Let's go

The bridge to possible

Best Practices for Hybrid Cloud Automation

Chris Gascoigne, Principal Systems Architect
@chrisgascoigne@hachyderm.io

BRKCLD-1391

Cisco Webex App

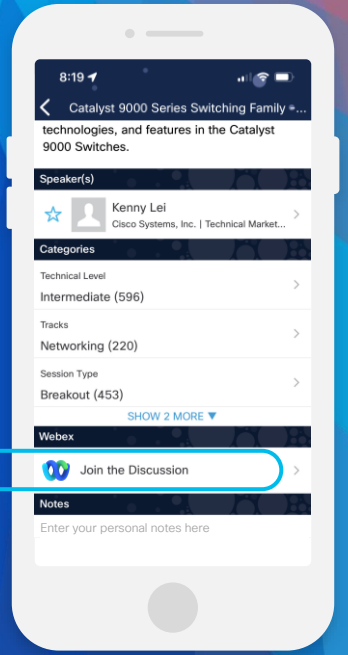
Questions?

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

How

1. Find this session in the Cisco Live Mobile App
2. Click “Join the Discussion”
3. Install the Webex App or go directly to the Webex space
4. Enter messages/questions in the Webex space

Webex spaces will be moderated by the speaker until December 22, 2023.



https://ciscolive.ciscoevents.com/ciscolivebot/#BRKCLD-1391

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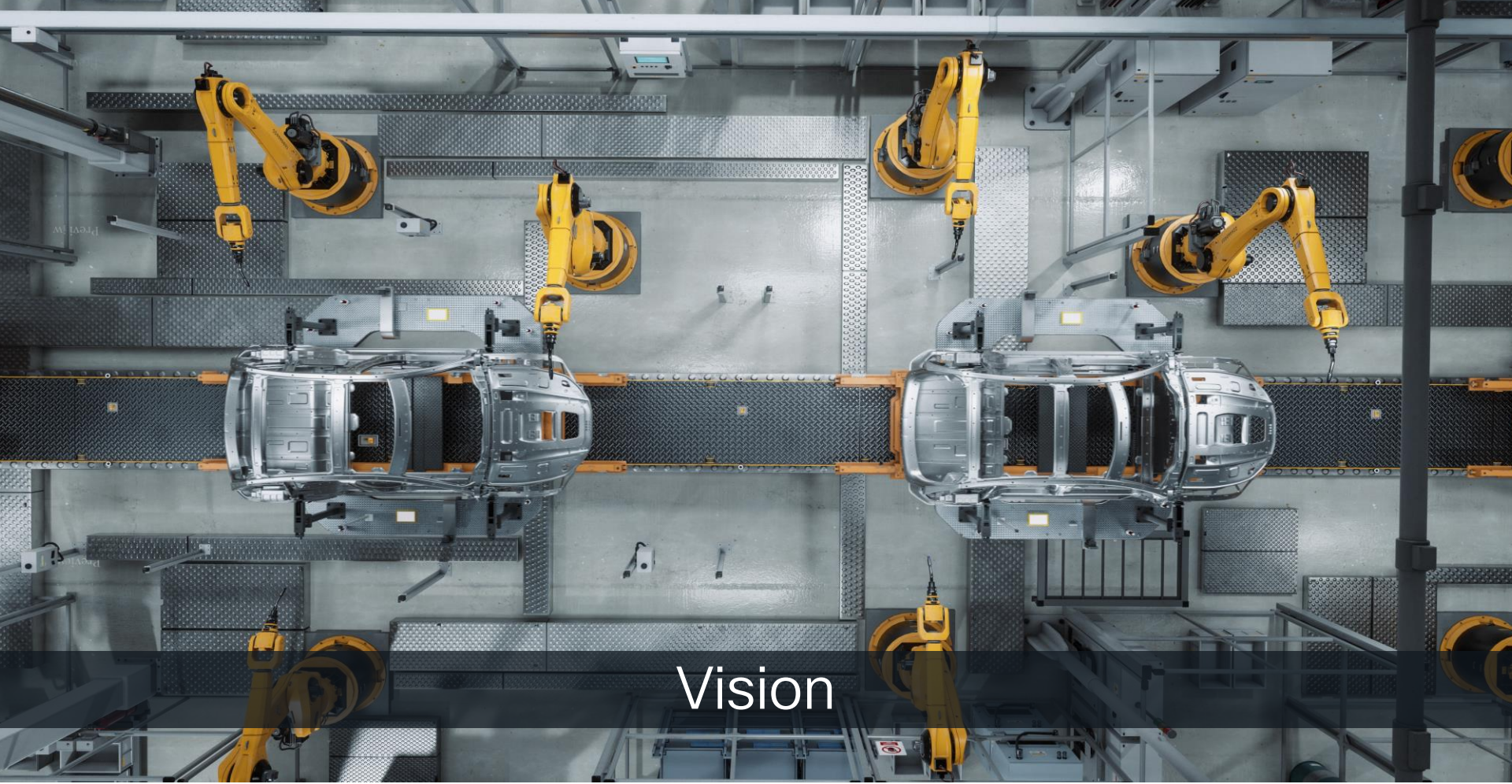

Vision

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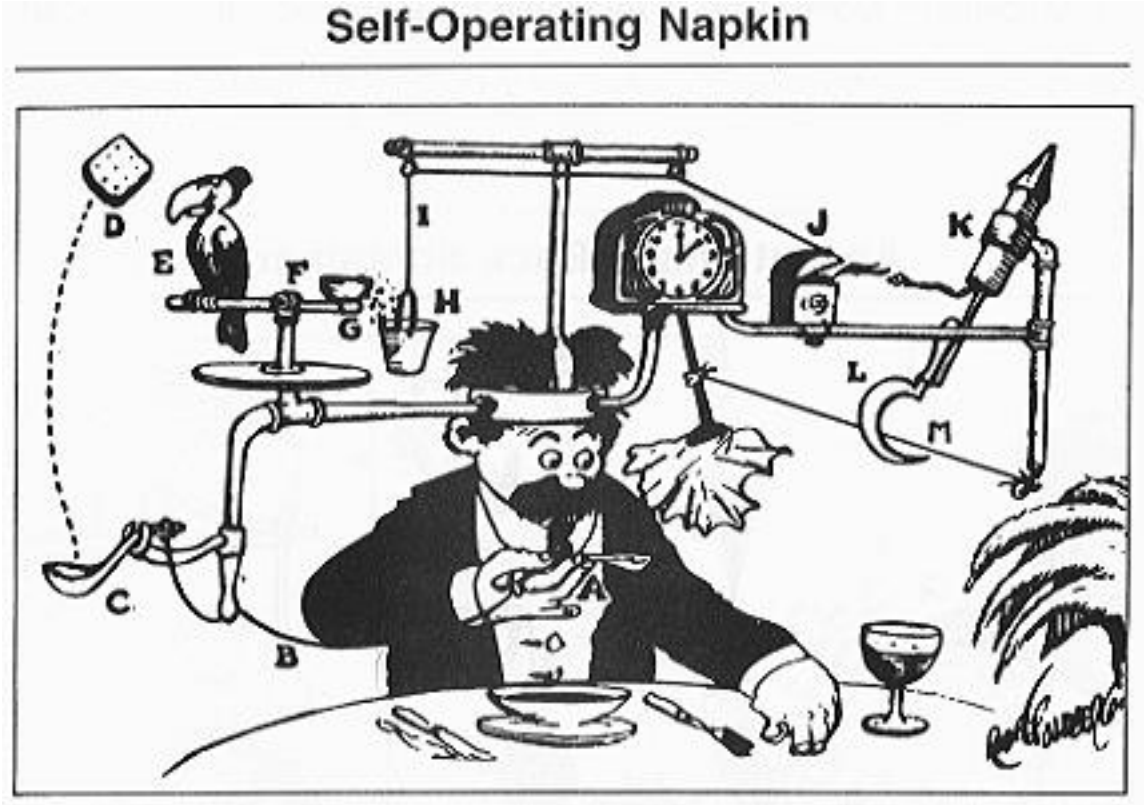

Reality

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Agenda

- Introduction
- Data Centre and Hybrid Cloud Architecture Best Practices
- Infrastructure as Code and Automation Tools
- Service Catalogues and ITSM
- Conclusion

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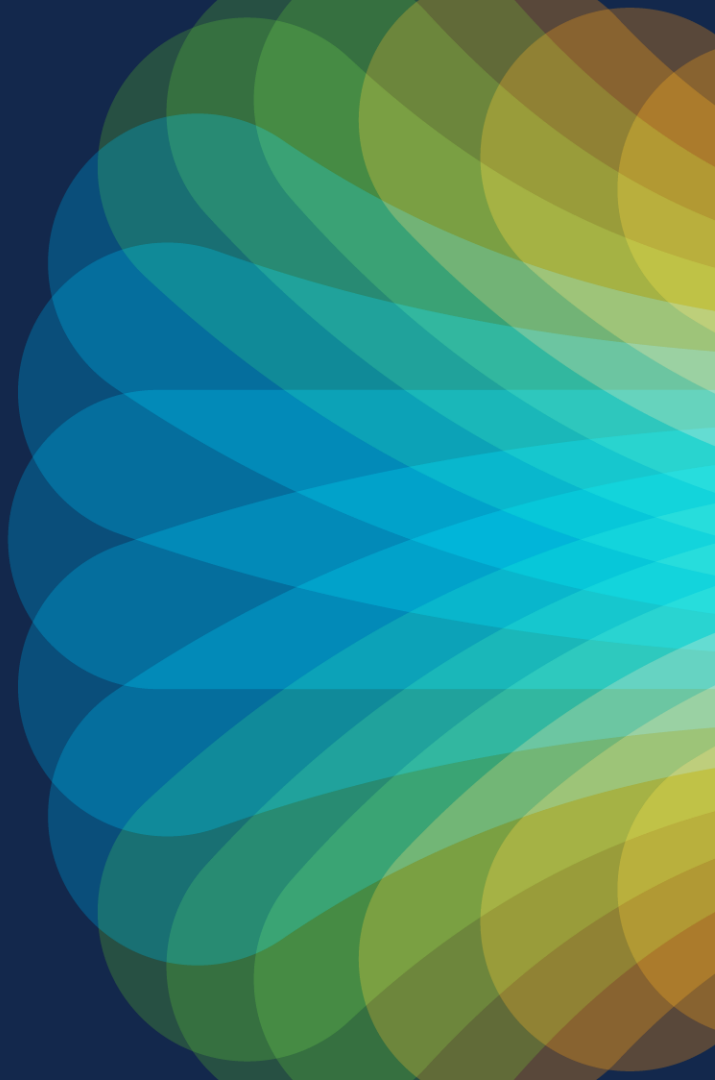
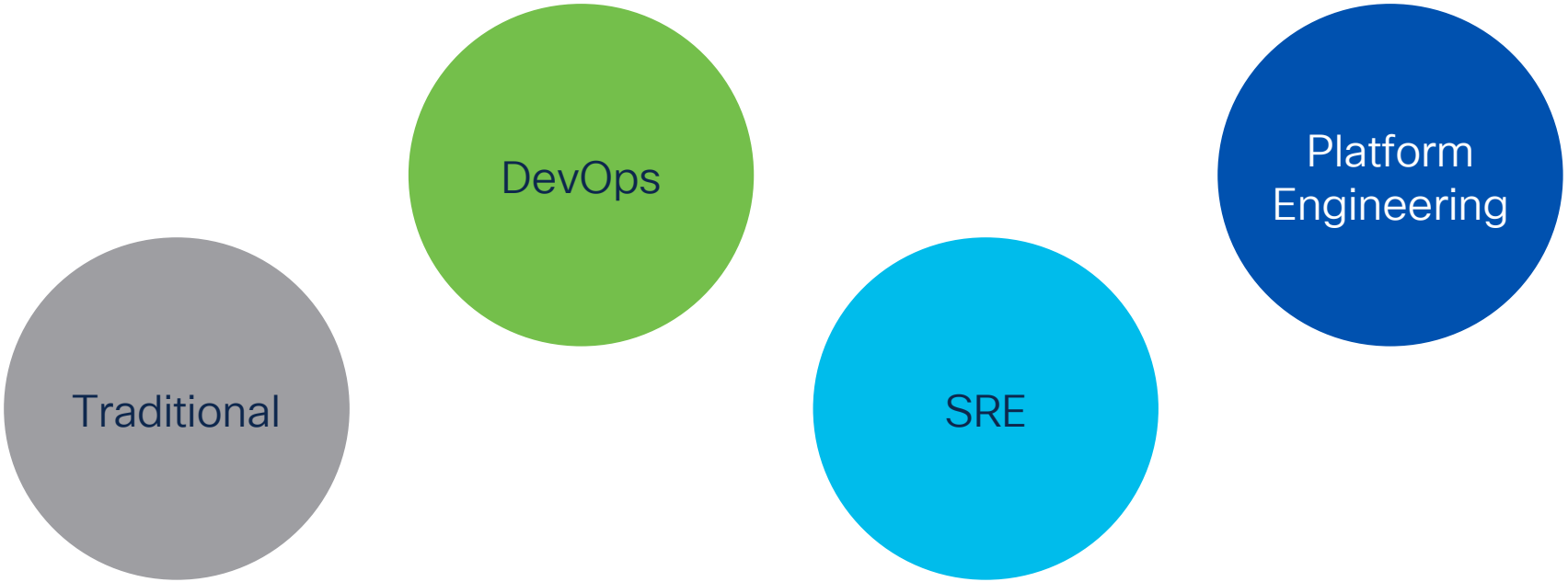
Introduction



