# ACP IT Solutions AG

## Hauzenberg • Regensburg • Nürnberg

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IT for innovators.

# Software Defined Networking

## Use Cases und Erfahrungen aus der Praxis

# SD-Networking – alter Hut?

SWS COMPUTERSYSTEME Member of ACP Group

Das Netzwerk der Zukunft –
automatisiert und sicher

Applica … k revolutionieren

SDN … llt ACI vor

11.11.2013 ·

SWS BrainS 2017

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Consultant
Oliver.knon@sws.de

Cisco Systems Networking SDN

Intent-based networking is Cisco's big push fo
Center – Cisco's IBN software

SWS COMPUTERSYSTEME Member of ACP Group

for 2018

## Next Generation Network

transparent, einfach und sicher

**Oliver Knon**
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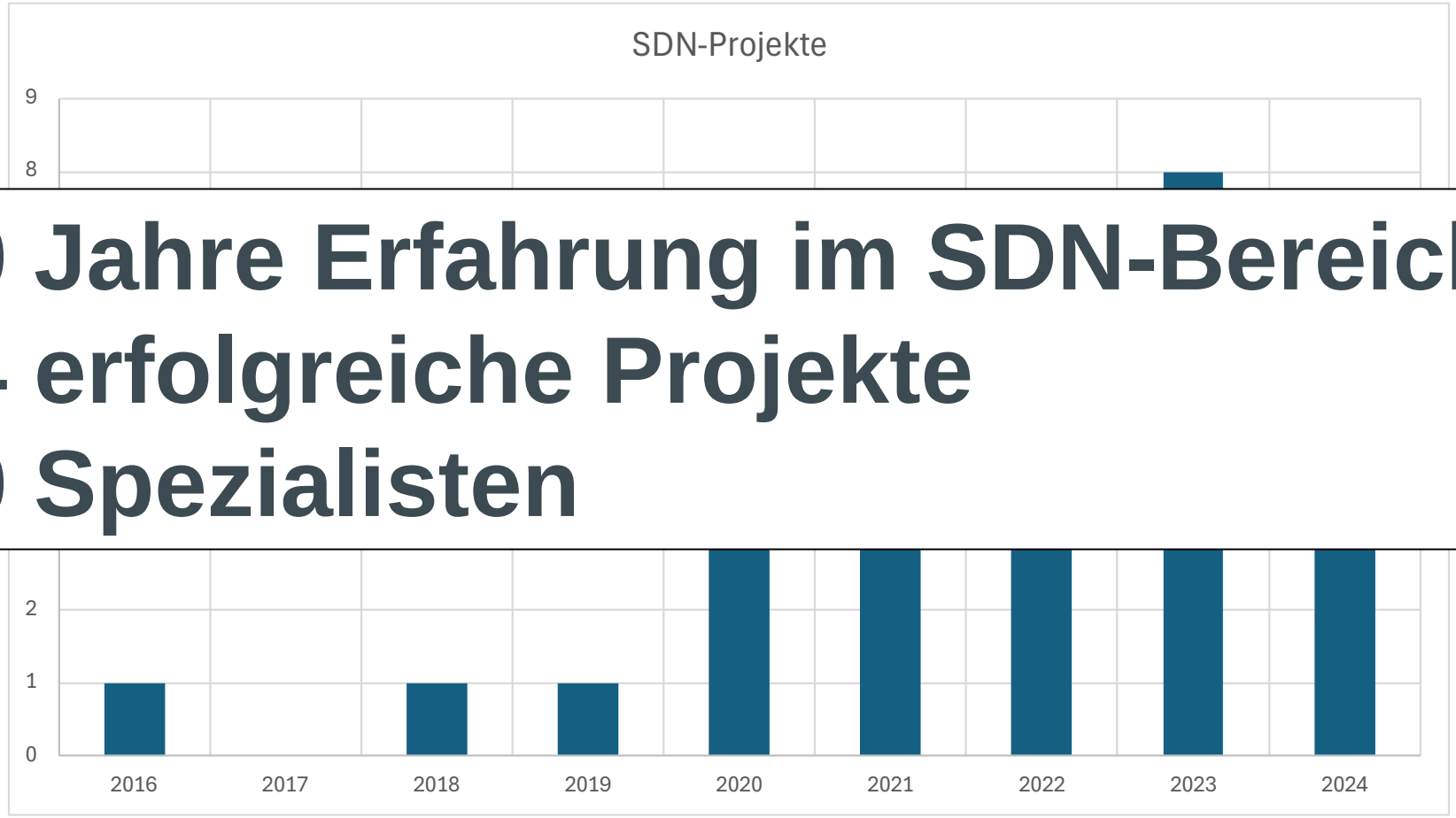
# SDN – Alter Hut?




**10 Jahre Erfahrung im SDN-Bereich**
**34 erfolgreiche Projekte**
**20 Spezialisten**

# Software Defined Networking

## Use Cases und Erfahrungen aus der Praxis

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# Agenda

01 Einleitung

02 SD-Campus

03 SD-WAN

04 SD-Datacenter

05 Ihre Fragen

IT for innovators.

ACP

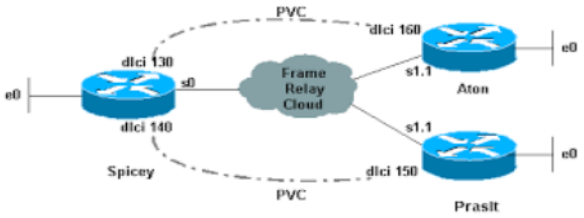
BRAIN SHARE

# Einleitung

IT for innovators.

# Classic Networking vs. Software Defined?

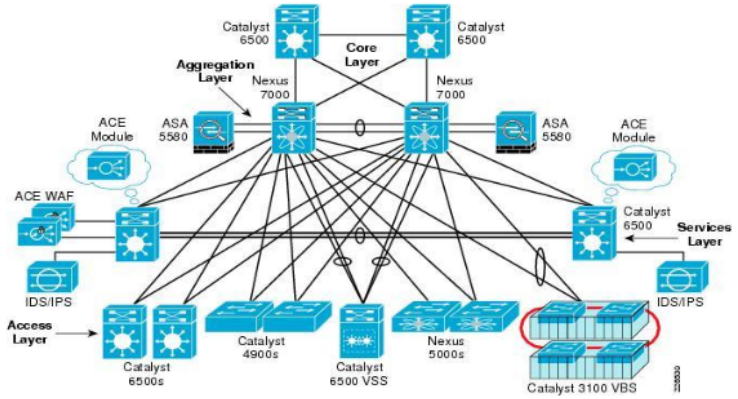
## 1990s




```
hq>enable
hq# config terminal
hq(config)# interface fastethernet 1/1
hq(config-if)# ip address
   1.1.1.1 255.255.255.0
hq(config-if)# no shutdown
hq(config-if)# exit
hq(config)# router eigrp
hq(config-router)# network 1.1.1.0
hq(config-router)# exit
hq(config)# exit
hq# copy run start
```

## Today

**What?**
**How?**

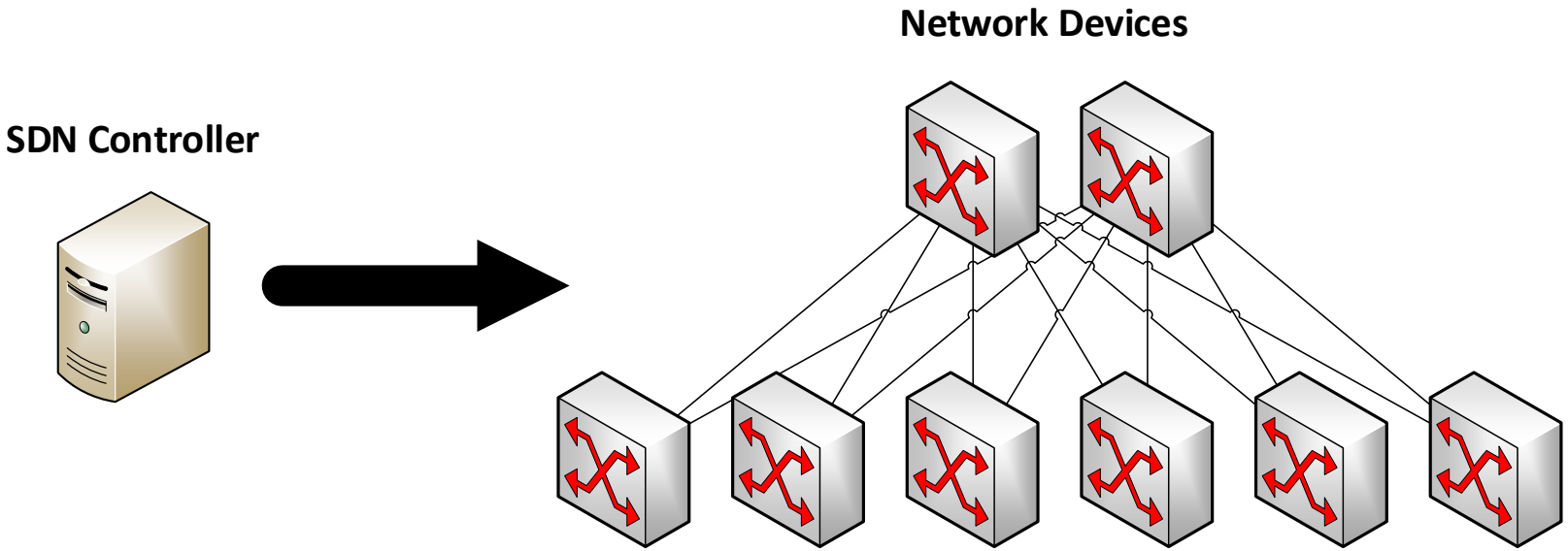



```
Catalyst>enable
Catalyst# config terminal
Catalyst(config)# interface
   Gigabitethernet 1/1/1
Catalyst(config-if)# no switchport
Catalyst(config-if)# ip address
   1.1.1.1 255.255.255.0
Catalyst(config-if)# no shutdown
Catalyst(config-if)# exit
```

```
Catalyst(config)# router eigrp Test1
Catalyst(config)# interface
   Te 1/1
Catalyst(config-if)# ip router
   eigrp Test1
Catalyst(config-if)# no shutdown
Catalyst(config-if)# end
Catalyst# copy run start
```

34 Years!

# Classic Networking vs. Software Defined?

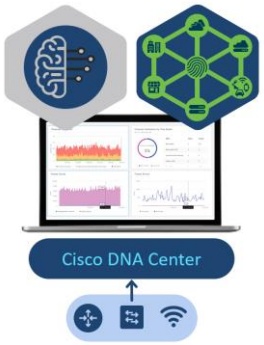


# Allgemeine Merkmale einer SDN-Lösung

- einfaches und zentrales Management
- einheitliche Konfiguration nach Hersteller Best Practice
- zentrale und einheitliche Policies (Security/QoS)
- Automatisierung in:
  - Rollout
  - Betrieb (RMA + Updates!!!)
  - Konfiguration
  - Fehlersuche
- KI gestützte Trenderkennung und Fehlersuche

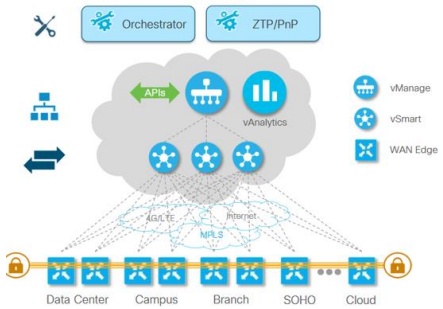
# ACP SDN-Lösungen

## Cisco SD-Access



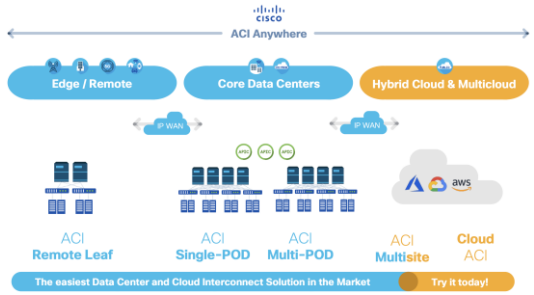

## Campus

## Cisco SD-WAN




## WAN

## Cisco ACI




## Datacenter / Cloud

# ACP Projekterfahrung

- 20 Cisco SD-Access Projekte von 200 bis 20.000 User
- 8 Cisco ACI Projekte von 500 bis 40.000 User
- 6 Cisco SD-WAN Projekte von 200 bis 2.500 Usern
- Branchen:
  - Industrie
  - Gesundheit
  - Versorger
  - Finanzen
  - Öffentlicher Dienst

# 02

# SD-Campus (Cisco SDA)

IT for innovators.

