have been started.
[prompt] If you have manually edited the cluster configuration file to introduce
additional machines, complete the installation by copying /lgdm-releases/lgdm-1.17.0
to each machine in the cluster and running the 'generated/<hostname>/install-
machine.sh' script. Press Enter when complete...
```

If your LGTM cluster configuration specifies other hosts, in addition to the current machine, deploy LGTM Enterprise to these machines following the instructions reported by the script. When you've finished deploying LGTM to all the hosts in the cluster, press .

```
[success] You can now access the LGTM admin panel in your browser by going to
https://<lgdm-server>/admin/ and logging in with the email and password you supplied
earlier.
```

You're ready to log in to LGTM Enterprise and get started.

### Tip

For information about deploying LGTM to other machines in the cluster, see the following topics in the administrator help:

- [Adding and removing workers](#)
- [Moving control pool components](#)

# Accessing the administration interface

When you finish **installing** LGTM Enterprise, you can log in to the application using the administrator account created during the installation process. This gives you access to the administration interface where you can configure the application.

1. In a browser, go to the URL supplied in the final installer message.

The LGTM Enterprise log in page is displayed.

## Note

The URL reported by the installer assumes that the web application is configured to run on the current machine. If you changed the URL (the value of `external_url`) or configured the web component to run on an alternative host, you will need to modify the URL accordingly.

2. Log in to LGTM Enterprise using the administrator account credentials you gave during installation.

3. If prompted to do so, choose a user name, or accept the default, and click **Let's go**.

The LGTM Enterprise administration home page is displayed.

4. Click **Admin help** in the menu bar to access the application administrator help pages.

## Tip

You can also access the administrator help at [help.semmle.com](https://help.semmle.com).

# Checking the environment of the work pool

You need to check that the machines hosting the worker processes have the correct environment to checkout and build all the projects you plan to analyze (see "[Prerequisites for installation](#)" on page 6).

The software required on the work pool machines depends on the projects and languages that you intend to analyze. For more detailed information about worker host configuration, see the topic "Configuring hosts to analyze code" in the [LGTM Enterprise administrator help](#).

## Checking the basic configuration

You can use the `lgtm-build-requirements` command to check whether work pool machines have the basic dependencies and environment for building/analyzing projects using the default build methods supported by LGTM Enterprise.

On each machine that runs worker daemons, run the command:

```
sudo lgtm-build-requirements
```

### Note

If you are not the root user you need to use `sudo` to run the `lgtm-build-requirements` command.

For more information about the `lgtm-build-requirements` command, see the reference topic in the administrator help on [help.semmle.com](http://help.semmle.com).

This command checks the machine for basic checkout and build requirements. Any systems that are accessible to LGTM workers are reported with a success message. For example:

```
[info] Python
[success] python2 found.
[success] pip for python2 found.
[success] packaging for python2 found.
[success] virtualenv for python2 found.
[error] python3 was not found. You are unlikely to be able to analyze any
Python 3 projects.
```

In this example, the command successfully found the core dependencies for Python 2 analysis but not for Python 3 analysis.

## Example—requirements for the tutorial

For example, to analyze the projects you're going to add in the [tutorial](#) later in this guide, the output for this command should include the following success messages:

```
[info] Java
[success] javac found.
[success] maven found.

[info] Python
[success] python2 found.
[success] pip for python2 found.
[success] packaging for python2 found.
[success] virtualenv for python2 found.

[info] Version Control
[success] git found.
```

The requirements are:

- Java compiler and Maven—used to build the example Java project.
- Pip package management system—used to install packages for Python.
- Packaging and virtualenv pip modules—necessary for the example Python project.

If one or more of these dependencies is reported as an error or warning, you will need to install additional software on the machine before trying the tutorial.

### Note

The machine must have the Java Development Kit installed: either OpenJDK 8 or Oracle JDK 8.

To install OpenJDK8:

- On RedHat or CentOS run: `sudo yum install java-1.8.0-openjdk`
- On Debian or Ubuntu run: `sudo apt-get install openjdk-8-jdk`

To install Maven:

- On RedHat or CentOS run: `sudo yum install maven`
- On Debian or Ubuntu run: `sudo apt-get install maven`

To install pip:

- On RedHat or CentOS run: `sudo yum -y install python-pip`
- On Debian or Ubuntu run: `sudo apt-get install python-pip`

To install the packaging and virtualenv modules:

- Run: `sudo pip install packaging virtualenv`

### Note

This completes the installation of LGTM Enterprise.

