**Reading/notes for exam IDATA2304**

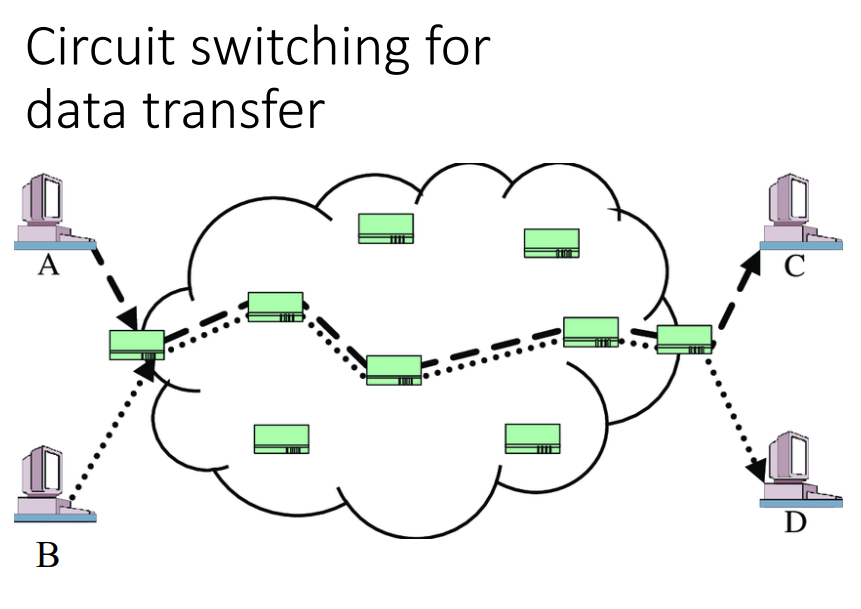
**Week:** 1 / **Topic:** History of the internet / **Where:** Power Point Notes

**Communication before the Internet**

1. The internet was not invented in an empty space. It was a natural evolution of previous communication technologies: telegraph and telephone
2. Both the post and the internet have a multi-link infrastructure where each link is managed by a specific institution (some institutions may manage many links).
3. The infrastructure is hierarchical – some organizations manage it at the international level, some for each country, some institutions manage a specific city, and so on.
4. The Internet (or the ARPANET) is not the first communication network in the world. It was possible to transmit both voice and data long before the Internet.

**Packet Switching and ARPANET**

Example of Circuit Switching for data transfer:



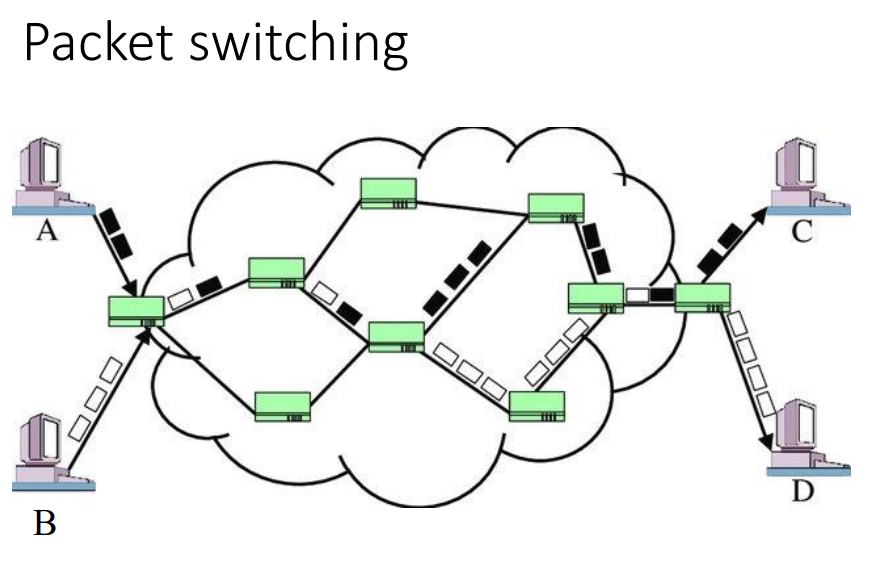
**Circuit Switching Advantages**

* Guaranteed speed
* Guaranteed latency
* Guaranteed quality (limited data loss)

**Circuit Switching Drawbacks**

* Expensive for the users
* Inefficient use of infrastructure

Example of Packet Switching for data transfer:



Each device has an address. Each packet contains source and destination address.

**Packet Switching Advantages**

* Cheap
* Efficient use of infrastructure
* Better scalability (can support many users, if they are not very active)

**Packet Switching Drawbacks**

* No guarantees for speed
* Unpredictable latency
* Packet loss can happen (when to many packets wait at a node)

**Packet switching history**

* First packet switching device in 1968: ARPANET

Things to remember

1. Packet switching was introduced for more efficient utilization of infrastructure in computer communication.
2. Packet switching reuses the same communication lines for data exchange between all nodes on the network.
3. First packet-switched network, ARPANET, was created in 1969 in the USA.
4. Norway connected to ARPANET as early as 1973.

**Inter-networking initiative**

1. There were several parallel developments of packet-switched networks.
2. There was a need for common protocol to connect the different proprietary networks together.
3. Development of TCP protocol started in 1974 and a usable version was out in 1983 when ARPANET starting using it.
4. Gradually academic institutions in other countries joined the internet.

**Rapid growth with the web**

1. The web was the main catalyst for the growth of the Internet.
2. The web has four main building blocks: Browser, Web server, HTTP protocol and HTML language.

**Week:** 2 / **Topic:** Fundamental Networking concepts / **Where:** Book

Contains:

* Nuts-and-bolts view (devices)
* Service view
* Protocols
* Data transmission
* Queues, delays, packet loss
* ISPs
* Network backbone
* Access networks

**Week:** 3 / **Topic:** Physical Layer / **Where:** Power Point Notes

**Week:** 4 / **Topic:** Computer Network Protocols / **Where:** Power Point Notes

**Week:** 5 / **Topic:** Application Layer / **Where:** Power Point Notes

**Week:** 6 / **Topic:** The DNS Protocol / **Where:** Power Point Notes

**Week:** 7 / **Topic:** The Web / **Where:** Power Point Notes

**Week:** 8 / **Topic:** Network programming – TCP sockets / **Where:** Power Point Notes

**Week:** 9 / **Topic:** Transport Layer / **Where:** Power Point Notes

**Week:** 10 / **Topic:** Network Layer / **Where:** Power Point Notes

**Week:** 11 / **Topic:** Retrospective / **Where:** Power Point Notes

**Week:** 12 / **Topic:** Security in computer networks / **Where:** Power Point Notes

**Week:** 13 / **Topic:** Data marshalling / **Where:** Power Point Notes

**Week:** 14 / **Topic:** Some higher-level abstractions / **Where:** Power Point Notes

**Week:** 15 / **Topic:** Wireless network challenges / **Where:** Power Point Notes