

Section 6:Installing a Physical Network

28. Introduction to structured Cabling

Structured Cabling has 3 pieces to it:

- 1.A telecommunications closet/equipment room
- 2.Horizontal Runs
- 3.Work Area

Things required:

- Equipment Rack
 - Patch Panel (One end of the Horizontal Run)
 - patch Cable (Stranded Core) from the patch panel to the switch
- **Horizontal cabling (solid core cabling) from the patch panel to the work area wall outlets

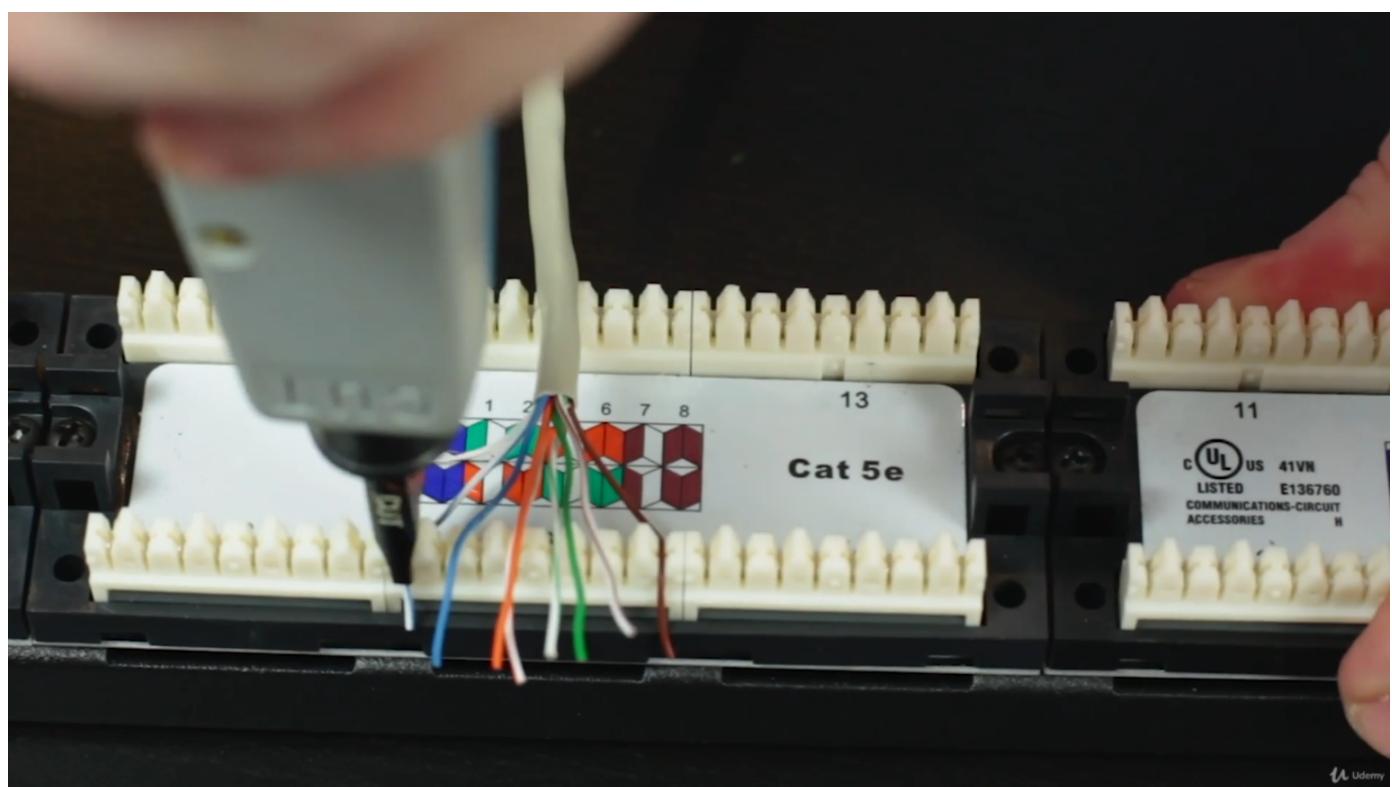
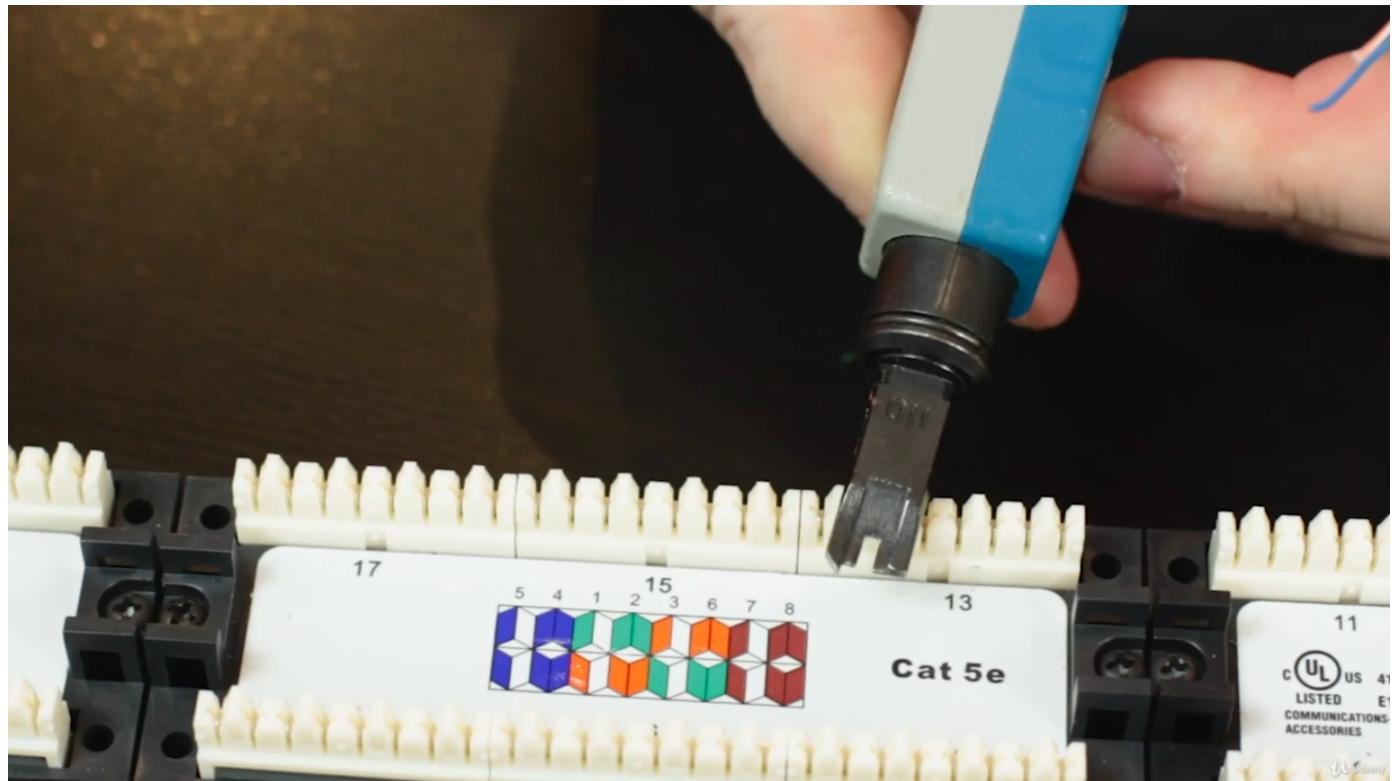
Standard TIA - Define all sorts of things.

