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Connect & Secure 2019
Welcome
14 maart 2019

Connecting to Digital

Connect & Secure 2019

Deepdive SD-Access

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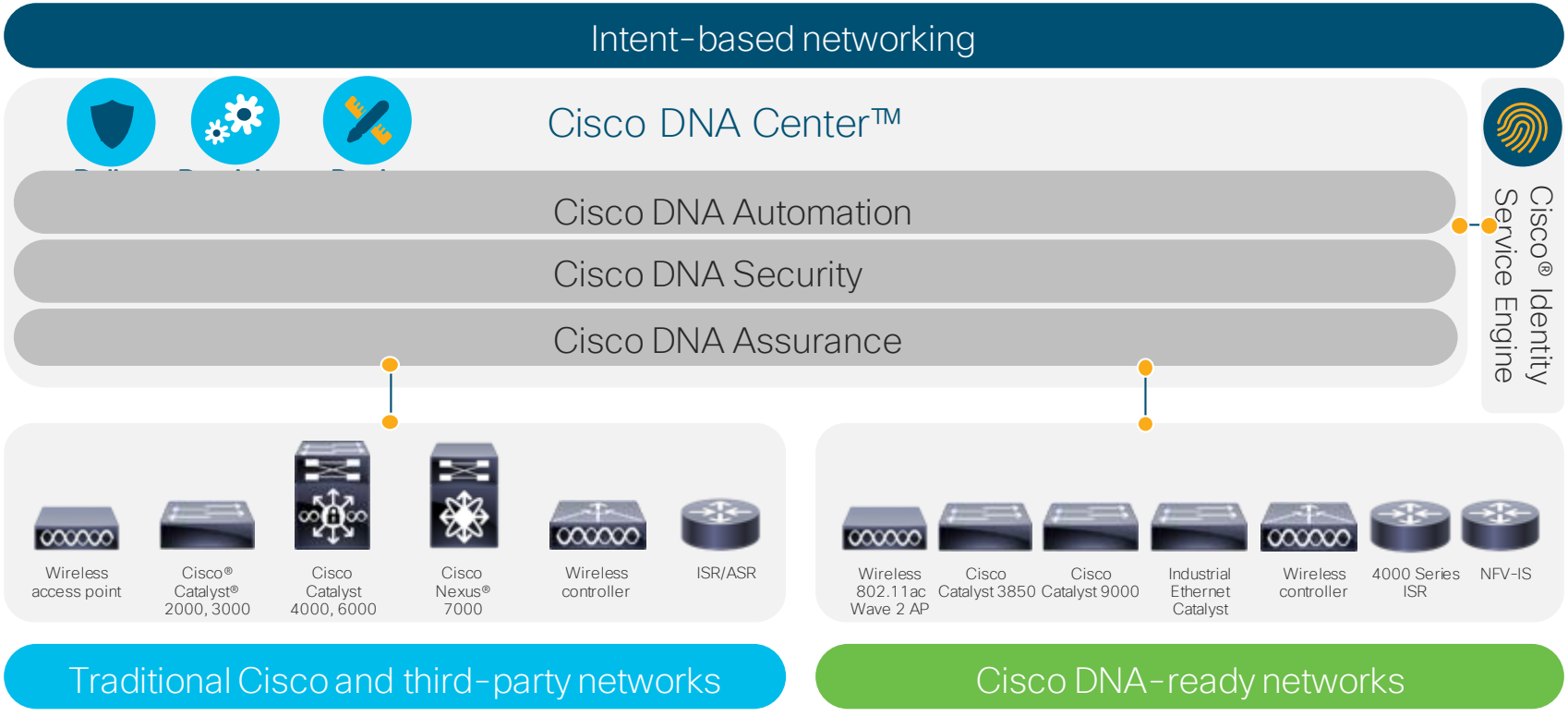
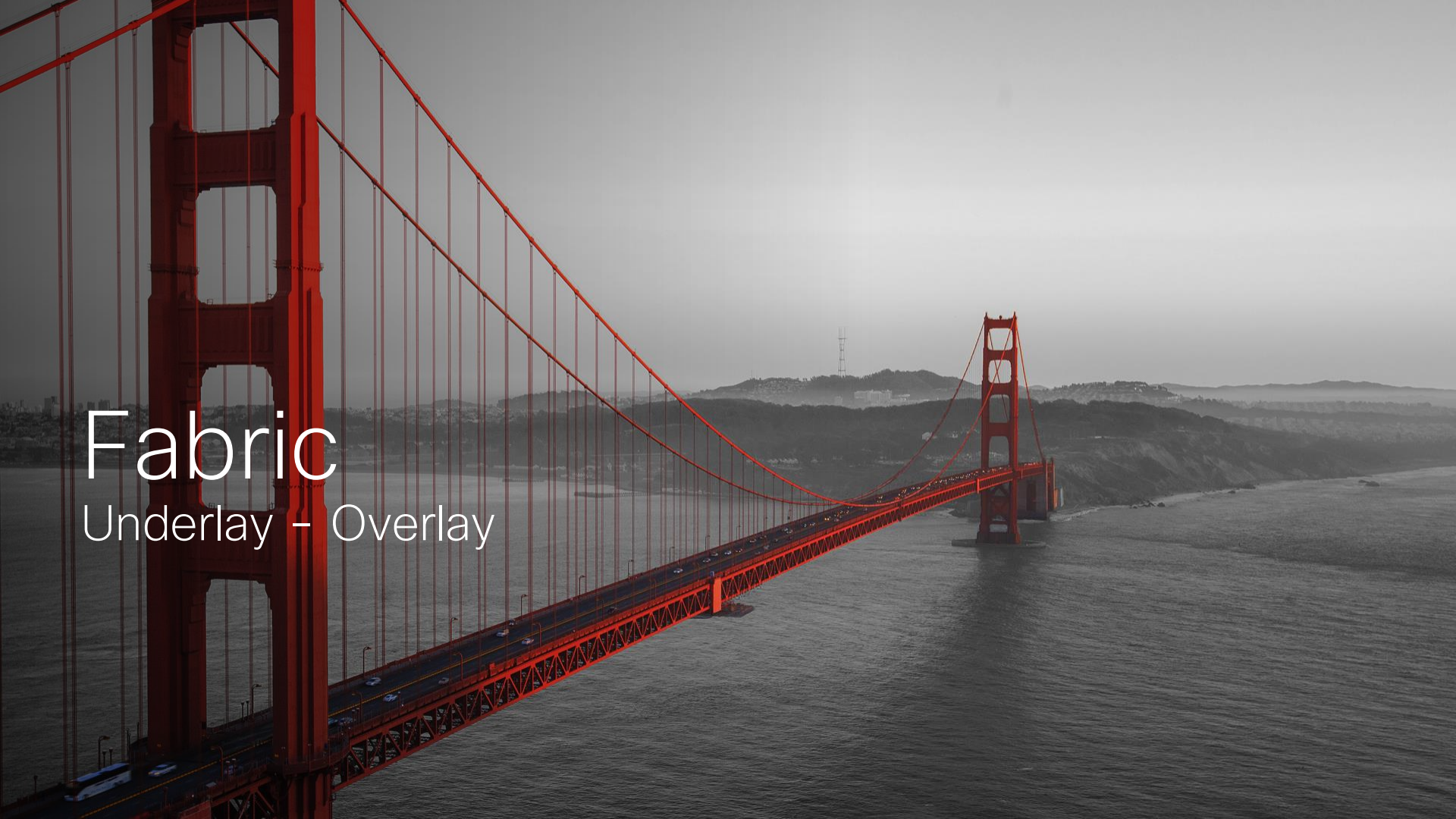
Cisco DNA Architecture





