Data Communication Concepts

Connecting a LAN network

Lab 2

Outline

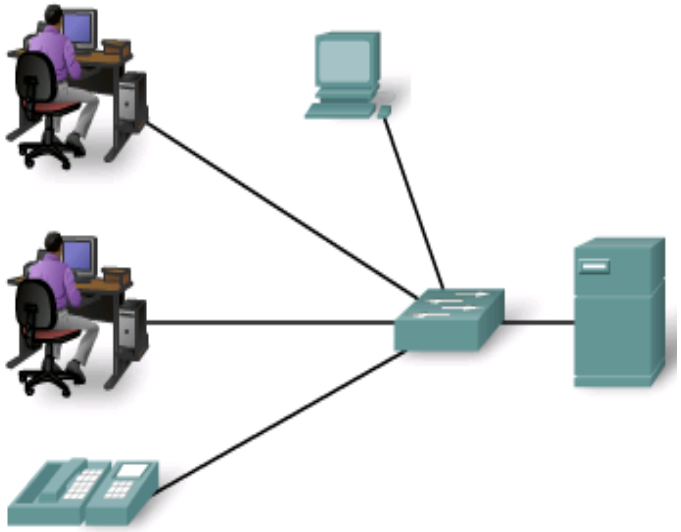
- **Introduction**
- **LAN –Getting Connected**
- **Terminating a UTP Cable**

Introduction

The main three types of network are:

- **Local Area Networks (LANs)**
- **Metropolitan Area Network (MAN)**
- **Wide Area Networks (WANs)**

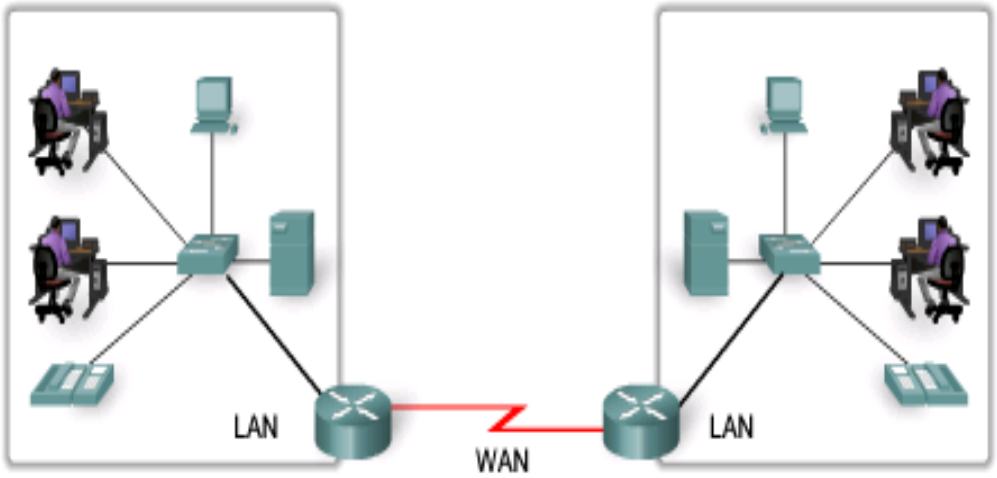
LAN provides services to small geographical area, such as a single building.



Introduction (Continue...)

A MAN usually consists of two or more LANs in a common geographic area. For example, a bank with multiple branches may utilize a MAN. While WAN interconnect LANs that separated by large geographic distance.

LANs separated by geographic distance are connected by a network known as a Wide Area Network (WAN).



LAN –Getting Connected

When planning the installation of LAN, there are four physical areas to consider:

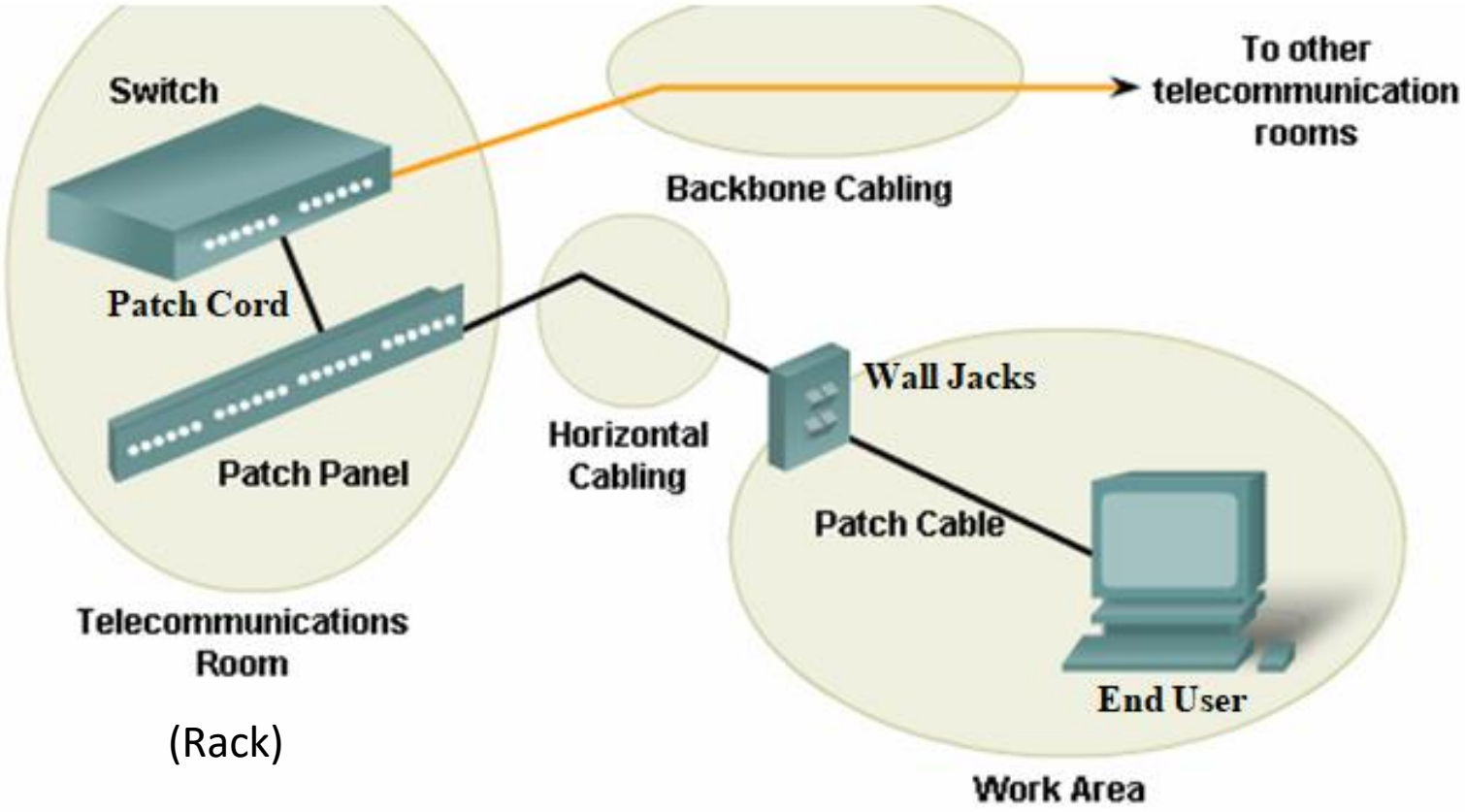
- **Work area**
- **Telecommunications room**, also known as rack
- **Backbone cabling**, also known as vertical cabling
- **Distribution cabling**, also known as horizontal cabling

LAN –Getting Connected

Backbone Cabling

Different sizes of racks

LAN –Getting Connected (Continue…)



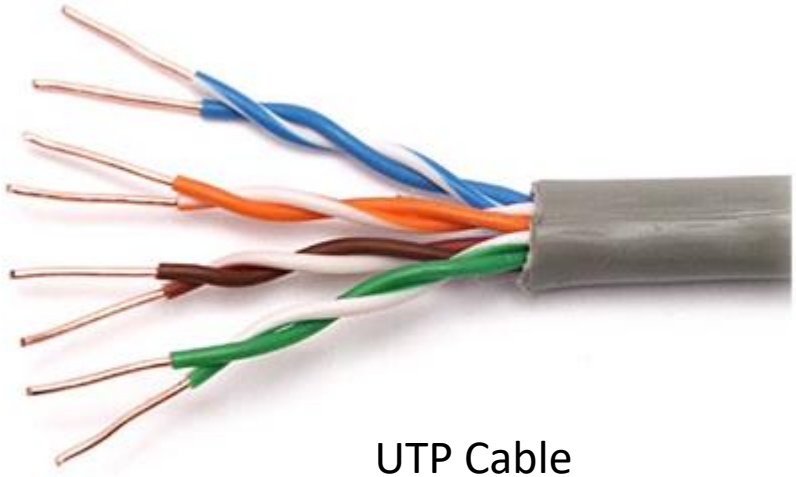
LAN –Getting Connected (Continue…)

- The most commonly cable type that used in work area, horizontal cabling and telecommunication room is UTP cable which is cooper media type. UTP have different types of cable connections between devices as shown in the following table.
- Group one devices: PC, server and router

Group two devices: switch, hub, repeater.