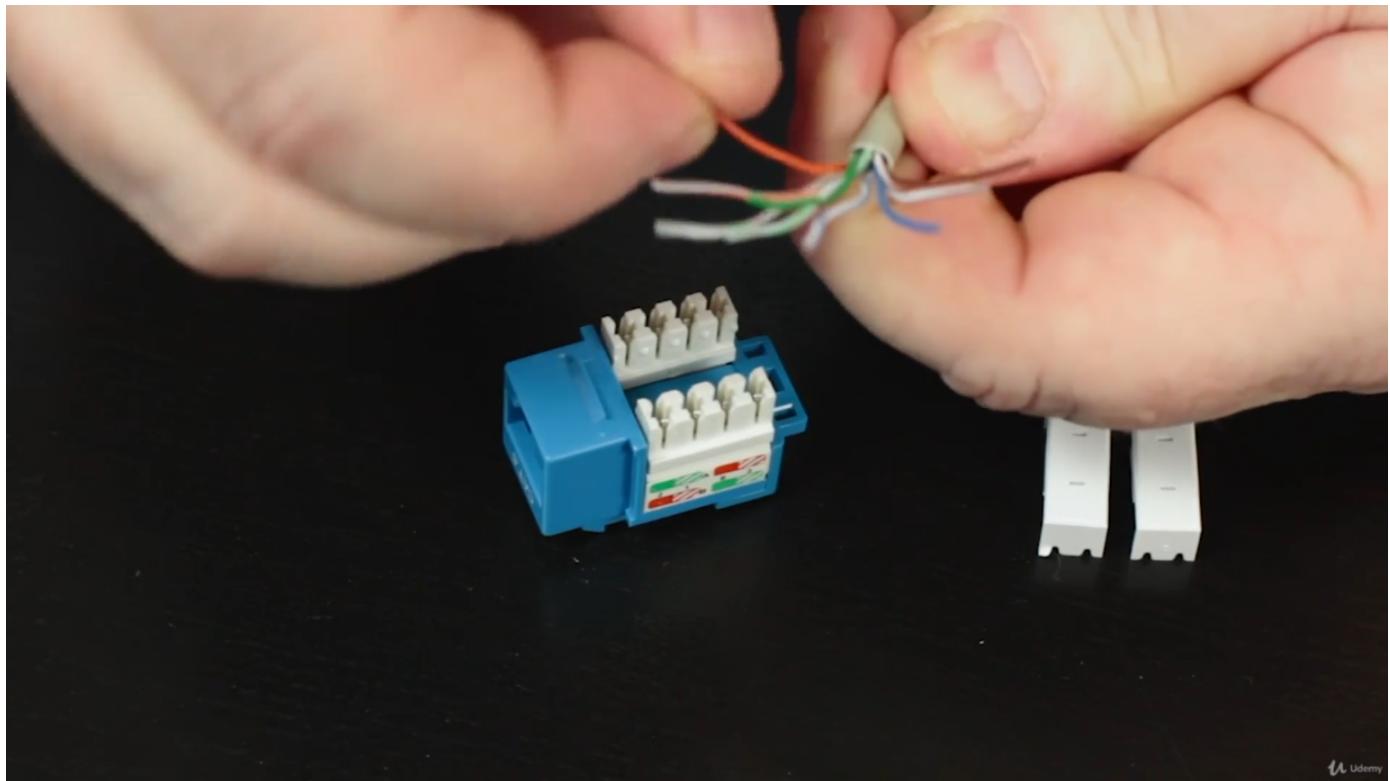
29.Terminating Structured Cabling

Crimps (RJ45) is used for patch cable

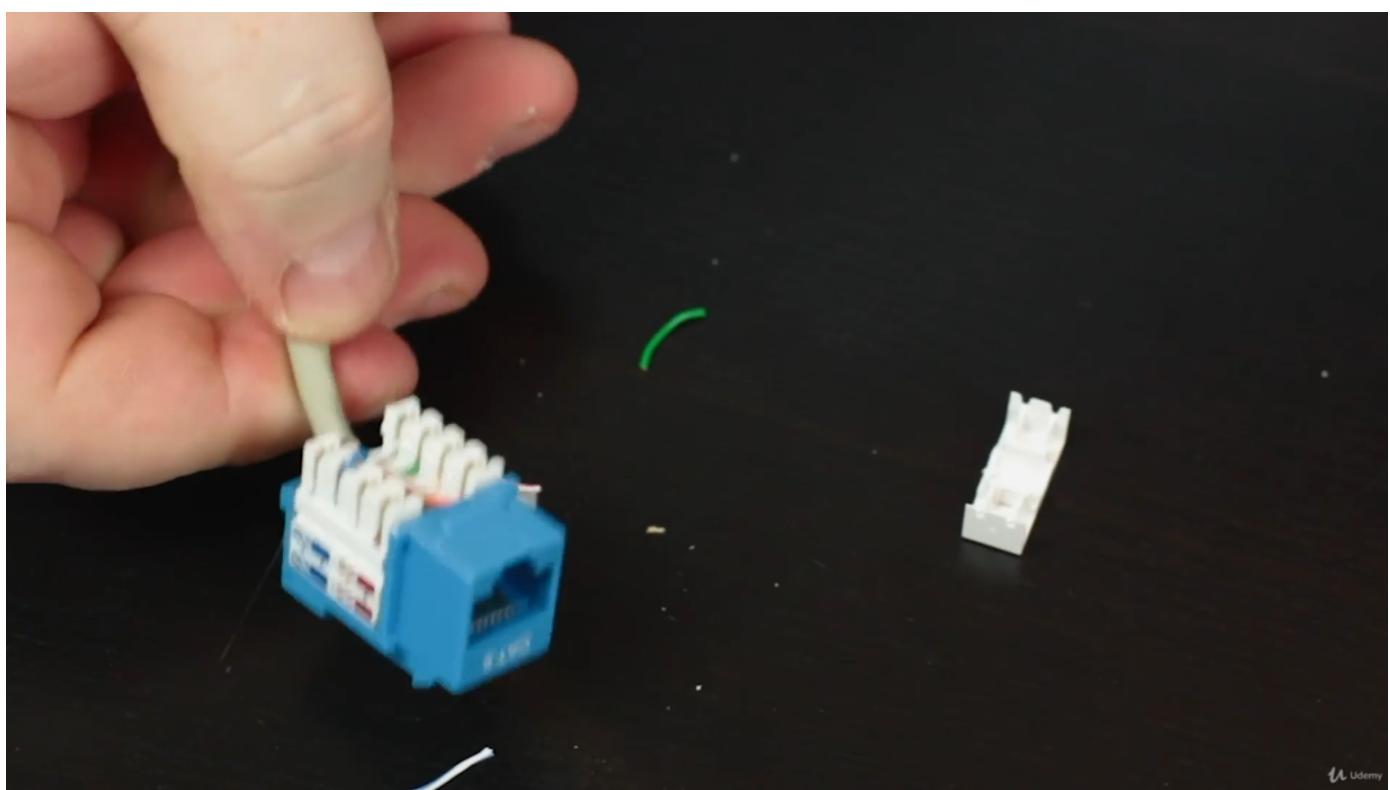
Everything else uses 110-Punchdowns

**One end of the Horizontal run is punched down at the Patch Panel, and the other is punched down to the wall outlet which you can plug RJ45 cabling into.