The remaining sections of this document take the form of a tutorial for setting up three open source projects for analysis.

# Making IDE plugins available to users

There are two types of integrated developer environment (IDE) plugin available:

- **LGTM plugins**—used by developers to download alerts from LGTM Enterprise and view them alongside the source code in their IDE.
- **QL IDE plugins**—used by query writers to write and run QL queries locally in their IDE.

There are installers available for the following IDEs: Eclipse, Visual Studio, and IntelliJ (LGTM plugin only).

You can download the installers from the customer wiki:

- LGTM plugins from the same place as the LGTM Enterprise installer and related documentation, [LGTM Enterprise downloads page](#).
- QL plugins from the [QL tools downloads page](#).

We recommend that you make these installers available to users in a central, secure location and publish details of this location to users.

For installation instructions and help for the LGTM plugins, see the ["IDE integration for LGTM"](#) topic in the user help. For installation instructions for the QL plugins, see the online help for [QL for Eclipse](#) or [QL for Visual Studio](#).

## Compatibility

When you upgrade to a new version of LGTM, you should also make the new versions of the plugins available to users. This ensures that users can take advantage of any improvements.

Users who have only installed the LGTM plugin can often continue to use an older plugin with an upgraded LGTM Enterprise, but it is always preferable to upgrade to the latest version.

For version 1.18 and earlier versions of LGTM, if users also install the QL plugin in the same IDE, it must be the same version. From 1.18 onward, installation of different versions of the LGTM and QL plugins is supported.

# Tutorial overview

This tutorial is intended for people who want to perform some tests to verify the basic features of LGTM Enterprise. It covers:

- Setting up integration with GitHub.com including authentication, authorization, and repository providers
- Adding some open source projects and start analyzing them
- Monitoring what's happening during the build/analysis process
- Logging in as a standard user and viewing the results

## Note

Setting up these example projects provides a quick way to evaluate a test instance of LGTM Enterprise. If you have installed a production instance of LGTM Enterprise, see the application administrator's help for information on integrating your repository providers and adding your own projects for analysis. To access this help, click **Admin help** at the top of the administration pages.

# Setting up integrations

LGTM Enterprise integrates with external systems to provide login authentication, authorization information, and source code repositories.

- **Authentication providers**—enable users to log in to LGTM Enterprise using existing account details for external systems.
- **Authorization providers**—enable LGTM Enterprise to use the external account details to determine what projects an authenticated user can view.
- **Repository providers**—enable LGTM Enterprise to connect to repositories and download source code to analyze.

After defining these providers, you will be able to add projects for LGTM Enterprise to analyze.

## Important

This tutorial should not be run on an instance of LGTM Enterprise that will be deployed to users. It is best to avoid adding unwanted integrations and projects to a production system.

## Add an authentication provider

In this example of adding an integration you will add GitHub.com as an authentication provider.

1. From the LGTM Enterprise administration home page, click **Integrations** in the panel on the left.
2. Click **Add new Authentication provider**.
3. Select **GitHub.com** from the drop-down list and click **Continue**.

The Add new GitHub authentication provider page is displayed.

4. Select and copy the value displayed in the Callback URL field.
5. In a new browser tab, go to [github.com](https://github.com) and log in.
6. In the upper-right corner of any page, click your profile image, then, in the drop-down list,

click **Settings**.

7. In the left sidebar, click **Developer settings**.
8. In the left sidebar, click **OAuth Apps**.
9. Click **New OAuth App**.

### Note

If you haven't created an app before, this button will say, **Register a new application**.

10. In Application name field, enter the name of your app. For example: LGTM Enterprise.
11. In the Homepage URL field, enter the full URL to your app's website: `https://<server>/`.  
Where `<server>` is the location of the LGTM Enterprise home page—typically, this will be the hostname or IP address of the server.

### Note

There is no need for the LGTM Enterprise web server to be publicly accessible for the GitHub.com integration to work.

