

## Debian GNU/Linux vs. Windows in corporate employment

### 1. Introduction. What is GNU/Linux?

Linux is a clone of the operating system Unix, started in 1991 by Linus Torvalds with assistance from a loosely-knit team of volunteer programmers across the net. In fact, Linux refers only to the kernel of the operating system, which by itself fulfils no function. The GNU project (initiated in 1983 by free software trailblazer Richard Stallman) provides everything else to make up a full-featured operating system, being completely open-source and free software. All components are protected by the GNU Public License, (GPL) which ensures that future versions of any existing software remain free. "Open Source" software means, that any source code is made public and may be viewed and modified by anyone. Other operating systems -- such as Microsoft's products -- are closed source, which means that only Microsoft itself is allowed and able to view and change the source code.

Several enterprises (SuSE,RedHat) and free projects (Debian) have combined GNU and Linux to make up GNU/Linux distributions, which are commonly in use as high quality production-level operating systems. Those free operating systems -- such as "Debian GNU/Linux" -- are distributed at very little or no cost and usually outperform non-free software such as Microsoft's products by orders of magnitude.

### 2. How can something free be better than a commercial product?

The open source nature of GNU/Linux lets many volunteers find errors and add improvements to the code easily, which leads to a very high level of perfection. This can never be matched by commercial closed-source vendors such as Microsoft, since their expensive programmers' man-hours have to be used for remunerative features and new products. Experience absolutely acknowledges these facts. Perfection has never been the main goal of commercial closed-source software vendors, since new "better" products must be sold in order to keep their business going.

### 3. Why are commercial operating systems so popular?

Microsoft is the world's largest software vendor in terms of turnover and number of users. Although Microsoft delivers imperfect solutions, many new PC owners choose to stay with the operating systems their hardware was supplied with. Obviously, Microsoft's sales department is very successful in convincing hardware manufacturers to bundle one of their operating systems with new hardware. Many new users are not even aware of the fact that there are better alternatives, and when they become aware, they prefer the easier way of staying with what they are used to.

### 4. Comparison of commercial operating systems vs. Debian GNU/Linux

#### 4.a. Flexibility, Versatility.

The behavior of a GNU/Linux system is traditionally defined in a set of well-documented, plain English text configuration files which allow a high grade of customization. In case of any customization requirements that go beyond the ample possibilities of those configuration files, single programs or even the whole system can be re-compiled with the source code modified to any extent. The flexibility of open source GNU/Linux goes even so far that you can not only make it run on i386 CPU's and successors, (Pentium, Athlon) but also on as many as 15 absolutely different architectures, such as Motorola 68K, (Amiga) PowerPC, (Mac) and SPARC. (Sun Workstations) It could run on your PDA or might be already running on your mobile phone.

#### 4.b. Stability, Reliability.

A professionally used operating system is expected to run well as long as the user/administrator wishes it to run. Server systems are typically run 24/7, and GNU/Linux server systems often have uptimes of many hundred days, if not even several years. A GNU/Linux server typically fulfils its assignments until either a piece of hardware fails or the system is shutdown/rebooted by the administrator.

#### 4.c. Security.

Linux is based on the principles of Unix, a multi-user system from the old days, when Computers were not enough available for each user to have his own. When a hundred employees had to share (rotational or simultaneous) access to one Computer, the administrator needed powerful tools to define and restrict each user's rights. Unix was a multi-user operating system, and so is GNU/Linux since it was invented. Microsoft's operating systems were designed in times of personal computers, originally lacking any kind of access restrictions. This is one of several reasons why Windows users are bugged by viruses and other malicious programs by orders of magnitude more likely than GNU/Linux users.

#### 4.d. Compatibility, connectivity.

GNU and Linux were invented on the Internet, based upon co-operation between volunteer developers communicating with each other by E-Mail. The first features of the Linux Kernel and of the GNU software suite were connectivity. By now, this connectivity has reached an unmatched level of maturity and quality. Any other modern operating system has only attempted to adapt a similar level of interoperability, but ever since unmatched. Free and open source software is based upon open protocols rather than closed, proprietary formats.

#### 4.e. Efficiency.

Enabling it to run on even mobile phones, the Linux kernel can be compiled into as little capacity as few hundred kilobytes. As well as on such applications, Linux runs on any system as efficiently as can be, up to the user's choice. On server systems there is no need for a graphical user interface. GNU/Linux servers are best maintained and fully controlled by a simple, yet powerful text interface, which can be accessed by secure methods all across the Internet, without drawbacks, so efficiency remains the choice of the user. Older systems do not need to be hardware upgraded to be able to run a smooth operating system, and there is no need to upgrade with every new version. Once a system runs well, it will run well as long as the hardware lasts.

#### 4.f. Performance.

The efficiently running Linux systems have often been benchmarked and compared to Microsoft server products. MS server Systems, which cost an awful lot of money only to be allowed to run them, have very few advantages over standard MS desktop systems. They are engineered to be the most effective MS server products, such as file servers, or servers for database or other applications. "Samba" as GNU/Linux's "Microsoft Network" Server program behaving just like any of MS's server OS's running on Linux has always outperformed native MS software by tens of percents. Samba can even act as a primary domain controlling server.

