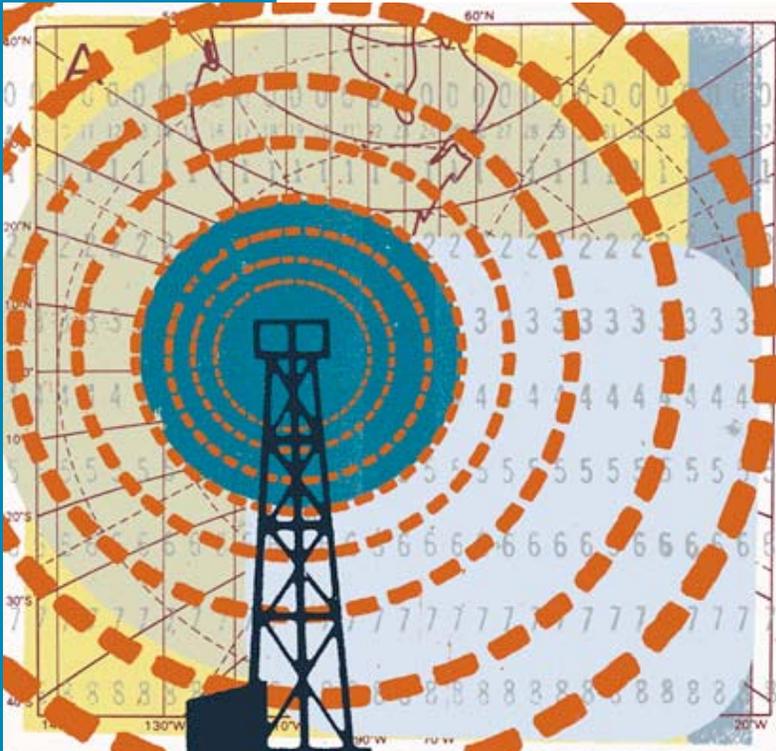


SkyPilot EMS Installation



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SkyPilot EMS 1.4

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About This Guide

This guide provides directions for installing the SkyPilot™ EMS 1.4 software, which allows automatic configuration and monitoring of SkyPilot devices from a central server at your network operations center (NOC).

This guide assumes administrator-level knowledge of IP networks and a familiarity with wireless networking.

This guide is organized as follows:

- “Preparing for Installation” lists the server requirements for installation.
- “Installing the SkyPilot EMS Server Software” provides information about the SkyPilot EMS server components, instructions for upgrading or installing the EMS server, and verification procedures.
- “Installing the SkyPilot EMS Java Client Software” provides instructions for installing and running the EMS Java client.
- “EMS Server Configuration Commands” describes the commands for verifying and managing the processes that run as part of the EMS server.

Complete SkyPilot documentation is available from the SkyPilot website at www.skypilot.com/support/.



Preparing for Installation

If you're setting up a SkyPilot network for automatic configuration of network devices, you need to install SkyPilot EMS software on the server you'll use to provision those devices.

Before You Begin

Before you can install and use SkyPilot EMS software, you must first perform a custom installation of the operating system on the server you'll be using to provision and manage your network nodes.

SkyPilot EMS software runs on Red Hat Linux 9.0, Fedora Core 2, Fedora Core 4, Fedora Core 5, Red Hat Enterprise Linux ES 3, and Red Hat Enterprise Linux ES 4.

For information on performing a custom installation, refer to the appropriate document (available from the SkyPilot website at www.skypilot.com/support/) for the operating system you'll be using:

- *SkyPilot OS Installation: Red Hat Linux 9.0*
- *SkyPilot OS Installation: Fedora Core 2 and 4*
- *SkyPilot OS Installation: Red Hat Enterprise Linux ES 3 and 4*

Requirements

Table 1 identifies the hardware and software requirements for the server on which you'll install the SkyPilot EMS software. Table 2 shows the requirements for the Java client software you'll use to operate the SkyPilot EMS software from other nodes on your network.

