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# Linux for HP Mobile Professionals

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For the past two years, I have used Linux almost exclusively to perform my duties as an HP Solution Architect. My motivations were to deepen my Linux knowledge and to continue working in the familiar context of a UNIX system.

This paper will help you understand how I set up my system, and the Linux-based tools I chose to integrate into our corporate infrastructure for applications such as Exchange messaging, Microsoft Office, VPN, dialup, wireless, and PDA synchronization. It will also describe other options that have emerged more recently.

## Background

As a Solution Architect, my productivity requires me to use many sources of information throughout the corporate infrastructure, as well as function effectively from remote locations, such as customer sites, hotel rooms, and home office. I have had several years of Tru64 UNIX experience and am more comfortable functioning in a UNIX work environment. So a couple of years ago, with the Linux desktop environment rapidly maturing, I decided to learn more about Linux by using it as my primary productivity platform. After a few months of experimentation, in Feb 2001, I finally took the plunge and switched to Linux as my primary operating system on my laptop. I am surprised at how well I have been able to function since then, and this paper is written to share my experiences.

Many of the technology choices I made were based on the options available to me in 2001. Since then, several new options have emerged, and others have matured considerably. I will refer to some of these in the course of this paper.

## Platform

### Laptop Hardware

I was issued a Compaq Armada M700 laptop, with 192 MB RAM, and two 12 GB disks. The system came pre-installed with Windows 2000 (W2K). I would have preferred to have had a single disk which had both operating systems (W2K and Linux) as well as my data, so that I could boot either system and still have access to my data. However, technical issues with the way my W2K disk was imaged, made repartitioning it near impossible, in spite of many hours on the phone with Partition Magic technical support. So I was forced to compromise, and have one disk with W2K and the other disk with Linux. Once I moved my data to my Linux disk, it was no longer accessible from W2K.

In a dual-boot environment with a shared data partition, one has to decide on the file system type to use for the data partition, so as to facilitate access from W2K and Linux. As of the writing of this document, there is only one viable candidate: FAT, since this is the only file-system type that can be safely mounted for read-write both by W2K and Linux.

### Linux Distribution

I chose Linux Mandrake as the distribution I would use, because of its strong desktop orientation, good compatibility with Red Hat, and the maturity of its KDE (K Desktop Environment) implementation. SuSE is another distribution that has a history of strong desktop support. Red Hat has only recently turned its attention to the desktop, and in the future may be a good choice. I typically have two versions of Linux on my "Linux drive". One is my production version (currently Mandrake 9.0), on which I've done all the integration testing, and has all my productivity tools installed. The second is my "kick the tires" version

(currently Mandrake 9.1), which I am trying out, and may become my next production version. My data is on a separate partition and can be accessed regardless of which version I boot.

### Disk Partitions

I partitioned my 12GB disk as follows:

| Partition | Size (MB) | Mount Point – Purpose |
|---|---|---|
| hda1 | 100 | /boot (multi-boot support) |
| hda5 | 240 | Swap |
| hda6 | 5000 | /home (my data – shared between two Linux versions) |
| hda7 | 3200 | / root partition for production version of Linux |
| hda8 | 3200 | / root partition for test version of Linux |

Notice that the swap partition and the /home partition are shared between the two different versions of Linux on hda7 and hda8. While LILO is currently the most widely used Linux boot-loader, I chose Grub for this purpose, because of the greater flexibility and functionality it offers compared to LILO. Kernel versions and boot options may be altered by simply editing the Grub configuration file, unlike LILO, which requires the boot record be rewritten. Please see Appendix A for my Grub configuration file.

## Exchange Mail

For mail, I have found that using IMAP on Exchange servers works well. My Exchange server has IMAP access turned on by default. So all I need is an IMAP client. Since I tend to leave my mail on the Exchange-IMAP server, I am free to try different IMAP clients on various platforms and still have access to my mail. So far, the best IMAP client for my needs has been the one that comes with the Mozilla browser, primarily because of it scales well with large mailboxes and has excellent LDAP integration. Ximian's Evolution is an up and coming quality mail client with a look-and-feel similar to Microsoft Outlook. Configuring LDAP on it can be quite a challenge. Also, the kmail application that comes with the KDE desktop, is another emerging IMAP client to watch.

