

The Cisco Live! logo features the word "CISCO" in a bold, black, sans-serif font, followed by "Live!" in a black, cursive script font. The background is a vibrant, multi-colored abstract pattern of overlapping, wavy bands in shades of red, orange, yellow, green, and blue, radiating from a bright white center on the right side.

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Let's go

#CiscoLive



The bridge to possible

Flexible Micro-Segmentation and Automation

For Application Aware Data Center Networks with Cisco ACI

Jim Mathers, Engineering Product Manager, Cisco Data Center & Provider Connectivity

Mayuri Kulkarni, Director, Product Management, Data Center & Provider Connectivity

PSODCN-1279

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Cisco Webex App

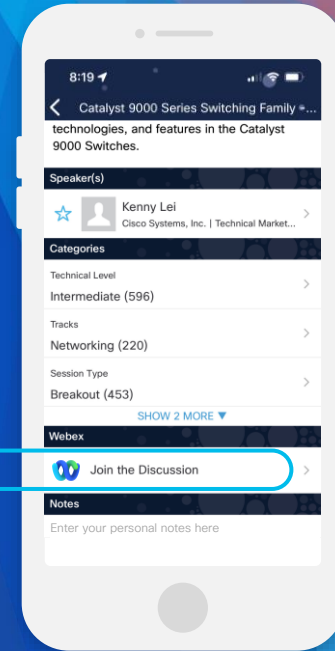
Questions?

Use Cisco Webex App to chat with the speaker after the session

How

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Webex spaces will be moderated by the speaker until June 9, 2023.

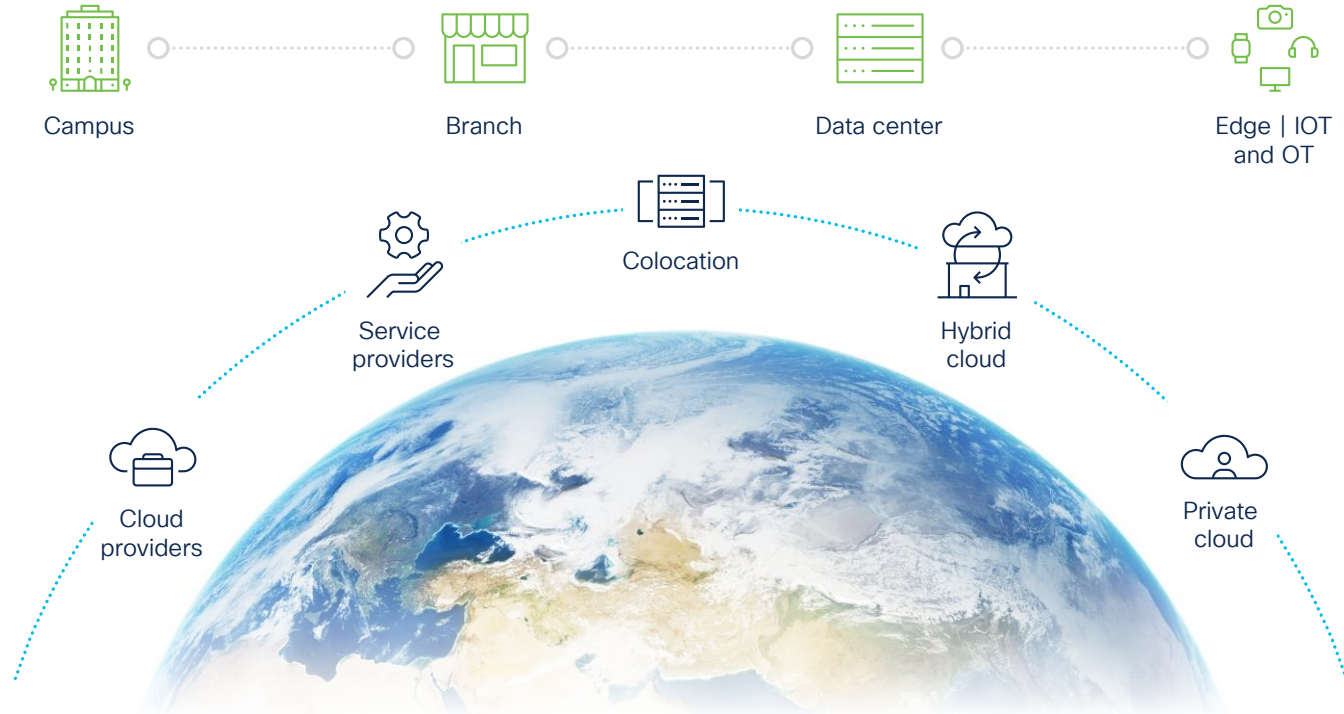


<https://ciscolive.ciscoevents.com/ciscolivebot/#PSODCN-1279>

Agenda

- Introduction
- Deployment Models
- Segmentation and Security
- Virtualization and Hybrid Cloud
- Operations and Automation
- Ecosystem
- Sustainability

The new normal is a hyper-distributed, extremely diverse IT landscape



And your world is constantly changing...



