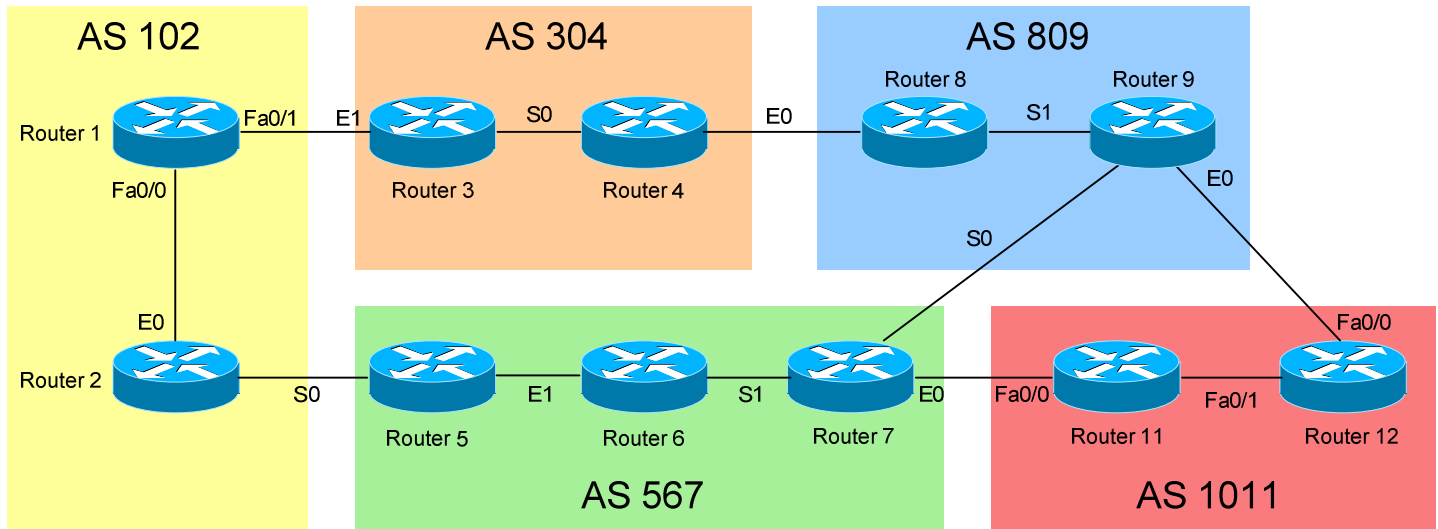


## - Multi-Protocol Lab 3 -

### Multi-Protocol Environment - Lab 3



#### Basic Objectives:

1. Configure and cable the Serial/Ethernet interfaces as indicated in the above diagram.
2. Configure the IP addresses on the routers using the following schemes:

Router 1 – 2 = 192.168.12.x/24	Router 6 – 7 = 172.16.67.x/24
Router 1 – 3 = 192.168.13.x/24	Router 7 – 9 = 172.16.79.x/24
Router 3 – 4 = 192.168.34.x/24	Router 8 – 9 = 172.16.89.x/24
Router 2 – 5 = 192.168.25.x/24	Router 7 - 11 = 172.16.117.x/24
Router 4 – 8 = 192.168.48.x/24	Router 9 – 12 = 172.16.129.x/24
Router 5 – 6 = 192.168.56.x/24	Router 11 – 12 = 172.16.121.x/24