Fabric

Underlay - Overlay

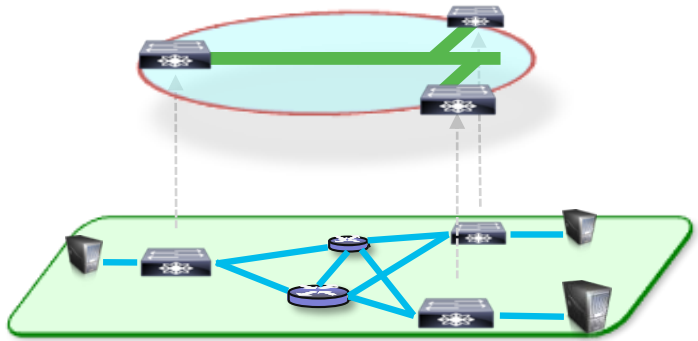
What exactly is a Fabric?

A Fabric is an Overlay

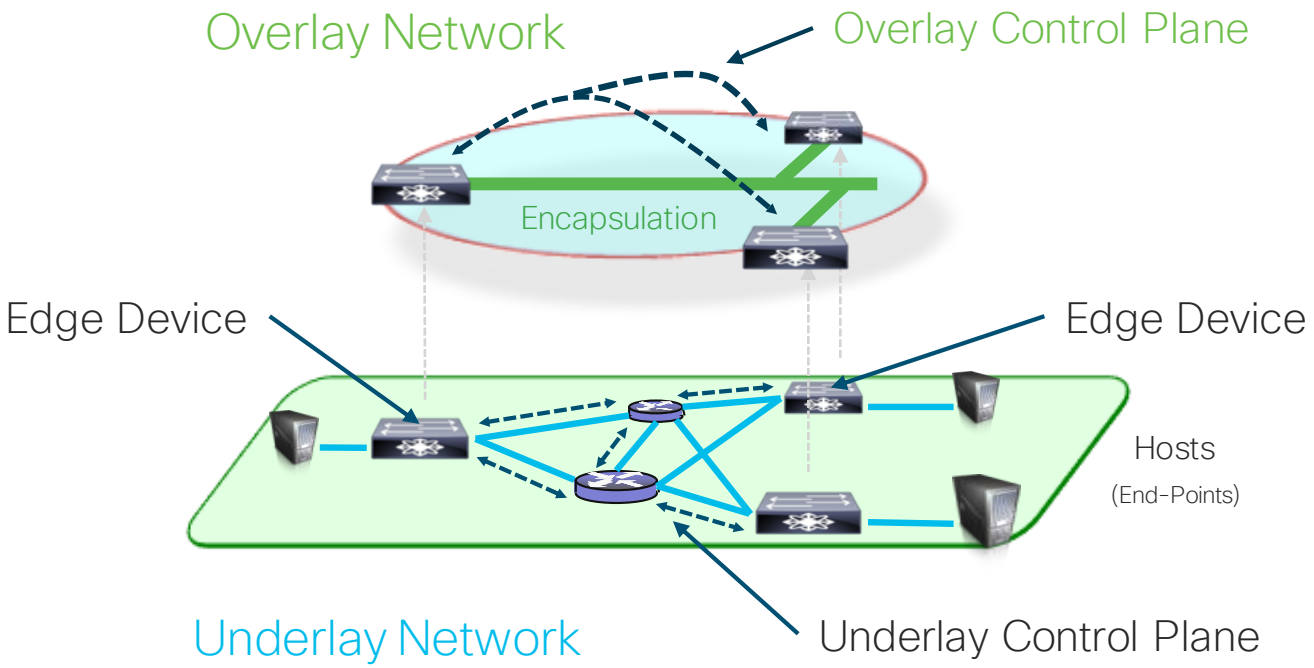
- An Overlay network is a logical topology used to virtually connect devices, built on top of some arbitrary physical Underlay topology.
- An Overlay network often uses alternate forwarding attributes to provide additional services, not provided by the Underlay.

Examples of Network Overlays

- GRE or mGRE
- MPLS or VPLS
- IPSec or DMVPN
- CAPWAP
- LISP
- OTV
- DFA
- ACI



SD-Access Underlay / Overlay



SD-Access Underlay
Manual vs. Automated

Manual Underlay

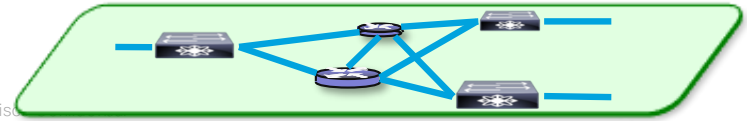
You can reuse your existing IP network as the Fabric Underlay!

- Key Requirements
  - IP reach from Edge to Edge/Border/CP
  - Can be L2 or L3 – We recommend L3
  - Can be any IGP – We recommend ISIS
- Key Considerations
  - MTU (Fabric Header adds 50B)
  - Latency (RTT of =/< 100ms)

