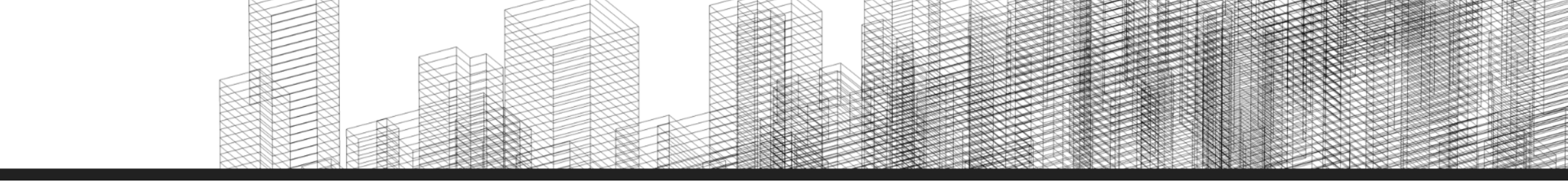

Network Fundamentals

OSI and TCP/IP
TCP and UDP
Network devices
Cloud resources
Three Tier and collapsed core
Network topologies
Network cabling
IPv4 addressing and subnetting
 - configure, verify, and troubleshoot
IPv4 address types
Private IPv4 addressing
IPv6 addressing schemes
IPv6 addressing
 - configure, verify, and troubleshoot
IPv6 SLAAC
 - configure, verify, and troubleshoot
IPv6 address types

OSI and TCP/IP Models

	OSI
7	Application
6	Presentation
5	Session
4	Transport
3	Network
2	Data Link
1	Physical

“Please do not throw sausage pizza away!”

OSI and TCP/IP Models

	OSI	TCP/IP
7	Application	Application
6	Presentation	
5	Session	
4	Transport	Transport
3	Network	Internet
2	Data Link	Network Access
1	Physical	

OSI and TCP/IP Models - PDU

	OSI	TCP/IP	Protocol Data Unit
7	Application	Application	Data
6	Presentation		
5	Session		
4	Transport	Transport	Segments
3	Network	Internet	Packets
2	Data Link	Network Access	Frames
1	Physical		Bits

OSI and TCP/IP Models - Devices

Layer	Devices
7	Layer 7 Firewall
6	
5	
4	Layer 4 Firewall
3	Router, Multilayer Switch, Wireless Router
2	Switch, Bridge, NIC, Wireless Access Point
1	Hub, NIC, Wireless Access Point

OSI and TCP/IP Models - Internet Protocol Suite

Layer	Internet Protocol Suite
7	HTTP, DNS, DHCP, FTP, Telnet, SSH, SMTP, POP, IMAP, NTP, SNMP, TLS/SSL, BGP, RIP, SIP
6	
5	
4	TCP, UDP
3	IPv4, IPv6, ICMP, ICMPv6, IPSec, OSPF, EIGRP
2	MAC, ARP, Ethernet 802.3, CDP, LLDP, HDLC, PPP, DSL, L2TP, 802.11, SONET/SDH
1	

Application Layer

	OSI	TCP/IP	Function
7	Application	Application	- Applications, protocols and services that interface with the end user - Data is formatted, converted, encrypted decrypted compressed and decompressed and sent or presented to the user (MIME types), - Open, close and manage a session between end-user application processes (RPC)
6	Presentation		
5	Session		
4	Transport	Transport	
3	Network	Internet	
2	Data Link	Network Access	
1	Physical		

Transport Layer

	OSI	TCP/IP	Function
7	Application	Application	- Facilitates end-to-end communications between multiple applications simultaneously (ports) - Reliable and unreliable end-to-end data transport and data stream services (TCP, UDP, SCTP) - Connection oriented, connectionless communications, and data stream services(session establishment and termination)
6	Presentation		
5	Session		
4	Transport	Transport	
3	Network	Internet	
2	Data Link	Network Access	
1	Physical		

Network Layer

	OSI	TCP/IP	Function
7	Application	Application	- Provide host addressing (IP) - Choose the best path to the destination network (Routing) - Switch packets out of the correct interface (Forwarding) - Maintain quality of service (QoS) - Connectionless end-to-end networking
6	Presentation		
5	Session		
4	Transport	Transport	
3	Network	Internet	
2	Data Link	Network Access	
1	Physical		

Data Link Layer

	OSI	TCP/IP	Function
7	Application	Application	- 2 sublayers: - Logical Link Control (LLC, 802.2) provides services to the upper layers - Media Access Control (MAC) defines how devices access the medium CSMA/CD, CSMA/CA, Token Passing Host addressing (MAC addressing) - Layer 2 Framing - Error Checking (CRC)
6	Presentation		
5	Session		
4	Transport	Transport	
3	Network	Internet	
2	Data Link	Network Access	
1	Physical		

Encapsulation and Decapsulation

	OSI	TCP/IP
7	Application	Application
6	Presentation	
5	Session	
4	Transport	Transport
3	Network	Internet
2	Data Link	Network Access
1	Physical	

Encapsulation