U Udemy



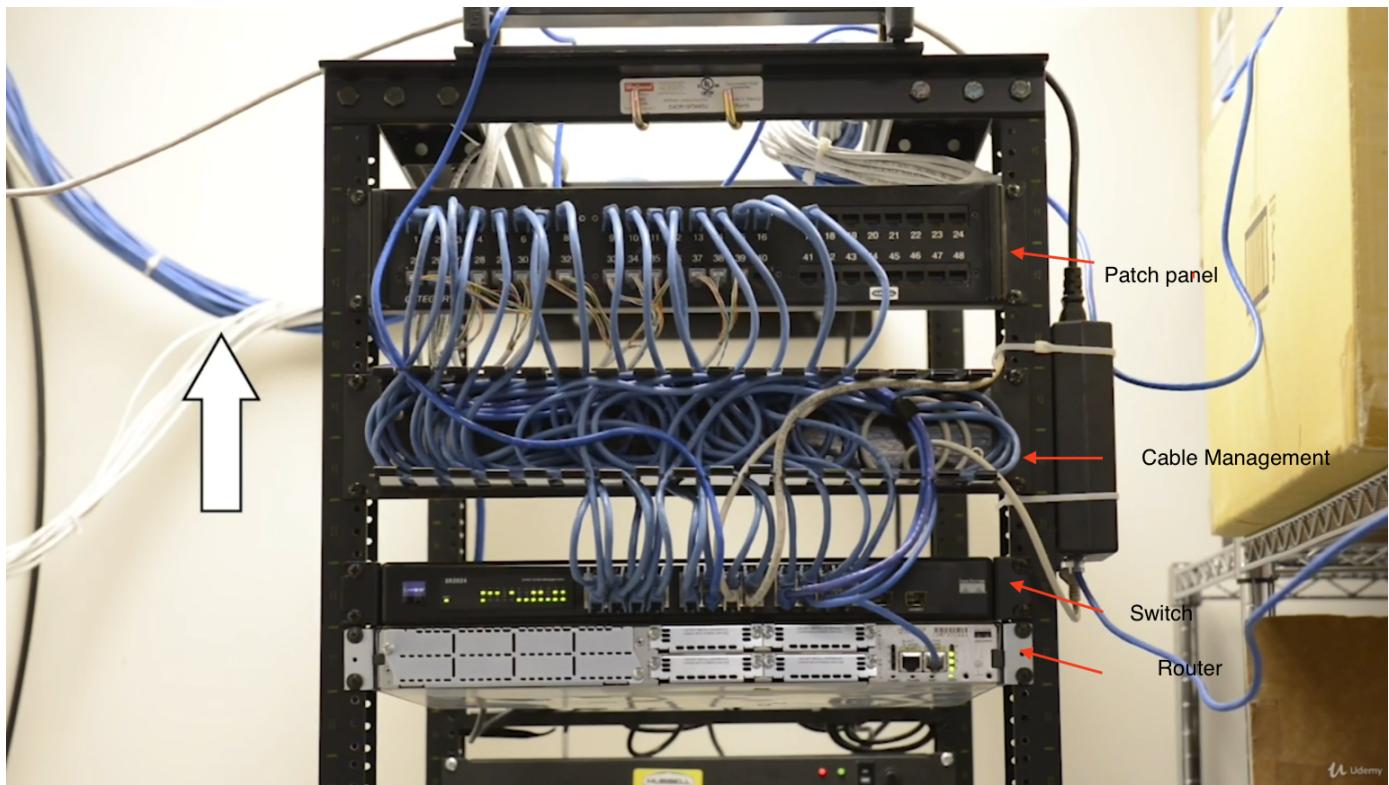
U Udemy

30. Equipment Room

19inch rack is standard for equipment racks (patch panel/switches)

Two ways to look at the Equipment Room:

- Main Distribution Frame (MDF) (Primary Equipment Rack)
- Intermediate Distribution Frames (IDF) (All Secondary Equipment Racks)



Equipment racks have standard spacing/heights called U's

A U (or Unit) is a standard height for components in a rack. Each U is one inch and 3/4.