Evolution of approaches



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Platform Engineering

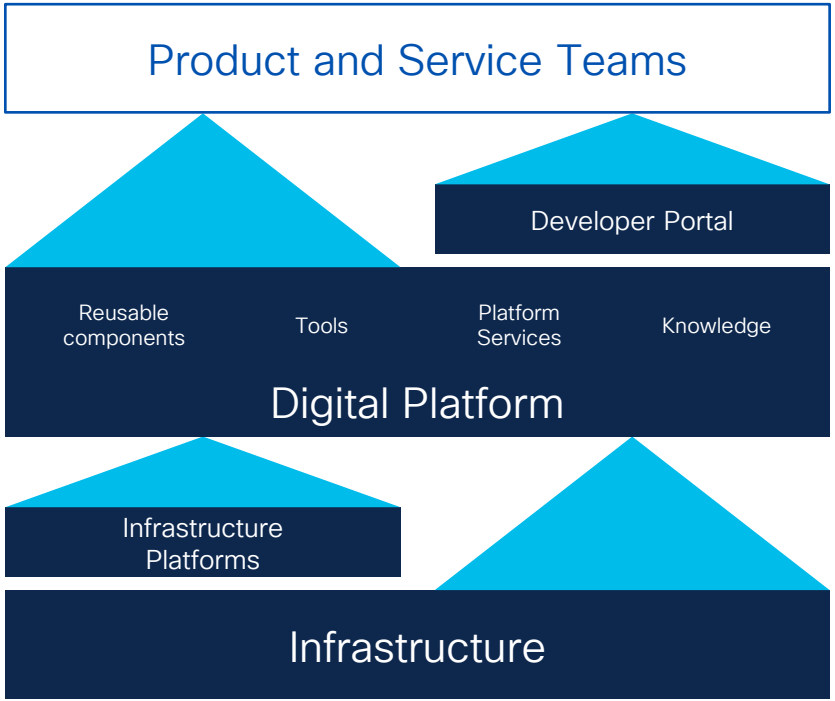
“By 2026,

80%

of software engineering organizations will establish platform teams as internal providers of reusable services, components and tools”

- Gartner Top Strategic Technology Trends 2024

- Optimise developer experience to accelerate business value
- Curate and build internal platforms



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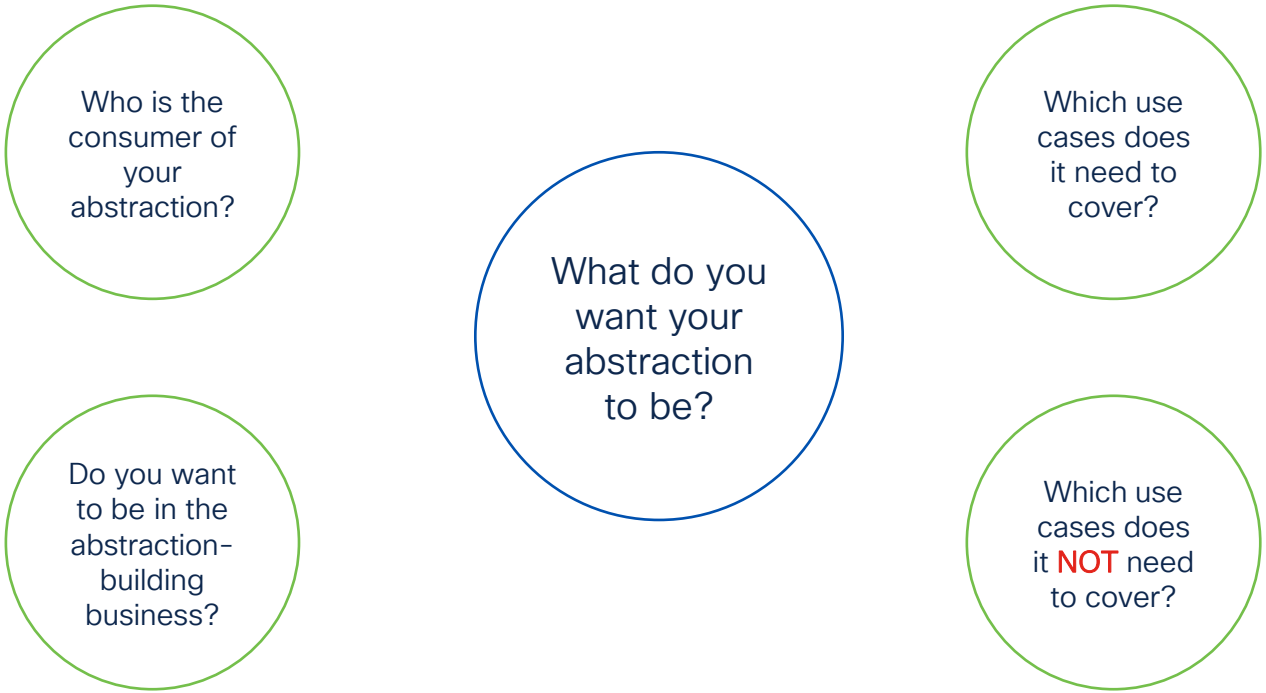
Automation is Abstraction



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Operating Model

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Who is your “customer”?

Are you trying to automate deltas (changes) or desired state?

What is the business workflow?

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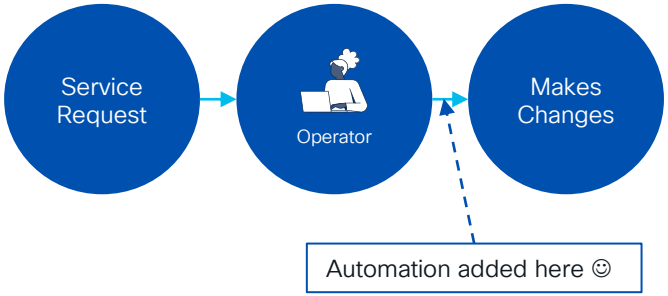
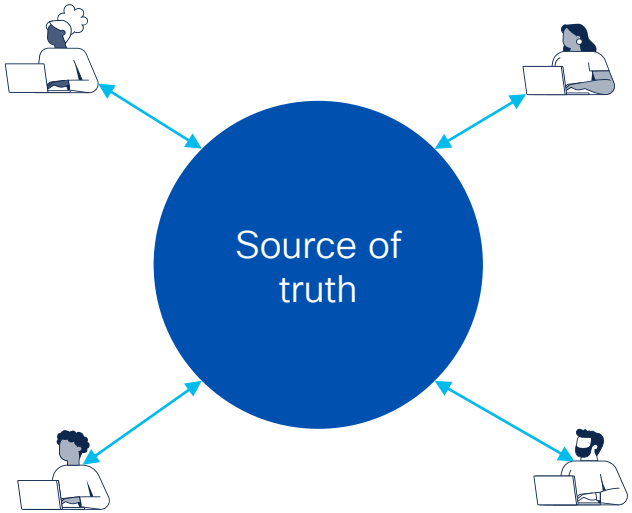
Operating Model



Service Request Model



GitOps Model

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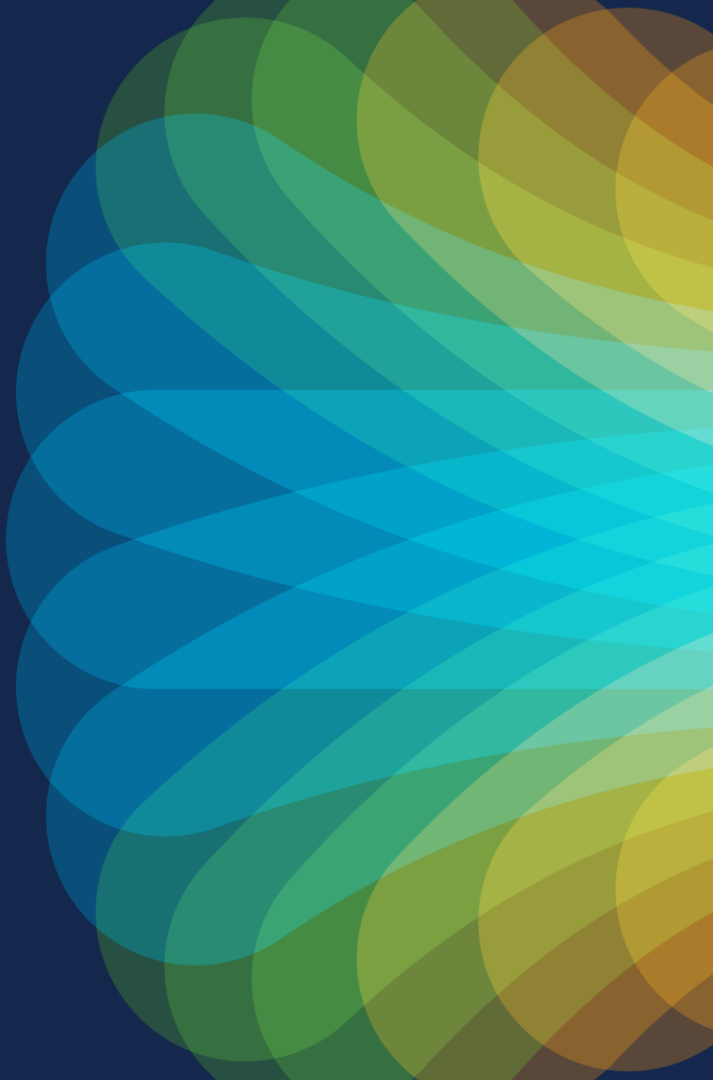
Infrastructure as Code and Automation Tools



"The enabling idea of infrastructure as code is that the systems and devices which are used to run software can be treated as if they, themselves, are software."

