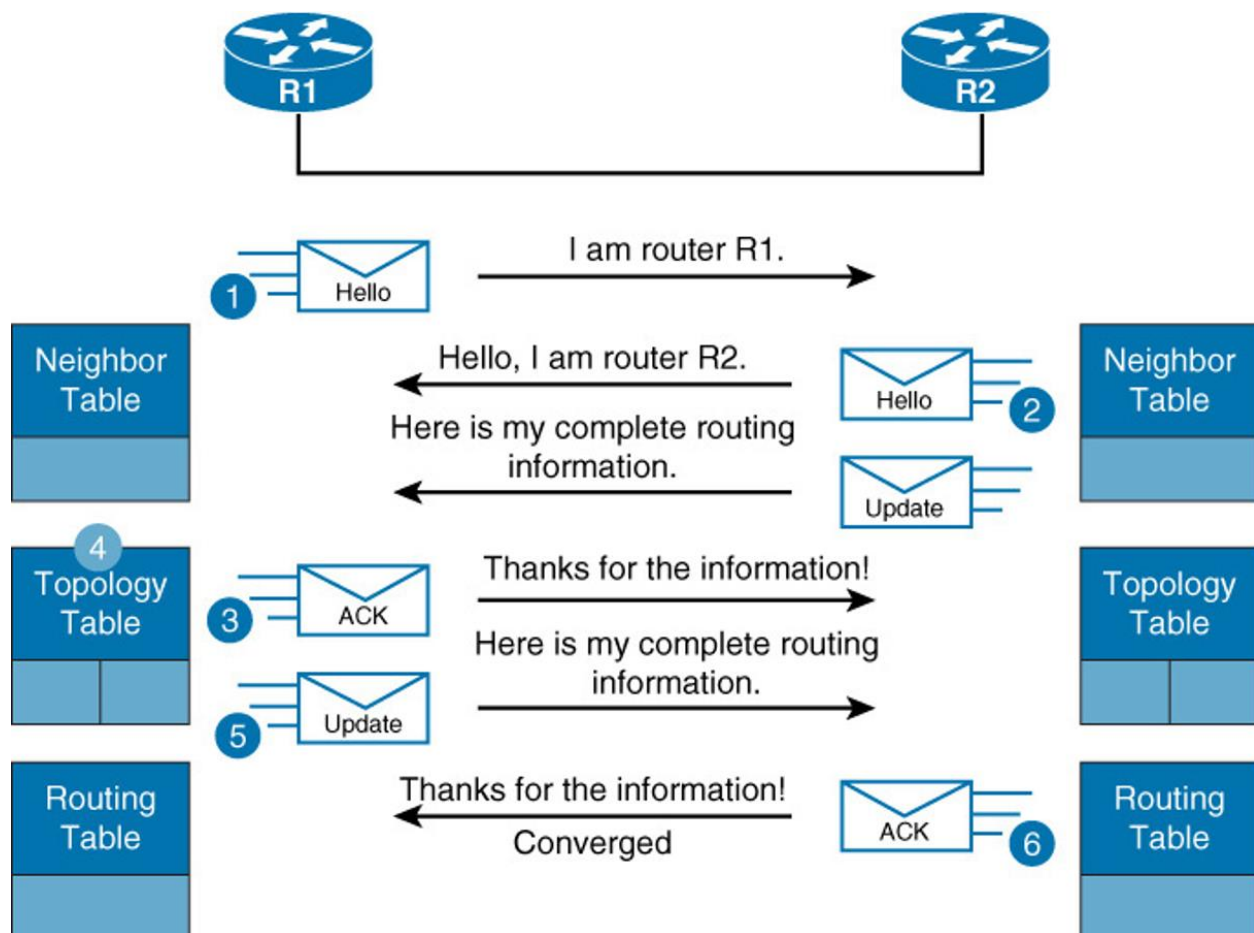


EIGRP Packet Types:

EIGRP uses five packet types in communication with its neighbors. The packet types are below.

