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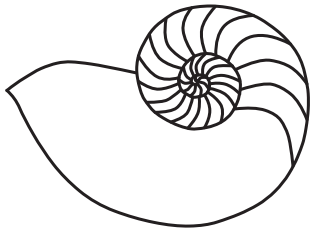

MUUGlines

The Manitoba Unix User Group Newsletter

June 8, 1999: Upstairs/ Downstairs, Inside/Outside

Or how to set up your own home network and connect it to the Internet

Michael Doob, from the University of Manitoba's Math department, will be describing and demonstrating how to set up IP masquerading, part of the firewall support that's included in Linux. This can be used to allow multiple hosts on a private LAN to connect out to the Internet via a single gateway host using a cable modem, for example.

In this presentation a minimal setup will be described that allows several Linux computers to be used together in a home network. This will permit the sharing of facilities such as a printer or hard disks among the computers. The network will then be linked to the Internet so that all machines will have access through a single modem and Internet account. For this talk, no technical background knowledge is assumed.

For the most part only standard UNIX tools will be used. IP masquerading will be used to connect several computers to the net through a single modem, and vnc will be used to allow X Window applications to run from a masqueraded computer.

As always, we're open to suggestions for meeting programmes, not to mention presenters! Feel free to convince someone you know to give a talk at on of our meetings, and be sure to mention that it's very informal. We're not looking for professional public speakers here. Contact any of the board at board@muug.mb.ca or in person at our meeting if you have an idea!

We will also have a round-table discussion, in which anyone can raise questions regarding their experiences (or lack thereof) with all things Unix. We realize that it can be a little intimidating, but please be assured that no question is too easy (or "dumb")!

Please note our meeting location: IBM Canada's offices in the TD Centre, at the corner of Portage and Main. We gather in the lobby on the main floor - please try to be there by about 7:15 PM. Steve Moffat will then take us up to the meeting room just before the meeting starts at 7:30. Please don't be late, or you may not get in.

Parking is available either in the parkade behind the TD building, off Albert Street, or in the ground level lot just north of the TD building. Entrance to the lot is from Albert Street, behind the parkade. Either way, parking is a $1.25 flat rate for the evening. You must purchase your ticket from a dispenser, so make sure you've got exact change - a loonie and a quarter, or 5 quarters.

Red Hat Linux 6.0

For all those who were wondering, yes, 6.0 is out. It was on their web site around the end of April, and 'officially' released May 10, although there doesn't seem to have been a formal press release. At any rate, after a little mix-up, MUUG's mirror site (see ftp://muug.mb.ca/redhat/) caught up.

In kernel news: Most distributions have settled on 2.2.5, which is reasonably stable, but has some performance difficulties under high loads. See http://slashdot.org/ and http://lwn.net/ for starters if you want to read the whole story about benchmarks and Linux. In the meantime, the latest stable kernel is 2.2.9, and it's recommended, especially if you are running a server serving upwards of 60 users. You might also want the latest Apache (or other Web server) and Samba (currently 2.0.4)

An Open Source... Book?

Christina Silveira (cms@oreilly.com) writes:

We've freed "Open Sources: Voices From the Open Source Revolution", a ground-breaking collection of essays that offer insight into how the Open Source movement works, why it succeeds, and where it is going. The entire book is now online and freely redistributable. Check it out at: http://www.oreilly.com/catalog/opensources/book/toc.html

VMware Goes 1.0

Contributed by Kevin McGregor

VMware 1.0 for Linux has been released. VMware is a thin software layer that effectively frees users from the "one machine, one operating system" model of computing and enables multiple operating systems and associated applications to run concurrently on a single machine, without disk partitioning or re-booting.

Each virtual machine environment provides full fault and security isolation, and yet can communicate and share files or devices with other virtual machines. This innovative approach allows individuals and organizations to achieve new levels of flexibility, productivity and security on their desktop or laptop PCs.

I recently tried out this unusual product on two systems, one at home, and one at work. The nutshell summary: cool. In fact, this product has a very high 'coolness factor' for the geeks in the immediate vicinity. I really wowed a couple of my co-workers when I showed them I was installing Windows NT from a CD while running Linux!

How does it work? Set the way-back machine for 1986, when Intel released the 80386. This CPU had an interesting feature that Microsoft (and other OS manfacturers) used to great advantage: It could 'virtualize' the 8086, and earlier member of the Intel CPU family. Programs, including operating systems, written for the 8086 could be run as regular programs *while believing that they had full control of the CPU*, and the 80386 could trap and (with software help) emulate any privileged operations. The 8086 operating system would have no way of knowing it did not have full control of the PC.

