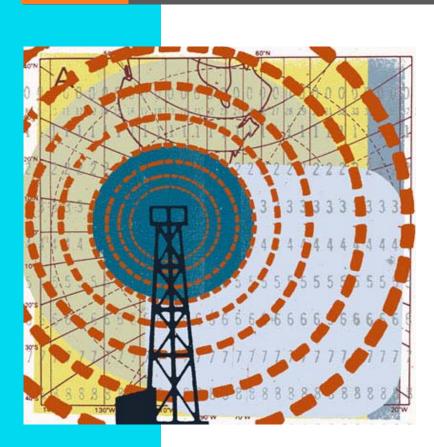
SkyPilot OS Installation: Fedora Core 2 and 4





671-00001-01 Rev C

© 2007 SkyPilot Networks, Inc. All rights reserved

This publication, or parts thereof, may not be reproduced in any form, by any method, for any purpose.

Product specifications are subject to change without notice. This material is provided for informational purposes only; SkyPilot assumes no liability related to its use and expressly disclaims any implied warranties of merchantability or fitness for any particular purpose.

SkyPilot Trademarks

SkyConnector, SkyControl, SkyExtender, SkyGateway, SkyPilot, SkyPilot Networks, SkyProvision, and the SkyPilot logo are the trademarks and registered trademarks of SkyPilot Networks, Inc.

Third-Party Trademarks

Java and all Java-based trademarks and logos are trademarks or registered trademarks of Sun Microsystems, Inc. in the United States and other countries. MySQL is a registered trademark of MySQL AB in the United States, the European Union, and other countries.

All other designated trademarks, trade names, logos, and brands are the property of their respective owners.

Third-Party Software Program Credits

This product includes software developed by the Apache Software Foundation (http://www.apache.org/), licensed under the Apache License

This product includes the DHCP Server software from Internet Systems Consortium, licensed under the DHCP License. The DHCP Server software is copyright © 2004 Internet Systems Consortium, Inc. ("ISC"). Copyright © 1995–2003 Internet Software Consortium. All rights reserved. Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met 1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer. 2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution. 3. Neither the name of ISC, ISC DHCP, nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission. THIS SOFTWARE IS PROVIDED BY INTERNET SYSTEMS CONSORTIUM AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL ISC OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

This product includes the FTP Server software from vsftpd (http://vsftpd.beasts.org/), licensed under the GNU General Public License.

This product includes Java software from Sun Microsystems, licensed under Sun Microsystems' Binary Code License Agreement. Copyright 2003, Sun Microsystems, Inc. All rights reserved. Use is subject to license terms. Sun, Sun Microsystems, the Sun logo, Solaris, Java, the Java Coffee Cup logo, J2SE, and all trademarks and logos based on Java are trademarks or registered trademarks of Sun Microsystems, Inc. in the U.S. and other countries.

This product includes JBOSS Version 3.2.3 software from JBoss, licensed under the GNU Lesser General Public License. Some bundled products in JBOSS are licensed under the Apache License.

This product contains Java Telnet Application (JTA 2.0).

This product contains the MibBrowser software from Mibble.

This product includes software the copyright of which is owned by and licensed from MySQLAB.

This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit. (http://www.openssl.org/). Copyright (c) 1998-2005 The OpenSSL Project. All rights reserved. Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met: 1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following ciclaimer. 2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution. 3. All advertising materials mentioning features or use of this software must display the following acknowledgment: "This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit. (http://www.openssl.org/)* 4. The names 'OpenSSL Toolkit' and 'OpenSSL Project'' must not be used to endorse or promote products derived from this software without prior written permission. For written permission, please contact openssl-core@openssl.org. 5. Products derived from this software may not be called 'OpenSSL' nopenSSL' appear in their names without prior written permission of the OpenSSL Project for use in the OpenSSL Project. G. Redistributions of any form whatsoever must retain the following acknowledgment: 'This product includes software developed by the OpenSSL Project for use in the OpenSSL Project' as any form whatsoever must retain the following acknowledgment: 'Sis' AND ANY EXPRESSED OR IMPLED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLED WARRANTIES OF MARCH IS PROVIDED BY THE OpenSSL PROJECT 'NCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAWAGES (INCLUDING, BUT NOT LIMITED TO, THE IMPLED WARRANTIES OF MAY DIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAWAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER

