Assignment #03

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Section   A
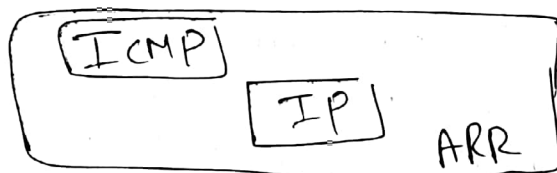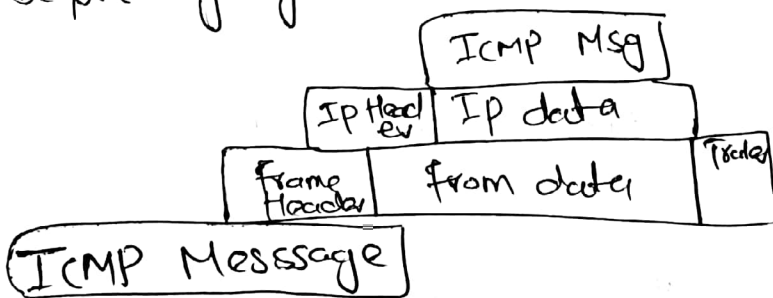
NU-ID   P180054

Assigment

ICMP and IP Mobile

ICMP Internet Control Message Protocol

Icmp is designed to overcome the following two problems with IP Protocol.

(i) No ERROR Reporting (Corresponding mechonism)

(ii) Lacks a Mechonism for Queries

```
┌─────────────────────┐
│ ┌─────┐             │
│ │ ICMP│             │
│ └─────┘ ┌────┐      │
│         │ IP │      │
│         └────┘  ARR │
└─────────────────────┘
```

ICMP Message are not directly passed to the data link layer. Instead the Message are first encupsulated Inside IP datagroms before going to the lower layer.
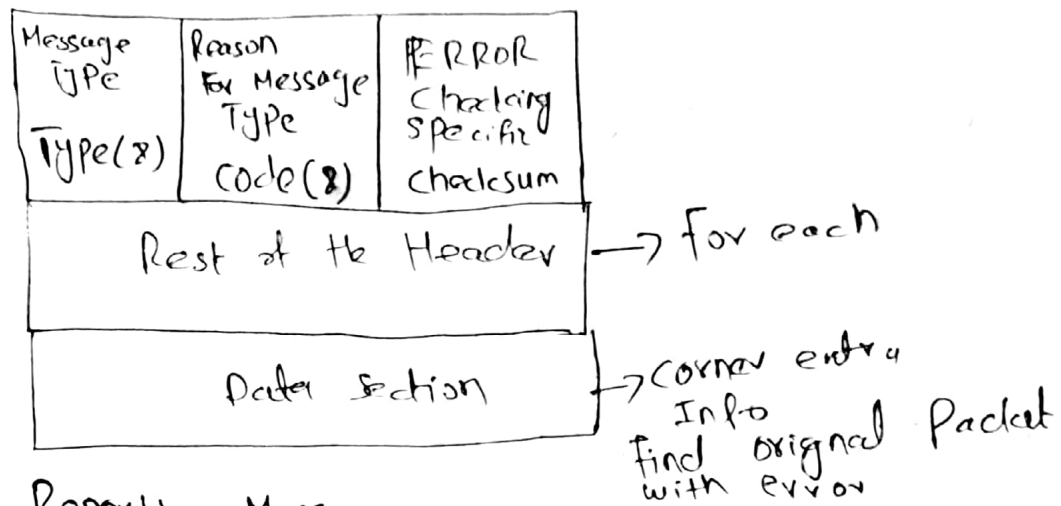
```
        ┌──────────────┐
        │  IcMP Msg    │
     ┌──┴────┬─────────┤
     │Ip Head│ Ip data │
  ┌──┴─┬─────┴─────┬───┤
  │Frame│ from data │Tscde│
  │Hacda│           │
  └─────┴───────────┴───┘
```

ICMP Messsage

  └> ERROR Reporting

Reports Problems that Router are Host may encounter while Processing of Ip packet

—> Query

  └> fetch Important specific Info from a Router or Host

ICMP Message format

Message Type	Reason For Message Type	ERROR Checking Specific
Type(8)	Code(8)	Checksum
Rest of the Header		→ for each
Data Section		→ corner entry Info

→ for each

→ corner entry Info
find orignal Packet
with error

ERROR Reporting Message

ICMP always Reports error message to the orignal to source.
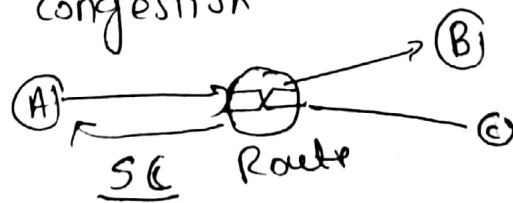
[ICMP does not Correct ERРаr]

i) Destination unreachable:

wherever a Router to the Destination is not found datagrom is discarded and Router/Hosts sends Destinations unreachable Message back to the source

