

• NETWORKERS

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1



Troubleshooting EIGRP

Session RST-309

Agenda

- **Troubleshooting Common EIGRP Problems**
 - Neighbor Stability
 - Stuck-in-Active Routes
- **Troubleshooting Tools**
 - Event Log
 - Debugs
 - Topology Table

Troubleshooting Neighbor Stability

Cisco.com



- Neighbor process—review

Multicast hellos (by default)

224.0.0.10 (0100.5e00.000a)

Neighbor timers

Hello Interval—5 or 60 sec.

Hold time—15 or 180 sec.

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Neighbor Process—Review

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```
RTRA#show ip eigrp neighbors
```

```
IP-EIGRP neighbors for process 1
```

H	Address	Interface	Hold (sec)	Uptime	SRTT (ms)	RTO	Q Cnt	Seq Num
2	10.1.1.1	Et0	12	6d16h	20	200	0	233
1	10.1.4.3	Et1	13	2w2d	87	522	0	452
0	10.1.4.2	Et1	10	2w2d	85	510	0	314



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Common Neighbor Stability Problems

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- Physical link state changes
- Hold timer expiring
- Exceeding the retry limit
- Manual changes
- Stuck-in-active routes

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Physical Link State Changes

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- Interface driver reports when a link goes down or comes up to EIGRP
- EIGRP takes neighbors down when the interface used to reach them goes down
- EIGRP (re)-initializes neighbors when a link comes up

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Hold Timer Expiring

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- **Hold time sent to neighbors inside the hello packet**
- **Hold timer expires when an EIGRP packet is not seen for period of hold time**

Usually caused by missing multicast hello packets

Typically caused by congestion or physical errors

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Exceeding the Retry Limit

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- **Two types of packets in EIGRP—unreliable and reliable**
 - Hellos and Acks are unreliable**
 - Updates, queries, and replies are reliable**
- **Reliable packets require an acknowledgement**
 - If not acknowledged, packets are retransmitted, up to 16 times**

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Exceeded the Retry Limit (Cont.)

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- **16 retransmits must occur AND hold time period must expire before declaring the neighbor down**

Retransmissions based on RTO, which is derived from SRTT

16 retransmits takes between 50 seconds and 80 seconds

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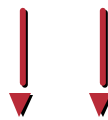
Retry Limit Exceeded (Cont.)

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RTRA#show ip eigrp neighbors

IP-EIGRP neighbors for process 1

H	Address	Interface	Hold (sec)	Uptime	SRTT (ms)	RTO	Q Cnt	Seq Num
2	10.1.1.1	Et0	12	6d16h	20	200	0	233
1	10.1.4.3	Et1	13	2w2d	87	522	0	452
0	10.1.4.2	Et1	10	2w2d	85	510	0	314



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Manual Changes

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- **Manual changes which cause EIGRP neighbors to be reset:**
 - Summary changes**
 - Metric component changes**
 - Route filter changes**

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Neighbor Stability Problems (Cont.)

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- **Stuck-in-active routes**
 - Often very complex problems**
 - Will be covered in later section**

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Troubleshooting Tools for Neighbor Problems

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```
RouterA#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
RouterA(config) #router eigrp 1
RouterA(config-router) #eigrp log-neighbor-changes
RouterA(config-router) #logging buffered 10000
RouterA(config) #service timestamps log datetime msec
RouterA(config) #^Z
RouterA#
```

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Log-Neighbor-Changes Messages

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```
Neighbor 10.1.1.1 (Ethernet0) is down: peer restarted
Neighbor 10.1.1.1 (Ethernet0) is up: new adjacency
Neighbor 10.1.1.1 (Ethernet0) is down: holding time expired
Neighbor 10.1.1.1 (Ethernet0) is down: retry limit exceeded
Neighbor 10.1.1.1 (Ethernet0) is down: route filter changed
Neighbor 10.1.1.1 (Ethernet0) is down: interface delay changed
Neighbor 10.1.1.1 (Ethernet0) is down: interface bandwidth changed
Others, but not often...
```

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Troubleshooting Tools for Neighbor Problems (Cont.)

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```
rp-esc-2621b#debug eigrp packet hello
EIGRP Packets debugging is on (HELLO)
*Mar 16 19:08:38.521: EIGRP: Sending HELLO on Serial1/1
*Mar 16 19:08:38.521: AS 1, Flags 0x0, Seq 0/0 idbQ 0/0 iibbQ un/rely 0/0
*Mar 16 19:08:38.869: EIGRP: Received HELLO on Serial1/1 nbr 10.1.6.2
*Mar 16 19:08:38.869: AS 1, Flags 0x0, Seq 0/0 idbQ 0/0 iibbQ un/rely 0/0
*Mar 16 19:08:39.081: EIGRP: Sending HELLO on FastEthernet0/0
*Mar 16 19:08:39.081: AS 1, Fags 0x0, Seq 0/0 idbQ 0/0 iibbQ un/rely 0/0
*Mar 16 19:08:39.749: EIGRP: Received HELLO on Serial1/2 nbr 10.1.7.2
*Mar 16 19:08:39.749: AS 1, Flags 0x0, Seq 0/0 idbQ 0/0 iibbQ un/rely 0/0
*Mar 16 19:08:40.973: EIGRP: Sending HELLO on FastEthernet0/1
*Mar 16 19:08:40.973: AS 1, Flags 0x0, Seq 0/0 idbQ 0/0 iibbQ un/rely 0/0
*Mar 16 19:08:43.409: EIGRP: Sending HELLO on Serial1/1
*Mar 16 19:08:43.409: AS 1, Flags 0x0, Seq 0/0 idbQ 0/0 iibbQ un/rely 0/0
```

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Unusual Neighbor Problems

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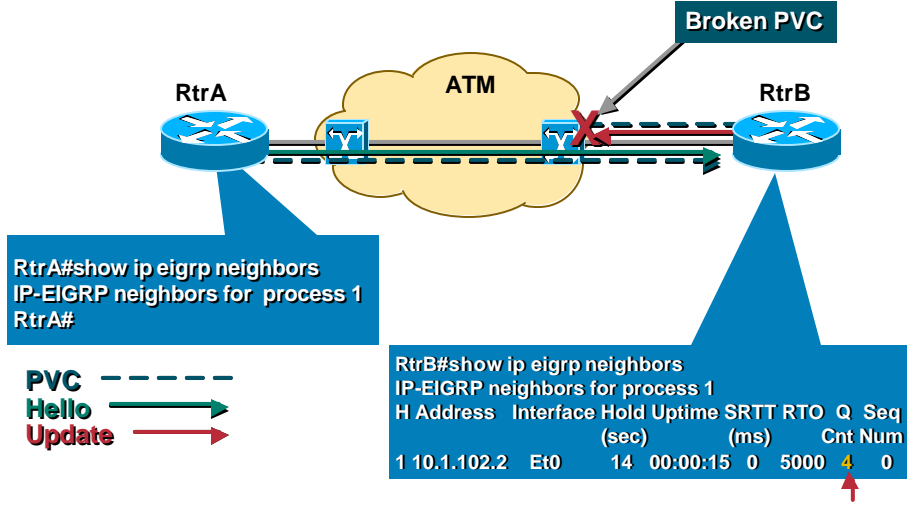
- Unidirectional links
- Mismatched masks
- Mismatch of primary/
secondary addresses

