MPLS Global Mode

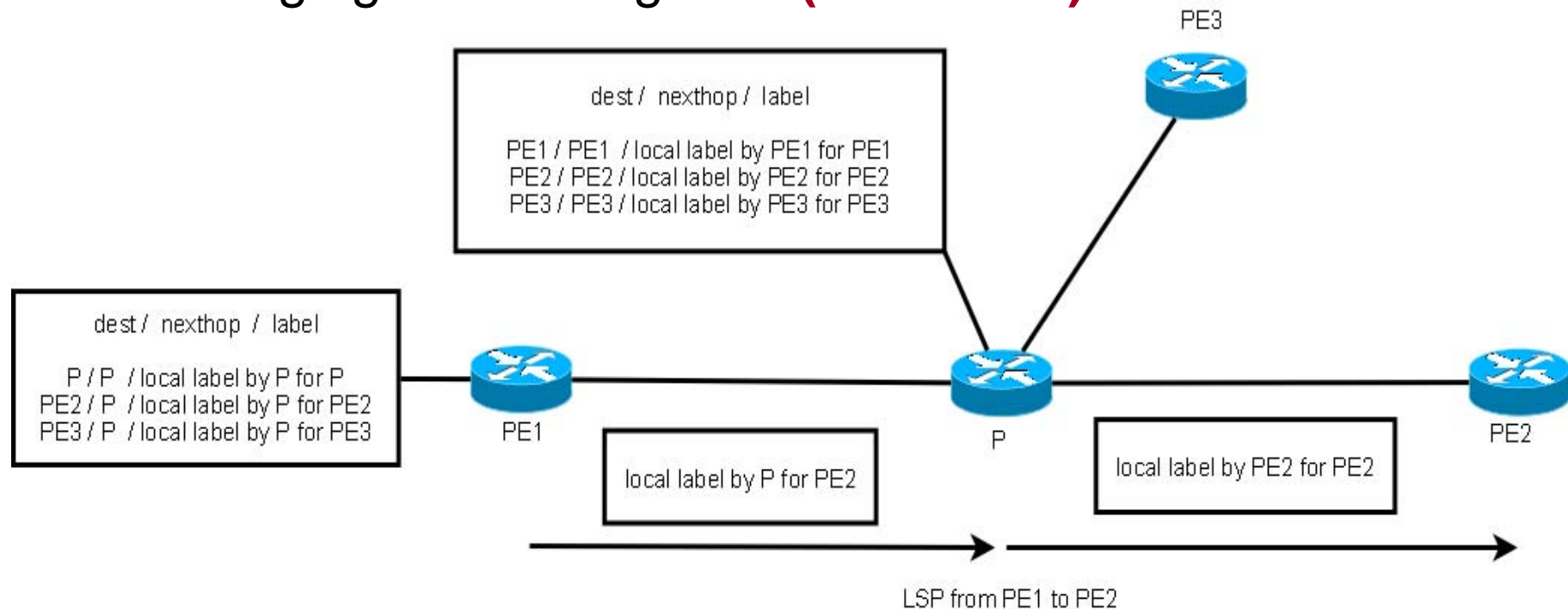## Service Management Simplified

Albert

2009

Purpose & Considerations

- MPLS services are deployed via layers of labels
- But different service has different flavor
- Existing label is locally allocated-has local semantics
- Global label semantics defined to simplify service mgmt
- Suitable for label per platform mode
- Limitation for the globalized label: single label stack is 1 million, but may use label stack to fix
- May use global label assign coordination mechanism
- Global semantics fit for single AS, inter-as to be studied
- May use label place holder for provisioning and instantiate the actual value during activation

Inter-node LSP Local Mode

- Label/Node binding allocated by each PE **(Workload)**
- Binding sent to neighbors via IF **(Workload)**
- Neighbors install FIB for receiving IF
- Changing label along LSP **(Workload)**

