Networks – Background Overview

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Computer Network

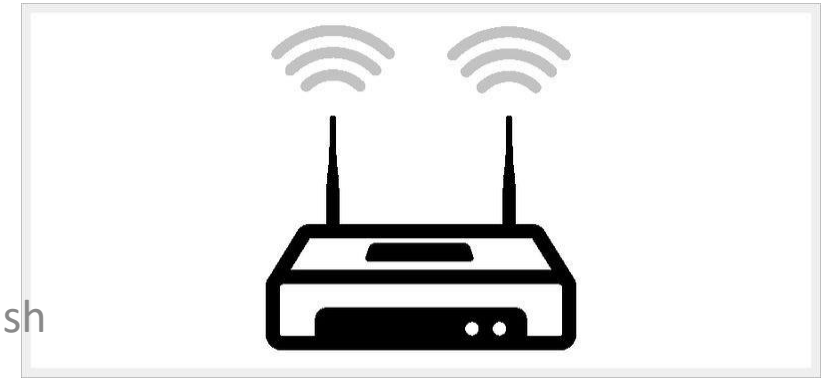
- More than one device (node) connected together so they can communicate electronically
- To transmit data, it needs to be split into chunks called “packets” which are recombined at the other end
- A node is a point of connection within a network e.g. a PC, a smart device

Packets

- Header – IP of sender and receiver
- Number of packets, packet number
- Payload (1000-1500 bytes)
- Footer – Cyclic Redundancy Check

Receiving and sending packets

- Hubs
- Switches
- Routers



7 Layers

Application	prepares message for sending
Presentation	translates the message into a language the receiving node can understand e.g. ASCII
Session	opens and maintains communications with the receiving node
Transport	protects the data being sent, creates checksum tests etc.
Network	selects a route for the message, forms segments into packets
Data Link	supervises the transmission
Physical	encodes the packets into the medium which will carry them e.g. analogue signals, and sends them

7 Layer ISO Network Model

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Security controls can be applied at multiple layers

Internet Protocol Suite

Application	Application layer protocol, e.g. HTTP
Transport	TCP - ports
Network	routing data, uses IP addresses e.g. 22.231.113.64
Link	responsible for passing packets

Good description in Appendix B ‘Innocent Code’ Sverre H. Huseby

Internet Protocols – TCP/IP

- IP- Internet Protocol
- IP Addresses – Identify a host
- Port – internal address (number, e.g.) reserved for a specific application on a computer e.g. HTTP, FTP
- Socket – an end point of communication defined by IP address and port
- TCP – transmission control protocol

Areas of Network Vulnerability

- Ports
- Router
- Servers
- Communication channels