



Managing ACE Software Licenses

This chapter describes how to manage the software licenses for your Cisco Application Control Engine (ACE) module. It contains the following major sections:

- [Available ACE Licenses](#)
- [Ordering an Upgrade License and Generating a Key](#)
- [Copying a License File to the ACE](#)
- [Installing a New or Upgrade License File](#)
- [Replacing a Demo License with a Permanent License](#)
- [Removing a License](#)
- [Backing Up a License File](#)
- [Displaying License Configurations and Statistics](#)

**Note**

You can access the **license** and **show license** commands only in the Admin context. You must have the Admin role in the Admin context to install, remove, and update the license file.

Available ACE Licenses

By default, the ACE supports the following features and capabilities:

- Virtualization with one Admin context and five user contexts
- Module bandwidth of 4 gigabits per second (Gbps)
- Secure Sockets Layer (SSL) with 1000 transactions per second (TPS)

You can increase the number of default user contexts, module bandwidth, and SSL TPS by purchasing upgrade licenses. [Table 3-1](#) lists the available ACE licenses, product IDs (PIDs), and descriptions.

Table 3-1 ACE Licenses

| Feature (Default) | License PID | Description |
|-----------------------------------------------------------------------|--------------|------------------------------------------------------------------------------|
| Virtualization (default, one Admin context and five user contexts) | ACE-VIRT-020 | 20 virtual contexts |
| | ACE-VIRT-050 | 50 virtual contexts |
| | ACE-VIRT-100 | 100 virtual contexts |
| | ACE-VIRT-250 | 250 virtual contexts |
| | ACE-VIRT-UP1 | Upgrades 20 to 50 contexts |
| | ACE-VIRT-UP2 | Upgrades 50 to 100 contexts |
| | ACE-VIRT-UP3 | Upgrades 100 to 250 contexts |
| Module bandwidth (default, 4 Gbps) | ACE-04G-LIC | Default 4-Gbps bandwidth |
| | ACE-08G-LIC | 8-Gbps bandwidth |
| | ACE-16G-LIC | 16-Gbps bandwidth (ACE20-MOD-K9 module only) |
| | ACE-UPG1-LIC | Upgrades 4-Gbps bandwidth to 8-Gbps bandwidth |
| | ACE-UPG2-LIC | Upgrades 8-Gbps bandwidth to 16-Gbps bandwidth (ACE20-MOD-K9 module only) |

Table 3-1 ACE Licenses (continued)

| Feature (Default) | License PID | Description |
|-----------------------------|----------------|---------------------|
| SSL TPS (default, 1000 TPS) | ACE-SSL-05K-K9 | SSL with 5000 TPS |
| | ACE-SSL-10K-K9 | SSL with 10,000 TPS |
| | ACE-SSL-15K-K9 | SSL with 15,000 TPS |

You can upgrade virtualization in increments if you do not exceed the limits of the ACE (a maximum of 250 contexts).

For information on ACE demo licenses, contact your Cisco account representative.

**Note**

If you need to replace the ACE, you can copy and install the license file for the license onto the replacement module.

Ordering an Upgrade License and Generating a Key

This section describes the process that you use to order an upgrade license and to generate a license key for your ACE. To order an upgrade license, perform the following steps:

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- Step 1** Order one of the licenses from the list in the “[Available ACE Licenses](#)” section using any of the available Cisco ordering tools on cisco.com.
 - Step 2** When you receive the Software License Claim Certificate from Cisco, follow the instructions that direct you to the Cisco.com website. As a registered user of Cisco.com, go to this URL:

<http://www.cisco.com/go/license>
 - Step 3** Enter the Product Authorization Key (PAK) number found on the Software License Claim Certificate as your proof of purchase.
 - Step 4** Provide all the requested information to generate a license key.

- Step 5** After the system generates the license key, you will receive a license key e-mail with an attached license file and installation instructions. Save the license key e-mail in a safe place in case you need it in the future (for example, to transfer the license to another ACE).
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Copying a License File to the ACE

When you receive the software license key e-mail from Cisco Systems, you must copy the attached license file to a network server. Use the **copy** command in Exec mode from the Admin context to copy the file to disk0: on the ACE. For detailed information on copying files from a remote server, see [Chapter 4, Managing the ACE Software](#).

For example, the syntax of the **copy tftp** command is as follows:

```
copy tftp://server[/path/][/filename]] disk0:[path/]filename
```

The arguments and keywords are as follows:

- `[/server[/path/][/filename]]`—The path to the network server. This path is optional because the ACE prompts you for this information if you omit it.
- **disk0:**`[path/]filename`—Specifies that the file destination is the disk0: directory of the current context and the filename. If you do not provide the optional path, the ACE copies the file to the root directory on the disk0: file system.

