REISS ROMOLI

top-ix
WE DO CONNECTIONS

# MPLS, Segment Routing, SD-WAN

## let's do some clarity

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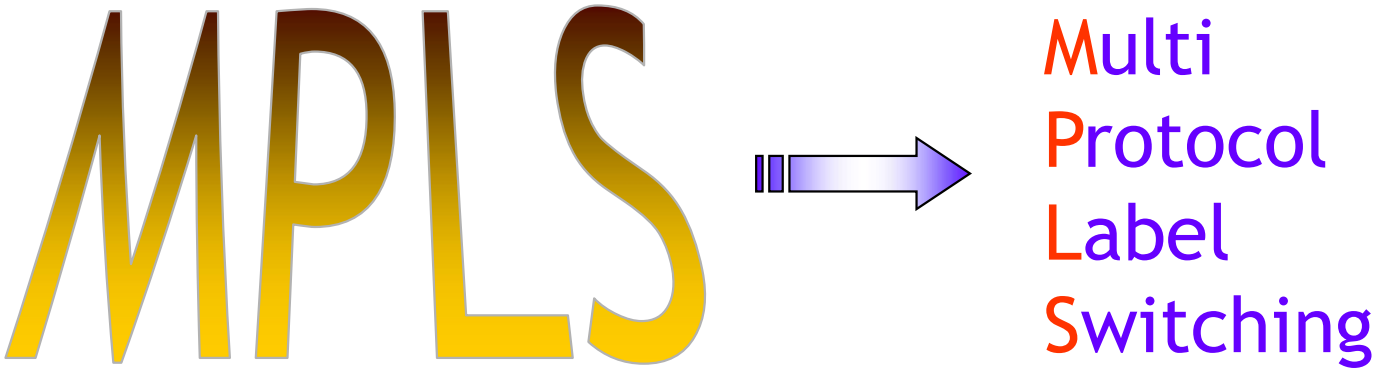
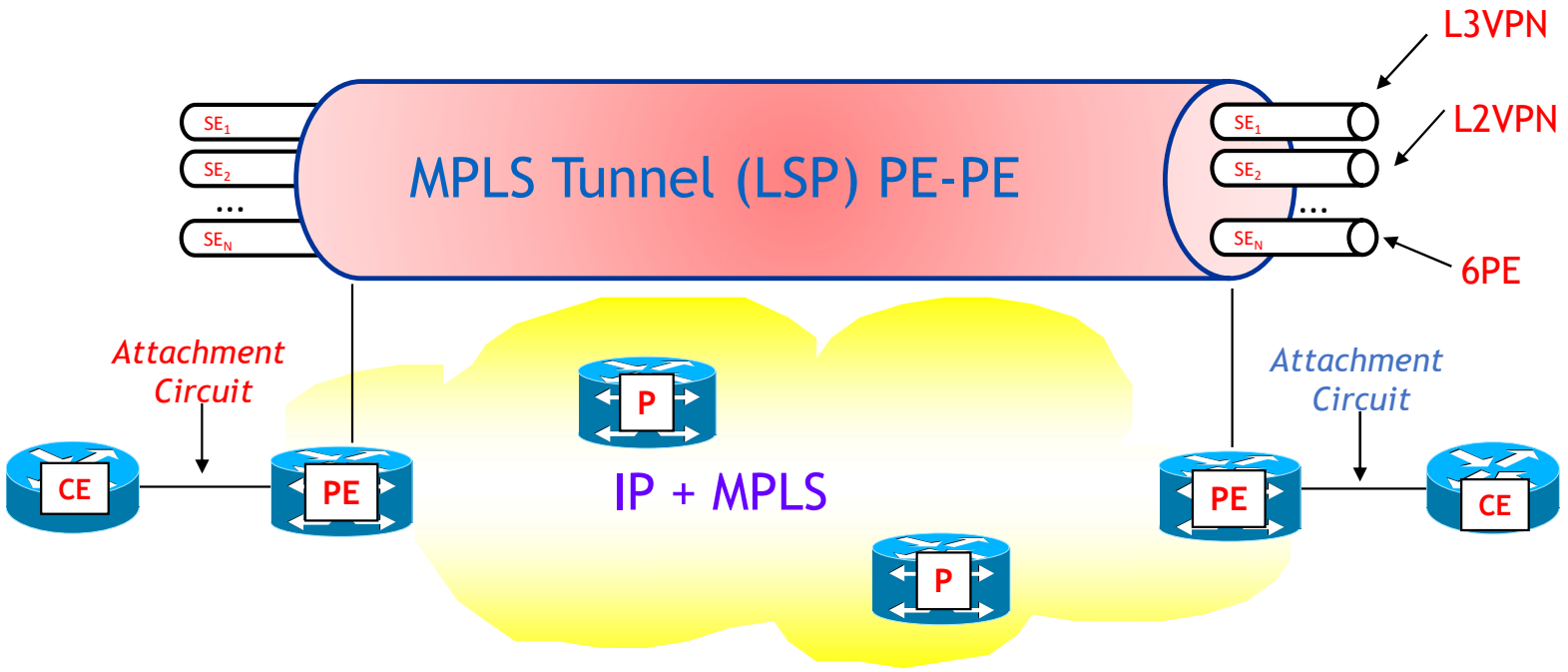
# A bit of history: why MPLS?

