CHAPTER 1

Overview of Cisco License Manager

This chapter provides overview information about Cisco License Manager and includes the following sections:

Introduction

Cisco License Manager is a software application that assists you in obtaining licenses from Cisco, deploying the licenses to the Cisco devices in your network, discovering the devices, and managing and viewing your inventory of licenses and devices. Cisco License Manager is used with Cisco devices that require Cisco licensing. New or upgraded Cisco devices should be registered, and a product authorization key (PAK) must be provided to obtain licenses from Cisco.

This application provides the following two external interfaces, which enable you to perform several licensing tasks from a central location:

- Application programming interface (API)—A programmatic interface that enables client programs to invoke functions implemented on the back-end server, allowing you to integrate Cisco License Manager into your systems. You can also use the API to write custom programs to perform your licensing tasks using either Java or Perl.
- Graphical user interface (GUI)—A standalone Java application that provides an end-user interface used to invoke functions implemented on the back-end server.

Note You can use the Cisco IOS command-line interface (CLI) to license your devices. Refer to your device documentation for more information.

Features

Cisco License Manager features are as follows:

- Intuitive and easy-to-use GUI.
- Ability to keep an up-to-date inventory of deployed licensed features on the network through notifications and optional polling.
- Ability to simplify license transfers from one device to another.
- Agentless device communication using Secure Shell (SSH) or Telnet.
- Improved detailed license reporting.
- Full-functionality Java and Perl Software Development Kit (SDK).
- Enhanced security with role-based access control and per-user access control lists for the managed network devices and PAKs.
- Completely automated license management through a simple rule-based policy interface.
- Troubleshooting capabilities and X.733 based alerts.

Cisco Software Licensing Methodology

Cisco IOS software has traditionally been covered by a right-to-use license, with one license associated with each device. When a customer began using a Cisco product, the usage automatically constituted acceptance of the license agreement and validated the license for that customer (device licenses are nontransferable between end-user customers).

While this practice made it relatively easy to deploy and begin using the Cisco product, it had implications for tracking hardware and software systems, adding service features, updating and upgrading images, and transferring licenses. Customers increasingly requested simpler ways to manage these tasks.

Automated Deployment

Deploying and managing new licenses has largely been a manual process. Users with large numbers of devices have requested an automated license management mechanism to save time and improve productivity.

Simplified Upgrades

Adding new functionality can be complicated. Customers need simpler ways of purchasing new software images and additional capabilities to minimize the time required to

- Fully test new software systems
- Deploy new software images to all affected devices
- Accurately configure every instance of the new software

- Closely monitor changed systems

Improving Consistency

Multiple software images deployed throughout an infrastructure can create complexity and service inconsistencies. With multiple images—often on similar device types—managing upgrades, patches, and refreshes can be difficult. Making software licensing more consistent enables users to improve delivery of network services in locations such as enterprise branches and wiring closets.

Improved Tracking of License Status

When a person in charge of a device moved or left a company, the known status of existing licenses and feature sets often went with him or her. Licenses often end up on different devices from those on which they were originally installed. With the ability to track license deployments, businesses have full knowledge of how software is used and can avoid paying for extra licenses.

Minimizing the Risk of Noncompliance and Fraud

There is a growing emphasis on software audits in order to meet compliance requirements, yet tracking installed licenses can be difficult. In addition, counterfeit hardware and software are becoming more common. In recent months, Cisco has identified a growing incidence of counterfeit equipment and copied software and has changed its licensing approach to minimize the risk to users.

In the case of a return material authorization (RMA), for example, a customer may have a license discrepancy due to accidentally not returning a failed device. Now both the failed and replacement devices are using the licensed feature although the customer has paid for only one device. This situation might cause the customer to fail an audit.

Cisco License Manager provides an RMA discrepancy report that interacts with the Cisco.com license server to detect this kind of discrepancy across the customer network.

Note For more information about Cisco Software Licensing and license compliance, see the Cisco Software End User License Agreement at the following URL:
http://www.cisco.com/en/US/docs/general/warranty/English/EU1KEN_.html

