Lab 3: LDP – Part 1

Or: Basic LDP config, ECMP for load balancing

What you will do:

1. Verify full IGP reachability throughout the network
2. Configure LDP throughout the (model of the) Service Provider network
3. Configure ECMP, to achieve LDP load balancing
4. Determine path selection characteristics for ECMP

Things that you will need to know or learn:

1. CLI commands for configuring static and default routes; and OSPF routing
2. Material from the MPLS Module 3 slide deck; contents of MPLS Labs 3.1 – 3.3
3. CLI commands for configuring LDP
4. ECMP stands for **E**qual **C**ost **M**ulti-**P**ath
5. Rules for choosing a path with ECMP

What you need to submit and when:

1. The pre-lab activity is reading all documents so that you are properly prepared for lab!
2. Complete the in-lab part of the exercise (see below), **before** the end of your lab period.
3. Complete the “Lab 3 Post-lab” exercise and submit to BrightSpace, by **11:59pm** on the assigned due date before your next lab period (Sat/Thu).

Required Equipment:

- USB memory stick to save results for post-lab questions
- Hard-cover lab notebook, for reference during SBA at the end of the course.
- PC with internet access, a browser, Java, and terminal program (Provided in T108)

In-Lab Marks:

Each of the items listed below is worth a single mark towards your in-lab score.

- Demo of end-to-end LSP ping and traceroute between the routers in your pod
- Demo of end-to-end LSP ping and traceroute between adjacent pods
- Demo of end-to-end LSP ping and traceroute diagonally across entire lab topology.
- Demo of a command which proves that ECMP is working for LDP

The in-lab portion is worth **40%** and the post-lab is worth **60%** of this lab, even though they may have a different number of points assigned to them.

10% of your final mark is for labs done during the course of the semester.

References and Resources:

- MPLS lab guide; specifically labs 3.1 – 3.3
- Command reference (beginning of Lab 3 section, and lab 3.3, in the lab guide)
- MySRLab: remote-access lab facility hosted at the Nokia Kanata campus

PLEASE see either "Lab01-Prelab" or "Lab01-IntroToSR7750-CLI" for details of saving & restoring config files!

Addressing & Login Table

	Edu **Lab 1**	Edu **Lab 2**	Edu **Lab 3**
R1	.164	.196	.228
R2	.165	.197	.229
R3	.166	.198	.230
R4	.167	.199	.231
R5	.168	.200	.232
R6	.169	.201	.233
R7	.170	.202	.234
R8	.171	.203	.235
R9	.172	.204	.236
R10	.173	.205	.237
R11	.174	.206	.238
R12	.175	.207	.239

	My specific login information
EDU Lab # (1, 2, or 3)	
Individual login ID	
Corresponding password	

See BrightSpace for a list of login IDs and passwords; write **yours** in the space above.

Base IP address is: **192.168.206.0/24**

Task 1: Verify full IGP (OSPF) connectivity in the network

Based on your previous lab, confirm and reconfigure as necessary, full OSPF connectivity between **all 12 routers** in your lab. Use **/24** subnets throughout!

Task 2: Configure LDP throughout the network

Follow the instructions given in MPLS Lab 3.2 to configure LDP throughout the Service Provider network (**including** the outer-most routers, R9-R12). Remember to use **/24** subnets throughout. Be sure to read and answer **all questions** which appear in the lab guide! (Any or all of these questions may appear in the post-lab, in-class quizzes, tests, or final exam.)

CHECK POINT #1, #2, #3: Be prepared, with output on your screen, to prove LSP connectivity within your pod, between upper & lower pods, and end-to-end diagonally across the lab.

Task 3: Configure ECMP, to achieve LDP load balancing

Follow the instructions given in MPLS Lab 3.3 to configure ECMP. Be sure to read and answer **all questions** which appear in the lab guide! (Any or all of these questions may appear in the post-lab, in-class quizzes, tests, or final exam.)

CHECK POINT #4: Prove, with output on your screen, that ECMP is working for LDP.

Task 4: (Challenge) Determine path selection for ECMP

Be sure to leave ECMP enabled and the diagonal links shutdown, and repeat Lab 3.3 step 7 enough times to determine whether ECMP path selection is constant or variable. Are you sure??

Help any of your classmates who haven't yet succeeded in getting all the tasks completed. (Time permitting) Start working ahead on Lab 3.4: Export policy for Label Distribution.