Campus



Branch



Data center



Edge | IOT
and OT



Trends: What our customers care about

Cybersecurity

50%

of cybersecurity leaders are speeding up the deployment of zero trust

Operational simplicity in an increasingly complex world

82%

of organizations have adopted hybrid cloud*

Increasing pace of workload deployments

58%

are moving workloads between on and off-prem environments weekly*

Evolving priorities: TCO

50%

NetOps list automation and visibility as highest technology priorities**

Evolving priorities: Sustainability

#1

Gartner ranks sustainability listed at IT's top strategic priority for 2023***

Sources

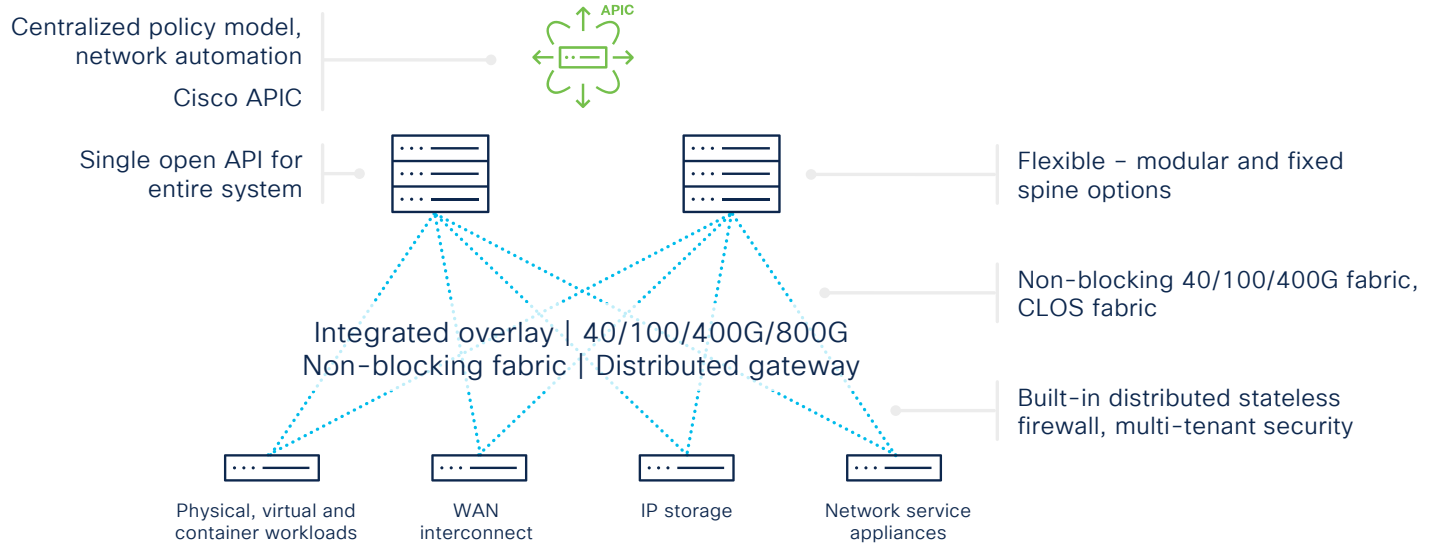
* Cisco: Hybrid Cloud Global Trends Report

