

How WWT's Advanced Technology Center Revolutionized Their Network Architecture by Leveraging Cisco Nexus Hardware and Nexus Dashboard Services

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CSSDCN-1000

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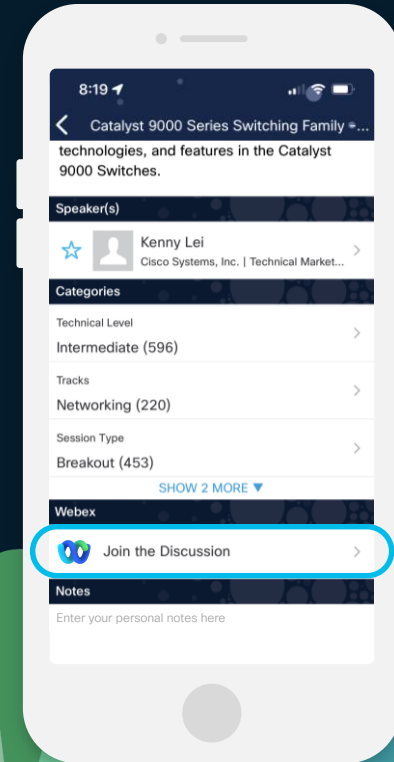
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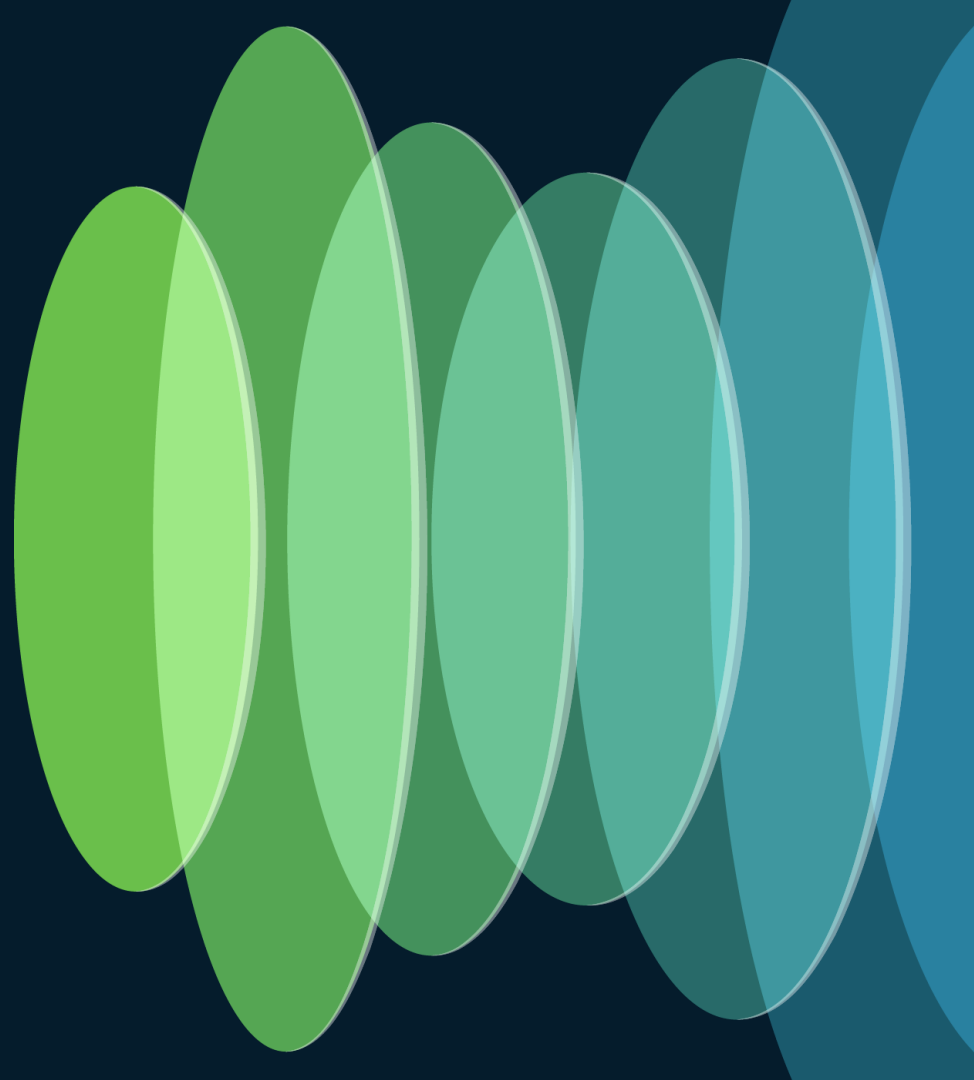




Agenda

- Nexus Portfolio Overview
- Introduction
- Previous State + Opportunity
- Goals
- Solution + Benefits
- API Usage
- Future Projects

Nexus Portfolio Overview



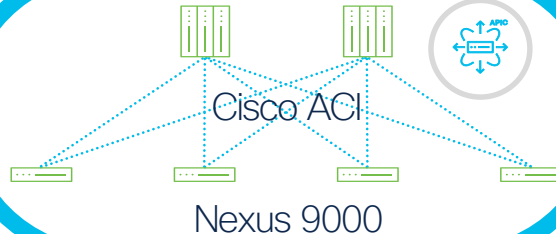
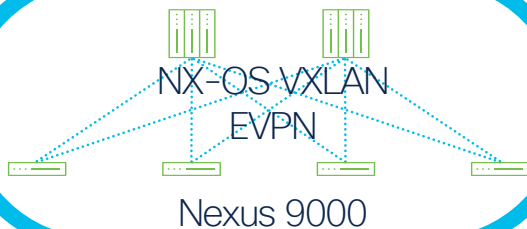
Cisco Data Center Networking Portfolio