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Unidirectional Links

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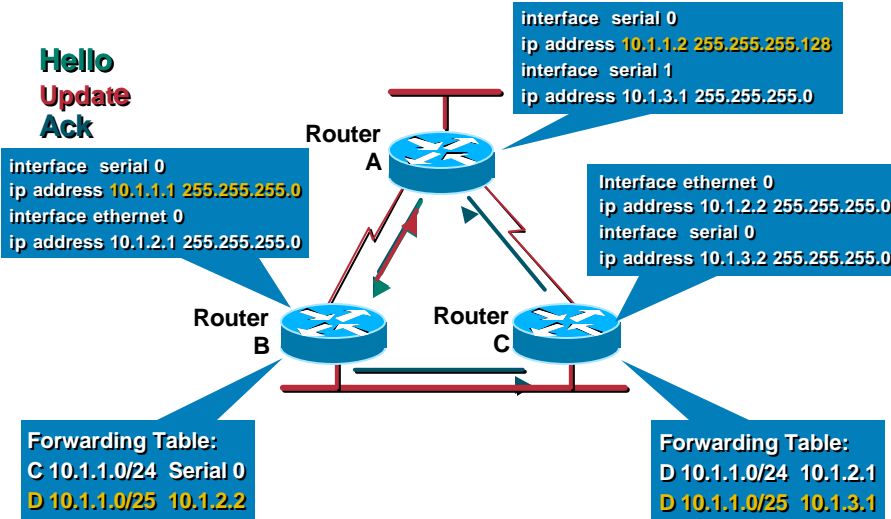


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Mismatched Masks

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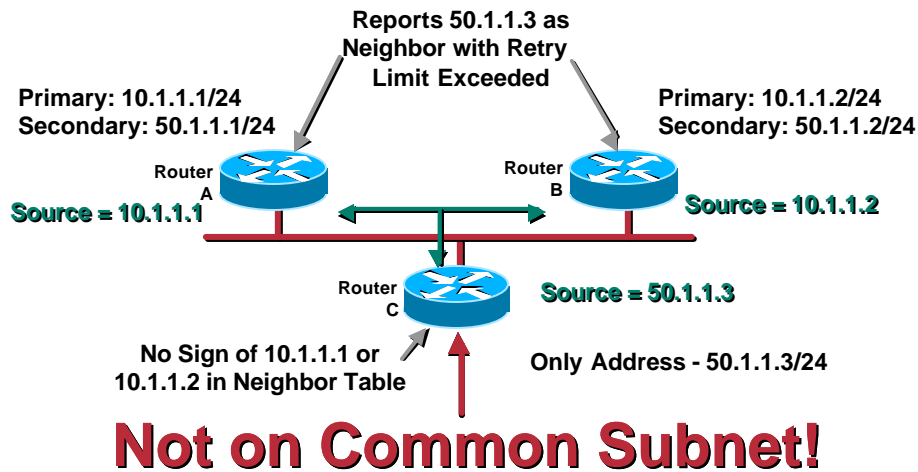


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Primary/Secondary Mismatch

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Agenda

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- Troubleshooting Common EIGRP Problems
 - Neighbor Stability
 - Stuck-in-Active Routes**
- Troubleshooting Tools
 - Event Log
 - Debugs
 - Topology Table

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Stuck-in-Active Routes (SIA)

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**%DUAL-3-SIA: Route 10.64.5.0 255.255.255.192
stuck-in-active state in IP-EIGRP 100. Cleaning up**

- **Indicates at least two problems**
 - A route went active**
 - It got stuck**

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Review of Active Process

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- **Going “active” is the normal process for resolving network topology changes**
- **Normal (stable) state of a route is **passive****
- **Route becomes “active” if it is lost and no other successor or feasible successor exists**

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When the Active Process Fails!

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- **When a route goes active, timer started**
Approximately 3 to 3-1/2 minutes
- **If timer expires without all queries being answered, “stuck” in the active process**

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Stuck-in-Active (Cont.)

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- **On the router where timer expires:**
Reinitializes neighbor(s) who didn't answer
Goes active on all routes known through bounced neighbor(s)
Re-advertises to bounced neighbor all routes that we were advertising

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Likely Causes for Stuck-in-Active

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- Bad or congested links
- Query range is too long
- Excessive redundancy
- Overloaded router (high CPU)
- Router memory shortage
- Software defects (very seldom)

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Troubleshooting SIAs

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- Two (probably) unrelated causes of the problem—**stuck** and **active**
- Need to troubleshoot both parts
 - Cause of active often easier to find
 - Cause of stuck more important to find

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Troubleshooting the Active Part of SIAs

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- **Determine what is common to routes going active**

Flapping link(s)?

From the same region of the network?

/32s from dial-in PPP?

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Troubleshooting the Stuck Part of SIAs

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- ***Show ip eigrp topology active***

Useful only while the problem is occurring

If problem isn't occurring at the time, it is difficult to find the source of route getting stuck

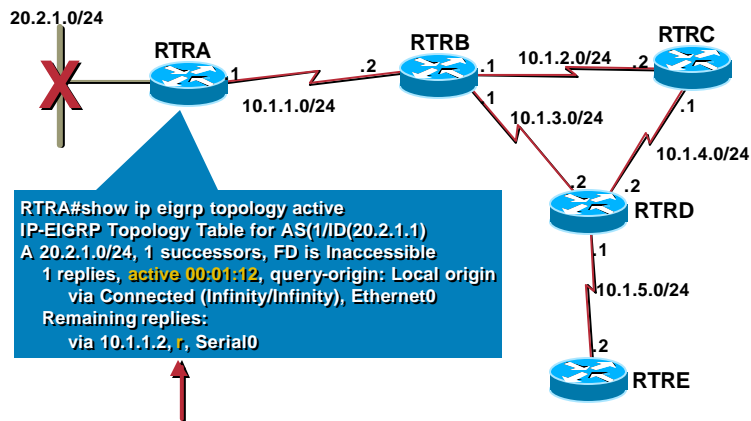
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Chasing Active Routes—Example

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Why Is RTRA Reporting SIA Routes? Let's Look at a Problem in Progress...

