Building Virtual Service Topologies in BGP VPNs

(draft-rfernando-virt-topo-bgp-vpn)

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Introduction

- Traditional networks achieve isolation and services within a VPN using topological constraints and routing
  - Services applied at service nodes placed in traffic path
- L3VPN supports constrained policy based routing
  - Extranets, hub-n-spoke mechanisms used to re-direct traffic for services
- Porting traditional network service model to a virtualized data center requires:
  - Create more complex topologies for each tenant VPN
  - Flexibly and efficiently constrain the flow of routes and traffic over these virtual topologies
- L3VPN constructs can be easily extended to support flexible service chains

Purpose of the draft

- Describe the concept of Virtual Service Topologies in BGP VPNs
  - Defined using standard VPN constructs
- Describe functions at a PE to efficiently constrain routing and traffic flows over these topologies
- Informational

Virtual Machine Intra-zone routing

- In a data center, servers host virtual machines where end applications reside
  - Each application VM is a CE from a BGP VPN perspective
- A collection of CE/VMs that can communicate freely form a *zone*
  - A PE creates a VRF for its attached CE/VMs in a zone
- Intra-zone connectivity achieved by designating a RT per zone (zone-RT)
  - Applied on all PE VRFs that terminate the CE/VMs that belong to the zone

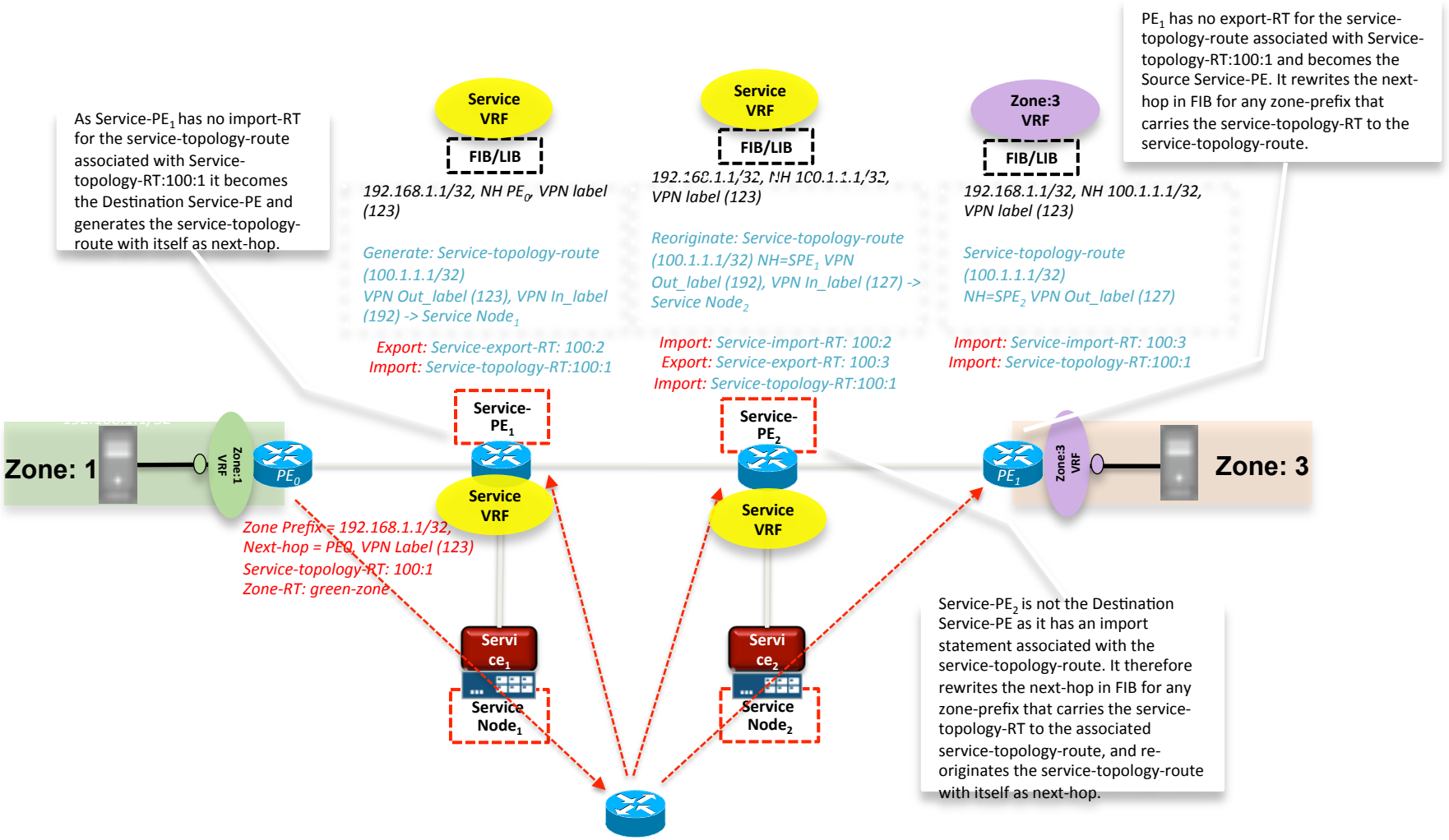
Inter-zone Routing and Traffic Forwarding

