



# LinMin Bare Metal Provisioning™ Installation Guide

Release 5.5.2

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# 1 LinMin Bare Metal Pre-installation Checklist

This section presents the prerequisites and information that should be gathered and known in advance so that a rapid installation can be accomplished.

Section 1 presents the requirements for the system that will be your LinMin server (also called LBMP server).

Section 2 presents the requirements for the systems that will be provisioned ("LinMin clients").

## 1.1 LinMin Server Requirements

### 1.1.1 Hardware Requirements for the LinMin Server

**CPU** – Verify the LinMin server has one of the following Intel or AMD CPU architectures: x86 (IA32) or x86\_64 (EM64T or AMD64). We recommend Pentium 4 or Celeron systems, though LBMP will run on Pentium III. Recommended minimum RAM: 512MB

**MAC Address** – Identify the LBMP Server's MAC address for NIC you will be using to provision clients and email the MAC address to [linmin-support@linmin.com](mailto:linmin-support@linmin.com) so that a license key file can be generated before you start the product installation. If you need assistance with identifying the MAC address, please refer to the appendix in the LinMin BMP User's Guide.

**Disk space** – Verify the server has disk space sufficient to store all software that will be provisioned, including operating systems and user-specified software: if you provision only 1 or 2 distros, a 20GB disk is ample. If you wish to capture disc images of the client systems, considerable disc storage on the LBMP server should be available (locally or NFS-mounted).

**Tip** The typical Linux distro media is around 4GB and Windows OS (without drivers) is under 1GB.

### 1.2.1 Software Requirements for the LinMin Server

**Operating system** – Have Red Hat Enterprise Server 5.2, 5.3 or 5.4, or CentOS 5.2, 5.3 or 5.4 i386 freshly installed. The base OS installation with a graphical desktop (for convenience, otherwise you'll access the LinMin GUI from Firefox on another system) is sufficient: no need to install any database or other services as LinMin's installation script automatically downloads and configures everything needed. **Do a "yum update"**.

If you are not a Red Hat subscriber and wish to obtain a free copy of CentOS, [www.centos.org](http://www.centos.org) will point you to any number of mirrors, such as [mirrors.kernel.org](http://mirrors.kernel.org).

Or simply download this file: <http://mirrors.kernel.org/centos/5.4/isos/i386/CentOS-5.4-i386-bin-DVD.iso>

If you are downloading this file to a Windows system, please refer to appendix H on how to copy an iso file to DVD.

Our installation script also performs an update before downloading any required packages, so you can save time by having done the update immediately prior to running our installation scripts.

**Language** – Please make sure that you specify to install the OS with English US language. If you have already installed RHEL or CentOS with another language, you may change it by editing `/etc/sysconfig/i18n`, and changing, for example, `LANG="de_DE.UTF-8"` to `LANG="en_US.UTF-8"`

**Services** – All services required to run LBMP are automatically installed and configured with the installation scripts (DHCP, PostgreSQL, etc.) Note that DHCP (`dhcpd.conf`) is installed as non-authoritative to better coexist with other DHCP servers. If the LinMin DHCP is the only DHCP server on the network, the authoritative directive should be uncommented (changed from “# authoritative” to “authoritative”). Please refer to the [User's Guide Appendix E on Co-existing with DHCP servers and running on multiple LANs/VLANs](#).

**HTTP server** -- Verify the system where the LBMP server will be installed has *no* HTTP server. LBMP uses Port 80, the same used by Apache for example.

**Firewall Ports** – All processes associated with the Firewall ports listed in Table 1 must be stopped during installation of the LinMin Provision server

**Table 1 – Firewall Ports That Must Have Processes Stopped During Installation of LBMP**

Port Number	Protocol	Port Name
9	TCP/UDP	dccp
21	TCP/UDP	ftp
67	UDP	bootp (also used by dhcp)
68	UDP	bootp (also used by dhcp)
80	TCP	http or www or www-http

**Step 1 – Identify all processes and process IDs (PIDs) associated with networking ports**

Identify the ports listed in Table 1, their processes, and PIDs by executing the `netstat` command with the following options:

```
netstat -pan
```

