THE Internet

Internet

A global network of billions of computers and other electronic devices.

It access almost any information, communicate with anyone else in the world, and do much more.

What is the Web?

The **World Wide Web**—usually called the **Web** for short—is a collection of different **websites** you can access through the Internet

A website is made up of related text, images, and other resources.

a news platform, an advertisement, an online library, a forum for sharing images, or an educational site.

How does internet work?

An overview:

- The Internet works through a packet (pieces of data) routing network in accordance with the Internet Protocol (IP), the Transport Control Protocol (TCP) and other protocols.

What's a protocol?

is a set of rules specifying how computers should communicate with each other over a network.

Example:
the ***Transport Control Protocol*** has a rule that if one computer sends data to another computer, the destination computer should let the source computer know if any data was missing so the source computer can re-send it.

What’s a protocol?

More Example:

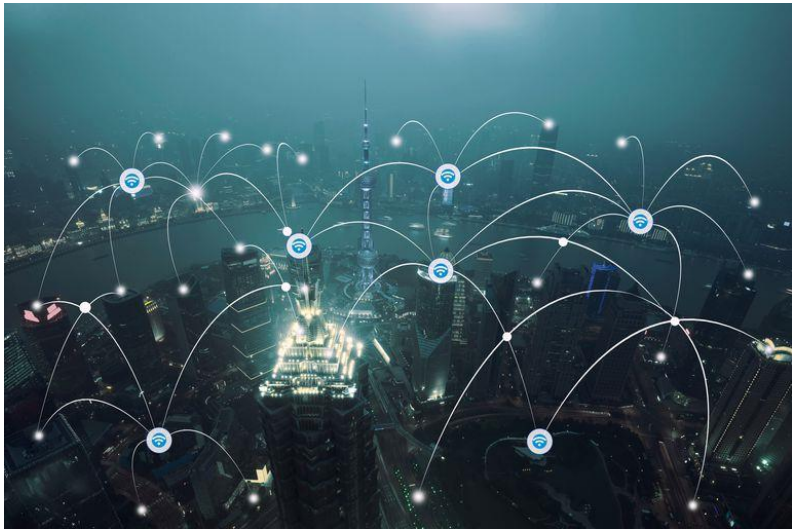
the ***Internet Protocol*** which specifies how computers should route information to other computers by attaching addresses onto the data it sends.

What's a packet?

- Data sent across the Internet is called a message.
- Before a message is sent, it is first split in many fragments called packets.
- These packets are sent independently of each other. The typical maximum packet size is between 1000 and 3000 characters.
- The Internet Protocol specifies how messages should be packetized.

What's a packet routing network?

- It is a network that routes ***packets*** from a source computer to a destination computer.
- The Internet is made up of a massive network of specialized computers called ***routers***.
- Each ***router's*** job is to know how to move ***packets*** along from their source to their destination.
- A ***packet*** will have moved through multiple ***routers*** during its journey.

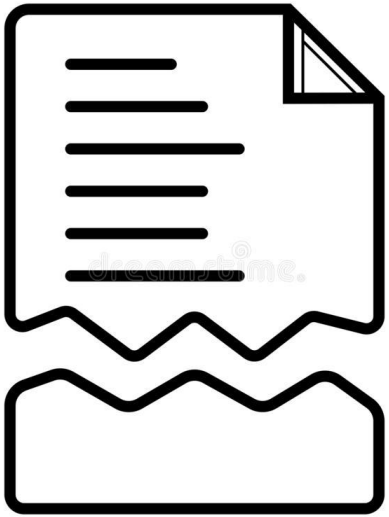


Do the packets always arrive in order? If not, how is the message re-assembled?

- The packets may arrive at their destination out of order. This happens when a later packet finds a quicker path to the destination than an earlier one. But packet's header contains information about the packet's order relative to the entire message.
- The Transport Control Protocol uses this info for reconstructing the message at the destination.

Do packets always make it to their destination?

