

# **LINUX – IS IT RIGHT FOR YOU?**

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## **ABSTRACT**

Linux is gaining popularity as an effective complement/replacement to traditional operating systems in use on Personal Computers in Education, Industry and in the home. We modeled our testing to see if it could be used as a replacement for currently used operating systems, installing various distributions on a wide range of hardware configurations. We also looked at productivity tools that are commonly used with current operating systems for compatibility and portability. We will look at the pros and cons, tools available, applications available, installation and ease of use of Linux as opposed to other operating systems currently available. We will show you where you can get information on specific distributions of Linux and where to get help once you have decided to install and use Linux. Special concerns included ease of installation, hardware compatibility and system security.

## **INTRODUCTION**

If you truly enjoy working with computers, Linux is the operating system of your dreams. It is more fun than any other computer operating system around. However, the reason why Linux is truly revolutionary is that it is Open Software. You do not need a great deal of UNIX experience to get started with Linux. Many UNIX novices have successfully installed Linux on their systems. This is a worthwhile learning experience, but keep in mind that it can be frustrating. Moreover, once you are ready to delve into the more complex tasks of running Linux—installing new software, recompiling the kernel, and so forth—having background knowledge in UNIX is necessary. However, simply by running your own Linux system you will learn the essentials of UNIX.

## **WHAT IS LINUX?**

Linux is a very powerful Unix operating system, which is free, having many features of commercial system including multitasking, virtual memory, shared libraries and TCP/IP networking. It runs on many different processors including Intel x86, Motorola 68k series (Amiga and Atari), DEC Alpha, Sun Sparc, Mips and Motorola PowerPC. Linux was originally written by Linus Torvalds at the University of Helsinki in Finland. He

announced his first official version of Linux near the end of 1991. Linux now runs on several different platforms, can support many different hardware devices and has a lot of good software running on it. Linux is developed under the [GNU General Public License](#) and its source code is freely available to everyone. Linux may be used for a wide variety of purposes including networking, software development, and as an end-user platform. Linux is often considered an excellent, low-cost alternative to other more expensive operating systems.

Linux is available in several formats or what is referred to as distributions. These distributions are subtly different in the way they set things up and the way they package software. They are similar in that they provide you with some media, usually a set of CDs or floppy disks, from which you can install Linux. They also provide graphical tools to install the system and configure it. One of the major problems of Linux, however, is installation. It is not quite as smooth as installing other operating systems. As well, any sort of system administration work is more difficult to perform on Linux than on, say, Windows95.

## WHERE TO GET LINUX

Here is a listing of several of the more commonly used distributions of Linux and their respective web sites:

1. [OpenLinux from Caldera](http://www.caldera.com) (http://www.caldera.com)
2. [Redhat from Redhat](http://www.redhat.com) (http://www.redhat.com)
3. [Debian from Debian](http://www.debian.org) (http://www.debian.org)
4. [Mandrake from Mandrake](http://www.linux-mandrake.com) (http://www.linux-mandrake.com)
5. [SUSE from Suse](http://www.suse.de) (http://www.suse.de)
6. [Slackware from Slackware](http://www.slackware.com) (http://www.slackware.com)

There are many Linux distributions available today. Since selecting one can be a difficult task, here are a couple pointers to resources that can help you with the choice:

1. A good place to start is the chapter on choosing a Linux distribution from *Linux Administration Made Easy* by Steve Frampton. An online version can be seen at [ZDNet's Linux Hardware Database site](http://lhd.zdnet.com/LDP/LDP/lame/LAME/linux-admin-made-easy/x42.html) (http://lhd.zdnet.com/LDP/LDP/lame/LAME/linux-admin-made-easy/x42.html).
2. [The Linux Headquarters](http://www.linuxhq.com/dist.html) (http://www.linuxhq.com/dist.html) has an extensive section on the different Linux distributions. This is also a good site to keep up on kernel developments and the latest patches to Linux. Another excellent resource for information about the different offerings is the [Linux Distributions section](http://www.linux.org/dist/index.html) (http://www.linux.org/dist/index.html) of Linux Online! For a detailed description of the different options, try reading Eric Raymond's [Linux Distribution HOW-TO](http://lhd.zdnet.com/LDP/HOWTO/Distribution-HOWTO.html) (http://lhd.zdnet.com/LDP/HOWTO/Distribution-HOWTO.html).

3. When it comes to obtaining your copy of Linux, you can either buy a CD-ROM from the vendor, or download the distribution over the Internet. Buying a CD is the easier way to go, and odds are that your local computer store will at least have a copy of RedHat Linux, if not a whole selection.