The stdout from the `netstat -pan` command lists the networking ports, the names of the processes associated with each port, and the PIDs for each process. Identify each port shown in Table 1, and for each identified port, make a note of *all* associated processes and their PIDs

**Step 2 – Remove the symbolic links between the identified processes and the `init.d` file**

Remove the symbolic links between every process identified processes and the `init.d` file

**Note 1** The `init.d` file is usually located at `/etc/init.d` or `/etc/rc.d/init.d`

**Note 2** The method for removing symbolic links between processes and the `init.d` file is determined by the Linux distribution. Consult your distribution's documentation for instructions

**Note 3** Any `http` process operating on Port 8080 can be allowed to operate, and its symbolic links to the file `init.d` can be left in operation

### 1.3.1 Network Requirements for the LinMin Server

**Internet Connection** – Make sure you have access to a Yum repository (either a remote mirror or RHN, or a local mirror or Satellite) from the LBMP server. It will be needed during the automated installation process only (many packages will be downloaded from repositories). Once you have installed LBMP, the server will no longer need an Internet connection unless you provision Ubuntu systems.

**Static IP Address** – Verify the LBMP server has a static IP address: in `/etc/sysconfig/network-scripts/` the file `ifcfg-eth0` must contain the static IP address, subnet mask, DNS and Gateway addresses, and the DHCP flag should say "none". [Please refer to Appendix C for more details.](#)

**Single subnet** – Verify all LinMin clients will be on the same LAN segment as the LBMP server. They can either be physically on the LAN segment or be connected through a DHCP relay or virtual LAN.

**DHCP server** – Verify a DHCP server ("Primary DHCP Server") is on the same subnet as the LBMP server; it can be on the LBMP server or on another server on the subnet.

When LinMin installs its own DHCP server, it defaults to "non-authoritative", allowing for coexistence and eliminating conflicts with other DHCP servers on the network. If LinMin's DHCP server is to be the only DHCP server on the LinMin subnet, the "#authoritative" line in the `/etc/dhcpd.conf` file needs to be uncommented to "authoritative".

[Please refer to the User's Guide Appendix E on Co-existing with DHCP servers and running on multiple LANs/VLANs.](#)

**IP address range** – Verify you have a range of available IP addresses to assign to the LBMP server's DHCP server that does not conflict with the range of IP addresses assigned by the Primary DHCP Server. LBMP issues short-lived dynamic addresses during provisioning, then upon rebooting, the LinMin client will be directed to obtain a dynamic IP address from the Primary DHCP Server (unless the LinMin client was assigned a static IP address). The range should be the maximum number of LinMin Clients you wish to provision simultaneously.

**Ports open on firewall** – If you provision clients over a firewall-protected network, verify the ports listed in Table 2 are open (defined as exceptions) on the LBMP server and on any machine located between the LBMP server and the LinMin client to be provisioned.

**Table 2 Ports That Must Be Open on the LBMP Server on a Firewall-protected Network**

<i>Port Number</i>	<i>Port Name</i>	<i>Protocol</i>
21 (see Note)	FTP	TCP/UDP
67	BOOTP	UDP
69	TFTP	UDP
111	NFS (rpcbind)	TCP
139	NetBios (netbios-ssn)	TCP
445	SMB Samba (Microsoft-ds)	TCP
4011	BINL	UDP

**Note** Port 21 (FTP): although FTP is not in use with this current LinMin release, the port must be open for LinMin Bare Metal Provisioning to start.

FTP access can be prevented using an iptables rule:

```
iptables -A INPUT -p tcp --dport 21 -j REJECT
```

Then to reactivate iptables on reboot, issue this command:

```
chkconfig --level 345 iptables on
```

## 1.2 LinMin Client Requirements

### 1.2.1 Hardware Requirements for the LinMin Client Systems

The hardware listed in this section is required by the default control files supplied with LinMin Bare Metal Provisioning. You can provision clients with differing architectures if you create customized control files. Instructions for creating customized control files are given in the *LinMin Bare Metal Provisioning User's Guide*.