Automated Underlay

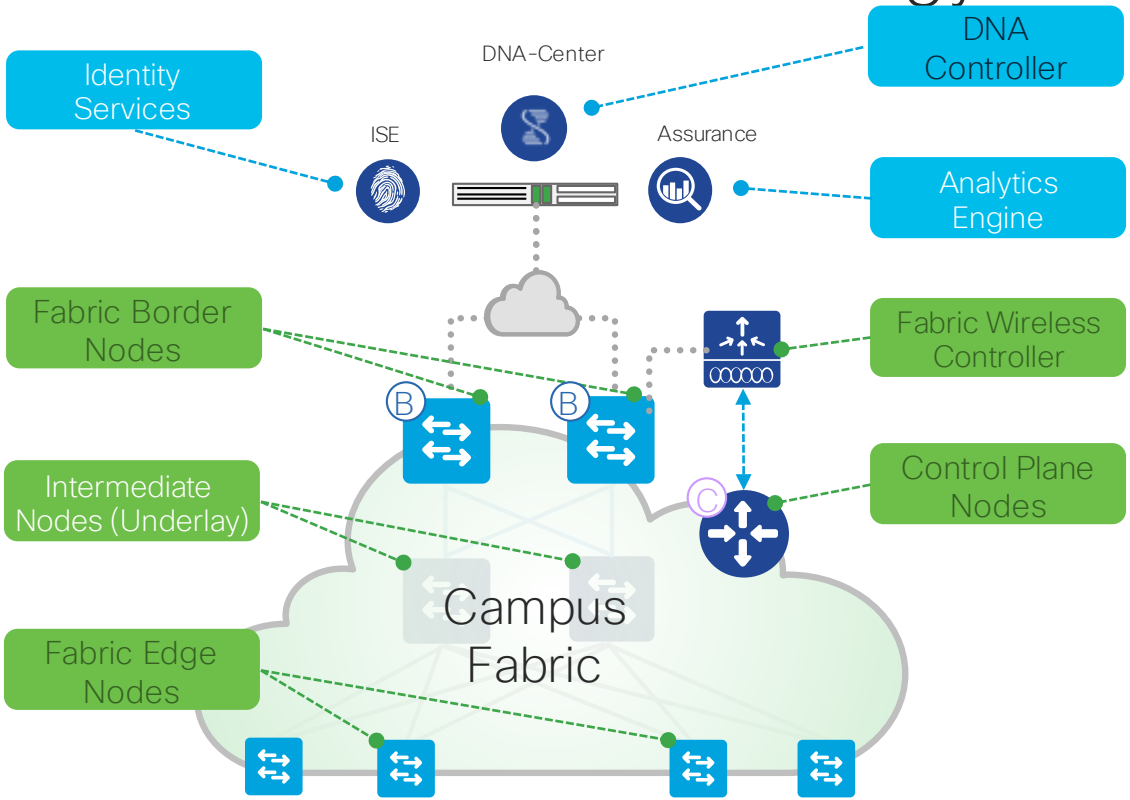
Prescriptive fully automated Global and IP Underlay Provisioning!

- Key Requirements
  - Leverages standard PNP for Bootstrap
  - Assumes New / Erased Configuration
  - Uses a Global “Underlay” Address Pool
- Key Considerations
  - PNP pre-setup is required
  - 100% Prescriptive (No Custom)



SD-Access Roles

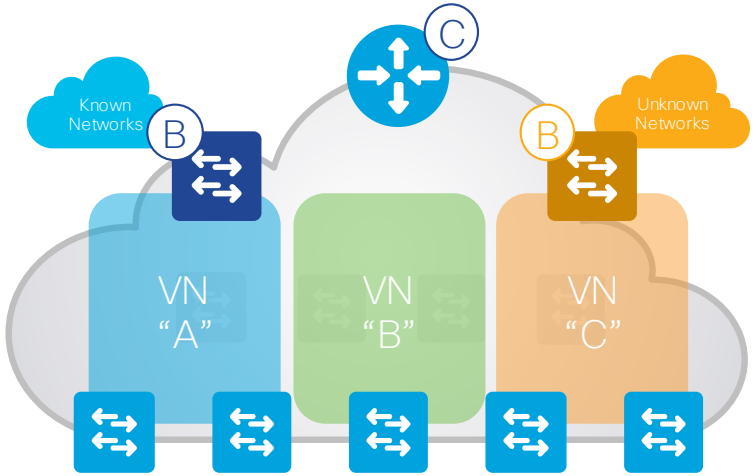
Fabric Roles & Terminology



- DNA Controller – Enterprise SDN Controller (e.g. DNA Center) provides GUI management and abstraction via Apps that share context
- Identity Services – External ID System(s) (e.g. ISE) are leveraged for dynamic Endpoint to Group mapping and Policy definition
- Analytics Engine – External Data Collector(s) are leveraged to analyze Endpoint to App flows and monitor fabric status
- Control Plane Nodes – Map System that manages Endpoint to Device relationships
- Fabric Border Nodes – A Fabric device (e.g. Core) that connects External L3 network(s) to the SD-Access Fabric
- Fabric Edge Nodes – A Fabric device (e.g. Access or Distribution) that connects Wired Endpoints to the SD-Access Fabric
- Fabric Wireless Controller – A Fabric device (WLC) that connects Wireless Endpoints to the SD-Access Fabric

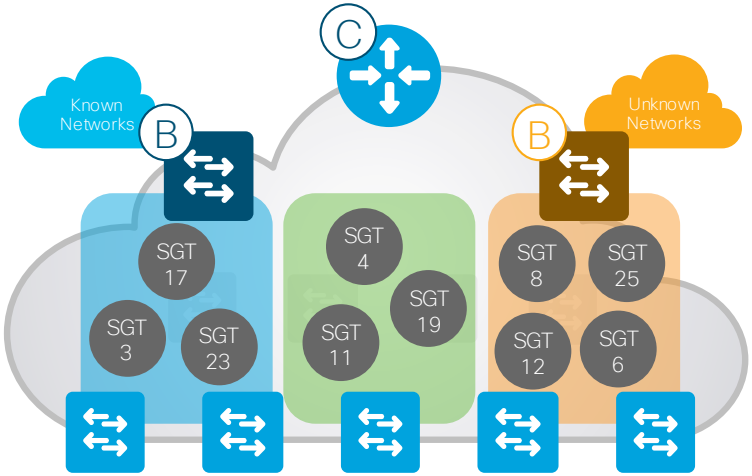
SD-Access Virtual Network

Virtual Network maintains a separate Routing & Switching instance for the devices within it.