Table 1. Server Requirements

	Minimum	Recommended
Operating system	Any of the following: <ul style="list-style-type: none">• Red Hat Linux 9.0• Fedora Core 2, 4, or 5• Red Hat Enterprise Linux ES 3 or 4	—
CPU (RAM)	2 GHz Pentium	3 GHz Xenon
Memory	512 MB	1 GB
Hard disk space	10 GB	40 GB
Network	10/100 Mbps Ethernet	—

Table 2. Java Client Requirements

	Minimum	Recommended
Operating system	Windows, Linux	—
CPU (RAM)	2 GHz Pentium	3 GHz Xenon
Memory (RAM)	512 MB	1 GB
Hard disk space	1 GB	10 GB
Network	10/100 Mbps Ethernet	—
Video card RAM	8 MB	16 MB



Installing the SkyPilot EMS Server Software

This section provides information about the SkyPilot EMS server components, instructions for upgrading or installing the EMS server, and verification procedures.

Section Highlights

- SkyPilot EMS server components
- Server installation procedure overview
- Obtaining a license key
- Installing EMS server software (upgrade)
- Installing EMS server software (new install)
- Verifying EMS server installation
- Setting up the DHCP server

SkyPilot EMS Server Components

The SkyPilot EMS server software includes applications from SkyPilot and various services running as independent processes in the Linux environment, as indicated in the following list. Working together, these applications and services allow the automatic configuration and remote management of devices on the SkyPilot network.

- **SkyProvision™ and SkyControl™**—Java-based software applications (including J2RE version 1.4.2 from Sun Microsystems). SkyProvision is used to set up automatic provisioning of devices on the SkyPilot network; SkyControl is used to monitor devices on the network.
- **Web client**—Web-based application built into the EMS server. This tool provides much the same functionality as the SkyProvision portion of the EMS Java client through an easy to use Web interface.
- **VSFTPD**—An open-source FTP server used to download software images to SkyPilot devices or transfer files to and from the EMS server.
- **ISC DHCP**—An open-source DHCP server, which can be used to provide IP addresses to SkyPilot devices.
- **Apache HTTP**—An open-source Web server, which can be used to transfer configuration information between SkyPilot devices and the EMS server via the HTTP protocol.
- **MySQL**—An open-source database server for storing the configuration information for SkyPilot devices.
- **Relay_Server**—An custom agent created by SkyPilot to process requests between MySQL and the Apache HTTP server.

Server Installation Procedure Overview

Table 3 summarizes the steps required to install (or upgrade to) EMS server 1.4.

Table 3. EMS Server Installation Steps

Step		Refer To
1	Make sure there are no duplicate EMS components. Following the OS installation instructions ensures there will be no duplicates.	The preceding section for a list of these components, and the appropriate <i>SkyPilot OS Installation</i> document for custom installation instructions
2	If you're upgrading from EMS server versions earlier than 1.1, install version 1.1 before proceeding with the 1.4 installation.	The <i>SkyPilot EMS Installation Guide</i> accompanying EMS version 1.1.
3	If necessary, obtain a license key.	"Obtaining a License Key" on page 10
4	Install EMS server 1.4.	Either of the following: <ul style="list-style-type: none">• "Installing EMS Server Software (Upgrade)" on page 11• "Installing EMS Server Software (New Install)" on page 14
5	Verify that the EMS server 1.4 installation was successful.	"Verifying EMS Server Installation" on page 18
6	Configure a DHCP server to respond to requests from SkyPilot devices for IP addresses.	"Setting Up the DHCP Server" on page 19

Obtaining a License Key

You cannot run any of the EMS software applications without a license key from SkyPilot. If you haven't already obtained a license key, follow the procedure described in this section.

Notes

- You can install the EMS software without a license key, but you will not be able to run the EMS server software until the key is copied to the correct location.
- New license keys are not required if your server is already running version 1.1 or later. If you're upgrading to version 1.1 from an earlier version of EMS server, you will have to obtain a new license key before upgrading.

To obtain a license key:

- 1 Send an email message to license@skypilot.com requesting a license for your installation. Include the Ethernet MAC address of the server on which you installed or are about to install the SkyPilot software. The server's MAC address can be located using the `ifconfig` command from a terminal prompt.