Cisco Nexus Dashboard as single point of control and operations

Cisco Nexus Dashboard

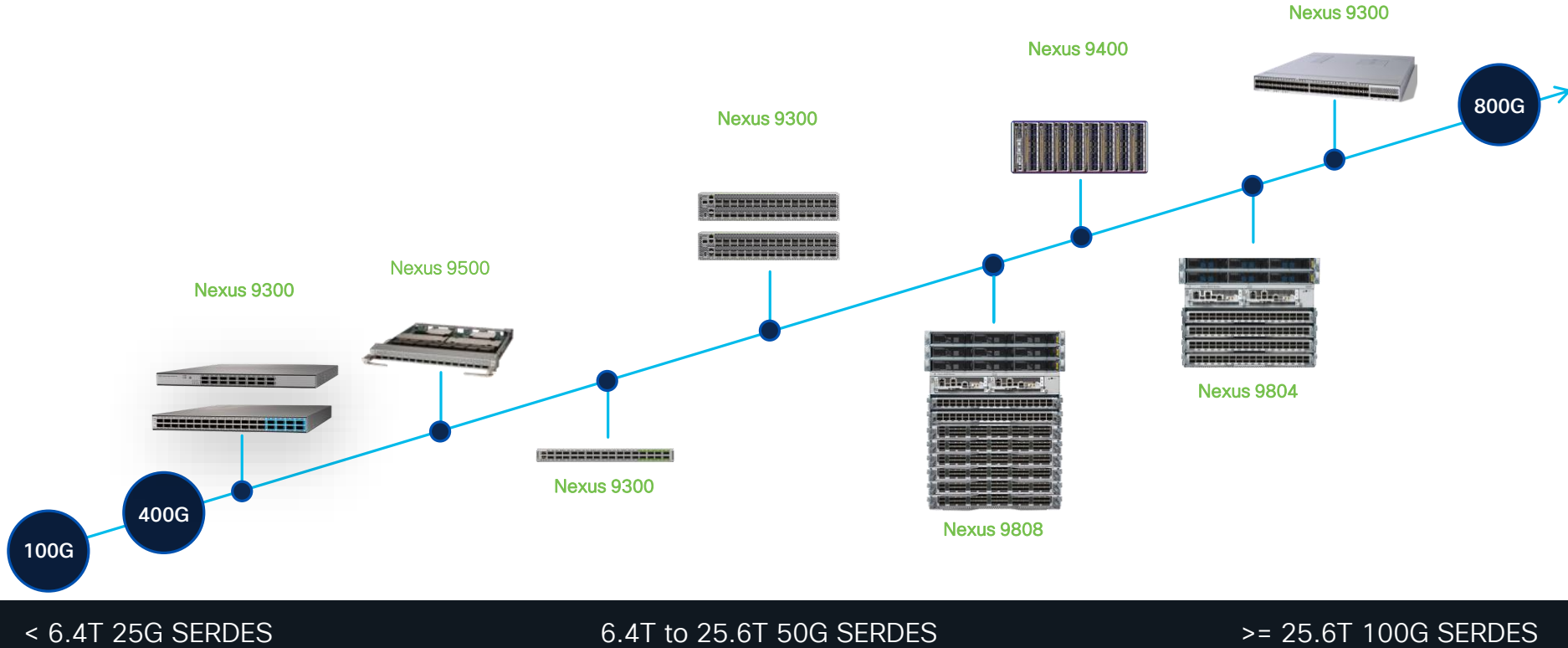


Network-as-Code



Ecosystem Integrations

Nexus 9000 400/800G portfolio evolution



Cloud service providers



Telco service providers



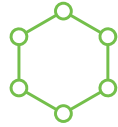
Enterprise



AI/ML networks

Cisco NX-OS

Flexibility



Effortlessly expand architecture with various fabric types supported

Scalability



Easily scale up with no downtime

Modularity



Container hosted. Streamline network maintenance, additions, and troubleshooting

Open APIs and DevOps Automation



Device APIs

REST / JSON RPC
NETCONF YANG
OPEN-CONFIG
gNMI streaming



DevOps

Ansible Chef
Puppet Saltstack



Simulation

Nexus 9300v
Nexus 9500v
Nexus 9800v



Container hosting

Docker hosting
LXC hosting

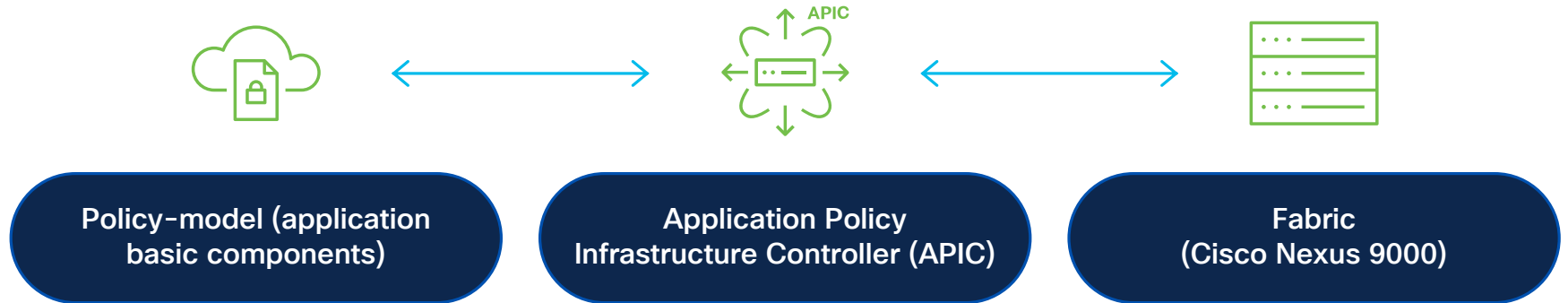


Extensive **Open Integrations** for Diverse Customer Base

Cisco ACI

An application centric model- networking framework

Software-defined network that takes a systems approach to deliver best-in-class automation through integration of hardware, software, physical and virtual elements



The unified point of automation and management for the Cisco ACI fabric, policy enforcement and health monitoring for physical, virtual and cloud infrastructures



Nexus Dashboard

Services

Provisioning

Controller

Orchestrator



Automation

splunk>

servicenow

Terraform
ENTERPRISE



PANDUIT

VERTIV

Operations

Insights

Visibility



Analytics



Troubleshooting

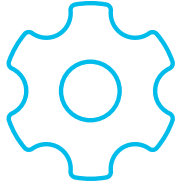


Compliance



Access to Nexus Dashboard services/features is based on the Cisco Nexus 9000 [switch license tier](#)

Cisco Nexus Dashboard Fabric Controller



Automation

Accelerate provisioning and simplify deployments



Management

Gain in-depth management and control for all network deployments



Visibility

Centralize visibility and monitoring views

Fabric types

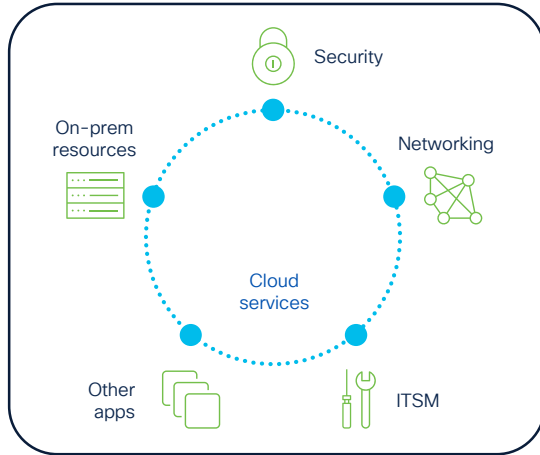
LAN (VXLAN and classic)

