Monitoring the Environment and Security

- Data rooms are often serviced by HVAC systems separate from the rest of the building
- Specialized products can monitor the critical factors of a data closet's environment:
  - Unacceptable temperature
  - Humidity
  - Airflow conditions
- Every data room should be locked with only limited IT personnel having keys
  - Security cameras are suggested

Knowledge Check Activity 2-1

Which of the following causes physical layer failures?

a. SCADA
b. PVC
c. STP
d. EMI

Knowledge Check Activity 2-1: Answer

Which of the following causes physical layer failures?

Answer: d. EMI

Install cable at least 3 feet away from fluorescent lights or other sources of EMI (electromagnetic interference) to reduce the possibility of noise (interference) that can affect your network's signals at the physical layer

Network Documentation

- Having up-to-date and detailed documentation of your network is essential for the following reasons:
  - Makes communication with coworkers more efficient
  - Speeds up troubleshooting efforts
  - Puts information at your fingertips when facing similar problems in the future

Network Diagrams (1 of 6)

- Network diagrams are graphical representations of a network's devices and connections
  - They may show physical layout, logical topology, IP address reserves, names of major network devices, and types of transmission media
- Network mapping - the process of discovering and identifying the devices on a network
  - Nmap – one of the most popular tools used for network mapping
  - Zenmap – Nmap's GUI option
- Cisco Systems set the standard for diagram symbols used to represent network devices

Network Diagrams (2 of 6)

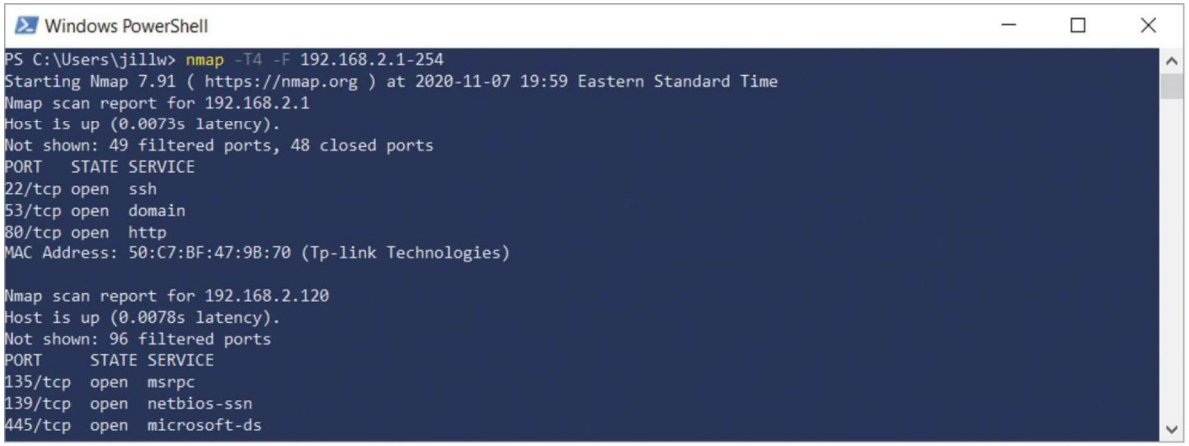

Figure 2-23 Nmap output in PowerShell using the `nmap` command

Figure 2-23 Nmap output in PowerShell using the **`nmap`** command

Network Diagrams (3 of 6)

