


RSVP Pop'n'Go



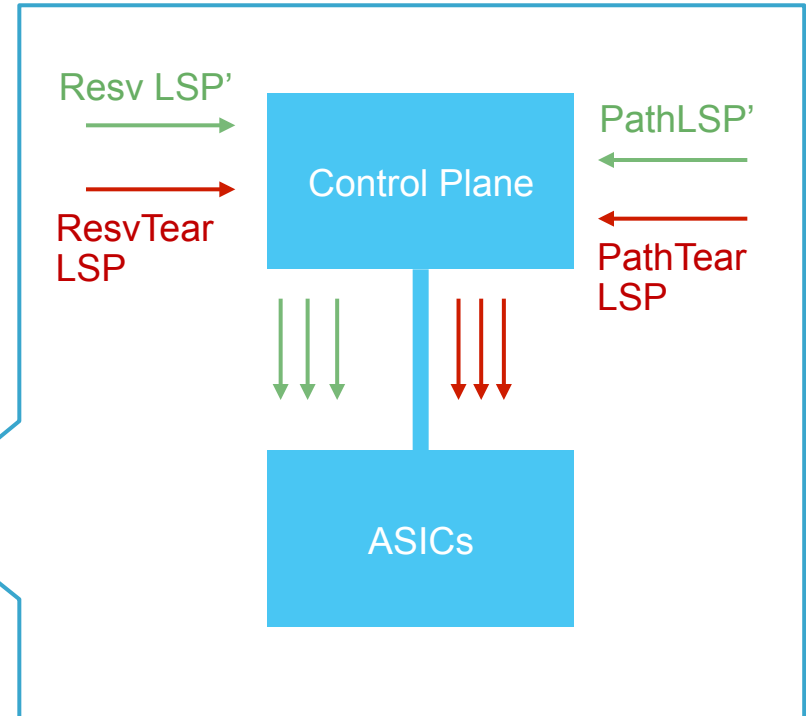
State-less, Churn-less Traffic Engineering w
RSVP

The Traffic Engineering characterization

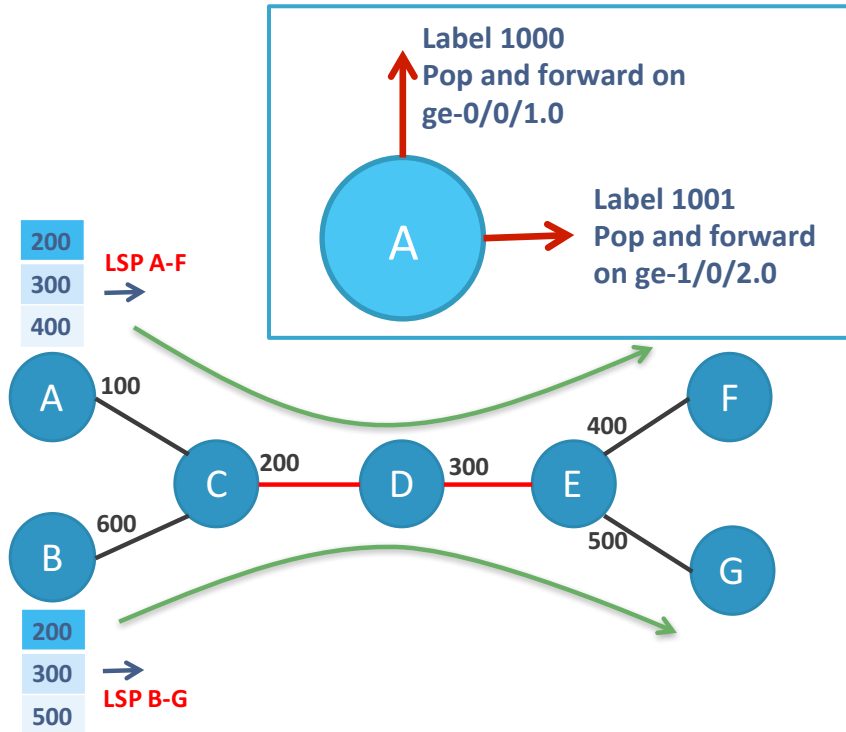
	inefficient		efficient	
Control Plane scale			RSVP	SPRING
Control Plane churn	RSVP			SPRING
Data Plane scale	RSVP			SPRING
Data Plane churn	RSVP			SPRING
TE capability w/o PCE	SPRING			RSVP
TE capability w/ PCE				RSVP, SPRING
LSP BW visibility	SPRING			RSVP

