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The bridge to possible

From Zero to Managed Campus Using Cisco DNAC

Hector Morales, Sr. TSA, Global Partner Engineering

BRKGEN-1366

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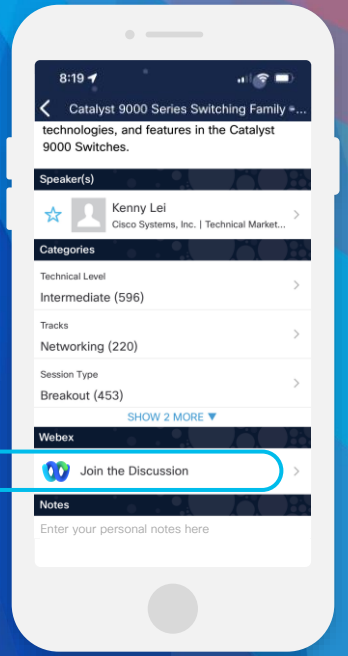
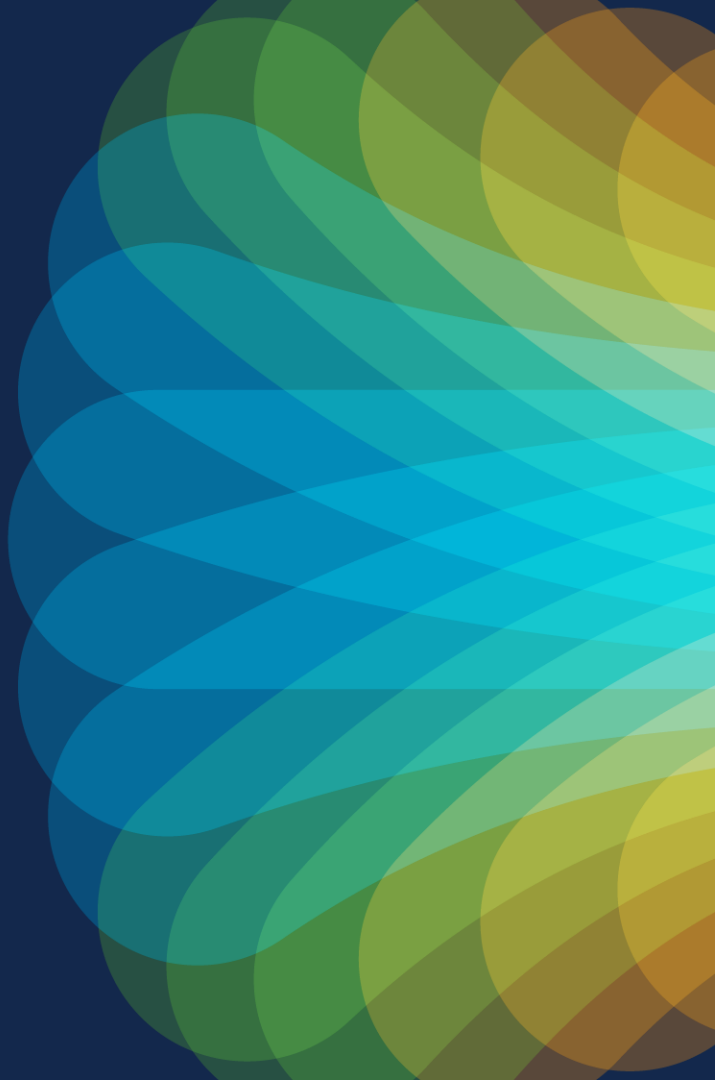


https://ciscolive.ciscoevents.com/ciscolivebot/#BRKGEN-1366

Agenda

- Customer issues, market evolution and challenges
- Managed Campus Solution Overview
- A deeper look
- Managed campus use cases
- Q&A

Customer issues

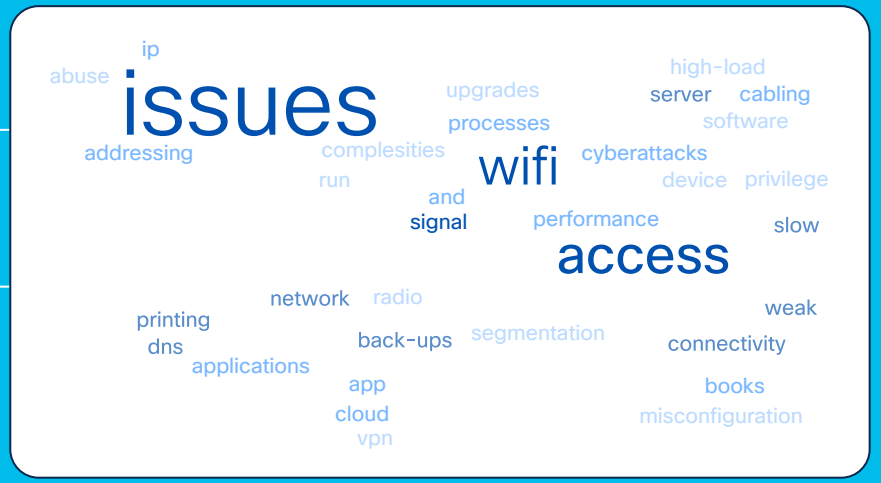


End customer issues during pandemic

Before COVID19 pandemic, internet traffic grew at 30% annually. In fall of 2020, internet traffic grew 20%[1]

VPN connectivity increased by 200% and campus traffic decreased by 55%[1]

According to Deloitte[2], cyber attacks increased in 2020 more than 130%, 47% more phishing scams at home and more than 500,000 attacks to video conference services



[1] Feltmann, A, et al. "A Year in Lockdown: How the Waves of COVID-19 Impact Internet Traffic", Communications of the ACM (2021): https://cacm.acm.org/magazines/2021/7/253468-a-year-in-lockdown/fulltext?mobile=false

[2] Deloitte (2022). "Impact of COVID-19 on Cybersecurity": https://www2.deloitte.com/ch/en/pages/risk/articles/impact-covid-cybersecurity.html

Digital Transformation is driving new business priorities

Transform processes and business models

- Foster innovations
- Decrease time to market

Empower the workforce with efficiency and innovation

- Increase productivity
- Boost retention

Personalize customer experiences

- Gain greater insights
- Increase loyalty

But new priorities raise IT and network complexity

Mobility

5-7X growth in business mobile traffic through 2022[1]

Cloud

71% of enterprises want consistent visibility and control across clouds[2]

IoT

19% CAGR growth of M2M connections from 2018-2023[1]

Security

$8.19 million was the average cost of a data breach in the U.S. in 2019[1]

By 2023, 29 billion devices will access the internet. That's nearly 4 devices per person (Cisco® analysis) 98% of all meetings will include participants joining from home (Cisco analysis)

[1] 2020 Cisco VNI: Global Fixed and Mobile Internet Traffic Forecasts

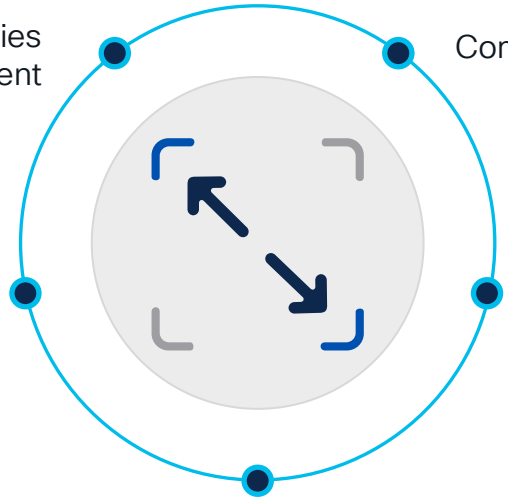
[2] September 2020, IDC Survey Spotlight (Shared Cross-Cloud Management Control Planes Become Enterprise Priority)

But also increased complexities

Provisioning, securing, and scaling are driving up operational costs

End-to-end policies definition and enforcement

Compliance requirements



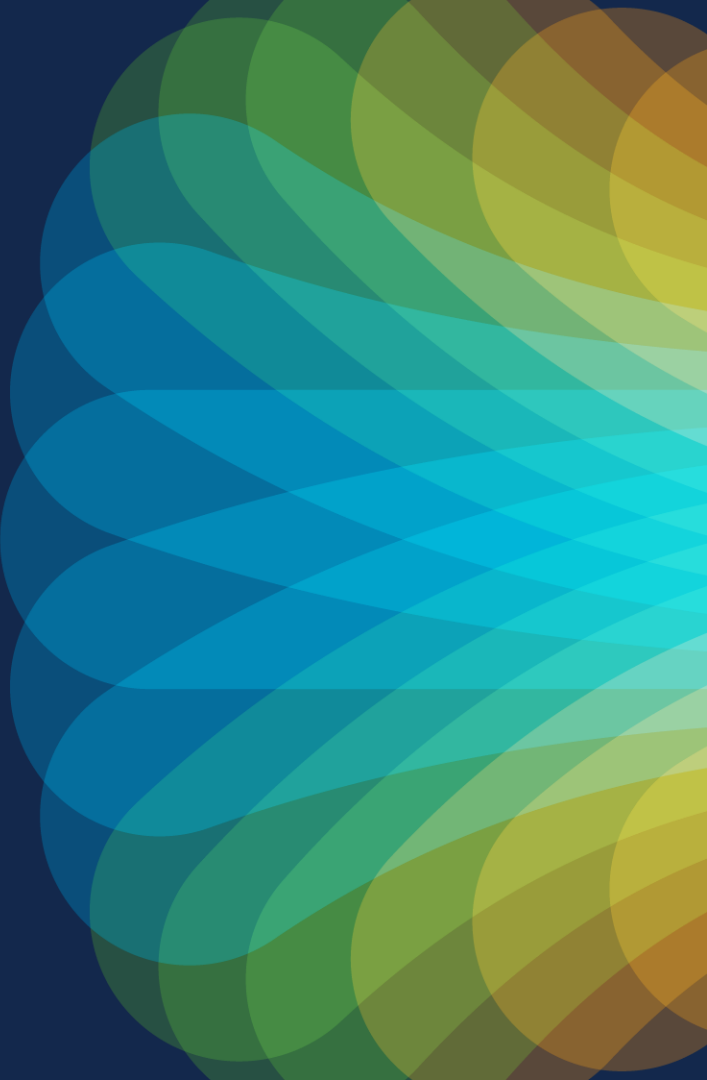
Constant updates for changes, additions, and deletions based on IP addresses

Users and IoT devices onboarding at scale

Traffic flow separation with VLAN, VRFs, and ACL configurations

95% of network changes are still performed manually.

