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KOMMUNE

New Data Center – Spine Leaf Architecture

RK – IT -Network – 20/21.09.2022



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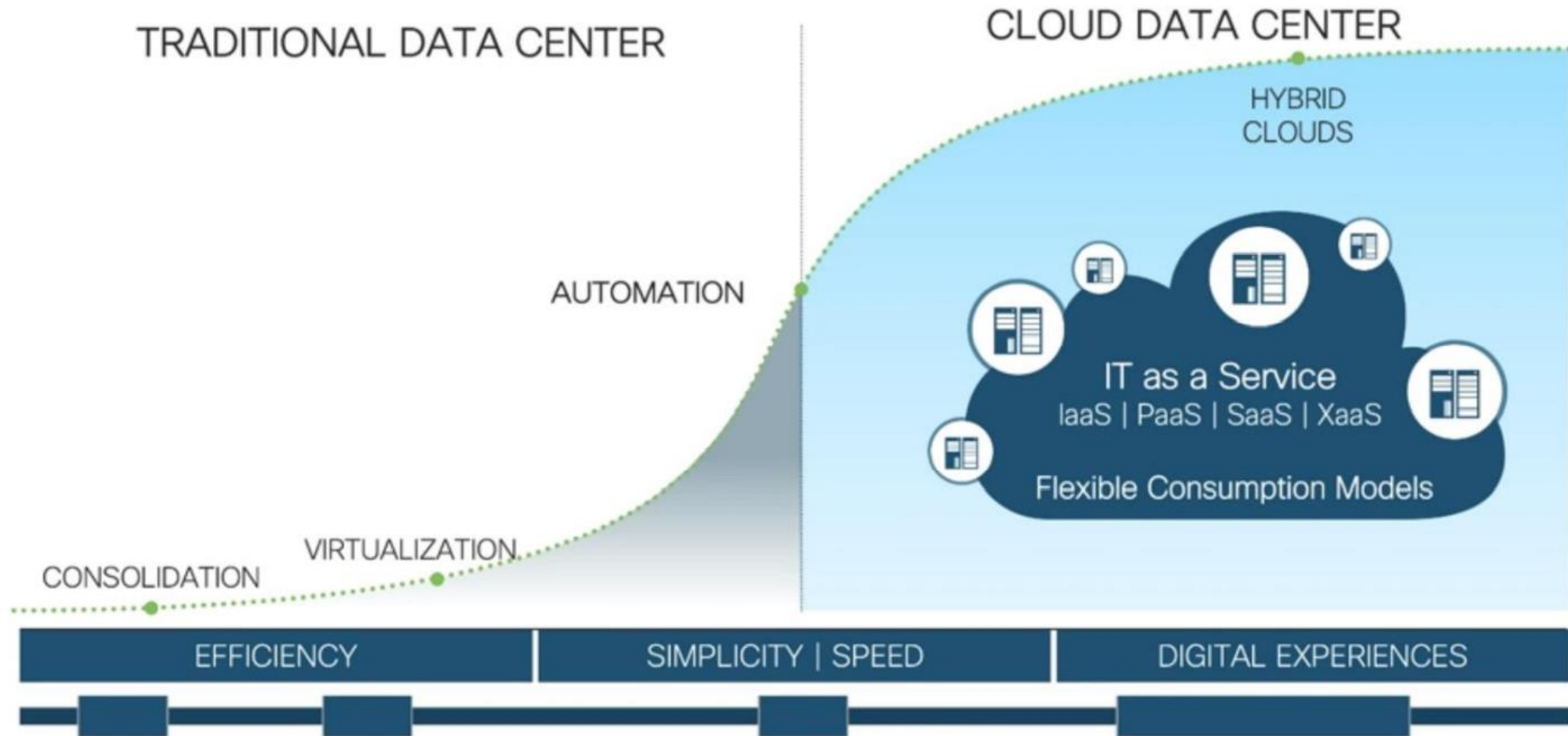
Linux & Network - background



- Digitalization
- IOT & OT
- New deployments model (Cloud, Multi-tenancy)
- **Security**
- Traditional Apps
- Workload (Virtual, Containers..)
- New apps