This way, more than one 8086 operating system could run at the same time on a 80386. This feature wasn't used in exactly this way in Windows 3.0, but it was close. The entire graphical interface, plus all Windows 3.x programs, ran in one virtual 8086 'box', while each command-prompt window ran in another.

VMware does something similar. The Pentium CPU can do the same thing, but now it can virtualize a 80386 CPU, meaning most modern operating systems can be run in a VMware window. I know what some of you are thinking, and no, you can't run VMware in a VMware window. This is because VMware requires a Pentium or better to run, and the Pentium can't virtualize a Pentium. Hence, no recursive VMware-ing.

(On another note, I'd like to acknowledge that IBM came up with this idea a long time ago, and used in their mainframe products decades earlier. See VM/390.)

However, there is a fairly long list of OSes that you can run using VMware for Linux. They include MSDOS, Windows 3.1, 95, 98 and Windows NT (workstation and server) and Linux. VMware plans to support all popular OSes as 'guest' operating systems, but not OS/2. They do mention upcoming support for BeOS and various BSDs. I also recall a mention of Solaris, and I've read newsgroup mentions of people successfully installing and running Netware 4.x, and limited success with Netware 5.0.

If you haven't guessed already, this product will only run on Intel-based Linux PCs. VMware has announced that they will soon begin beta-testing a version of their product that runs on Windows NT as the host OS.

Enough of the background (I'm such a windbag), and on to my experiences with the product. I worked for a bit with the beta version, and just installed the trial 1.0 version last weekend. Both versions I tested gave me pretty much the same results. In short, the easiest way to get this going is to do a fresh install of the guest OS in the virtual PC, and secondly, have lots of RAM.

This product has a fairly simple installation procedure, given the sophistication of the program. Simply download one file, un-tar and unzip it (as a regular user), then 'su', run install.pl, then 'exit' out of the root account. To actually run it, you need a license. To get this, fill out the form on their website, and save the file they send back - automatically, in minutes - as 'license' in a directory called '.vmware' that you've created in the user's (your) home directory. Then, logged in as the user, run /usr/bin/local/vmware. That's it!

There are some complications available. You must have X properly configured and running. VMware has a modified version of XFree86 based on 3.3.3.1 that you can download and install for improved performance. They have sent their patches back to the XFree86 project for inclusion in future versions, so we don't have to worry about VMware keeping up with the latest

XFree86 development.

When VMware is started up, a wizard dialogue box pops up, and can guide you through setting up a virtual environment, specifying things like virtual hard drive and memory size, and whether you want to allow access to the real CD and floppy drives.

There are also networking options available. You can set up the (virtual) networking to be disabled, access the host only, or 'bridged', which makes the virtual PC look like another real PC to other computers on your real network. For example, your host PC would appear as 10.140.3.1, and your virtual PCs would appear as 10.140.3.2, 10.140.3.3, and so on. You can even set up a Windows NT server and several clients, all running on the same PC as a test network! Keep in mind that you'll want real RAM for each virtual PC to use. Three virtual PCs using 32 MB of RAM each means your PC should have 96 MB plus enough for Linux! You don't have to have that much RAM, but you do have to have enough swap space and patience otherwise.

My installation woes came when I tried to use an advanced configuration. One option is to use an existing partition on your hard drive which has the OS (say, Windows 95) already installed and working. Since your PC and the virtual PC provided by VMware will not have the same hardware, prepare for a lot of virtual reboots and Plug and Play detection. And to avoid video problems, you might want to boot your computer into Windows 95 and set the video driver back to 16-colour VGA before trying this.

After you get it running, there is another performance improvement available. Download VMware's 'VMtools' and SVGA video driver into the virtual PC's hard drive, and install them. This installs an option-toggling program in the system tray, and a video driver that offers improved performance over the standard VGA driver. This works well, but I believe this is where I lost my Adobe Type Manager functionality. I haven't found any references to this problem at the VMware site. I also haven't tried reinstalling ATM, though either; I guess that's my next step.

Overall, this is a great product well implemented. I have had no weird crashes other than trying to reconfigure my existing Windows 95 partition to run under VMware. It seems solid, and performance is good on my Pentium II/350. This is going to reduce the number of reboots I have to endure, and is a good solution for experimenting with various OSes and running Windows programs (until Wine improves or Adobe comes out with a Linux version of PageMaker!). I'm looking forward to running BeOS on Linux!

VMware is available for a limited time at US$75 for hobbyists and home users. See www.vmware.com for full details.

