



Layer 2 Extensions for Data Center Interconnect with Catalyst 6500



Belmont Chia

***Consulting System Engineer
Data Center Network Architecture***

Agenda

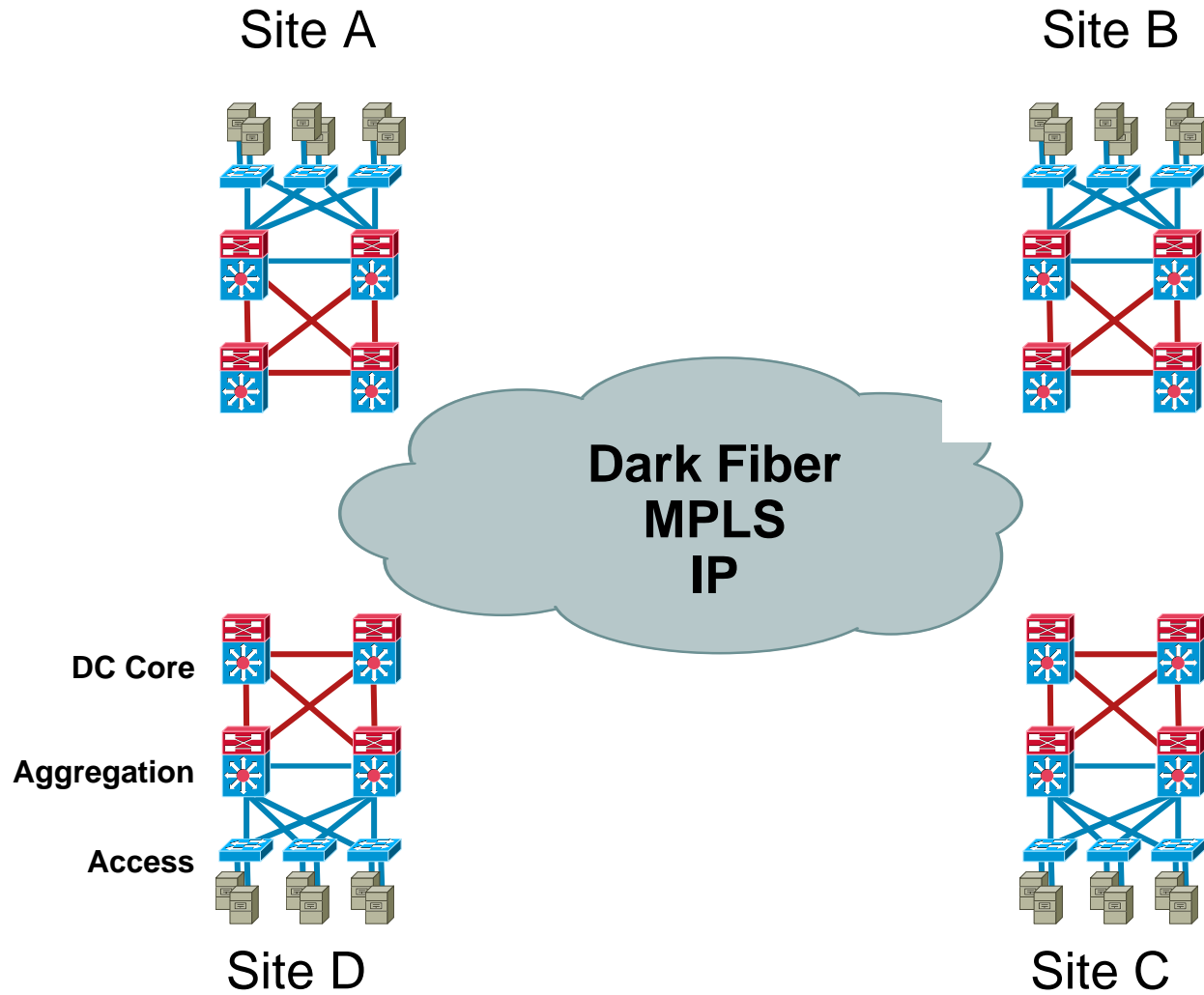
- Problem Statement
- Transport Options
 1. Dark Fiber
 2. MPLS
 3. IP
- Encryption

Problem Statement

- Why Layer 2 across Data Centers
 1. Geocluster
 2. Legacy applications (hard-coded IP)
 3. Redundant configurations (HSRP/VRRP, heartbeats, etc)

- Provide layer 2 connectivity between data centers with:
 1. Redundant Paths
 2. STP Isolation
 3. Failover within <4 seconds
 4. Load balancing
 5. Scalable
 6. Encryption (optional)

