Hands-on
Routing configuration / Paris laboratory

Testbed setup

RENATER -4

Legend:
- ATM / STM -1
- POS / STM -1
- GE
- FE

AS 1717
Managed by the trainer

GSR -1

POS 3/2

Gigabitethernet 0/0

POS 3/3

GSR-2 POS 3/0

POS 3/1

POS 3/1 POS 3/0

GSR -3

POS 3/2

ALCATEL

7200-2

POS 3/2

POS 3/0

ATM2/1.100

ATM2/0.200

POS 3/2

POS 3/0

7200-3

interface 2/2

fastethernet0/0

AT0/3/0.1

ATM1/0.200

AS 65111
Managed by the students

M5

ATM1/0.200

7200 -1

Testbed diagram
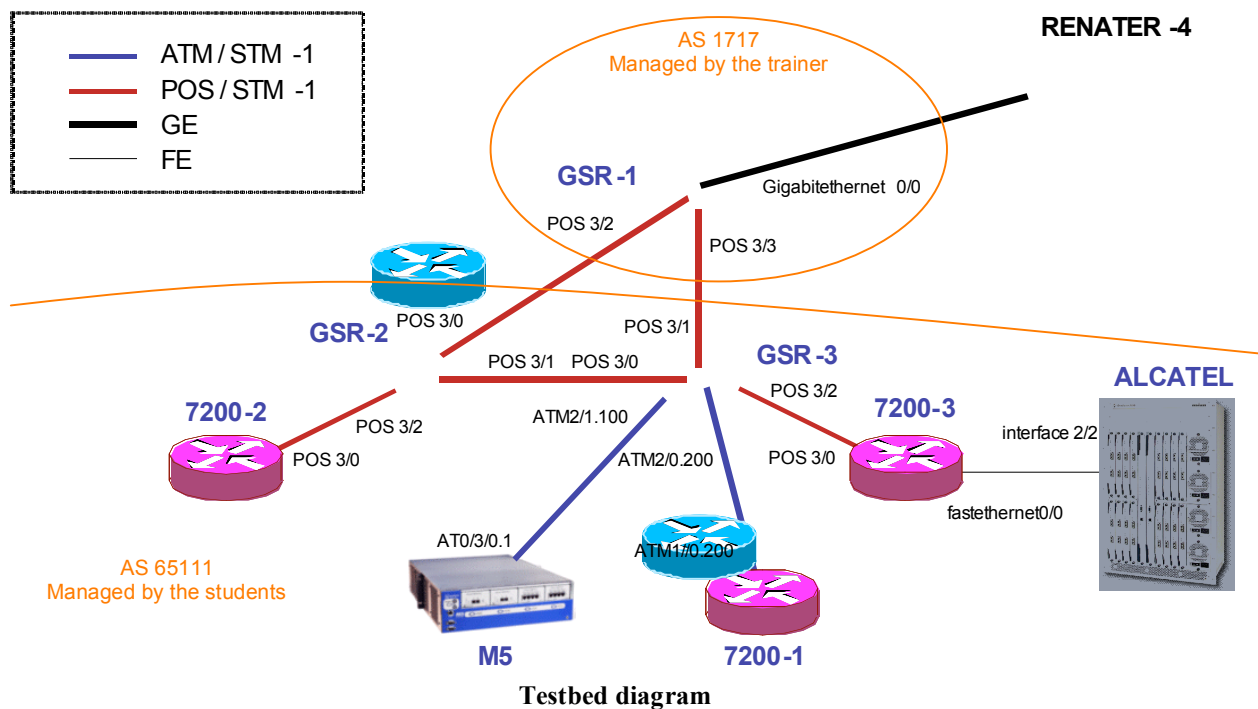
Routers login:

Use telnet protocol with the

Name	How to connect
GSR-2	194.254.101.5
GSR-3	194.254.101.6
7200-1	194.254.101.12
7200-2	194.254.101.8
7200-3	194.254.101.9
ALCATEL	194.254.101.58
M5	194.254.101.2

Routers connection information

Login: 6diss
Password: 6diss

Addressing configuration

1°) Configure the following addressing plan on the routers.