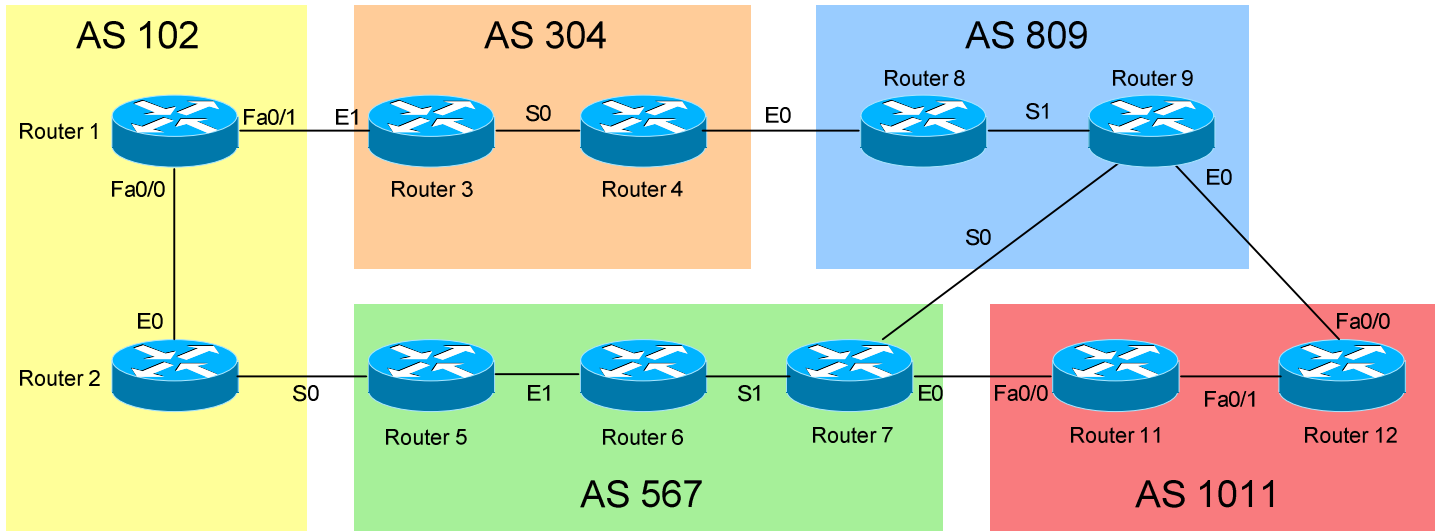
3. Configure a loopback0 interface on each router. The interface should have an address using the following scheme: Y.Y.Y.Y/24. For example, Router 4's loopback0 should be 4.4.4.4/24.

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**Multi-Protocol Environment - Lab 3 (continued)**



**Core Objectives:**

4. All routers in the above diagram should run BGP, with the exception of Router 6. Autonomous System numbers should be configured as shown. Additionally:
  - a. All BGP updates should be sourced from the loopback interface
  - b. All BGP neighbors should be authenticated with a password of "CISCO"

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5. The internal networks within each AS can utilize an IGP of your choosing. Remember, Router 6 cannot run BGP. All IGP updates should be authenticated using the most secure method available.

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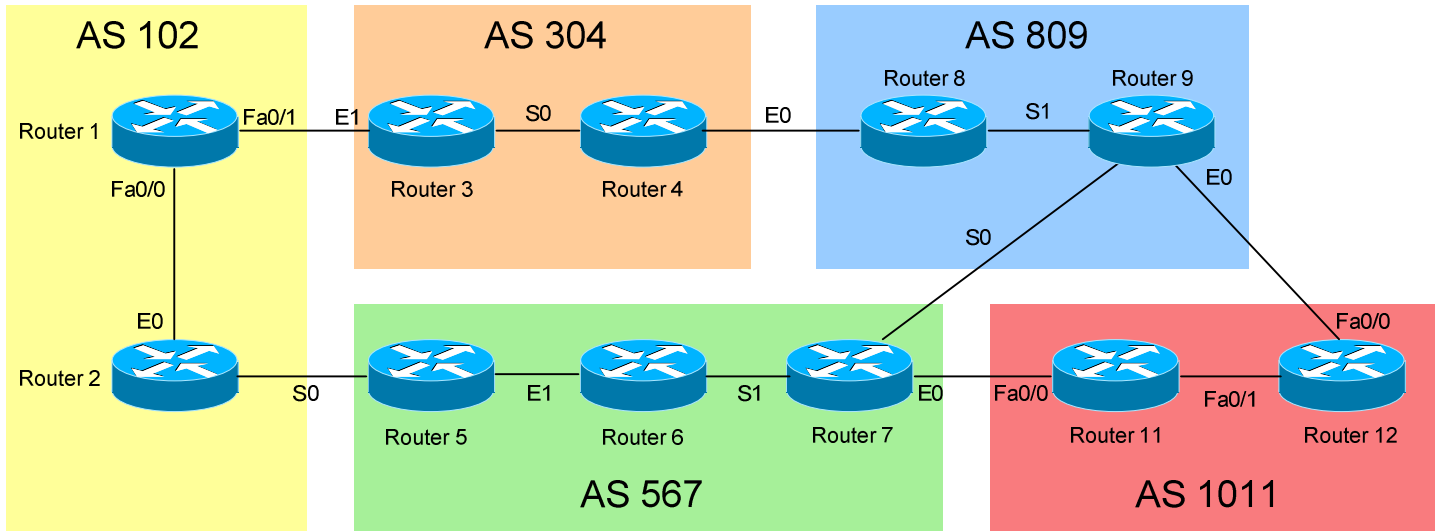
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**Multi-Protocol Environment - Lab 3 (continued)**