Market evolution and challenges



Digital transformation
has been painful

Any company of any size and in any vertical or industry require to support a flexible, secure and scalable hybrid work operation

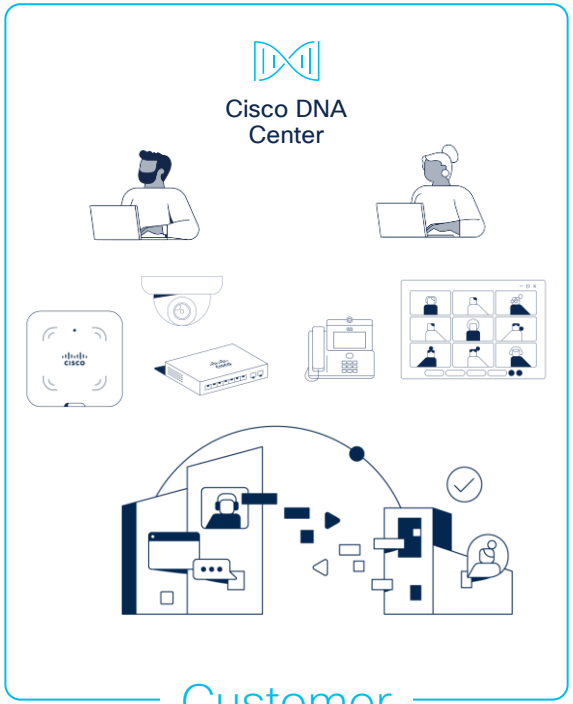
Employees are demanding flexibility with 64% saying the ability work from anywhere drives their decision to stay at a job

98% of all meetings will have at least one remote participant

Large enterprises face additional challenges:

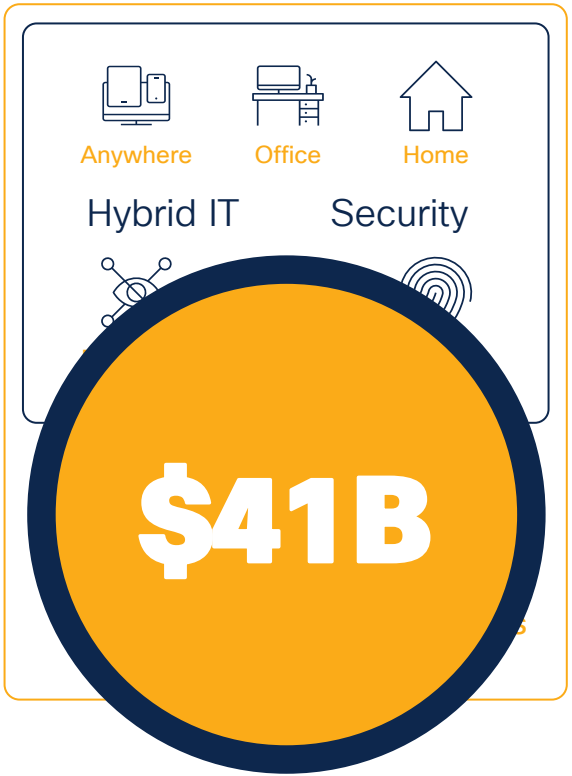
- Need quicker and more precise responses
- Effectiveness to change requests
- Secured environments
- Lower costs of deployment and operations

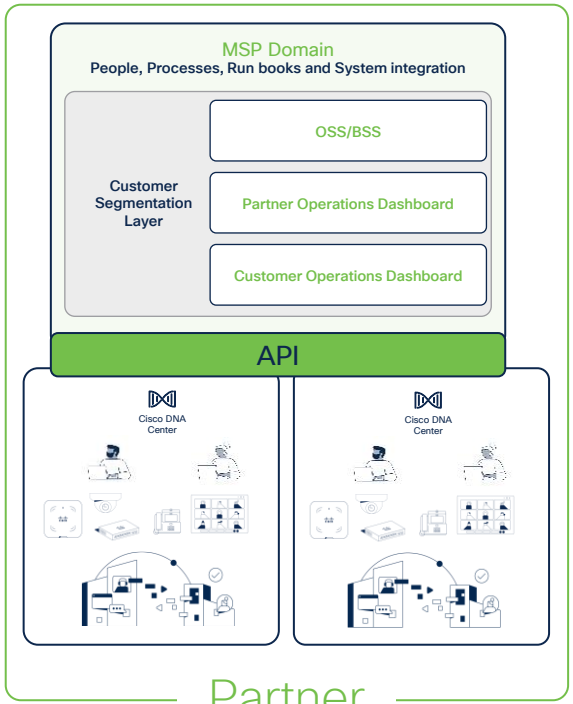
Market evolution



Customer

2017-2019





Partner

2023

Practical Realities of Digital Transformation

It can be hard and expensive

$60B

Annually spent on Network Operations, Labor & Tools[1]

95%

Network changes performed manually

75%

of Opex spent on changes and troubleshooting

70%

of Policy Violations are due to human error

1 Cisco McKinsey Study

The Managed Campus MSP Opportunity

Driving MSP Operational Value & Customer Outcome Value

MSP Operations & Integration

API integration to existing runbooks and systems

Optimizing APIs

Scale out with NetDevOps

Streamline operational process with automation

MSP Operational complexity

Phase 1

Monitoring

Guided workflows

Network topology visibility

Device inventory

Phase 2

Provisioning

Template provisioning

Image management

Device lifecycle management

Phase 3

Automation

Zero-touch provisioning

Automated upgrades

User and endpoint identification

Phase 4

Observability

Assurance

Guided remediation

User, client, device and aplication visibility

Phase 5

AI Operations

SD-Access

Encrypted Traffic Analylatics

Wireless 360

Thousand Eyes & AppD integration

Customer Value creation

Product Development

Service creation based on existing capabilities

SLAs mapped to KPI on service offers

Smooth integration to more complex systems and offers

Increased Partner profitability

Managed Campus Solution Overview

Introducing Cisco DNAC for Managed Services

Enables Extensive Network Control for MSPs

Onboard and monitor network devices through automation provisioning and management capabilities

Proactive insights and Analytics

Keep customers informed through automated, customisable reports and data analytics

OSS API Integration Ready

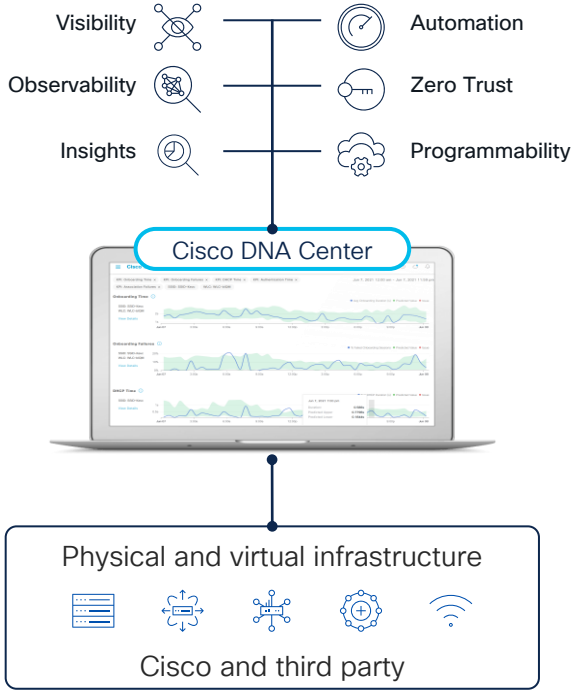
Easily integrate Cisco solutions with your portfolio and management systems

Simplified Service Creation

Quickly deploy utilizing Cisco Developer Resources

DNA Center delivers MSP operational value

Enabling MSPs to deliver business outcomes, smarter and faster at scale



NetOps — Increase Scale

- Providing customers with business resiliency, continuity, and quick time to value
- Enabling customers to achieve Compliance of network with config policies
- MSP automation to simplify the creation and maintenance of customers networks

SecOps — Improved Security

- AI-driven security to classify endpoints and enforce security policies for a complete zero trust workplace solution
- Automate end point visibility, classification, and grouping

DevOps — Improved Service Delivery

- Mature APIs, SDKs, and closed-loop integrations to simplify and streamline ecosystem integration
- Faster service delivery using API-based automation workflows
- Early issue detection and integration with 3rd party platforms through enhanced notification channels

AIOps — Improved Performance Insights

- Reduced proactive problem resolution through faster Root Cause Analysis
- AI-driven visibility, observability, insights, and troubleshooting to ensure the health your customers applications, infrastructure and user experience

DNA Center

Powered for MSP integration

Event Notifications

- Assurance Issues
- AI/ML Insights
- System Health
- Integration Connectivity
- License Management
- Webhooks
- PagerDuty
- Email
- Syslog
- SNMP

Northbound REST APIs

- Network Inventory
- Network Topology
- Network Design
- Provisioning
- SWIM, PnP
- Path Trace
- Assurance
- SDA
- Templates
- RMA
- Config Archive
- Sensors

IT Ecosystem Integrations

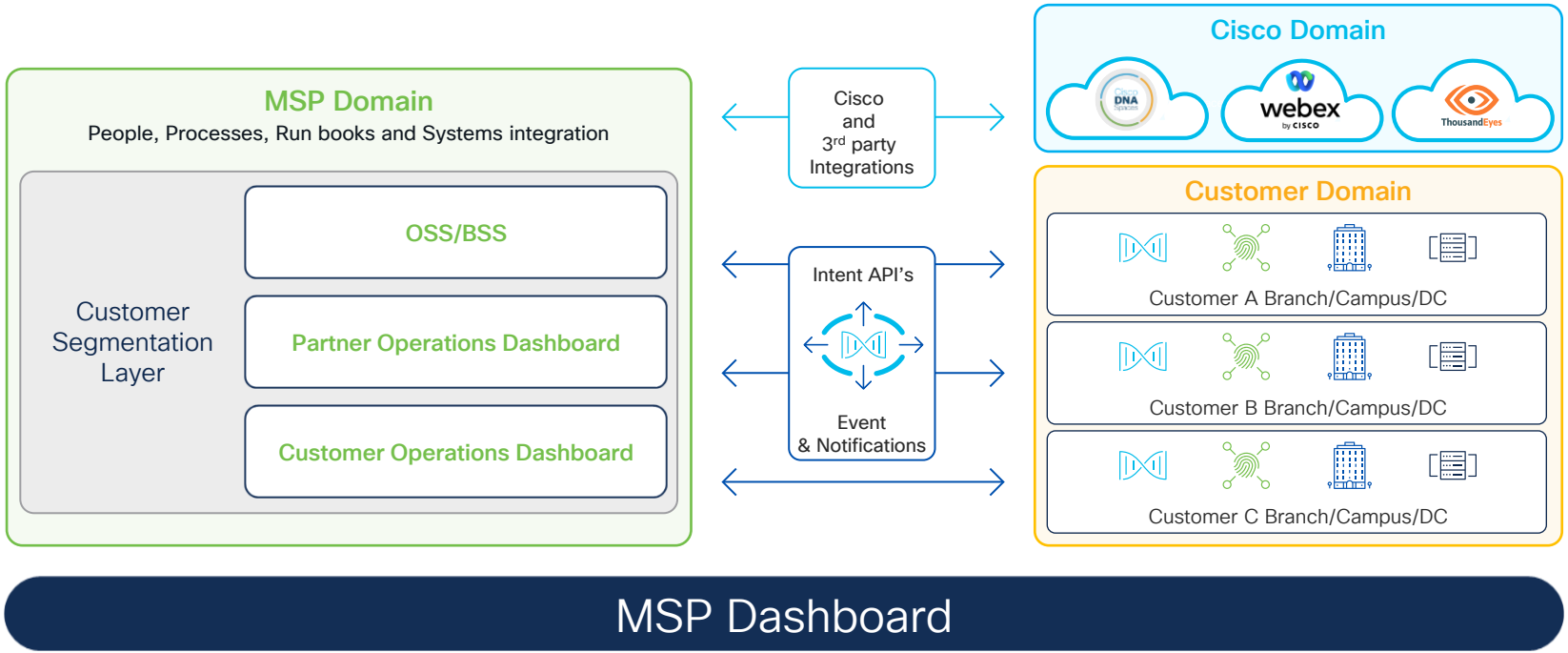
- IT Service Management
- IP Address Management
- Reporting
- Wireless Planning
- Alerting
- SIEM

