User-based Licensing

Version 1.2022121

License Server Administration Guide

Non-Confidential

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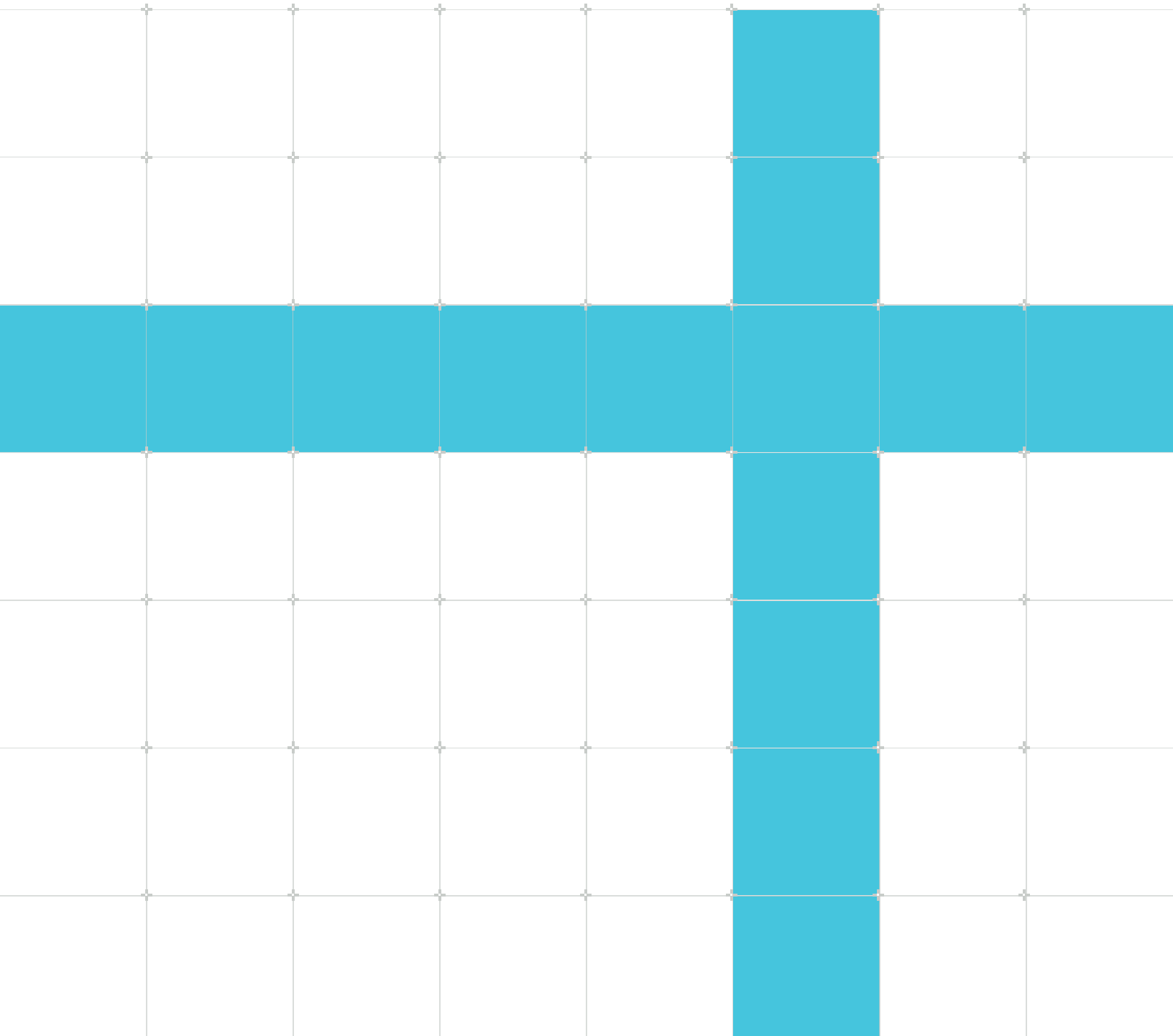

User-based Licensing
License Server Administration Guide

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Release information

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1. Introduction

This guide describes how to install and manage a license server for Arm products licensed under the user-based licensing model.

