

Ethernet Media

By:

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Outline

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- UTP Implementation
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Media Standards

Standard	Speed	Maximum Distance	Media Type	Connector Used
10Base-2	10Mbps	185m	RG-58 Coaxial	BNC
10Base-5	10Mbps	500m	RG-58 Coaxial	BNC
10Base-T	10Mbps	100m	Cat 3,4,5 UTP/STP	RJ-45
10Base-FL	10Mbps	Up to 2km	Fiber Optic	SC / ST
100Base-T	100Mbps	100m	Cat 3,4,5 UTP/STP	RJ-45
100BaseTX	100Mbps	100m	Cat 5 UTP/STP	RJ-45
100BaseFX	100Mbps	412m with half-duplex MM fiber	Fiber Optic	SC / ST
1000BaseT or 1000BaseTX	1Gbps	75m	Cat 5 UTP or higher	RJ-45
1000BaseCX	1Gbps	25m	Shielded Copper Wire	9-pin shielded connector
1000BaseSX	1Gbps	275m with half or full-duplex 62.5micron MM fiber	MM Fiber Optic	SC / ST

Connection Media

1000Base-T GBIC

- Provides full duplex Gigabit Ethernet connectivity
- Using existing copper network infrastructures



Connection Media

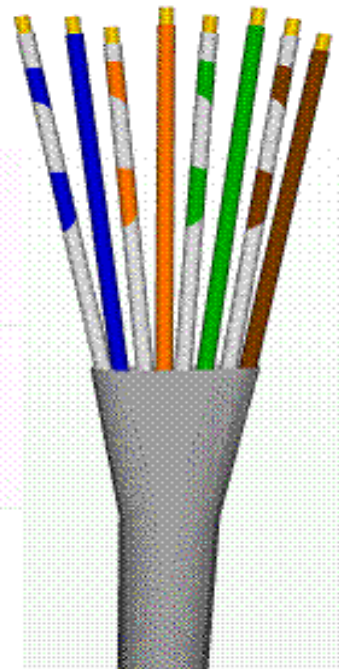
Fiber-Optic GBICs

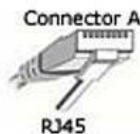
- Short wavelength (1000Base-SX)
- Long wavelength/long haul (1000Base-LX/LH)
- Extended distance (1000Base-ZX)



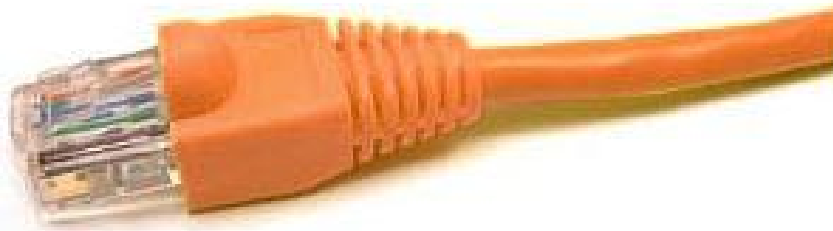
Unshielded Twisted-Pair Cable

- 10 to 1000Mbps throughput
- Least expensive
- Small media and connector size
- Varying maximum cable length

Wire pair #1:	White/Blue Blue	
Wire pair #2:	White/Orange Orange	
Wire pair #3:	White/Green Green	
Wire pair #4:	White/Brown Brown	



