

Virtual Topologies for Service Chaining in BGP IP MPLS VPNs

(draft-rfernando-l3vpn-service-chaining-04)

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About this draft

- Describes the concept of Virtual Service Topologies in BGP VPNs
- Explains functions at PEs to efficiently constrain routing and traffic flow over these topologies
- Uses standard BGP IP/MPLS VPN constructs and procedures
- Proposes incremental extensions to PE control plane behavior
- Briefly describes network orchestration controlled approach

Draft History

- First presented at IETF 85 in Atlanta (November 2012)
- Added additional co-authors
- Incorporated couple of rounds of comments and feedback
- Changed from Informational to Standards Track
 - Proposes change in PE behavior, local VPN procedures
- Current version is -04

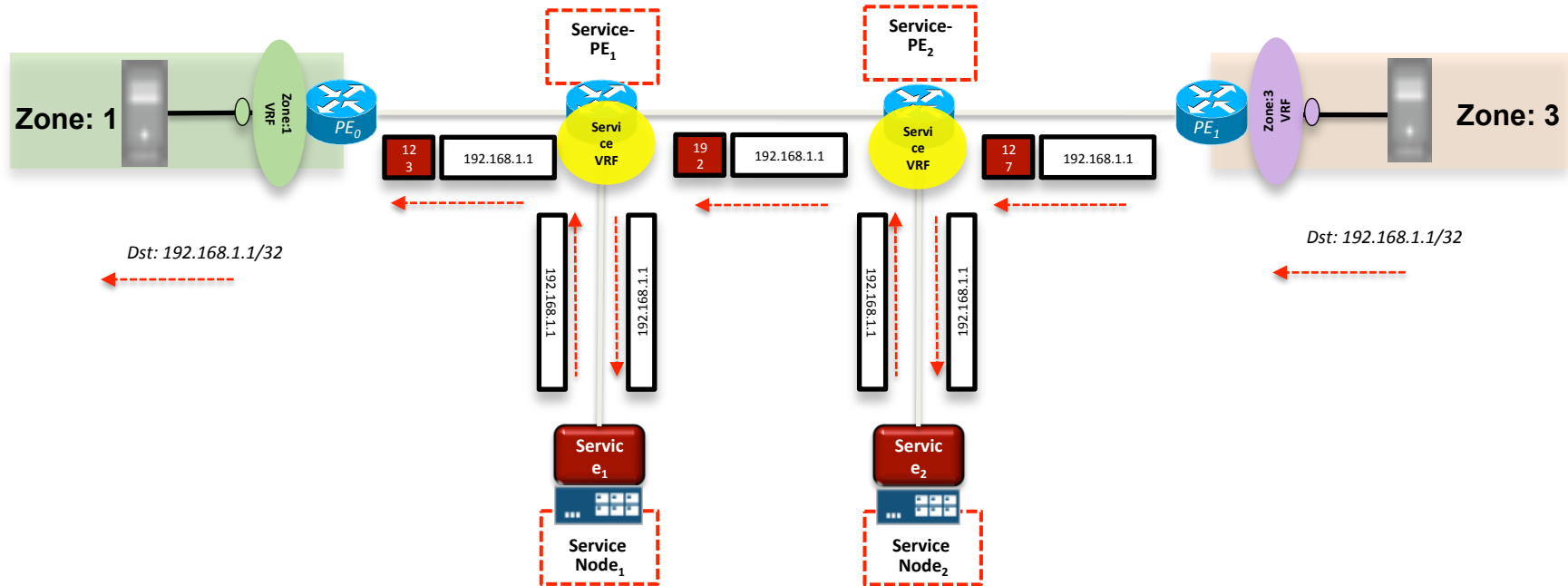
Virtual Service Topology

- A virtual network divided into network zones (source, destination)
- Inter-zone traffic may need application of network policies and set of services
- Service nodes may be VMs spread across a physical network, attached to various PEs
- Inter-zone traffic must follow a specific service path and forwarding through a sequence of one or more service nodes
- The sequence of service nodes creates a unidirectional service chain in the topology

Zone: 1

Zone: 3

Topology



Virtual Topology Routing/Forwarding Steps

- Service Chain provisioning
 - <Service-topology-RT, Service-node-Sequence>
 - Service-node-Sequence: List of IP addresses
 - Provisioned/signaled to relevant set of PEs for a VPN
- Service node reachability
 - Route to an attached service node's IP address originated by PE as a VPN route
 - Each node serves as a Service-next-hop for the actual inter-zone (VPN) prefixes
- Zone Prefix route resolution

Zone: 1 Zone prefixes advertised with Service-topology-RT attached Zone: 3

 - PEs hosting service nodes, source zone resolve route via appropriate Service-next-hop

PE behavior modifications

- Service, source zone PEs must ignore VPN label and next-hop carried with inter-zone routes
- Resolve next-hop in VRF using appropriate service node in sequence
- Currently specified as a local PE procedure change
 - Could define protocol extension

Next Steps

- Describe potential protocol extensions
- Incorporate recent comments and feedback
- Ready to request WG adoption