** Cisco: Global Networking Trends Report

*** Gartner: Top 10 Strategic Technology Trends for 2023

Application Centric Infrastructure building blocks

Built on Cisco Nexus 9000



Industry leading



Price



Performance



Port density



Programmability



Power efficiency

Flexible Cisco ACI controller deployments

Remote APIC cluster



L3 network



Deploy APIC cluster in a remote secure zone

Virtual APIC cluster



Hypervisor



L3 network



Deploy APIC cluster on hypervisor over L3 network

Cloud hosted APIC cluster



L3 network



Deploy APIC cluster in the cloud to manage on-premises fabric

Cisco ACI-as-a-service*



L3 network

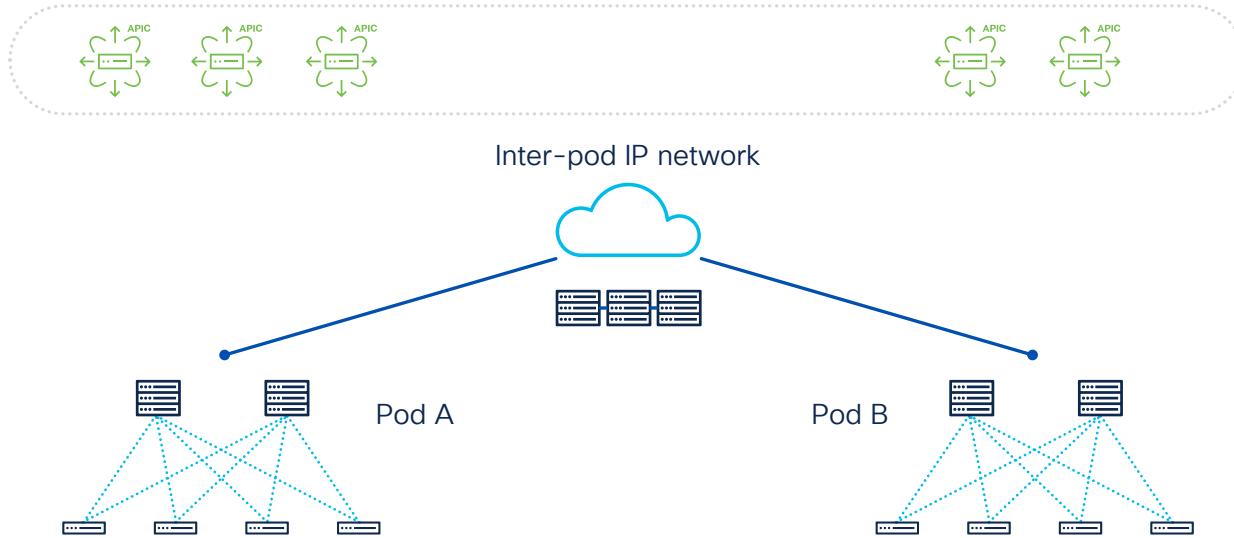


Manage Cisco ACI fabric from cloud-as-a-service

*Future release

Cisco ACI Multi-Pod

Create on-prem availability zones with multiple fabrics



Benefits

Disaster recovery

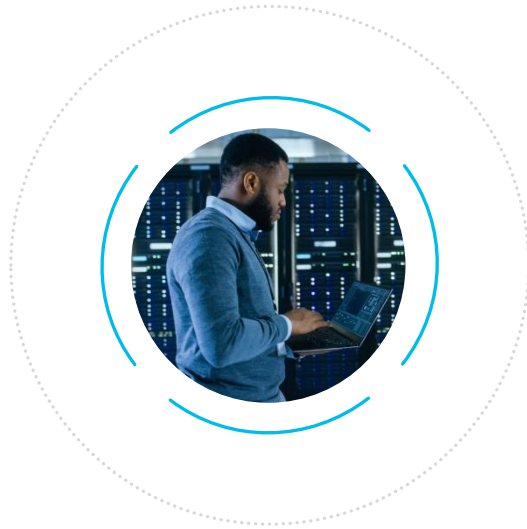
Active-active load balancing

Deploy highly available applications

Extend VM and container mobility domains

Cisco ACI Multi-Site

Create fault tolerant regions in geographically distributed on-prem data centers



Benefits

Deploy applications based on geo-performance

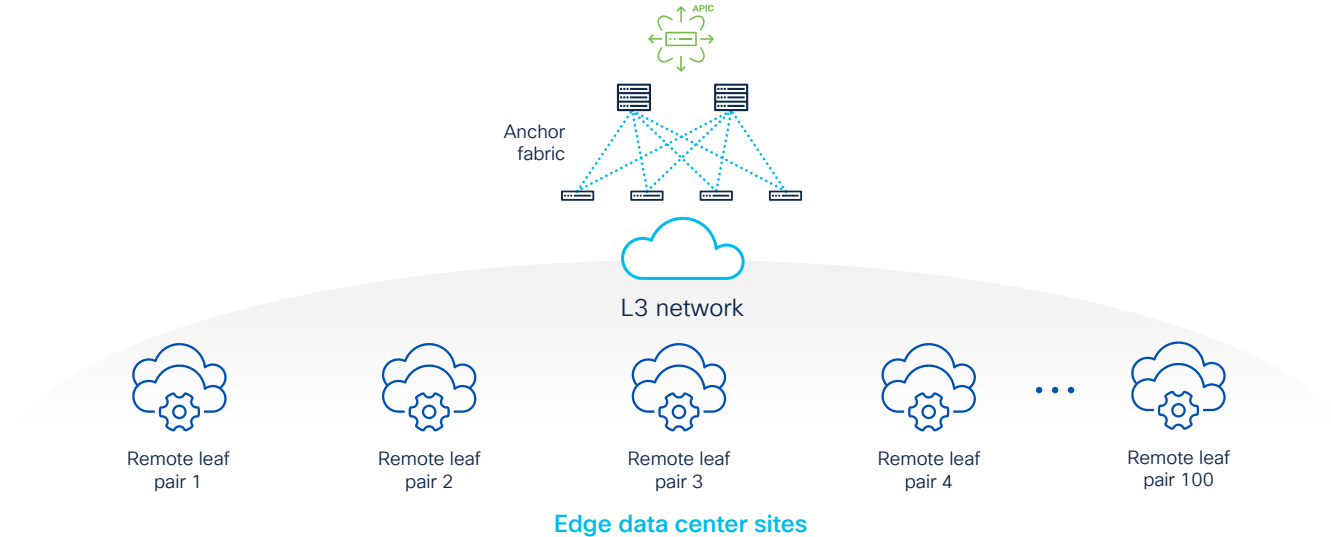
Geo-compliance and data privacy

Limit blast radius to a single application geography

Unify ACI policy geographically

Cisco ACI: Remote leaf

Enable low-touch remote application deployments with the power of ACI



Benefits

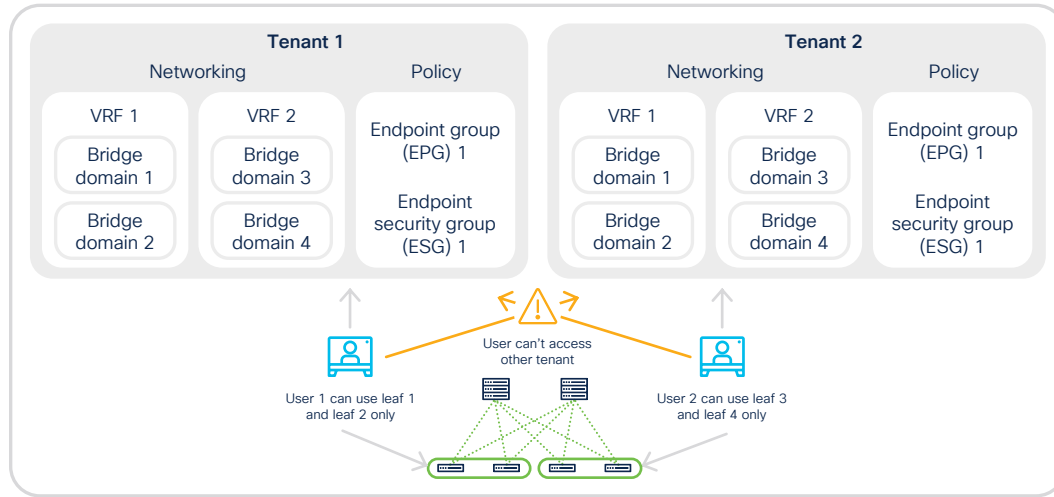
Single management plane for core fabric and remote leaf

Automation of global data center footprint

End-to-end security using ACI's segmentation model

Build a true administrative boundary

Public cloud-like tenancy in an on-premises data center



What are tenants in Cisco ACI?

Tenants create a grouping of network and policy constructs based on an administrative boundary

Within a tenant, VRFs (private networks) provide traditional routing table (forwarding) isolation

Why tenants?

To realize enterprise-specific business outcomes associated with administrative separation

Benefits

Deploy separate virtual network fabrics aligned to organization or political grouping

Create smaller failure domains based on non-technical boundaries

Administrative separation in addition to traditional VRF isolation

Tenants in Cisco ACI: Practical use cases

Public cloud-like tenancy in an on-premises data center

Multiple NetOps organizations

One NetOps team manages networks for internal apps. Another NetOps team manages networks for external apps.



