

LESSONS FROM THE TRENCHES

George Martin

Linux Lessons

Practically buying up the store at an outlet hot spot, George only had to shell out \$4.99 each for vintage versions of Linux. Averting the \$70 price tag for the updated version, he felt more at ease to experiment. Linux, which is virtually free and open-sourced, is only getting better. To utilize the multitasking nature of Linux, take a tip from George and take advantage of the closeouts!



Over the past year, I've considered installing Linux. However, I haven't made much progress because I've been busy and all my systems seem to be dedicated to a particular task. I'm just too conservative (old-fashioned) to risk doing the installation on a system I depend on to be up and running. I know it's safe, but I don't trust myself that much, and I'm too lazy to back everything up, install Linux, test it out, and then reinstall the old software.

Well, two things happened recently to change my mind. First, a 100-MHz 486 system made by Hewlett Packard came my way. The HP system has 16 MB of DRAM, a floppy disk, CD-ROM, SVGA, and a 2-GB hard disk drive. It's a fairly reasonable system, perhaps three to five years old. It runs WIN95, and I thought this would be a good machine to experiment with and attempt to bring up Linux. That way, there was no chance of destroying my favorite accounting system while testing this new OS.

Second, I found Linux virtually for free. You've probably seen all the ads, and if you do a web search, you'll be overwhelmed with information. You can download a copy of Linux with the source, but then you need to install it. So, a packaged version was the practical place to start for a rookie like me. It could be that I'm cheap, but for some reason, the \$70 price tag kept me from experimenting. I didn't want the base offering for \$29.95. I needed the professional version with all the bells and whistles.

What to do...what to do? Road trip! Where I live, there's a chain of outlet stores called Ocean State Job Lot that buys leftovers and closeouts. To my surprise, the outlet had several versions of 1999 vintage Linux packages, and best of all, it was practically giving them away at \$4.99. How could I go wrong? So, I bought the whole stock, which included several copies of each version, and I gave some away to customers and friends.

There I sat with my dedicated 486 system and several installation CDs. I have several packages, including one that contains:

- Deluxe Linux Operating System 6.5
- Linux-Mandrake 6.1 Red Hat Linux with enhancements
- Compatible with Red Hat 6.0
- Upgrade to the latest kernel 2.2.1x
- KDE 1.1x
- Star Office 5.1
- WordPerfect 8 Lite

Sounds OK. Another is a 3² book with a CD-ROM containing:

- Caldera's OpenLinux 2.2
- KDE 1.1
- WordPerfect 8
- Netscape Communicator 4.51
- Star Office 5.0
- Boot Magic, Caldera Edition
- Partition Magic, Caldera Edition

The other packages are lesser versions or flavors of Mandrake and Caldera. It looks like the two packages are similar, and as I read more about the installation process, I find that they are installing the same basic versions of Linux and its utilities but present different wrappers and user interfaces.

Both packages have different installation specifics but can be installed from WIN95 or WIN98, then launched from Windows, and use the LILO (boot loader) for a dual boot capability. Both packages and both options work.

BOOTING UP

I started loading Linux from inside WIN95 and selected the dual boot option. After several different installations of different Linux products, I was able to crash the boot loader and then needed the boot-from-floppy option. Through my mistakes and omissions, I lost the boot to Windows capability. Caution: attempting a Linux installation on your main development system can result in lost data. But, I was also using WIN95 and could not reinstall it without erasing the existing data. WIN98 solved this issue.

The minimum system requirements are listed as Intel Pentium I, AMD K6, 16 MB required, 64 MB recommended, 500-MB disk minimum, and 1 GB recommended. I fall just short of these requirements with my 100-MHz 486 and 16 MB of RAM. But, let's see what happens.

I followed the installation procedures contained in the various packages. In short, you select a keyboard and mouse, partition the hard disk, and select a graphics card. I opted for no network or modem. The only problem was in recognizing the graphics card. The installation procedure would not (or could not) discover the HP hardware and install an appropriate driver. Resolution was only 640 × 480 with 16-bit color.