Packet	Description
Hello	Used to identify neighbors. They are sent as periodic multicasts.
Update	Used to advertise routes, only sent as multicasts when something is changed.
Ack	Acknowledges receipt of an update.
Query	Used to find alternate paths when all paths to a destination have failed.
Reply	Used to response to query packets about routing information.



```
R1#show ip eigrp traffic
EIGRP-IPv4 Traffic Statistics for AS(1)
Hello sent/received: 2187/2179
Updates sent/received: 10/9
Queries sent/received: 0/0
Replies sent/received: 0/0
Acks sent/received: 9/4
SIA-Queries sent/received: 0/0
SIA-Replies sent/received: 0/0
Hello Process ID: 307
```



Hello:

Hello packets are used for neighbor discovery. As soon as the hello packets send and receive EIGRP routers will try to form the neighbor adjacency. They are multicast to 224.0.0.10. By default, EIGRP sends hello packets every 5 seconds. Hello Packets are used to establish and maintain EIGRP Neighborhood and also use for Keepalive message.

Update:

EIGRP Update Packets are used to send routing updates. With these Update messages, Topology Tables and Routing Tables are built. Update Messages are sent both Unicast and Multicast. If an update is sent to a new neighbor, it is sent as unicast. If this update is related to any route change, then it is sent as Multicast to 224.0.0.10 address. Update packets are acknowledged to ensure reliable transmission.

Query:

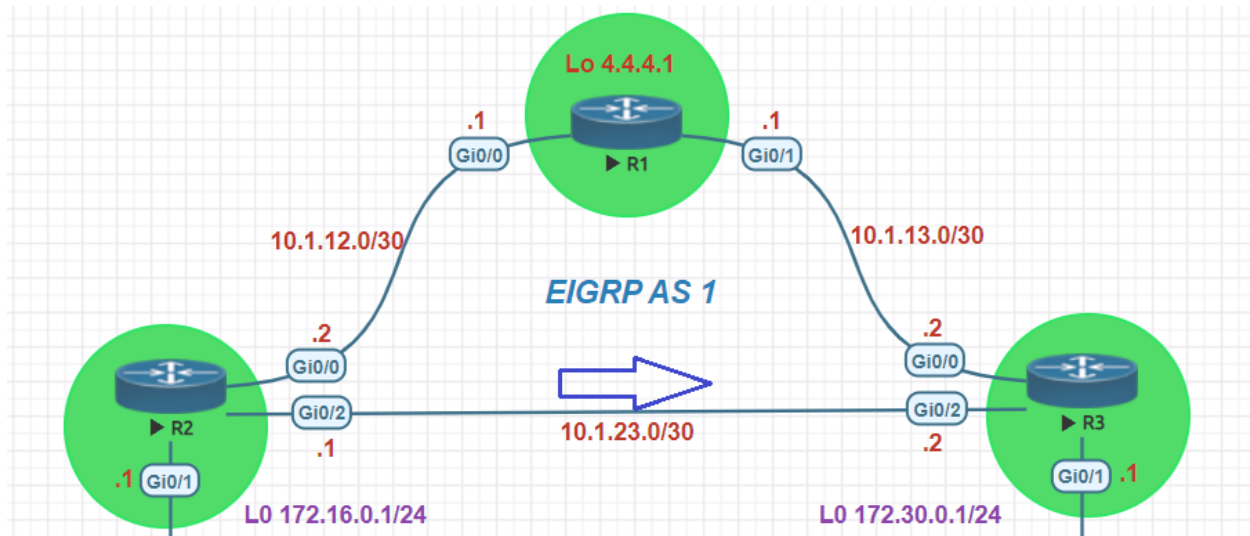
EIGRP sends query packets used to find alternate paths when all paths to a destination have failed. EIGRP Query Packets are used to ask for any routing update, requests an update. Query packets are always multicast. EIGRP uses a query packet to find an alternate path to a particular destination when it has lost the exiting path to the destination. EIGRP always uses the reliable multicast method to send query packets & requires an acknowledgment for each query packet.