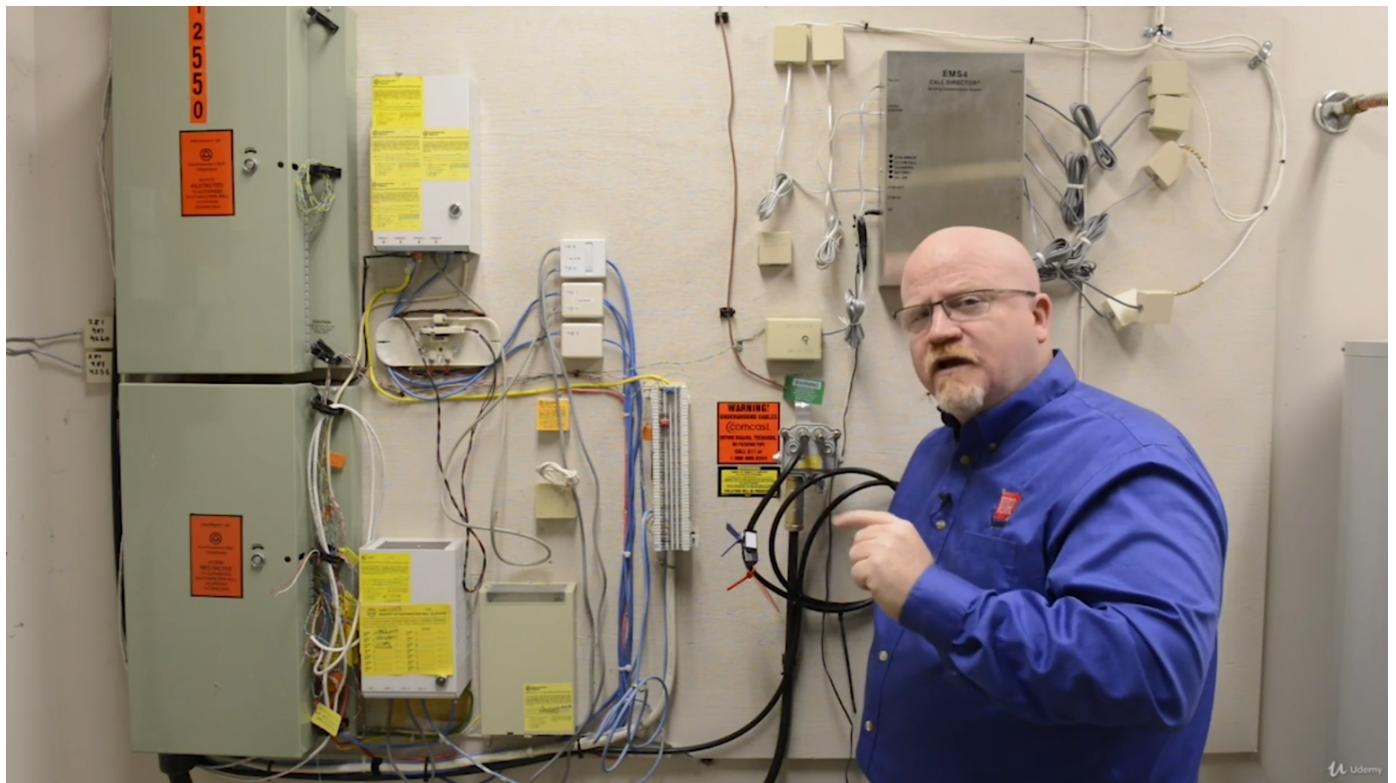
Servers: 3 1U servers, and a 5U server on the bottom.



Demarc - Separates what is the property of the phone company/cable company from what is yours. If you cannot put your network in the Demarc you need a Demarc extension.

Demarc Extension - if you need to split the demarc and bring it to your network in a shared building

Demarc Area:



31. Alternative Distribution Panels:

110-Punchdown bloack patch panel is the way to distribute copper wired networks

66-Punchdown Block - First Patch panel create for untwisted shielded pair (Made for telephones)

Fiber Distribution Panel - Used for fiber optic distribution

32. Testing Cable

Test For:

Wiremap - means that all of the individual wires are punched into the right place on the crimp.
understand how to read and interpret the wiremap feature on a cable tester.



