Evolve your Zero Trust Architecture: A Case Study with Cisco IT

Lessons learned from Cisco's SSE Deployment

Sanjeet Sharma
IT Security Architect

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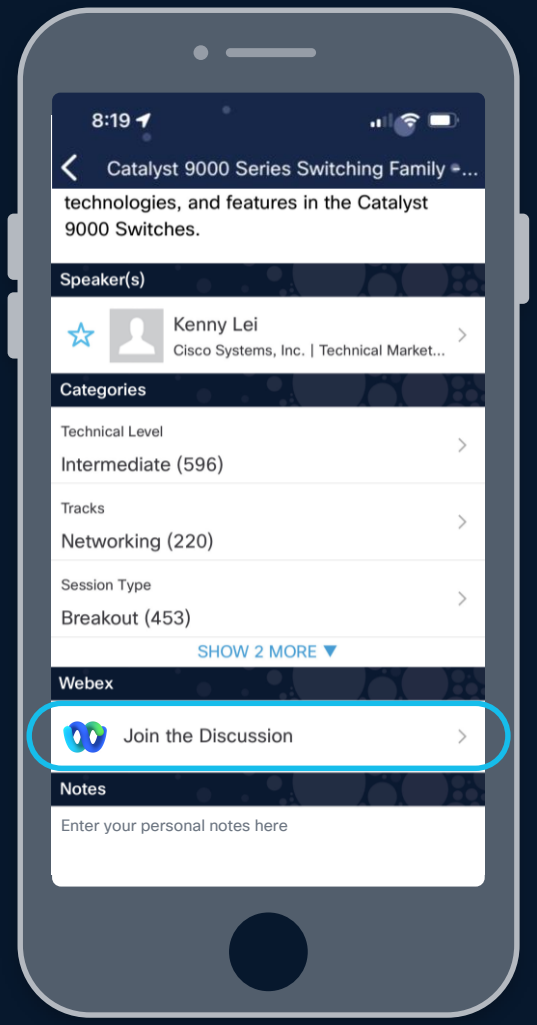


Agenda

01 Cisco IT at a glance

02 Business Landscape

03 Remote Access with VPNaaS

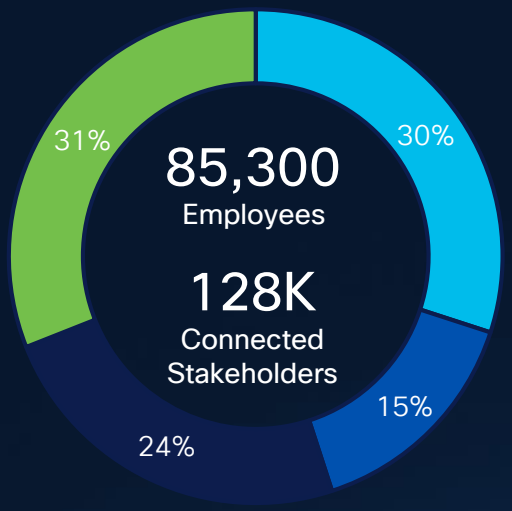
04 Zero Trust with Duo Network Gateway

05 Technical Deep Dive: ZTA

06 Practical Guidance for Organizations

Cisco at a Glance

Employee Distribution



Engineering · Sales & Marketing · Customer Experience · Corporate Functions

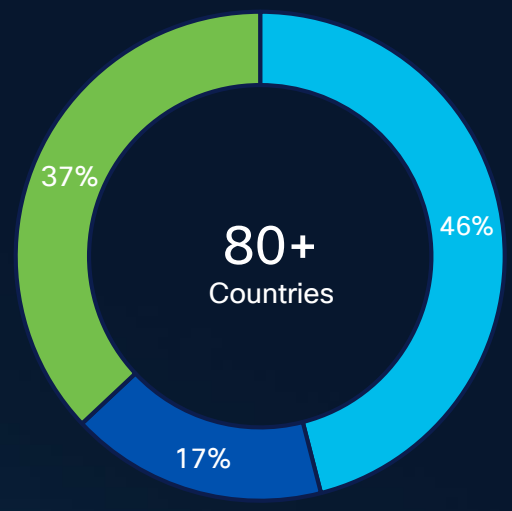
5,663
Routers

7,633
LAN Switches

11,164
Unified Computing
System Servers

33.5B
DNS Requests
per Day

Global Cisco Distribution



Americas · EMEA · APJC

27,684
Cisco Video Devices

71,096
Virtual Machines

61,483
Mobile Devices

130PB
Overall Usable Storage

1.52M
Webex Meetings per
Month

17.7M
DNS Threat Requests
Blocked per Day

Cisco IT

Security Challenge Inside Cisco

8 Trillion
SIEM Events / Day across Network (Splunk)

50 Billion
Netflows Analyzed / Day (Cisco Secure Network Analytics)

47 TB
Internet Traffic Inspected

33.5 Billion
DNS Requests / Day

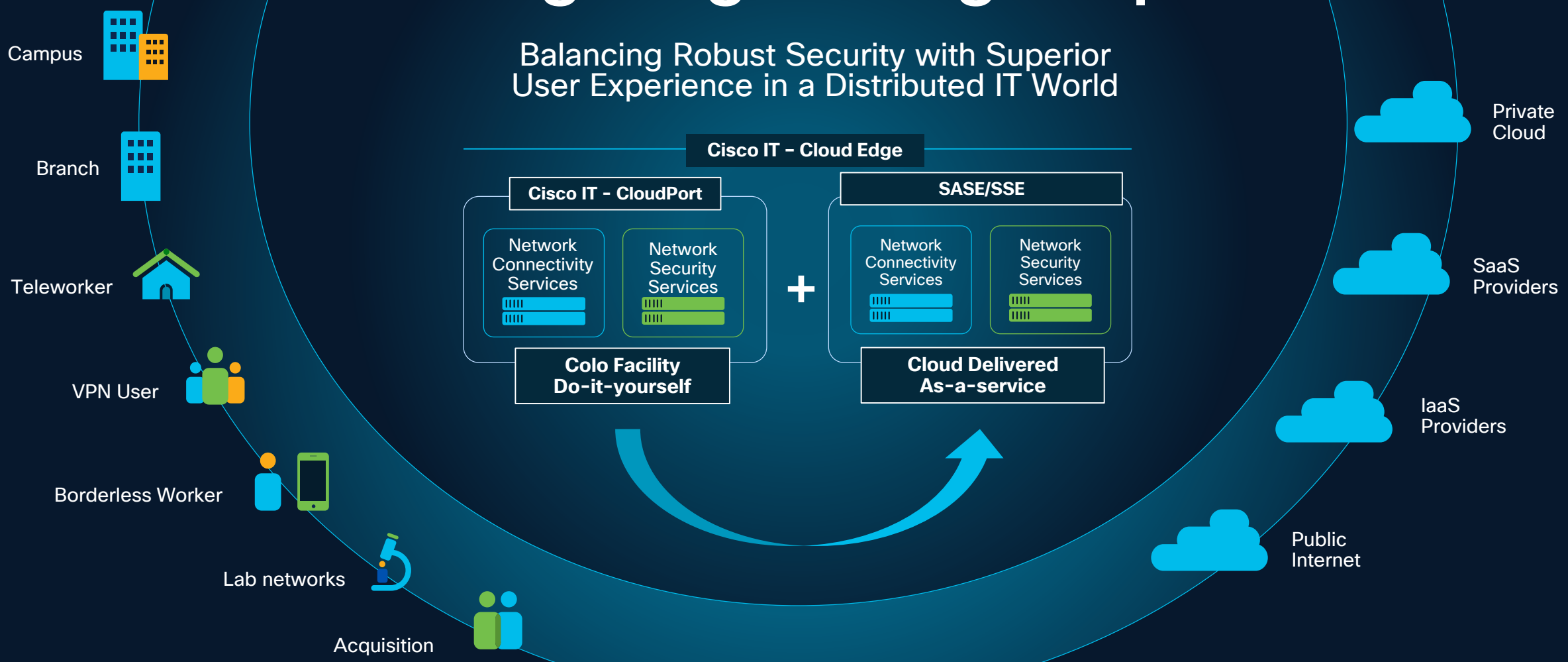
2.3 Million
E-mails received / Day (Cisco Secure Email)

12 Million
Intrusion Alerts / Day (NGIPS)

Balancing IT Priorities

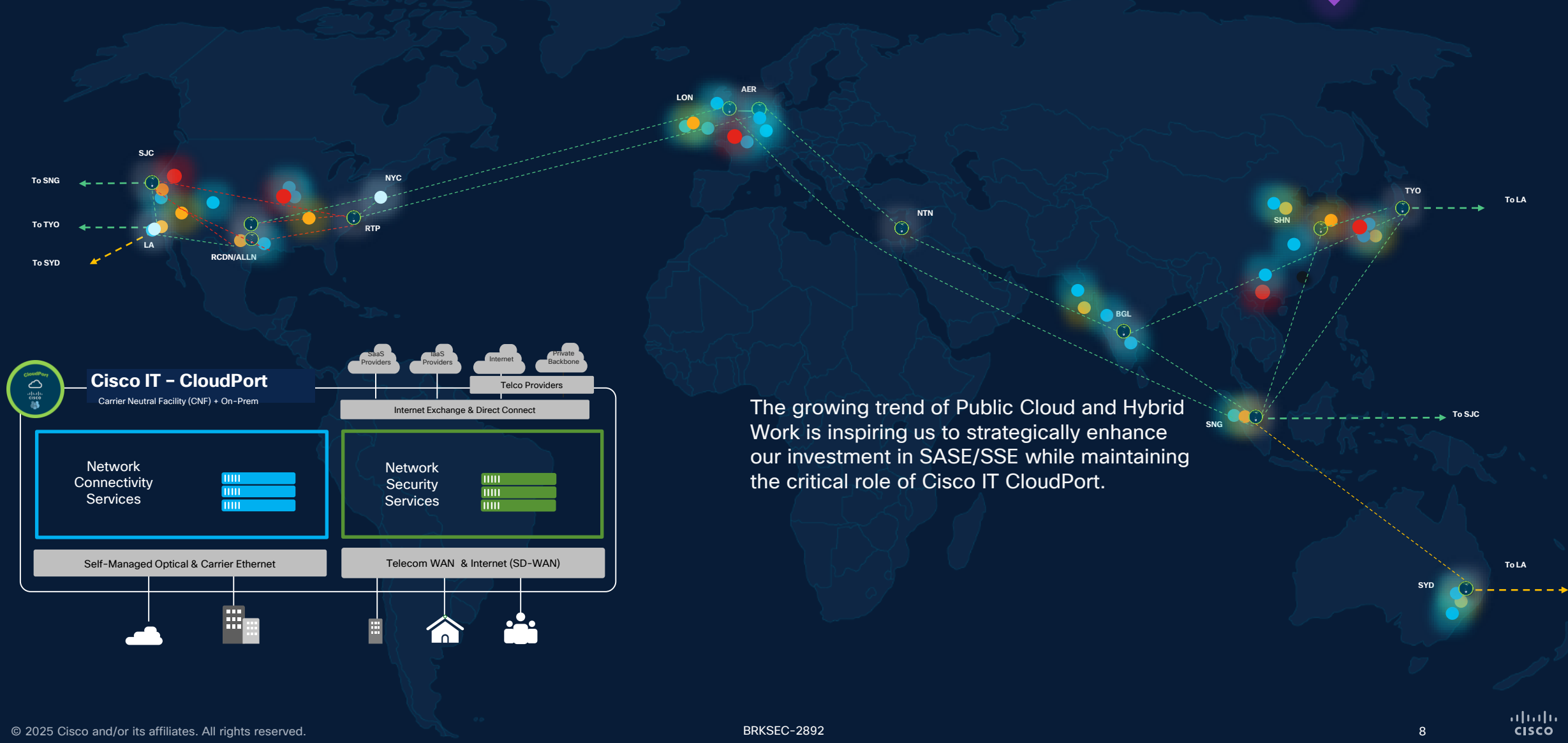
Navigating the Tightrope

Balancing Robust Security with Superior User Experience in a Distributed IT World



Cisco IT– CloudPort

A single tenant “SASE”



The growing trend of Public Cloud and Hybrid Work is inspiring us to strategically enhance our investment in SASE/SSE while maintaining the critical role of Cisco IT CloudPort.

