Lab 5: CSPF (+ prep for LDP-over-RSVP)

Or: Hop selection via TE; Inter-area RSVP

What you will do:

1. Configure RSVP throughout a single-area OSPF region
2. Enable TE extensions to OSPF to generate opaque LSAs (type 10)
3. Configure link colouring
4. Create and test a CSPF LSP, constrained by link colours.
5. Prepare to create T-LDP tunnels across an RSVP region

Things that you will need to know or learn:

1. CLI commands for configuring OSPF, RSVP, and MPLS
2. CLI commands for configuring LDP, T-LDP
3. CLI commands for enabling LDP tunnels, and ldp-over-rsvp
4. Ability to understand and interpret MPLS terminology as given in the lab manual

What you need to submit and when:

1. There is no pre-lab for Lab 5.
2. Complete the in-lab part of the exercise (see below), **before** the end of your lab period.
3. Complete the “Lab 5 Post-lab” exercise and submit to Blackboard, **before** your next lab period.

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.

- [Lab 5.1] Demo the LSP, which includes green and excludes red, going clockwise
- [Lab 5.1] Demo the LSP going counter clockwise, including green and excluding red
- [Lab 5.1] Demo the LSP running CSPF but failing to find an acceptable path

The in-lab score is worth 33% of the mark for this lab.
The post-lab score is worth 66% of the mark for this lab.

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

References and Resources:

- MPLS lab guide; specifically labs 5.1 (pages 26-29) and 5.3 (pages 32-34)
- Command reference (beginning of Lab 5 section, and command reference next page)
- MySRLab: remote-access lab facility hosted at the Nokia Kanata campus

Addressing & Login Table

	Edu **Lab 1**	Edu **Lab 2**
R1	192.168.206.164	192.168.206.196
R2	192.168.206.165	192.168.206.197
R3	192.168.206.166	192.168.206.198
R4	192.168.206.167	192.168.206.199
R5	192.168.206.168	192.168.206.200
R6	192.168.206.169	192.168.206.201
R7	192.168.206.170	192.168.206.202
R8	192.168.206.171	192.168.206.203

(R9-R12 are not needed or used in this lab.)

Edu **Lab 1** Login	Passwd	Edu **Lab 2** Login	Passwd
src-otti**01**u1		src-otti**02**u1	
src-otti**01**u2		src-otti**02**u2	
src-otti**01**u3		src-otti**02**u3	
src-otti**01**u4		src-otti**02**u4	
src-otti**01**u5		src-otti**02**u5	
src-otti**01**u6		src-otti**02**u6	
src-otti**01**u7		src-otti**02**u7	
src-otti**01**u8		src-otti**02**u8	

See Blackboard for a list of passwords;
write **yours** in the space above.

Command Reference

configure • router • **if-attribute** • **admin-group** <grp-name> **value** <bit-flag> # define group

show • router • if-attribute • **admin-group** # show groups

configure • router • ospf • **traffic-engineering** # Turns on generating of type 10 opaque LSAs

configure • router • mpls • interface <interface-name> • **admin-group** <group-name>

configure • router • mpls • lsp <lsp-name> • **cspf** # activates CSPF determination of path

configure • router • mpls • lsp <lsp-name> • primary <path-name> • **include** <group-name>
configure • router • mpls • lsp <lsp-name> • primary <path-name> • **exclude** <group-name>

Task 1: Configure infrastructure for Lab 5.1

Follow the lab instructions for setting up the infrastructure. Main items are:
(1) **No** CE routers; (2) single-area OSPF; (3) MPLS enabled on all interfaces; (4) RSVP enabled.

Task 2: Complete all steps in Lab 5.1

Follow all steps in the lab. **Ask** for help if you get stuck. *Wait* a few moments for reconvergence.
NB: Students on PE routers should complete all activities using an LSP to the clockwise P router.

CHECK POINT #1, #2, #3: Show the output of the lsp path detail command to confirm results.

Help any of your classmates who haven't yet succeeded in getting all the tasks completed.

Task 3: Prepare in-lab infrastructure for Lab 5.3

Delete the existing MPLS/RSVP configuration. Shutdown OSPF, then add the extra OSPF areas as indicated in the topology diagram for Lab 5.3. Re-configure MPLS/RSVP as per the lab.

Task 4: Start work on Lab 5.3 (time permitting)

Follow all steps in the lab. Any new commands are given in the lab. **Ask** for help if you get stuck.