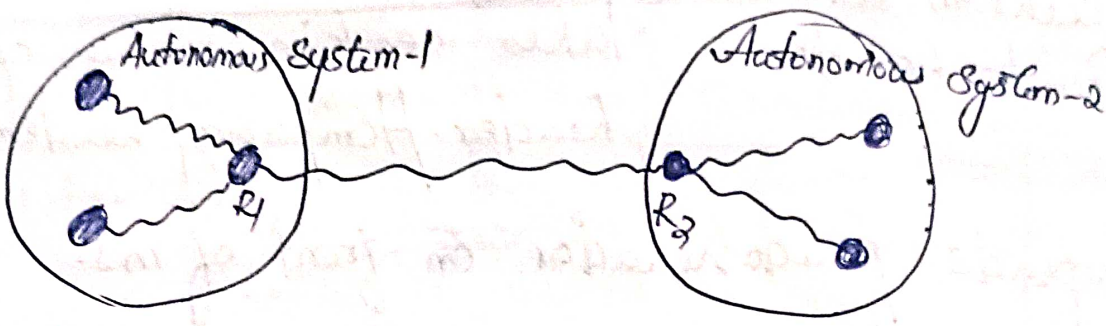
22-3-24

Module - 3 PROTOCOLS

⇒ Distance vector routing & Link state routing algo.

⇒ Autonomous System



- Network under single administrative authority.
- Every autonomous system has an identified Autonomous System number.
- It is also a Subnet.
- They are independent of selecting routing algorithm/ architecture protocols.

⇒ Internal Routing Alg.	⇒ External Routing alg.
• Interior gateway protocol. - RIP, OSPF. - Within an autonomous System inorder to share information	• Exterior gateway protocol (EGP) - Between autonomous System inorder to share routing info. Ex: BGP - Network reachability information.

⇒ Routing algorithm - used to build routing table.
- passes information and builds table.
- handles computations.

⇒ Routing protocol - Specifies the format of the message and rules of forwarding (ARP, ICMP).

- RIP uses distance vector routing algorithm.
- OSPF - Link State Routing algorithm.

⇒ Interior Gateway Protocol

1) RIP - Routing Information Protocol.

- Within an autonomous System.
- Two types of participants - active & passive (hosts, routers). ← Participants.
- * routing updates : every 30 seconds || # FIB.
- metric : hop count.
- Update : on receiving a lesser distance adv. — network address, Integer (distance (hop count)).
- * timers : 180 seconds.
- Subnet - routing process - host and routers are participants.

Participants

- Active - one which share updates in participant defined periods (on every 30 sec) into subnet.
- Passive - always listen to other routers
  - collects and compute FIB.

⇒ FIB = Forwarding Information Base

- Has n no. of entries.
- each entry is a pair of information.

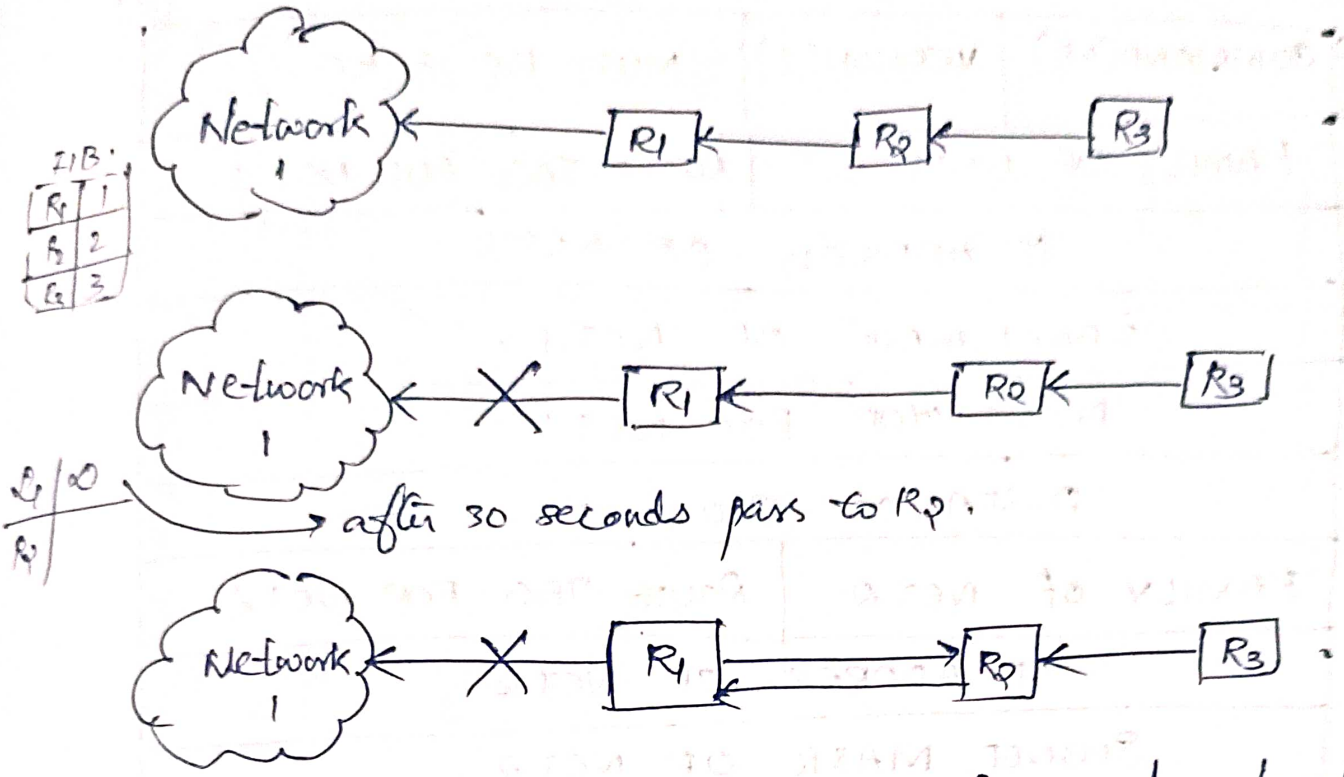
Network address — Integer distance metric (hop count)
- directly connected
- hop count