For example, to copy the ACE-VIRT-020.lic license file from the license directory on the track network server to the root directory on disk0:, enter:

```
host1/Admin# copy tftp://track/license/ACE-VIRT-020.lic disk0:
```

If the license is a demo or permanent license for a new or upgrade installation, see the [“Installing a New or Upgrade License File”](#) section.

If the license is a permanent license replacing a demo license, see the [“Replacing a Demo License with a Permanent License”](#) section.

Installing a New or Upgrade License File

After you copy a demo or permanent license file to the ACE for a new or upgrade installation, you can install the license. All license installations except two have no adverse impact to an operating ACE as follows:

- A reboot is required when you upgrade the bandwidth license from 8 Gbps to 16 Gbps in an ACE10 module.
- In a redundant configuration, mismatched context licenses between the active and the standby ACEs cause the active ACE to generate a syslog message (if logging is enabled) and to disable configuration synchronization. After you install the correct matching license on the standby ACE, the software automatically detects the new license and restores normal operation.

After you install the correct matching license on the standby ACE, the software automatically detects the license and restores normal operation. For information on replacing a demo license with a permanent one, see the [“Replacing a Demo License with a Permanent License”](#) section.



Caution

If you install a context demo license, make sure that you save the Admin running configuration and all user context running configurations to a remote server. If you allow a context license to expire, the ACE automatically removes all user contexts from the Admin running configuration and all configurations for the user contexts.

To install or upgrade a license on your ACE, use the **license install disk0:** command in Exec mode from the Admin context. The syntax of this command is as follows:

```
license install disk0:[path/]filename [target_filename]
```

The arguments are as follows:

- *[path/]filename*—License stored on the disk0: file system. If you do not specify the optional path, the ACE looks for the file in the root directory.
- *target_filename*—(Optional) Target filename for the license file.

For example, to upgrade the module bandwidth license from 4 Gps to 8 Gbps, enter:

```
host1/Admin# license install disk0:ACE-UPG1-LIC.lic
```

Installing a New or Upgrade License File

To install a license file for an SSL 5000 TPS license, enter:

```
host1/Admin# license install disk0:ACE-SSL-05K-K9.lic
```

To install a license file for a 20 context license, enter:

```
host1/Admin# license install disk0:ACE-VIRT-020.lic
```

There are multiple virtual context licenses including upgrade licenses. The number of contexts currently installed on the ACE determines which additional license you can install, as shown in [Table 3-2](#).

Table 3-2 Allowable Virtual User Context Installation

| Current Number of Contexts | Allowable License Installation |
|----------------------------|--------------------------------------------------------------|
| 5 (default) | ACE-VIRT-020 ACE-VIRT-050 ACE-VIRT-100 ACE-VIRT-250 |
| 20 | ACE-VIRT-UP1 (to upgrade to 50 contexts) |
| 50 | ACE-VIRT-UP2 (to upgrade to 100 contexts) |
| 100 | ACE-VIRT-UP3 (to upgrade to 250 contexts) |
| 250 | No additional licenses |

Replacing a Demo License with a Permanent License

If you installed an ACE demo license, four weeks before the license expires, the ACE generates warning syslog messages once a day. During the final week, a warning syslog message occurs once an hour. Before this period ends, you must update the demo license with a permanent license. Otherwise, the ACE will revert to its previous bandwidth, SSL TPS, or number of contexts.



Caution

If you replace the context demo license with a permanent license, you can continue to use the configured user contexts on the ACE. However, if you allow a context license to expire, the ACE automatically removes all user contexts from

the Admin running configuration and all configurations for the user contexts. Before a context license expires, save the Admin running configuration and the user context running configurations to a remote server.

To view the expiration of the demo license, use the **show license usage** command in Exec mode from the Admin context.

After you copy the permanent license file to the ACE, you can install it. To replace a demo license with a permanent license, use the **license update disk0:** command in Exec mode from the Admin context. The syntax of this command is as follows:

```
license update disk0:[path/]permanent_filename demo_filename
```

The arguments are as follows:

- *[path/]permanent_filename*—Filename for the permanent license file that you copied onto the ACE.
- *demo_filename*—Filename for the demo license file that the permanent license file is replacing.

For example, enter:

```
host1/Admin# license update disk0:ACE-VIRT-250.lic  
ACE-VIRT-250-DEMO.lic
```

Removing a License

To remove a module bandwidth, SSL TPS, or user context license, use the **license uninstall** command in Exec mode from the Admin context. The syntax of this command is as follows:

```
license uninstall license_filename
```

The *license_filename* argument specifies the filename of the license file that you want to remove. Enter the license filename as an unquoted text string with no spaces.

