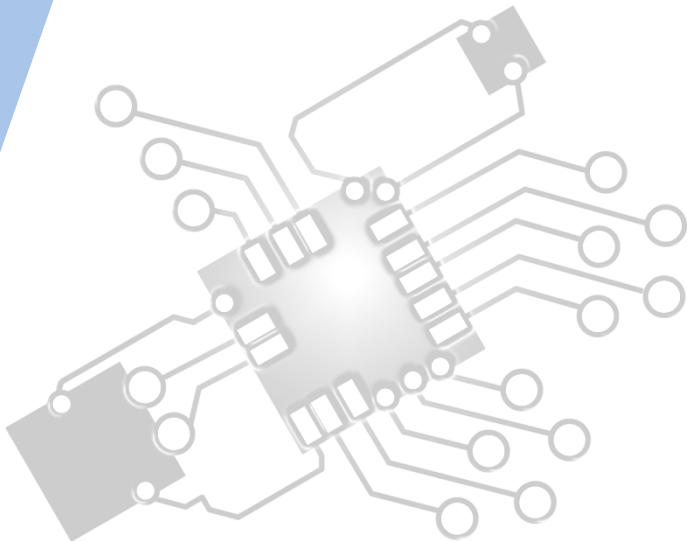




Planning & system installation

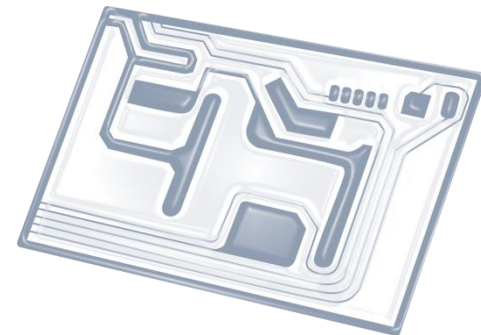
IB Computer Science



Content developed by
Dartford Grammar School
Computer Science Department



HL Topics 1-7, D1-4



1: System design



2: Computer Organisation



3: Networks



4: Computational thinking



5: Abstract data structures



6: Resource management



7: Control



D: OOP

HL & SL 3 Overview

Network fundamentals

- 3.1.1 Identify different types of networks
- 3.1.2 Outline the importance of standards in the construction of networks
- 3.1.3 Describe how communication over networks is broken down into different layers
- 3.1.4 Identify the technologies required to provide a VPN
- 3.1.5 Evaluate the use of a VPN

Data transmission

- 3.1.6 Define the terms: protocol, data packet
- 3.1.7 Explain why protocols are necessary
- 3.1.8 Explain why the speed of data transmission across a network can vary
- 3.1.9 Explain why compression of data is often necessary when transmitting across a network
- 3.1.10 Outline the characteristics of different transmission media
- 3.1.11 Explain how data is transmitted by packet switching

Wireless networking

- 3.1.12 Outline the advantages and disadvantages of wireless networks
- 3.1.13 Describe the hardware and software components of a wireless network
- 3.1.14 Describe the characteristics of wireless networks
- 3.1.15 Describe the different methods of network security
- 3.1.16 Evaluate the advantages and disadvantages of each method of network security



