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Fast Innovation requires Fast IT

Cisco Connect

Network Infrastructure Responding to Data Center Demands

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Manager, Product Marketing

Cisco Systems

Today's Agenda

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- Trends of Data Center
- Unified Fabric Platforms
- Unified Fabric Technologies and Innovations
- Benefits and Use cases

Trends are Changing the Role of IT

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TECHNOLOGY TRANSITIONS

- MOBILE
- CLOUD
- NEW BREED OF APPS
- DATA & ANALYTICS
- INTERNET OF THINGS

NETWORK AT THE CENTER

- GROWTH & PRODUCTIVITY
- NEW BUSINESS MODELS
- EXPERIENCE EXPECTATIONS
- GLOBALIZATION
- SECURITY & COMPLIANCE

BUSINESS IMPLICATIONS

WORKLOADS DRIVING SERVER PORT BANDWIDTH, VM DENSITY, BIG DATA

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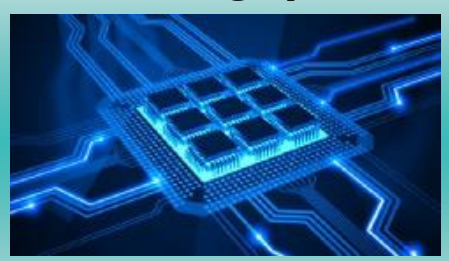
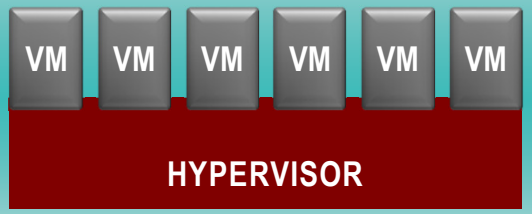
New Server Platforms Enabling Higher I/0 Throughput



