Cables and Connectors

Course Code: CSC 3116 Course Title: Computer Networks

Dept. of Computer Science
Faculty of Science and Technology

Lecturer No:	Lab 4	**Week No:**	4	**Semester:**	Spring 22-23
Lecturer:	*Dr. Mehedi Hasan; mmhasan@aiub.edu*				

Lecture Outline

1. Different types of devices
2. Ethernet Cabling
3. Terminal Emulation Software
4. Remote Access

Cisco Switch

Fig. A 2960 series cisco switch

CLI access options

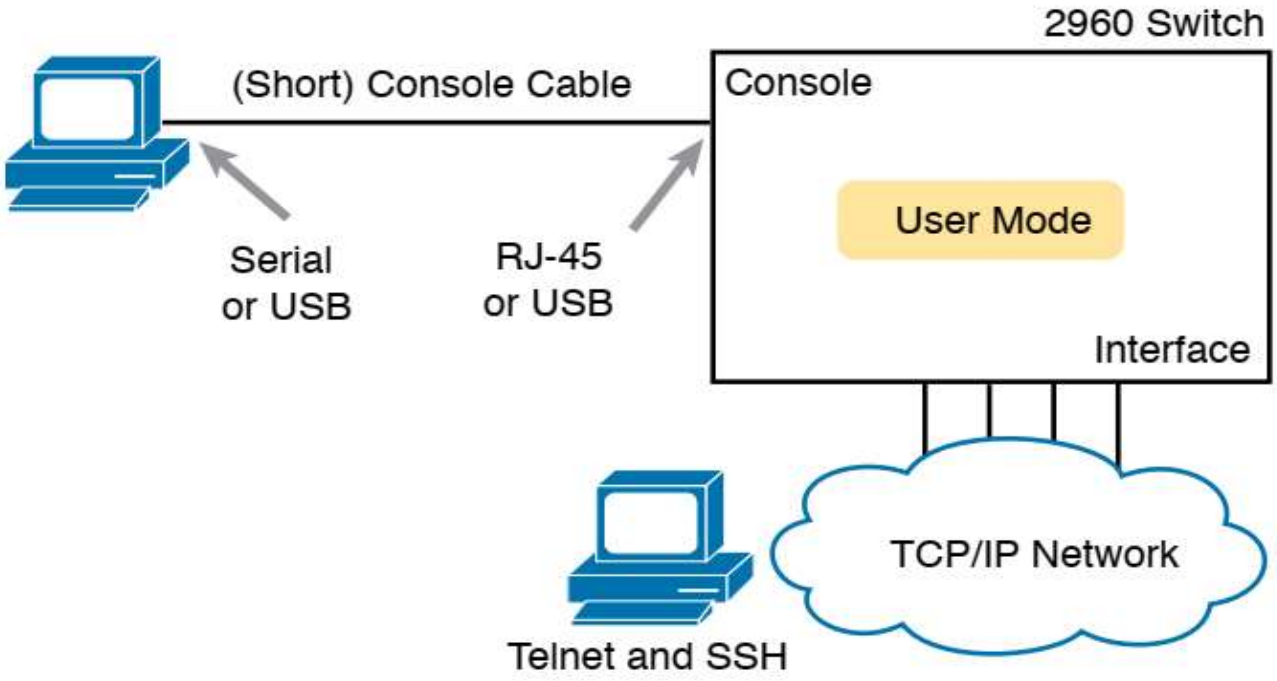


Fig. CLI access options

Console Connection to Switch

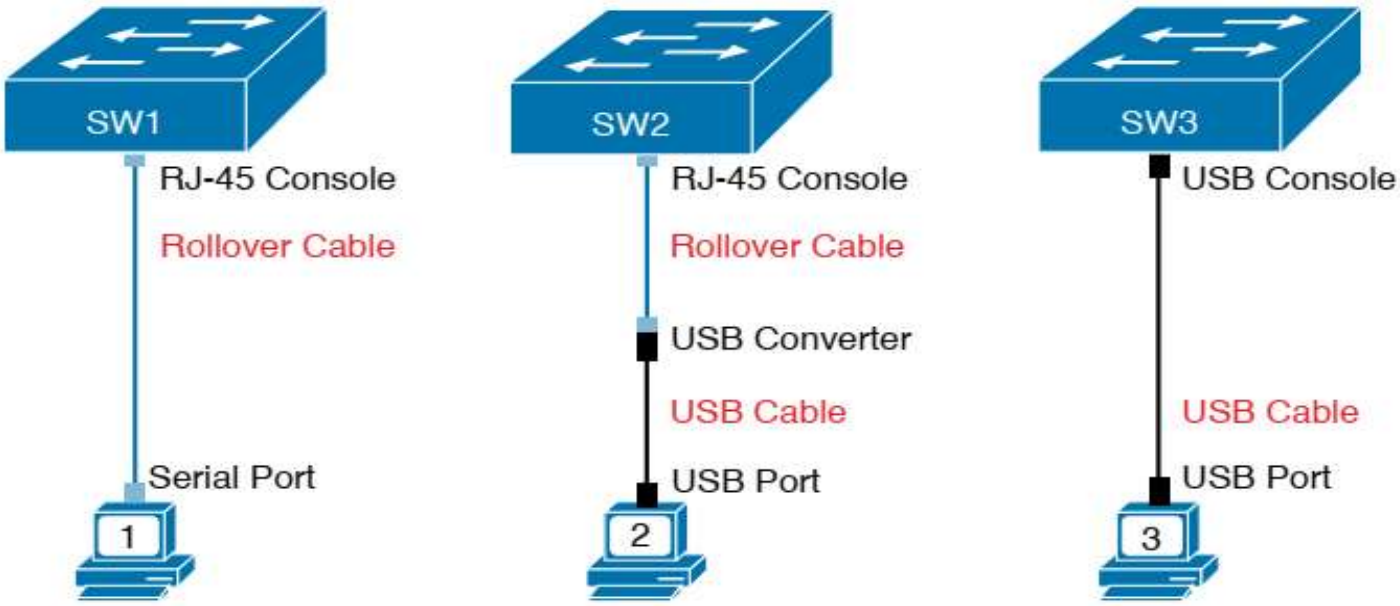
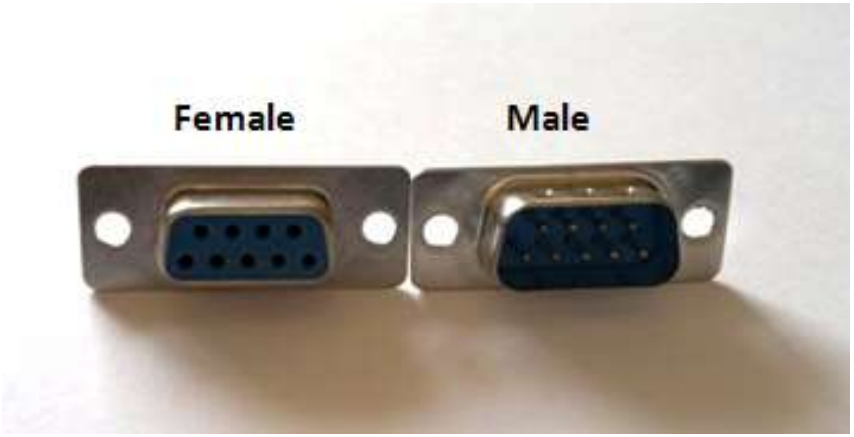


