**COMPUTER COMMUNICATIONS LEC 01**

Tutorials start week 2

LAB FROM week 1 – create account on netacad.com

**Make up of network**

* Devices – communicate to each other
* Medium – how the devices are connected to each other
* Messages – the information that travels through the medium
* Rules – governs how messages flow through the medium

**Internet**

Two key innovations:

* Packets/datagrams
  + Contains and address to communicate to receiver
* Store and forward
  + Stores message in network when it is busy

However:

* Hard to control delay
  + No upper bound of delay time
* Switches need a buffer (memory required)
  + Storing when busy
* Convergence of flows can lead to congestion

**Challenges**

IP addresses are unique identities

* Shortage due to free distribution
* Decentralised control – hard to recover addresses after handed out

Decentralisation. Nobody is controlling the internet

* Allows scaling, but not reliable
* Single fault of failure can cause a disaster
  + No control who can join
* Hard to guarantee security
* No uniform solution for billing and accounting
* No way to reliably discover a user’s email address (no yellow pages)
* Non-optimal routing
  + Each admin unit makes a locally optimal decision

Multimedia – Using video or photos. Real-time applications.

* Requires a network to support quality of service of some sort
  + Hard to integrate into current architecture
  + With store and forward its had to provide service quality

A screenshot of a cell phone

Description automatically generated**Layering** partitions related communications functions into groups that are manageable.

Each layer provides a **service** to the layer above.

Each layer operates according to a **protocol.**

Eg. Physical layer contains information for how the data will physically travel.

**Network architecture characteristics**

* Fault tolerance
* Scalability
* Quality of service
  + Prioritises communication
* Security

**Broadcast network**

Message from one to all receivers

**Switched Network**

Communication is between transmitted by being routed through an interconnected set of nodes.

**Packet**

* Packets have header, data and trailer.
* Passed through nodes. Its stored at a node and then forwarded to the next.

COMPARISON BETWEEN TYPES