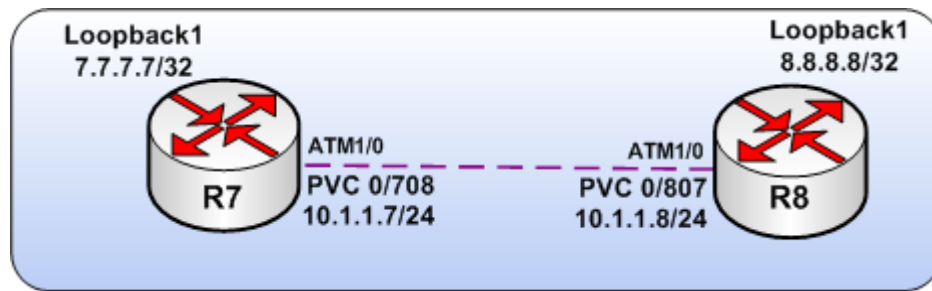


Lab 1 - ATM PVC Point-to-Point Sub-Interface using Dynamic Mapping



Task 1: Configure an ATM PVC between R7 and R8 using a Point-to-point sub-interface and aal5snap encapsulation. Do not use static maps.

Add the loopbacks 7.7.7.7/32 and 8.8.8.8/32 to each respective router.

Solution:

Note – Point-to-Point sub-interfaces are treated differently than Multi-point and Physical. As the interface can only be tied to a single pvc the use of dynamic /static maps is not needed, There is only one path for traffic in the 10.1.1.0/24 subnet. This is identified by the lack of dynamic maps being displayed with the **show atm map** command. This functionality also alleviates issue seen with physical and multi-point interfaces as the interface address can now be reached without additional configuration.

The other difference in a point-to-point configuration is that broadcasts are enabled by default but the redundant packet issue seen in the Physical and Multi-point labs does not occur

R7 Configuration:

```
interface loopback 1
ip addr 7.7.7.7 255.255.255.255
no shut
!
interface ATM1/0
no shut
interface ATM1/0.708 point-to-point
ip address 10.1.1.7 255.255.255.0
no atm enable-ilmi-trap
pvc 0/708
encapsulation aal5snap
!
end
```

R8 Configuration:

```
interface loopback 1
ip addr 8.8.8.8 255.255.255.255
no shut
!
interface ATM1/0
no shut
interface ATM1/0.807 point-to-point
ip address 10.1.1.8 255.255.255.0
no atm enable-ilmi-trap
pvc 0/807
encapsulation aal5snap
!
end
```

Verification on R7:

R7#ping 10.1.1.7

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.1.1.7, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 16/16/16 ms

R7#ping 10.1.1.8

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.1.1.8, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 12/25/48 ms

R7#show atm map

R7#show atm pvc

Interface	Name	VCD /	VPI	VCI	Type	Encaps	SC	Peak Kbps	Avg/Min Kbps	Burst	Cells	Sts
1/0.708	1		0	708	PVC	SNAP	UBR	155000				UP

R7#

Verification on R8

R8#ping 10.1.1.7

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.1.1.7, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 8/12/24 ms

R8#ping 10.1.1.8

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.1.1.8, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 16/31/56 ms

R8#show atm map

R8#show atm pvc

Interface Name	VPI	VCI	Type	Encaps	SC	Kbps	Kbps	Cells	Sts
1/0.807	1	0	807 PVC	SNAP	UBR	155000			UP

R8#

Task 2: Configure R7 and R8 as per Task 1 guidelines, But DO NOT use the pvc command.

Solution:

Note – Previously, PVC configuration was performed with the **pvc** command under the atm sub-interface. The older style of configuration occurred with the **atm pvc** command under the atm sub-interface. A map-list does not have to be used in this scenario due to the properties of the sub-interfaces type.

