The Portable Private Teaching Network

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Agenda

- What is it?
- What did it cost?
- Why do we have it?
- Why the choices of hardware?
- Setup and configuration
- How do we install Operating Systems?
- Some real uses
- Problems and Solutions
- Demo of imaging workstations
- Resources
- Questions and Answers

What is it?

- 20 Dell Inspiron 1100s
  - 750MB RAM, 30GB HDD, 2.2GHz Celeron
  - External USB floppy drives
  - 10/100 Ethernet (PXE-enabled) and 56k Modem
- Netgear FS108 10/100 8 port unmanaged switches
- Netgear FR114P NAT Router/Print Server
- HP LaserJet 1300N
- Epson EMP-730 Data Projector
- Lots of Network Cables/Power Cables
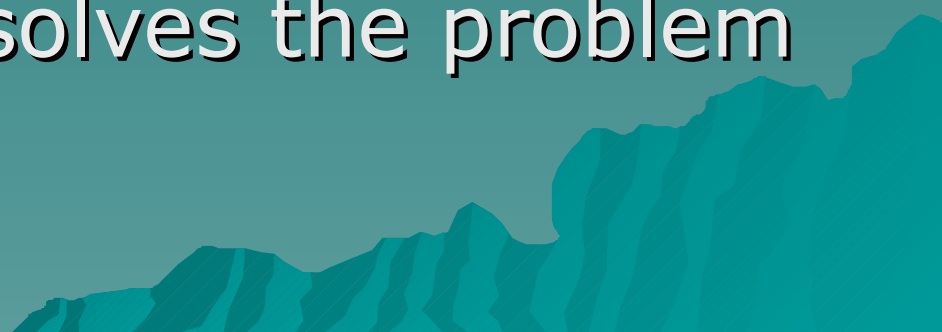- Master PC with XP Pro and Ghost 7.5
- Naming theme is The Simpsons

6 Way Plain Strip

6 Way Plain Strip

6 Way Plain Strip

6 Way Plain Strip

FS108

FS108

FS108

OUCS Private Portable Teaching Network

FR114P

4 way surge protector

4 way surge protector

Server PC with Symantec Ghost

Optional Network Uplink

Mains Feeds

Cat5E Cable

Mains Cable

Student PCs (mains connection not shown)

Tony Brett, OUCS, October 2003

In action…

What did it cost?

- Inspirons were c. £525 each, USB Floppy drives £20, RAM upgrades £59 each

- Network kit, cables, power adaptors etc.

- Total c. £15,000

- Soon pays for itself when laptops are at least £50 per day per laptop to hire: 20 Laptops for 5 days = £5000

Why do we have it?

- Demand for hands-on courses is increasing
- Rooms are Easy to find
- Rooms with computers are hard to find
- Computers that we can trash are even harder!
- Portable network solves the problem in one go

Hardware Choices

- Dell were cheapest and most reliable
- Didn't want laptops to be too light and stealable
- Battery Life irrelevant
- Wanted well-known machines so many OSs can be supported
- Wanted 10/100 Network/Modem/USB
- NAT Router prevents infection from external nasties
- Private network does not interfere with host network (if connected)
- All PCs able to access the internet safely if required

Setup and configuration

- Router acts as DHCP client to uplink (WAN) and DHCP server to laptops (LAN)
- Router knows laptop MAC addresses so always gives them the same IP address
- OS – Independent
- Router configurable via Web Browser
- Links to switches direct from Router
- Anti-surge power strips – UPS not necessary for laptops

OS Maintenance and Installation

- Ghost is our friend!
- Images of various OSs held on master PC
- Boot PCs with bootable USB stick with packet drivers and ghost executable
- We have standard images for mutlcasting
- Can have (external) trainer build one PC and then clone to all others
- Multicasting saves lots of time!

Real uses

 ◆ Windows 2003 server course

 ◆ Why linux? Course

 ◆ Novell NDS Troubleshooting Course

 ◆ Testing software on old OSs, old browers
   – Could use VMWare but actual machine
     sometimes better

 ◆ Demos and exhibitions

 ◆ Lending out to colleges/departments for
   teaching, conferences etc.

Problems and Solutions

- Broadcom Network adapter (4400) gave a bit of trouble with finding a packet driver and linux drivers
  - Ghost boot disk builder solved problem with NDIS/PKT shim
- Video Driver hard to configure in some Linux versions (Fedora Core 2 was fine)
  - BIOS Upgrade from A22 to A29 improved matters vastly
- Ghost 7.5 screws up GRUB
  - Symantec have a documented fix.
  - Not a problem with Ghost 8.0
- Haven't yet got PXE to work
  - USB stick booting is workaround, much quicker than floppies
  - Dell have a utility for making USB sticks bootable

Imaging Demo

- Bart has Windows 2000
- Smithers has Fedora Core 2
- Can change or refresh quickly with Ghost

Resources

- Symantec GRUB workaround
  - http://www.symantec.com/techsupp/index.html
- Dell Bootable USB Key Utility
  - http://support.euro.dell.com/uk/en/filelib/downloa
- Netgear Support
  - http://kbserver.netgear.com/main.asp
- This Talk
  - http://users.ox.ac.uk/~tony/pptn.ppt

Questions and Answers