Tenant 1
Internal applications



Tenant 2
External applications
www.company.com



Tenant 1
Instances of application A



Tenant 2
Instances of application B

Software development

One tenant per software development lifecycle phase of a given application, or for all applications.



Tenant 1
Development



Tenant 2
Test



Tenant 3
Production

Cisco ACI's pervasive security model

Use cases with endpoint security groups (ESG)

ESG as a container for all workloads comprising a single application

ESG 1

All workloads in application A

ESG 2

All workloads in application B

ESG as a container for all malware infected hosts

ESG 3

All systems infected by malware

Security groupings based on business outcomes for bare-metal, VMs and containers with a network-wide (VRF) scope

ESG as a container for an application

Network operators now have a seat at the InfoSec table and a seat at the auditing table

									Summary	Policy	Operational	Health	Faults	History
									Client Endpoints	Contracts	Deployed Leaves	Tag Selectors		
Healthy											Refresh	Download		
MAC/IP	Endpoint Name	Learning Source	Hosting Server	Reporting Controller Name	Interface (learned)	Encap	Base EPG	Policy Tags						
00:00:91:11:20:11		learned			Pod-1/Node-101/eth1/1 (le...	vlan-2011	ESG_Demo:OnlineStore:VLAN10_192.168.1.0_24	application OnlineStor						
00:00:92:22:20:11		learned			Pod-1/Node-101/eth1/2 (le...	vlan-2011	ESG_Demo:OnlineStore:VLAN10_192.168.1.0_24							
192.168.1.21							ESG_Demo:OnlineStore:VLAN10_192.168.1.0_24							
00:00:92:22:20:12		learned			Pod-1/Node-102/eth1/2 (le...	vlan-2012	ESG_Demo:OnlineStore:VLAN10_192.168.1.0_24							
00:00:92:22:20:21		learned			Pod-1/Node-101/eth1/2 (le...	vlan-2021	ESG_Demo:OnlineStore:VLAN20_192.168.2.0_24							
00:00:92:22:20:22		learned			Pod-1/Node-102/eth1/2 (le...	vlan-2022	ESG_Demo:OnlineStore:VLAN20_192.168.2.0_24							
00:00:92:22:20:31		learned			Pod-1/Node-101/eth1/2 (le...	vlan-2031	ESG_Demo:OnlineStore:VLAN30_192.168.3.0_24							
00:00:92:22:20:33		learned			Pod-2/Node-103/eth1/2 (le...	vlan-2033	ESG_Demo:OnlineStore:VLAN30_192.168.3.0_24							
00:50:56:8C:2D:5D	onlinestore_adservice2	learned vmm	10.23.239.90	VC67	Pod-1/Node-101/eth1/24 (l...	vlan-2254... vlan-2255...	ESG_Demo:OnlineStore:VLAN20_192.168.2.0_24	__vmm::vmname onlir						
192.168.2.114							ESG_Demo:OnlineStore:VLAN20_192.168.2.0_24							
00:50:56:8C:3E:C4	onlinestore_catalog1	learned vmm	10.23.239.90	VC67	Pod-1/Node-101/eth1/24 (l...	vlan-2286... vlan-2287...	ESG_Demo:OnlineStore:VLAN10_192.168.1.0_24	__vmm::vmname onlir						
192.168.1.115							ESG_Demo:OnlineStore:VLAN10_192.168.1.0_24							

Cisco ACI application aware service chaining

Use case: Different treatment for different flows in a three-tiered web application

Flow 1: Requires stateful firewalling and load balancing



www.company.com



Stateful firewall



Load balancer



Middleware

Flow 2: Does not require stateful firewalling or load balancing; requires ultra-low-latency



Middleware



Database

Benefits

Redirect specific flows to specific IP services appliances based on business outcomes (compliance, InfoSec, etc.)

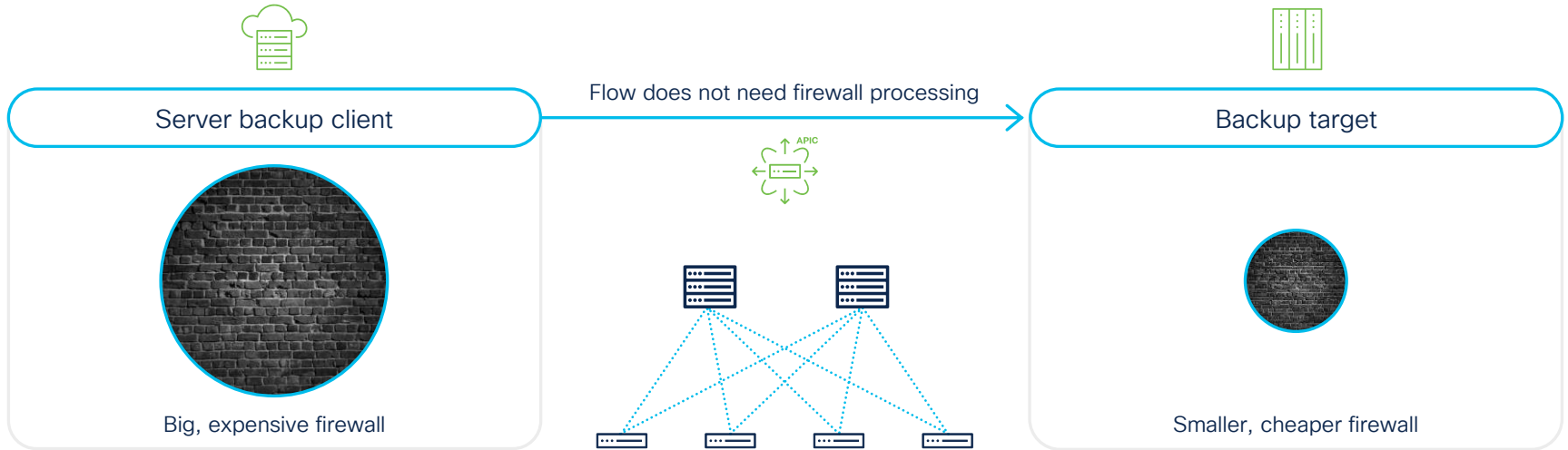
Reduce CapEx; offload unnecessary flows from firewalls and load balancers