DC Interconnect – Transport Options



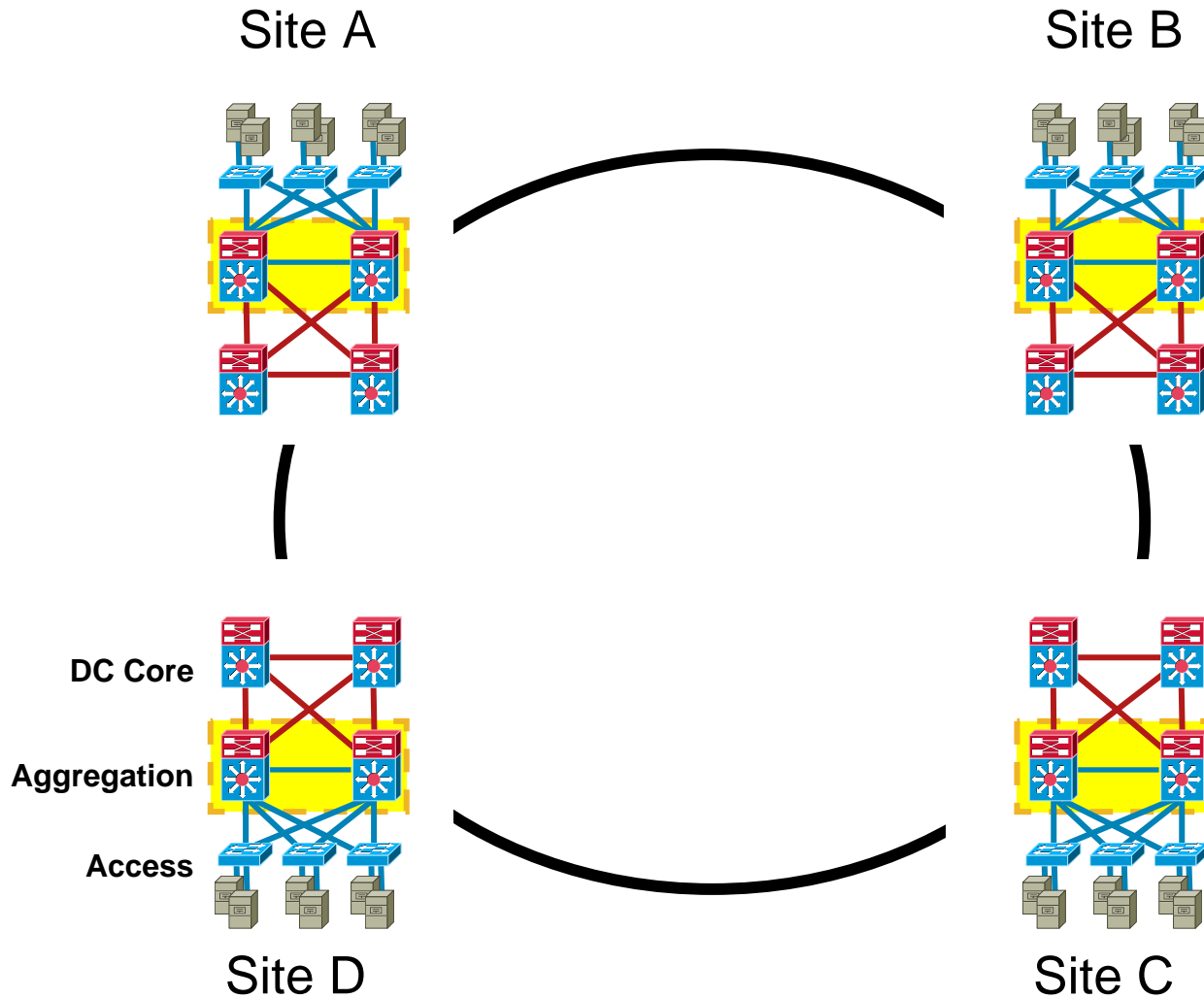
L2 Extension Transport Options

- Dark Fiber
 - Applicable for Short Distances (< 100km)
- MPLS
 - Applicable if Enterprise is ready to deploy MPLS in core
 - MPLS service can be self-deployed or as managed service from SP (directly attached L2VPN or Carrier supporting Carrier)
- IP
 - Applicable for majority of customers with no Dark Fiber or MPLS

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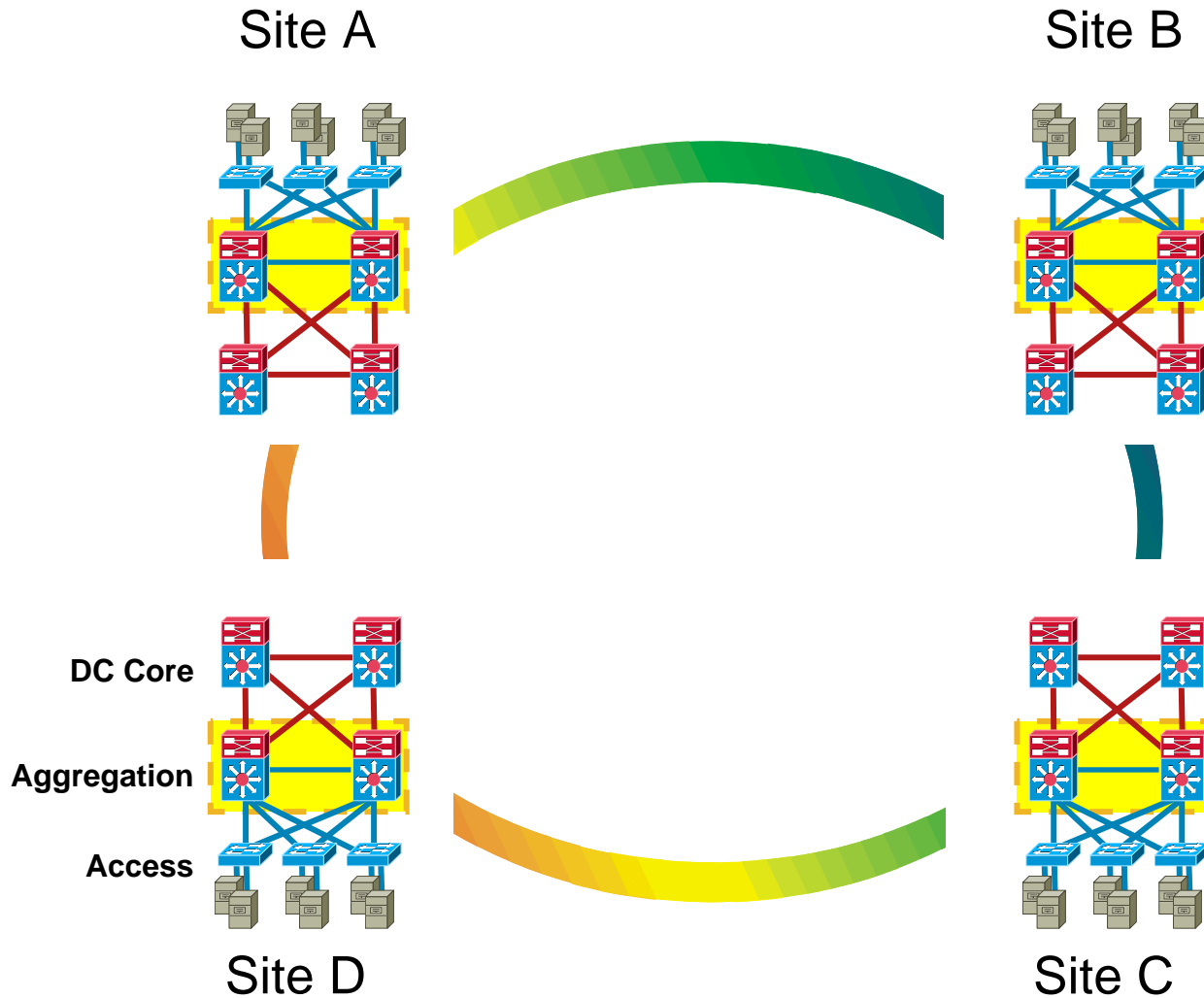
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DC Interconnect – Dark Fiber



