OSI Reference Model
Recap

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WAY TO REINVENT YOURSELF

OSI Model

- Nodes must follow rules to communicate
    - Example: any language - English, Spanish, etc
- Rules for networking are divided into 7 layers (OSI Model)

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

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WAY TO REINVENT YOURSELF

Layer 1 - Physical

- **Purpose: Transporting Bits**
  - Transmits bits (1's, 0's) between nodes
- **Technologies**
  - Cables, WiFi, Repeaters, Hubs



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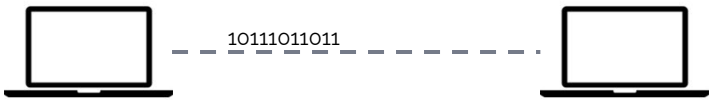
Layer 1 - Transporting Bits



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Layer 2 - Data Link

- **Purpose: Hop-to-Hop**
  - Addressing scheme: MAC Address
    - 48-bits / 12 hex digits (e.g. 74:56:D9:84:AB:6F)
  - Often traffic is sent over multiple “hops”

- **Technologies**
  - Network Interface Card (NIC)
  - Switch

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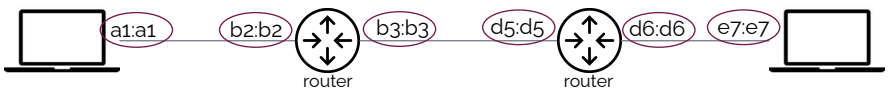
Layer 2 - Hop to Hop



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Layer 3 - Network Layer

- **Purpose: End-to-End**
  - Addressing scheme: IP Address
    - 32-bits / 4 Octets each 0-255
    - 192.168.1.20
- **Technologies**
  - Routers, Hosts
  - Anything with an IP

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Layer 3 - End-to-End

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Layer 4 - Transport Layer

- **Purpose: Service-to-Service**
  - Deliver to the right service (aka software)
    - Distinguish data streams
  - Addressing scheme: Port / Protocol
  - Ports - 0 to 65535
  - Protocols - TCP, UDP

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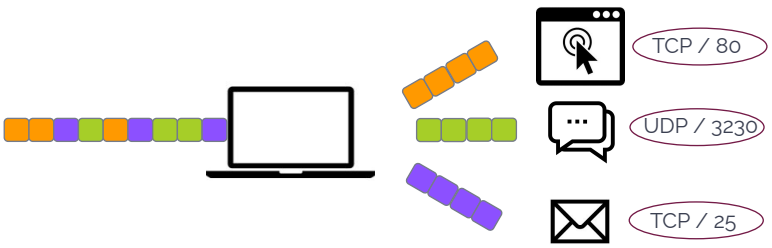
Layer 4 - Transport Layer



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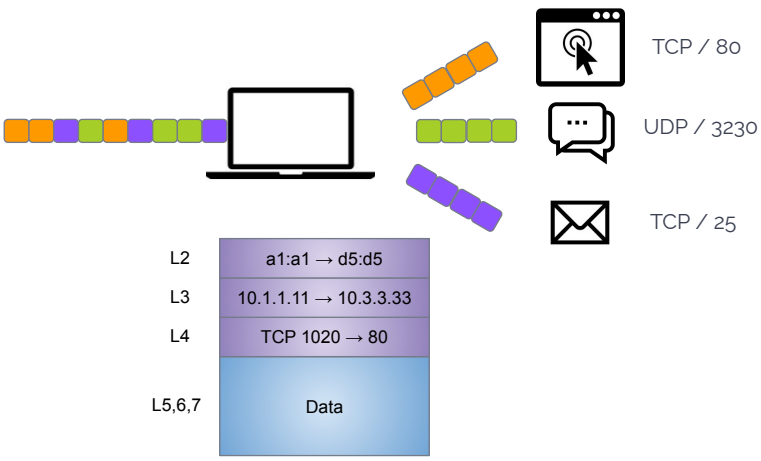
Contribution of Each Layer



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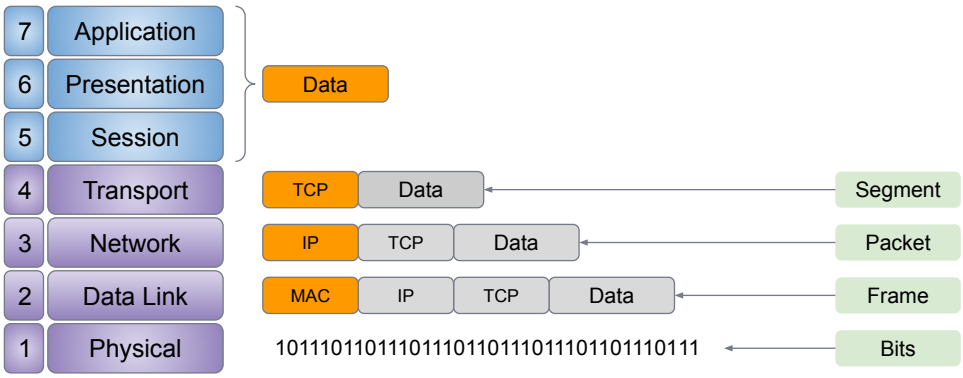
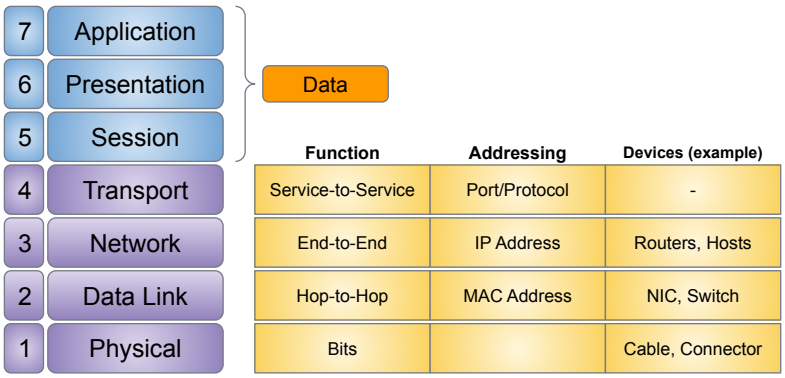
Encapsulation



Summary



Function	Addressing	Devices (example)
Service-to-Service	Port/Protocol	-
End-to-End	IP Address	Routers, Hosts
Hop-to-Hop	MAC Address	NIC, Switch
Bits		Cable, Connector