Decouple IP services processing from the destination forwarding table

Centrally locate IP services appliances

Cisco ACI application aware service chaining

Practical use case: Server backup traffic overloads firewall



Business outcomes

Bypass IP services appliances for specific flows based on business outcomes

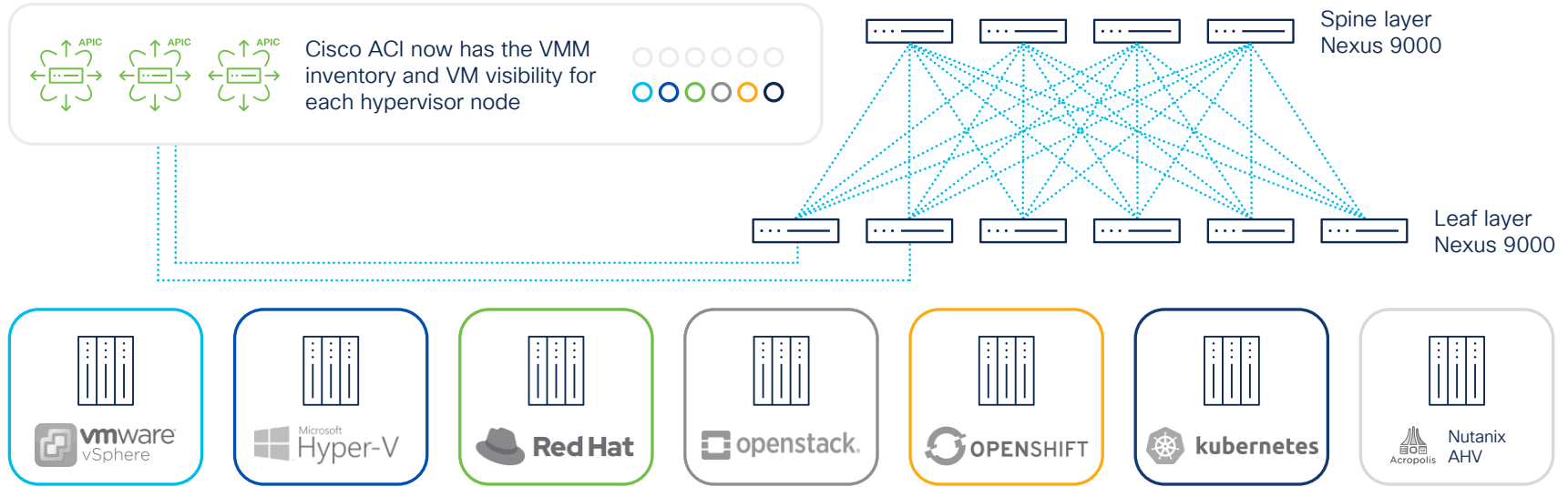
Reduce CapEx; purchase right-sized firewall and IP services appliances

Agenda

- Introduction
- Deployment Models
- Segmentation and Security
- **Virtualization and Hybrid Cloud**
- Operations and Automation
- Ecosystem
- Sustainability

Cisco ACI VMM integration

Cisco ACI: Single SDN



Business outcomes

Policy-driven integrated network (physical/virtual)

Hypervisor agnostic

Dynamic endpoint discovery and policy enforcement

Deep infrastructure visibility and telemetry

Hybrid Cloud Networking

Cisco Cloud Network Controller

Connectivity Automation

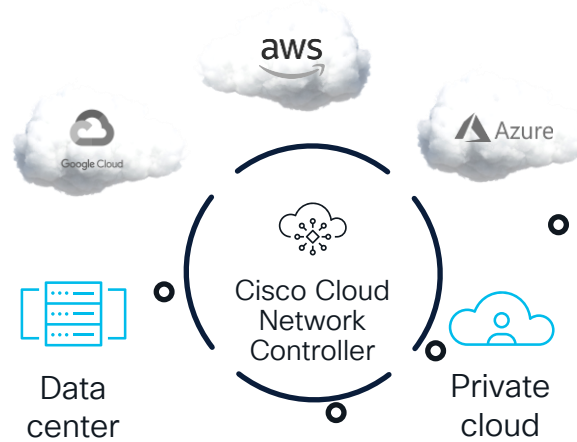
- Inter-Cloud, Intra-Cloud
- On Prem to Cloud (DC, Branch)
- Underlay and Overlay: Internet/Private Link/Co-Io/SDWAN ; VXLAN/ IP/ IPSEC

Business Continuity & Disaster Recovery

- Application Migration : Inter-Cloud, Intra-Cloud
- High availability & Redundancy
- Network Failover

Visibility

- View and connect to brownfield VPC networks
- Inventory and topology view
- Configuration Drift



Service Integrations

- Service insertion for East-West & North-South traffic
- Service chaining for Cloud native and third party L4-7 services

