Open Source in the Data Centre

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Bulletproof Networks
About Me
Experience

- Previous
  - Engineer, ZipWorld (ISP)
  - Senior Engineer, Pacific Internet (ISP)

- Current
  - Technical Guru, linux.conf.au 2007
  - Owner, Beagle Internet
    - Internet Service Provider
    - Dialup and ADSL
  - Research and Development Manager, Bulletproof Networks
    - Managed Dedicated Hosting
    - Managed VM Hosting
    - Monitoring (as a service)
The Data Centre
The Data Centre

- Some data centres look like this...
- Most I know look like this...
Why do servers come with 3 meter power cables?
Now, where's that power cable?
Oh! I just have to extend the CM arms?
IDC Components

- Internet Connectivity
  - Border Routers, Peering Links

- The Network
  - Switches, VPN Links

- Core Infrastructure
  - DNS, AAA, Monitoring

- Hosted Infrastructure
  - Web Sites, Email, B2B
Software in the IDC

- Operating Systems
- Monitoring
- Backups
- High Availability
- Load Balancing
- Authentication
- Networks
- Support
- Web Hosting
Free and Open Source Software
Where can FOSS be used?

- In all of the components in the previous slide
- Although, this doesn't mean you always should
- PC hardware vs Appliances vs Routers
- Where can't FOSS be used??
  - Network and fibre switches
  - Windows, well No
FOSS on Windows

- cygwin
- Open Office
- Apache
- Postgres
- MySQL

Most of the things in the following slides
Why use FOSS?

- Easier to Troubleshoot
  - You can work anything out when you have the source
- Higher Quality
- More Flexible
- Openness, Standards
- Choice
FOSS as a small business

- Cheap
- Buy vs Build/Deploy
- Commercial Software
- Lowers the barrier to entry
- Scalability
Monitoring
Monitoring

- Is my Server Up or Down
- Are all the services running
  - Individual service checks
  - Process Fingerprint
- Utilisation Graphs
  - Disk
  - CPU
  - IO
- Notifications
  - SMS
  - Pager
  - Email
Monitoring

- **Nagios**
  - My monitoring platform of choice
  - Used to be called Netsaint

- **Very extensible with plugings**
  - Standard plugins – (http, smtp, ping, https, etc)
  - Any script, return codes evaluate to status
  - WWW::Mechanize

- **Lots of 3rd party extensions**

- **net-snmp**
  - formerly ucd-snmpd
  - Vendor snmpd #?&%!!!
Nagios

Nagios Demo Here
Graphs

- MRTG
  - Has been used for years
  - Make sure you use Round Robin Database

- RRDTool
  - Lets you store graph data
  - Many tools to insert and display data

- Easy to roll your own
MRTG and RRDtool Demo

Demo Here
Notifications

- Use pagers, not SMSs
- SMSClient can be used to interface with most networks
  - Link SMSClient, modem or Internet
  - Redrock, simple perl script
- Jabber nagios notifications (soon to be open sourced)
Backups
Backups

- Disk to Disk to Tape
- BackupPC
  - Methods
    - rsync
    - ssh
    - samba
  - Utilises hardlinks to save on space
  - Each incremental backup becomes a full backup
- Tape only used if Disk fails
  - use tar or dump
BackupPC

sources

/bin/ls  /bin/ls  /bin/ls  /bin/ls

backup

/bin/ls  /bin/ls
BackupPC

- 12 hosts
- 77 Full backups 871GB
- 72 Incremental backups 197GB
- Actual space used 183GB
- 5 times less space
BackupPC Demo

Demo Here
Load Balancing and High Availability
Load Balancing

- Commerical options
  - Alteon
  - Cisco CSS
  - BIG IP

- Linux kernel supports IPVS
- Layer 4 load balancing
- ipvsadm is the command line tool
- Basicaly routing at TCP level
- Multiple backends + Sorry Server
Load Balancing

- **Heartbeat**
  - fake + ldirectord
  - fairly old and slow for large installs

- **Keepalived**
  - Fast and Simple
  - Checks back end servers
    - http, https, connect, script
  - Takes servers in and out of cluster
High Availability

- Keepalived
  - Implements VRRP

- VRRPd

- STONITH
  - Shoot the other server in the head
  - Solves quorom problem
  - Hardware needed
  - Experimental kernel module
Authentication
Authentication

- PAM
  - /etc/shadow
  - XSQL
  - LDAP

- LDAP
  - OpenLDAP

- RADIUS
  - freeRADIUS
  - Integrates with multiple backends
    - LDAP
    - MYSQL, PostgreSQL, Oracle
    - BDBM
    - Shell scripts!!
Tickets

- Ticketing System
  - Request Tracker
- Highly Extensible
- Web and Email based
- Can support a basic workflow
Requet Tracker

Demo
Documentation

- Wiki's are easy to use
  - wikipedia

- Twiki
  - Highly extensible
  - Lots of plugins
Demo
Email
Email

- A whole presentation in it self
- Exim, Postfix, Sendmail
- Spamassassin, DSPAM
- Dovecot (IMAP, POP)
- ClamAV
- IMP
- Integrate all of the above with LDAP
- perdition
Networks

- quogga (formerly zebra)
- cflowd
- pptpd
- OpenSWAN
- iptables
Web Hosting

- Apache
- PHP
- Tomcat
- Perl, python etc
Databases

- PostgreSQL
- MySQL
Operating Systems

- Linux
  - Debian
  - Ubuntu
  - Redhat
- AIX
- HPUX
- Windows
  - cygwin
Looking Forward

- Virtualisation
  - VMware (not Open Source)
  - Xen
- More automation
- Patch Management
Questions

- Any questions?
linux.conf.au 2007

- 15\textsuperscript{th} - 20\textsuperscript{th} January 2007
- University of New South Wales, Sydney
Employment

- Bulletproof is currently employing people in Sydney. Please see the Bulletproof website for details.
Bulletproof Networks

About Bulletproof Networks

Bulletproof Networks is a best-of-breed managed service provider, supplying some of Australia's largest companies with high performance, high availability managed hosting, virtualisation and website infrastructure monitoring.

Bulletproof is the first provider in Australia to launch a fully managed, dedicated virtualised hosting service.

Bulletproof is also the largest provider in Australia of customised website and Internet infrastructure monitoring as a service.