RSVP and Traffic Engineering (Part 1)

Essentials: Opaque LSAs, Admin groups, CSPF

Agenda

- Test #1: **Fri Feb 7** during regular class time
  Will cover everything in MPLS modules 0-4 as well as all lab material
1. RSVP: Module 4, section 1 (Intro, protocol basics, control plane)
   (Also: RFC2113 – IP Option 20 = Router Alert and "fast path")
2. Lab Prep: Traffic Engineering in RSVP
3. Start RSVP & Traffic Engineering in Module 5:
   – CSPF: what is it and how does it work? (Mod 5.46-50)
- Coming next: complete RSVP (Mod 4); continue TE

Assignments and Lab work

- Read: complete MPLS Module 4: RSVP (entire; by next Wed)
- Study for test #1: re-read: Modules 1-3; references from NRS-II textbook
- Lab 4 post-lab: due by 11:59pm on your lab section's assigned due date.
- Exercise #1: MPLS LSPs due **Wed Feb 5 @ 11:59am**
  instructions on course site; quiz on BrightSpace
- Lab #5: MPLS Lab Guide, Lab 5.1 and prep for Lab 5.3

RSVP Traffic Engineering Essentials

- OSPF Type 10 (intra-area) LSAs (ref: Mod 5.18-20)
- Enabling the OSPF Traffic Engineering extension (ref: Mod 5.21)
- Admin Groups aka Link Colouring (ref: Mod5.60)
  – defining groups
  – characterizing links by assigning Admin Group parameters
- CSPF: activating Constrained Shortest Path First (ref: Mod 5.46-50)
- Specifying Constraints on an LSP (ref: Mod 5.64-65)

NB: The NRS II textbook was published in 2011 and used SR OS ~ver 8; we are using ver 13. Some of the commands have changed format and now reside in a different command context.

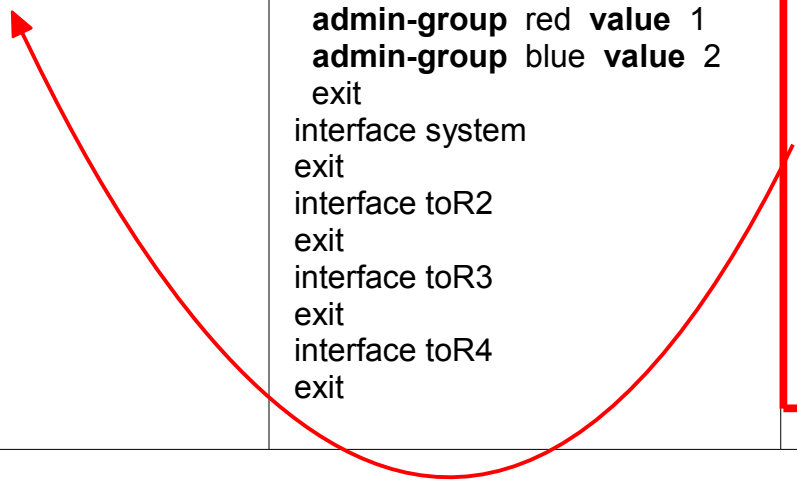
SR OS ver 12 supported both old & new formats; weekly in-lab and MyNetworkLab use ver 13 which **only** supports the new format.

In short: the **courseware slidedecks** have the **correct** command syntax and context; the **NRS II** textbook is now only **mostly correct**.

Lab Prep

Setting up the infrastructure for Traffic Engineering is split across three contexts:

OSPF	Admin Group Def'n	TED configuration
(See Mod5 slide 21) config>router>**ospf#** ---------- **traffic-engineering** exit	(See Mod 5 slide 60) config>**router#** ---------- **if-attribute** **admin-group** red **value** 1 **admin-group** blue **value** 2 exit interface system exit interface toR2 exit interface toR3 exit interface toR4 exit	(See Mod 5 slide 60) config>router>**mpls#** info ---------- interface system exit interface toR2 **admin-group** "blue" exit interface toR3 **admin-group** "red" exit interface toR4 **admin-group** "blue" **admin-group** "red" exit **no shutdown**



Once the pre-requisites for TE have been configured, defining an RSVP LSP with (for example) link colouring requires two more steps:

(The first types of TE are *not* specified within the path definition, so not even a single change here)	A:R1>config>router>mpls# ---------- **path** "empty_list_aka_loose" **no shutdown** exit
1. Activate the TE algorithm (CSPF) **2**. specify the admin groups which must be followed or avoided If either is missing, the LSP is *not* following the intended TE specification!	A:R1>config>router>mpls# ---------- lsp "to_R6" **cspf** to 10.10.10.6 primary "empty_list_aka_loose" **include** "blue" #(i.e. "MUST...") # and/or **exclude** "red" #(MUST NOT...) exit **no shutdown** exit

The lab guide provides several "show" commands which provide insight into the TE and LSP operation.