SkyPilot will send you the license in an email attachment.

The license is made up of two files: `License.dat` and `sey.dat`.

- 2 When the license arrives, retain the instructions in the email message for copying the files to a specific location on the server.

The EMS installer script will create the folders in which the license files must reside. Before rebooting the server at the end of the installation procedure, you'll need to copy the two license files to those folders:

- Copy `sey.dat` to `/usr/local/skypilot/EMS/server/conf/`
- Copy `License.dat` to `/usr/local/skypilot/EMS/server/data/`

TIP You may want to make a backup copy of the license files in case you need to reinstall the server software at some point.

Installing EMS Server Software (Upgrade)

This section provides instructions for upgrading to EMS server 1.4 from EMS server version 1.1 or later.

Notes

- If you're upgrading from a version earlier than 1.1, you must first upgrade to version 1.1 before upgrading to the current version of EMS server. (For information on installing version 1.1 of the EMS server software, refer to the *SkyPilot EMS Installation Guide* accompanying that version of the product.)
- If you're installing EMS server for the first time on a system, skip this section and use the procedures in "Installing EMS Server Software (New Install)" on page 14.

To upgrade to EMS 1.4 from EMS 1.1 or later:

- 1 Open a console window and log in to the server as `root`.
- 2 Download the appropriate installation tar file for your operating system (see Table 4) from the SkyPilot website at www.skypilot.com/support/.

Table 4. EMS Server Software Installation Files

Operating system	File name
Red Hat Linux 9.0	<code>skypilot_ems-1_4_0_rh9.tar</code>
Fedora Core 2	<code>skypilot_ems-1_4_0_fc2.tar</code>
Fedora Core 4	<code>skypilot_ems-1_4_0_fc4.tar</code>
Fedora Core 5	<code>skypilot_ems-1_4_0_fc5.tar</code>
Red Hat Enterprise Linux ES 3	<code>skypilot_ems-1_4_0_rhe3.tar</code>
Red Hat Enterprise Linux ES 4	<code>skypilot_ems-1_4_0_rhe4.tar</code>

- 3 Unpack the installation file:

```
tar -xf <file-name>
```

where *<file-name>* is the name of the file you downloaded in step 2.

- 4 Run the installation shell script.

Table 5 identifies the installation directory that was created when you unpacked the installation file in step 3.

Table 5. EMS Server Software Installation Directories

Operating system	Directory name
Red Hat Linux 9.0	skypilot_ems_1_4_rh9
Fedora Core 2	skypilot_ems_1_4_fc2
Fedora Core 4	skypilot_ems_1_4_fc4
Fedora Core 5	skypilot_ems_1_4_fc5
Red Hat Enterprise Linux ES 3	skypilot_ems-1_4_rhe3
Red Hat Enterprise Linux ES 4	skypilot_ems-1_4_rhe4

- a Change to the installation directory:

```
cd <dir-name>
```

where <dir-name> is the name of your installation directory, as identified in Table 5.

- b Run the shell script to install the SkyPilot EMS software (including the third-party software):

```
sh skypilot_ems_install.sh
```

The installer script checks for a previous version of EMS software. When the earlier version is found, the installer asks you to confirm the upgrade. (If no earlier version is found, the installer will perform a new installation as described in “Installing EMS Server Software (New Install)” on page 14.)

- c Type **yes** and press ENTER to confirm the upgrade.

Before performing the upgrade, the installer checks to confirm that the system meets hardware and software requirements. If the installer encounters any conflicts, it tries to uninstall the conflicting package, and if unsuccessful it may cancel the installation and display a list of suspected causes.

If no conflicts are found, the installer displays the license conditions and prompts you for acceptance. (You may need to scroll through the agreement content.)

- d** To accept the license agreement, type **accept** and press ENTER.

To decline the agreement and exit the installation, type **decline** and press ENTER.

- e** When you're prompted for localization, localize the `skyems` service on the desired network interface.