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IT for innovators.

# Wer kennt´s?

„Das wurde wohl bei der Config vergessen…“

„Schon wieder ein neuer CVE?“

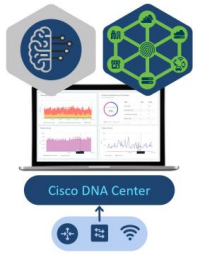
„Das ganze Wochenende updaten...hervorragend!“

„Segmentierung? Gern, aber wie?“

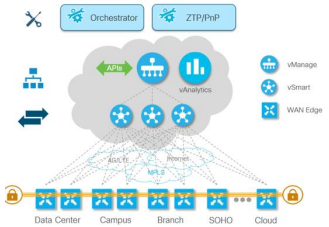
„Wo hängt der PC gleich wieder dran?“

# „Put your money where your mouth is“

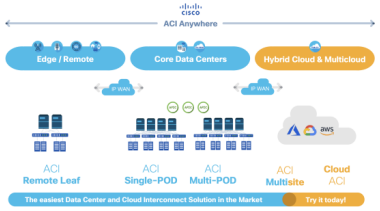
Cisco SD-Access



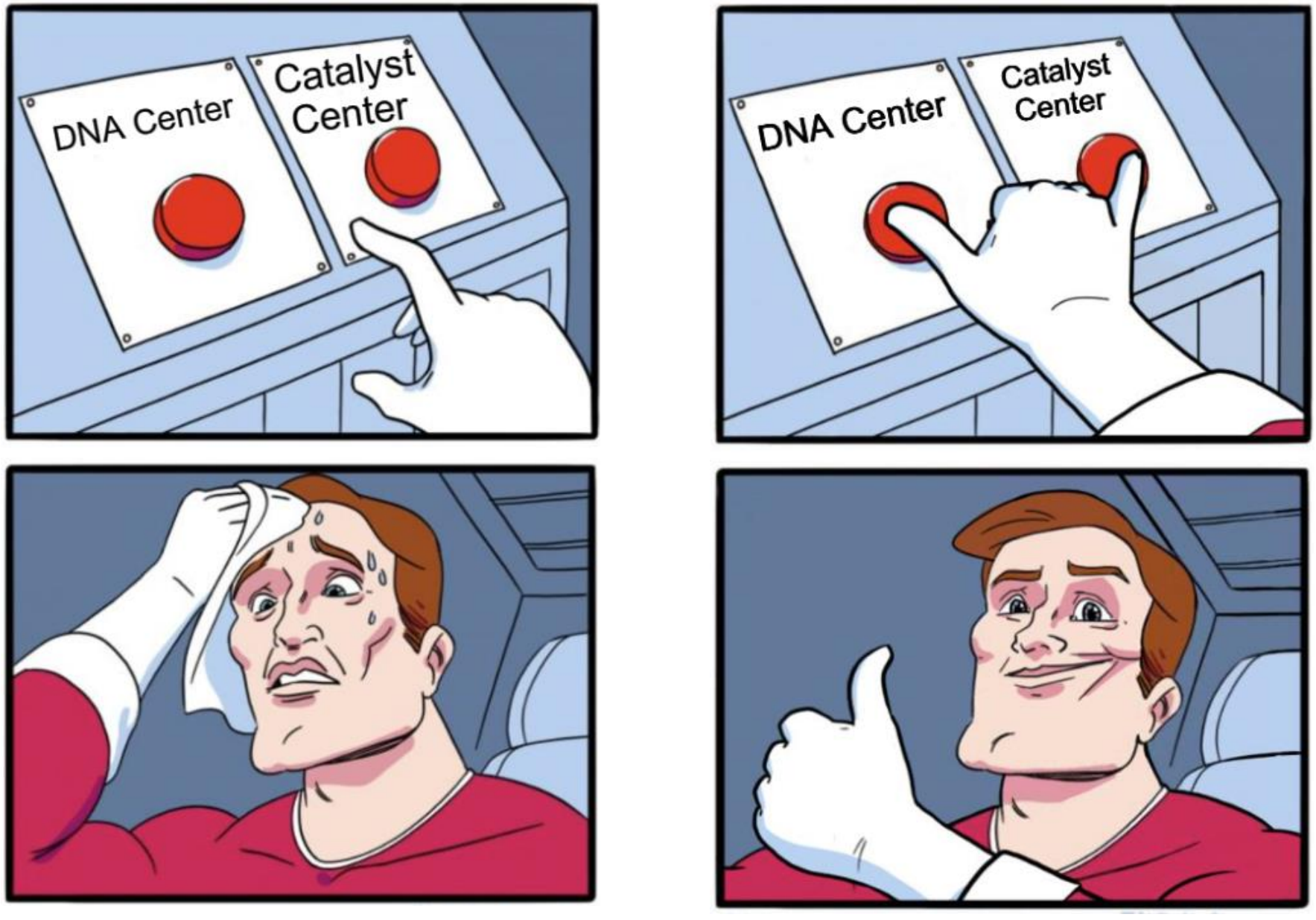

Cisco SD-WAN



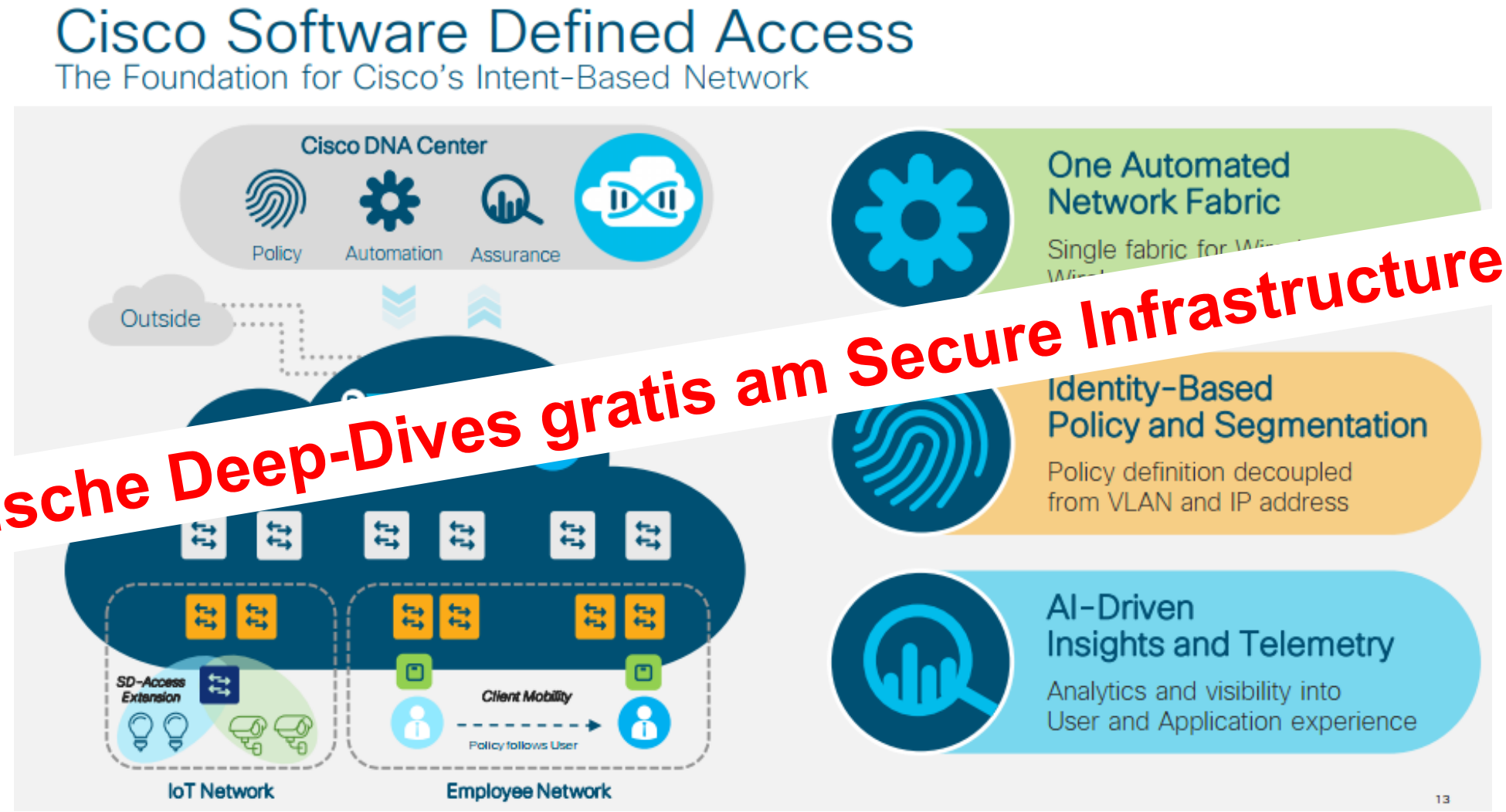

Cisco ACI



# First Things First



# First Things First



# Use Case: SDA LAN Automation

**Herausforderung:** „Das wurde wohl bei der Config vergessen…“

**Lösung: SD-Access LAN Automation**

# Use Case: SDA LAN Automation

**Ziel:** (Voll-)automatisierte Inbetriebnahme der SDA-Switches

**Ablauf:**

1. Definieren der Uplink-Switches + Ports
2. Starten der LAN Automation
3. Neuen Switch einbauen und anstecken
4. Warten (ca. 30min.)

**30min? Schon lang, oder…?**

Moment!