PE3

dest / nexthop / label

PE1 / PE1 / local label by PE1 for PE1
PE2 / PE2 / local label by PE2 for PE2
PE3 / PE3 / local label by PE3 for PE3

dest / nexthop / label

P / P / local label by P for P
PE2 / P / local label by P for PE2
PE3 / P / local label by P for PE3

PE1

P

PE2

local label by P for PE2

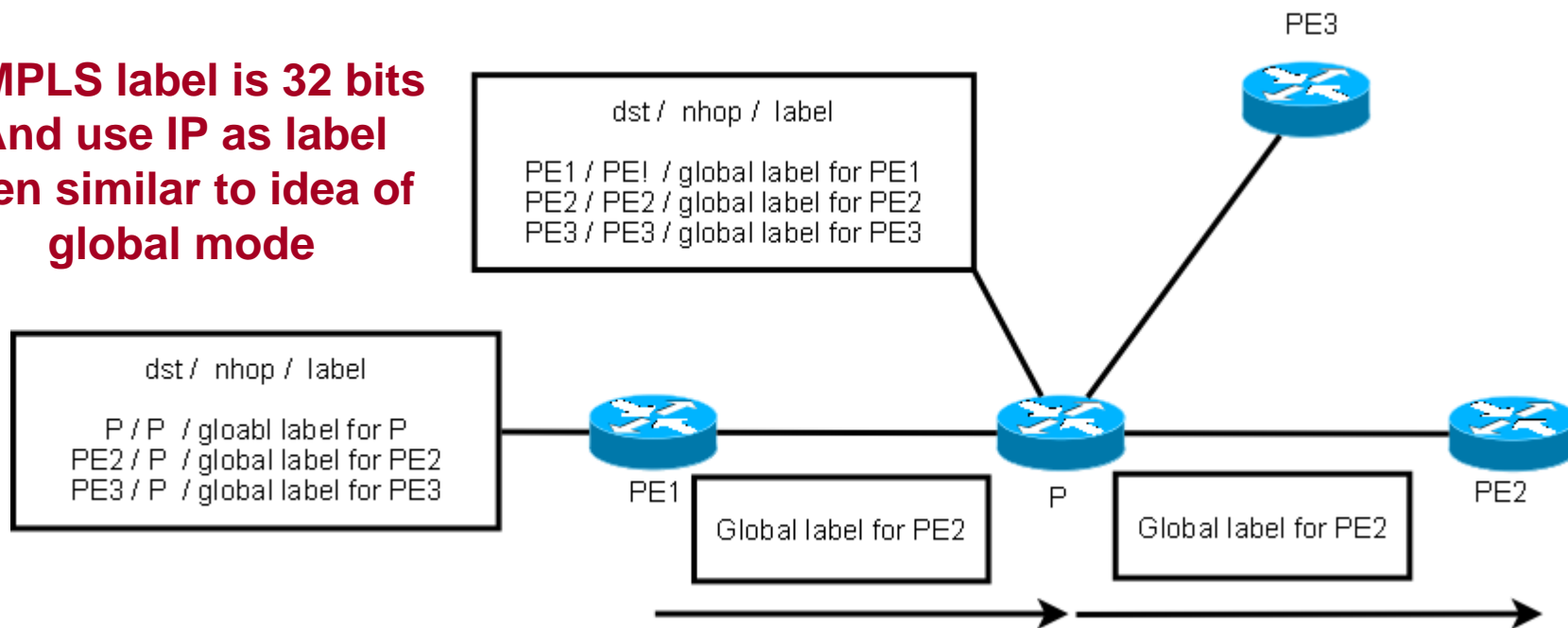local label by PE2 for PE2

LSP from PE1 to PE2

Inter-node LSP Global Mode

- Label/node binding allocated globally **(Simplified)**
- Binding known by neighbors **(Simplified)**
- Neighbors learn route to Node & install FIB
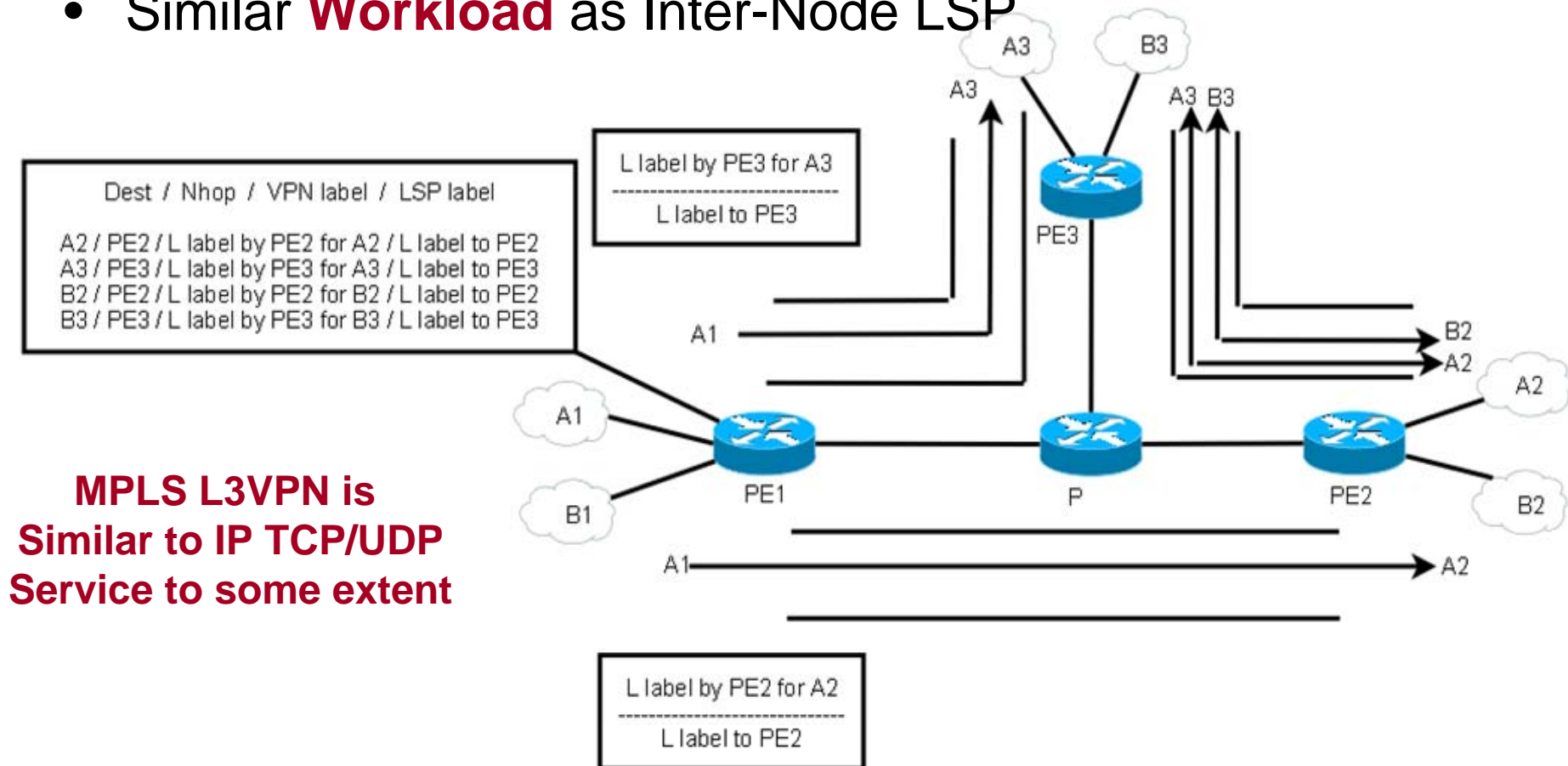- Consistent label along LSP **(Simplified)**
- Something like MP2P LSP?

