Cron, the time daemon

Suddenly, your system freezes... you try all the tricks you know, but still you can't free it up. It happened to Chris Bidmead, and here, he shows you how to unravel the dark secrets of Crond.

A couple of months ago I was in the middle of some work with Gimp — see www.gimp.org for a real treat if you don't know about this stunning, free graphics package — on the IBM PC315. Suddenly, the whole system ground to a halt. This was particularly alarming because the PC315, with its 200MHz Pentium Pro, is one of the mightiest machines on my modest network.

I tried to shift from my X screen into a virtual terminal to investigate what was going on, but there weren't enough spare cycles on the system even to do this, and none to allow me to open an xterm from which to start killing a few processes; to all intents and purposes, the system was locked up. If you're on a network, the other thing to try in a situation like this is telnetting in from another machine. But running the telnet daemon also needs machine cycles,so I was stuck.

A glance at the computer's fascia showed me that some sort of frenetic drive activity was in progress. It was a few minutes past midnight and I guessed what was going on. The system had decided to start doing some housekeeping. Unfortunately, it had chosen a time when user memory (including swap memory) was very low, most of it having been taken up with Gimp and its data: hard-drive housekeeping, when there is no spare memory, will freeze out everything else.

Crond memories

Automated processes are the responsibility of the "time daemon" crond, usually referred to as just "cron". It runs all the time, and checks its configuration files every minute to see if there is work to do. The location of these config files depends on the system you are running. At the time, I had RedHat 5.0 on the IBM PC315, and the vixie-cron this uses — named after its author, the great free-software guru, Paul Vixie — checks in /var/spool/cron for various cron configuration files named after each user. The crontab utility manages these "user" cron files — where "user" can be *bidmead* or *daemon* or *news* or any of the users listed in /etc/passwd — which allows you to inspect and edit the cron entries. Vixie-cron additionally implements an older convention, of running the commands set up in /etc/crontab. This is the system cron file, which is unrelated to any particular user. For the structure of these cron files, see man 5 crontab (as opposed to just man crontab) which tells you about the crontab utility itself. If you're not familiar with the man manual utility, this can be confusing. Essentially, the man pages are divided into numbered sections dealing with different aspects of the system. If you supply a section number, you get the entry in that section; if you don't, you get the first entry that man finds. This version of RedHat has /etc/crontab set up periodically to run scripts that are in the /etc/cron.<period> directories, where <period> is either hourly, daily, monthly or weekly. This is a convenience, not a fundamental change to how cron works. But it means that instead of having to mess with /etc/crontab or the /var/spool/cron files, you just put a script that you want to run, say, hourly into /etc/cron.hourly. I searched through /etc/crontab for the script that had

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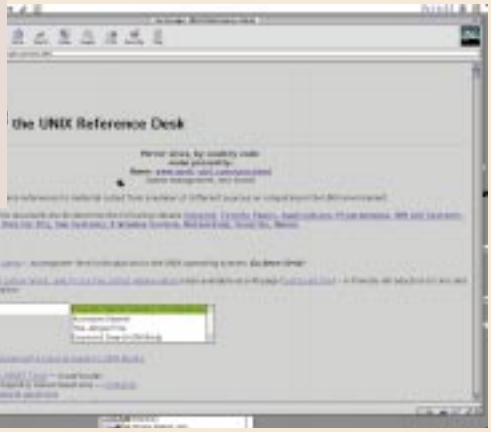
GEEK-GIRLS (AND BOYS) IN CLASS