- A standard
  - To evolve the traditional IP routing model towards new traffic management functions (i.e. MPLS Traffic Engineering)
  - To allow the creation of more scalable IP networks
  - **To expand the offer of network services** (i.e. L3VPN, L2VPN, IPv6 transport, etc.)

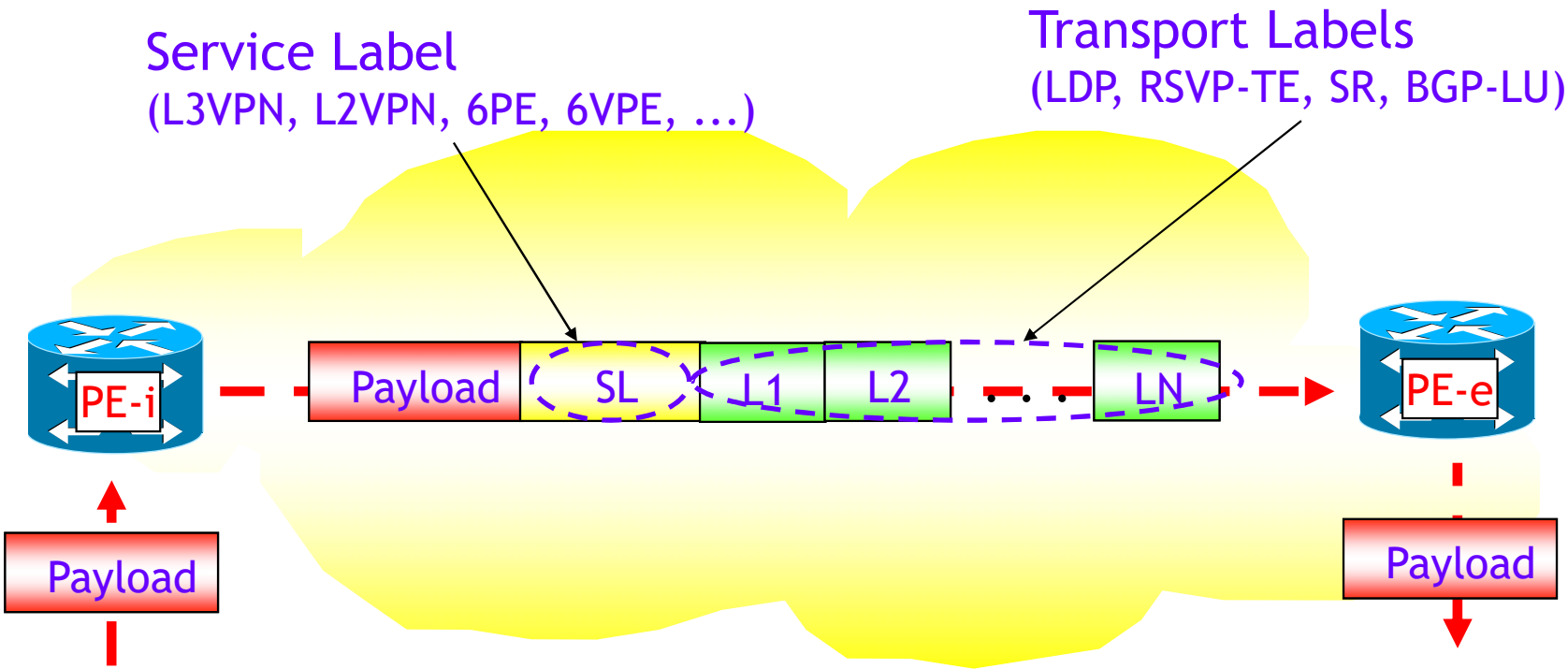


# One tunnel fits all (services)!

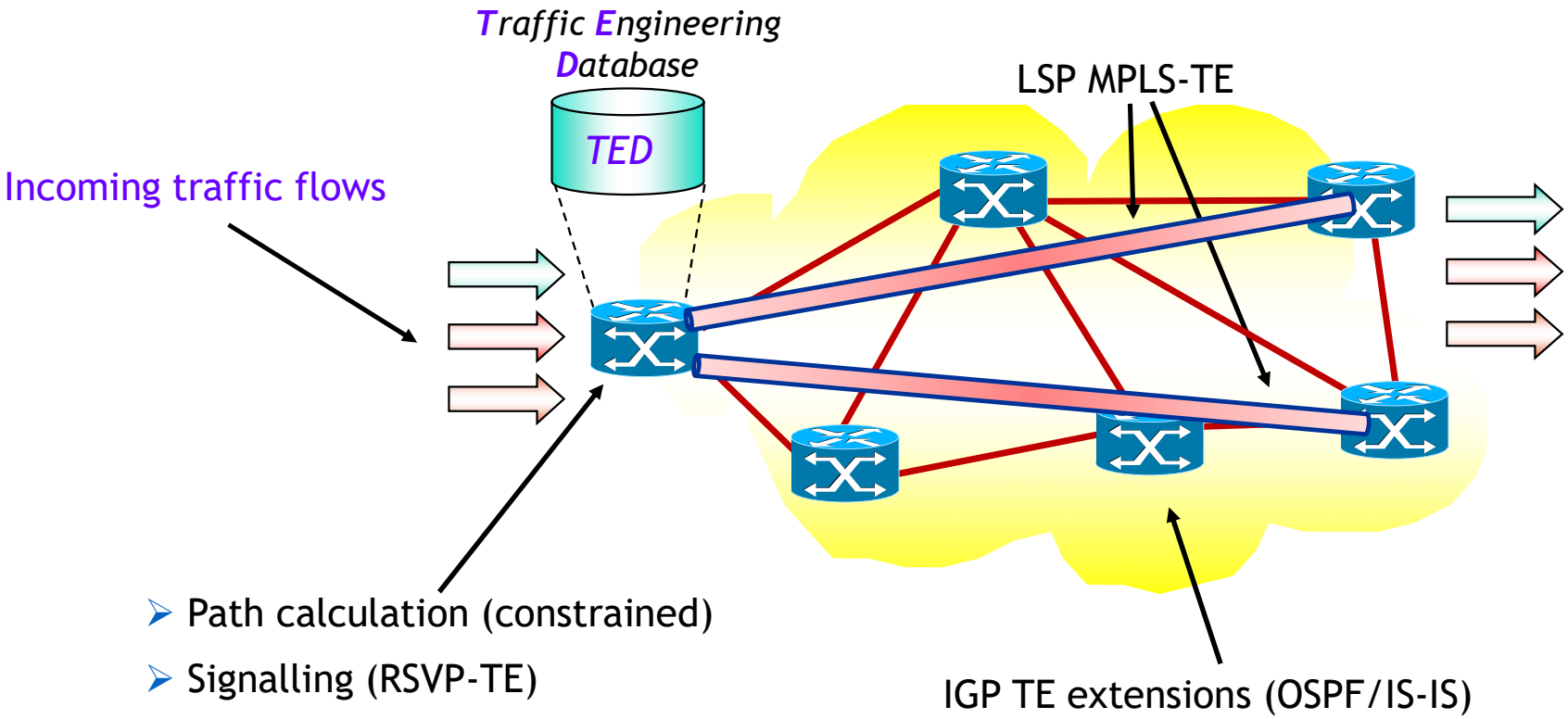



- CE: Customer Equipment
- PE: Provider Edge
- P: Provider (transit router)