Evolving to Zero Trust

Zero Trust is a mindset

Organizations should adopt a holistic zero trust approach to prevent user friction

Cisco IT Principles

- *Consistent user experience regardless of location*
- *Independent of underlying network*
- *Continuous validation of identity and trust*
- *Identity and policy for users, devices and things*
- *Least privilege access and micro-segmentation*

Remote Workers **Office Workers** **Devices & Things**

VPN as a Service

Cisco Secure Access (SSE)

Migration Strategy

Refresh Opportunity
6,500 Users

Cisco IT aggressively adopted Cisco Secure Access for a differentiated access VPN service to address and End of Hardware support situation

30-day migration target

Phase 1	Give users the option
Phase 2	Make SSE the default, but allow opt-out
Phase 3	SSE is the only option

Employee VPN
Cisco Workforce

Cisco IT took a more prudent approach to migrate the entire workforce giving people a way out in the very early stages

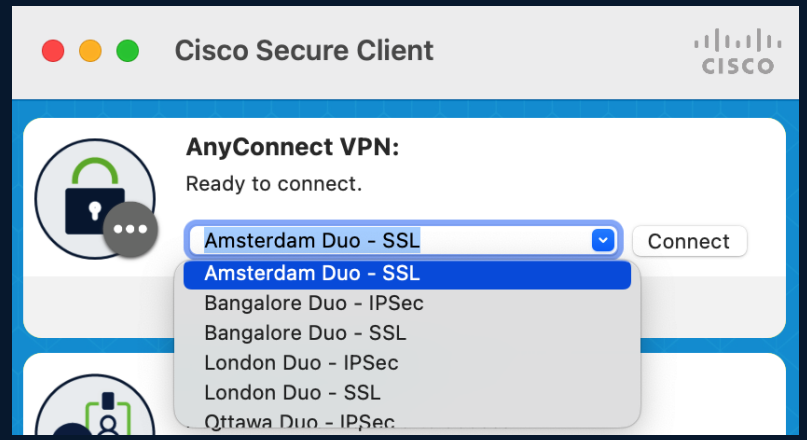
6-Month migration target

Phase 1	10K Users* 1. Give users the option 2. SSE is the only option
Phase 2	Workforce 1. Give users the option 2. SSE is the default with limited Opt-Out 3. SSE is the only option

(*) Eating our own dogfood = Make SSE the default for the people building the product

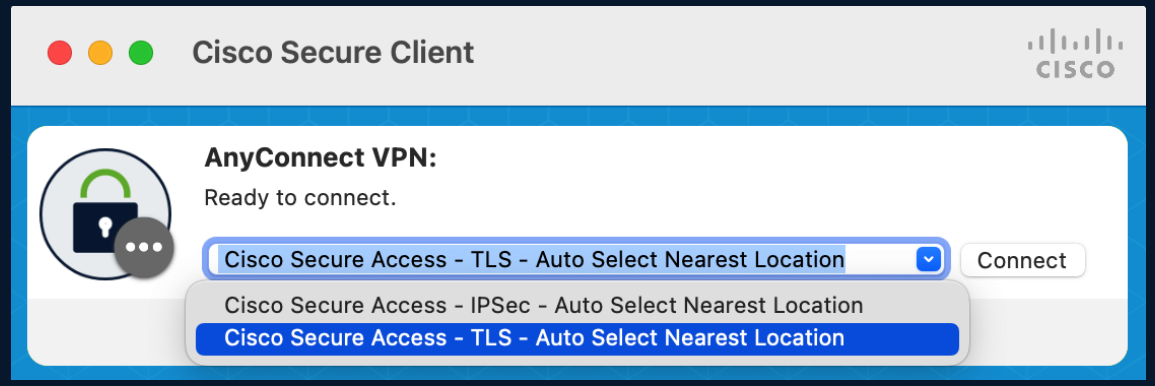
User Experience

Before



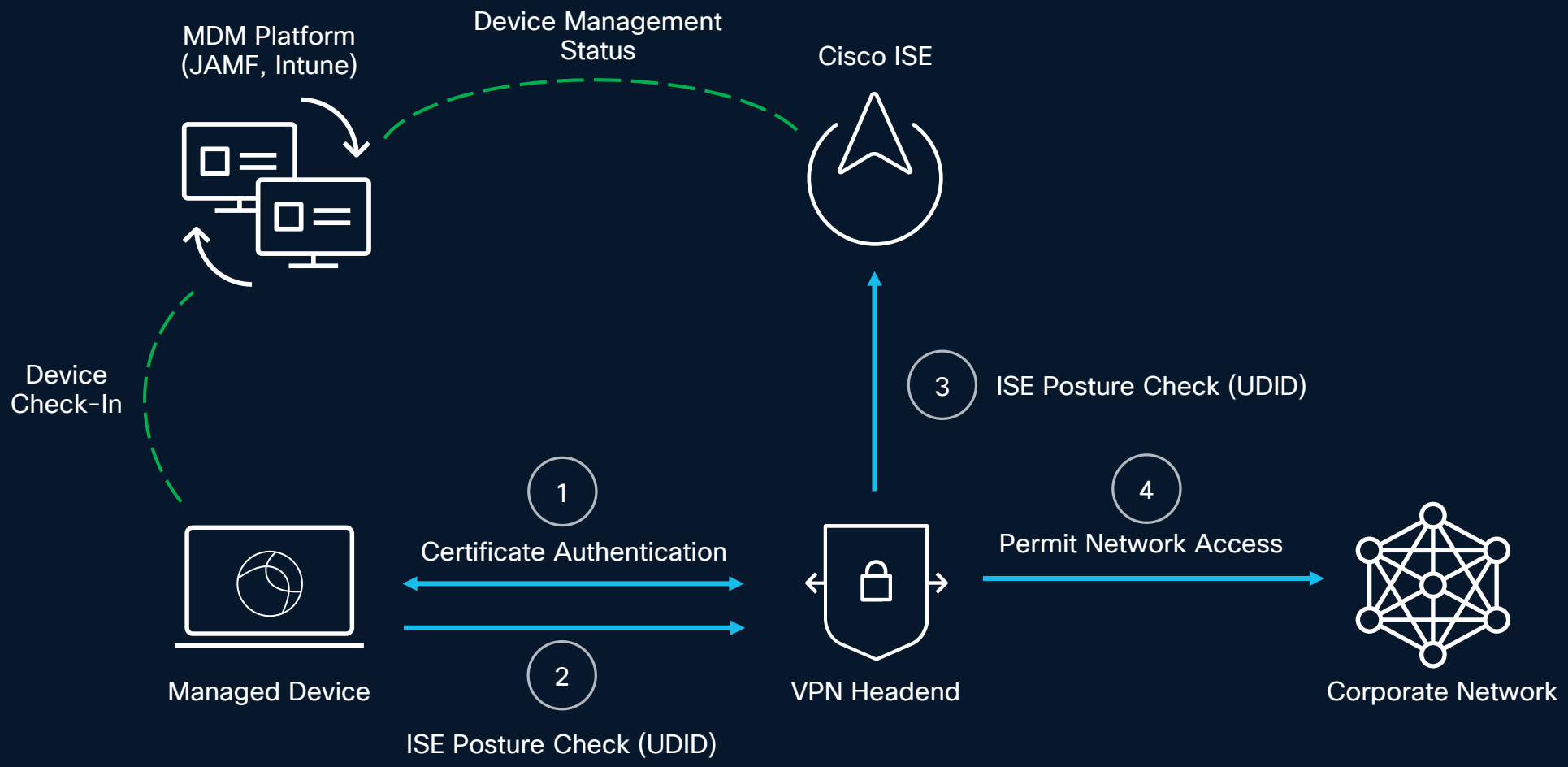
Users had to manually select one of the options from the dropdown. Many users connected to sub-optimal locations and blame VPN for poor performance.

After

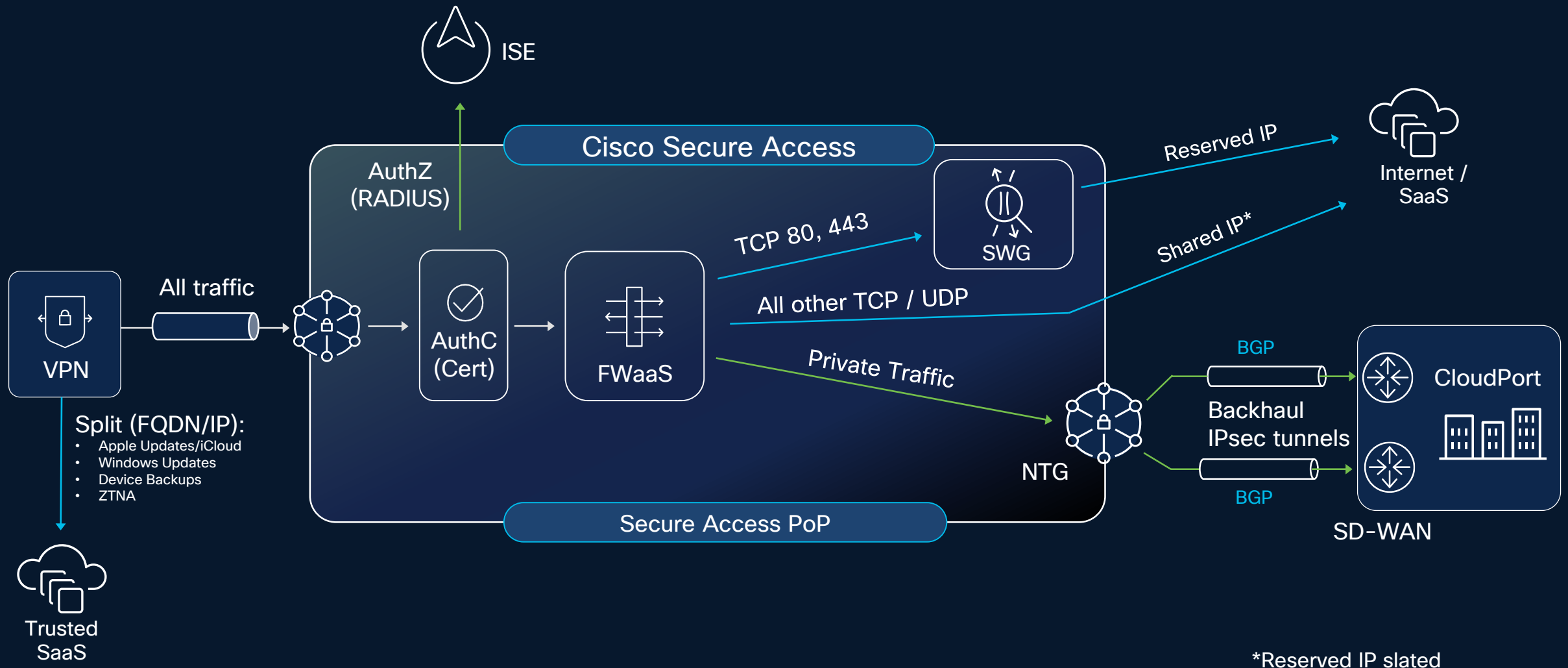


Cisco IT made the decision to only expose 2 options which both connect users to he nearest location. The regional profiles will be made available for users that need it through self-service on the client machine.