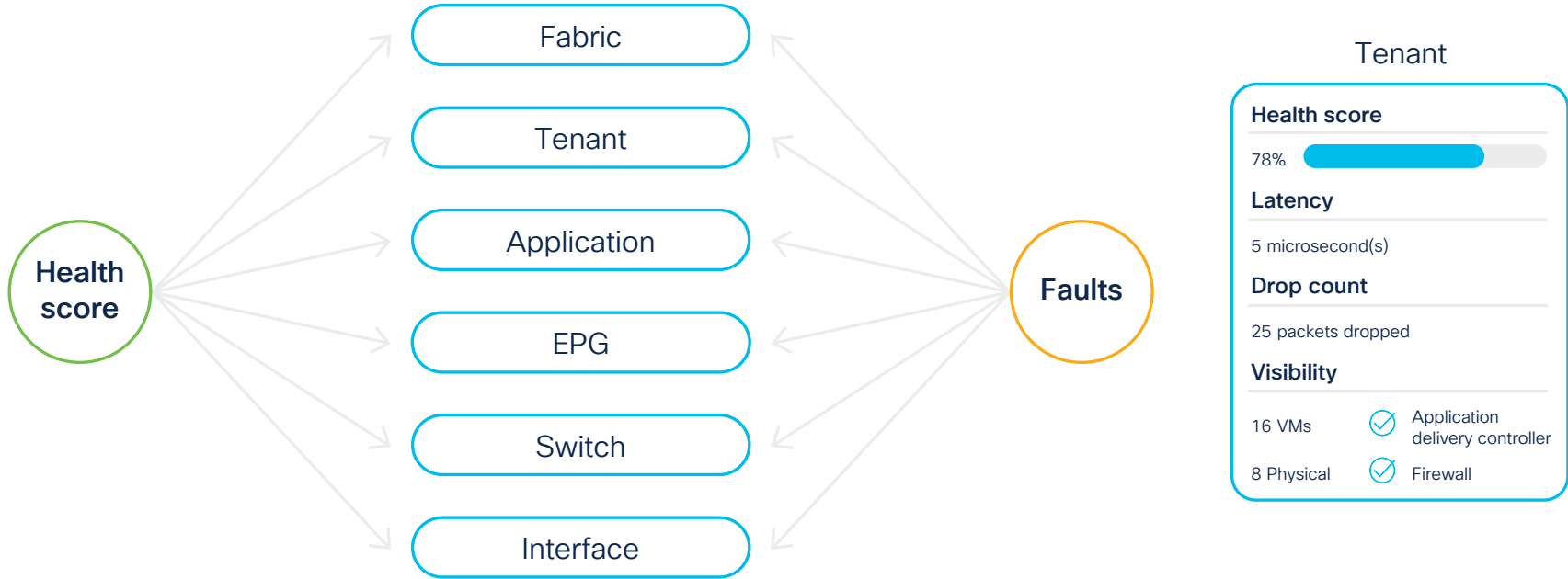
Segmentation

- Application Segmentation
- Network segment extensions from on-prem to cloud
- Network segment mapping (VRF, VPC/VNET)
- Security groups/rules : Macro & Micro segments

Configuration Management & Policy Orchestration

- Centralized management of network configuration
- Normalized network framework for heterogeneous cloud environments
- Automating Cloud native and Cisco Cloud routers

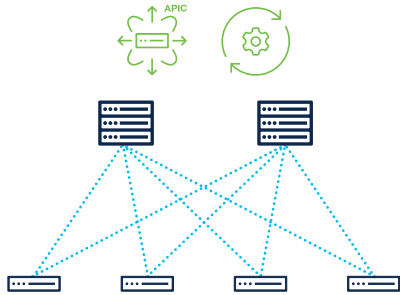
Cisco ACI: Granular operational visibility



Simplified and central fault management reduces Mean Time to Innocence (MTTI)

Cisco ACI: A platform built for automation

Simplicity and speed: A single API call to deliver a data center-wide construct (like a VRF)



Day 0

Out of the box automation

- Hardware
- Fabric
- Underlay
- Parts of overlay

ACI fabric is automatically deployed based on industry best practices
Avoid 100s of design decisions required to deploy a traditional fabric

Day 1

Operations ticketing queue

ServiceNow ticket – create VRF

Ansible | Terraform | Python

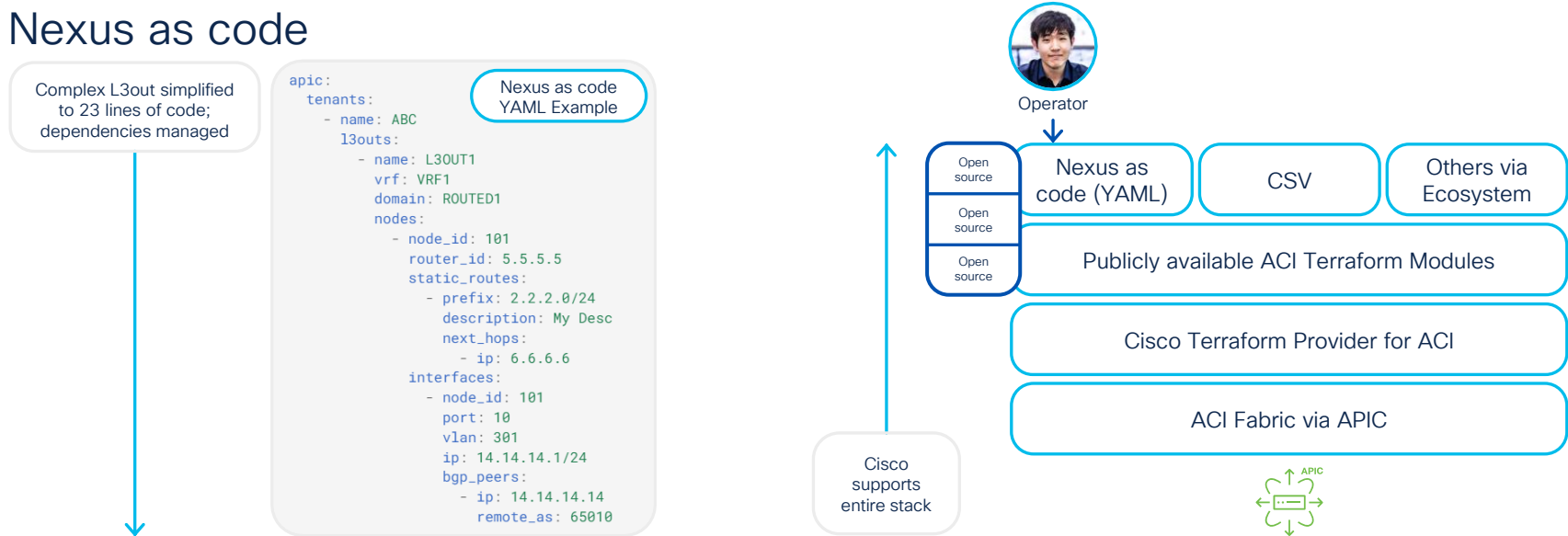
APIC API

Hundreds of switches and 1000s of ports

IT operations lifecycle: Provision, automate and operate

Cisco ACI: A purpose-built infrastructure as code platform

Nexus as code



Nexus as code is an ACI abstraction to simplify consumption using a prescriptive data model

