

# Router : How it Works

**Router** is the essential part of the **Wi-Fi system** that forward **data packets** across the computer network from the **broad band**. It is a **microprocessor** controlled device that is used to connect two or more data lines from different networks. Router functions as a **controller** for the **traffic direction** from the network. When the data packet arrives, the router will read the **address information** for determining its destination. By reading the routing information in its **Routing Table**, the router then directs the data packet. The router also translates the **Data Transmission Protocol** for the appropriate protocol of the network and prevents the unauthorized network access with the help of firewall. The router will create a routing table of preferred routes between any two systems which are interconnected.

The router has two stages of operation. These are Control Plane and Forwarding plane.

## 1. Control plane

By using the preconfigured address of the router, it will determine routing table to transfer the data packet through which **physical interface** is used (Ethernet cable or wireless).

## 2. Forwarding plane

Using the information in the **Packet Header**, the router will forward the data packets between the incoming and outgoing interfaces.

## Some important terminology

### 1. Packet

It is a piece of information transmitted over a packet switching network. It contains data and destination address. **Datagram** is the packet in IP network.

### 2. Packet switching

It is the **protocol** that divides the message in to packets before transmission. After dividing, each packet is transferring individually to the destination. **WAN**, **TCP / IP**, and **Framework protocols** uses Packet switching technology while the Telephone system uses Circuit switching through dedicated lines between the users. The advantage of **Packet switching** is that the data transfer is efficient and can withstand some delay while transferring the details of web pages and emails. The new technology of ATM combines both Packet switching and Circuit switching technologies.

### **3. Gateway**

It is the **Node** on a network that helps to enter into another network. In **Enterprise**, the gate way is the computer that routes the packets from the work station to the outside net work. In **Home networking**, the gateway is the ISP that connects the computer with the internet.

### **4. Header**

It is the unit of information that precedes a data object. It is the part of data packet that contains transparent information about the files. The header is the beginning of each file that contains **Book keeping information**. The file header contains, Date of creation of file, date of last updated and the size of the file. The header can be accessed only by the operating system of the computer or specialized software. In email packets, the header contains subject, origin and destination of email path etc.

### **5. Hub**

**Hub** is the common **connection point** for the devices in the network. The use of Hub is to connect the Segments of a LAN. It contains multiple ports. When the Data packet arrives in one port, which will be copied to other ports so that many computers can access the data at the same time.

### **6. Switch**

It Filters and Forward the packets between the LAN segments. LAN that uses Switches to join the segments is called Switching LANs and the Ethernet that uses Switches is called **Switched Ethernet LANs**.

### **7. Bandwidth**

It is difference between the upper and lower frequencies in a contiguous set of frequencies measured in terms of Hertz. In Digital data transfer systems it refers to the Data rate measured in Bits per second.

### **8. MAC Address**

**Media Access Control address** is the unique identifier for the Network interfaces for communication over physical network segments. MAC address contains the manufacturer's identification number (Burn – in Address).

### **9. ICMP**

**Internet Control Message Protocol**. Core protocol of Internet protocol suit. Computer operating system uses ICMP to send Error messages such as "Service not available" or "the router is not accessible".

## **10. DSL**

**Digital Subscriber Line.** Digital data transmission system over local telephone system.

## **11. DNS**

**Domain Name System.** Hierarchical naming system built on a distributed data base for the computers or any resources connected to Internet. It translates computer host name into IP address. For example the web address `www.....` will be translated to its IP address.

### **Wireless Router**

It is the most common type of Router used for **Wireless transmission** of Internet data to PC or Laptop. These Broadband routers convert and broadcast the signals coming from the Telephone lines in a fixed

### **How to Find the IP address of the Router?**

The Router IP address is determined by the Router used which is available in the manual available along with the Router. If it is not available, it can be obtained using the IP config provision of the Windows. To get IP address of the Router, Type `cmd` in the search box in the Start menu. When the command window opens, type `ipconfig` and press Enter. The local network information will be available in it. The default Gateway is the IP address of the Router. Type this IP address in the address bar of Browser to log on into the router to access the settings.

Source : <http://dmohankumar.wordpress.com/2012/12/01/router-how-stuff-works/>