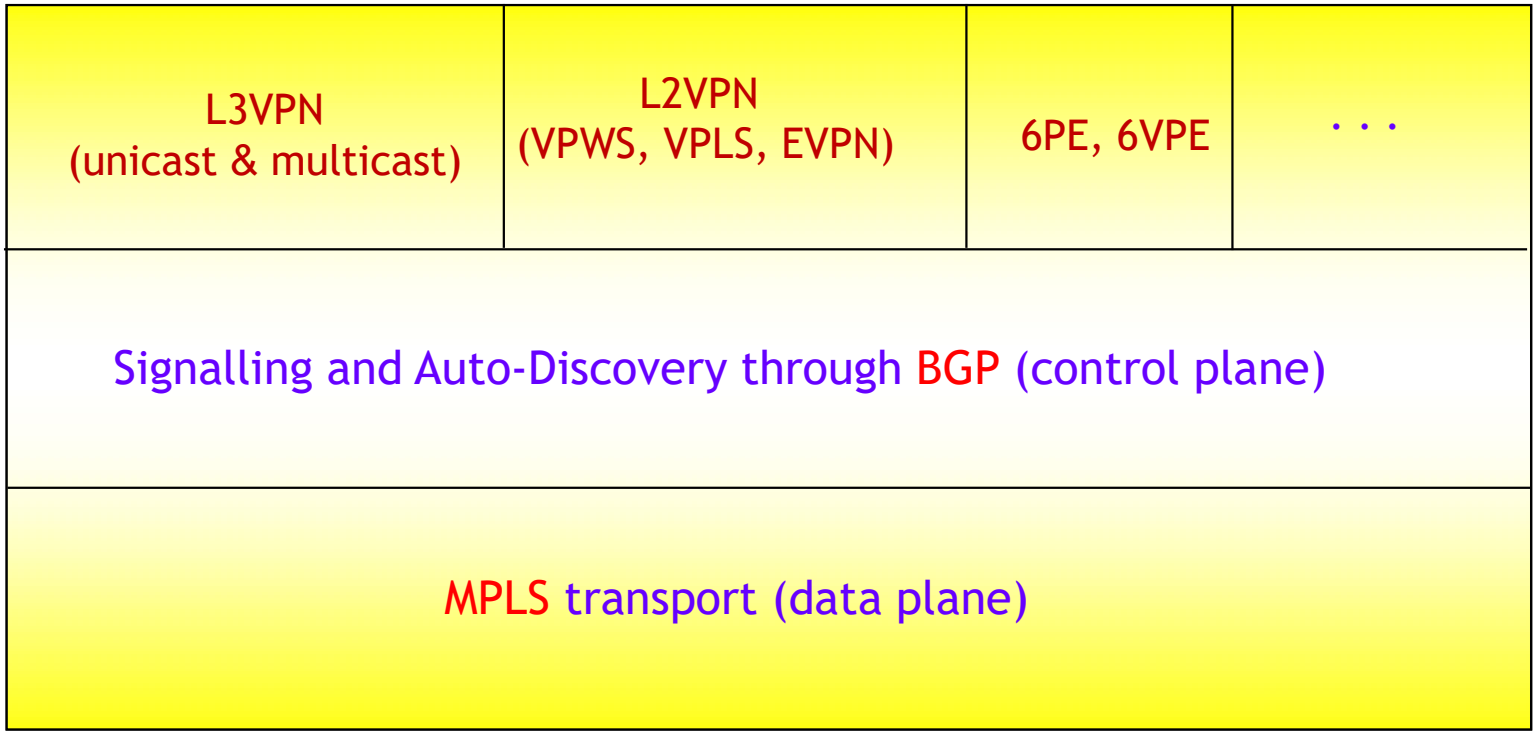
# Service and Transport Labels



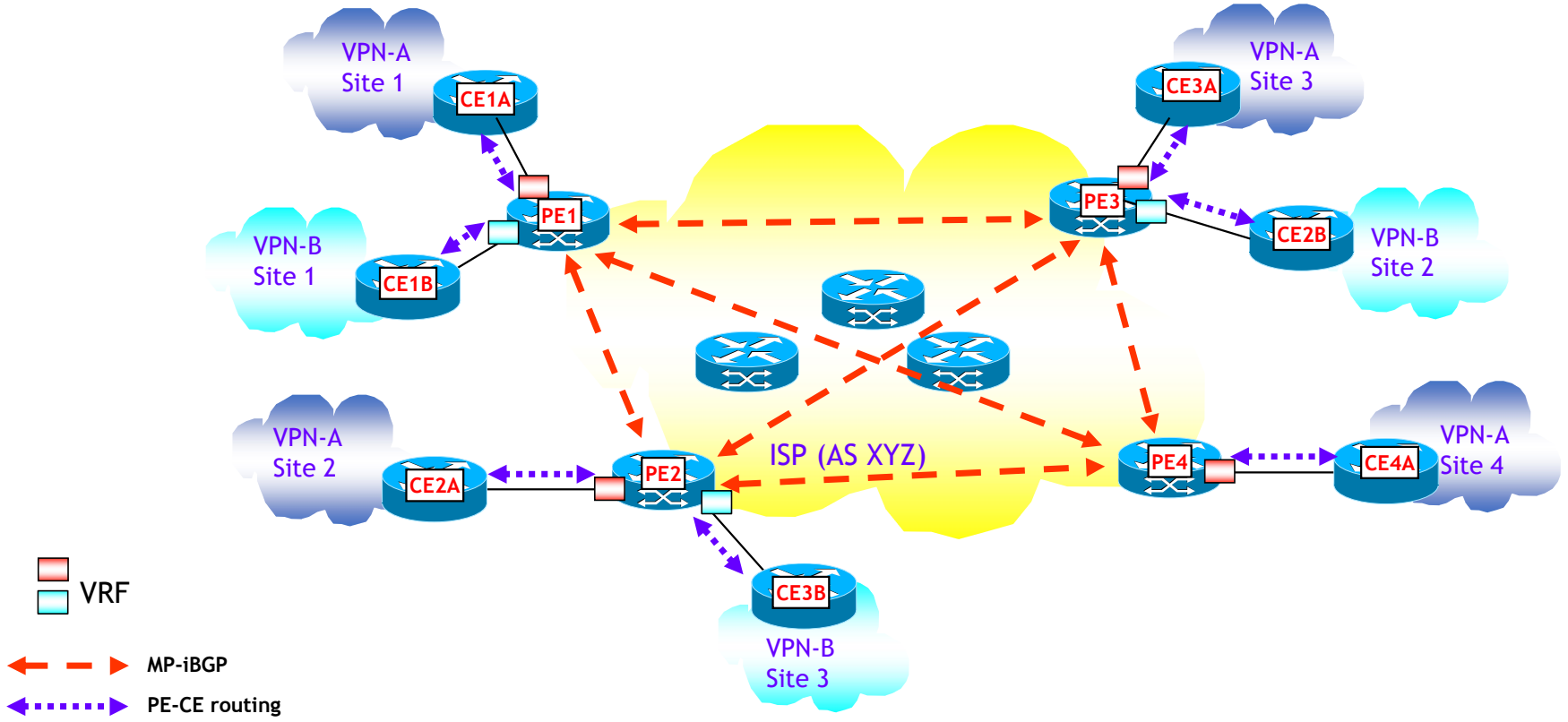
# Service # 1: MPLS Traffic Engineering



# BGP/MPLS services

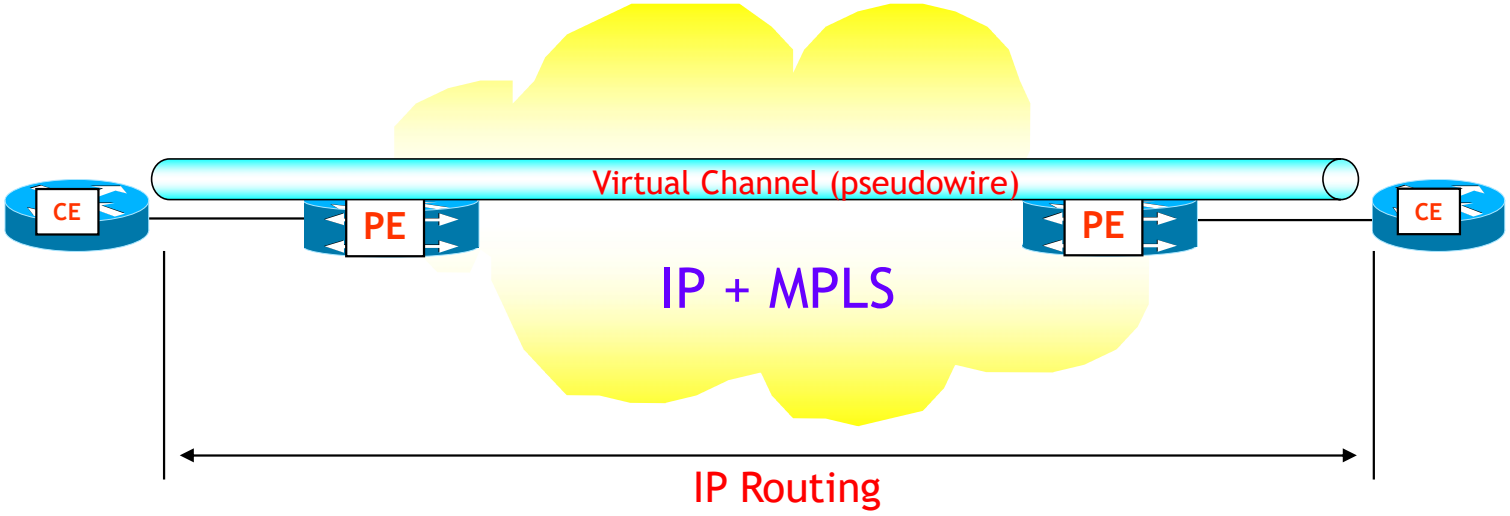