VPN Posture Checks

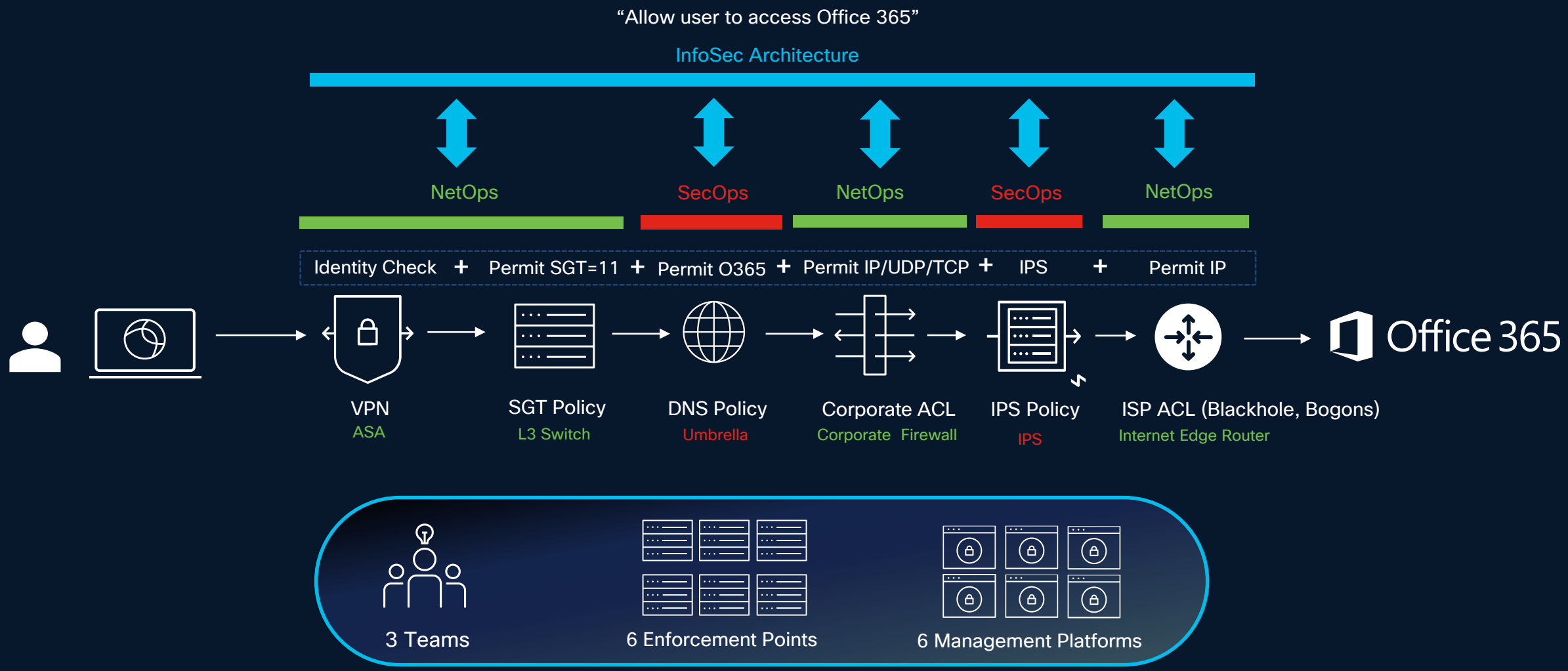


VPN Full Traffic Flow

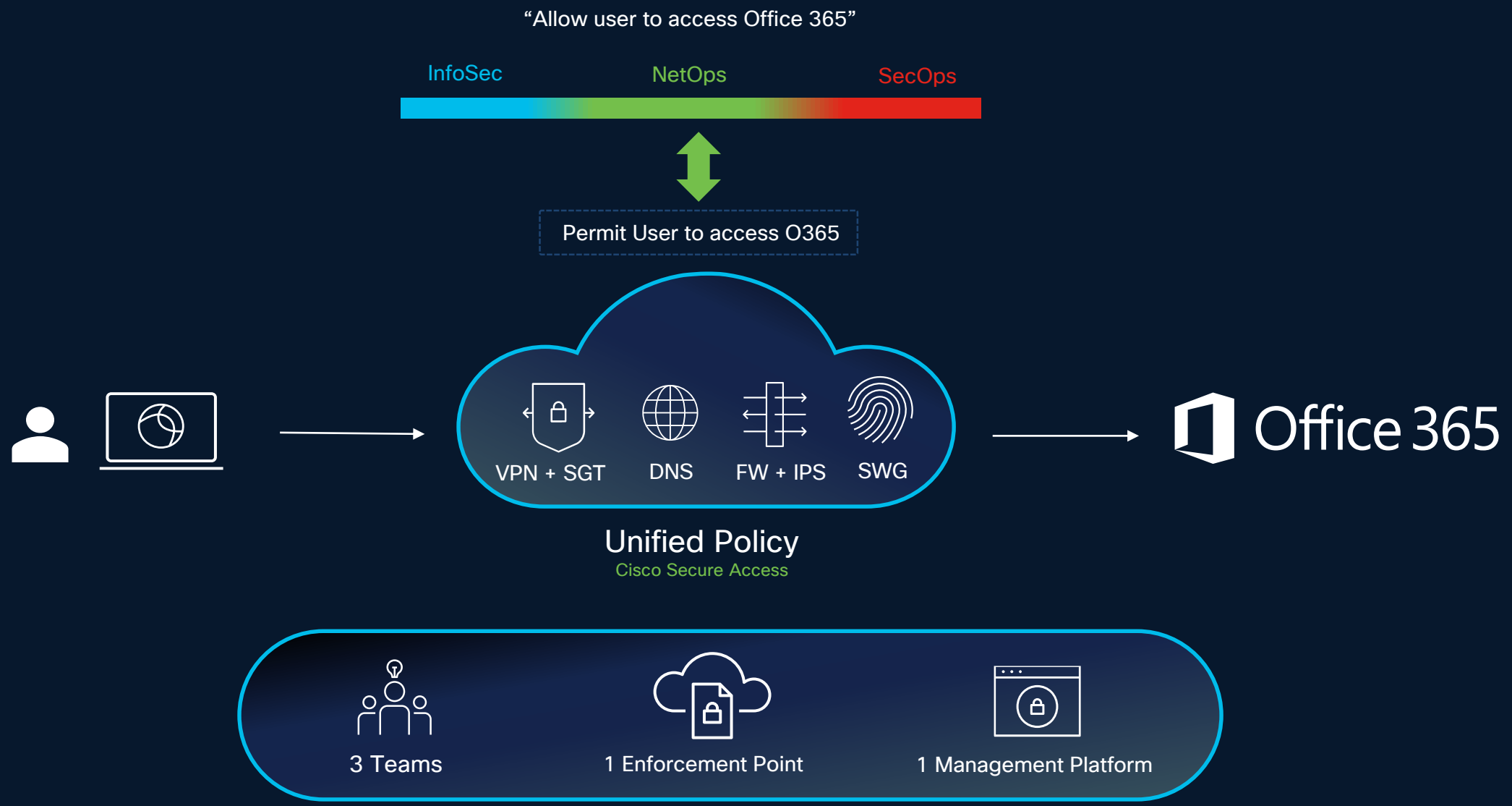


*Reserved IP slated for Q4FY25

Policy in the Enterprise Network



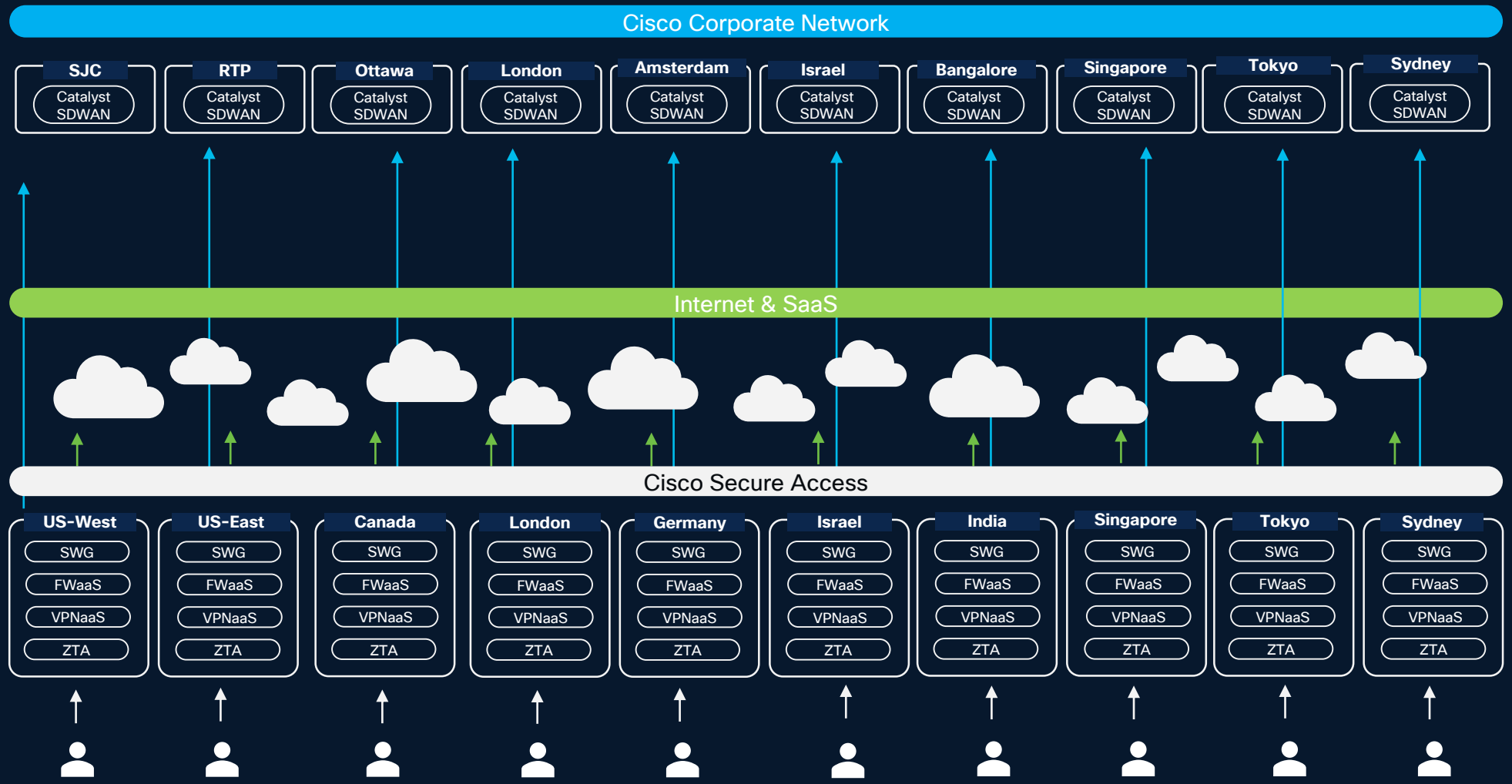
Policy in SSE



Global Architecture Overview

VPN Enablement

- 10 VPN Regions in strategic locations worldwide with the option to add many more in the future
- Each region has resilient and scalable connectivity to the Cisco enterprise
- Certificate-Based Authentication with RADIUS Authorization (ISE)
- Reserved IP for Secure Internet Access
- Significantly simplified security policy due to established trust and improved observability.
- Simplified IT operations by not having to manage boxes ease of troubleshooting.