The installer prompts you to confirm the running of a localization script that configures the EMS server (`skyems` service) with the IP address of your server network interface.

- f** Type **yes** and press ENTER to confirm the running of the localization script.

The installer lists the Ethernet interfaces available on the server and asks you to identify the interface you want to use as the one through which remote clients connect to the EMS server.

Unlike SkyPilot devices that can use any available interface to receive IP addresses and configuration files, a PC running the EMS client software will be able to access only the interface you specify here (typically `eth0`).

- g** Type the interface name and press ENTER.

If the interface name is invalid, the installer prompts you for a new one.

If the interface name is valid, the installer displays the IP address associated with the interface and a hostname. For example:

```
Using the IP address from interface eth0 to localize
SkyPilot EMS server configuration file and /etc/hosts:
```

```
eth0 has IP address 10.2.2.2 and the hostname is
godbox.corp.skypilot.com
```

```
The httpd server config file and /etc/hosts have been
updated with the IP address 10.2.2.2 of eth0
```

- 5 When installation is complete, the installer prompts you to reboot the server; enter the following command:

```
reboot
```

Upon system reboot, the EMS server starts automatically.

- 6 Verify that the installation was successful by following the instructions in “Verifying EMS Server Installation” on page 18.

Installing EMS Server Software (New Install)

This section provides instructions for installing EMS server software (version 1.4) for the first time on a server.

Notes

- If you’re upgrading from an existing EMS server, skip this section and use the procedures in “Installing EMS Server Software (Upgrade)” on page 11.
- If you do not already have a license key, obtain one by following the instructions in “Obtaining a License Key” on page 10.

To perform a new EMS server installation:

- 1 Open a console window and log in to the server as `root`.
- 2 Download the appropriate installation file for your operating system (see Table 4) from the SkyPilot website at www.skypilot.com/support/.

Table 6. EMS Server Software Installation Files

Operating system	Filename
Red Hat Linux 9.0	skypilot_ems-1_4_0_rh9.tar
Fedora Core 2	skypilot_ems-1_4_0_fc2.tar
Fedora Core 4	skypilot_ems-1_4_0_fc4.tar
Fedora Core 5	skypilot_ems-1_4_0_fc5.tar
Red Hat Enterprise Linux ES 3	skypilot_ems-1_4_0_rhe3.tar
Red Hat Enterprise Linux ES 4	skypilot_ems-1_4_0_rhe4.tar

- 3** Unpack the installation file:

```
tar -xf <file-name>
```

where *<file-name>* is the name of the file you downloaded in step **2**.

- 4** Run the installation shell script (see substep **a** to substep **h**).

Table 7 identifies the installation directory that was created when you unpacked the installation file in step **3**.

Table 7. EMS Server Software Installation Directories

Operating system	Directory name
Red Hat Linux 9.0	skypilot_ems_1_4_rh9
Fedora Core 2	skypilot_ems_1_4_fc2
Fedora Core 4	skypilot_ems_1_4_fc4
Fedora Core 5	skypilot_ems_1_4_fc5
Red Hat Enterprise Linux ES 3	skypilot_ems_1_4_rhe3
Red Hat Enterprise Linux ES 4	skypilot_ems_1_4_rhe4

- a** Change to the installation directory:

```
cd <dir-name>
```

where *<dir-name>* is your installation directory, as identified in Table 7.

- b** Run the shell script to install the SkyPilot software (and the included third-party software):

```
sh skypilot_ems_install.sh
```

The installer reminds you that you need a license key to start (run) EMS, and asks you to confirm the installation.

- c** Type **yes** and press ENTER to confirm the installation.

Before installing the software, the installer checks your system to confirm that it meets hardware and software requirements. If the installer encounters any conflicts, it tries to correct the conflicts, and if

unsuccessful the installer may cancel the installation and display a list of suspected causes.

If no conflicts are found, the installer displays the license conditions and prompts you for acceptance. (You may need to scroll through the agreement content.)

- d** To accept the license agreement, type **accept** and press ENTER.

To decline the agreement and exit the installation, type **decline** and press ENTER.