**Core Objectives:**

6. Router 1, Router 2, Router 4, Router 6, and Router 12 should inject additional routes into this internetwork. These networks should be reachable via ICMP. You are not allowed to use static routes. The additional networks should be as followed:
  - a. Router 1 = 101.101.1-7.x/24
  - b. Router 2 = 102.102.1-7.x/24
  - c. Router 4 = 104.104.1-7.x/24
  - d. Router 6 = 106.106.1-7.x/24
  - e. Router 12 = 122.122.1-7.x/24

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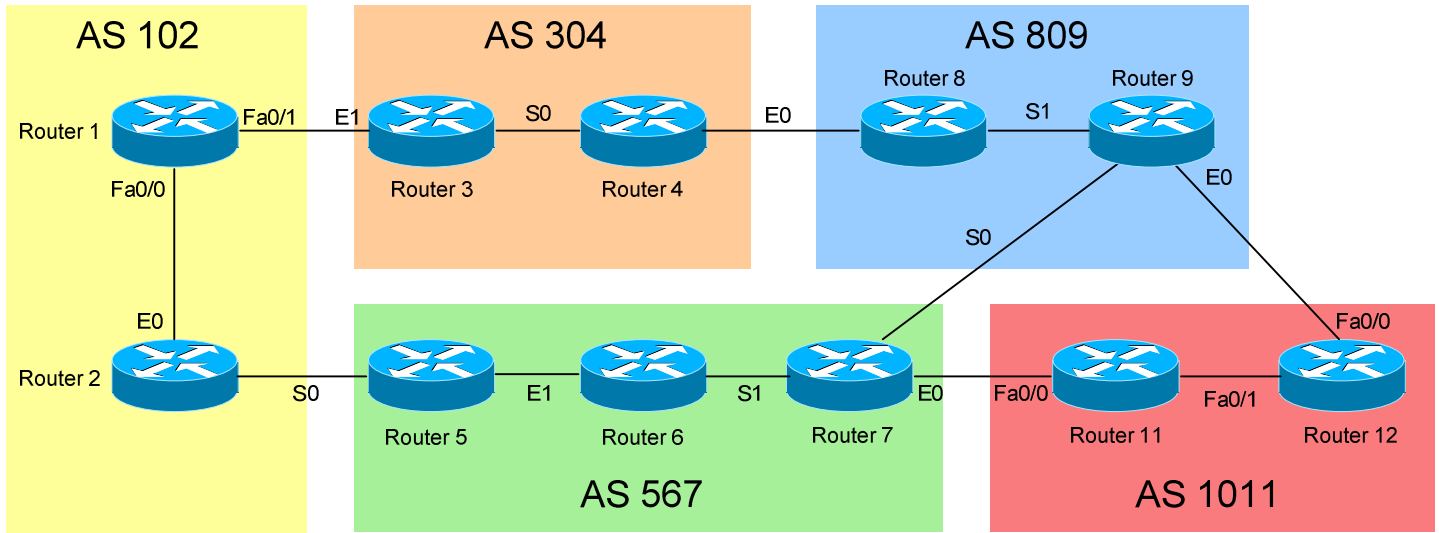
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**Multi-Protocol Environment - Lab 3 (continued)**



**Core Objectives:**

- 7. BGP should not auto-summarize. Only the networks listed in Objective #6 from Router 4 and Router 12 should be summarized when sent outside the local AS.

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- 8. Ensure reachability to all routes throughout the internetwork.