Zero Trust Access

with the Duo Network Gateway

Per-App Access with Duo

Authenticate Users

- MFA
- Passwordless
- Employees/Contractors

Verify Devices

- Device Trust
- Device health & compliance
- Mac, Win, Linux, iOS, Android

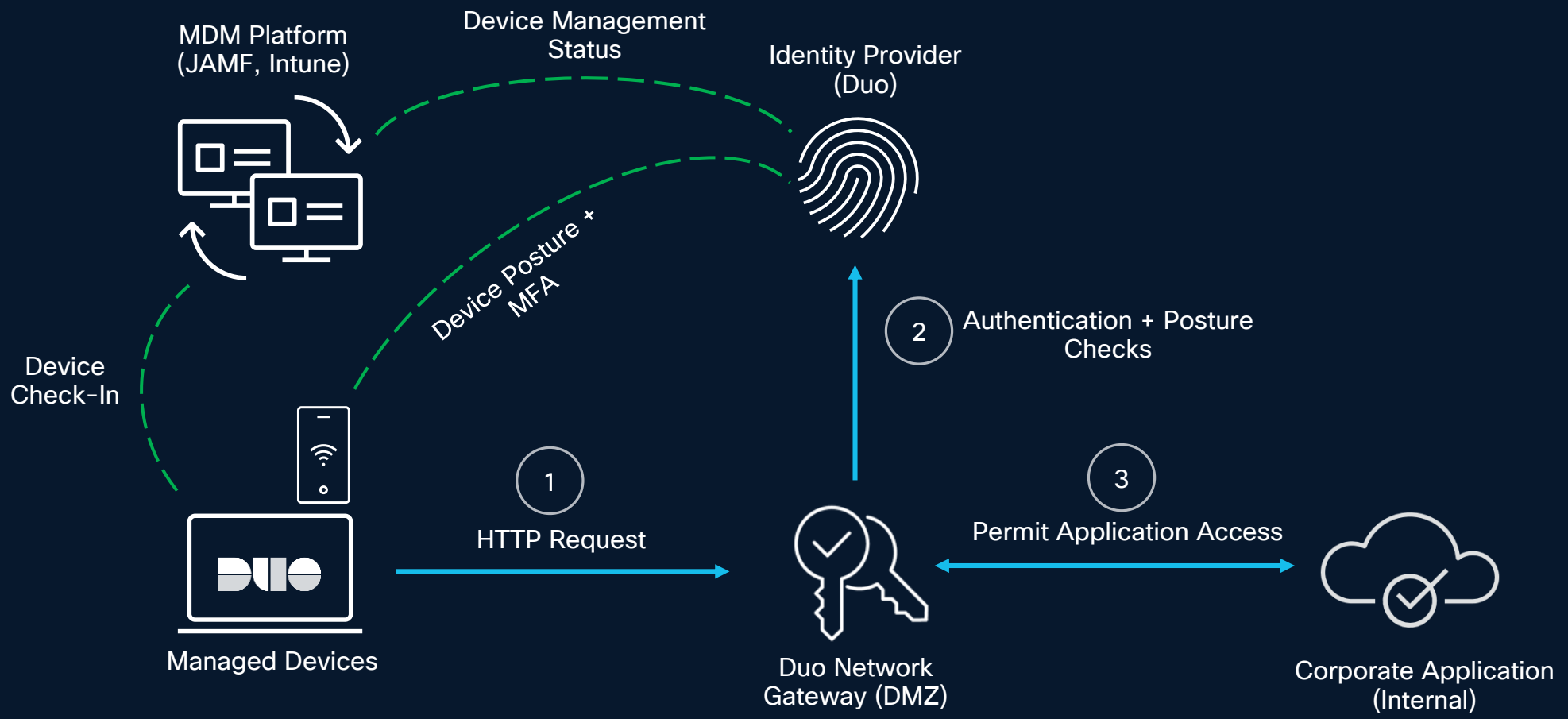
Enable Access

- Single Sign-On (SSO)
- VPN-less remote access
- Access only authorized to specific application

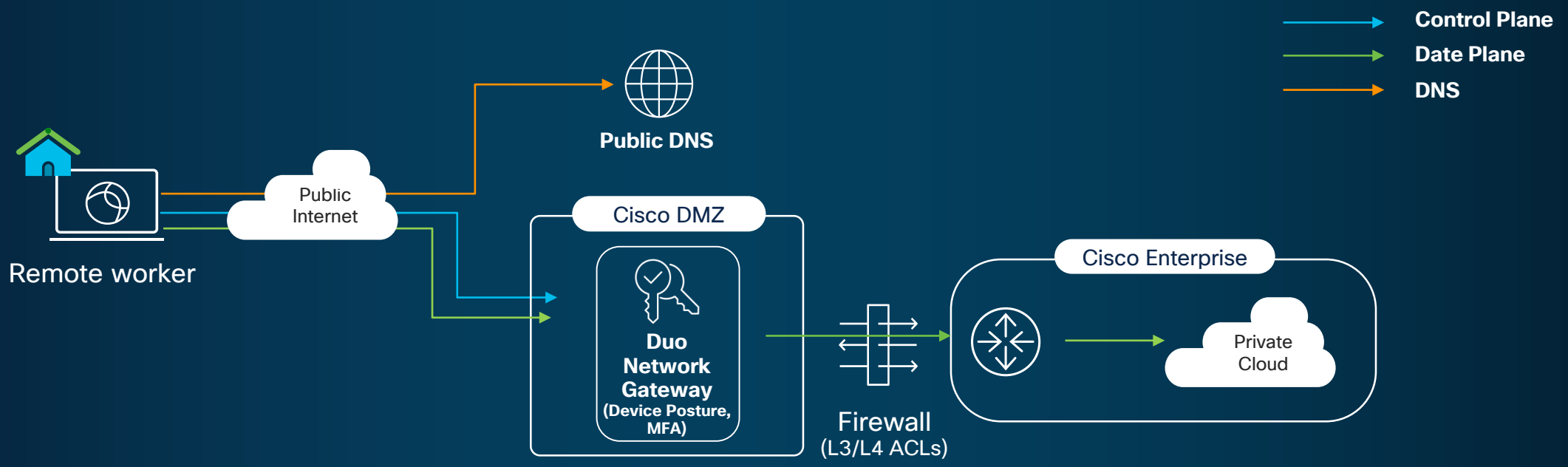
CORPORATE RESOURCES

Risk Based Authentication

Control Plane Architecture



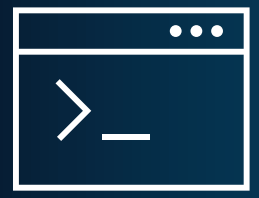
Data Plane Architecture



Cisco’s Duo Deployment

Managed Devices

Deployed Device Configs to over **170K** Endpoints (Mobile/Desktop)