Transition - Traditional to Cloud





- Existing DC
- Scalability
- Security
- Resources
- Daily operations





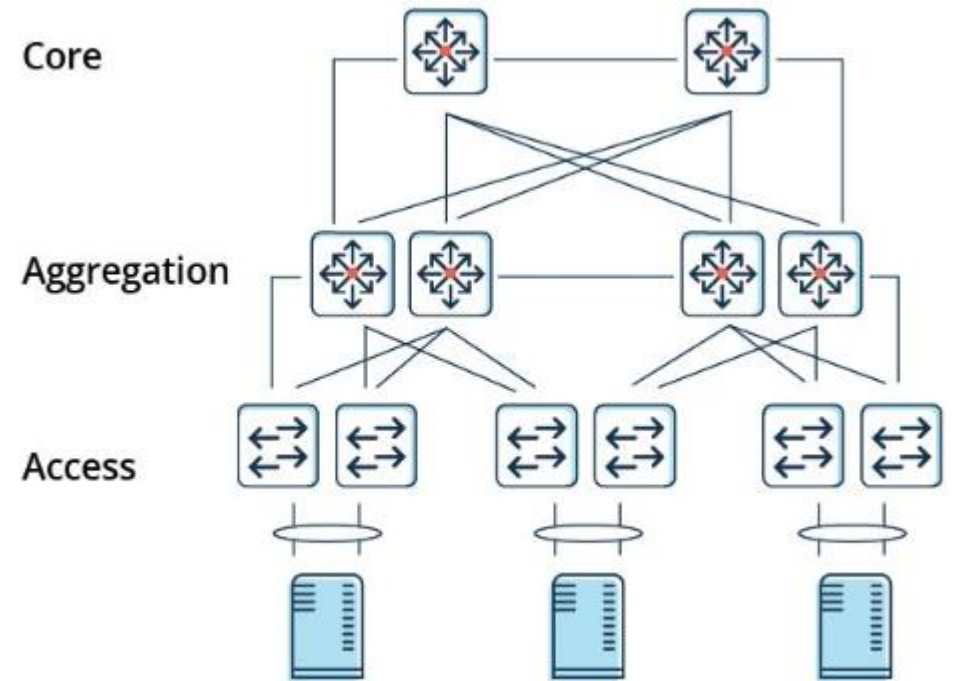
- Built more than 10 years ago



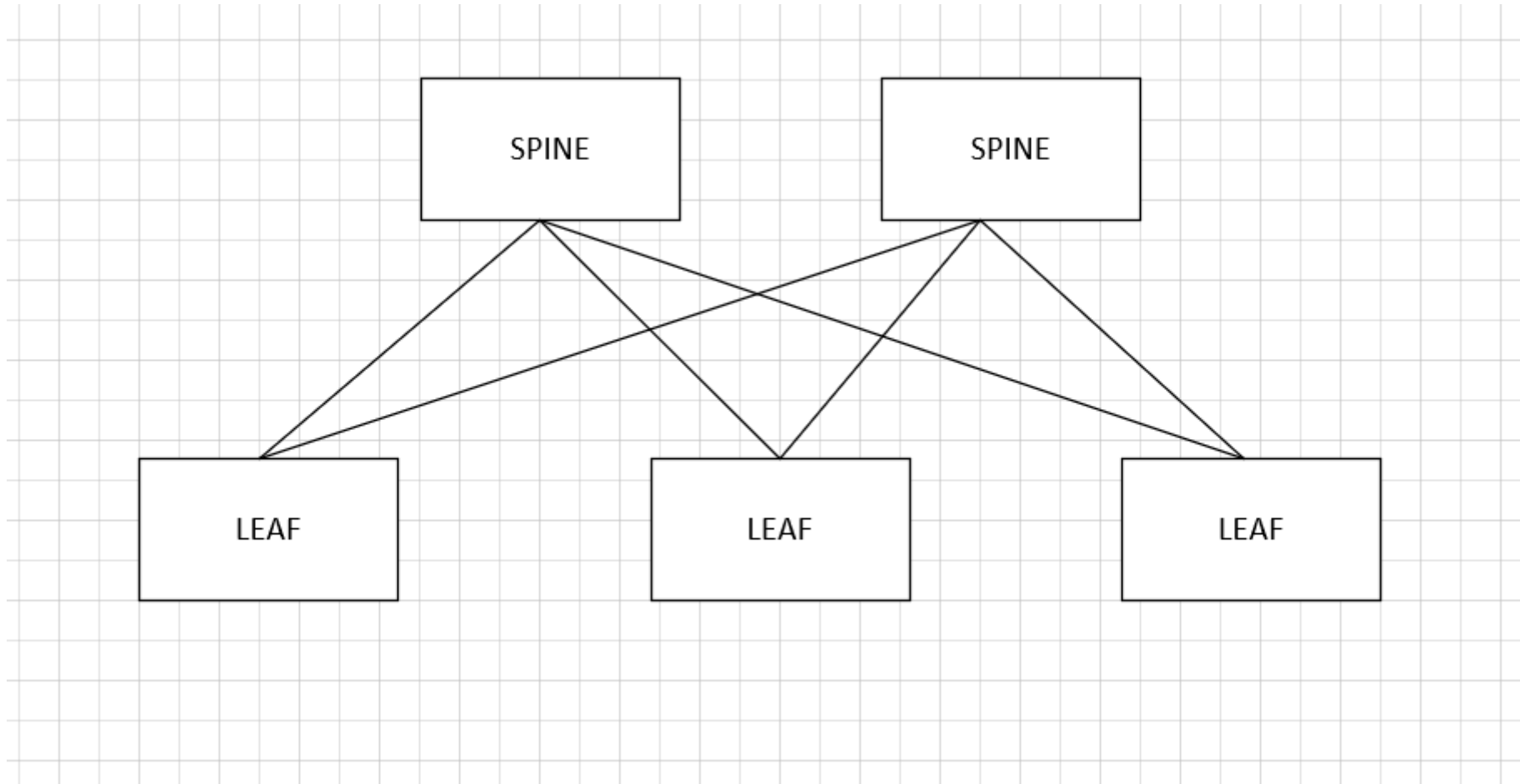
3 – Tier Model



Was built when most traffic was North to South