1: System design

2: Computer Organisation



3: Networks

4: Computational thinking



5: Abstract data structures

6: Resource management



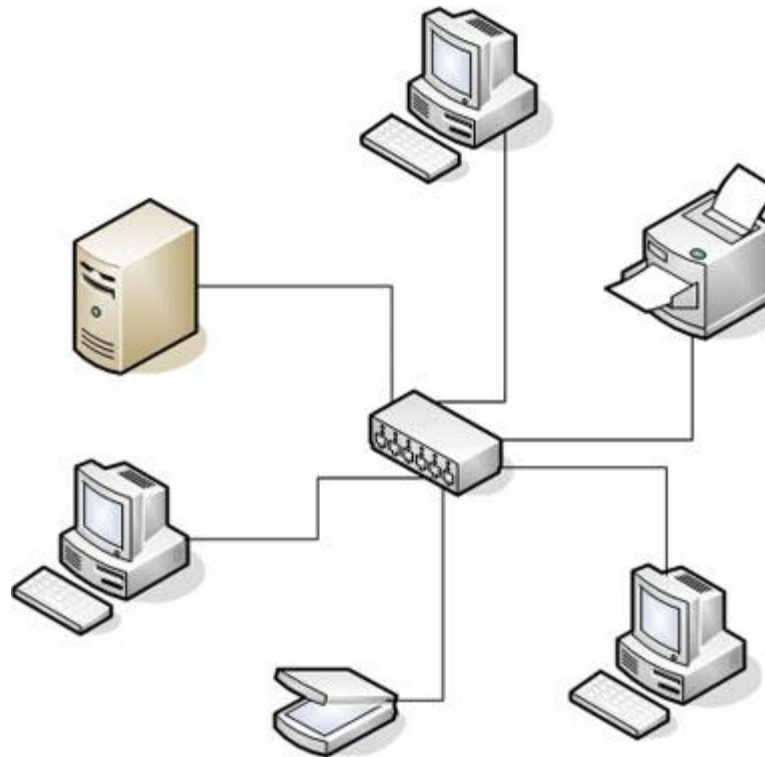
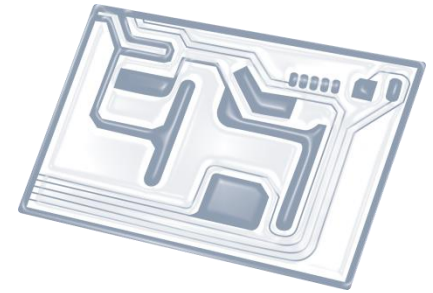
7: Control

D: OOP



Topic 3.1.1

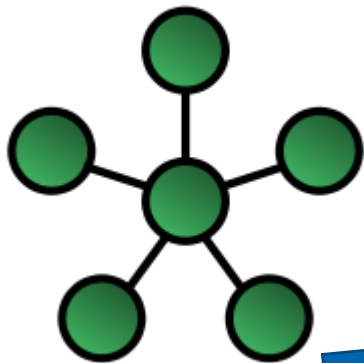
Identify different **types** of **networks**



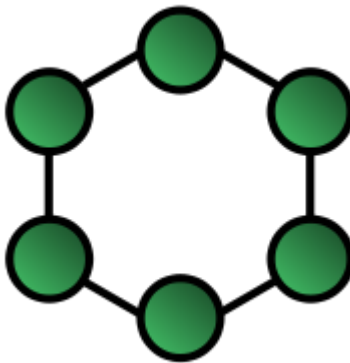
Basic Topologies

Topology = **physical layout** of a network

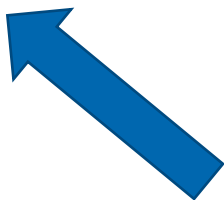
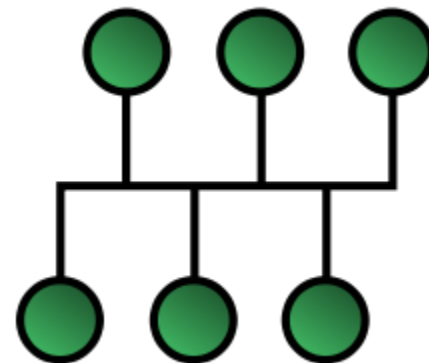
Star