Developer Resources

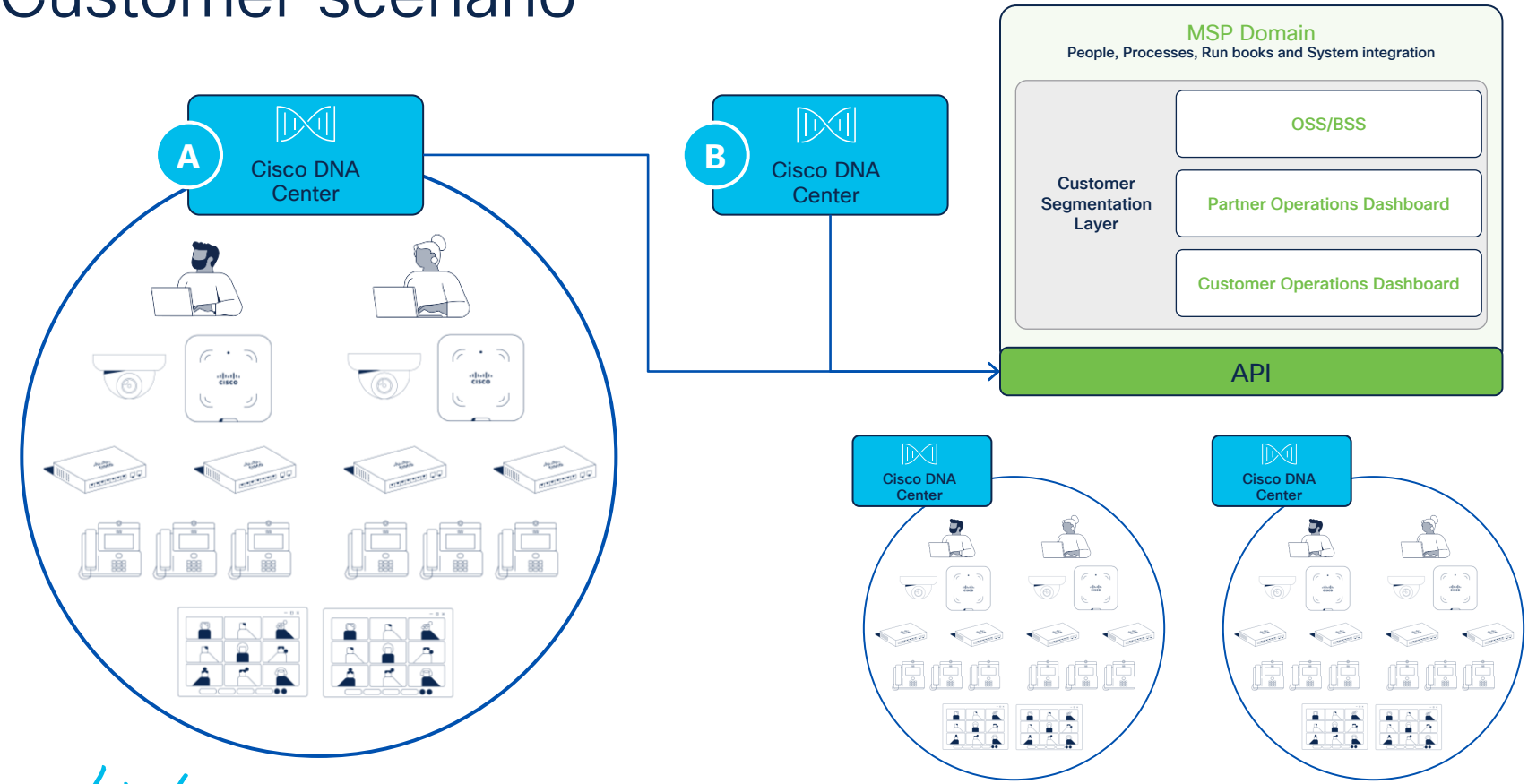
- Sample Code, Videos
- Python SDK, Ansible, Terraform
- Cisco DevNet
  - Sandboxes, Learning Labs
  - Developer Guides
  - Sample Code

Managed Campus: scaling to multiple customers

Enabling MSPs to create and support DNAC Services at scale



Customer scenario



Managed Campus Solution: a deeper look

Cisco DNAC Intent API

Northbound

The Intent API is a REST API that exposes specific capabilities of the Cisco DNA Center platform.

Provides policy-based abstraction of business intent, allowing focus on an outcome rather than struggling with individual mechanisms steps.

The RESTful Cisco DNA Center Intent API uses HTTPS verbs (GET, POST, PUT, and DELETE) with JSON structures to discover and control the network.

Intent API hierarchies:

- Authentication domain
- Know your network domain
- Site management
- Connectivity
- Operational Tasks
- Policy
- Event Management

Cisco DNAC Event and Notifications

Eastbound

The Cisco DNA Center platform provides the ability to establish a notification handler when specific events are triggered, such as Cisco DNA Assurance and Automation (SWIM) events.

This mechanism enables external systems to take actions in response to an event. For example, a custom application could execute a software upgrade action in response to notification of network devices that are out of compliance.

Notifications may also be triggered by events internal DNA Center events. For example, Assurance events can be customized for IT Service Management incidents.

Cisco DNAC Integration API

Westbound

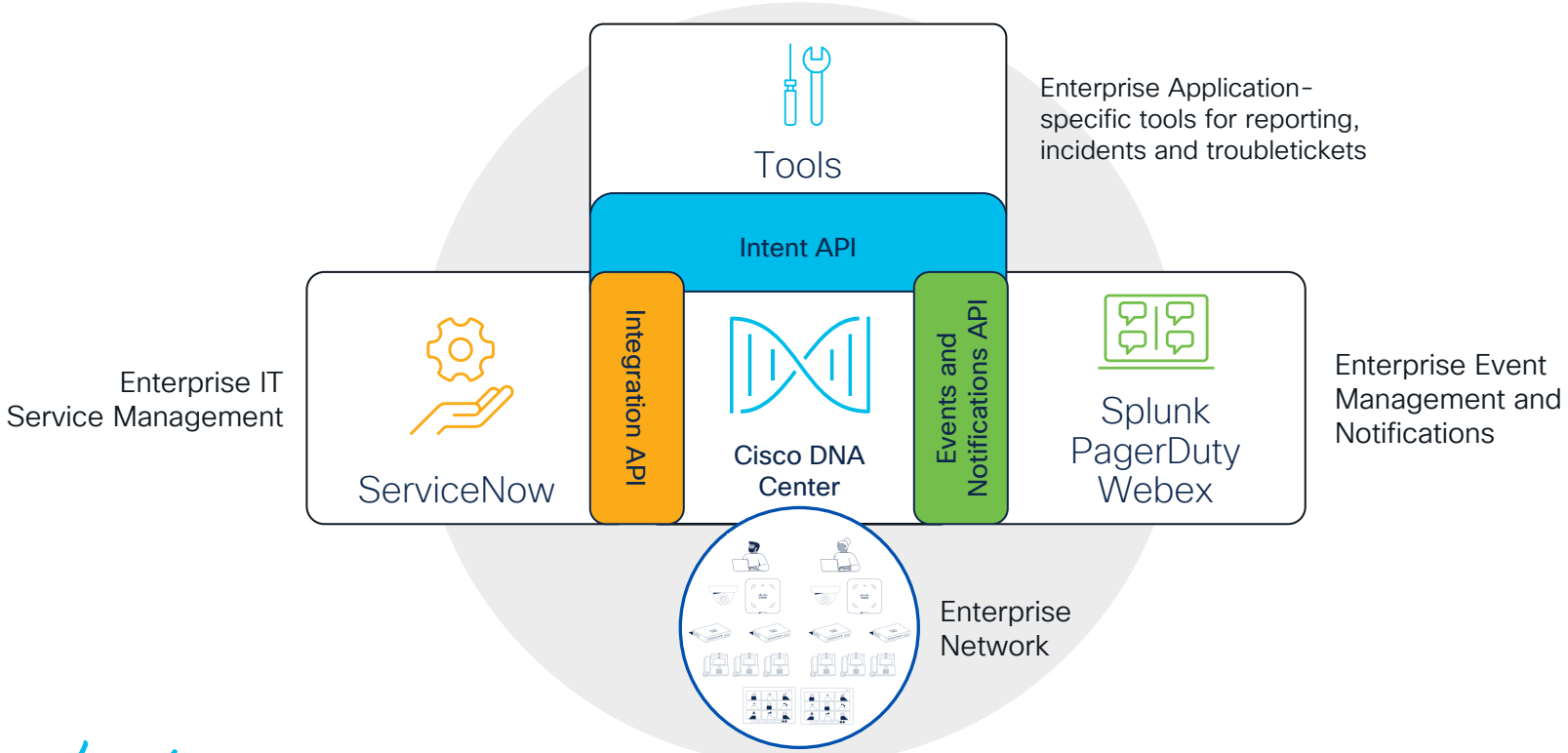
The Cisco DNA Center platform provides mechanisms for integrating Cisco DNA Assurance end-to-end workflows and data with third-party IT Service Management (ITSM) solutions.

ITSM minimizes handoffs, reduces duplication of issues, and optimizes processes by integrating the Cisco DNA Center platform into incident-management, change-management and problem-management systems. Integrates the Cisco DNA Center platform into approval- and pre-approval chains, and it links the Cisco DNA Center platform with formal change- and maintenance-window schedules.

DNAC also Integrates with Reporting and Analytics capabilities for capacity planning, asset management, compliance control, and auditing.

