



# Making Sense of Your Network Closets

~Network Closet Best Practices~

P-E-M Community School

## Presenters

Matt Anderson – I.T. Director – P-E-M Community School

Bob Tieffenbacher – I.T. Director Kingsland Public Schools



About Us



Background



Needs Assessment



Map it Out



Create a Timeline



Order Materials



Document Current Setup



Begin Installation



Test



Troubleshooting



Pictures



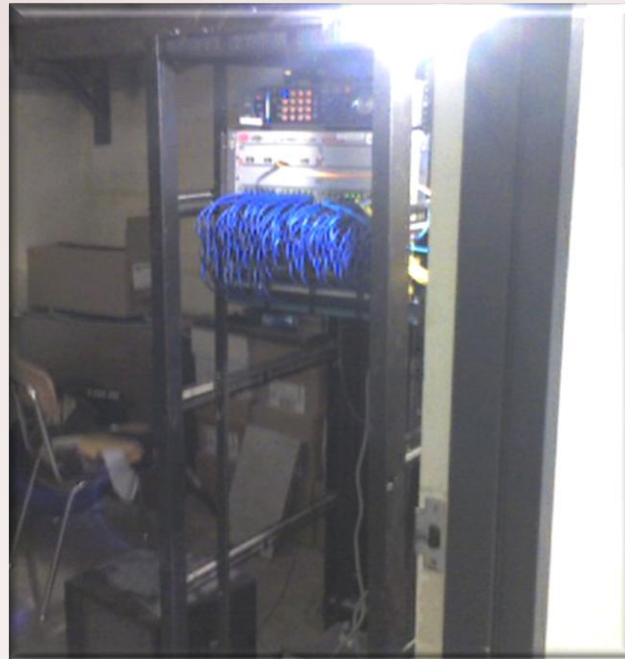
Resources



Contact Information

# Purpose

- Educate IT professionals on how to organize new network infrastructure and existing infrastructure in a logical way.
- Provide affordable vendor options for materials.



# Background

- Created a plan to separate network into 4 VLANs
  - ▣ New IP addressing scheme created
    - Subnets
      - VLAN 1 = 172.16.x.x
      - VLAN 2 = 172.17.x.x
      - VLAN 3 = 172.18.x.x
      - VLAN 4 = 172.19.x.x
    - IP Assignment
      - Routers & Firewalls = 172.x.0.x
      - Server = 172.x.2.x
      - Printers = 172.x.3.x
      - Wireless = 172.x.4.x
      - Cameras = 172.x.5.x
      - Workstations 172.x.10.x – 172.x.14.x
- Installed Domain Controllers for each building VLAN
  - ▣ Setup DHCP, DNS, WINS on each server

# Background ~ cont.

- Problem immediately disappeared the following day
  - Vendors/Professionals we worked with
    - 3 IT Directors from neighboring schools
    - Venture Computer Systems (Now MARCO)
    - Progressive Technology Systems , LLC
    - CISCO
    - QWEST
    - Pearson
    - Experts-Exchange
- Total cost of upgrades
  - Switches = \$4,725
  - Patch Cables = \$650
  - Fiber Optic Installation = \$825
  - 3 Additional DC Servers = \$1,200
  - Total Cost = \$7,400
- Total cost of troubleshooting
  - \$1,100