1.1 Conventions

The following subsections describe conventions used in Arm documents.

Glossary

The Arm Glossary is a list of terms used in Arm documentation, together with definitions for those terms. The Arm Glossary does not contain terms that are industry standard unless the Arm meaning differs from the generally accepted meaning.

See the Arm Glossary for more information: developer.arm.com/glossary.

Typographic conventions

Arm documentation uses typographical conventions to convey specific meaning.

Convention	Use
italic	Citations.
bold	Interface elements, such as menu names. Terms in descriptive lists, where appropriate.
`monospace`	Text that you can enter at the keyboard, such as commands, file and program names, and source code.
`monospace underline`	A permitted abbreviation for a command or option. You can enter the underlined text instead of the full command or option name.
`<and>`	Encloses replaceable terms for assembler syntax where they appear in code or code fragments. For example: `MRC p15, 0, <Rd>, <CRn>, <CRm>, <Opcode_2>`
SMALL CAPITALS	Terms that have specific technical meanings as defined in the *Arm® Glossary*. For example, **IMPLEMENTATION DEFINED**, **IMPLEMENTATION SPECIFIC**, **UNKNOWN**, and **UNPREDICTABLE**.
Caution	Recommendations. Not following these recommendations might lead to system failure or damage.
Warning	Requirements for the system. Not following these requirements might result in system failure or damage.
Danger	Requirements for the system. Not following these requirements will result in system failure or damage.

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Convention	Use
 Note	An important piece of information that needs your attention.
 Tip	A useful tip that might make it easier, better or faster to perform a task.
 Remember	A reminder of something important that relates to the information you are reading.

1.2 Useful resources

This document contains information that is specific to this product. See the following resources for other useful information.

Access to Arm documents depends on their confidentiality:

- Non-Confidential documents are available at developer.arm.com/documentation. Each document link in the following tables goes to the online version of the document.
- Confidential documents are available to licensees only through the product package.

Arm product resources	Document ID	Confidentiality
User-based Licensing User Guide	102516	Non-Confidential

1.3 Other information

See the Arm website for other relevant information.

- Arm® Developer.
- Arm® Documentation.
- Technical Support.
- Arm® Glossary.

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2. Getting started with user-based licensing

Describes how to install, configure, and register the license server for Arm products licensed under the user-based licensing model.


Note

The user-based licensing license server software is different from, and incompatible with, other license models used by Arm development tools, including:

- FlexNet Publisher node-locked and floating
- Keil® node-locked and floating
- Allinea node-locked and floating

2.1 Hardware and software requirements

The hardware and software requirements presented in this section are for the Arm user-based licensing license server software. In a typical deployment setup, the license server software runs on a dedicated license-managed device, separate from Arm development tools running on client devices.

Hardware requirements

The license server has the following minimum hardware requirements:

- Processor: A dual core 64-bit x86 2GHz processor (or equivalent)
- Memory: 4GB
- Storage: 500MB

Supported operating systems

The license server is supported on the following operating systems:

- Red Hat Enterprise Linux or CentOS 7
- Red Hat Enterprise Linux or CentOS 8
- Ubuntu 20.04 LTS

Required system software

The license server and utilities require the following software to be installed and, where applicable, running:

- Common Linux utilities: `bash`, `tar`, `sed`, `getopt`, `uname`, `sleep`, and `grep`
- `Systemd` Linux service manager
- Python 3.6 or higher. The PyYAML module must be installed.
- One of the following Java Virtual Machine (JVM) implementations:
  - Oracle Java SE 8

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- OpenJDK 8
- OpenJDK 11

2.2 Install your license server

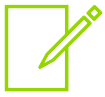
To install the license server, use the following procedure.