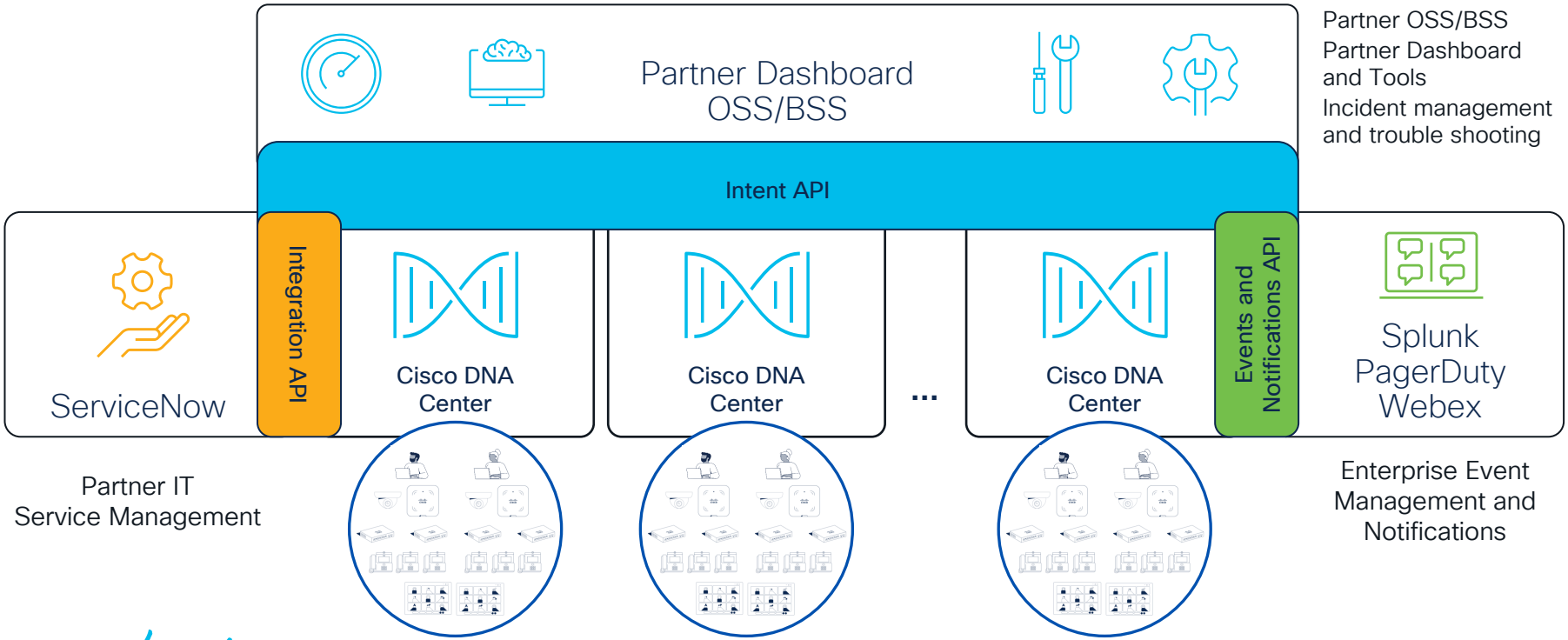
Cisco DNAC architecture

Enterprise ITIL Management



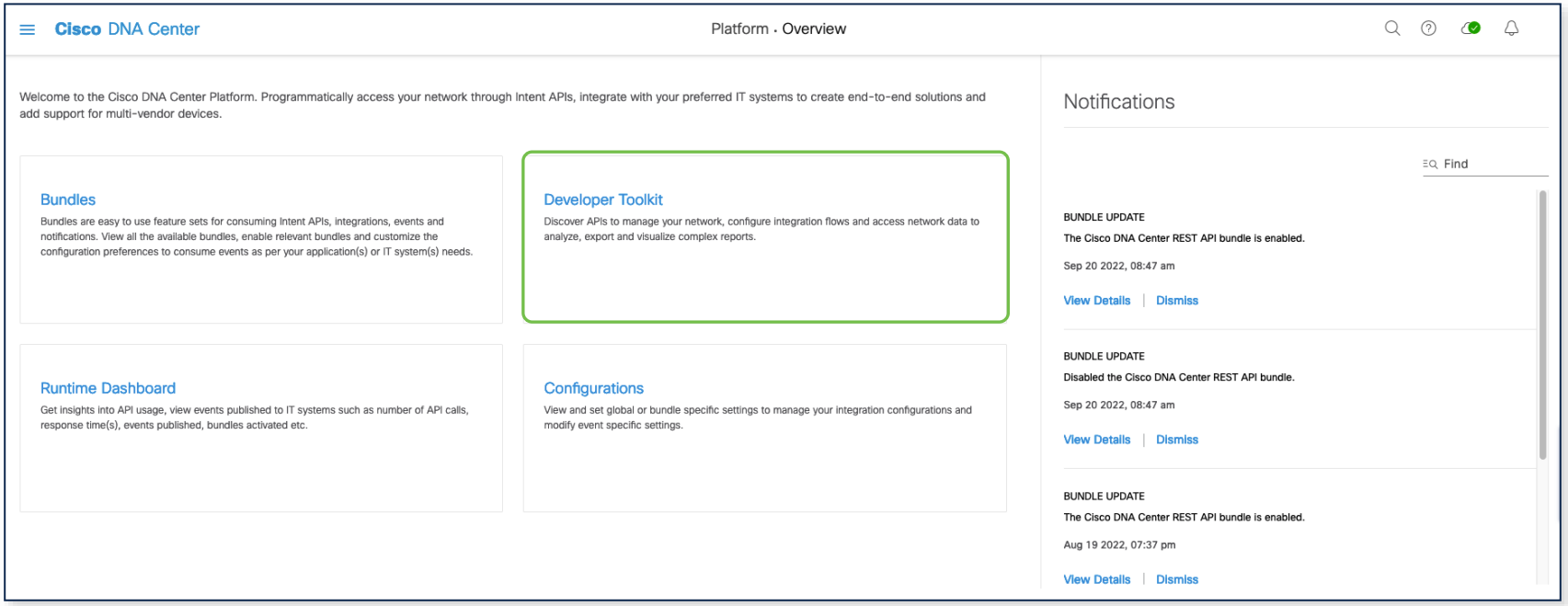
Cisco DNAC architecture

Ready for MSPs



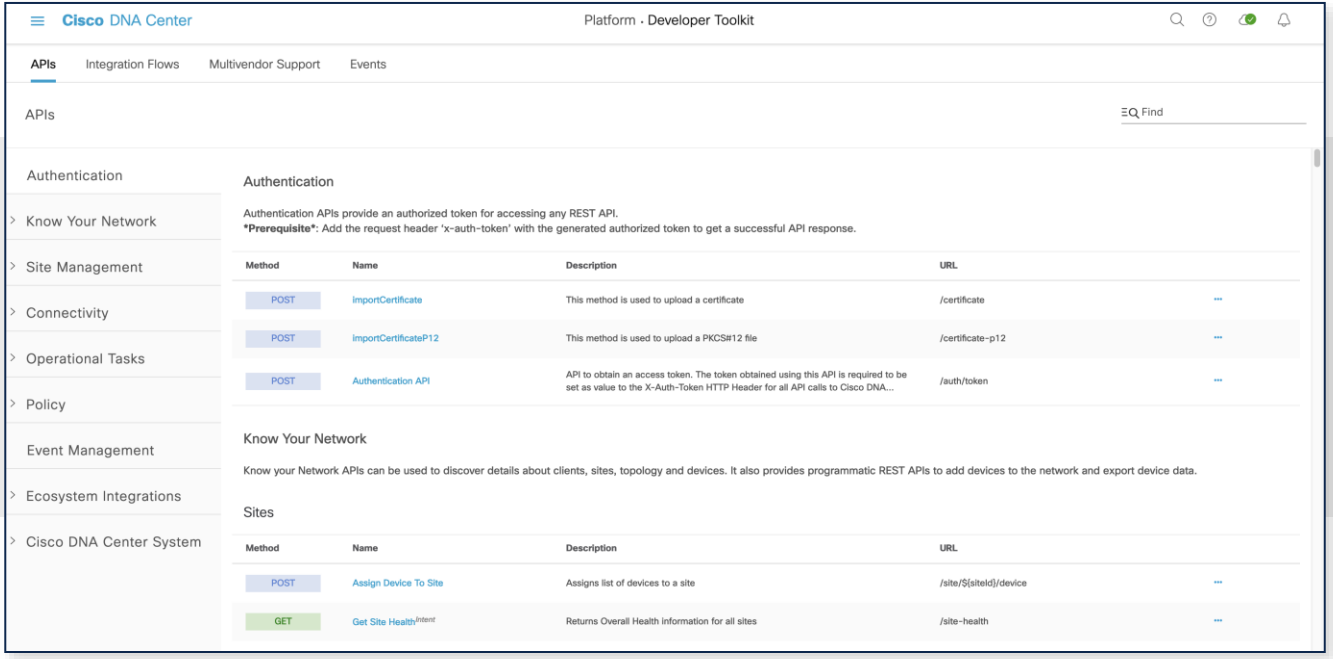
Cisco DNA Center

Platform overview



Cisco DNA Center

APIs usage and documentation



Authentication

POST	Authentication API	API to obtain an access token. The token obtained using this API is required to be set as value to the X-Auth-Token HTTP Header for all API calls to Cisco DNA...	/auth/token

```
def get_token(dnac_ip,uname,passwd):
    token = requests.post(
        'https://' + str(dnac_ip)+ '/dna/
        auth=HTTPBasicAuth(
            username=uname,
            password=passwd
        ),
        headers={'content-type': 'applica
        verify=False,
    )
    data = token.json()
    return data['Token']
```

```
# DNAC code
# Define variables
dnac_ip = <Your DNAC DNS/IP>
username = <Your DNAC username>
password = <Your DNAC password>

token = get_token(dnac_ip, username, password)

print(token)
```

General instructions to call a DNAC API

```python
# Headers
headers = {'content-type': 'application/json','x-auth-token': token}

sites = get_sites(BASE_URL, SITE_URL, headers)
```

```python
# Authentication
BASE_URL = 'https://dnac-79.infra.ciscomsx.com'
AUTH_URL = '/dna/system/api/v1/auth/token'
# URLs
SITE_URL = '/dna/intent/api/v1/site'
SITE_COUNT_URL = '/dna/intent/api/v1/site/count'
MEMBERSHIP_SITE_URL = '/dna/intent/api/v1/membership/{site_id}'
SITE_HEALTH_URL = '/dna/intent/api/v1/site-health'
ISSUES = url = '/dna/intent/api/v1/issues'
```

```python
# Get list of sites
def get_sites(BASE_URL, URL, headers):
    response = requests.get(BASE_URL + URL,
                            headers=headers, verify=False)
    return response.json()['response']
```

Monitoring your network

Site

GET	Get Site Health *Intent*	Returns Overall Health information for all sites	/site-health
GET	Get Site *Intent*	Get site using siteNameHierarchy/siteId/type ,return all sites if these parameters are not given as input.	/site
GET	Get Membership *Intent*	Getting the site children details and device details.	/membership/${siteId}
GET	Issues *Intent*	Intent API to get a list of global issues, issues for a specific device, or issue for a specific client device's MAC address.	/issues

Monitoring your network

Topology

GET	Get VLAN details	Returns the list of VLAN names	/topology/vlan/vlan-names
GET	Get Physical Topology	Returns the raw physical topology by specified criteria of nodeType	/topology/physical-topology
GET	Get L3 Topology Details	Returns the Layer 3 network topology by routing protocol	/topology/l3/${topologyType}
GET	Get Site Topology	Returns site topology	/topology/site-topology
GET	Get topology details	Returns Layer 2 network topology by specified VLAN ID	/topology/l2/${vlanID}
GET	Get Overall Network Health *Intent*	Returns Overall Network Health information by Device category (Access, Distribution, Core, Router, Wireless) for any given point of time	/network-health

Monitoring your network

Issues

GET	Issues *Intent*	Intent API to get a list of global issues, issues for a specific device, or issue for a specific client device's MAC address.	/issues


```
{
   "issueId":"04f6c371-5b98-433b-98b2-375d67b6e95c",
   "name":"Excessive time lag between Cisco DNA Center and device \"MSX-OTT02-CAT3650-01\"",
   "siteId":"",
   "deviceId":"0ed45671-ec6f-4b66-9ab8-a919d31008f5",
   "deviceRole":"",
   "aiDriven":"",
   "clientMac":"",
   "issue_occurence_count":1,
   "status":"active",
   "priority":"",
   "category":"",
   "last_occurence_time":1682364608000
```

Monitoring your network

Issues

GET	Get Issue Enrichment Details *Intent*	Enriches a given network issue context (an issue id or end user's Mac Address) with details about the issue(s), impacted hosts and suggested actions for...	/issue-enrichment-details


```
"issueDetails":{
  "issue":[
    {
      "issueId":"04f6c371-5b98-433b-98b2-375d67b6e95c",
      "issueSource":"Cisco DNA",
      "issueCategory":"Device",
      "issueName":"device_time_drift",
      "issueDescription":"The time on Cisco DNA Center and Device \"MSX-OTT02-CAT3650-01\"
      "issueEntity":"network_device",
      "issueEntityValue":"0ed45671-ec6f-4b66-9ab8-a919d31008f5",
      "issueSeverity":"HIGH",
      "issuePriority":"P3",
      "issueSummary":"Excessive time lag between Cisco DNA Center and device \"MSX-OTT02-CA
      "issueTimestamp":1682364608000,
      "deviceId":"0ed45671-ec6f-4b66-9ab8-a919d31008f5",
```

```
"suggestedActions":[
  {
    "message":"Check time on the Device",
    "steps":[
      {
        "entityId":"0ed45671-ec6f-4b66-9ab8-a919d31008f5",
        "description":"Check system time",
        "command":"show clock",
        "stepType":"command-Runner",
        "runButton":null
      }
    ]
  },
```