Media fabrics

SAN fabrics

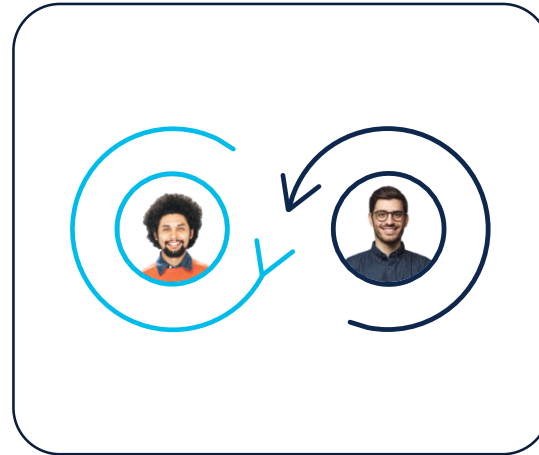
Cisco Nexus Dashboard Insights

360-degree visibility



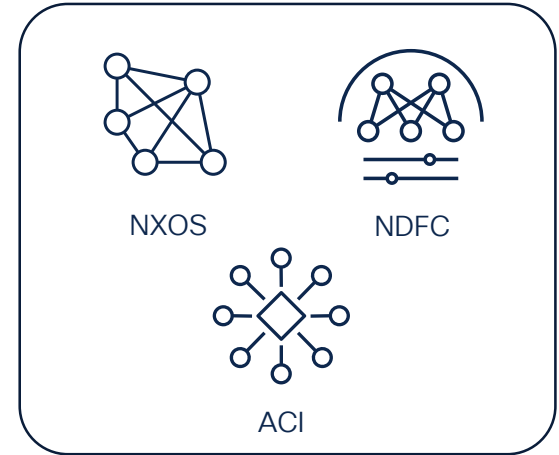
Network,
applications, integrations

Analytics



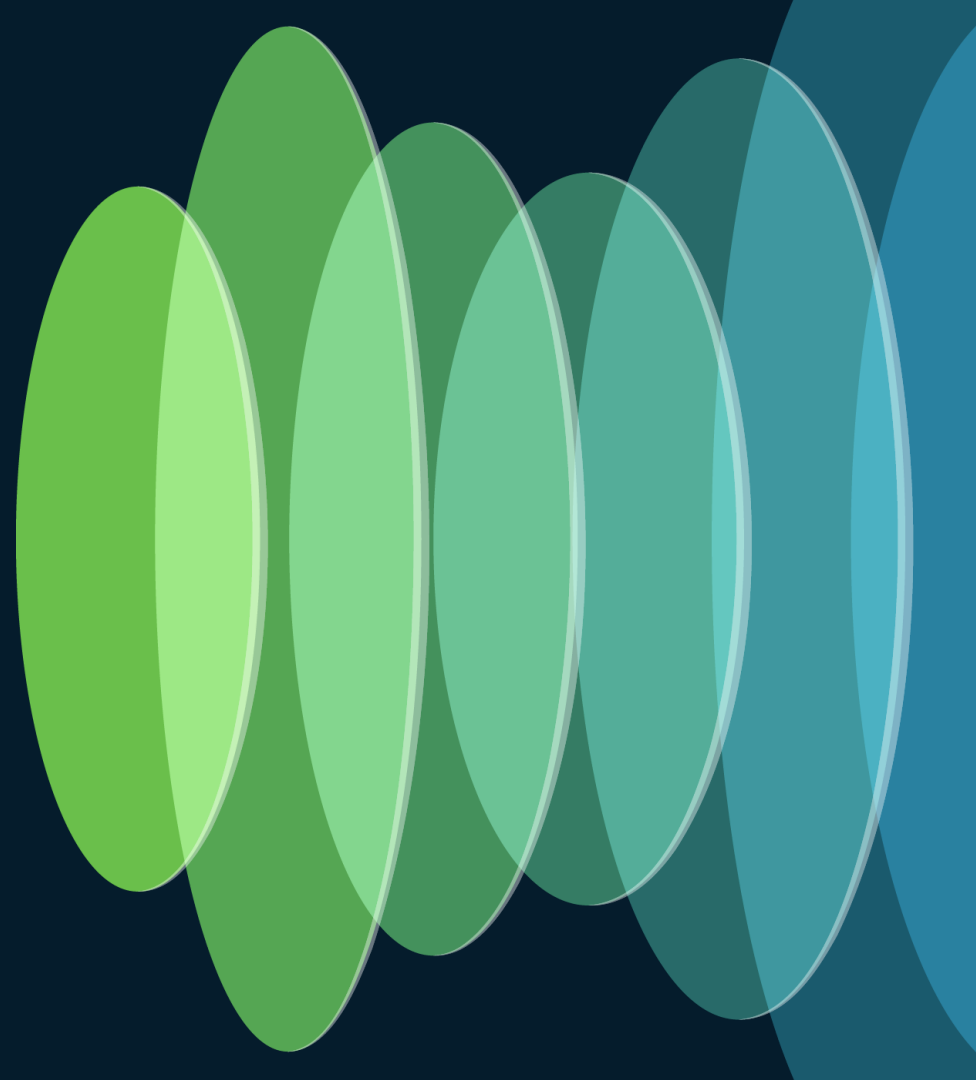
Digitization,
telemetry, correlation

Fabrics Supported

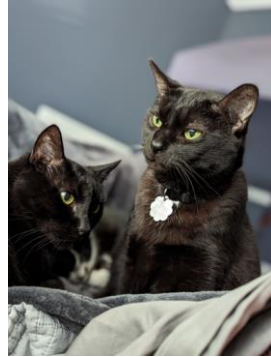
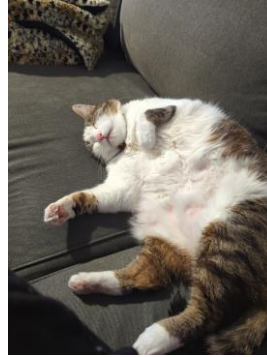


Unprecedented
visibility into data
center environments

Nexus in Action





About Nathan, Lead Network Architect – ATC



The Advanced Technology Center

224 *lab environments
accessibly anytime,
anywhere*

"[WWT is] providing people with access to technical expertise via a radically simplified experience and without requiring extensive and costly training." - Gartner

