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Cisco ACI – Disaster Recovery Solution

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Agenda

- Introduction to Cisco Application Centric Infrastructure – Cisco ACI
- Cisco ACI Stretched Fabric
- Cisco ACI Dual Fabric
- Conclusion

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Introduction to Cisco ACI

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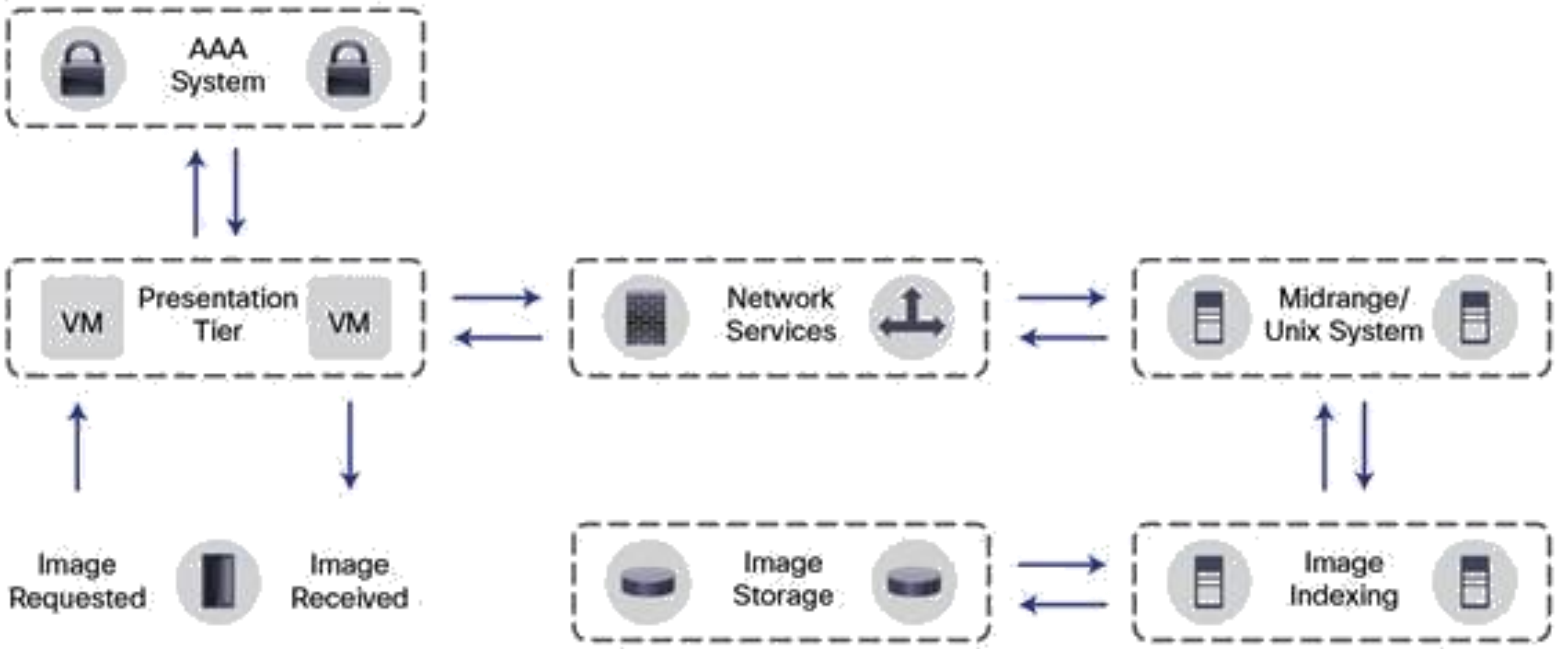
Application components and tiers



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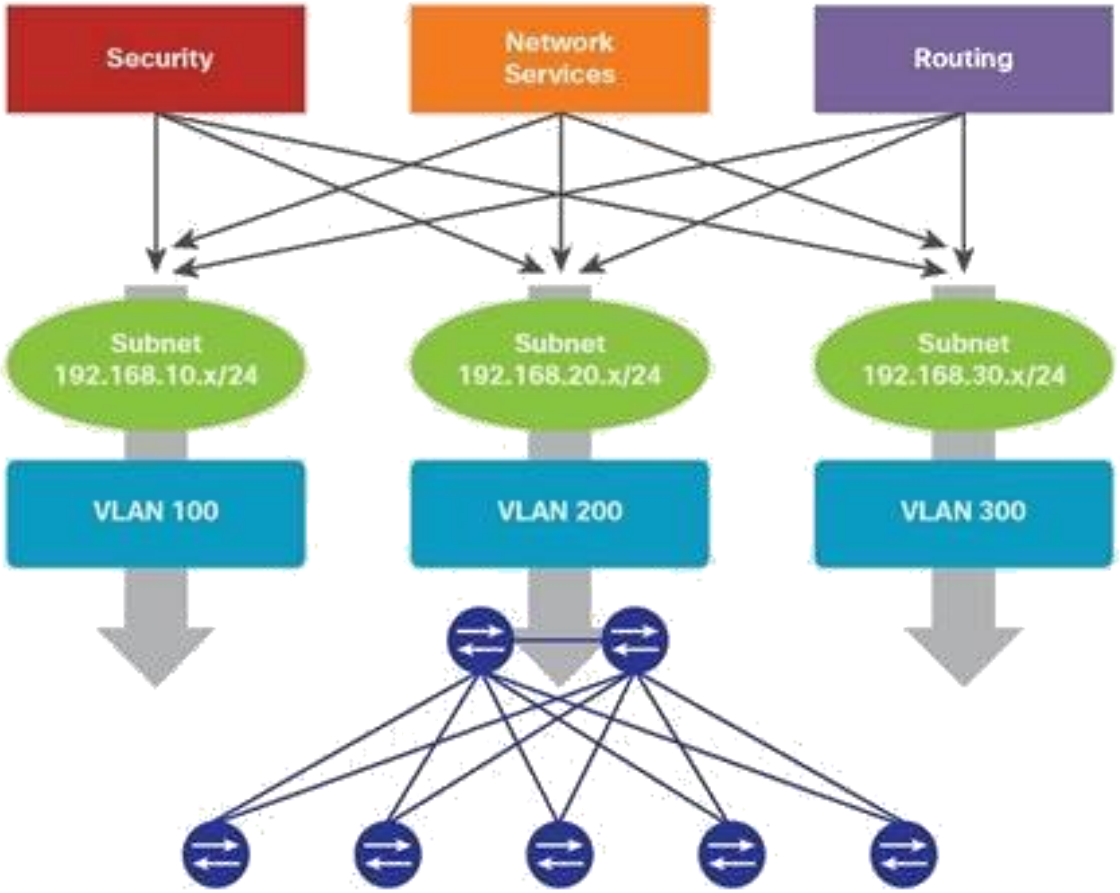
Current Network Definitions of Application



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Developers Infrastructure Team

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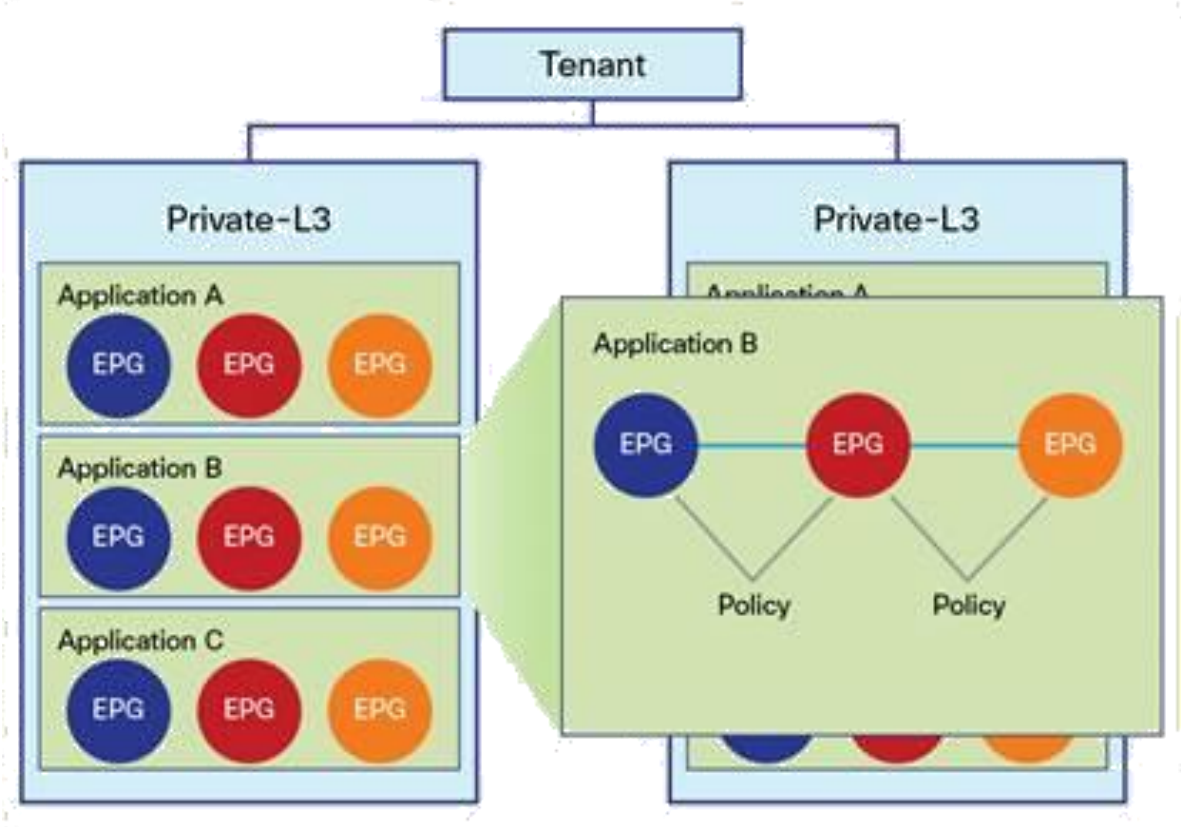
Cisco ACI Logical Object Model



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Cisco ACI Endpoint Groups

- EPGs act as a container for collections of applications, or application components and tiers that can be used to apply forwarding and policy logic.

