

SRv6 Point-to-Multipoint Path

draft-chen-pim-srv6-p2mp-path-00

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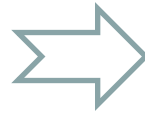
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Introduction

MPLS TE in IETF for 20+ years

- Unicast, P2P TE LSP
- Multicast, P2MP TE LSP

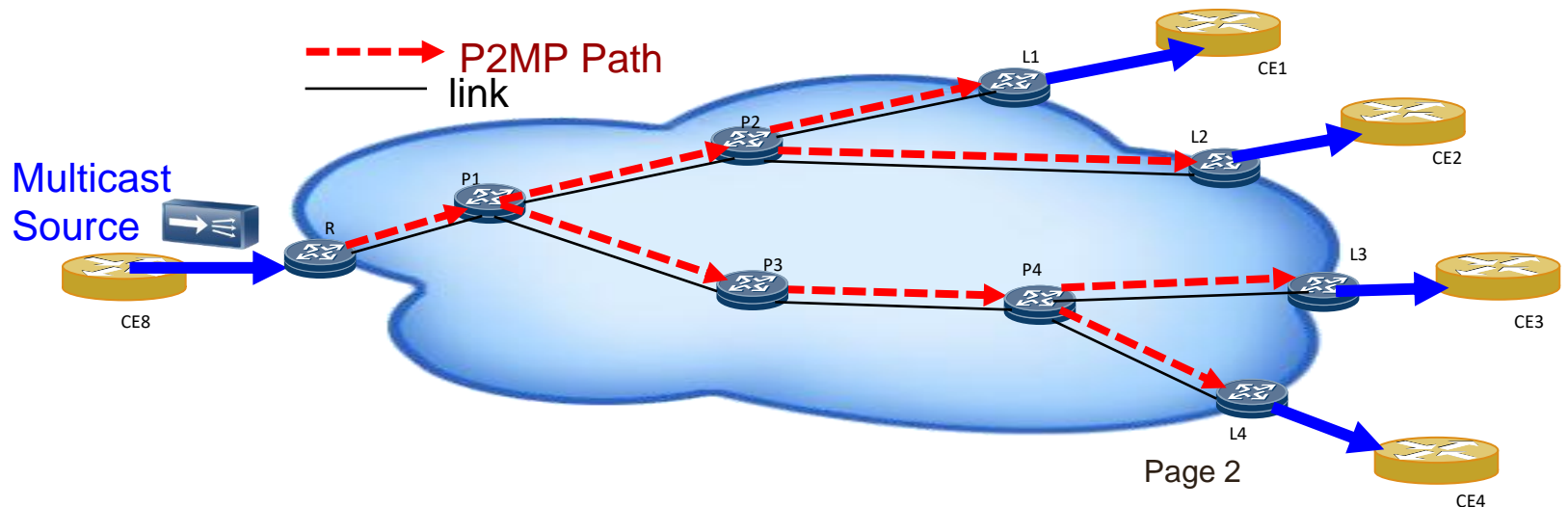


SR in IETF for 7 years
no state, no signaling in core, ...

↑ scalability, simple OPs, ...

- Unicast, SR P2P Path
Widely deployed

? **Multicast, SR P2MP Path**
Need SR P2MP Path solution,
consistent with SR principle