Kief Morris, *Infrastructure as Code*

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Which tool is best? Which one should I use?

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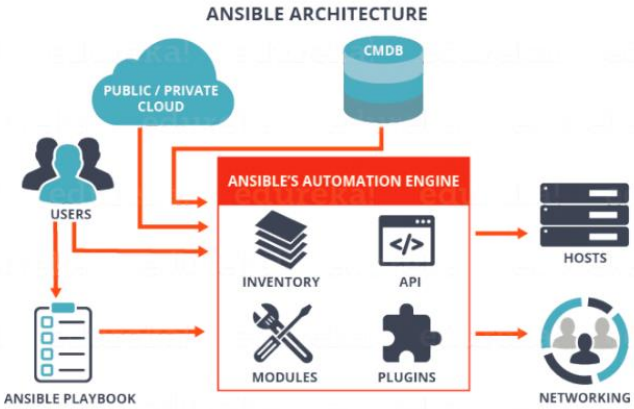
What is Ansible?



- Open-source Configuration Management Tool
- Commercial support from RedHat
- Declarative (when possible) and idempotent
- Can manage a wide range of systems:
  VMs, network devices, cloud instances, etc.
- Agentless
- Python server-side dependencies
- Stateless – Need “undo” run book

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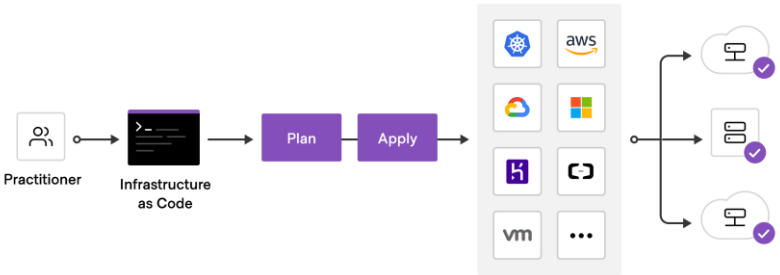
What is Terraform?

HashiCorp Terraform



- Open-source Infrastructure Provisioning Tool
- Commercial support from HashiCorp
- Declarative and idempotent
- Immutable infrastructure concept
- Can manage a wide range of systems:
  VMs, network devices, cloud instances, etc.
- Agentless, single binary file
- Zero server-side dependencies
- Stateful – can reverse/destroy changes

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Cisco Intersight: Automate

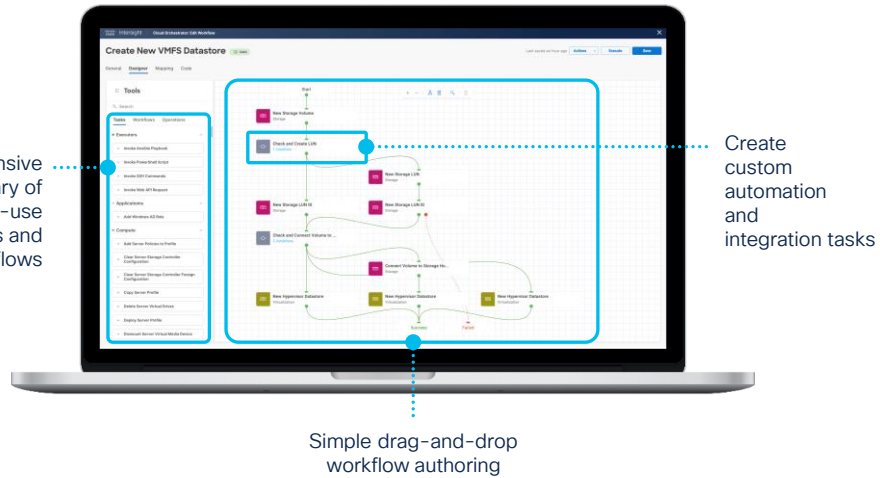
Create automated workflows to...

- Accelerate delivery of apps and infrastructure
- Reduce risk with standardization
- Simplify cross-domain orchestration

Automate anything, anywhere
Orchestrate infrastructure and workloads, across on-prem and public clouds

Easy-to-use, low-code orchestration
Create and execute complex workflows with a GUI-based designer

Boost IT operations
Benefit from a library of curated tasks and workflows



"With consistent and repeatable workflows offered by Cisco Intersight, IT teams can save time and decrease operational costs." – ESG

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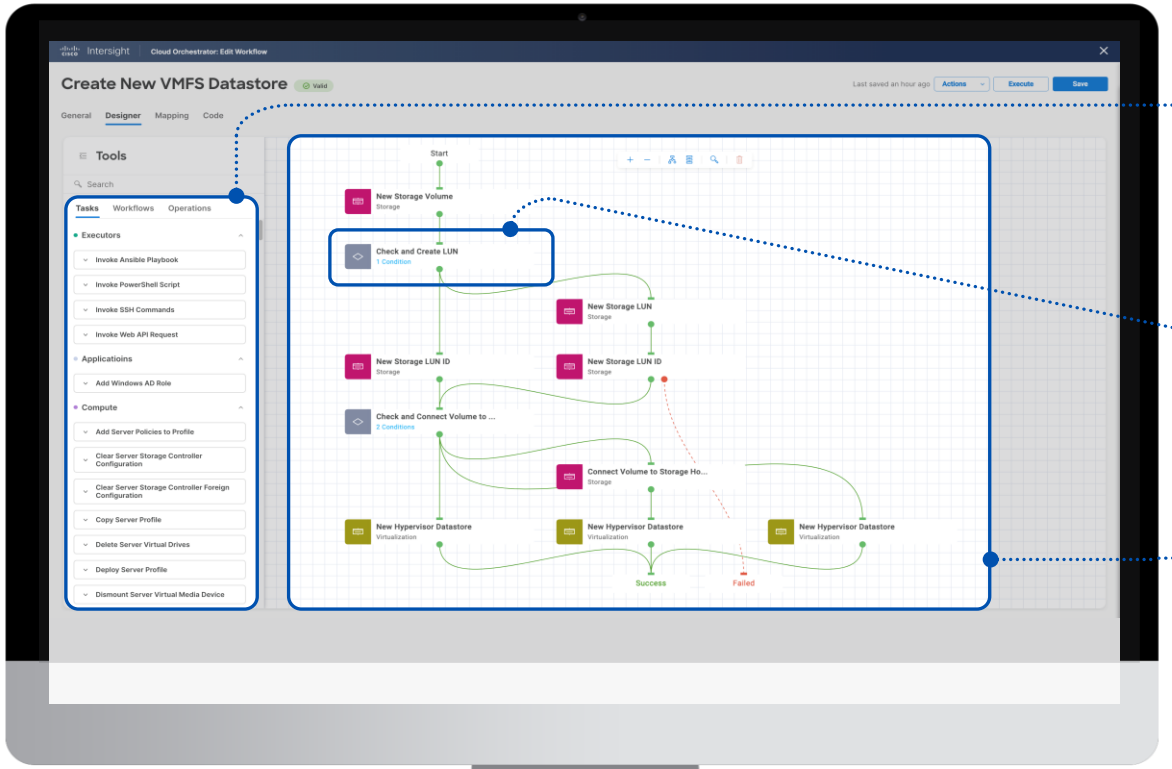
Cross-domain orchestration with Intersight



Extensive library of ready-to-use tasks and workflows

Create custom automation and integration tasks

Simple drag-and-drop workflow authoring

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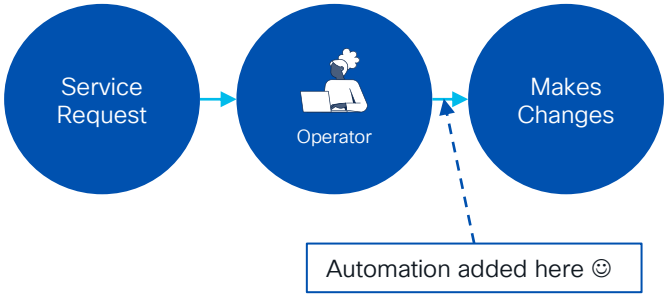
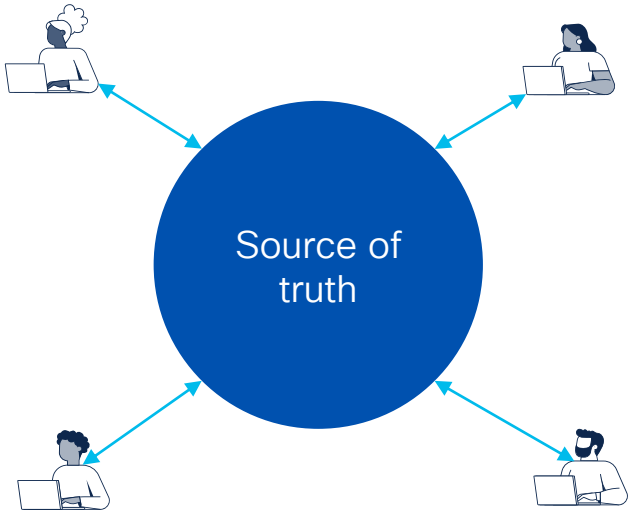
Coming back to the Operating Model



Service Request Model



GitOps Model

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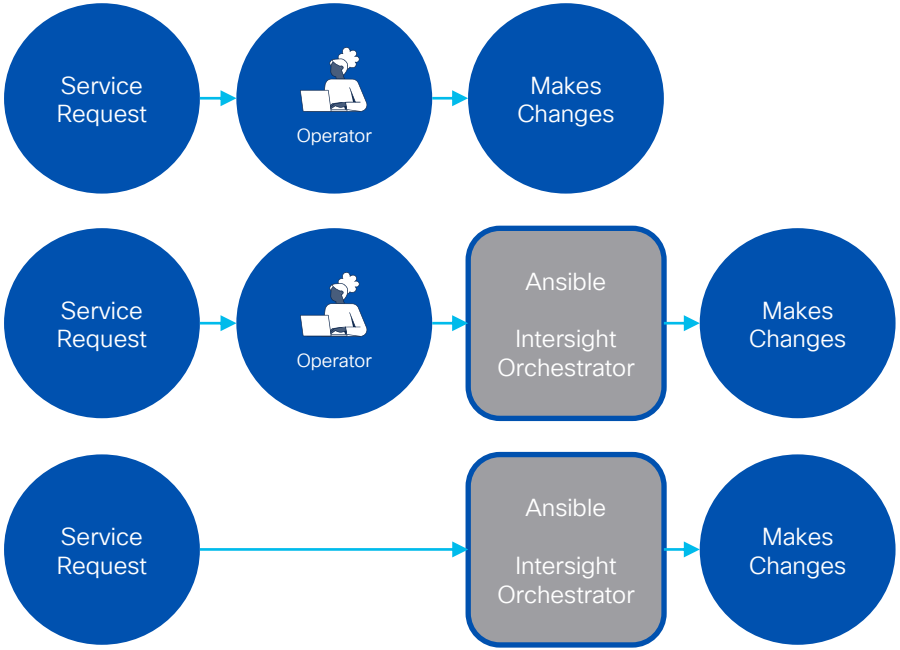
Coming back to the Operating Model