6000+ 
Customer Engagements
\$900M 
Infrastructure Investment



*A combination of on-prem,
off-prem, and public cloud
capabilities*



**GLOBAL
ACCESS
TO THE ATC**



Australia, Japan, Korea,
Guam, Germany, Italy,
Belgium, UK,
Afghanistan, Hawaii

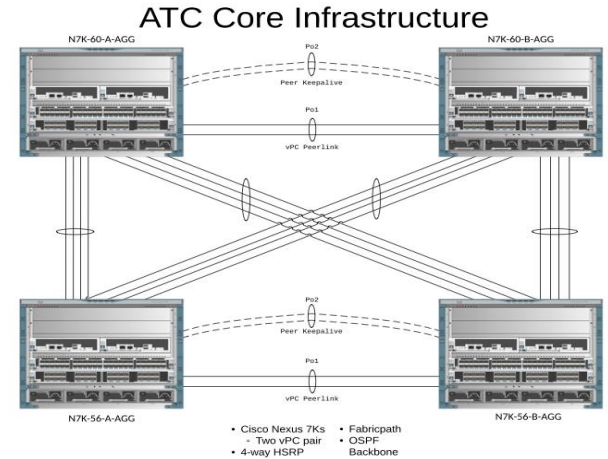
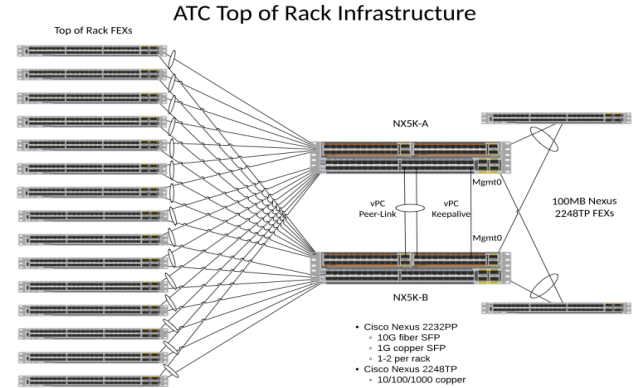
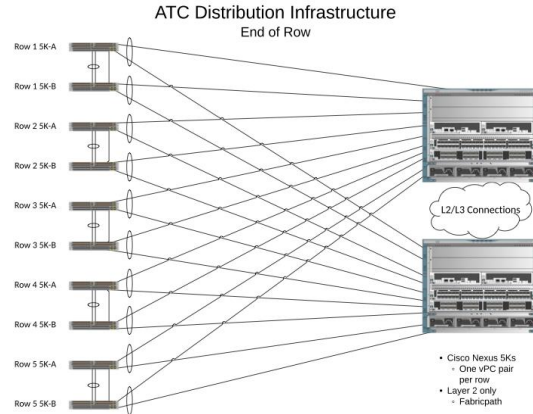
Opportunity



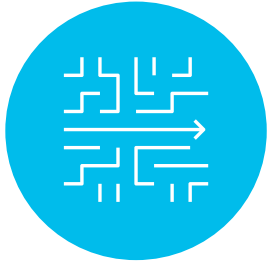
- Simply and efficiently orchestrate a massive migration of 4 on-site data centers to new architecture and infrastructure while meeting high level goals
- Logical and physical migration of ATC Core with more efficient Day 2 operations control

Previous State

- Hardware EOL with aging design model
- Varying hardware models across Data Centers