2 – Tier Model

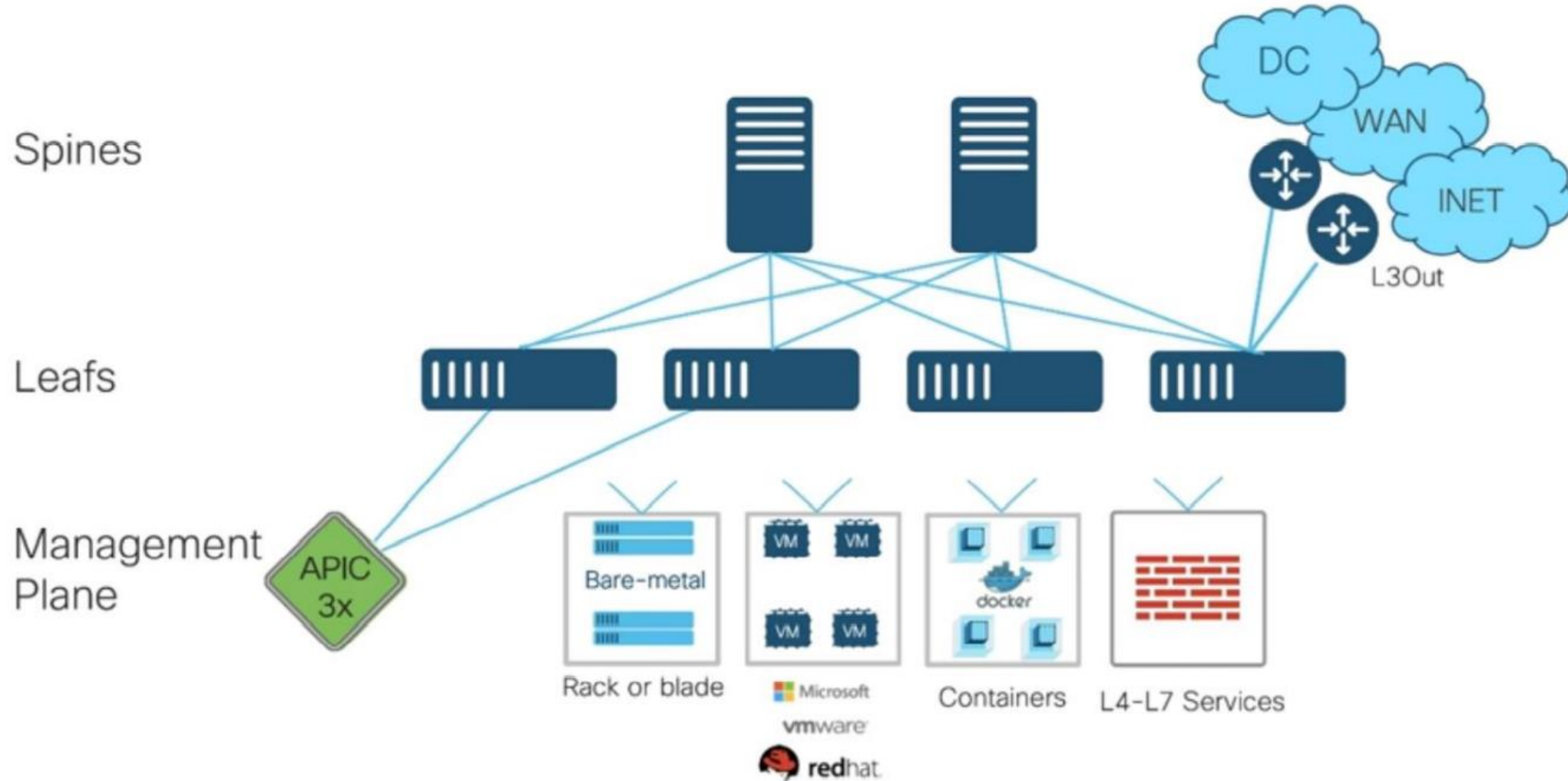




- Supplier



Cisco ACI Building Blocks





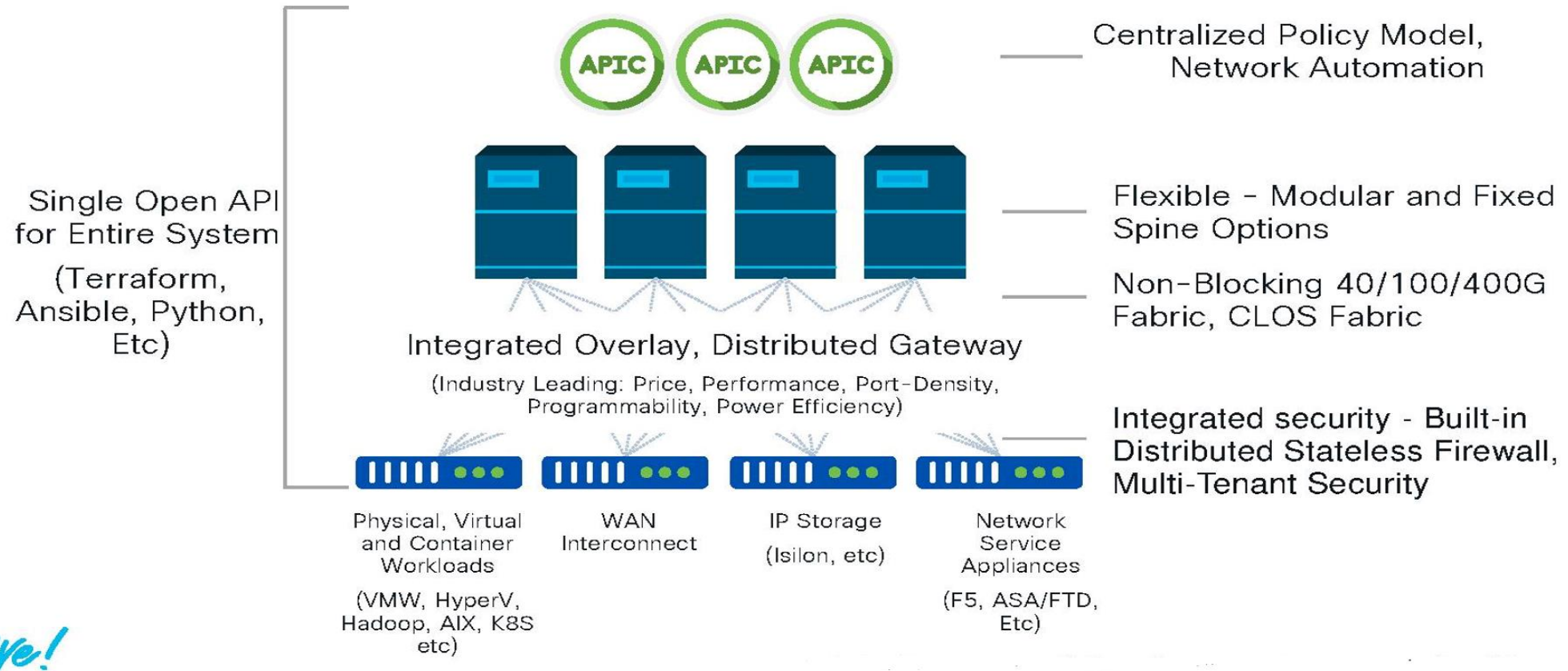
- APIC Controller
- VXLAN
- Microsegmentation
- Security
- Scalability
- Automation & Orchestration



