NOTES

Chapter 24
UDP

Transport Level Protocols

- Transport Level Protocols provide process-to-process communication
- We will look at TCP/IP's two most popular transport level protocols:
  - UDP
  - TCP
- both UDP and TCP are layered on top of IP

Application	(e.g., Telnet)
Transport	UDP or TCP
Intenet	IP
Network Interface	(e.g., Ethernet)
Hardware	(e.g., Ethernet)

User Datagram Protocol

- UDP delivers independent messages, called datagrams between applications or processes on host computers
  - UDP provides process-to-process "Best effort" delivery - datagrams may be lost, delivered out of order, etc.
  - Checksum (optionally) guarantees integrity of data
- For generality, endpoints of UDP are called protocol ports or just ports
- Ports are endpoints of communication or mailboxes (like ports you studied in your OS class)
- An (IP address, UDP port) uniquely identifies a delivery point (usually a single process)
- Each UDP datagram specifies the internet address and port number of the destination and the source of the message
- Destination port and source port may be different

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UDP Packet Format

- UDP packets are encapsulated inside IP packets
- UDP packets have the following format

UDP SRC Port	**UDP DST Port**
UDP Msg Length	**UDP Checksum**
UDP Data Region	

Figure 1: UDP Packet Format

- Maximum Packet length is
- Checksum is optionally computed

Selecting UDP port numbers

- Communicating computers must agree on a port number
  - "Server" opens selected port and waits for incoming messages
  - "Client" selects local port and sends message to selected port
- Services provided by many computers use reserved, well-known port numbers :
  - ECHO
  - DISCARD
  - NTP
- Other services use dynamically assigned port numbers

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Well-Known UDP Ports

Port	Service	Description
7	echo	Echo input back to sender
9	discard	Discard the input
11	systat	Return System Statistics
13	daytime	Return Time of Day in ascii
17	quote	Return a Quote of the day
37	time	Return the System time (seconds since 1970)
53	domain	DNS server port
69	tftp	Trivial File Transfer Protocol (TFTP)
123	ntp	Network Time Protocol (NTP)
161	snmp	Simple Network Management Protocol (SNMP)