4-Layer Model

Applic-ation	OSI L7, L6, L5 - user interface, defines protocols used, interface wth transport layer, IP adresses
ex :	HTTP, SNMP, Telnet, DNS, FTP, SMTP, SSH, SSL/TLS
Transport	TCP, UDP, RTP (Real-Time Protocol)
Internet	data is packaged into IP datagrams (IP, ICMP, ARP, Reverse ARP
Network	how to transmit bits, how NW medium is used (wireless, cable, etc)

IP Protocol Types

TCP	Layer 4 of OSI Model
Transmission Control Protocol	3-way Handshake Client<>Server
	connection oriented method, reliable
UDP	lightweight data transport protocol
User Datagram Protocol	error & integrity datagram check (*checksum*)
	used in streaming audio/video, not reliable
ICMP	check network connectivity issues
Internet Control Message Protocol	ping scan & NW mapping
GRE	packets tunneling protocol
Generic Routing Encapsulation	can encapusulate variety of protocols over IP
	used for VPN
IPsec	set of secure communication protocols
. AH	*Autentification Header*
	-> for authentication & integrity
. ESP	*Encapsulating security payload*
	-> for encryption & integrity

Data Transfer Over Networks

Ports	0-65'535
. *well-known*	0-1024, reserved and unchanged
. *ephemeral*	1024-65'535, short-lived, random selection
IPv4 Packets	Source, Dest, IP Flags, Protocol
Overheads	TCP is heavy (20bytes), UDP lighter (8bytes)

Protocols and Ports

FTP	File Transfer Protocol	20, 21
SSH	Secure Shell	22
SFTP	Secure FTP	22
Telnet		23
SMTP	Simple Transfer Mail Protocol	25
DNS	Domain Name System	53
DHCP	Dynamic Host Control Protocol	67, 68
TFTP	Trivial FTP	69
HTTP	HyperText Transfer Protocol	80
POP3	Post Office Pr. v3	110
NTP	Network Time Protocol	123
NetBios		139
IMAP	Internet Mail Access Protocol	143
SNMP	Simple Network Management	161
LDAP	Lightweight Directory Access	389
HTTPS	HTTP Secure	443
SMB	Server Message Block	445
SLPS	System Logging Protocol Syslog	514
SMTP TLS	SMTP Transport Layer Security	587
LDAPS	LDAP Secure	636
IMAP over SSL		993
POP3 over SSL		995
SQL Server	client > database engine	1433
SQLnet	client > oracle database	1521
MySQL	client > MySQL database engine	3306
RDP	Remote Desktop Protocol	3389
SIP	Session Initiation Protocol	5060, 5061