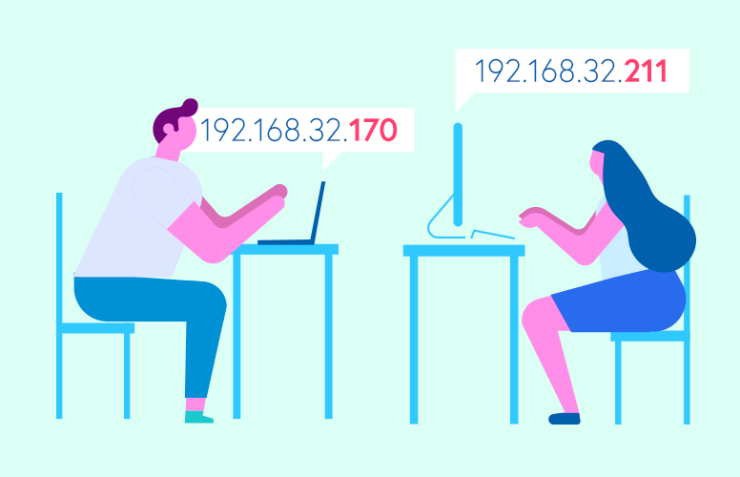
- The Internet Protocol makes **no guarantee** that packets will always arrive at their destinations. When that happens, it's called a ***packet loss***.
- This typically happens when a router receives more packets it can process. It has no option other than to drop some packets.
- However, the **Transport Control Protocol** handles packet loss by performing re-transmissions.



What do these Internet addresses look like?

- These ***addresses*** are called ***IP addresses*** and there are two standards:IPv4 and IPv6

- IPv4 – example: *212.78.1.25*
  (supports about 4M)
- IPv6 - example: 3ffe:1893:3452:4:345:f345:f345:42fc
  (supports about 8 billion)



How do networked computers figure out IP addresses based on domain names?

- We call looking up the IP address of a human-readable domain name like www.google.com “resolving the IP address”. Computers resolve IP addresses through the ***Domain Name System (DNS),*** a decentralized database of mappings from domain names to IP addresses.

CABLE MAINTENANCE: PLDT/SMART, GLOBE, CONVERGE, SKY ADVISORIES

In Business by Ramon Lopez / September 25, 2020 / Leave a Comment

Internet users in the Philippines might be in for a long week as internet service providers are bracing for the impact of emergency maintenance activities on a submarine cable system that connects South East Asia with the United States.

The Asia-America Gateway, a 200,000-km-long submarine cable system, provides internet access to several countries, including Hong Kong, Singapore, Vietnam, Thailand, Malaysia, Cambodia, the U.S., and the Philippines

Communication Types, Network and Channels

Computer Network

- Two or more connected computers sharing resources with one another

2 aspects:

1. **Physical Connection** (wires, cables, wireless media)
2. **Logical Connection** (data transporting across the physical media)

Types of Computer Networks

Based on Network Architecture

- **Client-Server**
- **Peer-to-Peer**

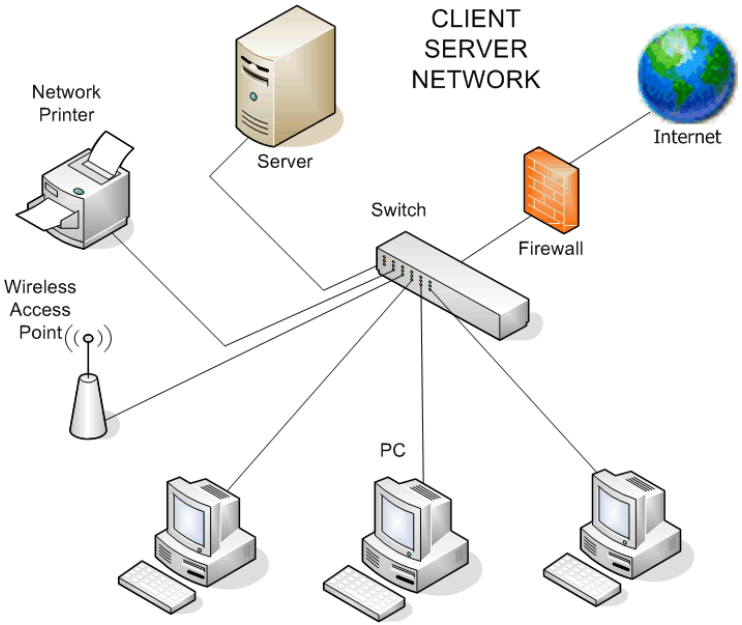
Based on Networks by Size

- **Local Area Network (LAN)**
- **Campus Area Network (CAN)**
- **Metropolitan Area Network (MAN)**
- **Wide Area Network (WAN)**

Based on Network Architecture

Client-Server Network

- Network is Composed of Clients and Servers
- Servers Provide Resources
- Clients Receive Resources
- Servers Provided Centralized Control Over Network Resources (files, printers, authentication, etc.)