Cisco ACI Building Blocks



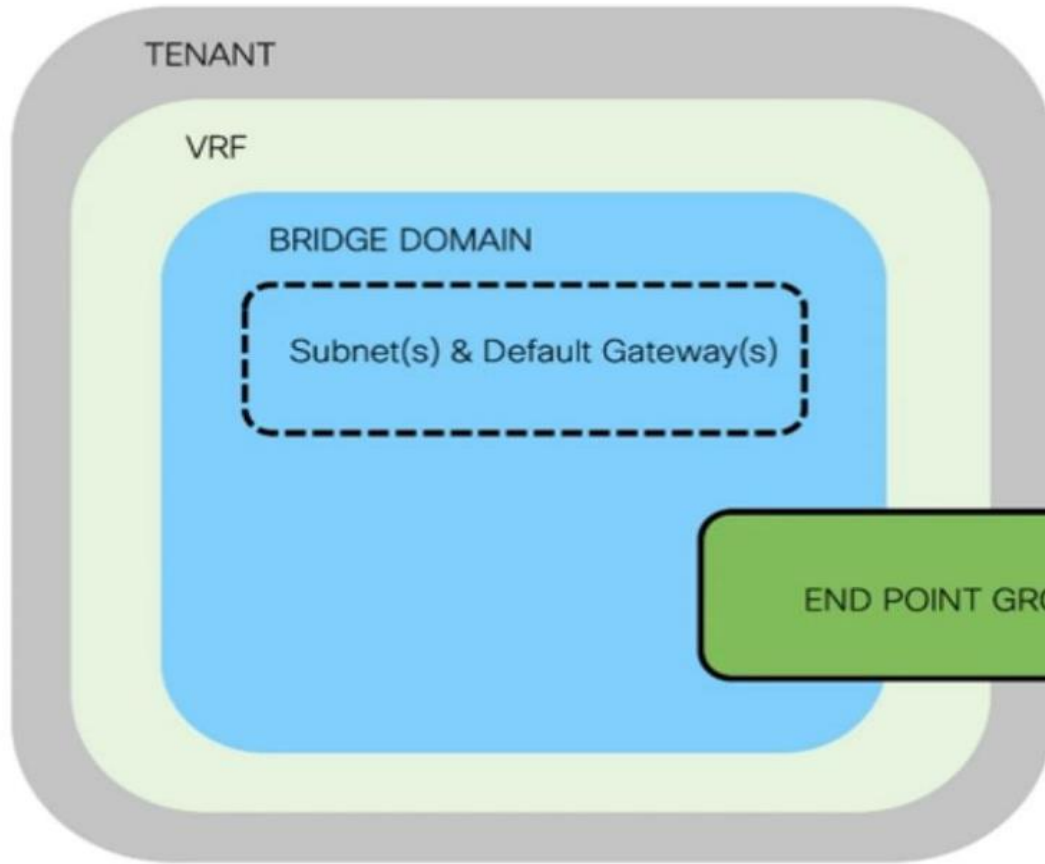
Built on the Nexus 9000



CISCO *Live!*



Cisco ACI Building Blocks



TENANT: Simply a container to keep things organized

VRF: IPv4 or IPv6 Routing Space. A tenant can have multiple VRFs (if you want)

BRIDGE DOMAIN: Container for subnets plus settings for L2, flooding and/or unicast routing. Default gateways configured here. Usually one BD per subnet

END POINT GROUP: This is where you put actual end points (physical or virtual) and apply forwarding and security policy. EPGs attach to BDs. An ACI fabric will have many EPGs



DOMAIN: An object to group EPs by type and how they physically connect to the fabric, like Bare Metal Servers or Virtual Machines. We map this to an EPG to establish EP membership