- Inter-zone traffic may need the ability to apply network policies and services in a specific order
- Service nodes may be VMs spread across the data center
- Inter-zone traffic must follow a predetermined service path and forwarding through one or more service nodes
- A sequence of service-PEs and their attached service nodes creates a unidirectional service chain or topology
- Two step process:
  - Virtual Service Topology construction
  - Inter-zone Routing and Service Chaining

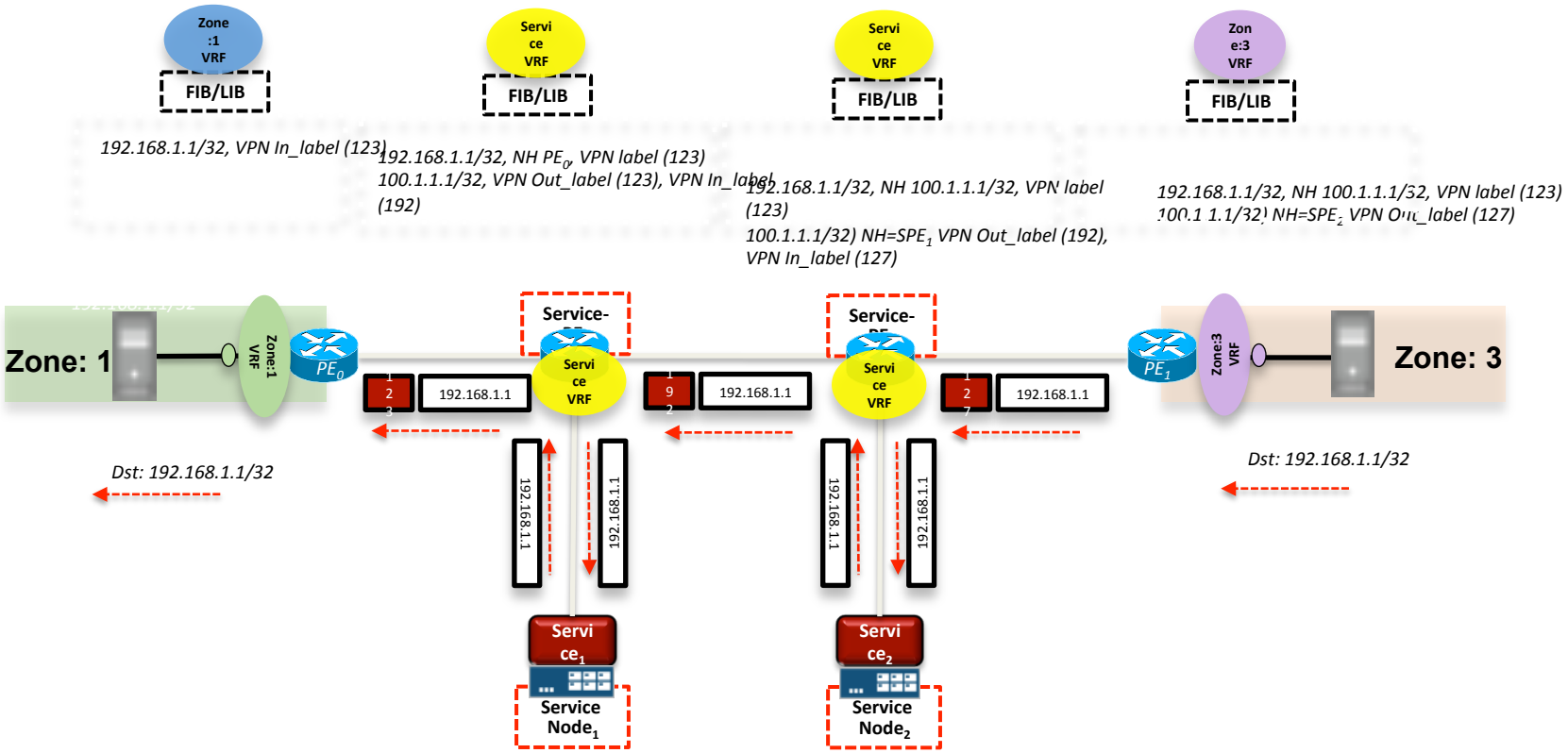
Zone: 1

Zone: 3

Inter-zone Routing
Service Topology Route and Zone prefixes



Inter-zone Routing
Inter-zone Traffic Forwarding



Next Steps

-01 version will have detailed descriptions with examples

Describe additional scenarios and optimizations

Incorporate comments and feedback