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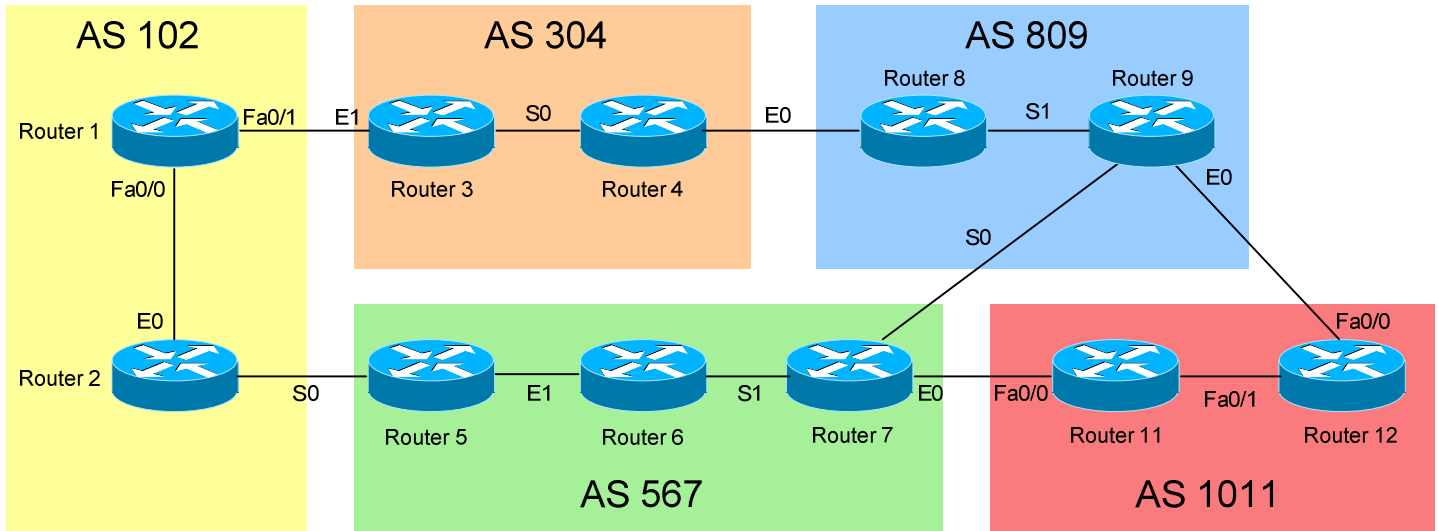
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**Multi-Protocol Environment - Lab 3 (continued)**



**Absurd Objectives:**

- 9. AS 1011 should prefer the path through AS 809 and AS 304 to reach AS 102, instead of through AS 567.

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- 10. AS 304 should prefer the path through AS 102 and AS 567 to reach AS 1011, instead of through AS 809.

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- 11. Router 11 should not advertise any routes to Router 12 sourced from AS 102. Do not use an IP access-list or prefix-list to accomplish this.

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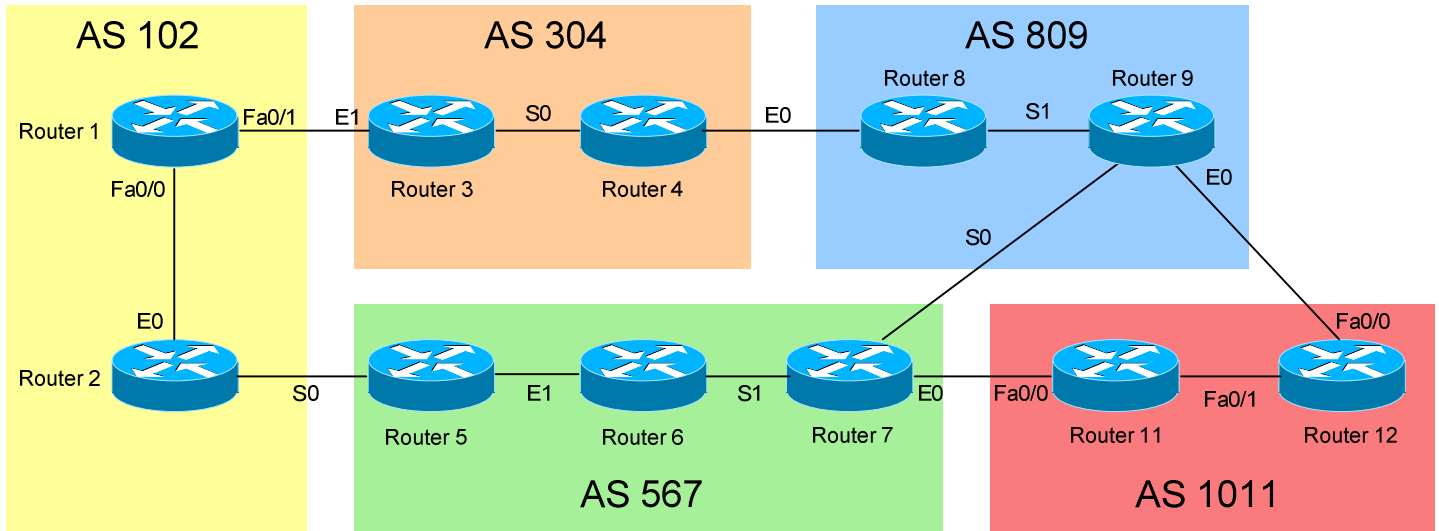
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**Multi-Protocol Environment - Lab 3 (continued)**