- Cisco Layer 2 FabricPath
- Minimal automation, third-party app centric

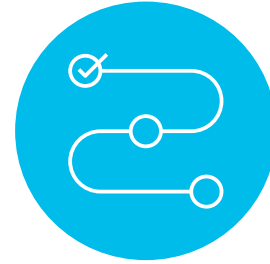


High Level Goals & Expectations



FLEXIBILITY

- Provide connectivity and support to customers for any use case presented



EASE OF OPERATIONS

- Efficient processes to administer the details of a data centers on the fly, regardless of team size and expertise

Solution Choice & Details



Nexus Switches:

Connection-dense, high bandwidth Cisco 9000 infrastructure + 64 bit NX-OS software

Nexus Dashboard:

One stop for data center operations management

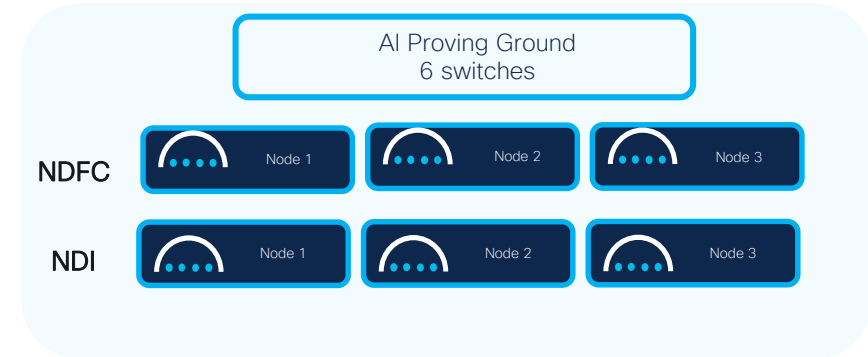
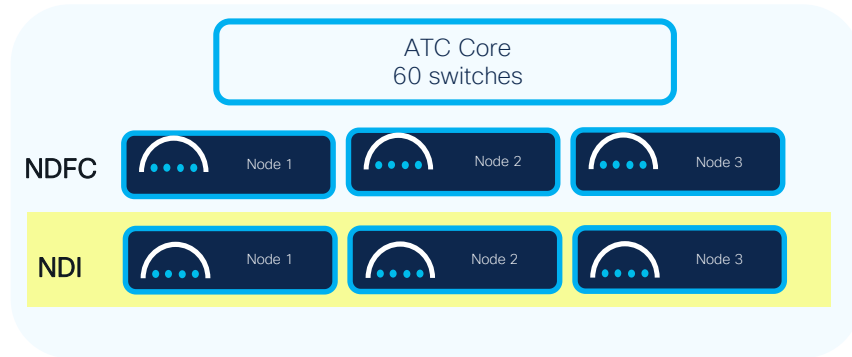
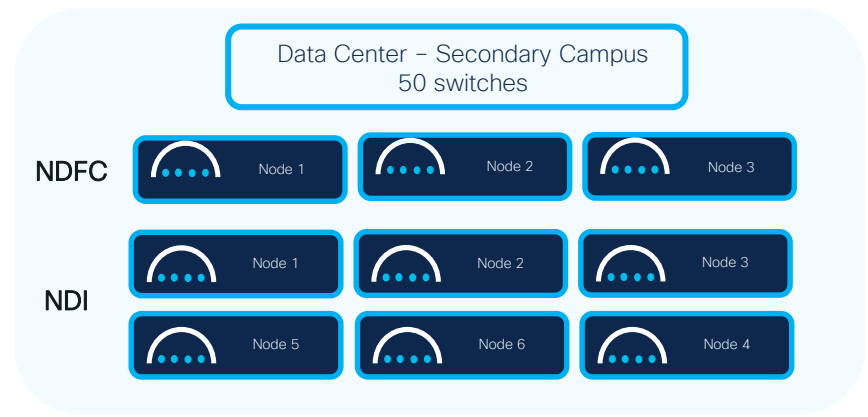
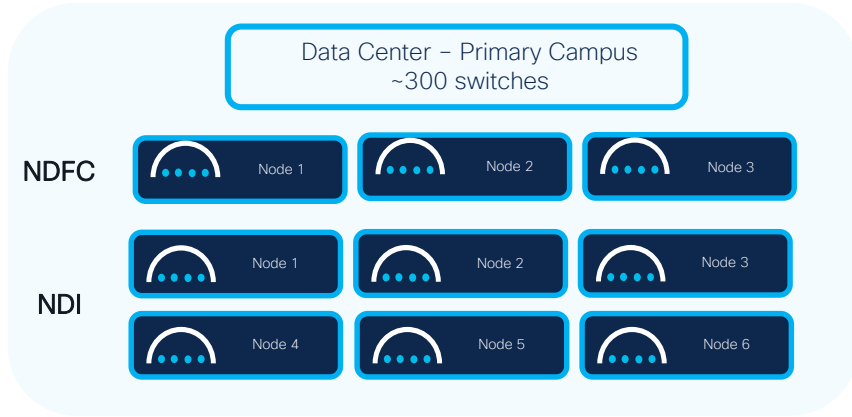
Nexus Dashboard Fabric Controller:

Day 0 automation and Day 1 management of multi-site VXLAN BGP EVPN architecture + ECL core

Nexus Dashboard Insights:

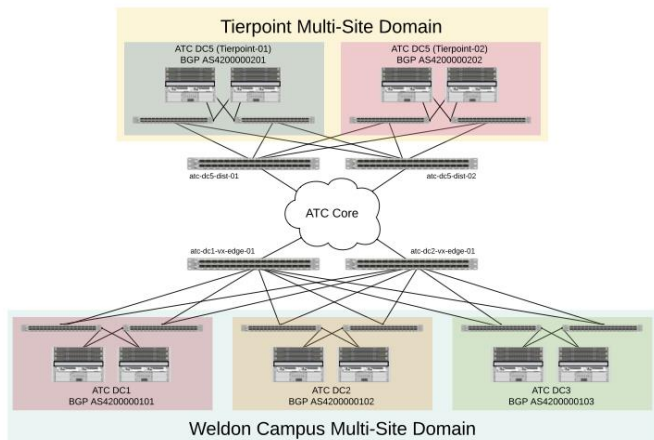
Leveraged to stream telemetry data

Nexus Dashboard Deployments



ATC Data Center Architecture

VXLAN Multi-Site Domains



World Wide Technology, Inc.
ADVANCED TECHNOLOGY CENTER

Prepared by Nathan Lutz, April 2022

New Data Centers



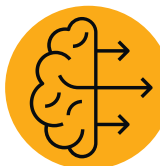
Hardware

N9500 chassis spine, 93180 FX3 top rack leaves, 9336 FX2 BGWs and VPC leaves, 93108TC supporting 100M



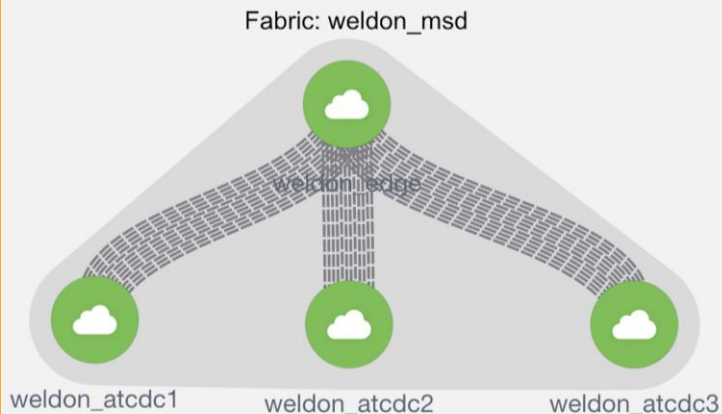
Config

Customer engagements fully routable to ATC Core but exist on separate fabrics. 900 customer networks migrated to VXLAN in October '22



Key Benefits

- Per rack bandwidth increase by 10x over previous FEX deployment
- Able to logically and physically separate data centers as they relate to customer engagements from the ATC Core
- NDFC automates multi-site design with ease