If you want to download a Linux distribution, try [ZDNet's Linux Download section](http://www.zdnet.com/enterprise/filters/resources/landing/0,10227,6011806,00.html#Distributions) (<http://www.zdnet.com/enterprise/filters/resources/landing/0,10227,6011806,00.html#Distributions>), where links to all the major releases can be found.

For the Linux beginner we definitely recommend obtaining Linux on CD-ROM rather than downloading it over the net as even with a cable modem Linux will take a long time to download. However if you have a fast net connection you can download Linux from:

1. RedHat <ftp://ftp.redhat.com/>
2. Corel Linux <ftp://linux.corel.com/> (check this link)
3. Debian <ftp://ftp.debian.org/>
4. OpenLinux from Caldera <ftp://ftp.caldera.com/>
5. Mandrake from Mandrake <ftp://ftp.linux-mandrake.com/>
6. SUSE from Suse <ftp://ftp.suse.de/>
7. Slackware from Slackware <ftp://ftp.slackware.com/>

Once you have decided to install Linux and obtained a distribution, you will want to obtain information about your hardware. Performing a system inventory will help you determine if your hardware is going to work with Linux. It may also come in handy during the installation if you are queried about specific components of your system. Many of the modern distributions can auto-detect common hardware configurations, but it's always a good idea to have the details printed out just in case. You should note the number, size and type (IDE or SCSI) of your hard drives; the make and model of your CD-ROM drives, video card, sound card, network card, SCSI adapter and modem; and the type of mouse being used. Take note of all IRQ settings as well.

**Hardware compatibility is another concern** If your machine is fairly new (but not too new), then you should not have compatibility concerns. This can often be a hurdle for those new to Linux. Linux currently supports less hardware than Windows. With most new purchases of accessories drivers for the Windows based operating systems are included, yet still Linux drivers are normally not provided. Accessories that aren't supported in Linux are the latest 3D graphic cards (or at least only some of their functionality is supported), Winmodems (which only work with Microsoft Windows), windows printers and some soundcards.

## PRODUCTIVITY TOOLS

Once you have completed your Linux installation, you will want to start making use of some of the Productivity tools available. Below is a short listing of several that I have installed and use:

This list is not intended to be a complete list of Linux applications. Rather, these are apps that I have found useful and recommend to others:

For general office productivity, I recommend these:

1. [StarOffice 5.1](http://www.sun.com/products/staroffice/get.cgi#download) (<http://www.sun.com/products/staroffice/get.cgi#download>)

StarOffice 5.1 is a complete office suite with a word processor, spreadsheet, presenter, mail client, and more. StarOffice was originally a commercial product developed by a German company, Star Division. Sun Microsystems in 1999 acquired Star Division and began shipping StarOffice free of charge for both personal and commercial use. StarOffice has its own desktop that you must use to open the other StarOffice applications. It has the ability to import and export Microsoft Office documents. However, like every other office suite, the conversion is not perfect, and many formatting details can be lost in the conversion. If your MS Office document uses any macro functions, you can expect even more problems.

2. [WordPerfect 8](http://download.tucows.com/partners/corel/) (<http://download.tucows.com/partners/corel/>)

Corel WordPerfect 8 for Linux is very similar to the Windows version. The look and feel are almost identical except that the Linux version uses multiple windows for each file opened keeping with the multi-window look and feel of X Windows. As with the Windows version, the MS Word conversion is not perfect but it sufficient to view a MS Word document you might encounter. It has a nice selection of fonts to choose from although not as many as Windows. However, this is probably due to the limitation of XFree86 font support. It has the ability to create tables, check spelling and grammar reveal formatting codes, import pictures, and many more features that computer users have grown accustomed to having in a complete word processor.

For general Internet productivity, I recommend these:

3. [Netscape 4.75](http://www.linuxheadquarters.com/howto/apps/netscape475.shtml)  
(<http://www.linuxheadquarters.com/howto/apps/netscape475.shtml>)

Probably the core of your internet experience is the web browser. Netscape for Linux is a good place to start. You will also want to take advantage of web content requiring special software called plug-ins. Below are listed some that you will want to have installed.

4. [Adobe Acrobat PDF Reader](http://www.linuxheadquarters.com/howto/apps/acrobat.shtml)  
(<http://www.linuxheadquarters.com/howto/apps/acrobat.shtml>)

Many of you are probably familiar with Adobe Acrobat Reader for viewing PDF files and also as a Netscape plug-in. Linux has other PDF viewers that come with some of the distributions. The original was ghostview. KDE and Gnome now have their own versions

of ghostview called Kghostview and Gnome ghostview, respectively. However, I think Adobe Acrobat Reader makes the PDF files look better than ghostview.