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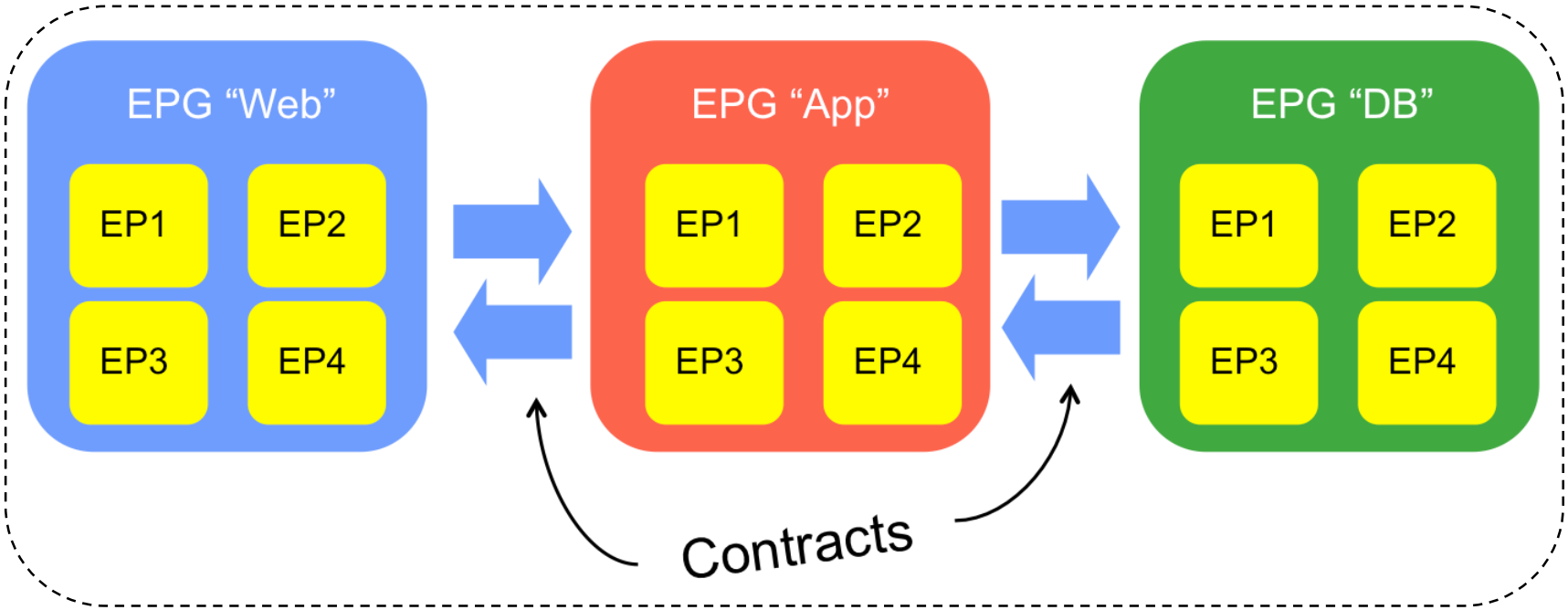
Cisco ACI Contracts

- Contracts allow for both simple and complex definition of how a given EPG communicates with other EPGs dependent on the requirements of a given environment.



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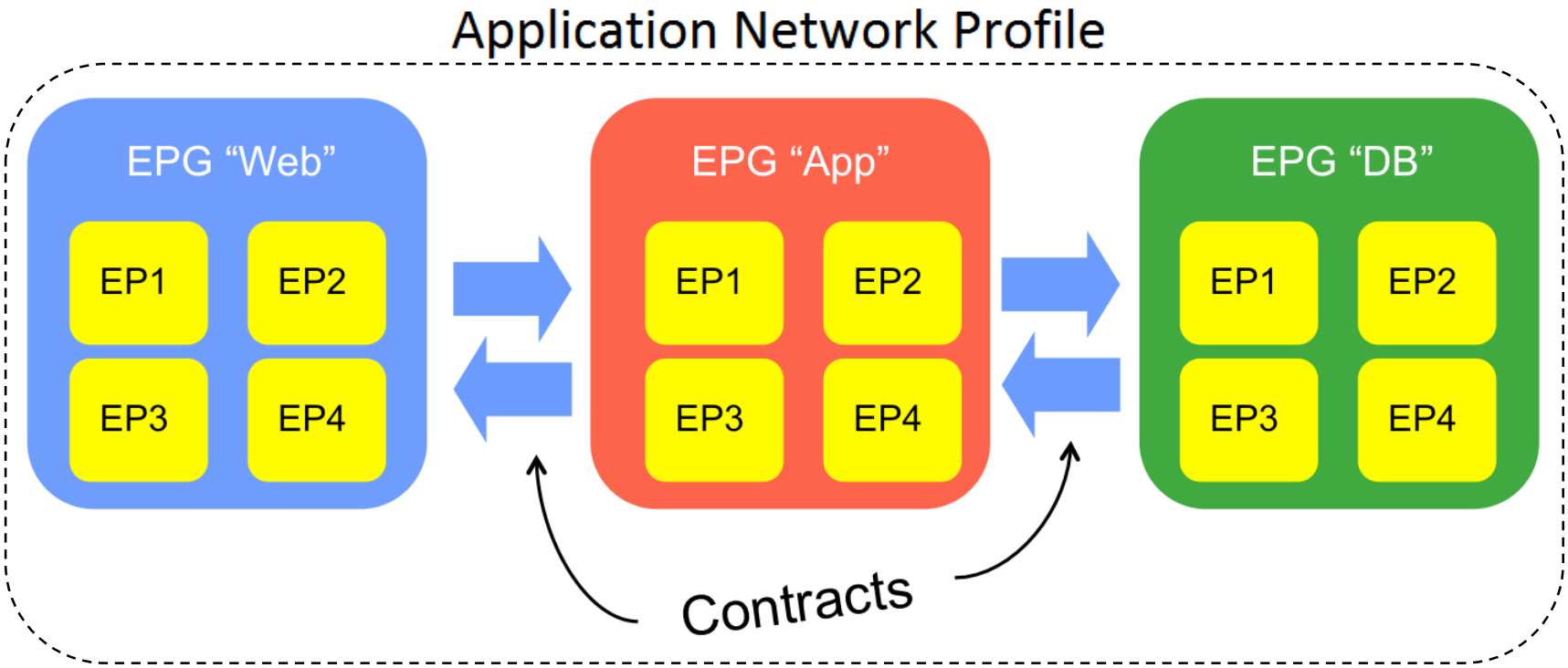
Cisco ACI Application Network Profiles

- Application Network Profiles are the instantiation of a complete application on the network.



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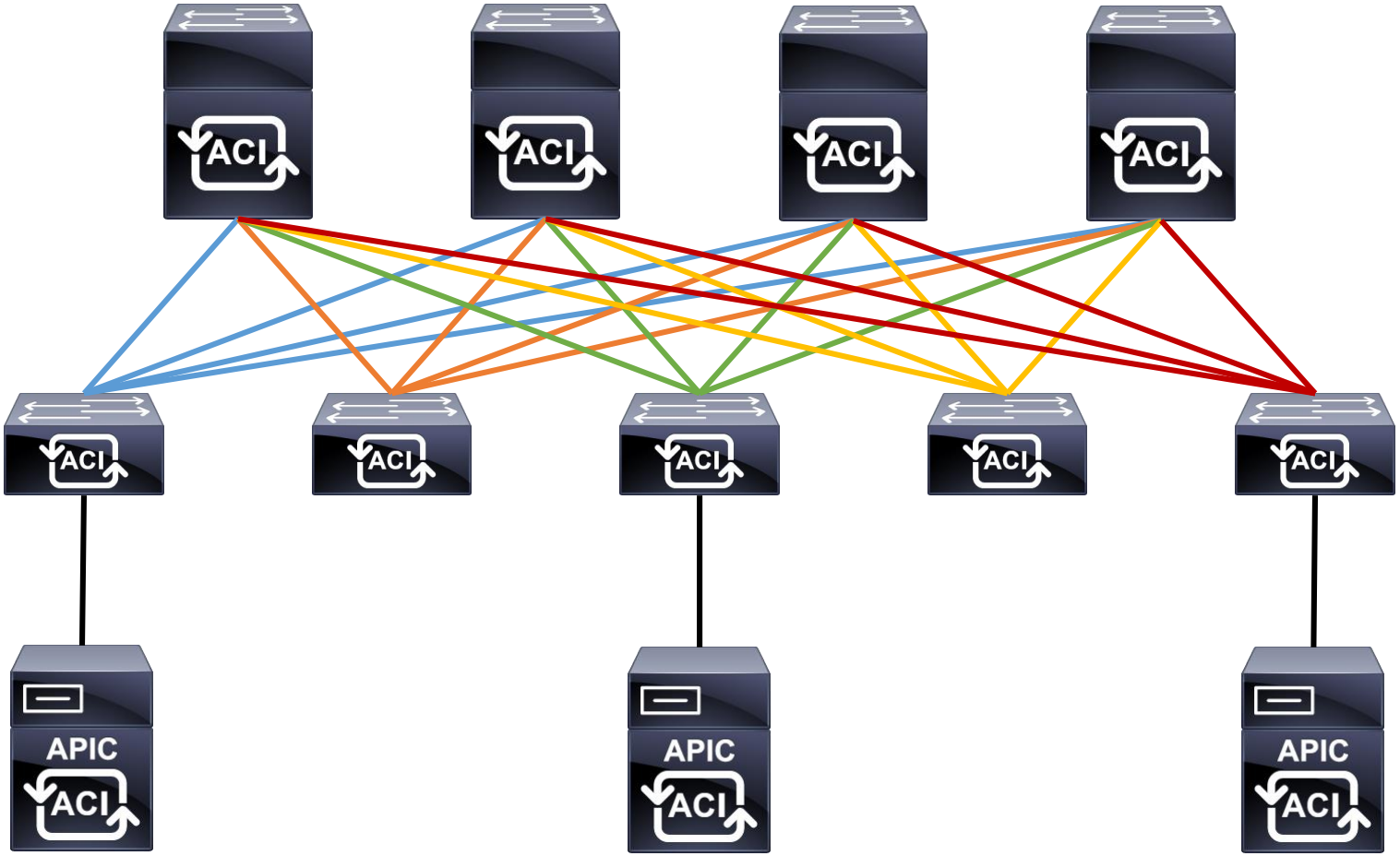
Cisco ACI elements



