BGP/MPLS VPN Virtual PE

draft-fang-l3vpn-virtual-pe-05

Luyuan Fang, Ed.

David Ward

Rex Fernando

Maria Napierala

Nabil Bitar

Dhananjaya Rao

Bruno Rijsman

Ning So

Jim Guichard

Wen Wang

Manuel Paul

Wim Henderickx

What is this draft about?

- A solution architecture of virtual PE
  - Allow physical control plane and data plane separation
  - Allow MPLS VPN to be extended into end-systems/devices
  - Allow large scale dynamic orchestration support
- Scope
  - Any networks, Data Centers and beyond
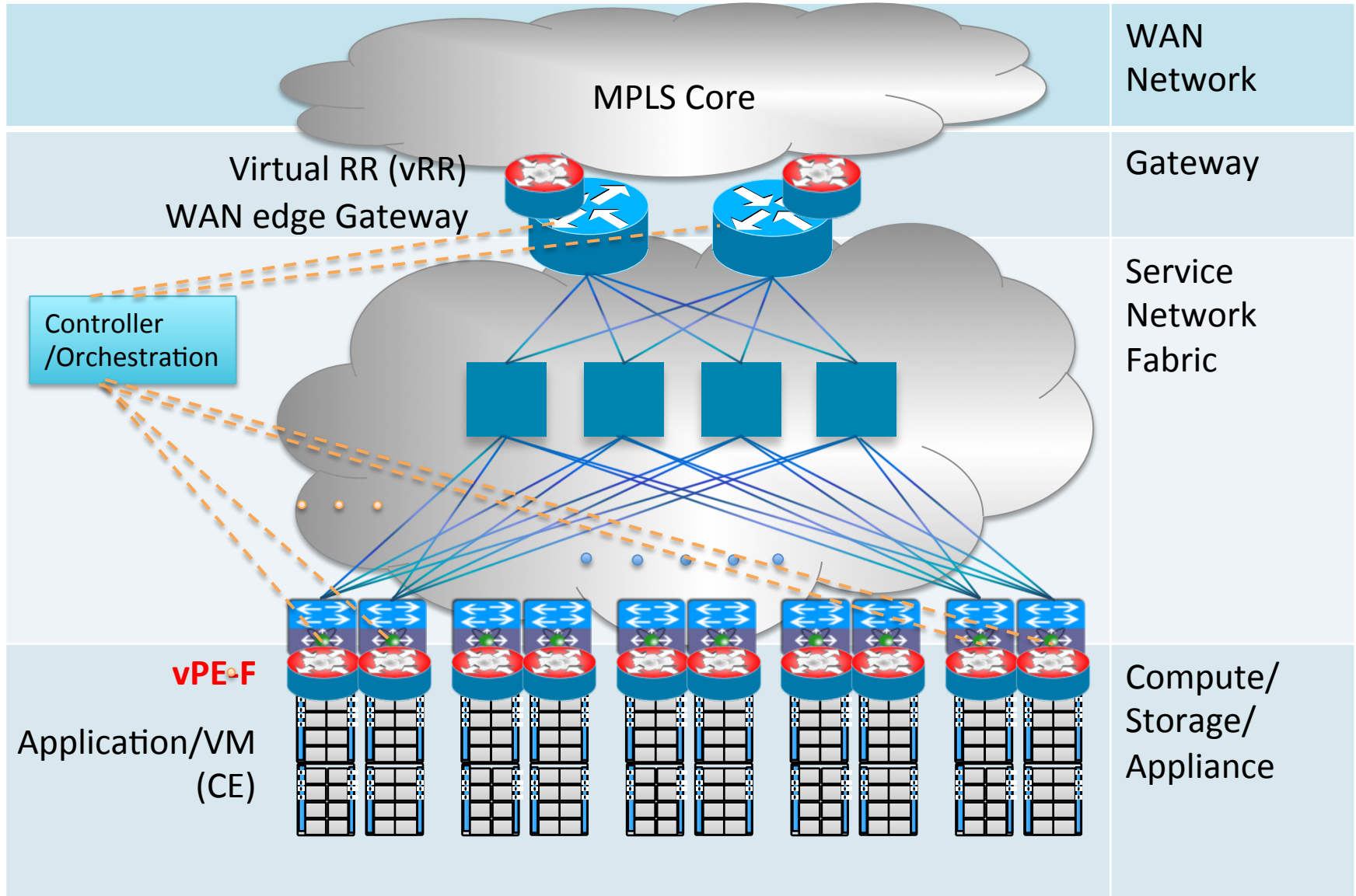
Virtual PE Definition

- A virtual PE (vPE): a BGP IP VPN PE software instance which may reside in any network or computing devices.
  - vPE-F: vPE Forwarding Plane
  - vPE-C: vPE Control Plane
- vPE-C and vPE-F can be decoupled, they may reside in the same physical device, or most often in different physical devices.