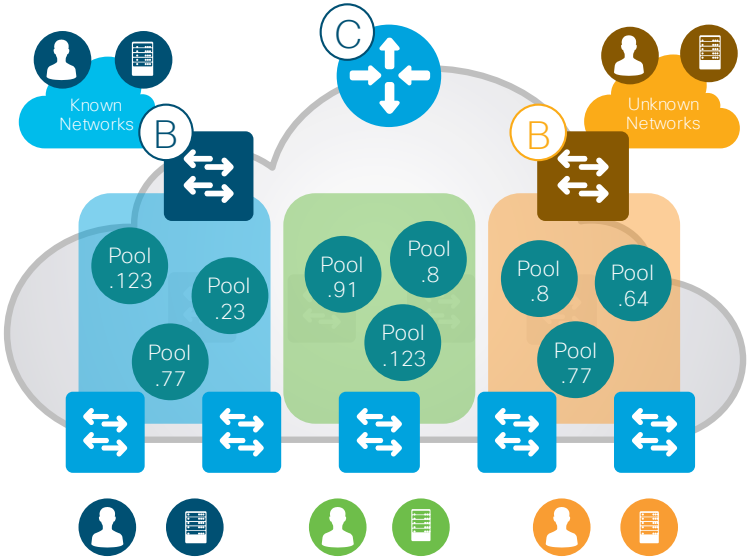
SD-Access Scalable Group

Scalable Group is a logical ID object to “group” Users and/or Devices.



