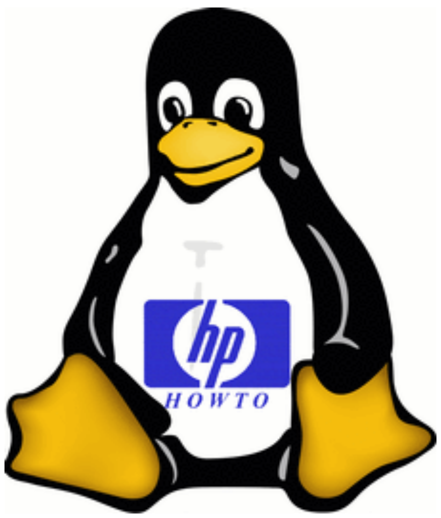
HP HOWTO

Utilisation and Configuration Guide of HP Products under Linux (Version 0.92)



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This document describes the use of products available in the Hewlett−Packard (HP) catalog with Linux and some free software. It gives the state of the support for hardware, software to use, answers to some frequently asked questions and gives elements of sizing. The goals are to offer a general view of free software functions and their use at best with HP products; as well as to make new users of HP products rapidly operational and also to allow others to choose their products knowing facts.

License

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Chapter 1. Introduction

1.1. Presentation

This document is a guide on the use of products proposed by the hardware manufacturer Hewlett−Packard (HP) under Linux. It's a quick reference guide, covering all what you need to know to size, install and configure your products under Linux, or which complementary software will be usefull for their use. Frequently Asked Questions find answers, and references are given concerning other sources of information related to HP technologies and applications.

Opinions expressed here are those of the author, and don't commit both Medasys or Hewlett−Packard . Informations are provided in the aim to be useful to the readers. However, there can't be, through this document, any warranty of any kind either from Medasys or Hewlett−Packard on these systems under Linux, as well as from myself. Neither Medasys , nor Hewlett−Packard , nor the author could be responsible for any problem caused by the use of these informations. However, software editors don't garantee you a lot either (re−read the contracts).

1.1.1. New versions of this document

New versions of this document will be announced regularly on the Usenet groups and . They will also be updated on the various anonymous ftp sites which archive such informations, mainly .

Hypertext versions of this and other Linux HOWTO are available on many web sites, including and . Most Linux distributions on CD−ROM include the HOWTO, often under the `/usr/doc`, directory, and you can also buy printed copies from several vendors. Sometimes the HOWTO available from CD−ROM vendors, ftp sites or printed format are out of date. If the date on this HOWTO is more than 6 months in the past, then a newer copy is probably available on the Internet. The site of reference for this HOWTO is

If you make a translation of this document into another language, please let me know so that I can include a reference to it here.

1.1.2. Suggestions

I rely on you, the reader, to make this HOWTO useful. If you have any suggestions, corrections, or congratulations :−) don't hesitate to send them to me `<Bruno@HyPer−Linux.org>`, and I will try to incorporate them in a next revision.

I am also willing to answer general questions on HP hardware and software with Linux, as best I can. Before doing so, please read all of the information in this HOWTO, and then send me detailed information about the problem.

If you publish this document on a CD−ROM or in hardcopy form, a complimentary copy would be appreciated; mail me for my postal address. Also consider making a donation to the Linux Documentation Project to help support free documentation for Linux. Contact the Linux HOWTO coordinator, Guylhem AZNAR `<guylhem@rrremovethis.oeil.qc.ca>`.

1.2. Aknowledgements

Most of the informations provided here come from research made in HP documentations, files provided with Linux kernel sources, the FAQ of the Usenet newsgroup with a HTML version available on all mirror sites like the CICT, my own experience on HP products, a lot of tests and deployments realised, and remarks from Linux users.

Numerous people have contributed to this document and augmented its contents. You'll find the most complete possible list in the Chapter 7. I would like to thank just now, without any particular order, those without whom this document would simply not exist :

- Marc Hia Balié <Marc_Hia-Balie@hp.com>, who ordered that document and accepted to make it a free documentation.
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Chapter 2. Presentation of Linux and Free Software

2.1. Some definitions

Before going into more details in the presentation, it could be useful to give some definitions of terms and software mentionned in that HOWTO.

2.1.1. Free Software or Open Source software

A *free software (or Open Source software)* is a software distributed with its source code, allowing its study, its transmission, its adaptation. The problem, in english, is the use of free, which has both meanings of "at no cost" and "without constraint". Here, it's the second use which has to be considered, hence the use of Open Source. To remember, think of free as speech, not beer.

Depending on the licenses used for its development, the constraints for users of such a software are various. The most open licenses (like the BSD one) allow code appropriation by third parties, including the resell of the resulting software (with or without modification) in commercial products, without any problem, and without owing something else to the originators than the mention of their copyright. Other licenses (like the GNU Public License or GPL) force every modified GPL software to be free GPL software itself ; this doesn't allow the use of such programs in a commercial one. Many other licenses exist, more or less open: the Artistic License (perl), the NPL one (mozilla), the QPL one (Qt) ...

A vast majority of free software is today under the GPL license, even if the BSD world takes always a great place, however less visible, mainly in the press. Linux is placed under GPL. To have more informations on these definitions and the licenses, please refer to the following reference sites :

GNU project Web site

> You find there all of the informations on the GNU project, including the licenses produced (GPL and LGPL) and various discussions on free software.

Open Source project Web site

> This site proposes a new definition, a bit less restrictive, of free software – called here OpenSource Software – by well–known people.

FreeBSD project Web site

> Here are explained the advantages of the very open BSD license.

2.1.2. Examples and counter–examples

First of all, free software and *freeware* shouldn't be mixed up. A freeware is not necessarily a software provided with its sources, on the contrary of a free software. On the other side, on the contrary of a freeware, you may be charged to obtain a free software (it's not in contradiction with the licensed used). The ambiguity, as stated before, comes from the word "free" . A freeware is then free of charge, but not necessarily "free of sources". (As well, the *shareware* has nothing to do with free software).

So examples of important and well−known free software are the Linux and FreeBSD operating systems, the Apache Web server, the SaMBa SMB server, GNU C and C++ compilers ... A contrario, examples of well−known freeware are the Internet Explorer browser, the Eudora Light mail reader, ...

2.1.3. Linux

Linux is a free operating system, superset of the POSIX norm. "Linux" points out the kernel alone. By extension, the name is also given to distributions based on that kernel plus a set of tools from the GNU project.

Linux is by consequence a Unix system, except that it doesn't use any proprietary code and is furnished under the GPL license, implying the availability of the sources. As every Unix system, Linux is multi−tasking and multi−user. It's also extremely portable, and it is available officialy today on processors such as Intel (i386 to Pentium III), Alpha, Motorola (680x0 and PowerPC), Sparc, StrongArm, Mips. Without mention of the ports, operational or in process on PalmPilot, Itanium (ex−Merced), PA−Risc, Crusoe ...

The system is today perfectly stable and mature. Versions "x.y.z" of the Linux kernel, where "y" is an even number, are stable and only bug corrections are generaly applied when "z" augments. Versions "x.y.z" of the Linux kernel, where "y" is an odd number, are development versions which may be instable and are reserved to developers or intrepids.

>From time to time, when the kernel development stabilizes a "freeze" is announced to furnish a new "stable" version (even), and the development goes on on a new version (odd).

The current stable version is the version 2.2.18 (this last number may evolve following the rythm of corrections). Development has on the other side begun again with a 2.4test version currently in code freeze.

Numerous presentations of Linux are currently available. Among them, you should consult the one made by Michael Johnson at .

2.1.3.1. Linux technical characteristics

The system offers the following technical characteristics :

- Multi−tasking : executes several programs in pseudo−parallel.
- Multi−users : many users acting on the same machine at the same time (without worrying on licenses).
- Portable and interoperable : works on several hardware architectures. All the sources are available. Linux supports a lot of file systems, outside the native ext2 : System V, BSD, Sun, MS−DOS, VFAT, NTFS, Mac, HPFS, EFS, ISO9660. On the network side, it supports the following protocols TCP/IP v4 and v6, Appletalk, Netware (client and server), Lan Manager SMB (client and server), X−Window, NFS, PPP, SLIP, UUCP.
- Performant architecture : modular kernel, built at will, execution in protect mode on 80x86 processors, page load on demand, page share between executables when reading, virtual memory

with swap on disk, use of a dynamical disk cache in memory, dynamic libraries, process management, pseudo terminals, virtual consoles.

- Security : protection of memory between processes: one user program can't compromise the whole system operation. The kernel may also, on the other hand, filter network packets.
- Respect of norms and standards : Posix, with System V and BSD extensions. Support of COFF and ELF binaries. Binary compatibility with SCO, SVR3/4 through the iBCS2 module. Native Language Support as well as national keyboards, fonts...

2.2. Free software concepts

Once the definitions are given, it is important to stay on at ideas promoted by the free software movement. It's important as well to clear some wrong ideas hawked on these software. This section gives then a various set of elements in favour of the introduction of free software and ends on the real problems remaining to solve.

2.2.1. Free software philosophy

In fact, the philosophy promoted by the free software movement is not that different from the one proposed by the scientific movement till a long time already: to put in common ideas and collective knowledge to allow the progression of the research and the growth of this knowledge. The knowledge of the human genome is one of the examples of such a collaborative work.

The computer engineering environement, and especially the software one, seems to have turn away till the last 20 years from these base concepts of the scientific world. It prefers on the contrary to keep the customer captive instead of giving him the informations needed to exploit his computing environement the best he can. That's indeed following such a problem at the begining of the 80's that Richard Stallman, who was doing researches in artificial intelligence at the MIT, decided to create the GNU project. This project is the foundation of the current free software movement.

The main ideas promoted by this movement and stated by Richard Stallman himself are :

- Liberty: every user should be free to copy, diffuse, modify a program, either to share it with others, or to adapt it to his own needs. As well, he should be able to analyse it to understand, imitate, improve, verify its operations, as well as every scientific result is published and seen by the peers for verification, study, understanding and realisation of derived works. Could you imagine a vaccine against the liver cancer that another laboratory couldn't derive to make a vaccine against the pancres cancer.
- Equality: every person should have the same rights on the software. Thus the provider isn't priviledged and can't keep customers to whom he furnished his work captive. Could you think that only the producer of our vaccine could use it ?
- Fraternity: this mode of working encourages the whole computer engineering community to cooperate and thus to produce software more and more reliable and useful to all. Could you imagine that a discovery like the vaccine above couldn't help everyone and favour other discoveries.

More over the utopy of these ideas, we can find other reasons which allowed free software to spread so widely today. They are detailed in Section 2.2.2.

The free software movement materializes itself also through a community of people. That community, informal meeting of personnalities, is heterogeneous in its contents, actions, ideas, even if all share the same belief in the freedom of the software. That community created for itself the tools needed to its communication : Internet and Usenet. And these communication tools are based of course on a lot of free software to work. Among the outstanding persons of this movement, we can present :

- Linus Torvalds, conceptor of Linux.
- Richard Stallman, GNU project conceptor.
- Eric S. Raymond, writer of several and excellent articles, which inspired so many vocations.
- Larry Wall, author of Perl and of the patch tool, and philosopher.
- Tim O'Reilly `<ask_tim@oreilly.com>`, free software advocate and editor of several books dedicated to them.

All these personalities are, above all, excellent computer engineers, which allows them to be recognized as major actors of the free software movement. Their human and communication qualities are also strong characteristics of their nature. In any case they aren't considered for their power, but for their knowledge.

Of course, the free software community is built of thousands of programmers, whose complete list would be too tedious. All share the will of producing useful work, free, and to be recognized for their technical qualities above all.

2.2.2. The choice of free software

To use free software to bring solutions in a computing environment is a choice. First, it is in favour of a plurality of solutions, mainly in the personal computer world which tends to be monopolistic. Then, the choice is made, and that's what is finally important, on the own qualities of free software, which are detailed just below.

Source code access

This point is the most important of the choice, because it allows the undestanding, adaptation, correction, distribution, improvement of the software.

Reliability

That quality is derived from the previous one: the free software is the combined result of the experience and the intelligence of all the participants. Its reliability increases then as time passes, with all the corrections which are made. More over, no marketing pression obliges the software's producer to deliver it to its customers before it is in a satisfactory state.

Portability

This quality is not intrinsic to free software, but is very often seen in a free software. Indeed if a softawre meets success, it will necessarily be adapted to other environments than those initialy considered. Thus by increasing its disponibility, its portability and reliability are also increased.

Universality

One essential quality of free software is the character naturaly universal of the data format used.

Even if they don't follow standards, the availibility of the source code assures the user that he will understand them, and more over be able to write any filter needed to the reuse of data or their exchange with other software. This allows also users to stabilize their environment, because they are not obliged to migrate in case of incompatibility of data formats in their applications.

Performance

Resulting from a lot of examinations, the use of algorithms coming from advanced research works, as well as tested by various usages, free software have good performances by nature. Frequently large portions of code are rewritten to allow the reuse of the original ideas with a better code and thus to increase performance. Several tests made by various organisms tend to prove it also

Table 2−1. Performances of Free Software

Subject	URL
Apache Web Server and competitors	
SMB SaMBa server vs Windows NT	

Once more, there is no obligation to diffuse an application whose performances would be bad.

Interoperability

Historically, Unix environment was always a ferment for interoperability with other systems (big or medium size systems, as well as personal computers). The support in Linux, for example, of a lot of network protocols, filesystem formats, and even binary compatibility modes assures a good interoperability.

Reactivity

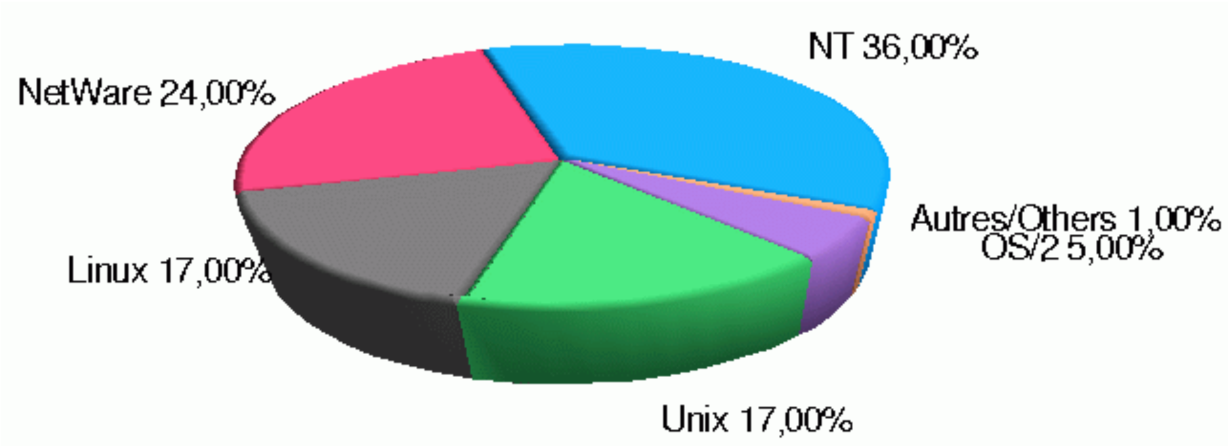
When considering the more and more longer development cycles of the software editors, the reactivity brought by the free software movement is interesting for a lot of sites, concerned by the rapid obtention of corrections to a given problem. Thus, during the recent discoveries of IP problems (ping of the death,...), patches were always available within the next 3 days. And above that, only the patch correcting the hole found was delivered. There were no functionality added, which could have create other instabilities.

Independantly of its qualities, it's possible to give other reasons of various nature, in favor of free software, depending on the type of the person met.

2.2.2.1. Marketing argumentation

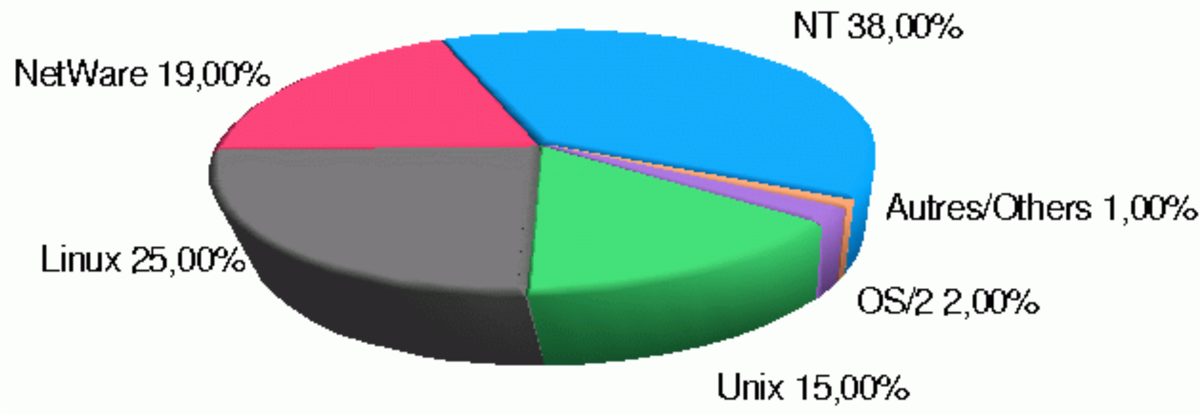
Studies from IDC bring to light the irresistible rise of Linux as a server operating system. In 1998, Linux is credited with 17% of market share, with an increase of 212%, which is the most important in that domain. The following graphics give the whole market share repartition.

Figure 2−1. Server operating system repartition in 1998 (IDC).



This was confirmed in 1999 with a market share climbing to 24% and an ancrease of 93%, always more than four times the increase of the follower.

Figure 2−2. Server operating system repartition in 1999 (IDC).

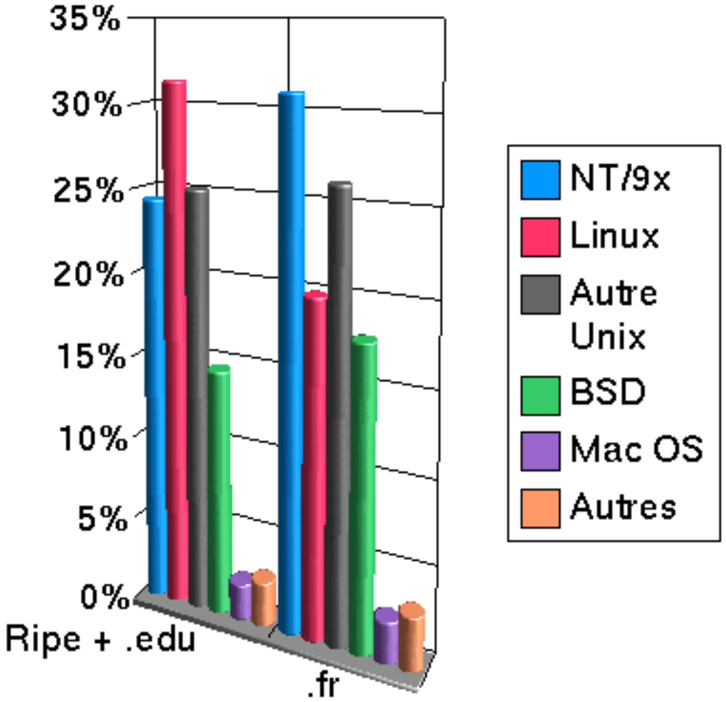


Dataquest estimates on its side that Linux servers will represent, with 1.1 million of units, 14% of the servers sold in 2003.

the Net itself produces marketing tools to demonstrate the superiority of free software. Two counters are regularly updated by Netcraft, on web server software, and by IOS Counter for the servers on Internet. Results, reproduced below, show the importance taken by Apache with more than 6 millions of operational sites, crushing the competition, as well as the free operating systems Linux and *BSD which dominate the world of Internet servers.

