

**JANET NetLab
Network Virtualisation**

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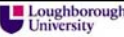


A bit about myself...


- Network & Security Manager at Loughborough University
- Team of ten IT Professionals
- Worked at Loughborough for 9+ years
- JANET(UK) Trainer
- Security Researcher




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Virtualisation: A Networking and Security Conundrum



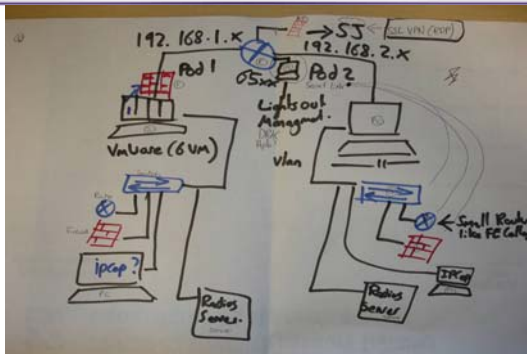
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Background, where we came from...



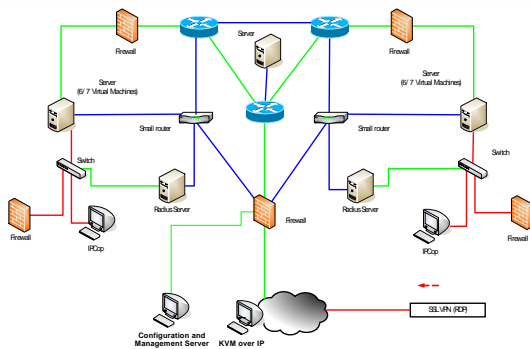
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JANET NetLab is born



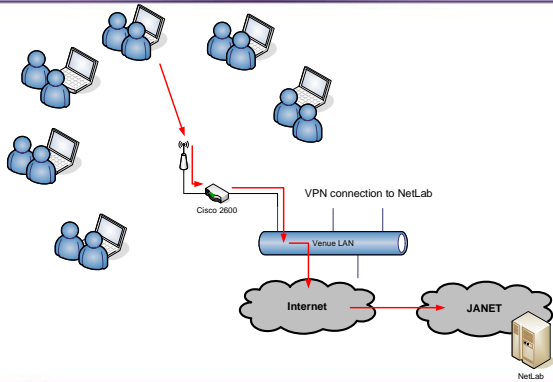
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Topology Diagram



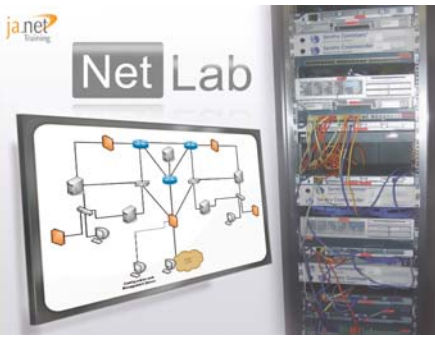
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At a venue



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JANET NetLab



- Core of JANET
- State of the art
- Industry standard
- Course support
- VMware ESX
- VPN connection
- Firewalls
- IPv6
- Multicast

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Potential Uses in New Courses

Firewalls
Configuration of real firewall hardware. Write firewall rules and see the effect in real time!

Roaming
Configuring and deploying the infrastructure to join the JRS

IPv6
Hands-on configuration of networking and services for IPv6

Multicast
Understanding multicast deployment and troubleshooting

UK Federation
Understanding and configuring a Shibboleth IdP as part of a test federation

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Where next?

- Short term
 - Implemented, thanks to Dunc et al
 - Activities developed for courses
 - NetLab trail in Abergavenny
- Longer term
 - Hardware expanded for other courses
 - 3G card for remote locations
 - Full VMware course coming soon

How Secure?

- Can secure Virtual Machines exist on the same host?
 - Do you want to run your Web and SQL server on the same physical computer, even if virtualised?
 - Breaking out of the VM is possible
- Is automatic provisioning a good idea?
- Where is the traditional DMZ?
- Shared VM Services
 - Anti Virus
 - HIDS/HIPS



Network Implications

- Is the virtual network secure?
 - Does your IDS/IPS have visibility of the virtual switch?
 - Network probe guest VM?
 - Increased frequency of SSL based attacks
- Expectation that the network can deliver:
 - Speed requirements, does it make sense to virtualise high bandwidth applications?
 - Same IP Everywhere (VMotion)
 - Automated VLAN changes
 - What is the virtual switch, or router?



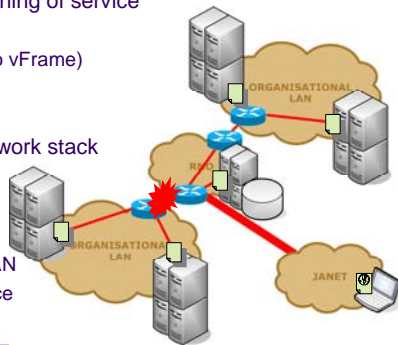
Hidden Extras

- Can you get enough bandwidth from the server?
 - PCI-X 1.0 - 133 Mhz @ 8.53Gb/sec
 - PCI-X 2.0 - 266 Mhz @ 17.2Gb/sec
 - PCI-X 2.0 - 533 Mhz @ 34.4Gb/sec
 - However: beware slow cards, slow the whole bus
 - Take advantage of multiple buses
 - Don't let the network take the blame!
- Fixing shortcomings in software
 - USB over IP
 - Digi's AnywhereUSB
 - http://www.vmware.com/pdf/esx_anywhereusb2.pdf

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Futures

- Automated provisioning of service
 - Virtual Machine
 - Networking (Cisco vFrame)
 - Storage
- Complete IPv6 Network stack
- Pervasive Data Centres
 - Organisational SAN
 - Shared VM Service



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Questions?

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<http://escarpment.net/>
