

The following notes for the NET3012-IP Architectures and Solutions course are based on the Nokia MPLS (p/n 3HE02276AA) and Nokia Services Architecture (p/n 3HE02277AA) courses from the Nokia Service Routing Certification Program curriculum. These are copyrighted products of Nokia.

Lab 6: LDP over RSVP

Or: Use LDP as glue across RSVP regions

What you will do:

1. Verify OSPF area 0 connectivity on all Core (R1-R4) and Edge (R5-R6) routers
2. Create multi-area (1-4) OSPF for pods 1-4, and verify
3. Configure RSVP throughout each of the individual areas
4. Configure a Targeted-LDP session to span each OSPF area
5. Create an inter-area LDP tunnel by enabling LDP-over-RSVP

Things that you will need to know or learn:

1. CLI commands for configuring static and default routes; and OSPF routing
2. CLI commands for configuring RSVP
3. CLI commands for configuring LDP
4. CLI commands to enable the formation of LDP-over-RSVP tunnels:
configure router ldp • targeted-session peer x.x.x.x • tunneling
configure router ospf • ldp-over-rsvp
5. CLI commands so that LDP-over-RSVP tunnels can be used by the IGP for regular traffic:
configure router ldp-shortcut

What you need to submit and when:

1. There is no pre-lab for Lab 6.
2. Complete the in-lab part of the exercise (see below), **before** the end of your lab period.
3. Complete “Lab 6 Post-lab” exercise and submit to Blackboard by **Mon Feb 26 @ 8:00am**

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 compatible browser, and terminal program (Provided in T108)

In-Lab Marks:

2 marks: Demo of inter-area LDP tunnel, via LDP bindings table

1 mark: Clear explanation of lsp-trace results from Lab 5.3 step 16

The in-lab is worth 35% of the overall lab mark; the post-lab is worth 66% of the overall lab mark.

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

References and Resources:

- **MPLS lab** guide; specifically **5.3** (pages 32-34)
- Command reference (beginning of Lab 5 section in the MPLS lab guide)
- MySRLab: remote-access lab facility hosted at the Nokia Kanata campus

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 Blackboard 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 between Core & Edge routers

Based on your previous lab, confirm and reconfigure as necessary, full OSPF connectivity between all 8 Core and Edge routers in your lab. Use existing subnet masks (either /24 or /27).

Task 2: Remove any other existing configuration

The ability to clearly see what is happening and why is very important for this lab. Shutdown (as necessary) and then remove all other pre-existing configuration on **all** routers: LDP, MPLS, RSVP

Task 3: Configure MPLS LSPs and Targeted-LDP sessions

Follow the instructions given in **MPLS lab 5.3** Note the following points:

- Configure interfaces into OSPF exactly as instructed in step 1
- At no time during this lab are any interfaces configured in (link) LDP; remove any found!
- Targeted-LDP requires matching configuration at **both** ends for a session to form
- LSPs are uni-directional as always! If RSVP & TE are enabled throughout, then it's possible to get an LSP enabled regardless of what the other team is doing at their end!

CHECK POINT #1: Prove, with output on your screen, that LDP is forming tunnels over RSVP

Task 4: LSP trace operation

Complete the lsp-trace and make sure you understand the results. Compare the results you get using ping: the same or different? What tunnel mode is in use? Can you switch modes??

CHECK POINT #2: Explain the lsp-trace results to the lab Professor; explain the tunnel mode.

Task 5: (Challenge) Is CSPF strictly necessary in this exact scenario?

Determine which LSPs actually need CSPF enabled for this scenario. Be prepared with an answer of exactly which routers need it enabled.