10G LOM/FlexLoM Shipping *4

Up to 12 Cores per Socket *2

Virtual Machine Density Driving I/0 Performance



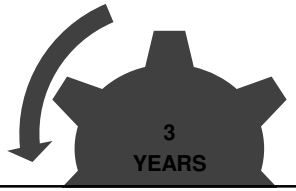
Avg. **11** VMs/ Linux Server*1

Big Data Increasing East West Traffic

DATA CENTER IP TRAFFIC GROWTH

25% CAGR (2012-2017)*3

FASTER SERVER REFRESH CYCLE ~ 3 YRS



FASTER NETWORK REFRESH CYCLE ~ 5 YRS

*2 Intel Xeon E5 Spec

*4http://h30507.www3.hp.com/t5/Coffee-Coaching-HP-a...-p/108515

CISCO NEXUS® UNIFIED FABRIC

Continued Evolution of Data Center Switching

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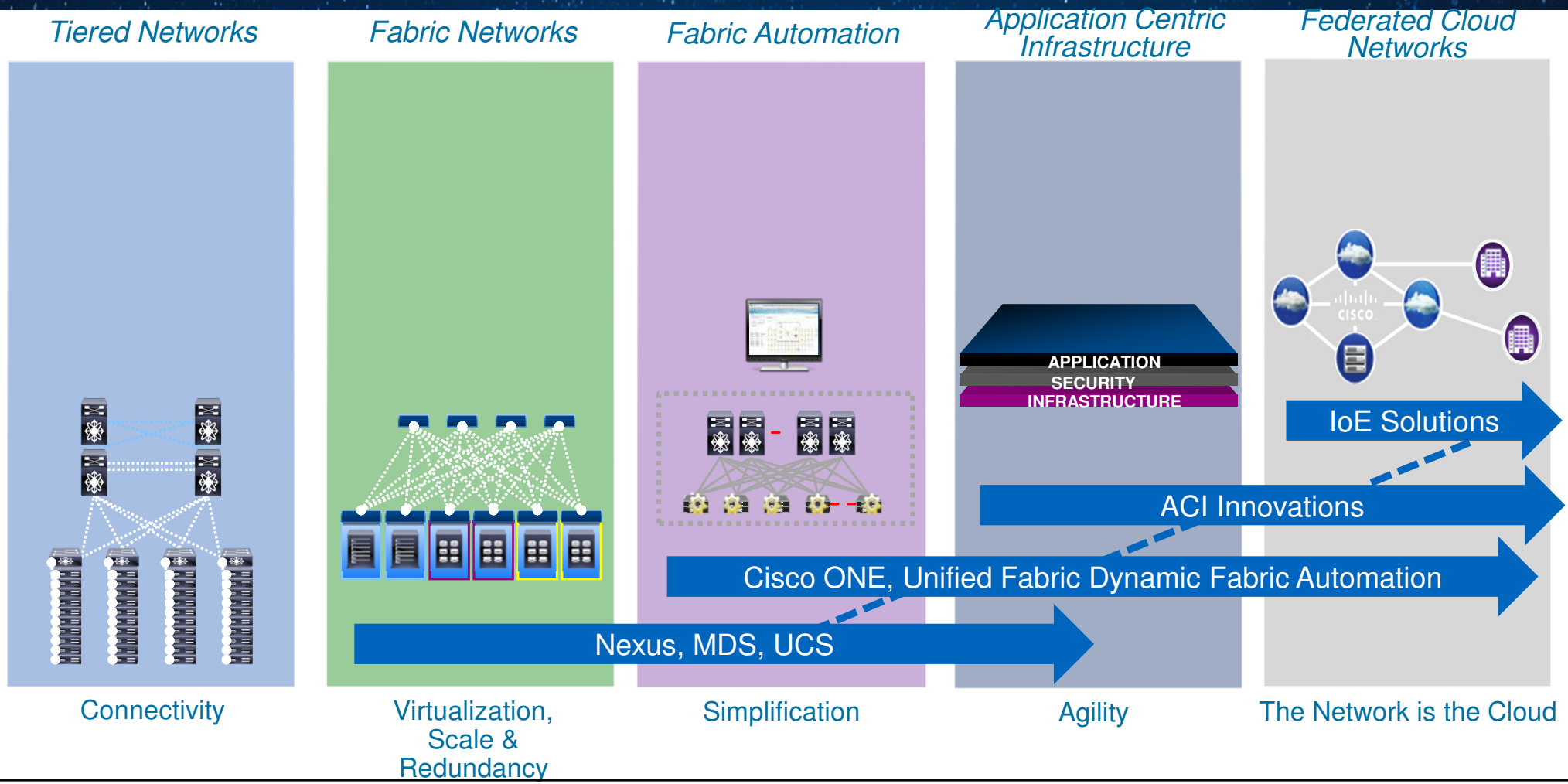

Expanding DC and Cloud Networking Portfolio

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OPEN
APIs/Open Source/Application Policy Model

HIGH-PERFORMANCE FABRIC
1/10/40/100 GE

SCALABLE SECURE SEGMENTATION
VXLAN

55K+ NX-OS customers

17K+FEX customers

8.5K+ Nexus1Kv customers

3K+Fabric Path customers

DELIVERING TO YOUR DATA CENTER NEEDS

Resilient, Scalable Fabric

Workload Mobility Within/Across DCs

LAN/SAN Convergence

Operational Efficiency – P-V-C

Architectural Flexibility

New Nexus 7000
Evolution and Innovation

Cisco Nexus 7700 Platform Switches
Value Proposition Of The Cisco Nexus 7700 Platform

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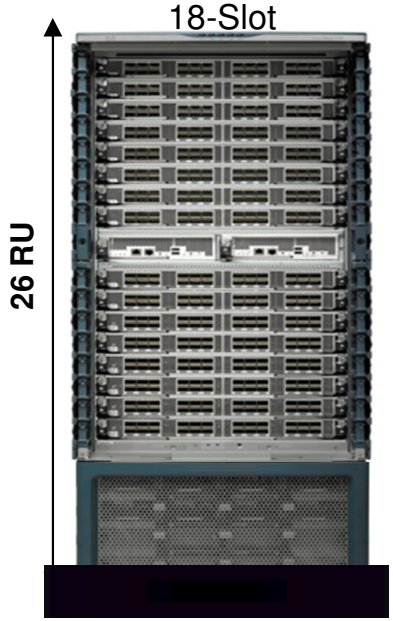
Cisco Nexus® 7700
18-Slot