Figure 2−3. Web server software by Netcraft between 1995 and 2000.

Figure 2−4. Repartition of Internet servers by IOS Counter in April 1999.



2.2.2.2. Financial argumentation

Financial arguments also speaks for free software. And first the price to aquire them is low. Low, because it's never zero. Even if you can find it on Internet, you have to consider the costs related to that link. However costs are greatly less expensive than for commercial software. So a RedHat 6.2 Linux distribution, delivered with more than 1200 software packages, costs about 60 USD when you have to pay more than 800 USD to obtain Windows NT server, delivered only with IIS.

On the other side, free software don't have the notion of license by user or by supplmentary service. Thus there is no additional cost when you have to increase the use of these software in your entity. That's of course not the case with commercial software whose economical logic is often based on the number of licenses.

Free software bring in addition a better mastering of the TCO (Total Cost of Ownership), mentionned so frequently in the massive deployment of personal computers. Thus administration costs are reduced because systems like Linux or FreeBSD, as Unix, are managed completely remotely, either through command line orders (with **telnet**) or in graphical mode by using X–Window. More over, we benefit from a true multi–users mode, improving these management operations. Always in this domain, it's also possible to do remote management, either through the own hardware capacities (as the Remote Assistant card integrated in most HP NetServers), or by doing a remote connexion (through modem, ISDN adapter or a permanent link) thanks to the native protocol PPP and secure connexion systems as tunneling or ssh. This managemnt could even be realised by an external entity, in outsourcing.

At last, the costs due to the hardware themselves could be controled; on one side, if by chance free software don't meet the needs, it's always possible to buy then commercial software solutions to cover the rest. On the other side, solutions based on free software have good performances by nature, and can use hardware platforms which would be considered as obsolete, if installed following the standard criterias of other operating systems or applications. It's so possible to use "old" hardware, mainly to model. It's then possible to invest, with a fine knowledge, when puting the solution in operation, if needed. The power increase may naturaly take place progressively.

2.2.2.3. Technical argumentation

This argumentation was already given in the previous sections. I think nevertheless that some notions may be explained with complementary informations.

So concerning the reliability aspects of free software based solutions, it's important to note that it implies an operational running time very high (standard characteristic of Unix systems in general). This is mesured by the command **uptime**. One of Medasys and HP customers, Saint−Michel Hospital, has a Vectra VL5 acting as router under Linux since more than 300 days. And that's not a isolated case.

Respect of standards and norms, as well as the extreme portability of free software assures also to applications developed on these platforms the same qualities. And notably, if after their use, the performances or services brought by free software based architectures were insufficient, it would be easy to migrate to machines offering more performances and capacities of evolution, as the HP 9000 systems, running HP−UX.

At last a development plan centered around performances implies a modularity, such as it's possible to resize the system kernel nearest to the capacities of the hardware or to use dynamically loaded modules following the needs. A packages installation may vary from 40 GB for a minimal system up to many GB for a complete distribution. The system linearity allow also the support of multi−processors machines (SMP) (tested up to 32 processors on a Sparc machine). The system modularity allows also to obtain an operational system on a 1.44 MB floppy disk, either to realize a minimal repair environment, or to provide a perfectly operational router. The world of embedded systems shows besides more and more interest for systems such as Linux, because above it's modularity, source availability makes communication with dedicated peripherals easier (acquisition cards, sonde, ...). Entities as CERN or Thomson already use such solutions.

2.2.2.4. Solutions argumentation

That argumentation is probably the most important of all, because it's useless to have free software if it's not to make something useful with it or to offer solutions to demands of entities willing to use it. In which sectors free softawre may bring solutions today ? Well, you have to admit it's in nearly all the sectors of enterprise computing.

Historically, Open Source Software were used to realise Internet/Intranet servers, because their growth was following the one of the Net. It's so possible to cover all aspects linked to the Internet, from the Web server (Apache), FTP server (Wu−Ftpd), DNS server (Bind), the E−Mail server (Sendmail or PostFix), the Usenet groups server(INN), the proxy server (IPmasqadm), the firewall (IP−Chains), Virtual Private Network (OpenSSH), the Cache server for the Web (Squid) or also the Time server (NTP) or as(LDAP) server, or as content management(Midgard") server ... All these software are available in standard in a Linux distribution. The client computer should be equiped with the software corresponding to the application used (mail reader, news reader, web browser, ...) whatever its operating system. The choice of the client is free, as all these tools respect the standards decreed in the RFCs.

The second preferential domain for free software is the file and print server domain. For these services, clients may be multiple: Unix type (use of NFS and KNFS or also Coda, for file sharing and of **lpd** for print service), Microsoft Windows type (use of SaMBa , which allows also the use of local client printers), Novell type (Use of Mars_nwe) or MacIntosh type (use of NetAtalk). All these software are provided in standard in a Linux distribution and don't need any modification at the client level to work.

The other domains where a system such as Linux may bring solutions is the computation one, with support of multiprocessor, linked to the realisation of clusters with multiple nodes with high−speed network interfaces (100 Mbit/s, Gigabit or Myrinet); those of data security with the support of HP NetRaid[Rem.] cards, allowing Raid level of 0, 1, 3, 5, 10, 50, and HotSpare disks, managed by the harware; those of centralized fax server, with a free software like HylaFAX or also as an archive/backup server with HP SureStore DAT or DLT libraries thanks to a commercial software like Arkeia or at last as a database server with free solutions like PostgreSQL,MySQL or commercial like Oracle, to speak only of these three.

On the client side, even if it's less highlighted for the moment, possibilities to use solutions based on free or commercial software are numerous. There also the Internet part is the main one, with tools like graphical web browsers (Netscape) or textual (lynx), a lot of graphical mail readers (Kmail, XFMail, ...) or textual (mutt, elm, ...). But you also have the whole panel of indispensable tools for a personal computer today as a PDF reader (Acrobat Reader or xpdf), image manipulation tools (ImageMagick, the Gimp, RealPlayer tools ...), word processors (LyX, LaTeX, SGMLTools, Wordperfect, ...), commercial office suites (ApplixWare, StarOffice), sound management tools (WavTools, eplaymidi, xmcd, ...), CD burning tools (cdrecord, BurnIT, ... with complements as mkisofs, cdparanoia), free and commercial emulators for various systems (Wine, Executor, WABI, DOSEmu, ...), compilers and interpretors for all the languages (C, C++, Pascal, Fortran, Basic, Tcl/Tk, Perl, Python, Ada, Eiffel, Lisp, Scheme, Prolog...), including commercial versions (PGI, ...), graphical environments (Gnome, KDE, Motif, ...). The evolution of these last tools indicates that the 2000's may be the years where Linux and free software will break through at their turn on the client.

I want to mention that this document was realized on an HP Brio BAx equiped only with a Linux distribution, with the help of tools like SGMLTools, Jade and DocBook, which allowed to generate from a single source the formats HTML, Txt, RTF, PostScript, and PDF.

2.2.2.5. Service argumentation

This one was for a long time a blocking point to the expansion of free software in the firms. It's not the case today. Many service providers or hardware manufacturers, like HP, control today these solutions and propose support around them.

Other sources of informations are also available, in abundance, through several web sites dedicated to these solutions, specialised mailing−lists, and various Usenet groups, such as for Linux, the international groups under **comp.os.linux.*** or for the french speaking people under **fr.comp.os.linux.***.

Concerning competences, more and more young engineers or academics finish their learning cycle being trained to the use of free applications and operating systems. This wealth of competences arrives now on the labour market and will contribute to increase the movement of generalisation of these tools. At last, many firms have internaly ignored competences. In fact, their employees often install this software at home, and have a good mastering, usable when arrives the deployment of the software in their professional structure.

2.2.3. Wrong ideas on free software

Advocating free software consists also to mention some generally accepted ideas concerning them and to fight them.

"There is no support, no training"

As seen previously, support is currently structuring itself. A firm like RedHat provides today support for their solutions. Only in France, we may mention firms like Medasys , Atrid, Alcove which assure support on free software. Likewise, always in France, training on free software may be given by HP France, Learning Tree, the IUT de Vélizy, without mentioning generic network and Unix trainings (besides proposed also by the same organizations) which represent a fundamental base in a training course. And at last, we should mention the ability of each of us to self−train, mainly thanks to the huge documentation available (See the Chapter 6).

"There is no documentation"

There is a whole set of manuals, the Linux Documentation Project made of FAQ (Frequently Asked Questions) and HOWTO, counting more than 300 documents around Linux, the main being translated in french, available as free documentation. This documentation has a various quality, more or less up to date, following the subjects, certainly but it makes a corpus allowing to apprehend alone a Linux distribution and all its components. For myself, I always found in it everything I needed to do my job with free software. And, in case of complementary informations, a lot of web sites and Usenet groups may again bring some of the elements needed. And without counting the innumerable manual pages available on line.

On the other side, the editors O'Reilly and SSC have specialised in providing books around free software, written generaly by the writers of the software themselves. Their books are considered as reference books in their respective domains.

"A free or nearly free product is a toy"

You should always make a difference between free (as speech) and free (as beer). Too many freeware in Microsoft environment are in fact toys and of poor quality. It's absolutely not the case for free software, as stated in the previous sections. Remember just that they are reliable by construction.

"Linux is difficult to install"

Linux is a professional operating system. At that title, it requires competences to install it, as well as any other professional operating system, like the other Unix or Windows NT for example. But it isn't more difficult to install than those either, mainly thanks to distributions as RedHat 6.2, Mandrake 7.1, ... You need about 30 minutes to realize a complete installation of such distributions, so quite the same as for HP−UX and noticeably less than for Windows NT Server.

On the other hand, as before installing a server with Windows NT you have to verify its compatibilité with the Hardware Compatibility List of Microsoft, for Linux it's also greatly recommended to verify the Hardware HOWTO, and for HP machines to refer to this page.

"Free Software are not adequate for heavy tasks"

This is less and less true and this criticism will be obsolete with the next versions of the Linux kernel which will include a journalised filesystem, allowing a true application cluster. But already Linux authorises the use of multi−processors, several nodes to realise computation clusters. And don't forget it's used by the portal Voila (France Telecom) or the engine Deja among other prestigious references. As well, FreeBSD is used with success as the world biggest ftp server : Walnut Creek CDROM server

"What appeal do I have in case of problem with the editors ?"

There is no appeal, because software licences deny all responsabilities for the writers, in case of problem. But, in reality developers are always ready to help in case of problem and try to correct as soon as possible the bugs encountered (for the F00F bug of the pentium, a patch for the Linux kernel was published within 3 days, for example). On the other side, commercial editors guarantee very badly users against problems other than packaging errors. please read the notes furnished with your software to judge.

2.2.4. Real problems around free software

It would not be honest to negate certain remaining problems linked to free software. Some have begun to disappear, other are inherent to the system, other at last will take time to diappear.

The first problem, inherent to the model of free software, is the multiplicity of tools and distributions available. So, if you want to setup a mail server, you have to choose between Sendmail, Exim, PostFix, Qmail, Smail. As well if you want to install Linux, you may choose between the distributions RedHat , SuSE, Slackware, Mandrake, Turbo Linux, Debian. This represents often a problem for the newcomer, but the esperienced user will always prefer to have a large choice he will confront to his particularities and to his experience. As long as an actor respects the rules by freeing his code (it's the case of the rpm and deb formats for example), there is little risk from the comunity point of view.

The second problem, inherent also to the free software birth, is the necessity to have strong Unix and Internet competences, to manage such solutions. The power available through these systems is proportional to the competence of their administrators. And that will stay true even with the growth of more and more grahical solutions to manage them. On the other side, you capitalize the investment in time to learn their functions and that doesn't disappear, because you don't have to re−learn eveything from one version to the other. Don't forget that systems you use daily seem to be simple, uniquely because you passed enough time to learn them. For Internet competences, it's a statement of the obvious to say that this investment isn't lost. At last, even with the work of translators to provide informations in french and other languages, a good knowledge in technical english is definitively a plus.

The last problem met in the implementation of free software solutions is to suceed in convincing some mnagers to go against the prevailing opinion. The aim of this part is precisely to give all sorts of argumentations to achieve that goal, but you need each time to show conviction to get his way in the end. As soon as these solutions will be adopted by big firms principaly, resistances will disappear.

2.3. Linux and other operating systems

The aim is not to examine completely or to compare the functions of the various operating systems available. It's more upon looking at the respective positions of Linux in comparaison with other systems. Only systems having a sufficient representation on the market are considered.

2.3.1. Linux and other proprietary Unix (HP−UX, Tru64, AIX, Solaris, Irix)

The situation taken by all the hardware manufacturers place Linux today in the entry level (when it's taken in account) and their own Unix system in the middle and high level. Reality is sometimes more cruel than the situation wanted by the marketing department :−). Technically, a Linux distribution has no cause to be envious of the manufacturers Unix solutions, except for the moment the set of commercial applications. And we can often see that users dope their workstations with free software to complete their usage.

To be precise in the talk, we should consider manufacturers Unix solutions as split in stations and servers.

On the station side, there's no doubt in my mind: for a customer, the only reason today to buy one is linked to the availability of a software or a hardware which wouldn't exist in the free environment, or due to intrinsic performances of the machine. In the first case, we can see that this argument should have a short life time, because logically every software editor (except maybe hardware manufacturers) and every hardware manufacturer has interest in porting their applications or allowing the use of their hardware on all the major environments in the market. As shown by Oracle, Informix, Sybase, ... Linux becomes today one of the major environments. In the second case, the difference in term of performances between the Linux dominant platform (IA−32) and the other competitors decreases and should even disappear with the availability of the IA−64 architecture, which seems to be adopted largely by a majority of actors. More over, Linux is often available natively on the processors of these actors (Sparc, Mips, PowerPC, 68xxx, Alpha, Crusoe, PA−Risc to come). I think Linux may represent the famous unique and standard Unix that everybody dreamed of from a long time, without succeeding to impose it (the open and free characteristics brought by Linux are not without influence on that). I think that at the end hardware manufacturer Unix workstations will be restricted to some niches such as high end computation, virtual reality, ... and that as long as solutions are not available on a free environment. Linux offers all the functional qualities of the other Unix systems, and thus of the workstation, on a more various hardware platform and potentially at a better price, if on PCs. So it is the natural choice of every computer engineer with a strong Unix culture (old customer of the workstation) who will prefer that solution to the migration to a Microsoft system typically.

On the server side, in addtion to the points mentionned previously for the stations, problems are more complex. Ram, disks, processors capacities, extensions of every kind make them difficultly repleacable by machines with a IA−32 architecture for example. More over, certain solutions such as high availability clusters for example are not already in production in a Linux environment. The other brake is often linked to investments already done around software solutions deployed on these servers. Whatever their natural life time is much higher than those of the stations. Changes will thus be made more slowly in that domain. Here we can consider rightly Linux solutions as an entry/middle level solutions, when hardware manufacturer Unix servers are the middle/high level. The introduction of Linux in place of these machines will begin only with a massive availability of applications, mainly in the management sector.

The advantages of the hardware manufacturer solutions, explaining why they are so often chosen when applications are critical, are linked to the homogeneity of the solution (hardware and software mastered by the same entity, which can't invoke a third party in case of problem), and to the support and maintenance garantees furnished.

Finally, there is not so much antagonism between these systems, because they are full cousins. Their association allows today to computer teams "pro−Unix" to have solutions from start to finish, without having to lose in functions, as it's so often the case with other operating systems available for personal computers.

2.3.2. Linux and SCO

The comparaison between Linux and the SCO systems seems to me quite unbalanced. First, all the previous points are vaild here also. More over, SCO isn't a hardware manufacturer, so the homogeneity advantage disappears. the IA−32 Intel platform is supported by both systems, so cost is identical. On the other hand, the software solution has a disproportionate cost (few software provided in the base install, thus a lot of expenses to extend, as well as to increase the number of users). Having to manage one OpenServer, I can say that performances are far beyond those of a Linux system. More over, its conception is older, abounds of symbolic links which makes management complex. The hardware supported by SCO is less numerous than those Linux supports. Only stay as an advantage the installed base and the set of applications available. But for how long ? Besides the fact that SCO choose Monterey (AIX based) for the IA−64 port seems significant for the future reserved to OpenServer or UnixWare.

2.3.3. Linux and Windows NT

The comparaison is here more difficult, because Windows NT isn't an open system, as the precedings, which is already redhibitory for certain users. An excellent comparaison was made by John Kirch between Unix and Windows NT Server. I recommend to people searching to have an enlightened opinion on this subject to read it; it's updated regularly and was written by a specialist of both Microsoft and Unix operating systems. Financially, obvious advantage for the free software. And it's more obvious, as for SCO, if you consider the set of complementary software you need to use a server. The author evaluates the difference from 1 to 100 all the same ! Technically, either on the functions provided or on the reliability, the administration, the performances, the hardware supported, and more over the security, Unix systems and particularly free systems outperform what is proposed by Windows NT. The fact to have a GUI non independant from the kernel contributes greatly to the instability of NT, because it's more difficult to avoid errors in a GUI (there is no mastering possible of the user comportment in front of it) rather than in a kernel.

Which are the real advantages of Windows NT ?: the marketing power of Microsoft which persuades the world that computers equal Windows and which leans on the enormous installed base; its office applications (a monopolistic situation on the market) only available in this environment; the confusion maintained between the various flavours of Windows (95/98, NT, 2000), and between the server and client functions; its agreements with the biggest hardware manufacturers which often oblige them to provide a Microsoft system with their platforms; its technological initiatives to occupy the market in first, based on proprietary code and that often without respect of known or documented standards.

The lack of hegemony in the servers sector is the best reason to hope that a plurality of solutions may exist in the future for computers users, also at the desktop.

Chapter 3. Linux and HP products

To maintain such a chapter is an endless task :−).

3.1. Informations on HP products and Linux

3.1.1. General informations

HP became recently concious of the importance taken by Linux and free software in general, and on its machines particularly. Thus a web site dedicated to Linux in HP environment is now available at .

In France, there is for a longer time a site on these themes, under the responsability of Jacques Misselis `<Jacques_Misselis@hp.com>`, hosted by l'École Centrale de Lyon at the address .

On the other side, the firm Medasys , for which I worked between 1996 and 2000, put at disposition of the community a certain number of informations since 1997, available at . This HOWTO is the result of this work.

HP also realized a synthesis document (PDF format) concerning his position in front of Linux, the White Paper HP Linux Strategy.

HP is a member of Linux International.

3.1.2. Particular announces

HP also communicates through its web site around Linux and free software. You'll find some links here.

