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Data Center Interconnect Ethernet VPN

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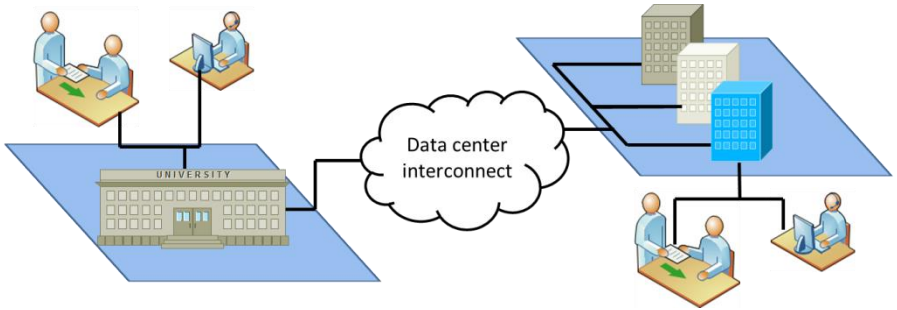
Journées LCG 2015

Lyon

jres Montpellier 2015

Data Center Interconnect (DCI)

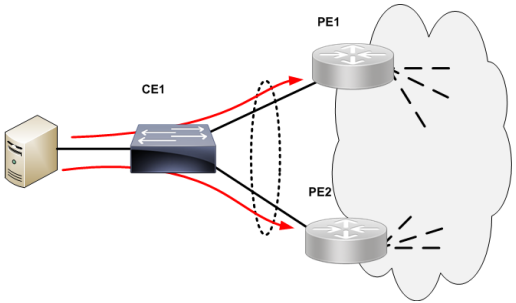
- Data Center is a crucial point for research and education
  - Data deluge
- Data Center Interconnection is a strategic topic for NRENs and Regional Network
- Full fill DCI requirement (EVPN requirement RFC 7209)



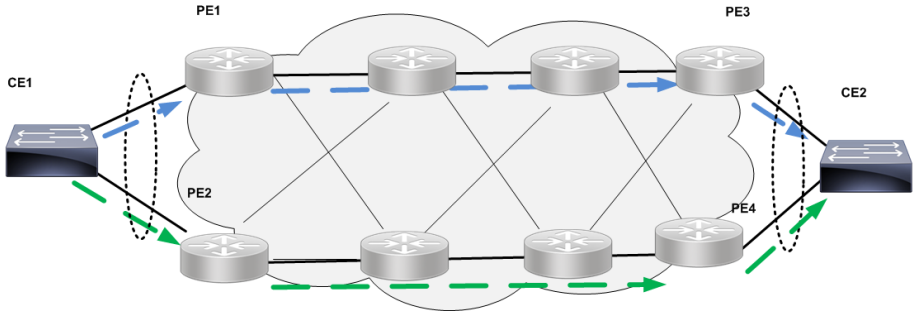
- Network support for highly virtualized multi-tenants in DC

