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Protocol and Its Applications

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Abstract: It is a digital language through which we communicate with others on internet. It is a set of mutually accepted and implemented rules at both ends of the communication channel. Let's see the types of protocols, applications and implementation of protocols in the field of network.

Keywords: ARPA, Gopher, rules, Processes, transmitter.

I. INTRODUCTION

Protocol is a set of rules and guidelines or regulations for communicating data between two devices. Rules are defined for each step or process during the communication. Networks have to follow the protocols of data successful completion of data transmission. With the help of these guidelines the computers can communicate and interchange information between two devices. It is not possible to use the internet without protocols each protocol is identified by unique name and different use. It is travel from sender to receiver by a physical path using protocol. Protocols have some standards for communication and provide detailed information on processes involved in data transfer.

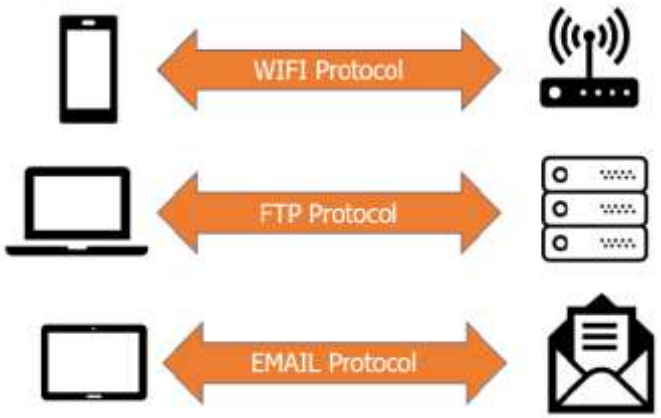

Figure1. Protocols

Advanced research project agency part of defense program introduced the concept of standardized protocol. The connection of computers between different vendor's protocols should be standardized one. ARPA is a resource sharing network can connect different computer at universities in the United States.

Protocol is likes the programming languages and designed for efficiency.

Internet technology hides the particulars of network hardware and computers to communicate separately of their physical network connections. One example of this is TCP/IP. A Gopher system consists of a series of hierarchical hyper connectable menus. The choice of menu and titles is controlled by the supervisor of the server. Similar to a file on a Web server, a file on a Gopher server can be connected to as a menu from any other Gopher server. Many servers take advantage of this inter-server connecting to supply a directory of other servers that the user can access.

The processes include;

a. Type of task
b. Process nature
c. Data flow rate
d. Data type
e. Device management

One single task is handled by many protocols simultaneously. This creates a protocol family.

II. TYPES OF PROTOCOLS

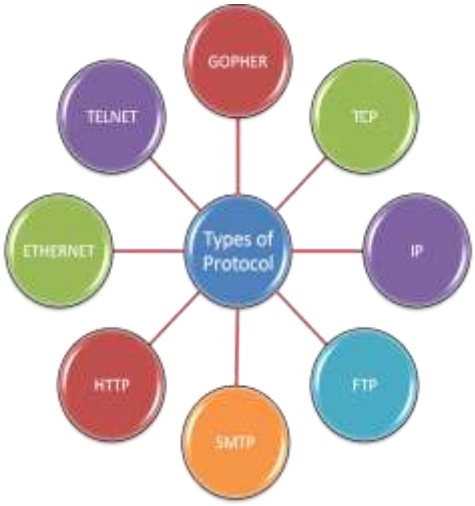

Figure2. Types of protocols

With the development of ARPA an integrated network using packet protocol is introduced and the concept of packet switching came into existence. After that many protocols emerged they are;

Transmission control protocol:

It is one of the important protocols used for the communication over a network. In this data is broken into small pieces that are packets and then send to destination. Like that the data travels from source to destination in the form of packet.

Internet protocol:

This protocol makes assure that the packet transmission by the TCP reaches its correct destination or not IP also work with TCP as an addressing protocol.

File transfer protocol:

It is very useful protocol for transferring/ sharing files over the network that is we can easily share large file like text file and multimedia file.

Simple mail transfer protocol:

It helps for managing mail transfer and outgoing mail over the internet.

Hypertext transfer protocol:

Http protocols are used to transfer files on internet. It is used by the web browsers. It is an application layer protocol. Application layer is one of the layers in open system interconnected.

Telnet:

It has some rules which is used to connect one computer to another computer. It is mainly used in remote login process, suppose one computer is requesting for connection means that is said to be local computer and the computer which accept the request is called remote computer.

Gopher:

It is also an application layer protocol which is used for searching and retrieving document from remote site.

In this world protocol are organization developed by many industries wide. This protocol data are stored in the form of binary information.

III. NETWORK PROTOCOLS AND PACKETS

The internet and network work by organizing data in from small pieces called packets. In that each network protocols define certain regulation for how the data packets should be formatted. Method called encapsulation can be implemented for this. Some data can be encapsulated inside a packet. Likewise one protocol can be format of some other protocol.

The network devices use protocol operating system of network devices support some lower level network protocol which was in built one .the more computer operating system support in the form of Bluetooth and Wi-Fi.