TE: head-tail LSP

**If MPLS label is 32 bits
And use IP as label
Then similar to idea of
global mode**

PE3

dst / nhop / label

PE1 / PE! / global label for PE1
PE2 / PE2 / global label for PE2
PE3 / PE3 / global label for PE3

dst / nhop / label

P / P / gloabl label for P
PE2 / P / global label for PE2
PE3 / P / global label for PE3
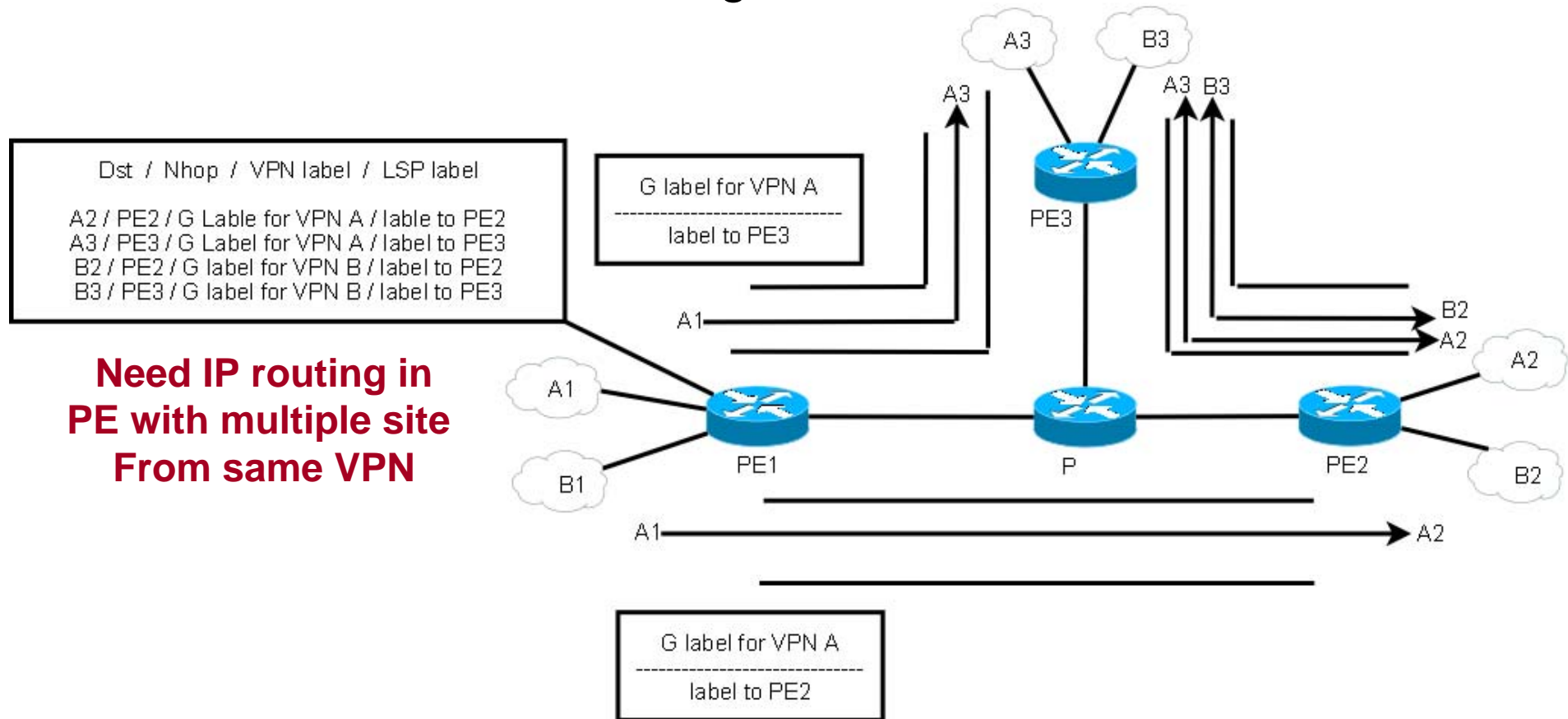
PE1

