

# Improving Network Management for Universities and SMEs

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A presentation at AfNOG 2012, Serekunda, Gambia

My own opinions, not my employer's

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# What is Network Management?

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- Solving network problems
- Preventing network problems
- Operating a help desk with ticketing
  - More IT users → harder to remember and plan
  - More IT support staff → harder to coordinate

# Benefits

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- Reliable Voice over IP
- Faster, more reliable Internet access
  - Ensure fair access to a shared resource
  - Reduce upgrade needs for a while
- Fast, efficient service and support
- Better shared infrastructure for local services
  - Email, web, intranets, conferencing, media sharing
- Security incidents handled properly
- Certain applications become possible (think Cloud)

# Commercial tools

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- Expensive commercial tools exist
  - Cisco, Packeteer, Solar Winds, SpiceWorks, ManageEngine
- Reliable, easy to understand, easy to use
  - Good manuals and documentation
  - Pretty reports and graphs
  - Training required, but less
  - Certification has value outside of Africa
- Fancy commercial support to solve any problem

# Free tools

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- Free alternatives exist
  - Routers, firewalls, ticketing, service monitoring, graphing, configuring
- Built by experts for their own use
- Shared because sharing is free, and for personal reasons
- Impressive but hard to install and use
- Free support on mailing lists
  - Requires high level of technical skills to engage with
  - AfNOG mailing list is an exception

# Investing

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- Improve quality of service, at reasonable cost
  - Professional development?
  - Improve the free tools?
  - Buy commercial tools?
- What is a good investment?
  - What provides the best long-term return?
- How easy is it to procure?
  - Equipment > Development > People?

# Investing in Staff

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- EARNEST says:
  - “The network support team should be adequately staffed and have appropriate expertise... It is vitally important that they are properly trained to carry out the tasks expected of them.”
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# Challenges for Investing in Staff

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- Tendency to leave for higher-paid jobs
- Everyone wants professional development
- Low salaries and limited opportunities
  - Firefighting with no resources is frustrating!
- Competition:
  - ISPs
  - tech companies
  - jobs abroad



# Staff Retention: Ideas

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- What might motivate good people to stay?
  - Better working environment (less pressure)
  - Access to latest technology, opportunity to experiment
  - Less pressure, allowed to fail and learn
  - Part-time attracts women and new parents
  - Social ties (community, church, friends)
  - Opportunities to travel, attend conferences
- What might increase supply?
  - Universities could turn out hundreds of IT staff per year

# Investing in Commercial Tools

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- Waste of money in my view
  - Goes into pockets of rich businessmen
  - Keep buying upgrades, support, licenses
- Not developed for this context
  - Pay western prices due to global market
  - High hardware and software requirements
  - Low volume, ignored by vendors
- Support is good but essential and expensive
- Violating license is common but dangerous
  - Allows licensor to hold to ransom

# Benefits of Investing in Free Tools

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- No license fees, “free” prototyping (time only)
- Pays back over and over:
  - Better documentation → easier to learn and train
  - Easier to install → easier to maintain platform
  - Easier to use → faster results, less effort
  - More features → solve more problems, more quickly
- Everyone benefits
- Ensures that the project stays alive (motivation)
- Builds local capacity for support
  - More transferable skills than commercial tools

# How to Invest in Free Tools

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- Open source means that anyone can modify
  - Many orgs improve free tools but don't share results
  - Sharing costs, but custom versions lock you in the past
  - Don't be a freeloader – give back!
- Small budgets can go a long way
  - Local developers can solve some problems cheaply
  - Groups can join forces to pay for difficult projects
  - ONLY if coordinated
  - Will everyone attend the meetings, read the mailing list?
  - At least announce your intentions to users

# Which tools to invest in?

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- Some are simpler, cheaper to modify
  - Ideally target a feature set, not a tool
- Take advantage of (open) standards
- GigaCampus assessment concluded that:
  - “Co-ordinating and standardising infrastructure, bringing together technical communities for technical gatherings and agreeing on joint best practices by means of technical specifications (best practice documents) has clearly been of enormous value.
  - The pay-back factor of the project budget was calculated to a ratio of 3.7.”

# Budgeting for Investment

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- Current budget?
- Cost depends on number of:
  - PCs
  - users
  - infrastructure devices
  - ISPs
- All of these are growing?
  - Even if the hardware is free, costs are increasing

# Proposal

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- Increase your budget by 10% of your Internet connection cost
  - 5% on professional development for IT staff
  - 5% on improving the tools that you use
  - Promise results and deliver them
- Professional development might include:
  - AfNOG and NSRC training courses
  - Cisco, Microsoft, Red Hat qualifications
- Improving tools might include:
  - Contract local developers and students
  - Offer bounties, or announce on AfNOG list

# How Bounties Work

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- Small tender, contract or reward
  - Offer a fixed price for a particular feature
- Others may add their offer to yours
  - Consider adding your bounty to someone else's
- Require integration into the main code base
  - Ensures that your customisation has a future
- Automatic distribution of talent to valuable work



# For software developers

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- UNINETT model:
  - GigaCampus nearing completion in 2009
  - More than 90% of the ICT directors wanted it to continue
  - Financial model changed to finance permanent activity
  - Model still running today
- UNINETT is sustainable!
  - Helping universities to implement best practices
  - Part-funding projects that meet best practices
  - Manage and share procurement
  - Giving them their own money back?!
  - Does it work in other industries?

# Summary

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- Increase your budget or set some aside
- Invest in:
  - Your staff (existing and potential)
  - Your working environment (to attract and keep them)
  - Your tools and equipment (Free software, open systems)
- May eventually pay for itself:
  - Improved productivity of all staff
  - Improved staff retention
  - More efficient IT operations, slower growth
  - Fewer security incidents and less severe

# Where to Get Help

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- AfNOG
  - Annual training event and free online support mailing list
- Network Startup Resource Centre (NSRC)
  - 20+ trainings per year worldwide
- Aptivate
  - Looking for funding to offer training, support, software development
- <http://live.gnome.org/BountiesDiscussion>
- [http://en.wikipedia.org/wiki/Open-source\\_bounty](http://en.wikipedia.org/wiki/Open-source_bounty)