5. FTP: Graphical FTP Client (<http://www.ncftp.com/>)

A good File Transfer Protocol client is essential to your internet experience. There are many good clients available, we happened to choose NCFTP. NcFTP is a program implementing the File Transfer Protocol (FTP). It allows a user to transfer files to and from a remote network site, and offers additional features that are not found in the standard interface, ftp. You can download a copy from <http://www.ncftp.com/download/>.

6. [Real Player 7](#)  
(<http://www.linuxheadquarters.com/howto/apps/realplayer.shtml>)

Real Networks has developed a Linux version of RealPlayer 7. It will work as a Netscape plug-in.

**The key is to run the installation script under your login, NOT as root.** This will allow you to setup the plug-in under your plug-ins directory ~/.netscape/plugins. You can do this for each user on your system for the RealPlayer plug-in to work.

7. [Macromedia Shockwave Netscape Plugin](#)  
([http://www.macromedia.com/shockwave/download/index.cgi?P1\\_Prod\\_Version=ShockwaveFlash?application/x-shockwave-flash](http://www.macromedia.com/shockwave/download/index.cgi?P1_Prod_Version=ShockwaveFlash?application/x-shockwave-flash))

Macromedia has developed a version of its popular Shockwave plug-in called Flash Player. Many websites embed Shockwave on their first page. This plug-in is easy to install and works well with Netscape 4.0 and higher. In addition, the glibc version of Netscape must be used. It can be installed as a personal Netscape plug-in or a global Netscape plug-in.

## BASIC COMMANDS

Similar to other operating systems, you will want to have basic knowledge of several commands to navigate around Linux from a system prompt. These are a few of the very basic commands you will want to become familiar with.

Lets take a look at some essential commands. The table shows a comparison between DOS and Linux for some essential commands.

<b>DOS vs Linux</b>		
<b>DOS</b>	<b>Linux</b>	<b>Remarks</b>
CD dirname	cd dirname	Similar syntax, but beware of /in Linux as opposed to \in DOS
COPY sourcefile destination file	cp sourcefile destination file	Identical
DEL filename	rm filename	Caution: no undelete available
DIR	ls-al	Similar syntax, more options with is
FORMAT	Fdformat	Different syntax, additional commands like mount and umount required
HELP command	man command	Similar
MD dirname	mkdir dirname	Similar
MOVE source destination	mv source destination	Similar
REN original newname	mv original newname	Does not support multiple files
TYPE filename	less filename	Less supports scrolling, searching and many more features

In order to save disk space on servers and hard drives, utilities to compress files have long been implemented. Those for DOS/Windows include ZIP, ARC, LHZ as well as a host of others. Linux is no different. Common archive types include TAR ( tape archive r) and GZ (gzip). Below we explain some of the basics of the use of the compression utilities tar and gzip.

1. If the file ends with ".tar" like "filename.tar" then you use "tar -xvf filename.tar"
2. If the file ends with ".gz" like "filename.gz" then you use "gunzip filename.gz"
3. If the file ends with ".tar.gz" like "filename.tar.gz" then you use "tar -xvfz filename.tar.gz"

x untar's the file  
v stands for verbose and lets you see what is happening  
f is typed before the file name  
z uncompresses the file

Operating systems generally have specific locations for files, Linux follows suit with the following folders.

- /bin** User and systems administration binaries
- /sbin** Systems Administration binaries run as root
- /etc** Configuration information
- /dev** Device files
- /lib** Shared libraries and kernel modules
- /mnt** Temporary mounting points for hardware such as CD-ROMs, Zip drives, etc
- /opt** Optional add-on software directory
- /tmp** Stores temporary files generated by software packages

Passwords are necessary to protect your system from intruders. It is a good idea to change your password on a regular basis. To change your password type in "passwd username"

Now that your system is up and running, you will want to become familiar with some basic Linux commands. Here are some of the more common you will want to become familiar with first.

### Setting Your Path

The syntax for setting your path is slightly dependent on which shell you are using. If you are using a different shell, you can read the man pages by typing `man "shellname"` to find out the exact syntax. To find out which shell you are running, type the command `finger "yourusername"` such as `finger tchin` and look at the argument for "Shell:"

- For bash shell:  
`export PATH=$PATH:/usr/sbin:/usr/local/bin`
- For tcsh or csh:  
`set PATH = ($PATH /usr/sbin /usr/local/bin)`

In Linux, the floppy and CDROM drives must be "mounted" before the data on them can be read. This allows users to read not only floppy disks formatted for the ext2 Linux filesystem, but also Windows (DOS) disks. After using the floppy drive, the disk must be "unmounted" before it is removed.