- FireHunter announce (10/06/1998)
- Covision program announce (01/27/1999)
- Linux support on NetServers and IA−64 announce (01/27/1999)
- PA−Risc port announce (03/01/1999)
- Informix HP association announce (03/02/1999)
- Kayak Linux support (03/17/1999)
- World Linux support announce (04/20/1999)
- HP OpenView announces (05/17/1999)
- Availability of Apache on HP 3000 (Summer/1999)
- Visualize Linux support announce (06/21/1999)

- Open Source Software commitment by HP (08/09/1999)
- Aberdeen group analysis on HP position on free software (08/09/1999)
- HP Linux vision (01/01/2000)
- HP announces the certification of its DAT and DLT products under Linux (02/02/2000)
- HP Brings Award−winning 3−D VISUALIZE Graphics to Linux Desktop (02/02/2000)

and

- HP and Intel Release IA−64 Developer's Kit for Linux (06/13/2000)
- HP Announces Linux Support for State−of−the−art 3−D Graphics Accelerators (07/25/2000)
- HP Expands Commitment to Linux (08/14/2000)
- HP adds Linux support for its Chai appliance platform Software (09/26/2000)
- HP's open letter to the Open source Community (10/18/2000)
- HP Ultrium Tape Drives Certified to be Linux Compatible (11/21/2000)
- Bruce Perens, Open Source advocate, joins HP (12/04/2000)
- HP NetServers make Linux Hum for Solid State Design
- Medasys chosen by Hewlett−Packard France Education/Research as Linux competence center
- Hewlett−Packard France Education/Research announces commitment to Linux promotion

HP France has also published an article on Linux and free software in its May 1999 issue of HP Computer News, an article on HP Linux support in the September 1999 issue, and an article on Linux RedHat solutions on HP Visualize workstation in the November 1999 issue.

3.2. HP hardware supported by Linux

This section presents HP hardware supported today by Linux. Informations are based on the latest stable version of the Linux kernel, which is currently version 2.2.18. A development kernel (version 2.4test) is also available but doesn't offer any garantee of stability.

3.2.1. Intel based computer range

Page last updated the 27th of December 2000.

That computer range is today the main set of HP machines supported by Linux, and that till many years. In case you didn't already do it before, some preliminaty readings are recommended before to try to install Linux on these platforms.

The Linux Installation HOWTO contains a great number of informations to install Linux. If you bought linux on a CD−ROM, chances are that installation instructions are provided with it (the little booklet inside the disk case, and/or files on the CD).

The Linux Kernel HOWTO should be read to have details on kernel construction. I will just mention here points which are specific to HP hardware.

Outside particular indication, Linux support means during the installation of a RedHat 6.2 distribution. In special cases, a kernel rebuild will be necessary to support completely some hardware elements. You should note that what is true for one distribution is generally true for another, as these functions are linked to the kernel or the XFree86 server, and not to the distribution itself.

3.2.1.1. The desktop range (Brio, Vectra, Kayak)

HP has a new program called "Freedom of Choice" on the whole desktop range. Linux is thus one of hte operating systems pushed by HP. Cf: and .

A FAQ is also available.

HP insures the support of certified Linux hardware by the following method : all the machines have the Diagtool utility. If this utility indicates a problem, it's taken in account by HP maintenance. If it doesn't, it's considered as a software problem and should be reported to the distribution provider.

The following tables indicate the state of Linux support by these platforms :

Table 3−1. Brio and Linux

Machine	Graphic Card	Linux support	Network Card	Linux support	SCSI Card	Linux support	Sound Card	Linux support	Tested
Brio (D5522A, D5526A, D5857A, D6665A, D5838A, D5848A, D6514A, D5527A, D5528A, D6666A, D6675A, D5849A, D5839A, D5859A, D6666A, D6510A, D6515A, D6667A, D5840A, D5861A, D6668A, D5840C, D5841A, D6516B)	S3 Trio 64V2 PCI	Yes XFree 3.3.6 Rem. (SVGA)	None	N/A	None	N/A	???	???	Yes
Brio (D6810A, D6812A)	ATI Rage	Yes XFree	None	N/A	None	N/A	???	???	No

	Pro ZX AGP	3.3.6Rem.	(Mach 64)						
Brio (D6638A, D6639A, D6640A, D6644A, D7901A, D7902A, D6645A, D6646A) Chipset BXRem.	ATI Rage Pro ZX AGP	Yes XFree 3.3.6Rem.	None (Mach 64)	N/A	None	N/A	???	???	No
Brio (D5841A, D6516B)	Matrox Millenium II PCI	Yes XFree 3.3.6Rem.	None (SVGA)	N/A	None	N/A	???	???	No
Brio (D6760A, D7671A, D6908A, D7930A, D7672A, D7925T, D6776A, D6769A, D6755A, D6895A, D6896A, D6897A, D7931A)	Matrox Productiva G100 AGPRem.	Yes XFree 3.3.6Rem.	None (SVGA)	N/A	None	N/A	???	???	No
Brio BA (D7581A, D7584A, D7585A, D7587A, D7586A, D7591A, D7594A, D8411A)	Sis 5595 AGP	Yes XFree 3.3.6Rem. in Frame Buffer mode (FBDEV)Rem.	None	N/A	None	N/A	Cirrus Logic CS 4614	Yes driver AlsaRem.	No
Brio BAx (D7600A, D7603A, D7624A, D7625A, D7630A, D7610A)Rem.	Matrox Productiva G200 AGP	Yes XFree 3.3.6Rem.	None (SVGA)	N/A	None	N/A	Cirrus Logic CS 4614	Yes driver AlsaRem.	Yes
Brio BAx (D7605A)Rem.	Matrox Productiva G200 AGP	Yes XFree 3.3.6Rem.	??? (SVGA)	???	None	N/A	Cirrus Logic CS 4614	Yes driver AlsaRem.	No
Brio BA400 (D8760A, D8761A, D8763A, D8764A, D8767A, D8768A, D8769A, D8934A, D8935A, D8936A, D8943A, D8947A, D8952A, D8953A, D9720A, D9721A, D9724A)	Intel i810 AGPRem.	Yes XFree 3.3.6Rem. X Server i810)	None (Intel	N/A	None	N/A	???	???	Yes
Brio BA410 (P1682A, P1683A, P1686A, P1687A, P1689A, P1692A, P1694A, P1710A, P1711A,	S3 Savage AGPRem.	Yes XFree 3.3.6Rem. X Server	None (S3	N/A	None	N/A	VIA 82C686	Yes driver AlsaRem.	Yes

P1718A, P1719A, P1720A, P1722A, 03237A, P2738A, P2739A, P2741A, P2743A, P2745A, P2746A, P3235A, P3263A, P3264A, P3265A, P3266A, P3267A, P3268A, P3269A, P3271A, P3272A,)		Savage)							
Brio BA410 (P1716A, P1721A, P1723A, P3270A, P3273A)	S3 Savage AGP[Rem.]	Yes XFree 3.3.6[Rem.] (X Server Savage)	SMC 1211 TX EZ Card 10/100 BT	Yes driver rtl8139	None	N/A	VIA 82C686	Yes driver Alsa[Rem.]	Yes
Brio BA410 (P2744A, P3274A)	nVidia GeForce 2 GTS AGP	Yes XFree 3.3.6[Rem.]	None (SVGA)	N/A	None	N/A	VIA 82C686	Yes driver Alsa[Rem.]	No
Brio BA600 (D8770A, D8771A, D8772A, D8773A, D8778A, D8780A, D8783A, D8784A, D8785A, D8788A, D8789A, D8963A, D9070A, D9072A, D9080A, D9082A, D9085A, D9091A) Chipset BX[Rem.]	Matrox Productiva G200 AGP	Yes XFree 3.3.6[Rem.]	None (SVGA)	N/A	None	N/A	Cirrus Logic CS 4614	Yes driver Alsa[Rem.]	Yes
Brio BA600 (D8406A, D8774A, D8781A, D8787A, D8967A, D9075A) Chipset BX[Rem.]	Matrox Productiva G200 AGP	Yes XFree 3.3.6[Rem.]	??? (SVGA)	???	None	N/A	Cirrus Logic CS 4614	Yes driver Alsa[Rem.]	No

Table 3−2. Vectra and Linux

Machine	**Graphic Card**	**Linux support**	**Network Card**	**Linux support**	**SCSI Card**	**Linux support**	**Sound Card**	**Linux support**	**Tested**
Vectra VE5 (D5592A, D5602A, D5603A, D5604A, D5606N, D5608A, D5612A, D5615A, D5618A,	S3 Trio 64V2 PCI	Yes XFree 3.3.6[Rem.]	None (SVGA)	N/A	None	N/A	???	???	Yes

D5607A, D5617A)									
Vectra VE7 (D6530A, D6531A, D6533A, D6610A, D6611A, D6615A, D6616A, D6613A)	ATI Rage II C AGP	Yes XFree 3.3.6[Rem.] (Mach 64)	None	N/A	None	N/A	???	???	Yes
Vectra VE7 (D6532A, D6612A, D6617A, D6618A)	ATI Rage II C AGP	Yes XFree 3.3.6[Rem.] (Mach 64)	3Com 905B−TX 10/100 BT[Rem.]	Yes driver 3c59x[Rem.]	None	N/A	???	???	Yes
Vectra VE8 (D6550A, D6560A, D6570A, D6554A, D6584A, D6540A, D6541A, D6544A, D6543A, D6578A, D6573A, D6574A, D6580A,D6581A, D6584A, D6583A, D6593A, D6597A, D6598A) Chipset BX[Rem.]	Matrox Productiva G100 AGP[Rem.]	Yes XFree 3.3.6[Rem.] (SVGA)	None	N/A	None	N/A	AZTEC 2320	Yes driver Alsa[Rem.]	Yes
Vectra VE8 (D6552N, D6562N, D6565N, D6542A, D6572A, D6575A, D6582A, D6595A, D6582A, D6585N, D6599A) Chipset BX[Rem.]	Matrox Productiva G100 AGP[Rem.]	Yes XFree 3.3.6[Rem.] (SVGA)	3Com 905B−TX 10/100 BT[Rem.]	Yes driver 3c59x[Rem.]	None	N/A	AZTEC 2320	Yes driver Alsa[Rem.]	Yes
Vectra VEi7 (D8112A, D8117A, D8121A, D8123A, D8124A, D8126A, D8128A, D8129A, D8131A, D8133A, D8134A, D8136A, D8138A, D8139A, D8141A, D8143A, D8144A, D8145A, D8148A, P1618A, P1619A)	Sis 5595 AGP	Yes XFree 3.3.6[Rem.] in Frame Buffer mode (FBDEV)[Rem.]	None	N/A	None	N/A	???	???	Yes
Vectra VEi7 (D8118N, D8122A, D8127N, D8132A, D8137A, P1620A)	Sis 5595 AGP	Yes XFree 3.3.6[Rem.] in Frame Buffer mode (FBDEV)[Rem.]	3Com 905B−TX 10/100 BT[Rem.]	Yes driver 3c59x[Rem.]	None	N/A	???	???	No

Vectra VEi8 (D8166A, D8168A, D8151A, D8153A, D8155A, D8169A, D8171A, D8173A, D8174A, D8181A, D8183A, D8184A, D8186A, D8188A, D9784A, D9785A, D9786A, D9788A, D9791A, D9793A, P1626A, P1628A, P1633A)	Matrox Productiva G200 AGP	Yes XFree 3.3.6[Rem.] (SVGA)	None	N/A	None	N/A	???	???	No
Vectra VEi8 (D8167N, D8152N, D8172N, D8182N, D8187N, D9787N, D9789A, D9792N, P1627A)	Matrox Productiva G200 AGP	Yes XFree 3.3.6[Rem.] (SVGA)	3Com 905B−TX 10/100 BT[Rem.]	Yes driver 3c59x[Rem.]	None	N/A	???	???	No
Vectra VL5 (D4552A, D4543A, D4554A, D4555A, D4556A, D4557A, D4558A, D4559A, D4560A, D4567A, D4562A, D4563A, D4572A, D4574A, D4576A, D4579A, D4577A)	S3 Trio 64V2 PCI	Yes XFree 3.3.6[Rem.] (SVGA)	None	N/A	None	N/A	???	???	Yes
Vectra VL6	Cirrus Logic GD 5446 PCI	Yes XFree 3.3.6[Rem.] (SVGA)	None	N/A	None	N/A	???	???	Yes
Vectra VL6	Matrox Millenium II PCI	Yes XFree 3.3.6[Rem.] (SVGA)	None	N/A	None	N/A	???	???	No
Vectra VL7 (D5710A, D5711N, D5725A, D5720A, D5721N, D5731N, D5797N, D5737A, D5799N)	Cirrus Logic GD 5465 AGP[Rem.]	Yes XFree 3.3.6[Rem.] (SVGA)	None	N/A	None	N/A	???	???	Yes
Vectra VL7 (D5734N, D5729N, D5739N, D5728N, D5798N)	Matrox Millenium II PCI	Yes XFree 3.3.6[Rem.] (SVGA)	None	N/A	None	N/A	???	???	No
Vectra VL7 (D5724N, D5796N)	Cirrus Logic GD 5465 AGP[Rem.]	Yes XFree 3.3.6[Rem.] (SVGA)	AMD 79C971 KC 10/100 BT	Yes driver pcnet32	None	N/A	???	???	No

Vectra VL8 (D5880A, D5882A, D5890A, D5891A, D5893A, D5896A, D5898A, D5900A, D5902A, D6945A) Chipset BX[Rem.]	Matrox Productiva G100 AGP[Rem.]	Yes XFree 3.3.6[Rem.] (SVGA)	None	N/A	None	N/A	???	???	No
Vectra VL8 (D5881A, D5883A, D5894A, D5888A, D5892A) Chipset BX[Rem.]	Matrox Productiva G100 AGP[Rem.]	Yes XFree 3.3.6[Rem.] (SVGA)	3Com 905B−TX 10/100 BT[Rem.]	Yes driver 3c59x[Rem.]	None	N/A	???	???	No
Vectra VL8 (D5887A) Chipset BX[Rem.]	Matrox Productiva G100 AGP[Rem.]	Yes XFree 3.3.6[Rem.] (SVGA)	3Com 905B−TX 10/100 BT[Rem.]	Yes driver 3c59x[Rem.]	???	???	???	???	No
Vectra VL8 (D6944A) Chipset BX[Rem.]	Matrox Millenium G200 AGP	Yes XFree 3.3.6[Rem.] (SVGA)	None	N/A	None	N/A	???	???	No
Vectra VL8 (D6940A, D6941A, D6942A) Chipset BX[Rem.]	Matrox Millenium G200 AGP	Yes XFree 3.3.6[Rem.] (SVGA)	3Com 905B−TX 10/100 BT[Rem.]	Yes driver 3c59x[Rem.]	None	N/A	???	???	No
Vectra VL8 (D6943A) Chipset BX[Rem.]	Matrox Millenium G200 AGP	Yes XFree 3.3.6[Rem.] (SVGA)	3Com 905B−TX 10/100 BT[Rem.]	Yes driver 3c59x[Rem.]	Adaptec AIC 7880 UW PCI	Yes driver aic7xxx[Rem.]	???	???	Yes
Vectra VLi8 (D7941A, D7943A, D7945A, D7948A, D7951A, D7953A, D7955A, D7961A, D7963A, D7965A, D7958A, D7968A, D7969A, D7973A, D7976A, D9459A, D9460A, D9463A, D9467A, D9774A, D9810A, P1894A, P1898A)	Matrox Millenium G200 AGP	Yes XFree 3.3.6[Rem.] (SVGA)	None	N/A	None	N/A	Cirrus Logic CS 4614	Yes driver Alsa[Rem.]	Yes
Vectra VLi8 (D7826A, D7836A, D7837A, D7846A, D7847A, D7848A, D7856A, D7857A, D7866A, D7867N, D7876A, D7877N, D7942A, D7949A, D7952A,	Matrox Millenium G200 AGP	Yes XFree 3.3.6[Rem.] (SVGA)	3Com 905C−TX 10/100 BT	Yes driver 3c59x[Rem.]	None	N/A	Cirrus Logic CS 4614	Yes driver Alsa[Rem.]	Yes

D7959A, D7962A, D7969A, D7972A, D8696A, D8697A, D8950A, D9456A, D9457N, D9461A, D9462A, D9770N, D9771N, D9775A, D9778A, D9779N, D9809A, P1896A, P1899A)										
Vectra VL400 (D9815A, D9816A, D9817A, D9818A, D9819A, D9820A, D9821A, D9822A, D9824A, D9826A, D9828A, D9829A, D9830A, D9831A, D9833A, P1555A, P1556A, P1557A, P1558A, P1560A, P2260A, P2261A, P2266A, P2265A, P2778A, P2779A, P3351A, P3353A, P3389A, P3390A, P3391A, P3394A, P3614A, P3615A, P3616A, P3618A, P3697A, P3698A, P3699A, P3700A, P3702A, P3687A, P3691A, P3694A) Chipset i820[Rem.]	Intel i815 AGP[Rem.]	Yes XFree 3.3.6[Rem.] (Intel X Server i815)	3Com 905C−TX 10/100 BT	Yes driver 3c59x[Rem.]	None	N/A	Intel 82810 Audio	Yes driver Alsa[Rem.]	Yes	
Vectra VL400 (D9825A, D9827A, D9832A, D9834A, P1554A, P1559A, P1561A, P1562A, P3352A, P3384A, P3686A, P3701A, P3703A, P3617A, P3619A, P3688A, P3690A, P3692A, P3693A, P3695A, P3696A) Chipset i820[Rem.]	Matrox Millenium G450D AGP	???	???	3Com 905C−TX 10/100 BT	Yes driver 3c59x[Rem.]	None	N/A	Intel 82810 Audio	Yes driver Alsa[Rem.]	No
Vectra VL400 (P2257A,) Chipset	Matrox Millenium	Yes XFree	3Com 905C−TX	Yes driver	None	N/A	Intel 82810	Yes driver	No	

i820Rem.	G400D AGP	3.3.6Rem. (SVGA)	10/100 BT	3c59xRem.			Audio	AlsaRem.		
Vectra VL600 (D9733A, D8643A, D8653A, D8657A, D8663A, D8667A, D9737A, D8647A, D8677A, P2780A, P3285A, P3288A) Chipset i820Rem.	Matrox Millenium G250 AGP	Yes XFree 3.3.6Rem. (SVGA)	None	N/A	None	N/A	Cirrus Logic CS 4614	Yes driver AlsaRem.	No	
Vectra VL600 (D7543N, D8644N, D8648N, D8654N, D8658N, D8664N, D8668N, D8678A, D9734N, D9738N, P2786A, P3286N, P3289N, P3604N, P3705N) Chipset i820Rem.	Matrox Millenium G250 AGP	Yes XFree 3.3.6Rem. (SVGA)	3Com 905C−TX 10/100 BT	Yes driver 3c59xRem.	None	N/A	Cirrus Logic CS 4614	Yes driver AlsaRem.	No	
Vectra VL600 (D8635A, D8645A, D8649N, D8655A, D8659N, D8665A, D8669N, D8679N, D9735A, D9739N, P2787A, P3287A, P3290N, P3344N, P3345N, P3605N, P3606N, P3607N, P3608N, P3610N) Chipset i820Rem.	Matrox Millenium G400D AGP	Yes XFree 3.3.6Rem. (SVGA)	3Com 905C−TX 10/100 BT	Yes driver 3c59xRem.	None	N/A	Cirrus Logic CS 4614	Yes driver AlsaRem.	Yes	
Vectra VL600 (P3609N) Chipset i820Rem.	Matrox Millenium G450D AGP	???	???	3Com 905C−TX 10/100 BT	Yes driver 3c59xRem.	None	N/A	Cirrus Logic CS 4614	Yes driver AlsaRem.	No
Vectra VL600 (D8656N) Chipset i820Rem.	Matrox Millenium G250 AGP	Yes XFree 3.3.6Rem. (SVGA)	None	N/A	???	???	Cirrus Logic CS 4614	Yes driver AlsaRem.	No	
Vectra XA (D3986A, D3989A, D3990A, D3991A, D3993A, D4770N, D4771N, D4773N, D4774N, D3994N, D3995N, D4776N)	Matrox Millenium II PCI	Yes XFree 3.3.6Rem. (SVGA)	AMD 79C971 KC 10/100 BT	Yes driver pcnet32	None	N/A	???	???	No	