Before you begin

- Download the license server Linux installation package from https://lm.arm.com/downloads.
- If you have previously installed a license server for Arm products licensed under the user-based licensing model, you must uninstall that server:
  - If you are upgrading your license server and want to retain the existing licenses, uninstall the license server but do not use the `--delete-storage` parameter.
  - If you are installing a new license server on a device, you must delete all existing license server data after the licenses have been removed. For details see Obsolete a license server. License data for all users of the device must be removed.
- The installation requires elevated privileges to:
  - Create a new `flexnetls` group and user for the license server service
  - Create the installation directory (`/opt/flexnetls-armlmd` by default)
  - Create the data storage directory (`/var/opt/flexnetls-armlmd` by default)
  - Register the license server service with `systemd` and start the service

Procedure

1. From the command line, change directory to the directory containing the downloaded software bundle and then extract it using the following command:
   ```
   tar -xf flexnetls-armlmd-<version>.tar.gz
   ```
   The extraction creates the installer directory, `flexnetls-armlmd-<version>`.

   
   Note

   The `flexnetls-armlmd-<version>` installation directory can be placed in any disk location and can be deleted after the installation process has completed.

2. Install the license server by running the following command as root:
   ```
   sudo [-E] flexnetls-armlmd-<version>/install_license_server [--port <port>] [--install-dir <installation_directory>] [--data-dir <data_directory>]
   ```
   Where:
   - The `-E` parameter preserves the environment of the current user when running the command as root. This might be required if the location of the Java Virtual Machine (JVM) relies on the JAVA_HOME environment variable set in the environment of the current user.

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- `<port>` specifies the TCP network port that the license server listens on. If the `--port` parameter is not specified, the port defaults to *7070*.

  

  You cannot specify a port number of 1024 or lower because this port range is reserved for processes running as `root`. For security reasons, the license server runs as the `flexnetls` user and Arm does not recommend changing this user to `root`.

- `<installation_directory>` is the installation directory for the license server software. If the `--install-dir` parameter is not specified, the installation directory defaults to `/opt/flexnetls-armlmd`.
- `<data_directory>` is the directory used to store the license server state files and logs. If the `--data-dir` parameter is not specified, the data directory defaults to `/var/opt/flexnetls-armlmd`.

The license server is automatically started after the installation process completes. The license server also starts automatically when the server device is restarted.

Results

After the license server is installed, it starts automatically. The license server service is configured to start and stop automatically with the operating system.

The installation directory has the following content:

- `bin` contains the administration utilities.
- `etc` contains the `paths` text file detailing the paths to the data and server directories.
- `server` contains the license server daemon and related configuration files.
- `license_terms` contains the software license agreement.
- `VERSION` text file details the license server version.

Next steps

Configure your license server

2.3 Configure your license server

After the license server has been installed, you must configure the server.

Before you begin

- Install your license server

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Procedure

1. Set the `PATH` environment variable on the license server device to include the `bin` directory in the license server installation directory. For example:
   ```
   export PATH=/opt/flexnetls-armlmd/bin:$PATH
   ```
2. You must change the default installed administrator user (`admin`) password because you cannot use this password to perform administration tasks. Run the `armlm_change_admin_password` command to change the password.
   The new password must meet the following criteria:
   - Between 8 and 64 characters
   - At least one digit
   - At least one uppercase character
   - At least one special character (for example, ^*$-+?_&=!%{}/#@)
   - No whitespace characters

   The password change tool asks you to confirm the new password by entering it again.

   The following is output when the administration password is successfully changed:

   ```
   Administrative account password changed successfully
   ```
3. During installation, you can set the license server port number. If not set during installation, the port number defaults to `7070`. You can change the port number as follows:
   a) Edit the `<installation_directory>/server/local-configuration.yaml` file.
   b) Change the `port` value. For example:
      `port: 7071`
   c) Restart the license server using the following command:
      ```
      sudo systemctl restart flexnetls-armlmd
      ```

Next steps

Register your license server

2.4 Register your license server

You must register your license server on the Arm licensing portal.