This product includes libraries developed by Eric Young and is licensed under the Original SSLeay License. This product includes cryptographic software written by Eric Young (eav@cryptsoft.com). This product includes software written by Tim Hudson (tjh@cryptsoft.com). Copyright (C) 1995–1998 Eric Young (eav@cryptsoft.com). All rights reserved. Redistributions on use in source and binary forms, with or without modification, are permitted provided that the following conditions are met: 1. Redistributions of source code must retain the copyright notice, this list of conditions and the following disclaimer 2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer 2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer 2. Redistributions in provided with the distribution. 3. All advertising materials mentioning features or use of this software must display the following acknowledgement: "This product includes cryptographic software written by Eric Young (eav@cryptsoft.com)" The word 'cryptographic' can be left out if the routines from the library being used are not cryptographic related:-). 4. If you include any Windows specific code (or a derivative thereof) from the apps directory (application code) you must include an acknowledgement: "This product includes software written by Tim Hudson (tjh@cryptsoft.com)". THIS SOFTWARE IS PROVIDED BY ERIC YOUNG 'AS IS' AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES, OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INDIRECT, NCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABLITY. WHETHER IN CONTRACT, STRICT LI

This product includes SNMP software from WestHawk, licensed under the WestHawk License.

This product includes JFreeCharts from http://www.jfree.org/, licensed under GNU Lesser General Public License.

This product includes JasperReports from http://jasperreports.sourceforge.net/index.html, licensed under GNU Lesser Public License.

GOVERNMENT USE

The following provision applies to United States Government end users. This product is comprised of "commercial computer software" and "commercial computer software documentation" as such terms are used in 48 C.F.R. 12.212 and are provided to the Government (i) for acquisition by or on behalf of civilian agencies, consistent with the policy set forth in 48 C.F.R. 12.212; or (ii) for acquisition by or on behalf of units of the Department of Defense, consistent with the policies set forth in 48 C.F.R. 227.7202-1 and 227.7202-3.

SkyPilot Firmware 1.5 Document Last Revised: April 18, 2007



Contents

bout This Guide	1
reparing for Installation	
Requirements	. 3
stalling Fedora Core	
Installation Procedure	
onfiguring a Firewall for SkyPilot Operations	15

About This Guide

This guide provides directions for installing the Fedora Core 2 or 4 operating system on the server you'll use for configuring and managing nodes on your SkyPilot wireless network.

This guide assumes administrator-level knowledge of IP networks, basic knowledge of wireless networking, and a familiarity with the information in *Getting Started with the SkyPilot Network*.

This guide is organized as follows:

- "Preparing for Installation" lists the server requirements for installation.
- "Installing Fedora Core" provides detailed instructions for performing a custom installation of the Fedora Core operating system.
- "Configuring a Firewall for SkyPilot Operations" tells you which ports to open for data traffic from SkyPilot devices if your server is behind a firewall.

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 to use automatic provisioning of devices under the Fedora Core 2 or 4 operating system, you must perform a custom installation of the operating system. This custom installation prepares your server for the installation of SkyPilot EMS software that will provide unattended configuration of SkyPilot devices from a central server at your network operations center (NOC).

Requirements

Table 1 lists the hardware and software requirements for the server on which you'll install the Fedora Core operating system and, later on, the SkyPilot EMS software.

Table 1. Server Requirements

	Minimum	Recommended
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	10/100 Mbps Ethernet



Installing Fedora Core

To prepare your server for provisioning and management of devices on a SkyPilot wireless network, you must perform a custom installation (or reinstallation) of the operating system that will, among other things, exclude software packages or services that are duplicated by the SkyPilot EMS server software installation: the Apache HTTP server, MySQL database server, VSFTPD server, and DHCP server.

Installation Procedure

WARNING The following installation procedure will reformat your server's hard drive, overwriting its contents. If you have important data on the drive, back it up before proceeding.

To perform a custom installation of Fedora Core:

- Insert Fedora Core Disk 1 in the CD-ROM drive of the server and reboot.
 After the server reboots, the installer's Welcome screen appears.
- 2 Click Next to continue.
- **3** Follow the prompts to select options on the Language Selection screen and additional configuration screens, until either the Upgrade Examine screen (for OS upgrades) or the Installation Type screen (for new installations) appears.

Figure 1. Upgrade Examine screen



4 If the Installation Type screen appears, skip this step. Otherwise, select **Install Fedora Core** and click **Next**.

The Installation Type screen appears, prompting you to select the type of installation: personal desktop (client), workstation, server, or custom.

Figure 2. Installation Type screen



Because you'll need to exclude or include specific packages and services to support the SkyPilot EMS server, you must select the **Custom** option.

5 Select Custom and click Next.

The Disk Partitioning Setup screen appears, offering you a choice between automatic partition and manual partitioning (with the Disk Druid utility).