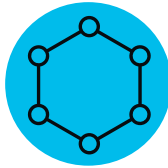


New ATC Core



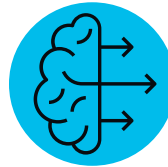
Hardware

2 node 9500 chassis core, VPC pairing, providing L2 to the data centers



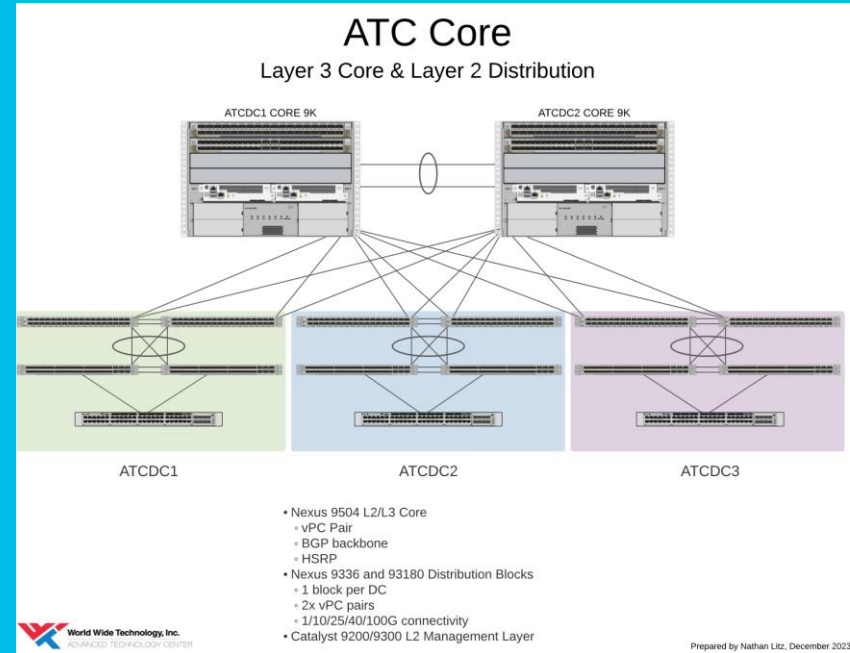
Config

Leveraged NDFC 12.1.3 to lab Enhanced Classic Lan fabric. Migrated production core into ECL using NDFC 12.2.1



Key Benefits

- NDFC provides commonality to API work that various BU's leverage
- Using ECL automates configuration functions that may be small but are greatly impactful and tedious

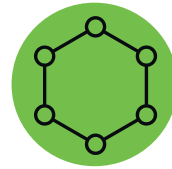


AI Proving Ground Fabric



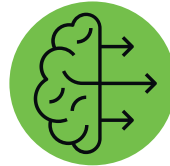
Hardware

Standing inventory of Cisco 400G 9332 GX2Bs that can be put together in various topologies supporting RoCEv2 and AI/ML workloads



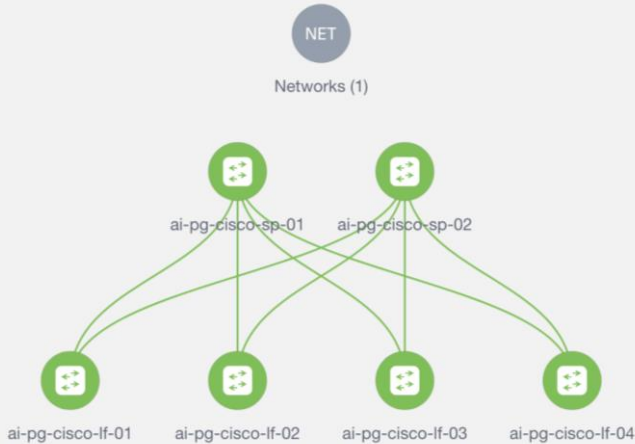
Config

Standard eBGP Routed Fabric with AI/ML focused configured items (QoS, ECN, PFC, etc.)

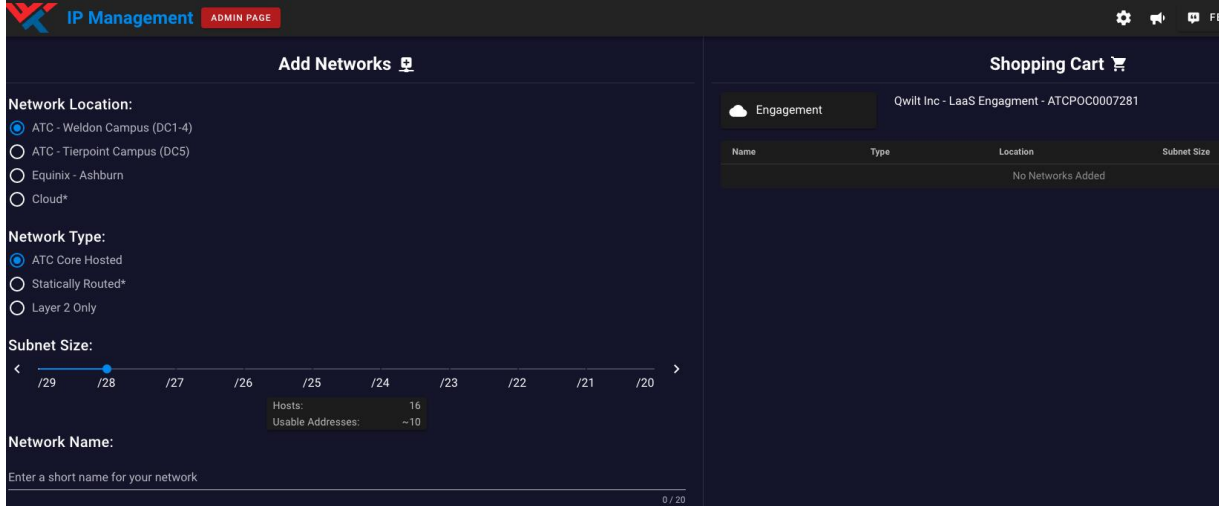


Key Benefits

- NDFC supports Day 0 provisioning for AI/ML networks with best practices templates
- Simple QoS classification and marking in fabric builder