Reply:

EIGRP sends reply packets to respond to query packets. Reply packets provide a feasible successor to the sender of the query. Reply packets are unicast to the sender of the query packet. EIGRP Reply Packets are used as a response to the Query Packets. They include the alternate routes to the requested destination. Reply Messages are unicast messages.

ACK:

ACK packets are used to acknowledge the receipt of update, query and replay packets. Ack Packets are used as a feedback to the Update, Query or Reply packets as a feedback mechanism. It is not used for Hello Packets and Ack Packets. Ack messages are empty hello messages without any data. ACK packets are sent by using unicast.



To check on the Wireshark to capture the packets between R2 and R3 interface g0/2.

No.	Time	Source	Destination	Protocol	Length	Info
8	8.943682569	10.1.12.2	10.1.12.1	EIGRP	60	Hello (Ack)
9	9.665030793	50:0b:00:03:00:00	50:0b:00:03:00:00	CDP/VTP/DTP/PAgP/UD...	399	Device ID: R2 Port ID: GigabitEthernet0/0
10	11.132991883	50:0b:00:01:00:00	50:0b:00:01:00:00	LOOP	60	Reply
11	11.918197929	10.1.12.2	224.0.0.10	EIGRP	74	Hello
12	14.447321354	10.1.12.1	224.0.0.10	EIGRP	74	Hello
13	16.050453419	50:0b:00:03:00:00	50:0b:00:03:00:00	LOOP	60	Reply
14	16.912118582	10.1.12.2	224.0.0.10	EIGRP	74	Hello
15	19.082800645	10.1.12.1	224.0.0.10	EIGRP	74	Hello
16	20.528834524	50:0b:00:01:00:00	50:0b:00:01:00:00	CDP/VTP/DTP/PAgP/UD...	399	Device ID: R1 Port ID: GigabitEthernet0/0
17	22.065744096	50:0b:00:01:00:00	50:0b:00:01:00:00	LOOP	60	Reply
18	22.191638605	10.1.12.2	224.0.0.10	EIGRP	74	Hello
19	23.154467074	10.1.12.2	224.0.0.10	EIGRP	539	Query
20	23.164721855	10.1.12.1	10.1.12.2	EIGRP	60	Hello (Ack)
21	23.177541640	10.1.12.2	224.0.0.10	EIGRP	99	Update
22	23.201575763	10.1.12.1	10.1.12.2	EIGRP	539	Reply
23	23.209753271	10.1.12.1	10.1.12.2	EIGRP	60	Hello (Ack)
24	23.227096013	10.1.12.2	10.1.12.1	EIGRP	60	Hello (Ack)
25	23.280948996	10.1.12.2	224.0.0.10	EIGRP	539	Update
26	23.310120286	10.1.12.1	10.1.12.2	EIGRP	60	Hello (Ack)
27	24.423751522	10.1.12.1	224.0.0.10	EIGRP	74	Hello
28	26.710689938	50:0b:00:03:00:00	50:0b:00:03:00:00	LOOP	60	Reply
29	28.632786235	10.1.12.2	224.0.0.10	EIGRP	74	Hello
30	29.092346947	10.1.12.1	224.0.0.10	EIGRP	74	Hello
31	32.888521463	50:0b:00:01:00:00	50:0b:00:01:00:00	LOOP	60	Reply
32	33.555830497	10.1.12.2	224.0.0.10	EIGRP	74	Hello

After hearing "Hello" from R2, R3 will respond with another "Hello" packet. R3 will also send its routing table to R2 by "Update" packets. Remember that R3 will send its complete routing table for the first time. R2 confirms it has received the Update packet by an "ACK" message. R2 will also send to R3 its entire routing table for the first time R3 sends a message saying it has received R2's routing table. Now both R2 and R3 learn all the paths of the neighbor and the network is converged.

