VRRP: Virtual Router Redundancy Protocol:

→ VRRP is an open standard protocol

→ It is a Layer-3 redundancy protocol.

→ VRRP provides high availability and fault tolerance for routers on a LAN.

→ It gives multiple routers the ability to work together as a virtual router, sharing common IP address and ensuring that if one router fails, another can seemlessly take over & minimizing disruptions in the network connectivity.

→ VRRP assigns a single IP address to a group of routers to increase redundancy and provide virtualization.

→ Virtual MAC-Address is reserved 0000.5e00.01xx with xx represents the hexadecimal group number

→ Uses protocol number 112.

→ After election only master router will send hello messages.

How VRRP Works:

⇒ **Router Choice:** A group of routers are Configured and prioritized.

* The router with the highest priority number will become the master, while the rest are the backup routers.
* The router Chaise is entirely based on predefined ~~Criteo~~ Criteria.

⇒ **Virtual Router Identifier:**

→ Each group of routers are assigned with a VRID.

⇒ The VRID is used by the router to ~~ideno~~ identify others routers in the same cluster.

⇒ **Virtual IP address:**

→ The virtual IP address is the actual IP address entered into the node to identify the router as a gateway.

⇒ **Hello Messaging:**

→ Communication b/w the routers is a Critical Component to ensure VRRP works as intended.

→ periodically, the routers Send "HELLO" messages to eachother to ensure they function properly.

→ Specifically, they are multicasts Sent to the IP address 224.0.0.18.

→ If the back router does not recieve the "hello" message from the master router then, the next prioritized backup router takes its place.

→ Hello packets are sent every 1 second and sent to multicast address: 224.0.0.18

⇒ **Hold down timer:** The neighbour will hold the information for 3 seconds

⇒ preemption:

→ optionally, the original master router can take over again once it is up in order.

otherwise, the backup router will continue performing the primary/master router's duty.

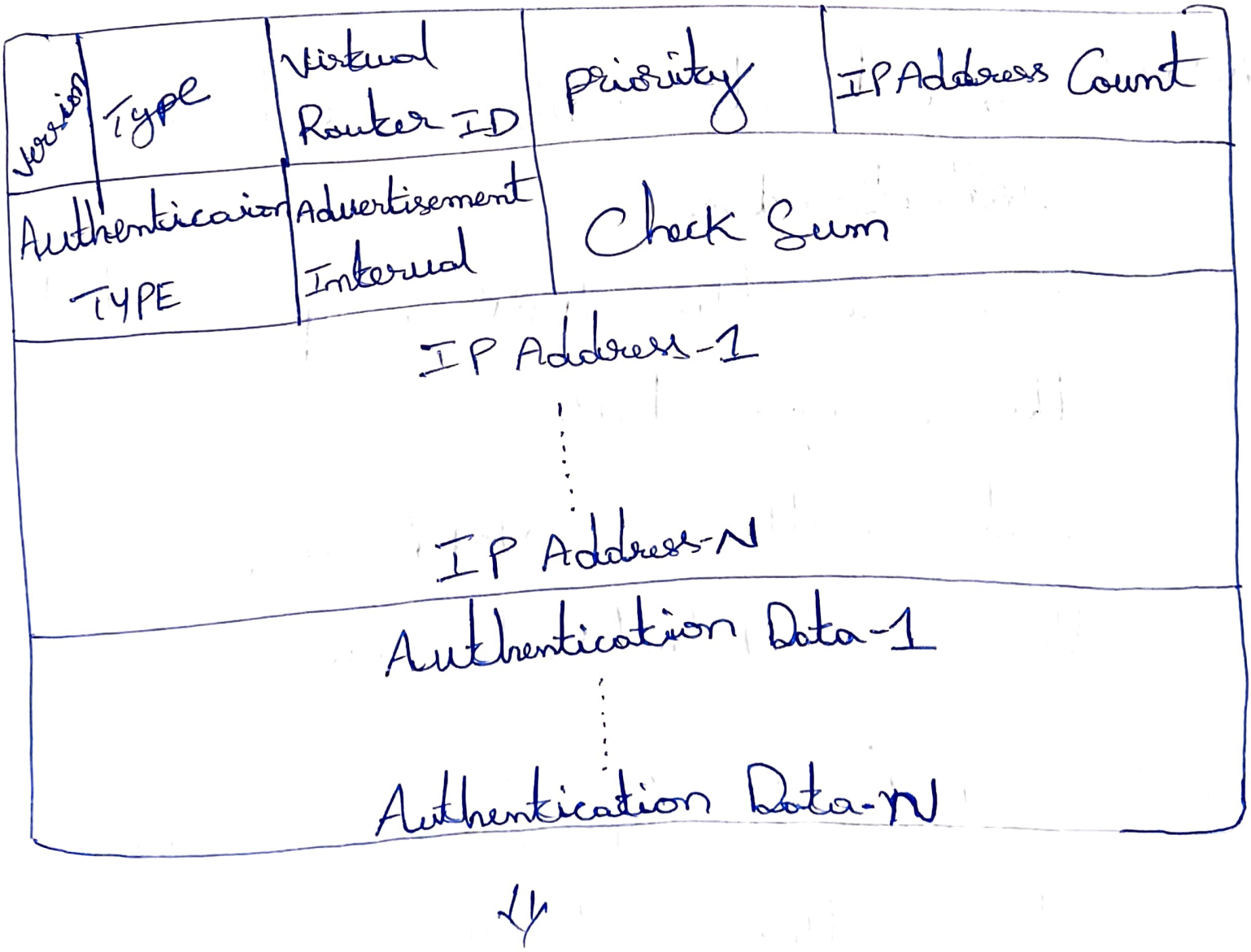
VRRP Master Router election process:

→ Highest priority

→ Highest IP address

→ by default priority is 100.

VRRP packet


Version
Type
Virtual Router ID
priority
IP Address Count
Authentication TYPE
Advertisement Interval
Check Sum
IP Address-1
IP Address-N
Authentication Data-1
Authentication Data-N

Version: VRRP protocol version number.

VRID: Virtual Router I.D, ~~Indicate the Identifies the~~

Identifies the VRRP Group to which the message belongs.

Routers in the Same VRRP Group ~~Sa~~ uses the Same Virtual Router I.D.

Type: Indicates the type of VRRP, message it generally set to 1 for VRRP advertisement

Priority: Indicates, the priority of the router sending the message. The router with the highest priority is typically elected as master router.

Authentication type: Specifies the authentication method used.

(eg; no authentication, simple password etc.....)

Authentication data: Contains authentication information if authentication is used.

Advertise Interval: Specifies the time interval in seconds between VRRP advertisement messages.
Default value is 1 second

Checksum: A checksum value for error checking the VRRP message.

payload:

Virtual I.P addresses list

The list of virtual IP addresses that are associated with the virtual router.
This is crucial for the routers to know which IP address they need to manage and provide redundancy.

IP Address Count: The no. of IP addresses contained in the VRRP ~~adver~~ advertisement.