(A)———→ (V) ————→(B) destination
source DU Router   Route to B

ii) Source Quench

This message Informs the source that adatagram has beon dis ordered due to congestion
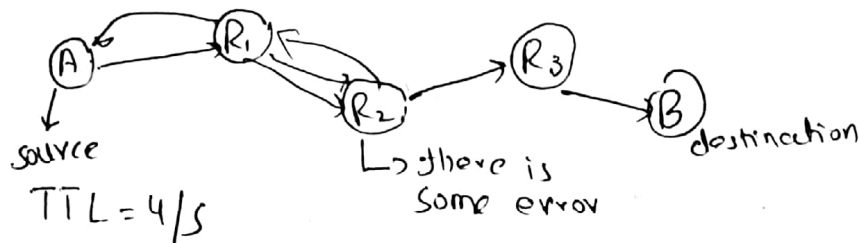
(A)——————(V)———→(B)
                    ©
SC Route

iii) Time Exceeded
It is generated two case

Case-0

Whenever a Router decrease a datogram with Time to live value to zero(0). It discord the datagrum and Sends a time encoodell Msg to the orignal source

source

TTL=4/s

↳ there is some error

destination

Case = 2

When the final destination does not recieve all Fragment in a set time, it discards the recieved fragments and Sends a time exceed Msg to the orignal source

TE

$(t_1 + t)$
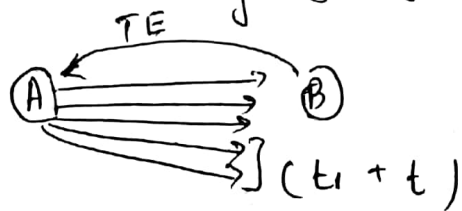
Parameter Problem

If Router/host ~~discord~~ discover an ambigeous or missing value in any Field of the datogram it discord datogrum and sends a Paramoter Problems message back to the source

↳ Case 1

↳ ERROR/AMbigyeality in one of the Header field

↳ Case #02

↳ Required Post of the option is missing

## Redirection

It is sent from Router to a host on same Local N/w

Let suppose Message send A to B. But first send b to R_1 then R_1 will redirect them to R_2 and also send Message b to the original sauce.

ICMP Query Message

It is used to diagonse some w/w problems

i) Echo Request and Reply:

Designed for the diagonstic purpose. Those message are used to determine whether two system can talk communicate with each other


echo Request

echo Reply
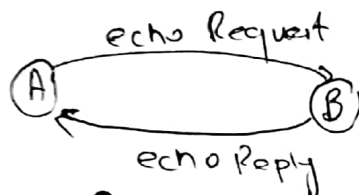
(ii) Timestamp Request and Reply

Two Machine use these message to determine the Round Trip time needed for an IP datagrom to travel between them

$\rightarrow$ Sending time $\Rightarrow$ Recive - orignal

$\rightarrow$ Recieving time $\Rightarrow$ Returned Transmit

$\rightarrow$ Round Trip $\Rightarrow$ Sending + Reciever

How Mobile IP works??

Mobile IP enables Routing of IP dadagram of Mobile nodes. The Mobiles node home address always Identifies the Mobile Node regardless of Input current point of attachments to the Internet, or organization network when away from home, a care of address associated tthe Mobile node with it's Home address by providing Information about Mobile node

Current attachment to the Internet or an organization network.

The home agent reclivect datagrams from the home network to the care of address by constructing a new Ip. This new header then encupculated the orignal Ip datagram causing mobile nock home address to have no ffect untill it's arrive at the Care of addvess. This type of encupsulation is called tunnelling. Aflev arrived heve. each datagram is de-encupsulated and delivored to the Mobile Node.
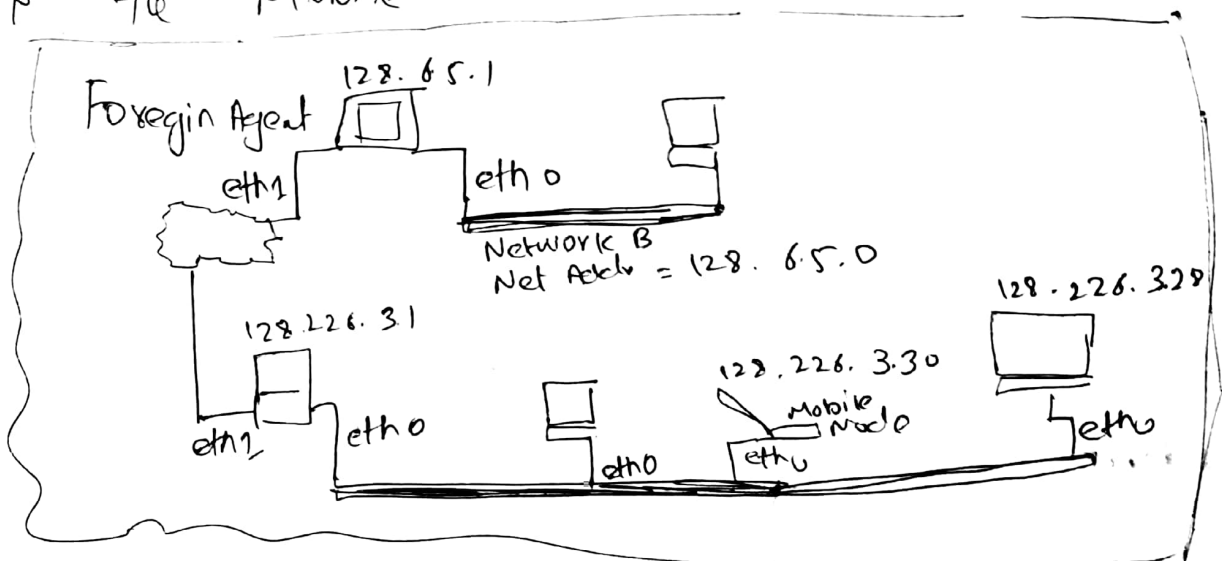
The following illustration shows a mobile node resicling on it's home network. Network A, before the Mobile node moves to forign netwavlc Network B. Both netwovlc support Mobib IP. The Mobile node is olways associated with its home netwovlc by it's parmanaut IP address 128.226.3.30. Though Network A has a home agent, datagrom destined for Mobilo Mode