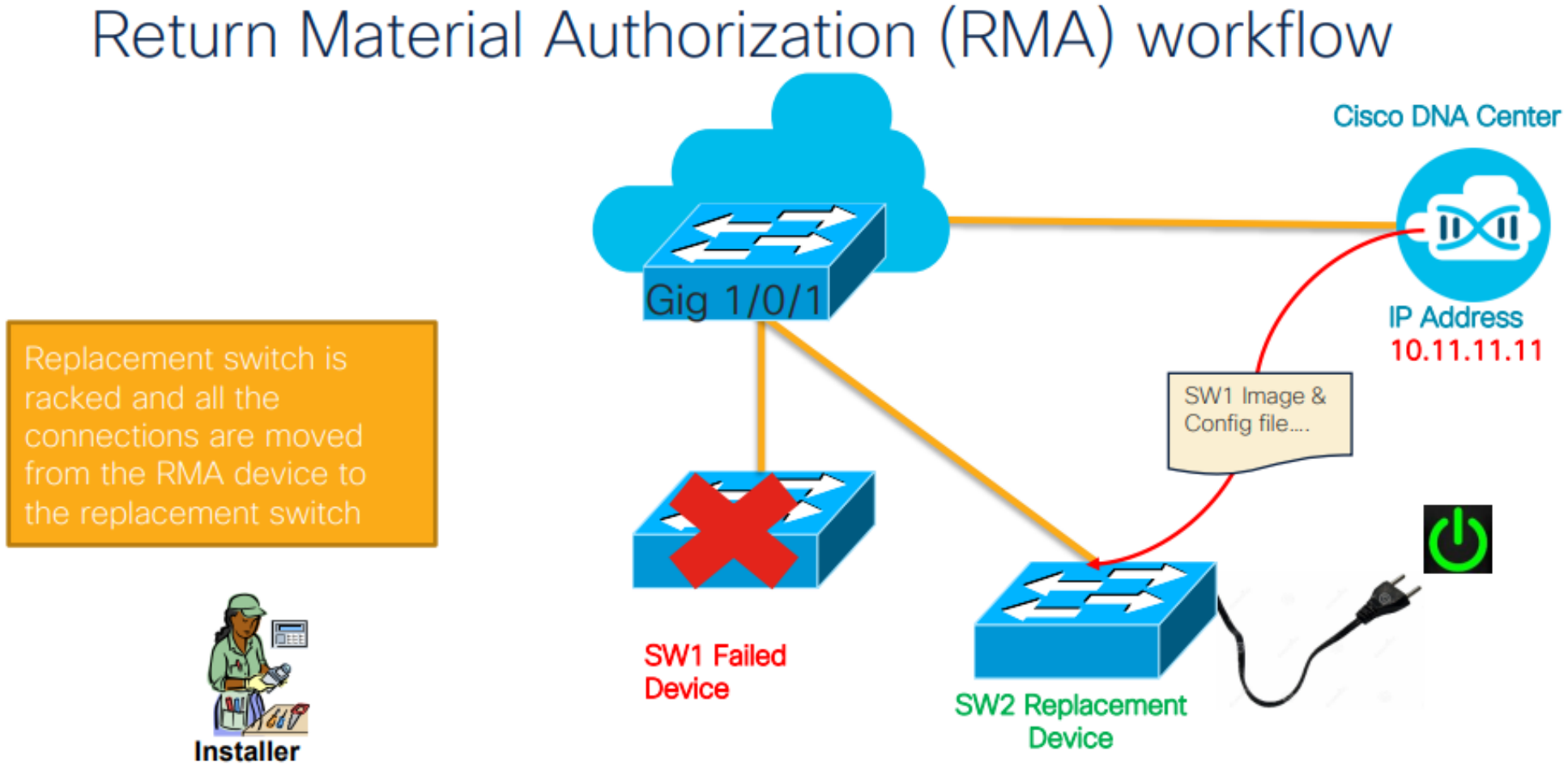
**Was passiert im Hintergrund:**

- Software-Update auf Kundenstandard
- Automatisierter Rollout der SDA Switch-Config nach CVD + Kundenparameter
  → Good Bye Copy-Paste-Fehler!

**Unser Benefit:**

**Netzwerkmigration an 30+ Standorten (400+ Switches) in wenigen Monaten**

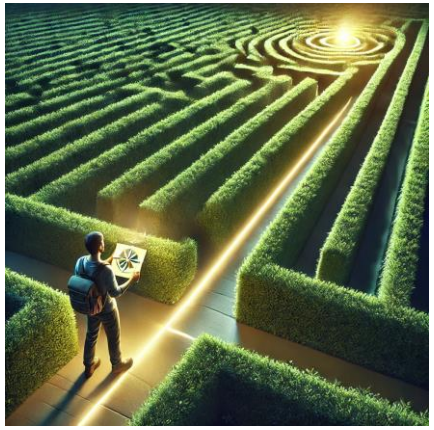
# Use Case: RMA Workflow




**Unser Benefit: Kein Fachpersonal <u>vor Ort</u> benötigt**

# Use Case: CVE Management

**Herausforderung:** „Schon wieder ein neuer CVE?“



**Lösung: DNA-Center Security Advisories**

# Use Case: CVE Management

**Jeden Morgen 06 Uhr**

Cisco DNA Center

# Use Case: CVE Management


Cisco DNA Center

# Use Case: CVE Management

ADVISORIES

0 Critical | 2 High | 0 Medium

SCAN CRITERIA

15 Software Version | 0 Custom | 2 Advanced

Re-scan Network

Devices | Advisories

**SUMMARY**

> Impact

> Custom Match Pattern

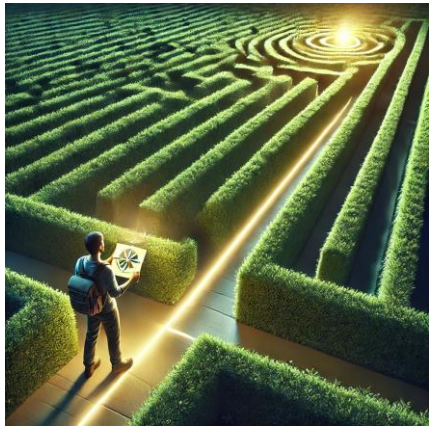
Advisories (2) [All] [Affecting Devices]

Filter

| Advisory ID | Advisory Title | CVSS Score | Impact | CVE | Devices |
|---|---|---|---|---|---|
| cisco-sa-caf-3dXM8exv | Cisco IOx Application Framework Arbitrary File Creation Vulnerability | 8.1 | High | CVE-2020-3238 | 2 |
| cisco-sa-20190513-secureboot | Cisco Secure Boot Hardware Tampering Vulnerability | 6.7 | High | CVE-2019-1649 | 2 |

# Use Case: Software Updates

**Herausforderung:** „Das ganze Wochenende updaten…hervorragend!“



**Lösung: DNA-Center Software Image Management**

# Use Case: Software Updates


Automate your software upgrade cycle

# Use Case: SDA Segmentierung

**Herausforderung:** „Segmentierung? Gern, aber wie?“

**Lösung: SD-Access Segmentierung**

# Use Case: Segmentierung

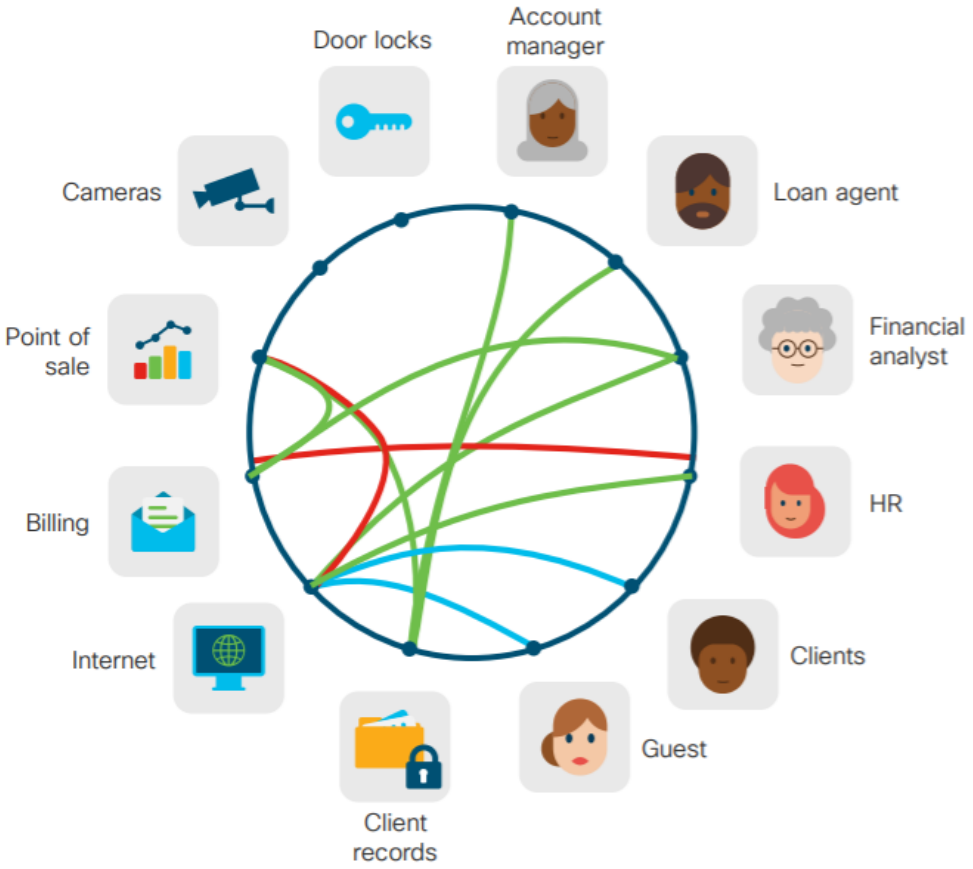
**Angriffsfläche verkleinern!**

# Use Case: Segmentierung

Macro-Segmentation and Micro-Segmentation

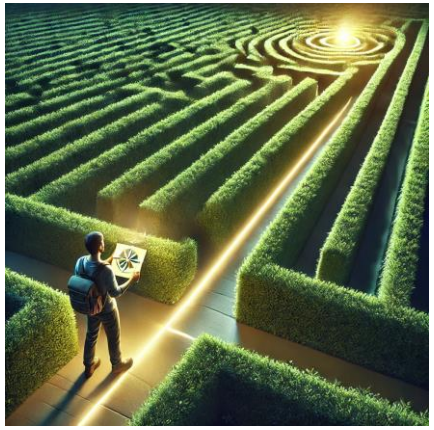
# Use Case: Segmentierung

## Group Based Access Control




# Use Case: Assurance

**Herausforderung:** „Wo hängt der PC gleich wieder dran?“



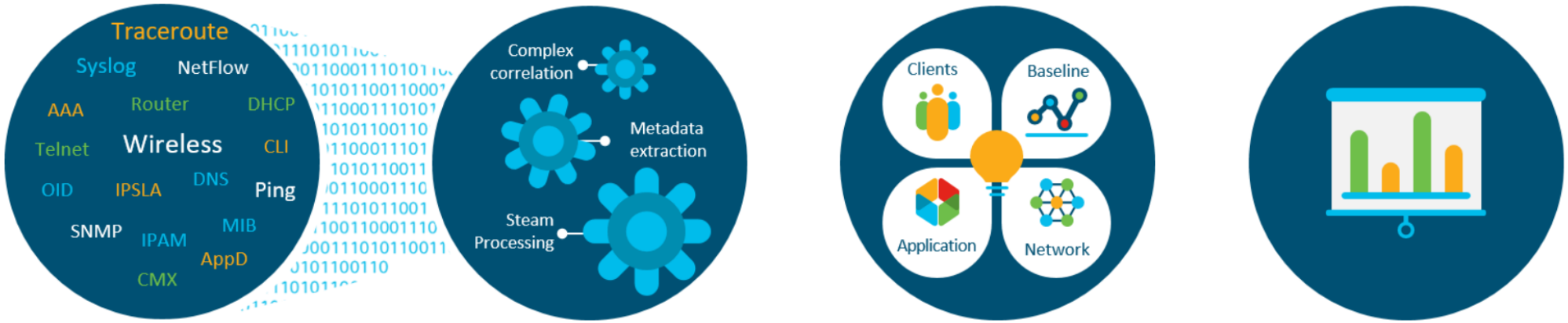
**Lösung: DNA-Center Assurance**

# Use Case: Assurance & AI/MR

## Cisco DNA Assurance

From network data to business insights

Network telemetry contextual data | Complex event processing | Correlated insights | Suggested remediation

