Signaling RSVP-TE tunnels on a shared MPLS forwarding plane

draft-sitaraman-mpls-rsvp-shared-labels-01

Harish Sitaraman (hsitaraman@juniper.net)

Vishnu Pavan Beeram (vbeeram@juniper.net)

Tejal Parikh (tejal.parikh@verizon.com)

Tarek Saad (tsaad@cisco.com)

Recap

- Couple the feature benefits of the RSVP-TE control plane with the simplicity of the SR MPLS forwarding plane.

- Allocate unique pop labels with pop-and-forward label action for each TE link.

- Use label stacking from ingress.

- Delegation of label stack imposition.

Changes since -00

- Delegation of label stack imposition

  - Delegation labels

  - Automatic/Explicit delegation

  - Construction of label stack

- Added new co-author and contributor

Delegation of label stack imposition

Manage limitations of label stack depth imposition at ingress

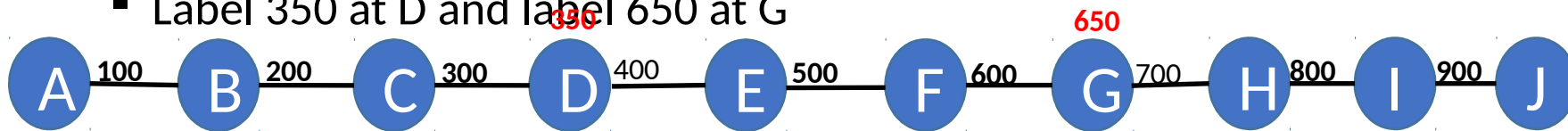**Automatic** selection of label stack delegation hops

- Allow transits to automatically select delegation hops D and G

Explicit selection of label stack delegation hops

- Allow ingress to explicitly select delegation hops D and G

Delegation hop

- Allocates a *delegation label* to represent a set of labels that will be pushed
- Label 350 at D and label 650 at G

- RRO Label subobject flag
  - Delegation label

- Attributes Flags TLV: Label Stack Imposition – Delegation (LSI-D)
  - HOP_ATTRIBUTES subobject
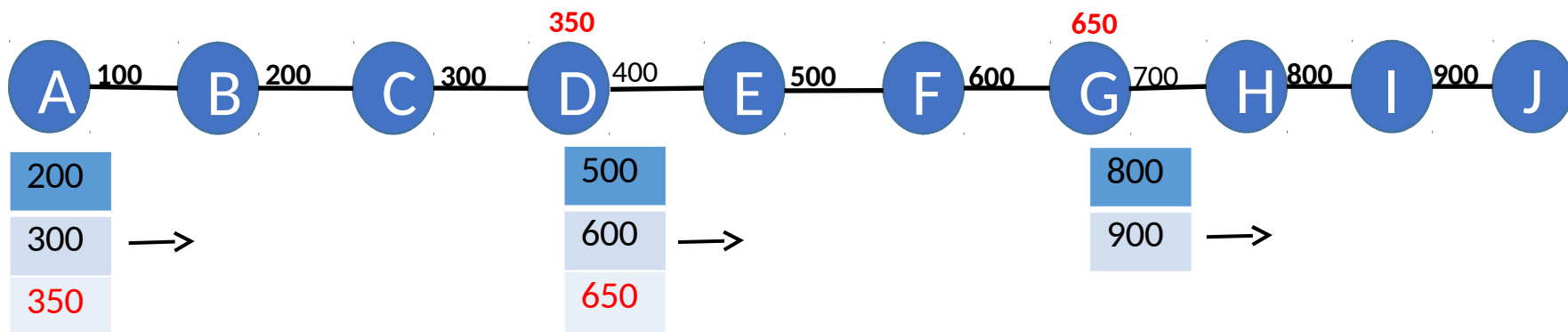 - LSP_ATTRIBUTES subobject

4

Stacking to reach delegation hop

RSVP-TE pop and forward tunnel from A to J
- Delegation hops D and G

At ingress and delegation hops, label stack…
- Includes the next delegation label