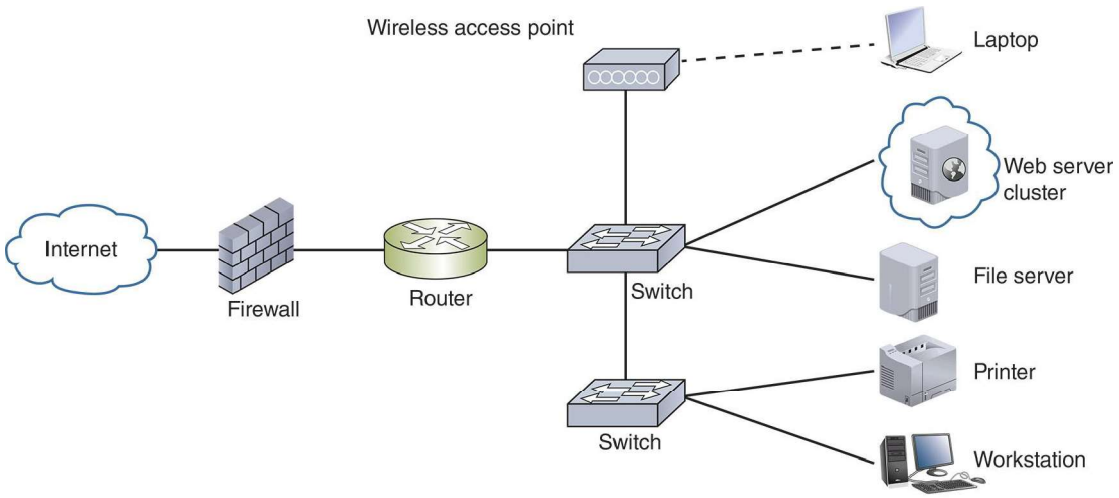

Figure 2-25 Network diagram using Cisco symbols

Figure 2-25 Network diagram using Cisco symbols

Network Diagrams (4 of 6)

- Network diagrams provide broad snapshots of a network's physical or logical topology
  - Useful for planning where to insert a new switch or determining how a particular router, gateway, or firewall interact
- Wiring schematic is a graphical representation of a network's wired infrastructure
  - In detailed form, it shows every wire necessary to interconnect network devices
- Rack diagram is a drawing that show devices stacked in a rack system

Network Diagrams (5 of 6)

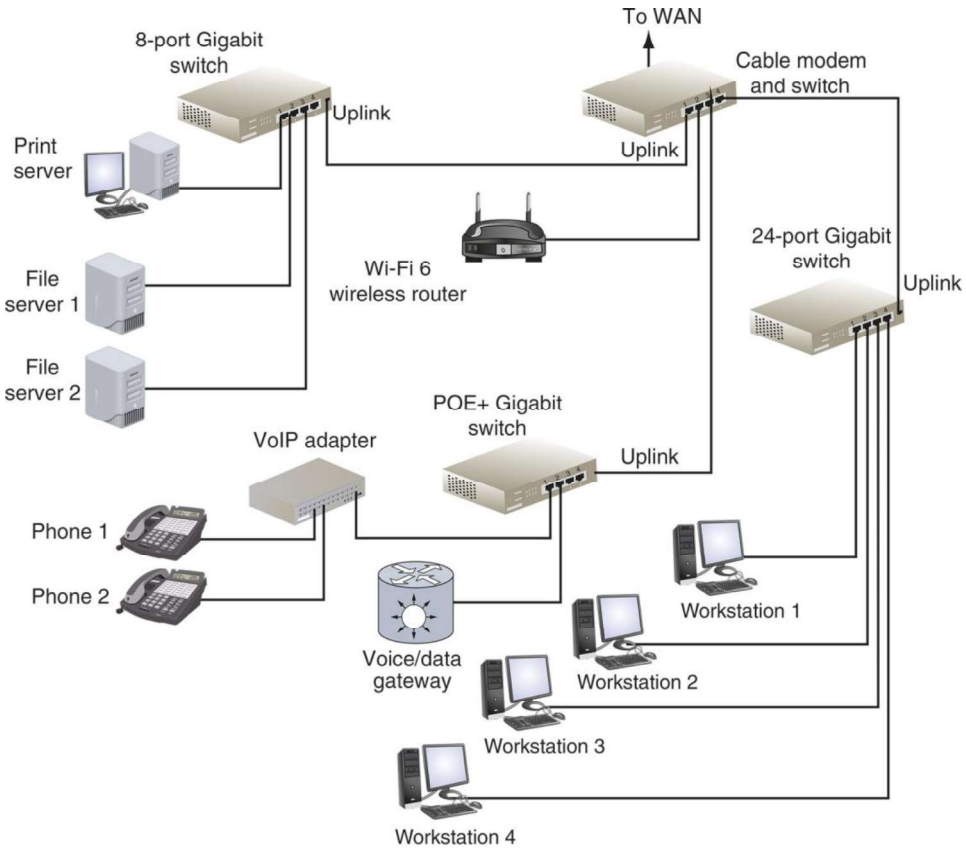

Figure 2-29 Wiring diagram

Figure 2-29 Wiring diagram

Network Diagrams (6 of 6)