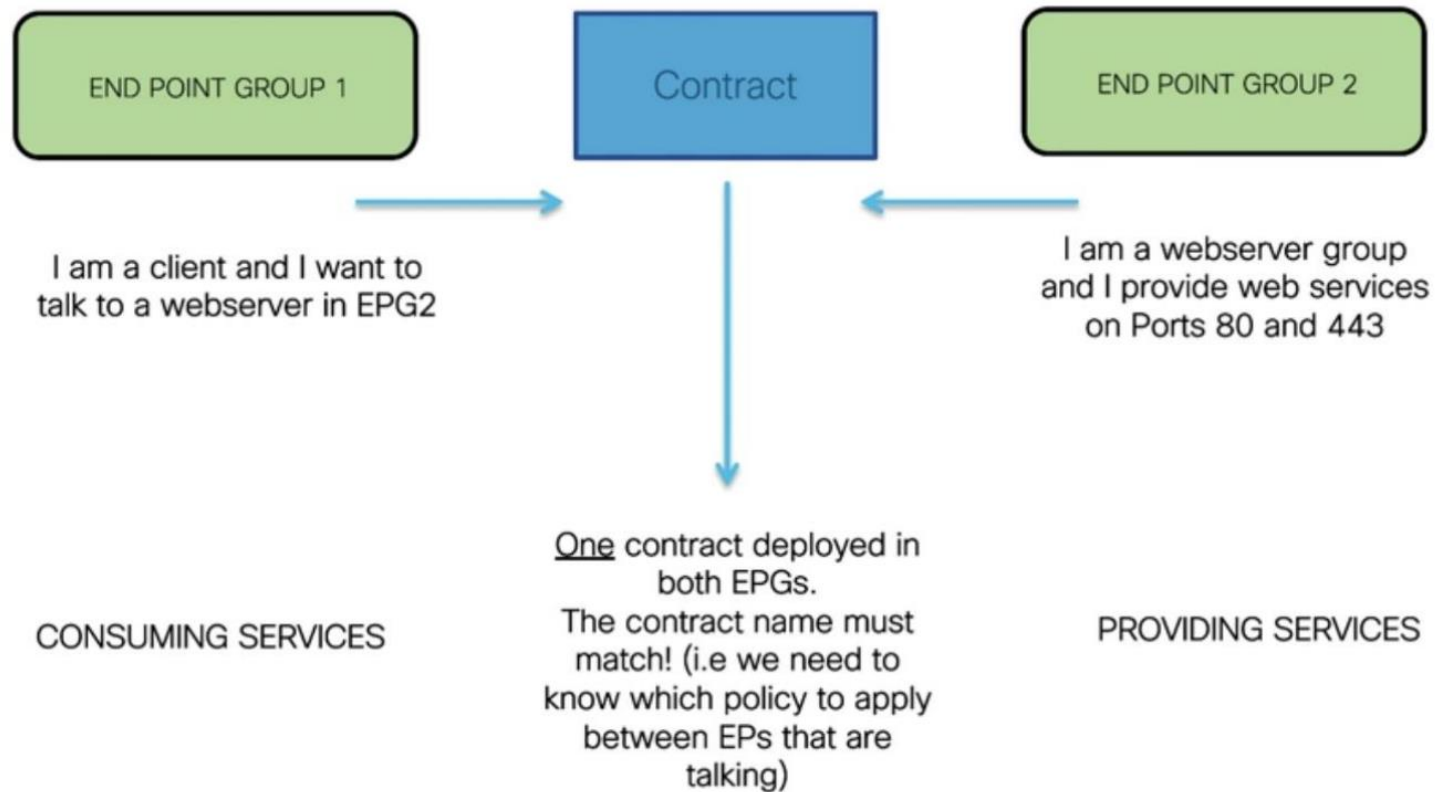


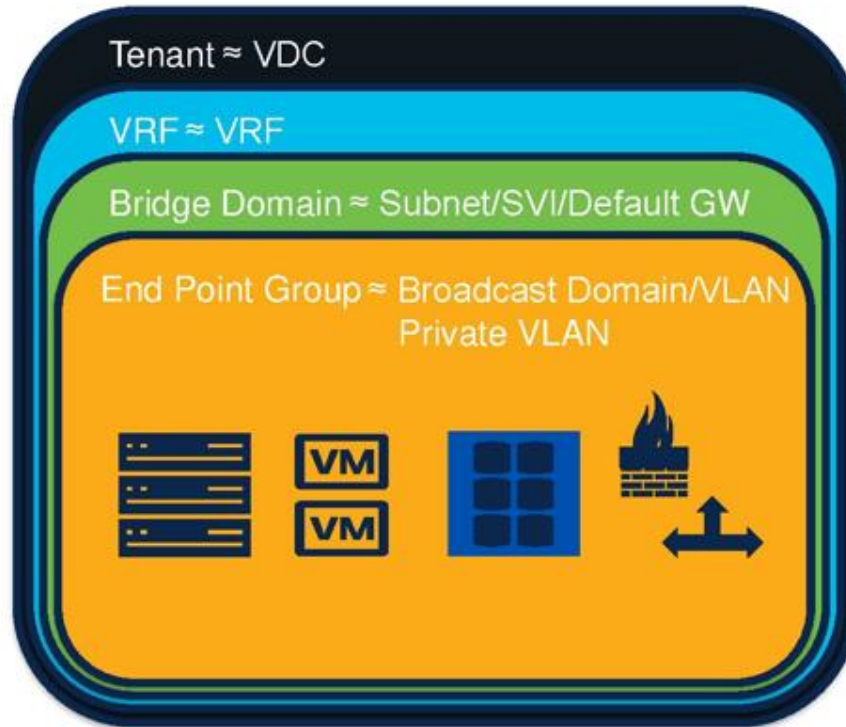
- Contracats are similar to ACLs
- Contracts are needed when you want to talk bw EPGs
- Contracts are NOT needed with same EPG
- Contracts need consumers and providers