Red Hat Ansible and HashiCorp Terraform with Cisco ACI

An infrastructure as code practice

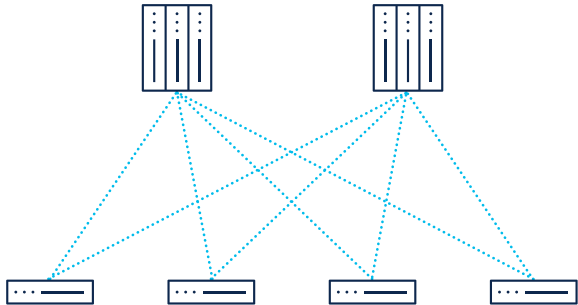


ANSIBLE

140+ Ansible modules for ACI



180+ Terraform resources for ACI



Automate fabrics end-to-end with Ansible and Terraform

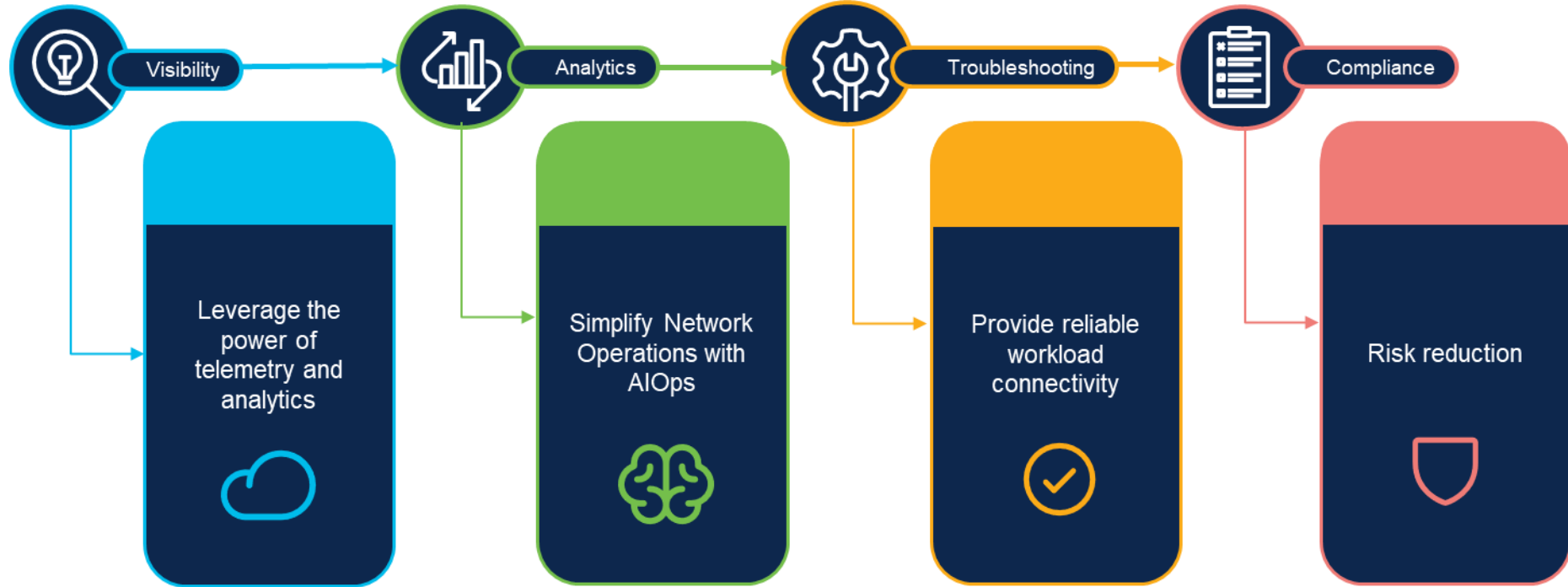
Capabilities

- Comprehensive coverage of the ACI REST API
- Common configuration management language
- Simple CI/CD
 - Ansible Automation Platform, GitHub and GitHub Actions (CI)
 - Terraform Cloud for Business

Benefits

- Leverage ACI's object model and single configuration API for 100s of Nexus 9000s
- ACI as on-prem anchor for hybrid cloud
- Certified by both RedHat, HashiCorp and Cisco Cloud Networking BU

ACI and Nexus Dashboard



Sustainable data centers

Optimize efficiency, visibility, performance and cost across your networking and compute infrastructure

Build

Decrease energy consumption

Solutions designed with less energy and resources, reducing waste in systems

Deploy

Increase energy efficiency

Modern architectures enabling consolidation, power and cooling optimization and future-readiness

Operate

Sustainability Metrics

Real-time visibility of energy consumption, and workload and resource optimization

Cisco Data Center Networking Ecosystem Vision

As powerful and open as you want it to be



Be open

Programmable infrastructure for today's hyper-distributed, container-native, modern applications

Vast ecosystem of partners establishes platform openness

Extensible for homegrown tools

Focused on solutions and outcomes instead of on point products

Spans a broad set of DC automation, operations, and management use cases

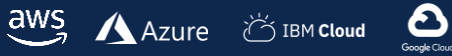
Built on open APIs and can be expanded upon further by our customers