# About Us

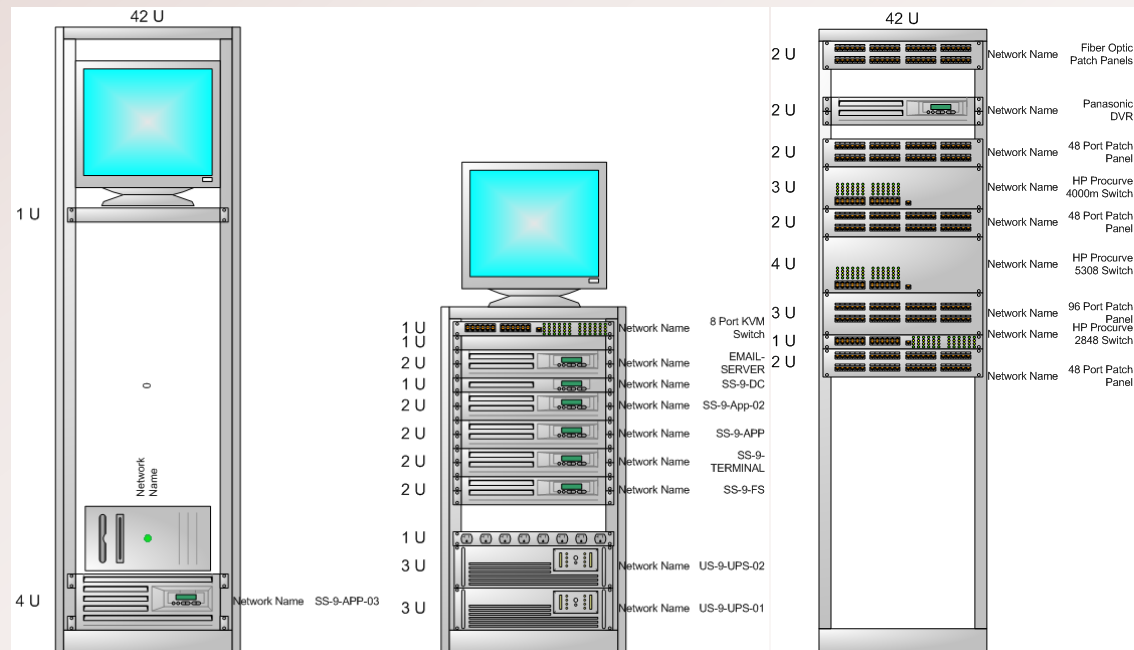
- **Matt Anderson – P-E-M Community Schools**
  - I.T. Director at P-E-M for 6 Years
  - Systems Support Specialist at Financial for 3 Years
  - Technician at Gateway for 1 year
- **Bob Tieffenbacher – Kingsland Public Schools**
  - I.T. Director at Kingsland Public Schools

# Needs Assessment

- Materials
  - ▣ Cat5e or Cat6 patch cables 1'-3'
  - ▣ Additional Patch Panels (if applicable)
  - ▣ Rack Screws
- Tools
  - Toner
  - Cable Tester
  - Wireshark (software)
  - Switch Management Software
  - Notepad and Pencil
  - Drill with Phillips bit
  - Punch down
  - Crimper
- Personnel
  - ▣ Have someone available to help hold heavy equipment

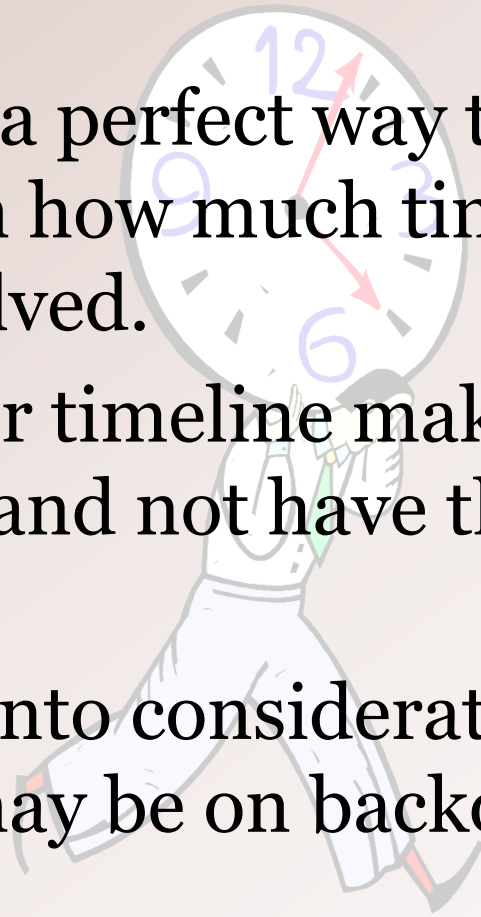
# Map it Out

- Use a program such as Visio or Excel to design your rack
- Make sure you analyze the current setup to determine if patch panels can be moved or not.
- Designing your closet prior to starting eliminates time consuming headaches