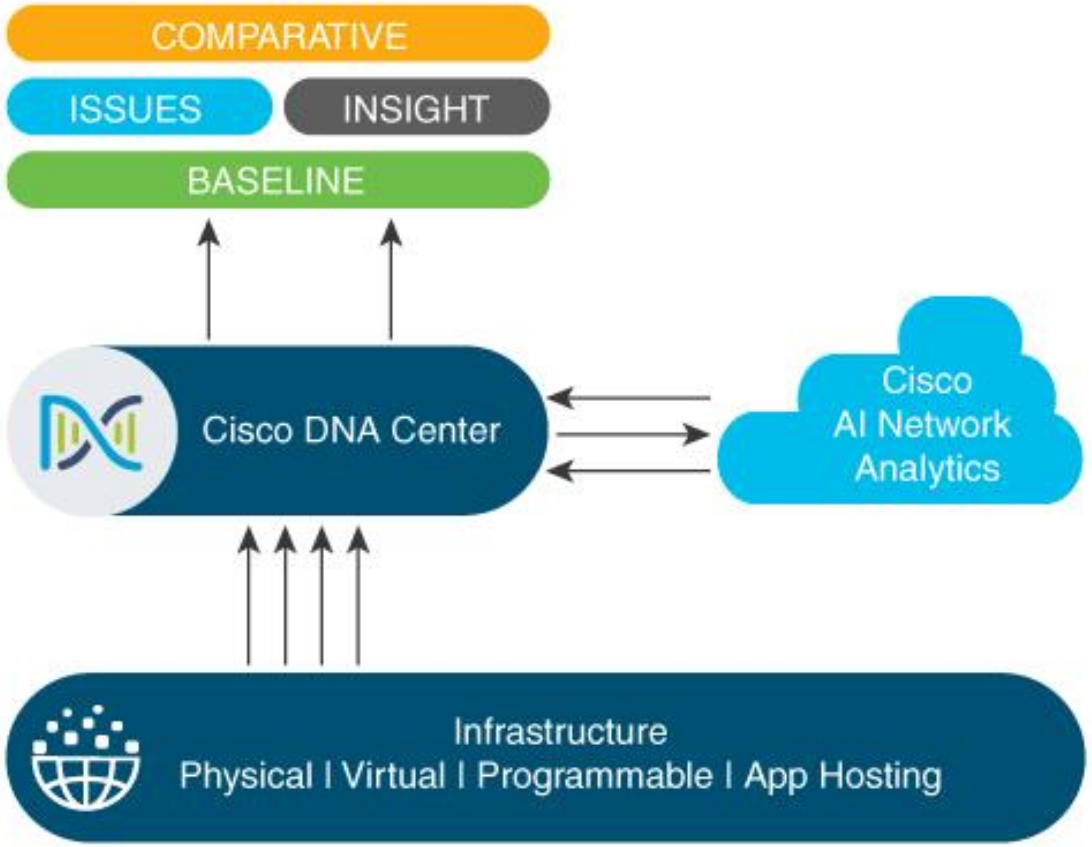



**Everything as a sensor**

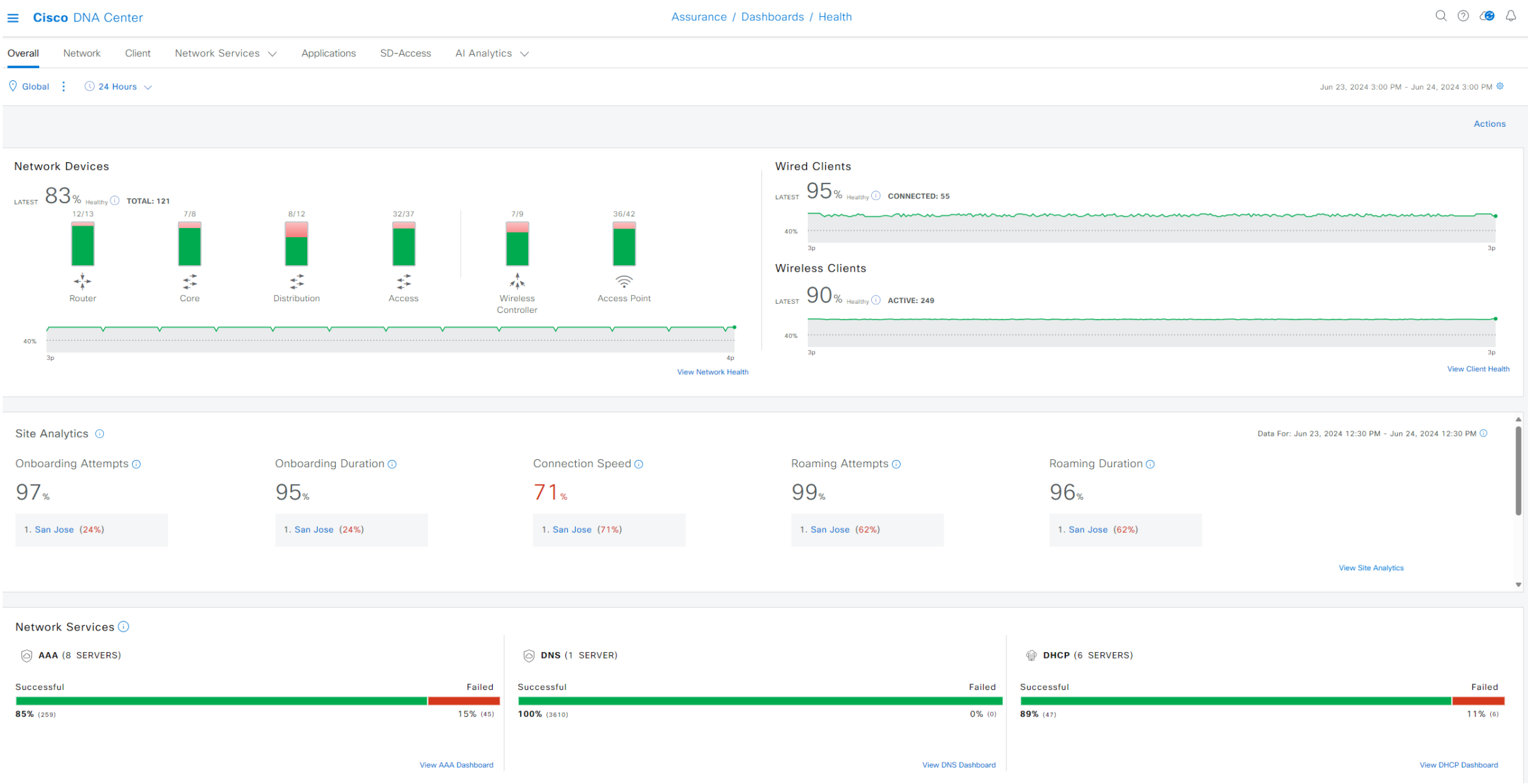
Over 150 actionable insights

Clients | Applications | Wireless | Switching | Routing

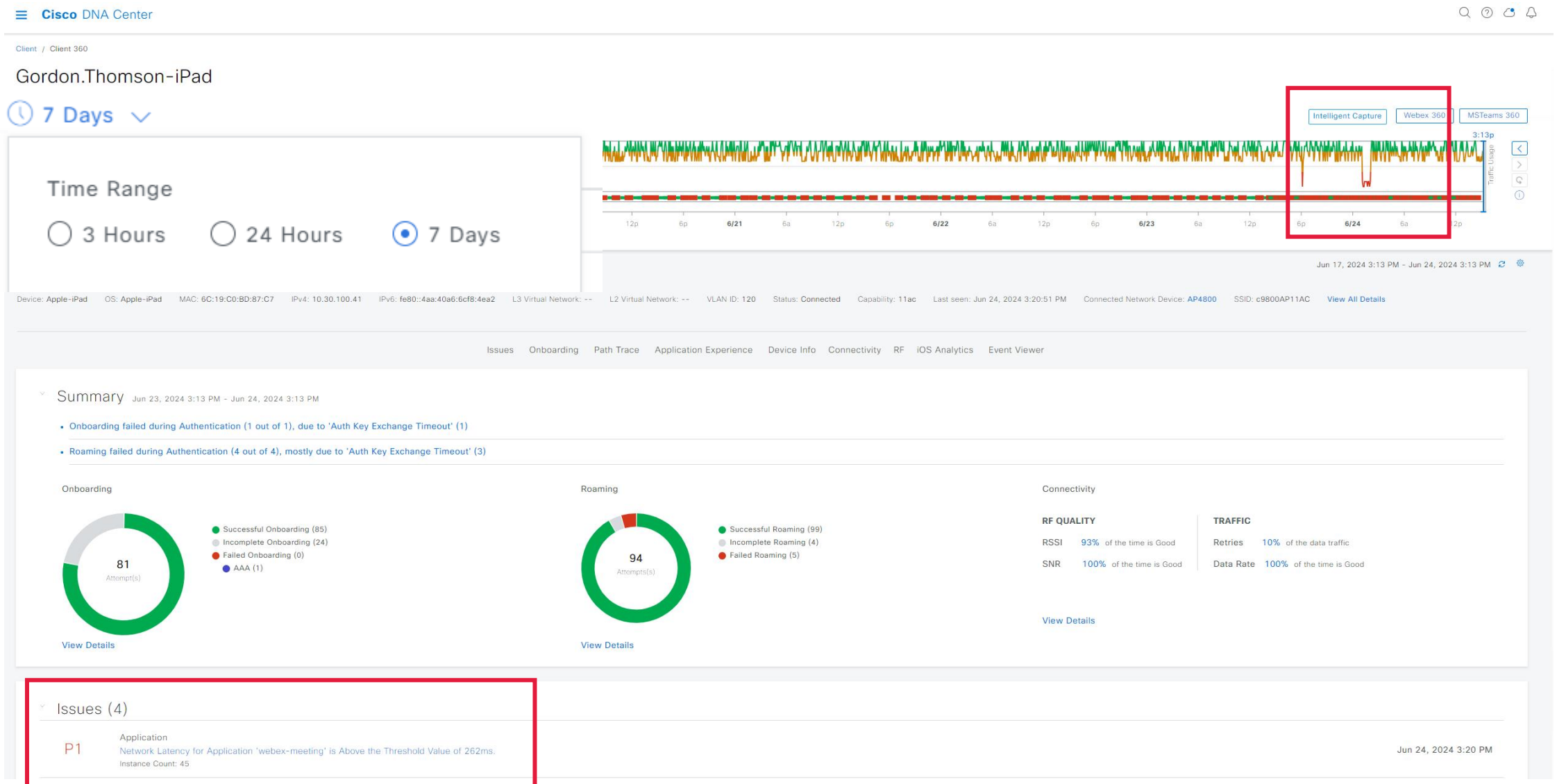
# Use Case: Assurance & AI/MR



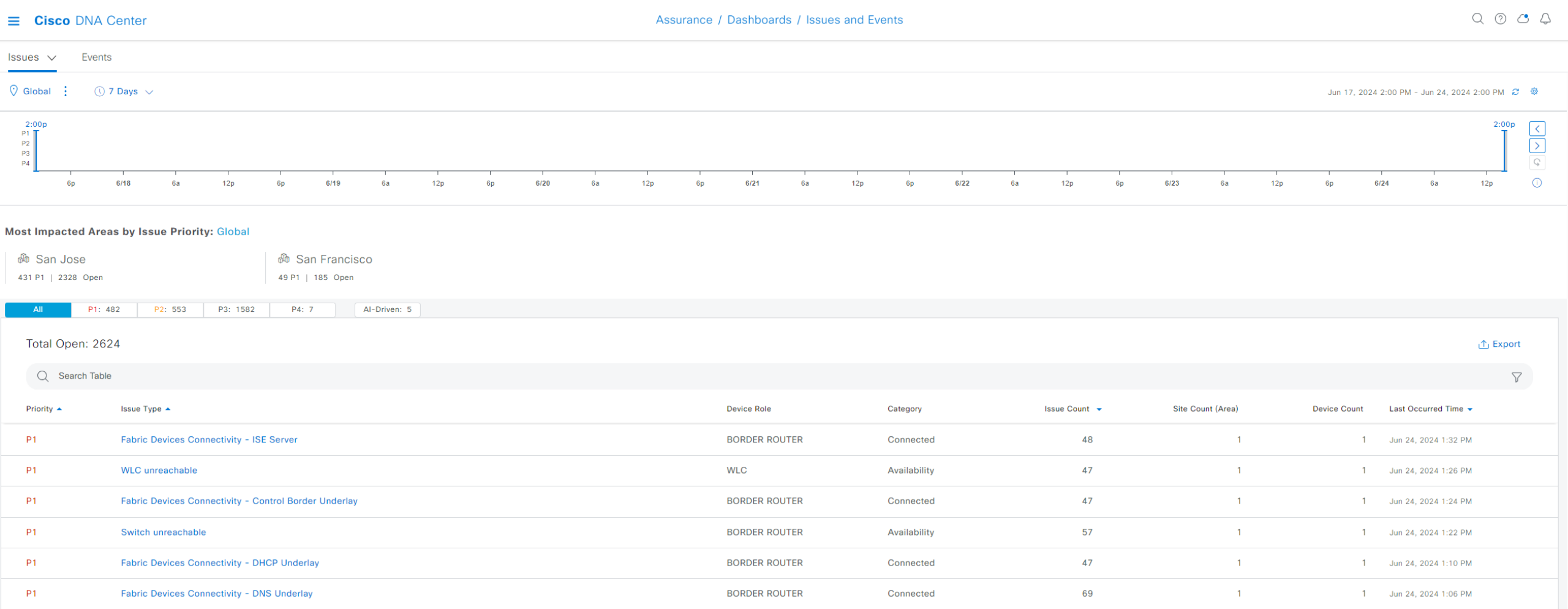

# Use Case: Assurance & AI/MR



# Use Case: Assurance & AI/MR

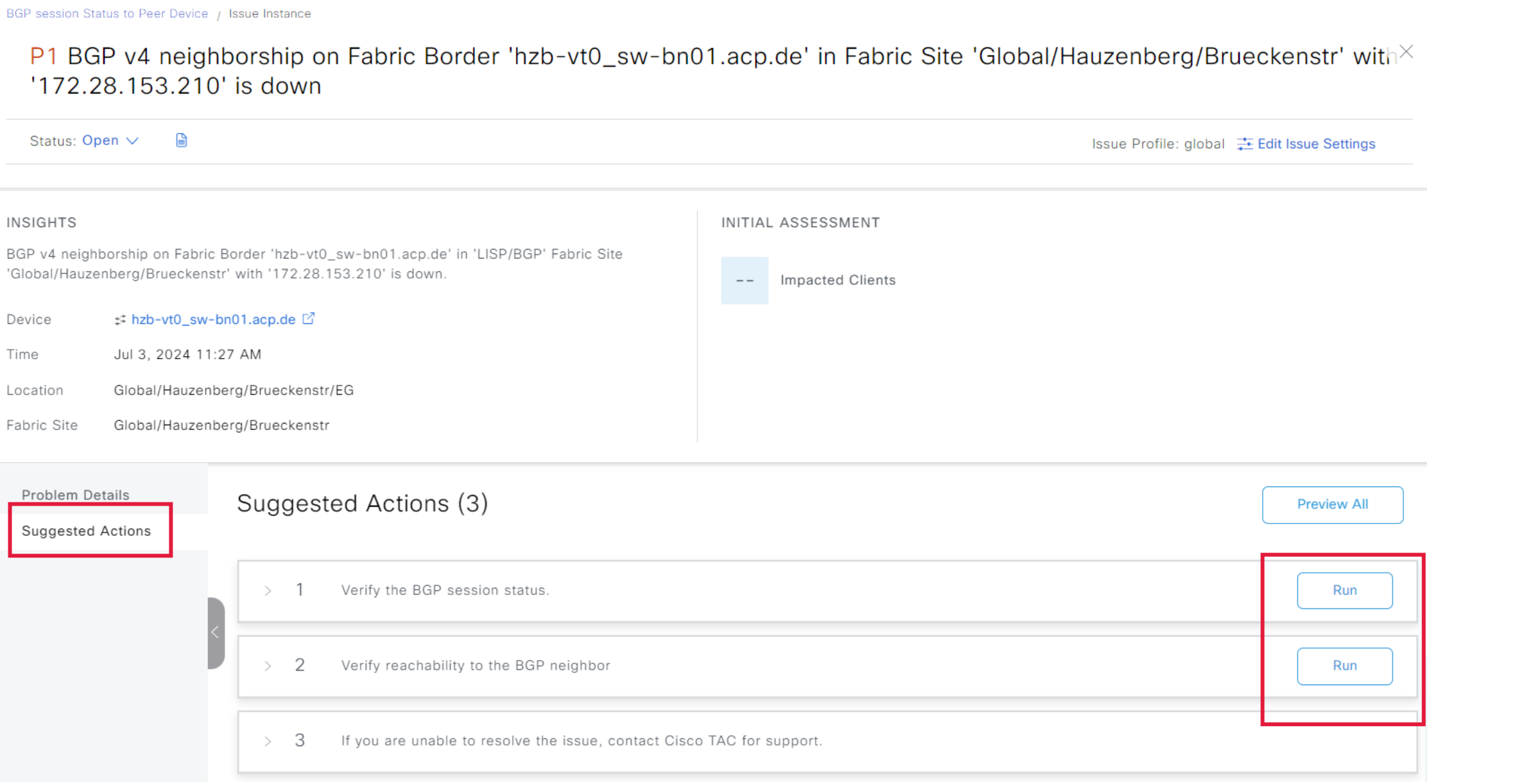


# Use Case: Assurance & AI/MR




| Priority | Issue Type | Device Role | Category | Issue Count | Site Count (Area) | Device Count | Last Occurred Time |
|---|---|---|---|---|---|---|---|
| P1 | Fabric Devices Connectivity - ISE Server | BORDER ROUTER | Connected | 48 | 1 | 1 | Jun 24, 2024 1:32 PM |
| P1 | WLC unreachable | WLC | Availability | 47 | 1 | 1 | Jun 24, 2024 1:26 PM |
| P1 | Fabric Devices Connectivity - Control Border Underlay | BORDER ROUTER | Connected | 47 | 1 | 1 | Jun 24, 2024 1:24 PM |
| P1 | Switch unreachable | BORDER ROUTER | Availability | 57 | 1 | 1 | Jun 24, 2024 1:22 PM |
| P1 | Fabric Devices Connectivity - DHCP Underlay | BORDER ROUTER | Connected | 47 | 1 | 1 | Jun 24, 2024 1:10 PM |
| P1 | Fabric Devices Connectivity - DNS Underlay | BORDER ROUTER | Connected | 69 | 1 | 1 | Jun 24, 2024 1:06 PM |

# Use Case: Assurance & AI/MR



# Use Case: Assurance & AI/MR

Problem Details

Suggested Actions

## Suggested Actions (3)

Preview All

1 Verify the BGP session status.

**Verify the BGP session status**

*show ip bgp ipv4 unicast summary*

Success

```
show ip bgp ipv4 unicast summary