Not to worry, because the procedure lets you pick a different card type and then run a brief test. If you like the results, you can go on. If not, then you can back up and select another card type. It is a bit disconcerting because this usually takes you down the path of

no return. But, all the packages are user-friendly, and even if you get the system completely installed, you can still change all the drivers and even add drivers you may have left out.

Also, I noticed a lot of hard disk activity during the install process. Upon closer observation, I realized that Linux was installing data from the drive while it was prompting me for particulars about the hardware. This was my first exposure to the multitasking nature of Linux. I could go forward in hardware selection and back up to partitioning the hard disk, changing my selections along the way.

After looking at both Mandrake and Caldera, I settled on Caldera. This is just personal preference, like Ford versus Chevy. I hope Ocean State Job Lot gets a Red Hat package soon.

GETTING THE BEST PERFORMANCE

One observation I made was that the system seemed slow. So, I ran some tests. It took 1 min. 46 s to load Netscape V.4.51. That seemed like a long time to me. I had 16 MB of RAM, and I added another 16 MB for a total of 32 MB. Netscape now loaded in 58 s, taking approximately half as long. And if you assume that a 200-MHz Pentium is four times as fast as a 100-MHz 486, 58 s is right in the ballpark. Load up your browser on your system, and I bet your performance is in line with these numbers. I've got a 200-MHz Pentium II with 128-MB RAM, and I load Netscape V.4.76 in 22 s.

One of the applications available is a task manager. The task manager lets you view the running applications by user, calling source, or as a CPU and memory load. With 16 MB of DRAM, the system loaded up 20,966 KB of memory before Netscape and 28,700 KB after. Both are larger than the 16 MB of installed memory, so swapping takes place to run all the code. With 32 MB of DRAM, the readings were 24,904 KB before and 42,196 KB after loading Netscape. So, although the system was using more memory, the memory management routines made for a more efficient system. What a pleasant surprise!

Although both installations

stumbled over the graphics card identification, after I was up and running, adding the modem was a piece of cake. The modem card was installed as COM3, and I selected that device from the list and had a modem. The dialer was also straightforward; I simply followed the examples in the Caldera manual. Perhaps I was more comfortable with all that printed material and that's why I prefer this version. Another surprise was that the modem had trouble running at 28.8 KB in WIN95 but ran at 33.8 KB under Linux (maybe because of the better drivers and a cleaner OS).

I set up two users on the system and logged in as one of them. Then I started customizing the operating system and recompiling. I kept up until I blew away anything that resembled Linux. "Thank you. Thank you very much." However, I could reboot into the other user, and of course, I could boot into the root and reinstall the corrupted user.

You get spreadsheets, word processors, browsers, calculators, viewers, clocks, and games. Remember Asteroids? Well, I have a vintage-looking version running in the year 2001. It's great! Oh, I forgot moon phases, calendars, appointment books, mouse odometers, world maps, and too many more to mention. Plus, C++ editors and compilers.

FINAL DEDUCTION

My observations and recommendations? Don't install Linux on a mission-critical system. Plan to try different versions. Perhaps you and your friends could each get a different type and compare notes. Read the directions through a couple of times before you start. Don't think of Linux in the same way as Windows. It's a stable safe system, but not all encompassing yet. And, plan to run Linux in the near future.

For the past 10 years, we (embedded engineers) have lived in the wake of the PC and Windows (WINTEL). I feel that the PC is taking a market-driven path that we will no longer be willing or able to follow. Linux today has everything we need and will only keep getting better. It's virtually free and

open-sourced. And, Linux is text-based so the compilers and editors really scream.

I've left out all the details of the installation. I was installing last year's, and it doesn't seem to be of much value because you're going to be using at least a 2000 vintage. Also, there have been several Linux articles in *Circuit Cellar* over the past couple of years, so check them out if you're truly interested.

I'll get off my soapbox. I'm looking at a new schematic and artwork package. I think I'll try to get a Linux version. ☹

George Martin began his career in the aerospace industry in 1969. After five years at a real job, he set out on his own and cofounded a design and manufacturing firm. Typical systems that George designs include servo-motion control, graphical input and output, data acquisition, and remote control. George is a charter member of the Ciarcia Design Works Team and most recently, he's been working on the people-tracking system for Bill Gates' new house. You can reach him at george.martin@worldnet.att.net.

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