Fig. Console Connection to a Switch

2960-XR series supports both the older RJ-45 console port and a USB console port

USB console port is Not rectangular ,rather it is Mini-B port

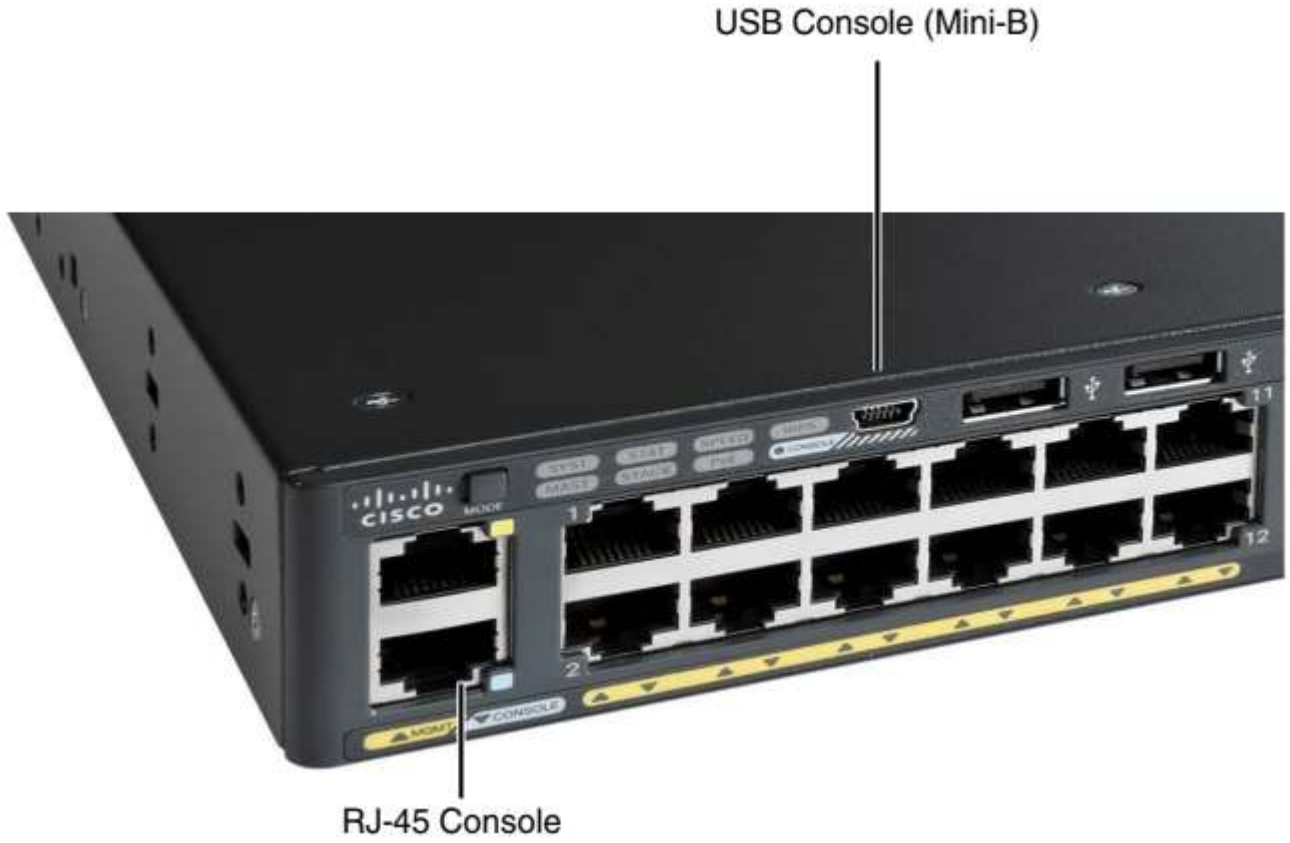
DB9 Connector



Almost obsolete
Replaced by USB

Fig. DB9 Connector (For serial port of PC)