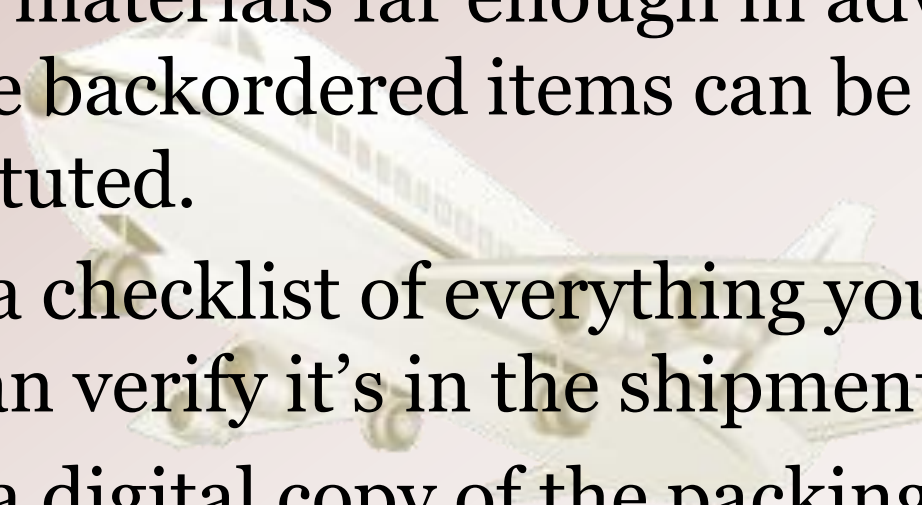


# Create a Timeline

- A timeline is a perfect way to determine from start to finish how much time is needed of all persons involved.
- Knowing your timeline makes it easier to place orders and not have the equipment be late.
- Always take into consideration that some equipment may be on backorder and plan accordingly.



# Order Materials

- Order materials far enough in advance to ensure backordered items can be shipped or substituted.
  - Keep a checklist of everything you order so you can verify it's in the shipment.
  - Keep a digital copy of the packing slip or order. You may need to order these supplies for future projects.
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# Document Current Setup

- ❑ Mark/Document empty patch panel ports
- ❑ Mark/Document custom configured switch ports
- ❑ Create a checklist of tasks
  - ❑ Unplug power (if applicable)
  - ❑ Post patch panel/switch documentation
  - ❑ Remove network cables
  - ❑ Move patch panels/Switches
  - ❑ Reconnect network cables
  - ❑ Ensure custom configured ports are correct
  - ❑ Test connections
  - ❑ Review checklist



# Begin Installation

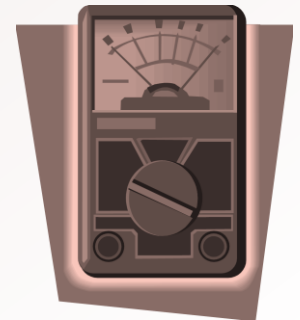
## Plan the disconnect

- ❑ Replace 1:1
  - Pros
    - Accuracy
    - Little to no overall down time
  - Cons
    - Slow
    - New can get in the way of old
- ❑ Replace Patch Panel at a time
  - Pros
    - Can be faster
  - Cons
    - Difficult if patch panels and switches must be moved
    - Some overall down time
- ❑ Remove all then replace
  - Pros
    - Fast
    - Easier to move patch panels and Switches
  - Cons
    - Can cause more overall downtime
    - Possibility of inaccuracy



# Test

- Test connections
  - ▣ Ensure all devices are plugged back in
  - ▣ Ensure all switches are operational
  - ▣ Ensure all customized ports are operational
- Review checklist
- Test from all locations affected
  - ▣ Never assume that a service is operating properly just because it is working in your office