# Service # 2: L3VPN (the great success …)



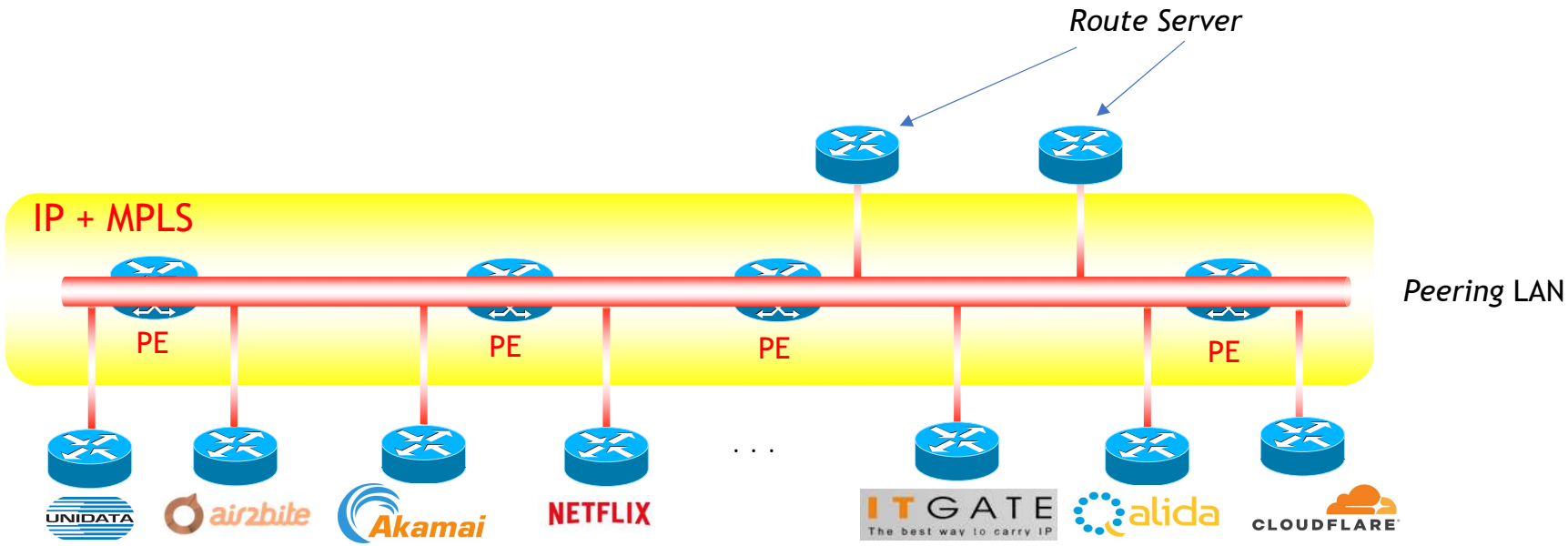
# Service # 3: L2VPN point-to-point

- Circuit emulation services (*point-to-point*)
  - Can transport any Layer 2: Ethernet, ATM, Frame Relay, PPP, etc.
  - IETF terminology: VPWS (Virtual Private Wire Service)
  - MEF terminologiy: E-Line



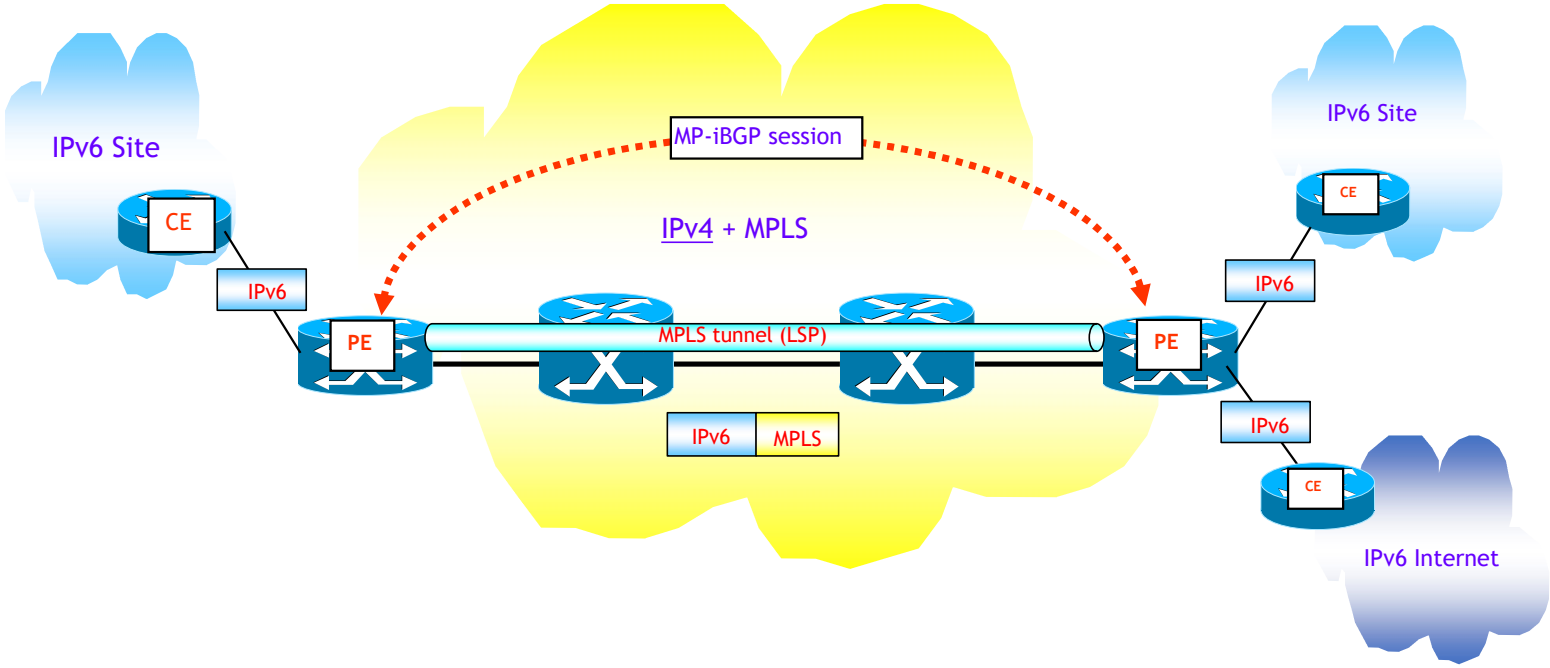
# Service # 4: L2VPN multipoint-to-multipoint