Data-center requirement

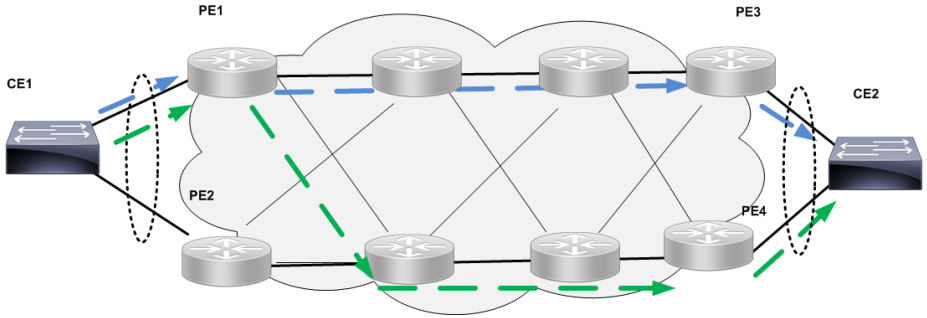
- Multi-homing active/active



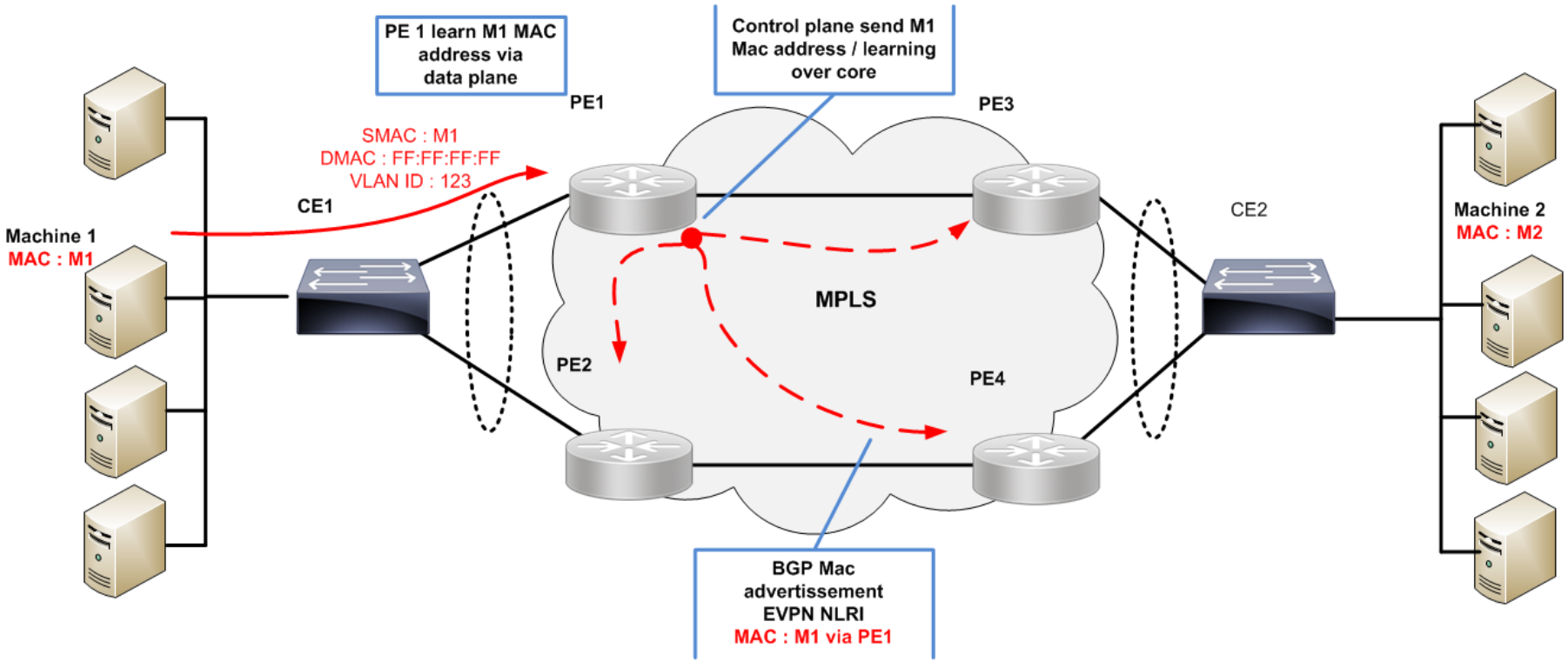
- Load balancing per flow



- Multicast optimisation
- Ease provisioning
- Fast convergence
- Integration of L3 routing
- Scalability
- Support different data plane
- VM mobility



EVPN principle



What is EVPN?