Service Request Model



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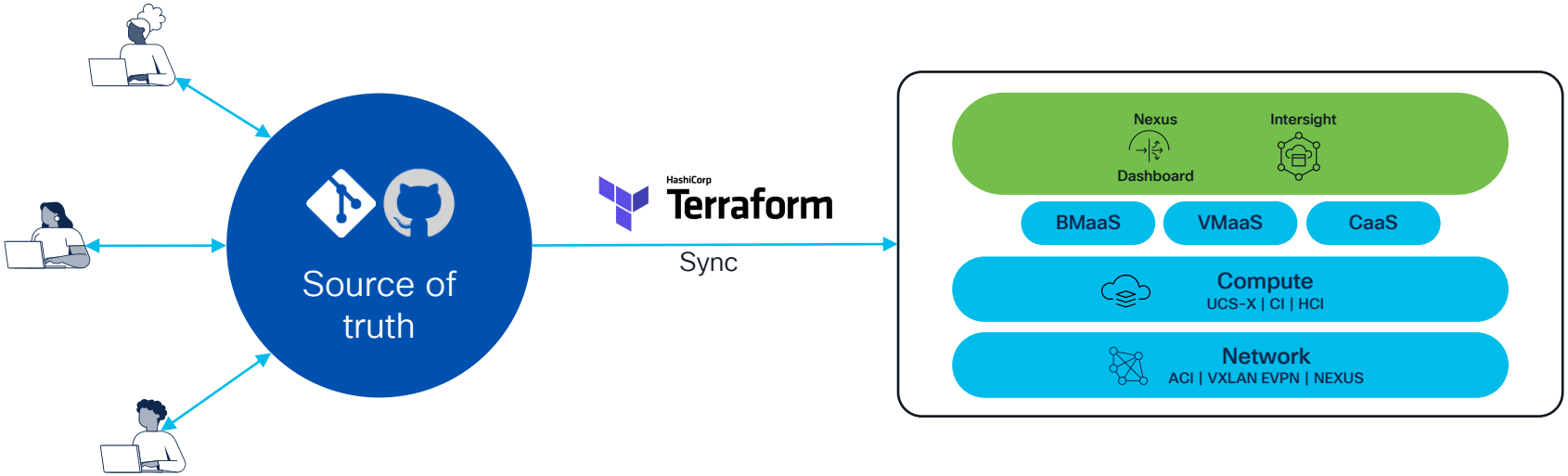
Coming back to the Operating Model

GitOps Model



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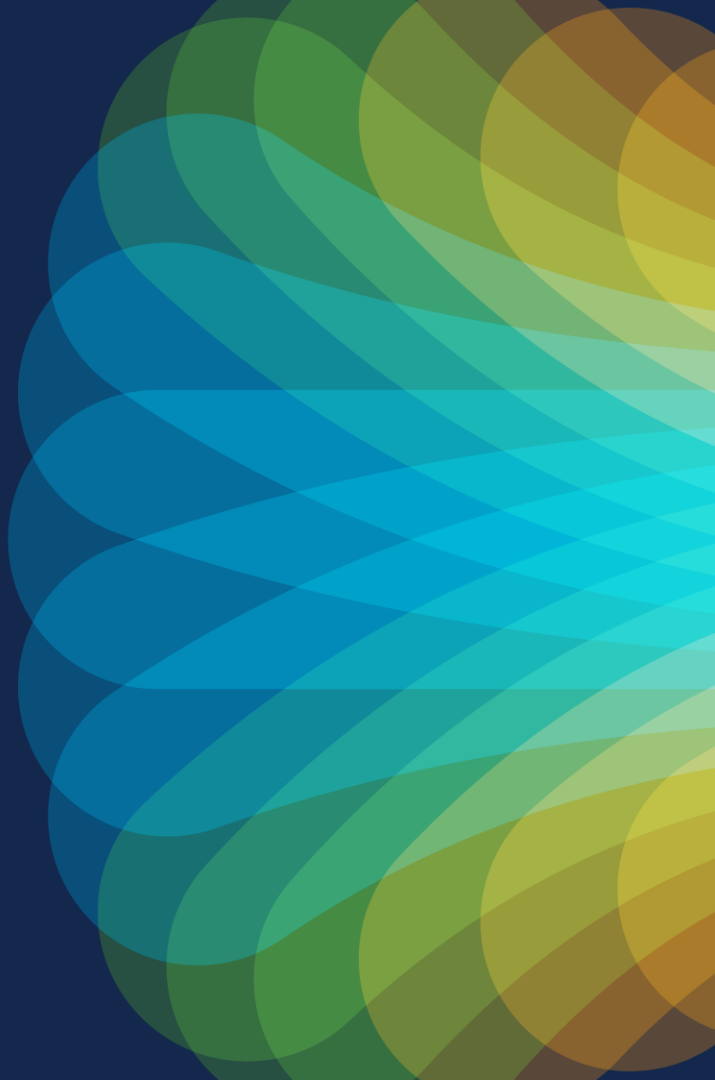
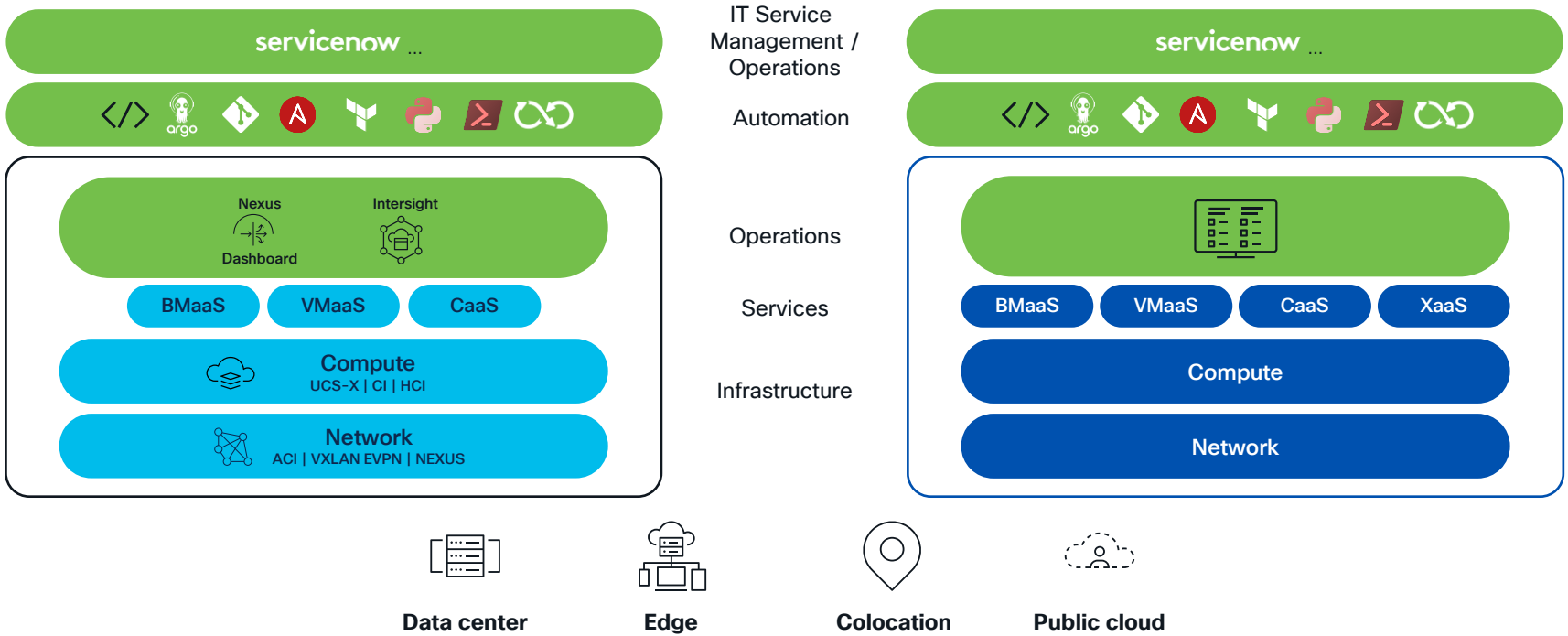
Data Centre and Hybrid Cloud Architecture Best Practices



cisco Live!

Common cloud experience



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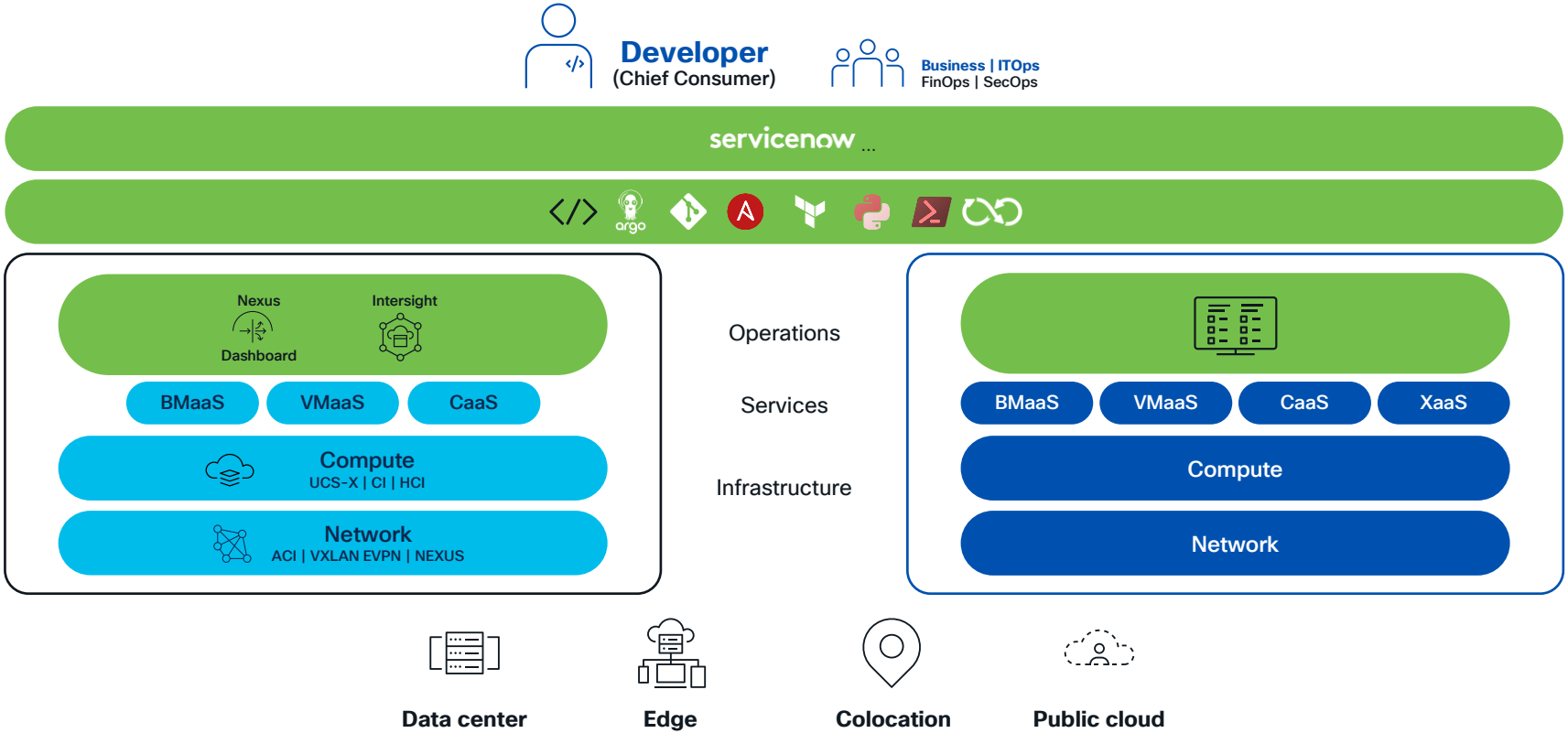
Hybrid cloud experience