Vectra XA (D4777A)	Matrox Millenium II PCI	Yes XFree 3.3.6Rem. (SVGA)	AMD 79C971 (KC 10/100 BT	Yes driver pcnet32	Adaptec AIC 7880 UW PCI	Yes driver aic7xxxRem.	???	???	Yes

Table 3−3. e−Vectra and Linux

Machine	Graphic Card	Linux support	Network Card	Linux support	SCSI Card	Linux support	Sound Card	Linux support	Tested
e−Vectra (D9896T, D9897T, D9898T, D9899T, P2024T, P2025T, P2027T, P2706T, P2707T)	Intel i810 AGPRem.	Yes XFree 3.3.6Rem. (Intel X Server i810)	3Com 905C−TX 10/100 BT	Yes driver 3c59xRem.	None	N/A	Intel 82810 Audio	Yes driver AlsaRem.	Yes
e−PC (P2760A, P2761A, P2763A, P2765A, P2791A, P2792A, P2793A, P2794A, P2795A, P3355A, P3362A)	Intel i810 AGPRem.	Yes XFree 3.3.6Rem. (Intel X Server i810)	3Com 905C−TX 10/100 BT	Yes driver 3c59xRem.	None	N/A	Intel 82810 Audio	Yes driver AlsaRem.	No

Table 3−4. Kayak and Linux

Machine	Graphic Card	Linux support	Network Card	Linux support	SCSI Card	Linux support	Sound Card	Linux support	Tested
Kayak XA (D4792A, D4795N)	Cirrus Logic GD 5465 AGPRem.	Yes XFree 3.3.6Rem. (SVGA)	None	N/A	None	N/A	???	???	No
Kayak XA (D4807N, D4796N, D6491N, D6492N, D4806N, D4808N, D6493N)	Cirrus Logic GD 5465 AGPRem.	Yes XFree 3.3.6Rem. (SVGA)	AMD 79C971 (KC 10/100 BT	Yes driver pcnet32	None	N/A	???	???	Yes
Kayak XA (D4798N, D6490N, D4799N, D4803N, D6494N)	Cirrus Logic GD 5465 AGPRem.	Yes XFree 3.3.6Rem. (SVGA)	AMD 79C974 (KC 10/100 BT + SCSI	Yes driver pcnet32	Symbios Logic 8751SP with network card	Yes driver ncr−53c8xx	Analog Device 1816Rem.	Yes driver AD1816Rem.	Yes
Kayak XA (D4796S, D6493S)	Matrox Millenium	Yes XFree	None	N/A	None	N/A	???	???	No

	II AGP	3.3.6[Rem.] (SVGA)								
Kayak XA (D4803S)	Matrox Millenium II AGP	Yes XFree 3.3.6[Rem.] (SVGA)	AMD 79C974 (KC 10/100 BT + SCSI	Yes driver pcnet32	Symbios Logic 8751SP with network card	Yes driver ncr−53c8xx[Rem.]	???	???	No
Kayak XA (D6720N, D6721N, D6723N, D6726N, D6724N, D6730N, D6731N, D6735N, D6736N, D6738N, D6739N, D7994N)	Matrox Millenium G200 AGP	Yes XFree 3.3.6[Rem.] (SVGA)	None	N/A	None	N/A	???	???	No
Kayak XA (D6722N, D6729N, D6734N)	Elsa Gloria Synergy + AGP[Rem.]	Yes XFree 3.3.6[Rem.] (3D Labs)	None	N/A	None	N/A	???	???	Yes
Kayak XA (D6725N, D6732N, D6737N, D7993N)	Matrox Millenium G200 AGP	Yes XFree 3.3.6[Rem.] (SVGA)	AMD 79C971 (KC 10/100 BT + SCSI (D6692A)[Rem.]	Yes driver pcnet32	Symbios Logic 53c875 with network card (D6692A)	Yes driver ncr−53c8xx[Rem.]	???	???	Yes
Kayak XA (D6727N)	Elsa Gloria Synergy + AGP[Rem.]	Yes XFree 3.3.6[Rem.] (3D Labs)	AMD 79C971 (KD 10/100 BT + SCSI (D6692A)[Rem.]	Yes driver pcnet32	Symbios Logic 53c875 with network card (D6692A)	Yes driver ncr−53c8xx[Rem.]	???	???	No
Kayak XA (D6728N, D6733N)	Accel Galaxy AGP	Yes XFree 3.3.6[Rem.] in Frame Buffer mode (FBDEV)[Rem.] Not interesting	None	N/A	None	N/A	???	???	No
Kayak XA−s (D5751N, D5752N, D5753N, D5755N, D5754N, D5756N, D5759N) Chipset BX[Rem.]	Matrox Productiva G100 AGP[Rem.]	Yes XFree 3.3.6[Rem.] (SVGA)	None	N/A	None	N/A	???	???	No
Kayak XA−s (D5757N,	Matrox	Yes	AMD	Yes	Symbios	Yes	???	???	Yes

D5758N) Chipset BX[Rem.]	Productiva G100 AGP[Rem.]	XFree 3.3.6[Rem.] (SVGA)	79C971 KC 10/100 BT + SCSI (D6692A)[Rem.]	driver pcnet32	Logic 53c875 with network card (D6692A)	driver ncr−53c8xx[Rem.]			
Kayak XA−s (D5765N, D5763N, D5766N, D5769N, D7982N, D7986N, D7991N, D7987N) Chipset BX[Rem.]	Matrox Productiva G200 AGP	Yes XFree 3.3.6[Rem.] (SVGA)	None	N/A	None	N/A	???	???	Yes
Kayak XA−s (D5768N, D5767N) Chipset BX[Rem.]	Matrox Productiva G200 AGP	Yes XFree 3.3.6[Rem.] (SVGA)	AMD 79C971 KC 10/100 BT + SCSI (D6692A)[Rem.]	Yes driver pcnet32	Symbios Logic 53c875 with network card (D6692A)	Yes driver ncr−53c8xx[Rem.]	???	???	No
Kayak XA−s (D5762N, D7984N, D7988N) Chipset BX[Rem.]	Elsa Gloria Synergy + AGP[Rem.]	Yes XFree 3.3.6[Rem.] (3D Labs)	AMD 79C971 KC 10/100 BT + SCSI (D6692A)[Rem.]	Yes driver pcnet32	Symbios Logic 53c875 with network card (D6692A)	Yes driver ncr−53c8xx[Rem.]	???	???	Yes
Kayak XA−s (D5764N, D7983N, D7989N) Chipset BX[Rem.]	Accel Galaxy AGP	Yes XFree 3.3.6[Rem.] in Frame Buffer mode (FBDEV)[Rem.] Not interesting	AMD 79C971 KC 10/100 BT + SCSI (D6692A)[Rem.]	Yes driver pcnet32	Symbios Logic 53c875 with network card (D6692A)	Yes driver ncr−53c8xx[Rem.]	???	???	No
Kayak XA−s (D7990N) Chipset BX[Rem.]	Matrox Productiva G100 AGP[Rem.]	Yes XFree 3.3.6[Rem.] (SVGA)	AMD 79C971 KC 10/100 BT + SCSI (D6692A)[Rem.]	Yes driver pcnet32	Symbios Logic 53c875 with network card (D6692A)	Yes driver ncr−53c8xx[Rem.]	???	???	No
Kayak XA−s (D7992N) Chipset BX[Rem.]	Elsa Gloria Synergy II AGP	Yes XFree 3.3.6[Rem.] (SVGA)	AMD 79C971 KC 10/100 BT + SCSI (D6692A)[Rem.]	Yes driver pcnet32	Symbios Logic 53c875 with network card (D6692A)	Yes driver ncr−53c8xx[Rem.]	Analog Device 1816	Yes driver AD1816[Rem.]	Yes

Kayak XM600 (D9531N, D9533N, D9535N, D9541N, D9549N, D9552N, D9553N, D9555N, D9556N, D9557N, D9559N, P1642N, P1645N, P1653N, P1655N, P1658N, P2055N, P2191N, P2202N)	Matrox Millenium G250 AGP	Yes XFree 3.3.6 Rem. (SVGA)	SMC 1211 TX EZ Card 10/100 BT	Yes driver rtl8139	None	N/A	Cirrus Logic CS 4614	Yes driver Alsa Rem.	No
Kayak XM600 (P1650N, P1652N, P1656N)	Matrox Millenium G250 AGP	Yes XFree 3.3.6 Rem. (SVGA)	SMC 1211 TX EZ Card 10/100 BT	Yes driver rtl8139	Symbios Logic 53C895 PCI	Yes driver ncr−53c8xx Rem.	Cirrus Logic CS 4614	Yes driver Alsa Rem.	No
Kayak XM600 (D8350N, D9554N, D9558N) Rem.	Matrox Millenium G250 AGP	Yes XFree 3.3.6 Rem. (SVGA)	SMC 1211 TX EZ Card 10/100 BT	Yes driver rtl8139	None	N/A	Cirrus Logic CS 4614	Yes driver Alsa Rem.	No
Kayak XM600 (P2054N) Rem.	Matrox Millenium G400D AGP	Yes XFree 3.3.6 Rem. (SVGA)	None	N/A	None	N/A	Cirrus Logic CS 4614	Yes driver Alsa Rem.	No
Kayak XM600 (D9563N)	Matrox Millenium G400D AGP	Yes XFree 3.3.6 Rem. (SVGA)	None	N/A	None	N/A	Cirrus Logic CS 4614	Yes driver Alsa Rem.	No
Kayak XM600 (D9536N, D9537N, D9538N, D9544N, D9548N, P1646N, P1648N, P2192N, P2193N, P2203N, P2204N, P2204N, P2192N, P2193N)	Matrox Millenium G400D AGP	Yes XFree 3.3.6 Rem. (SVGA)	SMC 1211 TX EZ Card 10/100 BT	Yes driver rtl8139	None	N/A	Cirrus Logic CS 4614	Yes driver Alsa Rem.	No
Kayak XM600 (D9539N, D9565N, P1651N, P1657N, P2190N, P2194N)	Matrox Millenium G400D AGP	Yes XFree 3.3.6 Rem. (SVGA)	SMC 1211 TX EZ Card 10/100 BT	Yes driver rtl8139	Symbios Logic 53C895 PCI	Yes driver ncr−53c8xx Rem.	Cirrus Logic CS 4614	Yes driver Alsa Rem.	No
Kayak XM600 (D9550N, D9567N)	Elsa Gloria	Yes XFree	SMC 1211	Yes driver	None	N/A	Cirrus Logic	Yes driver	Yes

	Synergy II AGP	3.3.6[Rem.] (SVGA)	TX EZ Card 10/100 BT	rtl8139			CS 4614	Alsa[Rem.]	
Kayak XM600 (D9534N, D9540N, D9543N, D9546N, D9564N, P1644N, P1647N, P1649N, P2053N, P2056N, P2195N, P2210N, P2211N)	Elsa Gloria Synergy II AGP	Yes XFree 3.3.6[Rem.] (SVGA)	SMC 1211 TX EZ Card 10/100 BT	Yes driver rtl8139	Symbios Logic 53C895 PCI	Yes driver ncr−53c8xx[Rem.]	Cirrus Logic CS 4614	Yes driver Alsa[Rem.]	Yes
Kayak XM600 (D9545N, D8366N)	3DLabs Oxygen GVX1 AGP	Yes XFree 3.3.6[Rem.] in Frame Buffer mode (FBDEV)[Rem.]	SMC 1211 TX EZ Card 10/100 BT	Yes driver rtl8139	Symbios Logic 53C895 PCI	Yes driver ncr−53c8xx[Rem.]	Cirrus Logic CS 4614	Yes driver Alsa[Rem.]	Yes
Kayak XU (D4691N, D4692N, D4695N, D4701N, D4693N, D4694N, D4702N, D4705N)	Matrox Millenium II PCI	Yes XFree 3.3.6[Rem.] (SVGA)	AMD 79C971 KC 10/100 BT	Yes driver pcnet32	Adaptec AIC 7860 PCI + Adaptec AIC 7880 UW PCI	Yes driver aic7xxx[Rem.]	???	???	Yes
Kayak XU (D5680N, D5682N, D5683N, D5684N) Chipset BX[Rem.]	Matrox Millenium II PCI	Yes XFree 3.3.6[Rem.] (SVGA)	AMD 79C971 KC 10/100 BT	Yes driver pcnet32	Adaptec AIC 7860 PCI + Adaptec AIC 7880 UW PCI	Yes driver aic7xxx[Rem.]	Analog Device 1816	Yes driver AD1816[Rem.]	Yes
Kayak XU (D5702, D5704, D5686N, D6336N, D6348N, D8431N, D8920N)	Matrox Millenium G200 AGP	Yes XFree 3.3.6[Rem.] (SVGA)	AMD 79C972 10/100 BT + SCSI (D6692A)[Rem.]	Yes driver pcnet32	Symbios Logic 53c875 with network card (D6692A) + Adaptec AIC 7880 PCI	Yes driver ncr53c8xx and driver aic7xxx	???	???	Yes
Kayak XU (D5687N,	Elsa	Yes	AMD	Yes	Symbios	Yes	???	???	No

D6333N, D6334N, D8432N, D6345N, D8923N)	Gloria Synergy + AGP[Rem.]	XFree 3.3.6[Rem.] (3D Labs)	79C972 10/100 BT + SCSI (D6692A)[Rem.]	driver pcnet32	Logic 53c875 with network card (D6692A) + Adaptec AIC 7880 PCI	driver ncr53c8xx and driver aic7xxx			
Kayak XU (D6337N, D6346N)	Accel Galaxy AGP	Yes XFree 3.3.6[Rem.] in Frame Buffer mode (FBDEV)[Rem.] Not interesting	AMD 79C972 10/100 BT + SCSI (D6692A)[Rem.]	Yes driver pcnet32	Symbios Logic 53c875 with network card (D6692A) + Adaptec AIC 7880 PCI	Yes driver ncr53c8xx and driver aic7xxx	???	???	No
Kayak XU (D6347N)	Matrox Productiva G100 AGP[Rem.]	Yes XFree 3.3.6[Rem.] (SVGA)	AMD 79C972 10/100 BT + SCSI (D6692A)[Rem.]	Yes driver pcnet32	Symbios Logic 53c875 with network card (D6692A) + Adaptec AIC 7880 PCI	Yes driver ncr53c8xx and driver aic7xxx	???	???	No
Kayak XU (D8924N)	Matrox Millenium G400D AGP	Yes XFree 3.3.6[Rem.] (SVGA)	AMD 79C972 10/100 BT + SCSI (D6692A)[Rem.]	Yes driver pcnet32	Symbios Logic 53c875 with network card (D6692A) + Adaptec AIC 7880 PCI	Yes driver ncr53c8xx and driver aic7xxx	???	???	No
Kayak XU800 (D8019N) [Rem.]	Matrox Millenium	Yes XFree	SMC 1211	Yes driver	None	N/A	Cirrus Logic	Yes driver	No

	G250 AGP	3.3.6 Rem. (SVGA)	TX EZ Card 10/100 BT	rtl8139			CS 4614	Alsa Rem.	
Kayak XU800 (D8021N, P1586N, P1661N) Rem.	Matrox Millenium G400D AGP	Yes XFree 3.3.6 Rem. (SVGA)	SMC 1211 TX EZ Card 10/100 BT	Yes driver rtl8139	None	N/A	Cirrus Logic CS 4614	Yes driver Alsa Rem.	No
Kayak XU800 (D8000N, D8001N) Rem. Rem.	Matrox Millenium G250 AGP	Yes XFree 3.3.6 Rem. (SVGA)	SMC 1211 TX EZ Card 10/100 BT	Yes driver rtl8139	Symbios Logic 53C895 PCI	Yes driver ncr−53c8xx Rem.	Cirrus Logic CS 4614	Yes driver Alsa Rem.	No
Kayak XU800 (D8002N, D8010N, D8016N, P1585N, P1589N, P1663N, P1664N, P1668N) Rem.	Matrox Millenium G250 AGP	Yes XFree 3.3.6 Rem. (SVGA)	SMC 1211 TX EZ Card 10/100 BT	Yes driver rtl8139	Symbios Logic 53C895 PCI	Yes driver ncr−53c8xx Rem.	Cirrus Logic CS 4614	Yes driver Alsa Rem.	No
Kayak XU800 (D8003N, D8006N, D8012N, P1587N, P1665N, P1669N) Rem.	Matrox Millenium G400D AGP	Yes XFree 3.3.6 Rem. (SVGA)	SMC 1211 TX EZ Card 10/100 BT	Yes driver rtl8139	Symbios Logic 53C895 PCI	Yes driver ncr−53c8xx Rem.	Cirrus Logic CS 4614	Yes driver Alsa Rem.	Yes
Kayak XU800 (P1667N) Rem. Rem.	Matrox Millenium G400D AGP	Yes XFree 3.3.6 Rem. (SVGA)	SMC 1211 TX EZ Card 10/100 BT	Yes driver rtl8139	Symbios Logic 53C895 PCI	Yes driver ncr−53c8xx Rem.	Cirrus Logic CS 4614	Yes driver Alsa Rem.	No
Kayak XU800 (D8007N, D8013N, D8020N, D8022N, P1588N, P1590N, P1662N, P3220N, P3221N) Rem.	Elsa Gloria Synergy II AGP	Yes XFree 3.3.6 Rem. (SVGA)	SMC 1211 TX EZ Card 10/100 BT	Yes driver rtl8139	Symbios Logic 53C895 PCI	Yes driver ncr−53c8xx Rem.	Cirrus Logic CS 4614	Yes driver Alsa Rem.	No
Kayak XU800 (D8009N, D8015N) Rem.	3DLabs Oxygen GVX1 AGP	Yes XFree 3.3.6 Rem. in Frame Buffer mode (FBDEV) Rem.	SMC 1211 TX EZ Card 10/100 BT	Yes driver rtl8139	Symbios Logic 53C895 PCI	Yes driver ncr−53c8xx Rem.	Cirrus Logic CS 4614	Yes driver Alsa Rem.	Yes