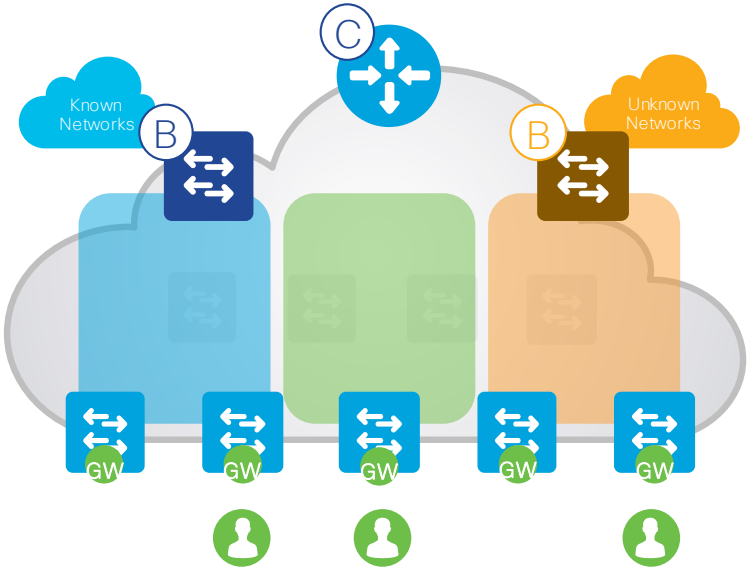
SD-Access Host Pool

Host Pool provides basic IP functions necessary for attached Endpoints



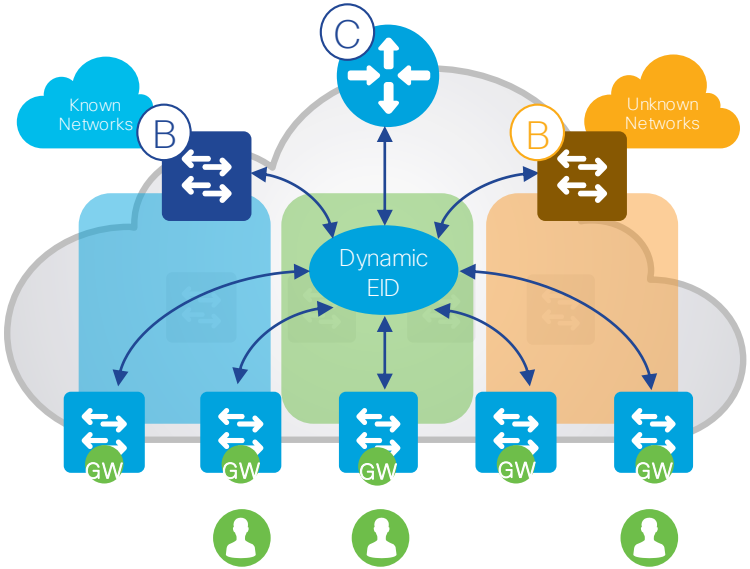
SD-Access Anycast Gateway

Anycast GW provides a single L3 Default Gateway for IP capable endpoints



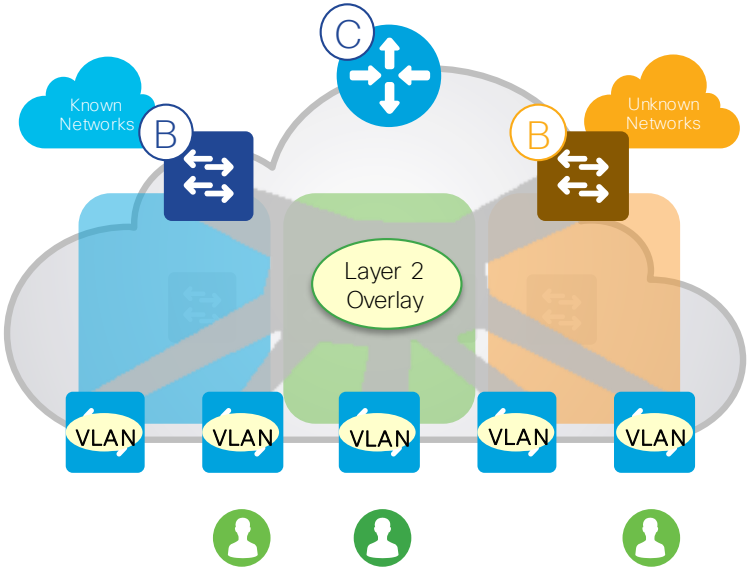
SD-Access Stretched Subnets

Stretched Subnets allow an IP subnet to be “stretched” via the overlay



SD-Access Layer2 Overlays

Layer2 Overlays allows Non-IP hosts to connect Broadcast & Multicast



SD-Access Key Components

Key Components of SD-Access

1. Control Plane based on LISP
2. Data-Plane based on VXLAN
3. Policy-Plane based on TrustSec

Key Differences

- L2 + L3 Overlay -vs- L2 or L3 Only
- Host Mobility with Anycast Gateway
- Adds VRF + SGT into Data-Plane
- Virtual Tunnel Endpoints (No Static)
- No Topology Limitations (Basic IP)

