REVIEW LESSON

MTA Course: 98-366 Networking Fundamentals
Lesson name: Understanding Network Hardware 2.1_A
Topic: Understand switches. (One 50-minute class periods)
File name: NetFund_RL_2.1_A

Lesson Objective:

2.1_A: Understand switches. *This objective may include but is not limited to:* transmission speed; number and type of ports; number of uplinks; speed of uplinks; managed or unmanaged switches; VLAN capabilities

Preparation Details

Prerequisite student experiences and knowledge

This MTA Certification Exam Review lesson is written for students who have learned about networking fundamentals. Students who do not have the prerequisite knowledge and experiences cited in the objective will find additional learning opportunities using resources such as those listed in the Microsoft® resources and Web links at the end of this review lesson.

Instructor preparation activities

- Make copies of Student Activity NetFund_SA_2.1_A

Resources, software, and additional files needed for this lesson

- NetFund_PPT_2.1_A

Teaching Guide

Essential Vocabulary

bridge—a LAN device that connects at the data link layer (layer 2) of the OSI reference model.

Ethernet—a family of frame-based computer networking technologies for local area networks.

crossover cable—has different connection ends. A straight-through cable has identical ends.

MAC addresses—Media access control address is a unique identifier assigned to network adapters (also called network interface cards [NICs]) to provide a physical address.

managed or unmanaged switches—a managed switch it has its own IP address, and has a telnet and maybe a web-based interface to monitor and secure access to each port on the switch while an unmanaged switch cannot be controlled.

OSI model—a way of subdividing a communications system into smaller parts called layers.

ports—connections to peripherals can have 4, 8, or more ports for Ethernet.

switches—a computer networking device that connects network segments; switches include repeaters, hubs, and bridges.

transmission speed—data bytes are moved across a communications channel at different rates.

uplinks—a transmitter on the ground sends radio or other signals to an aircraft or communications satellite.

uplink speed—Ethernet standards on uplink speeds are of 10mbps, 100mbps, 1000mbps/1gbps, 10gbps since switches come with autosensing in various combinations.

VLAN capabilities—Virtual LANs allow for separate logical network connectivity from a physical connectivity for better manageability, improved performance, and security.

Lesson Sequence

Activating prior knowledge/lesson staging (Anticipatory Set: 10 minutes)

1. Student prompt (PowerPoint® slide 3)
   A traditional light switch control has only 2 settings: on or off. A dimmer switch control allows for variations of light intensity. Think about these two variations of controls and what you have already learned about network hubs and switches. Explain what you think the difference is between a network hub and switch.

2. Have students form groups of three to discuss their answers.
3. Give students a few minutes to respond, allowing them to work until they have finished.

Lesson activity (30 minutes)

1. Teacher Instruction (30 minutes)
   - Use the included PowerPoint slideshow to review switches and the following details: transmission speed, number and type of ports, number of uplinks, speed of uplinks, VLAN capabilities, managed or unmanaged switches, layer 2 and layer 3 switches.

Assessment/lesson reflection (10 minutes)

1. As indicated in the slideshow, have the students answer the questions.
2. Review the correct answers with the class and clarify student questions.

Microsoft resources and Web links

- **About.com: MAC Addresses**
  http://compnetworking.about.com/od/networkprotocolsip/l/aa062202a.htm
- **Candelatech: VLAN**
  http://www.candelatech.com/~greear/vlan.html
- **Cisco: Switches**
  http://www.cisco.com/web/about/ac123/ac147/archived_issues/ipj_1-2/switch_evolution.html
- **Fengnet: VLAN**
  http://www.fengnet.com/book/icuna/ch05lev1sec5.html
- **How Stuff Works: How Switches Work**
  http://computer.howstuffworks.com/lan-switch12.htm
- **HP: Switches**
  http://docs.hp.com/en/5992-0538/ar01s01.html
- **It Knowledge Exchange: Unmanaged vs. managed switch**
  http://itknowledgeexchange.techtarget.com/itanswers/unmanaged-vs-managed-switch/
- **Juniper.net: Aggregated Ethernet**
  http://www.juniper.net/techpubs/en_US/junos9.5/topics/example/interfaces-aggregated-ethernet-virtual-chassis-uplinks.html

- **Networking IT Toolbox: Switch-backplane**
  http://networking.ittoolbox.com/groups/technical-functional/cisco-infrastructure-l/switch-backplane-560672
- **Network World: Layer 4 switches**
  http://www.networkworld.com/details/725.html?def
- **Speedguide.net: - What is the Uplink port on a router, hub, switch for?**
  http://www.speedguide.net/faq_in_q.php?category=90&qid=85
- **Support.3com: Switches**
  http://support.3com.com/infodeli/tools/switches/s_stack2/3c16902/manual.a02/
- **Tekelec: Switching**
  http://www.tekelec.com/ss7/protocols/switching.asp
- **Tech Republic: Switch security**
  http://articles.techrepublic.com.com/5100-10878_11-5754342.html
- **Wikipedia: Network switch**
  http://en.wikipedia.org/wiki/Network_switch
- **Wikipedia: High Speed Uplink**
  http://en.wikipedia.org/wiki/High-Speed_Uplink_Packet_Access
- **Wikipedia: MAC Address**
  http://en.wikipedia.org/wiki/MAC_address
- **Wikipedia: OSI model**
  http://en.wikipedia.org/wiki/OSI_model