SPINE
Nexus 9000

LEAF
Nexus 9000

APIC Cluster

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Cisco ACI Stretched Fabric

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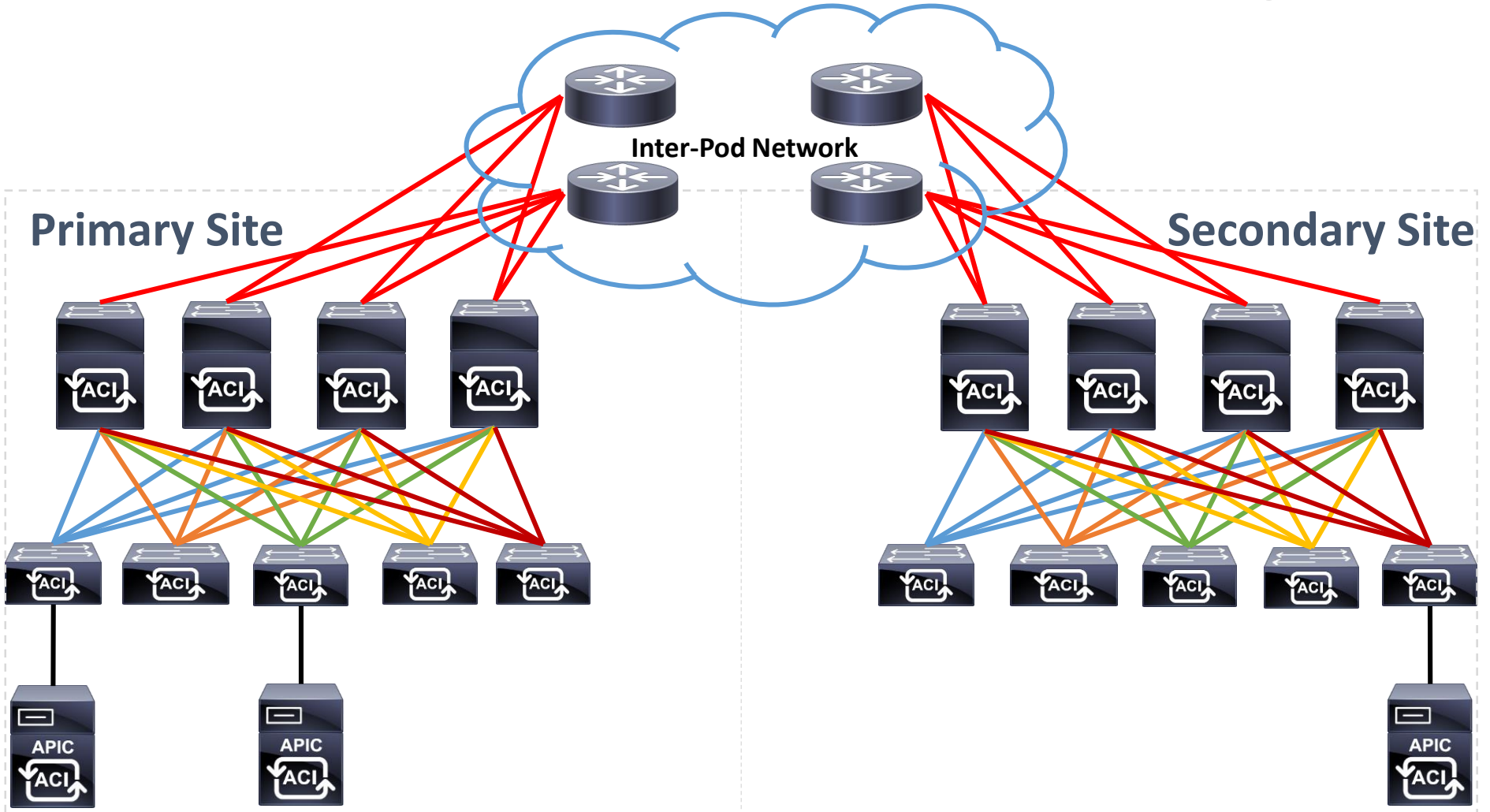
Cisco ACI Stretched Fabric Design



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Site-to-Site Connectivity Options

ACI stretched fabric site-to-site connectivity options include:

- Dark Fiber (up to 40km)
- Dense Wavelength Division Multiplexing (up to 800km)
- Ethernet over MPLS (EoMPLS) pseudowire (up to 800km)

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Inter-Pod Network

- Not managed by the APIC
- Inter-Pod Network topology can be arbitrary, not mandatory to connect all spines
- Main Requirements:
  - 40G/100G interfaces to connect to the spine nodes
  - DHCP Relay to enable spine/leaf nodes discovery across Pods
  - OSPF to peer with the spine nodes and learn VTEP reachability
  - Increased MTU support to handle VXLAN encapsulated traffic
  - QoS (to prioritise intra APIC cluster communication)

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Failure Scenarios

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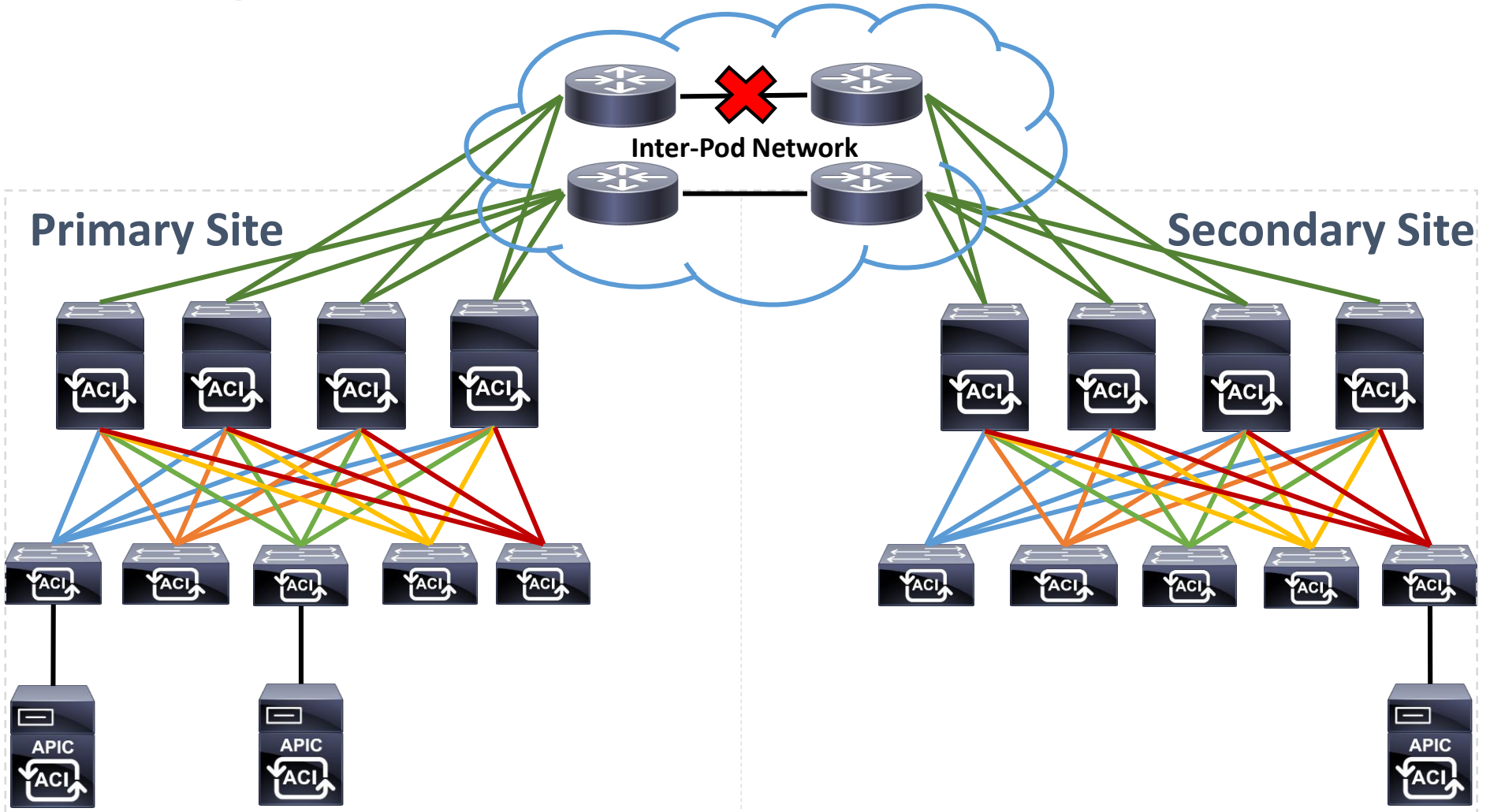
Single Link Failure between Sites



