

# Internet Engineering

241-461

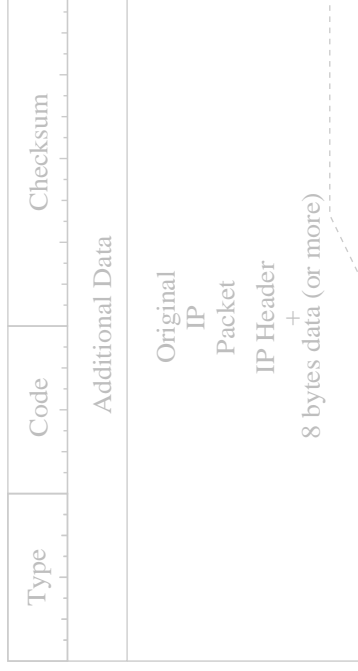
Robert Elz

[kre@munnari.OZ.AU](mailto:kre@munnari.OZ.AU)

[kre@coe.psu.ac.th](mailto:kre@coe.psu.ac.th)

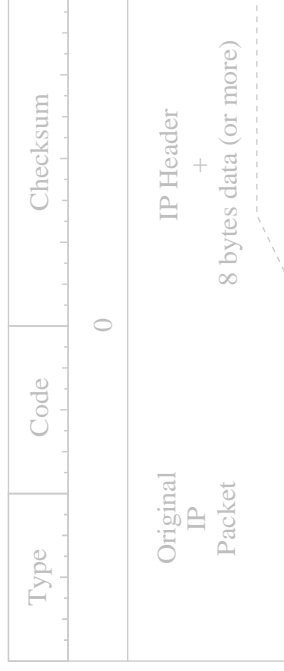
<http://fivedots.coe.psu.ac.th/~kre>

## ICMP errors



- ◇ **Additional Data**
  - Sometimes indicates where error occurred
- ◇ **Original Packet**
  - Allows source to recognise
    - > which packet had problem
  - 8 data bytes is usually transport header
    - > or part of it

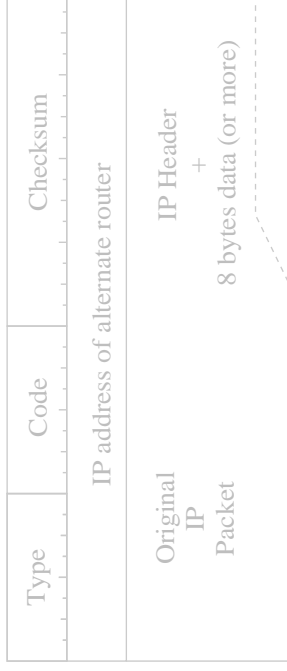
## ICMP Unreachable



- ◇ **Packet could not be delivered**
- ◇ **No additional data**
  - Except modern Fragmentation Required: MTU
- ◇ **Code: Why...**

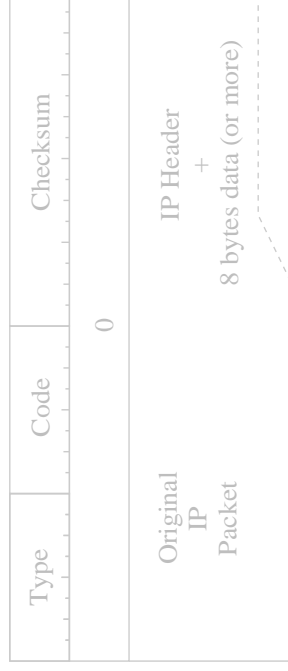
Network	Host	Protocol
Port	Need to Fragment	Source Route Fail
Net Unknown	Host Unknown	Source Isolated
Net Prohibited	Host Prohibited	Bad TOS (Net)
Bad TOS (Host)	Admin Prohibit	

## ICMP Redirect



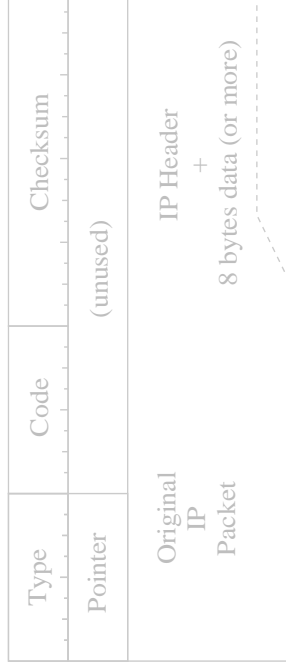
- ◇ **If host chooses wrong router**
  - hosts have no information to make choice
- ◇ **router still forwards packet**
- ◇ **router also returns redirect**
  - next packet to destination should be sent
  - to the alternate router address specified
- ◇ **Code:**
  - host or net; always, or for TOS used

## ICMP Time Exceeded



- ◇ **TTL decremented to 0**
- ◇ **Code 0**
  - In Transit
    - ▷ while being forwarded
- ◇ **Code 1**
  - In reassembly queue
    - ▷ waiting for later fragments to arrive
    - ▷ only first fragment (offset == 0)

## ICMP Parameter Problem



- ◇ **Error of some kind in headers**
  - Packet was discarded
    - ▷ No ICMP error sent if packet forwarded
- ◇ **Pointer is offset to the byte of the header**
  - where the error was detected

# ICMP Error Rule

## ◇ Never send ICMP error packet if

- packet with the problem was an ICMP error packet

## ◇ Error types

- Unreachable (3) Source Quench (4)
- Redirect (5) Time Exceeded (11)
- Param Prob (12)

## ◇ Not Errors

- Echo/Reply (8/0) Time/Reply (13/14)
- Info/Reply (15/16) Mask/Reply (17/18)
- Router Solicit/Advert (10/9)

## ◇ What about type 6?