Leveraging NDFC APIs for Custom Web Apps

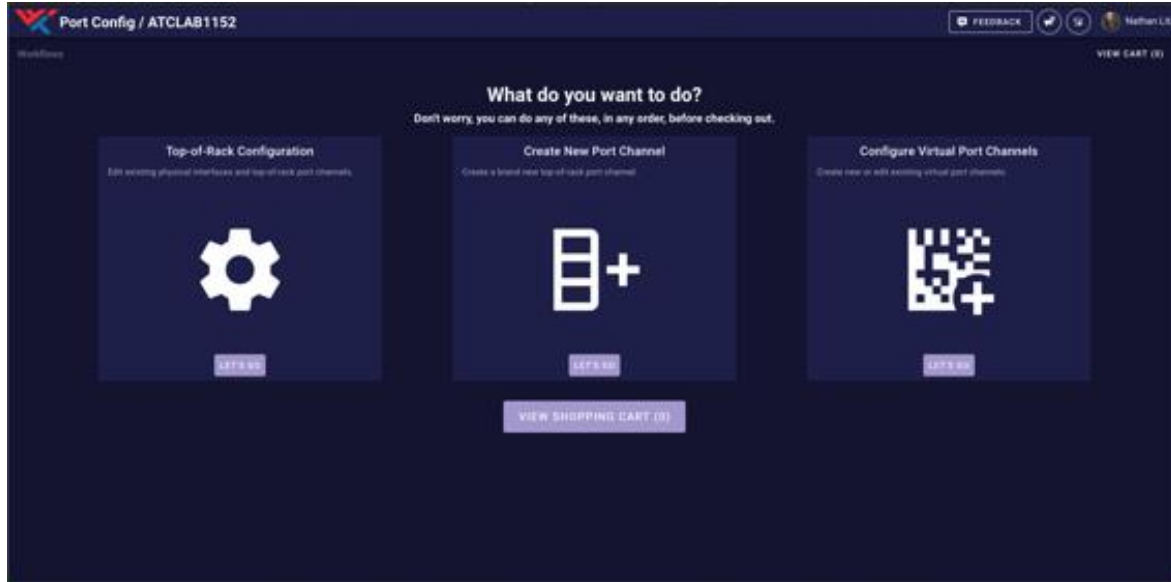


IP Management Tool

Key Attributes:

- Open up the process of network requests and creation to customers
- NDFC does work BTS to determine NDFC instance, VLAN ID, create, attach, and deploy network

Leveraging NDFC APIs for Custom Web Apps



Port Management Tool

Key Attributes:

- Simple, standardized configuration of physical interfaces
- Open APIs to NDFC has allowed us to abstract a significant amount of work needed to perform common daily tasks

Solution Benefits



Labor Hour Reduction

- Easy to understand fabric & automated deployment
- Open APIs for custom web apps
- Real-time endpoint data leveraged by security team



Flexible Configuration

- Seamless management of multi-site fabrics
- Multiple fabric types to support various topologies and requirements



Customer Sentiment

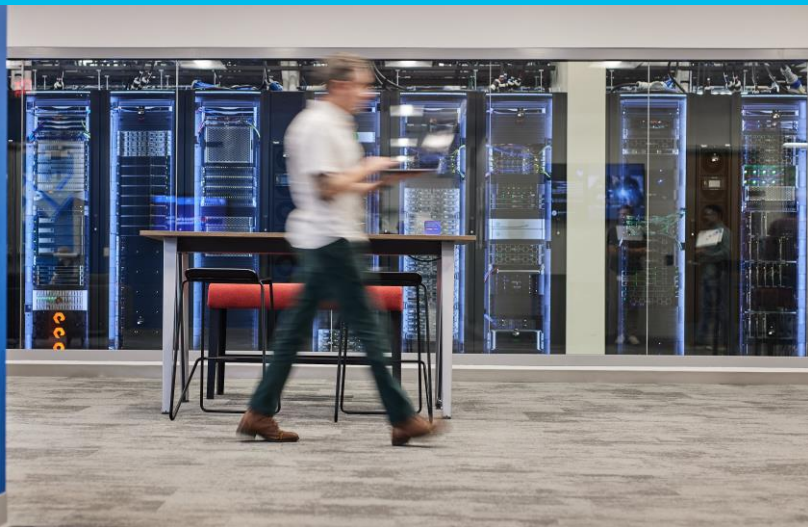
- Mitigate downtime during migrations
- Increased customer ownership via API based web apps

Summary

- Cisco Nexus hardware & software services provide future-efficient solution for even the most complex network architectures
- Partnership with Cisco Nexus teams helped WWT ATC operationalize their new architectures to meet goals



Future Projects



- Expanding secondary campus data center switch scale from 50 to 500+ managed switches
- New 3pND cluster to run NDI dedicated to ATC core
- Continue NXOS and ND service upgrades
- Continued API utilization

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Contact me at: Antaraa (antanand@cisco.com)
// Nathan (Nathan.litz@wwt.com)



The bridge to possible

Thank you

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