Kayak XW (D6475N)	Elsa Gloria Synergy[Rem.]	Yes XFree 3.3.6[Rem.] (KD Labs)	AMD 79C971 KC 10/100 BT	Yes driver pcnet32	Adaptec AIC 7860 PCI + Adaptec AIC 7880 UW PCI	Yes driver aic7xxx[Rem.]	???	???	No
Kayak XW (D5505N, D5507N, D5509N)	Accel Eclipse PCI	Yes XFree 3.3.6[Rem.] in Frame Buffer mode (FBDEV)[Rem.] Not interesting	AMD 79C971 KC 10/100 BT	Yes driver pcnet32	Adaptec AIC 7860 PCI + Adaptec AIC 7880 UW PCI	Yes driver aic7xxx[Rem.]	???	???	No
Kayak XW (D5510N, D5514N, D6485N)	HP Fx−4 AGP	No XFree 3.3.6[Rem.] in Frame Buffer mode (FBDEV)[Rem.] Not interesting	AMD 79C971 KC 10/100 BT	Yes driver pcnet32	Adaptec AIC 7860 PCI + Adaptec AIC 7880 UW PCI	Yes driver aic7xxx[Rem.]	???	???	No
Kayak XW (D6480N, D6481N, D6482N) Chipset BX[Rem.]	Accel Eclipse PCI	Yes XFree 3.3.6[Rem.] in Frame Buffer mode (FBDEV)[Rem.] Not interesting	???	???	???	???	???	???	No
Kayak XW (D6797N)	HP Fx−6 AGP	No XFree 3.3.6[Rem.] in Frame Buffer mode (FBDEV)[Rem.] Not interesting	???	???	???	???	???	???	No
Kayak XW (D6486N, D6487N, D6488N) Chipset BX[Rem.]	HP Fx−4 AGP	No XFree 3.3.6[Rem.] in Frame Buffer mode (FBDEV)[Rem.] Not interesting	???	???	???	???	???	???	No

The health monitoring system HP Kayak Maxilife, available on the whole Kayak range, is supported by Linux with the tool Lm_sensors

Table 3−5. Visualize and Linux

Machine	Graphic Card	Linux support	Network Card	Linux support	SCSI Card	Linux support	Sound Card	Linux support	Tested
Visualize P (A5015A) Chipset BX Rem.	Elsa Gloria Synergy + AGP Rem.	Yes XFree 3.3.6 Rem. (3D Labs)	???	???	???	???	Analog Device 1816	Yes driver AD1816 Rem.	No
Visualize P (A1296A) Chipset BX Rem.	Elsa Gloria Synergy II AGP	Yes XFree 3.3.6 Rem. (SVGA)	???	???	???	???	Analog Device 1816	Yes driver AD1816 Rem.	No
Visualize X (A5014A) Chipset BX Rem.	Elsa Gloria Synergy II AGP	Yes XFree 3.3.6 Rem. (SVGA)	???	???	???	???	Analog Device 1816	Yes driver AD1816 Rem.	No
Visualize X (A1297A) Chipset BX Rem.	Elsa Gloria Synergy + AGP Rem.	Yes XFree 3.3.6 Rem. (3D Labs)	???	???	???	???	Analog Device 1816	Yes driver AD1816 Rem.	No
Visualize X (A1280A)	Elsa Gloria Synergy II AGP	Yes XFree 3.3.6 Rem. (SVGA)	???	???	???	???	Analog Device 1816	Yes driver AD1816 Rem.	No

A page dedicated to these machines and their support under Linux is available at the following address :

A page of questions and answers on these machines is also available at the following address :

In particular, it's recommended to use a kernel 2.2.16 at least to support correctly the SCSI controller of these machines.

A beta X server for the FX2+, FX4+ and FX6+ cards is available at the following address :

3.2.1.2. Desktop computer accessories

The following table provides all of the informations on the support for this hardware by Linux.

Table 3−6. Desktop computer accessories

Reference	Card type	Chipset	Linux support	Tested
D5480A	FastRaid Card	Adaptec ARO Raidport	No	No
D6690A	FastRaid Card	Adaptec ARO Raidport	No	No
D6951A	SCSI Card	Adaptec AIC 7880 UW PCI	Yes driver aic7xxx[Rem.]	Yes
D9528A	SCSI Card	Symbios Logic 8952U Ultra2 Wide PCI	???	No
D9529A	SCSI Card	Symbios Logic 53C895 PCI	Yes driver ncr−53c8xx[Rem.]	Yes
D9663A	SCSI Card	Symbios Logic 53C895 PCI	Yes driver ncr−53c8xx[Rem.]	Yes
D9561A	SCSI Card	???	???	No
D6936A	Network Card	AMD 79C972 AKC 10/100 BT	Yes driver pcnet32	Yes
D7504A	Network Card	3Com 905B−TX 10/100 BT[Rem.]	Yes driver 3c59x[Rem.]	Yes
D7506A	Network Card	???	???	No
D7508A	Network Card	???	???	No
D7522A	Network Card	3Com 905C−TX 10/100 BT	Yes driver 3c59x[Rem.]	Yes
D7531A	Network Card	Carte HP chipset RealTek	Yes driver RealTek	Yes
D6657A	Sound Card	???	???	No
D5183A	Sound Card	???	???	No
P1552A	Video Card	Matrox Millenium G250 AGP	Yes XFree 3.3.6[Rem.] (SVGA)	Yes
D9521A	Video Card	Matrox Millenium G400D AGP	Yes XFree 3.3.6[Rem.] (SVGA)	Yes
D9509A, D9522A, D9522B	Video Card	Elsa Gloria Synergy II AGP	Yes XFree 3.3.6[Rem.] (SVGA)	Yes
D9523A	Video Card	3DLabs Oxygen GVX1 AGP	Yes XFree 3.3.6[Rem.] in Frame Buffer mode (FBDEV)[Rem.]	Yes

CD−ROM, DVD and ZIP drives are supported by Linux kernel. Read the various HOWTO for their use, following the interface type.

3.2.1.3. The portable range (OmniBook)

The following table provides all of the informations on the support for this hardware by Linux.

Table 3−7. OmniBook and Linux

Machine	**Graphic Card**	**Linux support**	**Network Card**	**Linux support**	**SCSI Card**	**Linux support**	**Sound Card**	**Linux support**	**Tested**
OmniBook Sojourn (F1430A)	Neomagic MagicGraph 128XD NM2160	Yes XFree 3.3.6 Rem. (SVGA)	None	N/A	None	N/A	???	???	No
OmniBook XE (F1719W, F1720W, F1721W, F1722W) Rem.	Silicon Motion LynxE SM810 Rem.	Yes XFree 3.3.6 Rem. (SVGA)	None	N/A	None	N/A	ESS Maestro 2	Yes driver maestro Rem.	Yes
OmniBook XE2 (F1664W, F1666W, F1666N, F1667W, F1667N, F1674W, F1675W, F1753W, F1756W, F1755W, F1755N, F1772W, F1774N, F1774W, F1775N, F1775W, F1962W, F2051W, F2052W, F2052K, F2053W, F2053K, F2055W, F2055K, F2065W, F2065K, F2068W, F2069W, F2069K) Rem.	Silicon Motion LynxE SM810 Rem.	Yes XFree 3.3.6 Rem. (SVGA)	None	N/A	None	N/A	ESS Maestro 3	No Rem.	Yes
OmniBook XE3 (F2113W, F2113K, F2114W, F2114K) Rem. Rem.	S3 Savage AGP Rem.	Yes XFree 3.3.6 Rem. (S3 X Server Savage)	Accton EN2242 minipci	Yes driver tulip	None	N/A	ESS Maestro 3	No Rem.	Yes
OmniBook XE3 (F2115W, F2115K, F2116W, F2116K, F2117W, F2117K) Rem. Rem.	S3 Savage AGP Rem.	Yes XFree 3.3.6 Rem. (S3 X Server Savage)	Accton EN2242 minipci	Yes driver tulip	None	N/A	ESS Maestro 3	No Rem.	Yes
OmniBook 600 ()	Chips & Technologies CT65545	Yes XFree 3.3.6 Rem. (SVGA)	None	N/A	None	N/A	???	???	No

OmniBook 800 (F1360A, F1175A, F1174A, F1173A, F1172A, F1171A)	Neomagic MagicGraph 128XD NM2160	Yes XFree 3.3.6 [Rem.]	None (SVGA)	N/A	SCSI Card	Yes driver ncr−53c8xx [Rem.]	SoundBlaster compatible	Yes driver sb	Yes
OmniBook 900 (F1711W, F1712W, F1760W, F1711N, F1712N, F1765N)	Neomagic MagicGraph 256AV NM2200	Yes XFree 3.3.6 [Rem.]	None (SVGA)	N/A	None	N/A	Analog Device 1848	Yes driver AD1848	Yes
OmniBook 900 (F1769W, F1769N, F1769K, F1770W, F1770N, F1770K, F1979W, F1979N, F1979K, F1980W, F1980N, F1980K, F2007W, F2007N, F2007K)	ATI Rage Mobility	Yes XFree 3.3.6 [Rem.] Frame Buffer mode (FBDEV) [Rem.]	None in [Rem.]	N/A	None	N/A	ESS Maestro 2	Yes driver maestro [Rem.]	Yes
OmniBook 2000 (F1356A, F1397A)	Chips & Technologies CT65554	Yes XFree 3.3.6 [Rem.]	None (SVGA)	N/A	None	N/A	???	???	No
OmniBook 2100 (F1584W, F1580W, F1581W, F1597W, F1598W, F1599W, F1600W, F1729W)	Neomagic MagicGraph 128XD NM2160	Yes XFree 3.3.6 [Rem.]	None (SVGA)	N/A	None	N/A	Crystal CS 4232	Yes	Yes
OmniBook 3000 (F1391A, F1392A, F1393A)	Neomagic MagicGraph 128XD NM2160	Yes XFree 3.3.6 [Rem.]	None (SVGA)	N/A	None	N/A	Crystal CS 4232	Yes	No
OmniBook 3100 (F1582W)	Neomagic MagicGraph 128XD NM2160	Yes XFree 3.3.6 [Rem.]	None (SVGA)	N/A	None	N/A	SoundBlaster compatible	Yes driver sb	No
OmniBook 4000 ()	WD90C24 PCI	Yes XFree 3.3.6 [Rem.]	None (SVGA)	N/A	None	N/A	???	???	No
OmniBook 4100 (F1462W, F1463W, F1479W, F1464W, F1703W)	Neomagic MagicGraph 128XD NM2160	Yes XFree 3.3.6 [Rem.]	None (SVGA)	N/A	None	N/A	???	???	Yes
OmniBook 4150 (F1629W, F1640W, F1641W, F1642W, F1629N, F1640N, F1641N,	Neomagic MagicGraph 256AV NM2200	Yes XFree 3.3.6 [Rem.]	None (SVGA)	N/A	None	N/A	???	???	Yes

F1642N, F1647W, F1647N, F1648W, F1648N, F1663W, F1663N)									
OmniBook 4150 (F1649W, F1649N, F1649K, F1650W, F1650N, F1650K, F1658W, F1658N, F1660W, F1660N, F1662W, F1662N, F1662K, F1976W, F1976N, F1976K, F1983W, F1983N, F1983K, F2000W, F2000N, F2000K,)	ATI Rage Mobility	Yes XFree 3.3.6 Rem. in Frame Buffer mode (FBDEV) Rem. Rem.	None	N/A	None	N/A	ESS Maestro 2	Yes driver maestro Rem.	Yes
OmniBook 5000 ()	Chips & Technologies CT65545	Yes XFree 3.3.6 Rem. (SVGA)	None	N/A	None	N/A	Crystal CS 4232	Yes	Yes
OmniBook 5500 ()	Chips & Technologies CT65548	Yes XFree 3.3.6 Rem. (SVGA)	None	N/A	None	N/A	Crystal CS 4232	Yes	Yes
OmniBook 5700 (F1352A, F1353A, F1396A, F1354A, F1355A)	Chips & Technologies CT65554	Yes XFree 3.3.6 Rem. (SVGA)	None	N/A	None	N/A	???	???	Yes
OmniBook 6000 (F2072W, F2072K, F2079W, F2079K, F2081W, F2081K, F2083W, F2083K, F2087W, F2087K, F2090W, F2090K, F2140W, F2140K, F2144W, F2144K, F2148W, F2148K, F2150W, F2150K, F2186W, F2186K, F2182W, F2182K, F2184W, F2184K)	ATI Rage Mobility	Yes XFree 3.3.6 Rem. in Frame Buffer mode (FBDEV) Rem. Rem.	3Com 3C556 10/100 BT	Yes driver Rem.	None	N/A	ESS Maestro 3	No Rem.	Yes
OmniBook 7100 (F1441W, F1442W)	ATI Rage LT Pro	Yes XFree 3.3.6 Rem. (Mach 64)	None	N/A	None	N/A	???	???	Yes
OmniBook 7150 (F1443W)	ATI Rage	Yes XFree	None	N/A	None	N/A	ESS Maestro	Yes driver	No

	LT Pro	3.3.6 Rem. 64)	(Mach				2	maestro Rem.	

3.2.1.4. Portable accessories

The cards mentionned below are PCMCIA or PC−Card cards.

The following table provides all of the informations on the support for this hardware by Linux.

Table 3−8. Portable accessories

Reference	Card type	Chipset	Linux support	Tested
F1623A	Modem/Net Card	Xircom CEM56−100 56Kb 10/100 BT	Yes driver xirc2ps_cs	Yes
F1625A	Modem Card	???	???	No
F1626A	Network Card	3Com 3CXFE575BT 10/100 BT	???	No
F1626B	Network Card	???	???	No
F1643A	Modem/Net Card	???	???	No
F1782A	Modem/Net Card	???	???	No

3.2.1.5. The server range (NetServer)

A page on how Linux works on HP NetServers is available at

An official compatibility matrix of HP NetServers with Linux and other operating systems is available at :

Official documents to help configuring NetServers under Linux RedHat 5.2 and 6.0 are also available.

The following table provides all of the informations on the support for this hardware by Linux.

Table 3−9. NetServers and Linux

Machine	Graphic Card	Linux support	Network Card	Linux support	SCSI Card	Linux support	Sound Card	Linux support	Tested
NetServer E45 (D4973A, D4974A, D4975A, D4976A, D5971A)	Cirrus Logic GD 5446 PCI	Yes XFree 3.3.6 Rem.	Intel i82557 / i82558 10/100 BT (D5013A/B)	Yes driver eepro−100	Adaptec AIC 2910bui (7860) PCI	Yes driver aic7xxx Rem.	None	N/A	No

NetServer E50 (D6034A, D6033A, D6035A, D6031A, D6030A, D6032A)	Cirrus Logic GD 5446 PCI	Yes XFree 3.3.6[Rem.] (SVGA)	Intel i82557 / i82558 10/100 BT (D5013A/B)	Yes driver eepro-100	Adaptec AIC 7880 UW PCI	Yes driver aic7xxx[Rem.]	None	N/A	Yes
NetServer E55 (D9337A)	ATI Rage II C AGP	Yes XFree 3.3.6[Rem.] (Mach 64)	Intel S82093AA / i82559 10/100 BT	Yes driver eepro-100	Adaptec AIC 7895H PCI	Yes driver aic7xxx[Rem.]	None	N/A	No
NetServer E60 (D7140A, D7142A, D7144A, D7146A, D7148A, D9123A, D9127A, D9128A, D9129A)	ATI Rage II C AGP	Yes XFree 3.3.6[Rem.] (Mach 64)	Intel S82093AA / i82559 10/100 BT	Yes driver eepro-100	Adaptec AIC 7895H PCI	Yes driver aic7xxx[Rem.]	None	N/A	Yes
NetServer E200 (P1205A, P2448A)	ATI Rage II C AGP	Yes XFree 3.3.6[Rem.] (Mach 64)	Intel i82557 / i82558 10/100 BT (D5013A/B)	Yes driver eepro-100	Adaptec AIC 7880 UW PCI	Yes driver aic7xxx[Rem.]	None	N/A	No
NetServer E800 (D9400A, D9402A, D9404A, D9408A, D9409, D9411A, P2457A, P2458A, P2460A, P3432A)	ATI Rage II C AGP	Yes XFree 3.3.6[Rem.] (Mach 64)	Intel S82093AA / i82559 10/100 BT	Yes driver eepro-100	2 Symbios Logic 53C896 PCI	Yes driver ncr-53c8xx[Rem.]	None	N/A	Yes
NetServer LCII (D4907A, D4909A, D5014A, D5015A, D5016A, D5969A, D5970A, D5959A, D5961A)	Cirrus Logic GD 5446 PCI	Yes XFree 3.3.6[Rem.] (SVGA)	Intel i82557 / i82558 10/100 BT (D5013A/B)	Yes driver eepro-100	Adaptec AIC 7880 UW PCI	Yes driver aic7xxx[Rem.]	None	N/A	Yes
NetServer LC3 (D6123A, D7018A, D6125A, D7020A, D7028A, D7025A, D7126A, D8594A) Chipset BX[Rem.]	Cirrus Logic GD 5446 PCI	Yes XFree 3.3.6[Rem.] (SVGA)	Intel i82557 / i82558 10/100 BT (D5013A/B)	Yes driver eepro-100	Adaptec AIC 7880 UW PCI	Yes driver aic7xxx[Rem.]	None	N/A	Yes
NetServer LC2000 (D8514A, D8515A, D8519A, D8520A, D8524A, D8525A, D9162A, D9163A, D9164A, D9165A,	ATI Rage II C AGP	Yes XFree 3.3.6[Rem.] (Mach 64)	Intel S82093AA / i82559 10/100 BT	Yes driver eepro-100	2 Symbios Logic 53C897 PCI	Yes driver ncr-53c8xx[Rem.]	None	N/A	Yes

P1802A, P1804A, P2478A, P2479A) Chipset i820[Rem. Rem.]									
NetServer LDPro (D4944A, D4946A, D4961A, D4962A)	Trident TVGA 9000i	Yes XFree 3.3.6[Rem.] (SVGA)	Intel i82557 / i82558 10/100 BT (D5013A/B)	Yes driver eepro−100	Adaptec AIC 7880 UW PCI	Yes driver aic7xxx[Rem.]	None	N/A	No
NetServer LHPro (D4979A, D4980A, D4981A, D4982A)	Trident TVGA 9000i	Yes XFree 3.3.6[Rem.] (SVGA)	None	N/A	2 Adaptec AIC 7880 UW PCI	Yes driver aic7xxx[Rem.]	None	N/A	Yes
NetServer LHII (D5017A, D5953A, D5021A, D5023A, D6047A, D6048A)	Trident TVGA 9000i	Yes XFree 3.3.6[Rem.] (SVGA)	None	N/A	2 Adaptec AIC 7880 UW PCI	Yes driver aic7xxx[Rem.]	None	N/A	Yes
NetServer LH3 (D4998A, D5002A, D5000A, D5004A, D7033A, D7034A, D8503A, D8504A, D8567A, D8568A, D9343A, D9344A) Chipset BX[Rem. Rem.]	Cirrus Logic GD 5446 PCI	Yes XFree 3.3.6[Rem.] (SVGA)	Intel i82557 / i82558 10/100 BT (D5013A/B)	Yes driver eepro−100	2 Symbios Logic 53C895 PCI	Yes driver ncr−53c8xx[Rem.]	None	N/A	Yes
NetServer LH3000 (D8228A, D8230A, D8236A, D8238A, D8244A, D8246A, D9176A, D9178A, D9180A, D9182A, P1794A, P1796A, P2482A, P2483A) Chipset BX[Rem. Rem.]	ATI Rage II C AGP	Yes XFree 3.3.6[Rem.] (Mach 64)	Intel S82093A / i82559 10/100 BT	Yes driver eepro−100	Adaptec AIC 7880 PCI + 2 Symbios Logic 53C896 PCI	Yes driver aic7xxx and driver ncr53c8xx	None	N/A	Yes
NetServer LH4 (D7092A, D7093A, D7094A, D7095A, D6971A, D6972A, D6973A, D6974A, D7103A, D7104A, D8552A, D8553A, D8556A, D8557A, D8560A, D8561A, P1225A, P1227A) Chipset BX[Rem. Rem.Rem. Rem.]	Cirrus Logic GD 5446 PCI	Yes XFree 3.3.6[Rem.] (SVGA)	Intel i82557 / i82558 10/100 BT (D5013A/B)	Yes driver eepro−100	2 Symbios Logic 53C895 PCI	Yes driver ncr−53c8xx[Rem.]	None	N/A	Yes