LAN –Getting Connected (Continue…)

RJ-45



UTP Cable

Resultant terminated cable

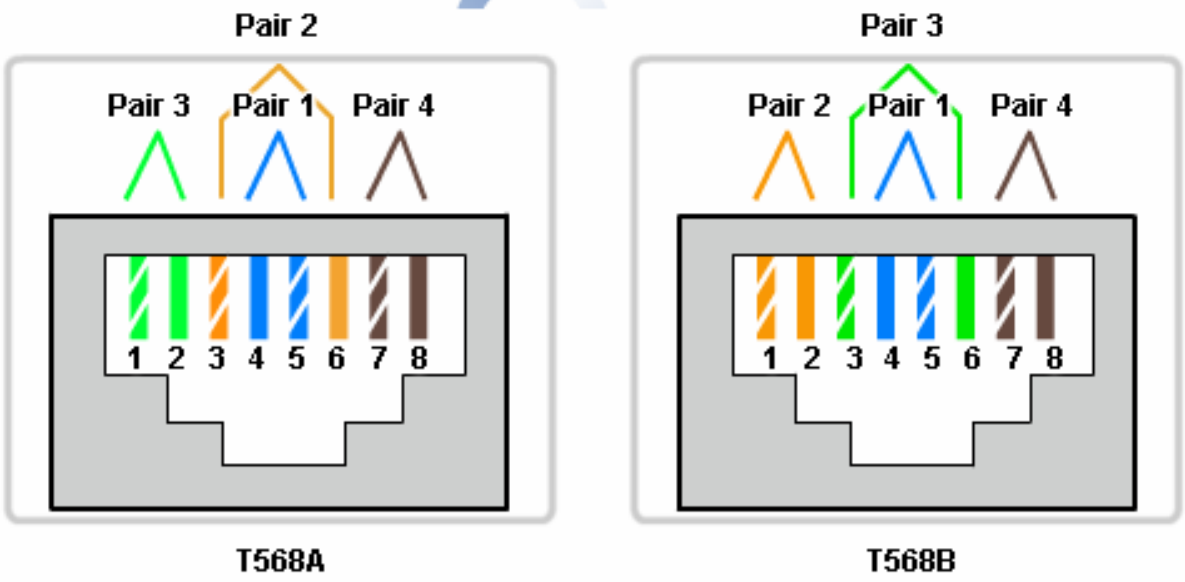
Crimping Tool

LAN –Getting Connected (Continue…)