Contract bw EPGs: Consumer vs Provider



Contracts Example





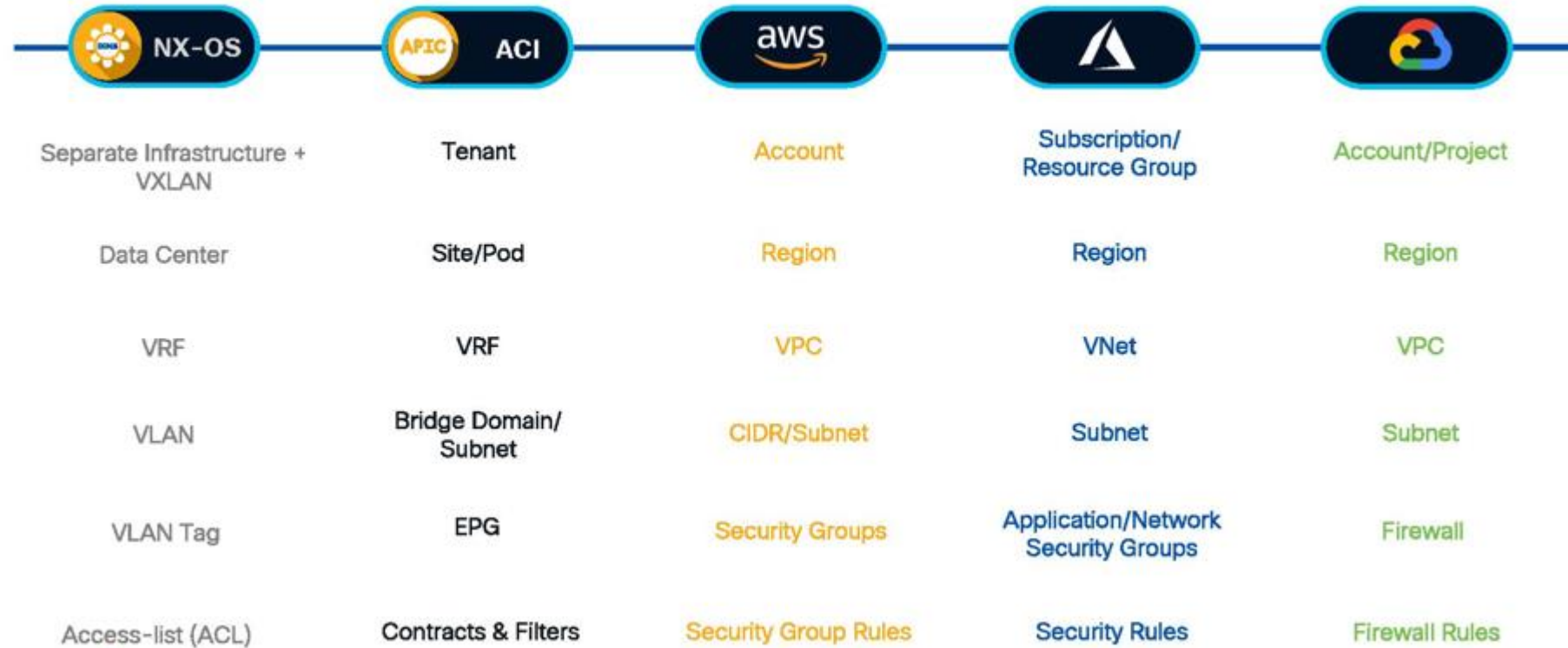
Contracts ≈ Access Lists



L2 External EPG ≈ 802.1q Trunk

L3 External EPG ≈ L3 Routed Link

ACI – Policy Model vs NX-OS & Cloud





ACI – SECURITY
DC – SECURITY





- **Zero Trust**
- **Microsegmentation**
- **Whitelisting & EPGs**
- **ACI Policy Based Model**





- **Cisco ACI uses a whitelist model:** all communication is blocked by default;
- After creating EPG and adding endpoint to these groups, **communication is denied between any 2 EPGs unless a contract is assigned** between EPGs
- **Filter that allows for communication**



- DC Security





- Multitenancy
- Next Generation Firewall - Firepower
- Web Application Firewall – WAF
- DDoS Protection (ISP+Advance WAF)
- Bot Mitigation
- NAC





- Cisco ACI --- ACI MINI



Cisco ACI Mini



Price Estimate

Simen Sorbo
Cisco Systems, Inc.
Lautrupsgade 7,0
COPENHAGEN, 84-2100
DENMARK
Ph no:+45 39 58 51 70

UNITED STATES

Price Estimate for planning and information purposes only and is not a binding offer from Cisco.