Before you begin

- Configure your license server

Procedure

1. Make sure the license server is running using the following command:
   ```
   armlm_check_server_status
   ```

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If the server is not running, start it using the following command:

```
sudo systemctl start flexnetls-armlmd
```


Note

If the license server fails to start, you can check for errors in the systemctl logs. For example, use the following `journalctl` command to print all `flexnetls-armlmd` service events that have been logged since the operating system was last started:

```
journalctl -u flexnetls-armlmd.service -b
```

2. When you install the license server, the installation process selects a hostid. Several other hostids could be available, depending on the hardware configuration of the host. You must check that the selected hostid is appropriate, for example to ensure the most stable hostid is used.


Note

The licenses generated for a license server are locked to the hostid of the license server. You cannot change the license server hostid after you have registered your license server.

Use the following command to review the selected hostid:

```
armlm_show_hostid
```

The password for `admin` is requested. The output shows the selected hostid and the available hostids. For example:

```
{
  "selected" : {
    "hostidType" : "ETHERNET",
    "hostidValue" : "0800270AA6FF"
  },
  "hostids" : [ {
    "hostidType" : "ETHERNET",
    "hostidValue" : "0800270AA6FF"
  }, {
    "hostidType" : "ETHERNET",
    "hostidValue" : "080027503FFF"
  } ]
}
```

If you want to change the hostid used by the license server:

a) Edit the `<installation_directory>/server/local-configuration.yaml` file.
b) Uncomment the following line:
   `#active-hostid:`

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c) Add one of the hostids identified by `armlm_show_hostid` command as the `active-hostid` value in the format `<hostid>/ETHERNET`. For example:
`active-hostid: 080027503FFF/ETHERNET`

3. Create an identity file for the license server, in your current directory, using the following command:

```
armlm_generate_server_identity --identity-file identity.bin
```

The password for `admin` is requested.

4. Register your license server with Arm:
   a) Access the Arm user-based licensing portal on https://developer.arm.com/support/licensing/user-based.
   b) Click **Manage License Servers** and then click **Register Local License Server**.
   c) Click **Browse**, select the `identity.bin` file, and then click **Open**.
   d) Click **Upload**. After a short while, you are returned to the **Manage License Servers** page with your license server shown in the list of license servers. The name of the server is the license server hostid.

Next steps

Allocate products to the license server

2.5 Allocate products to the license server

After you have registered your license server, allocate your product licenses to the server.

Before you begin

- Register your license server

Procedure

1. Access the Arm user-based licensing portal on https://developer.arm.com/support/licensing/user-based.
2. Click **Manage License Servers**.
3. Select the products you want to add to your server as follows:
   a) Click **Manage Server** on the required license server. The server page displays the products associated with your server. For a new license server, there are no products to display.
   b) Click **Add Products**. The **Add Products to License Server** page shows the available products with licenses (seats) already allocated and the product expiry date.
   c) In the **Quantity** field, enter the number of licenses to transfer to your license server.
   d) Click **Add Products**.

   You are returned to the server page, which displays the added product(s).
4. If the product license file has not automatically downloaded, click **Download all licenses allocated to this server** to download the license file.
   The license file name is `licenses-<server_ID>-<timestamp>.bin`, where `<server_ID>` is the license server name and `<timestamp>` is the date and time the license file was created.

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5. If required, transfer the product license file to the license server device.
6. Load the product licenses using the following command on the license server device:
   `armlm_update_licenses --data-file <license_file>`

   Where `<license_file>` is the name of the product license file. The password for `admin` is requested.

   The following output confirms that no further action is required:

   ```
   Licenses have been successfully updated. No confirmation is required.
   ```

Next steps
User license activation

Related information
List licenses and usage on page 17
Modify number of licenses on page 18

2.6 User license activation

After the license server has been registered, you must inform your users how to activate the licenses for their Arm products. In this case, a user could be a human using an Arm development tool or an automated process. Users can license a development tool using one of the following methods:

- Activate your product using a license server
- Activate your product if your device is offline

- The server URL that users use to activate their product license must only contain the server base. For example, `https://myserver:port` is a valid server URL but `https://myserver:port/api/1.0/instance/~` is not valid.
- Users can obtain a product license from the license server by setting the `ARMLM_ONDEMAND_ACTIVATION` environment variable to `<product_code>@<server_URL>`.
  - Before setting this environment variable, the user must use the following command to check that the license server URL is valid and the required product license is available:

    ```
    armlm inspect --server <license server URL>
    ```

    If the user can connect to the server, this command returns the different product licenses available on the license server and the licenses used by the user on the device.