As far as accessing the corporate address book, LDAP works extremely well. I like the address-book lookup in Mozilla (using LDAP) much better than the Outlook 2000 client GAL lookup; in Mozilla, you simply start typing the name in the To: field, and it suggests a list of completions based on a personal address book and an LDAP lookup. To configure LDAP on Mozilla mail, invoke Edit->Preferences->Mail&Newsgroups->Addressing->Directory Server->Edit Directories->Add. Set Hostname to ldap.hp.com, and Base DN to o=hp.com, and use the default port (389).

The IMAP protocol has "disconnected use" support (i.e. ability to access cached mail on the client, while disconnected from the server). I use the Mozilla mail client for disconnected access occasionally, and have been pleased with it.

The shared calendaring capability available via Outlook is difficult to achieve in Linux. Ximian has a $69 Evolution Connector enhancement to their free Evolution mail client that advertises calendar access on an Exchange 2000 server. Also, the Korganizer program shipped with KDE 3.1 claims the ability to move data to/from an Exchange 2000 calendar (from the description, it does not seem to have robust synchronization). I have not had a chance to try either of these. I have simply been living without shared calendar functionality.

Outlook Web Access is yet another method of accessing Exchange mail via a web browser on Linux. While not as versatile as the IMAP clients discussed above, it provides simple access, and even has some calendaring functionality.

## Microsoft Office

I have two solutions for Microsoft Office application compatibility. The one that I use the most is OpenOffice (the open source release on which Sun's StarOffice is based), which has good Microsoft Office file compatibility. While compatibility is about 90%, I rarely run into documents that OpenOffice can't handle. I have made many customer presentations with Open Office (by simply opening a PowerPoint file).

My second solution is to have a Windows virtual machine running under Linux. The particular one that I

chose is Win4Lin V3.0 ($89 for the license). Win4Lin allows me to run Windows as a collection of Linux processes. I have installed Win98 on this "virtual machine" and Microsoft Office 2000 on top of that (licenses are required for Windows and Microsoft Office). I have been very pleased with the quality of Win4Lin, and I am seeing 100% fidelity with Microsoft Office. Most of my customer presentations are done using PowerPoint running under Win4Lin. The Linux file system is used for Windows, so I see the same files both from the Windows side and the Linux side. Recovery from Blue-Screens is much faster on the Windows Virtual machine than in a real Windows environment (no need to run chkdisk etc.) One hassle with Win4Lin is that it requires a special kernel patch during installation. So when a new version of a distribution comes out, I have to wait till Netraverse makes the appropriate Win4Lin patch available. As compared to VMware virtual machines, Win4Lin is cheaper, faster, integrates better with the Linux filesystem, I/O and networking stacks, but the lacks the breadth of application compatibility as VMware.

A third option has recently emerged: Codeweavers' CrossOver Office available for $55. The strategy here is to use Wine technology to run Microsoft Office on Linux (no underlying Windows OS). I am told the Word, Excel and PowerPoint components work quite well, but the Outlook and Internet Explorer components need work.

### Internet

The bulk of my Web browsing is done with Mozilla, the open source browser upon which Netscape is based. There are several other good choices available on Linux (such as Opera, Konqueror the KDE browser). When I run into a page that is Internet Expolorer(IE)-biased (some internal HPQ sites suffer from this bias), then I resort to using IE-5 running under Win4Lin.

With regards to VPN access, there is a PPTP client available for Linux. I have used this extensively via a cable modem at home and am very pleased with it. Installation of this client does require some specific kernel modules to be built, and the installation script guides you through the process. This PPTP client implements split tunneling in that it does not send non-HPQ traffic through the VPN.