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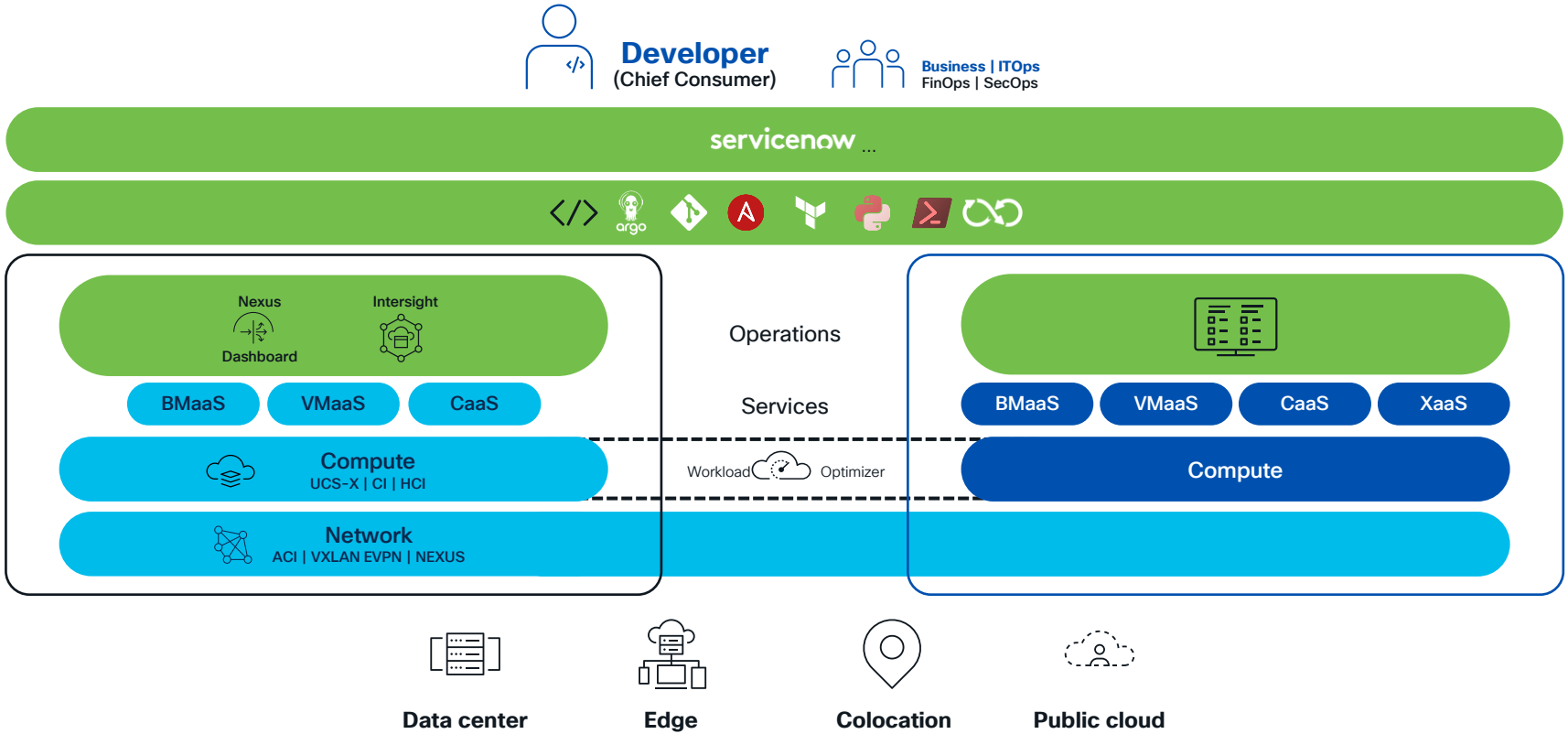
Hybrid cloud experience



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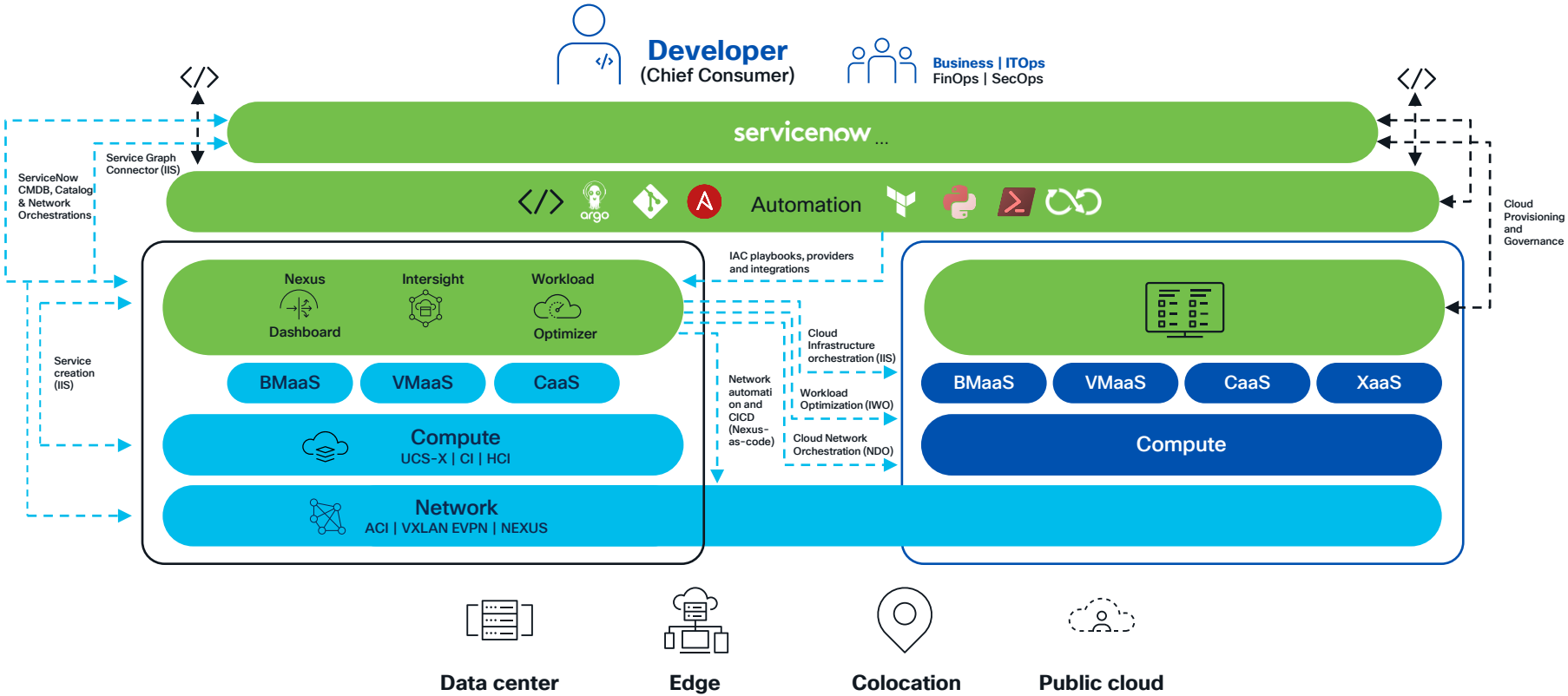
Cloud integrations



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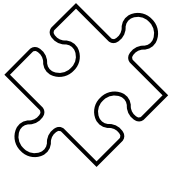
Puzzle Pieces

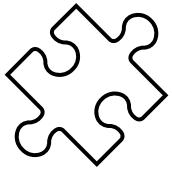


Intersight

REST

Ansible

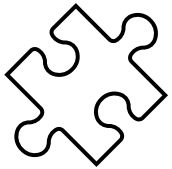
Terraform



UCS Manager

Non-REST API

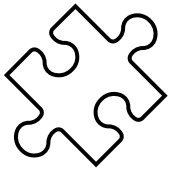
Ansible



UCS Integrated Management Controller

REST

Ansible

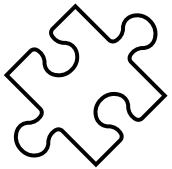


Nexus Dashboard Orchestrator

REST

Ansible

Terraform

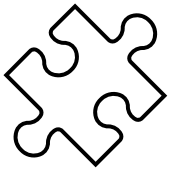


ACI

REST

Ansible

Terraform

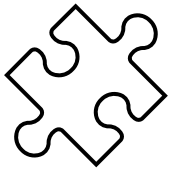


Nexus Dashboard Fabric Controller

REST

Ansible

Terraform



NX-OS

REST

Ansible

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Coming back to abstraction

Built-in Abstraction

DIY Abstraction

Nexus Dashboard Orchestrator	ACI	Nexus Dashboard Fabric Controller	NX-OS
Multicloud	Multicloud	Multicloud	Multicloud
Multi-DC	Multi-DC	Multi-DC	Multi-DC
Application Segmentation	Application Segmentation	Application Segmentation	Application Segmentation
L4-7 Services	L4-7 Services	L4-7 Services	L4-7 Services
Network Segmentation	Network Segmentation	Network Segmentation	Network Segmentation
Network Virtualisation	Network Virtualisation	Network Virtualisation	Network Virtualisation
Interface Configuration	Interface Configuration	Interface Configuration	Interface Configuration
Device Configuration	Device Configuration	Device Configuration	Device Configuration

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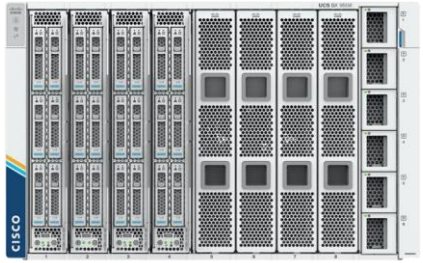
The policy dividend – UCS example

TEMPLATE
(Blueprint for one or more Profiles)

PROFILES
(Contains all settings and identifiers for a server)



POLICY
(Bucket of settings with a specific focus)

POOL
(List of identities
(IP, MAC, WWN,...)