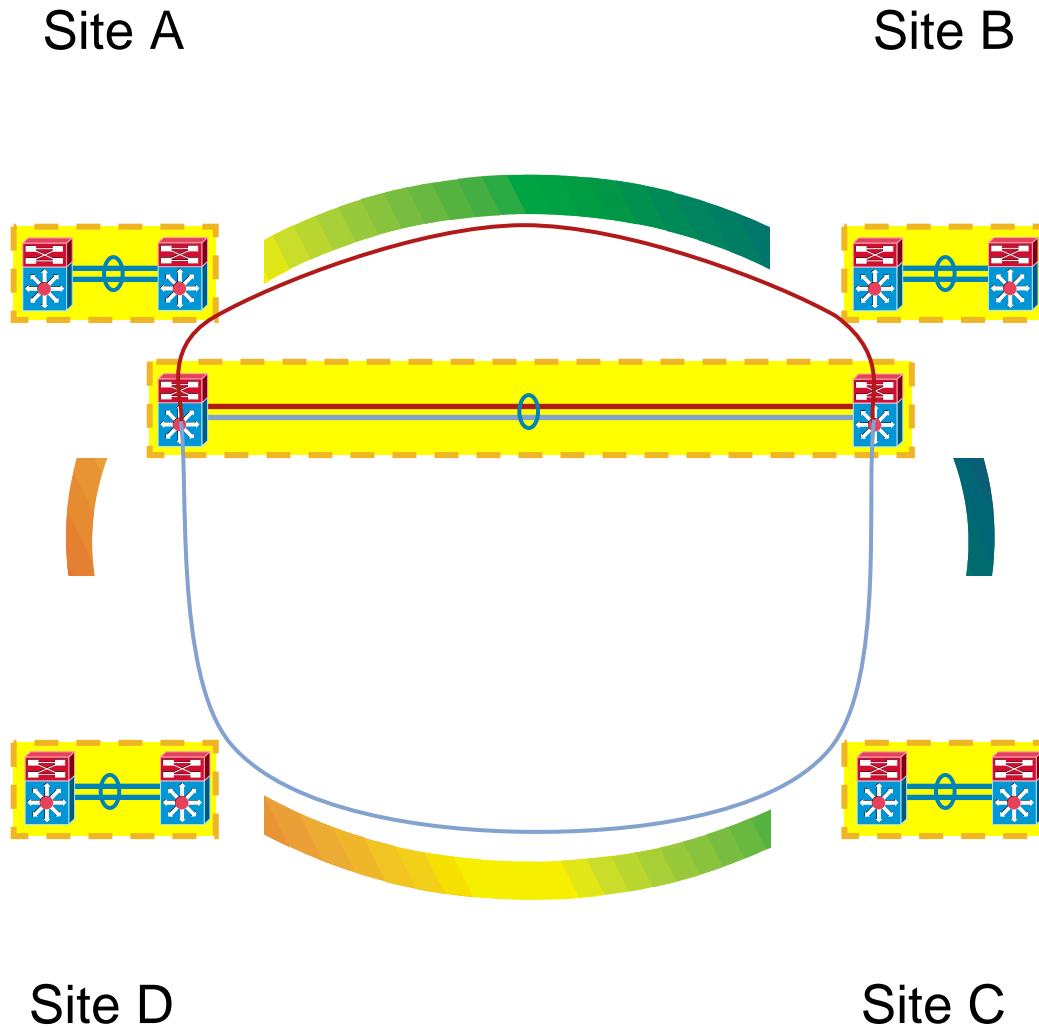
- Assumes dark fiber between sites
- Distance limitations are given by DWDM
- Number of sites can be 2 or more