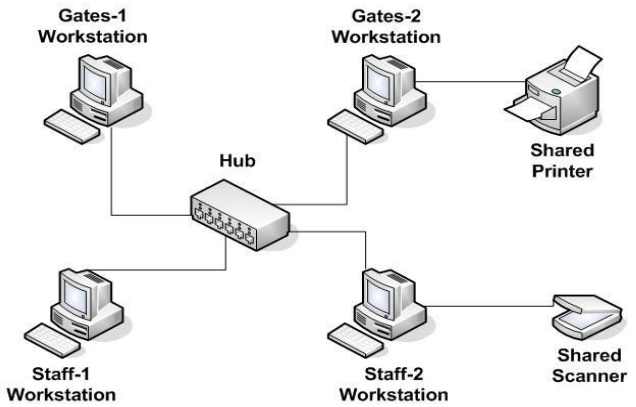


Based on Network Architecture

Peer-Peer Network

- All Computers on the Network Are Peers
- No Dedicated Servers
- There is no centralized control over shared resources
- Any Individual Machine Can Share Its Resources as It Pleases

Peer-to-Peer Network



Types Of Network Based On Size

Local Area Network (LAN)

- A computer network within a small geographical area, such as a single room, building or group of buildings.

Campus Area Network (CAN)

- A computer network of multiple interconnected LANs in a limited geographical area, such as a corporation, government agency, or university campus.

Metropolitan Area Network (MAN)

- A computer network that interconnects users with computer resources in a city.
- Larger than a campus area network, but smaller than a wide area network.

Wide Area Network (WAN)

- A computer network that extends over a large geographical distance, typically multiple cities and countries.

Network Channels

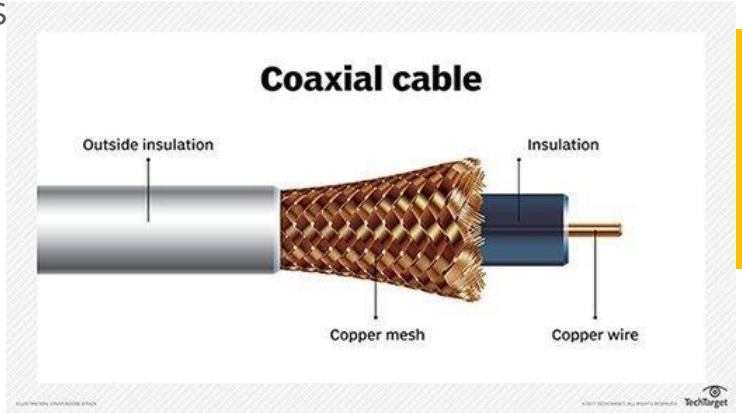
Types of Network Cabling

1. Coaxial Cable
2. Twisted Pair
3. Fiber Optic Cable

Coaxial Cable

- This unique design allows coaxial cable runs to installed next to metal objects such as gutters without the power losses that occur in other types of transmission lines.

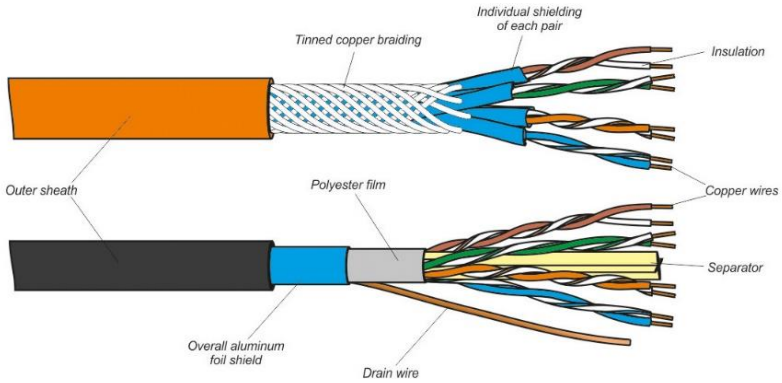
- This kind of cable is mainly adopted in feedlines connecting radio transmitters and receivers with their antennas, computer network connections, and distributing cable television signals



Twisted Pair

- A type of ordinary wiring which connects home and many business computers to the telephone company.