BGP router identifier 172.28.156.73, local AS number 65002
BGP table version is 773, main routing table version 773
76 network entries using 18848 bytes of memory
109 path entries using 14824 bytes of memory
12/9 BGP path/bestpath attribute entries using 3552 bytes of memory
1 BGP AS-PATH entries using 24 bytes of memory
1 BGP community entries using 24 bytes of memory
```

**Verify the BGP session for the neighbor 172.28.153.210**

*show ip bgp vpnv4 all neighbors 172.28.153.210*

Success

```
show ip bgp vpnv4 all neighbors 172.28.153.210
BGP neighbor is 172.28.153.210,  vrf STAGING_VN,  remote AS 65001, external link
  BGP version 4, remote router ID 0.0.0.0
  BGP state = Active, down for never
  Last update received: n/a
  Neighbor sessions:
    0 active, is not multisession capable (disabled)
    Stateful switchover support enabled: NO for session 0
```

# SDN – Feedback unserer Kunden

***„Was man nicht im Kopf hat, hat man im DNAC!“***

***„Dass Vieles einfach über eine Oberfläche betreut werden kann, unterstützt logischerweise beim Troubleshooting und macht es effizienter. “***

***„Durch die Mikrosegmentierung ist es für uns sehr einfach Geräte diverser Hersteller im gleichen Netz voneinander zu separieren und gezielt Freischaltungen zu machen.“***

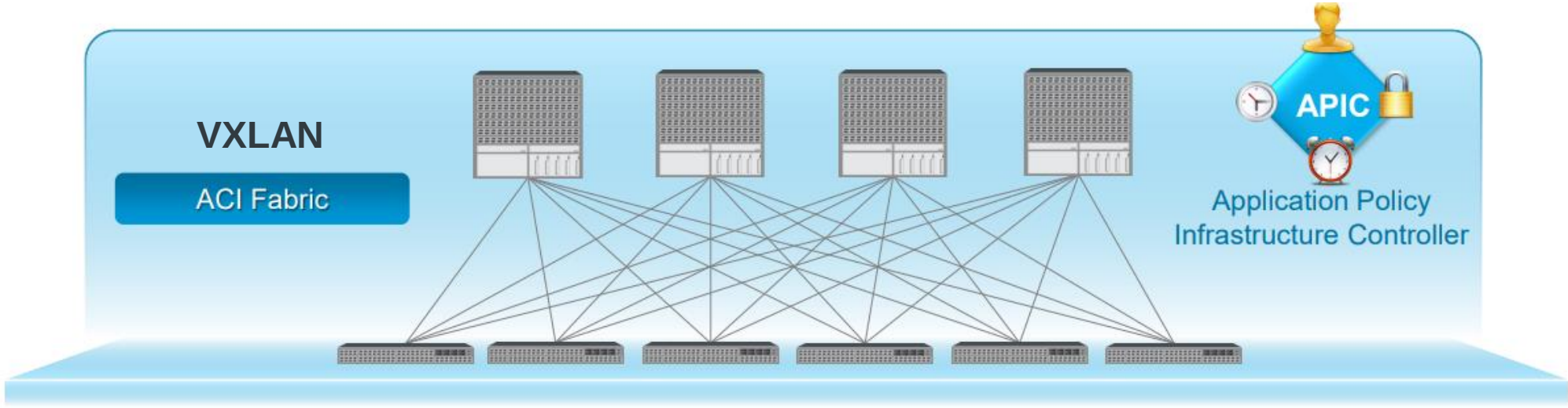
***„Von der Assurance bin ich ziemlich begeistert, es kommt ja doch hin und wieder vor, dass ein Client ein Netzwerkproblem hat und da können wir super nachvollziehen, wo das Problem ist bzw. sein könnte.“***

# 03

# SD-Datacenter (Cisco ACI)

IT for innovators.

