
Internet Bandwidth Challenges

Strategies for optimising and managing bandwidth in low bandwidth environments

ICT Technical Staff

Martin Belcher
<mbelcher@inasp.info>

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Presentation outline

- Review the challenges that universities face in relation to Internet service provision and access (bandwidth)
- Review the role of bandwidth management in these issues (now and in the future)
- Review the role that ICT staff and technicians have to play in this area
- Examine possible actions and best practice for ICT staff and technicians

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The essential issue

- Bandwidth is a resource that is...
 - limited
 - in high demand
 - expensive
 - of high value
- It should be managed accordingly

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What is the bandwidth challenge?

- Available bandwidth is limited and insufficient to meet demand
- Existing bandwidth is usually running at maximum capacity
 - as a result it is often unusable
- The cost of bandwidth is extremely high
- Expanding bandwidth capacity is limited due to finances, supply, technology

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Why are these issues a challenge?

- Existing bandwidth is often not managed
 - See the ATICS Report: www.atics.info for full details of the situation in African universities

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What does this mean?

- The university is not participating in the digital library revolution
 - Existing digital library resources are under-utilised
 - Further investment in digital library technology is unrewarding (high cost/low use)
- The university is not providing its staff, researchers and students with the information they require
 - Lack of access to up-to-date, global research information = restricted research potential

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The financial impact

- Low level of return on investment
 - High network costs (c.\$5000 per month)
 - Low level of use (page downloads taking >10 minutes)
- Low incentive to invest more within the university infrastructure
 - Poor ICT investment (including staff, training, etc.)
 - More computers / same bandwidth = slower access / less research

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Possible solutions?

- Do nothing !
 - often the reality but not the answer
- More bandwidth and lower cost
 - Local, national and international consortia
- Better management of the existing resource
 - Improved access, no additional bandwidth costs
- Combined approach (low cost + management)
 - Half price + double speed = quadruple access
 - Increased long-term sustainability

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Bandwidth management

1. **Monitoring** and **management** of available resource
 2. **Optimisation** of the resource to ensure value for money and fitness of purpose
- Three key groups to ensure success:
 - Executive management
 - Senior implementation management
 - Technical staff involved in the day-to-day implementation

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Bandwidth management essentials

Issues for technical staff and technical solutions

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Supportive environment

- A supportive environment must exist to allow technical staff to be effective:
 - Effective leadership from the executive level to provide authority to all decisions and actions
 - Sponsorship and advocacy from senior management to provide commitment to all developments
 - Strategic direction from the organisation which includes bandwidth management as an integrated component

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Resourcing and support

- The IT department must be adequately equipped and managed
 - Appropriate IT governance
 - Appropriate alignment of IT operations with institutional objectives
 - Appropriate resourcing of IT staff and operations
 - Appropriate benchmarking and explanation of bandwidth use

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Recommendations technical staff 1

- Install good security and adopt anti-virus practices
- Track and report on all relevant aspects of the network, bandwidth and Internet usage
- Implement content filtering to block undesirable web content
- Use proxy servers and local caching DNS servers to keep local copies of previously retrieved web pages and Internet addresses
- Use the network to locally manage upgrades and updates

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Recommendations technical staff 2

- Make sure all user activities can (if necessary) be traced
- Consider implementing a bandwidth manager product that allows you to give bandwidth priority to certain protocols, and to throttle others
- Discourage and control certain types of 'peer to peer' networking.
- Offer Email addresses and web based Email facilities to users

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Recommendations technical staff 3

- Configure the network to avoid open relay hosts and open proxies
- Train all users to use the Internet safely and efficiently
- Consider outsourcing and mirroring options
- Charging for bandwidth may help encourage users to use bandwidth sparingly

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Further information ...

- More information on the Bandwidth Management and Optimisation programme can be found in:
 - *Optimising Internet Bandwidth in Developing Country Higher Education*
In print and also online: <http://www.inasp.info/pubs> in English, French or Spanish
 - <http://www.inasp.info/bandwidth>
More information about the entire support programme, workshops, resources and publications

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Further information about INASP

- International Network for the Availability of Scientific Publications (INASP)
- Established in 1992
- The mission of INASP is to enable worldwide access to information and knowledge with particular emphasis on the needs of developing and transitional countries.

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INASP

- The major components of our strategy are:
Networking people • providing access to information • supporting local exchange of information and knowledge • strengthening local publishing • training and capacity development
- Programme areas
 - Research and Education
 - Library Support Programme
 - Publishing Support Initiatives
 - Health Information
 - Rural Development

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INASP

To find out more about
INASP programmes and activities
visit our website:
<http://www.inasp.info>

INASP
58 St Aldates, Oxford, OX1 1ST, UK
Tel: +44 1865 249909
Fax: +44 1865 251060
Email: inasplinfo

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Thank you

Further information on bandwidth management and optimisation:

<http://www.inasp.info/bandwidth/>
<http://www.bmo-community.org/>

The bandwidth management and optimisation programme is supported by:
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