RSVP scale and churn

- Scale
 - 1:1 CP soft-state to label-swap
 - $O(n^2)$ label swaps in Data Plane
 - Unique 'swap-to' label \rightarrow HW limitations
- Data-plane Churn
 - LSP setup, re-optimization, BW adjustment
 - New RSVP session \rightarrow new labels
 - @ $O(n^2)$ scale



RSVP Pop'n'Go – Scale and churn



- Inherit from SPRING
 - label stack
 - RSVP-neighbour local label (Adj-SID like)
- Data Plane scale $O(m)$ where
 - m - # direct neighbors
 - Labels shared among LSP
- Data Plane churn
 - Only if egress neighbor change




RSVP Pop'n'Go – Other goodies

- Inherit RSVP TE capabilities
 - BW-driven optimization
 - No need for PCE controller
 - PCE/controller compatible
- Automatic label-stack compression
 - Auto-discovery
 - Stack expansion delegation
 - Push capability awareness

- 5 push allowed, 2 for service → max 3 for transport
- 8-hop TE LSP

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10.10.10.10
  From: 2.2.2.2, State: Up, ActiveRoute: 0, LSPname: t1
  [ . . . ]
    Computed ERO (S [L] denotes strict [loose] hops): (CSPF
metric: 80)
80.1.1.2 S 90.1.1.1 S 70.1.1.2 S 92.1.1.1 S 93.1.1.2 S
102.1.1.2 S 100.1.1.2 S 101.1.1.2 S
  Received RRO (ProtectionFlag 1=Available 2=InUse 4=B/W
8=Node 10=SoftPreempt 20=Node-ID):
3.3.3.3(flag=0x20) 80.1.1.2(Label=299808 (0x3), Pop)
4.4.4.4(flag=0x20) 90.1.1.1(Label=299776 (0x3), Pop)
5.5.5.5(flag=0x20) 70.1.1.2(Label=299824 (0x5), Delegate)
6.6.6.6(flag=0x20) 92.1.1.1(Label=299792 (0x3), Pop)
7.7.7.7(flag=0x20) 93.1.1.2(Label=299776 (0x3), Pop)
8.8.8.8(flag=0x20) 102.1.1.2(Label=19 (0x5), Delegate)
9.9.9.9(flag=0x20) 100.1.1.2(Label=16 (0x3), Pop)
10.10.10.10(flag=0x20) 101.1.1.2(Label=3 (0x1), Swap)
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The Traffic Engineering characterization

	Weak		Strength
Control Plane scale			RSVP SPRING
Control Plane churn	RSVP		SPRING
Data Plane scale			SPRING, RSVP
Data Plane churn			SPRING, RSVP
TE capability w/o PCE	SPRING		RSVP
TE capability w/ PCE			RSVP, SPRING
LSP BW visibility	SPRING		RSVP

Interested in more ?

- Signaling RSVP-TE tunnels on a shared MPLS forwarding plane
<https://datatracker.ietf.org/doc/draft-sitaraman-mpls-rsvp-shared-labels/>
- Want to play with?
 - Routing-tme@juniper.net
 - rafal@juniper.net

The image features a blue-tinted background showing a crowd of people, likely at a conference or event. The text "Thank you" is prominently displayed in the center in a large, white, sans-serif font. The overall mood is professional and appreciative.

Thank you