**Absurd Objectives:**

12. At AS borders, BGP peers should filter outgoing updates to *not* include loopback0 networks of internal routers.

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13. Each BGP router should be configured to limit the number of routes received by a neighbor to 1000.

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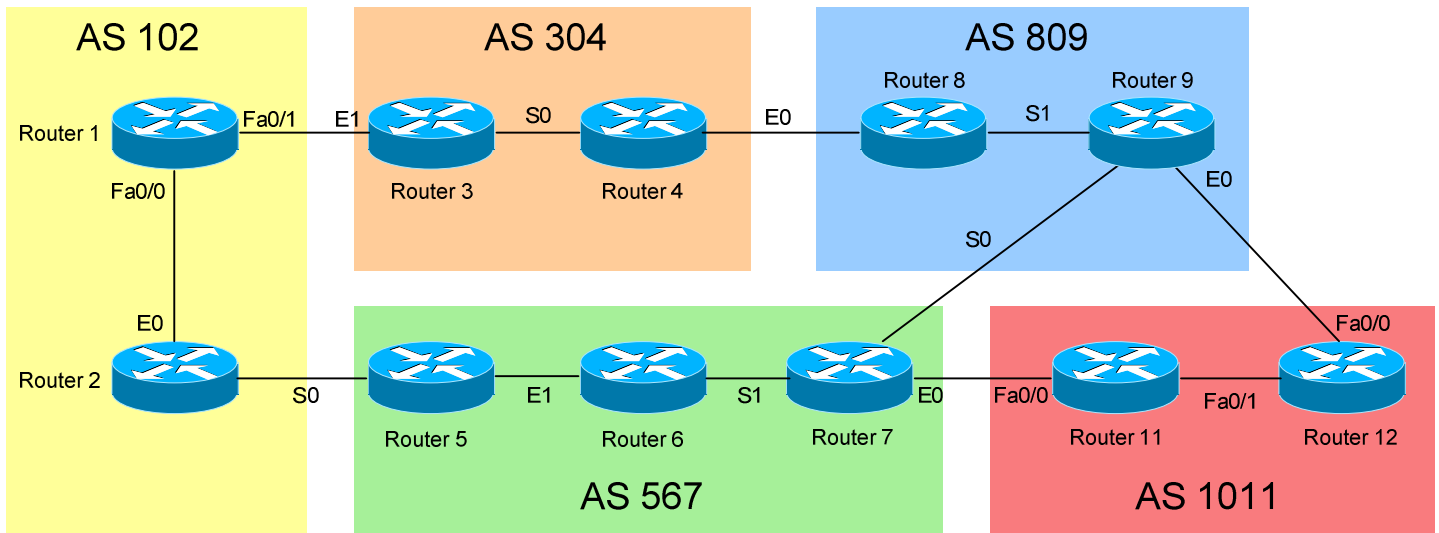
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**Multi-Protocol Environment - Lab 3 (continued)**



**Absurd Objectives:**

- 14. Ensure each router is configurable by telnet:
  - a. Use a local username of “silent” and a password of “genius”
  - b. Routers should be ping-able by name by all other routers.
  - c. Devices within the same AS should be able to access their routers via telnet at all times
  - d. Devices from another AS should be able to access remote routers only during working hours (8:00a.m.-5:00p.m.) on weekdays.