The installer creates a new account for user `skypilot`, and prompts you for a password. The purpose of this account is to enable the transfer of files to and from the EMS server. By default, the `root` account cannot be used for `ftp` file transfer.

- e** Enter a password. It's recommended that your password be 6 or more characters, including letters, numbers, and at least one special character.

- f** Enter the password a second time to confirm it.

The installer prompts you to confirm the running of a localization script that configures the EMS server with the IP address of your server network interface.

- g** Type **yes** and press ENTER to confirm the running of the localization script.

The installer lists the Ethernet interfaces available on the server and asks you to identify the interface you want to use as the one through which remote clients connect to the EMS server.

Unlike SkyPilot devices that can use any available interface to receive IP addresses and configuration files, a PC running the EMS client software will be able to access only the interface you specify here (typically `eth0`).

- h** Type the interface name and press ENTER.

If the interface name is invalid, the installer prompts you for a new one.

If the interface name is valid, the installer displays the IP address associated with the interface and a hostname. For example:

```
SkyPilot EMS server added as a service and activated.
```

```
The /etc/rc.d/init.d/skyems file has been updated with the  
IP address 192.168.4.104 of eth0.
```

```
You can run skypilot_localize again if you wish to make  
changes in the future.
```

- 5** If you have new license files, copy them to the location specified in the email message that accompanied the license files.

- 6** When installation is complete, the installer prompts you to reboot the server; enter the following command:

```
reboot
```

Upon system reboot, the EMS server starts automatically.

- 7** Verify that the installation was successful by following the instructions in the next section, "Verifying EMS Server Installation."

Verifying EMS Server Installation

SkyPilot provides a set of configuration commands that you can use to confirm a successful EMS installation, as well as to restart the EMS components. (For the complete list of commands, see “EMS Server Configuration Commands.”)

NOTE The DHCP server provided as a component service will not start until you configure it for use with your network environment, as instructed in the next section, “Setting Up the DHCP Server.”

To verify a successful EMS installation:

- 1 If you haven't already done so, start the EMS server.

The recommended procedure is to reboot the EMS server (which results in the EMS services automatically starting), although you can use the configuration commands instead (“EMS Server Configuration Commands” on page 23).

- 2 At the command prompt, type `skypilot_check` and press ENTER.

This command identifies all the processes running on the system to determine whether SkyPilot EMS is running, returns a list of currently running services, and provides current system information; for example:

```
Checking for SkyPilot EMS server processes
-----

vsftpd (pid 24957) is running...
dhcpd (pid 24979) is running...
skyems server (java, PID 19221 ) is running
httpd (pid 25639 25031 25030 25029 25028 25027 25026 24993) is
running...
MySQL (pid 19395 19342 19340 19321 25083 25082 25081 25080
25079) is running
relay_server (pid 25063) is running...

IP address in httpd.conf file:    10.10.10.1
```

- 3 If `skypilot_check` verifies that all services (except DHCP) are running, the installation is correct, and you're done with this procedure.

If `skypilot_check` shows that the EMS server is *not* running, confirm that the license files are stored in the correct folder and repeat this procedure. If the installation fails after confirming proper license file locations, check the server log files (located in the `/var/log/skypilot/` directory).

Setting Up the DHCP Server

For automatic provisioning, your network must provide a DHCP server to respond to requests from SkyPilot devices for IP addresses. The SkyPilot software you installed on the server includes a DHCP server and a sample configuration file, `/etc/dhcp.conf`. The sample file shows how to provide a static IP address to a SkyPilot device requesting an address.

If you use ISC DHCP (the open-source DHCP server provided with the SkyPilot EMS software), make sure you're familiar with its configuration parameters and the requirements for your specific network.

If you use a third-party DHCP server, make sure that option 66 (TFTP server) and option 72 (HTTP server) contain the IP address of the provisioning server.

For detailed information about the role of DHCP in automatic provisioning, refer to the SkyPilot website at www.skypilot.com/support/.