Monitoring your network

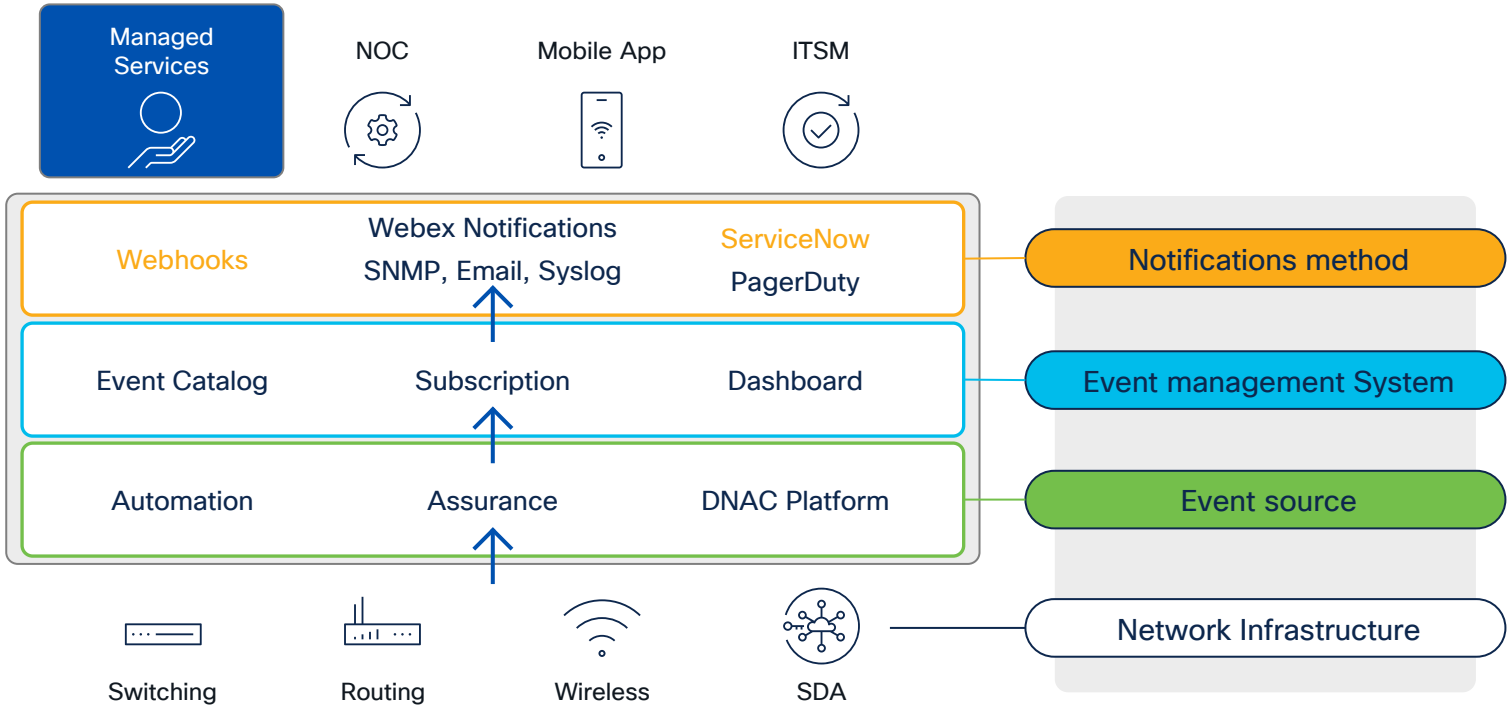
Health and Performance

```python
# Get System Health
def get_system_health (BASE_URL, URL, headers):
    response = requests.get(BASE_URL + URL,
                            headers=headers, verify=False)
    print(response)
    return response.json()
```

Note: this response does not have the 'response' key in the json response

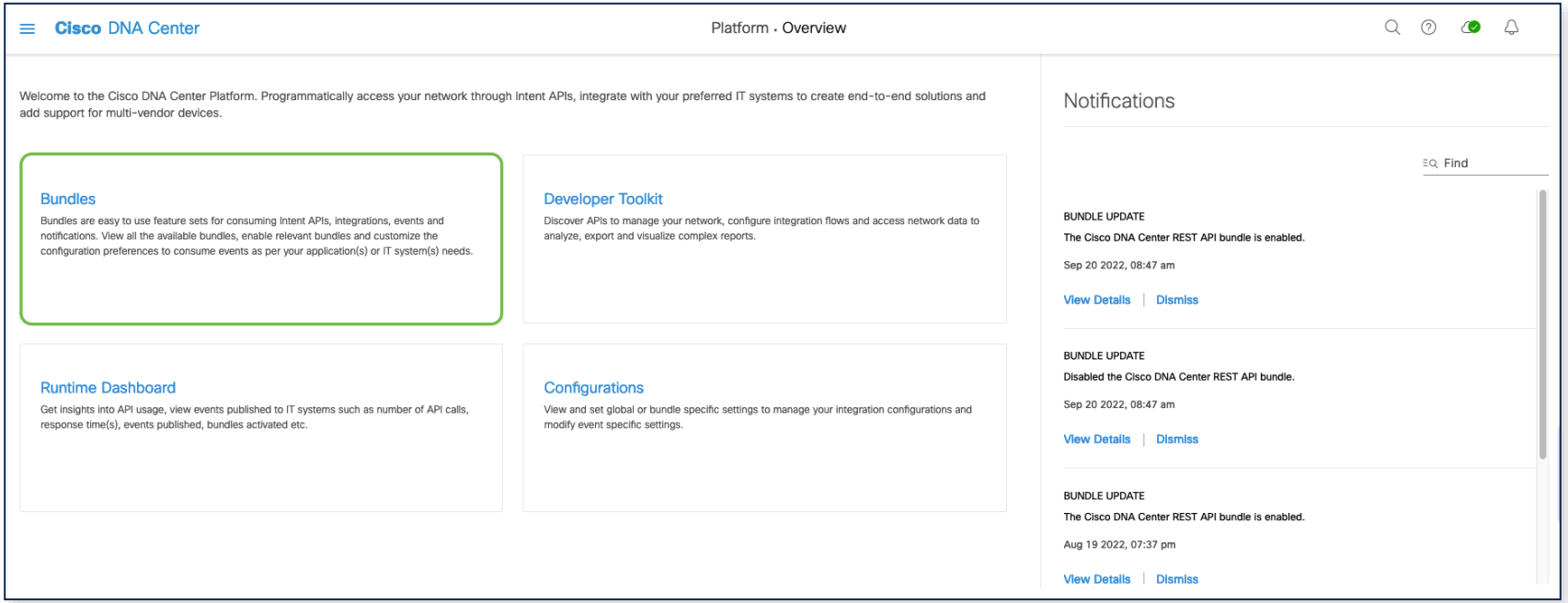
GET	System Health Count API *Intent*	This API gives the count of the latest system events	/diagnostics/system/health/count
GET	System Health API *Intent*	This API retrieves the latest system events	/diagnostics/system/health
GET	System Performance Historical API *Intent*	This API retrieves the historical performance indicators . The data can be retrieved for the last 3 months.	/diagnostics/system/performance/history
GET	System Performance API *Intent*	This API gives the aggregated performance indicators. The data can be retrieved for the last 3 months.	/diagnostics/system/performance

