

Smoothwork

The lead review in this month's *LinuxUser* is of Smoothwall, a popular new UK-based, voluntarily produced GPL'd router/firewall package (see Reviews, page 49). Trevor Parsons examines the workings of a real-life open source project

They say a liberal is just a conservative who hasn't been mugged yet. You can observe something similar with computer security. When someone who thinks it'll never happen to them finally notices that an intruder has been at work, the politics of their network always seem to undergo a draconian change.

If you are working at home on confidential

documents on a Windows 98 or 3.11 box connected to the Internet, and you've got shares active, a malicious cracker could probably get into that connection and install Back Orifice, with which they could then control mouse, keyboard, and exploit any one of about ten or 15 hacks. Smoothwall – co-authored by Richard Morrell and Lawrence Manning – is about protecting your internal clients from people doing that.

It's not just Windows users who get hacked. Having had his home network spammed by a script kiddie (see box, The Itch), Morrell decided it was time to start learning how to put up the metaphorical electronic security gates. Sitting down with a Sybex book on ipchains, the firewalling software built into the Linux kernel, he began filling in the gaps in his knowledge.

"It completely changed the way I work," says Morrell. "With ipchains you tie everything down, then open up the ports you need to get your work done. I found I couldn't use my IRC chat client, my ftp client, and I had to work out which ports to open for all sorts of bits and pieces, like CuseeME and so on. I gave up and started to talk to Lawrence for help."

Consulting the guru

Lawrence Manning had been working on ideas for solving much the same problems since November 1998. There are, of course, lots of packaged firewalling solutions available if you want to avoid having to set up ipchains yourself by hand on a Linux box, including commercial products. But none of the available options seemed quite right to Morrell and Manning.

"We looked around at other projects like the Linux Router Project (see Small is beautiful,

The Itch

"Every good work of software starts by scratching a developer's personal itch," Eric Raymond famously declares, and it's certainly true in the case of Smoothwall.

For project mover and shaker Richard Morrell, his itch came when he was hacked by a 15-year-old lad.

"A very clever kid, this one. If he was old enough I'd give him a job today. He was basically just spamming me completely. My hard drive would sit there for half an hour every night crunching away, but his big mistake was working from a BT Internet account with a static IP address, so I was able to track him down and warn him off."

Problem solved temporarily. But the need was clear: it was time for Richard to get himself some firewall protection. Yet none of the solutions seemed to be just what he wanted...

The team

It is amazing how quickly you can pick up help on a project that is seen to fit a need. Morrell says: "I sent out mail asking for translators, and within two days we had 14, and now Smoothwall documentation is available in 17 languages."

"We owe a debt of gratitude to a lot of people to whom we could never afford to pay a penny. But at the end of the day we're all trying to give people a really good cheap way of getting connected to the Net – plus it's getting Linux into people's houses who've never used it before."

The mover and shaker

Richard Morrell is project manager and co-author of Smoothwall. During the day he works for VA Linux Systems in their European operation as a sales engineer. He also contributes to the RedmondLinux project... and has a somewhat fanatical obsession with Sunderland Football Club.

As well as bringing his co-ordinating and technical abilities to the project, Richard has one of the largest Linux archives (books and CDs) in the UK and has an enterprise level network lab in his home – invaluable for research, development and testing.

The guru

Lawrence Manning is development manager and co-author. He did the bulk of the initial sheer hacking work on the project, including paring down the VA Linux distribution on which Smoothwall is based, and writing the Perl which automates its configuration.

Lawrence has contributed code to the wwwoffle proxy caching application programme. He is also involved in testing and building development kernels and IO scheduler testing.

The rest

Jon Fautley – Undertakes software quality checking, contributes features and comes up with new avenues for ongoing coding and specification. Jon, 17, is also listmaster for the project.

Tom Ellis – Documentation manager Tom has built the documentation archives and the FAQs. He is in charge of bug tracking and version control, and also for keeping an eye

on web statistics and coverage attracted by the project.

Toni Kuokkanen and **Mark Thomas** – logo design and graphic design

At 21 people and growing, the team is too large to credit in entirety here, but the effort is world-wide. Among current contributors: developers in the US working on new scripts and automating the web front end; a young Australian building in snort, a detection tool for network hackers; and two people in Africa working to get pulse dialling working because their telephone exchanges don't have tone dialling.

The tools

Smoothwall.org



The project's home page, thrown together in a matter of minutes, but still providing a useful point of reference for users and testers, giving background on Smoothwall and latest news on releases and developments.

Sourceforge

Offers space, collaborative tools and other facilities for open source projects. Rolling out the project on SourceForge has provided

the capacity to allow thousands of people to download their copy (although there are other mirrors).



Sourceforge is so well known and used, so it has also brought the project to the attention of lots more people, especially when Smoothwall neared the top of Sourceforge's downloads hit parade.

The site also offers CVS (concurrent versions system), although the Smoothwall team do not use it because it is better suited to single software programs rather than a diverse package.

Morrell and Manning have some reservations, though: "It's very secure, and the way they operate it is great, but you really do have to change the way you work to embrace it – and it's the same with Source Exchange, if you look at collab.net's way of doing things."

Majordomo

News groups have been set up, largely to manage the reports from people testing Smoothwall.

LinuxUser October 2000, page 40), which is quite cool, but because of size restriction of the floppy, it didn't offer the level of functionality I wanted because, quite honestly, sitting in a text editor like pico or joe trying to edit a script file really didn't get me any further than my attempts with ipchains – it just wasn't easy enough to use.”

