REVIEW LESSON

MTA Course: 98-366 Networking Fundamentals
Lesson name: Understanding Network Hardware 2.3_A
Topic: Understand media types.
(Two 50-minute class periods)
File name: NetFund_RL_2.3_A

Lesson Objective

2.3_A: Understand media types. *This objective may include but is not limited to:* cable types and their characteristics, including media segment length and speed; fiber optic; susceptibility to external interference (for example, machinery, power cables); susceptibility to electricity (for example, lightning), susceptibility to interception; twisted pair shielded or nonshielded; cabling, wireless.

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

- Gather tools, wires, terminator ends, and all the materials necessary to show and to make a cable when demonstrating how to make the cable in the next session during lesson 2.3_B.

Resources, software, and additional files needed for this lesson

- NetFund_PPT_2.3_A

Teaching Guide

Essential Vocabulary

cable—two or more wires running side by side and bonded, twisted or braided together to form a single assembly. They come in these shapes and have these characteristics:

- **coaxial cable –** a hollow outer cylindrical conductor surrounding a single inner wire made of two conducting elements.
- **shielded cable –** one or more insulated conductors enclosed by a common conductive layer.
- **twisted pair –** incorporates shielding, cancellation, wire twisting, and it reduces electrical noise both within the cable and from outside the cable, used in Ethernet networking.
- **fiber-optic –** uses light pulses to transmit information.

electromagnetic interference (EMI)—any undesirable electromagnetic emission or any electrical or electronic disturbance that causes an undesirable response, malfunctioning or degradation in the performance of electrical equipment.

external interference—anything that alters, modifies, or disrupts a message as it travels along a channel between a source and a receiver.

fiber optic—fibers (usually made of glass) that use light pulses to transmit information.

radio frequency interference (RFI)— Noise introduced into an electronic circuit, such as a radio or television, by electromagnetic radiation produced by another circuit, such as a computer.

susceptibility to external interference—interference from equipment and cables causing major stoppage or damage to a system.

susceptibility to electricity—a disturbance that affects an electrical circuit due to electromagnetic conduction of the electromagnetic radiation emitted from the source such as a lightning strike.

susceptibility to interception—data communication equipment can sometimes emit modulated optical signals that carry information for an eavesdropper to reproduce the entire data stream with an oscilloscope.

Lesson Sequence

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

1. Student prompt (PowerPoint® slide 3):
   - Compare the two images of cables on slide 3.
   - Discuss the implications of each in your small group.
2. Give students a few minutes to think, allowing them to record ideas.

Lesson activity (30 minutes)

1. Teacher Instruction (30 minutes)
    - Use the included PowerPoint presentation to review the network media types and their susceptibility

Assessment/lesson reflection (10 minutes)

1. Create a list of the networks in your home, school, or place of work.
2. Speculate about the types of interference susceptibility that each might be vulnerable to.
3. Compare your ideas with your partner.

Microsoft resources and Web links

- **Answsers.com: Twisted-Pair**
  http://www.answers.com/topic/twisted-pair
- **Arcelect: Fiber Cable**
  http://www.arcelect.com/fibercable.htm
- **Cisco Press: Fiber Optic Cable**
  http://www.ciscopress.com/articles/article.asp?p=170740
- **Cisco Press: Network Media Types**
  http://www.ciscopress.com/articles/article.asp?p=31276
- **Cisco Press: Network Media – The Physical Layer**
  http://www.ciscopress.com/articles/article.asp?p=169686
- **JMKfilters: Electromagnetic Interference**
  http://www.jmkfilters.com/faq.htm#electromagnetic_interference
- **Qedata: Equipment and Cable Interference**
  http://www.qedata.se/e_emi_bakgrund.htm
- **SSLHQ: Network Media**
  http://www.sslhq.com/info/network-media-utp-cat3-cat5-stp-coax-fiber-optic-cable-single-mode-mutli
- **Webopedia: Media**
  http://www.webopedia.com/TERM/M/media.html
- **Wikipedia: Electromagnetic Interference**
  http://en.wikipedia.org/wiki/Electromagnetic_interference
- **Wikipedia: Fiber Optic Cable**
  http://en.wikipedia.org/wiki/Fiber_optic_cable