Ring



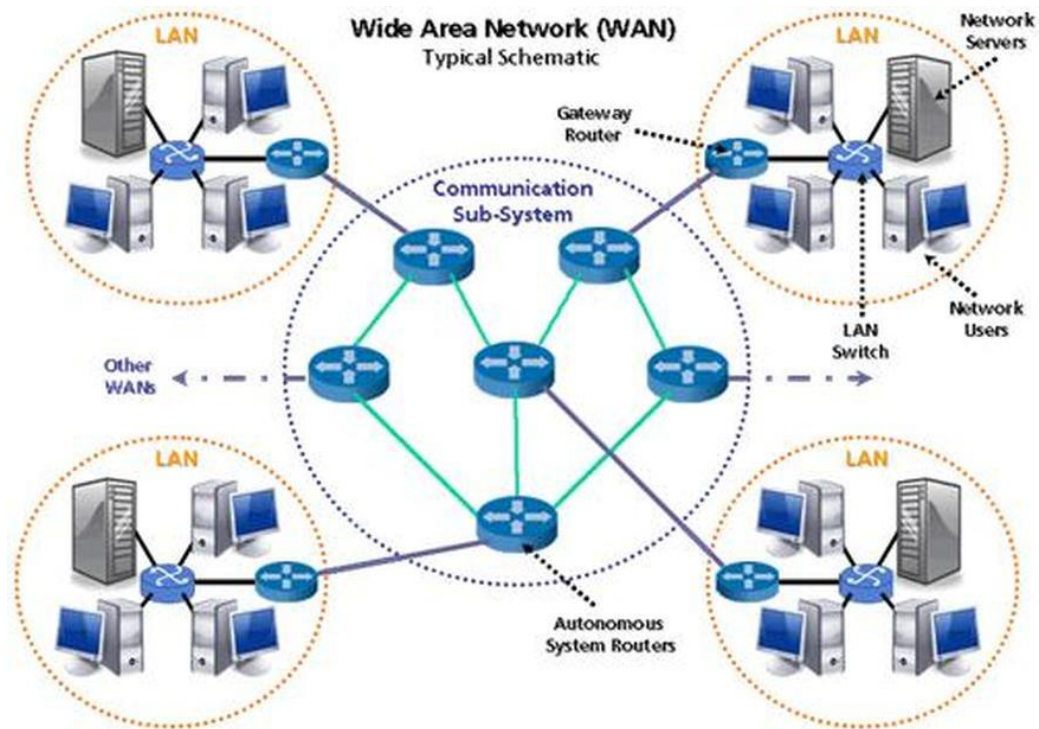
Bus



These are called **NODES**

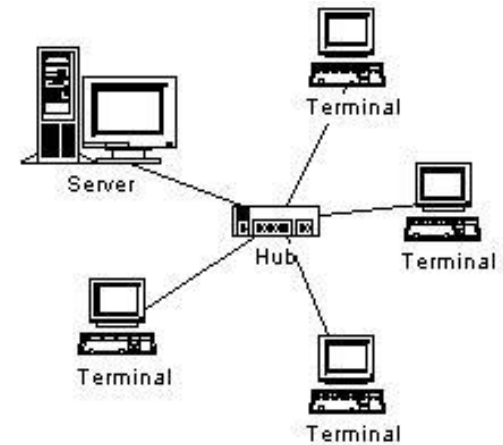
Types of Network

- LAN
- WAN
- GAN
- (W)PAN
- WLAN
- SAN
- VPN
- VLAN
- Internet/Extranet/Intranet



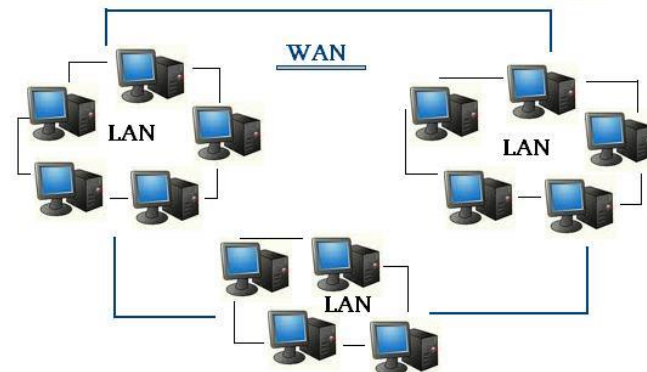
LAN

- **Local Area Network**
- A network in which the nodes are close together. For example, in the same building, on the same site (school).
 - Small geographic area
 - Tend to use private connections as opposed to leased communication lines.