R7 Configuration

```
interface ATM1/0.708 point-to-point
ip address 10.1.1.7 255.255.255.0
atm pvc 6 0 708 aal5snap
no atm enable-ilmi-trap
no clns route-cache
end
```

R8 Configuration

```
interface ATM1/0.807 point-to-point
ip address 10.1.1.8 255.255.255.0
atm pvc 6 0 807 aal5snap
no atm enable-ilmi-trap
no clns route-cache
```

end

Verification on R7

R7#ping 10.1.1.7

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.1.1.7, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 16/32/56 ms

R7#ping 10.1.1.8

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.1.1.8, timeout is 2 seconds:

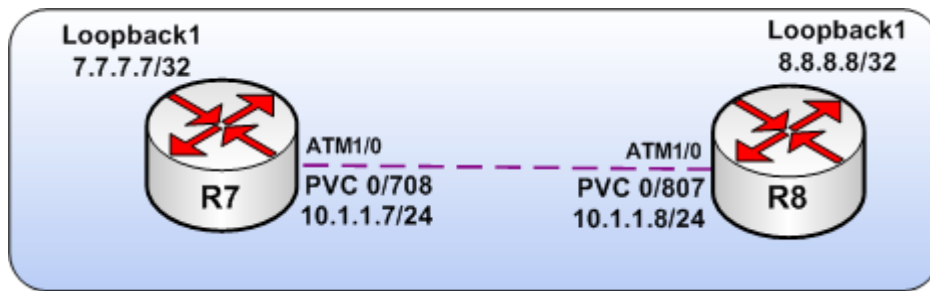
!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 4/9/12 ms

R7#

Lab completed, Erase config and continue to next lab.

Lab 2 - ATM PVC Point-to-point Sub-interface using Static Mapping



Task 1: Configure an ATM PVC between R7 and R8 using a Point-to-point sub-interface and aal5snap encapsulation. Using only static mappings, Allow each router to ping itself and its neighbor

Add the loopbacks 7.7.7.7/32 and 8.8.8.8/32 to each respective router.

Solution:

Note - When configuring static maps Broadcasts are not enabled by default as show with show atm map. But broadcast traffic is **still** replicated out the sub-interface to the properties of the point-to-point sub-interface. The issue of redundant broadcasts once again **does not** appear when using point-to-point sub-interfaces. There is a debug output below showing in action.

R7 Configuration:

```
interface loopback 1
ip addr 7.7.7.7 255.255.255.255
no shut
!
interface ATM1/0
no shut
interface ATM1/0.708 point-to-point
ip address 10.1.1.7 255.255.255.0
no atm enable-ilmi-trap
pvc 0/708
encapsulation aal5snap
no protocol ip inarp
protocol ip 10.1.1.7
protocol ip 10.1.1.8
!
end
```

R8 Configuration:

```
interface loopback 1
ip addr 8.8.8.8 255.255.255.255
no shut
!
interface ATM1/0
no shut
interface ATM1/0.807 point-to-point
ip address 10.1.1.8 255.255.255.0
no atm enable-ilmi-trap
pvc 0/807
encapsulation aal5snap
no protocol ip inarp
protocol ip 10.1.1.7
protocol ip 10.1.1.8
!
end
```

Verification on R7:

```
R7#show atm map
Map list ATM1/0.708pvc2C4 : PERMANENT
ip 10.1.1.7 maps to VC 1, VPI 0, VCI 708, ATM1/0.708
ip 10.1.1.8 maps to VC 1, VPI 0, VCI 708, ATM1/0.708
```

```
R7#ping 10.1.1.7
```

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.1.1.7, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 16/20/24 ms

```
R7#ping 10.1.1.8
```

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.1.1.8, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 4/17/52 ms

```
R7#
```

Verification on R8

```
R8#show atm map
```

```
Map list ATM1/0.807pvc327 : PERMANENT
ip 10.1.1.7 maps to VC 1, VPI 0, VCI 807, ATM1/0.807
ip 10.1.1.8 maps to VC 1, VPI 0, VCI 807, ATM1/0.807
```

```
R8#ping 10.1.1.7
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 10.1.1.7, timeout is 2 seconds:
```

```
!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 8/8/12 ms
```

```
R8#ping 10.1.1.8
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 10.1.1.8, timeout is 2 seconds:
```

```
!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 16/45/76 ms
```

```
R8#
```