**CPU** – For the provisioning of Linux and Windows, verify the client has one of the following Intel or AMD CPU architectures: x86 or x86\_64 (also called AMD64 or EM64T).

**Disk drive device drivers** – Verify that each LinMin client has disk drive device drivers supported by the OS that will be provisioned to the client

**Pre-Boot Execution Environment (PXE)** – Verify each LinMin client has PXE 2.1 or newer (or is equipped with a PXE-boot floppy disk or USB flash drive)

**Note 2** PXE systems older than 2.1 can be used by installing a legacy PXE server on your LBMP Server. Instructions for installing a PXE server are in the Appendix A. We suggest you try provisioning the older PXE clients first, as many of them can be readily provisioned by LBMP.

**RIS-compliant NIC drivers** – For any LinMin client that will be provisioned with a Windows OS, verify that the client has Network Interface Card (NIC) drivers that are Windows Remote Installation Services (RIS) compliant. Instructions for obtaining and deploying these drivers are in the *LinMin Bare Metal Provisioning User's Guide*.

**OEM disk controller drivers** – For any LinMin client that will be provisioned with a Windows OS, verify the client has disk controller drivers that are included with the Windows installation programs. If the Windows installation drivers are not available, the *LinMin Bare Metal Provisioning User's Guide* has instructions for obtaining and deploying these drivers.

**Note 3** Headless clients (computers without a monitor and keyboard) can be provisioned by using a default MAC-Independent System Role or by using a MAC-specific Provisioning System Role. Instructions for creating system Roles are in the *LinMin Bare Metal Provisioning User's Guide*.

### 1.2.2 Supported LinMin Client Operating Systems

LinMin Clients do not require any software before provisioning (hence the expression “bare metal” provisioning).

The following is a list of Linux distributions and Windows operating systems as of the time this document was published. For the latest list of supported platforms, please visit [www.linmin.com/site/platforms.html](http://www.linmin.com/site/platforms.html).

Unless otherwise indicated, all supported platforms can be provisioned with 32-bit and 64-bit versions of:

- Asianux® 3.0
- CentOS 4 and 5 (all releases)
- Debian 4.0 (Etch) and 5.0 (Lenny)
- Fedora 7, Fedora 8, Fedora 9, Fedora 10, Fedora 11 and Fedora 12

- Microsoft® Windows® XP (all versions) 32-bit and Microsoft 2003 Server 32/64-bit
- Novell® SUSE Linux Enterprise Server (SLES) 10, 10 SP1, 10 SP2, 10 SP3 and SLES 11
- OpenSUSE 10.2, OpenSUSE 10.3, OpenSUSE 11 and OpenSUSE 11.1.
- Red Hat® Enterprise Linux 3, 4 and 5 (all releases, including RHEL 5.4).
- Ubuntu 8.04.1 LTS, 8.10 and 9.04 (all from DVD). See the User's Guide for the link to the free DVD ISOs.

Imaging supports all major Linux and Windows file systems.

For Virtual Clients, full virtualization is required. VMware® Workstation and Server clients can be provisioned if you set the Operating System to "Other/Other" and configure the virtual disk to grow as you go (do NOT click "Allocate disk space now"). Also, when creating your VM, select "bridged networking".

See the LBMP User's Guide for instructions on setting static MAC addresses in VMware Virtual Machines.

## 2 Installing the LinMin Bare Metal Provisioning Server

The installation process consists of 3 steps:

- 1) Change your network settings to have a static IP address
- 2) Place the LinMin-provided license key file in `/usr/local/linmin`
- 3) Run a script

### 2.1 Change your Network Settings to a Static IP Address

◆ **Before:** the following is the example of how the file `/etc/sysconfig/network-scripts/ifcfg-eth0` should appear after you have provisioned your system with a dynamic IP address:

```
# Realtek Semiconductor Co., Ltd. RTL-8169 Gigabit Ethernet (your NIC brand and MAC address will
# be different
TYPE=Ethernet
DEVICE=eth0
HWADDR=00:11:09:2E:B4:05
ONBOOT=yes
BOOTPROTO=dhcp
```