**Note**

When you enter the **clear startup-config** or the **write erase** command, the ACE does not remove license files from the startup-configuration file. You must use the **license uninstall** command to remove license files from the ACE.

This section contains the following topics:

- [Removing a Module Bandwidth License](#)
- [Removing an SSL TPS License](#)
- [Removing a User Context License](#)

**Caution**

When you remove a demo or permanent virtual context license, the ACE removes all user contexts from the Admin running configuration. By removing the user contexts, their running and startup configurations are also removed from the ACE. Before removing any virtual context license, save the Admin running configuration and the user context running configurations to a remote server. For more information, see the [“Removing a User Context License”](#) section.

Removing a Module Bandwidth License

To remove a bandwidth license, use the **license uninstall** command in Exec mode from the Admin context. When you uninstall an ACE-08G-LIC or ACE-UPG1-LIC bandwidth license, it reduces the module bandwidth to the default of 4 Gbps on the ACE. When you install an ACE-UPG2-LIC bandwidth license, it reduces the module bandwidth to 8 Gbps on the ACE.

For example, to remove an ACE-08G-LIC bandwidth license, enter:

```
host1/Admin# license uninstall ACE-08G-LIC.lic
```

Removing an SSL TPS License

To remove an SSL TPS license, use the **license uninstall** command in Exec mode from the Admin context. When you uninstall an SSL license, it reduces SSL TPS performance to 1000 TPS on the ACE.

For example, to remove an ACE-SSL-05K-K9 SSL TPS license, enter:

```
host1/Admin# license uninstall ACE-SSL-05K-K9.lic
```

Removing a User Context License

The number of virtual contexts and type of licenses currently installed on the ACE determines which license you can remove. [Table 3-3](#) lists the currently installed contexts, the type of license on the ACE, and the remaining number of context after the license is removed.

Table 3-3 Virtual Context License Removal

| Current Number of Contexts | Applicable Licenses | Results of License Removal |
|----------------------------|---------------------|----------------------------|
| 5 (default) | Not applicable | — |
| 20 | ACE-VIRT-020 | 5 contexts |
| 50 | ACE-VIRT-050 | 5 contexts |
| | ACE-VIRT-UP1 | 20 contexts |
| 100 | ACE-VIRT-100 | 5 contexts |
| | ACE-VIRT-UP2 | 50 contexts |
| 250 | ACE-VIRT-250 | 5 contexts |
| | ACE-VIRT-UP3 | 100 contexts |



Caution

When you remove a demo or permanent virtual context license, the ACE removes all user contexts from the Admin running configuration. By removing the user contexts, their running and startup configurations are also removed from the ACE. Before removing any virtual context license, save the Admin running configuration and the user context running configurations to a remote server.

To remove a context license, perform the following steps:

- Step 1** Save the Admin and user context running configurations to a remote server by entering the **copy running-config** command in Exec mode in each context. For more information on this command, see [Chapter 4, Managing the ACE Software](#).

For example, to copy the Admin running configuration to an TFTP server as R-CONFIG-ADM, enter:

```
host1/Admin# copy running-config tftp://192.168.1.2/R-CONFIG-ADM
```

To copy the C1 user context running configuration to an TFTP server, access the C1 context and enter:

```
host1/C1# copy running-config tftp://192.168.1.2/R-CONFIG-C1
```

- Step 2** Remove the license with the **license uninstall** command. For example, to remove the ACE-VIRT-250.LIC license, enter:

```
host1/Admin# license uninstall ACE-VIRT-250.lic
```

The ACE displays the following messages and prompt:

```
Clearing license ACE-VIRT-250.lic:
SERVER this_host ANY
VENDOR cisco
INCREMENT ACE-VIRT-250 cisco 1.0 permanent 1 \
    VENDOR_STRING=<count>1</count> HOSTID=ANY \

NOTICE="<LicFileID>20051103151315824</LicFileID><LicLineID>1</LicLineID> \
    <PAK></PAK>" SIGN=86A13B1EA2F2

INCREMENT ACE-VIRT-250 cisco 1.0 permanent 1 \
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!! WARNING: Uninstalling virtual context license will automatically!!
!!! cleanup all the user context configurations, please backup the !!
!!! configurations before proceeding further with uninstallation  !!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
Do you want to continue? (y/n)
```

- Step 3** If you have not saved the running configurations for the Admin and user contexts to a remote server, enter **n**. Go to Step 1

If you saved the running configurations for the Admin and user contexts to a remote server, enter **y**.

During the license removal, the ACE removes the user context configurations from the Admin running configuration, causing the deletion of all user contexts including their running and startup configurations.

- Step 4** Display the current number of supported contexts on the ACE by entering the **show license status** command in Exec mode of the Admin context.

