

Layer 3 – The Network Layer



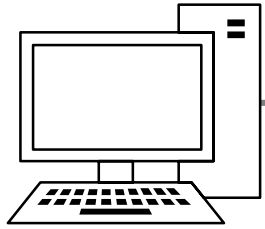
- The Network layer is responsible for routing packets to their destination and for Quality of Service.
- IP (Internet Protocol) is the best known Layer 3 protocol. IPv4 is the focus of this section.
- It is a connectionless protocol with no acknowledgements at Layer 3.
- Other Layer 3 protocols include ICMP (Internet Control Message Protocol) and IPSec.

IP Addressing

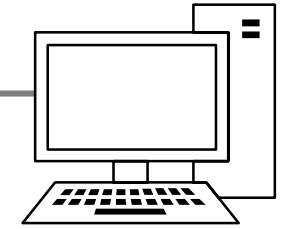


- IP addressing is a logical addressing scheme which is implemented at Layer 3.
- The network designer uses IP addressing to partition the overall network into smaller 'subnets'.
- This improves performance and security and makes troubleshooting easier.
- Layer 2 MAC addresses use one big flat addressing scheme. There is no logical separation between networks at Layer 2, it's done at Layer 3.

OSI Reference Model - Encapsulation



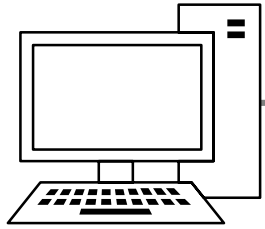
Sender



Receiver

Layer	Name	Includes	Devices
7			
6			
5			
4			
3			
2			
1			

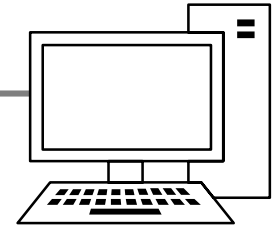
OSI Reference Model - Encapsulation



Sender

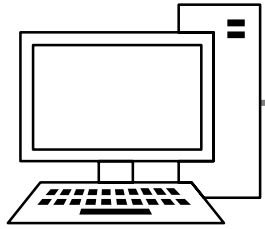


Layer	Name	Includes	Devices
7	Application		
6			
5			
4			
3			
2			
1			



Receiver

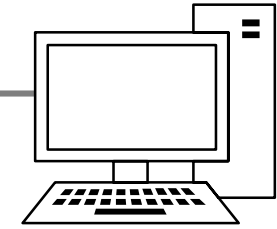
OSI Reference Model - Encapsulation



Sender



Layer	Name	Includes	Devices
7	Application		
6	Presentation		
5			
4			
3			
2			
1			

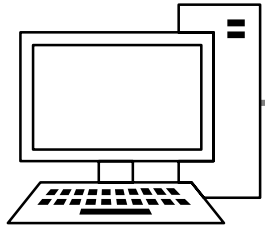


Receiver

L6

L7

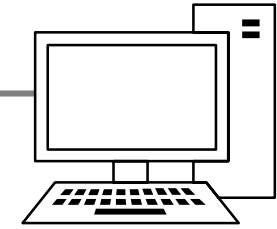
OSI Reference Model - Encapsulation



Sender



Layer	Name	Includes	Devices
7	Application		
6	Presentation		
5	Session		
4			
3			
2			
1			



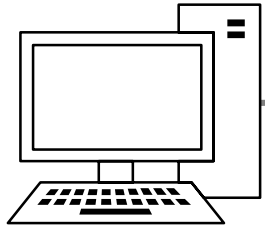
Receiver

L5

L6

L7

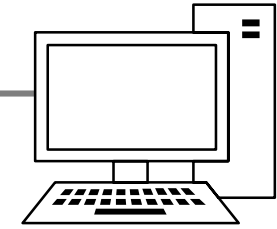
OSI Reference Model - Encapsulation



Sender



Layer	Name	Includes	Devices
7	Application		
6	Presentation		
5	Session		
4	Transport	TCP/UDP, Port	
3			
2			
1			



Receiver

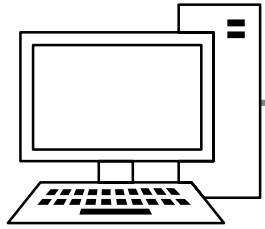
L4

L5

L6

L7

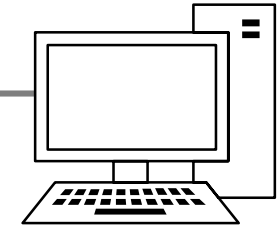
OSI Reference Model - Encapsulation



Sender



Layer	Name	Includes	Devices
7	Application		
6	Presentation		
5	Session		
4	Transport	TCP/UDP, Port	
3	Network	IP Address	Routers
2			
1			



Receiver

L3

L4

L5

L6

L7

OSI Reference Model - Encapsulation



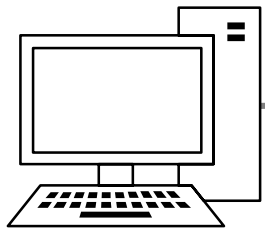
Sender

Receiver

Layer	Name	Includes	Devices
7	Application		
6	Presentation		
5	Session		
4	Transport	TCP/UDP, Port	
3	Network	IP Address	Routers
2	Data-Link	Ethernet MAC Address	Switches
1			



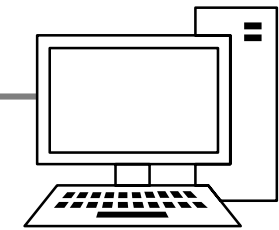
OSI Reference Model - Encapsulation



Sender



Layer	Name	Includes	Devices
7	Application		
6	Presentation		
5	Session		
4	Transport	TCP/UDP, Port	
3	Network	IP Address	Routers
2	Data-Link	Ethernet MAC Address	Switches
1	Physical		Hubs



Receiver



The IP Header