◆ **After:** this is what the file `/etc/sysconfig/network-scripts/ifcfg-eth0` should appear after you have made the changes necessary to assign a static IP address and provide other networking parameters:

```
# Realtek Semiconductor Co., Ltd. RTL-8169 Gigabit Ethernet
TYPE=Ethernet
DEVICE=eth0
```

```
HWADDR=00:11:09:2E:B4:05
ONBOOT=yes
# Please note to change BOOTPROTO=dhcp to BOOTPROTO=none
BOOTPROTO=none
# Enter your IP, Netmask, Network, Broadcast, Gateway and DNS information
IPADDR=192.168.0.222
NETMASK=255.255.255.0
NETWORK=192.168.0.0
BROADCAST=192.168.0.255
GATEWAY=192.168.0.254
DNS=192.168.0.254
```

If you do not make these changes, you may lose your network connection during the pre-installation process. If the values are missing, you will be prompted to either have the discovered values added to `ifcfg-eth0` or you will be given the action to exit the installation process.

You may have additional parameters in the file: please leave those unchanged.

**After you have made the changes**, shut down and restart the network service and verify you have an Internet connection:

```
service network restart
```

Then do an a yum or up2date update to verify you have access to your media repositories.

```
yum update
```

## 2.2 Place your License Key File in /usr/local/linmin

The license key provided to you by LinMin will have a file name similar to `CustomerName_lbmp.key`.

The key should be placed in `/usr/local/linmin`

LinMin Bare Metal will install even if you do not have a key: you will be able to use the GUI, but you will not be able to provision or image systems.

## 2.3 Run the LinMin Installation Script

Login as root. After verifying your server has an Internet connection, execute the commands:

```
cd /usr/local/linmin
```

```
sh linmin-bmp-{version#}.exp
```

**The installation script will take 10 to 15 minutes to execute** as it installs and configures the services needed by LBMP. During the process, you will be asked to accept the software license terms and conditions.

Any inconsistencies with your network settings will be discovered and you will be asked whether to proceed or not.

```
linmin-bmp-5.5.2-5.exp
```

```
LinMin Bare Metal Provisioning Installer -- 2010-01-15 12:24:25
```

```
.....
```

```
NOTE: Please do not interrupt the install process with Ctrl+c or by any other means.
```

```
The LinMin Bare Metal Provisioning automated install process takes about 5 to 15 minutes of execution time. There are some up-front UI pause interactions, respond as requested. There are some long intervals with no console output.
```

```
They should be no longer than 5 minutes.
```

```
Please be patient.
```

```
Respond: Continue or exit?:continue:exit: [continue]
```

**Note:** When LinMin installs its own DHCP server, it defaults to "non-authoritative", allowing for coexistence and eliminating conflicts with other DHCP servers on the network. If LinMin's DHCP server is to be the only DHCP server on the LinMin subnet, the "#authoritative" line in the /etc/dhcpd.conf file needs to be uncommented to "authoritative".

## 2.4 Troubleshooting the LinMin Installation

### Diagnostics Tools:

The LinMin Server will start every time the system on which it runs is powered on. At any time, you can stop, start, restart or check the status of the LinMin server by following the instructions below:

Execute as **root** user:

To start all services required to run LinMin (including at system boot time):

```
/usr/local/linmin/linmin-services.sh start
```

Note that the script can also be executed by:

```
cd /usr/local/linmin
./linmin-services.sh start
```

To stop all services required to run LinMin:

```
/usr/local/linmin/linmin-services.sh stop
```

To restart (shut down then start) all services required to run LinMin:

```
/usr/local/linmin/linmin-services.sh restart
```

To check the status of all services required to run LinMin:

```
/usr/local/linmin/linmin-services.sh status
```

The script may be invoked at any time a status check is desired. If all services are running, the following message will appear:

```
LinMin Bare Metal server status is OK
```

Error results will be displayed on the console and logged to `/usr/local/linmin/status/current_status_check` and to a `status_ERRORS.{scriptTimeStamp}`.