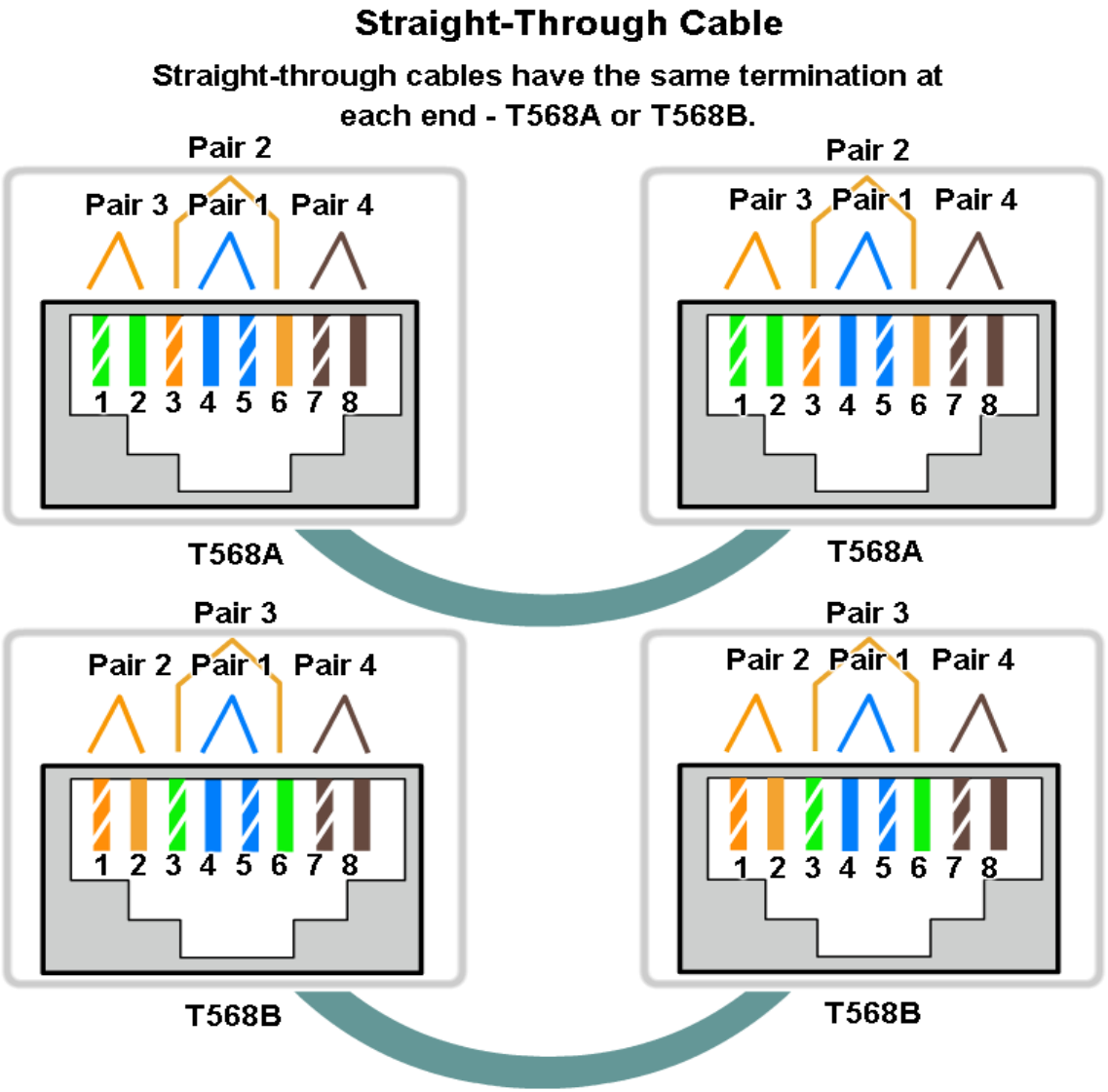
Straight-through, Crossover, and Rollover Cable Types

Cable Type	Standard	Application
Ethernet Straight-through	Both end T568A or both end T568B	Connecting a network host to a network device such as a switch or hub.
Ethernet Crossover	One end T568A, other end T568B	Connecting two network hosts. Connecting two network intermediary devices (switch to switch, or router to router).
Rollover	Cisco proprietary	Connect a workstation serial port to a router console port, using an adapter.

1—3
2—6



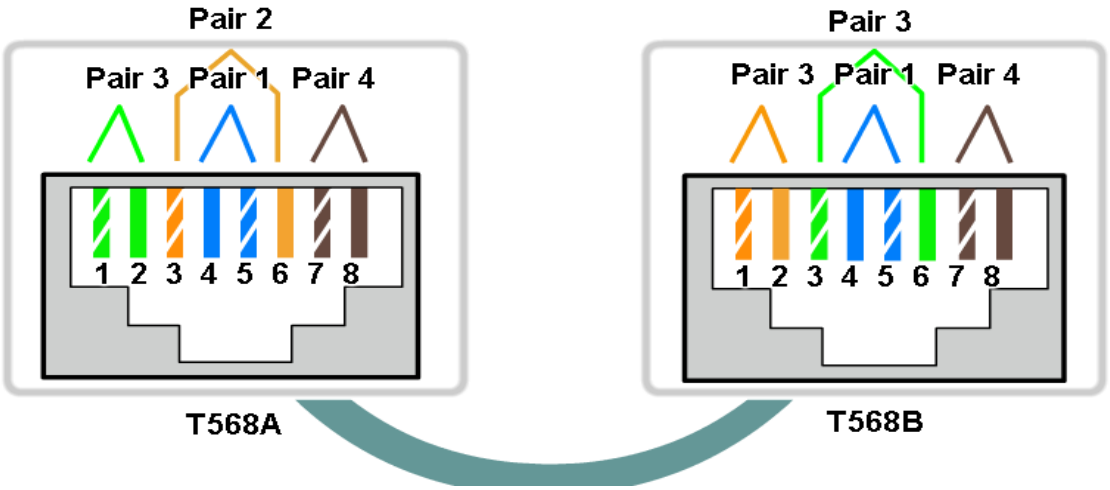
LAN –Getting Connected (Continue…)



LAN –Getting Connected (Continue…)

Crossover Cable

Crossover cables have a T568A termination at one end and a T568B termination at the other end.