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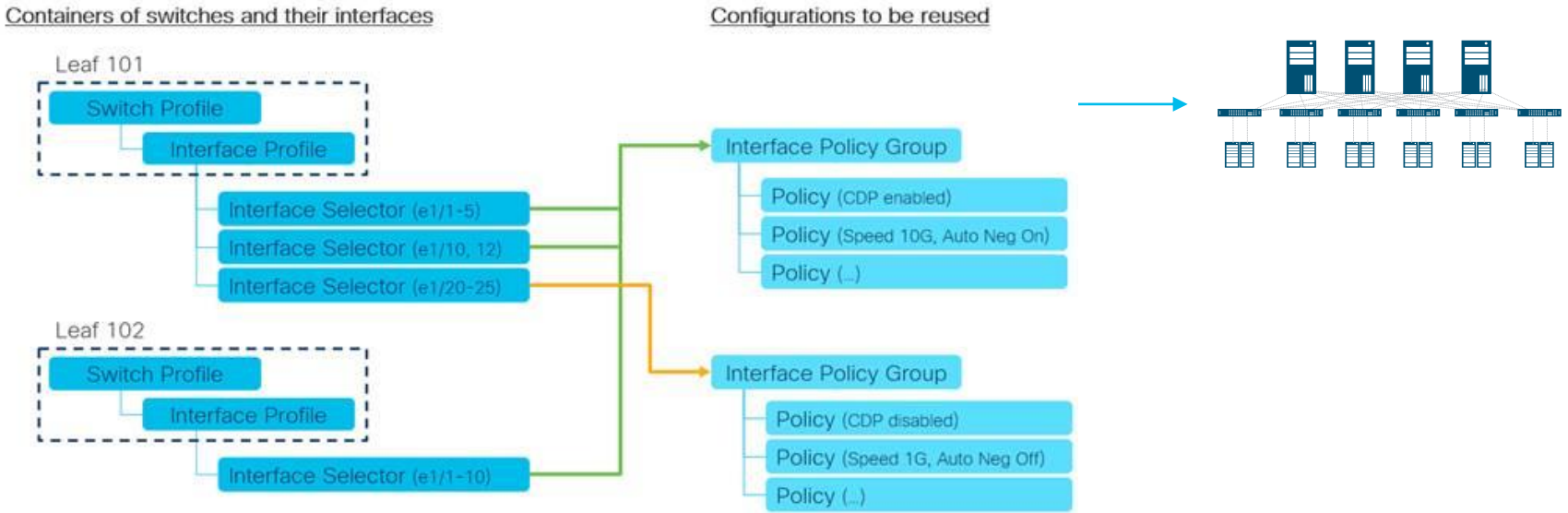
The policy dividend – ACI example



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Split Automation

main.tf

main.tf > resource "mso_schema_template_anp_epg_contract" "web-to-outside-prov"

```
94   ### web-to-app contract
95   resource "mso_schema_template_contract" "web-to-app" {
96     schema_id = mso_schema.schema.id
97     template_name = local.template_name
98
99     contract_name = "web-to-app-ctrct"
100    display_name = "web-to-app-ctrct"
101    scope = "application-profile"
102
103    filter_relationships = {
104      filter_schema_id = mso_schema.schema.id
105      filter_template_name = local.template_name
106      filter_name = mso_schema_template_filter_entry.web-to-app.name
107    }
108    directives = ["none"]
109  }
110
```

DevOps
App Teams

Application Network Profile

App 1 | App 2 | ... | App n

NetOps
SecOps

Tenants
VRFs
IP Addressing
External
Connectivity

ACI Fabric(s)

Data center | Cloud | Colo | Edge

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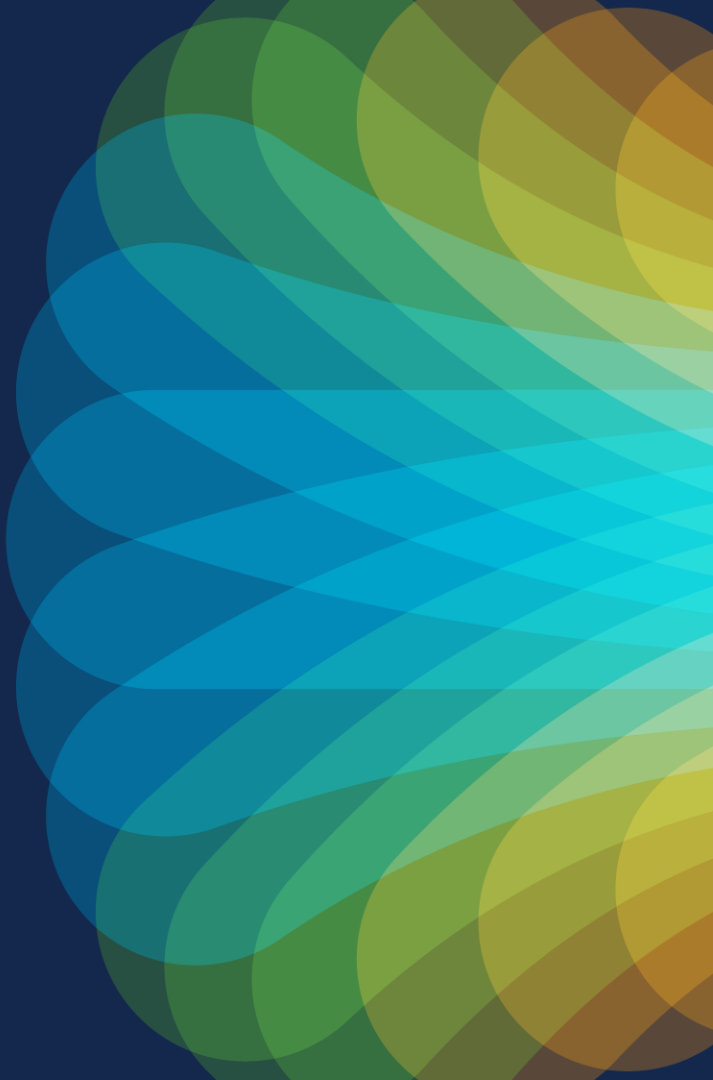
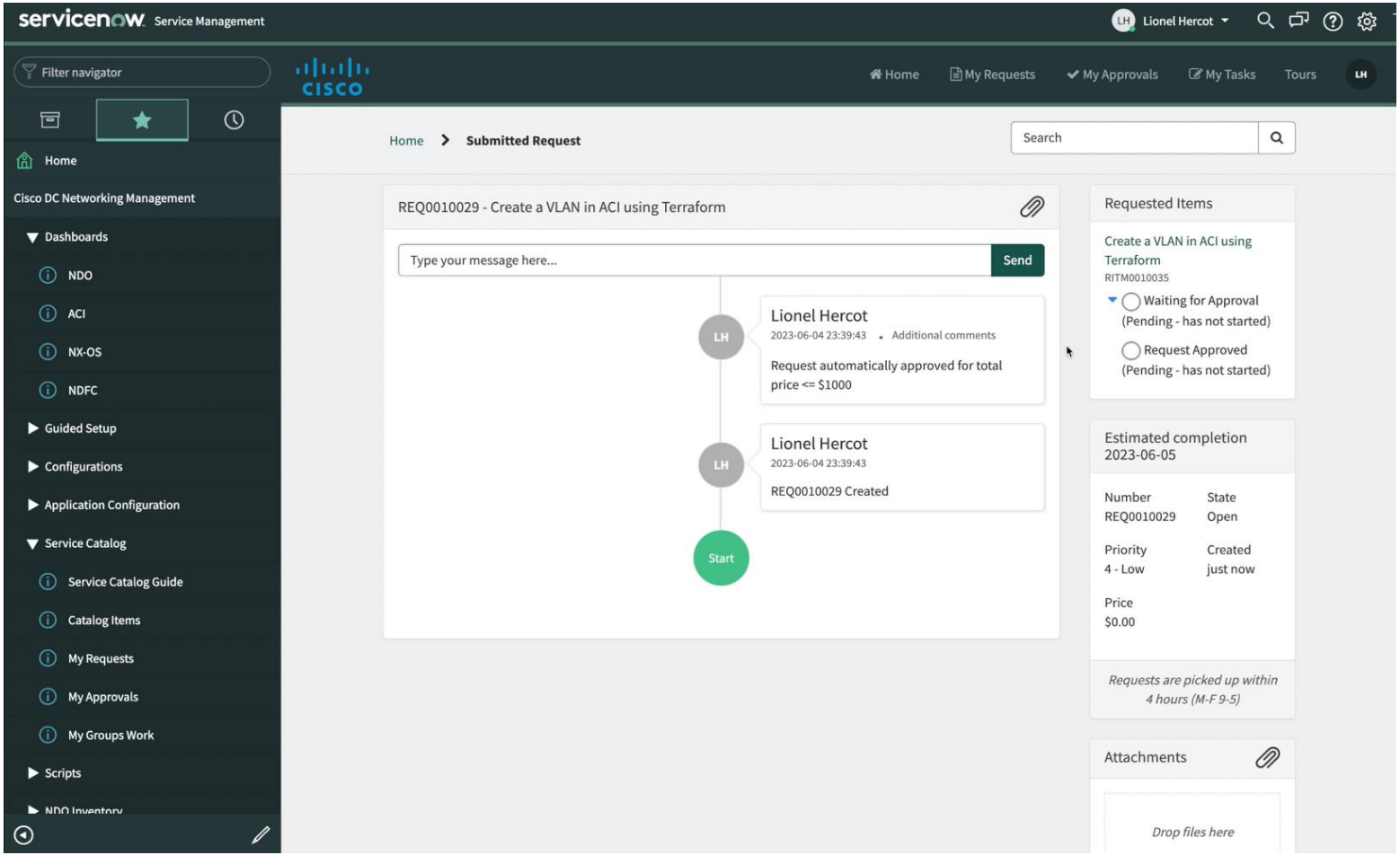
Service Catalogues and ITSM





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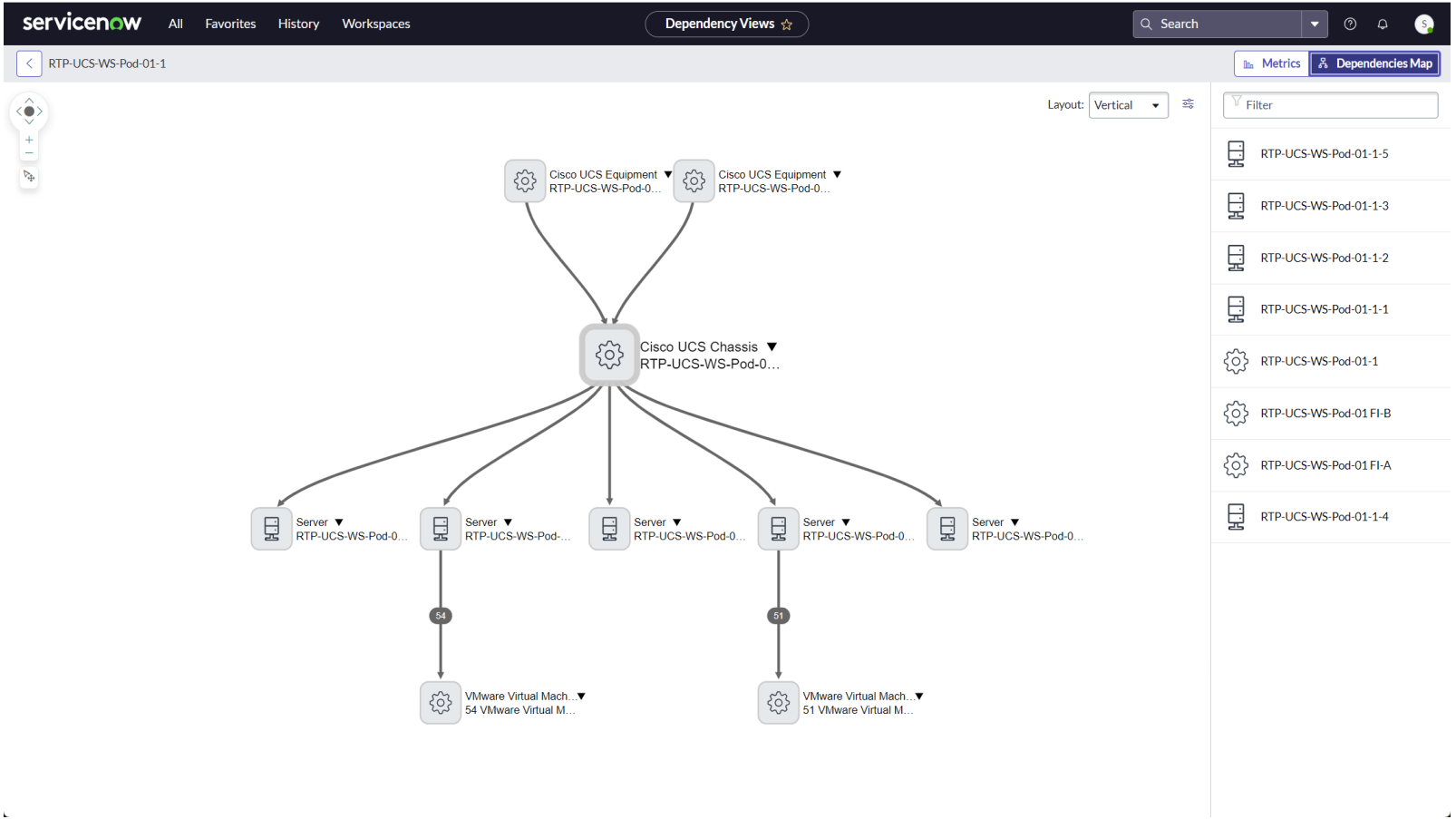