- Uses Distance vector routing alg.
- FIB doesn't store the state information - starts timer (180 sec) - stores and after that it is deleted.
- Lesser network distance comes in b/w - updates FIB with the new one - timer restarts.

⇒ Problem of RIP

DV - count to infinity

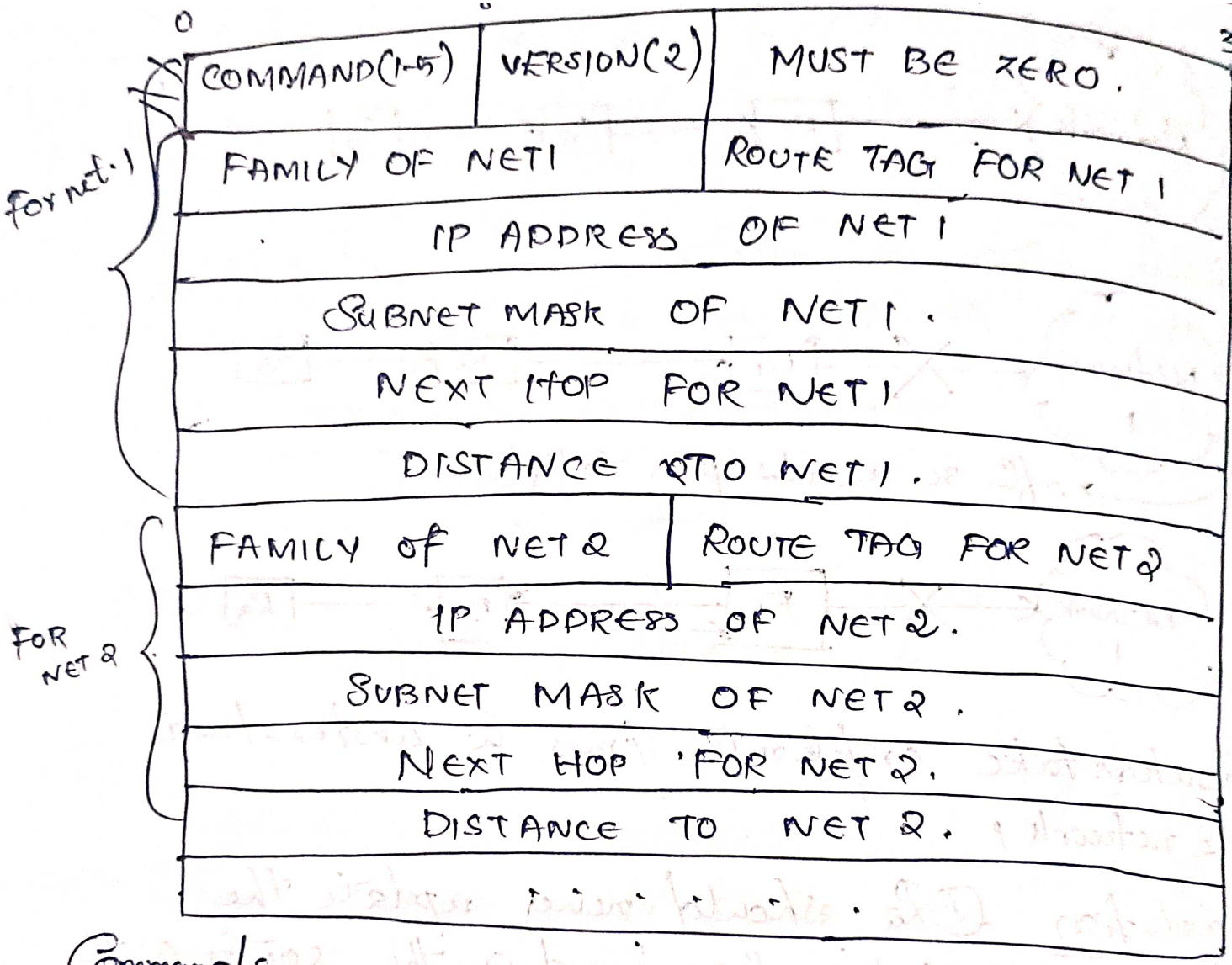
- Slow convergence / count to infinity.