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    - This method might not be suitable where a large number of parallel processes can make initial license requests, because the license server could time-out some of the requests.

After activation, the user is assigned to the product license for seven days. Subsequent use of any Arm development tool that supports user-based licensing on the same device by that user renews the license for the next seven days by contacting the activation code URLs (for details see Network requirements for user-based licensing) or license server.

If you cannot extend the product license, you can still use the product as licensed until the 7-day limit expires. This could occur if your device cannot contact the license server.

Activating licenses on multiple devices

The product license assigned to a user can be used on multiple devices. You can make the license assigned to a user available on another device using one of the following methods:

- On the new device, activate the product license for an Arm development tool that has the same user.
- The cached Arm product license details are stored in the `.armlm` directory. Other devices using an Arm development tool can use the cached license by, for example:
    - Copying the `.armlm` directory to a local directory on the new device.
    - Copying the `.armlm` directory to a network directory. On the new device, set the `ARMLM_CACHED_LICENSES_LOCATION` environment variable to the location of `.armlm` on the network drive.

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3. License server administration

Describes how you can administer the Arm user-based licensing license server, including the available license server commands.

3.1 Stop the license server

The license server is automatically started after installation and when the server device is restarted.

Procedure

Stop the license server with the following command:

```
sudo systemctl stop flexnetls-armlmd
```

Related information

Find the license server status on page 17
Start the license server on page 16

3.2 Start the license server

The license server is automatically started after installation and when the server device is restarted.

Before you begin

The license server has been stopped by the administrator.

Procedure

Start the license server with the following command:

```
sudo systemctl start flexnetls-armlmd
```

If the license server fails to start, you can check for errors in the systemctl logs. For example, use the following `journalctl` command to print all `flexnetls-armlmd` service events that have been logged since the operating system was last started:

```
journalctl -u flexnetls-armlmd.service -b
```

Related information

Find the license server status on page 17

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3.3 Restart the license server

Restart the license server.

Before you begin
The license server must be running.

Procedure
Restart the license server using the following command:

```
sudo systemctl restart flexnetls-armlmd
```


Note

If the license server fails to start, you can check for errors in the systemctl logs. For example, use the following `journalctl` command to print all `flexnetls-armlmd` service events that have been logged since the operating system was last started:

```
journalctl -u flexnetls-armlmd.service -b
```

Related information
Find the license server status on page 17

3.4 Find the license server status

Find the status of your license server.

Procedure
Check the license server service status using the following command:

```
armlm_check_server_status
```

Related information
Restart the license server on page 16
Stop the license server on page 16
Start the license server on page 16

3.5 List licenses and usage

List the product licenses and their usage on your license server.

Before you begin
The license server must be running.

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Procedure

List the product licenses on your license server using the following command:

```
armlm_list_products
```

The following is an example of the output from this command:

```
3 product(s) found on license server

Hardware Success Kit Standard, HWSKT-STD0, 60 seat(s), 33 seat(s) used
  Order 273591004, valid until: 2023-02-24, 50 seat(s), 28 seat(s) used
  Order 273591034, valid until: 2023-12-31, 10 seat(s), 5 seat(s) used

Keil MDK Professional, KEMDK-PRO0, 20 seat(s), 12 seat(s) used
  Order 273591003, valid until: 2023-02-15, 20 seat(s), 12 seat(s) used
```

Related information

List users on page 19

3.6 Modify number of licenses

Modify the number of product licenses available on the license server.

Before you begin

The license server must be running.