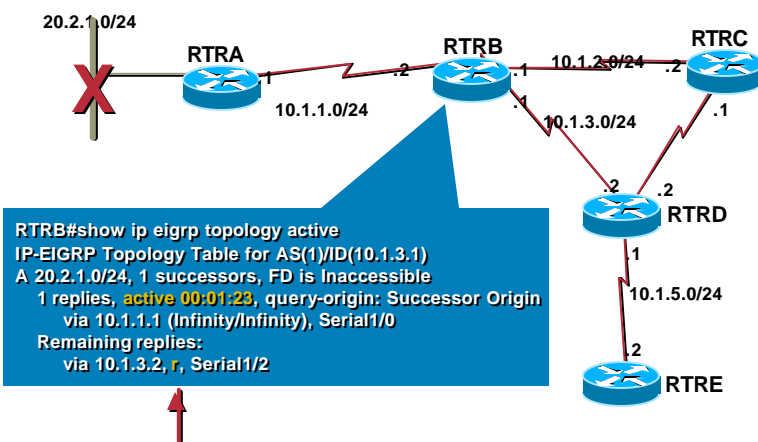


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Chasing Active Routes (Cont.)

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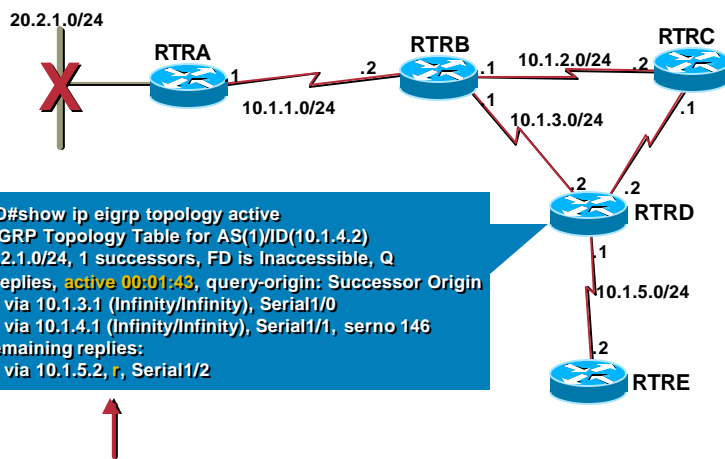


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Chasing Active Routes (Cont.)

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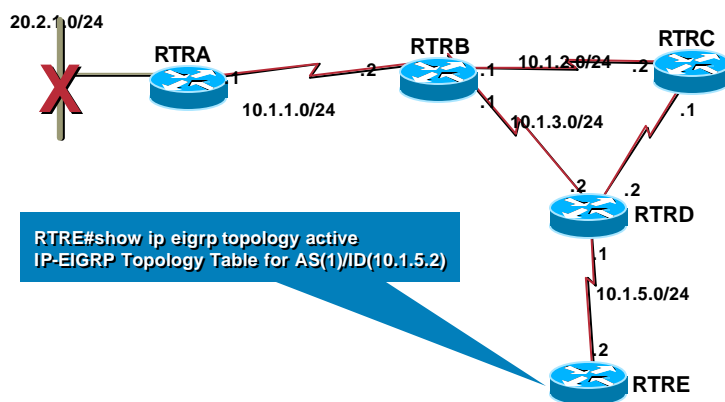


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Chasing Active Routes (Cont.)

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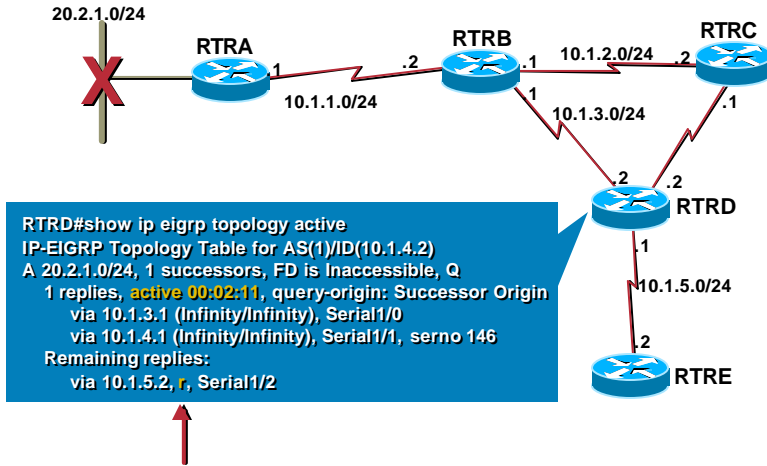


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Chasing Active Routes (Cont.)

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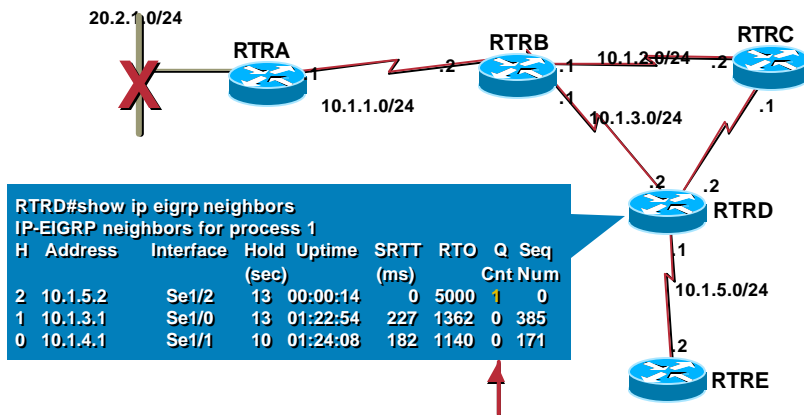


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Chasing Active Routes (Cont.)

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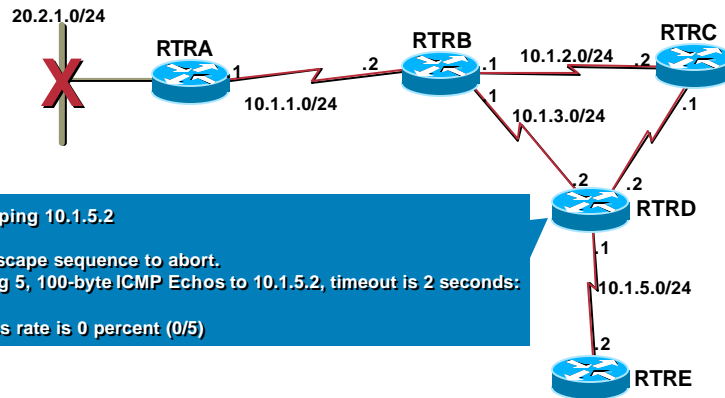


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Chasing Active Routes (Cont.)