NetServer LH6000 (D9103A, D9104A, D9107A, D9108A, D9190A, D9192A, D9194A, D9196A, P2622A, P2623A) Chipset BX[Rem.] [Rem.] [Rem.] [Rem.]	ATI Rage II C AGP	Yes XFree 3.3.6[Rem.] (Mach 64)	Intel S82093A / i82559 10/100 BT	Yes driver eepro−100	Adaptec AIC 7880 PCI + 2 Symbios Logic 53C896 PCI	Yes driver aic7xxx and driver ncr53c8xx	None	N/A	Yes
NetServer LPr (D6130A, D6131A, D7171A, D9133A, D9348A, D9431A, D9434A, P1736A, P1738A, P1820A, P3417A) Chipset BX[Rem.]	Cirrus Logic GD 5446 PCI	Yes XFree 3.3.6[Rem.] (SVGA)	Intel i82557 / i82558 10/100 BT (D5013A/B)	Yes driver eepro−100	Symbios Logic 53C895 PCI	Yes driver ncr−53c8xx[Rem.]	None	N/A	Yes
NetServer LP1000r (P1810A, P1812A, P2465A) [Rem.]	ATI Rage II C AGP	Yes XFree 3.3.6[Rem.] (Mach 64)	2 x Intel i82559 10/100 BT	Yes driver eepro−100	2 Symbios Logic 53C1010 PCI	Yes driver ncr−53c8xx[Rem.]	None	N/A	Yes
Cluster NetServer LPr (D6131A, P1133A)[Rem.]	Cirrus Logic GD 5446 PCI	Yes XFree 3.3.6[Rem.] (SVGA)	Intel i82557 / i82558 10/100 BT (D5013A/B)	Yes driver eepro−100	Symbios Logic 53C895 PCI	Yes driver ncr−53c8xx[Rem.]	None	N/A	Yes
NetServer LT6000r (D9143A, D9145A, P1756A, P1758A, P2621A, P3460) Chipset BX[Rem.] [Rem.] [Rem.] [Rem.]	ATI Rage II C AGP	Yes XFree 3.3.6[Rem.] (Mach 64)	Intel S82093A / i82559 10/100 BT	Yes driver eepro−100	Adaptec AIC 7880 PCI + 2 Symbios Logic 53C896 PCI	Yes driver aic7xxx and driver ncr53c8xx	None	N/A	Yes
NetServer LXePro/LXPro (D4920B, D4925B, D6036A, D4311B, D4312B, D6037A, D4315B, D4958B, D6014A, D6015A, D4964B, D4898A, D6016A, D4899A, D6017A, D4900A, D6018A)	Cirrus Logic GD 5424 PCI	Yes XFree 3.3.6[Rem.] (SVGA)	None	N/A	2 Adaptec AIC 7880 UW PCI	Yes driver aic7xxx[Rem.]	None	N/A	No
NetServer LXrPro8 (D5028A)	?	?	None	N/A	Symbios logic	?	None	N/A	No

					UW				
NetServer LXr8000 (D6021A, D6022A, D6136A, D6137A, D7000A, D8256A, D8257A, D8258A, D8546A, D8548A) Rem.	Cirrus Logic GD 5446 PCI	Yes XFree 3.3.6Rem.	None (SVGA)	N/A	2 Symbios Logic 53C896 PCI	Yes driver ncr−53c8xxRem.	None	N/A	Yes
NetServer LXr8500 (D8540A, D8542A, D9317A, D9417A, D9418A, P1230A, P1765A, P3461A) Rem.	Cirrus Logic GD 5446 PCI	Yes XFree 3.3.6Rem.	None (SVGA)	N/A	2 Symbios Logic 53C896 PCI	Yes driver ncr−53c8xxRem.	None	N/A	No

3.2.1.6. NetServers accessories

The following table provides all of the informations on the support for this hardware by Linux.

Table 3−10. NetServers accessories

Reference	Card type	Chipset	Linux support	Tested
NetRaid 1 D4992A	NetRaid Card	AMI Megaraid (Raid 0, 1, 3, 5, 10, 50)	Yes driver megaraidRem.	Yes
NetRaid 3 D4943A	NetRaid Card	AMI Megaraid (Raid 0, 1, 3, 5, 10, 50)	Yes driver megaraidRem.	Yes
NetRaid 1Si D2140A	NetRaid Card	AMI Megaraid (Raid 0, 1, 3, 5, 10, 50)	Yes driver megaraidRem.	Yes
NetRaid 3Si D5955A	NetRaid Card	AMI Megaraid (Raid 0, 1, 3, 5, 10, 50)	Yes driver megaraidRem.	Yes
NetRaid 4M D9161A/D9351A	NetRaid Card	Strong ARM (Raid 0, 1, 3, 5, 10, 50)	No Rem.	Yes
C1578B	SCSI Card	Adaptec AIC 7895H PCI	Yes driver aic7xxxRem.	No
C7430A	SCSI Card	Adaptec AIC 7880 UW PCI	Yes driver aic7xxxRem.	No
D5025A	SCSI Card	Adaptec AIC 7880 UW PCI	Yes driver aic7xxxRem.	Yes
D5252A	SCSI Card	Adaptec AIC 7880 UWD PCI	Yes driver aic7xxxRem.	Yes
P3413A	SCSI Card	???	???	No
D5013A, D5013B	Network Card	Intel i82557 / i82558 10/100 BT (D5013A/B)	Yes driver eepro−100	Yes

J2585B	Network Card	Carte 100VG (J2585B)	Yes driver hp100	Yes
D6977A	Fibre Channel Card	???	???	No
D5246A	Fibre Channel Card	???	???	No
D8602A	Fibre Channel Card	???	???	No
D8602B	Fibre Channel Card	???	???	No
D6028A	Top Tools Card	???	Yes	Yes

3.2.1.7. Complementary informations

Please refer to the Hardware Howto and Ethernet Howto for other details concerning the support of some hardware elements by Linux.

For video chipsets support, a fundamental page is the one of XFree86 with its supported chipsets list and the new running developments by Suse (Think, in that case, to download also the configuration tool) and RedHat at the following addresses :

•

Commercial servers are also available, as those of X−Inside and MetroLink

Netvectra are not supported by Linux.

Driver supporting the HP GPIB cards (IEEE 488) HP 27209 (= HP 82990, HP 61062, HP 88500) and HP 82335 is available at the following address :

3.2.1.7.1. Remarks

XFree86

The latest version of XFree86 is the 3.3.6, available from our mirror.

G100 card

To use the MGA G100 AGP card, with a version of XFree86 before the 3.3.2 one, you have to use an option in the file `XF86Config` : Option "no_accel".

Section example :

```
Section "Device"
[...]
      VendorName "Matrox"
      VideoRam 4096
      Option "no_accel"
EndSection
```

ATI Rage Mobility video card

The maximum resolution supported by vthis chipset in frame−buffer mode is 800x600 in 16 bpp

(vga=0x315 in `/etc/lilo.conf`)

This chipset is also supported by XFree 3.3.6 with the Mach64 driver and a patch available at .

A precompiled X server is available at this address : .

GD 5465 video card

To use a Cirrus Logic GD 5465 AGP card, with a version below Xfree86 3.3.3, you have to use an option in the file `XF86Config` : Option "xaa_no_color_exp".

Section example :

```
Section "Device"
[...]
       Identifier "CL-GD5465"
       VendorName "Cirrus"
       BoardName  "GD5465"
       VideoRam   2048
       Option     "xaa_no_color_exp"
EndSection
```

Some users who had problems with the support of this chipset were more satisfied with the use of the "sw_cursor" option.

Elsa Gloria Synergy card

Specifications of that card should be consulted on Elsa web site. This card is equiped with an hardware OpenGL accelerator. Under Linux, there is an OpenGL compatible layer called Mesa. This layer begins to support hardware accelerators, and among them the 3DLabs chipset which is on Elsa Gloria cards.

- ♦ Elsa web site
- ♦ OpenGL web site
- ♦ Mesa web site

Silicon Motion LynxE card

This card is only supported from the 3.3.6 version of XFree86. Nevertheless, even in that version, this is a preliminary support, which isn't as stable as the Frame Buffer mode.

On the other hand, to be able to install a RedHat 6.1 version, you should do that in text mode, because the server provided (3.3.5) doesn't support this card.

If you have a dual−boot system, booting first on Windows, and initialize the card through its driver seems to improve the oprations then under Linux (warm reboot).

Intel i810/i815 card

(Informations provided by Frédéric Dubuy `<F.Dubuy@atrid.fr>`, Anne−Marie Mahfouf `<a-m.mahfouf@lineone.net>` and Jean−Bernard Chaffardon `<Jean-Bernard_Chaffardon@hp.com>`)

These cards are only supported with a specific X server XFCom_i810/5 downloadable in both format RPM or tar.gz and a complementary module for the kernel agpgart, downloadable in both format SRPM or tar.gz (old).

Detailed documentations on the installation are provided at and

To summarize, once the X server installed, the module compiled and installed, it's sufficient to modify with the following parameters the file `/etc/X11/XF86Config` :

```
Section "Device"
[...]
      Identifier "i810"
[...]
EndSection

[...]
Section "Screen"
[...]
      Driver "svga"
      Device "i810"
[...]
EndSection
```

You have to note that the agpgart module provided by Intel should replace the one delivered in the kernel so that it works. You then have to reinstall it, particularly when a kernel update occurs.

S3 Savage 4 card

This card is only supported with a specific X server downloadable at

For the installation, please read the following document

Frame Buffer

To use the Frame Buffer mode, please consult the following documents and .

Aic7xxx

The latest version of the aic7xxx driver is available from the reference site.

Ncr53c8xx

The latest version of the ncr53c8xx driver is available from the reference site.

D6692A card

To use the D6692A card, you need to use a 2.1.122 kernel at least. Previous kernels didn't handled correctly the shared IRQ between the network and SCSI parts of the card. In particular, a standard RedHat 5.2 version doesn't allow to the network part to be supported. You have to update your kernel with a recent one (preferably 2.2.18) and the distribution with the complementary packages needed.

3C59x

The latest version of the 3c59x driver is available from the reference site.

There is also a version provided and supported by 3Com, available at .

There are also other drivers available at and .

3C556

This card is supported by kernel 2.2.17 and upper.

Sound Chipset ESS Maestro

The chipset 2EM (Vendor id: 125d − device id: 1978) is supported in 2.2.14 kernel and upper. Version 3 (Vendor id: 125d − device id: 1998) on the other side is only supported for the moment by an alpha−version maestro3, driver, in the Alsa[Rem.] project (version >= 0.5.10) driver, and in the commercial software Open Sound System . The latest version of the ESS Maestro driver is available from the reference site.

Sound Chipset AD1816

The latest version of the AD1816 driver is available from the reference site.

For Visualize workstations, it's recommended by HP to put in `/etc/conf.modules` :

```
alias sound ad1816
pre−install sound /sbin/insmod sound dmabuf=1
options ad1816 io=0x500 irq=5 dma=0 dma2=3 ad1816_clockfreq=33000
alias midi opl3
options opl3 io=0x388
```

(Source :)

Alsa Sound Drivers

The Alsa project has for primary goals to develop drivers to support sound cards in Linux, being fully compatible with current OSS drivers, bringing more functionalities and supporting more hardware.

All the information on this project, as well as sources under the GPL license, are available from their home page

RPMs for RedHat 6.2 and Turbo Linux 6.0 distribution are available at the address

DOS models

These models are delivered with MS−DOS only, in order to have a Linux Machine at the best price.

Turbo Linux models

These models are delivered ready to be installed with Turbo Linux, in order to have a Linux Machine at the best price (2 CDs + 30 days of support).

XU800

On that machine, the Bios doesn't give the right amount of memory which is in the machine to Linux. You need to use a line such as append="mem=xxxM" at the begining of `/etc/lilo.conf` where xxx is your RAM in MB.

The support of "big size" IDE disks (for example, 27 GB disks provided for the XU 800) on these machines needs a kernel 2.2.15 at least.

Omnibook XE

If you intend to use both the sound chipset and a PCMCIA card in this laptop, in order to avoid conflicts at input/output ports level, you'll have to modify the file `/etc/pcmcia/config.opts` to change the line 6 to

```
include port 0x300-0x4ff, port 0x1000-0x17ff
```

The NSC PC87108/338 chipset controlling IrDA on this model is supported by the 0.92 kernel. (Source :)

Some users had to apply the same tric for their Omnibook 4150 with success.

Omnibook XE3

The integrated modem card is not supported under Linux (ESS ES56CVM−PL).

The installation of a RedHat 6.2 distribution gives a problem when rebooting the system, at the PCMCIA initialisation. You have to install the latest version of the pcmcia−cs package at

To use the network, you need a tulip driver modified by P. "goldpenguin" Depouilly, and available at

LC 2000

In order to use the native SCSI controler you need to disable in the Bios the option "Reserve PCI Bus Numbers", in the menu PCI Device Setting. (Indication of GILLYNN COUCH)

LP1000r/LP2000r

To use the native SCSI bus of this machine, it's necessary to use the sym53c8xx driver with a version upon 1.6c. A driver disk for RedHat 7.0 is available there. For the SuSE 7.0 distribution, you have to enter the manual mode to load the driver, as autodetection doesn't work correctly.

LH 6000

In order to use the native SCSI controler you need to desactivate in the Bios the "reserver PCI Bus #s", in the menu PCI Device Setting. The PS/2 system doesn't work correctly with a RedHat 6.1 or 6.2 distribution. In order to correct that you need to either put the machine in MPS 1.1, in the BIOS, or use a kernel above 2.3.47 in MPS 1.4 mode. The network card doesn't work correctly with the kernel of the RedHat 6.2 distribution.

LT 6000r

In order to use the native SCSI controler you need to desactivate in the Bios the "reserver PCI Bus #s", in the menu PCI Device Setting.

BX Chipset

Intel BX Chipset (Memory Bus at 100 MHz) is supported by kernels above 2.0.34/2.1.103.

i820 Chipset

Coppermine 0.18 µm technology − 256 kB synchronous cache − Intel i820 Chipset

BAx

Attention, the XF86_SVGA server works correctly with this mother board embedded version only above XFree86 3.3.5, due to the use of different frequencies (In particular, use the updates for RedHat 5.2/6.0).

Boot disk for 3Com card

Creation of a custom RedHat Boot disk

To be able to boot with the RedHat 5.1 boot disk, and to have the support of the 3C905B−TX card, you need to do the following :

```
# Log as root. Go in the home directory  (~root)
#cd ~
# Put there the 3c59x.c source module for the 3Com card
#ncftp ftp://ftp.medasys-digital-systems.fr/pub/linux/networking/drivers/3c59x.c
# Compile it
#gcc -DMODULE -D__KERNEL__ -Wall -Wstrict-prototypes -O6 -c 3c59x.c `[ -f /usr/include/linux/modversions.h ] 38;38; echo -DMODVERSIONS`
# put the RedHat 5.1 floppy boot disk in the drive
# you have to copy the initrd.img file from the floppy disk
#mcopy a:initrd.img /tmp
# then uncompress it
#gzip -cd /tmp/initrd.img > /tmp/initrd.ext2
# Mount the "file" filesystem thus obtained
#mount -t ext2 /tmp/initrd.ext2 /mnt/floppy -o loop
# uncompress the modules provided
#gzip -cd /mnt/floppy/modules/modules.cgz > /tmp/modules.cpio
# extract the modules
#cd /tmp ; mkdir modules ;
cd modules ; cat /tmp/modules.cpio | cpio -i
# Copy the new updated module for the 3Com card
#cp ~/3c59x.o .
# recreate the compressed cpio file
#ls | cpio -o | gzip -c9 > ../newmodules.cgz
# replace the modules by their update
#cp ../newmodules.cgz /mnt/floppy/modules/modules.cgz
# unmount the "file" filesystem
#umount /mnt/floppy
# compress the "file" filesystem
#gzip -c9 /tmp/initrd.ext2 > /tmp/initrd.img
# copy it on the floppy disk
#mcopy /tmp/initrd.img a:
```

LH 4

The LH4 doesn't seem to work correctly when not in Raid. Even with the latest Bios available at the time of the test (16.00), the problem remains. If you desactivate the Raid management, during the boot, the ncr53c8xx driver in Linux detects 4 controlers instead of 2 and boot doesn't end. To avoid that, you have to activate the Raid in the Bios and use each of the disk in Raid0 mode, which is quite the same as the solution without Raid at all.

NetRaid card

These cards are equiped with an AMI Megaraid chipset and may support the following Raid levels : 0, 1, 3, 5, 10, 30 and 50. Some NetRaid cards, as well as the chipset integrated on the LH3 and LH4 mother boards are supported by recent version of the Linux kernel (2.0.36/2.2.18 typically – don't use 2.0.37/38).

For the RedHat 5.2 distribution, it's not possible to install the system on this type of controler, because it's not detected by the installation program. You have to use a specific floppy disk . This floppy disk should be used as input to the **rawrite** tool, for example. It works for systems with less than 1 GB of memory.

For the RedHat 6.0 distribution, you have to manually declare the existence of this card as a supplementary SCSI adapter, in order to use it directly during the installation. The megaraid driver isn't automatically detected.

To avoid strange messages during the boot printed by the megaraid driver, it's necessary to recompile it with the option –DHP.

For the RedHat 6.1 distribution, the megaraid driver provided by the kernel does support on ly the first logical drive. In order to obtain the others, please recompile a 2.2.18 standard kernel.

You have to note that the integrated card of the LH3/4 realises a software parity checks and performs thus less efficiently than the NetRaid daughter cards. On the other side, LH3000/6000 are equiped with an integrated card doing hardware checks.

In the fourniture of the driver provided by AMI there is a Raid management tool megamgr, usable within Linux, and equivalent to the tool included in the software embedded on the controler. It's downloadable from

In case of problem, a version is available there.

NetRaid 4M card

These cards are equiped with a StrongARM Chipset and correspond to the Adaptec card AAC–3642. A driver should be available during the 3 last monthes of year 2000.

Processors

To desactivate processors on a Linux server, you need to give an option during the boot to the kernel such as :

```
Lilo boot: linux maxcpus=3
```

where the number of processors given in option is less by one of the number of processors wanted. For example, here we activate 4 processors.

