Colour Coding Requirements for Crimping Crossover Cables

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Abstract- Terminating ethernet cables use to be based on specific standards; EIA/TIA A or B. Clearly, it has been either type A or B or both that has to be used to crimp a particular type. This has been technically tedious, trying to recall the colour coding in use which comforms to the existing standards. For example, a rollover cable have to use either type "A" or "B" on one side and inverting the chosen type at the other end. Recalling the exact colour code of the type to be used to crimp a rollover cable successfully doesn't seem to be user-friendly. Technically, this has been a concern, in a situation where an issue may need to be addressed and one is not online or not having the particular information for the job. Hence, exploring into the colour coding requirements for crimping rollover cable would proffer a more simplified procedure. Hence, this paper investigates into the colour coding requirements for crimping rollover cable. The investigation is done by getting a piece of category cable, use a procedure gotten from reviews to explore the standard colours for each type (A and B). Subsequent to this paper, demonstrating the crimping exercise in different options until a friendlier pattern is established.

I. INTRODUCTION

Taufik et al (2021) states that a rollover cable is one of the types of Ethernet cables that are often used for router's configuration. Making UTP rollover cables, one must have the following tools, a crimper, a category cable, RJ-45 connector, and LAN Tester. The crimper is used for stripping of the category cable, cutting the arranged untwisted pins to get it straight and grapping the pins inside the connectors. The connectors allows the pins to be fitted before grapping with crimper. The category cable is the UTP Piece. The LAN tester tests if the cable is now a working rollover cable.

II. LITERATURE REVIEW

Anfani et al (2024) specified computer network as a set of computers connected together for the purpose of sharing resources. The most common resource shared today is connection to the Internet. Other shared resources can include a printer or a file server. The Internet itself can be considered a computer network. One can also see computer network as a digital telecommunications network which allows nodes to share resources. In computer networks, computing devices exchange data with each other using connections (data links) between nodes. Computer network can be defined as two or more computers connected together by some means through which they are capable of sharing information. Datukun (2018) defined Campus Network design as a University Campuses network design that require a background design for computer network that would cover the master plan of the campus area. Ezema et al (2014) indicated that there are software that initiate and manage user's interaction in sharing files and other resources. A network, particularly computer network runs on platforms like hardware or software. Software requirements for networks consist of the compatible operating systems on which end-user and network devices runs. Also utility and application softwares required on a computer network. Igbinosa and Datukun (2024) iterates on the fact that the stronger a signal strength the better a network in terms of performance. Hence, a good network design, adequate system infrastructure would do a lot for a smart campus.

The study in Piyush et al (2015) compares the performance of copper and aluminium cables, especially in the automotive sector. Although aluminium can reduce vehicle weight, copper is significantly superior in terms of conductivity.

KIVANÇ et al (2022) added that copper is almost twice as resistant to mechanical stress due to its bending strength. More so, the annealing process of aluminium takes longer. Also, aluminium's thermal coefficient and heat resistance make copper more effective in the crimping process. Aluminium also has the disadvantage of poor corrosion resistance. This reveals that the copper in category cables used for making network Ethernet cables is reliable.

Taufik et al (2021) identified a rollover cable as also one made from a UTP cable. Making UTP rollover cable, one must have the following tools: To connect a computer network using cables, there are two types of cables that are often used, namely straight-through cables and crossover cables. As for making UTP Cross and Straight cables, you must have the following tools: Tank Crimping, UTP cable, RJ-45 connector, and LAN Tester. Doug (2020) specified that Ethernet is a standardized way of connecting computers to create a network. He said Cable is the plumbing of computer user's network. RJ-45 connectors for twisted-pair cables aren't too difficult to attach if users have the right crimping tool. A rollover cable only connects a computer to a router for the purpose of configuration. When computer users use twisted-pair cable to wire a network, they don't plug the computers into each other. Instead, each computer plugs into a separate device called a switch. Some switches, called stackable switches, can be expanded by adding additional switch modules that add additional ports to the switch.

Datukun (2020) highlights that Network media are channels through which network data are transmitted. These are Ethernet cables. A RJ45 connector is a modular 8 position, 8 pin connector used for terminating Cat5e patch cable or Cat6 cable. A pinout is a specific arrangement of wires that dictate how the connector is terminated. There are two standards recognized by ANSI, TIA and EIA for wiring Ethernet cables. The first is the T568A wiring standard and the second is T568B. T568B has surpassed 568A and is seen as the default wiring scheme for twisted pair structured cabling. If you are unsure of which to use, choose 568B. A rollover cable is a type of twisted pair cable that is used to connect a computer to a router for the purpose of configuration. On a rollover cable, the wired pins does not necessarily match. rollover cable use one wiring standard. For example, as one end uses T568A wiring standard the other end uses the same wiring standard in a reversed form.

III. METHODOLOGY

Datukun (2020) in his book published with Amazon online, indicated the steps on how to make a rollover cable. These are:

Step 1: Strip the cable jacket about 1.5 inch down from the end.

Step 2: Spread the four pairs of twisted wire apart.

Step 3: Untwist the wire pairs and neatly align them in the T568B on one side and A orientation on the other side.

Step 4: Cut the wires as straight as possible, about 0.5 inch above the end of the jacket.

Step 5: fit the ends into RJ-45 connectors

Step 6: fix both ends in a crimper tool and press carefully and firmly

Step 6: Reverse the same process on the other end of the cable

IV. RESULTS

Going through steps 1-3, the Table below reveals the colours of each cable. Particularly, after untwisting in step 3, the colours described in T568A are clearly visible. The Table below summarises the colour coding requirements for crimping a crossover cable bases on existing standards on the two ends of the cable.

T568A	Colour	T568A (reversed)	Colour
Pin 1	White Green	Pin 8	Brown
Pin 2	Green	Pin 7	White brown
Pin 3	White orange	Pin 6	Orange
Pin 4	Blue	Pin 5	White blue
Pin 5	White blue	Pin 4	Blue
Pin 6	Orange	Pin 3	White orange
Pin 7	White brown	Pin 2	Green

Pin 8	Brown	Pin 1	White green

Subsequent research will explore options to ascertain if the colours arrangement could be interwove and the other end of the cable picking order based on standards arrangements.

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