Technorama Roadshow 25:

Not that kind of networking…

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What are we talking about?

- Devices communicating with other devices
- Designing the network
- Equipment Types
- Segmentation
- IP Addressing
- ....

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What are we going to cover?

- Keep it simple...

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What are we going to cover?

- Keep it simple...
- A cable between two computers is ok
- But is it the right cable?

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IP Addresses

- How computers know where to send stuff.
- Static IP Addresses are ok.

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What are we going to cover?

- Required speeds
- Cable lengths
- Cable costs
- Flexibility

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More than one device?

- Switches
  - How many ports?
  - How many devices?
  - How fast?

What kind of switch?

- Unmanaged or managed
  - Monitoring
  - Redundancy
  - Quality of Service
  - Network Segments (VLANs)

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Redundancy

- What happens if a switch fails?
  - Stackable switches
  - NIC teaming

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Quality of Service

- Voice over IP

- Audio over IP
  - AoIP Vendor <u>may</u> have specific requirements
  - Trend is to COTS hardware

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Network Segments

- Types/Classes of devices/traffic
  - Trusted/Controlled devices – Servers
  - Trusted/Uncontrolled devices – company laptops
  - Untrusted devices – personal
  - Exposed devices – Tielines/port forwards
  - Protected devices – backup infrastructure/automation
  - Audio over IP
  - Voice
  - Security Systems
  - Management Traffic
  - Jump Computers

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Network Segments

⊟	⊪ LACP-Internal	⊪ 802.3ad Aggregate	▦ internal1 ▦ internal2
●	⊪ VL-Backup	⊪ VLAN	
●	⊪ VL-BYOD	⊪ VLAN	
●	⊪ VL-DMZ	⊪ VLAN	
●	⊪ VL-Jump	⊪ VLAN	
●	⊪ VL-OfficeLAN	⊪ VLAN	
●	⊪ VL-OfficeWLAN	⊪ VLAN	
●	⊪ VL-Printers	⊪ VLAN	
●	⊪ VL-Security	⊪ VLAN	
●	⊪ VL-Voice	⊪ VLAN	
●	⊪ VLAN-Alderley	⊪ VLAN	
	⊪ LACP-LiveWire	⊪ 802.3ad Aggregate	▦ internal6 ▦ internal5
	⊪ LACP-Zetta	⊪ 802.3ad Aggregate	▦ internal4 ▦ internal3

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But segments need to talk to each other right?

- Routers
  - Allow devices on a subnet to talk to another subnet.
- Firewalls
  - Limits how devices can talk to other networks
- Unified Threat Management/NGFW
  - Web filtering
  - Antivirus
  - Application Filtering
  - …

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But segments need to talk to each other right?

Segment	Inbound	Outbound
Automation Systems	None	Selected
DMZ	Selected traffic from internet	Selected traffic to internet
Untrusted devices	None	HTTP/HTTPS to internet
Printers	Print Servers	None
Jump	None	All the networks…

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The rest of the world

- Internet Access
  - What's going over the pipe?
  - Video conferencing
  - Media uploads
  - Streaming
- Multiple ISPs/Types
- SDWan
  - Making two internet connections work together

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You didn't mention WiFi

- Yep…

- Will a single access point work with one SSID?

- Things to think about:
  - Multiple wireless networks (subnets/VLANs…)
  - Access point placement
  - Channel Planning
  - Manual Power settings

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Where's it all going to go?

- Consider
    - Noise
    - Heat
    - Physical security
    - Cable management

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IP Addresses and DNS

- "it's always DNS"
- Network devices need IP addresses to talk to each other
  - Think phone numbers for computers
- Manual or Automatic
  - Static

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A couple of thoughts

- Label your cables.

A couple of thoughts

- Remote access
  - Can you get to your gear from outside of the station?
- Consider the lottobus factor
  - Who is coming after you?

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A couple of more thoughts.

- Keep it simple
  - It'll make it easier to troubleshoot but your requirements will drive design
- Keep your vendors consistent
- Second hand isn't always a bad thing

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Q&A from session