

Lab 2: Intra-domain SSM Answers

**Goal: Enable intra-domain SSM multicast between hosts Q and R.
Verify R -> Q operation with packet dumps and router state inspection.**

- Choose SSM address (232.x.y.z) and port for your pod.

- Configure PIM Sparse Mode on the Customer-D (FastEthernet0/1, FastEthernet1/0, and Serial0/0) and Customer-E (FastEthernet0/1 and Serial0/0) routers.

Customer-D

```
ip multicast-routing
ip pim ssm default
int FastEthernet0/1
    ip pim sparse-mode
int FastEthernet1/0
    ip pim sparse-mode
int Serial0/0
    ip pim sparse-mode
```

Customer-E

```
ip multicast-routing
ip pim ssm default
int FastEthernet0/1
    ip pim sparse-mode
int Serial0/0
    ip pim sparse-mode
```

- Configure IGMP version 3 on Customer-D (FastEthernet0/1.1 FastEthernet0/1.2) and Customer-E (FastEthernet0/1).

Customer-D

```
int FastEthernet0/1
    ip igmp version 3
int FastEthernet1/0
    ip igmp version 3
```

Customer-E

```
int FastEthernet0/1
    ip igmp version 3
```

- Launch SSM receiver program on Host-Q, requesting traffic from Host-R on a given group.

```
rtpqual <source>@<group> <port>
```

- Capture and decode packets on Host-Q to verify that the IGMP Group Membership Reports are being sent when requested.

```
ethereal  
Capture -> Start -> Filter: igmp -> OK
```

- On Customer-D, verify that the IGMP Group Membership is being seen on the client interface(s).

```
P2D#show ip igmp groups  
IGMP Connected Group Membership  
Group Address      Interface          Uptime    Expires    Last Reporter  
232.x.y.z          FastEthernet0/1   16:18:05  00:02:59  199.109.202.129  
P2D#
```

- On Customer-D and Customer-E verify RPF interface for Host-R.

```
P2D#  
P2D#show ip rpf 199.109.202.162  
RPF information for ? (199.109.202.162)  
  RPF interface: Serial0/0  
  RPF neighbor: ? (199.109.202.5)  
  RPF route/mask: 199.109.202.160/27  
  RPF type: unicast (ospf 65502)  
  RPF recursion count: 0  
  Doing distance-preferred lookups across tables  
P2D#  
  
P2E#  
P2E#show ip rpf 199.109.202.162  
RPF information for ? (199.109.202.162)  
  RPF interface: FastEthernet0/1  
  RPF neighbor: ? (0.0.0.0) - directly connected  
  RPF route/mask: 199.109.202.160/27  
  RPF type: unicast (connected)  
  RPF recursion count: 0  
  Doing distance-preferred lookups across tables  
P2E#
```

- On Customer-D, verify that the (S,G) state exists and has correct input interface, correct output interface(s), and no incrementing traffic counters.

```
show ip mroute <group>  
show ip mroute <group> count
```

- Start SSM source program on Host-R and configure stream.

```
iperf -u -c 232.x.y.z -p <port> -b 1 -i 5 -T 10 -t 1000
```

- Capture data stream packets on Host-R to verify that the traffic is being sourced properly.

```
ethtool  
Capture -> Start -> OK
```

- On Customer-D, verify that the traffic counters are incrementing properly.

```
show ip mroute <group> count
```

- Verify (via packet capture) that traffic stream is being received by the SSM receiver on Host-Q.

```
ethtool  
Capture -> Start -> OK
```

- Stop SSM source and receiver programs on Host-Q and Host-R.