Networking

Networking Fundamentals

1.3.4 - Cable Management

What is cable management and why is it important?

Overview
The student will be able to summarize the types of cables and connectors and explain which is the appropriate type for a solution

Grade Level(s)
10, 11, 12

Cyber Connections

- Threats & Vulnerabilities
- Networks & Internet
- Hardware & Software

This content is based upon work supported by the US Department of Homeland Security's Cybersecurity & Infrastructure Security Agency under the Cybersecurity Education Training and Assistance Program (CETAP).

Teacher Notes:

CompTIA N10-008 Network+ Objectives

Objective 1.3

- Summarize the types of cables and connectors and explain which is the appropriate type for a solution
    - Cable Management
        - Patch Panel/Patch Bay
        - Fiber Distribution Panel
        - Punchdown Block
            - 66
            - 110
            - Krone
            - Bix

Cable Management

Panels

A ***patch panel***, also known as a ***patch bay***, is a device that has many ports that go to many different locations in which cables can be connected. The purpose of a patch panel is to make it easy to organize cables and make transitions when a device moves location. For example, most schools will have patch panels in a room that help connect classrooms to the network. Each port on the patch panel might have an ethernet connection that goes to a different classroom. Thus, if a network administrator wants to connect a classroom to the network, they'll use the port that goes to that specific classroom. If that teacher moves classrooms, the network administrator can move that cable to the port that goes to their new classroom to help keep the same connection.

Example of a patch panel with ethernet cables

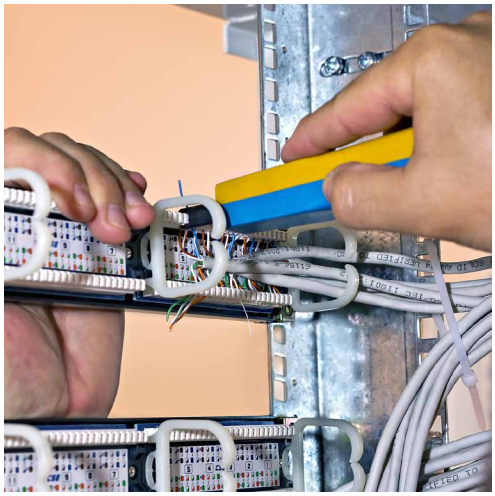
Teacher Notes:

There are many benefits to patch panels, one of the main purposes is for scalability. Patch panels allow network administrators to add new devices without having to run new wires/cables across a building. They also help reduce clutter and keep cables organized, thus leading to easier maintenance. It's very important for the patch cables to be properly labeled, and a lot of times cables will be zip tied together to help organize them. One last advantage of a patch panel is the cost, they are inexpensive devices since all they are doing is passing on data and not really processing any data.

A patch panel for fiber optics can also be known as a ***fiber distribution panel (FDP)***. While patch panels can be used for all sorts of ports and different connections, an FDP is specific towards fiber optic ports.

Punchdown Blocks

Punchdown blocks create connections by punching/pushing down wires into metal slots that strip the wire and complete a connection. They are typically pushed down with a punch-down tool. These blocks are efficient because the installation does not require the installer to constantly strip wires, instead they are just able to punch them down and quickly snip off the excess wiring.



Using a punchdown tool on a punchdown panel to connect wires.

Teacher Notes:

Here are four common punchdown panels:

- *66* - Used primarily with telephones lines, has become a little outdated. Contains 50 rows of clips.
- *110* - Similar to the 66 punchdown block, but can have connections for telephone or twisted pair cables. They are often built into the back of patch panels for the ends of cables.
- *Krone* - Alternative to the 110 block, sometimes used overseas in the UK. Krone is from the German word for Crown. You can tell the difference as the Krone blocks punchdowns are at a 45 degree angle
- *Bix* - Can have up to 25 twisted pair connections in the block, comes in a lot of different sizes.