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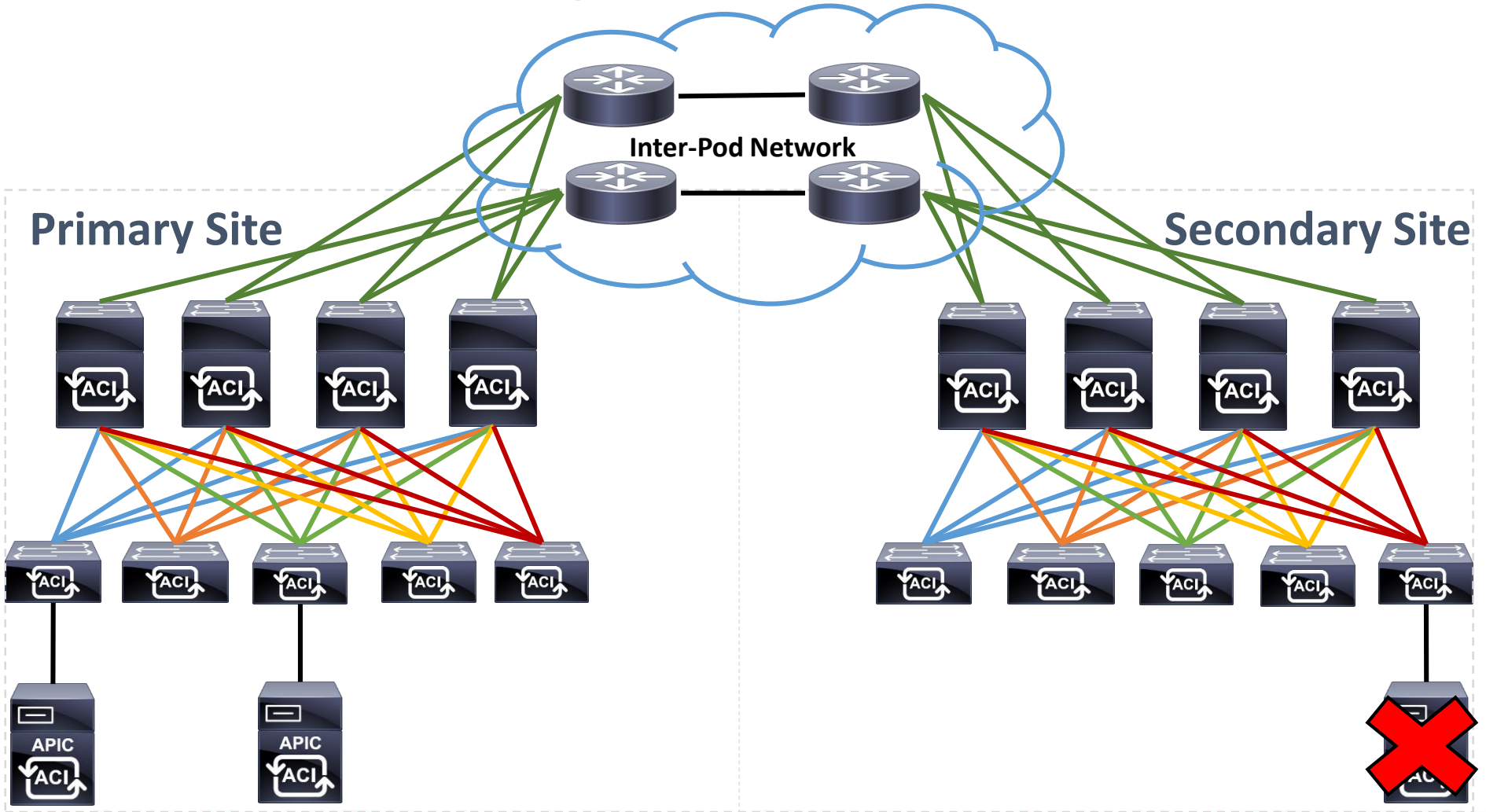
Loss of a Single APIC Controller



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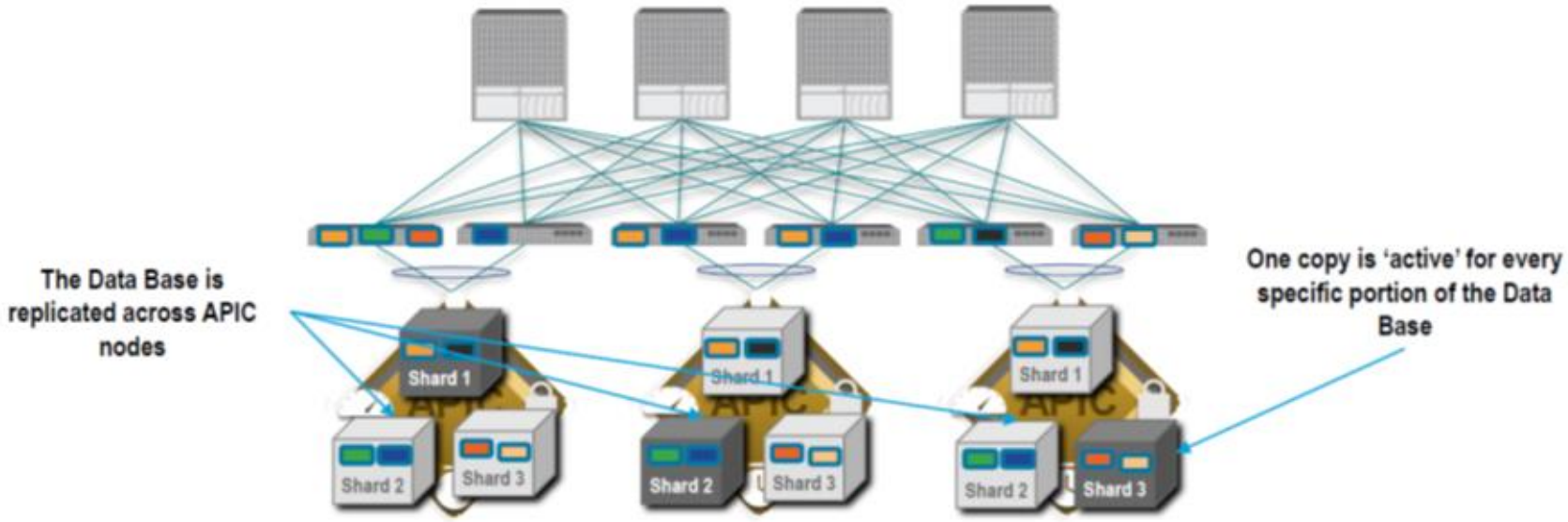
More that three APICs in a cluster?

- The Data Base is distributed as active + 2 backup instances (shards) for every attribute



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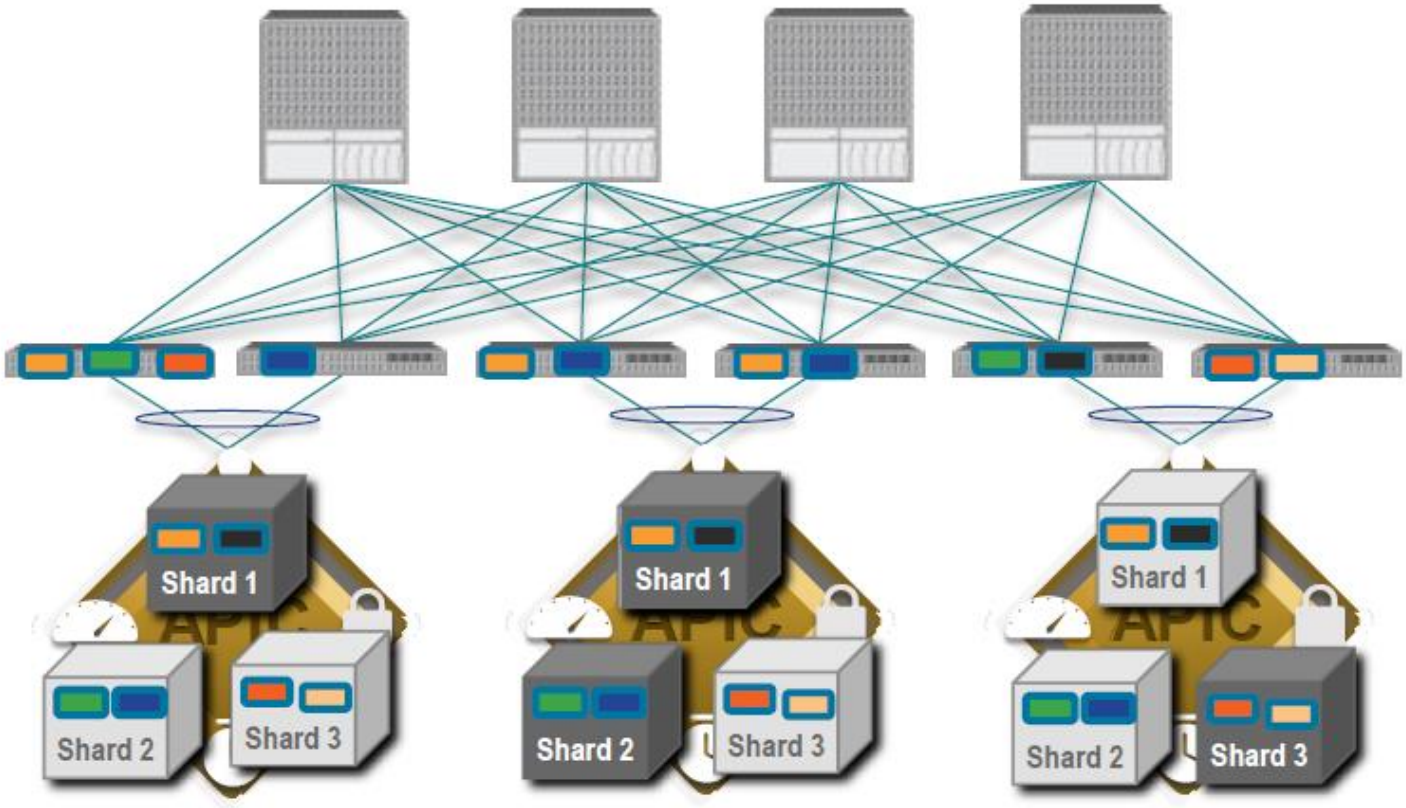
APIC Failure