Broadcasts work and no duplicate packets are sent – Debug

```
R7#show atm map
```

```
Map list ATM1/0.708pvc2C4 : PERMANENT
```

```
ip 10.1.1.7 maps to VC 1, VPI 0, VCI 708, ATM1/0.708
```

```
ip 10.1.1.8 maps to VC 1, VPI 0, VCI 708, ATM1/0.708
```

```
R7#ping 224.1.1.5
```

```
Type escape sequence to abort.
```

```
Sending 1, 100-byte ICMP Echos to 224.1.1.5, timeout is 2 seconds:
```

```
00:59:36: IP: s=10.1.1.7 (local), d=224.1.1.5 (ATM1/0.708), len 100, sending broad/multicast
```

```
00:59:36: IP: s=10.1.1.7 (local), d=224.1.1.5 (ATM1/0.708), len 100, sending full packet.
```

```
R7#
```

```
R7#ping 10.1.1.255
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 10.1.1.255, timeout is 2 seconds:
```

```
Reply to request 0 from 10.1.1.8, 16 ms
```

```
Reply to request 1 from 10.1.1.8, 8 ms
```

```
Reply to request 2 from 10.1.1.8, 8 ms
```

```
Reply to request 3 from 10.1.1.8, 8 ms
```

```
Reply to request 4 from 10.1.1.8, 12 ms
```

```
R7#
```

Task 2: Configure R7 and R8 as per Task 1 guidelines, But DO NOT use the pvc command.

Solution:

Note – Previously, PVC configuration was performed with the **pvc** command under the atm sub-interface. The older style of configuration occurred with the **atm pvc** command under the atm sub-interface. This required the use of a map-list which defined the static ip maps which was then associated with the atm sub-interface.

R7 Configuration

```
interface ATM1/0.708 point-to-point
ip address 10.1.1.7 255.255.255.0
map-group 708PVC
atm pvc 6 0 708 aal5snap
no atm enable-ilmi-trap
no clns route-cache
end
```

```
Router#show run | b map-list
map-list 708PVC
ip 10.1.1.7 atm-vc 6
ip 10.1.1.8 atm-vc 6
```

R8 Configuration

```
interface ATM1/0.807 point-to-point
ip address 10.1.1.8 255.255.255.0
map-group 807PVC
atm pvc 6 0 807 aal5snap
no atm enable-ilmi-trap
no clns route-cache
end
```

```
Router#show run | b map-list
map-list 807PVC
ip 10.1.1.8 atm-vc 6
ip 10.1.1.7 atm-vc 6
```

Verification on R7

```
R7#ping 10.1.1.7
```

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.1.1.7, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 16/32/56 ms

```
R7#ping 10.1.1.8
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 10.1.1.8, timeout is 2 seconds:
```

```
!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 4/9/12 ms
```