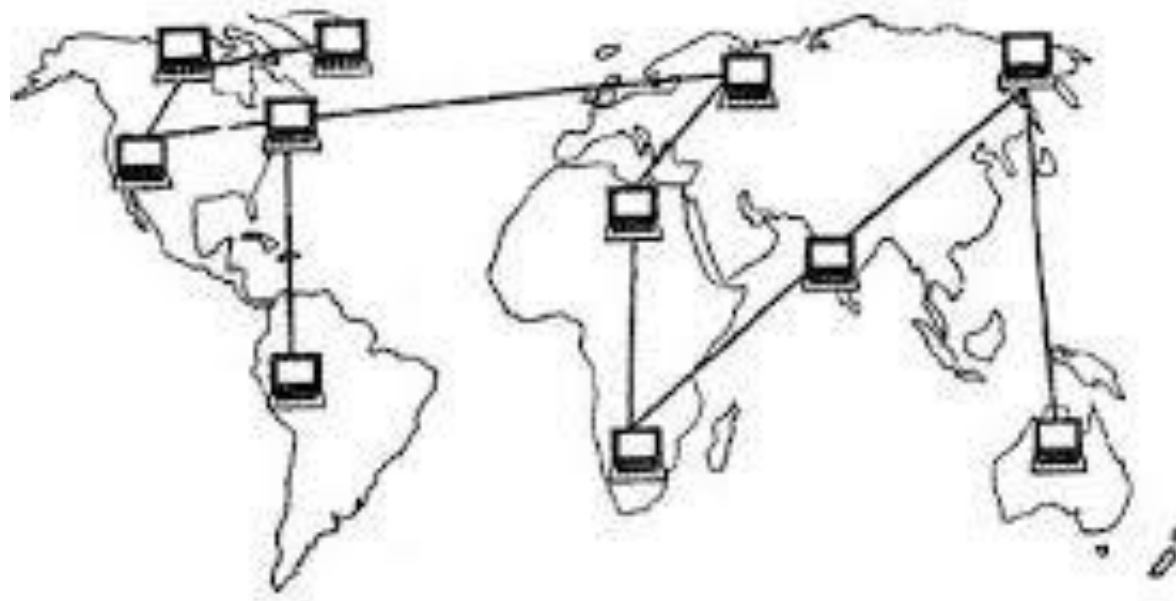
WAN

- **Wide Area Network**
- A network in which the nodes are spread out over a larger geographic area. For example, national and international retailers are connected.
 - Large geographic area
 - Uses leased communication lines.



GAN

- **Global Area Network**
- A network where the nodes are spread out globally. For example, the internet.