USB and RJ-45 Consle



Terminal Emulation Software

To interact with Switch/Routers

Examples

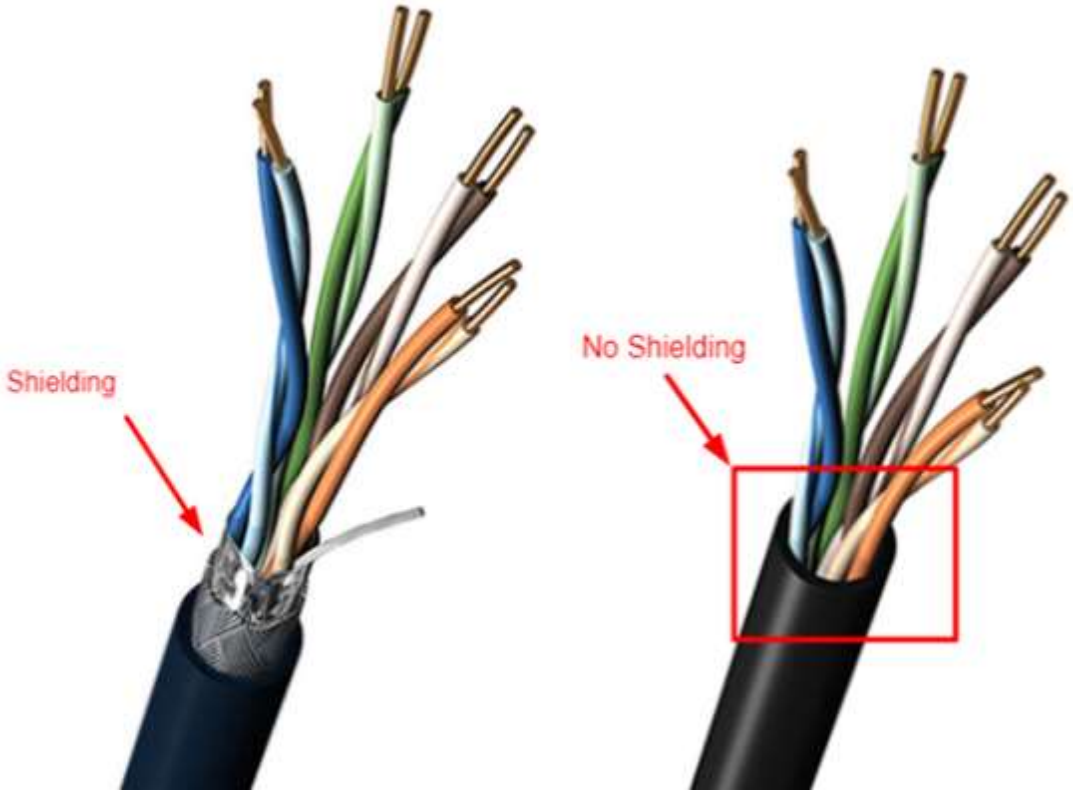
- SecureCRT: Supports serial, Telnet and SSH → Not free
- PuTTY: Supports serial, Telnet and SSH → free
- TeraTerm Pro: Supports serial, Telnet and SSH → free
- Windows Telnet (integrated to Windows OS) → Supports Telnet only
- Windows HyperTerminal → Supports Telnet and Serial, NOT SSH

Remote Access

- Telnet and SSH allows remote access to Switch/Router
- Must need password to access the device
- Telnet is not secure
  - No encryption
- SSH is secure
  - Encryption is used

Ethernet cabling

- Unshielded Twisted Pair (UTP)
  - Electromagnetic interference
  - Less data rate
  - cheap
- Shielded Twisted Pair (STP)
  - Less interference
  - Higher data rate
  - costly