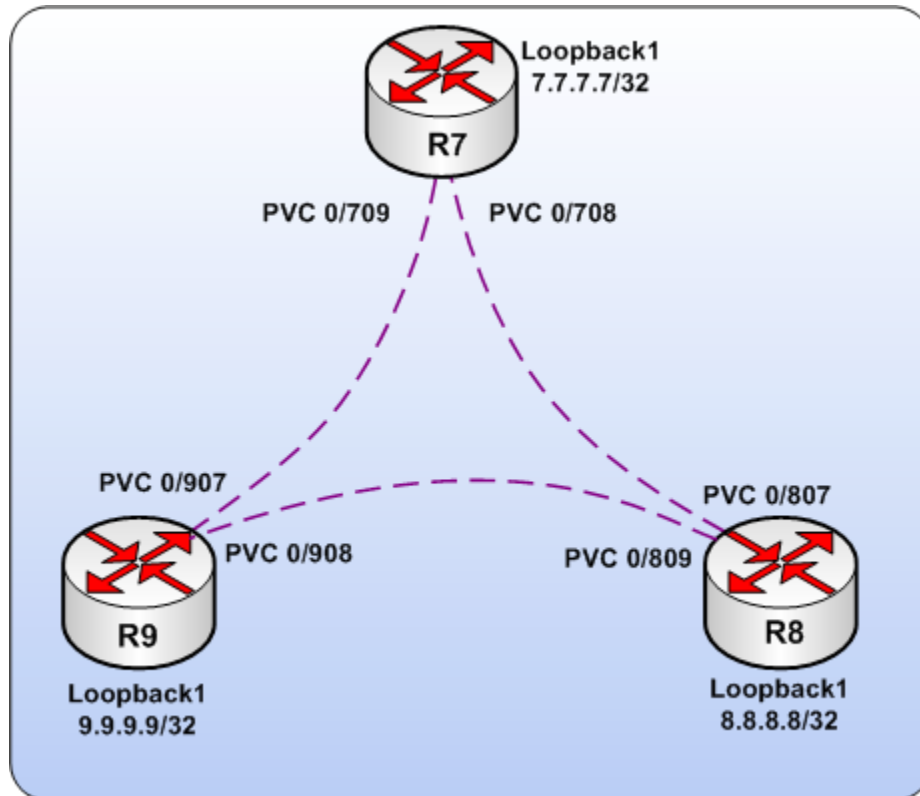
```
R7#
```

Lab completed, Erase config and continue to next lab.

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Lab 3 - ATM Point-to-point Sub-interfaces – Full Mesh PVC



R7 – ATM1/0.708	10.78.78.7/24
R7 – ATM1/0.709	10.79.79.7/24
R8 – ATM1/0.807	10.78.78.8/24
R8 – ATM1/0.809	10.89.89.8/24
R9 – ATM1/0.907	10.79.79.9/24
R9 – ATM1/0.908	10.89.89.9/24

Task 1: Configure R7, R8 and R9's ATM1 sub-interfaces with the ip addresses shown. Configure each sub-interface to use aal5snap encapsulation. Do not use static mappings.

Solution:

Note – A point-to-point sub-interface can only be associated with a single PVC, Due to this each PVC needs a separate sub-interface and its own ip subnet.

R7 Configuration:

```
interface ATM1/0
no ip address
```

```
no atm enable-ilmi-trap
!  
interface ATM1/0.708 point-to-point  
ip address 10.78.78.7 255.255.255.0  
no atm enable-ilmi-trap  
pvc 0/708  
!  
!  
interface ATM1/0.709 point-to-point  
ip address 10.79.79.7 255.255.255.0  
no atm enable-ilmi-trap  
pvc 0/709  
!  
end
```

R8 Configuration:

```
interface ATM1/0  
no ip address  
no atm enable-ilmi-trap  
!  
interface ATM1/0.807 point-to-point  
ip address 10.78.78.8 255.255.255.0  
no atm enable-ilmi-trap  
pvc 0/807  
!  
!  
interface ATM1/0.809 point-to-point  
ip address 10.89.89.8 255.255.255.0  
no atm enable-ilmi-trap  
pvc 0/809  
!  
end
```

R9 Configuration:

```
interface ATM1/0  
no ip address  
no atm enable-ilmi-trap  
no clns route-cache  
!  
interface ATM1/0.907 point-to-point  
ip address 10.79.79.9 255.255.255.0  
no atm enable-ilmi-trap  
pvc 0/907  
!  
!
```

```
interface ATM1/0.908 point-to-point
ip address 10.89.89.9 255.255.255.0
no atm enable-ilmi-trap
pvc 0/908
!
end
```

Verification on R7:

```
R7#show atm pvc
      VCD /
Interface Name      VPI VCI Type Encaps  SC Kbps  Kbps  Cells Sts
1/0.708  2          0 708 PVC  SNAP   UBR 155000      UP
1/0.709  3          0 709 PVC  SNAP   UBR 155000      UP
```

```
R7#show atm map
```

```
R7#ping 10.79.79.9
```

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.79.79.9, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 12/14/24 ms

```
R7#ping 10.78.78.8
```

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.78.78.8, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 4/12/20 ms

```
R7#
```

Verification on R8

```
R8#show atm pvc
      VCD /
Interface Name      VPI VCI Type Encaps  SC Kbps  Kbps  Cells Sts
1/0.807  2          0 807 PVC  SNAP   UBR 155000      UP
1/0.809  3          0 809 PVC  SNAP   UBR 155000      UP
```

```
R8#show atm map
```

```
R8#ping 10.78.78.7
```

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.78.78.7, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 8/10/16 ms

R8#ping 10.89.89.9

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.89.89.9, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 8/16/44 ms

R8#

Verification on R9

R9#show atm pvc

Interface	Name	VCD /	VPI	VCI	Type	Encaps	Peak Kbps	Avg/Min Kbps	Burst Kbps	Cells	Sts
1/0.907	1		0	907	PVC	SNAP UBR	155000				UP
1/0.908	2		0	908	PVC	SNAP UBR	155000				UP