Command	Filesystem
<code>mount -t ext2 /dev/fd0 /mnt/floppy</code>	Linux
<code>mount -t vfat /dev/fd0 /mnt/floppy</code>	Windows, DOS

The syntax is `mount -t iso9660 /dev/cdrom /mnt/cdrom`  
`/dev/cdrom` is usually autoconfigured during installation to point to a device off the EIDE or SCSI controller such as `/dev/hdb` or `/dev/sdb` depending on your controller and how many other devices you have in your machine.

## HELP

When in real trouble with Linux, though, you can always turn to the Linux community for help. This thriving international community is one of the biggest assets of Linux. It is helpful and unbelievably supportive. Helpful Linux users are active in Usenet newsgroups, on IRC chat channels and there are many web sites all packed with useful information about any area of Linux you might have a question about.

The Linux community is not only helpful but incredibly active as well. There is new software being released for Linux all the time.

There are a number of public 'forums' where beginners can ask Linux questions and draw upon the wealth of experience that exists. Firstly there are USENET newsgroups where Linux newbies can seek help depending on what their problem is:

news:comp.os.linux.help People discussing general Linux problems.  
news:comp.os.linux.networking Discussion of Linux networking related issues.  
news:comp.os.linux.setup How various elements of Linux are setup.  
news:comp.os.linux.x How to configure / run XWindows under Linux.  
comp.os.linux.admin for installing and administering Linux systems  
comp.os.linux.help for questions and advice about Linux  
comp.os.linux.x for installing and configuring the X server  
comp.os.linux.misc a good place to post questions NOT covered elsewhere  
news:comp.os.linux (and any of the subgroups)  
news:btinternet.linux  
news:uk.comp.os.linux

Some Linux resource web sites:

<a href="http://www.control-escape.com/">http://www.control-escape.com/</a>	Newbies
<a href="http://members.aa.net/~swear/pedia/learning-linux.html">http://members.aa.net/~swear/pedia/learning-linux.html</a>	Gary's Encyclopedia
<a href="http://qlink.queensu.ca/~3srf/linux-admin/">http://qlink.queensu.ca/~3srf/linux-admin/</a>	Linux administration
<a href="http://metalab.unc.edu/mdw/index.html#guide">http://metalab.unc.edu/mdw/index.html#guide</a>	Linux documentation.
<a href="http://www.freshmeat.org/">http://www.freshmeat.org/</a>	Update on Linux software
<a href="http://linuxtoday.com/">http://linuxtoday.com/</a>	Linux news
<a href="http://counter.li.org/linuxcounter_eng.html">http://counter.li.org/linuxcounter_eng.html</a>	The Linux counter.
<a href="http://www.cl.cam.ac.uk/users/iwj10/linux-faq/index.html">http://www.cl.cam.ac.uk/users/iwj10/linux-faq/index.html</a>	Linux FAQ.
<a href="ftp://sunsite.unc.edu/pub/Linux/">ftp://sunsite.unc.edu/pub/Linux/</a>	Tons of Linux software
<a href="http://directorysearch.mozilla.org/Computers/Operating_Systems/Linux/">http://directorysearch.mozilla.org/Computers/Operating_Systems/Linux/</a>	Newbies Portal links
<a href="http://www.linux.org/">http://www.linux.org/</a>	The main Linux page
<a href="http://lil.ashpool.com/">http://lil.ashpool.com/</a>	Linux incompatibility list
<a href="http://www.kde.org/">http://www.kde.org/</a>	KDE web site

Users groups are a very good source of help. Use this URL <http://www.linux.org/users/index.html> for a nice page on Linux Users Groups.

Once you have made the transition into the Linux environment, you will want to keep up with the latest developments. Here are several sites that I have found valuable.

[Freshmeat](http://www.freshmeat.net/) (<http://www.freshmeat.net/>)

-announcements about new releases of Linux software, articles

[LinuxLinks](http://www.linuxlinks.com/) (<http://www.linuxlinks.com/>)

- the latest links to Linux web sites

[Slashdot](http://www.slashdot.org/) (<http://www.slashdot.org/>)

-breaking news (not dedicated to Linux)

[Linux Today](http://www.linuxtoday.com/) (<http://www.linuxtoday.com/>)

-a quality Linux news site

[Linux Weekly News](http://www.lwn.net/) (<http://www.lwn.net/>)

-weekly columns with stories, articles and editorials about Linux

[linux.org](http://www.linux.org/) (<http://www.linux.org/>)

- the homeplace of Linux on the net

<http://sunsite.unc.edu/mdw/products.html>

-The Linux Documentation Project

## SECURITY

### **Protect your Linux system with these privacy and security tips.**

Is Unix security “an oxymoron” ? If someone wants to break in, they probably can. But why leave the place unlocked?

