

About the second lecturer

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- Transport layer and application layer protocols
- Building mobile applications and Web Services
- Multimedia streaming and P2P (optional)





• We use port numbers.



Layer 4 – the Transport Layer.

- The network layer performs machine to machine delivery of datagrams
- The transport layer performs application to application delivery.
- Ports are (16 bit) numbers (like house numbers) that form the address space of a *protocol*.
 i.e. you can have tcp/53 and udp/53.
- A socket is a software structure associated with a port.
- An application must 'bind' (associate) a socket to a port before it can be used.
- The Socket API is the interface for applications to gain access to the network.

Socket API

- Client/server paradigm
- Two levels of service in the socket API:
- User Datagram Protocol (UDP)
- Best effort protocol, transmits datagrams.
- Transmission Control Protocol (TCP)
 - reliable, byte stream-oriented, with capacity control, transmits segments.



Delivery Without Guarantees

- Remember, IP Datagrams may be:
 - Duplicated,
- Delivered out of order,
- Lost/Discarded
- Corrupted
- By the network layer.
- The TCP protocol will need to resolve these, while the UDP protocol ignores them.











Quick exercise

- When using the sliding-window protocol, will the utilization be improved because of the following?
 - A. Reduce propagation delay
 - B. Reduce sliding window size
 - C. Increase sliding window size
 - D. Reduce packet size













