



# Campus Issues

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# Issues For Investigation

- Campus Bottlenecks
- Providing Network Services
- Rollout of IPv6
- Training Network Staff
- Collaboration at Campus and National level



# CAMPUS Panel

- Rogelio Montañana, Valencia University, Spain
- Michael Nowlan, Trinity College Dublin, Ireland
- Ligia Ribeiro, Porto University, Portugal
- Martin Sutter, SWITCH, Switzerland

## *Plus*

- Jim Buddin, TERENA
- Jean-Paul le Guigner, CRU, Rennes, France
- Martin Price, EUNIS, UK



# Online Survey

- Targeted at Heads of campus IT services
- Took place in March 2007
- Areas of survey
  - Campus Infrastructures
  - Network Services
  - Governance/Funding
  - Networking Expertise
  - Collaboration



# Survey Findings

- Diversity of community
- Wide-ranging connection rates
- Few campus bottlenecks
- Some over-restrictive security
- Videoconferencing widely available - *but not widely used*
- Networking policy
  - non-existent in some institutions
  - little formal input from user community
- Networking staff
  - wide spectrum of staffing levels
  - recruitment/retention difficulties
  - training/retraining: problems of funding & career development
- Not much collaboration between institutions



# Discussion topics

- **INSTITUTIONS**
  - **NETWORKING POLICY**
  - **INFRASTRUCTURE & SERVICES**
  - **SECURITY**
  - **END USERS: REPRESENTATION & RESPONSIBILITIES**
  - **COLLABORATION**
  - **RAISING AWARENESS & TRAINING**
- **NRENS**
- **TECHNOLOGIES**



# Points for discussion (1)

## INSTITUTIONS - NETWORKING POLICY

- *Define networking policy at the highest level within institutions, covering the following topics:*
  - *Strategic plans to meet the aims and objectives of end users*
  - *Security*
  - *Arrangements for end user participation in policy making*
  - *Adoption of national guidelines*
  - *Annual budget adequate to meet objectives*
  - *Providing a well-resourced network team*



# Points for discussion (2)

## INSTITUTIONS - INFRASTRUCTURE & SERVICES

- *Adopt institution-wide specifications for networking infrastructure, including departmental and faculty*
- *Provide support and training for performance optimisation, especially to innovative and demanding users*
- *Set aggressive replacement policies for equipment - maximum life expectancy of 5 years*
- *Ensure seamless end-to-end connectivity where a particular quality of service is required*
- *Provide IPv6 services for all users at all layers (network, transport and application)*



# Points for discussion (3)

## INSTITUTIONS - SECURITY

- *Adopt security measures which are appropriate for purpose and do not hinder the effective use of the network*
- *Create a formal independent Security Team with a wide remit and a considerable degree of independence from the institution's central IT service*

## INSTITUTIONS - END USERS: REPRESENTATION & RESPONSIBILITIES

- *Ensure end users are involved in defining networking policy*
- *Establish formal procedures to identify end user requirements*
- *Agree and circulate an Acceptable Use Policy (AUP) to all end users which sets out clearly their rights and obligations when they use the network*



# Points for discussion (4)

## INSTITUTIONS - COLLABORATION

- *Establish formal arrangements for networking teams to share expertise with colleagues in other management domains, e.g. NRENs, intermediate networks, other institutions*

## INSTITUTIONS - RAISING AWARENESS & TRAINING

- *Networking emphasis is moving from connectivity to providing network services. Institutions should accelerate change by:*
  - *Providing training courses and good quality documentation to promote network services; e.g. videoconferencing, Multicast, video broadcasting, video on demand, IP telephony*
  - *Making arrangements for network support teams to keep up-to-date with fast-changing technologies*
  - *Encouraging innovative use of the network*



# Points for discussion (5)

## **NRENS**

- *Collaborate more closely with institutions in the following areas:*
  - *Deploying key services*
  - *Sharing strategic information*
  - *Organising training for innovative services*
  - *Coordinating working groups of networking staff to share expertise*
  - *Understanding the demands of high-end users*
- *Ensure support is available for institutions to make a smooth transition to IPv6*
- *Assist institutions to provide support and training to end users about performance optimisation, especially innovative or demanding users*
- *Provide guidelines for institutional networking policies*



# Points for discussion (6)

## TECHNOLOGIES

- *No proof of technology revolution in the near future*
- *Constant incremental evolution in several fields*
  - *Institutions need to keep up with technology*
  - *Avoid being overtaken by the evolutionary changes*
- *Some areas of technology deserve specific attention to:*
  - *facilitate the sharing of distributed resources*
  - *improve the roaming and mobility of users*
  - *provide higher capacities, QoS for accessing HPC and large databases*
  - *secure the access to the network without extra burden*
  - *guarantee seamless E2E connectivity*

***Define and review network policy & architecture on an annual basis***  
***Deploy technologies consequently***



# Points for discussion (7)

- ***Innovations in use of network***
  - *coming much from the application layer*
  - *new concepts, often not leading edge technologies*
  - *examples: P2P tools / Web2.0, ...*
- ***Techologies implemented by NRENs***
  - *Do not always suit the campuses (MPLS, GMPLS, ...)*
  - *Do not need to cross borders between NREN & campuses*

***The interests of end-users, institutions and NRENs are not always the same. They have different objectives.***



# Points for discussion (8)

## Lower layers

- *“cabling” infrastructures*
  - *Upgrade optical cables (fibre quality)*
  - *Introduce CWDM when possible and needed*
  - *Follow new standards for copper & wireless infra.*
- *Ethernet*
  - *VLANs + QoS + NAC enough for most E2E needs*
  - *New emerging Ethernet standards the next step?*
- *Control planes (MPLS, GMPLS, UCLP, ...)*
  - *No proven need to deploy on campuses*
- *Tools for monitoring and performance control*
  - *Better coordination with NRENs (PerfSonar, ...)*



# Points for discussion (9)

## Middleware

***Identity management is ESSENTIAL for the advancement of research and education***

- ***Identity federation:***
  - ***allow access to and share distributed resources***
  - ***documentation, services, CPU time, etc.***
- ***Identity management and mobility:***
  - ***eduroam deployment***
- ***Identity management and Grids:***
  - ***facilitate the deployment of operational Grids***



# Points for discussion (10)

## Network architecture

- *Some applications like Grids require higher network performance (bandwidth, delay, jitter)*
- *High networking performance should not be sought at the expenses of security*
- *Intelligent network architectures can be specified which allow for security and at the same time for dedicated network resources.*
- *→ Strong collaboration between NREN experts and institution experts should help solve problems.*



## As a final point on policy, architecture and technologies