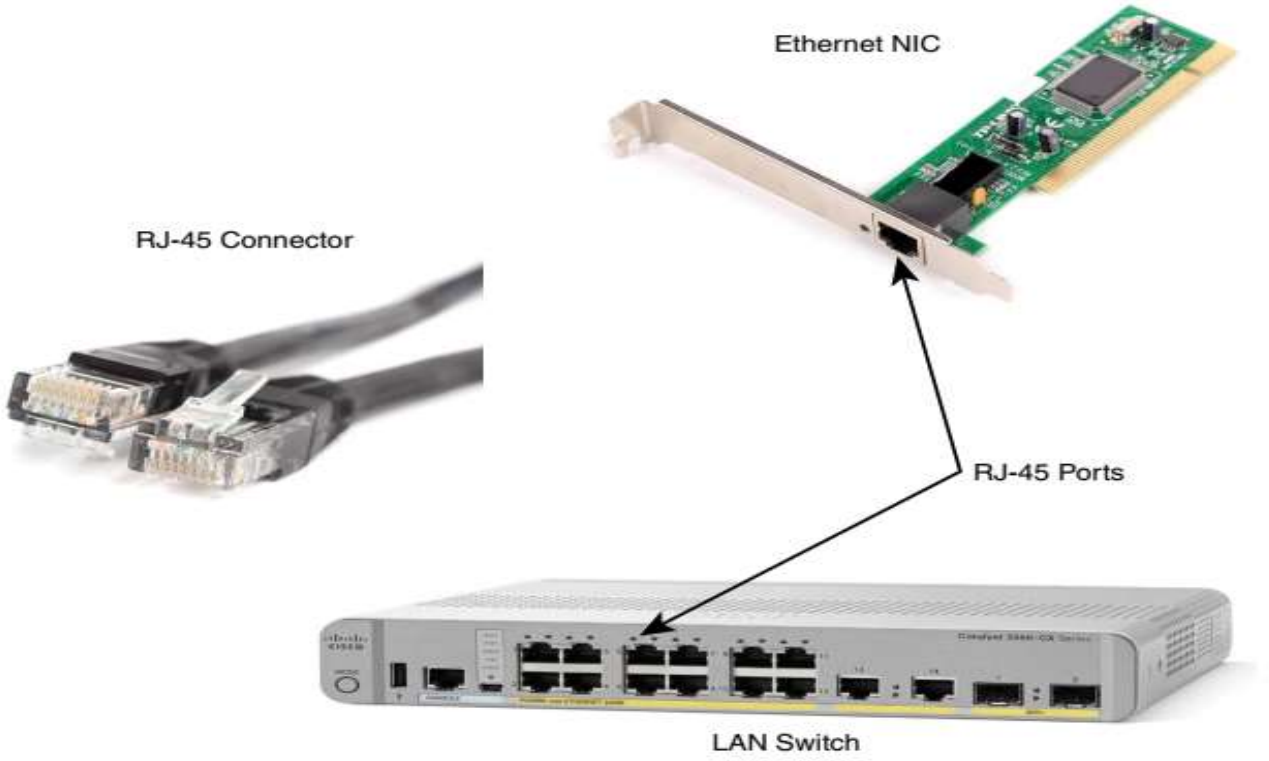


Ethernet cabling (contd…)

Table I Different categories of cable

Category	Speed (Mbps)	Common use
Cat 1	< 1	Analog voice
Cat 2	4	ARCNET
Cat 3	10	10baseT Ethernet
Cat 4	16	Token Ring
Cat 5	100	100baseT Ethernet
Cat 5e	1000	1000baseT Ethernet
Cat 6	1000	1000baseT Ethernet

Ethernet cabling (contd…)



Ethernet cabling (contd…)

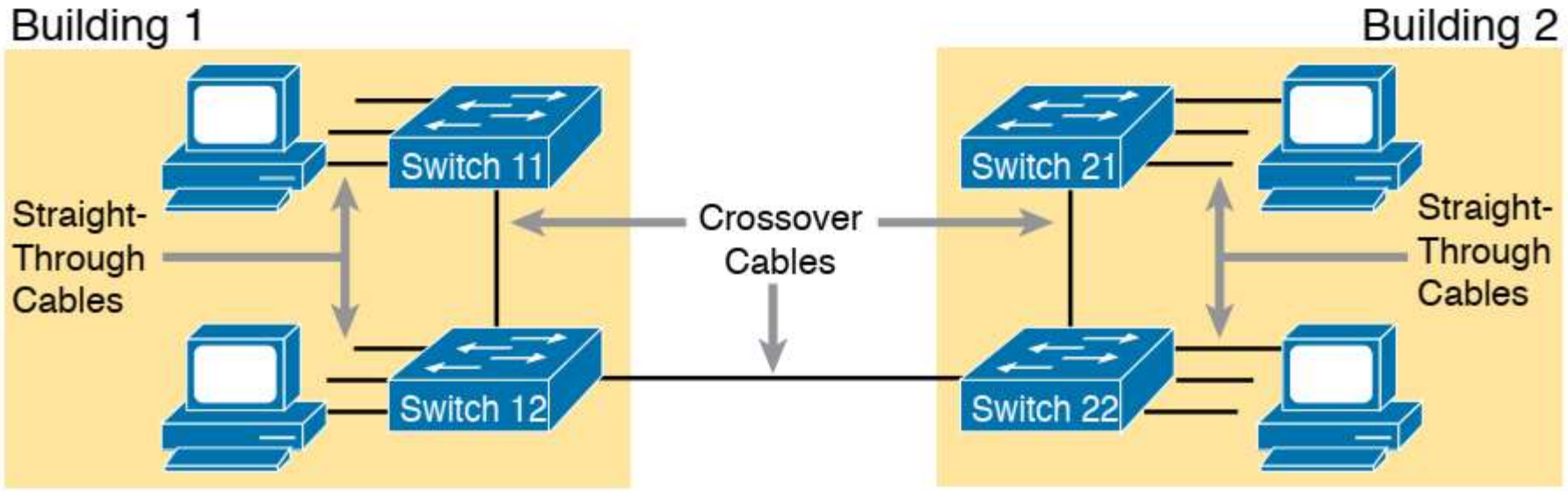
- Straight-Through cable
  - PC to Switch or Hub
  - Router to Switch or Hub
- Crossover cable
  - PC to PC
  - Switch to Switch
  - Hub to Hub
  - Switch to Hub
  - Router to Router
  - Router to PC
- Rollover
  - PC to Console