Global label for PE2

P

Global label for PE2

PE2

L3VPN Local Mode

- VPN Label for Service Mux & Route, via MP-BGP

- Inter-Node Label for LSP, via LDP

- Similar **Workload** as Inter-Node LSP

Dest / Nhop / VPN label / LSP label

A2 / PE2 / L label by PE2 for A2 / L label to PE2
A3 / PE3 / L label by PE3 for A3 / L label to PE3
B2 / PE2 / L label by PE2 for B2 / L label to PE2
B3 / PE3 / L label by PE3 for B3 / L label to PE3

L label by PE3 for A3

L label to PE3

L label by PE2 for A2

L label to PE2

**MPLS L3VPN is
Similar to IP TCP/UDP
Service to some extent**

L3VPN Global Mode

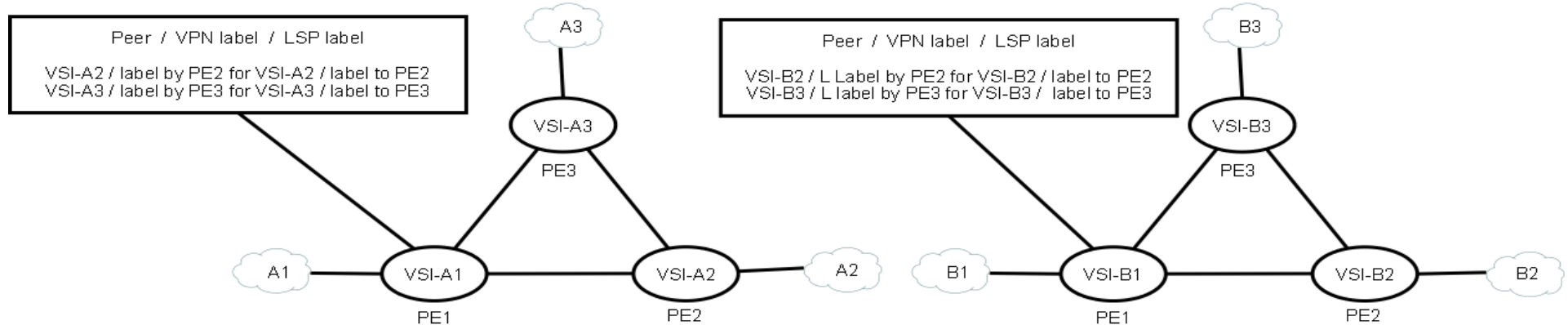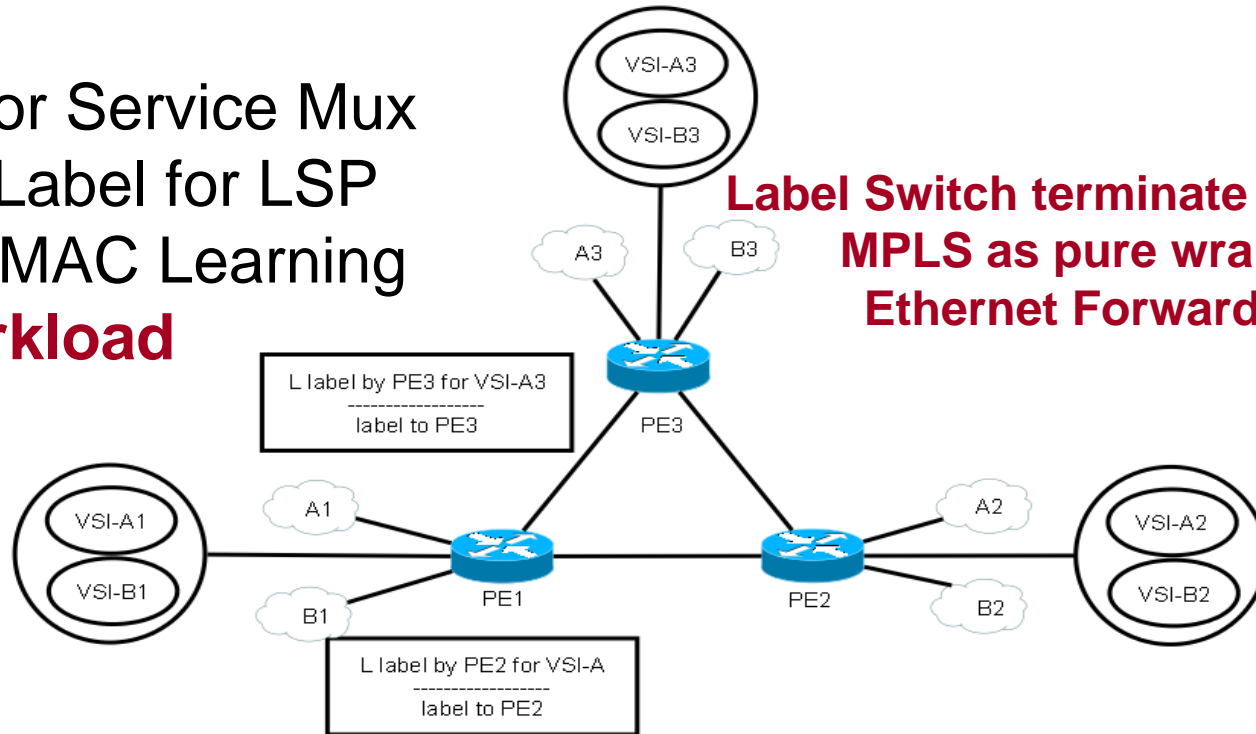- Similar to Inter-Node LSP
- **Simplify** Service Provision, Deploy, Troubleshooting
- VPN Route to PE binding needed