- LAN Ethernet emulation services (*multipoint-to-multipoint*)
  - IETF terminology: VPLS (Virtual Private LAN Service) / EVPN (Ethernet VPN)
  - MEF terminology: E-LAN



# Service # 5: IPv6 transport

- MPLS is multiprotocol, therefore can also transport IPv6 packets
  - The big plus: a single backbone for all types of traffic (L2/L3)
  - Two basic services
    - 6PE: transport of IPv6 packets over an IPv4 + MPLS backbone
    - 6VPE: IPv6 L3VPN



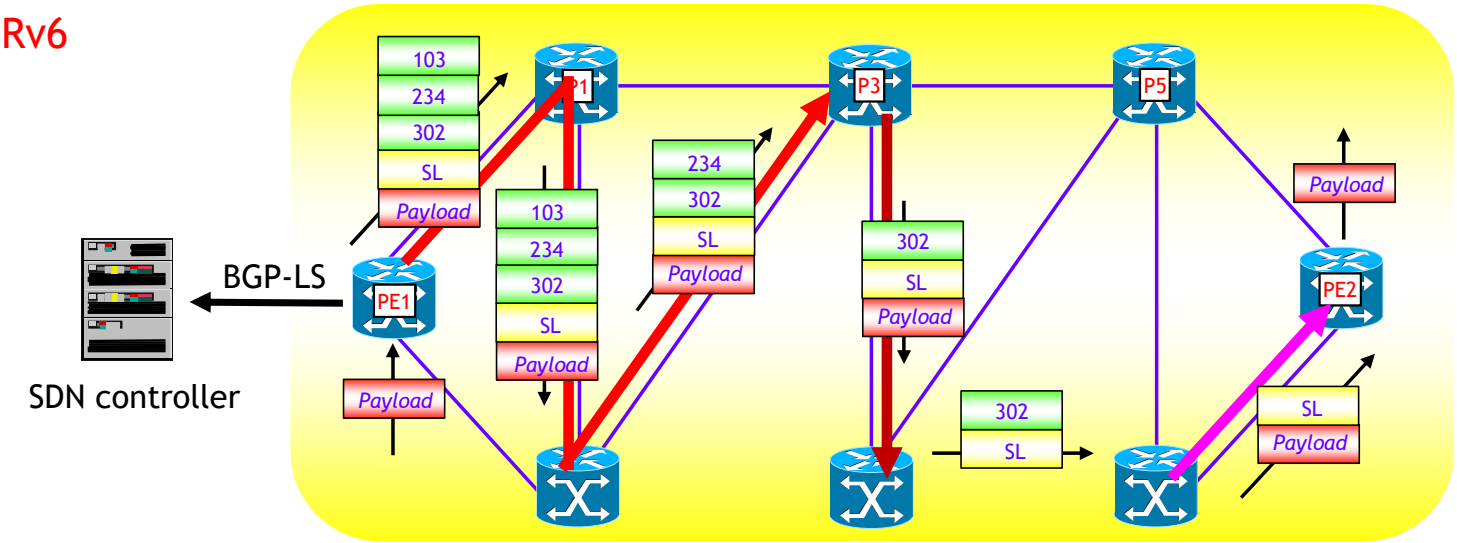
## The myth …

MPLS is dead
(long live to MPLS …)

# The alleged MPLS killers …

# Killer #1: Segment Routing (1/2)

- Segment routing is a modern variant of source routing
- In a segment routed network, an ingress node may prepend a header to packets that contain a list of labels (segments), which are instructions that are executed on subsequent nodes in the network
  - Labels are advertised using IGP protocols extensions (OSPF, IS-IS)
- Two flavors: SR-MPLS and SRv6