Applications Available

Borderless access for 150+ Applications

User Authentications

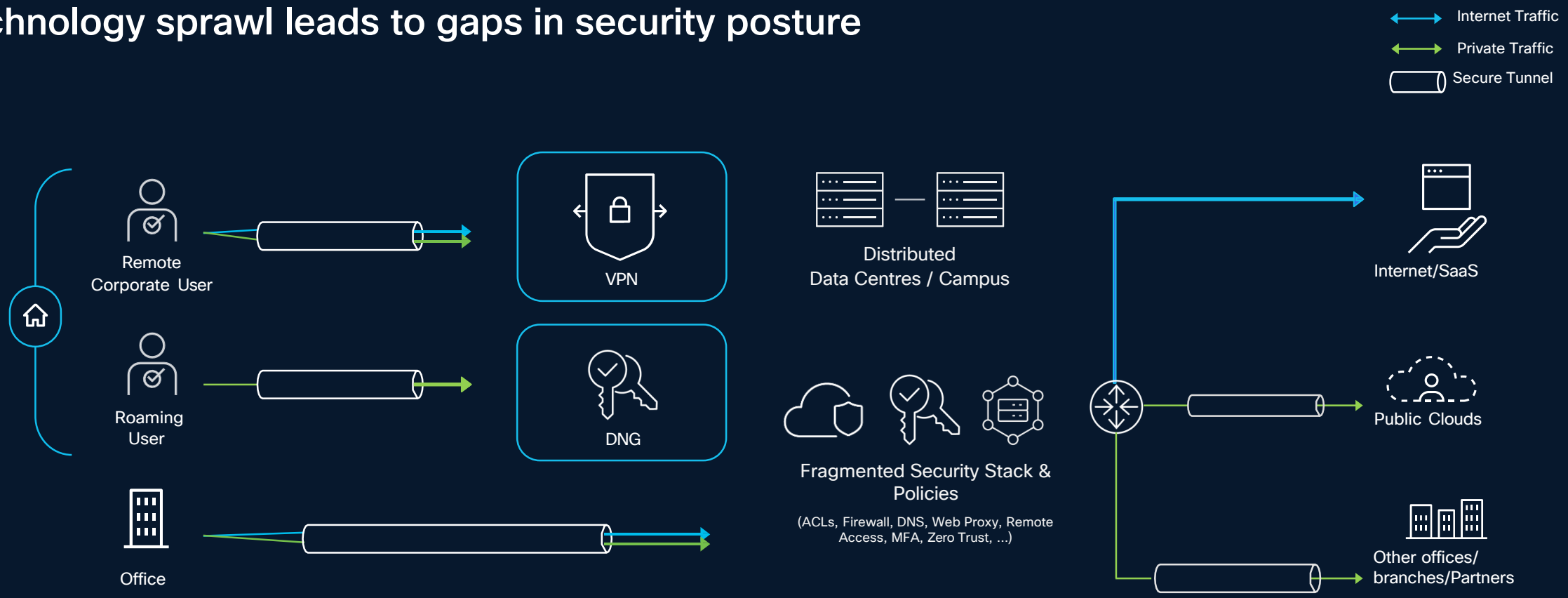
420K user authentications daily

Borderless Access

Borderless access for Mac, Windows, Linux, Android and iOS devices

Challenge

Technology sprawl leads to gaps in security posture

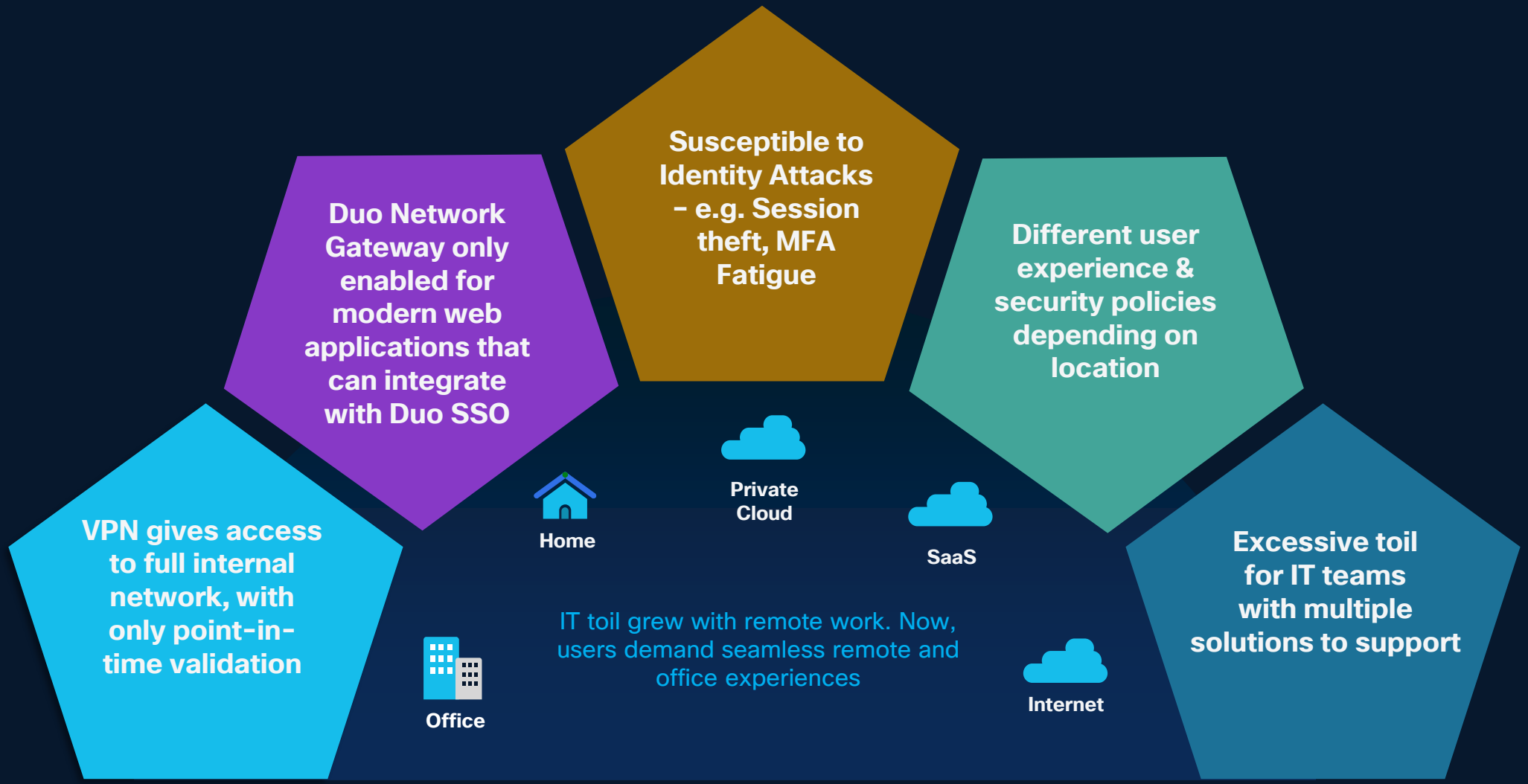


Poor user experience
Lower productivity

Large sets of individual solutions and vendors
Complexity of operations and costs

Gaps in security posture born out of complexity and fragmentation

Hybrid Access Challenges



Evolving the Zero Trust Architecture

with Cisco Secure Access

Access Approach in Cisco IT

There are 3 main security checks for accessing application resources today

User + Device Identity

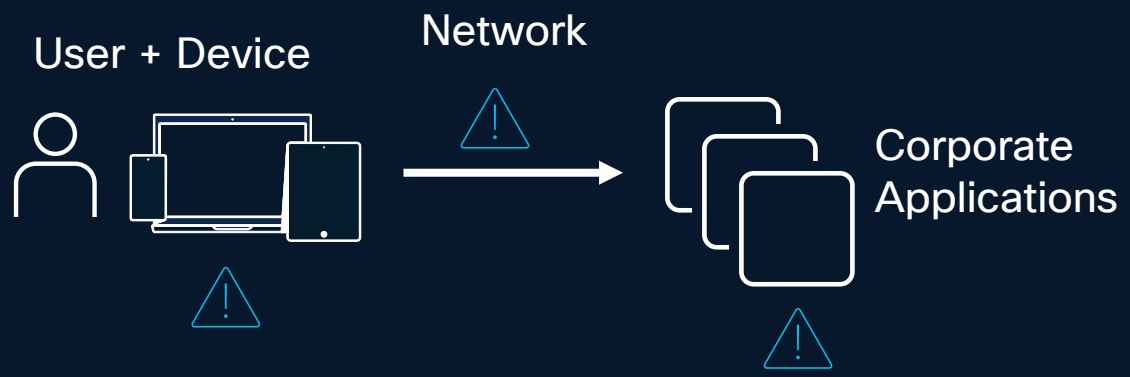
For granular role-based access control

Validation of Management

Ensure endpoint is actively managed by IT via a check against the Device Management Suite

Lightweight Posture Check

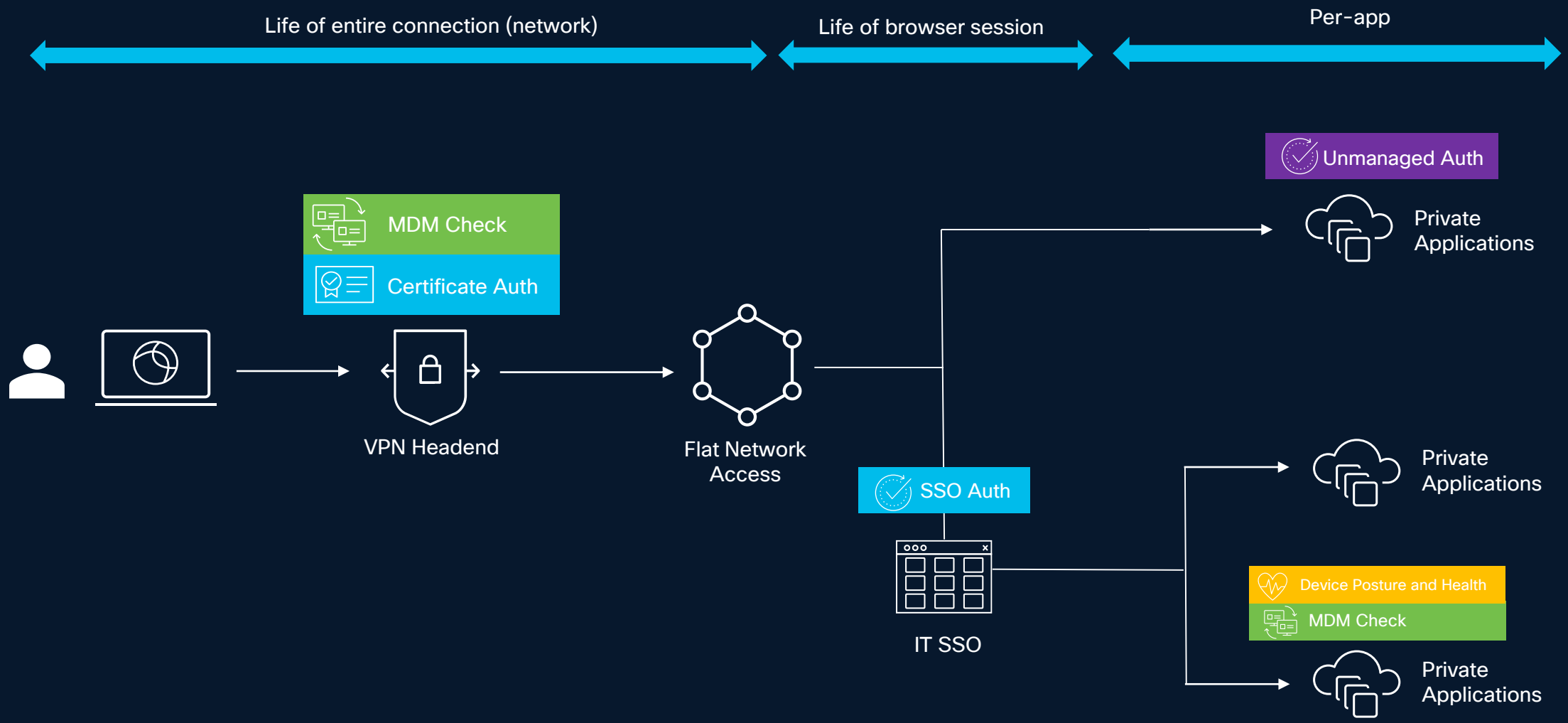
Device attributes, e.g. Minimum OS, Disk Encryption, Security Agent



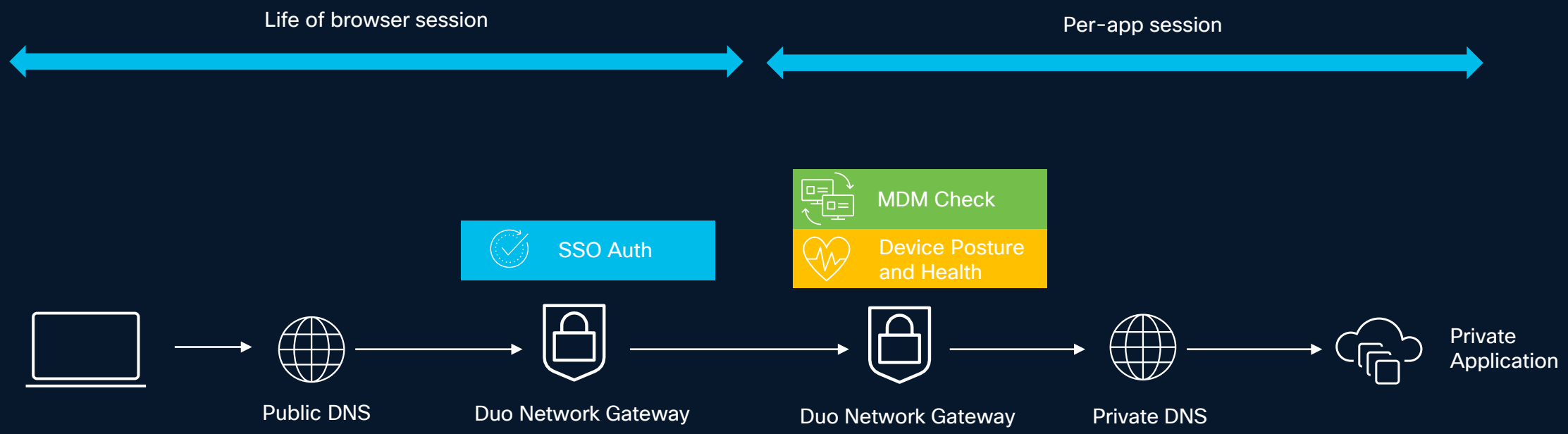
These checks are done at various stages of the connection. The goal is to have all 3 checks for any application access attempt.

Zero Trust Philosophy is to continually validate these attributes at smaller intervals

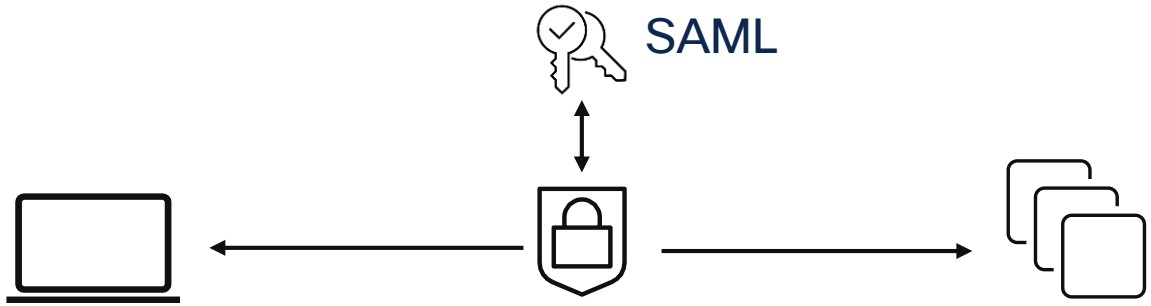
Application Access with VPN



Application Access with Duo Network Gateway



Duo Network Gateway



The DNG is a layer 7 reverse proxy – it only proxies some types of traffic, and inserts itself into the SAML Authentication layer to validate management status and device posture.

