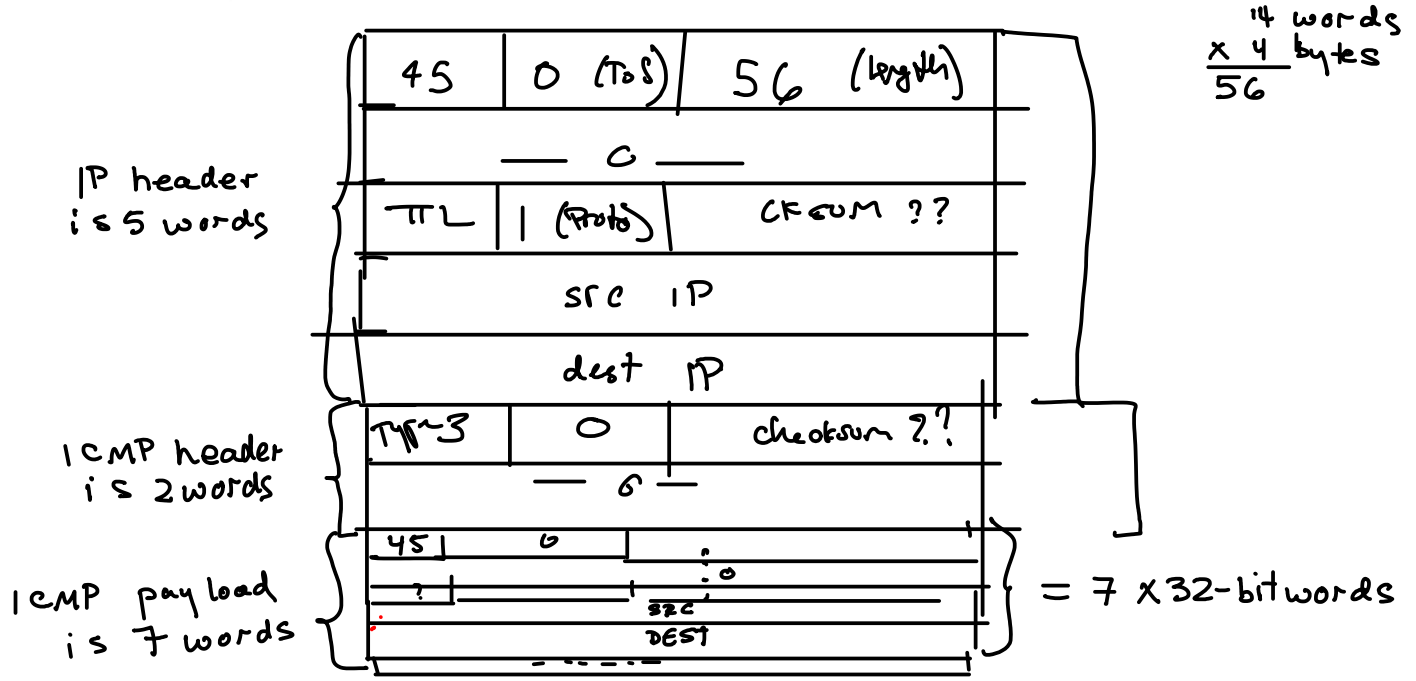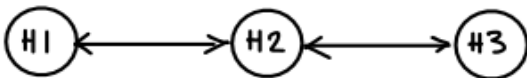# Lecture 20 - ICMP

Exercise 1: Write the contents of an ICMP Destination Unreachable packet with code 0 (Network Unreachable) including the IP header. Specify the values of any fields whose value are not defined by this question.

IP header is 5 words

ICMP header is 2 words

ICMP payload is 7 words

45	0 (ToS)	56 (length)
— c —		
TTL	1 (Proto)	CKSUM ??
src IP		
dest IP		
Typ~3	0	checksum ?.?
— 6 —		
45 1	6	
?		:.o
.		32C DEST

14 words
$\times$ 4 bytes
= 56

= 7 × 32-bit words

5 from unroutable IP header
+ 2 from packet payload

Exercise 2: The host H1 in the network shown in the diagram below issues the command 'traceroute H3'. Draw a table showing the ICMP messages transmitted and received by H1. Include five columns for source address, destination address, ICMP type, ICMP code and TTL value. Assume a single ping is used to discover each hop.

H1 ⟷ H2 ⟷ H3

	source	dest	icmp TYPE	ICMP coDE	TTL
tx →	H1	H3	echo request = 8	0	1
rx ←	H2	H1	TTL exceed = 11	0	(large)
→	H1	H3	echo request = 8	0	2
←	H3	H1	TTL exceeded = 11 OR echo response = 0	0 / 0	(large)