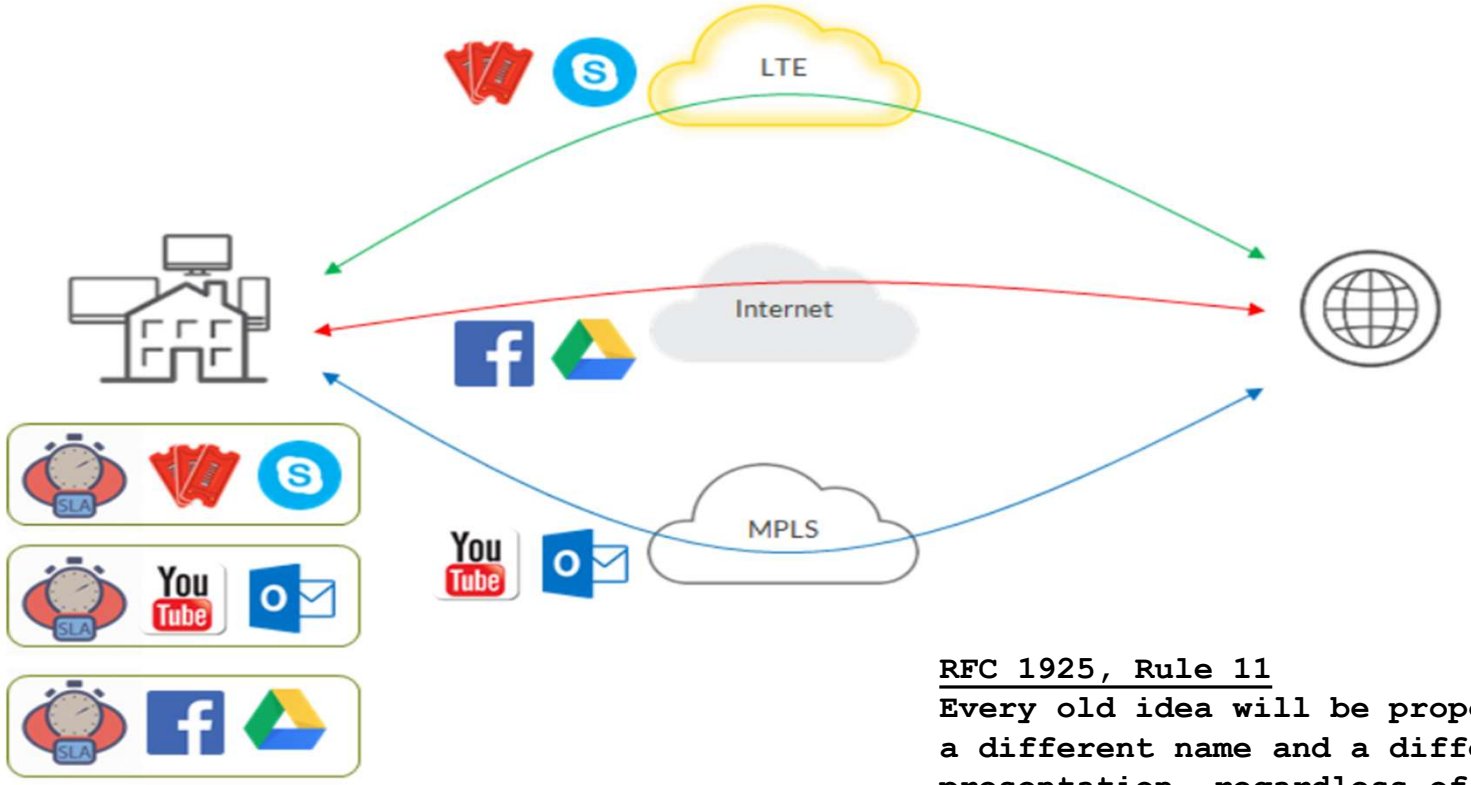


# Killer #1: Segment Routing (2/2)

## The reality (of SR-MPLS)

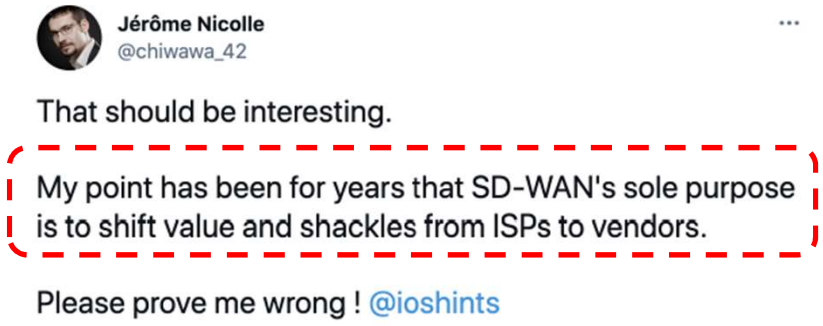
- Segment Routing is just a simplification of the MPLS control plane
  - No MPLS protocols (LDP/RSVP-TE), labels are advertised through IGP protocols (OSPF or IS-IS) extensions
  - Better traffic protection within the backbone (i.e. backup coverage 100% through TI-LFA)
- It has no influence on MPLS services

# Killer #2: SD-WAN (1/2)




RFC 1925, Rule 11
Every old idea will be proposed again with a different name and a different presentation, regardless of whether it works.

# Killer #2: SD-WAN (2/2)




- Use case (customer): replace expensive MPLS/VPN with Internet based transport
- Use case (SP): keep charging for expensive services
- Use case (vendor): create a network wide lock in with proprietary high margin product

# Long story short …

Whenever you're evaluating new technologies or architectures, try to figure out what business (not technology) problem you're really trying to solve, and whether the new shiny thing solves it or introduces another distracting layer of abstraction.

# Time is over …