Date: 19-Apr-2022

Estimate ID: XF134768166DX

Deal ID: NA

Part Number	Smart Account Mandatory	Description	Service Duration (Months)	Estimated Lead Time (Days)	Pricing Term	Qty
APIC-CLUSTER-XS	-	APIC Cluster with virtual APIC	---	14		1
CON-L1NBD-APICCLXS	-	CX LEVEL 1 8X5XNBD APIC Cluster with vi	60	N/A		1
APIC-VIRTUAL	-	ACI Virtual APIC	---	14		2
APIC-SERVER-M3	-	APIC Appliance - Medium Configuration (Upto 1200 Edge Ports)	---	70		1
APIC-DK9-5.2	-	APIC Base Software Release 5.2	---	14		1
CAB-C13-C14-2M	-	Power Cord Jumper, C13-C14 Connectors, 2 Meter Length	---	35		2
APIC-PCIE-C25Q-04	-	Cisco UCS VIC 1455 Quad Port 10/25G SFP28 CNA PCIE	---	112		1
APIC-PSU1-770W	-	770W power supply for USC C-Series	---	126		2
APIC-MR-X16G1RT-H	-	16GB DDR4-2933-MHz RDIMM/1Rx4/1.2v	---	14		6
APIC-TPM2-002	-	Trusted Platform Module 2.0 for UCS servers	---	119		1
APIC-RAID-M5	-	Cisco 12G Modular RAID controller with 2GB cache	---	35		1
APIC-HD1T7K12N	-	1 TB 12G SAS 7.2K RPM SFF HDD	---	28		2
APIC-CPU-3106	-	1.7 GHz 3106/85W 8C/11MB Cache/DDR4 2133MHz	---	56		2
APIC-SD800GK3X-EP	-	800GB 2.5in Enterprise Performance 12G SAS SSD(3X endurance)	---	14		1
APIC-MSTOR-SD	-	Mini Storage Carrier for SD (holds up to 2)	---	14		1
APIC-SD-32G-S	-	32GB SD Card for UCS servers	---	98		1
N9K-C93600-GX-B1	-	2x 93600CD-GX w/ 8x100G-BiDi or 8x100-FR or 4x400G-DR4	---	182		1
CON-L1NBD-N9C936GX	-	CX LEVEL 1 8X5XNBD 2x 93600CD-GX w/ 8x100G-BiDi or 8x100-FR	60	N/A		1
NXK-AF-PE	-	Dummy PID for Airflow Selection Port-side Exhaust	---	14		2
C1-SUBS-OPTOUT	-	OPT OUT FOR "Default" DCN Subscription Selection	---	14		2
ACI-SW-OPT-OUT	-	Opt out to remove mandatory Tier-Lic in MODE-ACI-Leaf mode	---	14		2

CON-L1NBD-N9KC936B	-	CX LEVEL 1 8X5XNBD Nexus 93600CD-GX bundle PID	60	N/A		1
ACI-N9KDK9-15.2	-	Nexus 9500 or 9300 ACI Base Software NX-OS Rel 15.2	---	14		1
NXK-ACC-KIT-1RU	-	Nexus 3K/9K Fixed Accessory Kit, 1RU front and rear removal	---	28		1
NXA-FAN-35CFM-PE	-	Nexus Fan, 35CFM, port side exhaust airflow	---	119		6
NXA-PAC-1100W-PE2	-	Nexus AC 1100W PSU - Port Side Exhaust	---	182		2
CAB-C13-C14-2M	-	Power Cord Jumper, C13-C14 Connectors, 2 Meter Length	---	35		2
NXK-PICK-BIDI	-	PID to select QSFP-40/100-SRBD Optic in the bundle	---	7		1
QSFP-40/100-SRBD	-	100G and 40GBASE SR-BIDI QSFP Transceiver, LC, 100m OM4 MMF	---	182		4
N9K-C93600CD-GX-B	-	Nexus 93600CD-GX bundle PID	---	182		1
CON-L1NBD-N9KC936B	-	CX LEVEL 1 8X5XNBD Nexus 93600CD-GX bundle PID	60	N/A		1
ACI-N9KDK9-15.2	-	Nexus 9500 or 9300 ACI Base Software NX-OS Rel 15.2	---	14		1
NXK-ACC-KIT-1RU	-	Nexus 3K/9K Fixed Accessory Kit, 1RU front and rear removal	---	28		1
NXA-FAN-35CFM-PE	-	Nexus Fan, 35CFM, port side exhaust airflow	---	119		6
NXA-PAC-1100W-PE2	-	Nexus AC 1100W PSU - Port Side Exhaust	---	182		2
CAB-C13-C14-2M	-	Power Cord Jumper, C13-C14 Connectors, 2 Meter Length	---	35		2
NXK-PICK-BIDI	-	PID to select QSFP-40/100-SRBD Optic in the bundle	---	7		1
QSFP-40/100-SRBD	-	100G and 40GBASE SR-BIDI QSFP Transceiver, LC, 100m OM4 MMF	---	182		4
N9K-C93180YC-FX3	-	Nexus 9300 48p 1/10/25G, 6p 40/100G, MACsec, SyncE	---	273		2
CON-SSSNT-N9KC93X3	-	SOLN SUPP 8X5XNBD Nexus 9300 48p 1/10/25G, 6p 40/100G, MAC	60	N/A		2
MODE-ACI-LEAF	-	Dummy PID for mode selection	---	14		2
NXK-AF-PE	-	Dummy PID for Airflow Selection Port-side Exhaust	---	14		2
ACI-N9KDK9-15.2	-	Nexus 9500 or 9300 ACI Base Software NX-OS Rel 15.2	---	14		2
NXK-ACC-KIT-1RU	-	Nexus 3K/9K Fixed Accessory Kit, 1RU front and rear removal	---	28		2
NXA-FAN-35CFM-PE	-	Nexus Fan, 35CFM, port side exhaust airflow	---	119		8
NXA-PAC-650W-PE	-	Nexus NEBs AC 650W PSU - Port Side Exhaust	---	154		4
NXK-MEM-16GB	-	Additional memory of 16GB for Nexus Switches	---	14		2
CAB-C13-C14-2M	-	Power Cord Jumper, C13-C14 Connectors, 2 Meter Length	---	35		4
C1E1TN9300XF-5Y	Yes	Data Center Networking Essentials Term N9300 XF, 5Y	---	3		2
Initial Term - 60.00 Months Auto Renewal Term - 0 Months Billing Model - Prepaid Term						
SVS-B-N9K-ESS-XF	-	EMBEDDED SOLN SUPPORT SWSS FOR ACI NEXUS 9K	---	3		2
Initial Term - 60.00 Months Auto Renewal Term - 0 Months Billing Model - Prepaid Term						
SFP-H10GB-CU2M=	-	10GBASE-CU SFP+ Cable 2 Meter	---	14		2