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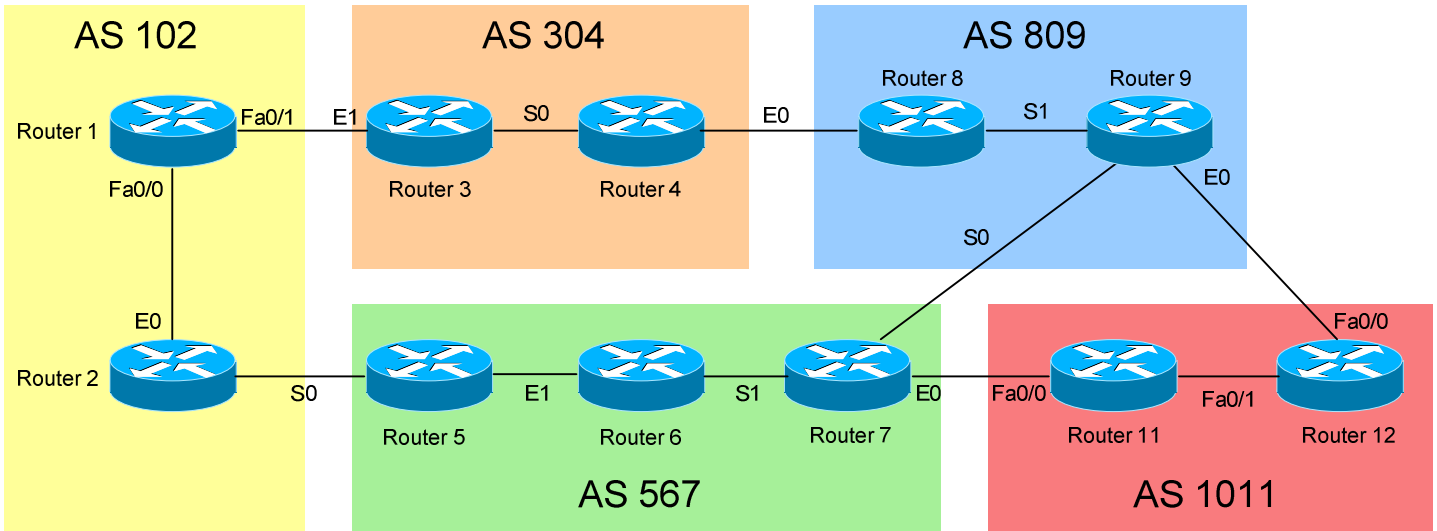
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**Multi-Protocol Environment - Lab 3 (continued)**



**Really Absurd Objectives:**

15. AS 567 is toying with the idea of using IPv6. The interfaces connecting Router 5, Router 6, and Router 7 should be configured with an IPv6 address. Use an Aggregate Global addressing scheme, with a /96 network prefix. Ensure the routers can ping each other's directly connected interfaces using IPv6.

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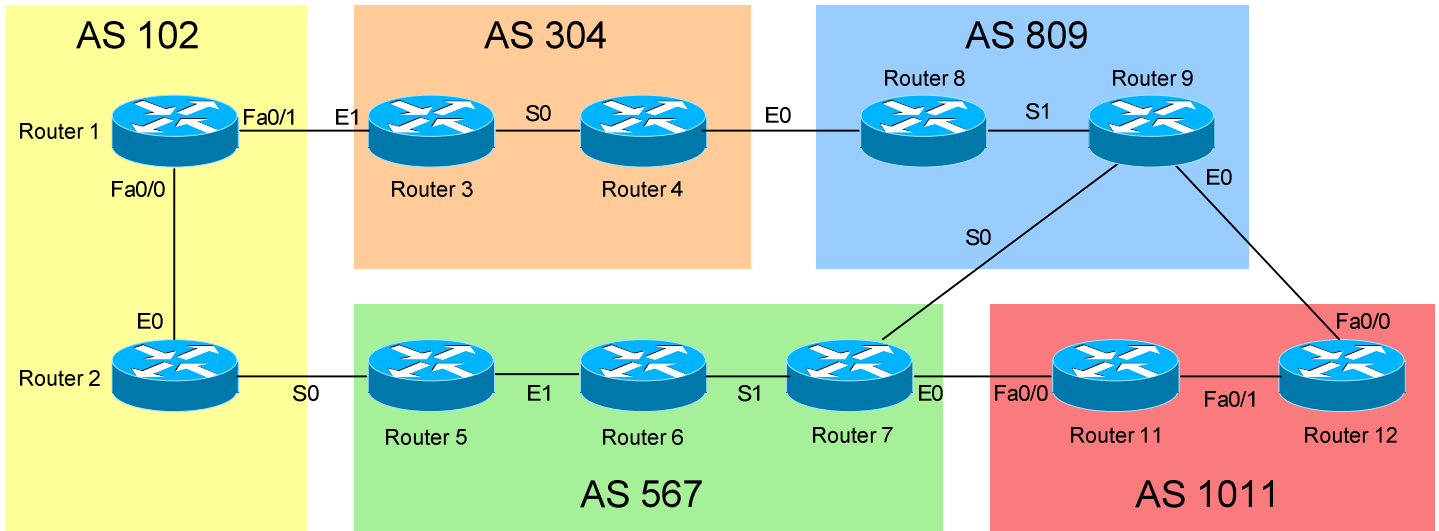
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**Multi-Protocol Environment - Lab 3 (continued)**