SD-Access Key Component – LISP

1. Control Plane based on LISP

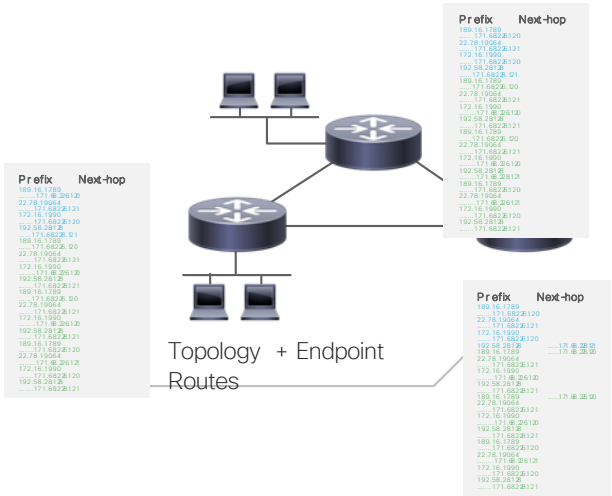
Host Mobility

Routing Protocols = Big Tables & More CPU
with Local L3 Gateway

LISP DB + Cache = Small Tables & Less CPU
with Anycast L3 Gateway

BEFORE

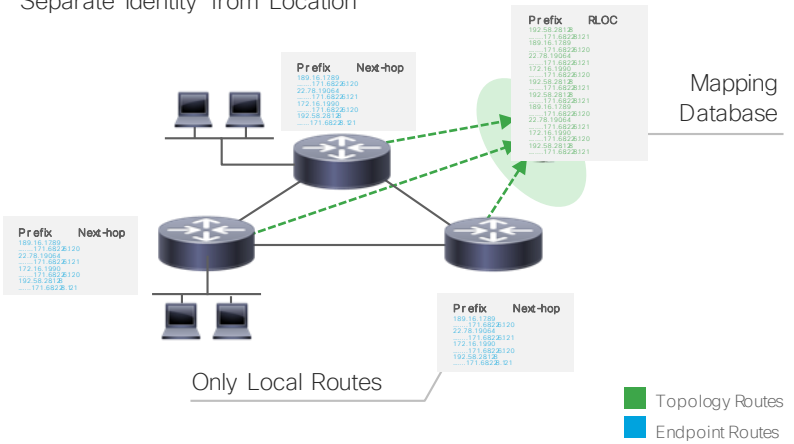
IP Address = Location + Identity



Endpoint Routes are Consolidated to LISP DB

AFTER

Separate Identity from Location



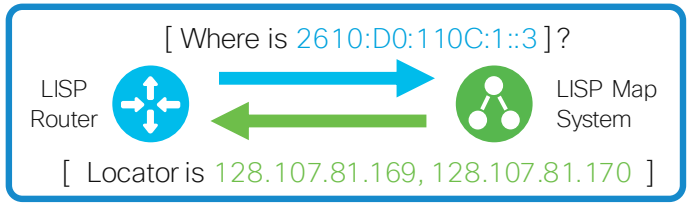
Locator / ID Separation Protocol
LISP Mapping System

LISP “Mapping System” is analogous to a DNS lookup

– DNS resolves IP Addresses for queried Name Answers the “WHO IS” question

DNS
Name -to- IP
URL Resolution

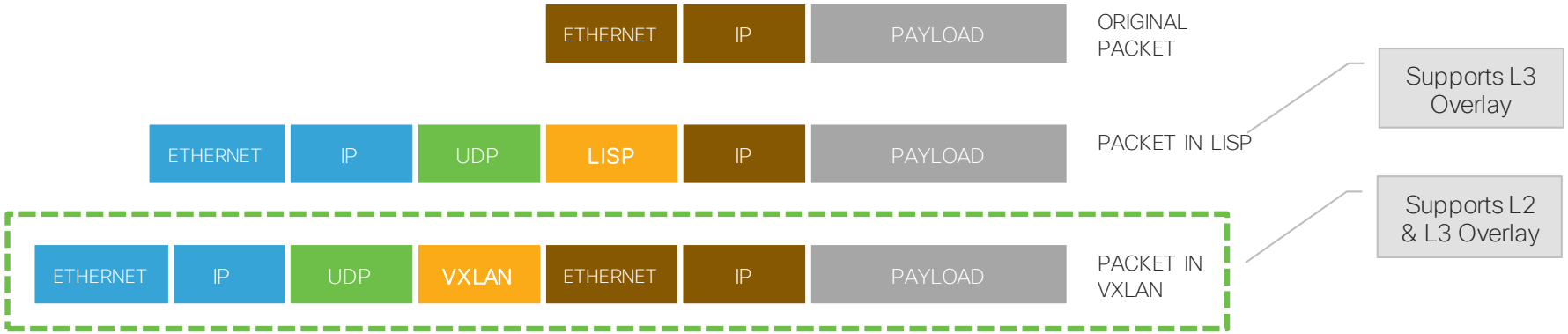
– LISP resolves Locators for queried Identities Answers the “WHERE IS” question



LISP
ID -to- Locator
Map Resolution

SD-Access Key Components – VXLAN

1. Control Plane based on LISP
2. Data-Plane based on VXLAN



SD-Access Key Components – TrustSec

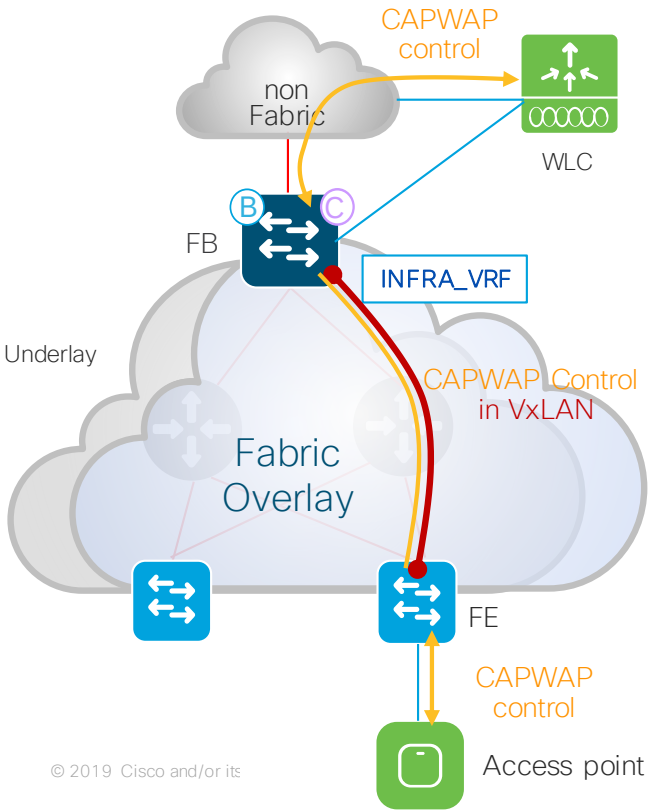
1. Control Plane based on LISP
2. Data-Plane based on VXLAN
3. Policy-Plane based on TrustSec

Virtual Routing & Forwarding

Scalable Group Tagging

SD-Access Wireless Integration

Wireless Integration
Where to connect APs and WLC?



