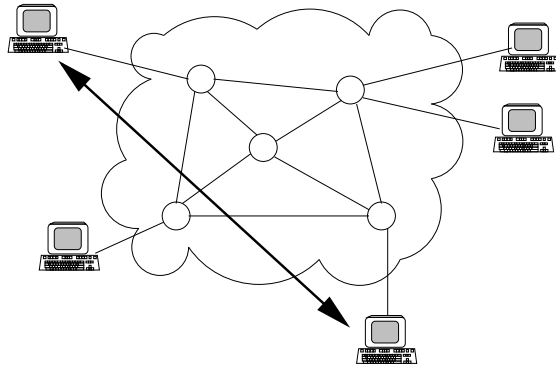


Computer Networks



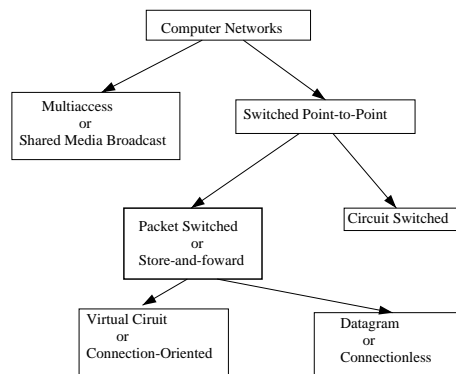
1

Sessions

- **Interactive:** Short messages, small delay, high reliability
- **File transfer:** Long messages, moderate delay, high reliability
- **Digitized Voice:** Short messages, fixed small delay, moderate reliability
- **Web Traffic:** Long messages, small delay, high reliability
- **Video:** Long messages, fixed small delay. Requires broadcast and multicast capabilities.

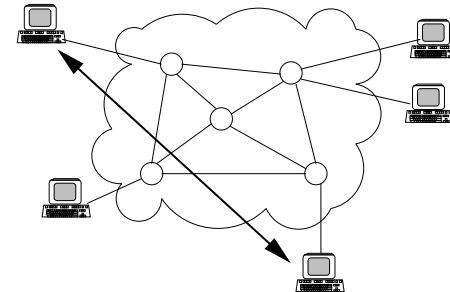
2

Network Types



3

How to Send a Message over a Network?



- Routing
- Addressing
- Reliable Data Transfer
- Congestion Control

4

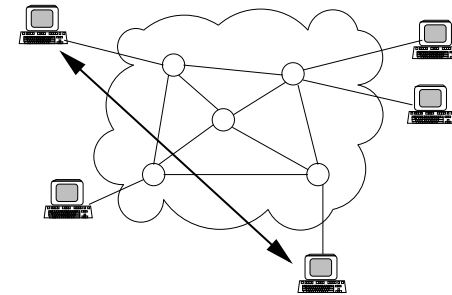
Layered Network Architecture

Application Layer
Transport Layer
Network Layer
Data Link Layer
Physical Layer

5

"The Roller-Coaster Ride of a Message"

A						A
T						T
N	N		N			N
D	D	D	D	D		D
Ph	Ph	Ph	Ph	Ph		Ph



6

Review

1. Each layer could provide to generic type of services - what are those two service types?
2. How can a higher layer map a unreliable (connectionless) service of a lower layer into a reliable service?
3. What is the advantage of a connectionless service? When would one might choose a connectionless service?
4. Does TCP provide a connectionless or a connection-oriented service?
5. What is the quality-of-service that TCP/IP provides?
6. When using TCP, would one might also want to use ARQ in the data link layer?

7

7. What is the advantage of using TCP/IP?
8. What is the disadvantage of using TCP/IP?
9. What is the advantage of a virtual circuit service over a datagram service? What is the disadvantage?
10. For what type of applications would you rather use UDP than TCP?
11. Is it possible for an application to enjoy reliable data transfer even when it runs over UDP? If so, how?
12. Which layer is the most complex layer. Why?
13. The transport and network layer provide a logical communication between "what"?
14. What is the advantage of using a shared media broadcast network?

8

15. What makes the design of a computer network more challenging than the design of a telephone network?
16. What is the advantage of using a circuit switched architecture for the telephone network?
17. What is the disadvantage of using a circuit switched architecture for computer networks?

.....

- There are still many problems to be solved!
- Mathematical models are useful!
- There are typically several choices/solutions!