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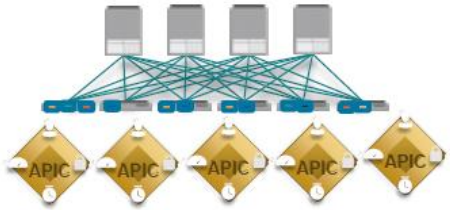
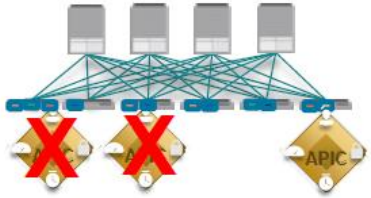
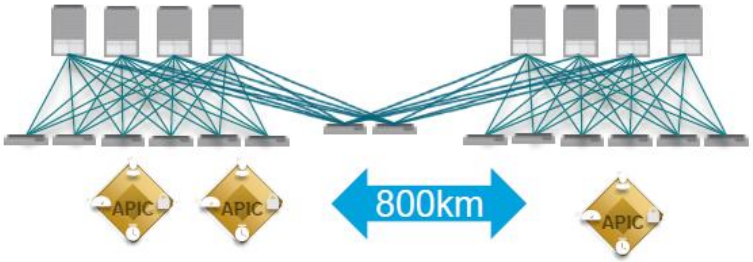
Design Considerations



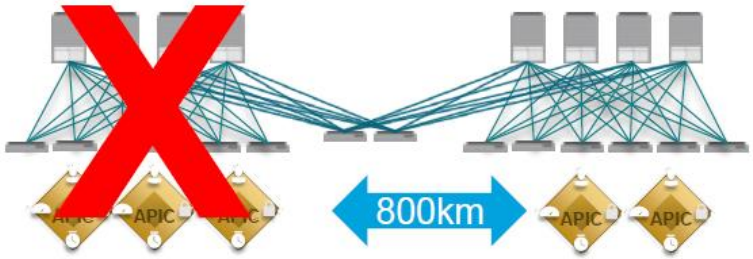
Additional APIC will increase the system scale (today up to 5 nodes supported) but does not add more redundancy



APIC will allow read-only access to the DB when only one node remains active (standard DB quorum)



There is a max supported distance between data base (APIC) nodes – 800km



NOT RECOMMENDED: failure of site 1 may cause irreparable loss of data for some shards and inconsistent behaviour for others

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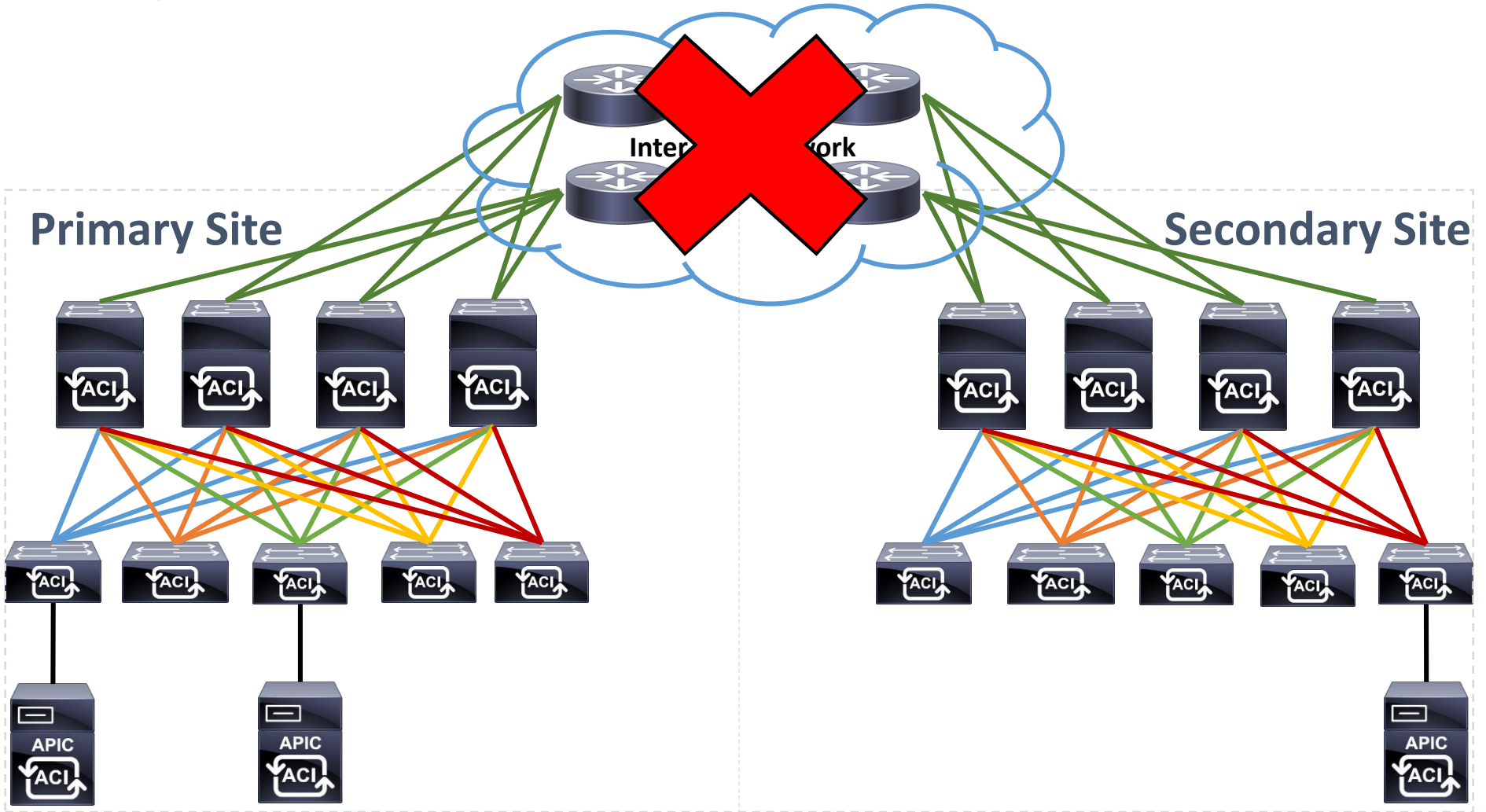
Split Fabric



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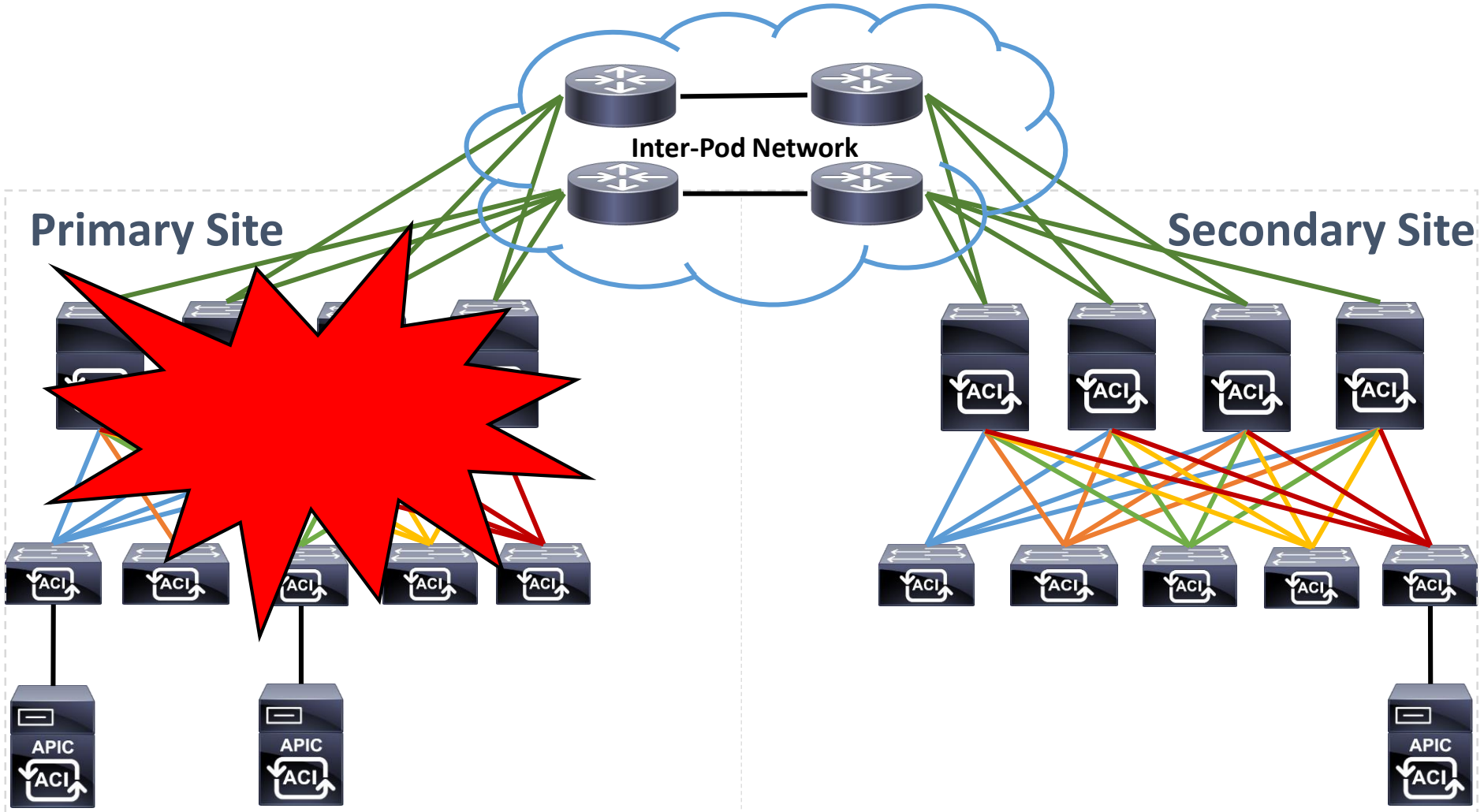
Data Centre Failure