	Nexus 7718
Capacity	83 Tbps
100G Density	192
40G density	384
1G / 10G density	768

Fabric BANDWIDTH

1.32 Tbps

Smaller FOOTPRINT

33% more compact

Environmental EFFICIENCY

True front-to-back airflow

95% Reduction in Power per Gigabit of Bandwidth

Unprecedented Cloud Simplicity

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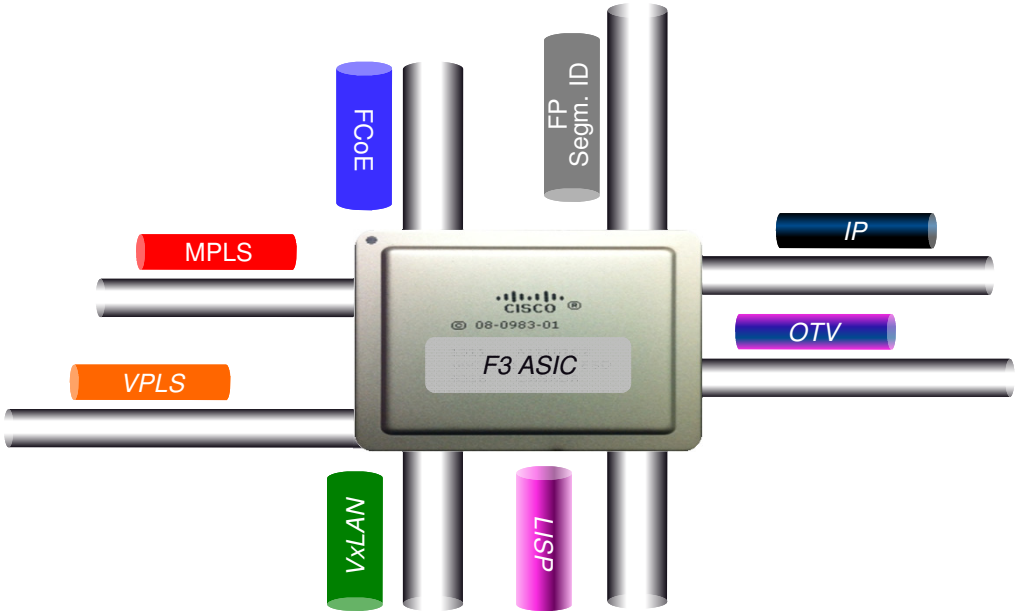

MOST COMPREHENSIVE FEATURE SET
Integrated AND rich for Core, Spine, Leaf, DCI, SAN Deployments

READY FOR CLOUD
Multi-tenancy and Virtualization Capable Hardware

ENVIRONMENTAL EFFICIENCY
60% MORE Energy Efficient

Consolidation of Functionality and Versatility of Deployment

Unleash Full F3 Potentials

New chassis – or existing chassis with an F3-only VDC

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Nexus 7700

F3 12p 100G

F3 24p 40G

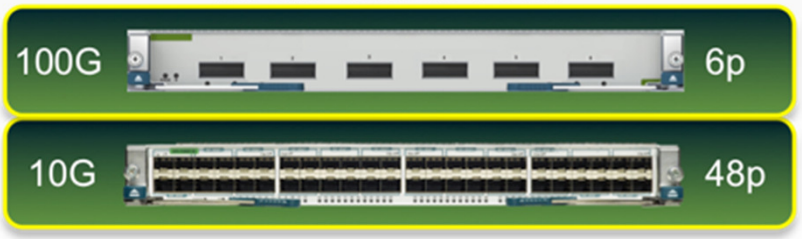
F3 48p 10G

* Q4 CY'14

Nexus 7000

F3 12p 40G (48p 10G with Breakout)

F3 10G and 100G Modules for the **Nexus 7000** *



	vPC	Layer2	Layer3	FEX	FabricPath	DFA	VXLAN	MPLS	OTV	LISP	FCoE	Table Sizes
F3 Only VDC	✓	✓	✓	✓	✓	✓	*	*	✓	*	*	F3 size