Commercial SoHo firewall boxes also failed to appeal, partly because of the high cost, but also because you often have to use a Windows client to configure them. They also have features such as Net filtering built in, but Morrell didn't particularly want to proxy his access to the Net. “I just wanted to share my internet connection and secure the way I worked,” he says.

Navigating an ocean of choices

The duo evolved a wish list: the process of installing and configuring a firewall and router should be automated and easy to use; the package should be large enough to offer a wide range of easy-to-use features, but small enough to deliver via modem; it should run on redundant hardware that anybody might have lying around gathering dust; it should support a wide range of network cards; and it should be configurable using any client on the network with a web browser.

Email

Although they've set up news groups and there's a forum on Sourceforge, Morrell and Manning receive most communication by email, which is very time-consuming to deal with.

But fortunately, the amount of mail requesting support is relatively small – a testament to Smoothwall's success in providing a really easy-to-use installation and configuration routine.

“The majority of support-related questions you get come from people who haven't read the manual,” says Morrell, “and they're trying to install Smoothie on a machine with only 4Mb of RAM.” It never ceases to amaze how people are prepared to download a 16.9Mb ISO image, but not the 7Kb README which accompanies it.

Current status

Version 0.9.4 – streamlined the already easy installer, added autoprobing for Ethernet cards and autoseup, tweaked the web-server and added baud rate control and some other features.

Downloads 15,000
Hits to site 150,000+

The future

► ISDN is now in beta testing, working on cards from ELSA and ASUS. The aim is to automate it get some feedback from some of the less helpful hardware manufacturers, and make it as easy as configuring PPP is currently.

► A dual Ethernet solution and a cable modem solution is being worked on concurrently in North America and the UK.

► Project to encourage schools in Ontario, Canada, to roll out Smoothwall to provide cheap, convenient, secure access to the Net

► PHP-based automatic support website planned

► Potential collaboration with SafeLinux – a project with similar goals

► Interest ISPs in bundling Smoothwall as a security solution for their domestic and small-office customers

► For the long term, Morrell is considering building some form of public key infrastructure or VPN client into Smoothwall to produce a commercial production. “If you're, say, a chain of estate agents,” he says, “when you open your next branch I want you to be able to just roll out your Smoothwall and you're connected to other branches securely over the Internet.”

Once they had decided on the parameters of the project (see table, Decisions, decisions, below), based on VA Linux 6.2.1 configured by hand-coded Perl scripts, developing their first working version was relatively fast.

After initial testing by friends and acquaintances, Smoothwall was released in the wild. Word got about quickly, and the team was completely overwhelmed by the package's popularity. “My employer VA only realised what I was doing in my spare time when they noticed that Smoothwall had hit number three in the download figures on Sourceforge,” says Morrell. “Almost all of those downloads represent people who've installed the package, configured it with ease, thanked us, as is often the case, and got on with their lives.”

International rescue

From all over the world, offers of assistance came in from people who were so impressed with Smoothwall that they wanted to help. With much of the groundwork on building the package already done, testing on a wide range of hardware has been the main focus

of the collaborative, global development community they evolved. But documentation has been another area of input, with 14 translators now on the books.

People also suggest – and provide – improvements and additional features, some eminently sensible, like adding a pulse dialling facility, and some which showed a basic lack of understanding of the focused nature of the project, wishing to expand it into a fully fledged, general purpose Linux distribution.

“Smoothwall is never going to be all things to all people,” says Morrell. “We have to keep our original vision in mind, and take on the best which our collaborators can offer.”

For the project leader of an open source project, it seems, deciding which suggestions to accept and which to reject is one of the most important responsibilities.

But one thing will never be rejected – and that's an offer of help. Whatever your skills – coding, testing, writing documentation, design, – it's certain that there'll be room for you to contribute to an open source project.

Decisions, decisions... the choices that shaped Smoothwall

PROBLEM	ALTERNATIVES CONSIDERED	VERDICTS	RESULT
Target size of package – optimise for which delivery method?	<ul style="list-style-type: none"> Download with modem Floppy disk CD-ROM in post T1/cable download 	<ul style="list-style-type: none"> Yes Would restrict features Expensive Not common outside North America 	16.9Mb download – max. 50 mins download (33.6 Kbits/sec modem) < 40 Mb installed – will fit on hard disk of low-end 486
Target host hardware	<ul style="list-style-type: none"> 486 to Pentium 100 High-end Pentium 8086 	<ul style="list-style-type: none"> Yes Over-specified, too expensive Won't run Linux! 	Smoothwall can offer good feature set while running on redundant hardware gathering dust in many homes and offices
Target network card	<ul style="list-style-type: none"> ISA cards, eg NE2000, upwards PCI only All network cards 	<ul style="list-style-type: none"> Yes Rarely found in 486's Too much development work needed 	Smoothwall can support all cards supported by 2.2.16 kernel (most cards found in redundant 486's)
Base Linux distribution	<ul style="list-style-type: none"> VA Linux Red Hat, Caldera, Tiny Linux, Slackware ...and many others 	<ul style="list-style-type: none"> Yes All promising, but would have taken extra work to prepare 	Most of the work was already done on making Linux secure for servers, so Smoothwall project could concentrate on configuration and tailoring
Configuration engine – where to put it, what to base it on?	<ul style="list-style-type: none"> Web pages activating hand-coded Perl configuration scripts Web pages activating Perl modules Web pages activating Javascript Configure via graphical installer Configure via Red Hat-based script installer 	<ul style="list-style-type: none"> Yes Promised to save development time, but would have run too slow on low-end hardware Nightmare! Many 486 graphics cards too slow Rather buggy 	Smoothwall configurable using any client on the network with a web browser; server-side load suits low-end hardware