Crossover cable: If the endpoints transmit on the same pin pair

Straight-through cable: If the endpoints transmit on different pin pairs

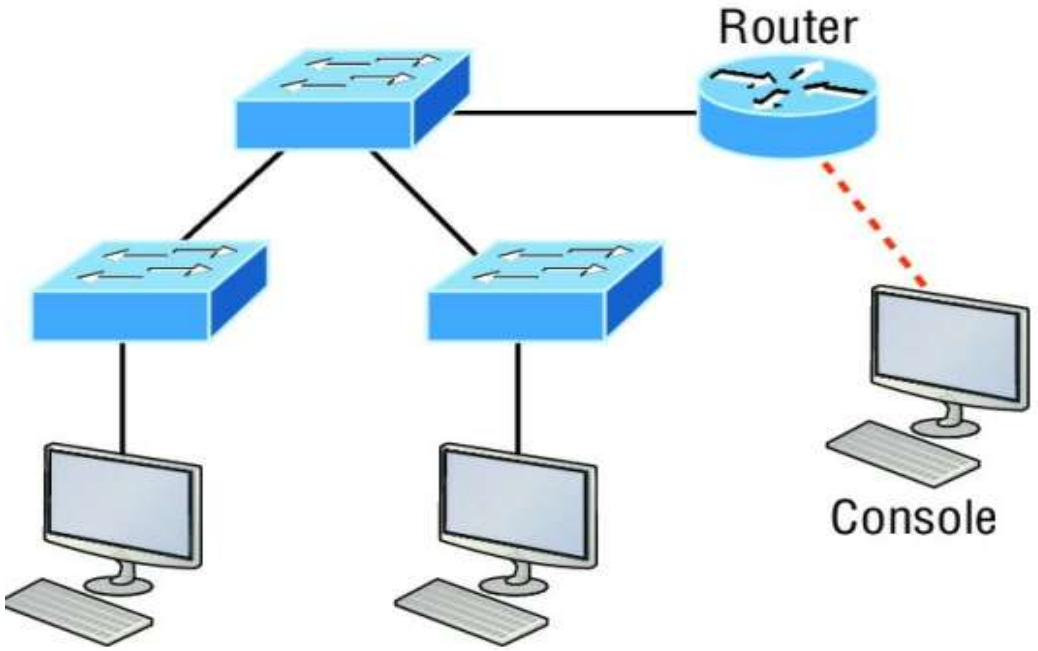
Transmits on Pins 1,2	Transmits on Pins 3,6
PC NICs	Hubs
Routers	Switches
Wireless access point (Ethernet interface)	—

Ethernet cabling (contd…)