DNAC Notifications Framework



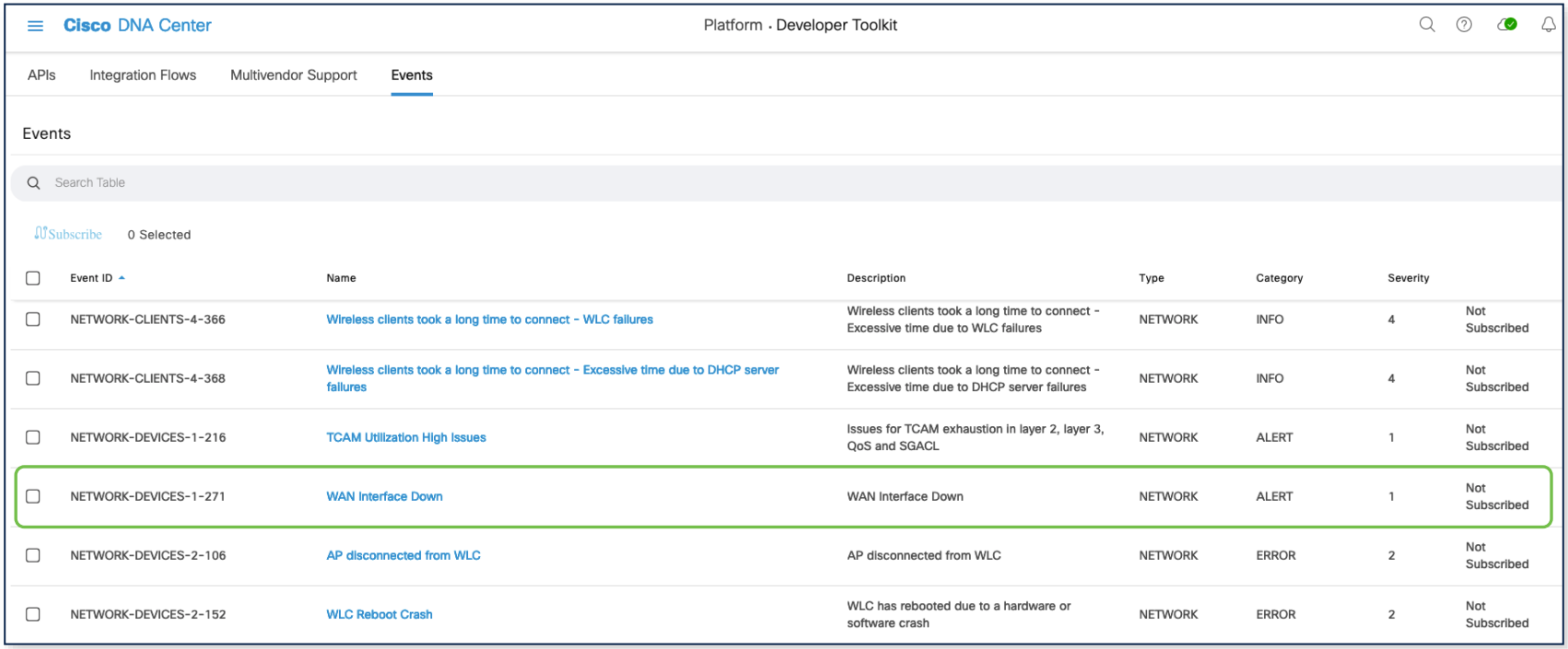
Cisco DNA Center

Platform overview



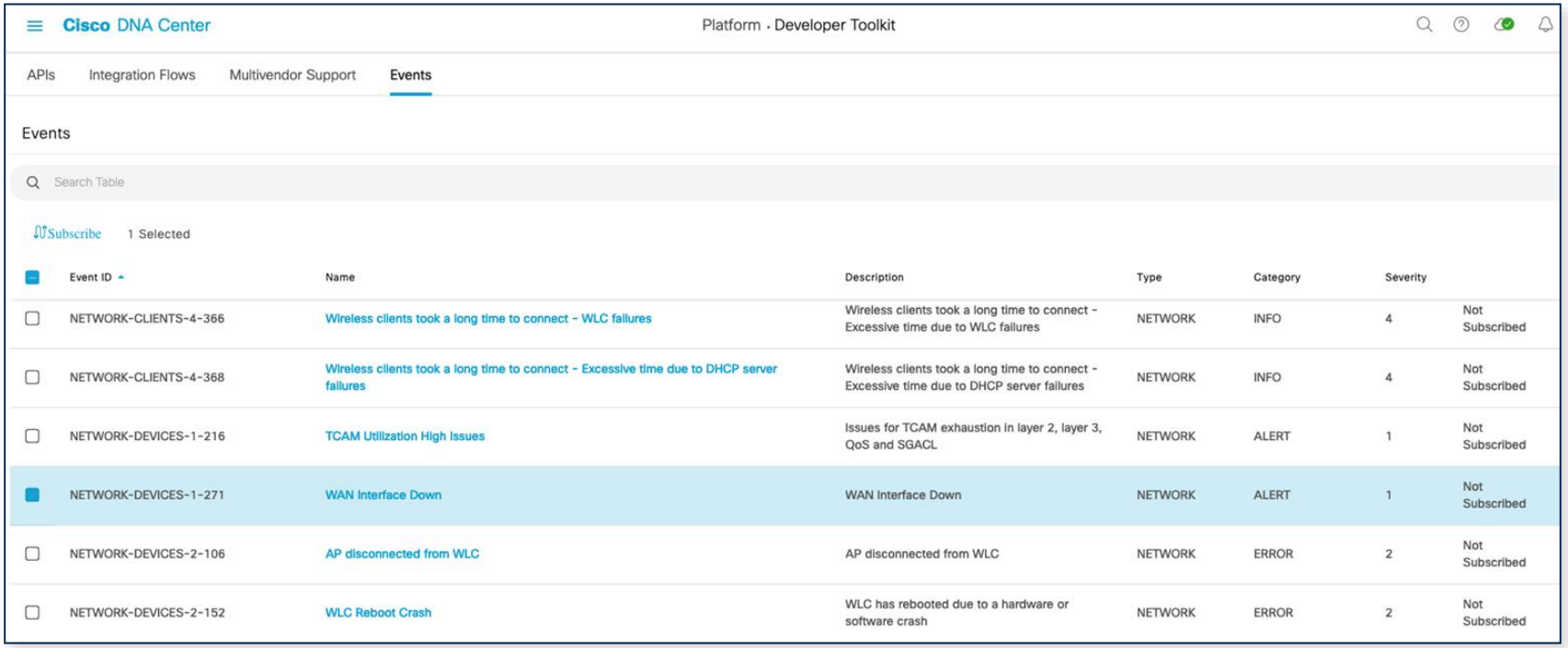
Events notifications

Subscription



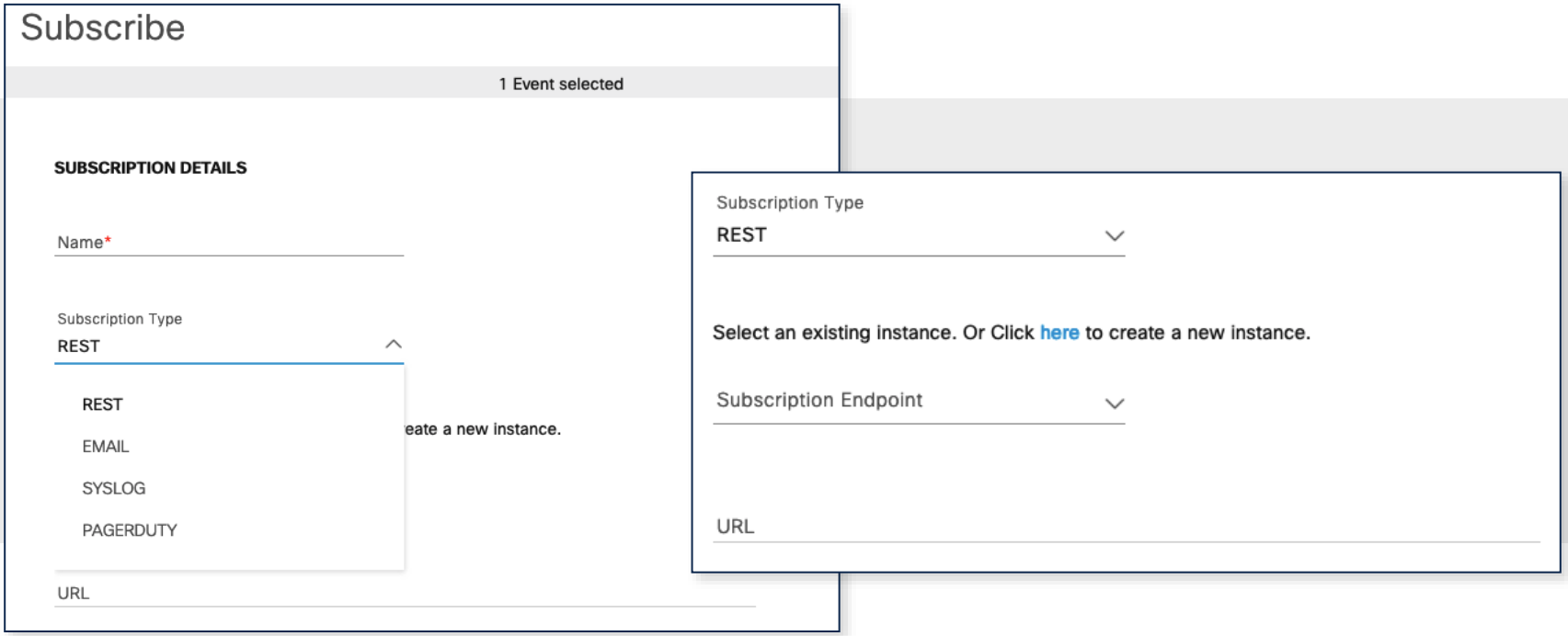
Events notifications

Subscription (Cont.)



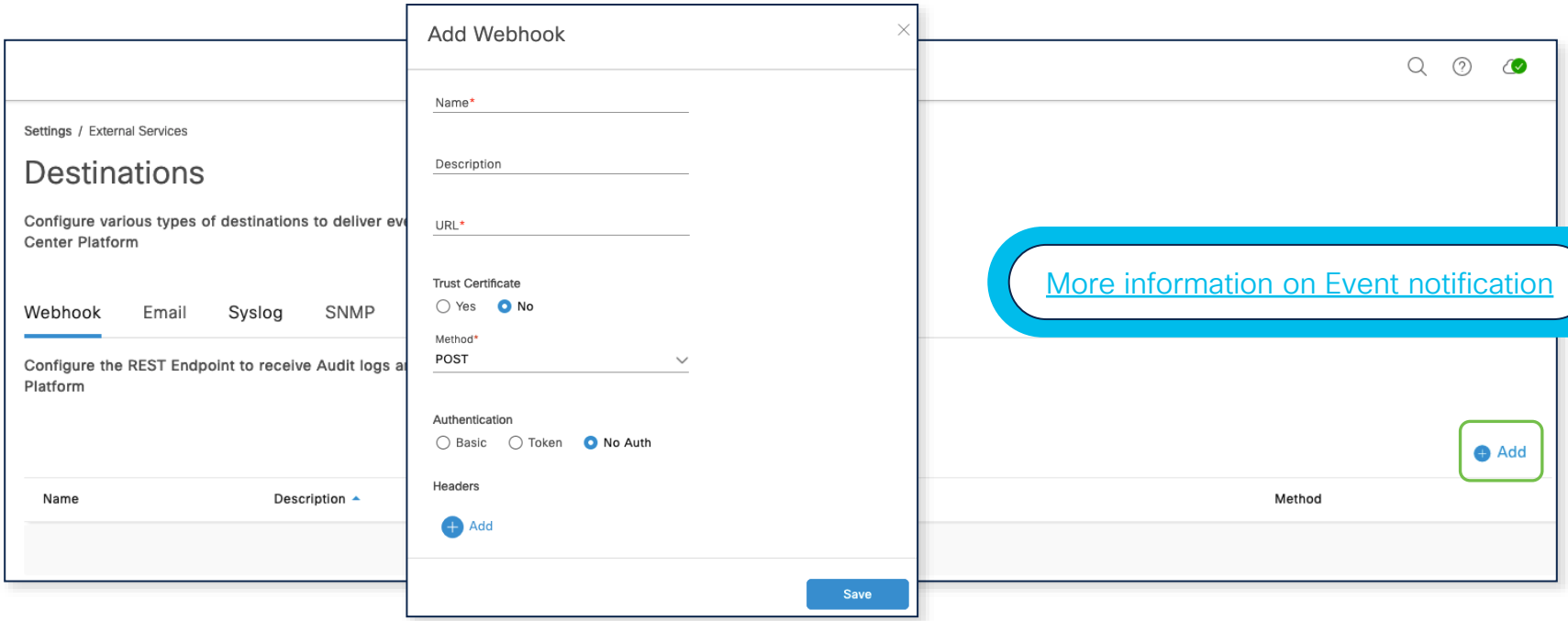
Events notifications

Subscription (Cont.)