The script `linmin-services.sh` generates or updates log and error files in `/usr/local/linmin/status/`:

- `current_status_check` (contains results of the most recent execution of the script `linmin-services.sh`)
- `prior_status_check` (contains results of the second-most recent execution of the script `linmin-services.sh`)
- `status_ERRORS.{scriptTimeStamp} [...]` (file generated each time there is an error condition)

To review the latest results:

```
cat /usr/local/linmin/status/current_status_check
```

or:

```
cd /usr/local/linmin/status/  
cat current_status_check
```

**If you continue to have difficulties during installation**, create the “Support Help” file by executing the script

```
cd /usr/local/linmin  
  
./linmin-bmp-support-help.sh
```

Email to [linmin-support@linmin.com](mailto:linmin-support@linmin.com) the resulting file “`lbmp-supporthelp_{date}.help`” file. The file will contain all the configuration information necessary to help us troubleshoot your installation.

**If you are encountering network problems, please verify that the corresponding parameters’ values in these files match:**

```
/home/tftpboot/config/ocprovision.conf  
/etc/dhcpd.conf  
/etc/syconfig/network-scripts/ifcfg-eth0  
/etc/resolv.conf.
```

Edit and correct above files. After making any changes, execute the following:

```
/usr/local/linmin/status/lbmp-checkstatus restart
```

LinMin captures the results of pre-installation and installation scripts in files located in `/usr/local/linmin`.

## 3 Getting Started with LinMin

Congratulations! The LinMin installation is now complete.

Please refer to the LBMP User's Guide. Remember, the process to provision with LBMP is very straightforward:

- Upload the Distro or OS Media into LBMP with `load dvd.pl`, then use the `loadlinux.pl` or `loadwindows.pl` scripts (and `addwindriver.pl` for Windows drivers integration)
- Use the GUI with your FireFox Browser to configure MAC-Independent roles or MAC-Specific provisioning roles (for either provisioning or imaging (covered in Section 3))
- Boot your client system from the network

## Appendix A: Install a Legacy PXE Server (Optional)

### Important Licensing Considerations

The PXE server recommended in this Appendix A is under a proprietary license from Intel. The Intel license expressly allows redistribution, provided the package contains the Intel license notes and conditions. Since the PXE server software package itself is taken from the CentOS distribution, the packaging should have the GNU General Public License.

### A.1 Introduction

Older PXE-bootable PCs (pre-2.1) cannot be provisioned with LinMin Bare Metal Provisioning because a required software component is no longer present in most current Linux distributions.

Table A-1 presents the differences between legacy PXE operations and current PXE operations.

Legacy PXE	Current PXE
Client requests and receives DHCP address	Client requests and receives DHCP address
Client contacts PXE server on port 4011/UDP	Client TFTP gets pxelinux.0
PXE server provides pxelinux.0	
Client TFTPpx pxelinux.cfg/<bootfile>	Client TFTPpx pxelinux.cfg/<bootfile>
Client displays boot menu	Client displays boot menu
<Installation procedure>	<Installation Procedure>

**Table A-1 Comparison of Legacy vs. Current PXE Operations**

To enable older systems to use LinMin Bare Metal Provisioning, the server needs to have this missing PXE server installed.

### A.2 Obtain and Install the PXE Server Software

A PXE server (Intel PXE server version 0.1-36) can be obtained with the CentOS 3.x Linux distribution, which is available from any CentOS mirror, e.g.

<http://mirrors.easynews.com/linux/centos/3/os/i386/RedHat/RPMS/pxe-0.1-36.i386.rpm>

Install the PXE Server package on CentOS 5.1.

