

# Label Distribution Protocol

## Agenda

- Tentative dates for term tests: Fri **Feb 7** + Fri **Mar 13** during class time
  - please allow extra time in your schedule in case tests run late
- Lab tip for copying configs:  
**environment no more** kills the pagination prompt!
- Lab prep: quick intro to RSVP
- Continue MPLS Module 3 on LDP
- 2<sup>nd</sup> hour: Guest Speaker from Nokia

## Assignments and Lab work

- Exercise #1 on LSPs: ... Check course site later today.
- Due next Wed: read Module 3 (all); Ref: NRS-II, Ch 13 (all) pages 600-656
- Lab 3 post-lab: due by 11:59pm on your lab section's due date (Sat/Thu)
- Lab work: Nokia MPLS Lab Guide, Labs 3.4 plus 2 additional tasks (i.e. IGP shortcuts; simple RSVP LSP)

## Key Points for LDP

- OAM lsp-ping and lsp-trace
- Distinguish: Hello/Hold time & Factor vs Keepalive time & Factor
- ECMP: hashing algorithm determines **per-flow** routing
- Implementing policies: prefix-list, policy-statement, begin & commit  
Compare & contrast: Cisco **redistribute** vs ALU **export** & **import**
- Resolving mis-matches between IGP & LDP mask lengths: use the option **aggregate-prefix-match**
- Targeted LDP (T-LDP): identify remote end via its system IP; all else same
- Authentication: MD5 (don't even *think* about using plain-text!)

## Policies on SR OS

Be sure you understand the export policies that you used for post-labs #2 & #3. For ease of reference, the following lines are from Nokia MPLS Lab Guide (p. 8):

```
A:MPLS_R1# configure>router>policy-options# begin
A:MPLS_R1# configure>router>policy-options# policy-statement <policy-name>
A:MPLS_R1# configure>router>policy-options>policy-statement# entry <entry index>
A:MPLS_R1# configure>router>policy-options>policy-statement>entry# action accept
A:MPLS_R1# configure>router>policy-options>policy-statement>entry# exit
A:MPLS_R1# configure>router>policy-options>policy-statement# exit
A:MPLS_R1# configure>router>policy-options# commit
```

```
A:MPLS_R1# configure>router>ldp# export <export-policy-name>
```

## Lab Prep

You may notice a repeating theme when seeing MPLS/RSVP protocol config:

<b>OSPF</b>	<b>LDP</b>	<b>MPLS</b> (as config'd)	<b>RSVP</b> (automatic)
config>router> <b>ospf</b> #area 0 config>... #> info	config>router> <b>ldp</b> # info	(See Module 4, slide 13) config>router> <b>mpls</b> # info	(See Module 4, slide 13) config>router> <b>rsvp</b> # info
----- <b>interface system</b> exit interface toR2 exit interface toR3 exit interface toR4 exit <b>no shutdown</b>	----- interface-parameters  interface "toR2" exit interface "toR3" exit interface "toR4" exit <b>no shutdown</b>	----- <b>interface system</b> exit interface toR2 exit interface toR3 exit interface toR4 exit <b>no shutdown</b>	----- <b>interface system</b> exit interface toR2 exit interface toR3 exit interface toR4 exit <b>no shutdown</b>

Once RSVP is configured for label distribution, an RSVP LSP has two parts:

<b>Part 1:</b> Configure a <b>Path</b> def'n	A:R1>config>router>mpls# ----- <b>path "empty_list_aka_loose"</b> <b>no shutdown</b> exit
<b>Part 2:</b> Configure an <b>LSP</b> : – <b>to</b> a destination; – <b>following</b> a certain path – that is <b>no(t) shutdown</b>	A:R1>config>router>mpls# ----- <b>lsp "to_R6"</b> <b>to</b> 10.10.10.6 <b>primary "empty_list_aka_loose"</b> exit <b>no shutdown</b> exit

There's lots of great "show" commands, given on slides 27-32 of Module 4.