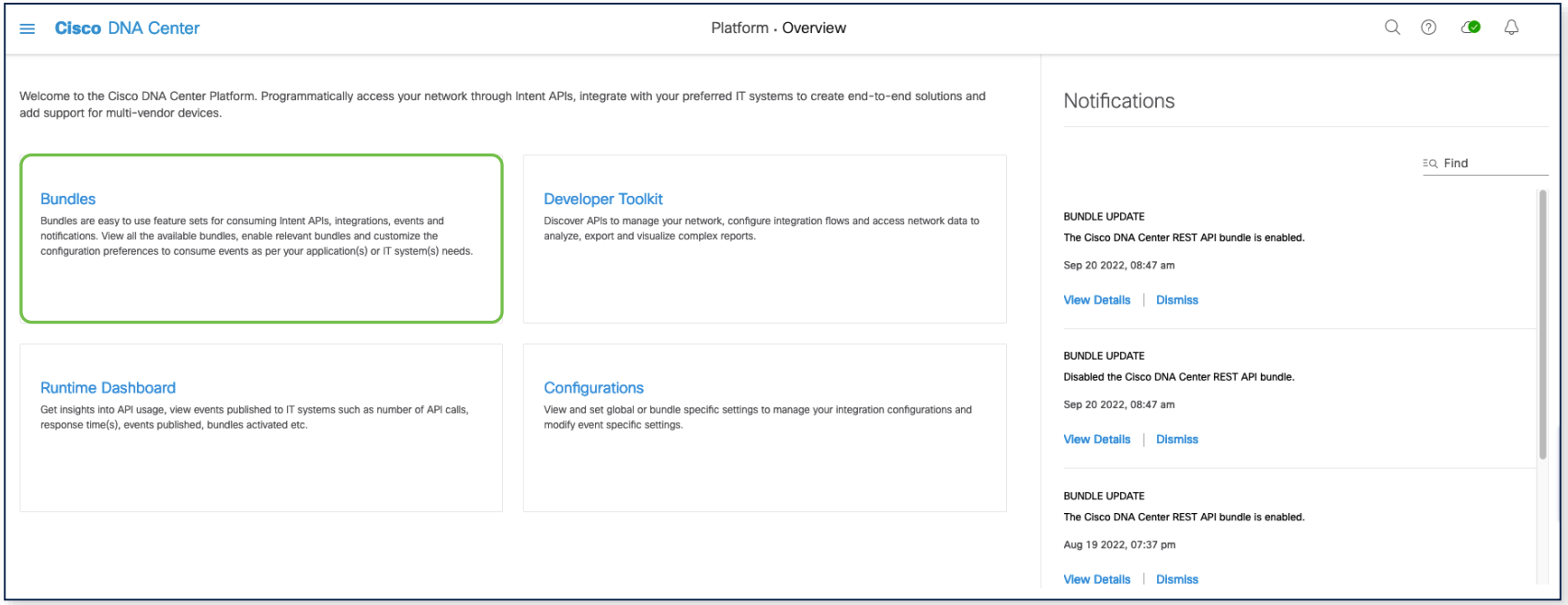
Destinations

Add a webhook



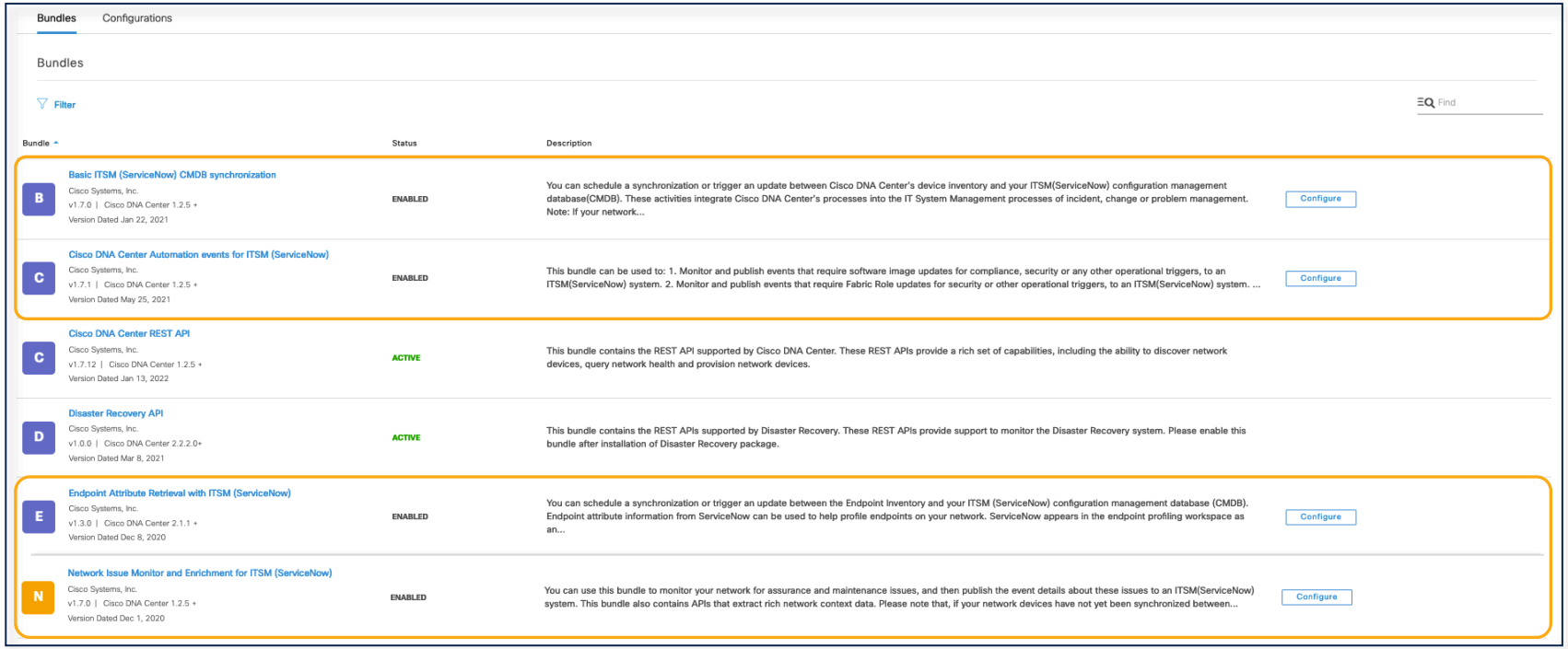
Bundle Integrations

ServiceNow integration

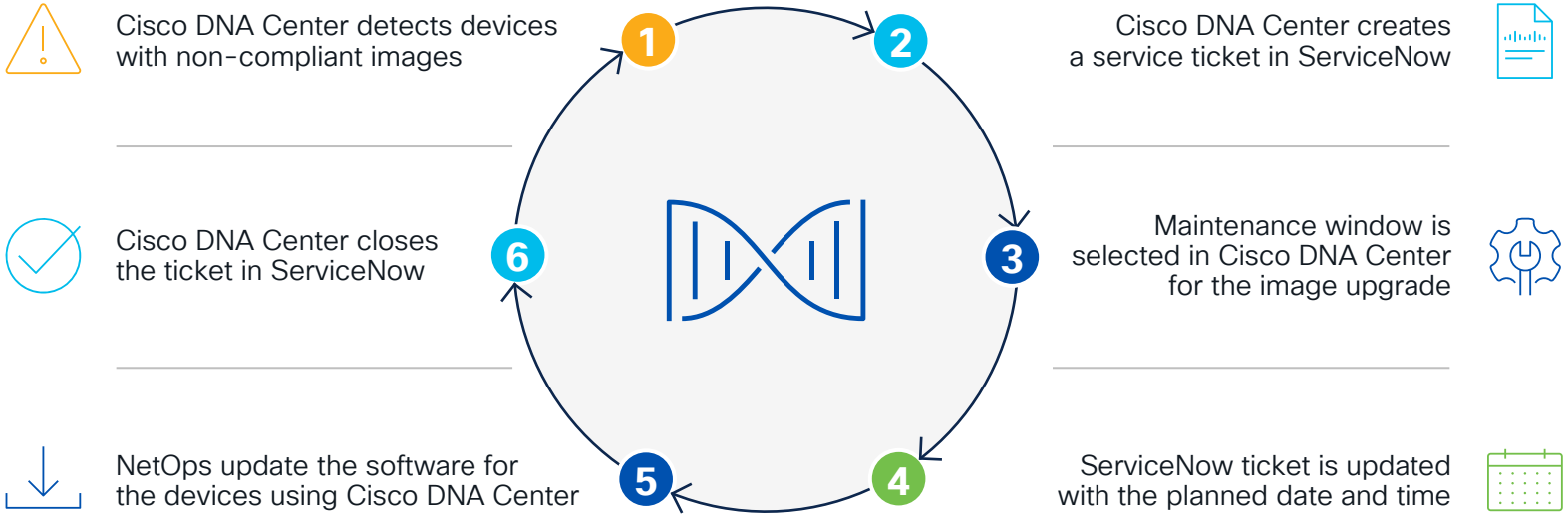


Bundles

ServiceNow



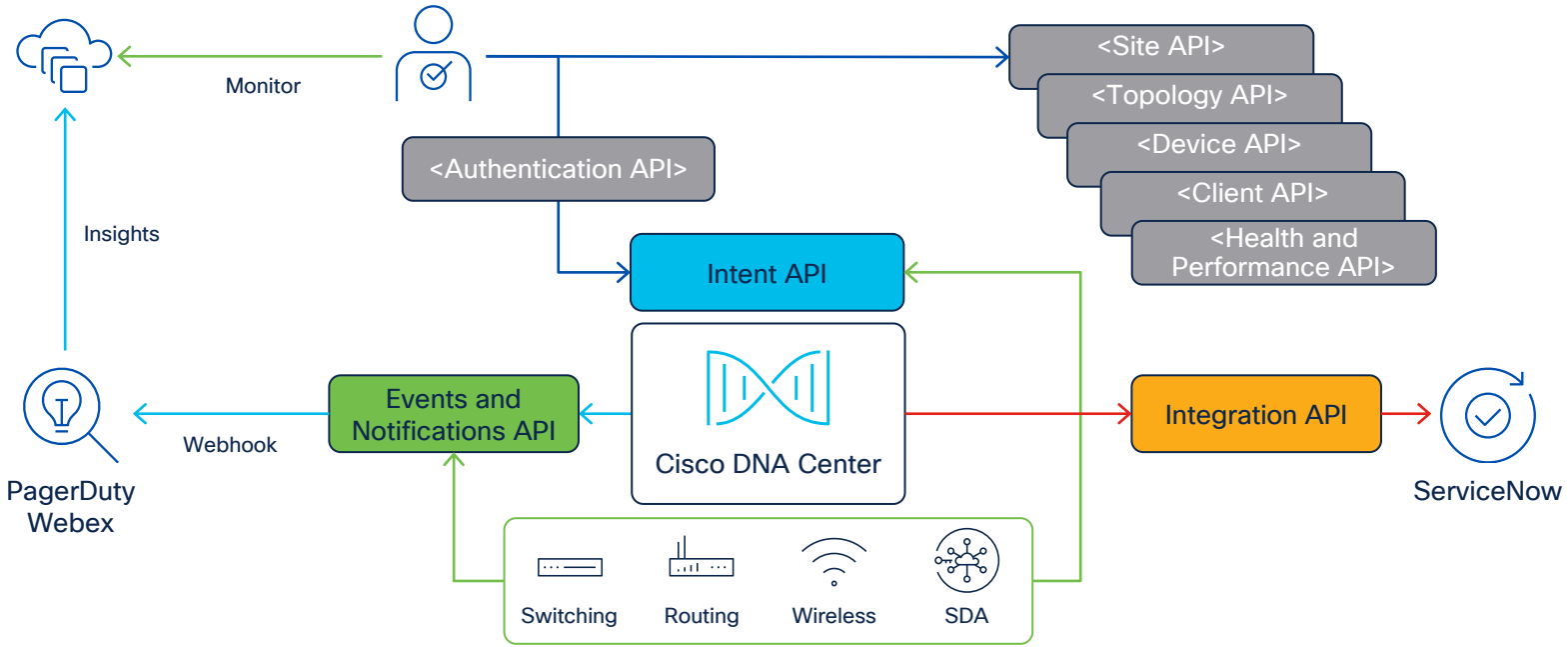
Closed-Loop ITSM integration example for MSPs



https://developer.cisco.com/dnacenter/integrationapis/

A quick review

Managed Campus

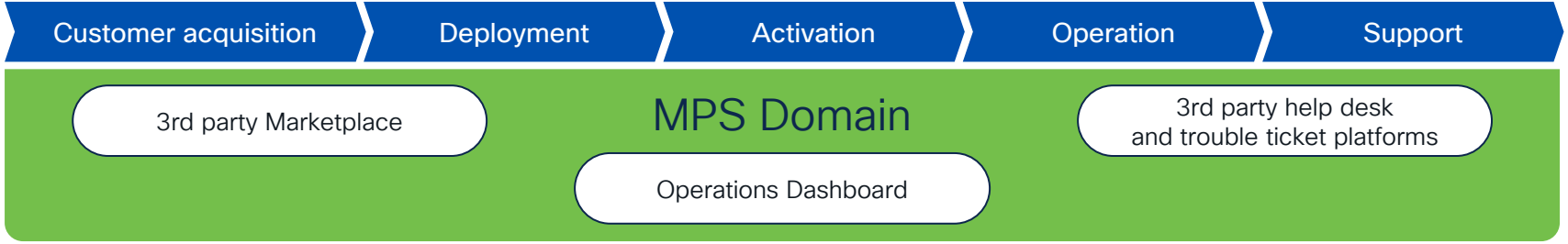


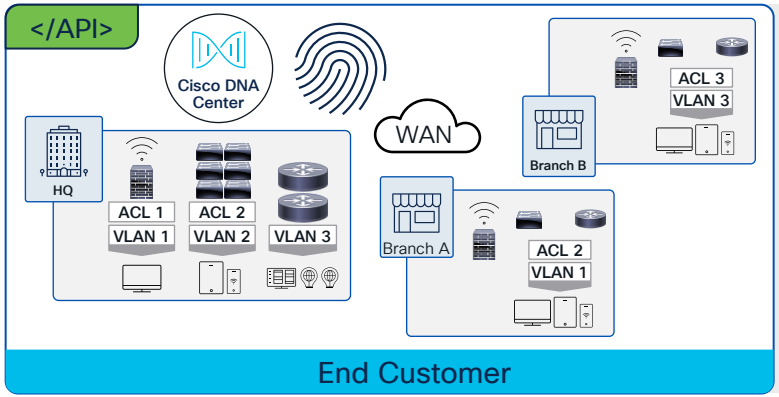
Putting everything together – Light demo