**Really Absurd Objectives:**

16. The network between Router 1 and Router 2 contains a multicast server, supporting a multicast group at address 229.1.1.150:
  - a. Ensure reach-ability to this group from all interfaces on Router 1, Router 2, Router 3, Router 4, and Router 9.
  - b. All physical interfaces on these routers should join this multicast group.
  - c. Use the least bandwidth-intensive mode for whatever multicast routing protocol you choose.
  - d. Do not use the default version of the multicast group management protocol on each interface.

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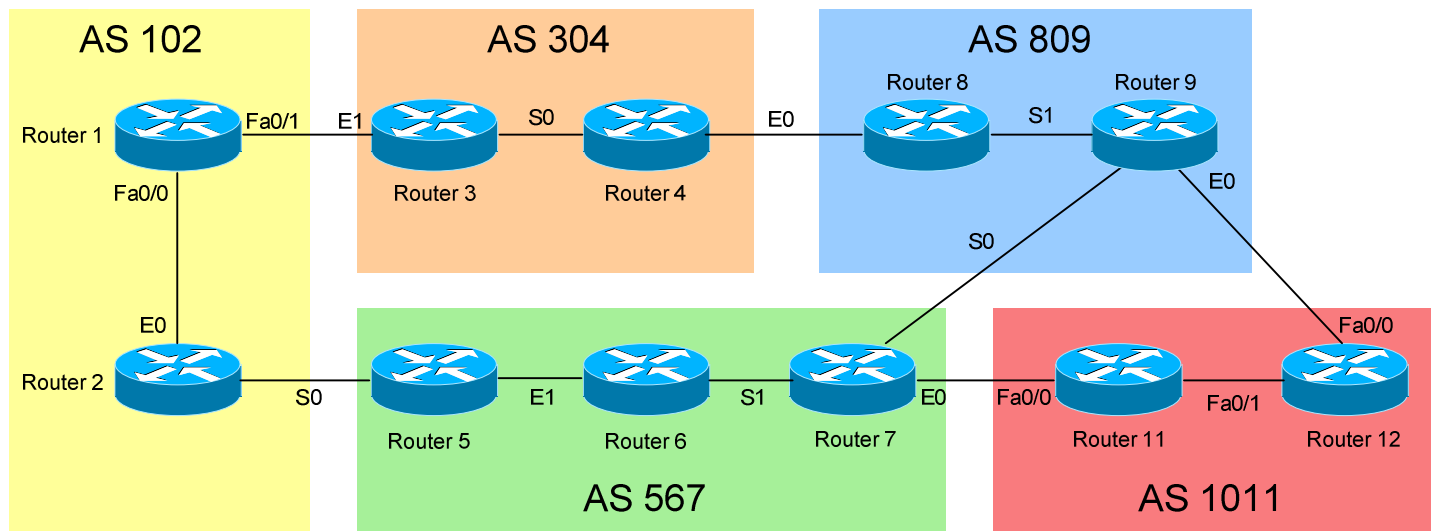
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***Multi-Protocol Environment - Lab 3 (continued)***



**The Absurdly Absurd “What-Is-He-Thinking” Objective:**

17. Accomplish objective #16 *without any* multicast configuration on Router 8, *or any other* routers not listed in objective #16.

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