Modify the ping.c program so that it builds the IP datagram with a "time to live" small enough to prevent the IP datagram from reaching its destination.

Intercept the ICMP "Time Exceeded" message (see documentation below from RFC 792) from the intermediate node that discarded the packet and print the IP address that originated this message on the screen.

0 1 2 3

0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1

+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+

| Type | Code | Checksum |

+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+

| unused |

+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+

| Internet Header + 64 bits of Original Data Datagram |

+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+

IP Fields:

Destination Address

The source network and address from the original datagram's data.

ICMP Fields:

Type

11

Code

0 = time to live exceeded in transit;

1 = fragment reassembly time exceeded.

Checksum

The checksum is the 16-bit ones's complement of the one's

complement sum of the ICMP message starting with the ICMP Type.

For computing the checksum , the checksum field should be zero.

This checksum may be replaced in the future.

Internet Header + 64 bits of Data Datagram

The internet header plus the first 64 bits of the original

datagram's data. This data is used by the host to match the

message to the appropriate process. If a higher level protocol

uses port numbers, they are assumed to be in the first 64 data

bits of the original datagram's data.

Description

If the gateway processing a datagram finds the time to live field

is zero it must discard the datagram. The gateway may also notify

the source host via the time exceeded message.

If a host reassembling a fragmented datagram cannot complete the

reassembly due to missing fragments within its time limit it

discards the datagram, and it may send a time exceeded message.

If fragment zero is not available then no time exceeded need be

sent at all.

Code 0 may be received from a gateway. Code 1 may be received

from a host.