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```
RTRD#ping 10.1.5.2
```

```
Type escape sequence to abort.  
Sending 5, 100-byte ICMP Echos to 10.1.5.2, timeout is 2 seconds:  
.....  
Success rate is 0 percent (0/5)
```

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Troubleshooting the Stuck Part of SIAs (Cont.)

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- It's not always this easy to find the cause
- Sometimes you chase the waiting neighbors in a circle
If so, summarize and simplify

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EIGRP SIAs—Enhancement on Handling Active Event

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- **EIGRP active process enhancement bug: CSCdp33034**
- **Integrated in IOS 12.1 release**
Recommended version to run is 12.1.7 or higher

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EIGRP SIAs—Enhancement on Handling Active Event (Cont.)

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- **Enhancements to the EIGRP active process:**
 - Would retransmit queries once, if no reply**
Retransmit time = active timer / 2
 - Give the neighbor a chance to say “I’m still working on it!”**
 - Should push failure point closer to where the problem actually exists**

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Minimizing SIA Routes

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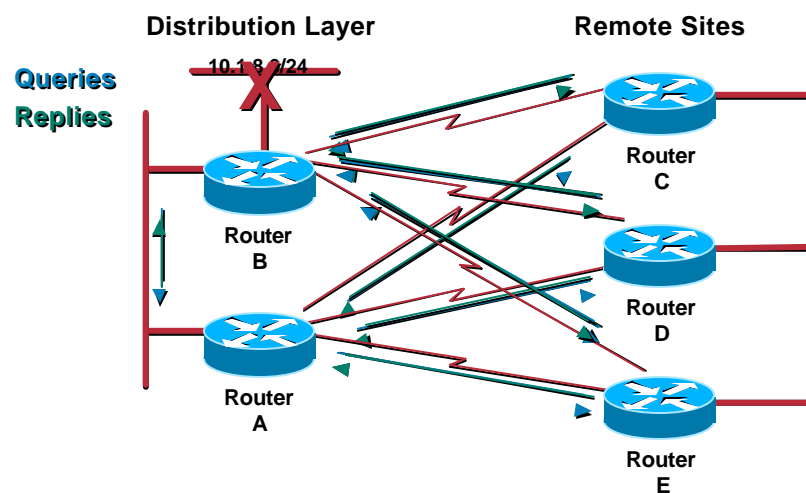
- **Decrease query scope (involve fewer routers in the query process)**
 - Summarization (manual or auto)
 - Distribute-lists
 - Define remote routers as stubs

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Decreasing Query Scope—Example

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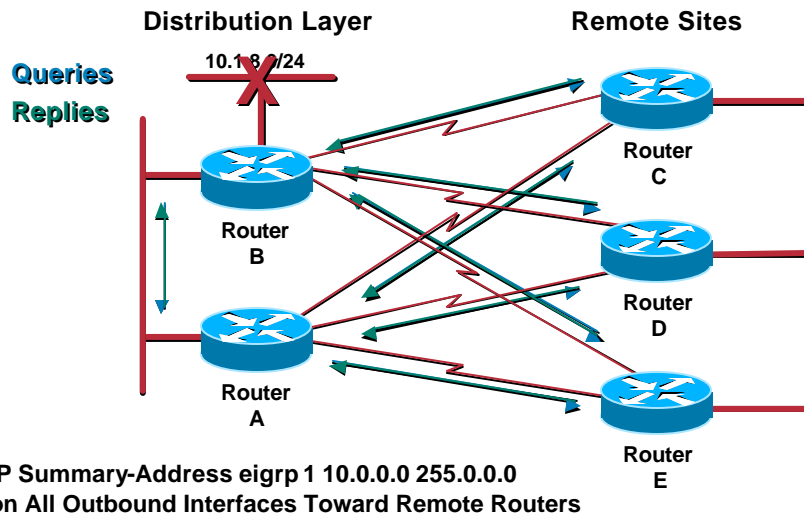


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Decreasing Query Scope—A Little Better

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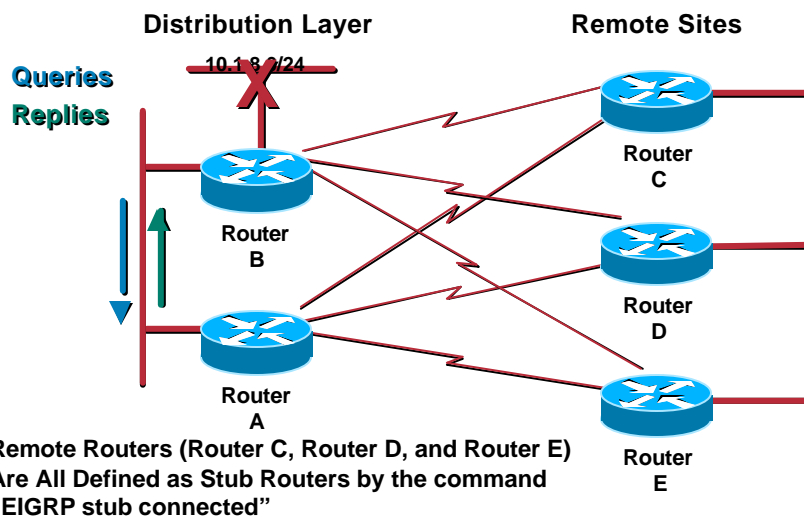
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Decreasing Query Scope—Stub Remotes

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Decreasing Query Scope Stub Routers

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```
Router eigrp 1
  eigrp stub [connected][static][summary][receive-only]
```

- Defined on remote routers
- Restricts route advertisement to connected, static, summary, or none
- Queries are not propagated to stub routers

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Minimizing SIA Routes (Cont.)

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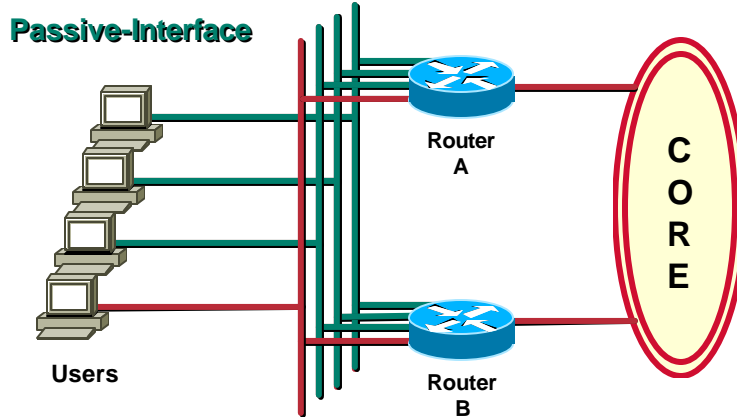
- **Maintain reasonable redundancy**
 - Don't make EIGRP's job too difficult
 - Use passive-interface
 - Use hierarchy

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Removing Excessive Redundancy

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Minimizing SIA Routes (Cont.)

