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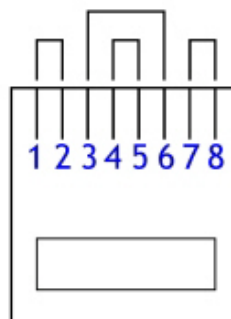
DO YOU REALLY KNOW YOUR UTP CABLE CONFIGURATION?

EIA/TIA wiring standards were first published in 1991 and have been evolving ever since. The EIA/TIA-568 standard defines the specification of the cable to be used as well as some installation rules. The latest version of the EIA/TIA standard is 568B, which contains some minor enhancements to the original 1991 standard. The most popular is Category 5, the highest-quality UTP cable. It is tested at 100 MHz, allowing it to run high-speed protocols such as 100 Mbps Fast Ethernet and FDDI. Category 5 cable also uses either 22 or 24 AWG unshielded twisted pair wire with impedance of 100 ohms.

The IEEE has defined three new physical layers for 100 Mbps Fast Ethernet. By far, the 100Base-TX is the most popular one. However, the IEEE also demands rigid compliance of how the cable is installed with RJ-45 connector. Otherwise, you will have high-speed data transmission problem - NEXT. NEXT is the coupling of signals from one twisted pair to another. NEXT is undesired because it represents unwanted spillover from one pair to other. The result is corrupted data or no connection at all.

Even you are using Cat 5 cable with 4 twisted pair wires, it doesn't mean that the cable is 100% compliant with EIA/TIA standard if it is not connected to RJ-45 in the way it should be. The **Straight-through cable** (**"Patch cable"**) connection should be:

Pin 1 and 2 are connected to same twisted pair wire
Pin 3 and 6 are connected to same twisted pair wire
Pin 4 and 5 are connected to same twisted pair wire
Pin 7 and 8 are connected to same twisted pair wire

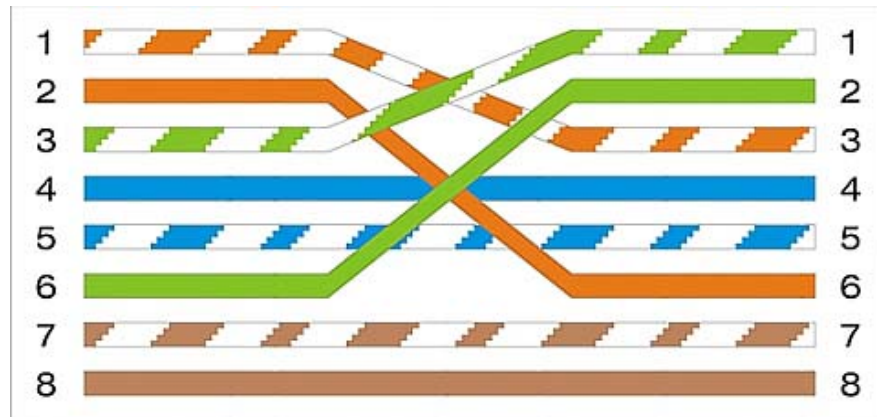| PIN	Pair	Cable Color
1| ---\	1	T2	White/Orange
2| ---/	2	R2	Orange
3| ------\	3	T3	White/Green
4| ---\ \	4	R1	Blue
5| ---/ /	5	T1	White/Blue
6| ------/	6	R3	Green
7| ---\	7	T4	White/Brown
8| ---/	8	R4	Brown

1 2 3 4 5 6 7 8

RJ-45 Plug with clip facing down

If you have the problem mentioned above, please check your cable to see if it is compliant with the standard. If not just simply cut out the existing RJ-45 connectors and replace them in the RIGHT way!

Here is the pin-out for **Crossover cable ("Uplink cable")**:

	Point A			Point B	
TR+	Pin 1	-----	Pin 3	RCV+
TR-	Pin 2	-----	Pin 6	RCV-
RCV+	Pin 3	-----	Pin 1	TR+
RCV-	Pin 6	-----	Pin 2	TR-

In normal wiring, the transmit pair is in ORANGE and the receive pair is in GREEN. The other two pairs, blue and brown, are ignored.

There is also another wiring standard - EIA/TIA-568A. Technically, there is no different between 568A and 568B in Ethernet applications. However, if Ethernet system combined with phone system is being used, most of the people will prefer 568A standard due to the fact that 568B may have backward compatibility problem with standard Universal Service Order Codes (USOC) hardware, which are commonly used in the telephone infrastructure.

568A and 568B Pin-out

568A		568B		
White/Green	--\	White/Orange	--\	Pin 1
Green	--/	Orange	--/	Pin 2
White/Orange	------\	White/Green	------\	Pin 3
Blue	--\ \	Blue	--\ \	Pin 4
White/Blue	--/ /	White/Blue	--/ /	Pin 5
Orange	------/	Green	------/	Pin 6
White/Brown	--\	White/Brown	--\	Pin 7
Brown	--/	Brown	--/	Pin 8

Last revised: January, 2002
All information is subject to change without notice.