- Step 5** Determine which contexts you want to keep in the Admin running configuration. Using a text editor, manually remove the extra context configurations from the Admin running configuration on the remote server.

If the Admin running configuration contains more contexts than what the ACE supports and you copy this configuration to the ACE, the ACE rejects contexts that exceed the supported limit. For example, if the running configuration contains 20 contexts, when you remove the license, the ACE supports five contexts. If you attempt to copy the configuration with all 20 contexts, the ACE allows the first five contexts, fails the remaining contexts, and displays error messages on the console.



Note You can also manually recreate the user contexts in the running configuration that is currently on the ACE. If you do, go to [Step 7](#)

- Step 6** Retrieve the modified Admin running configuration from the remote server. For example, to copy the R-CONFIG-ADM Admin running configuration from the TFTP server, enter:

```
host1/Admin# copy tftp://192.168.1.2/R-CONFIG-ADM running-config
```

- Step 7** Copy the Admin running configuration to the startup-configuration file. For example, enter:

```
host1/Admin# copy running-config startup-config
```



Note If you do not update the startup configuration with the latest running configuration, when the ACE restarts, it uses the startup configuration with the extra contexts. The ACE allows the number of contexts that the license supports, but fails the remaining contexts.

- Step 8** Access the user context, and copy its running configurations from the remote server. For example, to copy the C1 user context running configuration from the TFTP server, access the C1 context and enter:

```
host1/C1# tftp://192.168.1.2/R-CONFIG-C1 copy running-config
```

- Step 9** Copy the user context running configuration to the startup-configuration file. For example, enter:

```
host1/Admin# copy running-config startup-config
```

- Step 10** Repeat Steps 8 and 9 until you retrieve the running configurations for all user contexts configured in the Admin configuration.
-

Backing Up a License File

To protect your license files, we recommend that you back up your license files to the ACE Flash disk as tar files. To back up license files in .tar format, use the **copy licenses** command in Exec mode from the Admin context. The syntax of this command is as follows:

```
copy licenses disk0:[path/]filename.tar
```

The keyword and argument are as follows:

- **disk0:**—Specifies that the backup license file is copied to the disk0: file system.
- **[path/]filename.tar**—Destination filename for the backup licenses. The destination filename must have a .tar file extension.

For example, enter:

```
host1/Admin# copy licenses disk0:mylicenses.tar
```

If you accidentally remove or lose the license on the ACE, you can untar the backup file and reinstall it. To untar the license, use the **untar** command in Exec mode. The syntax of this command is as follows:

```
untar disk0:[path/]filename.tar
```

The **[path/]filename.tar** argument is the filename of the .tar backup license file.

For example, to untar the mylicense.tar file on disk0:, enter:

```
host1/Admin# untar disk0:mylicenses.tar
```

For information on installing the license, see the [“Installing a New or Upgrade License File”](#) section.

Displaying License Configurations and Statistics

This section describes the **show** commands that you can use to display license information about your ACE. To display license information, use the **show license** command in Exec mode from the Admin context. The syntax of this command is:

```
show license brief | file filename | internal event-history | status | usage
```

The options and arguments for this command are as follows:

- **brief**—Displays a list of the currently installed licenses
- **file filename**—Displays the file contents of the specified license
- **internal event-history**—Displays a history of licensing-related events
- **status**—Displays the status of licensed features
- **usage**—Displays the usage table for all licenses



Note

Entering the **show license** command without any options and arguments displays all installed ACE license files and their contents.

[Table 3-4](#) describes the fields in the **show license status** command output.

Table 3-4 Field Descriptions for the show license status Command Output

| Field | Description |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Licensed Feature | List including the ACE virtualized contexts, the SSL transactions per second, and the module bandwidth feature. |
| Count | Number of ACE-supported contexts, SSL transactions per second (TPS), and bandwidth in gigabits per second (Gbps). This information also provides the default number of contexts, SSL TPS, and module bandwidth that the ACE supports when a license is not installed. |

Table 3-5 describes the fields in the **show license usage** command output.

Table 3-5 *Field Descriptions for the show license usage Command Output*

| Field | Description |
|--------------|-----------------------------------------------------------------------------------------------------------------------------|
| License | Name of the license. |
| Ins | Whether the license is installed (Yes or No). |
| Lic Count | Number of licenses for this feature. |
| Status | Current state of the feature (In use or Unused). |
| Expiry Date | Date when the demo license expires, as defined in the license file. If the license is permanent, this field displays Never. |
| Comments | Licensing errors, if any. |

You can also view the ACE license by entering the following commands:

- The **show version** command in Exec mode on the ACE.
- The **show module services** command on the supervisor engine. See the license information under the Services field.