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- **Multiple EIGRP AS' are NOT the answer to minimizing query scope**
 - Terminates original query, but new one starts
 - Adds redistribution complexity
 - Requires distribute-lists to stop routing loops

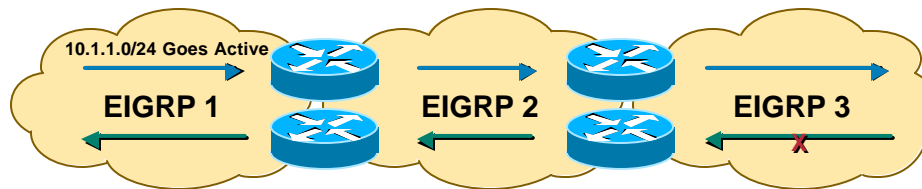
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Multiple EIGRP AS'

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Query
Reply



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Impact of Low-Speed Non-Broadcast Multiple Access (NBMA) Links

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- **Retry limit = hold time**
- **Hold time = 180 seconds**
- **Active timer = 180 seconds**
- **One broken link can cause SIAs**

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EIGRP Troubleshooting Tools

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- **Debugs versus the EIGRP event log**
 - On a busy, unstable network debugs can be hazardous to your health**
 - Event log is non-disruptive—already running**
 - Not for support personnel to interpret**

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Event Log

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- **Always running (unless manually disabled)**
- **Default 500 lines (configurable)**
- **Most recent events at top of log**

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Event Log (Cont.)

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- Three different event types can be logged

EIGRP log-event-type
[dual][xmit][transport]

Default is dual—most useful

Any combination of the three can be on at the same time

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Event Log (Cont.)

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```
RtrA#show ip eigrp events
Event information for AS 1:
1 01:52:51.223 NDB delete: 30.1.1.0/24 1
2 01:52:51.223 RDB delete: 30.1.1.0/24 10.1.3.2
3 01:52:51.191 Metric set: 30.1.1.0/24 4294967295
4 01:52:51.191 Poison squashed: 30.1.1.0/24 lost if
5 01:52:51.191 Poison squashed: 30.1.1.0/24 metric chg
6 01:52:51.191 Send reply: 30.1.1.0/24 10.1.3.2
7 01:52:51.187 Not active net/1=SH: 30.1.1.0/24 1
8 01:52:51.187 FC not sat Dmin/met: 4294967295 46738176
9 01:52:51.187 Find FS: 30.1.1.0/24 46738176
10 01:52:51.187 Rcv query met/succ met: 4294967295 4294967295
11 01:52:51.187 Rcv query dest/nh: 30.1.1.0/24 10.1.3.2
12 01:52:36.771 Change queue emptied, entries: 1
13 01:52:36.771 Metric set: 30.1.1.0/24 46738176
14 01:52:36.771 Update reason, delay: new if 4294967295
15 01:52:36.771 Update sent, RD: 30.1.1.0/24 4294967295
16 01:52:36.771 Update reason, delay: metric chg 4294967295
17 01:52:36.771 Update sent, RD: 30.1.1.0/24 4294967295
18 01:52:36.771 Route install: 30.1.1.0/24 10.1.3.2
19 01:52:36.767 Find FS: 30.1.1.0/24 4294967295
20 01:52:36.767 Rcv update met/succmet: 46738176 46226176
21 01:52:36.767 Rcv update dest/nh: 30.1.1.0/24 10.1.3.2
22 01:52:36.767 Metric set: 30.1.1.0/24 4294967295
```

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Debugs

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- **Remember—can be dangerous**
Use only in the lab or if advised by the TAC
- **To make a little safer:**
logging buffered <size>
no logging console

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Debugs (Cont.)

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- **Use modifiers to limit scope of route events or packet debugs**
Limit to a particular neighbor
debug ip eigrp neighbor AS address
Limit to a particular route
debug ip eigrp AS network mask

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Debug IP EIGRP (Route Events)

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```
RTRA#debug ip eigrp
IP-EIGRP Route Events debugging is on
RTRA#debug ip eigrp neighbor 1 10.1.6.2
IP Neighbor target enabled on AS 1 for 10.1.6.2
IP-EIGRP Neighbor Target Events debugging is on
RTRA#clear ip eigrp neighbor
RTRA#
*Mar 17 15:50:53.244: IP-EIGRP: 10.1.6.0/24 - do advertise out Serial1/2
*Mar 17 15:50:53.244: IP-EIGRP: Int 10.1.6.0/24 metric 20512000 -20000000 512000
*Mar 17 15:50:53.244: IP-EIGRP: 10.1.8.0/24 - do advertise out Serial1/2
*Mar 17 15:50:53.244: IP-EIGRP: Int 10.1.8.0/24 metric 28160 - 256002560
*Mar 17 15:50:53.244: IP-EIGRP: 10.1.7.0/24 - do advertise out Serial1/2
*Mar 17 15:50:53.244: IP-EIGRP: 10.1.1.0/24 - do advertise out Serial1/2
*Mar 17 15:50:53.244: IP-EIGRP: Int 10.1.1.0/24 metric 28160 - 25600256
*Mar 17 15:50:53.668: IP-EIGRP: Processing incoming UPDATE packet
*Mar 17 15:50:54.544: IP-EIGRP: 10.1.6.0/24 - do advertise out Serial1/1
```

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Debug IP EIGRP (Cont.)

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```
RTRA#debug ip eigrp
IP-EIGRP Route Events debugging is on
RTRA#debug ip eigrp 1 10.1.7.0 255.255.255.0
IP Target enabled on AS 1 for 10.1.7.0/24
IP-EIGRP AS Target Events debugging is on
RTRA#clear ip eigrp neighbor
*Mar 17 15:52:20.940: IP-EIGRP: 10.1.7.0/24 - do advertise out Serial1/2
*Mar 17 15:52:22.684: IP-EIGRP: 10.1.7.0/24 - do advertise out Serial1/1
*Mar 17 15:52:22.684: IP-EIGRP: Int 10.1.7.0/24 metric 20512000 20000000 512000
*Mar 17 15:52:22.940: IP-EIGRP: 10.1.7.0/24 - do advertise out Serial1/2
*Mar 17 15:52:22.968: IP-EIGRP: Processing incoming UPDATE packet
*Mar 17 15:52:24.684: IP-EIGRP: 10.1.7.0/24 - do advertise out Serial1/1
*Mar 17 15:52:24.684: IP-EIGRP: Int 10.1.7.0/24 metric 20512000 - 20000000 512000
*Mar 17 15:52:25.940: IP-EIGRP: 10.1.7.0/24 - do advertise out Serial1/2
```

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64

Debug EIGRP Packet <type>

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RTR#**debug eigrp packet ?**

ack	EIGRP ack packets
hello	EIGRP hello packets
ipxsap	EIGRP ipxsap packets
probe	EIGRP probe packets
query	EIGRP query packets
reply	EIGRP reply packets
request	EIGRP request packets
stub	EIGRP stub packets
retry	EIGRP retransmissions
terse	Display all EIGRP packets except Hellos
update	EIGRP update packets
verbose	Display all EIGRP packet

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Debug EIGRP Packet Terse

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Rtr#**debug eigrp packet terse**

EIGRP Packets debugging is on
(UPDTE, REQUEST, QUERY, REPLY, IPXSAP, PROBE, ACK, STUB)