12. In the Authorization callback URL field, paste the callback URL that you copied in a previous step.
13. Click **Register application**.
14. In the OAuth Apps page for LGTM Enterprise, copy the Client ID value.
15. Keep the GitHub page open in the browser tab.
16. Return to your LGTM Enterprise browser tab and the Add new GitHub authentication provider page.
17. Paste the copied ID into the Client ID field.
18. Go back to the GitHub browser tab and copy the Client Secret value.
19. Paste this into the Client secret field in LGTM Enterprise.

20. Click **Add**.

The Integrations page is displayed again.

21. Click **Test** to verify that this authentication provider is set up correctly.

## Add a repository provider

Before you can retrieve the source code of a project for analysis in LGTM Enterprise, you need to give LGTM the details of the repository provider that you use to store the code. Following on from the previous example, we are again using GitHub.com as the authentication provider in this example.

1. On the Integrations page of the LGTM Enterprise administration interface, click **Add new Repository** provider to display the Add new repository provider page.
2. From the drop-down list, select GitHub.com and click **Continue**.

The Add new GitHub repository provider page is displayed. Most of the fields are already filled and do not need to be changed.

3. Enter a value in the Short name field—for example gh to indicate GitHub. This value is used in the URLs for LGTM projects associated with this repository provider.

For example: `https://my.lgtm.server/projects/gh/myorganization/myproject/`

4. Leave the **Checkout method** selection unchanged.
5. In the **Username** and **Password** fields, enter the details for a GitHub.com account that LGTM Enterprise will use to access repositories. This can be the personal account of an actual GitHub user or it can be a service account (sometimes referred to as a "bot" account) created specifically for this type of access.
6. In the Authentication provider drop-down list, select **GitHub.com**.

7. In the Authorization provider drop-down list, select **Public**.

This gives users full authorization to see all of the information available for projects added to LGTM from this repository provider.

8. Leave the **Allow non-admin users to add projects** check box selected.
9. Click **Add**.

You can now add projects hosted on GitHub.com to your LGTM Enterprise installation.

# Adding projects

By default, any user of LGTM Enterprise can add projects directly from their My projects page. For details of how to do this, see the topic “Adding projects to LGTM” in the user help, which any user can access by clicking **Help** in the main interface. (If necessary, you can disable this option when you add a repository provider.)

We are going to use the Add projects page in the administration interface to add multiple projects from GitHub.com.

## Important

The projects we're going to add have build requirements. If you have not already done so, check these requirements and, if necessary, install any missing software before proceeding. See "[Example—requirements for the tutorial](#)" on page 19.

1. On the Add projects administration page, enter the following URLs for projects on GitHub.com, one per line:

`https://github.com/yarnpkg/yarn`

`https://github.com/pytest-dev/pytest`

`https://github.com/stanford-futuredata/macrobases`

## Note

- yarn is a JavaScript project
- pytest is a Python project
- macrobases is a Java project

2. Click **Add**.

A status page is displayed.

The projects are queued to be built and analyzed.

**Note**

Details of what happens when you add a project

Each URL is processed as follows:

- Test the URL against the repository provider URLs:
  - If a match is found, an "attempt build" task is queued for the repository, including any additional information defined by the provider.
  - If no match is found, an error is reported in the administration pages.
- Each attempt build task runs and tries to analyze the code base:
  - If at least one language is analyzed successfully, the project is added to LGTM.
  - If the analysis fails for all languages, an error is reported.

Successfully added projects are scheduled for full analysis and the initial alerts are available immediately in the end-user interface.

This is a good time to take a break. The default system just has a single worker to process these projects (the other worker is reserved for processing custom queries entered by users), so it will take a little to add all three projects.

Come back in half an hour. You can then check that analysis is successfully underway. After that you will leave the LGTM Enterprise to continue processing the projects and adding analysis data.

## Checking progress for added projects

You have left LGTM Enterprise for half an hour, to allow it time to add the example projects. Now—before leaving the system to generate analysis data for the projects—let’s just check that the projects were added successfully.

### Checking the projects were added

1. Click **Add projects** in the LGTM Enterprise administration interface.

2. Click the **History** tab.

This tab shows a list of requests to add new projects.