T568A
(Top View)

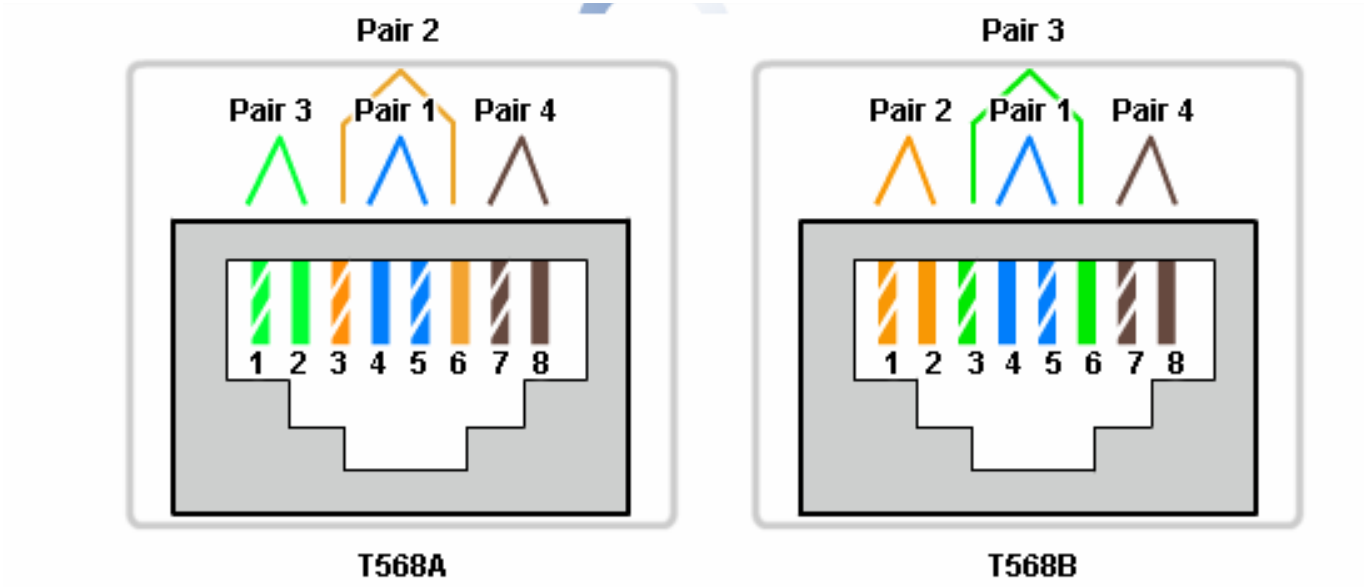
T568B
(Top View)

Terminating a UTP Cable

- UTP cabling, terminated with RJ-45 connectors, is a common copper-based medium for interconnecting network devices, such as computers, with intermediate devices, such as routers and network switches.
- Unshielded twisted-pair (UTP) cabling consists of four pairs of color-coded wires that have been twisted together and then encased in a flexible plastic sheath.

Terminating a UTP Cable

➢Different situations may require UTP cables to be wired according to different wiring conventions. This means that the individual wires in the cable have to be connected in different orders to different sets of pins in the RJ-45 connectors.

