NWEN 302 LAB 3 REPORT

> **Instructions:** Use this editable form to answer the questions and other discussion points. Type your answers in the boxes provided, ensuring that your answers do not go beyond the boxes. Once completed, save the file as `lab3-report.pdf` and submit to the ECS Submission System.

Last Name   [   ]   First Name   [   ]

Student ID   [   ]

Lab Objectives

1. To gain understanding of routing tables and use this knowledge to configure static routes.
2. To use and configure the Open Shortest Path First (OSPF) routing protocol for dynamic routing.

Objective 1: Understanding Routing Table and Static Routing

Q1.1: How many subnets are there in the network?

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Q1.2: How many entries are there in m1's routing table? What does `0.0.0.0` stand for?

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Q1.3: How many entries are there in R1's routing table? Copy and paste the command output into the report.

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Q1.4: What command did you use to display the IPv6 routing table?

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Q1.5: Which router did you need to add the static route, and what Zebra commands did you add? Provide 2 answers: one for IPv4 and one for IPv6.

Q1.6: What is the shortest path from m1 to m4? You can write the set of links that makes up the path.

Q1.7: Which nodes did you configure? For each node, write the Zebra commands that you added.

Q1.8: What throughput was achieved using the static route? Copy and paste the output of Netperf showing the throughput into your report.

Q1.9: What throughput was achieved using the new static route? Copy and paste the output of Netperf showing the throughput into your report.

Objective 2: Using and Configuring OSPF for Dynamic Routing

Q2.1: What is the output of the command show ip ospf route when executed at R1? Copy and paste the output.

Q2.2: Is the output the same across all routers? Explain your answer.

Q2.3: Compare the routing table before and after enabling OSPF. Describe how the Unix routing table has changed.

Q2.4: What is the output of the command show ipv6 ospf6 route when executed at R1? Copy and paste the output.

Q2.5: How would you test that this change (OSPFv3 is now running on all routers) enables IPv6 packets to be forwarded?

Q2.6: What happens to the output of traceroute after disconnecting? Explain the result.

Q2.7: What happens after you reconnect the link c2? Explain the result.

Q2.8: The changes you see take some time to happen. How long? Explain your result and how you worked this out.

Q2.9: Test your IPv6 network using the aforementioned tools and record the results of your tests.

Q2.10: What changes occurred to this table when you disconnect c2?

Q2.11: Record the debugging output from the experiment with disconnecting c2.

Q2.12: What happened when c2 was disconnected? Use your theoretical knowledge of OSPF and debugging output from the router to explain.

Q2.13: Devise a scheme to assign integer costs to links c1-c10. Briefly explain the scheme, and enumerate the cost for every link.

Q2.14: What is the route from m1 to m4? Is this different from the shortest path?

Q2.15: What is the throughput between m1 and m4? Is this better than the throughput you have achieved with static routing?