```
EIGRP: Enqueueing UPDATE on Serial1/0 iibQ un/rely 0/1 serno 19707-19707
EIGRP: Enqueueing UPDATE on Serial1/1 iibQ un/rely 0/1 serno 19707-19707
EIGRP: Enqueueing UPDATE on Serial1/2 iibQ un/rely 0/1 serno 19707-19707
EIGRP: Enqueueing UPDATE on Serial1/0 nbr 10.1.1.2 iibQ un/rely 0/0 peerQ un/rely 0/0 serno 19707-19707
EIGRP: Enqueueing UPDATE on Serial1/1 nbr 10.1.2.2 iibQ un/rely 0/0 peerQ un/rely 0/0 serno 19707-19707
EIGRP: Enqueueing UPDATE on Serial1/2 nbr 10.1.3.2 iibQ un/rely 0/0 peerQ un/rely 0/0 serno 19707-19707
EIGRP: Sending UPDATE on Serial1/0 nbr 10.1.1.2
AS 1, Flags 0x0, Seq 2831/1329 iibQ 0/0 iibQ un/rely 0/0 peerQ un/rely 0/1 serno 19707-19707
EIGRP: Sending UPDATE on Serial1/1 nbr 10.1.2.2
AS 1, Flags 0x0, Seq 2832/1708 iibQ 0/0 iibQ un/rely 0/0 peerQ un/rely 0/1 serno 19707-19707
EIGRP: Sending UPDATE on Serial1/2 nbr 10.1.3.2
AS 1, Flags 0x0, Seq 2833/1680 iibQ 0/0 iibQ un/rely 0/0 peerQ un/rely 0/1 serno 19707-19707
EIGRP: Received ACK on Serial1/0 nbr 10.1.1.2
AS 1, Flags 0x0, Seq 0/2831 iibQ 0/0 iibQ un/rly 0/0 peerQ un/rely 0/1
EIGRP: Serial1/0 multicast flow blocking cleared
EIGRP: Received ACK on Serial1/1 nbr 10.1.2.2
AS 1, Flags 0x0, Seq 0/2832 iibQ 0/0 iibQ un/rely 0/0 peerQ un/rely 0/1
EIGRP: Serial1/1 multicast flow blocking cleared
```

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66

Debug IP EIGRP Notifications

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```
rp-esc-2621b#debug ip eigrp notifications
IP-EIGRP Event notification debugging is on
rp-esc-2621b#clear ip route *
rp-esc-2621b#
*Mar 17 15:58:07.144: IP-EIGRP: Callback: reload_iptable
*Mar 17 15:58:08.148: IP-EIGRP: iptable_redistribute into eigrp AS 1
*Mar 17 15:58:12.144: IP-EIGRP: Callback: redist frm static AS 0 100.100.100.0/24
*Mar 17 15:58:12.144:      into: eigrp AS 1 event: 1
*Mar 17 15:58:12.144: IP-EIGRP: Callback: redist frm static AS 0 200.200.200.0/24
*Mar 17 15:58:12.144:      into: eigrp AS 1 event: 1
```

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67

Debug EIGRP FSM (Finite State Machine)

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```
RTRA#debug eigrp fsm
EIGRP FSM Events/Actions debugging is on
RTRA#clear ip route *
RTRA#
*Mar 17 15:59:04.972: DUAL: Find FS for dest 10.1.8.0/24. FD is 28160, RD is 28160
*Mar 17 15:59:04.972: DUAL: 0.0.0.0 metric 28160/0 found Dmin is 28160
*Mar 17 15:59:04.976: DUAL: Find FS for dest 10.1.3.0/24. FD is 21024000, RD is 21024000
*Mar 17 15:59:04.976: DUAL: 10.1.6.2 metric 21024000/2169856 found Dmin is 21024000
*Mar 17 15:59:04.976: DUAL: RT installed 10.1.3.0/24 via 10.1.6.2
*Mar 17 15:59:04.976: DUAL: Find FS for dest 10.1.2.0/24. FD is 21536000, RD is 21536000
```

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68

Topology Table

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- The topology table is probably the most critical structure in EIGRP
 - Contains building blocks used by DUAL
 - Used to create updates for neighbors/populate routing table
- Understanding topology table contents is very important to understanding EIGRP and help EIGRP troubleshooting

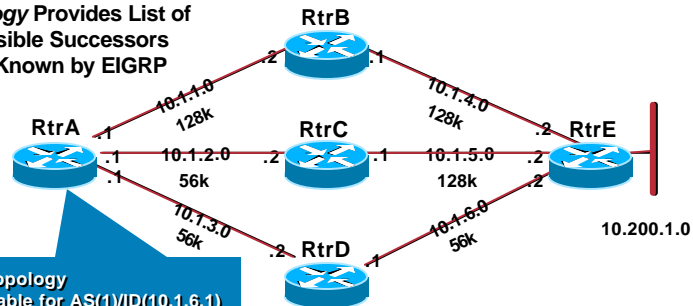
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69

Show IP EIGRP Topology

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Show ip eigrp topology Provides List of Successors and Feasible Successors For All Destinations Known by EIGRP



RtrA#show ip eigrp topology
IP-EIGRP Topology Table for AS(1)/ID(10.1.6.1)

```
.....snip.....
P 10.200.1.0/24, 1 successors, FD is 21026560
  via 10.1.1.2 (21026560/20514560), Serial1/0
  via 10.1.2.2 (46740736/20514560), Serial1/1
```

Feasible Distance
Successor
Feasible Successor

FD Thru RD
This Neighbor

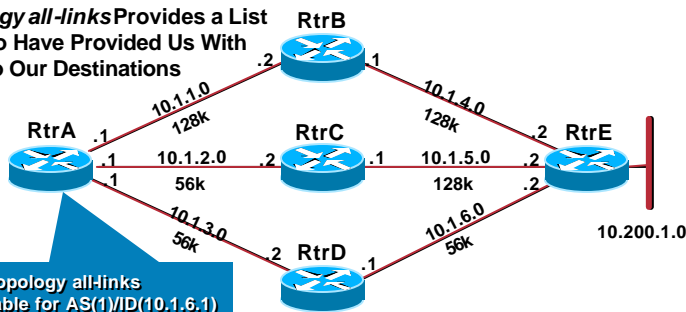
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70

Show IP EIGRP Topology All-Links

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Show ip eigrp topology all-links Provides a List Of All Neighbors Who Have Provided Us With an Alternative Path to Our Destinations



RtrA#show ip eigrp topology all-links
IP-EIGRP Topology Table for AS(1)/ID(10.1.6.1)

