Interconnecting Millions Of Endpoints with Segment Routing

draft-filsfils-spring-large-scale-interconnect-01

C. Filsfils, D. Cai, S. Previdi, Cisco
W. Henderickx, Alcatel-Lucent
R. Shakir, BT
D. Cooper, F. Ferguson, Level3
T. LaBerge, S. Lin, Microsoft
B. Decraene, Orange
L. Jalil, Verizon
J. Tantsura, Ericsson

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What’s new since version 00?

• Very simple, no much change
• Add new co-author
  • Jeff Tantsura, Ericsson
Problem Statement Re-cap

• Not like IP, there is no such concept of the label summarization and default label
• For the MPLS network, each node need specific label for the forwarding
• Millions of nodes/endpoints means millions of RIB/FIB, which is not desirable for the low cost DC switches or SP metro access nodes
The Principle and Reference Design
Using hierarchical label stack to solve large scale MPLS network

- Network is divided into 2 or 3 layers: core, leaf and sub-leaf (or local endpoint) optionally
- Each leaf domain is reachable via domain label (thinking zip code). Domain label is anycast SID which is advertised by the leaf border routers
- Endpoint use local adj SID which is behind one or multiple leaf nodes
Large-scale DC Network Use Case

DC Gateway

Leaf domain: DC1

Spine

ToR

Leaf domain:

POD 11

POD 12

WAN/DCI network

POD 21

POD 22

VM

NVE endpoint

VM

VM

VM

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VM
Large-scale DC Network Use Case
Benefit

• A simple way to scale MPLS network using existing SR, no protocol changes
• Fully leverage the distributed SR in each domain: ECMPs, TI-FRR and SR-TE
• Simple “X” node (border node) redundancy using anycast SID
• Fully inter-operate with existing network protocols and design: LDP, seamless MPLS
Questions/Comments?