# Cisco ACI Overview

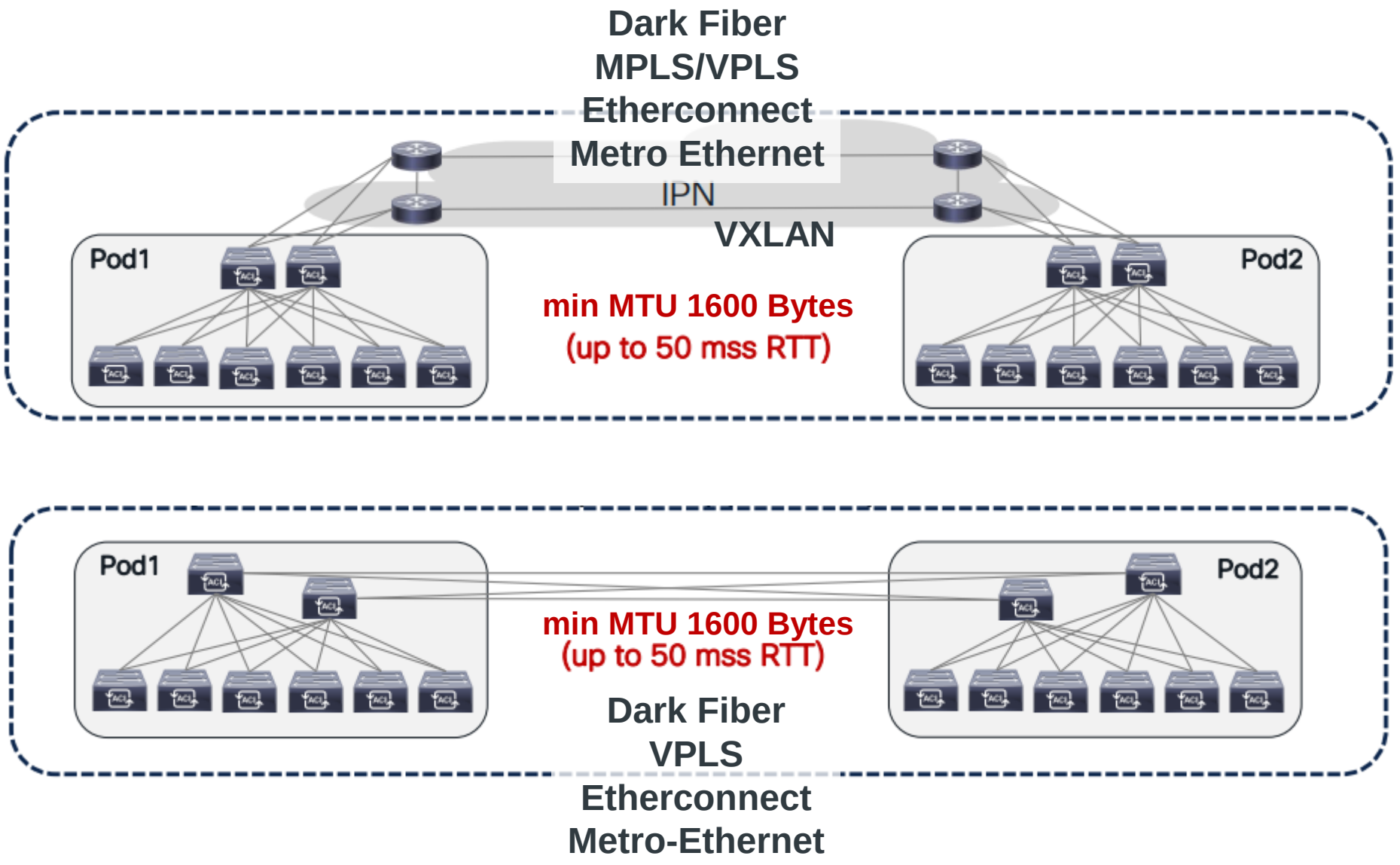


# Georedundates Datacenter

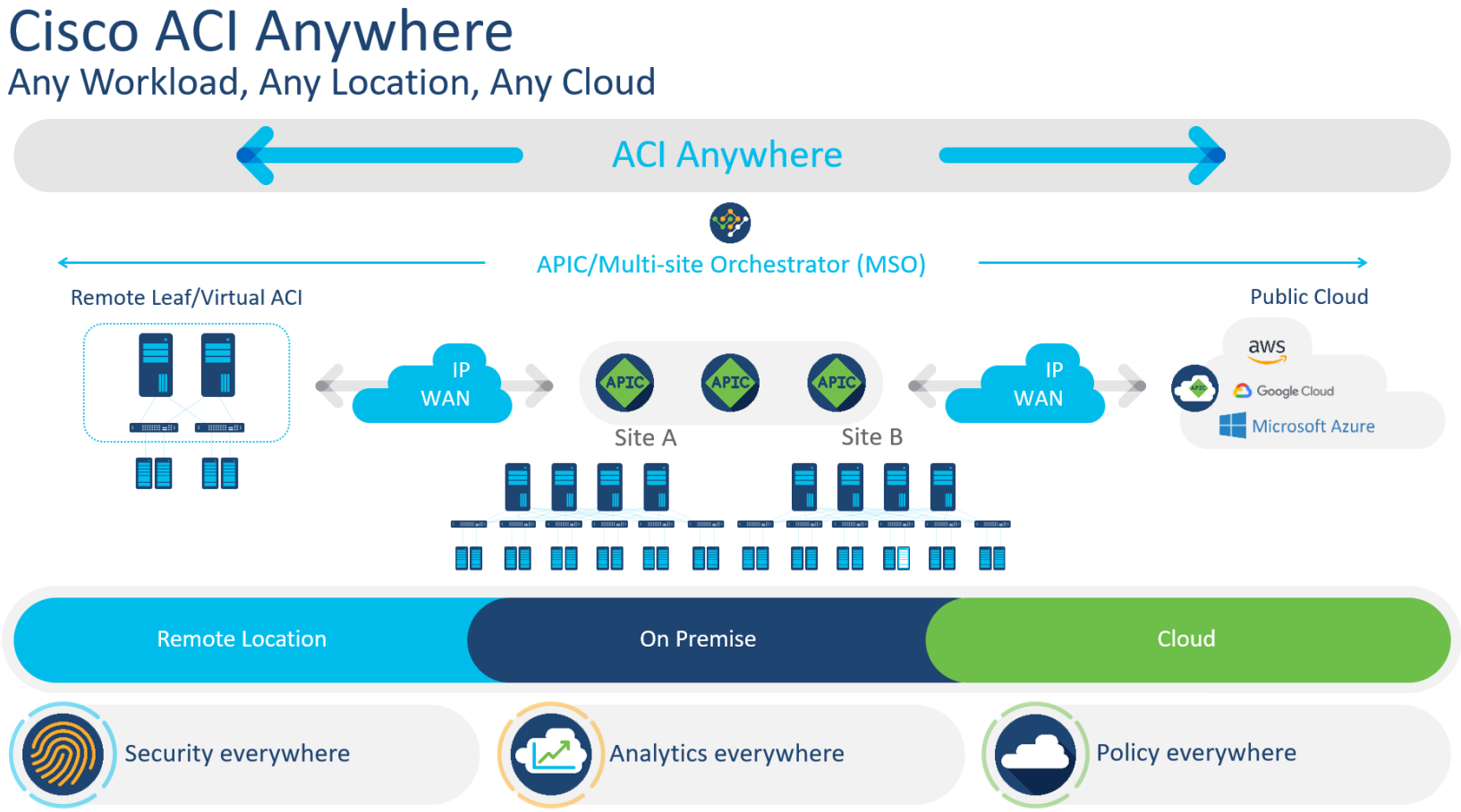
?

Dark Fiber
Etherconnect
MPLS
Metro Ethernet

# Georedundates Datacenter (ACI Multipod)

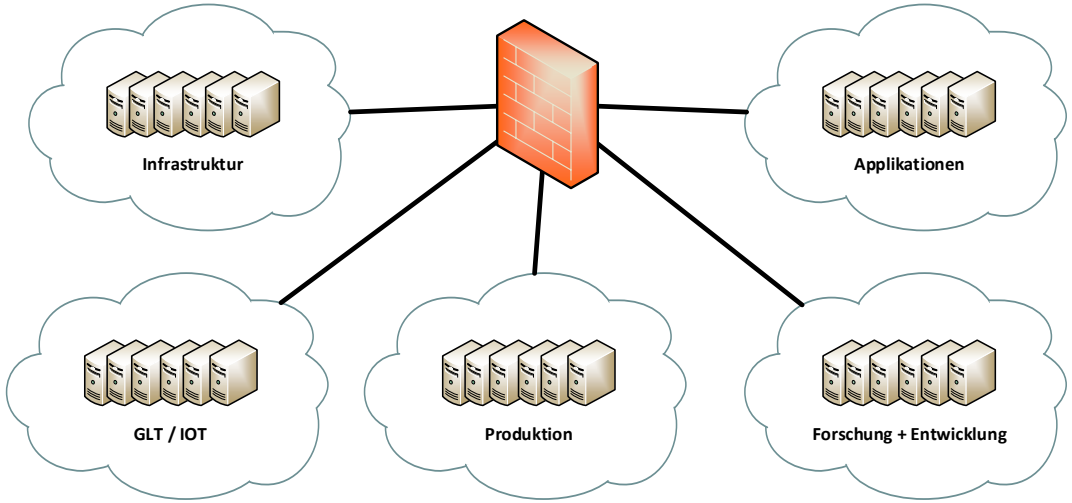


# ACI Anywhere

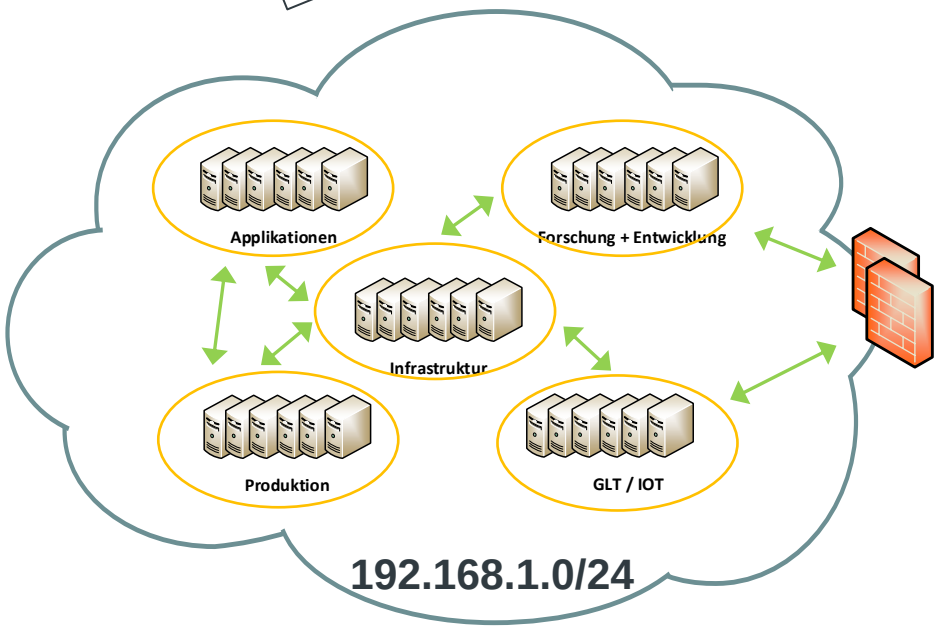


# Segmentierung im Datacenter

## Expectation…




## Cisco ACI

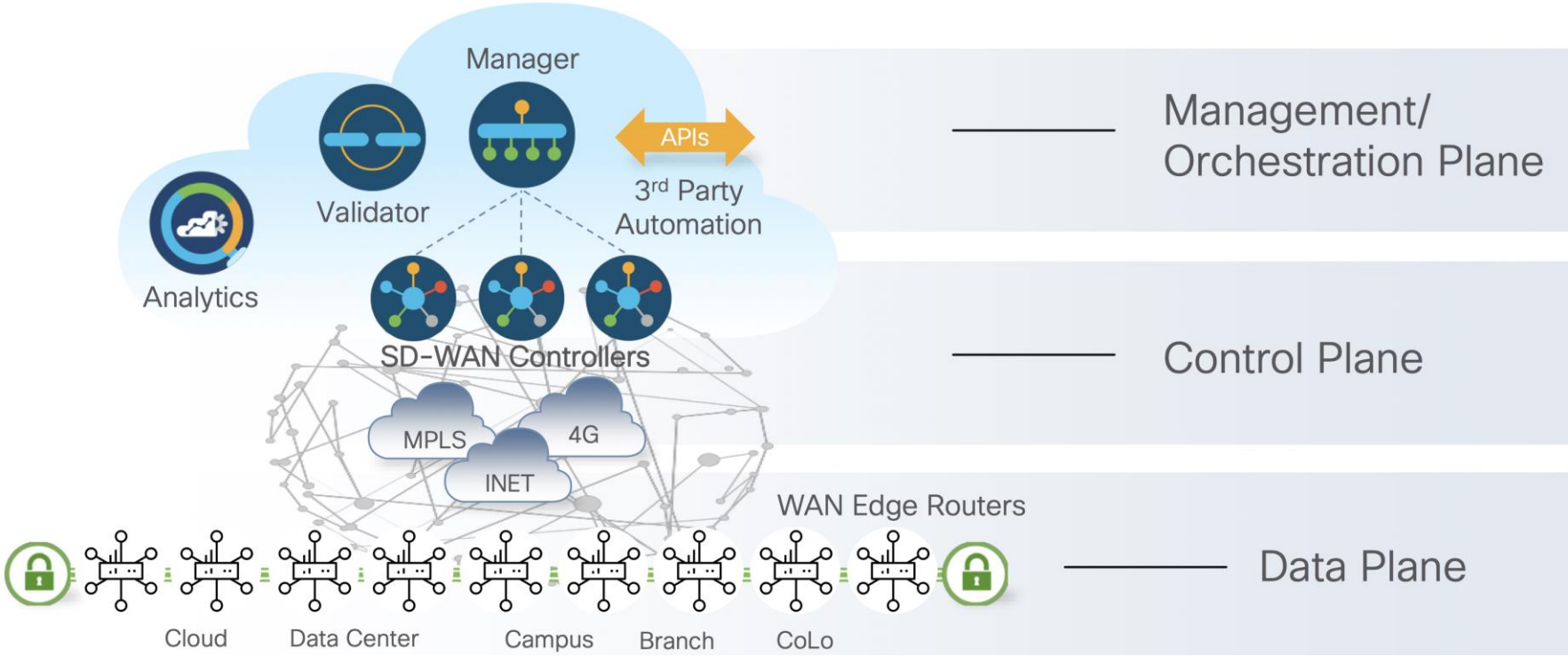


# 04

# SD-WAN (Cisco SD-WAN)

IT for innovators.