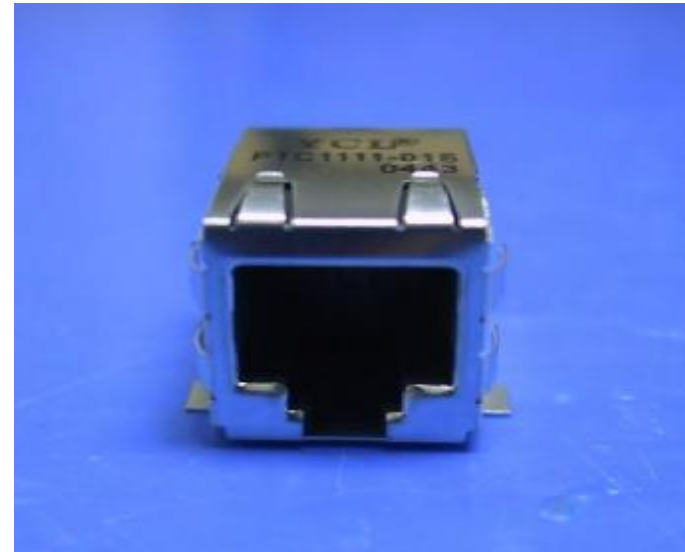
RJ-45 Connector and Jack



Connector A

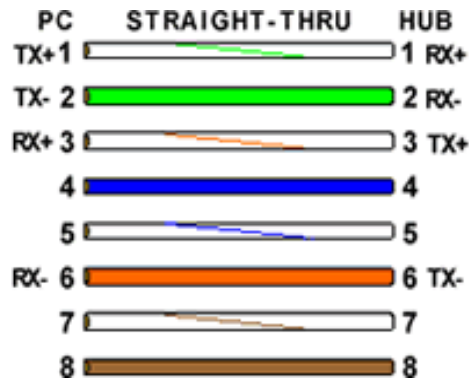
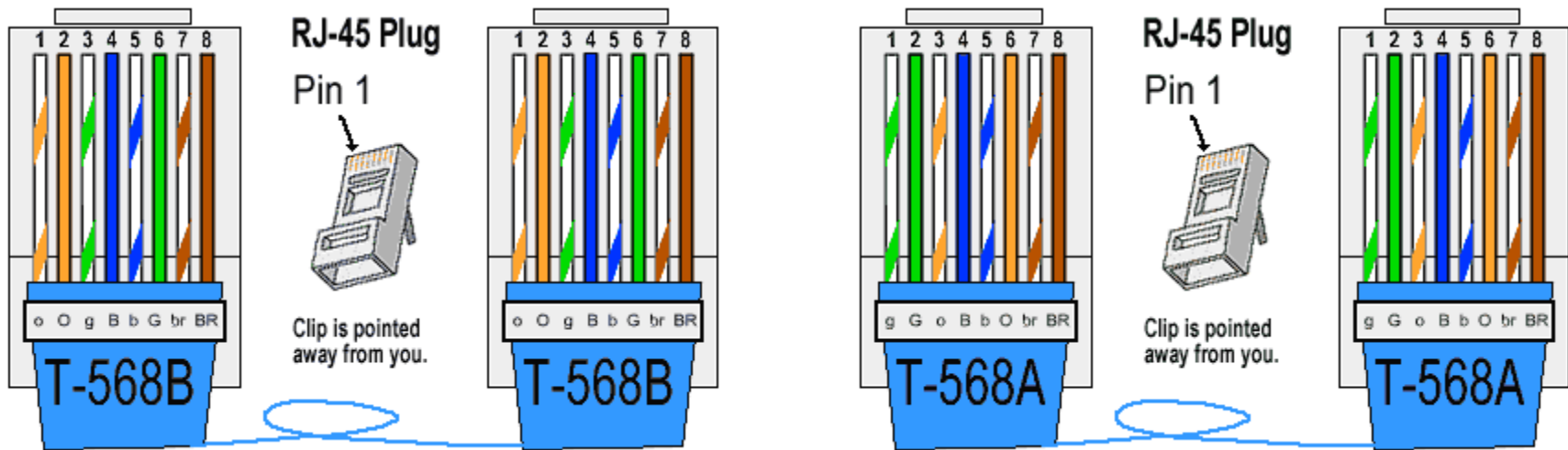


RJ45



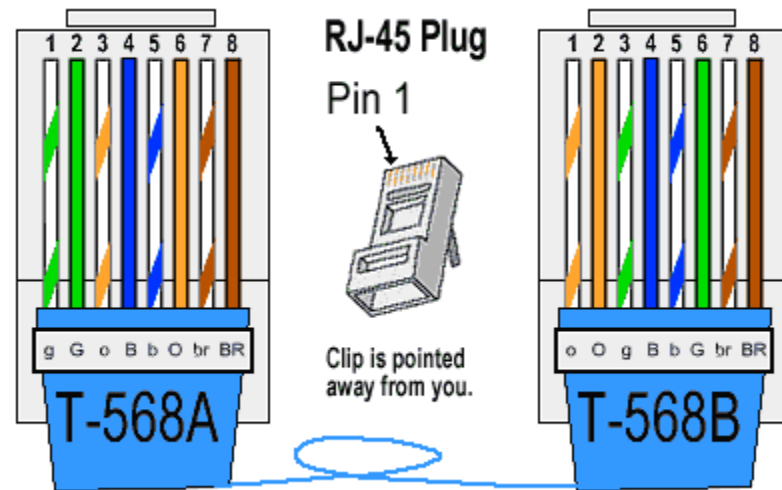
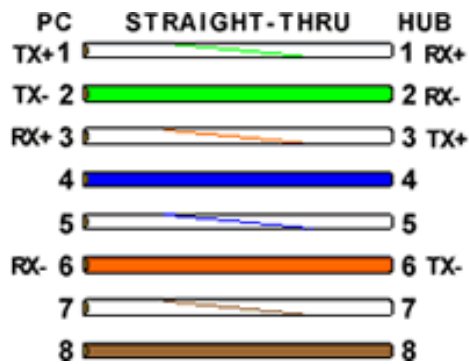
UPT Implementation (Straight Through)