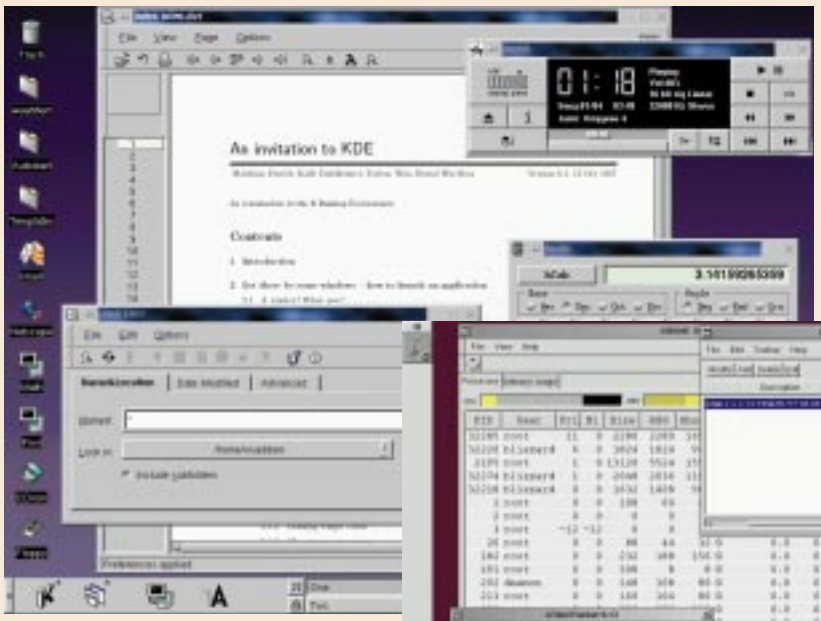
I get a lot of mail asking basic Unix questions, most of which I answer directly rather than recycling them through this column. A useful site is the Unix reference desk at www.geek-girl.com/unix.html (not just for girls).

Sean Tohill sean@westminster.ac.uk tells me that the University of Westminster is offering **Unix evening classes for beginners**, and also covers subjects like TCP/IP, web-site development, C and Java programming. Sean has been organising some of the courses, and suggests that you email him if you want to know more.

▶ THE GEEK-GIRL SITE CONTAINS REFERENCES TO MATERIAL GATHERED FROM MANY DIFFERENT SOURCES IN THE UNIX COMPUTING ENVIRONMENT, DIVIDED INTO 11 CLASSES, FROM 'GENERAL' TO 'SUN SYSTEMS' TO 'SECURITY', AND THERE'S EVEN ONE ENTITLED 'HUMOUR'!



The Linux desktop stakes



◀I GET A LOT OF MAIL ASKING ABOUT THE TWO MAIN CONTENDERS FOR THE LINUX DESKTOP STAKES, KDE AND GNOME. LUCKILY, YOU DON'T NEED TO DELVE INTO THE DEEP POLITICS INVOLVED TO REAP THE BENEFITS. JUST DOWNLOAD THEM. THIS IS WHAT KDE LOOKS LIKE...

▶...AND HERE'S GNOME. I'VE BORROWED BOTH SHOTS FROM THEIR RESPECTIVE WEB PAGES AT WWW.KDE.ORG AND WWW.GNOME.ORG. I'M NOT ACTUALLY RUNNING THEM ON MY OWN SYSTEM HERE BECAUSE, LIKE LINUS TORSVALD, I STILL PREFER UNFUSSY, TRIED-AND-TESTED, GOOD 'OLE FVWM

virtually locked up my machine and found several under /etc/cron.daily. The culprit seemed to be /etc/cron.daily/updatedb.cron, which is a script that triggers the updatedb utility. This runs around all the files on your system, collecting information for the global file database used by locate.

My main problem, however, was that at 16Mb my swap file was too small. I have fixed that now, but the other thing I want to do is to modify that updatedb.cron script to check on available memory and, if it's low, delay running updatedb. I think I know how I am going to do this (*hint: /proc/meminfo is an ASCI file that keeps track of available memory*) but you may have some better ideas about it. So, I am going to leave this as "an exercise for the reader" and I will publish the best solution sent to me.

■ **Just lately**, the trickle of email complaining that I spend too much time writing about Linux in this column has tailed off. This may be because Linux seems to be hitting critical mass and everybody is now interested in it in one way or another. When a once obscure "hackers' operating system" finds itself being profiled in *The Economist*, you know things are getting serious. Just to recap — this is not "The Linux Column". The focus here is Unix. But I have to acknowledge that Linux is the fastest-evolving, most easily accessible and most widely ported version of Unix there is. I know people like to describe Linux as a "Microsoft killer", but personally, I am not interested in killing anybody or anything. Linux is promulgating the Unix way of life, and as I have said before in this column, one of the most important things about Linux is that when you are using it and learning about it, you are, in addition, using and learning about Unix.

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MINT CONDITION

Here's a welcome reminder that the Unix philosophy extends far beyond any particular implementation.

"I've been reading your column for a couple of years now, and I suspect there are many 'lurkers' who read it but have not yet got around to installing Linux. I thought it might be useful for your readers if I were to point out that Unix-style operating systems run on more than just PC clones and dedicated workstations. I daresay that a number of readers have old Atari STs and Commodore Amigas sitting in cupboards. If not, they can be picked up cheaply these days. Several of these will run Linux 68k (or a similar variant of NetBSD) and might be a good way to dip a toe into the water.