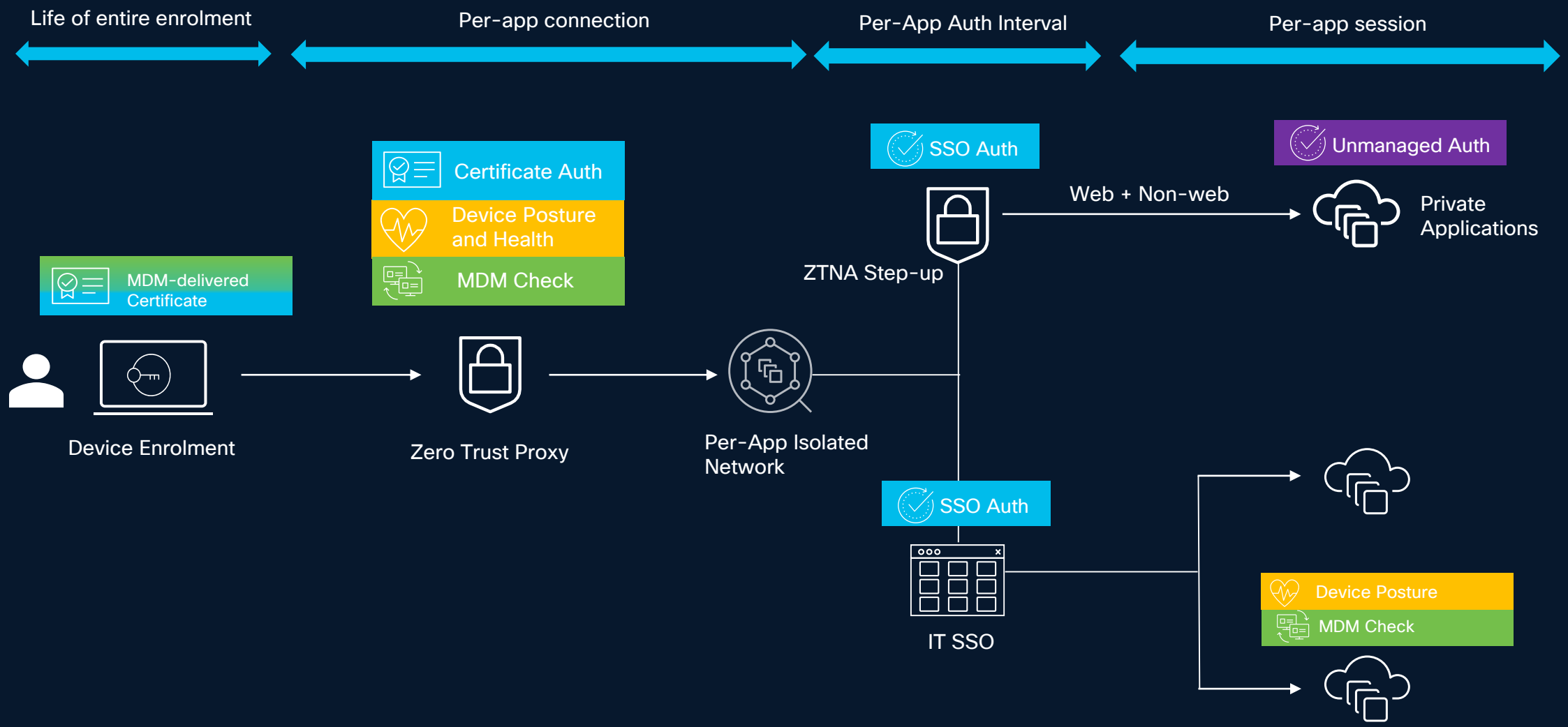
VS

Cisco Secure Access (ZTNA)

ZTNA is a layer 3 forward proxy – it proxies TCP and UDP sockets to validate device identity and posture. The application still runs its own authentication.

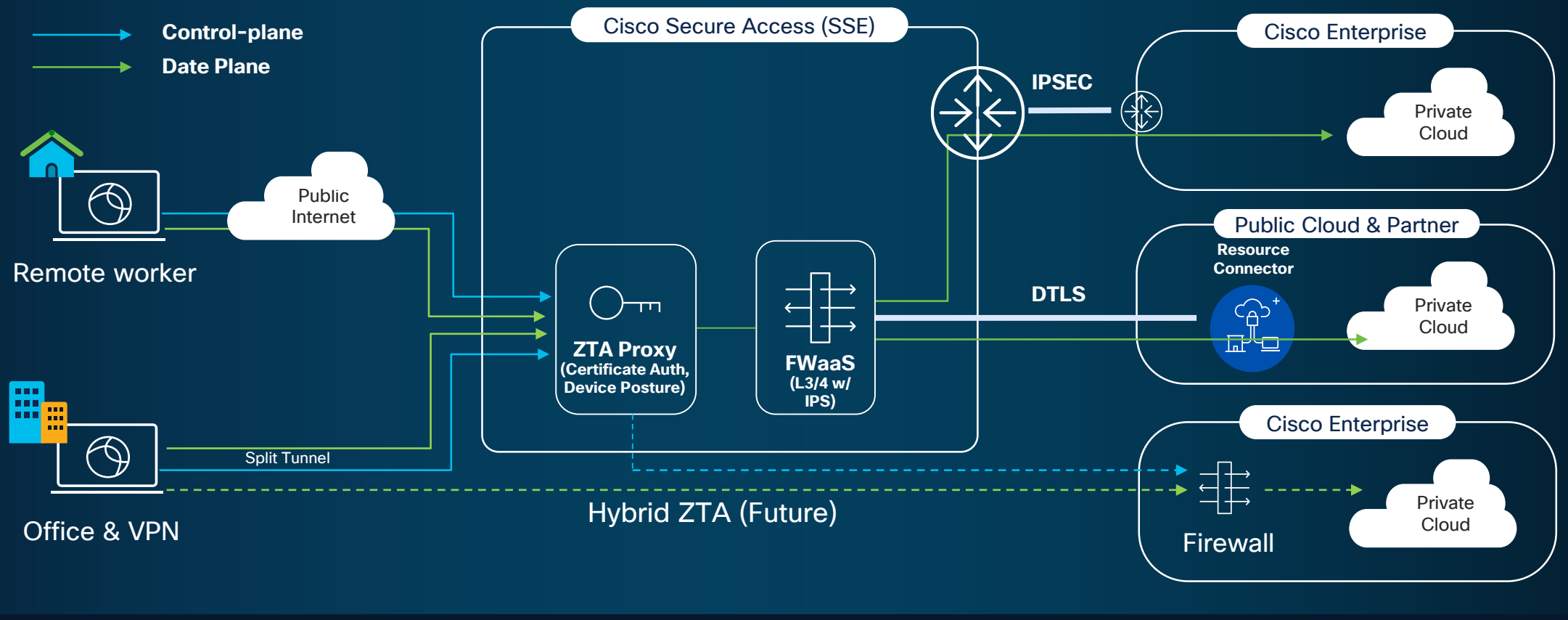
Therefore, ZTNA is **not** a 1:1 replacement of DNG, but an evolution

Application Access with ZTA

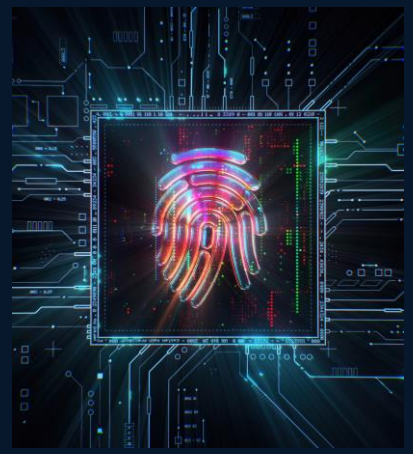


Architecture Overview

Cisco Secure Client
Zero Trust Access



Differentiators



TPM-Bound Keys

TPM is a hardware enclave that protects private keys. This secures ZTA clients against session/certificate hijacking (Windows, Mac, iOS, Android)

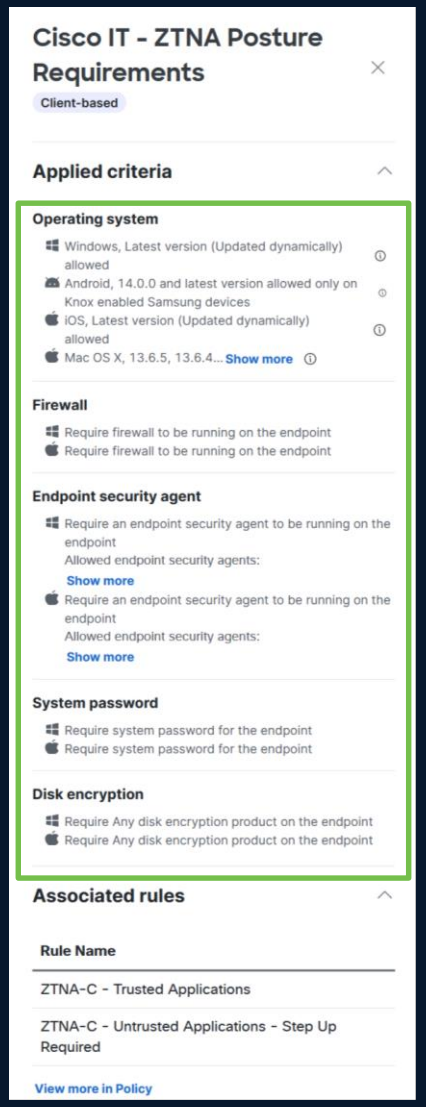
Backwards Compatible

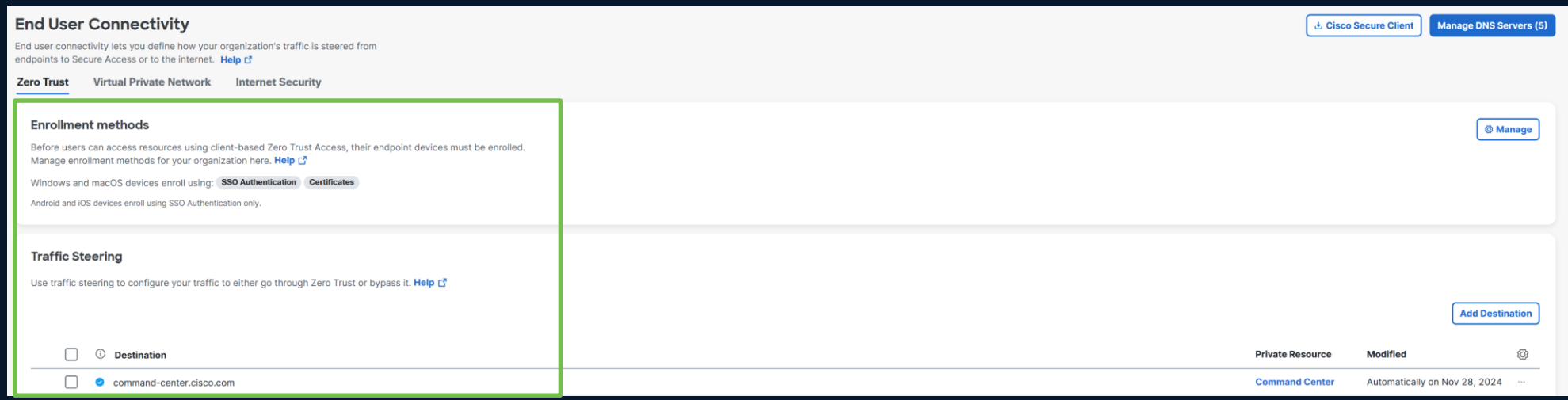
Onboarding apps to SSE does not affect existing VPN or DNG access, allowing for seamless migration. Apps can be gradually onboarding to an increased user base, and any failures allow fallback to the underlying network (VPN/Public).