- Routers take infinite times to understand the network.
- Solution ① R2 should never update the information based on the router with a value - Split Horizon.
  - ② Poison Reverse (Trigger) - Retain the forward information for some time.

RIP Message Format

IPv4

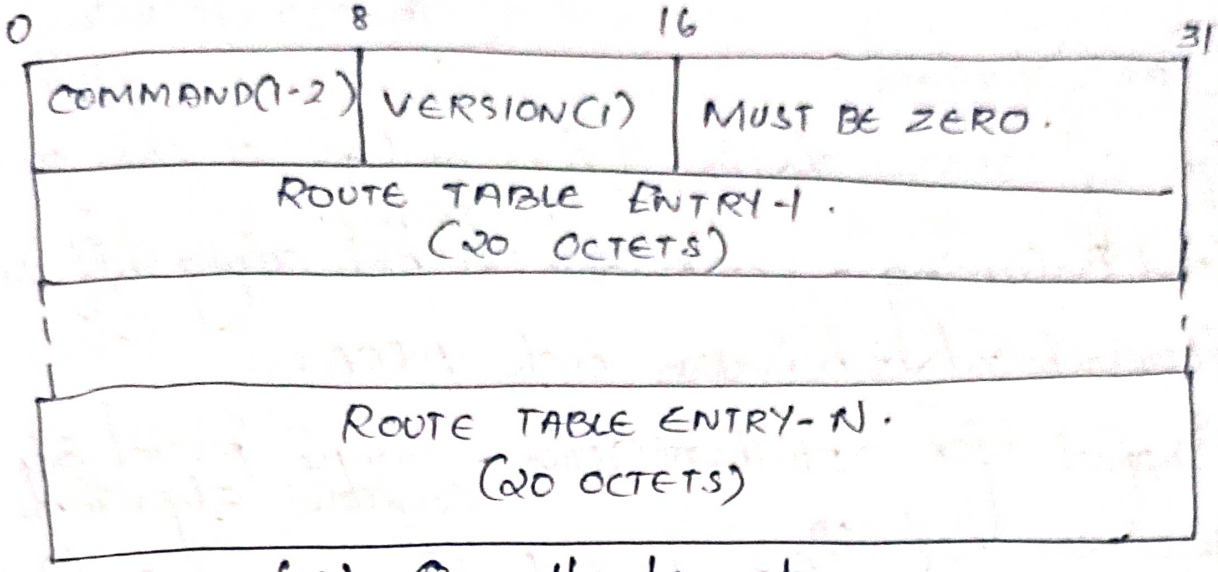


Command/s

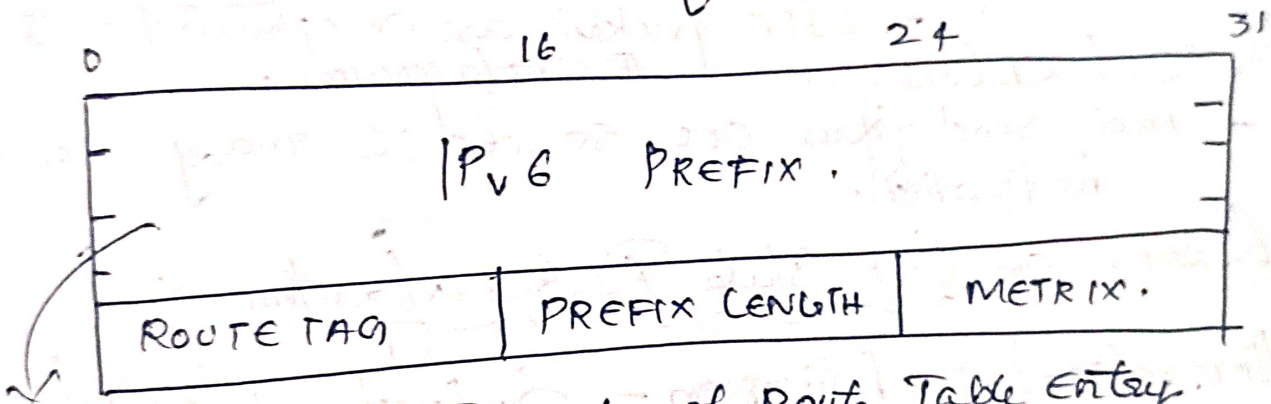
1. REQUEST FOR FULL OR PARTIAL ROUTING INFORMATION
2. RESPONSE CONTAINING Network - distance PAIR FROM SENDER'S FIB.
3. UPDATE REQUEST
4. UPDATE RESPONSE
5. UPDATE ACKNOWLEDGEMENT.

IP ADDRESS AND subnet mask - to understand the network address.

⇒ Message format : RIP_{ng} (IPv6)



(a) Overall format



(b) FORMAT of Route Table Entry.

to understand network address.