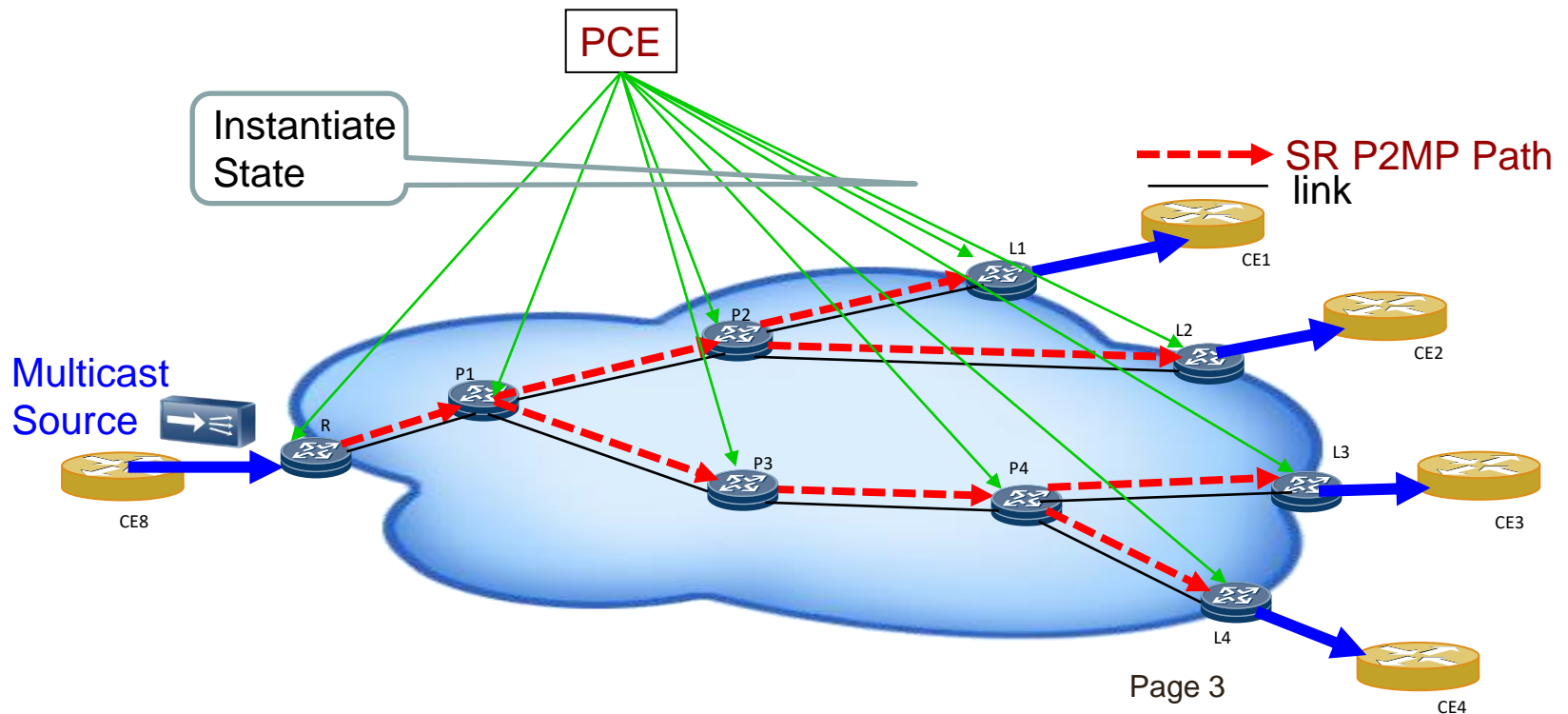
Brief on Existing Solutions

I-D.shen-spring-p2mp-transport-chain, for a SR P2MP path/tree

Multiple SR P2P tunnels from ingress to leaf with some leaves as buds

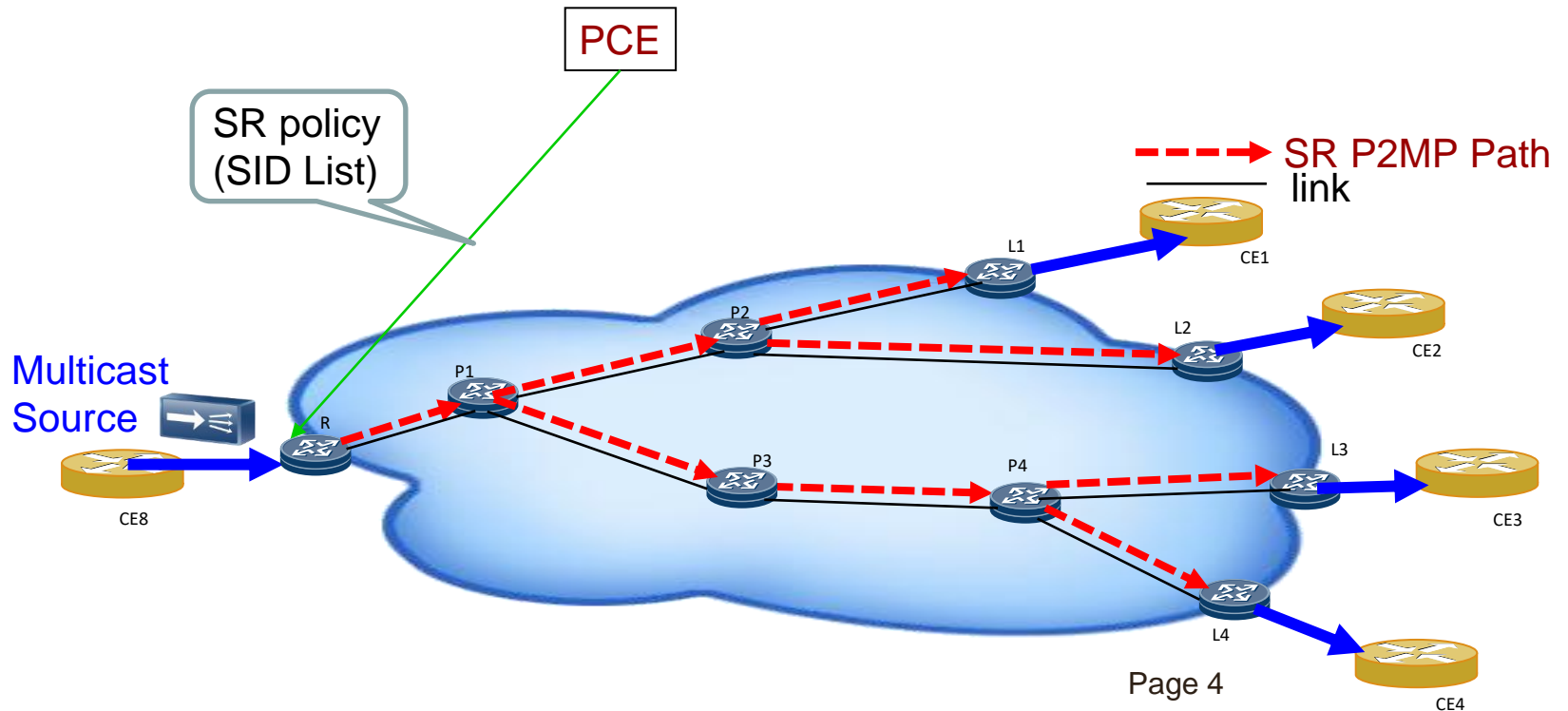
I-D.voyer-pim-sr-p2mp-policy, for a SR P2MP path/tree