Dst / Nhop / VPN label / LSP label

A2 / PE2 / G Lable for VPN A / lable to PE2
A3 / PE3 / G Label for VPN A / label to PE3
B2 / PE2 / G label for VPN B / label to PE2
B3 / PE3 / G label for VPN B / label to PE3

Need IP routing in PE with multiple site From same VPN

G label for VPN A
----
label to PE3

G label for VPN A

label to PE2

L2VPN(VPLS) Local Mode

VPN label for Service Mux
Inter-Node Label for LSP
L2 Fwd via MAC Learning
Similar **Workload**

**Label Switch terminate at PE VSI
MPLS as pure wrapper
Ethernet Forwarding**

VSI-A3

VSI-B3

A3   B3

L label by PE3 for VSI-A3
----
label to PE3

PE3

A1   VSI-A1   A2   VSI-A2

VSI-B1   PE1   PE2   B2   VSI-B2

B1

L label by PE2 for VSI-A
----
label to PE2

Peer / VPN label / LSP label

VSI-A2 / label by PE2 for VSI-A2 / label to PE2
VSI-A3 / label by PE3 for VSI-A3 / label to PE3

A3

VSI-A3

PE3

A1   VSI-A1   VSI-A2   A2

PE1   PE2

Peer / VPN label / LSP label

VSI-B2 / L Label by PE2 for VSI-B2 / label to PE2
VSI-B3 / L label by PE3 for VSI-B3 / label to PE3