Cisco ACI ecosystem breadth and depth

Security



Public cloud



Cloud automation



Big data



Automation and orchestration



Microservices and containers



Application delivery



Monitoring



Application performance

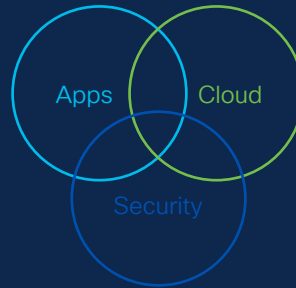
IPAM



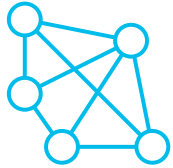
ITSM and ITOM



Infrastructure



Cisco ACI is the answer



Network
connectivity



Operations
and visibility



Services
integration



Segmentation
and security



Accelerate your data center transformation with Cisco CX

Gain faster results by quickly transforming and boosting the agility and automation of your data center operations with CX expertise – so you can focus on the outcomes that matter most



Visit CX Data Center to learn more

How we can help

Cisco Application Centric Infrastructure Services

Strategy and Solution Discovery

Discover and document business and technical requirements. Drive automation and infrastructure as code approach

Optimization and Monitoring Support

Unleash the full power of data center solutions through advanced network management

Assessments

Assess the readiness of your data center environment

Knowledge Transfer

Receive consulting support to drive your automation and DevOps priorities

Design, Implement, Migrate

Accelerate success throughout your network lifecycle with automation, micro-segmentation, and security

Learning | Certifications

Empower your workforce with efficiency and innovation



Optimize your network



Use and adopt



Protect your business



Accelerate multicloud

You don't have to do it alone.

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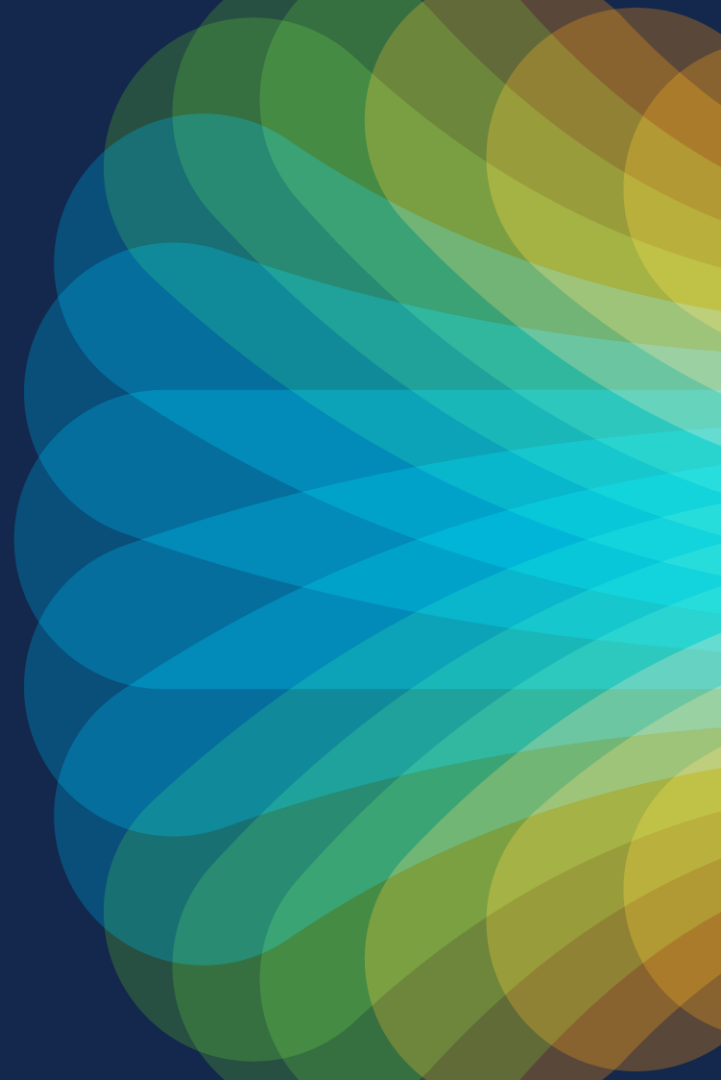


The bridge to possible

Thank you

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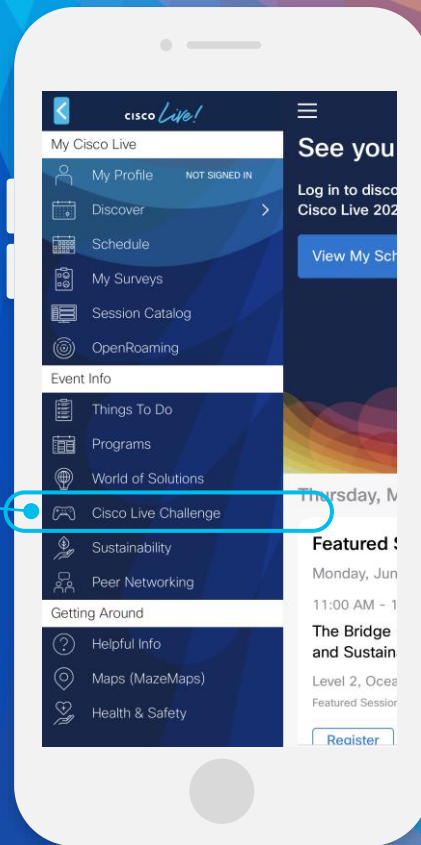
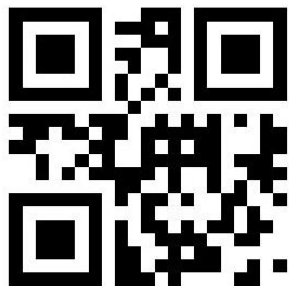


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- 4 Click the + at the bottom of the screen and scan the QR code:



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