Continuity - If the wire is actually connected at all.

Distance - Use a Time Domain Refectometer (TDR)

**TIA 568 rule specifies that a horizontal run must be no more than 90meters

Fiber Optic also uses TDR called an OTDR

(3 Big Tests: Wiremap, Continuity, TDR)

NEXT, FEXT (Near end cross talk, Far end cross talk)

Cross talk - interference between pairs on an individual cable, and too much crosstalk will keep cable from functioning at high levels. Cross Talk is measured in decibels.

#Troubleshooting Structured Cabling, Part 1

Structured cabling issues that take place in the **work area**:

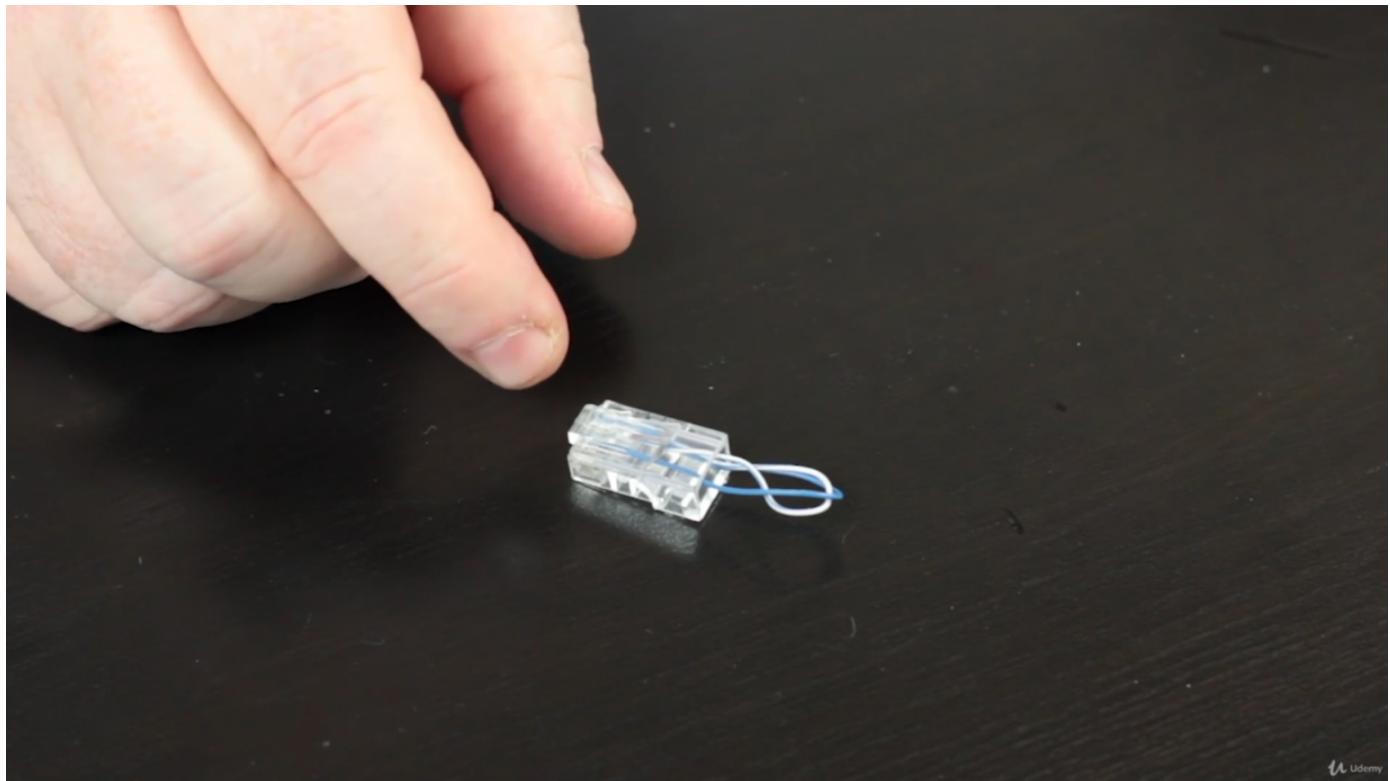
Verify that the OS sees a problem.