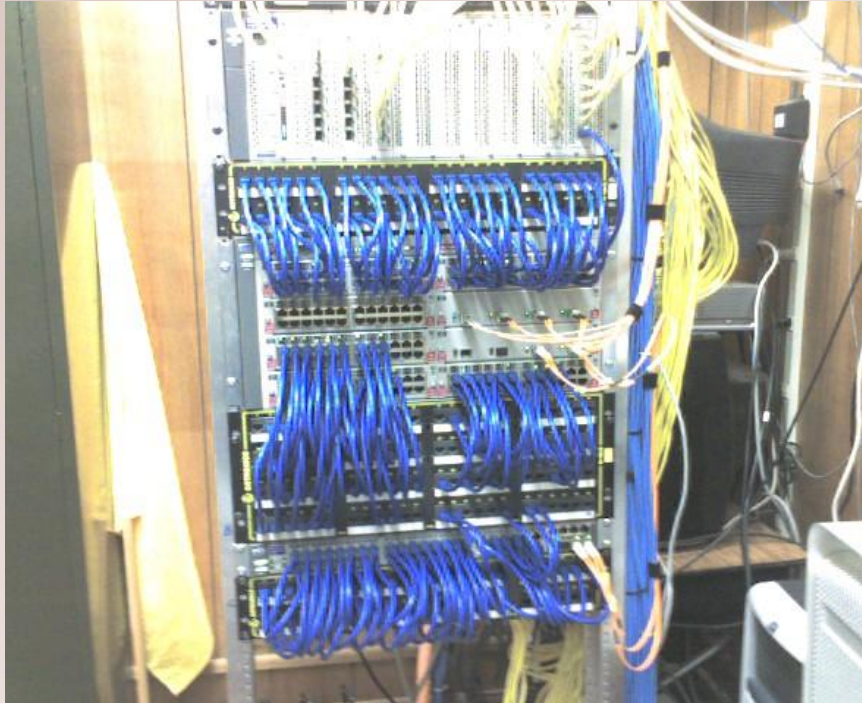


# Troubleshooting

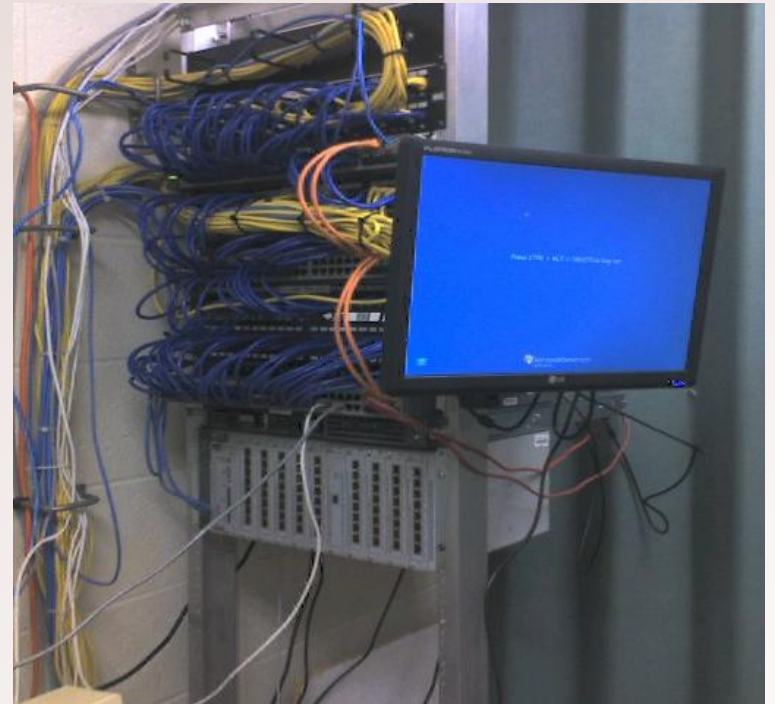
- Update documentation
- Know functioning vs non-functioning network
- Keep it simple, eliminate the obvious
- Document what you have done
- Utilize troubleshooting tools
- Communicate progress with staff



# Pictures



# Pictures



# Resources

- Monoprice - <http://www.monoprice.com>
  - Network Cable
    - 1' Cat 6 patch cable | Qty 1 = \$.79 | Qty 50+ = \$.58
    - 1' Cat 5e patch cable | Qty 1 = \$.61 | Qty 50+ = \$.44
  - Network Jacks
    - Modular Cat 5e Punch Down | Qty 1 = \$1.34 | Qty 50+ = \$.92
    - Modular Cat 5e Tool less | Qty 1 = \$1.34 | Qty 50+ = \$.92
  - LCD/LED/Plasma mounts from \$15 - \$100+
  - Other Cables (i.e. Coax, speaker, VGA, RCA, etc)
  - Tools
- CDW-G - <http://www.cdwg.com>
  - Rack equipment
  - Patch Panels
  - Tools
- Asset Recovery - <http://www.assetrecovery.com>
  - Used HP Switches – Procurve 2848 10/100/1000 48 port 1U switch \$550-\$600

# Resources ~ cont.



# Contact Information

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