#### 4.g. Internationalization.

Have you ever bought a PC with operating system in Germany? You usually get the German version, and all user messages are in German. No chance to switch languages. Have you ever tried to describe your error messages to a more experienced user of the English or Spanish version? How are they translated? Debian: easy. Just install the locale "de\_DE" and/or "es\_UY" with a simple command and you're set. Have your complete system speak Spanish or German, or for e-mailing error messages, if any, just switch over to "C" English for the time being. It's a mouse click.

#### 4.h. Maintenance.

As said in 4.b.(stability), the system just simply runs. Once it's up and does its job, you may expect it to continue doing that for years, unless its hardware fails. A Debian System can easily update its software over the Internet every night. You may think this might be not enough. What about salespersons coming up next year offering "better" newer versions for your application, demanding new investments and probably even new hardware, just for you to be "up to date", asking yet another lot of money. Just ignore them. Why pay for something you've already paid for? Debian GNU/Linux gives the cash decisions back to the owner.

#### 4.i. Hardware compatibility.

Free software and GNU/Linux are not compatible with every single piece of hardware there has been built. Most PC hardware comes with windows drivers, which are usually useless in Linux. Please ask the manufacturer for open source Linux drivers. Some manufacturers will comply, some won't. Linux has made own drivers for all kinds of popular hardware. You may expect a Hewlett-Packard (HP) Printer to run seamlessly, since HP gives open source drivers away for free, but if you have a Lexmark InkJet printer, please do not expect to be able to use it. It will be as good as a paperweight. Please make yourself aware before buying any hardware. This (not only co-incidentally) even lets you find out more about hardware vendors' habits. Linux-friendly HP has manufactured and given mechanical repair kits for free to all owners of a certain class of mini laser printers as soon as they noticed there was a slight design fault making the original product mechanically unreliable, whereas such Linux-unfriendly companies as Lexmark's InkJet division go even so far to build chips into their ink cartridges that "remember" the amount of ink inside and refuse to print if they think the ink has once been empty. Which of those hardware vendors would you trust more?

#### 4.k. Linux usability on the desktop

The free software community has started several desktop projects. GNOME is one example, but most windows users seem to work best with "KDE". ("K Desktop environment") Just click and play. Things are as easy as can be. Please feel free to test it by simply booting a KNOPPIX-CD. Usually, users of Microsoft Internet Explorer feel comfortable with Mozilla, and users of Microsoft Office use OpenOffice easily.

#### 4.i. Installing.

Now this is the bad part about it. Any experienced user can install windows, and has probably done it already. The installation of Debian GNU/Linux and the conversion takes someone who knows their way. Windows tends to require re-installation after a certain while as soon as things don't work properly any more. This is not the case for Debian systems. Once installed, they just simply run.

#### 4.k. Cost.

Debian GNU/Linux costs nothing but is given away for free. If you are able to install it yourself, or if you know someone who will install it for you, you're set. After this one time effort there will be no further expenses.

#### 5. Summary

Debian is a multi-purpose GNU/Linux distribution. It runs server systems as smoothly as desktop systems, interoperability as expected. Debian beats all non-free solutions and most open-source solutions in most disciplines. Debian has been the top operating system for servers for years, and has become also the top operating system for desktop PCs. So please consider using a free operating system rather than continuously paying for something intentionally imperfect.

Any questions, discussion or comments on this are highly appreciated by email, <KevinP@web.de>

Below are a few comments of users for whom I've installed Debian on desktop and/or server systems.

Written in 2004 by Kevin Price. Fell free to copy and/or cite as needed.

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"Our Debian Server is by far the most reliable server I've ever experienced."

"The performance of our Debian Server makes me think about replacing my OS with Linux, too."

-- Frank Gümmer, Wirtschafts-Student, debian server

"I have been using Linux/debian now for a couple of weeks and it it's not only an alternative. In the beginning I had little problems configuring the System, but with a helping hand the system developed to be the working tool I ever wanted to use - bug free, stable and configured on my needs and for no money."

-- Alexander Schepers, Wirtschafts-Student, debian desktop

"Nachdem ich mich mit dem Grundgedanken von Debian und mit der recht aufwendigen - jedoch überschaubaren - Konfiguration angefreundet hatte wurde ich mit einer sehr benutzerorientierten und angenehmen Umgebung belohnt. Zudem war ein System-Update noch nie so einfach!"

-- Timo Birnschein, Informatikstudent, debian desktop

"Ich bin mit Linux super zufrieden und dabei bleibe ich auch."

-- Anika Henseleit, Wirtschafts-Studentin, debian desktop & server

“Vom reinen Anwenderstandpunkt gibt es ja nun im Vergleich zu MS-Systemen keine deutlichen Unterschiede. Ich mache den Computer an, logge mich ein, starte über die grafische Oberfläche die benötigten Programme, bearbeite meine Daten, speichere sie ab, versende und empfangen Dateien. also eigentlich alles wie gehabt.”

-- Achim Kleemeyer, Biologe, debian desktop