Check if there is a link light on the system.

Check if there is a link light on the switch.

Check network settings on the computer

Use a loopback adapter to check things: according to TIA Net+ you can ping your local address with a loopback adapter (but in the real world loopback plugs are old tech)



Check if you have a bad patch cable.

Check the actual plug that goes into the wall (RJ45)

34. Troubleshooting Structured Cabling, part 2

Structured cabling issues that take place in the **Equipment Room**.

These issues tend to effect more than one computer on the network

-First thing to check is the electricity (Use a volt meter or a voltage monitor)

Use UPS - uninterruptable power supplies

-Check moisture

-Check heat

-Check issues with the horizontal run

*Use TDR to check for a break

*Check for interference (Unshielded twisted pair is vulnerable to interference)

*when you have fiber optic (multi-mode) it is susceptible to Modal distortion

-Modal distortion (focused light at the origin, fuzzy light at the receiving end)

35. Using a Toner and Probe

Fox and Hound (Tone Generator and Tone Prob):

-Designed to help you find cables and connections when you forget to label them.

-Tone generators create the signal for the probe

-Tone Probes translate the signal into an audible tone



36. Wired Connection Scenarios

1. Problems that give slow or poor communication

-Attenuation - Over a distance a signal will begin to degrade (Slow problem)

-Jitter - packet loss which is a problem for Voice over IP (VoIP), Video Streaming (Increase throughput), (Buffering)

-Incorrect cable type - Use newest best cable, using patch cables you can plug an old lower rated cable (Cable mismatch)(Keep good inventory)

2. Problems with no communication at all

-Bad Ports (try plugging into a different port)(If there is a bad port on the switch the other ports are not far behind)

-TX/RX Reverse (Using a crossover instead of a straight, or using a straight instead of crossover,

crimped cable wrong) (Fix is good documentation/labeling)

-Sometimes on certain switches the uplink port button may be engaged. (Disengage)

-Bent Pins (Dont perturb horizontal runs), (over time plugging and replacing in a port can be ports) (test other ports)

-Open/Short (Use of a bad cable. terminating cables and transmitting wires are not up (Open), two pins stuck together (Short)), (Replace the cable)

QUIZ

1. Which of the following is not an element of structured cabling?

- a. Telecommunication closet
- b. Table-top rack**
- c. Horizontal run
- d. Work Area

2. Patch panels and punch down tools are used on which kind of network cables?

- a. Patch Cables
- b. Work area cables
- c. Horizontal Runs**
- d. Fiber optic runs

3. Which of the following is not a distribution panel?

- a. 166 Punch-down block**
- b. 110 Punch-down block
- c. 66 Punch-down block
- d. fiber distribution panel

4. Which of the following is not a cable test?

- a. Wiremap
- b. Continuity
- c. Cable length
- d. Ping**

5. A network tech suspects a wiring issue in a work area. Which element does she not need to check?

- a. verify link lights at the workstation and the switch port
- b. Ensure that the connection from the router to the ISP good**
- c. Confirm network settings in the Operation System
- d. Ping the workstation NIC with a loopback plug installed.

6. A Fox and Hound are also known as what?

- a. Time Domain Reflectometer (TDR)
- b. Wiremap
- c. A tone generator and a tone probe**
- d. Continuity tester

7. Which of the following is not a common wired network problem?

- a. Attenuation

b. UTP cables < 100M

c. Jitter

d. Wrong cable type