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Cisco ACI Dual Fabric

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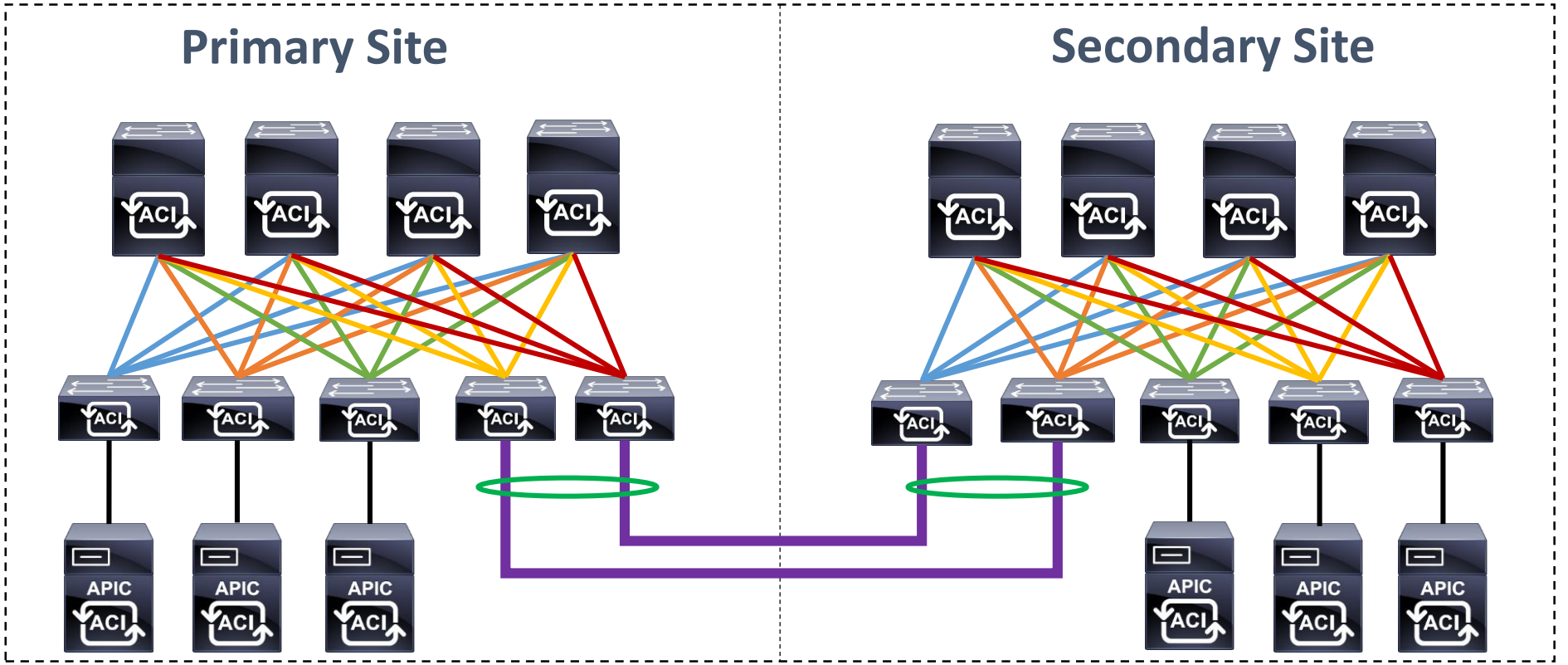
Cisco ACI Dual Fabric Design



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Site-to-Site Connectivity Options

ACI Dual Fabric Site-to-Site connectivity options include:

- vPC over dark fiber
- vPC over DWDM
- VXLAN or OTV

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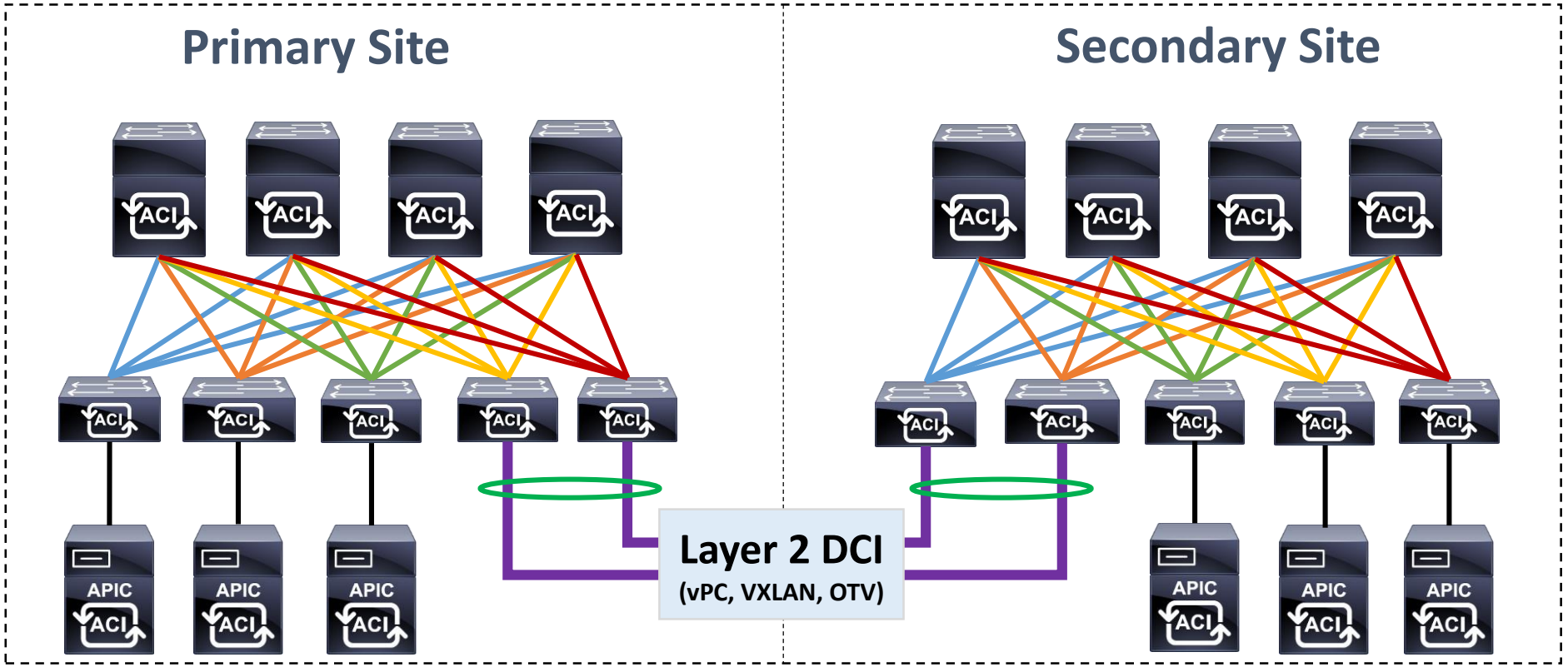
Dual Fabric Layer 2 connectivity



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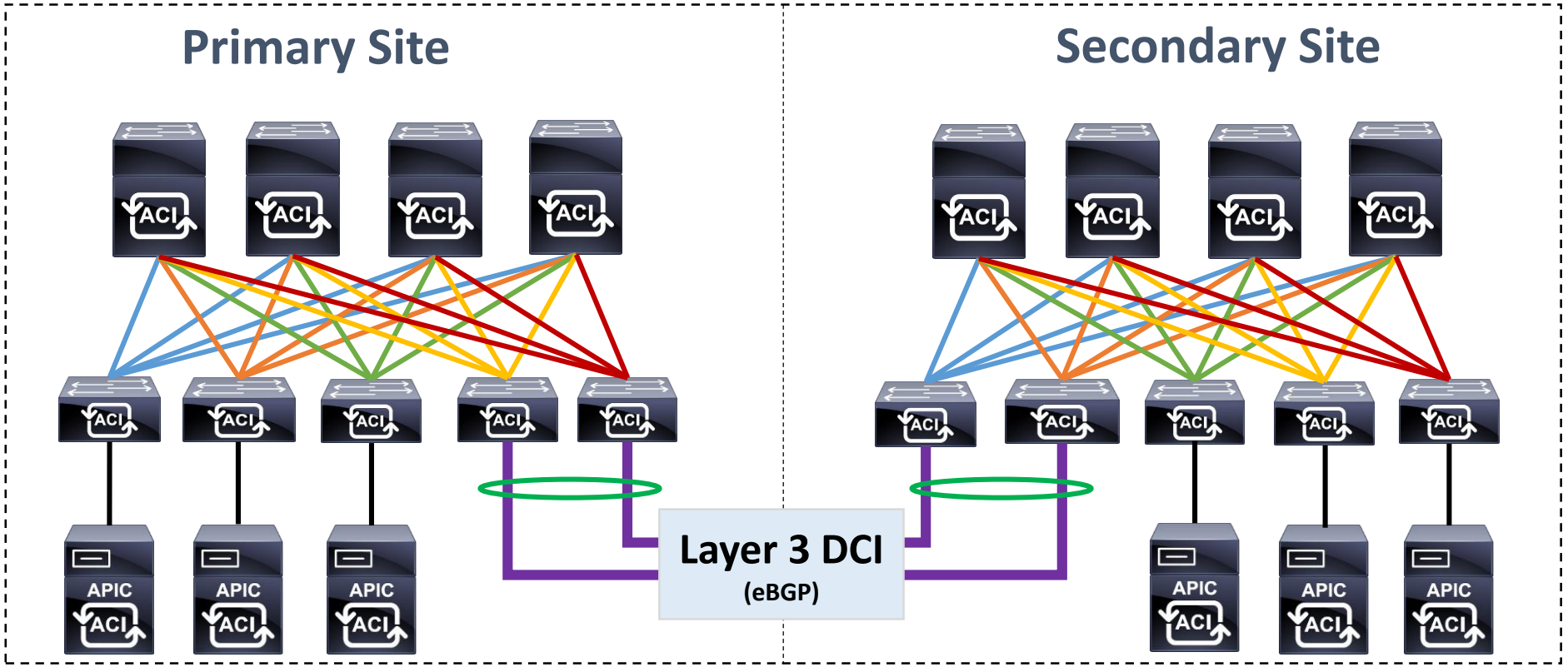
Dual Fabric Layer 3 connectivity