DC Interconnect – Dark Fiber



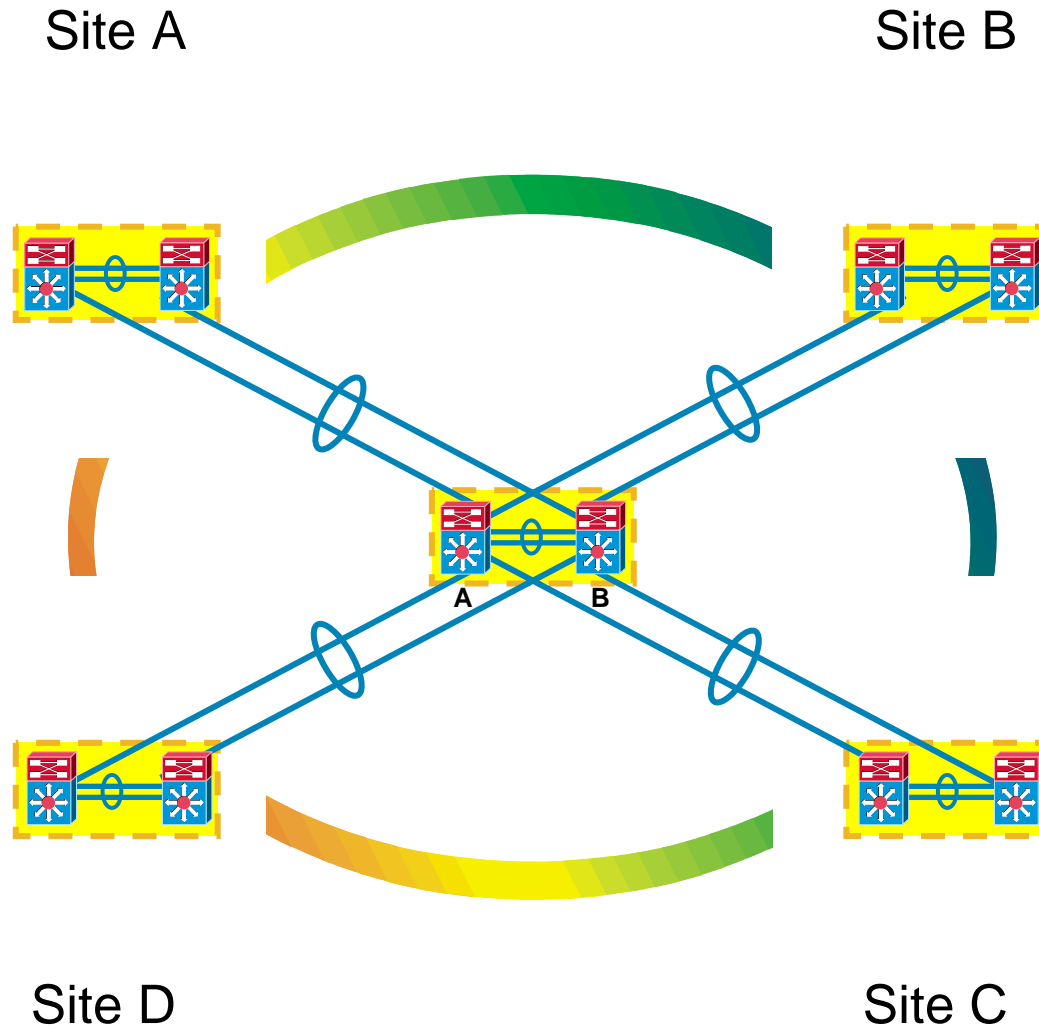
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DC Interconnect – Dark Fiber



- Add 2 switches in main data centers
- Switches use separate lambda to interconnect
- These switches will form a VSS
- Use DWDM X2 to build VSL*

