

# COMPUTER NETWORKS LAB (CS315)

## Assignment-10

### ICMP

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# ICMP: internet control message protocol

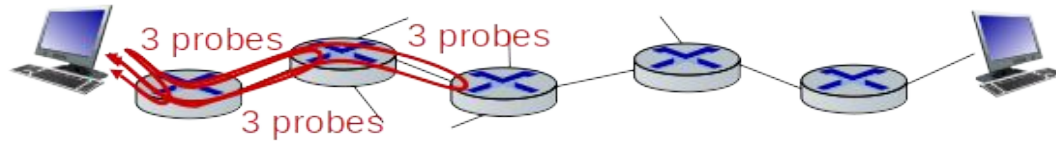
- used by hosts and routers to communicate network-level information
  - error reporting: unreachable host, network, port, protocol
  - echo request/reply (used by ping)
- network-layer “above” IP:
  - ICMP messages carried in IP datagrams
- *ICMP message*: type, code plus first 8 bytes of IP datagram causing error

<u>Type</u>	<u>Code</u>	<u>description</u>
0	0	echo reply (ping)
3	0	dest. network unreachable
3	1	dest host unreachable
3	2	dest protocol unreachable
3	3	dest port unreachable
3	6	dest network unknown
3	7	dest host unknown
4	0	source quench (congestion control - not used)
8	0	echo request (ping)
9	0	route advertisement
10	0	router discovery
11	0	TTL expired
12	0	bad IP header

Network Layer: 4-<number>



# Traceroute and ICMP



- source sends sets of UDP segments to destination
  - 1<sup>st</sup> set has TTL =1, 2<sup>nd</sup> set has TTL=2, etc.
- datagram in  $n$ th set arrives to  $n$ th router:
  - router discards datagram and sends source ICMP message (type 11, code 0)
  - ICMP message possibly includes name of router & IP address
- when ICMP message arrives at source: record RTTs

## stopping criteria:

- UDP segment eventually arrives at destination host
- destination returns ICMP “port unreachable” message (type 3, code 3)
- source stops

Network Layer: 4-<number>



# Thank you