- Next generation solution for Ethernet multipoint connectivity services
  - BGP control-plane for Ethernet Segment and MAC distribution and learning
  - Same principles and operational experience as IP VPNs (L3VPN)
  - EVPN can work over **multiple data planes**:
    MPLS or IP thanks to VXLAN, MPLS over GRE, nGRE

- No use of Pseudowires
  - Uses MP2P tunnels for unicast
  - Multi-destination frame delivery via ingress replication (via MP2P tunnels) or LSM

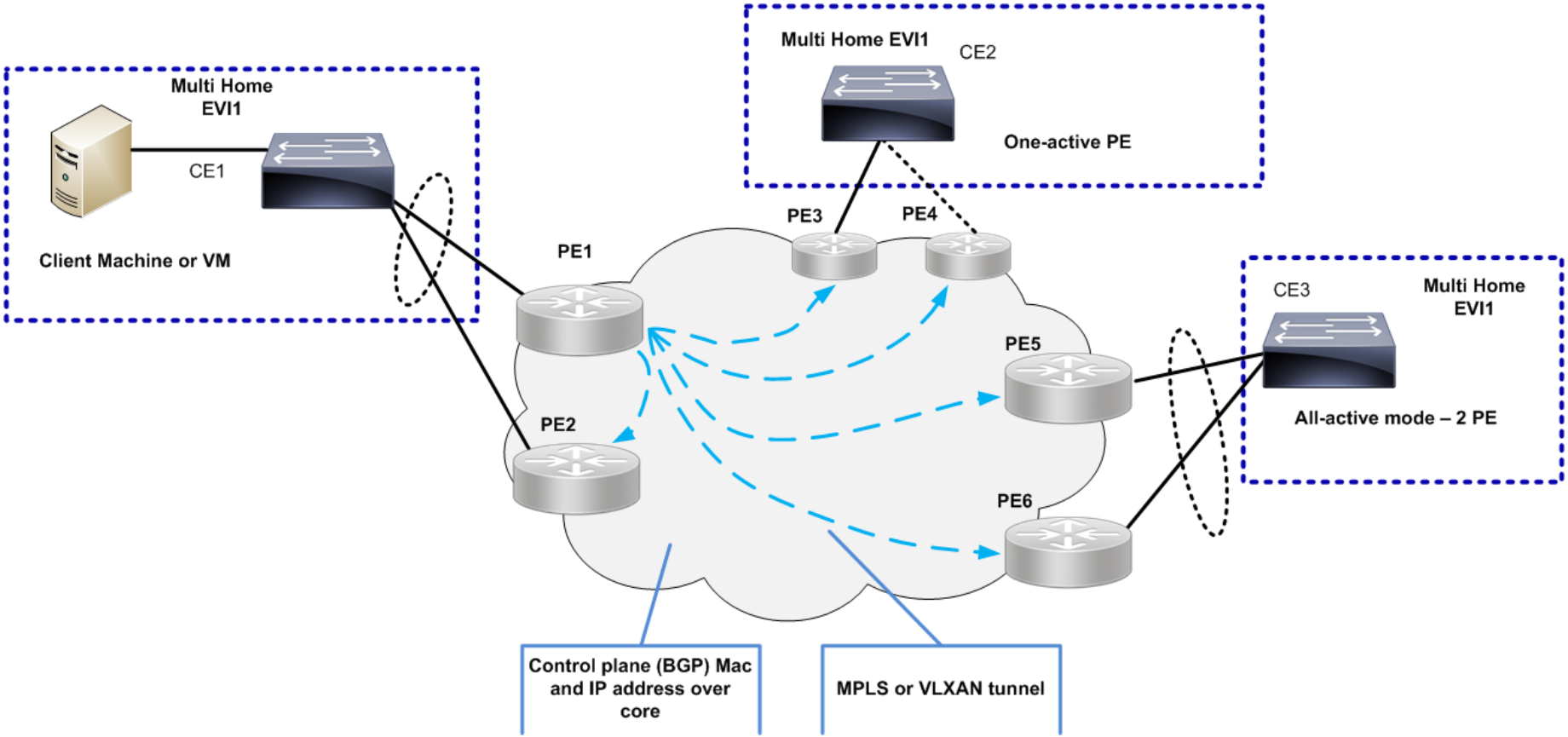
- Multi-vendor solutions … but all flavors are not available in all vendor catalogs for the moment, all vendors work on that point

Multi-vendor solutions

- Multi-vendor solutions … nevertheless
  - CISCO
    - PBB-EVPN over MPLS for its provider product
    - EVPN over VXLAN for data center product (Nexus)
  - Juniper
    - EVPN over MPLS and EVPN over VXLAN
  - Alcatel
    - EVPN over VXLAN