"My own Atari system runs neither Linux nor NetBSD. Instead it runs MiNT, an acronym that originally stood for 'MiNT is Not TOS' (where TOS is the unfortunately-named OS of the Atari) but which had the 'Not' changed to 'Now' when Atari licensed it as the core of its multitasking OS (MultiTOS!).

"The point is that MiNT will run on even the lowliest ST, and basically adds a pre-emptive multitasking OS based on BSD Unix. Consequently, a number of command-line utilities have been ported, including internet stuff and the like. There's even a version of X for it, although it's more of a curiosity than anything practical.

"As an introduction to Unix, MiNT is cheap and relatively straightforward. You can also use the GUI built in to the ST to run a 'normal' Atari program at the same time, or add a multitasking GUI to run several of them . For any real Atari fans, there is also an Atari emulator for X (called STonX) which emulates well enough to run MiNT, if you really want to get silly.

"Anyway, although this seems to have now turned into a shameless plug for all things Atari, I really wanted to point out that there are cheap alternatives for people who want to give Unix a try, but don't want to chance 'messing up' their main machine."

Mark Crutch
xav@compsoc.man.ac.uk

Thanks for that, Mark. Readers can follow up on this by visiting Mark's web site at www.compsoc.man.ac.uk/~xav. I seem to remember somebody producing a Unix port for Sir Clive Sinclair's QL (which we regarded as a terribly cheap machine at £600 in the mid-eighties) and before that the Dragon 64 had an alternative Unix-like operating system called OS/9. Next time I see a pile of Ataris at a car boot sale, I'll view them with more respect.

The point is that MiNT will run on even the lowliest ST

A suggestion with a tinge of criticism comes from Martijn Herber, who is kind enough to call me "a lone voice in the deafening (and dulling) roar of Wintel rhetoric, and much appreciated!". He's objecting to the space I gave, back in the July column, to Owen Kelly cpx4@hotmail.com. Owen's problem was a common one. Coming from the world of DOS and Windows, he was baffled about how to find his way around Unix. What, he wanted to know, were the equivalents of elementary commands like DIR and DEL in UnixSpeak? I'm only too sympathetic to Owen's plight because it doesn't seem so long ago that I was scratching around looking for a path through the long grass. But Martijn thinks this column has better things to do than spoon-feed neophytes.

Coming from DOS and Windows, he was baffled about Unix

"But really, should this person not have taken the effort to read some of the very most basic docs? This kind of stuff is just something you will find in any of the online manuals," writes Martijn. A piece of online documentation that helped him get started is the DOS/Win-to-Linux-HOWTO by Guido Gonzato, from www.caldera.com/LDP/HOWTO/DOS-Win-to-Linux-HOWTO.html, among other places. He also recommends "the excellent Linux Installation and Getting Started Guide, by Matt Welsh". Like the HOWTOs, this online book is part of the Linux Documentation Project (LDP), also accessible from the Caldera site. Martijn is concerned that by spending too much time dealing with beginners' issues, this column may be missing the point. He argues that we're being too defensive — trying to prove that "you can do it with Unix, too," rather than focusing on the unique features of the operating system and its own way of doing things. "How about some columns devoted to advanced technologies?" he asks, "stuff the rest of the industry can't do (or at least not for the price of a couple of CD's)? And how about a look at some of the 'principles' behind Unix? Actually, this is what drew me away from Microsoft: ideas like 'small is beautiful', 'everybody has a right to see the source code and compile it', 'make one program do one job real well', that prevail in the Unix world."

Martijn Herber,
fam.herber@wxs.nl

We have at least touched on most of these things over the course of the past five years. If you're new to the column you might want to start by checking out http://cesdis.gsfc.nasa.gov/beowulf/ or the Jazznet site at http://math.nist.gov/jazznet for an insight into how Linux is powering farms of standard hardware to create cheap supercomputers. The question of Unix principles is harder to deal with. I hope it's a thread that runs through everything I write here; for an excellent and thorough discussion, let me once more recommend Mike Gancarz' "The Unix Philosophy", by Digital Press.

PCW CONTACTS

Chris Bidmead *by post via the PCW editorial office (address, p10) or at* **unix@pcw.co.uk**