HA Cluster

To use a High Availability Custer under Linux, you need to use additional software, such as :

- RSF−1 (Commercial)
- Linux−HA project (free) and ext3

3.2.2. The monitors range

The following table provides all of the informations on the support for this hardware by XFree86.

Table 3−11. HP Monitors and Linux

Reference	Name	Vert. F. (Hz)	Hor. F. (kHz)	Bandwidth (MHz)	Resol.	Freq. (Hz)	Tested
D2825A, D2825S	15" HP Ultra VGA 1024	50−110	31−54	65	640x400, 640x480, 800x600, 1024x768	70, 60−72−75−85, 60−72−75−85, 60	Yes
D2826A, D2826S	15" HP 50	50−120	31−54	65	640x400, 640x480, 800x600, 1024x768	70, 60−75−85, 60−75−85, 60	Yes
D2827A	15" HP 51	50−120	31−54	???	???	???	No
D2828A	15" HP 52	50−120	30−54	65	640x400, 640x480, 800x600, 1024x768	70, 60−75−85, 60−75−85, 60	No
D8897A	15" HP 55	???	30−54	???	???	???	No
D2832A	15" HP M500	50−120	30−70	110	640x400, 640x480, 800x600, 1024x768, 1280x1024	70, 60−75−85, 72−75−85, 70−75−85, 60	No
D2807A	17" Ultra 1280	50−160	30−64	???	???	???	Yes
D2837A	17" HP70	50−120	30−70	110	640x400, 640x480, 800x600, 1024x768, 1280x1024	70, 75−85, 75−85, 75−85, 60	Yes
D2838A	17" HP M700	50−160	30−86	???	???	???	No

D8906A	17" HP P700	50−160	30−86	140	???	???	No	
D2840A	17" Ergo 1280	50−150	31−92	160	512x384, 640x480, 800x600, 1024x768, 1152x864, 1280x1024, 1440x1080, 1600x1200	85, 100, 100, 100, 100, 85, 72, 60	Yes	
D8901A, D8902A	17" HP71	50−120	30−60	110	640x400, 640x480, 800x600, 1024x768, 1280x1024	70, 60, 75−85, 75−85, 60	No	
D8900A	17" HP75	50−160	30−86 (30−64 real)	150	640x400, 640x480, 800x600, 1024x768, 1280x1024	70, 60−75−85, 75−85, 75−75−85, 75	Yes	
D2842A, D2842W	19" HP90	50−200	30−96	203	640x400, 640x480, 800x600, 1024x768, 1280x1024, 1600x1200	70, 75−85, 75−85, 75−85, 75−85, 75	Yes	
D8910A	19" HP P910	50−150	29−107	230	640x400, 640x480, 800x600, 1024x768, 1280x1024, 1600x1200	70, 60−85, 85, 75−85, 75−85, 75−85	No	
D8911A	19" HP91	???	30−96	???	???	???	No	
D8912A	19" HP P920	???	???	???	???	???	No	
A4031A	20"	48−150	30−82	???	???	???	Yes	
D2846A, A4576A	21" HP P1100	50−160	30−107	???	???	???	No	
D2847A	21" P1110	50−180	29−121	300	???	???	Yes	
D8915A	21" P1120	???	30−121	???	???	???	Yes	
A4033A	21"	50−120	30−80	???	???	???	Yes	
A1295A	24" Wide Aspect	50−160	30−96	???	???	???	No	
D5061A	15,1" LCD HP	???	???	N/A	???	???	No	
D5062A	15" LCD HPL1510	???	??−75	???	N/A	???	???	No
D5065A	18,1" LCD HP L1800	56−85	30−80	N/A	640x350,	70,	Yes	

					640x480, 720x400, 800x600, 832x624, 1024x768, 1152x870, 1152x900, 1280x1024	60−75−85, 70, 60−75−85, 75, 60−75−85, 75, 66, 60−75		
D5069A, D5069C, D5069J, D5069L	18" LCD HPL1800	???	??−75	???	N/A	???	???	No

3.2.3. PA−Risc based computer range

The PA−Risc range is achitectured around a processor designed and realised by HP. First versions were produced in 1987. Currently the versions are named PA−8000 (8200, 8500, ...).

HP has announced at the begining of 1999 its intention to contribute to the port of Linux on its PA−Risc architecture. This port is a native one, which is different from a preceding project which used MkLinux on machines based on PA−7200. The work is currently done with The Puffin Group bought by Linuxcare, and more precise informations on the status may be found on the official Web site. In particular, interesting starting points may be found on and . Quoting Grant Grundler (12/05/2000) : "latest update: 32−bit parisc−linux boots and mostly works on most workstations and servers. Native builds work as does networking and scsi. User space is being built for both debian (.debs) and RH (.rpms). 64−bit parisc−linux gets to a login prompt on A500 but isn't useful yet. Lots of syscalls don't work and I/O subsystem isn't stable. I expect 64−bit to be better than beta quality by the end of Q12001."

The first machines concerned by the port are the A and L Class servers. The port should be operational at the begining of 2001. Tests are also done on 712 and 715. Other people begin also to work on PA−2.0 machines. The last state of the port is always available at .

There is on the other side for these machines a Linux project based on the MkLinux micro−kernel. This project as developped within OSF. The web site mentionning informations is at . Links to more parisc ports are at .

3.2.4. The IA−64 range

HP is developping in collaboration with Intel a new generation of 64 bits processors called IA−64. The first processor of this new generation, called Itanium, should be there during 2000. The initial port of Linux on IA−64 was published the 2nd of february, 2000 and the sources of the project are available through . More informations on this topic may be found on this page of the HP labs : or on the reference site

HP, as a founding member of the Trilian project, worked on the port of the kernel, the initial version of gcc, gas, ld and emacs.

3.2.4.1. The IA64 server range

The following tables indicate the state of Linux support by these platforms :

Table 3−12. HP IA−64 Servers and Linux

Machine	Graphic Card	Linux support	Network Card	Linux support	SCSI Card	Linux support	Sound Card	Linux support	Tested
MX4000r	ATI Rage 128 AGP 8MB	Yes XFree 3.3.6 Rem. (Mach 64)	Intel S82093A /N82559 10/100 BT	Yes driver eepro−100	Qlogic Ultra3 Wide PCI	Yes driver qla1280	None	N/A	Yes

3.2.4.2. Complementary informations

To boot Linux on this kind of machine, you need to type in the initial environment >**`eli linux`**

3.2.5. X Terminals

The HP X terminal range (Entria, Envizex) is usable with a Linux server. More over, a Linux server may be a boot server for X terminals. To do it, a certain number of operations are mandatory.

We suupose we have a HP−UX machine named hpux, on which is installed Enware, a Linux server, named linux and an X Terminal with MAC address 08:00:09:db:8d:1c. The gateway on the network is at IP address 192.168.1.254, and the DNS name server at 192.168.1.1.

Commands to do are :

```
hpux #cd /opt/hpxt/enware/xthome

# Enware Home Directory

hpux #tar cvf ~ftp/en.tar * .??*

# Creation of a tar archive from this software

linux #ftp hpux
Connected to hpux.
220 hpux  FTP server (Version wu−2.5.0(1) Wed Aug 25 12:50:08 EDT 1999) ready.
Name (ftp:Root):ftp
331 Password required for  ftp.
Password:(type your mail address here)
230−
[...]
230−
230 User ftp logged in.  Access restrictions apply.
ftp>lcd /tmp
Local directory now /tmp
```

```
ftp>get en.tar
200 PORT command successful.
150 Opening ASCII mode data connection for en.tar (57638340 bytes).
226 Transfer complete.
57638340 bytes received in [...]
ftp>quit
[...]

# Download of the tar archive

linux #mkdir -p /tftpboot

# Creation of the target directory on the linux machine

linux #cd /tftpboot

# Go there

linux #tar xvf /tmp/en.tar

# untar the archive

linux #/usr/X11R6/bin/xfs -port 7100

# Launch the X Font Server working on port 7100

linux #cat >> /etc/bootptab << EOF
global.prof:\
          :sm=255.255.255.0:\
          :ds=192.168.1.1:\
          :gw=192.168.1.254:\
          :ht=ethernet:\
          :bf=bin/C3253A:        # Adjust to your terminal
tx1:hd=/tftpboot:tc=global.prof:ha=080009db8d1c:ip=192.168.1.100:
EOF

# Creation of the bootpd configuration file
linux #rpm -Uvh bootp-2.4.3-7.i386.rpm

# Install bootpd say from


# Verify the existence of such a line in  /etc/inetd.conf, and restart if needed the server by killall -1 inetd
bootps dgram   udp     wait    root    /usr/sbin/tcpd  bootpd

# Now enkoy your X terminal by booting it
```

For a more detailed description, as well as the software related to that operation, consult also the page .

3.2.6. The printing product range

3.2.6.1. General points

Printers may be connected directly to a machine through either a parallel port (generally), or a serial port, or even (more recently) through an USB port. They may also be directly wired to the network, for a global access; this is done thanks to a card put in a slot of the printer, or through the connexion of the parallel port of the printer to a sharing network box.

HP provides such boxes, called JetDirect, which allow thus to share personnal printers on the network, directly, without going through a machine. They exist for various network topologies (10 BT, 10/100 BT, Localtalk, 10B2) and offer the ability to access to the printer directly from machine which like Linux support the LPD protocol, by using a remote printer in the `/etc/printcap` file. The name of the queue to use is then `raw`.

An example of `/etc/printcap` file allowing to access to a printer, equiped with such a box or card, named lj4000 on the network is given below :

```
# REMOTE POSTSCRIPT 1200x1200 a4 {} PostScript Default {}
lj4000:\
        :sd=/var/spool/lpd/lj4000:\
        :rm=lj4000:\
        :rp=raw:\
        :if=/var/spool/lpd/lj4000/filter:\
        :mx#0:\
        :sh:
```

The configuration access to the box is done either through the WebJetAdmin tool provided also under Linux now, or by the **telnet** command. The default address of these products is 192.0.0.192. To connect to them initially, you just have to add an IP alias on your network interface, typically by :

```
#ifconfig eth0:0 192.0.0.1
```

and a route to that network (if not automatically created) typically by :

```
#route add −net 192.0.0.0
```

The access to the equipment is thus done simply by :

```
#telnet 192.0.0.192
```

Please pay attention to have only one such equipment on the network, at the same time, or you'll have duplicate IP addresses, which always causes problems. Note that HP manageable network equipments also use the same default address. The reading of the IP Alias mini HOWTO may be useful if you don't understand the previous paragraph :−).

It is of course possible to access through the network to an HP printer attached and declared directly on a Linux machine, thanks to the **lpd** service for the other Unix clients, through SaMBa for the clients of Microsoft systems (Win9x ou WinNTx) or through NetAtalk for the MacIntosh clients.

At last, SaMBa offers a tool, **smbclient**, which allows to print from a Unix/Linux machine to a printer wired directly on a Microsoft based PC, without any need to use a JetDirect system. All the details useful to realize this operation are described in the file example **smbprint** provided with the SaMBa package and on the page .

Communication between a Linux machine and a printer needs also, outside a network dialog, a discussion with an exchange language between the two elements. There are a lot of languages of that sort, such as PCL, Postscript or HPGL. To be able to print correctly, the tool providing the datas to print has to generate code known by the printer. Filters exist which allow to easily transform an output in one given format to another one. Thus the Ghostscript software authorizes the transformation of Postscript source in a great variety of output formats, as indicated by its invocation in the 'Available devices' part :

```
#gs -h
GNU Ghostscript 5.10 (1998-12-17)
Copyright (C) 1997 Aladdin Enterprises, Menlo Park, CA.  All rights reserved.
Usage: gs [switches] [file1.ps file2.ps ...]
Most frequently used switches: (you can use # in place of =)
 -dNOPAUSE           no pause after page   | -q       `quiet', fewer messages
 -g<width>x<height>  page size in pixels   | -r<res>  pixels/inch resolution
 -sDEVICE=<devname>  select device         | -dBATCH  exit after last file
 -sOutputFile=<file> select output file: - for stdout, |command for pipe,
                                         embed %d or %ld for page #
Input formats: PostScript PostScriptLevel1 PostScriptLevel2 PDF
Available devices:
   x11 x11alpha x11cmyk x11gray2 x11mono ap3250 imagen iwhi iwlo iwlq la50
   la70 la75 la75plus lbp8 ln03 lj250 lj4dith lp2563 m8510 necp6 oce9050
   r4081 sj48 st800 stcolor t4693d2 t4693d4 t4693d8 tek4696 xes deskjet
   djet500 djet500c dnj650c laserjet ljetplus ljet2p ljet3 ljet3d ljet4
   cdeskjet cdjcolor cdjmono cdj500 cdj550 paintjet pj pjxl pjxl300 uniprint
   bj10e bj200 bjc600 bjc800 epson eps9mid eps9high epsonc ibmpro jetp3852
   dfaxhigh dfaxlow faxg3 faxg32d faxg4 cp50 pcxmono pcxgray pcx16 pcx256
   pcx24b pcxcmyk pbm pbmraw pgm pgmraw pgnm pgnmraw pnm pnmraw ppm ppmraw
   tiffcrle tiffg3 tiffg32d tiffg4 tifflzw tiffpack tiff12nc tiff24nc psmono
   psgray bit bitrgb bitcmyk pngmono pnggray png16 png256 png16m jpeg
   jpeggray pdfwrite pswrite epswrite pxlmono pxlcolor nullpage
Search path:
   . : /usr/share/ghostscript/5.10 : /usr/share/fonts/default/ghostscript :
   /usr/share/fonts/default/Type1
For more information, see /usr/doc/ghostscript-5.10/use.txt.
Report bugs to ghost@aladdin.com; use the form in bug-form.txt.
```

This represents only the output formats compiled in the program. Other are also available. You may find a complete list of all the printers known by this software at .

A list of the HP printers support may be found on the following page : .

3.2.7. All−in−one range

These products gather many functions : printing (all), scanning (all), copying (all), and faxing (some).

More information from their dedicated web site : Partie scanner : http://www.ns.net/~paschal/sane

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3.2.8. Digital imaging product range

3.2.8.1. The scanners range (ScanJet)

The main tool available in Linux environment to manage scanners is SANE (Scanner Access Now Easy). This software provides in particular a driver for HP scanner management: hpbackend.

The following table provides all of the informations on the support for this hardware by Linux.

Table 3−13. Scanners and Linux

Reference	Scanner	Interface	Linux support	Tested
C9195A	ScanJet Plus	HP Parallel Interface Card	SANE and driver	No
C1750A	ScanJet IIc	SCSI	SANE	No
C2500A, C2507A, C2508A, C2509A	ScanJet IICX	SCSI	SANE	No
C1790A, C1797A, C1798A, C1799A	ScanJet IIP	SCSI	SANE	No
C2520A, C2527A, C2528A, C2529A	ScanJet 3C	SCSI	SANE	No
C2570A	ScanJet 3P	SCSI	SANE	No
C2520B, C2527B, C2527D, C2528B, C2529B	ScanJet 4C	SCSI	SANE	No
C1130B	ScanJet 4P	SCSI	SANE	No
C5110A, C5116A, C5117A, C5119A	ScanJet 5P	SCSI	SANE	No
C5160A, C5167A	ScanJet 5S	???	???	No
C7167A	ScanJet 3200C	Parallel Port	???	No
C7680A	ScanJet 3300C	USB	SANE and driver USB	No
C7727A	ScanJet 3400C	Parallel Port or USB	SANE and driver PPSCSI or driver USB	No
C6290A, C6292A, C6293A, C7297A	ScanJet 4100C, Cse, Cxi	USB	SANE and driver USB	No
C7177A	ScanJet 4200C	USB	SANE and driver USB	No
C7737A	ScanJet 4300C	Parallel Port or USB	SANE and driver PPSCSI or driver USB	No
C5190A, C5192A, C5193A, C5197A	ScanJet 5100C, Cse, Cxi	Parallel Port	SANE and driver PPSCSI	No
C7697A, C8477A	ScanJet 5300C, 5370C	Parallel Port or USB	SANE and driver PPSCSI or driver USB	No
C5190A, C7192A, C7193A	ScanJet 5200C	Parallel Port or USB	SANE and driver PPSCSI or driver USB	No
C6260A, C6266A, C6267A, C6269A	ScanJet 6100C	SCSI	SANE	No
C6270A, C6272A, C6273A, C6274A, C6275A, C7277A, C6278A	ScanJet 6200C, Cse, Cxi, 6250C	SCSI or USB	SANE or driver USB	No
C7677A, C7678A, C7679A	ScanJet 6300C, Cse, Cxi, 6350C, 6390C	SCSI or USB	SANE or driver USB	No

C5100A	PhotoSmart PhotoScanner	SCSI	SANE	No

A FAQ dedicated to HP scanners support under Linux with SANE is available at the address :

3.2.8.2. The Digital Sender

This product is a scanner, able to send the result of the digitalisation through e−mail, by sending the digitalised document as an attachement in PDF format. It may so well be used with a Linux (or other) mail server (sendmail, postfix, ...), as well as with clients reading their messages under Linux, providing they have a tool to display PDF file such as Acrobat Reader or xpdf.

The Digital Sender can also send images as black and white or colour TIFF files. The black and white images work fine, however, there is a problem with the colour TIFF files. These are sent in an obsolete format which is not supported by libtiff, which is the basis of support for the TIFF format for nearly all Linux software. This means that you cannot directly open colour TIFF images created by the Digital Sender using Linux software (e.g. The GIMP, ImageMagick).

3.2.8.3. The CapShare

I don't have any information on this product and its support in a Linux environment for the moment.

3.2.9. The Storage products range

3.2.9.1. Tape based products

Most HP SCSI tape drives work with Linux. the driver file to use is /dev/st0 for the first drive, /dev/st1, for the second...

More information may be found on the certification site

HP provides the tapeware software with its drives, including a Linux version. Other tools to manage such drives may be found on or or .

3.3. HP software and free software

This section presents rapidly some HP applications which can be used under Linux. These are either commercial applications or freeware applications.

It proposes also links to free software available for other operating systems (HP−UX, MPE/IX).

3.3.1. HP softwares under Linux

FireHunter

This software targetted to the ISP manages services levels and is available for RedHat version 5.2 distributions. .

HP Eloquence

This software is an IDE for management applications for small business firms and is available under Linux since 1997. A lot of distributions are supported by a third party firm to which HP has given the support. Complementary informations exist on the site .

HP WebJetAdmin

This software allows to manage HP network printers through the installation of a service on a Linux server, and is accessible from any browser running on any client machine. HP has announced the availability of this product in its 5.1 version in February 1999. Then was released version 6.0 in June 2000 and 6.1 version in August 2000. You may download the latest version at . All the informations on this product are available from the addresses : and .

The 5.6 version at the RPM format is also available at .

HP WebQoS

This software allows to manage Internet Quality of Service by stabilizing performances during high loads, by optimizing used resources, and by managing priorities at applications and users levels. HP has announced the availability of this product during summer 1999. Complementary informations exist on the site .

HP OpenView

This software is a complete network management platform. An NNM (Network Node Manager) has been announced, as well as ITO. An Omniback client is available for Redhat 5.2 distributions (Cf).

HP OpenMail

A version of this mail and work group management tool is available since the first of september, 1999. Informations concerning it are available on the page : .