- Cable 10Base-T/100Nase-TX Straight Through



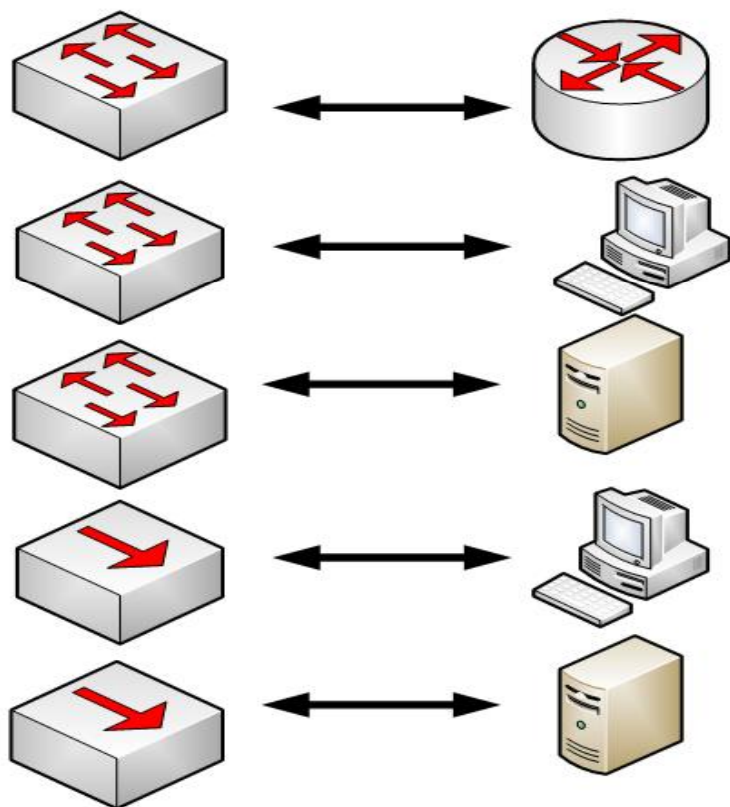
UPT Implementation (Cross-Over)