R9#show atm map

R9#ping 10.79.79.7

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.79.79.7, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 8/9/12 ms

R9#ping 10.89.89.8

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.89.89.8, timeout is 2 seconds:

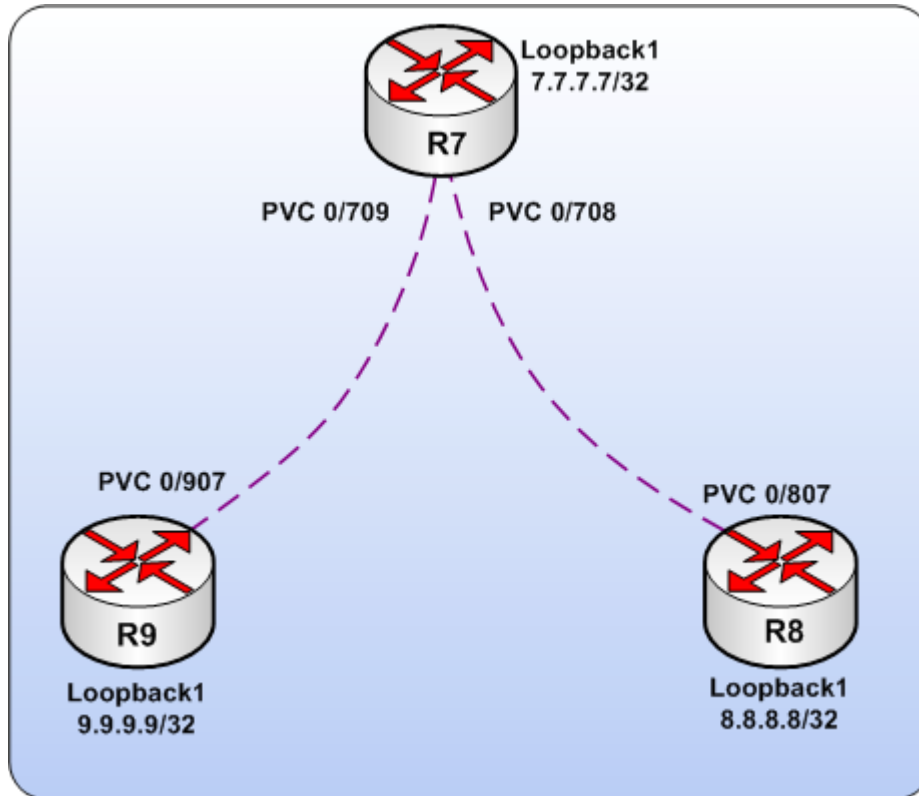
!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 8/10/16 ms

R9#

Lab completed, Erase config and continue to next lab.

Lab 4 - ATM point-to-point Sub-interface Hub and Spoke



R7 – ATM1/0.708	10.78.78.7/24
R7 – ATM1/0.709	10.79.79.7/24
R8 – ATM1/0.807	10.78.78.8/24
R9 – ATM1/0.907	10.79.79.9/24

Task 1: Configure R7, R8 and R9's ATM Sub-interfaces with the ip addresses shown. Configure each PVC to use aal5snap encapsulation. Do not use static mappings.

Solution:

Note – A point-to-point sub-interface can only be associated with a single PVC, Due to this each PVC needs a separate sub-interface and its own ip subnet. As shown below the two spokes are unable to communicate as there are no routing protocols/ static routing configured and they are in different subnets.

R7 Configuration:

```
interface ATM1/0
no ip address
```

```
no atm enable-ilmi-trap
!  
interface ATM1/0.708 point-to-point  
ip address 10.78.78.7 255.255.255.0  
no atm enable-ilmi-trap  
pvc 0/708  
!  
!  
interface ATM1/0.709 point-to-point  
ip address 10.79.79.7 255.255.255.0  
no atm enable-ilmi-trap  
pvc 0/709  
!  
end
```

R8 Configuration:

```
interface ATM1/0  
no ip address  
no atm enable-ilmi-trap  
!  
interface ATM1/0.807 point-to-point  
ip address 10.78.78.8 255.255.255.0  
no atm enable-ilmi-trap  
pvc 0/807  
!  
end
```