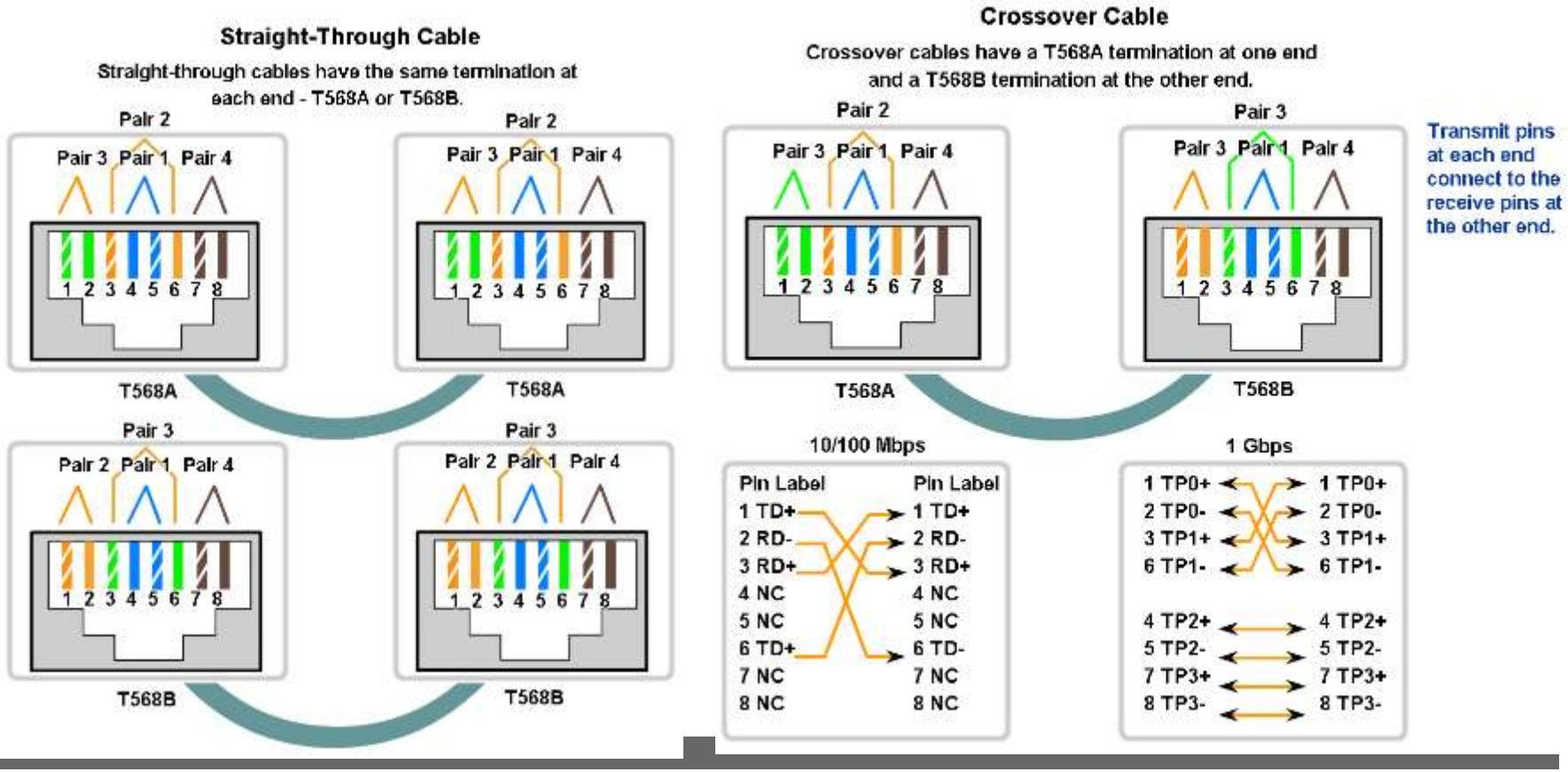


Ethernet cabling (contd…)

Identify cables



Ethernet cabling (contd…)



- Suppose that we have three networks BBA, CSE, and EEE with IP requirements of 100, 350 and 80.

If You are given an IP block 10.10.0.0, allocate IPs performing subnetting.