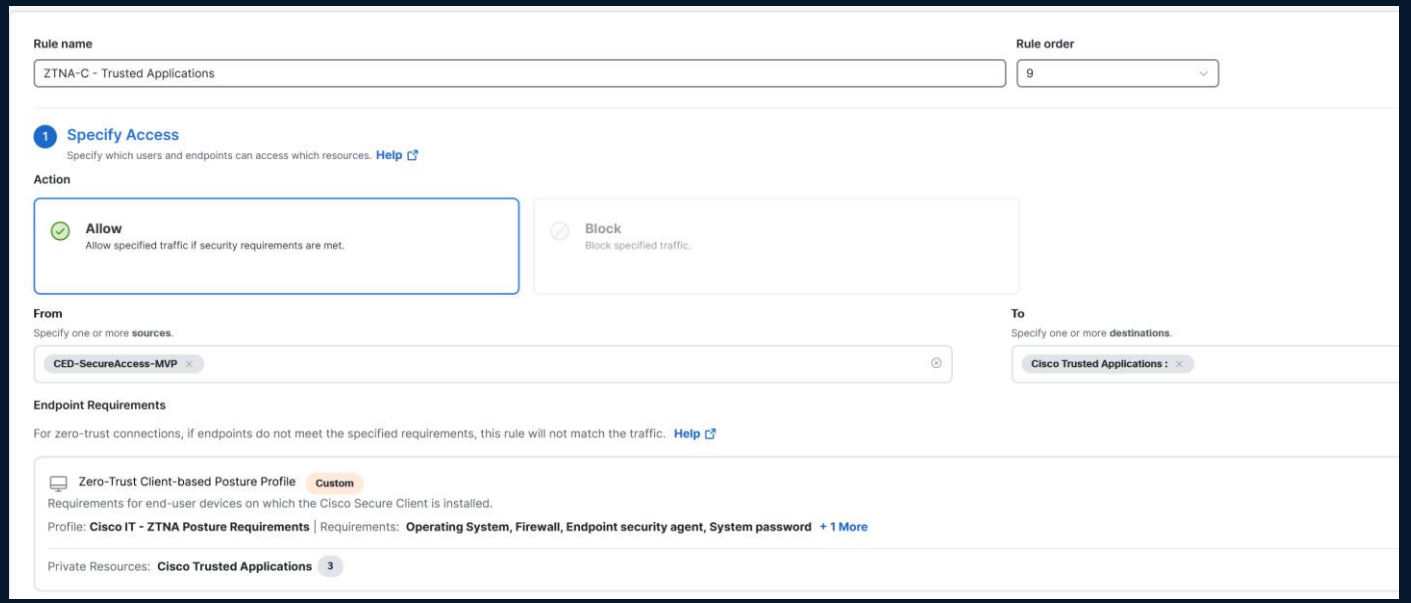
Secure Network

Instead of authorizing the whole application/browser session, SSE posture checks are evaluated separately for each TCP/UDP socket, providing a much more robust and secure zero trust framework. No exposure to public internet, or even internal IPs.

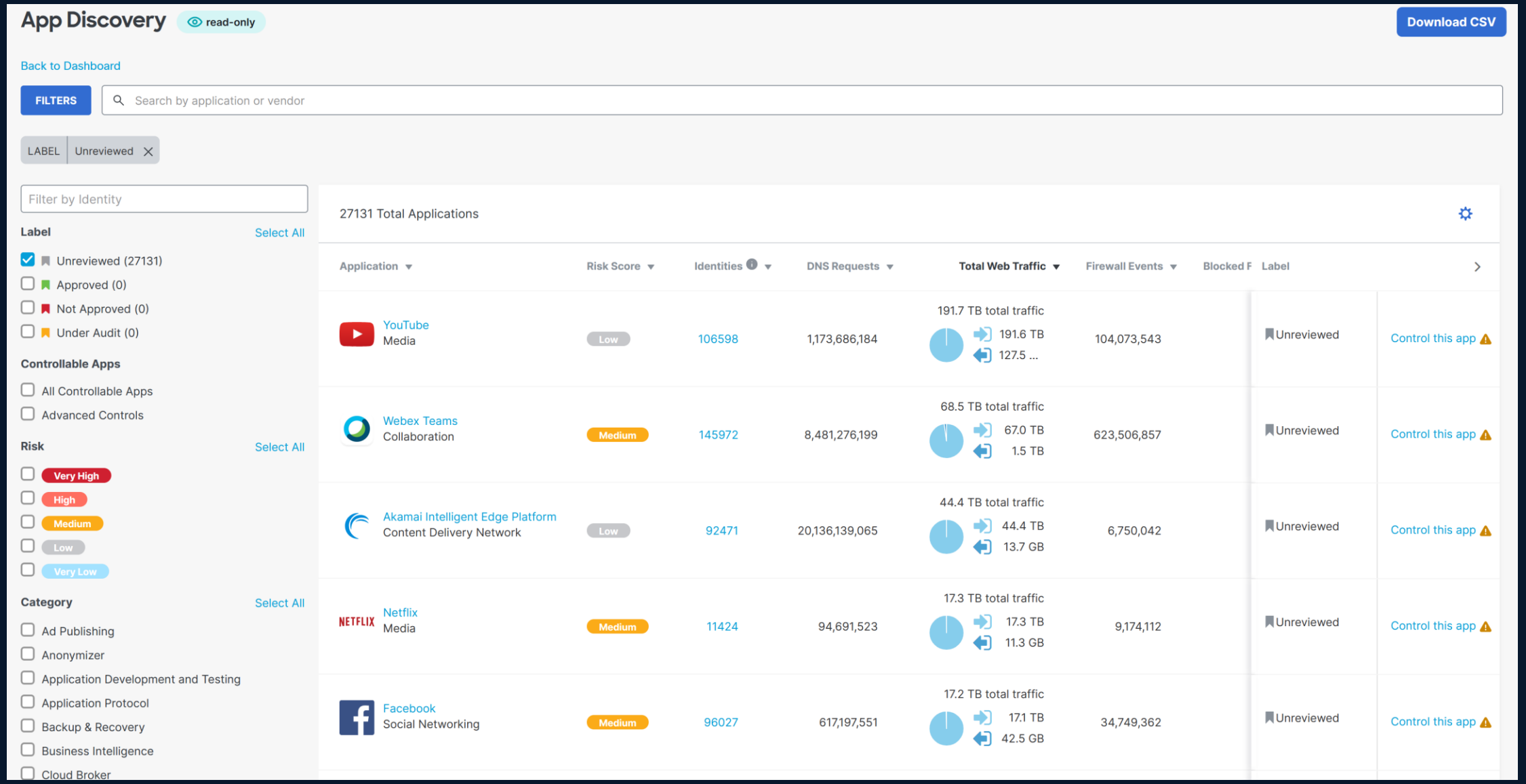
Cisco Secure Access Policy Creation





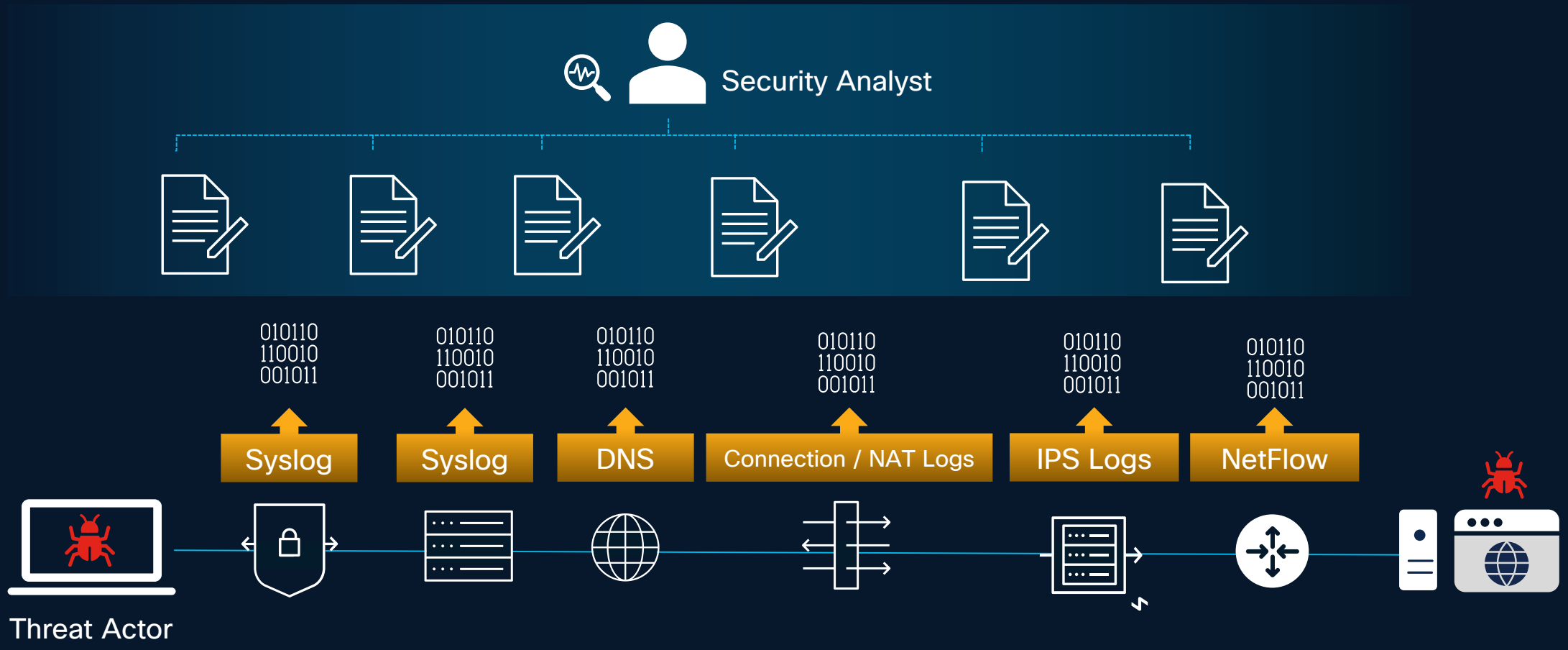


Detailed App Utilization Discovery



Security Analysis in Enterprise Network

Disparate Data Sources, Complex Correlation



Unified Activity Logging

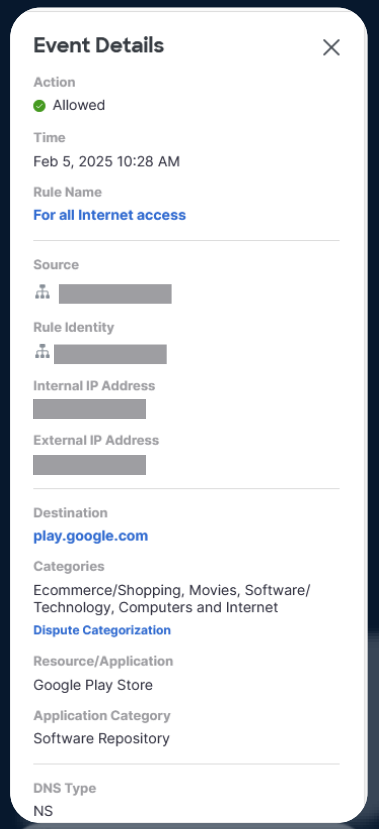
All logging is now centralized, eliminating the need for building tooling to do attribution across products.