We will address a few tips to deter the casual miscreant. If your system enjoys a direct Internet connection, such as dsl or cable, then you should probably stop reading now and look into a more serious security solution such as an edge router/firewall based on the

[Linux Router Project](#)

(<http://www.zdnet.com/zdhelp/stories/main/0,5594,2503199,00.html>) or [GNAT](#)

(<http://www.gnatbox.com/>).

However, if you run a Linux machine on a laptop, behind a corporate firewall or on a university LAN, the tips here could be of use.

### **Start Clean**

Security works best when built in from the foundation. Older systems may already be compromised in ways that are difficult to detect. If you want a secure system, you should probably back up, reinstall and restore your data.

## **Stay Current**

Keeping your software current is the single best way to stay ahead of security issues. Bugs and exploits get fixed really quickly in the Linux world

## **Keep It Simple**

When you do your base install, choose the minimum number of programs. Anything left un-configured or which you don't understand could be a security risk. That's especially true for networking things like NFS and Samba, and for games, which tend to run with superuser permissions for better access to system resources. Linux software is so easy to find and install that you are certainly better off adding things only as you need them.

## **Learn Your Permissions**

It can be tempting to chmod everything 777 or run programs as root to circumvent permissions errors. This can obviously lead to problems. Unix permissions seem inscrutable at times but are fundamental to everything and greatly worth learning. Be sure to investigate the different ways permissions work on directories, as compared to files.

## **SUMMARY**

Linux is a mature, powerful and extremely versatile UNIX-like operating system. The power and versatility come with a price--you may need to be computer-literate in order to set-up and maintain Linux. Linux is relatively easy to use once the operating system and applications are set up properly.

Linux is quite different than MS Windows; so do not expect that if you can get around MS Windows, Linux will be obvious to you. You may need to learn. On the other hand, if you come from UNIX, Linux will be easy for you. If you don't know much about computers or you don't enjoy them, chances are Linux administration is not for you. If you don't know your hardware, Linux installation may be a challenge for you.

Linux is cheap, flexible, powerful and scalable. It is useful in most areas of computing and new applications are being developed for Linux every day. It is not for everyone, though. There are times when a user will have to know a little bit more about the underlying operating system than they perhaps care to.

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## So, Why use Linux?

Here are good reasons why Linux could be the best operating system for you: A Linux Distribution has thousands of dollars worth of software for no cost (or a couple of dollars if purchased on CD)

1. Linux is a complete operating system that is:
2. stable - the crash of an application is much less likely to bring down the operating system under Linux
3. reliable - Linux servers are often up for hundreds of days compared with the regular reboots required with a Windows system
4. extremely powerful
5. Comes with a complete development environment, including C, C++, Fortran compilers, toolkits such as Qt and scripting languages such as Perl, Awk and sed.
6. Excellent networking facilities: allowing you to share CPUs, share modems etc.
7. The ideal environment to run servers such as a web server (e.g. Apache), or an FTP server.
8. A wide variety of commercial software is available if your needs aren't satisfied by the free software.
9. An operating system that is easily upgradeable. After a length of time a typical installation of Windows and software gets into a complete mess. Formatting and reinstalling often is the only way to recoup your system. Linux, however, is much better for maintaining the system.
10. Supports multiple processors as standard.
11. True multi-tasking; the ability to run more than one program at the same time.
12. An excellent window system called X; the equivalent of Windows but much more flexible.
13. Of course there are many other reasons to use Linux such as the full source code is provided and can be modified but "regular" application users will unlikely need the source code.

<b>For moving to Linux</b>	<b>Against moving to Linux</b>
<ol style="list-style-type: none"><li>1. Very stable system</li><li>2. Excellent multi tasking and multi-threading</li><li>3. Built in Networking</li><li>4. Free OS</li><li>5. Huge quantity of free software of all types</li><li>6. Minimal hardware requirements</li><li>7. A well configured system runs better than in Windows</li><li>8. Program development tools built in.</li></ol>	<ol style="list-style-type: none"><li>1. Can be a steep learning curve</li><li>2. Current data types may be incompatible</li><li>3. Can be complex for "newbies"</li><li>4. Struggle to configure</li><li>5. Bit of disparity between Kernels</li><li>6. You need to know the ins and outs of all your hardware - i.e. Don't even think of "Plug and Play"</li><li>7. The problem of reconfiguring your Network - if applicable.</li></ol>

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