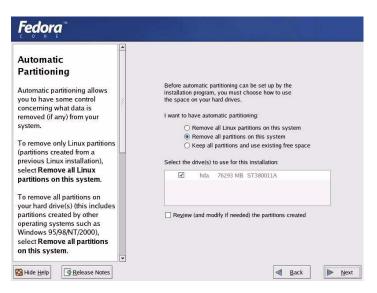
Figure 3. Disk Partitioning Setup screen

Fedora	
Disk Partitioning Setup One of the largest obstacles for a new user during a Linux installation is partitioning. This process is made easier by providing automatic partitioning. By selecting automatic partitioning you will not have to use partitioning tools to assign mount points, create partitions, or allocate space for your installation. To partition manually, choose the Disk Druid partitioning tool. Use the Back button to choose a different installation, or choose Next if you want to proceed with this installation.	Automatic Partitioning sets partitions based on the selected installation type. You also can customize the partitions once they have been created. The manual disk partitioning tool, Disk Druid, allows you to create partitions in an interactive environment. You can set the file system types, mount points, partition sizes, and more. @ Automatically partition Manually partition with Disk Druid Manually partition with Disk Druid

6 Select Automatically partition and click Next.

The Automatic Partitioning screen appears, offering you a choice of partitioning options.

Figure 4. Automatic Partitioning screen



For this installation, you must remove all partitions (Linux and otherwise) from the drive on which you're installing Fedora Core.

7 Select Remove all partitions on this system. If your server uses more than one hard drive, select the drive on which you want Fedora Core installed. Click Next to continue.

When prompted to confirm the removal of all partitions (and all data stored on them), click **Yes**.

The Boot Loader Configuration screen appears, providing options for booting other operating systems.

Figure 5. Boot Loader Configuration screen

Fedora [™]	
Boot Loader Configuration By default, the GRUB boot loader will be installed on the system. If you do not want to install CBI do surve beat	The GRUB boot loader will be installed on /dev/hda. Change boot loader You can configure the boot loader to boot other operating systems. It will allow you to select an operating system to boot from the list. To add additional operating systems, which are not automatically detected, click 'Add.' To change the operating system booted by default, select 'Default' by the desired operating system.
install GRUB as your boot loader, select Change boot loader.	Default Label Device Add □ DOS /dev/hda2 Edit ☑ Fedora Core /dev/hda5 Patrice
You can also choose which OS (if you have more than one) should boot by default. Select Default beside the preferred boot partition to choose your default bootable OS. You will not be able to move forward in the installation unless you	A boot loader password prevents users from changing options passed to the kernel. For greater system security, it is recommended that you set a password. Use a boot loader password Change password
choose a default boot image. You may add, edit, and delete the boot loader entries by selectina a partition with vour ▼ ⊠ Hide Help ③ Release Notes	Configure advanced boot loader options

8 Click Next.

The Network Configuration screen (Figure 6) appears, listing the network devices on your system and providing options for IP addressing and DNS settings. Figure 6 shows an example.

NOTE Automatic configuration of devices on a SkyPilot network requires a provisioning server with a static IP address.

Figure 6. Network Configuration screen

Network	Network Devices	
	Active on Boot Device IP/Netmask	Edit
Configuration	eth0 DHCP	- All Sector
Any network devices you have on the system will be automatically detected by the installation program and shown in the Network Devices list.		
in the rection bevices list	Hostname	
To configure the network	Set the bostname	
device, first select the device	automatically via DHCP	
and then click Edit. In the Edit	O <u>a</u> utomatically via DHCP	
Interface screen, you can	<u>manually</u>	(ex. "host.domain.com")
choose to have the IP and Netmask information configured by DHCP or you	Miscellaneous Settings	
can enter it manually. You can	Gateway:	
also choose to make the	Primary DNS:	
device active at boot time.	Secondary DNS:	
device delive di boot ane.		
If you do not have DHCP client	Tertiary DNS:	

9 Deselect the option for setting a hostname automatically via DHCP, and then make the appropriate selections and data entries for your network, including a static IP address for the server and a hostname of your choice. For optimal network connectivity, also include gateway and DNS addresses in the Miscellaneous Settings area of the screen. Click **Next** to continue.

The Firewall Configuration screen appears.

Figure 7. Firewall Configuration screen

Fedora	
Firewall Configuration	A firewall can help prevent unauthorized access to your computer from the outside world. Would you like to enable a firewall?
A firewall sits between your computer and the network, and determines which resources on your computer remote users on the network are able to access. A properly configured firewall can greatly increase the out-of- the-box security of your system.	What services should be allowed to pass through the firewall? WWW (HTTP) FTP SSH SSH Helenet Mail (SMTP)
Choose the appropriate security level for your system.	Other ports:
No Firewall — No firewall provides complete access to your system and does no security checking. Security checking is the disabling of access to certain services. This should only be selected if you	☐ eth0.

To ensure that the SkyPilot wireless network operates properly, it's recommended that you install the operating system *without* firewall protection.

NOTE If security issues demand that you include a firewall, you can still use the provisioning server by configuring the firewall to allow incoming data traffic on the ports used by SkyPilot devices and remote clients; see "Configuring a Firewall for SkyPilot Operations" on page 15. In this case, for step 10 leave the Enable Firewall option selected and click Next.

