

Exercise: Routing

Instructions

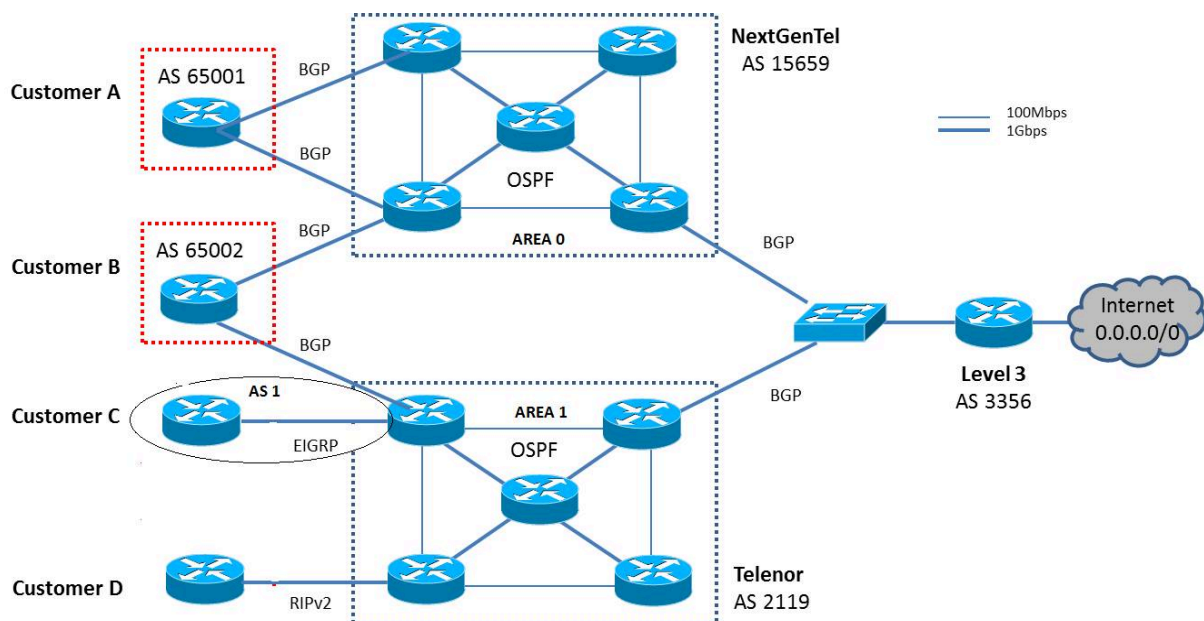
- Students may work in groups in terms of analyzing and discussing the exercise, but each student must do the exercise independently and deliver a unique report. Any copy & paste attempts between students are easily discovered, and will lead to a failure.

Learning objectives

- Learn how to make an IPv4 plan for a network
- To gain hands-on experience with configuration of real-life equipment (in this case Cisco 7200 routers)
- To gain experience with commonly used routing protocols (BGP, OSPF, EIGRP, RIP)
- Understand some of strengths and weaknesses of routing protocols

Getting Started:

- Use GNS3 to create and configure the network illustrated below.



Tasks

- Assign names to routers and assign interfaces to all links shown.
- Make an IP addressing plan for all links involved in the network shown.
 - All customer routers should have two loopback interfaces. A loopback interface has an IP address assigned and configured with a /32 mask (255.255.255.255)
 - NextGenTel should use the IP subnet 10.10.10.0/24 for all internal links, the subnet 100.100.100.0/24 for external links (i.e. toward customers) and towards Level3 the 172.16.1.0/24 network should be used. Links normally used subnets with /30 mask (255.255.255.252). Loopback interfaces are taken from 192.168.10.0/24 (loopback0) and 192.168.100.0/24 (loopback1).

- c. Telenor should use the IP subnet 20.20.20.0/24 for all internal links, the subnet 200.200.200.0/24 for external links (i.e. toward customers) and towards Level3 the 172.16.1.0/24 network should be used. Loopback interface addresses are taken from 192.168.20.0/24 (loopback0) and 192.168.200.0/24 (loopback 1).
 - d. For Level3, a single loopback interface should be configured using IP address 1.1.1.1/32. The Internet route is injected by a staticNull0 route
- 3. Configure all routing protocols as indicated. When completed, all routers should have a routing table containing all IP addresses used in the network (all loopback interface, all link addresses) and the route to Internet (0.0.0.0/0)
- 4. Inside the OSPF domains for both NextGenTel and Telenor, the routing should be changed / modified so that GE links are preferred instead of the FE links. This change should be done without using static routes.
- 5. Re-configure the OSPF processes so that they use the loopback0 address as their router-id, and thereafter prevent the advertisement of these addresses outside of their respective AS.