Valid through:

FOB Point: None

Notes

Signed:





PHASE 1 - Single Site

PHASE 2 - Single Site with multi pod

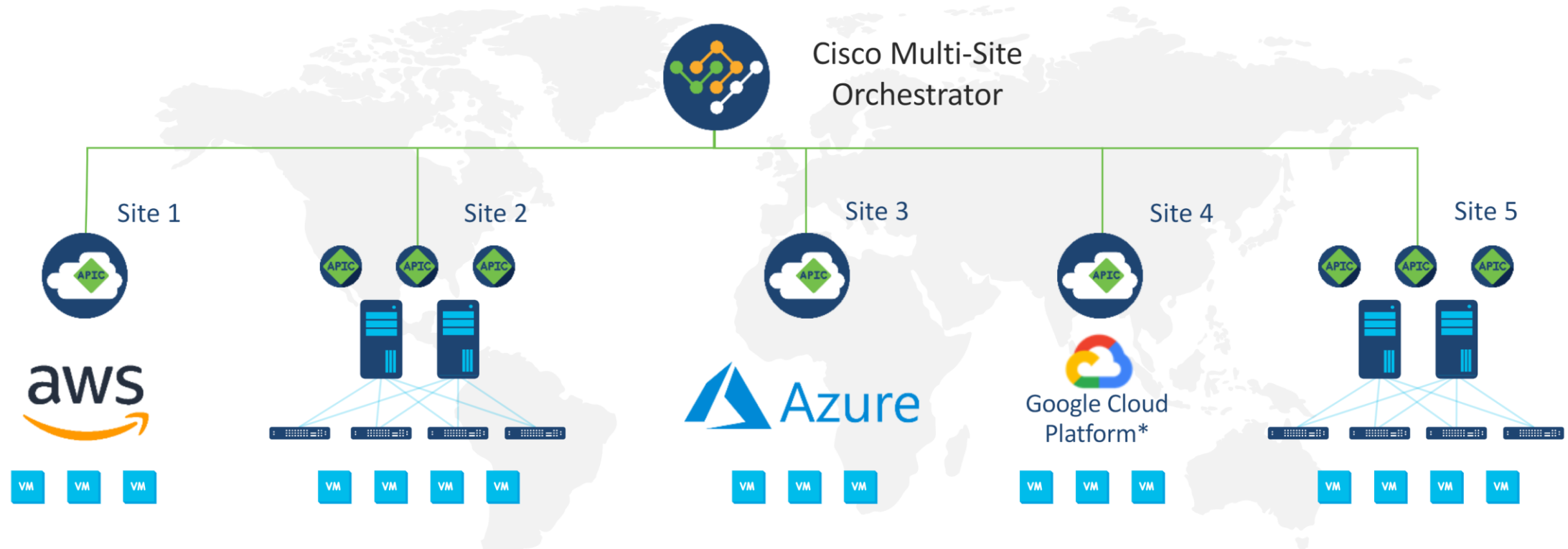
PHASE 3 – Multi site ACI any where - Public Cloud






SDN/ACI Extensions to Multi-Site & Multi-cloud

*Future




 Consistent Network and Policy

 Secure Automated Connectivity

 Single Point of Orchestration

 Secure Automated Connectivity

 Cloud Only (Multi-cloud)



Cisco Software Defined DC – ACI Anywhere



APIC/Multi-site Orchestrator (MSO)

Remote Leaf/Virtual ACI

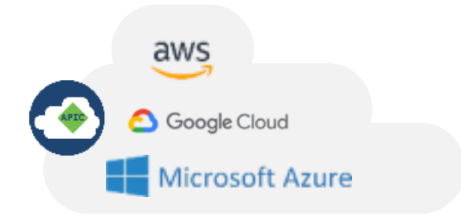


Site A

Site B



Public Cloud



Remote Location

On Premise

Cloud



Security everywhere



Analytics everywhere



Policy everywhere



- Training
- Support
- Daily operations
- Sharing





- Cisco Software Defined Data Center ACI





- Spine leaf base design
- Cisco ACI building blocks
- Security
- Operations





- Questions





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nærmest det meste



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