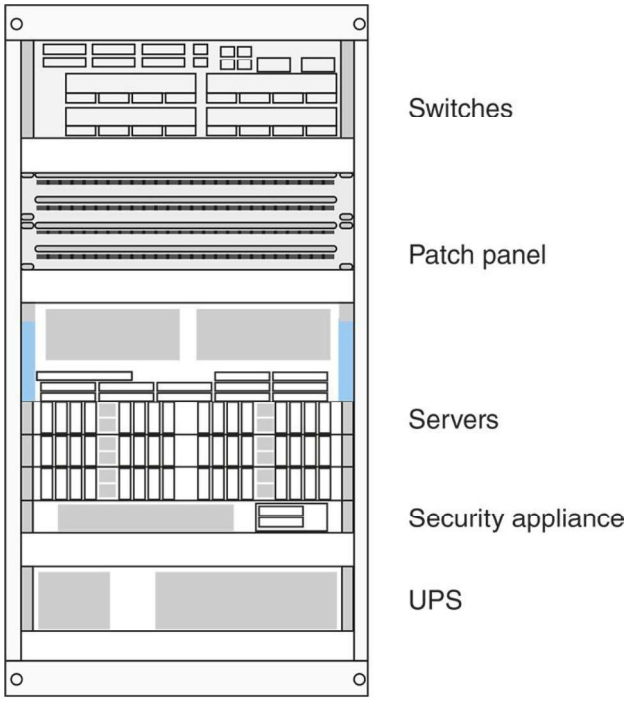

Figure 2-30 Typical devices installed on a rack

Figure 2-30 Typical devices installed on a rack

Operating Procedures

- Essential documentation:
  - Logical and physical connections on a network
  - Inventory management
  - IP address utilization
  - Vendors
  - Internal operating procedures
  - Policies
  - Standards
- Many corporations establish **SOPs (standard operating procedures)** to ensure consistency
- An organization could provide an internal website or database to hold this information

Inventory Management

- **System life cycle (SLC)** is the process of designing, implementing, and maintaining an entire network
- SLC includes:
  - Removal and disposal of outdated assets
  - Addition of compatible, updated devices
- **Inventory management** is the monitoring and maintaining of all assets that make up a network
  - Simplifies maintaining and upgrading a network
  - Provides network administrators with information about the costs and benefits of certain types of hardware or software

Labeling and Naming Conventions (1 of 3)

- Tips for labeling and naming conventions:
  - Use names that are as descriptive as possible
  - Only include fields that are essential in identifying the device
  - Don’t overcomplicate the name with useless or redundant information
  - Use established naming conventions
  - Think big-picture-down-to-details
  - Consider any security risks from details included in your naming convention
  - Use color-coded cables and use cable tags to identify each cable’s purpose
  - Label the ports and jacks that cables connect to
  - Where labels won’t fit on the device, draw a simple diagram of each device that indicates how each port is used
  - Use labels that are durable and are designed to stick to plastic and metal

Labeling and Naming Conventions (2 of 3)

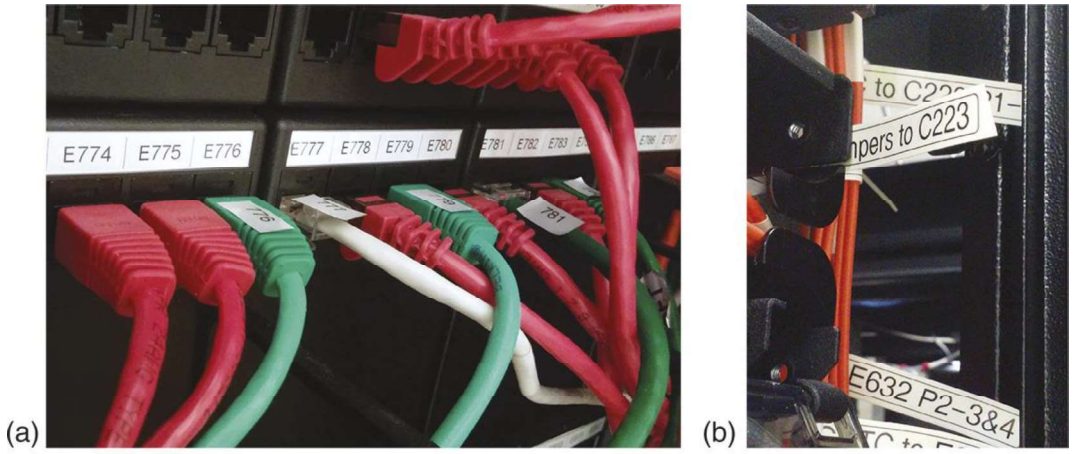

Figure 2-32 Labels on ports and tags on cables

Figure 2-32 Labels on ports and tags on cables

Labeling and Naming Conventions (3 of 3)