### A.3 Edit the PXE Server Configuration File

After the PXE server software is installed, the configuration file, pxe.conf, which is located at /etc/pxe.conf, needs to be modified to fit the configuration of the server. The sections of the pxe.conf file that require

modification are shown in Figure A-1. In Figure A-1 the comments shown inside parenthesis ( ) are for information only and cannot be in the actual configuration file.

```

...
[Network_Interface_Name]
eth0          (Example, use the correct interface)
...
[OurIpAddress]
192.168.25.2  (Example, use the correct IP address)
...
[Mtftpd_Root_Directory]
/home/tftpboot
...
[UseDHCPPort]
0
...
[Broadcast_ip_address]
192.168.25.255 (Example, use the correct Broadcast address)
...
[Service_Types]
0,BStrap
13,linux-install
# 14,linux-boot
...
[X86PC/UNDI/MENU]
13,Remote Install Linux (ensure Remote Install is placed before Local Boot)
0,Local Boot
# 14,Remote Boot Linux
...
[X86PC/UNDI/linux-install/ImageFile_Name]
0
0
pxelinux
...

```

**Figure A-1 Example of pxe.conf File Showing Modifications Required for Server Configuration**

## A.4 Set Up the PXE Workspace

In the directory `/home/tftpboot/`, create a new directory path with the command:

```
mkdir -p /home/tftpboot/X86PC/UNDI/linux-install
```

Inside the `X86PC/UNDI/linux-install` directory, create symbolic links with the following commands:

```
cd /home/tftpboot/X86PC/UNDI/linux-install
ln -s ../../../../msg .
ln -s ../../../../pub .
ln -s ../../../../pxelinux.cfg .
```

Copy the `/home/tftpboot/pxelinux.0` file into the `X86PC/UNDI/linux-install` directory with the following two commands:

```
cd /home/tftpboot/X86PC/UNDI/linux-install
cp /home/tftpboot/pxelinux.0 .
```

### Note Changes to Boot Process

#### 1. Boot Message Change

The boot process will now display an *additional* boot message *only* on *pre-PXE-2.1* systems; the additional message asks the user to press F8 to access the menu.

- ◆ Press F8 to access a *menu* for selection of either network boot or local boot. Select network boot to continue to the LinMin Bare Metal Provisioning boot menu
- ◆ Do not press F8 to **continue** the boot process to the Lin Min Bare Metal Provisioning boot menu.

#### ◆ Unattended Installation Delay

Unattended installation will proceed in the same manner as PXE-2.1+ systems except the legacy PXE system requires a few seconds of delay while the interim menu times out.

## Appendix B: Move the LinMin Server to a Different Network

- ◆ If your LBMP server has a legacy PXE, complete Sections B.1 and B.2.
- ◆ If your LBMP server's PXE is 2.1 or higher, complete only Section B.2
- ◆ NOTE: change your static IP address with the new address (see Appendix C) prior to proceeding with this section.

### B.1 Change the pxe.conf File (legacy PXE server only)

The pxe.conf file must be changed in two places to accommodate the new IP address. Figure B-1 shows an example of the modifications to pxe.conf for the new IP address.

```
...
[OurIpAddress]
192.168.50.2          (Example, use the correct IP address)
...
[Broadcast_ip_address]
192.168.50.255      (Example, use the correct Broadcast address)
...
```

Figure B-1 Example of pxe.conf File Modifications Required for the New IP Address

### B.2 Run the “Setup” Program

Execute the LBMP setup program, setup.pl, as follows:

```
cd /home/tftpboot/bin
perl setup.pl
```

And enter the new network-related information when prompted to do so.

## Appendix C: Setting The Static IP Address

- ◆ **Before:** the following is the example of how the file `/etc/sysconfig/network-scripts/ifcfg-eth0` should appear after you have provisioned your system with a dynamic IP address:

```
# Realtek Semiconductor Co., Ltd. RTL-8169 Gigabit Ethernet (your NIC brand and MAC address will
# be different
```

```
TYPE=Ethernet
DEVICE=eth0
HWADDR=00:11:09:2E:B4:05
ONBOOT=yes
BOOTPROTO=dhcp
```

- ◆ **After:** this is what the file `/etc/sysconfig/network-scripts/ifcfg-eth0` should appear after you have made the changes necessary to assign a static IP address and provide other networking parameters:

```
# Realtek Semiconductor Co., Ltd. RTL-8169 Gigabit Ethernet
TYPE=Ethernet
DEVICE=eth0
HWADDR=00:11:09:2E:B4:05
ONBOOT=yes
# Please note to change BOOTPROTO=dhcp to BOOTPROTO=none
BOOTPROTO=none
# Enter your IP, Netmask, Network, Broadcast, Gateway and DNS information
IPADDR=192.168.0.222
NETMASK=255.255.255.0
NETWORK=192.168.0.0
BROADCAST=192.168.0.255
GATEWAY=192.168.0.254
DNS=192.168.0.254
```

If you do not make these changes, you may lose your network connection during the pre-installation process!