- State (Data Plane) in core (root, transit nodes and leaves of path/tree)
- State is instantiated by a controller such as PCE



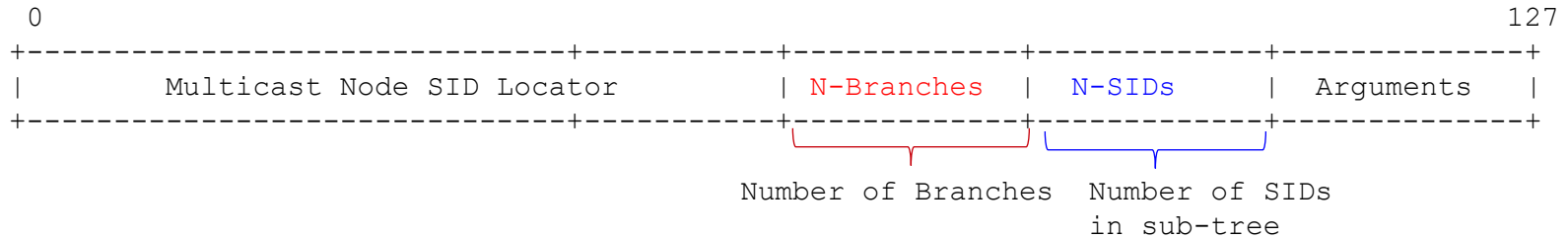
Brief on a Proposed Solution

- Closer to No state in network core
- SR policy (SID list) to ingress
- Multicast SID
- SID List for SR P2MP path/tree