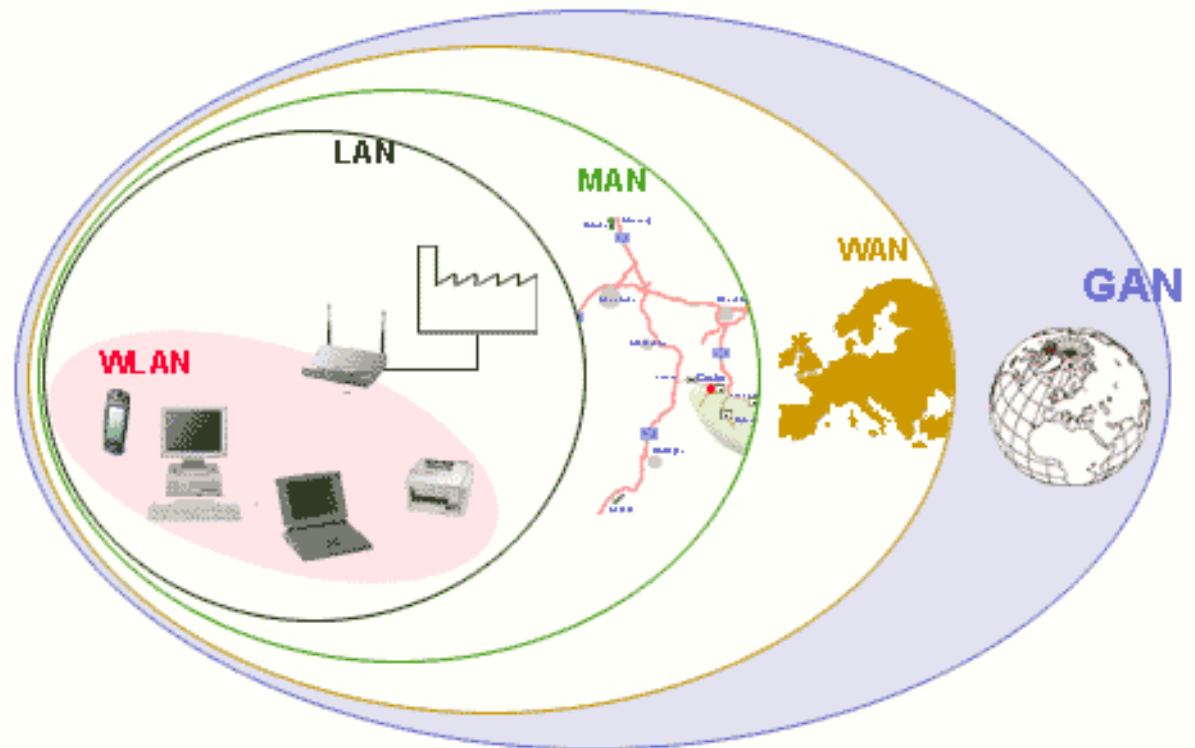
Computing Sin

The Internet **!=** World Wide Web



Types of Network

- LAN ✓
- WAN ✓
- GAN ✓
- (W)PAN
- P2P
- WLAN
- SAN
- VPN
- VLAN
- Internet/Extranet/Intranet

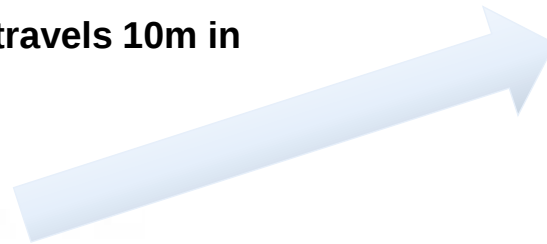


(W)PAN

- **(Wireless) Personal Area Network**
- A network which consists of computers, mobile phones, iPod, headphones etc.



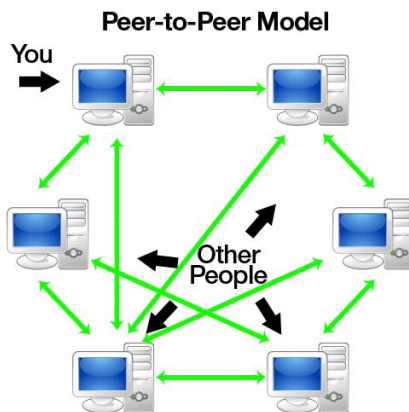
Bluetooth typically travels 10m in any direction.



P2P



- **Peer-to-Peer**
- **P2P** networking is a distributed architecture that partitions tasks or work loads between **peers**. **Peers** are equally privileged, equipotent (of the same power) participants in the application.
- They are said to form a **peer-to-peer network of nodes**.



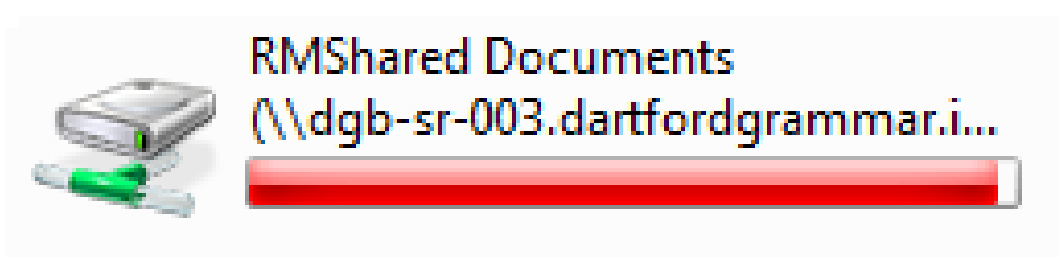
WLAN

- **Wireless Local Area Network**
- A network in which the nodes are close together. For example, in the same building, on the same site (school)...
BUT WITH NO WIRES!