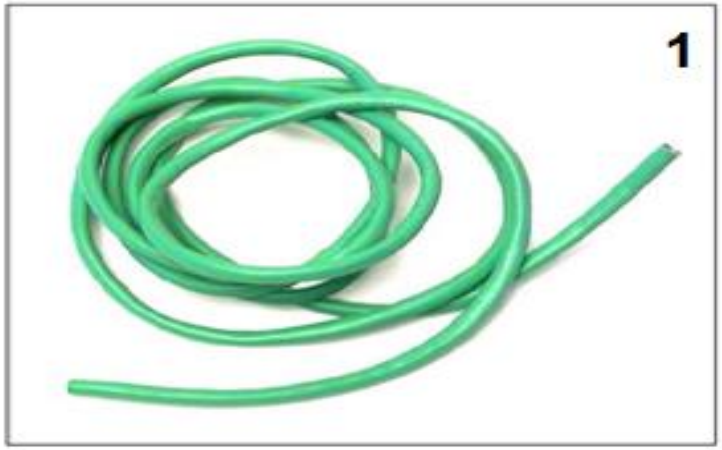


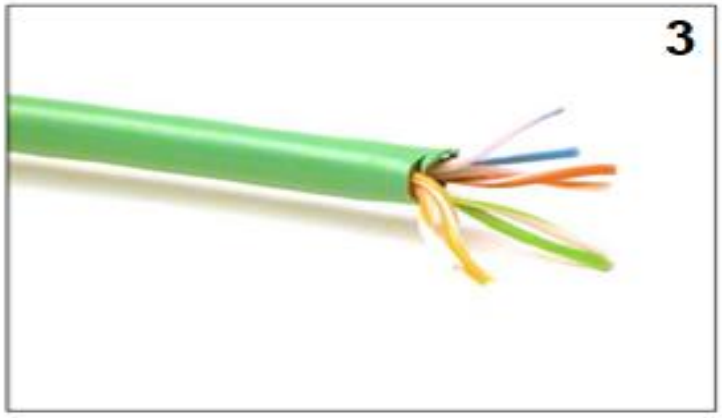
Crimping RJ-45 Connector into UTP cable

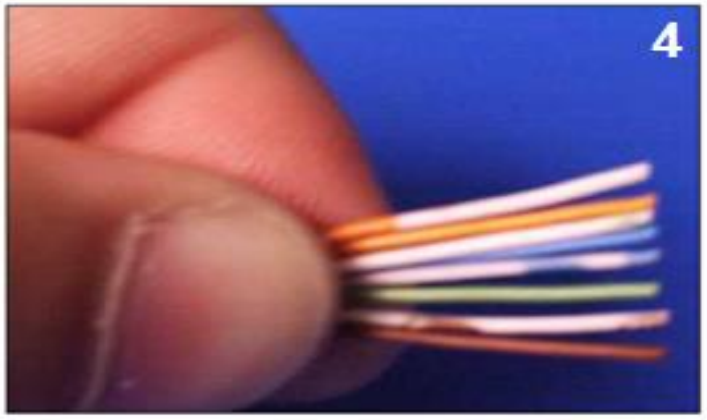
What we need

Crimping RJ-45 Connector into UTP cable

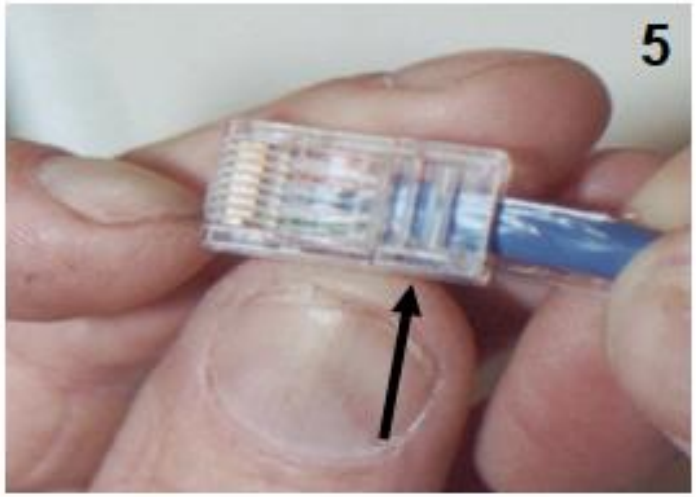
Steps for making UTP cable

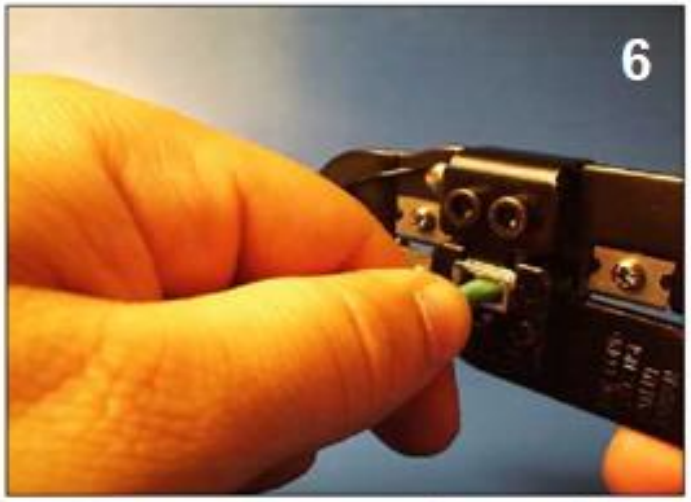






LAN –Getting Connected (Continue…)





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THANK YOU