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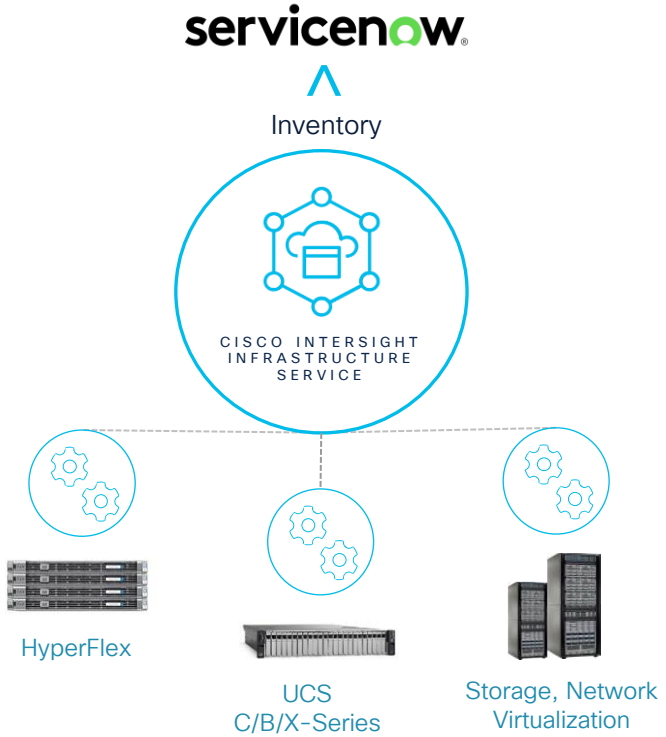
Service Graph Connector for Cisco Intersight

ServiceNow

- Cloud-based platform for IT management workflows

Service Graph Connectors

- Import third-party data into ServiceNow CMDB
- Ensures data quality, timeliness, and consistency
- Works out-of-the-box and complies with ServiceNow Common Service Data Model
- Synchronize inventory data between Cisco Intersight and ServiceNow



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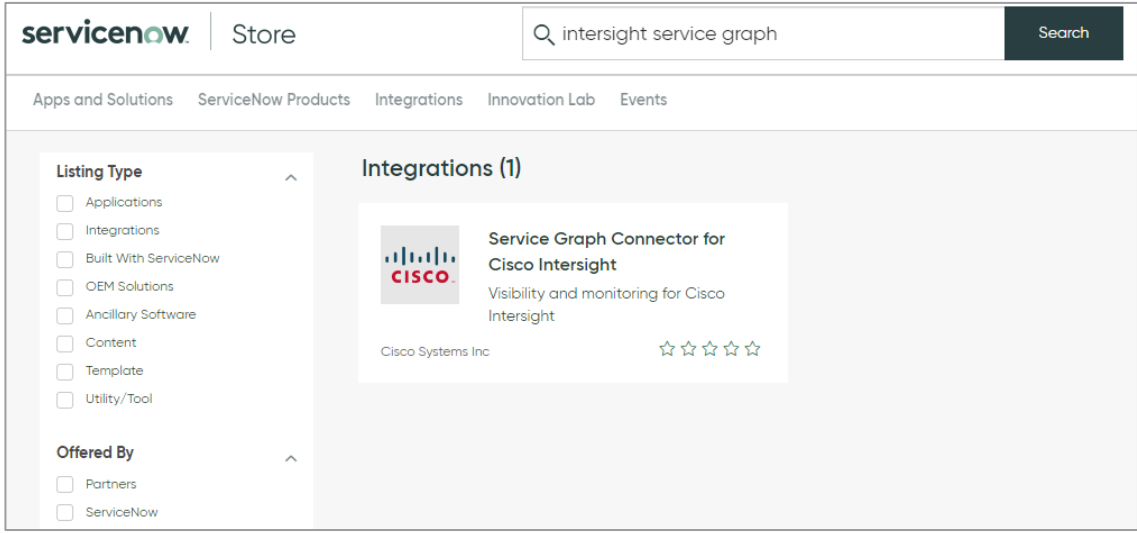
Service Graph Connector: Features

- Populate CMDB using Service graph
- Assets, Event, Change Management
- Supports for all Intersight claimed devices including 3rd party Servers, Storage, Nexus, MDS Switches
- Intersight License Tier: Advantage



Certified and listed on ServiceNow store

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Service Graph Connector: Key benefits

Enhanced Visibility

- Automatic view of Data Center Infrastructure inventory and relationships.
- Insight into servers, storage, network devices, and virtual machines.

Actionable Insights

- Understanding dependencies between workloads and infrastructure.
- Quick response and effective incident management.

Faster Time to Resolution

- Proactive prediction and prevention of service outages.
- Faster incident resolution and improved service availability.

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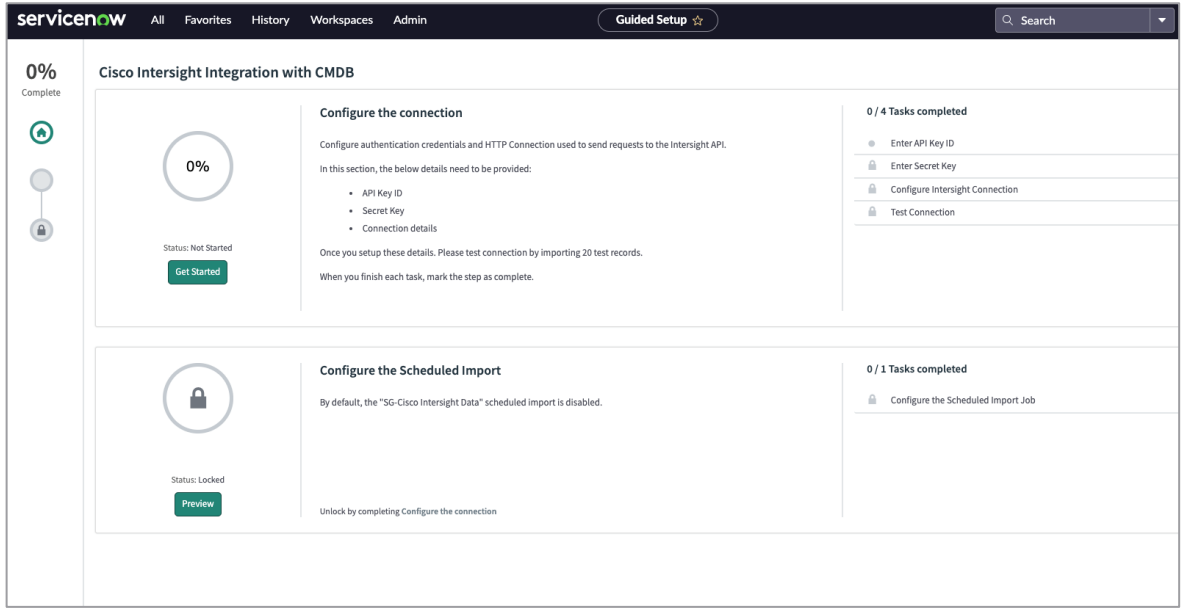
Service Graph Connector Overview

Uses the Intersight API

- API access can be Read-Only
- Additional RBAC within ServiceNow

App Features

- Device Inventory and Sync
- Relationships between Configuration Items (FIs/Chassis/Servers/Virtualization)
- Reconciliation Engine (avoids duplicate CIs)