Installing the SkyPilot EMS Java Client Software

After you've installed (or upgraded) the SkyPilot EMS server software and verified that the installation is correct, you can install the SkyPilot EMS Java client software. This software allows you to connect to the server from a networked computer, use SkyProvision to set up automatic provisioning, and use SkyControl to monitor network operations.

IMPORTANT In order to connect, you need to install the same version of the client software as the server version you've just installed (or upgraded to).

Installing EMS Java Client Software

This section provides instructions for installing the SkyPilot EMS Java client software on PCs running Microsoft Windows. If you're installing under a different operating system, you can download the appropriate package (for example, the Linux zip file) and perform similar functions, taking care to identify and install the correct Java Runtime Environment.

NOTE If you plan to run the EMS Java client on the same machine on which you installed the EMS server, you can skip this section; the EMS server installation automatically includes EMS Java client software installation.

To install EMS client software on PCs:

- 1 Confirm that the client computer meets or exceeds the requirements listed in Table 2 on page 5.
- 2 Download the `skypilot_ems-1_4_0_client.exe` file from the SkyPilot website (www.skypilot.com/support/) to the client computer.

- 3 To install the SkyPilot client software, double-click the executable file `skypilot_ems-1_4_0_client.exe` and follow the onscreen instructions.

Starting the EMS Java Client

After you've installed EMS server and EMS client applications, you can start the Java client application on the server or client machine and begin using SkyProvision and SkyControl to configure and monitor SkyPilot devices on the network.

NOTE In addition to the following procedure, you may be able to start the EMS Java client by using the **Start** menu or desktop shortcuts that may have been set up during installation.

To start the SkyPilot EMS Java client:

- 1 Execute the SkyPilot EMS Java client startup script, `SkyPilot\EMS\bin\startemsclient.bat` (for Windows systems) or `/usr/local/skypilot/EMS/bin/startsemsclient.sh` (for Linux systems).

The Login screen is displayed.

- 2 Enter your server hostname (`localhost` if starting the client on the EMS server machine), user name, and password. (The default value for both user name and password is `admin`.)

- 3 Click **Login**.

The SkyPilot EMS interface is displayed. For detailed information about using SkyPilot EMS, refer to *SkyPilot Network Administration*.



EMS Server Configuration Commands

The SkyPilot server installation provides a set of configuration commands for verifying and managing the processes that run as part of the EMS server. This section describes those commands.

Unless otherwise specified, the command being described has no parameters; just type the command name by itself.

skypilot_check

This command examines all the server processes and identifies whether services are running or not. It also returns system information, including IP address and hostname. Use this command to verify that your EMS installation is correct (see “Verifying EMS Server Installation” on page 18).

NOTE The command returns the IP address that was set during installation with the localization script (which also configured the `/etc/hosts` and `/usr/local/apache2/conf/httpd.conf` files).

skypilot_dhcp_refresh

This command restarts the DHCP service and deletes the contents of the DHCP leases file, `/var/lib/dhcp/dhcpd.leases`. If you made changes to the DHCP configuration, you must use this command to ensure that the updates take effect and that the correct IP is assigned.

skypilot_localize

Use this command to reselect an IP address for an Ethernet interface if the IP address of the server has changed. This command runs the same localization script that the installer ran during the original EMS installation.

skypilot_restart

This command stops all the server processes and then restarts them.

skypilot_start

This command starts a specific server process. Use it if you suspect a process has stopped, or if you stopped a process and want to restart it. (If you enter this command for a process is already running, this second process start will fail.)

The command syntax is:

```
skypilot_start [all | vsftpd | dhcpd | skyems | httpd | mysql | relay_server]
```

If no parameter is provided, the command shows usage information.

skypilot_stop

This command stops a specific server process. Use it if you want to test a process by stopping it and restarting it.

The command syntax is:

```
skypilot_stop [all | vsftpd | dhcpd | skyems | httpd | mysql | relay_server]
```

If no parameter is provided, the command shows usage information.

skypilot_uninstall_all_1_4_0

This command removes the entire SkyPilot EMS installation from the server. Use it only if you want to discard an existing installation and start over.

WARNING This command permanently removes all your SkyPilot processes and data.