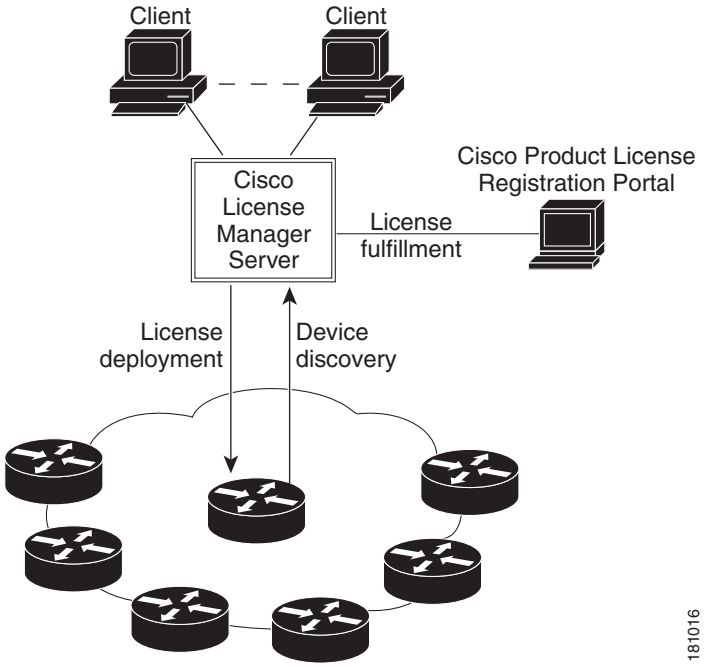
Cisco License Manager License Fulfillment Process

Cisco License Manager is implemented using a client/server model that enables you to perform licensing tasks from a central location without having to manually log on to Cisco.com. The client program can run either on the same host with the server or on a remote host. Multiple instances of the client program can interact with the same server. The client program invokes methods provided by the back-end server through the Java Remote Method Invocation (RMI) mechanism.

The following figure shows how Cisco License Manager works with the licensing infrastructure (called the Cisco Product License Registration Portal) on Cisco.com for license generation, fulfillment, and support. Using the Cisco IOS license agent on your Cisco device, Cisco License Manager helps you avoid having to perform command-line interface (CLI) commands on each Cisco device and performs all license requests from a central location. Cisco License Manager can manage licenses using SSH and Telnet even when the license agent is not configured on the devices.

Ensure that you are a registered user of Cisco.com and that your user profile is updated with your e-mail address and Cisco.com contact information. You will use the client interface to access the Cisco License Manager server.

Figure 1-1 License Fulfillment Process Using Cisco License Manager



License Acquisition

Licenses are generated by the Cisco Product License Registration Portal (the Cisco license server) on Cisco.com. Cisco License Manager contains a license acquisition component that handles the license requests and provide a means of transporting these requests to and from Cisco.com.

The license acquisition component interfaces with Cisco.com. It handles queries related to license acquisition, license upgrade, license transfer, license resend, and license migration from Cisco.com. The transport mechanism between the Cisco license server and the license acquisition component is HTTPS.

The license acquisition component provides the external interface that converts external requests into a sequence of interface calls to Cisco.com and returns the proper data object back to the calling components. This component provides both single-request and bulk-request APIs. It initiates an HTTPS connection with the Cisco license server at the beginning of the request and releases the connection at the end of the request.

Overview of Licensing

A license file is a file created by the Cisco Product License Registration Portal (the software licensing tool on Cisco.com) that unlocks a product and its features. License files contain a license key (a string of alphanumeric characters).

The licensing process consists of the following steps:

1. Purchase Cisco devices or software upgrades and receive a product authorization key (PAK).
2. Collect the PAK and unique device identifier (UDI) information for the devices you need to register.

3. Enter your device information in Cisco License Manager (see "Manage Devices" section on page 7-1).
4. Cisco License Manager passes the UDIs and PAKs to the Cisco Product License Registration Portal on Cisco.com.
5. The Cisco Product License Registration Portal e-mails you a license file. The license file enables Cisco License Manager to obtain information about the number of licenses, features, and SKUs supported.
6. Enter the license information and deploy the license to your device (see "Deploy a License" section on page 8-8).

Note Internet connectivity from your device to Cisco is not required.

If your devices are located in an isolated network, you can take Cisco License Manager outside the firewall and use it to acquire licenses and then bring it back inside the firewall to perform your license deployments.

User Authentication

User authentication (login and logout) is implemented in Cisco License Manager. Once you are logged in to the application, your privileges are based on the role associated with your username.

User authentication implements the following functions:

- Managing user accounts and profiles
- Managing the user's view of the inventory

If you are the default root user (administrator) or have an administrator role, you can create or delete user accounts. No other users can perform those functions. The root user password is created during setup, and you can modify it through the user interface. If you forget the administrator password, you must reinstall Cisco License Manager to reset the password.

Cisco License Manager supports role-based user management for granular access to resources and application functionality. The user's access to certain procedures is dependent on that user's role as defined in his or her user profile.

Role-Based User Management

Cisco License Manager supports the following role-based user management for granular access to resources and features:

- Administrator
- Inventory management
- PAK management
- License management
- Report management

Table 1-1 summarizes the tasks and features each role can perform.