- PBB-EVPN is not be able to interoperate with EVPN
  - but all vendors are working on developing the other flavors

EVPN RFC 7432 architecture



Network virtualization Overlay

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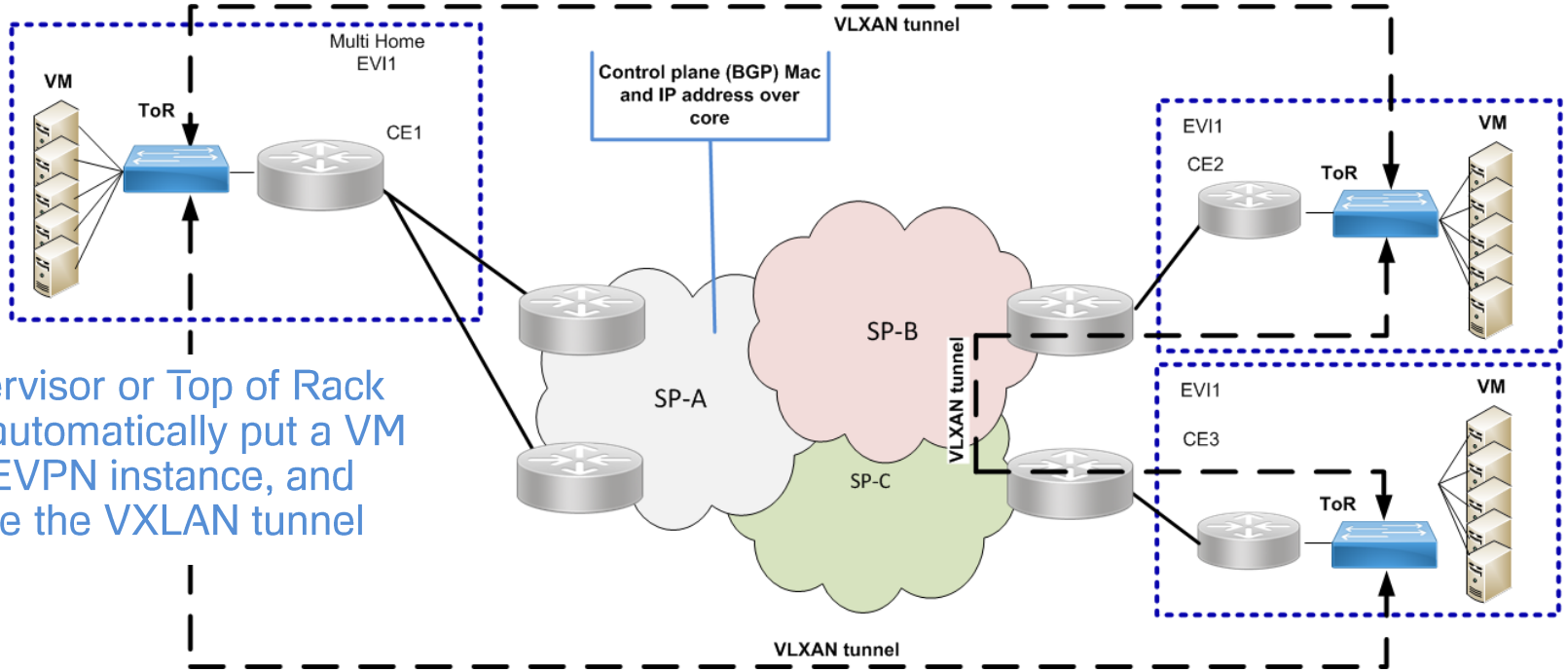
- PE can be interconnected thanks to IP
  → IP tunnelling is supported: IP/GRE, MPLS over GRE, VXLAN, NVGRE



- Hypervisor or Top of Rack can automatically put a VM in a EVPN instance, and create the VXLAN tunnel

