

# Label Distribution Protocol

## Agenda

- In The News: recent emails about job opportunities (URL given in-class)
- Reminder: tentative dates for term tests: Wed **Feb 6** and Wed **Mar 13**
  - 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
- Complete MPLS Module 3, section 2: additional LDP features

## Assignments and Lab work

- Due next Wed: read NRS-II, Ch 13 (all) pages 600-656
- Lab 3 post-lab: due by 11:59pm of the 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:

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

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

<p><b>Part 1:</b> Configure a <b>Path</b> def'n</p>	<pre>A:R1&gt;config&gt;router&gt;mpls# ----- <b>path "empty_list_aka_loose"</b> <b>no shutdown</b> exit</pre>
<p><b>Part 2:</b> Configure an <b>LSP</b>:</p> <ul style="list-style-type: none"> <li>– <b>to</b> a destination;</li> <li>– <b>following</b> a certain path</li> <li>– that is <b>no shutdown</b></li> </ul>	<pre>A:R1&gt;config&gt;router&gt;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</pre>

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