Table 1-1 Tasks and Features for Roles

Task/Feature	ADMINISTRATOR	INVENTORYMGR	PAKMGR	LICENSEMGR	REPORTMGR
Add, remove, and discover devices (on demand)	Yes	No	No	No	No
Inventory updates (periodic and on demand)	Yes	Yes	No	No	No
Add, remove, and change device authentication information (username and password)	Yes	Yes	No	No	No
Add, remove, and view PAKs	Yes	Yes	Yes	No	No
Obtain and deploy licenses	Yes	Yes	Yes	Yes	No
Resend and transfer licenses	Yes	Yes	Yes	Yes	No
View information about managed devices	Yes	Yes	Yes	Yes	Yes
Generate and view various Cisco License Manager reports	Yes	Yes	Yes	Yes	Yes

Device Discovery

Cisco License Manager can perform a quick discovery of any devices in your network. Cisco License Manager performs the following tasks when you choose to discover your network devices:

1. Determines the IP-accessible IP addresses within the subnet.
2. Uses user-defined transport methods (HTTP, Telnet, or SSH) to determine if those devices support Cisco licensing.
3. Retrieves information from the devices (UDI, hostname, and feature data).
4. Retrieves license information from the devices.
5. Synchronizes the Cisco License Manager inventory with any updated information from the devices.

The amount of time it takes to discover devices depends on your network connection.

How Cisco License Manager Communicates with Devices

To collect device license information, Cisco License Manager uses two methods:

- Discovery—The discovery method performs a ping to discover all IP-accessible devices and then uses HTTP/HTTPS, Telnet, or SSH to talk to a device to determine if it supports Cisco licensing. After discovering a device that supports Cisco licensing, Cisco License Manager uses the configured transport method to retrieve license information from the device and then stores the device information and license information in its inventory. Cisco License Manager disallows other discovery operations if a discovery operation is already in progress. Discovery is for initial device creation but can be used to rediscover devices as well.
- Device polling—The device-polling method assumes that devices are already in the Cisco License Manager inventory. Cisco License Manager retrieves an updated list of devices for all devices that support Cisco licensing. It then uses the configured transport (HTTP/HTTPS, Telnet, or SSH) with

an IP address and retrieves all the license information from the device. When all the licenses have been retrieved from the device, they are compared with the information from the inventory, and the inventory is updated if necessary.

To synchronize device license information, you can use device polling, which allows Cisco License Manager to update the license information.

Updating license information happens only between Cisco License Manager and devices (not between Cisco License Manager and Cisco.com).

Cisco License Manager supports HTTP-based notifications (for HTTP/HTTPS transport methods) or system logging notifications (for Telnet or SSH transport methods) when a license is installed, cleared, annotated, or revoked. Any of these notifications triggers synchronization of the license. Event-based notification to retrieve license information is not supported in this release.

Tip You must configure Cisco devices to send and receive notification to and from Cisco License Manager. For a summary of how to configure your Cisco device to notify Cisco License Manager, see "Configure Your Cisco Device to Authenticate Cisco License Manager" section on page 5-4. For detailed information about how to configure your Cisco device, see your device documentation.

Stackable Devices

Cisco License Manager handles the discovery and display of stackable devices by creating a master and any member devices that share an IP address. A stackable device is a device containing the Cisco Stackmaker MIB. Cisco License Manager uses the IP address to connect to the master device, collect the UDI information, and poll the license.

When you are setting up stackable devices, we recommend that you use the hostname as the device name.

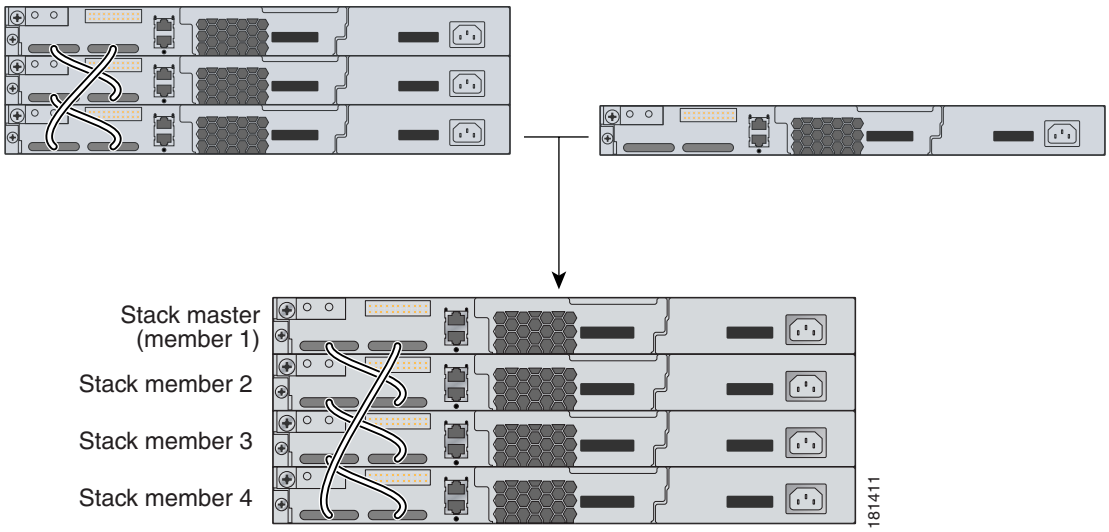
A stackable device is displayed in Cisco License Manager as a master device with subdevices appearing as member devices in a branch extending from the master device.