Access Points

- AP is directly connected to FE
- AP is part of Fabric overlay
- AP belongs to the INFRA_VRF which is mapped to the global routing table (new in DNAC 1.1)
- AP joins the WLC in Local mode

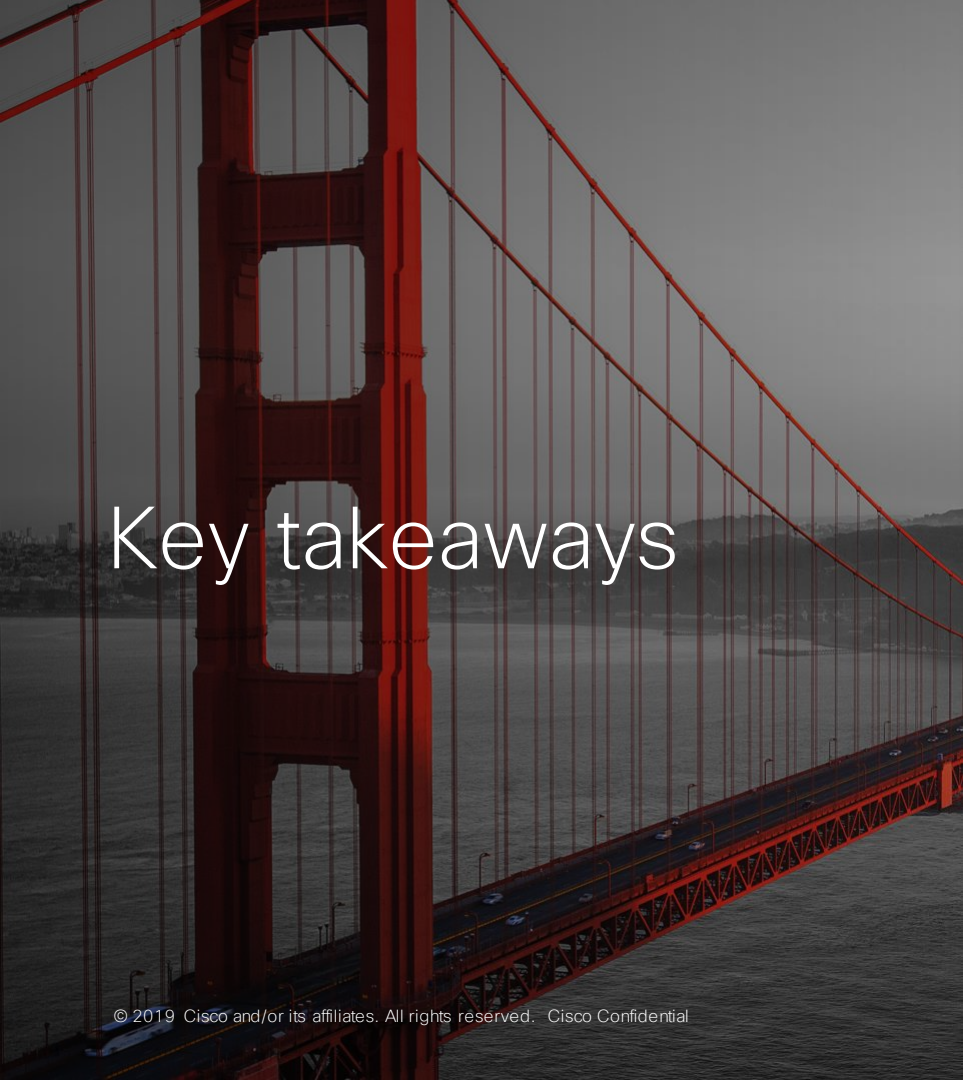
WLC

- WLC is connected outside Fabric (optionally directly to Border)
- WLC needs to reside in global routing table
- No need for inter-VRF leaking for AP to join the WLC
- WLC can only belong to one FD. WLC talks to one CP (two for HA)

Design Notes:

1) Fabric AP is in local mode, need < 20ms latency between AP & WLC
2) If WLC is used also for non-Fabric (mixed mode), considered MAC and ARP table scale of the directly-connected Border device


Demo



Key takeaways

- Plan your personal demo: https://cs.co/sdademo
- Contact your Cisco AM to schedule a design session
- Pick up your SD-Access book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