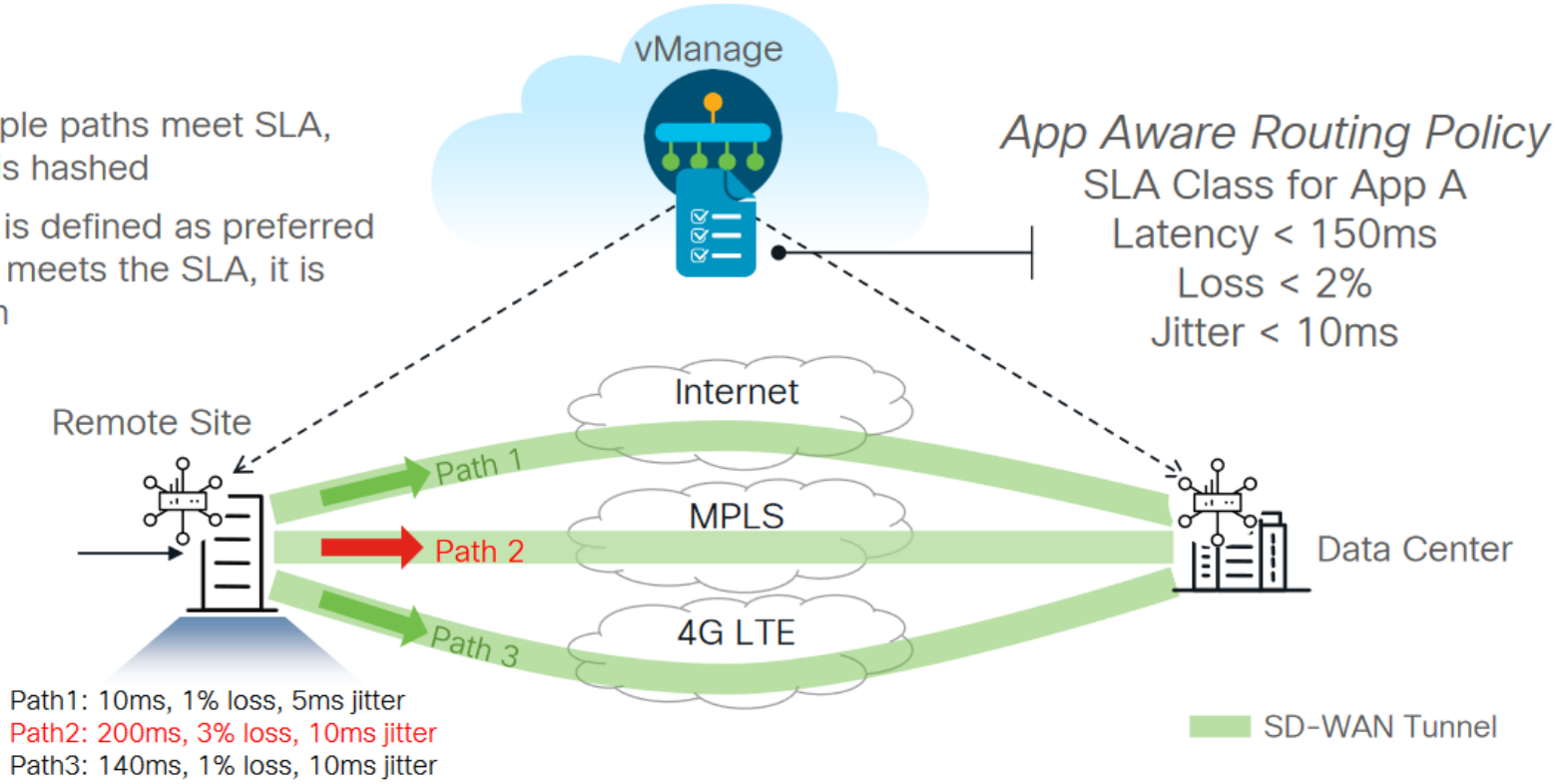
# Cisco Catalyst SD-WAN



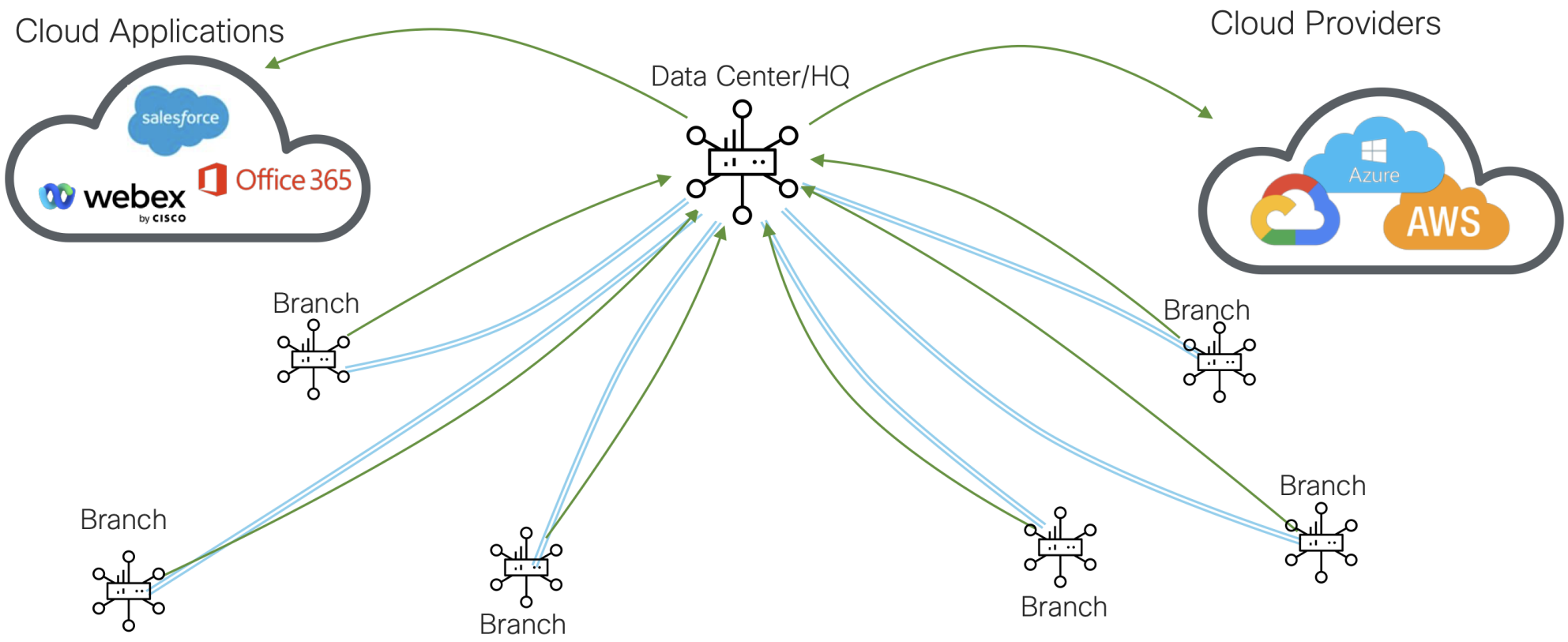
# Application Based Routing

## Application Aware Routing

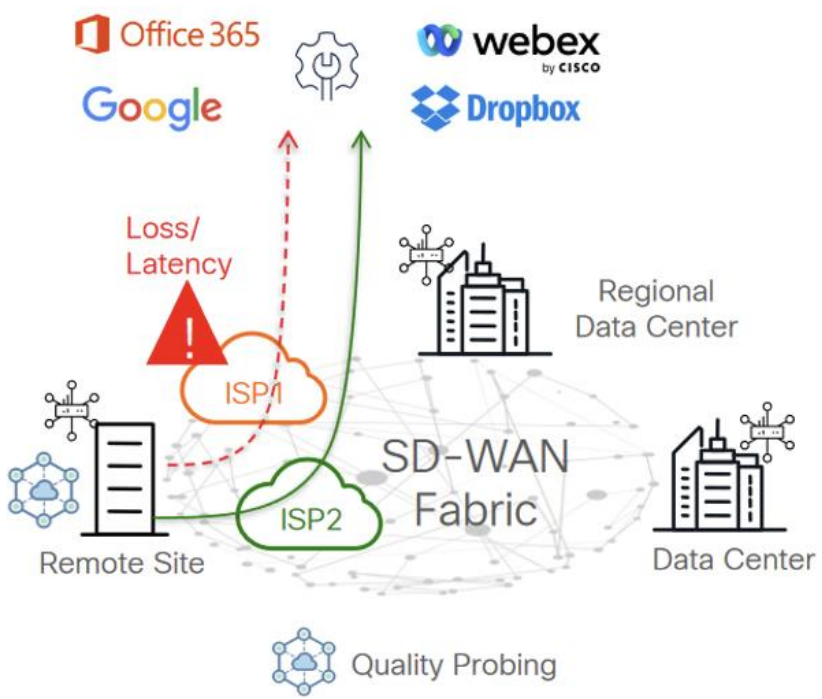
- If multiple paths meet SLA, traffic is hashed
- If path is defined as preferred AND it meets the SLA, it is chosen

