Data Communications and Networking
Lab 6 - Routing Algorithms

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Exercise

Starting with the two topologies that you built for Lab 5, re-configure topology A to use EIGRP and topology B to use OSPF.

Explore the behaviour of each routing algorithm by removing single links **and** routers during operation (no restarting of any devices), and observing the updates using Wireshark. You should look at the contents of the routing packets being exchanged, and at the effect on the routing tables within each router.

While you are doing this, take notes on your observations in a document, including screenshots. You should note which messages are sent for each change you make to the networks (e.g. using screenshots of Wireshark), and explain briefly why.

Finally, use BGP to connect the two topologies together. Add a single network link between the two topologies, and configure BGP on the two routers at the ends of the link, so that each topology is a BGP autonomous system with its own AS number. You should configure the BGP routers to `redistribute` the routes that they have already found using EIGRP and OSPF — this means that you don't need to set up BGP on any other routers, just those at the two ends of the link.

As in the earlier labs, you may like to refer to Cisco's documentation — EIGRP guide, OSPF guide, BGP guide — and to LinkedIn Learning if you need more background information.

You don't need to write a lot of text — maximum 500 words.

Marking scheme

This assessed lab exercise is worth 10% of your final mark for F29DC.

- A: You've thoroughly tested both topologies, and your document clearly explains what the two routing algorithms are doing in response to your changes, with discussion of the routing messages and routing tables. You have demonstrated routing between the two topologies using BGP.
- B: You've thoroughly tested both topologies, but there are some minor flaws in your explanation.
- C: You've missed some minor steps in testing.
- D: You've done some basic testing of both topologies but your explanation is seriously flawed.
- E: You haven't done adequate testing of both topologies.

Submission

You must submit a `.zip` file to the Lab 6 assignment on Canvas, containing:

- Your GNS3 project(s), including topologies and configurations. Make sure that all your configuration files have been saved correctly (e.g. using the `write` command).
- Your document, in PDF format.

We will mark the document with you in the lab and give you immediate feedback. You will need the GNS3 project(s) for the next lab, so please save a copy.