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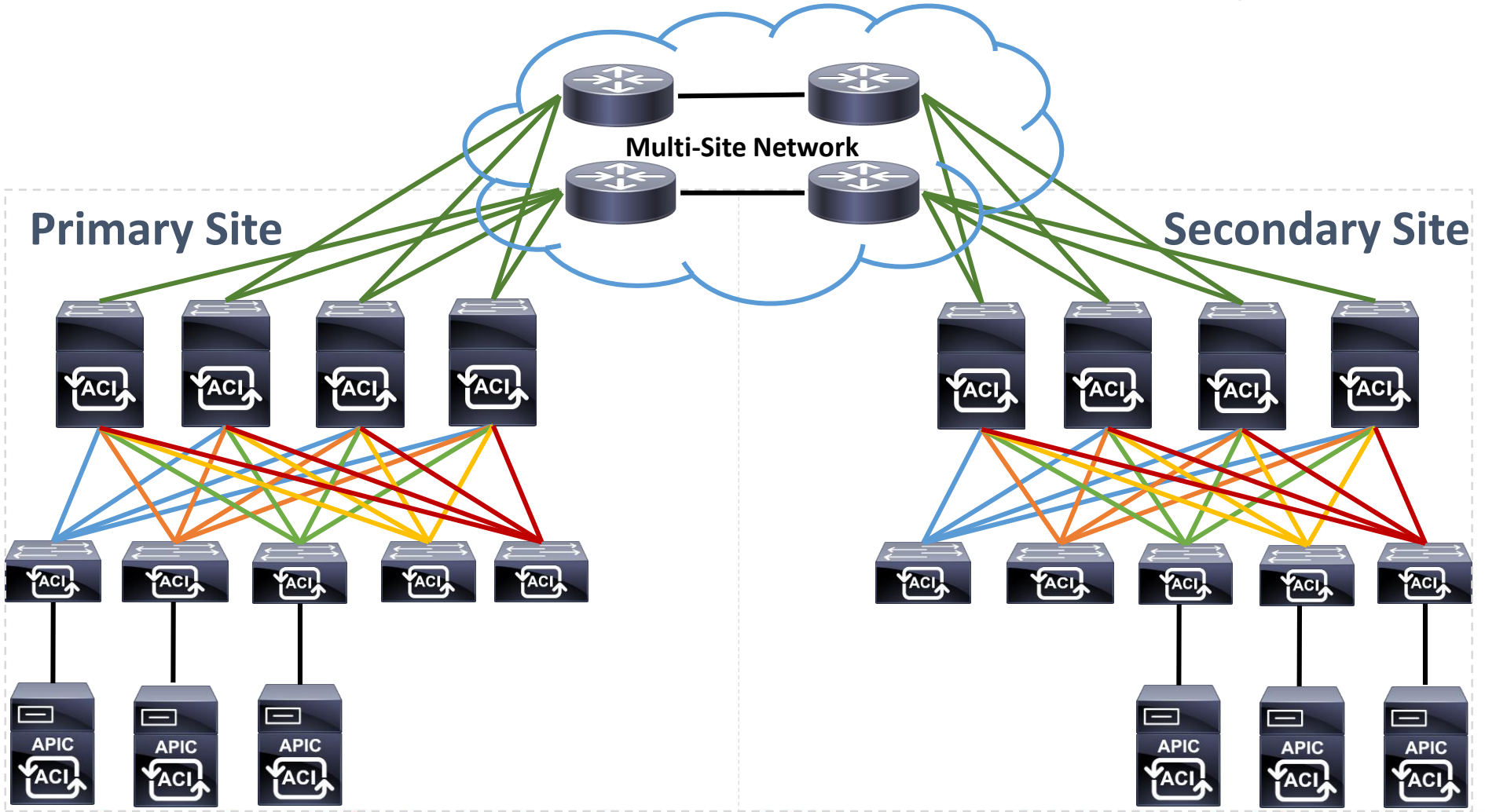
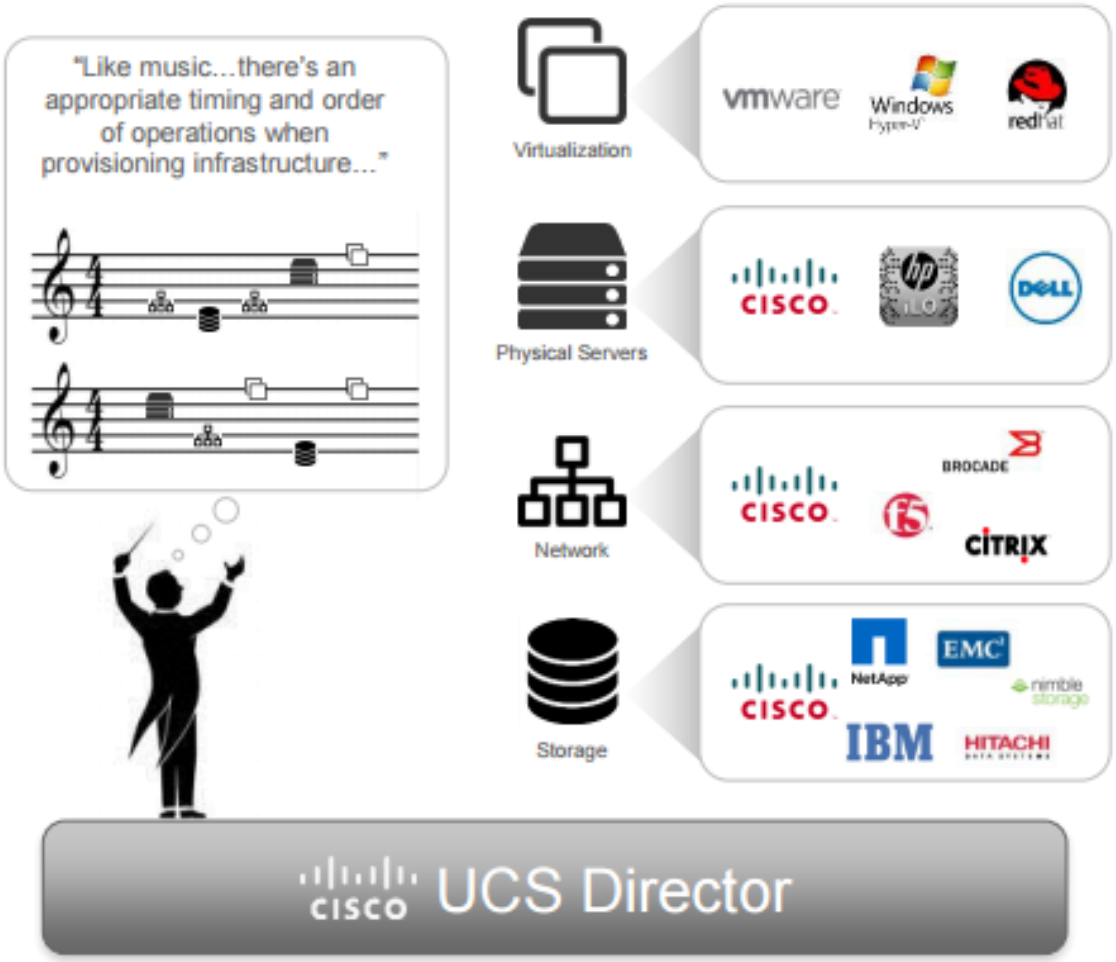
Dual Fabric Future Connectivity



Cisco UCS Director



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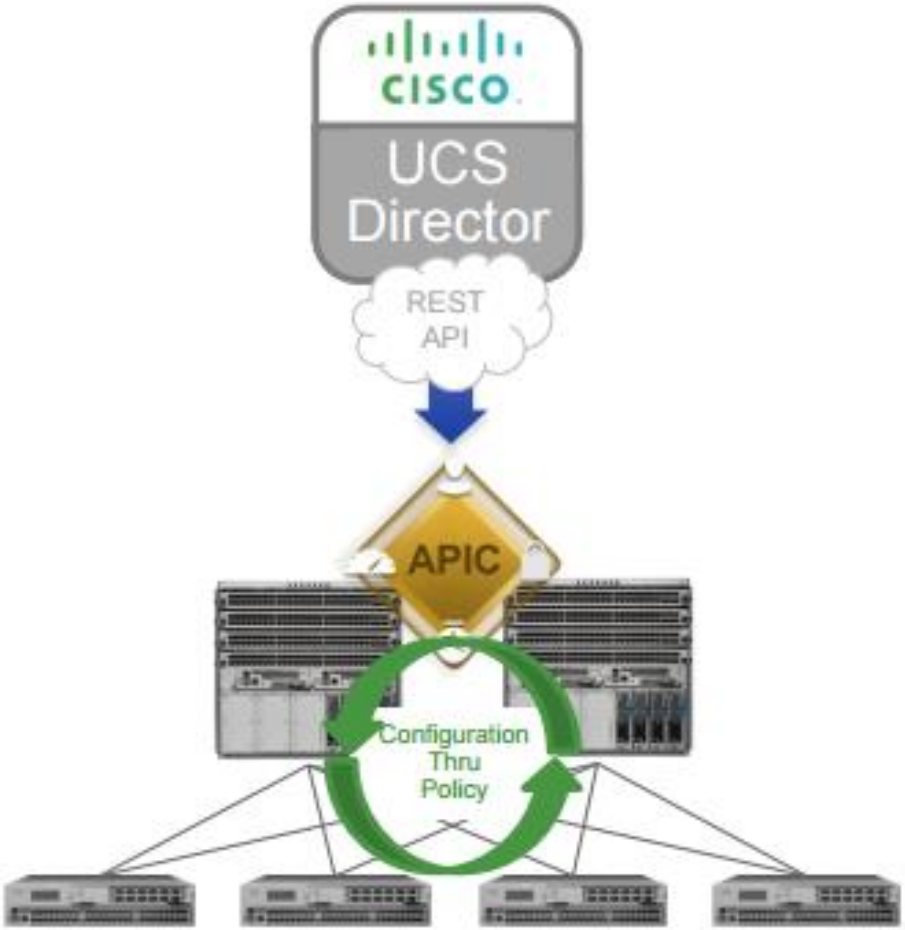
Cisco UCS Director ACI integration