DC Interconnect – Dark Fiber

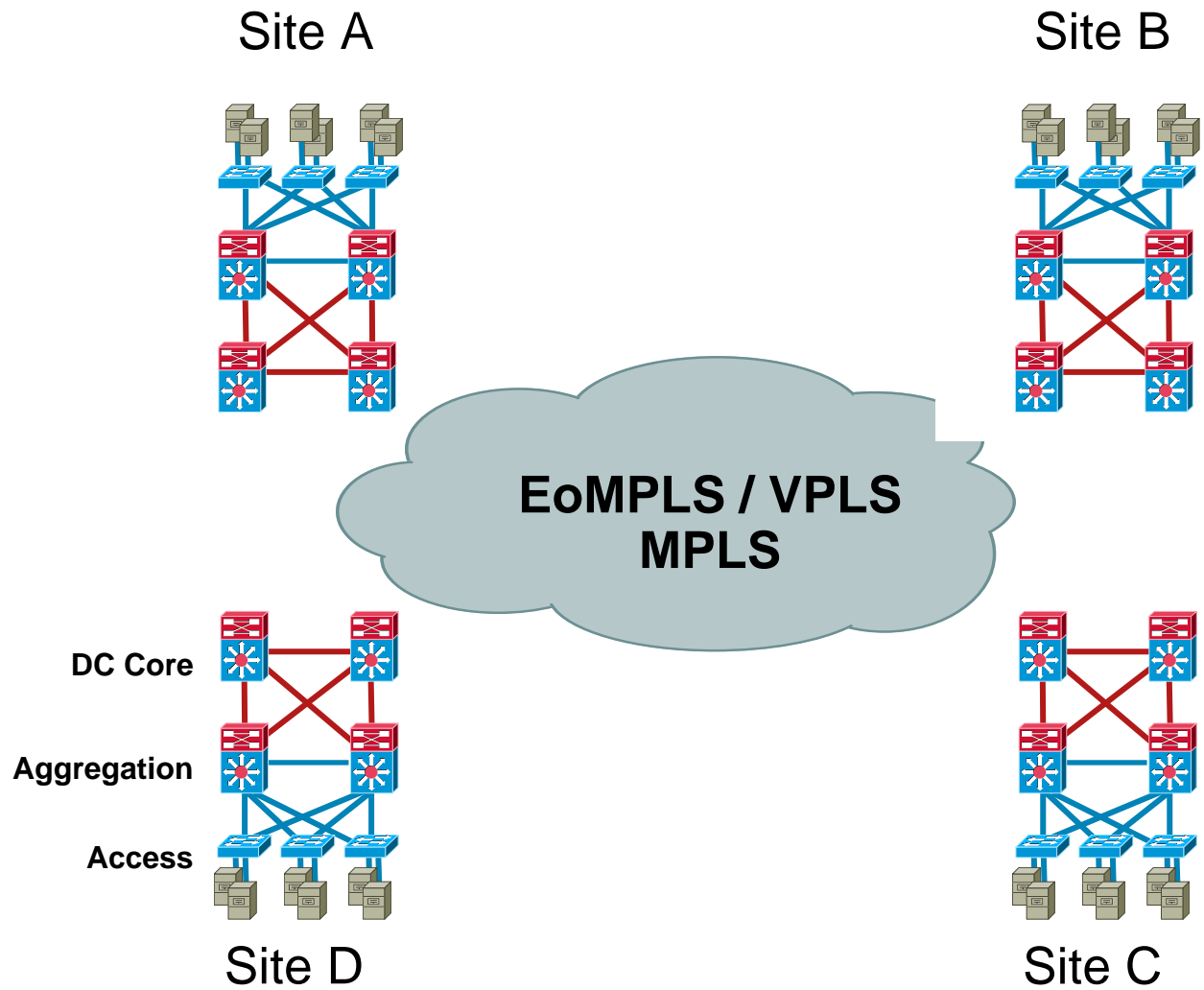


- Repeat similar principle for all sites

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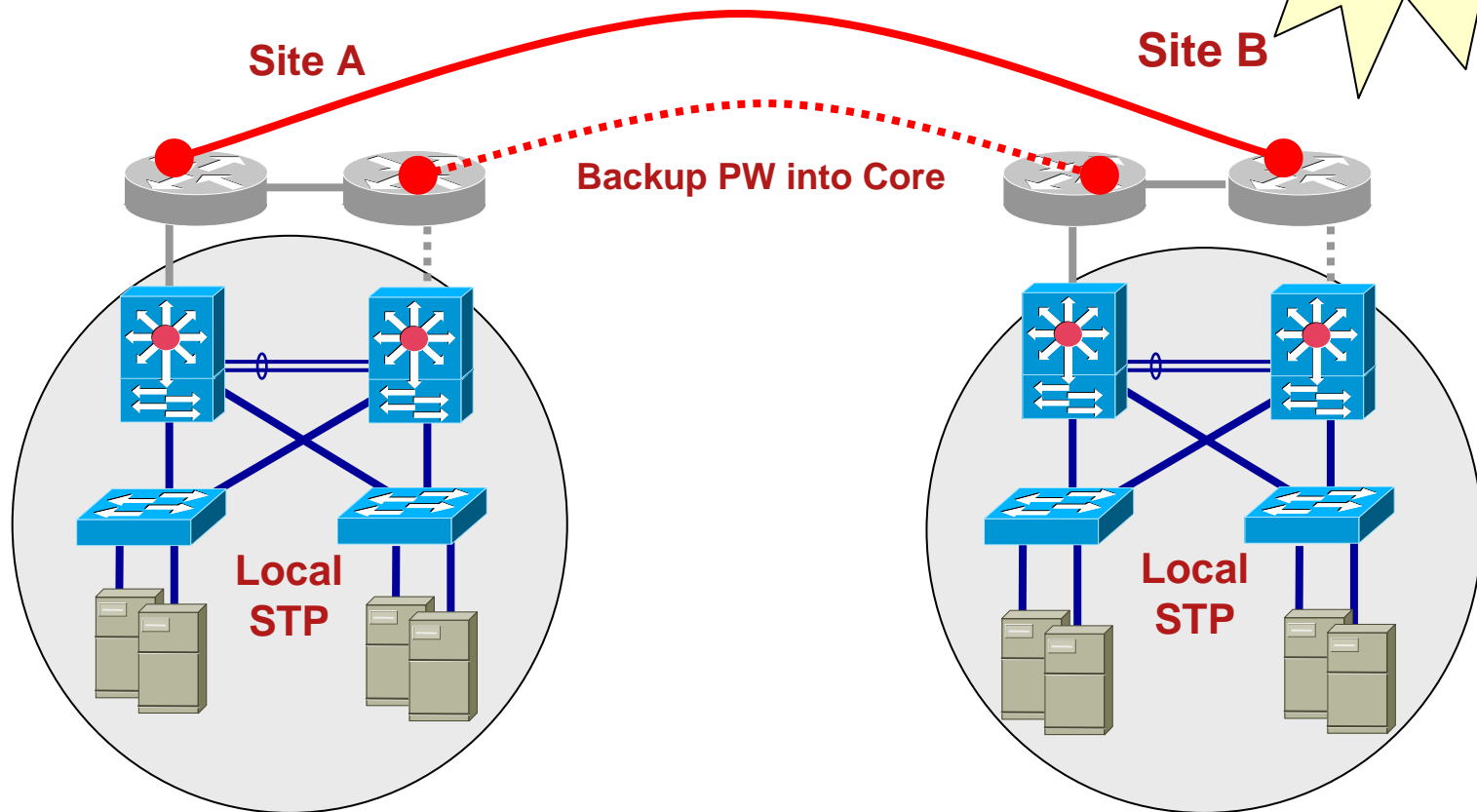
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DC Interconnect – MPLS



