

## The OSI Model

The Open System Interconnection (OSI) reference model was the first large effort by the International Organization for Standardization (ISO) to create a vendor-neutral networking model. It was intended to be used by any and every computer in the world.

Layer	Description	Protocols & Devices
7 - Application DATA	Interfaces between network and application software. Also includes authentication services.	P: FTP,SNMP, HTTP D: Browsers, Search Engines, Email, Chat, Vid
6 - Presentation DATA	Defines the format (rendering) and organization of data. Encryption also is defined by OSI as a presentation layer service.	P: ASCII text, EBCDIC text, binary, BCD, JPEG.
5 - Session DATA	Defines how to start, control, and end conversations (called sessions). This includes the control and management of multiple bidirectional messages. This allows the presentation layer to have a seamless view of an incoming stream of data.	P: Network File System, Remote Procedure Call, SQL, AppleTalk Session Protocol, NetBIOS Names
4 - Transport SEGMENTS	Although OSI Layers 5 through 7 focuses on issues related to the application, this layer focuses on issues related to data delivery to another computer—for instance, termination of virtual circuits, error detection/recovery and flow control.	P: TCP, UDP, SPX, Sliding Windows
3 – Network Packets	<p>This layer defines three main features: Logical addressing, routing (forwarding), and path determination.</p> <p>The routing concepts define how devices (typically routers) forward packets to their final destination. Logical addressing defines how each device can have an address that can be used by the routing process. Path determination refers to the work done by routing protocols by which all possible routes are learned, but the best route is chosen for use.</p>	<p>P: IP, IPX, ICMP, ARP, RIP, IGRP, ISPF, BGP</p> <p>D:Routers</p>
2 –Data Frames	<p>The data link layer defines the rules (protocols) that determine when a device can send data over a particular medium. Data link protocols also define the format of a header and trailer that allows devices attached to the medium to send and receive data successfully.</p> <p>The data link trailer, which follows the encapsulated data, typically defines a Frame Check Sequence (FCS) field, which allows the receiving device to detect transmission errors.</p>	<p>P: Ethernet, Token Ring, FDDI, Slip</p> <p>D: Switches, Bridges</p>
1 – Physical Bits	<p>Defines the electrical, optical, cabling, connectors, and procedural details required for transmitting bits, represented as some form of energy passing over a physical medium.</p> <p>This layer typically refers to standards from other organizations. These standards deal with the physical characteristics of the transmission medium, including connectors, pins, use of pins, electrical currents, encoding, light modulation, and the rules for how to activate and deactivate the use of the physical medium.</p>	<p>P: X.21, EIA/TIA,HSSI</p> <p>D:Hubs</p>

## Well Known Ports

Protocol	Port	Protocol	Port
FTP	20,21	POP3   SSL	995
SSH	22	IMAP4	143
TELNET	23	SNMP	161
SMTP	25	Private Email	24
SMTP   SSL	465	Kerberos	88
TACACS	49	DHCP	67,68
DNS (TCP/UDP)	53	TFTP	69
HTTP	80	L2TP	1701
HTTPS/SSL	443	PPTP	1723
POP3	110	Terminal Services	3389/3390