vPE Architecture and Design Options

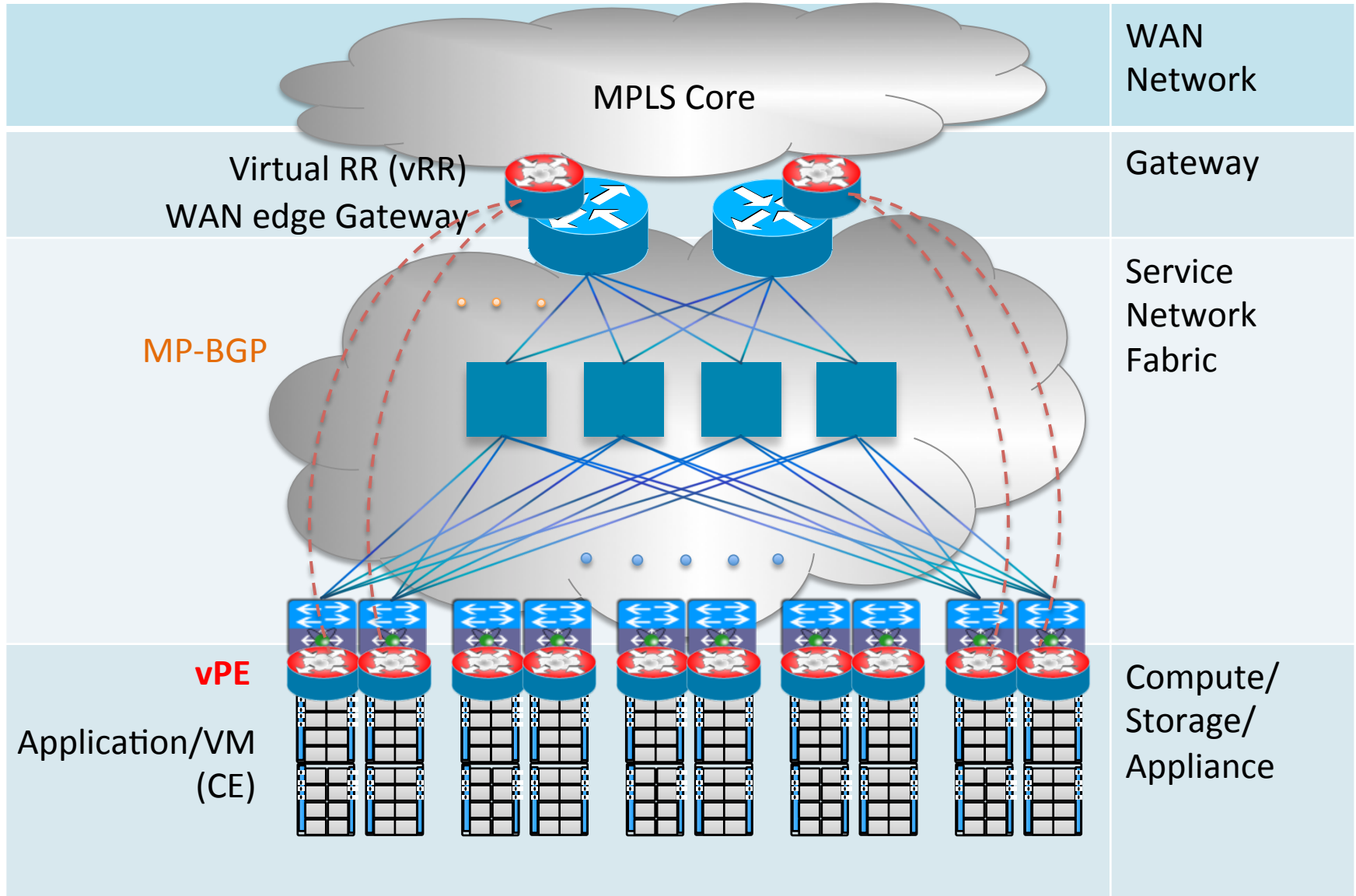|	Design Options
1. vPE-F location	1a. End device, such as a server (most common case)
	1b. Top of the Rack (ToR)
	1c. Any other devices/systems, e.g., a Gateway router
2. vPE-C location	2a. Controller (most attractive): centralized/distributed
	2b. Same location as vPE-F, using mp-bgp for signaling
3. Orchestration models	3a. Push model: push VPN provisioning from NMS or other central control provisioning systems to VPN network elements.
	3b. Pull model: pull from network elements to network management/AAA based upon data or control plane activity.

vPE Architecture Reference Models (1)
vPE-F in the end device, vPE-C in the controller

WAN
Network

MPLS Core

Virtual RR (vRR)
WAN edge Gateway

Gateway

Controller
/Orchestration

Service
Network
Fabric

vPE-F

Application/VM
(CE)

Compute/
Storage/
Appliance

vPE Architecture Reference Models (2)
vPE in the end device, using MP-BGP for control

WAN Network

MPLS Core

Virtual RR (vRR)
WAN edge Gateway

Gateway

MP-BGP

Service Network Fabric

vPE

Compute/ Storage/ Appliance

Application/VM (CE)

Changes from 04 to 05

- Expanded the scope from L3 VPN only to both L3 and L2 VPNs – per L3VPN WG Group discussion in previous meetings and off-line. (So the draft is also discussed in L2 WG in addition to L3 VPN WG).

- Added Wim Henderickx in our co-author list

- Addressed Daniel Voyer's comments, including VM security considerations. (Will add Daniel in the next revision)

- Update on Encap subsection

  MPLS encap for forwarding with distributed MPLS protocols or SDN controller are viable options

Next Steps

- Comments on the list or talk to us
- Request L3VPN WG to adopt the draft as WG document