Networking at MSU

A Plumber’s Perspective

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Network Plumbing
Network Plumbing?

- Many ways similar to plumbing
  - Big pipe flows to smaller pipes
  - Building infrastructure, hidden in the walls, remains for eternity
  - History of plumbing technology
  - Some MSU comm rooms in bathrooms
  - Series of tubes?
NO VLANS
PHYSICALLY SEPARATE
NETWORKS

NETWORK A

THE INTERNET
(a series of tubes)

NETWORK B

SWITCH

ROUTER

MICHIGAN STATE UNIVERSITY IT Services
VLANS
COMBINED NETWORKS

NETWORK A

SWITCH

NETWORK A + NETWORK B
USING VLANS

ROUTER

THE INTERNET
(a series of tubes)

NETWORK B
Network Plumbing

What are VLANs?

• Method of grouping users/ports/services
• Earlier in network history each network was physically separate
• Allows finer allocation of network resources
• Allows an MSU user in one building to appear to be in another building
SHOW MOVIE HERE
Network Entropy

Entropy: a measure of disorder that can only increase over time, second law of thermodynamics

• The network installation starts out in one state and slowly becomes more disorderly, hampering performance

• One corrective is to start off correctly using standards

• Otherwise, outages and the inevitable need to re-do
Dealing with Network Entropy

Standards

• ANSI, BICSI, IEEE, TIA/EIA, ISO, MSU
• Fire codes, electrical codes, construction codes
• Datacenter standards, building standards
• Best practices developed through experience
• Capacity planning
• Design like you’re going to space
Comm Presence Renovations
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Dealing with Network Entropy

THE BIG FIX
- Completely dismantle and put back together again
- Not cheap and interrupts service
- FAST

THE NOT SO BIG FIX
- Incremental approach
- More expensive and may never get completed
- SLOW
What has IT Services been doing to help?
• Working with Telecom Systems to “clean up” comm rooms on campus
• MSU has over 500 comm rooms
• Overhauling building networks
• Applying standards
• Learning from mistakes
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Conclusions…
• Start off right, continue right
• Don’t do stupid stuff
• Cables will cause 80% of all network problems
• Fiber is not fiber, clean your fiber!
• People want the network, it is required for work
• Call us for any questions! 2-6200