Procedure

1. On the Arm user-based licensing portal, modify the number of product licenses allocated to the license server as follows:
   a) Access the user-based licensing portal on https://developer.arm.com/support/licensing/user-based.
   b) Click **Manage License Servers** to display the list of servers.
   c) Click **Manage Server** on the required license server. The server page displays any product licenses associated with server.
   d) Click **Edit seats** on the required product.
   e) The number of seats currently allocated for this product are shown under **Total seat count**. Modify the number of licenses under **Total seat count** and then click **Confirm Changes**. If the number of licenses has been reduced, a warning dialog is shown and you must click **Confirm Changes** in this dialog.

   A file containing the new license data is downloaded. This file has the following filename:
   `licenses-<server_ID>-<timestamp>.bin`

   Where `<server_ID>` is the identifier of the server and `<timestamp>` is the time the file was created.

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Note

If you have reduced the number of licenses for a product, you cannot change the number of licenses for that product until a confirmation file is uploaded (see step 3).

2. Transfer the file to the license server device and use the following license command to load the modified license data:

```
armlm_update_licenses --data-file licenses-<server_ID>-<timestamp>.bin
```

The password for `admin` is requested. The output determines if further action is required:

- If licenses are removed, the following output confirms that further action is required:

```
Licenses have been successfully updated. A confirmation file needs to be
 generated to complete this process.
Please run the "armlm_generate_server_confirmation" command and upload the
 generated file to the licensing portal.
```

- If licenses are added, the following output confirms that no further action is required:

```
Licenses have been successfully updated. No confirmation is required.
```

3. If licenses have been removed, a confirmation is required:
   a) Use the following license server command to generate a confirmation file:

```
armlm_generate_server_confirmation --confirmation-file confirmation.bin
```

   The password for `admin` is requested.
   b) Access the user-based licensing portal on https://developer.arm.com/support/licensing/user-based.
   c) Click **Manage License Servers** to display the list of servers.
   d) Click **Manage Server** on the required license server. The server page displays any product licenses associated with server.
   e) Your product with the reduced number of licenses has an **Upload Confirmation** link. Click this link.
   f) In Server Configuration File, click **Browse** to select the `confirmation.bin` file. Click **Upload Confirmation**.
   After the file has uploaded successfully, you are returned to the server page.

Related information

List licenses and usage on page 17

3.7 List users

List the users on your license server and their associated products.

Before you begin

The license server must be running.

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Procedure

List the users on your license server using the following command:

```
armlm_list_users
```

The following is an example of the output from this command:

```
User    Product Code  Product Name          Last Access                Held Until
----    ------------  ------------          -----------                ----------
adlxho  HWSKT-STD0    Hardware Success Kit  2022-Apr-19 10:13:19 UTC  2022-May-19
hxyiso  HWSKT-STD0    Hardware Success Kit  2022-Apr-14 09:08:38 UTC  2022-May-14
jxycot  HWSKT-STD0    Hardware Success Kit  2022-Apr-12 09:58:42 UTC  2022-May-12
jxyche  HWSKT-STD0    Hardware Success Kit  2022-Apr-03 00:25:09 UTC  2022-May-03
```

Related information

List licenses and usage on page 17

3.8 License server version location

The license server version number is provided in the `<installation_directory>/VERSION` file, where `<installation_directory>` is the license server installation directory. If you did not change the installation directory during installation, this directory defaults to `/opt/flexnetls-armlmd`.

3.9 Change the administrator password

You can change the administrator password from the command line.

Before you begin

The license server must be running.

Procedure

1. From the command line, run the `armlm_change_admin_password` command.
2. Enter the existing password.

If you have forgotten the administrator password, you can reset the password using the instructions in Reset the administrator password.

3. Enter the new password. The new password must meet the following criteria:
   - Between 8 and 64 characters
   - At least one digit
   - At least one uppercase character
   - At least one special character (for example, ^*$-+?_&=!%{}/#@)

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- No whitespace characters

4. Confirm the new password by entering it again.

Results

The following is output when the administration password is successfully changed:

```
Administrative account password changed successfully
```

3.10 Reset the administrator password

Reset the administrator password if the original password was lost. If you know the original password, use the Change the administrator password procedure instead.