```
.....snip.....
P 10.200.1.0/24, 1 successors, FD is 21026560
  via 10.1.1.2 (21026560/20514560), Serial1/0
  via 10.1.2.2 (46740736/20514560), Serial1/1
  via 10.1.3.2 (46740736/46228736), Serial1/2
```

Successor
Feasible Successor
Possible Successor

RD

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71

Show IP EIGRP Topology <network><mask>

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RtrA#show ip eigrp topology 10.200.1.0 255.255.255.0
IP-EIGRP topology entry for 10.200.1.0/24
State is Passive, Query origin flag is 1, 1 Successor(s), FD is 21026560

Routing Descriptor Blocks:

10.1.1.2 (Serial1/0), from 10.1.1.2, Send flag is 0x0

Composite metric is (21026560/20514560), Route is Internal

Vector metric:

Minimum bandwidth is 128 Kbit

Total delay is 40100 microseconds

Reliability is 255/255

Load is 1/255

Minimum MTU is 1500

Hop count is 2

10.1.2.2 (Serial1/1), from 10.1.2.2, Send flag is 0x0

Composite metric is (46740736/20514560), Route is Internal

Vector metric:

Minimum bandwidth is 56 Kbit

Total delay is 40100 microseconds

Reliability is 255/255

Load is 1/255

Minimum MTU is 1500

Hop count is 2

10.1.3.2 (Serial1/2), from 10.1.3.2, Send flag is 0x0

Composite metric is (46740736/46228736), Route is Internal

Vector metric:

Minimum bandwidth is 56 Kbit

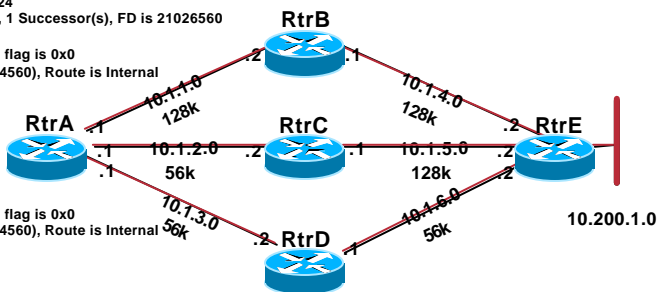
Total delay is 40100 microseconds

Reliability is 255/255

Load is 1/255

Minimum MTU is 1500

Hop count is 2



Showing the Topology Table Entry for A Single Route by Supplying the Network And Mask Gives Detailed Information For All Alternative Paths Received for That Destination (Similar to All-Links)

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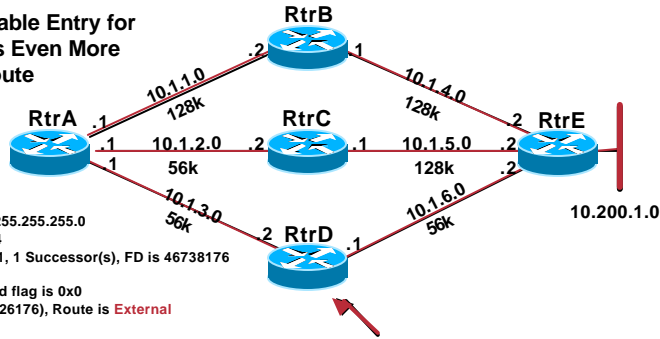
72

Show IP EIGRP Topology

<network><mask>

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Showing the Topology Table Entry for an External Route Shows Even More Information About the Route



```
RtrA#show ip eigrp topology 30.1.1.0 255.255.255.0
IP-EIGRP topology entry for 30.1.1.0/24
State is Passive, Query origin flag is 1, 1 Successor(s), FD is 46738176
Routing Descriptor Blocks:
10.1.3.2 (Serial1/2), from 10.1.3.2, Send flag is 0x0
Composite metric is (46738176/46226176), Route is External
Vector metric:
Minimum bandwidth is 56 Kbit
Total delay is 40000 microseconds
Reliability is 255/255
Load is 1/255
Minimum MTU is 1500
Hop count is 1
External data:
Originating router is 64.1.4.14
AS number of route is 0
External protocol is Static, external metric is 0
Administrator tag is 0 (0x00000000)
```

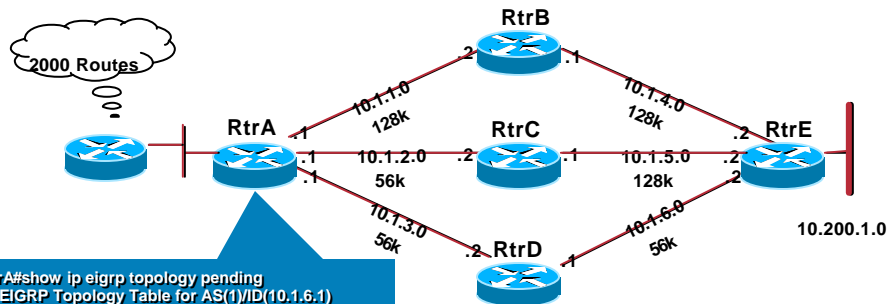
Static Route to 30.1.1.0/24 is Redistributed into EIGRP

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73

Show IP EIGRP Topology Pending

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```
RtrA#show ip eigrp topology pending
IP-EIGRP Topology Table for AS(1)/ID(10.1.6.1)
```

Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply, r - Reply status

```
P 50.8.58.0/24, 1 successors, FD is 30713, U
via 10.100.1.2 (30713/3120), FastEthernet0/0
P 50.7.53.0/24, 1 successors, FD is 31889, U
via 10.100.1.2 (31889/9407), FastEthernet0/0
P 50.6.52.0/24, 1 successors, FD is 32560, U
via 10.100.1.2 (32560/10212), FastEthernet0/0
...snip...
```

Using Show IP EIGRP Topology Pending, We Can See If We Have Anything Pending to Send to Our Neighbors

Pending Updates Queued to Send to Neighbors

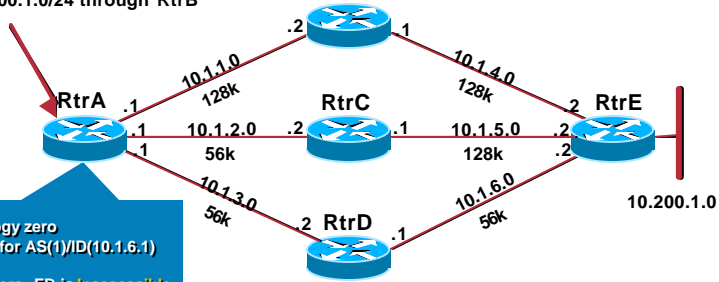
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74