R9 Configuration:

```
interface ATM1/0  
no ip address  
no atm enable-ilmi-trap  
no clns route-cache  
!  
interface ATM1/0.907 point-to-point  
ip address 10.79.79.9 255.255.255.0  
no atm enable-ilmi-trap  
pvc 0/907  
!  
end
```

Verification on R7:

```
R7#show atm pvc  
VCD /
```

```
Peak Avg/Min Burst
```



```
1/0.907 1 0 907 PVC SNAP UBR 155000 UP
R9#show atm map

R9#ping 10.79.79.7

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.79.79.7, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 8/16/40 ms
R9#ping 10.78.78.8

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.78.78.8, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
R9#
```

Task 2: Configure a static route on each spoke. This route should use the Hub as the next hop.

Solution:

R8 Configuration:

```
ip route 0.0.0.0 0.0.0.0 10.78.78.7
```

R9 Configuration:

```
ip route 0.0.0.0 0.0.0.0 10.79.79.7
```

Verification on R8

```
R8#show ip route
```

```
Codes: 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, E - EGP
       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
```

```
Gateway of last resort is 10.78.78.7 to network 0.0.0.0
```

10.0.0.0/24 is subnetted, 1 subnets
C 10.78.78.0 is directly connected, ATM1/0.807
S* 0.0.0.0/0 [1/0] via 10.78.78.7
R8#ping 10.79.79.9

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.79.79.9, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 16/19/24 ms

R8#

Verification on R9

R9#show ip route

Codes: 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, E - EGP

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

Gateway of last resort is 10.79.79.7 to network 0.0.0.0

10.0.0.0/24 is subnetted, 1 subnets

C 10.79.79.0 is directly connected, ATM1/0.907

S* 0.0.0.0/0 [1/0] via 10.79.79.7

R9#ping 10.78.78.8

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.78.78.8, timeout is 2 seconds:

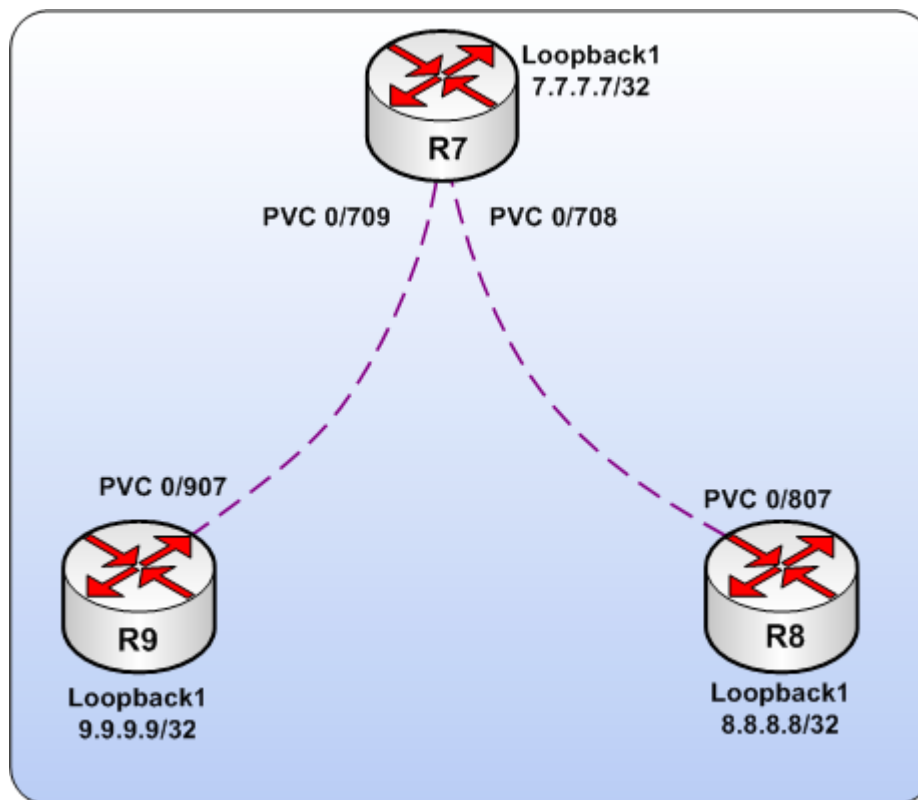
!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 12/32/60 ms

R9#

Lab completed, Erase config and continue to next lab.