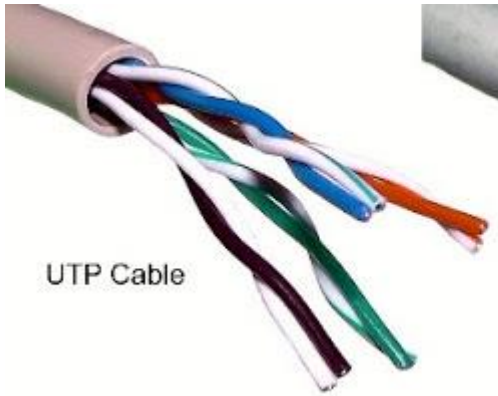
- There are two common types of twisted pair cables—shielded twisted pair (STP) cable and unshielded twisted pair (UTP) cable

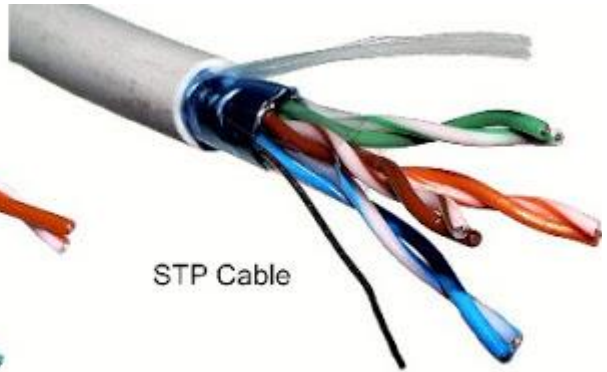


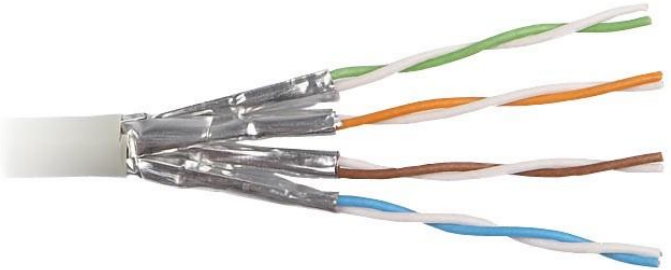
Shielded vs Unshielded Twisted Pair

- ***Unshielded Twisted Pair (UTP),*** more susceptible to electromagnetic interference (EMI)
- ***Shielded Twisted Pair (STP),*** Less susceptible to EMI and crosstalk if each part are shielded
- ***Electromagnetic Interference***, the disruption of the operation of an electronic device when it is in vicinity of an electromagnetic field caused by another device (e.g. manufacturing device, microwave, etc.)

Shielded vs Unshielded Twisted Pair



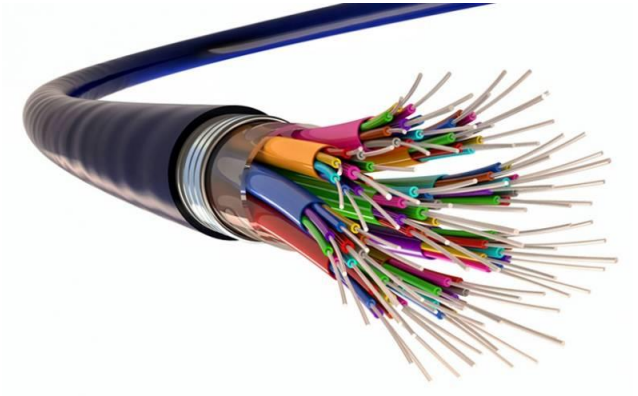




Fiber Optic Cable

- This consists of a bundle of glass threads, each of which is capable of transmitting messages modulated onto light waves.

- Perfect for certain atmospheres which contain huge amount of electrical interference. It has become the standard for connecting networks between buildings because of its resistance to lighting and moisture.



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