

RSVP Traffic Engineering (Part 1)

Essentials: Opaque LSAs, Admin groups, CSPF

Agenda

- Term Test #1: **next Wed Feb 8** (4pm, room P311)
Will cover everything in MPLS modules 0-4 as well as all lab material
- Lab Prep: Traffic Engineering in RSVP
- Continue 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)
- Start studying for test #1:
 - re-read: NRS-II book: Chapter 11
- Lab 4 post-lab: due by 11:59pm the **day before your lab** section.
- Lab #5: MPLS Lab Guide, Lab 5.1 and prep for Lab 5.3
- Exercise #1 (on BB): MPLS LSPs and Labels, due next **Mon @2:00pm**

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: Mod 5.60)
 - 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; ver 13 **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 link colouring requires two more steps:

(TE is <i>not</i> 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
– Activate the TE algorithm (CSPF) – specify the admin groups which must be followed or avoided If either is missing, the LSP is <i>not</i> 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.