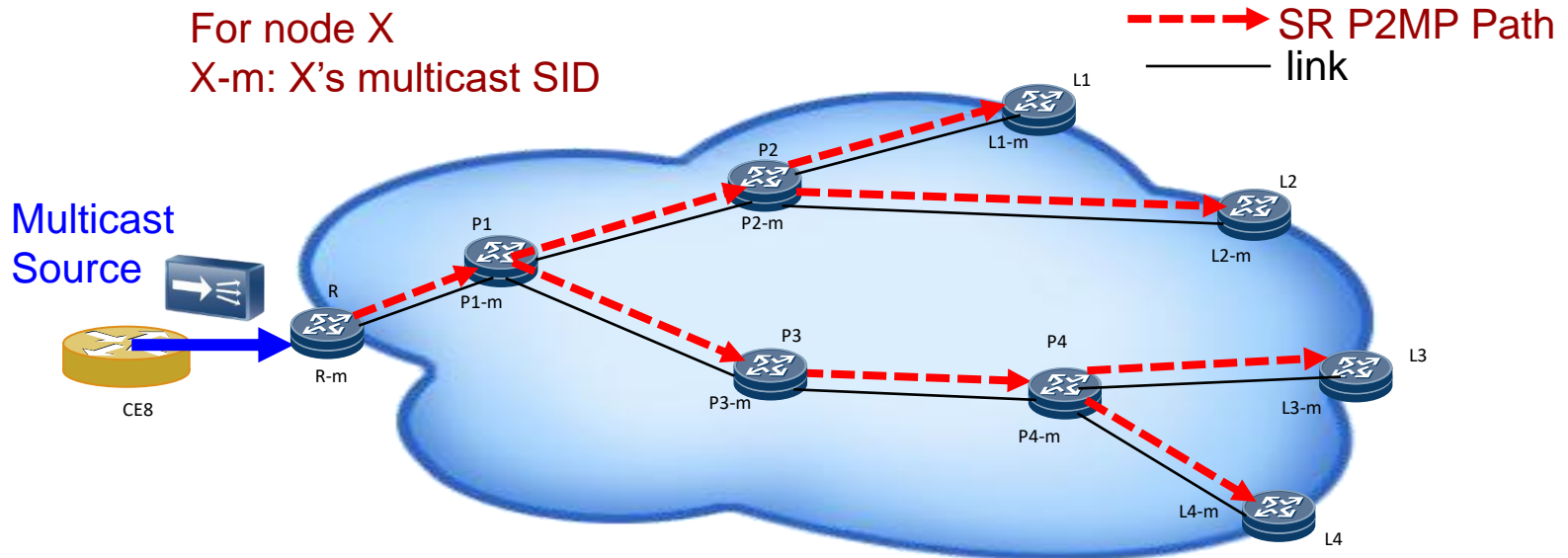


SRv6 P2MP Path Solution – Multicast SID

Multicast SIDs are special SIDs allocated from multicast SID block.
2 types Multicast SIDs: Multicast Node SID and Adjacency SID