Show IP EIGRP Topology Zero

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Static Route to 10.200.1.0/24 through RtrB



```
RtrA#show ip eigrp topology zero
IP-EIGRP Topology Table for AS(1)/ID(10.1.6.1)

P 10.200.1.0/24, 0 successors, FD is Inaccessible
  via 10.1.1.2 (21026560/20514560), Serial1/0
  via 10.1.2.2 (46740736/20514560), Serial1/1
  via 10.1.3.2 (46740736/46228736), Serial1/2
RtrA#show ip route 10.200.1.0 255.255.255.0
Routing entry for 10.200.1.0/24
  Known via "static", distance 1, metric 0
  Routing Descriptor Blocks:
    * 10.1.1.2
      Route metric is 0, traffic share count is 1
```

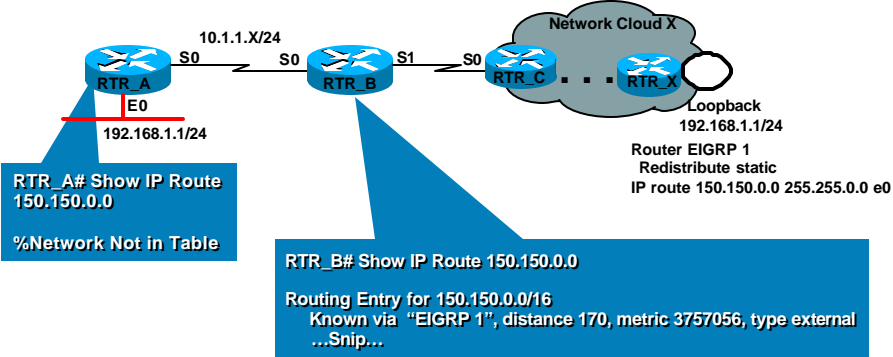
Routes That Fail to Get Installed in the Routing Table By EIGRP Because There is a Route With a Better Administrative Distance Already in the Routing Table Appear in the Topology Table As "Zero Successor" Routes

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75

EIGRP Not Installing External Routes (Case Study)

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```
RTR_A# Show IP Route
150.150.0.0
%Network Not in Table
```

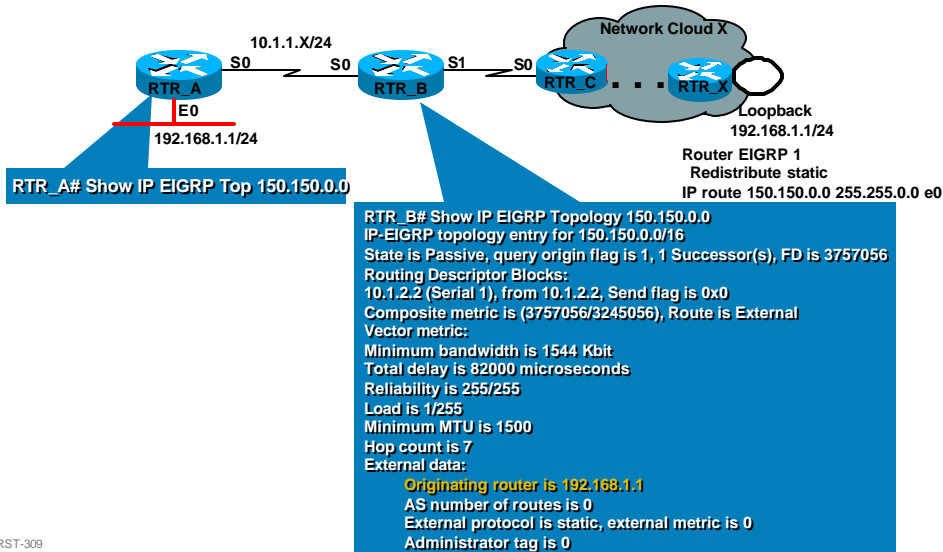
```
RTR_B# Show IP Route 150.150.0.0
Routing Entry for 150.150.0.0/16
  Known via "EIGRP 1", distance 170, metric 3757056, type external
  ...Snip...
```

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76

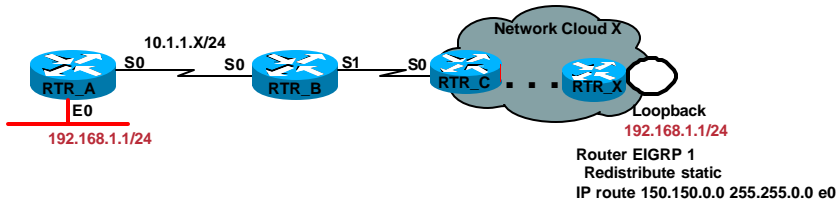
EIGRP Not Installing External Routes (Case Study) (Cont.)

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EIGRP Not Installing External Routes (Case Study) (Cont.)

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- The problem is the duplicate router ID for EIGRP between router X and router A
- RTR_A ignores the update because of same router ID as router X

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78

EIGRP Troubleshooting Summary

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- **Most problems seen in EIGRP networks are caused by factors outside of EIGRP, itself (congestion, lack of summarization, etc.)**
- **There are many tools and techniques available for troubleshooting problems in EIGRP networks**

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79

Further Reading on Troubleshooting EIGRP

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- **Routing TCP/IP Volume I**
By Jeff Doyle
- **EIGRP Network Design Solutions**
By Ivan Pepelnjak
- **Troubleshooting IP Routing Protocols (coming soon)**

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80

Questions?

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81

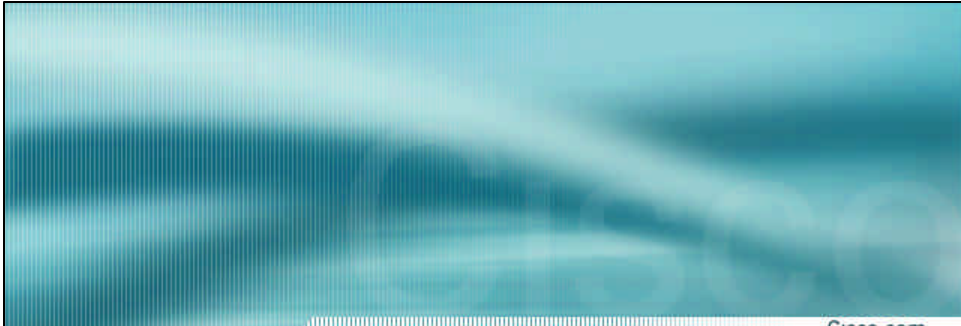
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Troubleshooting EIGRP

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Please Complete Your Evaluation Form


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84