During polling, Cisco License Manager polls an entire stack. This can be a time-consuming event. The length of time is based on the number of devices.

You can click a master device and deploy licenses to it. There is no particular sequence for deployment to the stackable devices. The master device dispatches the licenses to its subdevices sequentially according to the arrival and order of the licenses; therefore, it takes additional time to dispatch all the licenses to the devices in the stack.

Figure 1-2 shows an existing stack that adds another member and the resulting stack. If the stack master goes down or is taken out of service, Cisco License Manager may not be aware of this action. You would have to delete the stack master, and then the entire stack would be deleted. Use discovery to recreate the updated stack. As a result, one of the stack members becomes the master and the other becomes the member.

Figure 1-2 Stackable Devices



Mapping of Device Platforms and License Operations

Cisco License Manager supports licensing operations on the following devices:

- Cisco Modular Integrated Services Router (28XX, 38XX, 535X, 54XX)
- Cisco Wireless Controller (21XX, 44XX, Cisco Controller)
- Cisco Fixed Integrated Service Router (86X, 88X, 87X, 89X)
- Cisco Catalyst blade server switches (CBS31XX, CBS30XX)
- Cisco Integrated Service Router (C1861)
- Cisco Unified Communications 500 Series for Small Business (UC520)
- Cisco XR 1200 Series Router (12404/PRP, 12406/PRP)
- Cisco Catalyst 3560-E Series Switches (3560e)
- Cisco Catalyst 3750-E Series Switches (3750e)
- Cisco Intrusion Prevention System (AIM-IPS-K9, NME-IPS-K9)
- Cisco ASA 5500 Series Adaptive Security Appliances (ASA55XX)
- Cisco PIX 500 Series Security Appliances (PIX-51X, PIX-52X, PIX-53X)
- Cisco MDS9000 Series Multilayer Switches (MDS 91XX, MDS 92XX, MDS 95XX)
- Cisco Nexus 7000 Series Switches (Nexus7XXX)
- Cisco Mobility Service Engine
- Cisco IPS 4200 Series Sensors (IPS 42XX)
- Cisco Content Security and Control Security Services Module (CSC-SSM-10, CSC-SSM-20)

The following table lists the licensing operations supported by Cisco License Manager for the devices:

Devices	Poll License	Get License	Deploy License	Comment License	Transfer License	Resend License
Cisco Modular Integrated Services Router (28XX, 38XX, 535X, 54XX)	YES	YES	YES	YES	YES	YES
Cisco Wireless Controller (21XX, 44XX, Cisco Controller)	YES	YES	YES	YES	YES	YES
Cisco Fixed Integrated Service Router (86X, 88X, 87X)	YES	YES	YES	YES	YES	YES
Cisco Catalyst blade server switches (CBS31XX, CBS30XX)	YES	YES	YES	YES	YES*	YES
Cisco Unified Communications 500 Series for Small Business (UC520)	YES	YES	YES	YES	YES	YES
Cisco XR 1200 Series Router (12404/PRP, 12406/PRP)	YES	YES	YES	NO	NO	YES
Cisco Catalyst 3560-E/3750-E Series Switches (3560e, 3750e)	YES	YES	YES	YES	YES*	YES
Intrusion Prevention System (AIM-IPS-K9, NME-IPS-K9)	YES	YES	YES	NO	NO	NO
IOS Content Filtering	YES	YES	YES	NO	NO	NO
Cisco ASA 5500 Series Adaptive Security Appliances (ASA55XX)	YES	YES	YES	NO	NO	NO
Cisco PIX 500 Series Security Appliances (PIX-51X, PIX-52X, PIX-53X)	YES	YES	YES	NO	NO	NO
Cisco MDS9000 Series Multilayer Switches (MDS 91XX, MDS 92XX, MDS 95XX)	YES	YES	YES	NO	NO	NO

Cisco Mobility Service Engine	YES	YES	YES	NO	NO	NO
Cisco IPS 4200 Series Sensors (IPS 42XX)	YES	YES	YES	NO	NO	NO
Cisco Content Security and Control Security Services Module (CSC-SSM-10, CSC-SSM-20)	YES	YES	YES	NO	NO	NO

* The older images for the Catalyst blade server switches and the catalyst 3560e/3750e switches do not support the transfer of licenses. Cisco License Manager allows license transfer only if the image supports license transfer.