You may have additional parameters in the file: please leave those unchanged.

**After you have made the changes,** shut down and restart the network service and verify you have an Internet connection:

```
service network restart
ping www.google.com
```

## Appendix D: Changing your LinMin Settings

You can run the setup program any time should you wish to change your LBMP parameters:

```
cd /home/tftpbboot/bin
perl setup.pl
```

## Appendix E: Upgrading to a Newer Version of LinMin

First, obtain the latest version of the software by filling out the “Download” form at [www.linmin.com](http://www.linmin.com), which triggers an email with an encrypted link to the latest expandable file.

You will see the file name’s link in the email you receive. Click it, and download it to `usr/local/linmin`.

The process to upgrade takes less time than to read the instructions below. The LinMin upgrade process detects and reports differences between the LinMin-supplied configuration files and prior ones modified by the user. Files with differences will be listed and will prompt you to reconstruct changed files.

**Important** It is important that you log out of all LBMP GUI sessions and close all active browser instances where LBMP GUI sessions have been established. This will avoid any potential conflicts and confusion due to GUI upgrades. Once the upgrade is complete, starting a browser and logging will refresh both client and server cached data.

```
cd /usr/local/linmin
```

```
sh linmin-bmp-{version#}.exp
```

```
# Select the "Upgrade" option
```

```
# You will be presented with the Setup Program:
```

```
linmin-bmp-5.5.2-5.exp
```

```
LinMin Bare Metal Provisioning Installer -- 2010-01-17 06:18:14
```

```
.....
```

```
NOTE: Please do not interrupt the install process with Ctrl+c or by any other means.
```

```
The LinMin Bare Metal Provisioning automated install process takes about 5 to 15 minutes of execution time. There are some up-front UI pause interactions, respond as requested. There are some long intervals with no console output. They should be no longer than 5 minutes.
```

```
Please be patient.
```

```
Respond: Continue or exit?:continue:exit: [continue] :
```

```
LinMin Bare Metal Provisioning Installer has been previously executed:
```

```
NOTES:
```

```
The 'Upgrade' option will upgrade LBMP.
```

```
Some components will be uninstalled and replaced with new components.
```

```
* If this is an upgrade, select the 'Upgrade' option.
```

```
* If executed in error, select 'Exit'.
```

```
* If you are unsure, select 'Exit' and contact linmin-support@linmin.com.
```

```
Respond: Exit now or Upgrade? :Exit:Upgrade: [] :Upgrade
```

```
...action: Upgrade
```

```
... upgrade from: 5.5.1-3 to: 5.5.2-5
```

LinMin provides 2 types of control files:

- For MAC-Independent provisioning, they are located in /pub/distro\_name/\*.cfg or \*.xml
- MAC-Specific control files # are located in /ftptboot/templates and are .tmpl files.

And you have now upgraded your system.

**NOTE:** your existing license key will keep working once you have done an upgrade. If you instead re-install LinMin from scratch, your existing license key will stop working (please contact [linmin-support@linmin.com](mailto:linmin-support@linmin.com) with an explanation and a replacement key will be emailed to you). Please read Appendix H to learn about how our licensing mechanism works.

