TCP/IP Model – Cheat sheet (ATech)

What is TCP/IP Model ???

"TCP/IP Model is a standardised Reference Framework for conceptualising data communications between networks"

- ✓ Relevant RFC: RFC1122
- ✓ Also called 'Internet Model' or 'DoD Model'

TCP/IP Model Layers & their Functions

4	APPLICATION	App Mgmt, Supply Network services to Apps, ...
3	TRANSPORT	E2E Connections Mgmt, Transmission, Error Control, ...
2	INTERNET	Logical Addressing, Routing, ...
1	PHY Network INTERFACE	Phy standards, Phy Addressing, Switching, ...

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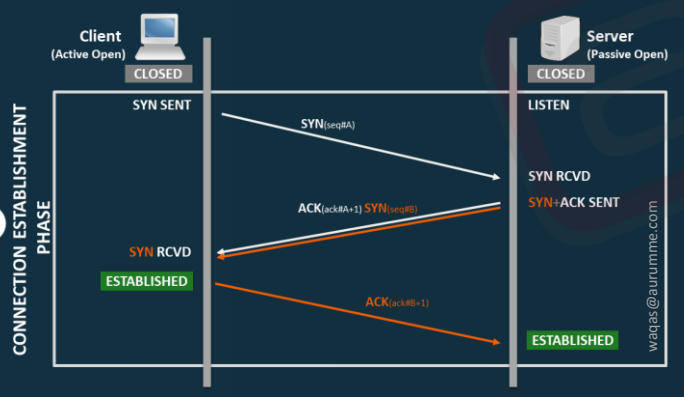
TCP 3-way Handshake Process



Protocols at each TCP/IP Layer

4	APPLICATION	DNS, DHCP, FTP, PDU, Telnet, POP3/IMAP, ...
3	TRANSPORT	TCP, UDP
2	INTERNET	IPv4, IPv6, OSPF, RIP, BGP, ICMP,...
1	PHY NETWORK INTERFACE	WiFi, USB, BT, RJ45, SDH, MW/RF, Ethernet, PPP, FR,...

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Encapsulation: **"Preparing & passing the data by any Upper layer to the layer below it, is called Encapsulation"**

(Means, going from the application layer all the way down to the physical layer)

Decapsulation: **"Decoding data while going Upwards from the physical layer till application layer is called decapsulation"**

TCP/IP Model	OSI Model
APPLICATION	APPLICATION
	PRESENTATION
	SESSION
TRANSPORT	TRANSPORT
InterNETWORK / INTERNET	NETWORK
NETWORK INTERFACE (Subnet Layer)	DATA LINK
	PHYSICAL

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OSI Model Vs TCP/IP Model

OSI Model	TCP/IP Model
Mostly used for reference purposes only	Practical Model in use today
Released in 1984 by ISO	Released in 1970s by DARPA
Each layer participates in Error Handling	Only **Transport Layer** handles Errors
Not so simple Model (7 Layers)	Simple Model (4Layers only)
Session Layer does **Connection Management**	Transport Layer does **Connection Mgmt**
Data Formatting is done by Present. Layer	**Data Formatting** is done by Application Layer
Uses **Horizontal Approach**	Uses **Vertical Approach**
--- waqas@aurumme.com	**Trans** Layer uses **3WHS + Sliding Windows**
Transport Layer is Connection Oriented	**Trans** Layer can be **Connection Oriented** or not
Netw Layer can be Connection Oriented or not	**Network Layer** is always Connectionless
Services & protocols are clearly defined	Services & protocols are not clearly separated
A protocol independent Model	A Protocol dependent Model
Hosts do not handle network operations	Hosts participate in most network protocols

Devices at each TCP/IP Layer

4	APPLICATION	End Devices (PC, Server, Phones), Firewalls, IDS, ..
3	TRANSPORT	Firewalls (Some), Load Balancers, ...
2	INTERNET	Routers, L3 Switches, ...
1	PHY NETWORK INTERFACE	Hubs/Rep, Modems, L2 Switches, Bridges, ...

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Transport Layer Ports

Category	Range	Comments
Well Known	0 - 1023	Used by system processes e.g. FTP(21)
Registered	1024 - 49151	For specific services e.g. Port 8080
Private	49152 – 65535	For Private purposes

Important Ports on Transport Layer

Port Number	Protocol	Application
20	TCP	FTP data
21	TCP	FTP control
22	TCP	SSH
23	TCP	Telnet
25	TCP	SMTP
53	UDP, TCP	DNS
67, 68	UDP	DHCP
69	UDP	TFTP
80	TCP	HTTP (WWW)
110	TCP	POP3
161	UDP	SNMP

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