L2 extension Loop Prevention

EoMPLS PW



EoMPLS PW-redundancy

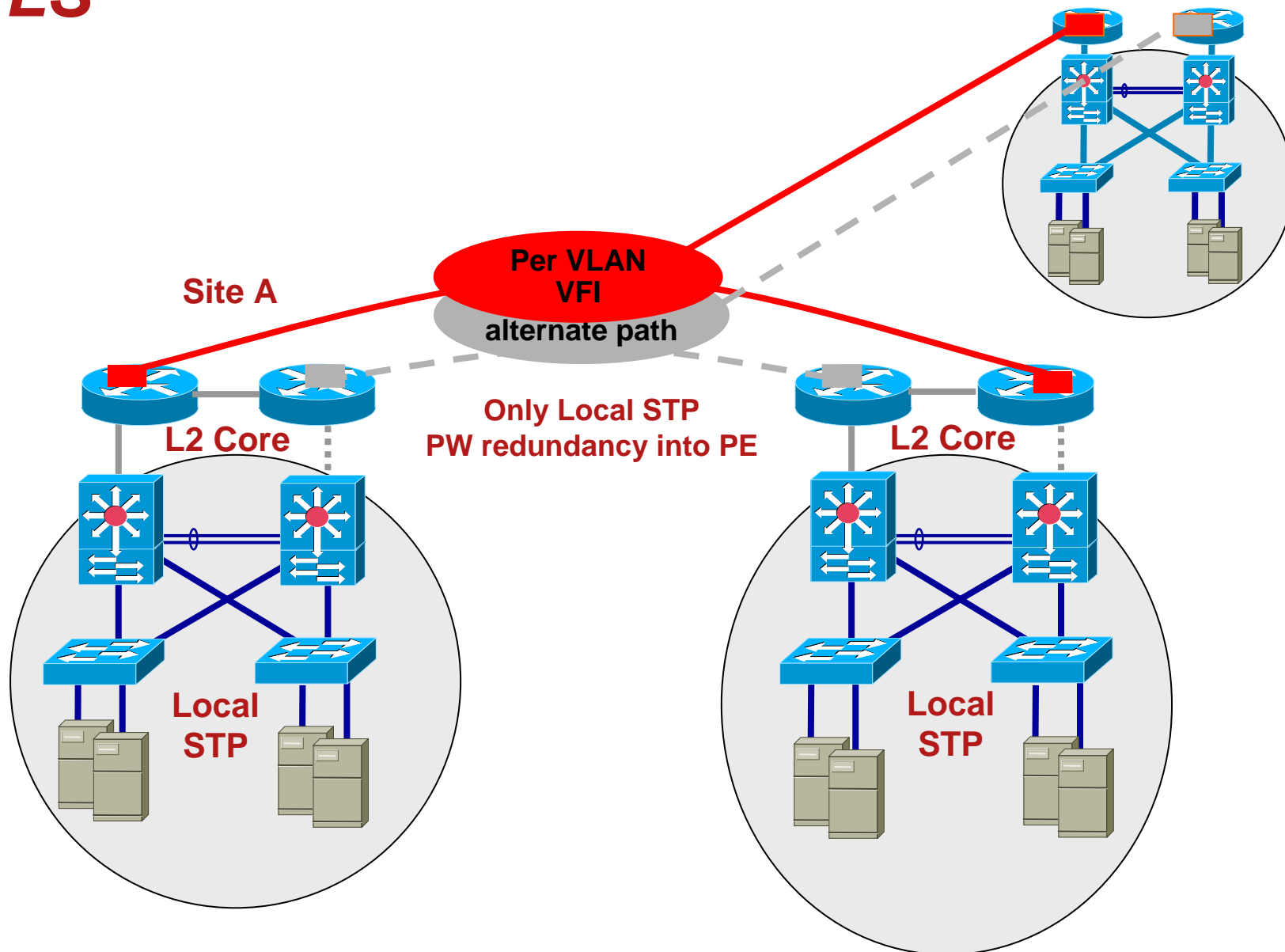
Loop-free interconnexion for **dual** sites VLAN extension