HP E−Speak

E−Speak, the open software platform for creating, composing, mediating, managing, and accessing Internet−based e−services. E−speak allows a resource (computing device, application, or data content) to be virtualized and re−deployed as an Internet−based e−service. All of the informations concerning it are available on the page : .

HP MC Service Guard

This software allows to manage a high availability cluster of applications. HP has announced the availability of this product for 2001. Complementary informations exist on the site .

Plug−in Scheduler policies for Linux

This patch enables you to write and use loadable kernel modules to change your Linux machine's scheduler policies without rebooting. It's available at .

HP TopTools Agent for Linux

This software is a DMI agent increasing the ease of management of HP Machines under Linux. Downlaodable from .

3.3.2. Third party softwares linked to HP for Linux

GNUPro

HP and Cygnus Solutions have announced the 8th of March, 1999 a partnership to provide the GNUPro tools on all the HP machines, including Linux.

3.3.3. Free softwares under HP−UX

Numerous free software for HP−UX are available at .

3.3.4. Free softwares under MPE/IX

Numerous free software for MPE/IX are available at

3.4. Support of HP solutions under Linux

HP proposes since May 1999 a worldwide support offer on Linux. It's detailed on the page . This offer includes up to the possibility to answer 24x7, in a delay of 2 hours after taking the call. The reference of this product is : HP LNXIA32A

HP has also online ressources to help people using Linux with its products :

Online Linux incidents

Linux training courses

Linux discussion Forum

Third party firms also propose Linux and free software support on HP platforms :

Medasys

Contact : Cédric Letailleur <Cedric.Letailleur@medasys-digital-systems.fr>

Atrid

Contact : Bruno Deschandelier <B.Deschandelliers@atrid.fr>

Alcove

Contact : Lucien Petit <lucien.petit@alcove.fr>

3.5. Training on HP Linux solutions

HP proposes since June 1999 a worldwide training offer on Linux. It's detailed on the page . The detail of all the training courses for France is available at : .

3.6. HP as an Open Source Software user and contributor

HP PostFix

```
# dig hp.com -t mx | grep MX
;;      hp.com, type = MX, class = IN
hp.com.                 21m28s IN MX    50 cossmtp.hp.com.
hp.com.                 21m28s IN MX    50 palsmtp.hp.com.
hp.com.                 21m28s IN MX    20 postal.agilent.com.
hp.com.                 21m28s IN MX    10 envelope.hp.com.
hp.com.                 21m28s IN MX    10 letter.hp.com.
hp.com.                 21m28s IN MX    20 stamp.agilent.com.
hp.com.                 21m28s IN MX    30 cossmtpx.hp.com.
hp.com.                 21m28s IN MX    50 atlsmtp.hp.com.
# telnet envelope.hp.com 25
Trying 192.151.10.4...
Connected to envelope.hp.com.
Escape character is '^]'.
220 envelope.hp.com ESMTP Postfix
QUIT
221 Bye
Connection closed by foreign host.
# telnet letter.hp.com 25
Trying 192.151.10.3...
Connected to letter.hp.com.
Escape character is '^]'.
220 letter.hp.com ESMTP Postfix
QUIT
221 Bye
Connection closed by foreign host.
# telnet postal.agilent.com 25
Trying 192.6.9.3...
Connected to postal.agilent.com.
Escape character is '^]'.
220 postal.agilent.com ESMTP Postfix
QUIT
```

```
221 Bye
Connection closed by foreign host.
```

Identically, for its institutional Web server, HP uses Apache as more than 8 million of other sites.

```
# wget -S http://www.hp.com/
--15:09:45--  http://www.hp.com:80/
           => `index.html.1'
Connecting to www.hp.com:80... connected!
HTTP request sent, awaiting response... 200 OK
2 Date: Fri, 05 May 2000 13:12:25 GMT
3 Server: Apache/1.3.9 (Unix) mod_fastcgi/2.2.2
[...]
```

Agilent (old−HP branch) uses also the free software Perl for CAD as related there

HP also worked on the improvement of the proxy−cache Squid , as related there

Chapter 4. Solutions and Sizing

This chapter proposes an help for sizing NetServers under Linux, depending on the different kinds of use.

You have to consider that exercise as a bit perilous. Indeed, only the reality allows to test such previsions. Nevertheless, using the experience acquired by deploying solutions in the past, we can give some useful rules.

We may apply a certain number of rules valid for the sizing of classical Unix servers, considering that CISC systems (the majority in Linux environment) need 2.5 less times resources in memory than RISC systems, due to the fact that binaries used are smaller (Intel platforms are for the moment 32 bits architectures). This has also influences on disk and swap space.

It's obvious you have to consider, whatever the system, bottlenecks of the solution put in place, because they will determine the weakest link in the chain.

You have to look particularly at the following points :

- The number and the speed of disks (the I/O rate of 10.000 rpm disks may go up to 15 MB/s),
- The number and the speed of SCSI controlers (the I/O rate of Ultra2 LVD of the LC2000 − LH3/4/3000/6000 may go up to 80 MB/s),
- The addition of a supplementary SCSI card supported, when adding slow peripherals (DAT, DLT, CD writer ...) in order to avoid that the controler slow down in compatible mode, and that I/O performanes drop significantly.

You have also to be suspicious of the extensible functions of machines. Indeed, it's often preferable for a customer to add a new server, rather than to augment the capacities of the one in place. The first reason is a financial one, on one side, because the costs of add−ons on an already old system may be near those of a new system, whose prices are becoming cheaper and cheaper. And the same for maintenance. On the other hand, technically, it could be more interesting to benefit from the latest technologies to obtain a machine more equilibrate and powerful. For example, when Ultra2 LVD was introduced, it was more interesting to buy a new server to benefit from the 80 MB/s SCSI bus speed, rather than to update a server which had 40 MB/s Ultra Wide SCSI. This implies that it's interesting to size correctly the server, from the begining, for the whole forseeable period of life of its use (typically 3 years nowadays).

In the same kind of ideas, you have to examine closely the choice between a bi−processors and two mono−processors machines. 2 different systems imply 2 disk controlers, 2 disks set, 2 separate RAM busses thus best performances, but more administration. On the other hand, a unique system renders it easier, allows for a quicker communication between processors, which could be necessary for certain applications, but makes the environment more fragile (more downtime in case of an hardware problem). In fact, there are more losses intrinsically on a multi−processor model, in communications at the system level. This question should mainly be considered for the addition of a processor (necesseraly obsolete) on a machine *a posteriori*, rather than to add a new server.

On memory aspects, Linux can't manage today more than 2 GB in stable kernels. But Linux takes the maximum from the memory you give to it, mainly by the constitution of a cache disk which improves greatly system performances. You may thus oversize the quantity of RAM installed, because it's preferable to a situation where the server would be obliged to swap (which drop performances dramatically). The minimum RAM size provided on the NetServers (64 or 128 MB) matches perfectly a normal use of a system, and doesn't need any particular addition. You have to take in account that there is no graphical environment used on production servers. Concerning the swap, under Linux, it comes in addition to the RAM to give the complete virtual memory available for the server. As a base rule, it's recommanded to give the same amount of swap space as the amount of RAM, to allow the system to put on disk nearly all the running processes in case of need. But the rule which exists for System V Unix (such as HP−UX) consisting of reserving twice the amount of RAM for swap isn't useful under Linux. You may note that Linux may swap certain inactive processes to free the maximum RAM possible. So having a system whose swap is partially used isn't necesseraly a proof of lack of memory, nor lack of performances.

You'll find below recommandations depending of the type of use made by the HP NetServer under Linux. It's possible to cumulate several functions on the same server. You'll take care to add in that case the resources needed to give the services.

Some generic rules have to be considered :

- We consider that the number of simultaneous users is the same as half the whole number of users on the server.
- The minimal RAM size needed for a usable Linux server is 32 MB, which is less than the minimum amount of RAM available on the NetServers (64 MB). In case you use X−Window with KDE or Gnome on this machine, you need to have 64 MB in supplement, thus 96 MB as a minimum.
- The minimal disk size needed for a usable Linux server is 2 GB, which is less than the minimum amount of disk available on the NetServers (9 GB).
- In case of use of Raid 1, you have to double the amount of disk space useful to obtain the disk space needed. In case of use of Raid 5, you need to add 1 disk to obtain the disk space needed.
- Except in particular cases (computing server), the amount of swap is the same as the amount of RAM.
- The minimal processor needed for a usable Linux server is a Pentium 133, which is less than the minimum processor available on the NetServers (Pentium II 450).
- Each X−Window user excuting a client on the server uses in average 2 MB.
- It may be useful to add network cards on this type of machine to smooth the traffic, depending on the number of clients.

4.1. Linux as file and print server

4.1.1. Linux as file server

The sharing service uses 2 MB of RAM, and 2 more MB per share. In case of a unique share (users space for example), it leads to a 2 MB consumption per user. In the proposed case, we estimate that each user has 100 MB of disk space on the server, with an evolution to 200 MB 3 years later. Processor resources used are relativeley small, an entry level model will be sufficient from that point of view. We will priviledge the I/O speed with Ultra 2 LVD SCSI at 80 MB/s, if the budget allows it, and 10.000 RPM disks.

Table 4−1. Sizing of a file server

Simultaneous users	RAM size	Disk size	Machine example
1 − 100	312 MB	27 GB	E800

100 – 500	1 GB	117 GB	LC2000
500 – 1000	2 GB	216 GB	LH3000

4.1.2. Linux as print server

The sharing service uses 2 MB of RAM, and 2 more MB per printer shared. In case of a unique share (One printer per user typically), it leads to a 2 MB consumption per user. In the proposed case, we estimate that each user prints simultaneously files of 5 MB in average, thus we need to have that space available on the server. Processor resources used are relativeley small, an entry level model will be sufficient from that point of view.

Table 4−2. Sizing of a print server

Simultaneous users	RAM size	Disk size	Machine example
1 – 100	312 MB	9 GB	E800
100 – 500	1 GB	9 GB	E800
500 – 1000	2 GB	9 GB	LC2000

4.2. Internet/Intranet Linux server

4.2.1. Web Server

The Web service uses 2.5 MB of RAM, in static mode (simple HTML pages) and 5 MB of RAM in dynamic mode (HTML pages generated from per, PHP, ...) per user. The disk space needed is function of the nature of the server, knowing that most of the consumption comes from images. Processor resources used are important, thus it could be useful to consider the increase in frequency and the addition of processors, because this type of traffic could be quite well done in parallel. We will priviledge also the I/O speed with Ultra 2 LVD SCSI at 80 MB/s, if the budget allows it, and 10.000 RPM disks.

Table 4−3. Sizing of a static Web server

Simultaneous users	RAM size	Disk size	Machine example
1 – 100	256 MB	9 GB	E800
100 – 500	1 GB	9 GB	LC2000 Bi−processor
500 – 1000	2 GB	9 GB	LH4 Quadri−processor

Table 4−4. Sizing of a dynamic Web server

Simultaneous users	RAM size	Disk size	Machine example
1 − 100	512 MB	9 GB	E800
100 − 500	2 GB	9 GB	LC2000 Bi−processor
500 − 1000	4 GB	18 GB	LH6000 Quadri−processor

4.2.2. Mail Server

Generally, this machine is used as both SMTP (sending and reception of messages) and POP server (keeper of messages and manager of client accesses). The SMTP Mail service uses 2 MB of RAM per user. The POP Mail service uses 2 MB of RAM per user. The disk space needed becomes more and more important as long as attachments (images, various documents) take the greatest place in exchanges via e−mail. We consider in that case that an average mail box size is 50 MB. Processor resources used are important, thus it could be useful to consider the increase in frequency and the addition of processors, because this type of traffic could be quite well done in parallel.

Table 4−5. Sizing of an e−mail server

Simultaneous users	RAM size	Disk size	Machine example
1 − 100	400 MB	9 GB	E800
100 − 500	2 GB	27 GB	LC2000 Bi−processor
500 − 1000	4 GB	54 GB	LH6000 Quadri−processor

4.2.3. Firewall/Proxy/Web−Cache server

Generally, this machine is both a Firewall server, a proxy (in both directions) and a cache for the Web because all requests go through it. The Firewall service uses 1 MB of RAM. The Proxy service uses 0.3 MB per incoming relay. The Web cache service uses 0.5 MB per user. The disk space needed is function of the parameters of the cache Web server. In that case, we consider 20 MB per user. Processor resources used are important, due to the analysis of IP packets. Thus it could be useful to consider the increase in frequency.

Table 4−6. Sizing of a Firewall/Proxy/Web−Cache server

Simultaneous users	RAM size	Disk size	Machine example
1 − 100	128 MB	9 GB	E800
100 − 500	512 MB	18 GB	E800
500 − 1000	1 GB	27 GB	E800

4.2.4. Directory server

Generally, this machine use a software like OpenLDAP to fulfill its goals. The LDAP service uses 1 MB of RAM and 10 kB of RAM per user. The disk space needed is of the same kind, so 10 kB per user. Processor resources used are moderated.

Table 4−7. Sizing of a LDAP server

Simultaneous users	RAM size	Disk size	Machine example
1 – 100	64 MB	9 GB	E800
100 − 500	64 MB	9 GB	E800
500 − 1000	128 MB	9 GB	E800

4.3. Linux as computing server

Generally, this machine is extremely stressed, mainly on the processor and RAM aspects. Sometimes this is combined with intensive I/O needs. We thus equip such a machine with high−end processors (nowadays Pentium III Xeon) with the greatest level 2 cache possible (nowadays 2 MB). In RAM, we would tend to reach the maximum possible, thus 4 GB. For this type of server, we should adapt the swap such as it covers all the needs in memory required by the computing codes to execute. There is often no specific constraint on network performances, except in case of a computing cluster, in which case we may consider to equip the machines with 100 Mb/s cards with a switch between them, even with Myrinet or Gigabit products. Typically, an LH4 2*PIII 550MHz 1 GB/2*9GB is the target of this type of server. The choice is extremely variable depending on the nature of the computation to do. We should underline that there are processors, such as PA−Risc, much more performant in floating point computation than today Intel processors (up to 6 times).

4.4. Linux as an office server

This kind of server is for the moment rare in the free software world. It's more frequent in Microsoft world, by association with Metaframe solutions of Citrix. An office server needs 50 MB of RAM per user. Intrinsically, this machine has no requirements in term of disk, if it's not at the same time a file server. Processor resources used are important, thus it could be useful to consider the increase in frequency and the addition of processors, because this type of traffic could be quite well done in parallel.

Table 4−8. Sizing of an office server

Simultaneous users	RAM size	Disk size	Machine example
1 – 10	512 MB	9 GB	E800
10 – 50	2 GB	9 GB	LH4 Bi−processor

50 – 100	4 GB	18 GB	LH6000 Quadri−processor

Chapter 5. Frequently Asked Questions (FAQ)

5.1. *"How to have more than 1 GB of RAM on my NetServer ?"*

The following informations are adapted from the page of Rik van Riel. They concern 2.0.x as well as 2.2.x kernels.

First of all, the IA32 Intel architecture is limited by construction in its memory management to 4 GB. Space which should be divided into virtual memory and physical memory. Which means that if you choose to recognize more RAM, the maximum size for a program decreases.

But Linux can't manage more than 1 GB by default. To go above that, in fact up to 2 GB today, because Linux can't manage more memory for the moment, you need to modify 2 files provided with kernel sources and recompile it. Those 2 sources are `/usr/src/linux/include/asm-i386/page.h` and `/usr/src/linux/arch/i386/vmlinux.lds`.

>From 2.0.37 and 2.2.12 kernels on, the patch was integrated in the kernel and may be activated when doing a **make config**.

The maximum Ram managed in the i386 version was ported to 64 GB after 2.3.23.

5.2. *"How to have more than 128 MB of swap on my NetServer ?"*

Up to the version 2.8x of the util−linux package, the **mkswap** command could create swap partitions only up to 128 MB maximum. You then had to create as much partitions as necessary. Till the 2.9 version, included in standard in RedHat 6.0 and following distributions, it's possible to create directly swap partitions up to 1 GB.

5.3. *"How to use the other procesors of my NetServer ?"*

Multi−processing is supported by Linux operationnaly till the 2.0 version of the kernel. For a 2.0.x kernel, you have to recompile it and set up the SMP variable in the Makefile to 1. For a 2.2.x kernel, you have to set it up during the **make config**. For more details, please consult the SMP−HOWTO.

5.4. *"Is Linux Y2K compatible ?"*

Generally, Linux is Y2K compatible. For more informations please consult the FAQ.

Chapter 6. References

I already mentioned the documentation files, installed typically under the directory `/usr/src/linux/Documentation`. They are a real gold mine of useful informations.

The following FAQ (Frequently Asked Questions) are periodically posted in the group and archived on FTP servers like :

- FAQ of the group
- FAQ of the group

A lot of other Linux HOWTO contain informations useful in link with our subject :

- Linux SCSI HOWTO
- Linux CD−Writing HOWTO
- Linux Hardware HOWTO
- Linux Distribution HOWTO
- Linux Kernel HOWTO
- Linux Sound HOWTO
- Linux PCMCIA HOWTO
- Linux Laptop Guide
- Linux on Laptops

The following Usenet groups cover subjects linked to HP :

-

You may also consult the groups mentioned in Section 2.2.2.5.

On Internet, you may consult with a great benefit the following sites :

Table 6−1. Web sites ofMedasys and HP

Subject	URL
HP Linux Portal	
HP and Linux	
HP France Education Linux	
Medasys Linux	
HP Support	
HP HOWTO	
Linux Pa−Risc (Puffin Group)	
Linux and HP Labs	
Linux IA64	
Linux IA64 (HP Labs)	
HP RedHat certification	
HP Linuxcare certification	
HP Utigroup	

Table 6−2. Other fundamental sites on Linux and Open Source Software

Subject	URL
Linux Documentation Project	
Linux Weekly News − Summary of 1998	
Linux Weekly News − Summary of 1999	
IOS Counter	
Comparaison MS−Windows NT Server 4.0 −− Unix	
Netcraft studies	
L'AFUL (Association)	
APRIL (Association)	
Linux Center	
Linux France	
Linux Journal	
Linux Gazette	
Linux Magazine France	
Linux Start	
Da Linux French Page	
RedHat Hardware support	
Source Exchange	
Mobilix : Linux Mobile	
Developers Servers	

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Chapter 8. Future versions

This chapter gives indications on elements which should be taken in account in future versions of this document. It should be taken more as a reminder for the author, than as an engagement of what he will really do !

Version 0.93

Images path.

Report of headers and footers on following pages (PS).

Better management of the size of tables (PS).

Place of the footer (PS).

One line paragraph management.

Management of the size of papers, margins and images (PS).

Paragraph on TX/e−vectra management

Rethink the copyright in front of the LDP/FDL one

Rework the printer paragraph

Version 0.94

URLs verification in function of the language. Use of official addresses and paragraph on mirrors.

Rework the cluster part

Paragraph on APM for portables

Linux as a backup server (Arkeia)

Remote Assistant − Remote Control. Management

Put the Argumementations in the TOC (HTML).

Avoid titles in end of page (PS).

Paragraph on network products

Version 0.95

Detail limitations of evolution from Unix to Linux

Rework the example of the vaccine :−)

Management of the date with wml

Rework chapter 1 (put there history and new versions)

Glossary/Abbreviations