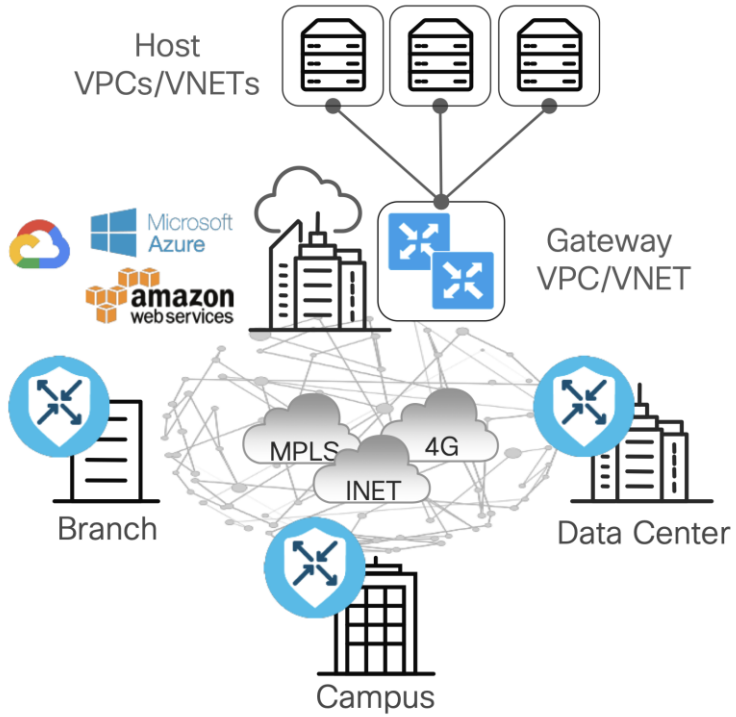


# SaaS / IaaS

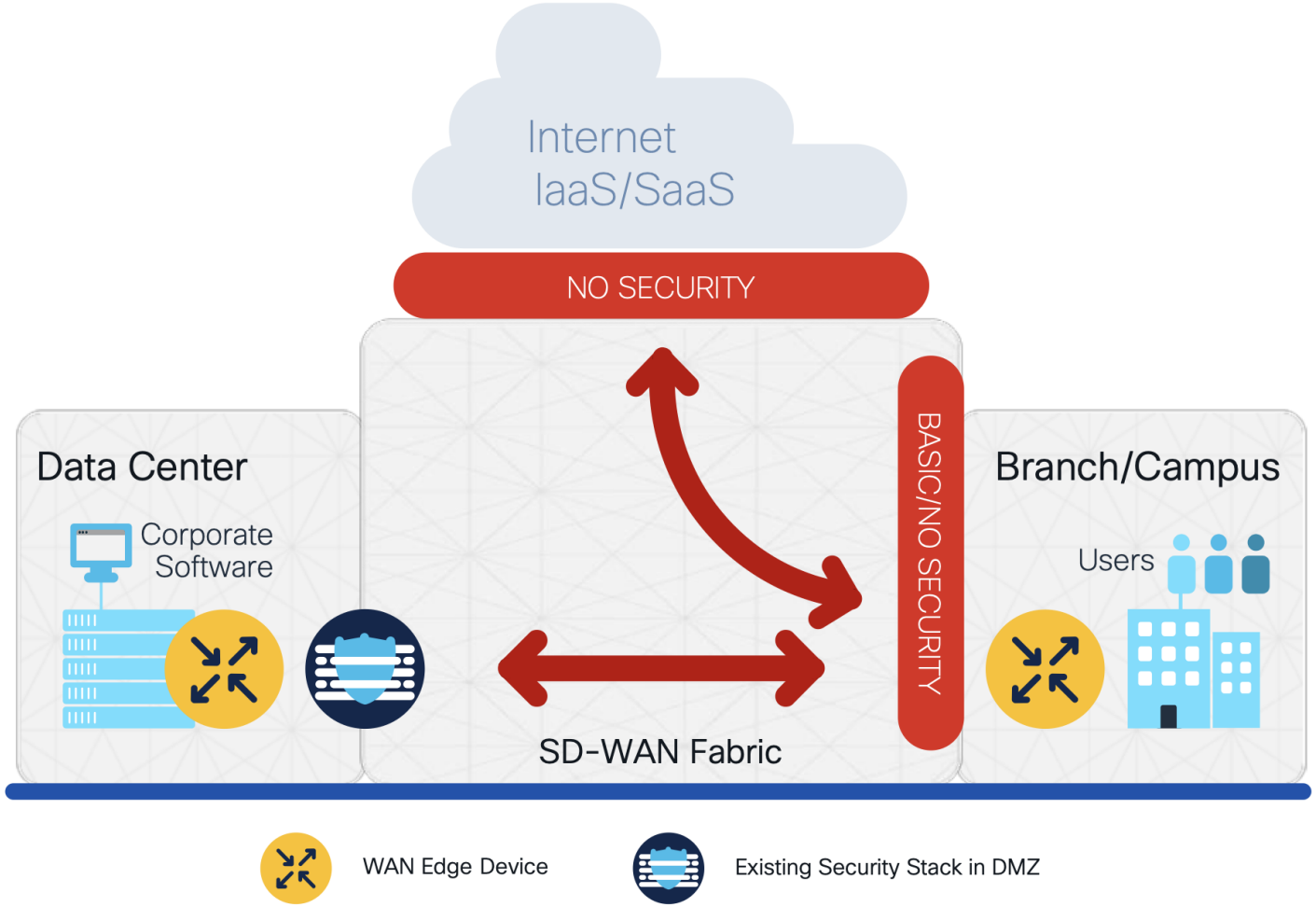

Cloud Applications
salesforce
webex by cisco
Office 365
Data Center/HQ
Cloud Providers
Azure
AWS
Branch
Branch
Branch
Branch
Branch
Branch

# Cloud On Ramp for Saas / IaaS

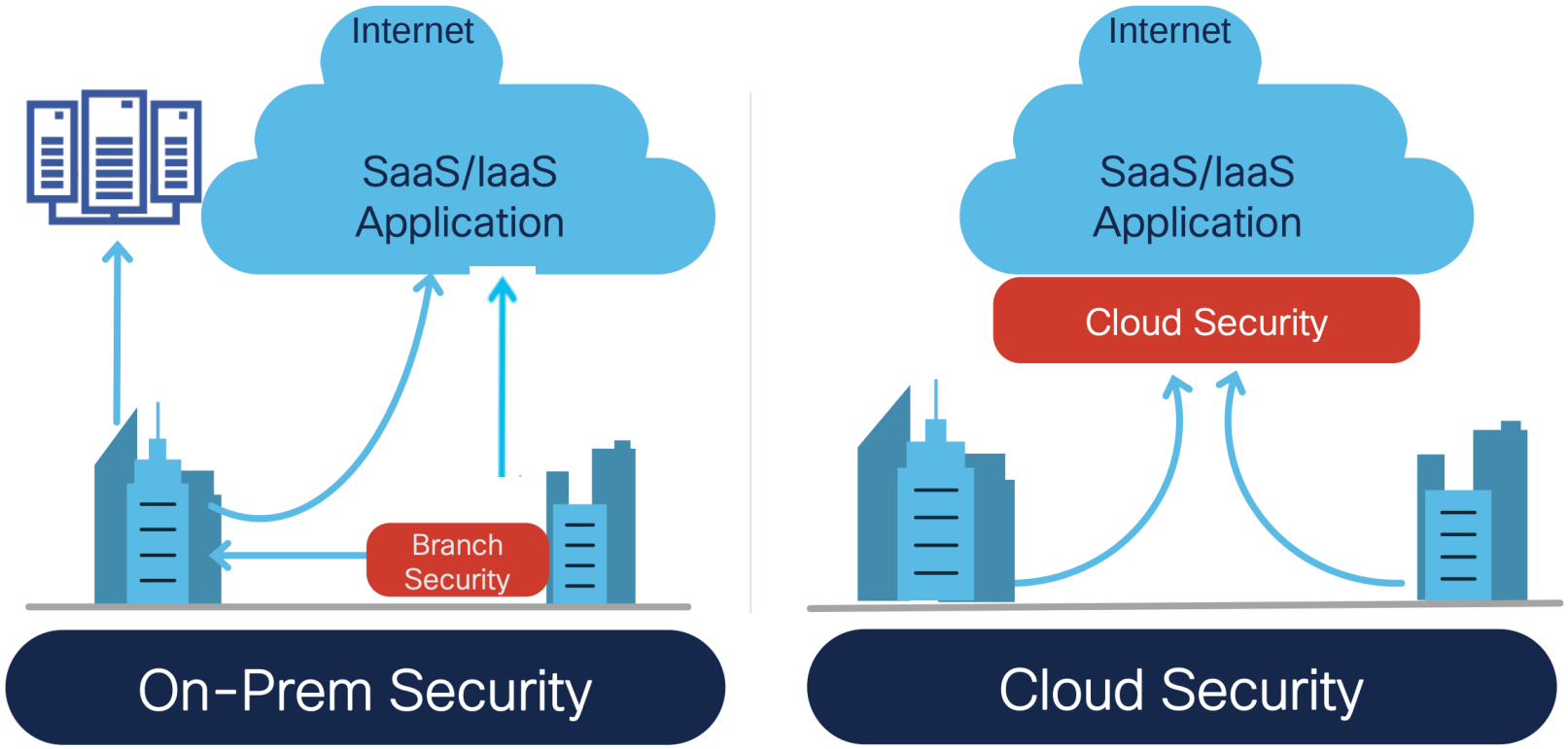


# Direct Internet Access (DIA)

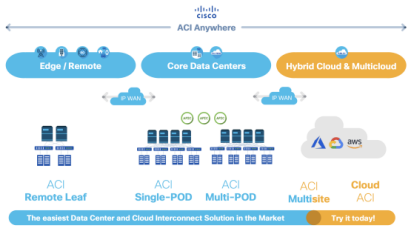


# Direct Internet Access (DIA)



# Cisco Multidomain Segmentation

## Cisco ACI




EPGs

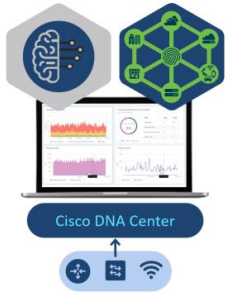
File Print Mail App DB Video GLT

Server

Internet

ISE

SGTs




Cisco SD-Access

Office

Building

Gäste

Makrosegmentierung

Mikrosegmentierung

# Cisco Multidomain Segmentation

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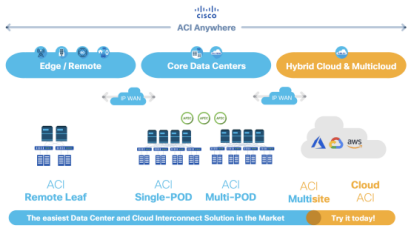


EPGs

ISE

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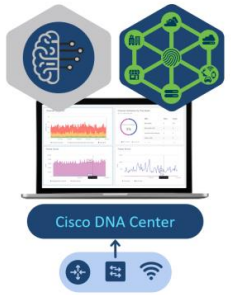
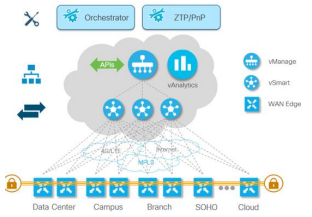



## Cisco SD-Access

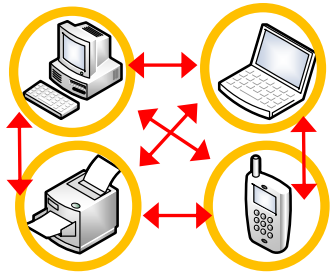
File Print Mail App DB Video GLT

Server

## Cisco SD-WAN




Internet



Office

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Makrosegmentierung

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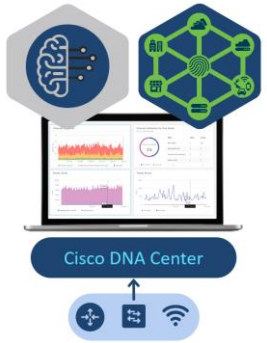
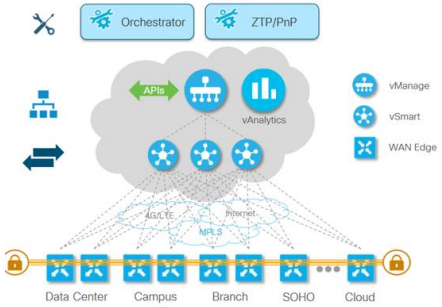
# ACP SDN-Lösungen

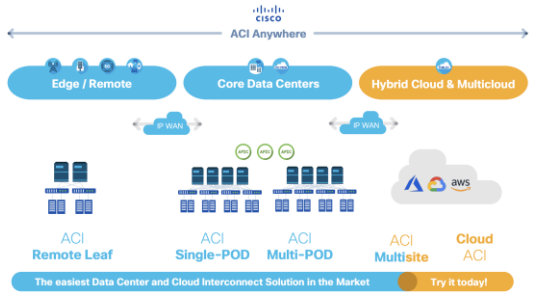
## Cisco SD-Access




## Cisco SD-WAN




## Cisco ACI




**Campus**

**WAN**

**Datacenter / Cloud**

## ACP Professional Services + Managed Services (24x7)

# Zusammenfassung Use Cases

- Automatisierung und Compliance
- CVE-Management + Updates
- Mikrosegmentierung
- Applikationsbasiertes Routing
- Security für lokalen Internetbreakout
- Flexibler DCI für georedundantes DC
- Seamless Public Cloud Integration

# Business Outcomes

- höhere IT-Sicherheit / weniger Risiken
- höhere Compliance
- bessere Konnektivität und Applikationsperformance
- gesteigerte Anwenderproduktivität
- geringere Betriebskosten

# Fragen?
# Antworten!