SAN

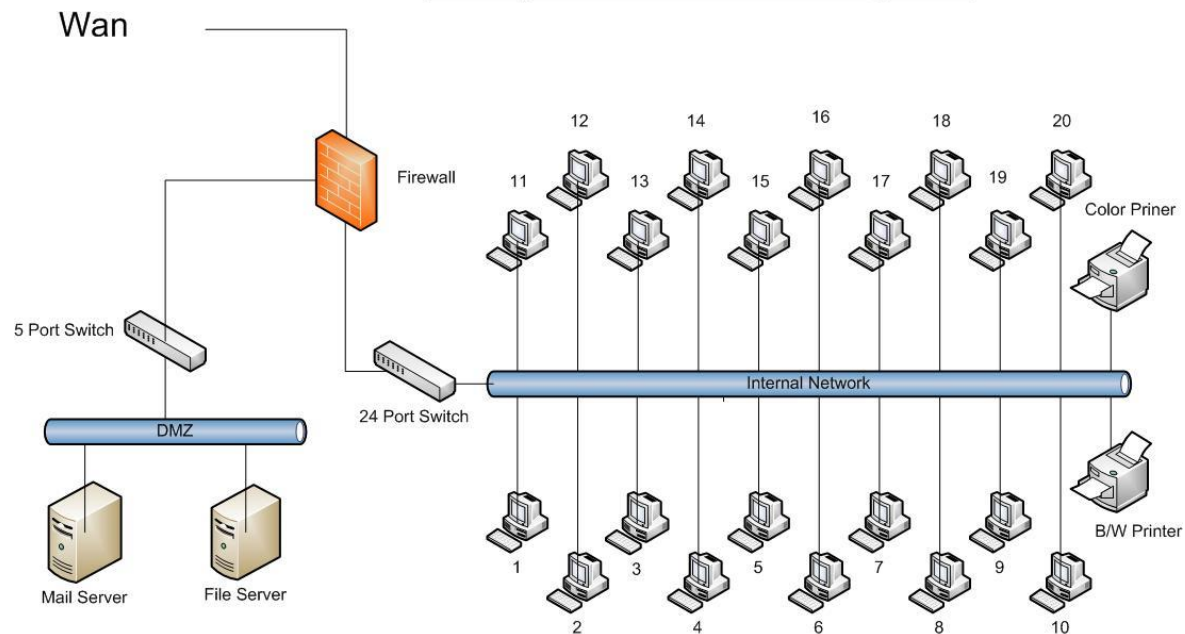
- **Storage Area Network**
- A network which provides dedicated access to storage. Typically, they have their own storage devices not accessible through the wider network; instead the SAN appears as a device to the OS.



Types of Network

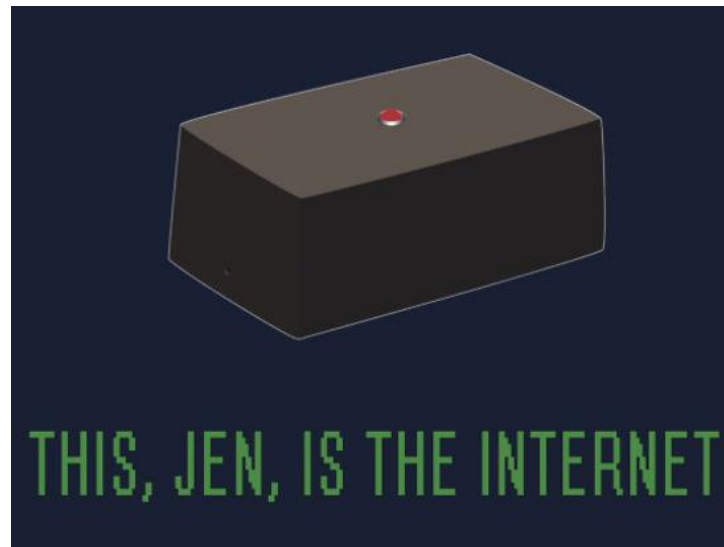
- LAN ✓
- WAN ✓
- GAN ✓
- (W)PAN ✓
- WLAN ✓
- SAN ✓
- VPN
- VLAN
- Internet/Extranet/Intranet

Sample Ltd Office Diagram



Internet

- The internet is a **network of networks**.
- Since 2013, spans beyond our solar system.
- Only 4% of WWW content is visible.