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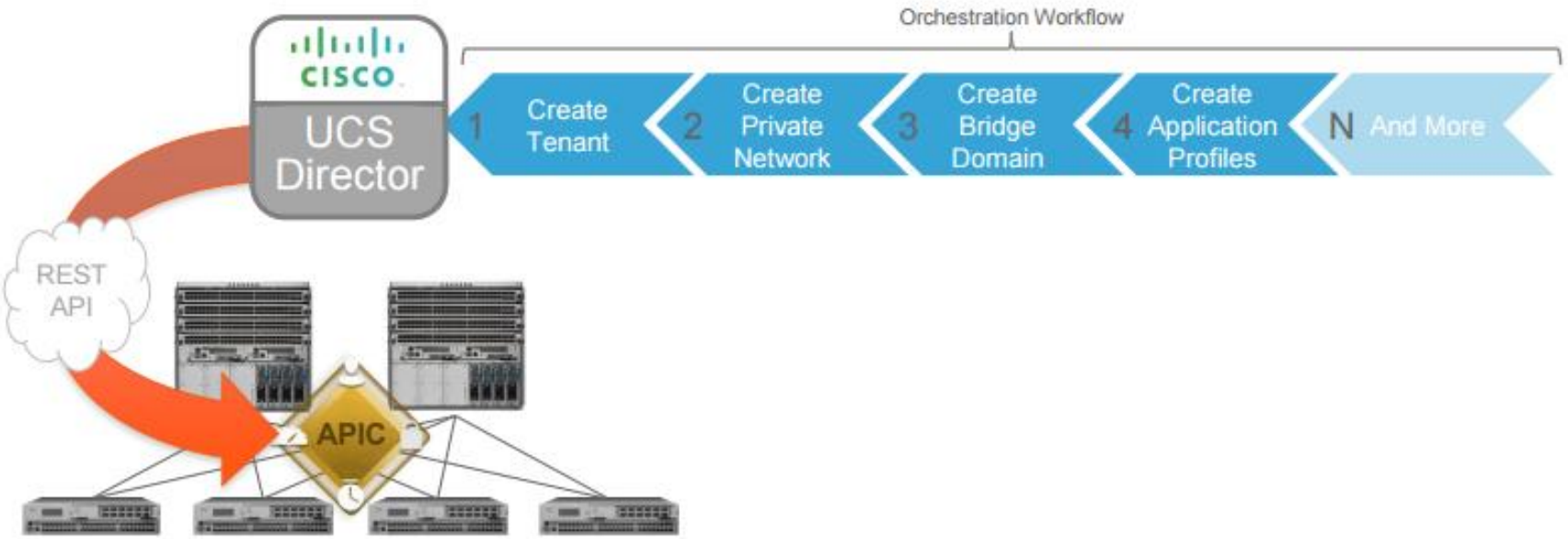
Operational task automation within Cisco ACI Fabric



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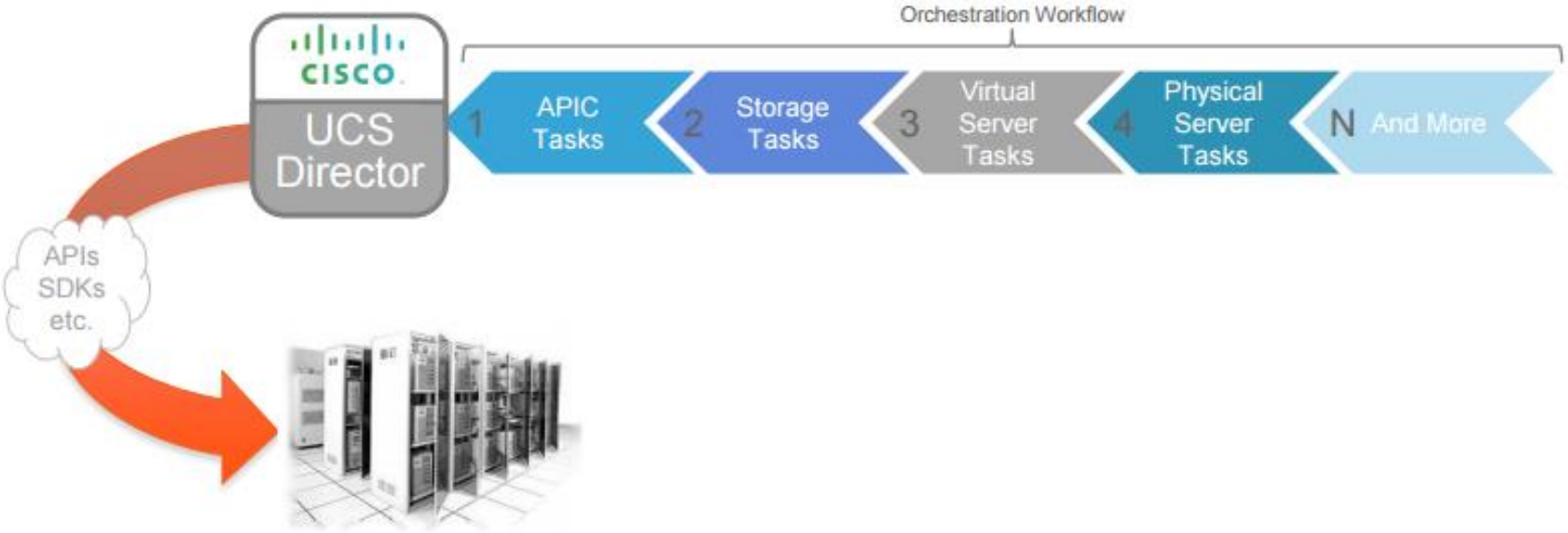
Endpoint Automation complementing Cisco ACI



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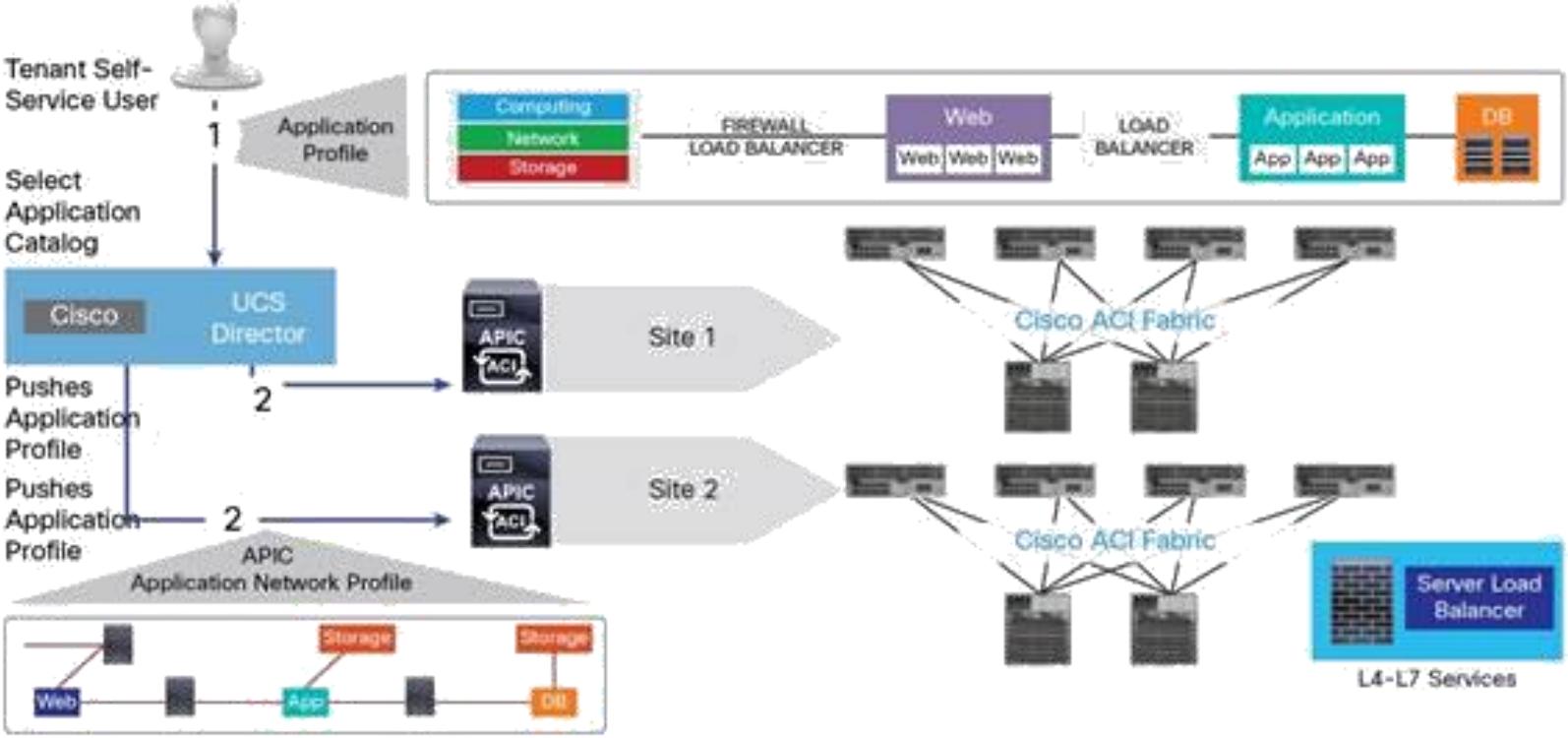
Integration in a Dual Fabric Design



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Conclusion

- Cisco ACI offers two different DR approaches:
  - **Stretched Fabric -> Multi-Pod Design**
    - Single APIC Cluster for multiple DCs
    - In event of >1 APIC Controller failure, you no longer can configure (read-only APIC mode)
  - **Dual Fabric -> Multi-Site Design**
    - One APIC Cluster per Site
    - Establish policy orchestration between sites for true Active/Active implementation

Business needs define which approach to implement!

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Thank you!