10 Select No firewall and click Next.

When prompted to confirm continuing without configuring a firewall, click **Proceed**.

The Additional Language Support screen appears.

11 Follow the prompts to select additional languages, set a time zone, specify a root password, and configure authentication, until the Package Group Selection screen appears.

Fedora Desktops Package Group X Window System [33/38] Details Selection Install this group of packages to use the base graphical (X) user interface. Select the package (application) GNOME Desktop [36/40] Details groups that you want to install. To select a package group, click on the check box beside it. GNOME is a powerful, graphical user interface which includes a panel, desktop, system icons, and a graphical file manager. C KDE (K Desktop Environment) [0/15] Once a package group has been KDE is a powerful, graphical user interface which includes a panel, desktop, system icons, and a graphical file manager. selected, click on Details to view which packages will be installed by default and to add or remove Applications optional packages from that group. Editors [3/7] Details Sometimes called text editors, these are programs that allow you to create and edit files. These include Emacs and VI. Engineering and Scientific [0/7] This group includes packages for performing mathematical and scientific computations and plotting, as well as unit 0 conversion. Total install size: 2,394M Release Notes d Back R Hide Help Next

Figure 8. Package Group Selection screen

You'll use this screen to choose package groups for exclusion or inclusion.

Table 2 shows which packages you must select or deselect for SkyPilot. For packages not listed in this table, you're free to include or exclude each, depending on your requirements.

NOTE Be careful *not* to check the **Everything** box at the bottom of the package group list. Checking this box automatically includes every package options in the installation.

Include (box checked)	Exclude (box unchecked)
Desktop packages:	Desktop packages:
X Window System	No exclusion requirement
GNOME or KDE	
Application packages	Application packages
Editors	No exclusion requirement
Graphical Internet	
Text-based Internet	
Office/Productivity	
Sound and Video	
Server packages:	Server packages:
Server Configuration Tool	Web server (Apache)
	SQL database server and clients
	FTP server
	Network servers (including DHCP and Telnet)
Developer packages:	Developer packages:
Development Tools	No exclusion requirement

Table 2. Fedora Core Package Options for SkyPilot (Page 1 of 2)

Include (box checked)	Exclude (box unchecked)
System packages:	System packages:
Administration Tools	No exclusion requirement
System Tools	
Printing Support	
Miscellaneous packages:	Miscellaneous packages:
No requirement	Everything
	Minimal

Table 2. Fedora Core Package Options for SkyPilot (Page 2 of 2)

12 Click checkboxes to select or deselect packages for your SkyPilot software installation (see Table 2). After selecting the appropriate packages (and being especially careful *not* to check the **Everything** box), click **Next** to continue.

The About to Install screen appears.

13 Click Continue.

The Required Install Media screen appears, identifying the media you will need to complete the installation.

14 Click Next.

The installer begins copying package files to the server's hard disk, and a meter tracks the installation progress.

When package installation is complete, the installer presents the first of a series of screens on which you select system options and identify hardware components.

15 Follow the prompts to make installation selections that correspond to your system setup.

Finally, the installer prompts you to prepare the system for rebooting. Remember to remove any installation media (diskette from the diskette drive or CD from the CD-ROM drive) if they haven't been ejected.

16 Click **Reboot** to reboot the server under Fedora Core.

When you boot Fedora Core for the first time, the system prompts you for additional information, including a user profile and the type of display. A resolution of 1024 x 768 is recommended for easier navigation of EMS.

What's Next

With your server running Fedora Core, you can now install the SkyPilot EMS software that you'll use to provision and manage SkyPilot devices.

For instructions on installing the EMS software, refer to the *SkyPilot EMS Installation Guide*, available from the SkyPilot website at <u>www.skypilot.com/support/</u>.

Configuring a Firewall for SkyPilot Operations

For optimal SkyPilot operations, you should install Fedora Core without a firewall. However, if security concerns or other issues force you to use a firewall, you must configure the firewall to allow incoming data traffic on ports that SkyPilot clients and devices use for server communications (see Table 3).

NOTE Each port you open reduces the overall security provided by the firewall.

То	Open these ports
Allow EMS clients to connect to the EMS server	1098 TCP (JBoss RMI port)
	1099 TCP (JBoss RMI port)
	4444 TCP (JBoss RMI object port)
	3306 TCP (MySQL DB port)
	32007 (Notification port)
Allow SkyProvision™ to configure SkyPilot devices outside the firewall	8000 TCP (HTTP server)
	20 TCP (FTP server)
	21 TCP (FTP server)
	67 TCP/UDP (DHCP server)
Allow SkyControl™ to monitor SkyPilot devices outside the firewall	161 TCP/UDP (SNMP Read)
	162 UDP (SNMP Traps)

Table 3. Ports to Open