SGI Open Sources XFS

At the Linux Expo on May 20, SGI announced it will contribute its journaled file system technology, XFS™, to the open source community. XFS is a key component of the company's highly successful IRIX® operating system and is the world's most scalable and robust journaled file sharing technology. In a separate release, SGI announced that it will investigate with Veritas the development of a unified Linux journaled file system solution.

"The XFS file system has long been one of the UNIX industry's most advanced file system implementations and one of the crown jewels of the IRIX operating systems," said Tony Iams, vice president of Midrange Systems and Software Research at D.H. Brown Associates. "SGI is demonstrating a commitment to Linux technology investment surpassing other conventional UNIX vendors who have focused primarily on sales and support."

"SGI's contribution of XFS to the open-source community has huge implications for the future of Linux as an enterprise-class application platform," said John R. 'Beau' Vrolyk, senior vice president, Computer Systems Business Unit, SGI. "XFS addresses one of the key issues previously limiting Linux - the lack of a journaled file system. Journaling improves performance and speeds recovery in the event of a system failure." XFS also provides full 64-bit file capabilities that will enable Linux™ to scale easily to handle file systems as large as 18 million terabytes (18×10^{18}) of data and file sizes as large as 9 million terabytes.

The Need to Scale

During the late 1980s, when disk capacities started approaching the 2GB ceiling of the file systems designed to manage them, it became clear that users would soon need a file system capable of scaling to meet demand for

large systems. To ensure that it had a file system capable of taking users into the next millennium, SGI designed XFS to address several underlying architecture issues that would guarantee the scalability and robustness of its new file system when dealing with large files or large numbers of files.

"XFS is unrivaled in the management of large file systems, large files, large directories, large numbers of files and overall file system performance," said Anne Vincenti, director of marketing, Storage and Networking, SGI. "XFS is able to scale where other file systems would simply fail to perform. At the same time, XFS provides enhanced reliability and rapid crash recovery without hampering performance."

"The SGI XFS file system delivers outstanding performance for large 2D and 3D data sets associated with ILM's award winning special effects," said Joe Takai, director of Production Engineering, Industrial Light & Magic. "Bringing these high-performance, file-handling capabilities to Linux will significantly increase the value of Linux as an operating system."

The XFS Contribution to Open Source

XFS technology will benefit Linux and the open-source community in many ways, including:

Scalability

XFS was designed to scale to meet the most demanding storage capacity and I/O storage needs through:

Large File Systems and Large Files

XFS is designed to handle rapid growth far into the 21st century. It enables users to manage file systems and individual files as large as an exabyte (10^{18} bytes), millions of times larger than the largest file systems of today.

Large Directories, Large Numbers of Files

SGI realized that as file systems became larger, the old way of searching files in a linear fashion would become so slow in large systems that it would render them useless. XFS incorporates large directories to address this problem. XFS has the ability to dynamically allocate index space for files, enabling systems to efficiently scale to support large numbers of files.

I/O Performance

Modern servers typically use large, striped disk arrays capable of providing aggregate bandwidths of tens to hundreds of megabytes per second. The key to optimizing performance from these arrays are I/O request size and I/O request parallelism.

Crash Recovery

XFS can recover from most unexpected interruptions in less than a second, regardless of the number of files being managed. Traditional file systems must do special file-system checks after an interruption, which can take many hours to complete. The XFS journaling features avoid the need for these lengthy file-system checks and also significantly reduce the time for reading and writing disks.

"This is terrific news and we're happy to have SGI as part of the open source family," said Ransom Love, president and CEO of Caldera Systems, Inc. "There's a great need in Linux for business to have that enterprise-class file technology and storage capability. Daily, we have enterprise customers asking for these solutions - particularly where graphics are concerned. With SGI's contribution and expertise in journaling, throughput and data integrity, we can meet the file sharing/storage needs of those customers with the best technology available. That SGI would make this contribution to the open source community says a lot about their vision and business acumen."

License and Availability

SGI will begin to offer code later this summer and meet the license guidelines set-forth by the Open Source Initiative.

SGI is a market leader in technical computing, offering the world's most powerful servers, supercomputers and visual workstations. The company is located on the Web at www.sgi.com.

MUUG Contact Information

To contact the MUUG board for membership information or anything else, send e-mail to board@muug.mb.ca. We have a Web presence as well, at http://www.muug.mb.ca/, where you can find all kinds of information, including details of upcoming and past meetings and presentations and references related to them. We're always interested in article submissions. Submit your articles and ideas to editor@muug.mb.ca. Note that we can't publish articles directly taken from other periodicals as that would be a violation of copyright laws if we did it without permission.