Lab 5 -ATM PVC Multi-point Hub and Point-to-point Spokes.



R7 – ATM1/0.789 Multi-point	10.1.1.7/24
R8 – ATM1/0.807 Point2Point	10.1.1.8/24
R9 – ATM1/0.907 Point2Point	10.1.1.9/24

Task 1: Configure R7, R8 and R9's ATM Sub-interfaces with the ip addresses shown. Configure each PVC to use aal5snap encapsulation. Do not use static mappings.

Solution:

Note – As only the spoke sub-interfaces are propagating broadcasts, problems can occur. A broadcast from R8 to R7 will work. But a broadcast from R7 to R8 or R9 will fail. As show below.

R7 Configuration:

```
interface ATM1/0
no ip address
no atm enable-ilmi-trap
!
interface ATM1/0.789 multipoint
```

```
ip address 10.1.1.7 255.255.255.0
no atm enable-ilmi-trap
pvc 0/708
!
pvc 0/709
!
end
```

R8 Configuration:

```
interface ATM1/0
no ip address
no atm enable-ilmi-trap
!
interface ATM1/0.807 point-to-point
ip address 10.1.1.8 255.255.255.0
no atm enable-ilmi-trap
pvc 0/807
!
end
```

R9 Configuration:

```
interface ATM1/0
no ip address
no atm enable-ilmi-trap
no clns route-cache
!
interface ATM1/0.907 point-to-point
ip address 10.1.1.9 255.255.255.0
no atm enable-ilmi-trap
pvc 0/907
!
end
```

Verification on R7:

```
R7#show atm pvc
```

Interface	Name	VCD /	VPI	VCI	Type	Encaps	SC	Kbps	Peak Kbps	Avg/Min	Burst	Cells	Sts
1/0.789	4		0	708	PVC	SNAP	UBR	155000					UP
1/0.789	5		0	709	PVC	SNAP	UBR	155000					UP

```
R7#show atm map
```

```
Map list ATM1/0.789_ATM_INARP : DYNAMIC
ip 10.1.1.8 maps to VC 4, VPI 0, VCI 708, ATM1/0.789
ip 10.1.1.9 maps to VC 5, VPI 0, VCI 709, ATM1/0.789
```

R7#ping 10.1.1.8

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.1.1.8, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 4/30/60 ms

R7#ping 10.1.1.9

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.1.1.9, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 8/12/24 ms

Verification on R8

R8#show atm pvc

Interface Name	VCD /	VPI	VCI	Type	Encaps	SC	Peak Kbps	Avg/Min Kbps	Burst	Cells	Sts
1/0.807	2	0	807	PVC	SNAP	UBR	155000				UP

R8#show atm map

R8#ping 10.1.1.7

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.1.1.7, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 8/13/20 ms

R8#ping 10.1.1.9

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.1.1.9, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 12/24/56 ms

R8#

Verification on R9

R9#show atm pvc

Interface Name	VCD /	VPI	VCI	Type	Encaps	SC	Peak Kbps	Avg/Min Kbps	Burst	Cells	Sts
1/0.907	1	0	907	PVC	SNAP	UBR	155000				UP

R9#show atm map

R9#ping 10.1.1.7

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.1.1.7, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 8/16/48 ms

R9#ping 10.1.1.8

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.1.1.8, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 16/32/52 ms

R9#

Broadcast Issues – Spoke to Hub works.

R8#ping 10.1.1.255

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.1.1.255, timeout is 2 seconds:

Reply to request 0 from 10.1.1.7, 12 ms

Reply to request 1 from 10.1.1.7, 12 ms

Reply to request 2 from 10.1.1.7, 12 ms

Reply to request 3 from 10.1.1.7, 8 ms

Reply to request 4 from 10.1.1.7, 12 ms

Broadcast Issues – Hub to Spoke Fails.

R7#debug ip packet

IP packet debugging is on

R7#ping 10.1.1.255

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.1.1.255, timeout is 2 seconds:

02:10:50: IP: s=10.1.1.7 (local), d=255.255.255.255 (ATM1/0.789), len 100, sending broad/multicast

02:10:50: IP: s=10.1.1.7 (local), d=255.255.255.255 (ATM1/0.789), len 100, encapsulation failed.