For dial up, there is a Lucent Winmodem driver that handles the modem in my M700. To keep my PPTP and RAS configuration files in /etc/ppp from interfering with each other, I have two separate directories: /etc/ppp.pptp and /etc/ppp.ras, with the symbolic link /etc/ppp pointing to the pptp or ras variant as appropriate.

My WL110 wireless card works out of the box on Mandrake with my wireless access point at home! Getting the WL110 to work right in the office (with the encryption keys) required the usage of the iwconfig utility to set the encryption keys. Please see Appendix B for a script I use to enable wireless encryption in the office.

### VAXnotes

I often need to access Notes files to tap the treasure of Digital-specific information buried there. (In this context, Notes does not mean Lotus Notes but rather a Digital collaborative technology that runs on OpenVMS servers.) For this, I am using the Tru64 DECnotes client that ships with the DECnet kit (but does not require DECnet). I telnet from Linux into my Tru64 system at the local (Indianapolis) office, and run the DECnotes client which accesses my notebook stored on a VMS system in the Detroit office. While both terminal-based and X-based notes clients are available, I have used the terminal-based client only.

### PDA Synchronization

There is no robust software yet to my knowledge that will allow the WinCE-based iPAQ to sync with a Linux desktop (A project has recently been launched to address this need, so stay tuned). Therefore, I have installed Familiar Linux on my iPAQ, and use it to show customers that we are serious about Linux. The iPAQ Linux Personal Information Manager (PIM) software is not mature enough yet for me to use. So I still carry around a Palm IIIe that I have had for a while, and keep my PIM data on it. There are several workable alternatives for backing up the Palm to a Linux desktop (I use Jpilot which is bundled with Mandrake).

### Summary

Given all the above, I can sit in my family room at home, boot Linux on my M700, use the WL110 wireless card to get to my home LAN, use Linux PPTP to VPN into the corporation over my cable-modem, access my Exchange account via IMAP, and process Word or Excel attachments using OpenOffice!

All in all, it has been a fun learning experience, integrating all these pieces into a usable desktop environment. As I am increasingly being asked to talk about Linux with customers, doing my presentation via Linux adds some credibility, and often generates some good discussion.

**Ram Rao** is a Solution Architect based in Indianapolis, Indiana, supporting Corporate Accounts. His primary focus currently is Linux. Since joining Digital in 1984, he has worked as a software developer in Unix Engineering, and more recently in the field supporting the sales of Unix-based solutions. Ram and his wife Asha, have 4 children, that they have home-schooled for the past 14 years.

## Appendix A – Grub configuration file

The following is my /boot/grub/menu.lst file which controls the behavior of the grub boot-loader.

```
timeout 10
color black/cyan yellow/cyan
i18n (hd0,0)/grub/messages
keytable (hd0,0)/us.klt
altconfigfile (hd0,0)/grub/menu.once
default 0

title mdk90
kernel (hd0,0)/win4lin2419 root=/dev/hda7

title mdk91
kernel (hd0,0)/vmlinuz-2.4.21-0.13mdk root=/dev/hda8 devfs=mount0
initrd (hd0,0)/initrd.img

title failsafe
kernel (hd0,0)/vmlinuz root=/dev/hda8 failsafe devfs=nomount
initrd (hd0,0)/initrd.img

title floppy
root (fd0)
chainloader +1
```

**Appendix B – wireless encryption configuration script**

I use the following script to set encryption parameters when at the HP office. The SSID and key values have been removed from the script listing for security reasons. Please replace the xxxx-xxxx-xx by the 10 hexadecimal character key values.

```
#!/bin/bash
# script to set encryption keys on the eth1 wireless NIC

/sbin/iwconfig eth1 essid MySSID
/sbin/iwconfig eth1 mode Managed
/sbin/iwconfig eth1 key xxxx-xxxx-xx [1]
/sbin/iwconfig eth1 key xxxx-xxxx-xx [2]
/sbin/iwconfig eth1 key xxxx-xxxx-xx [3]
/sbin/iwconfig eth1 key xxxx-xxxx-xx [4]
/sbin/iwconfig eth1 key [1]
```

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