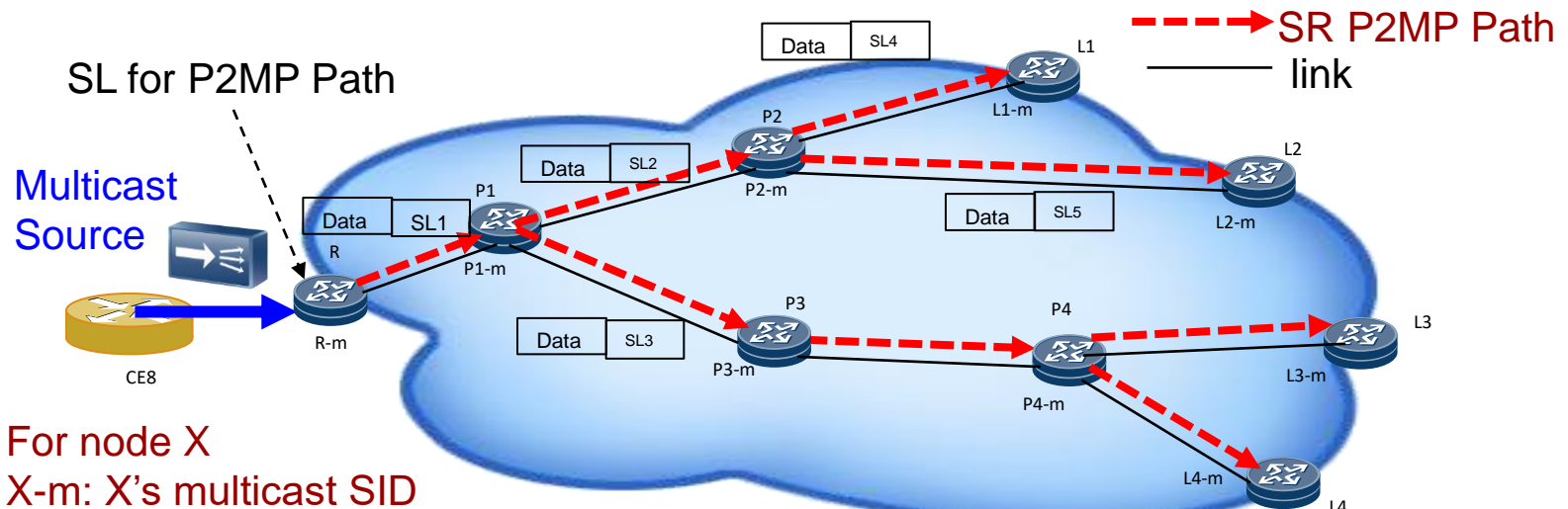


Format of Multicast Node SID with Branch and sub-tree Information



SRv6 P2MP Path Solution – SID List

- SID List (SL) represents SR P2MP path/tree or sub-tree
e.g., $SL = \{P1-m, P2-m, P3-m, L1-m, L2-m, P4-m, L3-m, L4-m\}$
arguments (such as N-Branches, N-SIDs) in SIDs indicate tree structure
- A SID List is pushed in a packet at Ingress R (Network Edge)
e.g., $DA=P1-m, SL1=\{P2-m, P3-m, L1-m, L2-m, P4-m, L3-m, L4-m\}$ pushed at R
- Each transit copies, sends packet to its next hops using DA, SID List in packet received (No state in core)
e.g., P1 copies, sends packet to P2 and P3; P2 copies, sends packet to L1 and L2



SID List Example in Details

0	B	L+B	127	
Multicast Node SID Block	Node-P1-ID	2	7	Arguments P1-m
Multicast Node SID Block	Node-P2-ID	2	2	Arguments P2-m
Multicast Node SID Block	Node-P3-ID	1	3	Arguments P3-m
Multicast Node SID Block	Node-L1-ID	0	0	Arguments L1-m
Multicast Node SID Block	Node-L2-ID	0	0	Arguments L2-m
Multicast Node SID Block	Node-P4-ID	2	2	Arguments P4-m
Multicast Node SID Block	Node-L3-ID	0	0	Arguments L3-m
Multicast Node SID Block	Node-L4-ID	0	0	Arguments L4-m