B3

VSI-B3

PE3

B1   VSI-B1   VSI-B2   B2

PE1   PE2

L2VPN(VPLS) Global Mode

VPN label Mgmt **Simplified**
Label Switching **Simplified**
L2 Fwd via MAC Learning
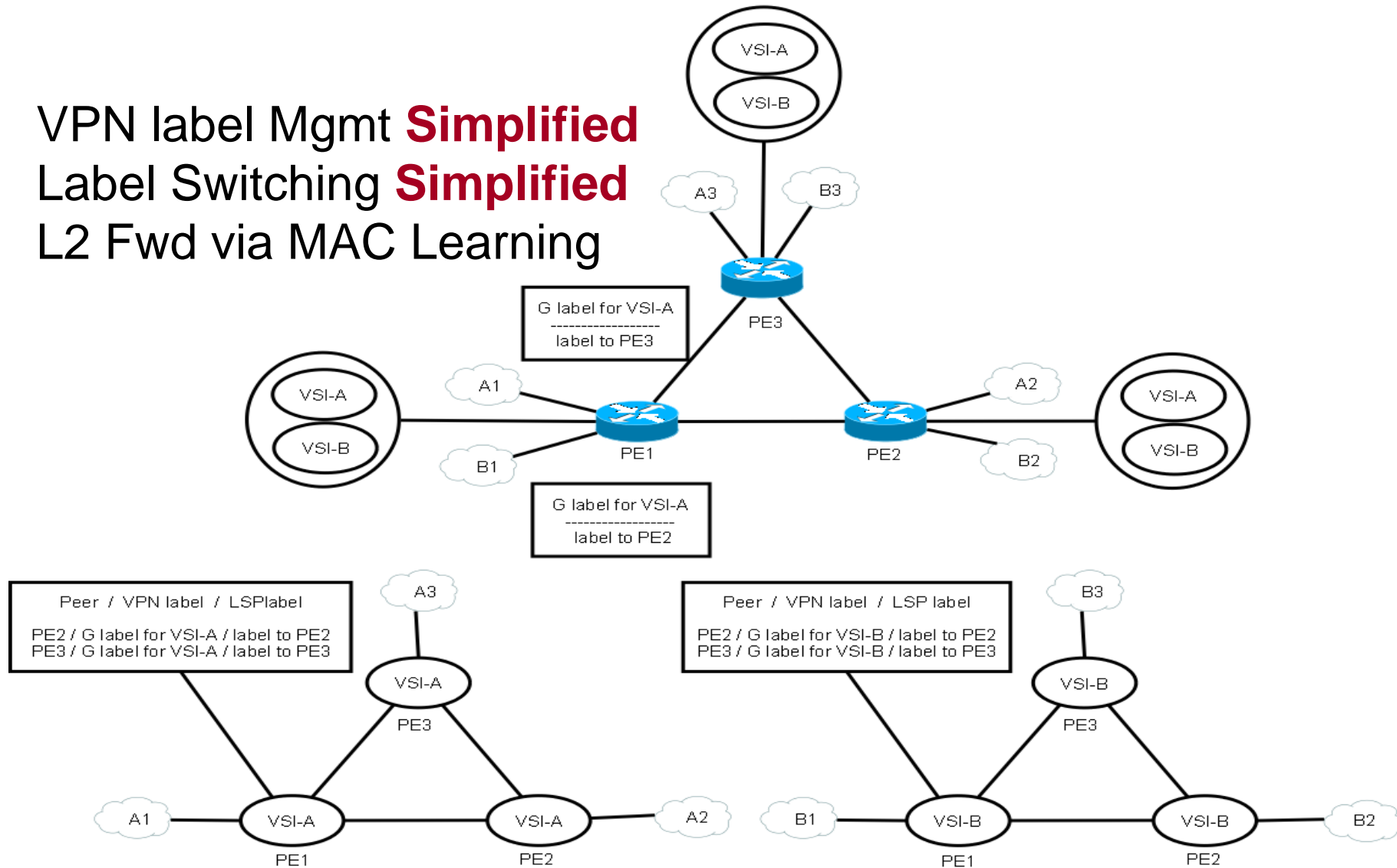
Next Step

- Open for community review
- TE LSP
- P2MP and MVPN
- Inter-AS

Summary

- Global semantics for label allocation
- Simplify service management
- Improve forwarding efficiency

Please Comment Thank You!