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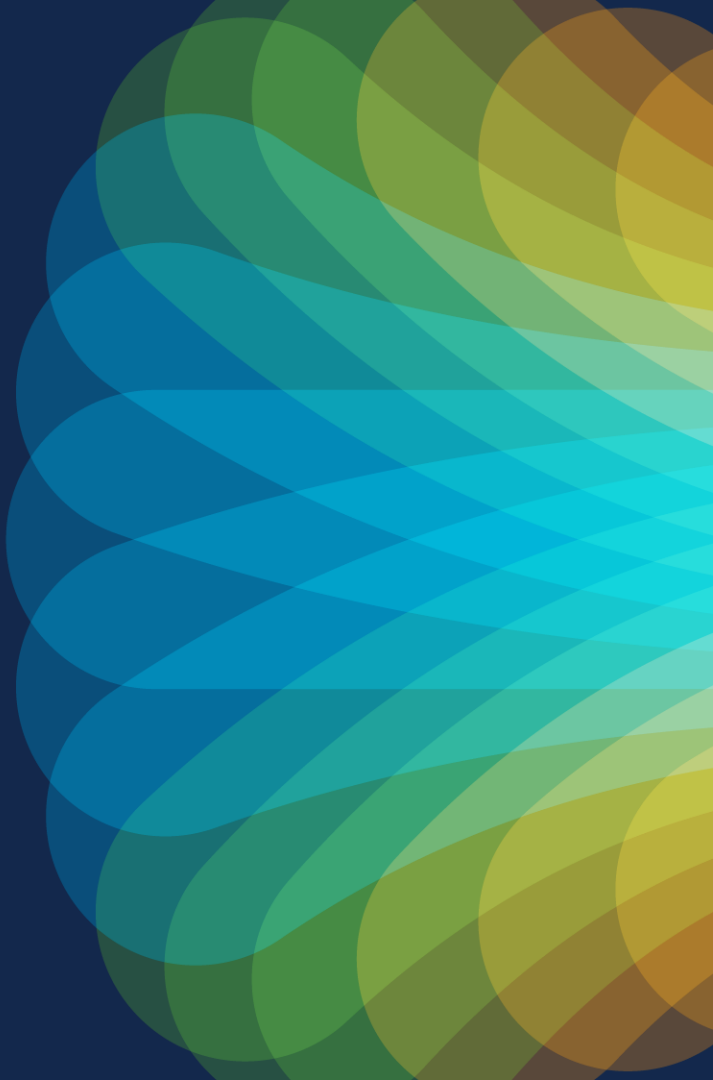
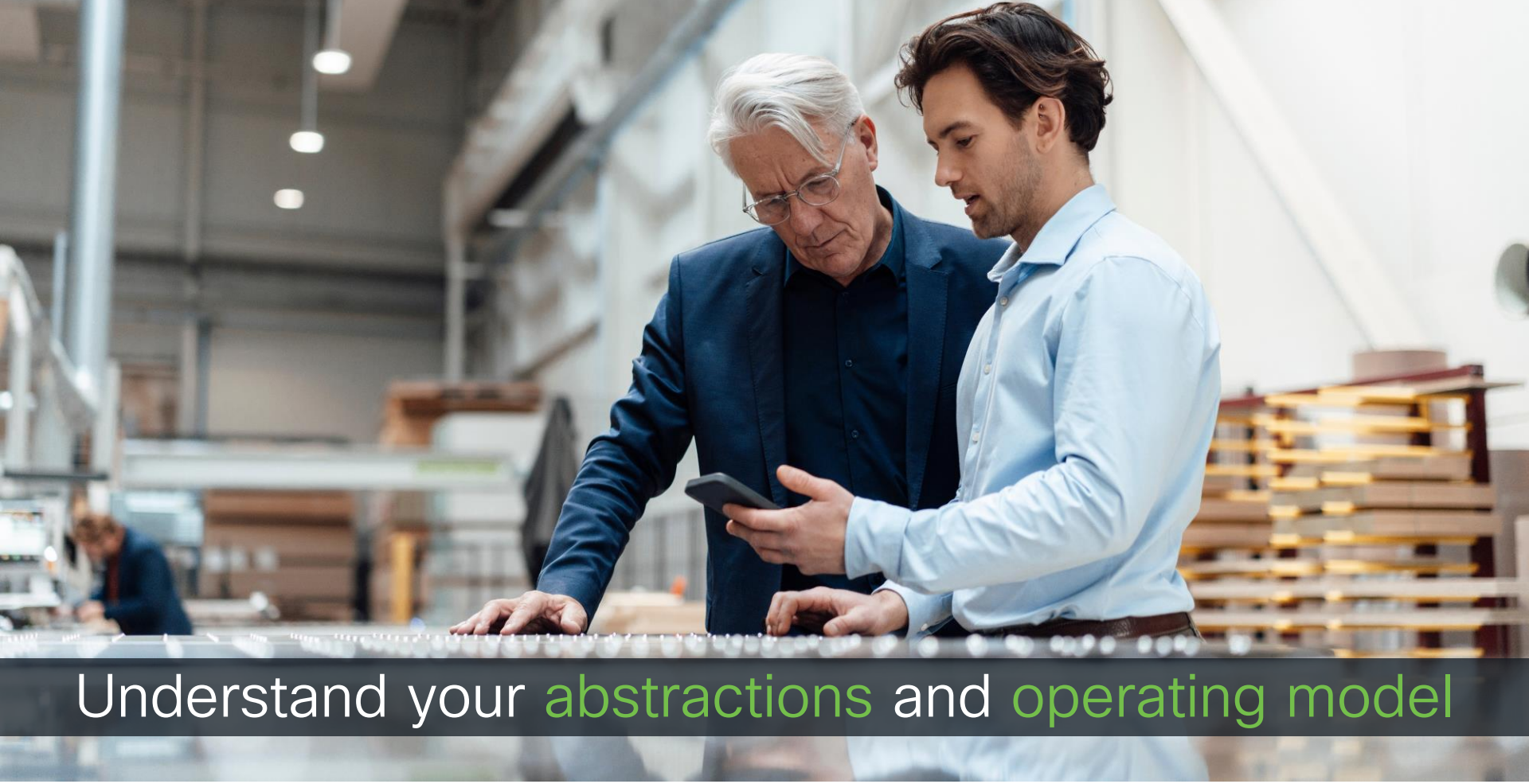
Demo

Key Takeaways





Understand your abstractions and operating model

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Let your operating model drive tool selection

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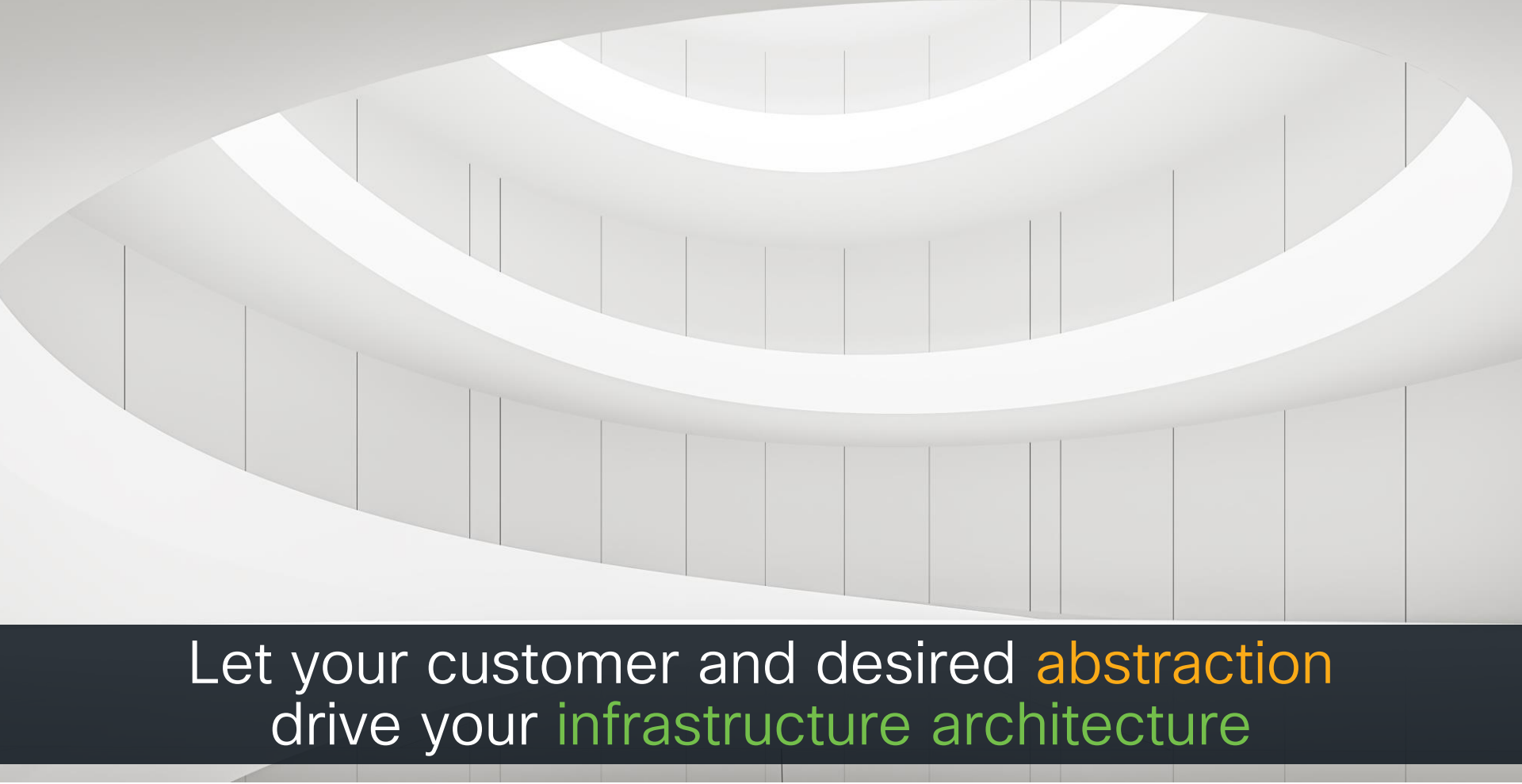

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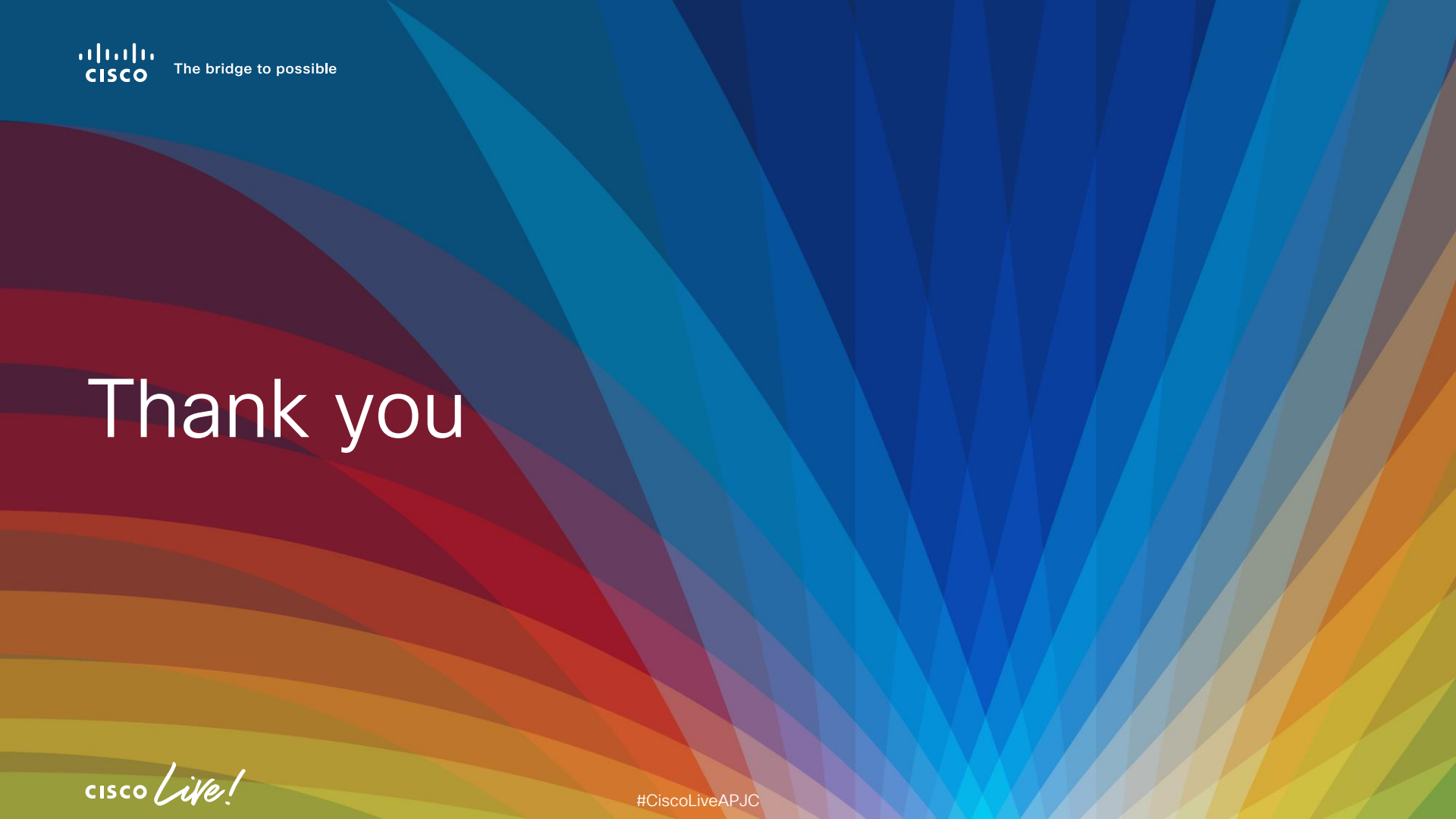
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