

## Neat Tricks with LDP, RSVP Essentials: LDP-over-RSVP, MPLS shortcuts

### Agenda

- Pop quiz
- Short de-brief on Nokia field trip
- Test #1: **this Wed** (starts at **3pm**); everything in **labs 1-5; Modules 0-4**
- Take up any questions from previous lectures and labs
- Recap from labs: commands for testing & debugging LSPs:  
*tools perform router mpls resignal lsp <lsp-name> path <path-name>*  
*tools perform router mpls cspf to ... [from ...] [NRS-II p. 710-712]*
- Review RSVP-TE, Module 5:
  - Section 4, slide 141+: LDP-over-RSVP
- New Material from Module 5:
  - Section 2 – Basic TE config
  - Section 5 – MPLS shortcuts
- Guest speaker: William Vail from **CENGN** (Kanata)
- (Coming after Feb break) VPN Services: SA Module 1; NRS-II Ch 17

### Assignments and Lab work

- Read: NRS-II book: Chapter 14 by Mon Feb 26
- Lab 6 post-lab: due by **Mon Feb 26 @ 8am**
- Lab 7: IPv6 over MPLS (NRS-II Lab 13.4)

(continued on next page)

## Differentiate LSA vs path details

When going through the slides in sections 1 & 2, be sure to distinguish the difference between:

- the path selection characteristics contained in the **opaque database** LSA
- the three groupings of hops in the **path detail** (Explicit, Actual, Computed)

Slides 5.52 - 5.53, and 5.66 - 5.69 describe the ERO.

Slides 5.66-5.69 leave some room for mis-interpretation, but don't be fooled: the ERO is a section in the PATH message that gets populated by:

- CSPF if it's enabled for that LSP,
- otherwise it's populated by strict hops if configured by the admin,
- otherwise the ERO is empty.

In other words, when viewing the path detail output, the ERO gets populated from the **ComputedHops** (if **CSPF** enabled) or the **ExplicitHops** (if strict hops configured by the admin), or the ERO is empty.

The **Actual Hops** is obtained from the RRO (Record Route Object) in the RESV message, and reflects the actual path obtained.

```
*A:PL1-CSPF-L5-R5>config>router>mpls#
```

```
*A:R1# show router mpls lsp "to_R6" path detail  
[...snip...]
```

```
Path Trans      : 1                               CSPF Queries: 1  
Failure Code    : noError  
Failure Node    : n/a  
ExplicitHops:  
  No Hops Specified  
Actual Hops :  
  10.1.3.1(10.10.10.1)      Record Label   : N/A  
-> 10.1.3.3(10.10.10.3)    Record Label   : 131071  
-> 10.3.5.5(10.10.10.5)    Record Label   : 131071  
-> 10.5.6.6(10.10.10.6)    Record Label   : 131071  
ComputedHops:  
  10.1.3.1 (S)  
-> 10.1.3.3 (S)  
-> 10.3.5.5 (S)  
-> 10.5.6.6 (S)
```