Stacking to reach egress
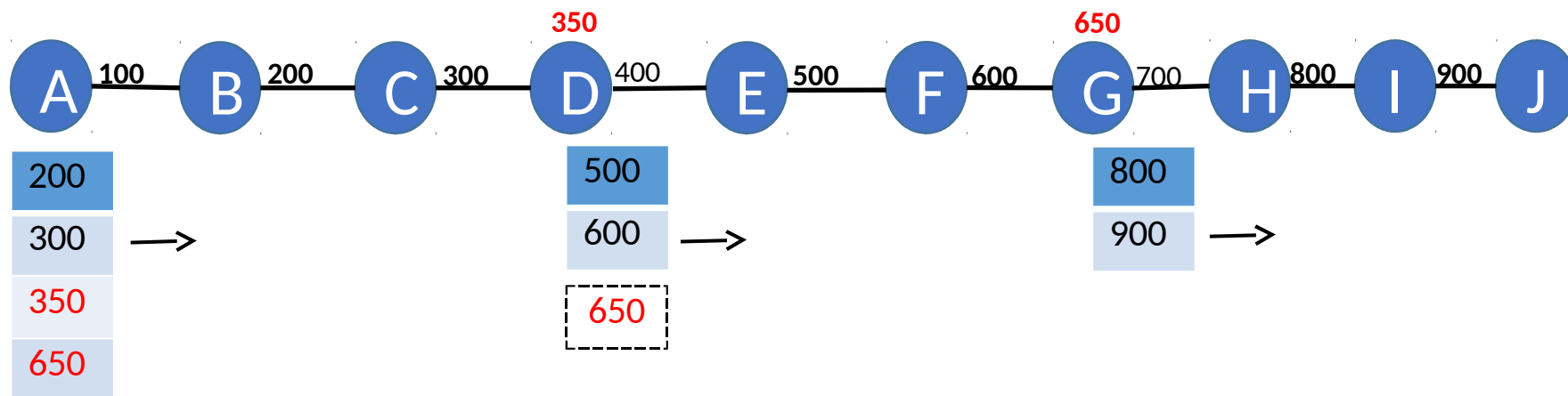
RSVP-TE pop and forward tunnel from A to J
- Delegation hops D and G

At ingress, label stack…
- Includes all delegation labels at the end of stack

At transit, label stack…
- Does NOT include the next delegation label

- Attributes Flags TLV: Label Stack Imposition – Delegation (LSI-D-S2E)
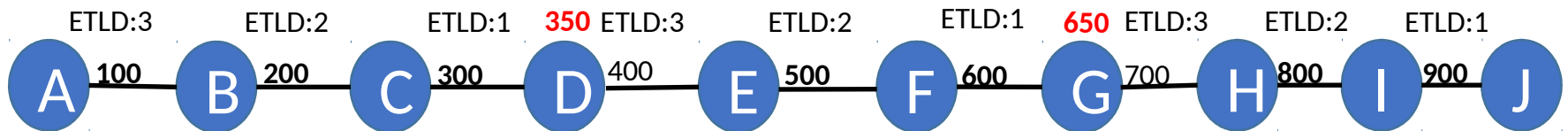 - LSP_ATTRIBUTES subobject

Automatic Delegation - Effective Transport Label-Stack Depth (ETLD)

RSVP-TE pop and forward tunnel from A to J

- Delegation hops D and G automatically chosen during initial signaling sequence.

ETLD (per-hop signaled attribute) processing:

- Ingress populates ETLD with the maximum number of transport labels that it can potentially send to its downstream hop.
- Each successive hop decrements it by 1 (or appropriately based on limitations at that hop).
- If a node is reached where the phop ETLD is 1 (or there is no phop ETLD), then that node selects itself as delegation hop.
- Each delegation hop resets the ETLD to the maximum number of transport labels that it can potentially send to its downstream hop.
- By the time the Path message reaches the egress, all delegation hops are known.

ETLD:3	ETLD:2	ETLD:1	**350** ETLD:3	ETLD:2	ETLD:1	**650** ETLD:3	ETLD:2	ETLD:1
A 100	B 200	C 300	D 400	E 500	F 600	G 700	H 800	I 900 J

- Attributes TLV: ETLD
    - HOP_ATTRIBUTES subobject

Next Steps

- Add section for Node protection.

- Request early allocation of IANA code points .

- Request WG adoption.