Managed Campus Use Cases

Managed Campus Services Lifecyle

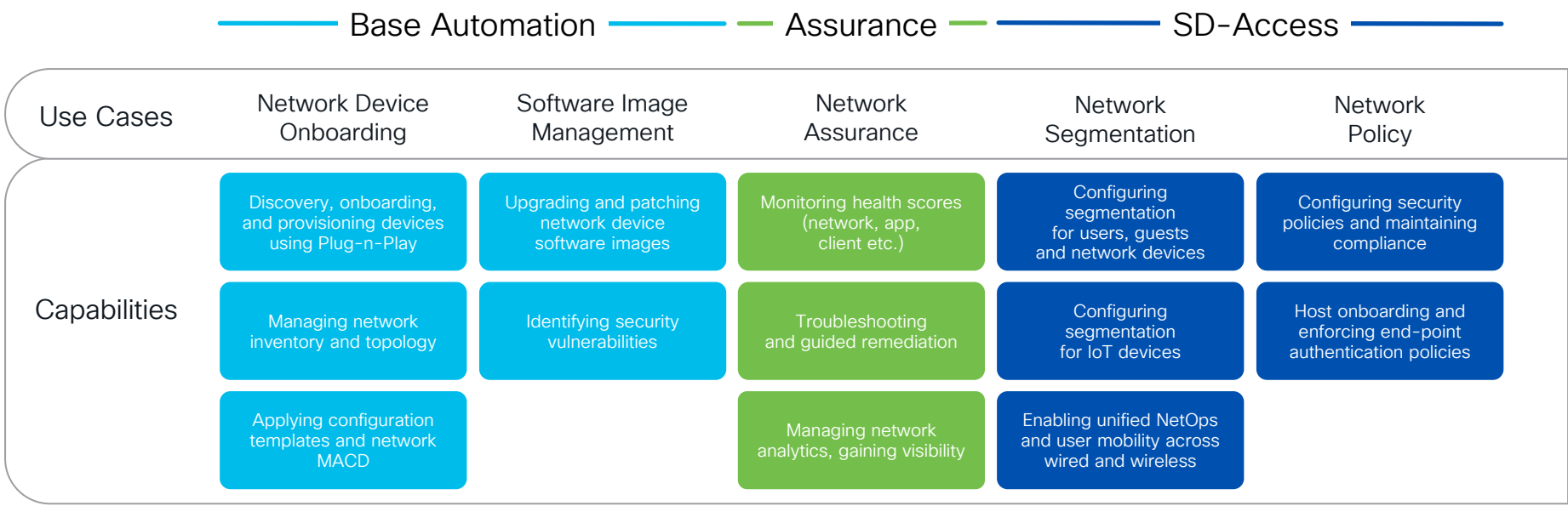
MSP Operations for Direct Managed DNAC



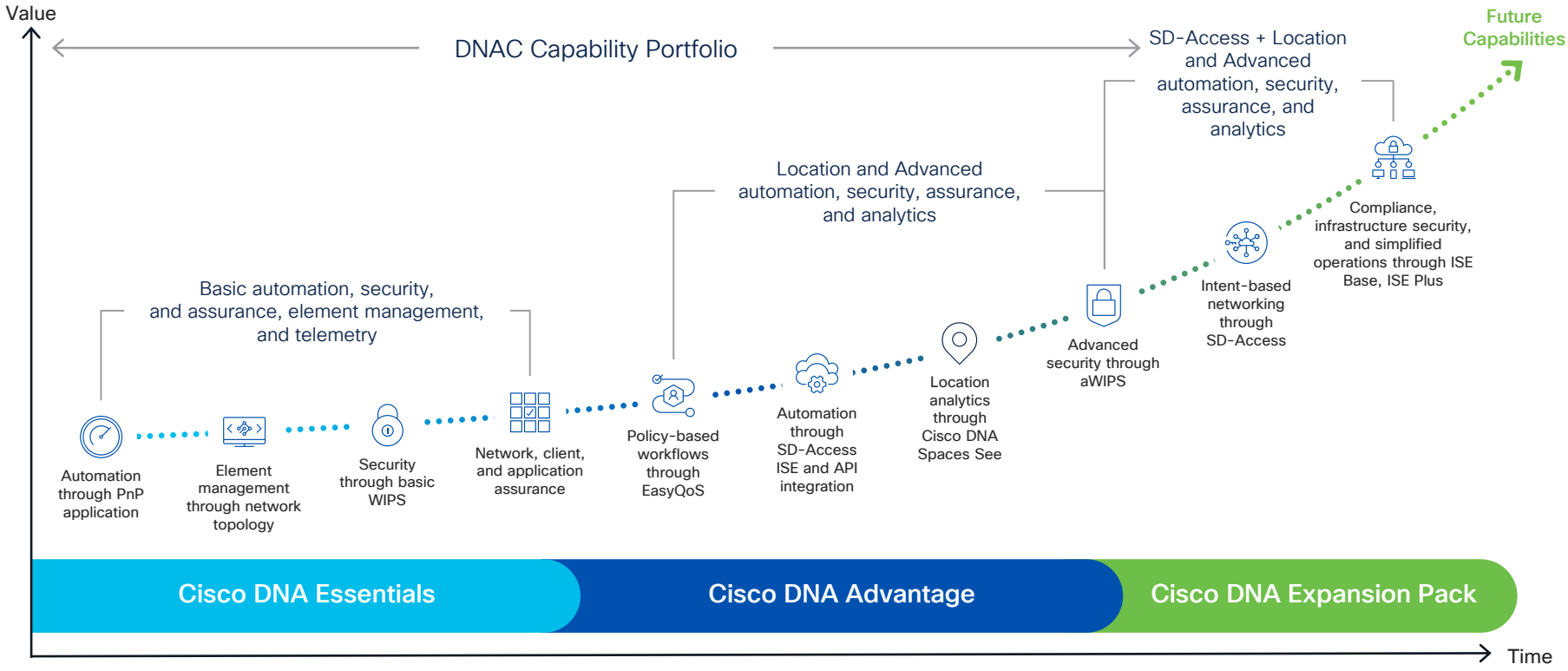


- MSP owns the service Lifecyle
- Managing infrastructure cases:
  - End customer owns all infrastructure including DNAC
  - End customer, owns network infrastructure, MSP manages it using DNAC
  - MSP owns and manage all network infrastructure using DNAC
- MSP might offer the service using a home-grown dashboard or a marketplace
- Deployment, activation and operations are done via DNAC API's and integrations
- Support might be offer with standard help desk and trouble ticketing platforms with DNAC integration

Use Case Capabilities



Increasing Customer Value and MSP Profitability



Managed Campus Packaging

- Managed Infrastructure
- Fully Managed Campus
- Managed Automation

+

ISE Policy Control (SD-Access)*

3 Primary Offers

+ SD-Access Add-on

*Optional add-on offer for access infrastructure

Comprehensive Managed Campus Offers

Model based on customer technology ownership

If Customer has: | They need:

DNA Center Capabilities	Campus Network Infrastructure	Campus Management Capabilities	ISE Policy Control (SD-Access)*	**Offers**
✓	✓	✗	+	Managed Infrastructure
✗	✓	✗	+	Managed Automation
✗	✗	✗	+	Fully Managed Campus

*Optional add-on offer for access infrastructure

First step into managed Cisco Managed Campus journey

There's a model to fit each customer's mixed environment

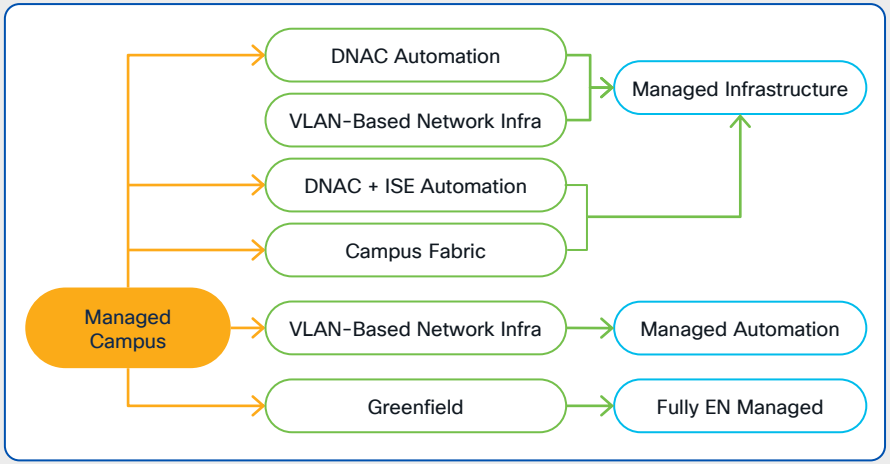
Your journey is unique

Do Managed Campus your way

Every organization has different:

- Investments (Technology investment)
- Architectures (Technology mix)
- Managed Requirements (Managed class)

Digital Transformation Plans



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Talk to one of our **subject matter experts** in our Booth #2217

Meet the Engineer, Sanjit Aiyappa (Meeting Zone or request a meeting in our Booth)

Find our Booth in the World of Solutions

Attend/listen to other Partner Managed Services relevant sessions

BRKNWT-2208 - Driving network automation through application visibility and event correlation

BRKGEN-2000 - Demystifying Cisco FSO Stack APIs- Building a secure code pipeline with Concourse CI and Vault Integration

DEVNET 2778 - Using IOT + Collab + Meraki API's for a safer return to the school

BRKIOT-1127 - Build pervasive wireless mobility in industrial environment

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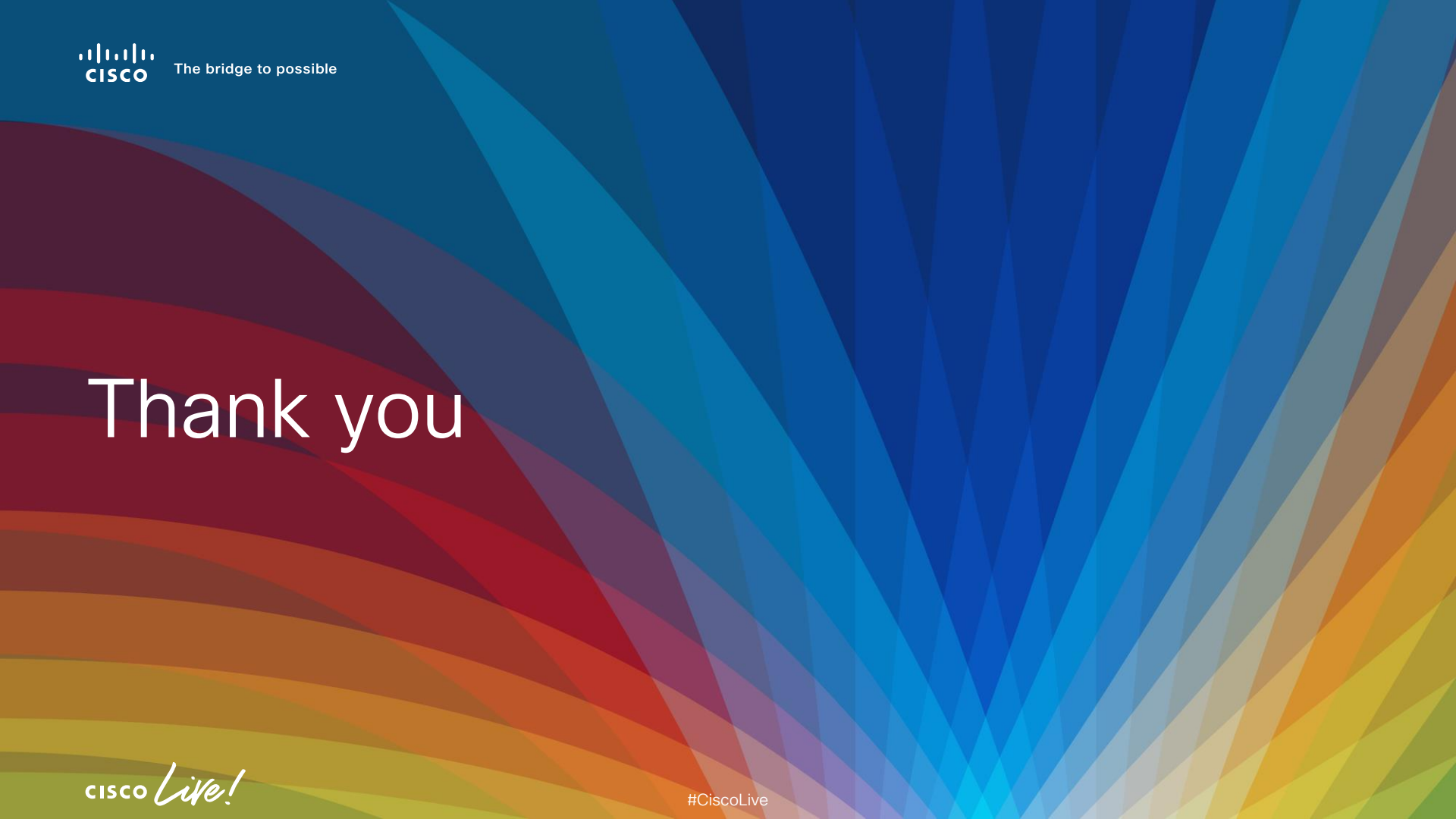
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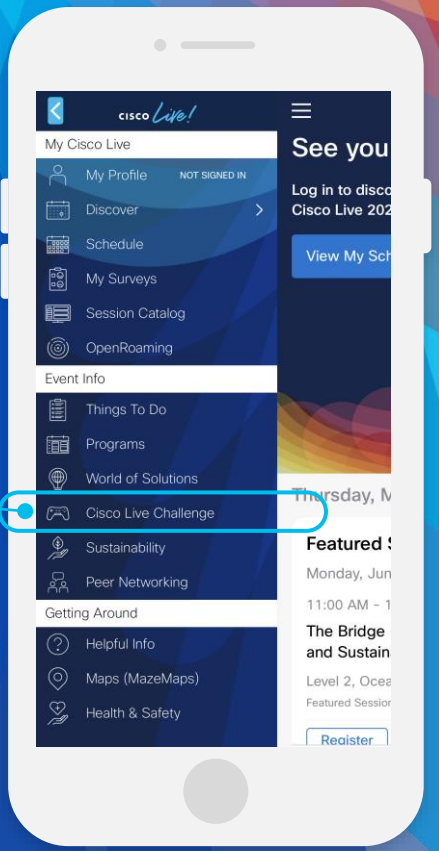


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