Deploy Anywhere
One Module, Many Roles

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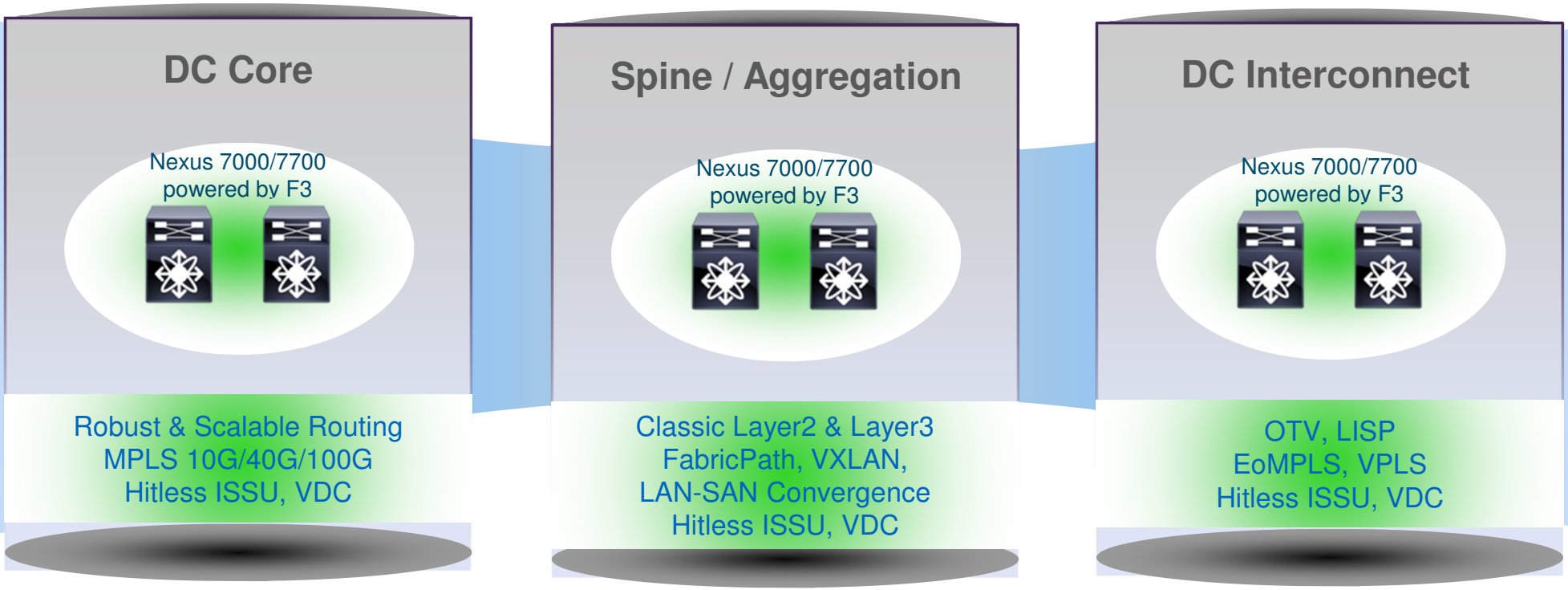

Deploy Anywhere
No learning curve: familiarity with architectures

New Nexus 7000 Service Integration Offerings

Service Integration challenges within Data Centers

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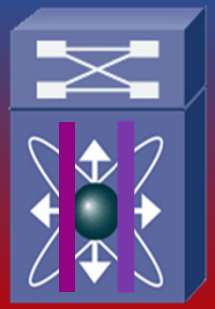
Service Modules



- ✓ Tightly embedded with switch backplane

- ✗ Slot is expensive
- ✗ Performance bottleneck
- ✗ Scaling is difficult

Cisco Intelligent Traffic Director (ITD)

