OSI layers

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Project   MSc Research View project

Project   Network Fundamentals Labs View project

REFERENCE MODELS

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OSI model layer	OSI model name	Layer Mnemonic		Function	Protocols	Words to remember	Hardware Equipment	Equipment Purpose	PDU (Protocol Data Unit)	TCP/IP Model	Hybrid Model
7	Application	All	away	This layer supports application and end-user processes. Communication partners are identified, quality of service is identified, user authentication and privacy are considered, and any constraints on data syntax are identified. Everything at this layer is application-specific. This layer provides application services for file transfers, e-mail, and other network software services. Telnet and FTP are applications that exist entirely in the application level. Tiered application architectures are part of this layer.	HTTP (80,8080), HTTPS (443), TFTP (69), FTP (20, 21), IMAP (143),SMTP (25), POP3 (110),SSH (22), Telnet (23), DNS (53) DHCP (67,68)	User interface, Application, Browser, Represent data to user	Computer, Gateway, Firewall	Regular computer or special gateway used to combine network using different communication protocols, filtering traffic	APDU (Encoded)	Application	Application
6	presentation	people	pizza	This layer provides independence from differences in data representation (e.g., encryption) by translating from application to network format, and vice versa. The presentation layer works to transform data into the form that the application layer can accept. This layer formats and encrypts data to be sent across a network, providing freedom from compatibility problems. It is sometimes called the syntax layer.	MIME, XDR, SSL, ASCII/EBCDIC, JPEG, MP3	Data format, Coding, Conversion, Compression, Language, Decryption Encoding, Encryption	Computer, Gateway redirector		PPDU Charter		
5	Session	seem	sausage	This layer establishes, manages and terminates connections between applications. The session layer sets up, coordinates, and terminates conversations, exchanges, and dialogues between the applications at each end. It deals with session and connection coordination.	NFS , SQL, RPC, Named Pipes, NetBIOS, SAP	User session (Establish, Restart ,End) Dialogues, Data exchange,	Computer, Gateway		SPDU		
4	Transport	to	throw	This layer provides transparent transfer of data between end systems, or hosts, and is responsible for end-to-end error recovery and flow control. It ensures complete data transfer.	TCP: transaction control protocol 20 bytes Protocol 6 UDP: User data gram 8 bytes Protocol 17	TCP, UDP, Process address, Segment, Encapsulation, Reassemble, Decapsulation	Computer, Advanced cable tester, Brouter		TPDU Segment	Transport	Transport
3	Network	need	not	This layer provides switching and routing technologies, creating logical paths, known as virtual circuits, for transmitting data from node to node. Routing and forwarding are functions of this layer, as well as addressing, internetworking, error handling, congestion control and packet sequencing.	IPv4 (32bits), IPSec, IPX, IPv6, RIP Apple talk, ICMP, ARP (48 bits), BGP, RARP	Route, static or dynamic, congestion ctrl, IP, best path, Logical address, quality of service	Router, Brouter, Frame relay device, ATM switch	Segment network into smaller broadcast domains.	packets	Internet	Network
2	Data link	data	do	At this layer, data packets are encoded and decoded into bits. It furnishes transmission protocol knowledge and management and handles errors in the physical layer, flow control and frame synchronization. The data link layer is divided into two sub layers: The Media Access Control (MAC) layer and the Logical Link Control (LLC) layer. The MAC sub layer controls how a computer on the network gains access to the data and permission to transmit it. The LLC layer controls frame synchronization, flow control and error checking.	Circuit switching, Packet switching, Ethernet, WIFI, Token Ring, ATM, FDDI, Frame Relay, WAN, HDLC, LLC 802.2, MAC 802.3,802.5, PPP, PPTP, L2TP	transmission errors, MAC medium access control, Flow control, Error check Circuit switching, Packet switching, Framing, CRC Physical address WPA,WEP	Bridge, Switch, NIC, ISDN router, Intelligent hub	Segment network into smaller collision domains	frames	Host to network	Data link
1	Physical	processing	please	This layer conveys the bit stream – electrical impulse, light or radio signal — through the network at the electrical and mechanical level. It provides the hardware means of sending and receiving data on a carrier, including defining cables, cards and physical aspects. Fast Ethernet, RS232, and ATM are protocols with physical layer components.	Bits, RS 232, V .35, T1, E1, ISDN, POTS, SONET, DSL, EIA/TIA	Bits, volts, 1 or 0, Cabling, nanoseconds, transmission directions, pins, Connector mechanical, electrical, timing and physical properties.	Repeaters, Hubs, Multi-port cabling, Multiplexer, TDR hubs Oscilloscope, Amplify	One collision and one broadcast domain.	Bit		Physical

Communication subnet boundary

The Open Systems Interconnection(OSI) model (ISO/IEC 7498-1) is a product of the Open Systems Interconnection effort at the International Organization for Standardization, It was provided by the work of Charles Bachman, Honeywell Info. Services by 1977.

TCP/IP request for Comments (RFC) 791 and 793 which was initially designed to meet the data communication needs of the U.S. Department of Defense (DOD), It was provided by the Advanced Research Projects Agency (ARPA, now called DARPA) of the U.S by 1969.

We will use the hybrid reference model as the framework.