EIGRP Debug Packets Commands

R1#debug eigrp packets all

R1#debug eigrp packets hello

R1#debug eigrp packets query

R1#debug eigrp packets reply

R1#debug eigrp packets ack

R1#debug eigrp packets update

```
R1#debug eigrp packets hello
(HELLO)
```

```
EIGRP Packet debugging is on
```

```
R1#
```

```
*Aug 25 17:23:29.540: EIGRP: Sending HELLO on Gi0/1 - paklen 20
```

```
*Aug 25 17:23:29.541: AS 1, Flags 0x0:(NULL), Seq 0/0 interfaceQ 0/0 iidbQ un/rely 0/0
```

```
*Aug 25 17:23:29.675: EIGRP: Sending HELLO on Gi0/0 - paklen 20
```

```
*Aug 25 17:23:29.676: AS 1, Flags 0x0:(NULL), Seq 0/0 interfaceQ 0/0 iidbQ un/rely 0/0
```

```
*Aug 25 17:19:10.693: EIGRP: Lost Peer: Total 1 (5/0/0/0/0)
```

```
*Aug 25 17:19:10.721: EIGRP: Enqueueing QUERY on Gi0/0 - paklen 0 tid 0 iidbQ un/rely 0/1 serno 327-338
```

```
*Aug 25 17:19:10.728: EIGRP: Sending QUERY on Gi0/0 - paklen 530 tid 0
```

```
*Aug 25 17:19:10.730: AS 1, Flags 0x0:(NULL), Seq 85/0 interfaceQ 0/0 iidbQ un/rely 0/0 serno 327-338
```

```
*Aug 25 17:19:10.762: EIGRP: Received ACK on Gi0/0 - paklen 0 nbr 10.1.12.2
```

```
*Aug 25 17:19:10.764: AS 1, Flags 0x0:(NULL), Seq 0/85 interfaceQ 0/0 iidbQ un/rely 0/0 peerQ un/rely 0/1
```

```
*Aug 25 17:19:10.767: EIGRP: GigabitEthernet0/0 multicast flow blocking cleared
```

```
*Aug 25 17:19:10.769: EIGRP: Enqueueing UPDATE on Gi0/0 - paklen 0 tid 0 iidbQ un/rely 0/1 serno 339-339
```

```
*Aug 25 17:19:10.778: EIGRP: Received REPLY on Gi0/0 - paklen 530 nbr 10.1.12.2
```

```
*Aug 25 17:19:10.780: AS 1, Flags 0x0:(NULL), Seq 61/85 interfaceQ 0/0 iidbQ un/rely 0/1 peerQ un/rely 0/0
```

```
*Aug 25 17:19:10.783: EIGRP: Enqueueing ACK on Gi0/0 - paklen 0 nbr 10.1.12.2 tid 0
```

```
*Aug 25 17:19:10.785: Ack seq 61 iidbQ un/rely 0/1 peerQ un/rely 1/0
```

```
*Aug 25 17:19:10.816: EIGRP: Sending UPDATE on Gi0/0 - paklen 45 tid 0
```

```
*Aug 25 17:19:10.817: AS 1, Flags 0x0:(NULL), Seq 86/0 interfaceQ 0/0 iidbQ un/rely 0/0 serno 339-339
```

```
*Aug 25 17:19:10.822: EIGRP: Sending ACK on Gi0/0 - paklen 0 nbr 10.1.12.2 tid 0
```

```
*Aug 25 17:19:10.824: AS 1, Flags 0x0:(NULL), Seq 0/61 interfaceQ 0/0 iidbQ un/rely 0/0 peerQ un/rely 1/1
```

```
*Aug 25 17:19:10.878: EIGRP: Received ACK on Gi0/0 - paklen 0 nbr 10.1.12.2
```

```
*Aug 25 17:19:10.880: AS 1, Flags 0x0:(NULL), Seq 0/86 interfaceQ 0/0 iidbQ un/rely 0/0 peer0 un/relv 0/1
```