Before you begin

The license server is unavailable during the password reset procedure. This can take some time as you must uninstall the server, re-install the server, and load the licenses back into the server. You should schedule this procedure accordingly and let your users know when the license server will be unavailable.

Procedure

1. Create a file containing the latest license data:
   a) Access the Arm user-based licensing portal on https://developer.arm.com/support/licensing/user-based.
   b) Click **Manage License Servers** and then, on the required license server, click **Manage Server**.
   c) Click **Download all licenses allocated to this server** and a license file containing the license data is downloaded. The license file name is `licenses-<server_ID>-<timestamp>.bin`, where `<server_ID>` is the license server name and `<timestamp>` is the date and time the license file was created.
   d) If the license file was not downloaded to the license server device, transfer the file to this device.

The license data file should not be saved in either of the following directories on the license server device, as these directories are deleted when the license server is uninstalled:

- The license server installation directory (`/opt/flexnetls-armlmd` by default)
- The data storage directory (`/var/opt/flexnetls-armlmd` by default)

2. Uninstall the license server using this instructions in Uninstall the license server. You must use the `--delete-storage` parameter to delete all license data.
3. Re-install the license server using the instructions in Install your license server. This procedure creates a new administrator password.
4. Load the license data using the following command:
   `armlm_update_licenses --data-file <license_file>`

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Where `<license_file>` is the name of the license file. The password for `admin` is requested.

The output from the command is as follows, confirming no further action is required when adding licenses:

```
Licenses have been successfully updated. No confirmation is required.
```

3.11 Monitor the license server

Log files for the Arm user-based licensing license server are stored in the `<data_directory>/logs` directory, where `<data_directory>` is the data directory that was set up when the license server was installed. If no data directory was specified during installation, the logs are stored in `/var/opt/flexnetls-armlmd/logs`.

3.12 Obsolete a license server

When the license server is no longer required, you must delete the product licenses on the license server device and in the Arm user-based licensing portal. This process ensures that your Arm product licenses become available for other servers.

Before you begin

- The license server must be running.
- If your Arm users accessing the license server to be deleted still require Arm products, you must set up an alternative license server. For details see Install your license server.

Procedure

1. Review the product licenses on the license server. For more details see List licenses and usage.
2. Remove all Arm product licenses from the license server, including uploading confirmation files into Arm user-based licensing portal for all products on your server.
   For more details, see Modify number of licenses.
3. In the licensing portal, delete the license server as follows:
   a) At the top level, click **Manage License Servers**.
   b) In the list of servers on this page, click **Manage Server** on the server to obsolete.
   c) Click **Obsolete Server** to remove the server from the Arm user-based licensing portal.
4. Uninstall the license server using the instructions in Uninstall the license server.

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3.13 Uninstall the license server

Uninstall the license server including, optionally, the license data.

About this task

If you are not going to re-install the license server after uninstalling it, you must recover the Arm product licenses so they can be used on other license servers. For details of how to do this, see Obsolete a license server.

Procedure

1. From the command line, change directory to a directory that is not in one of the following directories:
   - The license server installation directory (`/opt/flexnetls-armlmd` by default)
   - The data storage directory (`/var/opt/flexnetls-armlmd` by default)
2. Uninstall the license server using the following command:

   ```
   sudo <installation_directory>/bin/armlm_uninstall_license_server [--delete-storage]
   ```

   Where:

   - `<installation_directory>` is the license server installation directory. If you did not change the installation directory during installation, this directory defaults to `/opt/flexnetls-armlmd`.
   - `--delete-storage` is an optional parameter. When set, the uninstall process also deletes all license data, including the allocated licenses, administrator password, and license server configuration.

     

     - You must not use `--delete-storage` when upgrading the license server.
     - You must use `--delete-storage` when you Obsolete a license server.

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