Mixte architecture

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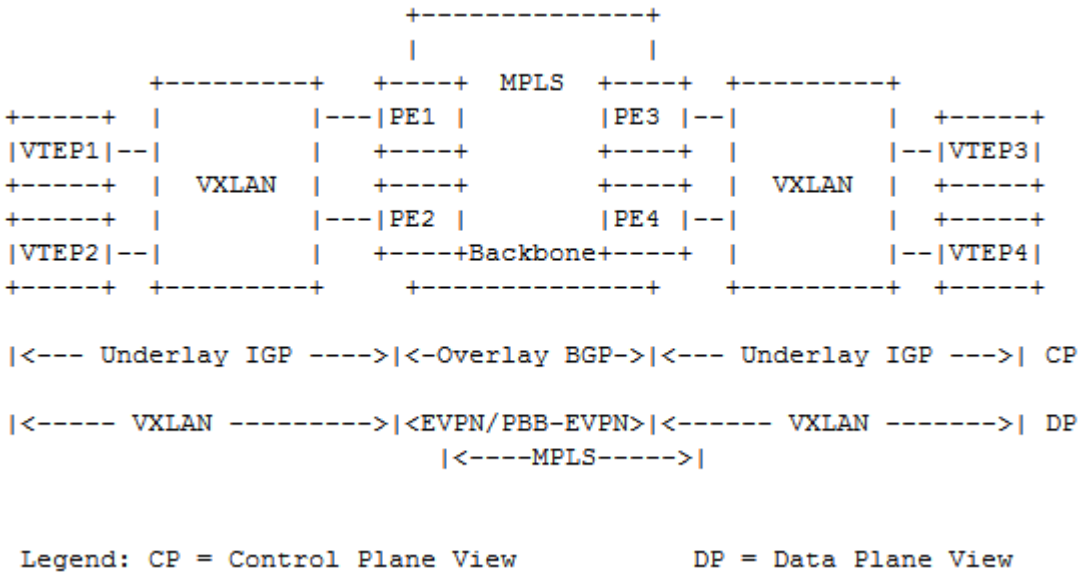
- VXLAN overlay to join a EVPN backbone



Use case

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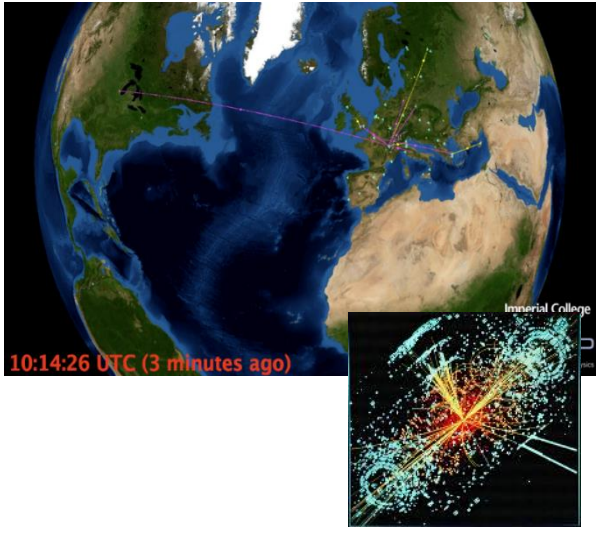
- Scientist and education project
  - LHCONE, PRACE, ITER, MESO-CENTRE, ….
  - Date center interconnection optimization
- Cloud and Data Center
  - EVPN NVO
  - VM mobility
  - Secure Data center (Crash recover in a remote DC)
  - Virtual infrastructure for Multi-tenant
- NREN and Regional network
  - All layer 2 services - scalable
  - Integration L3



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Démo

Summary

- EVPN is the next-generation of L2VPN solution
  - Based on a BGP control-plane for MAC distribution/learning over the core
  - EVPN is not simply a “better VPLS”
- EVPN is designed to address Data Centers new requirements:
  - All-active Redundancy and Load Balancing
  - Simplified Provisioning and Operation
  - Fast Convergence
  - VM mobility
- New EVPN service for the European and regional Data Centers
  - Use MD-VPN infrastructure

Summary

- Collaboration with Data Center
  - Identify Data center requirement
  - Provide the very appropriate infrastructure
  - Validate EVPN promisses