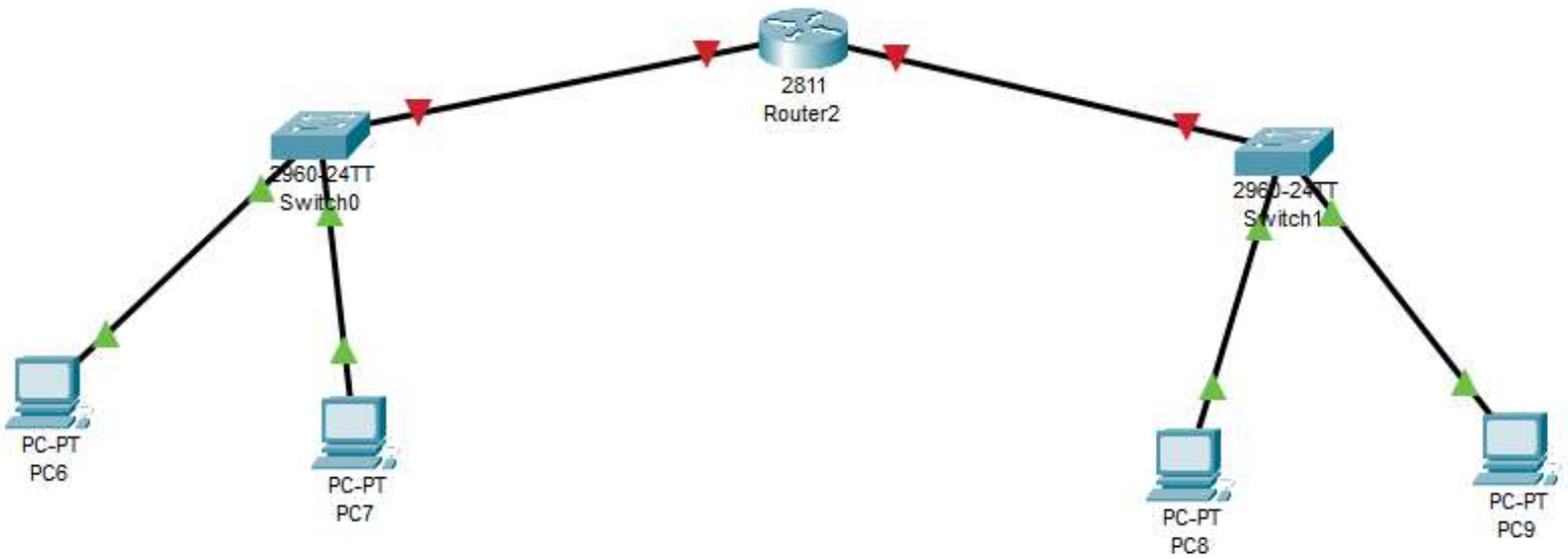
- Suppose that we have five networks A, B, C, D, and E with IP requirements of 10, 30, 90, 200, and 80.

If You are given an IP block 172.16.0.0, allocate IPs performing subnetting.

- Consider your ID: AB-CDEFG-H, Suppose that we have four networks A, B, C, and D with IP requirements of 100*C, 10*D, 50*A, and 20*G.

If You are given an IP block 192.168.0.0, allocate IPs performing subnetting.

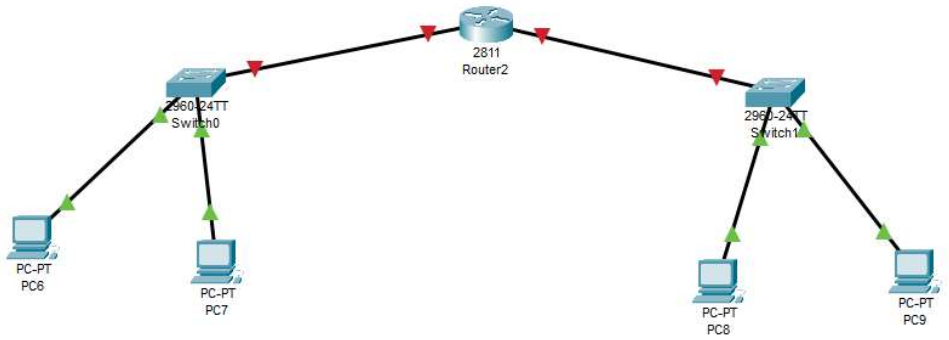
➢ Suppose that we have two networks CSE and EEE with IP requirements of 10 and 8. If You are given an IP block 192.168.0.0, allocate IPs performing subnetting.



➢ Suppose that we have two networks CSE and EEE with IP requirements of 10 and 8. If You are given an IP block 192.168.0.0, allocate IPs performing subnetting.

192.168.0.0/16
CSE→ 10 host → 4bit →192.168.0.0-15/28 → 255.255.255.240
Net address: 192.168.0.0/28
BC address: 192.168.0.15/28
Gateway: 192.168.0.14/28

EEE→ 8 host →3bit→192.168.0.16-23/29 → 255.255.255.248
Net address: 192.168.0.16/29
BC address: 192.168.0.23/29
Gateway: 192.168.0.22/29



References

1. Official Cert Guide CCNA 200-301 , vol. 1, *W. Odom*, Cisco Press, First Edition, 2019, USA.

2. CCNA Routing and Switching, *T. Lammle*, John Wily & Sons, Second Edition, 2016, USA.

3. Cisco IOS Configuration Fundamentals Command Reference. http://www.cisco.com

Books

1. Official Cert Guide CCNA 200-301 , vol. 1, *W. Odom*, Cisco Press, First Edition, 2019, USA.

2. CCNA Routing and Switching, *T. Lammle*, John Wily & Sons, Second Edition, 2016, USA.