Loopbacks:

Name	Loopback address
GSR-2	2001:660:3007:8005::1/64
GSR-3	2001:660:3007:8006::1/64
7200-1	2001:660:3007:8012::1/64
7200-2	2001:660:3007:8008::1/64
7200-3	2001:660:3007:8009::1/64
M5	2001:660:3007:8002::1/64

Interconnections:

Interconnecions (R1 - R2)	Prefix
GSR-1 - GSR-2	2001:660:3007:8101::/64
GSR-1 - GSR-3	2001:660:3007:8102::/64
7200-2 - GSR-2	2001:660:3007:8103::/64
GSR-2 - GSR-3	2001:660:3007:8104::/64
GSR-3 - 7200-3	2001:660:3007:8105::/64
7200-3 - ALCATEL	2001:660:3007:8106::/64
GSR-3 - M5	2001:660:3007:8107::/64
GSR-3 - 7200-1	2001:660:3007:8108::/64

R1 has address = prefix::1
R2 has address = prefix::2

2°) Check you can ping address of the routers connected to the router you manage.

3°) Take a look at the IPv6 details of an interface. Write down the different addresses you observe and give their types and usage.

IS-IS configuration for IPv6

1°) Enable IS-IS routing

For that purpose, use the following ISO addresses for IS-IS configuration.

Name	Loopback address
GSR-2	49.0000.0000.0000.0005.00
GSR-3	49.0000.0000.0000.0006.00
7200-1	49.0000.0000.0000.0012.00
7200-2	49.0000.0000.0000.0008.00
7200-3	49.0000.0000.0000.0009.00
M5	49.0000.0000.0000.0002.00

2°) Enable CEF switching for IPv6 on CISCO routers of the testbed

3°) Enable IS-IS on all interfaces connecting 2 routers of the labs. Don't configure IS-IS on interfaces toward GSR-1 router. Configure IS-IS level 1 only.

4°) Check the IS-IS neighborship

5°) Make sure you advertise the loopback prefixes via IS-IS.

6°) Check all routers in the labs receive all interconnection and loopback prefixes via IS-IS

7°) Check reachability of all routers loopback addresses from your router using ping command.

8°) Configure a default route on GSR-2 toward GSR-1. Configure GSR-2 to advertise the IPv6 default route with IS-IS. Note that you still won't have connectivity to the IPv6 internet as there is no static route on GSR-1 but a BGP peering. We will get IPv6 internet connectivity when we finish the BGP exercise.

BGP configuration for IPv6

1°) Configure an eMBGP peering between GSR-2 and GSR-1 and another peering between GSR-3 and GSR-1. For this purpose, interconnection addresses must be used to setup the peerings. Also note that the AS number of GSR-1 is 1717 and that the AS number to be configured in the lab is the private AS number 65111.

2°) Configure an iMBGP full mesh between all routers of the labs. Note that the iMBGP full mesh is configured between loopback addresses of the routers.

3°) Check the status of the eMBGP and iMBGP peerings. They must be in established state before going to the next step.

4°) Check that you receive prefixes via the eMBGP peerings. Check they are properly propagated to all the routers of the lab through iMBGP peerings.

5°) Advertise the prefix 2001:660:3007:8000::/49 to GSR-1 via the 2 eMBGP peerings. Make sure it is advertised and received on GSR-1. Ask the trainer for that purpose.

6°) Check the connectivity to the IPv6 internet. Use the ping / traceroute commands from the routers to some well known IPv6 web servers
- *www.6diss.org*
- *www.renater.fr*
- *www.kame.net*
- *...*

7°) Enforce policies on the eMBGP peerings to accept only legacy IPv6 prefixes. Some more details about this legacy prefixes and the way you can configure the policy can be found at *http://www.space.net/~gert/RIPE/ipv6-filters.html*

8°) Apply a policy to prefer the path between GSR-1 and GSR-2. For this purpose, configure on GSR-2 the local-preference 200 on prefixes received from GSR-1. Configure on GSR-3 the local-preference of 150 on prefixes received from GSR-1.

9°) Check the BGP details to make sure the policy is properly configured. Using traceroute command, make sure that the path between GSR-2 and GSR-1 is preferred.