02:10:52: IP: s=10.1.1.7 (local), d=255.255.255.255 (ATM1/0.789), len 100, sending broad/multicast

02:10:52: IP: s=10.1.1.7 (local), d=255.255.255.255 (ATM1/0.789), len 100, encapsulation failed.

02:10:54: IP: s=10.1.1.7 (local), d=255.255.255.255 (ATM1/0.789), len 100, sending broad/multicast

02:10:54: IP: s=10.1.1.7 (local), d=255.255.255.255 (ATM1/0.789), len 100, encapsulation failed.

02:10:56: IP: s=10.1.1.7 (local), d=255.255.255.255 (ATM1/0.789), len 100, sending broad/multicast

02:10:56: IP: s=10.1.1.7 (local), d=255.255.255.255 (ATM1/0.789), len 100, encapsulation failed.

02:10:58: IP: s=10.1.1.7 (local), d=255.255.255.255 (ATM1/0.789), len 100, sending broad/multicast

02:10:58: IP: s=10.1.1.7 (local), d=255.255.255.255 (ATM1/0.789), len 100, encapsulation failed.

R7#

Task 2: Change the Hub configuration so Broadcasts are allowed, Only use Dynamic maps.

Solution:

R7 Configuration:

```
interface ATM1/0
no ip address
no atm enable-ilmi-trap
!
interface ATM1/0.789 multipoint
pvc 0/708
broadcast
!
pvc 0/709
broadcast
!
end
```

Verification on R7

Map list ATM1/0.789_ATM_INARP : DYNAMIC

```
ip 10.1.1.8 maps to VC 8, VPI 0, VCI 708, ATM1/0.789
, broadcast
ip 10.1.1.9 maps to VC 9, VPI 0, VCI 709, ATM1/0.789
, broadcast
```

```
R7#ping 10.1.1.255
```

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.1.1.255, timeout is 2 seconds:

```
Reply to request 0 from 10.1.1.9, 12 ms
Reply to request 0 from 10.1.1.8, 12 ms
Reply to request 1 from 10.1.1.9, 12 ms
Reply to request 1 from 10.1.1.8, 12 ms
Reply to request 2 from 10.1.1.9, 12 ms
Reply to request 2 from 10.1.1.8, 12 ms
Reply to request 3 from 10.1.1.9, 48 ms
Reply to request 3 from 10.1.1.8, 48 ms
Reply to request 4 from 10.1.1.9, 8 ms
Reply to request 4 from 10.1.1.8, 8 ms
R7#
```

Task 3: Reconfigure R7 so the Task1 and 2 objectives are met using Static Maps.

Solution:

R7 Configuration:

```
no interface ATM1/0.789
!  
interface ATM1/0
  no ip address
  no atm enable-ilmi-trap
!  
interface ATM1/0.789 multipoint
  ip address 10.1.1.7 255.255.255.0
  pvc 0/708
  protocol ip 10.1.1.8 broadcast
  !
  pvc 0/709
  protocol ip 10.1.1.9 broadcast
  !
end
```

Verification on R7

```
R7#show atm map
Map list ATM1/0.789pvc2C4 : PERMANENT
ip 10.1.1.8 maps to VC 10, VPI 0, VCI 708, ATM1/0.789
  , broadcast
```

```
Map list ATM1/0.789pvc2C5 : PERMANENT
ip 10.1.1.9 maps to VC 11, VPI 0, VCI 709, ATM1/0.789
  , broadcast
```

```
R7#ping 10.1.1.255
```

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 10.1.1.255, timeout is 2 seconds:

```
Reply to request 0 from 10.1.1.9, 12 ms
Reply to request 0 from 10.1.1.8, 12 ms
Reply to request 1 from 10.1.1.9, 12 ms
Reply to request 1 from 10.1.1.8, 12 ms
Reply to request 2 from 10.1.1.9, 12 ms
Reply to request 2 from 10.1.1.8, 12 ms
Reply to request 3 from 10.1.1.9, 48 ms
```

Reply to request 3 from 10.1.1.8, 48 ms
Reply to request 4 from 10.1.1.9, 8 ms
Reply to request 4 from 10.1.1.8, 8 ms
R7#

Lab completed, Erase config and continue to next lab.

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