

Neat Tricks with LDP, RSVP Essentials: LDP-over-RSVP, MPLS shortcuts, 6PE

Agenda

- Review: 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]
- Complete Module 5
- (Time permitting) VPN Services: SA Module 1; NRS-II Ch 17

Assignments and Lab work

- Read: MPLS Module 5 by Mon Feb 27 (review & prep for Test #2)
- Read: NRS-II book: Chapter 14 by Mon Feb 27 (review & prep for Test #2)
- Lab 6 post-lab: due by **Mon Feb 27 @ 8am**
- Lab #7: IPv6 over MPLS (NRS-II Lab 13.4)
- Lab 7 post-lab: due by 11:59pm **the day before** your lab session #8.

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.

Sample output showing hops

```
*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)
```