

Layer		OSI protocols		Responsibilities		Scope	TCP/IP Model
#	Name						
7	Application	FTAM, X.400, X.500, DAP, ROSE, RTSE, ACSE	NNTP, SIP, SSI, DNS, FTP, Gopher, HTTP, NFS, NTP, DHCP, SMPP, SMTP, SNMP, Telnet, RIP, BGP, BOOTP, TFTP, POP3, IMAP,	User Applications Services	User Data	Application Data	Application
6	Presentation	ISO/IEC 8823, X.226, ISO/IEC 9576-1, X.236	MIME, SSL, TLS, XDR, Shells and Redirectors	Session Establishment, Management and Termination	Sessions	Sessions between local or remote devices	
5	Session	ISO/IEC 8327, X.225, ISO/IEC 9548-1, X.235	Sockets. Session establishment in TCP, SIP, RTP, NetBIOS, RPC, Named Pipes				
4	Transport	ISO/IEC 8073, TP0, TP1, TP2, TP3, TP4 (X.224), ISO/IEC 8602, X.234	TCP, UDP, SCTP	Process-Level Addressing; Multiplexing/Demultiplexing; Connections; Segmentation and Reassembly; Acknowledgments and Retransmissions; Flow Control	Datagrams/Segments		Transport (TCP)
3	Network	ISO/IEC 8208, X.25 (PLP), ISO/IEC 8878, X.223, ISO/IEC 8473-1, CLNP X.233.	IP, IPsec, ICMP, IGMP, OSPF, IPv6; IP NAT; IPsec; Mobile IP; ICMP; IPX; DLC; PLP; Routing protocols such as RIP and BGP				Internet (IP)
2	Data Link	ISO/IEC 7666, X.25 (LAPB), Token Bus, X.222, ISO/IEC 8802-2 LLC Type 1 and 2	PPP, SLIP, PPTP, L2TP	Encoding and Signaling; Physical Data Transmission; Hardware Specifications; Topology and Design	Bits	Low-level data messages between local devices	Network
1	Physical	X.25 (X.21bis, EIA/TIA-232, EIA/TIA-449, EIA-530, G.703)				Electrical or light signals sent between local devices	