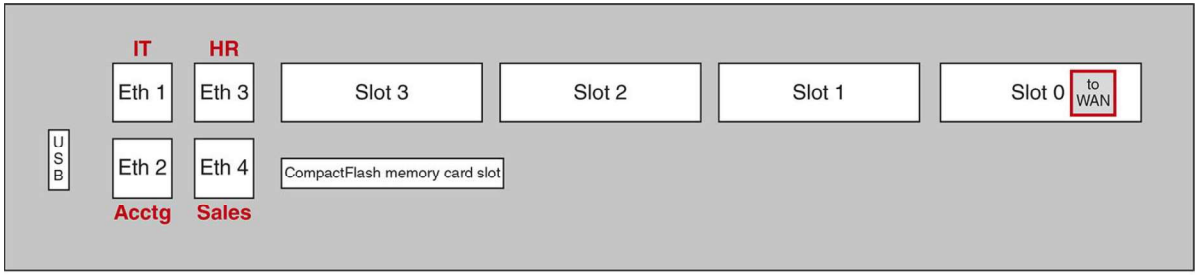

Figure 2-33 Simple diagram of a Cisco router with red labels identifying how five ports are used

Figure 2-33 Simple diagram of a Cisco router with red labels identifying how five ports are used

Business Documents (1 of 2)

- Standard business documents you may encounter:
  - RFP (request for proposal) is a request to vendors to submit a proposal for a product or service your company wants to purchase
  - MOU (memorandum of understanding) documents the intentions of two or more parties to enter into a binding agreement, or contract
  - SOW (statement of work) documents in detail the work that must be completed for a particular project
  - SLA (service-level agreement) is a legally binding contract or part of a contract that defines the aspects of a service provided to a customer
    - Example: the service provided by an ISP

Business Documents (2 of 2)

- Standard business documents you may encounter (continued):
  - MSA (master service agreement) is a contract that defines the terms of future contracts between parties
    - Examples include payment terms or arbitration arrangements
  - MLA (master license agreement) grants a license from a creator, developer, or producer to a third party for the purposes of marketing or sublicensing, or distributing the product to consumers

Knowledge Check Activity 2-2

Which network diagram shows a logical topology?

a. Rack diagram
b. Network map
c. Floor plan
d. Wiring diagram

Knowledge Check Activity 2-2: Answer

Which network diagram shows a logical topology?

Answer: b. Network map

Network mapping is the process of discovering and identifying the devices on a network

Change Management

- Managing change while maintaining network's efficiency and availability requires good planning
  - Network users need to know when to expect certain network resources to be unavailable
- Common software and hardware changes range from installing patches to replacing network backbone
- You may also need to know the change management documentation that might be required for an enterprise-scale network

Software and Hardware Changes (1 of 2)

- Four types of software changes:
  - Installation – new software to be installed on relevant devices and incorporated with network resources
  - Patch – a correction, improvement, or enhancement
  - Upgrade – a major change to a software package that enhances the functionality and features of the software
  - Rollback – also called backleveling or downgrading
    - Process of reverting to a previous version after attempting to patch or upgrade it
- Hardware changes could include adding new security cameras, replacing workstations, installing new printers, and upgrading hardware

Software and Hardware Changes (2 of 2)

- The same change management principles apply to any type of change:
  - Process all changes through the proper channels
  - Minimize negative impacts on business procedures
  - Plan thoroughly to maximize the changes of a successful change on the first attempt
  - Document each change throughout the process

Change Management Documentation

- Generally, the larger an organization, the more documentation required when making changes
- You may need to do the following:
  - Submit a change request document
  - Understand and follow the approval process
  - Follow project management procedures
  - Provide additional documentation that could include:
    - Network configuration
    - IP address utilization
    - Additions to the network
    - Physical location changes
  - Close the change