Security investigators can easily see who accessed what, when, how, and identify any concerns.

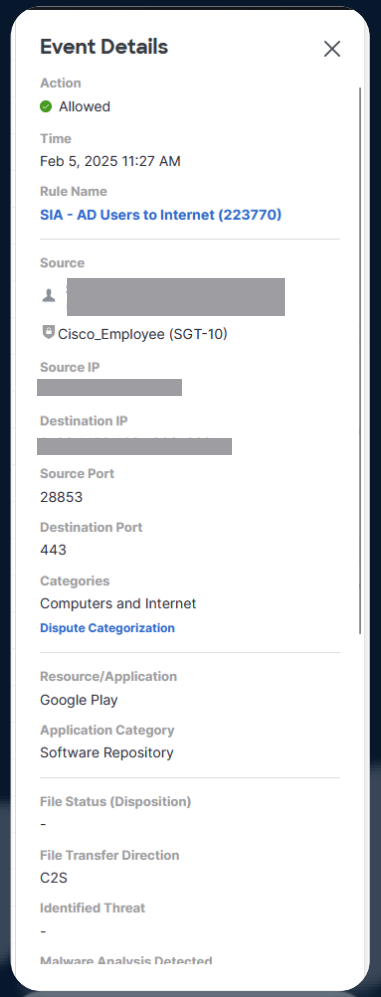
splunk>

Integrate with other data sources to write pro-active security plays

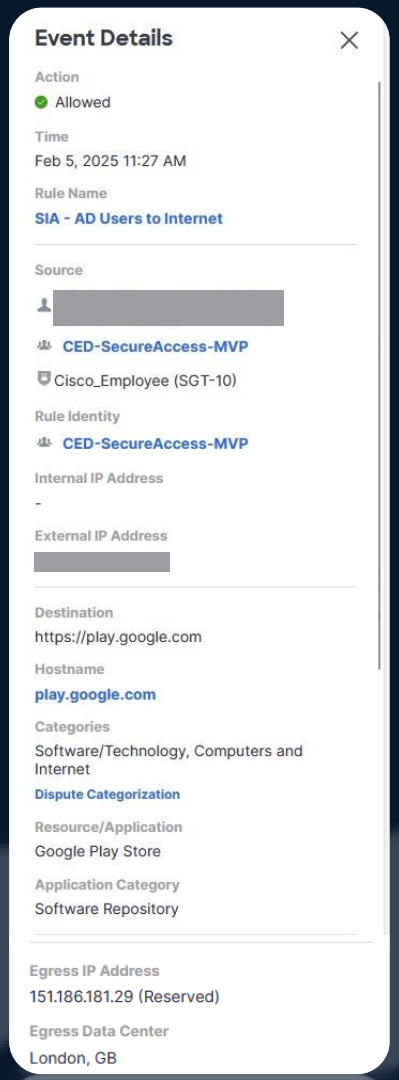
DNS Security



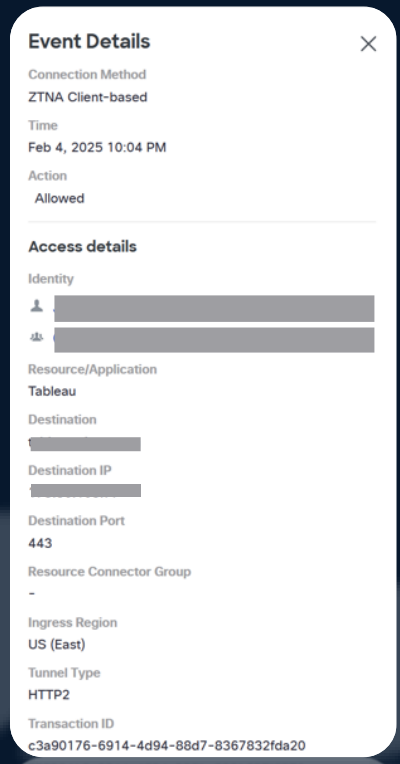
Firewall



Web Security



Zero Trust Access



Cisco IT Value Cases

Better Security

- Uplift from VPN to an isolated network per app, with strong identity
- Can secure unmanaged apps without needing intervention from app owner
- Continuous validation with better logging/visibility

Secure the Data Center – only the ZTA proxy has network access

User Experience

- Allow users access to wider range of apps without the need for VPN
- Better performance due to cloud availability and no HTTP redirects
- No difference in experience whether on ‘trusted’ network or not.

Onboard most – not some – applications onto ZTA

IT Operations

- Simplified network design compared to DNG
- No separate policies for DNG vs internal Duo apps
- No lifecycle management of on-premises VMs

IT simplification by consuming as a cloud service

The North Star Vision

VPNs aren’t vanishing, by Zero Trust Access is Stealing the Show

Current

ZTA
Duo Network Gateway

Frequently used IT Apps are enabled for Borderless Access

Posture checks for each App but different in office versus home

Users need to authenticate differently at home and office

VPN
Cisco Secure Access

More than 60% of the workforce still needs to use VPN at least once a week.

Posture at time of connect with broad access to everything

Users need to think if they need to fire up VPN or not

TRANSITION PLAN

Step 1
Move VPN to the Cloud

Step 2
Use enhanced telemetry to identify Apps and move to ZTA

Step 3
Migrate DNG Applications

Step 4
Limit Access on the VPN

Target

ZTA
Cisco Secure Access

Most IT and non-IT Apps are enabled for Zero Trust Access

ZT is always on regardless of location and continuous posture validation

More seamless authentication experience

VPN
Cisco Secure Access

Only ”special” applications continue need VPN

Posture at time of connect with only access to what is needed

The VPN is on by default, so users don’t have worry

Lessons Learned

Practical Guidance for Organizations

Lessons Learned

		Before	After
01	**Strategic Vision** Develop a company wide NorthStar vision and business outcomes	Different teams try to adopt SSE in isolation to address their specific challenges	Teams work closely together to achieve maximum business value
02	**Executive Sponsorship** Ensure strong, sustained leadership commitment and prioritization	Operational work tends to be prioritized over forward-looking innovation	Stop managing On-Prem and IT wide prioritization of work and resources

Lessons Learned

03

Form a virtual team with representatives from all parts of IT and Security

Cisco's integrated platforms unite network and security products, fostering closer collaboration between IT and security teams

Device Experience	IT Helpdesk	Information Security
★ IT Design & UX	IT Communications	Security Operations
Identity & Access Management	Workplace	Network Operations

Lessons Learned

04

Speed vs. Risk

Balance innovation speed with willingness or need to take risk

Being Customer Zero does not mean we sacrifice on user experience and security. At the end of the day – the job of IT is enabling our users to perform their job.

Move fast when needed

Cisco enabled the IT workforce for VPN, accelerated by an end-of-life hardware situation

A more prudent approach where it matters

Cisco IT enabled applications for ZTA in phases

Risk assessment and mitigation

Cisco IT invested time in understanding and documenting risks, finding ways to mitigate them before moving to the next phase

Steering Committee Go / No-Go decision

We communicated the risks of moving forward and the business impact of slowing down up the leadership chain, ensuring that all decisions had visibility at the VP level

Complete your session evaluations

Complete a minimum of 4 session surveys and the Overall Event Survey to be entered in a drawing to win 1 of 5 full conference passes to Cisco Live 2026.

Earn 100 points per survey completed and compete on the Cisco Live Challenge leaderboard.

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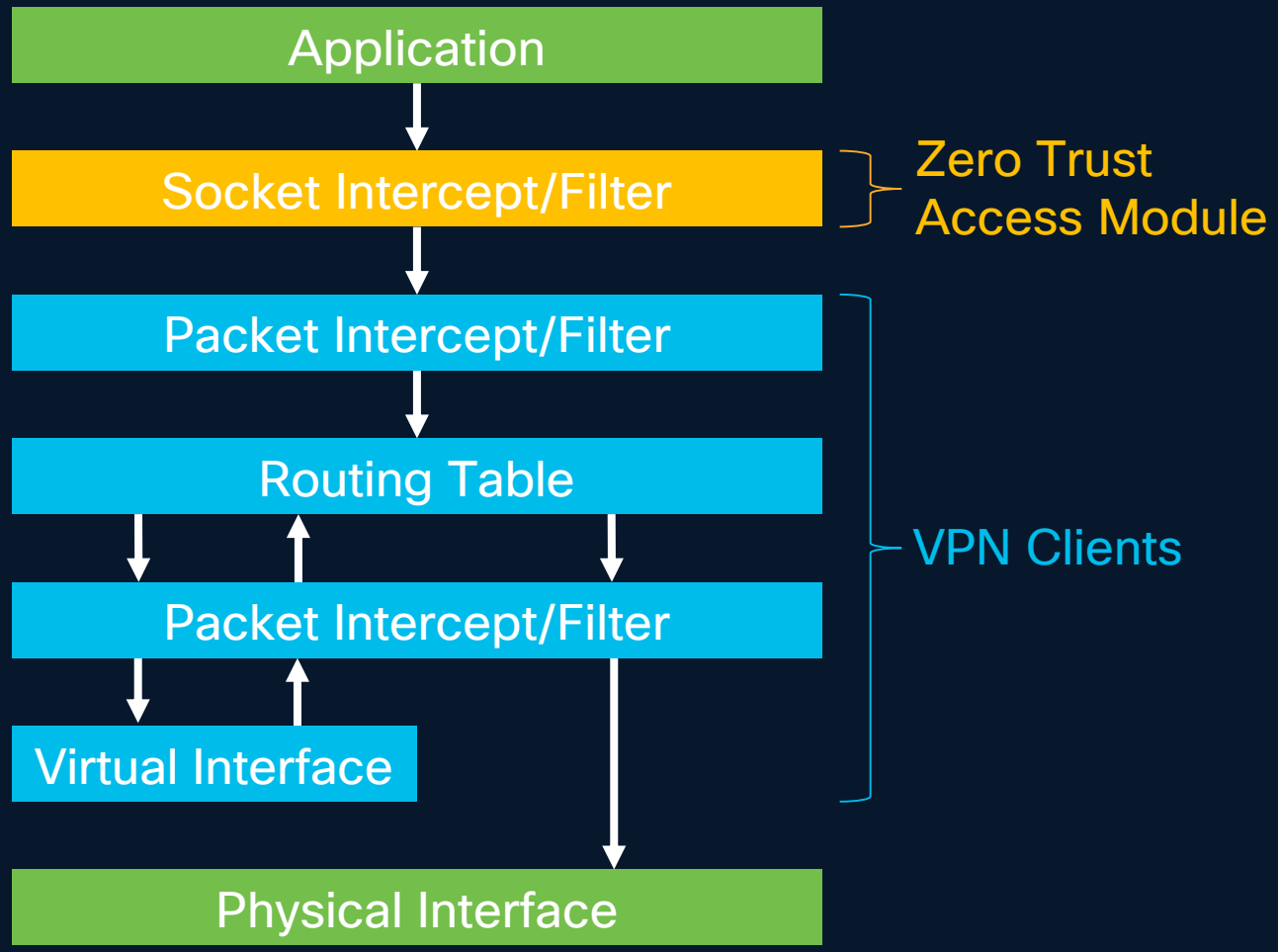
Visit the On-Demand Library for more sessions at www.CiscoLive.com/on-demand

Contact me: Webex Chat or find me at the conference

Thank you


CISCO

Cisco Secure Client: Socket Intercept



Why Socket Intercept?

- Control of DNS and application traffic *before* VPN clients
- No route table manipulation
- Ability to capture traffic by IP, IP subnet, FQDN and FQDN wildcard
- Interoperability with Cisco and non-Cisco VPNs