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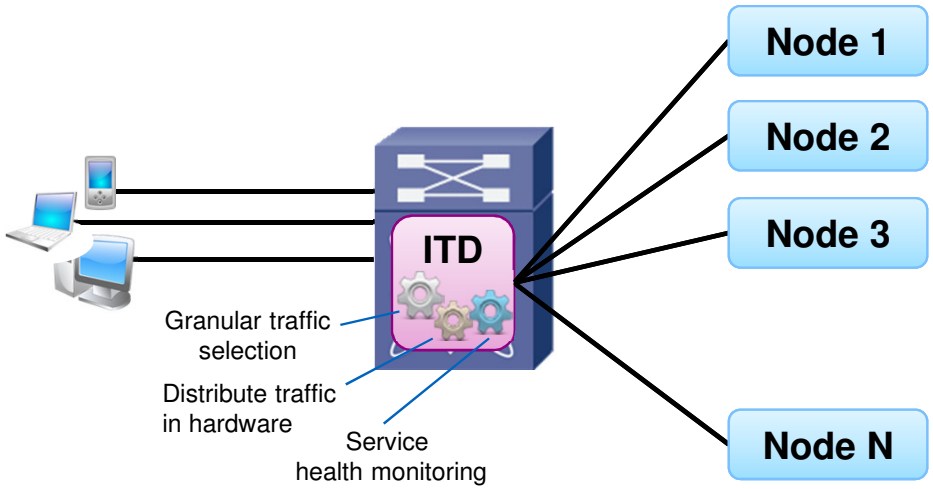
Challenge: Effectively distribute traffic high bandwidth traffic across services as a cost effective solution



Multi-Terabit Traffic Distribution for 10G, 40G, and 100G Services

ITD Overview:

- Utilizes HW hashing to provide scalable layer 3/4 line-rate traffic distribution for services
- Optimizes TCAM utilization to provide a highly scalable solution for distributing traffic across services and servers
- Order of magnitude reduction in configuration
- Integrated health monitoring of services to help ensure the highest level of service availability

Benefits:

- **Reduced Cost of Ownership:** Line-rate scaling of traffic distribution across services without the need of external devices.
- **Lower cost of operation**: via simplified provisioning, ease of deployment, and reduced complexity
- **Investment protection**: IPv4 & IPv6 support today and runs on all Nexus 7000/7700 systems