Layer	Name of Protocol	Name of Unit exchanged
Application	Application Protocol	APDU - Application Protocol Data Unit
Presentation	Presentation Protocol	PPDU - Presentation Protocol Data Unit
Session	Session Protocol	SPDU - Session Protocol Data Unit
Transport	Transport Protocol	TPDU - Transport Protocol Data Unit
Network	Network layer host-router Protocol	Packet
Data Link	Data link layer host-router Protocol	Frame
Physical	Physical layer host-router Protocol	Bit

Figure3. Types of Network protocols

IV. PURPOSE OF PROTOCOLS

In the network device doesn't understand the electronic signals which is the data send over the connection. So

by the help of protocol the device catch the signals easily. This protocol serves some function;

- Address data to the correct recipient
- With security protection the data is transmitted from source to destination
- Destinations get the messages appropriately which is send by the source device.

TCP/IP PROTOCOLS:

The TCP/IP is a group of protocols used on the network field. It is used for providing end to end connectivity. It specifies how the data should be addressed transmitted, packetized, routed, and received over the network. Each protocol in this suite resides on four different layers. The four layers in TCP/IP are;

- Application layer
- Transport layer
- Internet layer
- Link layer

The following table shows protocols which reside on each layer ;

Table1. Network Layer protocols

LAYER	PROTOCOLS
Application	HTTP,NFS,DNS,Telnet,FTP,SV MP,TCP,UDP
Transport	TCP,UDP
Internet	IPV4,IPV6,ARP,ICMP
Data link	Ethernet (IEEE 802.3) token ring ,FDDI

Let us see the protocols and its function over the layer.

HTTP: Hypertext transfer protocol it is used to transfer text, graphic, images, sound, video files, over the internet. This protocols resided on the application layer. This protocols used between web clients and web servers.

DNS: Domain name system is used for host names to the IP address resolution. It is also resided on application layer.

FTP: File transfer protocols which is also resided on application layer used for file transfer from one computer to another computer.

Telnet: Telecommunication networks used to connect and issue commands over the remote computer.

TCP: Transmission control protocols connection oriented protocol used to transfer reliable data between 2 computers it resided on second layer that is transport layer it is a reliable protocol.

UDP:

User datagram protocol connection less protocols for data transfer there is no guarantee for data delivery.

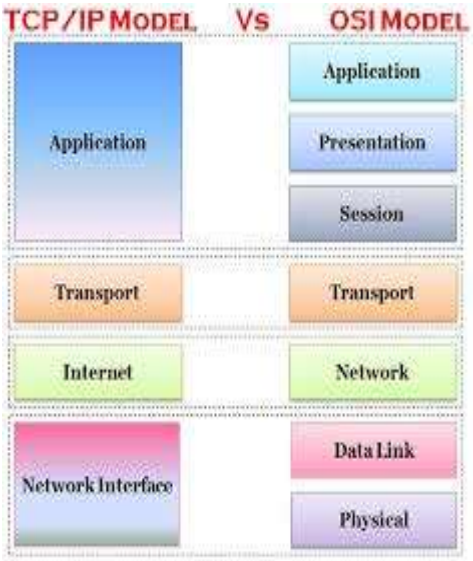

Figure4. Types of Network protocols VS OSI Model

ARP: Address resolution protocols used to associate a JP address with MAC address media access controls address of a device is a unique address assigned to network interface controls.

INTERNET PROTOCOL: It is also known as IP address used to deliver packets from source to destination computer based on the IP address. This is network layer protocol.

ICMP: it is stands for Internet control message protocol is used to identify and reports network errors.

The OSI model and protocol are tabulated below.

OSI MODEL	PROTOCOL
Application	DNS,DHCP,FTP.HTTPS,IMAP,SMTP,SNMP, TELENT,TFTP, RTP
Presentation layer	JPEG,MIDI,MPEG,PICT,TIFF
Session layer	NET BIOS,NFS,PAP,SCP,SQL,ZIP

Transport layer	TCP,UDP
Network layer	ICMP,LGMP,IPV4,IPV6,IPX,RIP
Data linklayer	ARP,ATM,CDP,FDDI,FRAME RELAY,HDLC,MPLS,PPP,STP,TOKEN RING
Physical layer	BLUTOOTH, ETHERENT, DSL, ISDN.

Table2. Network protocols VS OSI Model

Gopher Protocol:

The Gopher Protocol (GOPH) Core Technology was strongly oriented towards a menu-document design and presented an alternative to the World Wide Web in its early stages, but ultimately Hypertext Transfer Protocol (HTTP) became the dominant protocol. It is a TCP/ IP application layer protocol designed for distributing, searching, and retrieving documents.

Figure5. Gopher protocol

It offers is not natively supported by the Web and imposes a much stronger hierarchy on information stored on it. Its text menu interface is well-suited to the simplicity of its protocol facilitated a wide variety of client implementations. It is a revolutionary new platform with products that will change the way people interact with technology and each other.

- Faster and more efficient
- In use by enthusiasts,
- Minimum, data files on a CD-ROM
- Series of hierarchical hyper linkable menus.

V. CONCLUSION

Protocol plays a vital role in the field of networking. Protocols and its standards made more changes in the area of computer networks. There are many protocols available in different applications. The common application like email file transfer takes place using the TCP/IP. The internet protocol is not limited to a single task there are many facts were TCP/IP is used. The used of these protocol spread over the network.

Every protocol should be updated frequently so that they can communicate efficiently on the internet. The complicated networks and simple network need the basic TCP/IP to function on the internet. One or more protocol available to each layer a protocol defines the structure and how the systems communicate over the network. The internet protocol is a library of communicate to network and enable the data transfers.

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