N-Branches
N-SIDs

sub-tree under P2

sub-tree under P3

via P4 to PE3, PE4

SID list encoding P2MP path/tree under R via P1 towards L1 to L4

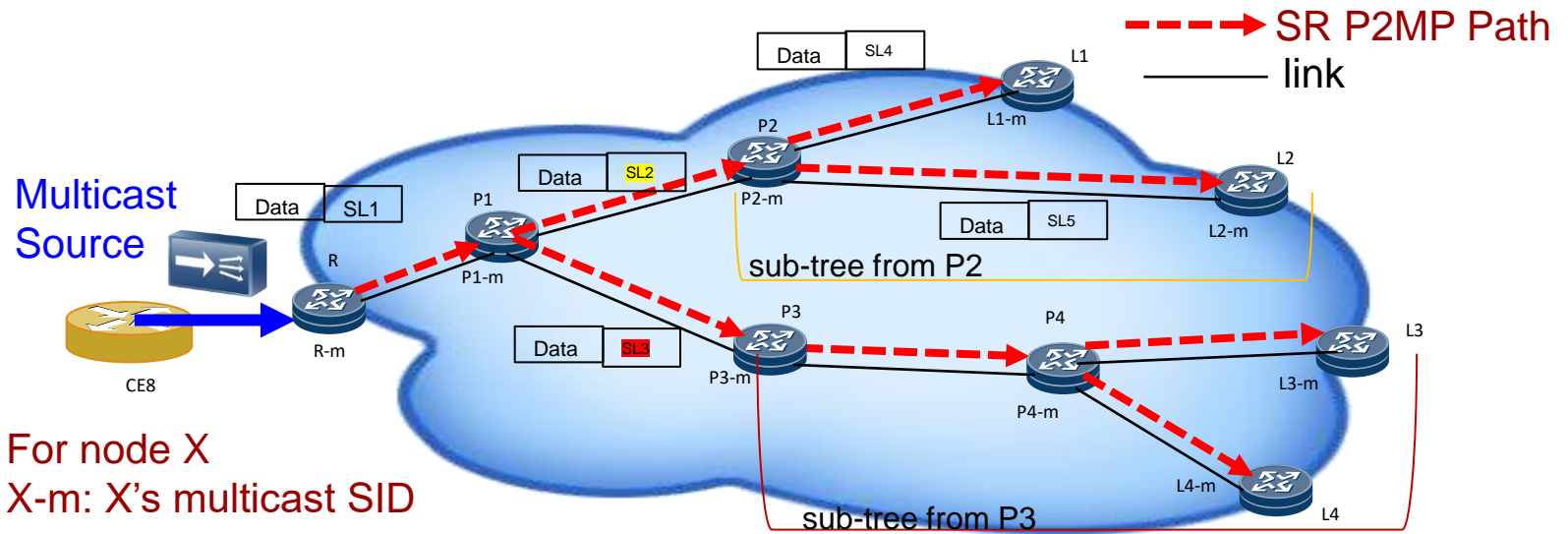
SID P1-m indicates that there are 2 branches and 7 SIDs under P1. SID P2-m indicates that there are 2 branches and 2 SIDs under P2. SID P3-m indicates that there are 1 branch and 3 SIDs under P3.

SIDs L1-m and L2-m indicate that no branch under them.

SID P4-m indicates that there are 2 branches and 2 SIDs under P4. L3-m and L4-m indicate that no branch under them.

SRv6 P2MP Path Solution – Some Details

- P1 receives packet
 DA = P1-m, SID List (SL1) = {P2-m, P3-m, L1-m, L2-m, P4-m, L3-m, L4-m}
 (P2-m, P3-m) are grouped as "sub-tree from P2" (2 branches)
 (P4-m, L3-m, L4-m) are grouped as "sub-tree from P3"
- P1 duplicates packet for P2 and P3
 P1 sends packet to P2, DA = P2-m, SID List (SL2) = {L1-m, L2-m} packet to P3
 DA = P3-m, SID List (SL3) = {P4-m, L3-m, L4-m}
- P2 receives packet (DA = P2-m, SID List (SL2) = {L1-m, L2-m})
 P2 duplicates, sends packet to L1 and L2 (with DA = L1-m and DA = L2-m respectively, SL4/5={})



For node X
X-m: X's multicast SID

Next

Request for Adoption