- Cable 10Base-T/100Nase-TX Cross-Over

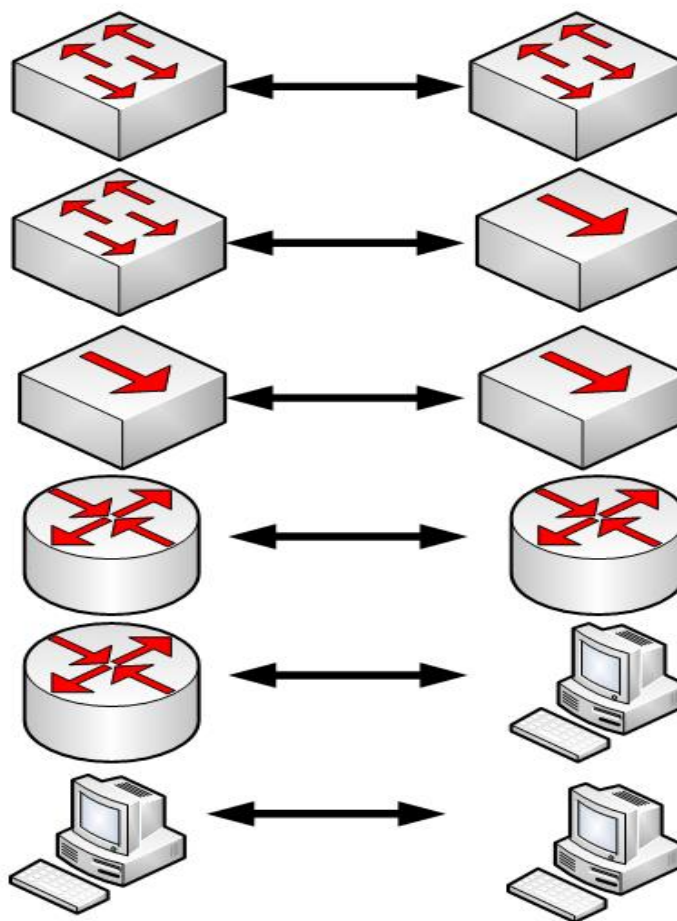


UTP Implementation: Straight-Through vs. Crossover

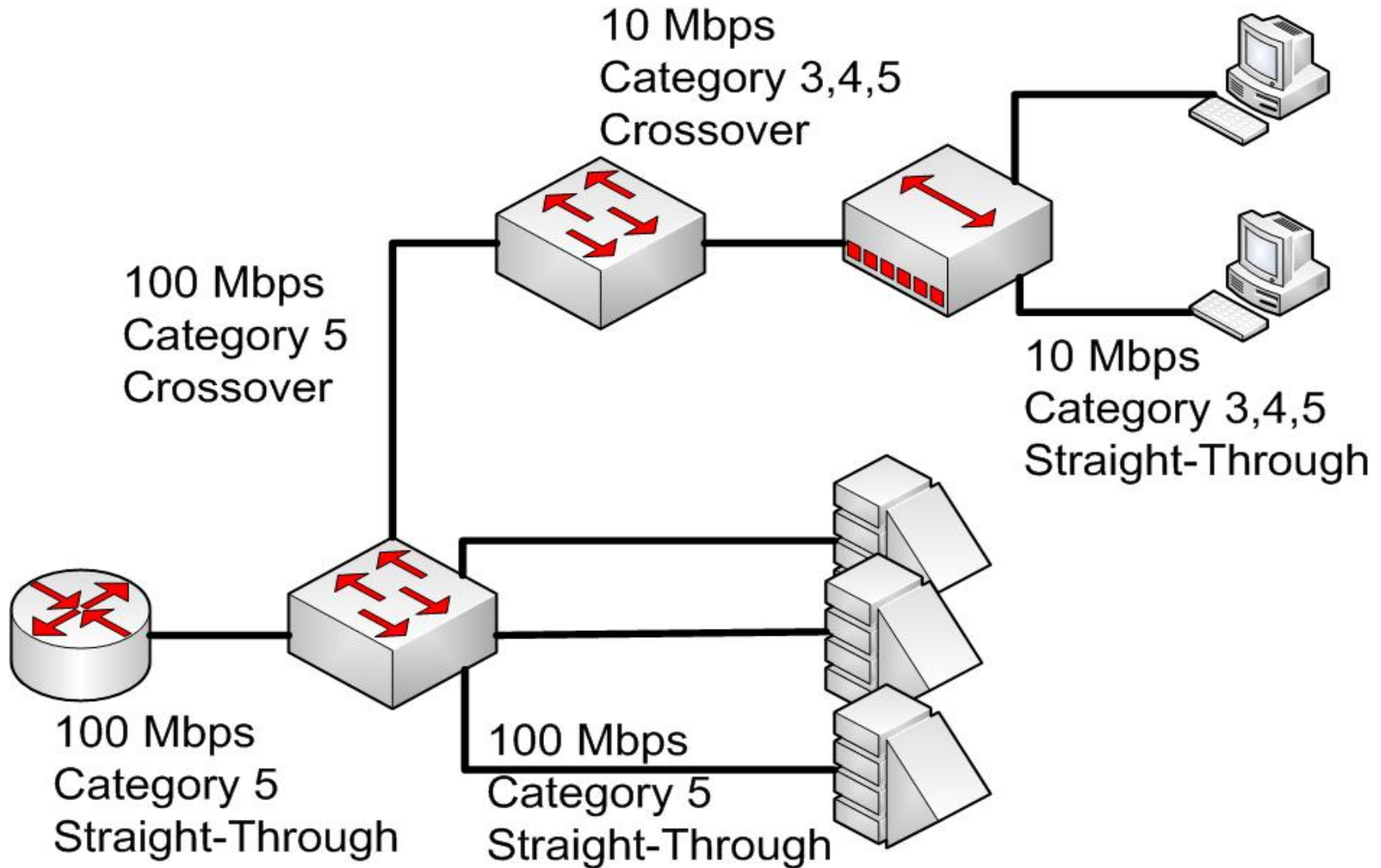
Straight-Through Cable



Crossover Cable



Using Varieties of UTP



Summary

- Also called a LAN adapter, the NIC plugs into a motherboard and provides a port for connecting to the network.
- The MAC address is burned onto each NIC by the manufacture, providing a unique, physical network address that permits the device to participate in the network.
- The cable and connector specifications used to support Ethernet implementations are derived from the EIA/TIA standards body.

Summary

- The categories of cabling defined for the Ethernet are derived from the EIA/TIA-568 (SP-2840) Commercial Building Telecommunications Wiring Standards.
- There are several connection media used for Ethernet, with RJ-45 and GBIC being the most common.
- A GBIC is a hot-swapped I/O device that plugs into a Gigabit Ethernet port.

Summary

- UTP cable is a 4-pair wire. Each of the eight individual copper wire is UTP cable is covered by insulating material, and the wires in each pair are twisted around each other.
- A crossover cable is used to connect between similar devices (such as switch to switch, router to routes, PC to PC and hub to hub).
- A straight-through cable is used to convert between dissimilar devices (such as switch to router, switch to PC, hub to router, and hub to PC.)