Native Port xconnect

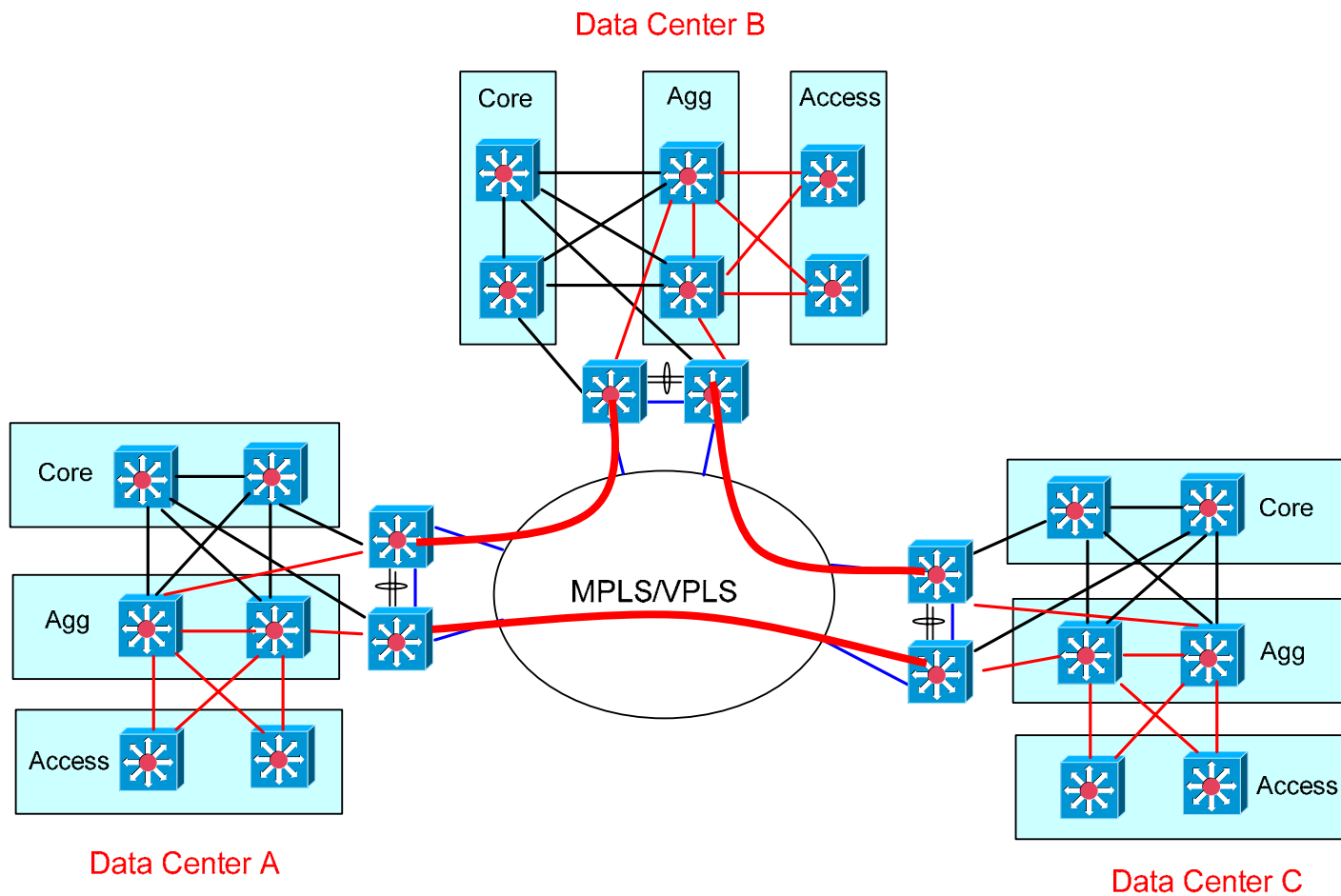
New solution under validation

L2 extension Loop Prevention

VPLS



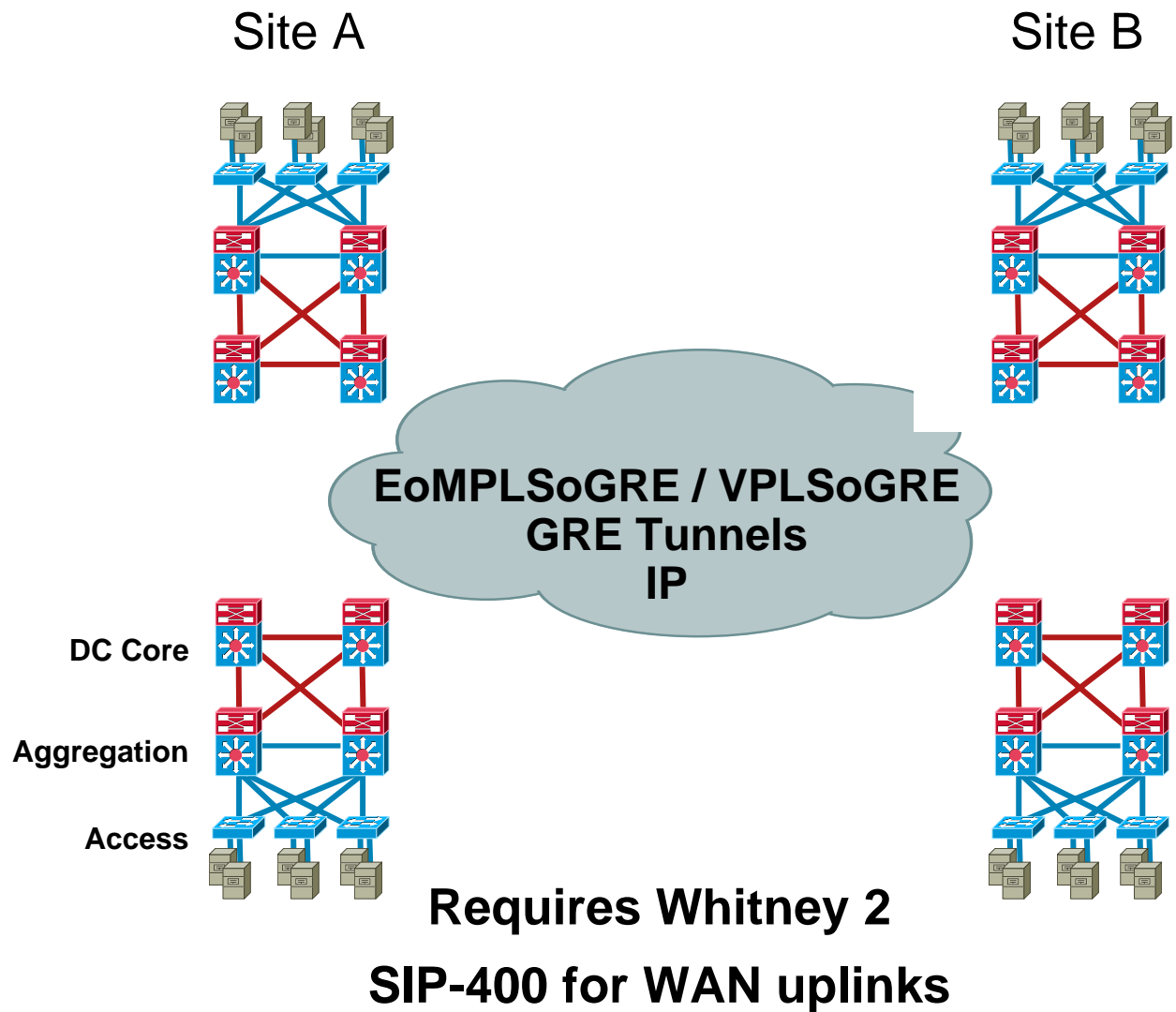
Layout for multiple DCs



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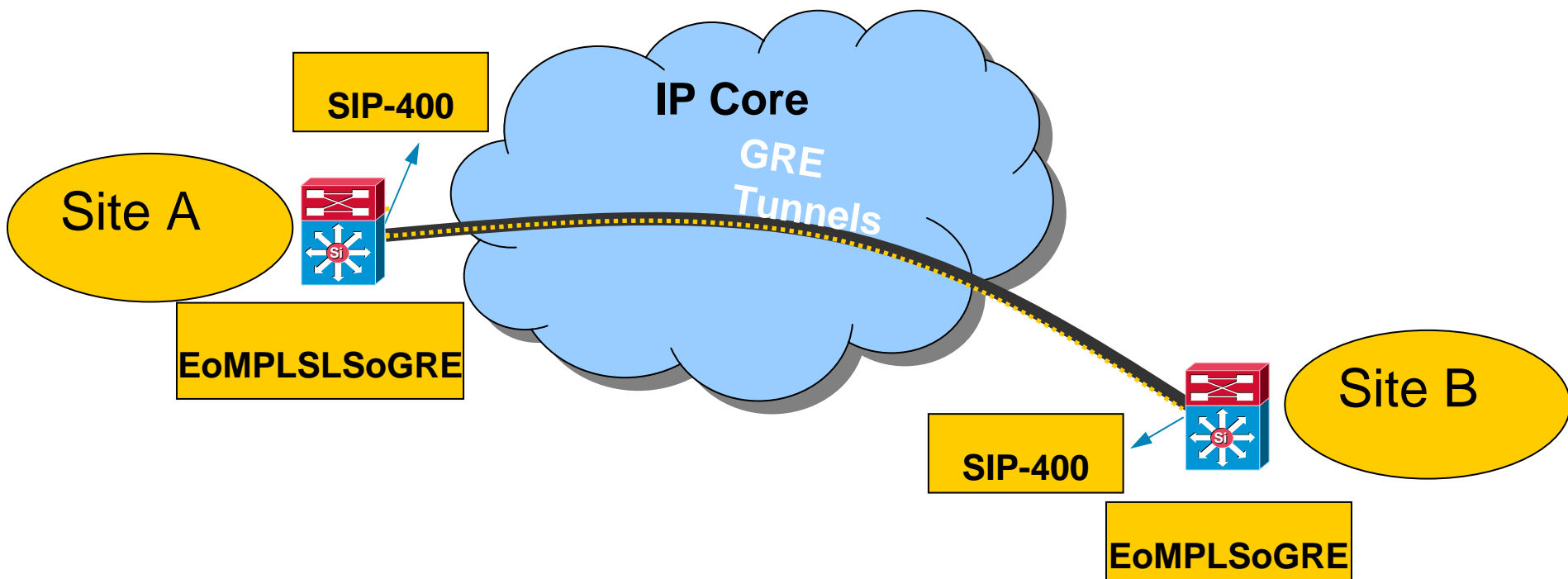
DC Interconnect – IP