Intranet/Extranet

Home



Extranet

Internet

Intranet



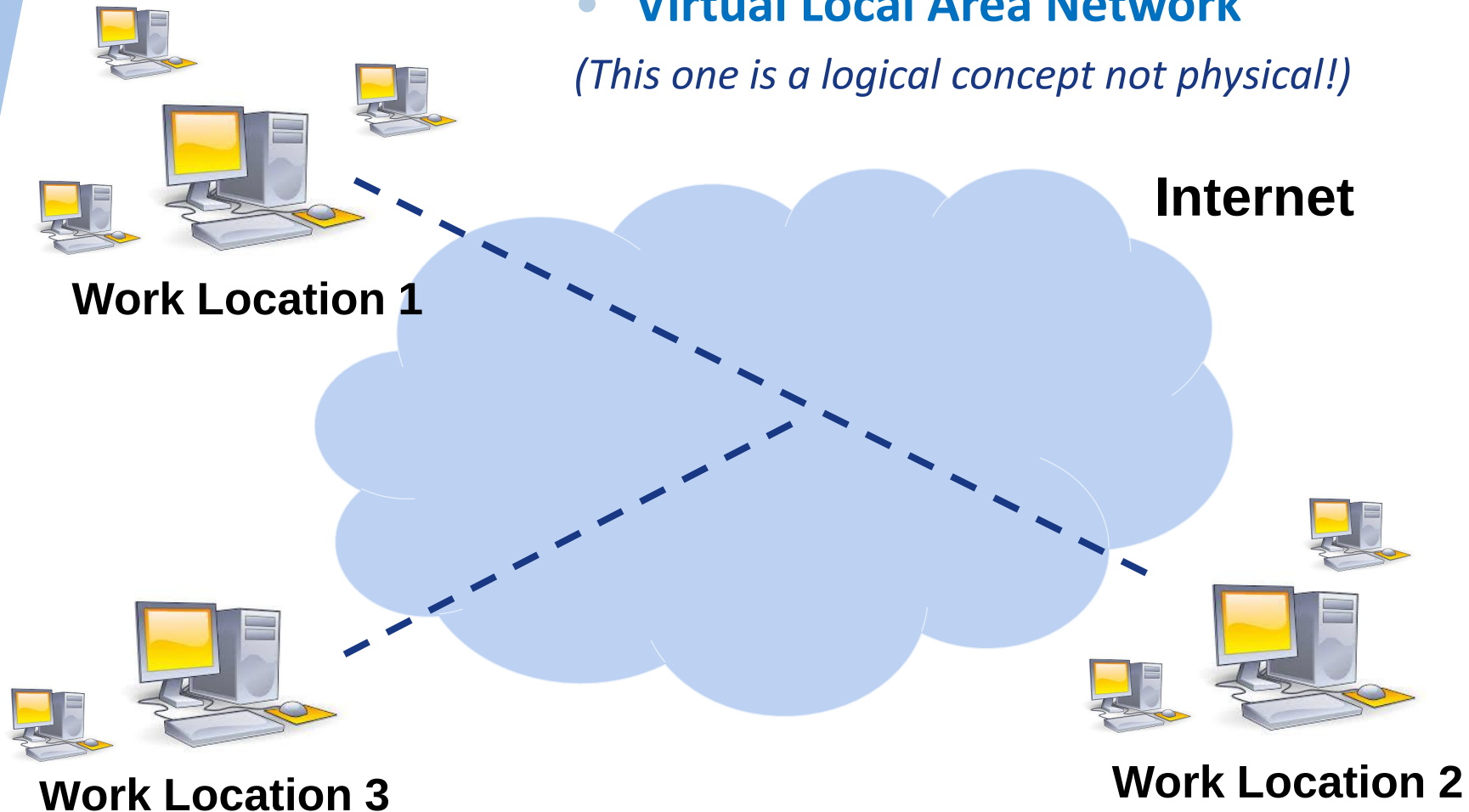
Work



VLAN

- **Virtual Local Area Network**

(This one is a logical concept not physical!)



VPN