## Appendix F: Installing or Upgrading Your License Key

To replace an existing license key file (for example, changing from an evaluation key to a paid-for subscription or perpetual license, or when renewing your subscription), place the new key in `/usr/local/linmin` and follow these instructions:

```
cd /home/tftpboot/bin
perl setup.pl
# and you will see this menu:
LinMin Bare Metal Provisioning Setup Menu
Version: LBMP-5.5.2-6.redhat
Run Type: Install

1: Install or Upgrade LinMin Bare Metal Provisioning

    This will walk you through every step of the setup process.
    You should select this option the first time you install LinMin
    and whenever you upgrade to a newer version.

If you want to change your existing LinMin settings, select from the options below:

2: (inactive, not used)
3: Network setup
4: Disk Image Snapshot and Restore storage directory setup
5: Create control files for MAC-independent provisioning
6: Install or update license key file

7: Restart the LinMin services and Exit LinMin Bare Metal Provisioning Setup
8: Do Not restart the LinMin services just Exit

Please make a selection [1]: 6

# Enter "6" to update your license key file. You will see the name "old" key path
# and file name.
# Type in or cut and paste the path and the real file name for the new key:
/usr/local/linmin/NewKeyFileName_lbmp.key

# You will now see the full setup menu.
# Exit Setup by typing "7"
7
# Go to the LinMin GUI's Help About page, and you will see the information on the
# new key, such as a new expiration date.
```

You have now installed your new license key file.

### **Important:**

Should your license expire or should you exceed the number of authorized client systems and you received a new key from LinMin, prior to running setup.pl, delete the file

home/tftpboot/pxelinux.cfg/autoboot.lic then run setup.pl to add the new license key file.

**NOTE:** your existing license key will keep working once you have done an upgrade. If you instead re-install LinMin from scratch, your existing license key will stop working (please contact [linmin-support@linmin.com](mailto:linmin-support@linmin.com) with an explanation and a replacement key will be emailed to you). Please read Appendix H to learn about how our licensing mechanism works.

## Appendix G: Uninstalling LinMin

To remove LinMin Bare Metal Provisioning from your system:

```
cd /usr/local/linmin
./lbmp-uninstall.sh
```

Note: your files and data will be archived in directories should you wish to recover your work. Otherwise, delete the directories listed on the screen at the end of the execution of the script.

## Appendix H: License Keys and Licensing

- A license key file tied to the MAC address of the system on which LinMin is installed is required in order to provision or image systems.
- The license key file will control how long the key may be used (e.g., for an evaluation period, or perpetually if licensed) as well as the number of unique MAC addresses of client systems being imaged or provisioned.
- The license key file must have been created after the version of LinMin being installed was built. However, upgrades of LinMin will not impact the proper functioning of the license key. If you install a previously used key on a new installation of LinMin, the key will say that it has expired (install the original key as emailed to you with the version of LinMin it was intended for, or request a replacement key from LinMin.)
- The first time a client system is provisioned or imaged, the new MAC address gets recorded, and can subsequently be provisioned or imaged an infinite number of times.
- LinMin is licensed on a per-client system basis, in increments of 10, 100, 250, 500 and 1000 client systems (each with a unique MAC address.) Current pricing can be found at <http://www.linmin.com/site/purchase.html>.
- The license fee includes the first 12 months of email support and product updates (for a given integer release). Email support and updates for subsequent years cost 20% of the initial license fee list price per year.

## Appendix I: Copying Linux ISO files from a Windows PC

The software utility that came with your Windows DVD writer typically can use as the “source” device either a DVD/CD Reader or a “.iso” file. The destination drive is of course your DVD Writer.

While all such utilities are different in their User Interface, here are a couple of examples:

NTI: when you ask to copy a DVD, you will be presented with both the detected DVD reader, and from the same drop-down, you can select “source” which opens a file browser from which you will point to the .iso file as the source medium.

Nero: Go to “Copy a DVD” (not “Create a Data DVD”), and select “more” at the bottom of the page. You will then be presented with “Image File” and a file browser from which you will point to the .iso file as the source medium.

The DVD you will have created is fully bootable and can be inserted into an x86-based PC with a DVD reader. If this is your first time installing Linux, we recommend you use the graphical installer option, and select the basic Gnome Desktop. Once you have finished the installation, rebooted and answered the “First time use” questions, you will be ready to install LinMin.

## Appendix J: LinMin and Multiple LANs/VLANs/Subnets

Please consult the User’s Guide Appendix E for full details on running LinMin in a multiple-subnet environment.