DC Interconnect using EoMPLSoGRE

12.2(33)SXI feature

Edge only functionality using SIP400



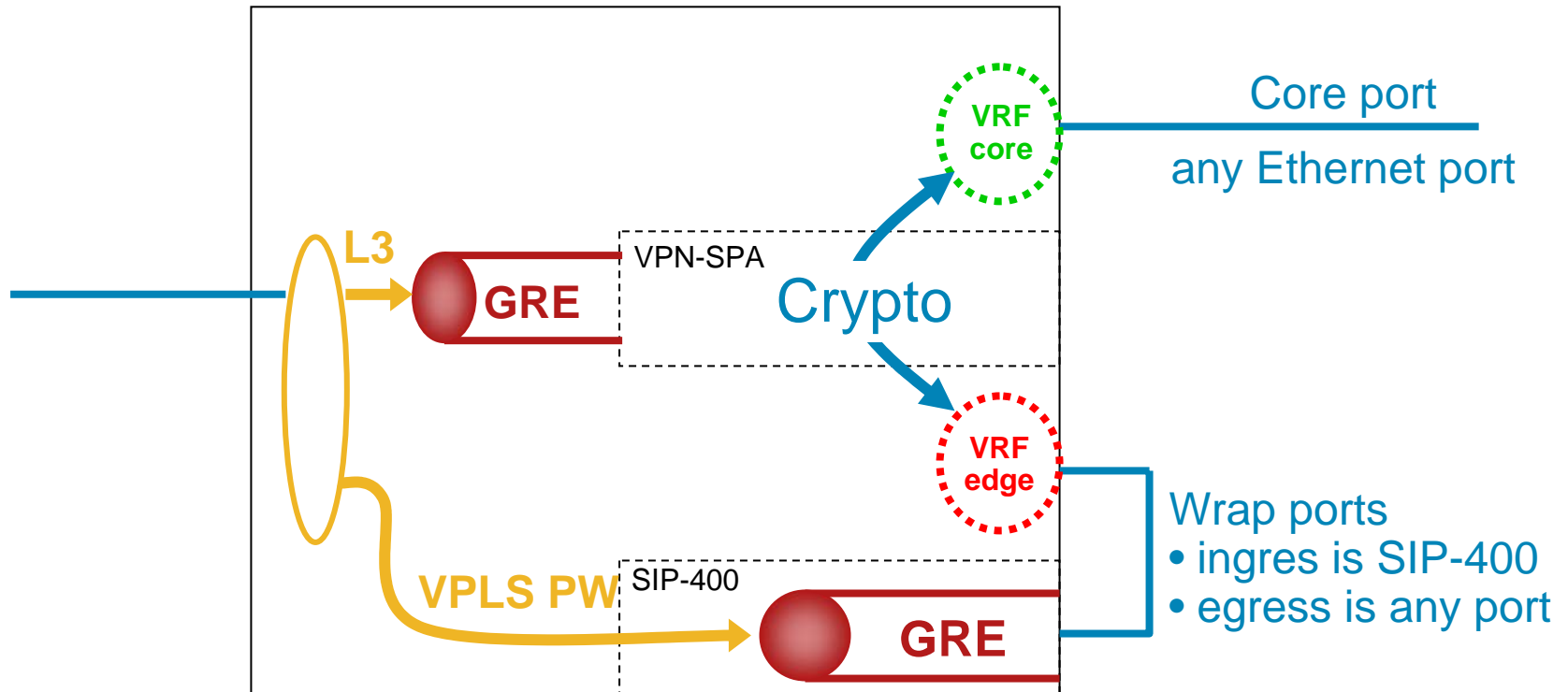
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Encrypted L2 extension *using ATOMoGRE*

- Nowadays IPsec is the main encryption mechanism
 - IPSEC requires IP packets
 - L2 are not IP packets
 - Today, no native L2oIP solution is existing
- L2oGRE is acting as L2oIP and so can be encrypted
 - EoMPLS for point to point solution
 - VPLS for multipoint solution
- Requires either:
 - Two boxes solution (one for L2VPNNoGRE, one for IPsec)
 - One box solution with a wrap cable

VPLS o GRE o IPSEC in one box *with wrap-cable*



To integrate both function in one box:

1. Use VRFs to isolate routing

- One VRF for edge link
- One VRF for Core links

2. Wrap cable to connect SIP-400 toward VRF

Key Takeaways

The Key Takeaways of this presentation are:

- Catalyst 6500 offers multiple solutions for extending Layer 2 between multiple Data Centers
- VSS with DWDM on Catalyst 6500 offers a 10G multipoint solution
- ATOMoGRE with SIP-400 offers a 1G multipoint solution for L2 extensions over a WAN with IP or MPLS core
- L2 extension options on Catalyst 6500 are redundant, scalable and secure.