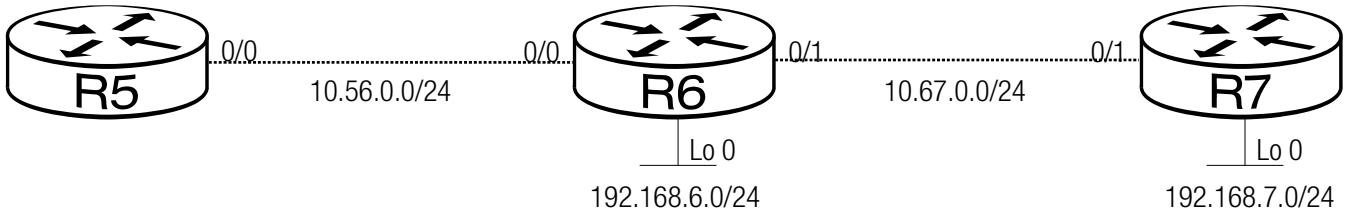
Starting Configuration



R5	R6	R7

`hostname R5`
`interface gi0/0`
` description TO R6`
` ip address 10.56.0.5 255.255.255.0`
	`hostname R6`
	`interface gi0/0`
	` description TO R5`
	` ip address 10.56.0.6 255.255.255.0`
	`interf gi0/1`
	` description TO R7`
	` ip address 10.67.0.6 255.255.255.0`
	`interface Loopback0`
	` ip address 192.168.6.1 255.255.255.0`
		`hostname R7`
		`interface gi0/1`
		` description TO R6`
		` ip address 10.67.0.7 255.255.255.0`
		`interface Lo0`
		` ip address 192.168.7.1 255.255.255.0`

`router rip`
` version 2`
` network 10.0.0.0`
	`router rip`
	` version 2`
	` network 10.0.0.0`
	` network 192.168.6.0`
		`router rip`
		` version 2`
		` network 10.0.0.0`
		` network 192.168.7.0`

Reverse Engineering the Configuration with Show Commands

Configuration	Show Command
`version 2`	`show ip protocols`
`network 10.0.0.0` (and thus, what interfaces have RIP enabled)	`show ip rip database` (Look for directly connected interfaces)
`[no] auto-summary`	`show ip protocols`
`maximum paths 2`	`show ip protocols` Book says default is to put all routes in the routing table, but my 2851 routers seem to default to 4 routes, max 32

R> show ip protocols

Tells what routing protocol & version is running, on which interfaces, and for which subnets. In this case, I forgot the "version 2" line in R7's RIP config, so R7 learns from R6, but not vice versa. The "version 2" config on R6 prevents it from processing v1 updates from R7.

Notice also that auto-summary is in effect (by default).

R6 With RIP v2

```
R6# show ip protocols
*** IP Routing is NSF aware ***

Routing Protocol is "rip"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Sending updates every 30 seconds, next due in 25 seconds
  Invalid after 180 seconds, hold down 180, flushed after 240
  Redistributing: rip
  Default version control: send version 2, receive version 2
    Interface             Send  Recv  Triggered RIP  Key-chain
    GigabitEthernet0/0    2     2
    GigabitEthernet0/1    2     2
    Loopback0             2     2
  Automatic network summarization is in effect
  Maximum path: 4
  Routing for Networks:
    10.0.0.0
    192.168.6.0
  Routing Information Sources:
    Gateway         Distance      Last Update
  Distance: (default is 120)
```

R7 With RIP v1

```
R7(config)#do sho ip protocols
*** IP Routing is NSF aware ***

Routing Protocol is "rip"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Sending updates every 30 seconds, next due in 19 seconds
  Invalid after 180 seconds, hold down 180, flushed after 240
  Redistributing: rip
  Default version control: send version 1, receive any version
    Interface             Send  Recv  Triggered RIP  Key-chain
    GigabitEthernet0/1    1     1 2
    Loopback0             1     1 2
  Automatic network summarization is in effect
  Maximum path: 4
  Routing for Networks:
    10.0.0.0
    192.168.7.0
  Routing Information Sources:
    Gateway         Distance      Last Update
    10.67.0.6            120      00:00:00
  Distance: (default is 120)
```

R> show ip route [rip]

```
R5> show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route, H - NHRP, l - LISP
       + - replicated route, % - next hop override

Gateway of last resort is not set

      10.0.0.0/8 is variably subnetted, 3 subnets, 2 masks
C        10.56.0.0/24 is directly connected, GigabitEthernet0/0
L        10.56.0.5/32 is directly connected, GigabitEthernet0/0
R        10.67.0.0/24 [120/1] via 10.56.0.6, 00:00:08, GigabitEthernet0/0
      192.168.5.0/24 is variably subnetted, 2 subnets, 2 masks
C        192.168.5.0/24 is directly connected, Loopback0
L        192.168.5.1/32 is directly connected, Loopback0
R     192.168.6.0/24 [120/1] via 10.56.0.6, 00:00:08, GigabitEthernet0/0

R5> show ip route rip
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route, H - NHRP, l - LISP
       + - replicated route, % - next hop override

Gateway of last resort is not set

      10.0.0.0/8 is variably subnetted, 3 subnets, 2 masks
R        10.67.0.0/24 [120/1] via 10.56.0.6, 00:00:16, GigabitEthernet0/0
R     192.168.6.0/24 [120/1] via 10.56.0.6, 00:00:16, GigabitEthernet0/0
```

R> show ip rip database

In addition to subnets learned from RIP, shows directly connected subnets on interfaces where RIP is enabled with a "network" command. This allows you to reverse-engineer the "network" statements on any given router.

R5 Before R7 RIP Version Fixed	R5 After R7 RIP Version 2
R5>sho ip rip database 10.0.0.0/8 auto-summary 10.56.0.0/24 directly connected, GigabitEthernet0/0 10.67.0.0/24 [1] via 10.56.0.6, 00:00:02, GigabitEthernet0/0 192.168.6.0/24 auto-summary 192.168.6.0/24 [1] via 10.56.0.6, 00:00:02, GigabitEthernet0/0	R5>show ip rip database 10.0.0.0/8 auto-summary 10.56.0.0/24 directly connected, GigabitEthernet0/0 10.67.0.0/24 [1] via 10.56.0.6, 00:00:20, GigabitEthernet0/0 192.168.6.0/24 auto-summary 192.168.6.0/24 [1] via 10.56.0.6, 00:00:20, GigabitEthernet0/0 192.168.7.0/24 auto-summary 192.168.7.0/24 [2] via 10.56.0.6, 00:00:20, GigabitEthernet0/0

R(config-router) default-information originate

```
R6(config)# ip route 0.0.0.0 0.0.0.0 gi0/0 10.56.0.5
R6(config)# router rip
R6(config-router)# default-information originate

R6# show ip route static
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       <some codes omitted>

Gateway of last resort is 10.56.0.5 to network 0.0.0.0

S*    0.0.0.0/0 [1/0] via 10.56.0.5, GigabitEthernet0/0
```

OK, the default route is correctly set locally on R6, now did it propogate via RIP to R7? If it had come from DHCP, the AD would be 254 instead of 1.

```
R7# show ip route

Gateway of last resort is 10.67.0.6 to network 0.0.0.0

R*    0.0.0.0/0 [120/1] via 10.67.0.6, 00:00:21, GigabitEthernet0/1
```

Yep, it did. The R and the 120 both show that it came from RIP.