3. Click the entry in the Time column.

The three projects are listed. Each should have at least one green check mark against it, to indicate that one or more languages in the repository were successfully analyzed. Each of the successfully analyzed repositories is added as a project.

4. Click **Logs** in the administration interface.

You should see a list of log entries with the status “SUCCESS.”

5. Click **Infrastructure**.

The chart should show activity (in green) starting and continuing for one of the two workers. The second worker is reserved to work on user queries run from the query console.

Leave LGTM Enterprise to process the projects for three or four hours before continuing with the instructions below. Alternatively, leave the application to run overnight, by which time there will be more analysis data to view.

### Monitoring the build/analysis process

After leaving LGTM Enterprise to generate analysis data, return to the LGTM Enterprise administration pages and check the progress of analysis.

1. Click **Projects** in the administration interface.
2. Click the first of the listed projects.
3. In the **Build status** tab, if LGTM analyzes more than one language for the project, select a language from the drop-down list displayed above the chart.
4. Click **Refresh health** to update the chart.

The chart and associated information show:

- The total number of commits in the project.
  - The number of commits that LGTM Enterprise has attempted to analyze for the selected language.
  - The number, and percentage, of commits that were successfully and unsuccessfully analyzed for the selected language.
5. If the Commit status chart shows a gray horizontal bar, click this to display the number of commits that have not yet been analyzed.
  6. Click **Infrastructure** in the administration interface.
  7. Check that one of the workers has continued to execute jobs (shown in green).
  8. Click **Logs** in the administration interface.
  9. Look through the list of log entries for lines that do not have the status “SUCCESS.”  

You can use the Type drop-down list to filter on specific types of job—for example, just build jobs.
  10. If you find an unsuccessful job you can review the log details by clicking the ID number.

## Viewing results

You will now create a standard (non-admin) user and log in to LGTM Enterprise to view analysis results.

1. In the LGTM Enterprise administration interface, click **Users**.
2. Click **Add new user**.
3. Complete the field details and click **Add**.
4. Open an incognito browser tab (or use a different browser to the one you have been using), and go to the URL of your LGTM Enterprise installation.  
  
A security message may be displayed by the browser. Continue to the site (you may have to add an exception, depending on which browser you are using).
5. Log in by entering the email address and password for the new user.
6. Choose a user name, or accept the default, and click **Let's go**.
7. On the LGTM Enterprise home page, search for / (a forward slash) to return matches for all projects, people and queries on the system.
8. Click **Projects (3)** to show only projects.
9. Click one of the search results.

The Overview tab for the project details is displayed.

### Note

Initially, when you first add a project the Overview page will say "Analysis in progress." After the two most recent project revisions have been processed, the project Overview page displays analysis data relating to the most recent changes to the code base. The page will begin to show more and more information as LGTM steps back through the project's revision history, analyzing historic revisions.

10. View the other projects.
11. With a project displayed in LGTM Enterprise, click **Follow** at the top right.

This adds the projects to a list of followed projects for quick access in future.

12. Click **My projects** in the menu bar.

The project is listed, and you can click the project name to view the analysis details.

13. On the My projects page, click **Add project**.

14. Enter the URL for another GitHub project to analyze.

For example: `https://github.com/atom/atom`

15. Click **Add**.

This is how users add projects that they want to be analyzed.

For more information, click **Help** (in the menu bar) and browse to **Using personalized views > Adding projects to LGTM**.

# Information for application administrators

The help pages of the LGTM Enterprise administration interface, provide useful information for application administrators. To access this help, click **Admin help** at the top of the administration pages.

Some topics that will help application administrators configure a newly installed LGTM Enterprise system are:

- **Adding an authentication provider**

Find out about other authentication providers that you can use.

- **Adding authorization providers**

Find out more about authorization for user accounts.

- **Adding repository providers**

Find out about other types of code repositories you can use.

- **Authorization policies**

When a user doesn't have access to a project should information about that project be restricted, or should the project be completely hidden from the user?

- **Configuring LGTM analysis**

How to show or hide query results, and how to exclude some file types from analysis.

- **Reference**

Learn about command-line commands that allow you to perform actions you can alternatively perform from the administration pages of LGTM Enterprise.