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CIDR	Subnets	IPs
/30	64	4
/29	32	8
/28	16	16
/27	8	32
/26	4	64
/25	2	128
/24	1	256
/23	2	512
/22	4	1,024
/21	8	2,048
/20	16	4,096
/19	32	8,192
/18	64	16,384
/17	128	32,768
/16	256	65,536

Memorize

CIDR	Subnets	IPs
/24	1	256
/25	2	128
/26	4	64
/27	8	32
/28	16	16
/29	32	8
/30	64	4

Country or worldwide
WAN
City or county
MAN
Campus or business park
CAN
Room or building
LAN
Around a person
PAN

Level	Condition	Indication
0	Emergency	The system has become unstable
1	Alert	A condition should be corrected immediately
2	Critical	A failure in the system's primary application requires immediate attention
3	Error	Something is preventing proper system function
4	Warning	An error will occur if action is not taken soon
5	Notice	The events are unusual
6	Information	Normal operational message that requires no action
7	Debugging	Useful information for developers

CATEGORY	STANDARD	BANDWIDTH	DISTANCE
CAT 3	10BASE-T	10 Mbps	100 meters
CAT 5	100BASE-TX	100 Mbps	100 meters
CAT 5e	1000BASE-T	1000 Mbps	100 meters
CAT 6	1000BASE-T/ 10GBASE-T	1000 Mbps/ 10 Gbps	100 meters/ 55 meters
CAT 6a	10GBASE-T	10 Gbps	100 meters
CAT 7	10GBASE-T	10 Gbps	100 meters
CAT 8	40GBASE-T	40 Gbps	30 meters

Standard	Band	Bandwidth
802.11a	5 GHz	54 Mbps
802.11b	2.4 GHz	11 Mbps
802.11g	2.4 GHz	54 Mbps
802.11n (Wi-Fi 4)	2.4 and 5 GHz	150 Mbps/ 600 Mbps (MIMO)
802.11ac (Wi-Fi 5)	5 GHz	3 Gbps (MU-MIMO)
802.11ax (Wi-Fi 6)	2.4, 5, and 6 GHz	9.6 Gbps (MU-MIMO)

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STANDARD	MODE	BANDWIDTH	DISTANCE
100BASE-FX	MMF	100 Mbps	2 kilometers
100BASE-SX	MMF	100 Mbps	300 meters
1000BASE-SX	MMF	1000 Mbps	220-550 meters
1000BASE-LX	SMF/ MMF	1000 Mbps	5 kilometers/ 550 meters
10GBASE-SR	MMF	10 Gbps	400 meters
10GBASE-LR	SMF	10 Gbps	10 kilometers

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Device Type	Collision Domains	Broadcast Domains	OSI Layer
Hub	1	1	1
Bridge	1 per port	1	2
Switch	1 per port	1	2
Multilayer Switch	1 per port	1 per port	3+
Router	1 per port	1 per port	3+

Technology	Frequency	Speed
1G	30 KHz	2 Kbps
2G	1800 MHz	14.4-64 Kbps
3G	1.6-2 GHz	144 Kbps to 2 Mbps
4G	2-8 GHz	100 Mbps to 1 Gbps
5G	600-850 MHz	30-250 Mbps
	2.5-3.7 GHz	100-900 Mbps
	25-39 GHz	Extremely high speed (in Gbps)

DNS Record	Description	Function
A	Address	Links a hostname to an IPv4 address
AAAA	Address	Links a hostname to an IPv6 address
CNAME	Canonical Name	Points a domain to another domain or subdomain
MX	Mail Exchange	Directs emails to a mail server
SOA	Start of Authority	Stores important information about a domain or zone
PTR	Pointer	Correlates an IP address with a domain name
TXT	Text	Adds text into the DNS
SRV	Service	Specifies a host and port for a specific service
NS	Nameserver	Indicates which DNS nameserver has the authority

WAN Technology	Typical Available Bandwidth
Frame Relay	56 Kbps – 1.544 Mbps
T1	1.544 Mbps
T3	44.736 Mbps
E1	2.048 Mbps
E3	34.4 Mbps
ATM	155 Mbps – 622 Mbps
SONET	51.84 Mbps (OC-1) – 159.25 Gbps (OC-3072)

Routing Protocol	Type	Interior/Exterior
Routing Information Protocol (RIP)	Distance vector	Interior
Open Shortest Path First (OSPF)	Link state	Interior
Enhanced Interior Gateway Routing Protocol (EIGRP)	Advanced distance vector	Interior
Intermediate System-to-Intermediate System (IS-IS)	Link state	Interior
Border Gateway Protocol (BGP)	Path vector	Exterior

A network can simultaneously support more than one routing protocol through route redistribution. This allows a router to participate in OSPF on one interface and EIGRP on another interface. The router can then translate from one protocol for redistribution as the other protocol.

Transceiver	Speed
Small form-factor pluggable (SFP)	Up to 4.2 Gbps
SFP+	Up to 16 Gbps
Quad small form-factor pluggable (QSFP)	Up to 40 Gbps
QSFP+	Up to 41.2 Gbps
QSFP28	Up to 100 Gbps
QSFP56	Up to 200 Gbps

Command Line Tools

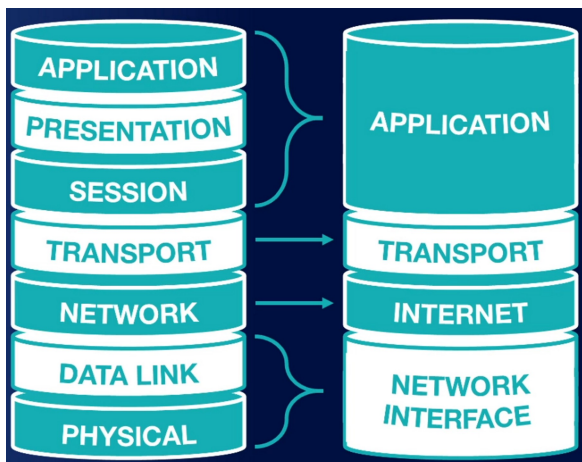| ping	ipconfig	ifconfig and ip
nslookup and dig	traceroute and tracert	arp
netstat	hostname	route
telnet	tcpdump	nmap

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Basic Network Platform Commands

show interface

show config

show route

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SDN Layers

The **application** layer focuses on the communication resource requests or information about the network.

The **control** layer uses the information from applications to decide how to route a data packet on the network and to make decisions about how traffic should be prioritized, how it should be secured, and where it should be forwarded to.

The **infrastructure** layer contains the physical networking devices that receive information from the control layer about where to move the data and then perform those movements.

The **management plane** is used to monitor traffic conditions, the status of the network, and allows network administrators to oversee the network and gain insight into its operations.