Nexus Fixed Platform Evolution and Innovation

Nexus 5000 Series Switches Positioning

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40G Innovations

Nexus 5696Q

High 40G Density
Low Latency
100G Uplinks

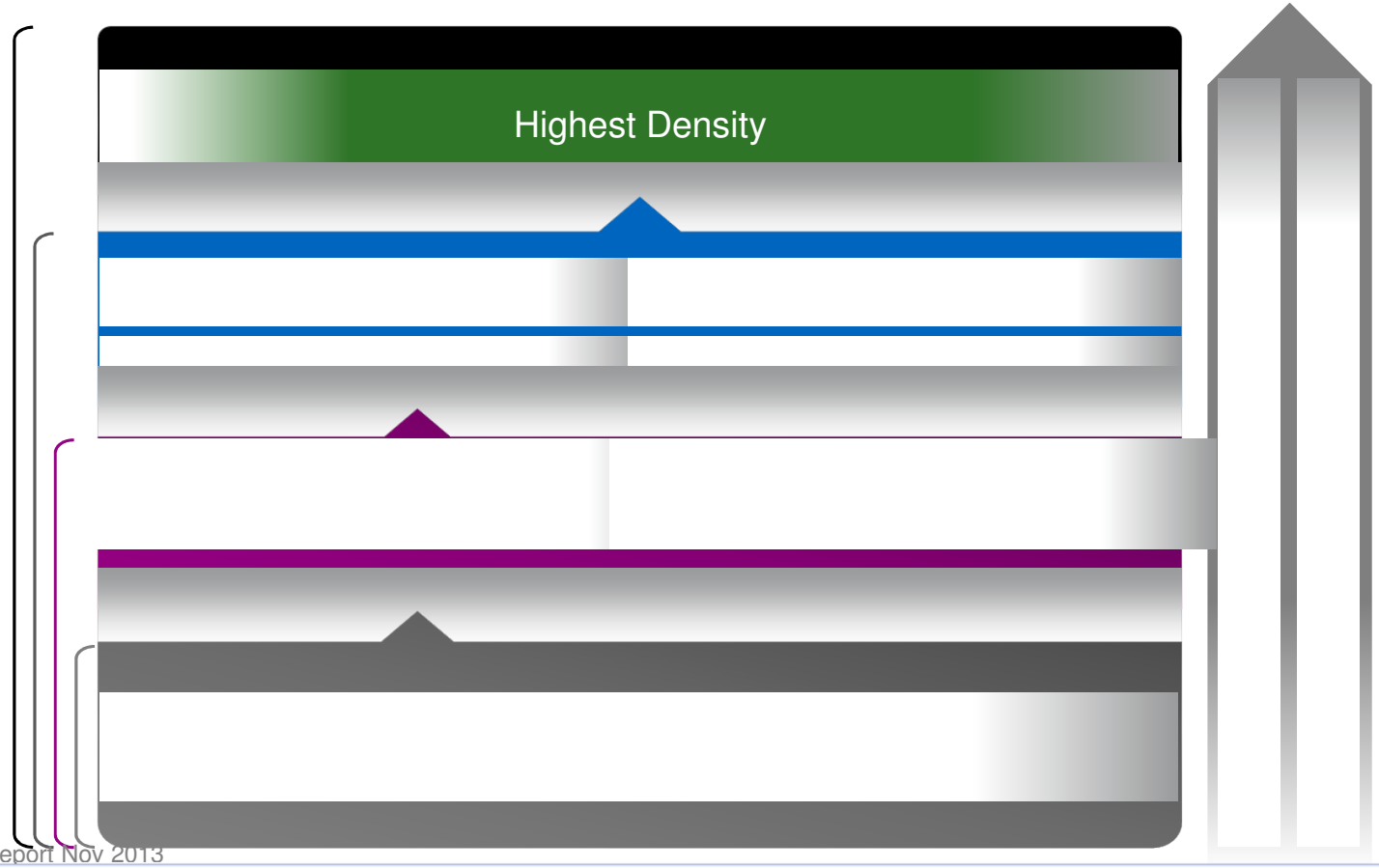
10G Innovations
40G Innovations

Nexus 5600

High 10G Density
Low Latency
40G Uplinks

Nexus 5500

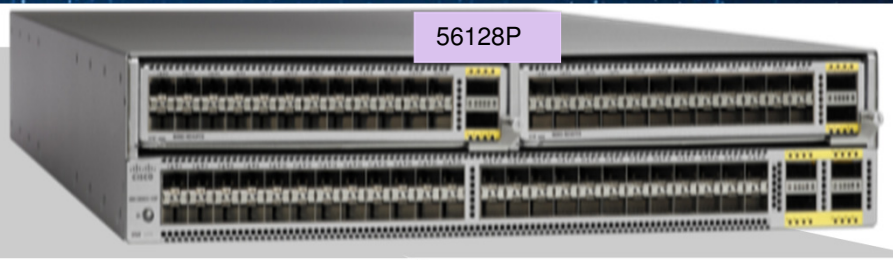
Flexibility
10G Uplinks



*Source: Dell 'Oro 10G Purpose-Built Fixed switching market share report Nov 2013

Industry's Most Flexible and Feature-rich Portfolio

Cisco Nexus 5600 Raising the Bar



High Performance

- Line rate L2 and L3 with all ports and all features and all frame sizes
- 1-microsecond port-to-port latency with all frame sizes
- 40-Gbps flow
- 40-Gbps FCoE
- Cut-through switching for 40 and 10 GE
- 25-MB buffer per port ASIC

High Scalability

- 10 GE and true 40 GE
- Up to 256,000 MAC (115k L2 / 64k L3 at FCS)
- Up to 128,000 ARP (64k at FCS)
- 32,000 LPM (24k at FCS)
- 16,000 bridge domains
- 31 Bidirectional SPAN sessions (16 at FCS)

Feature-Rich

- L2 and L3 features
- FEXlink
- vPC FabricPath
- FabricPath with segment ID
- Vinci leaf, spine, and border node
- Adapter-FEX/VM-FEX
- **VXLAN***

* Target Q4CY14

Visibility and Analytics

- Line-rate SPAN
- Sampled NetFlow
- Micro-burst and buffer monitoring
- Latency monitoring
- Conditional SPAN: SPAN on drop, SPAN on higher latency

Nexus 5696Q
VXLAN ready

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Density	96 Ports of 40G 384 Ports of 10G (breakout)
Extensible	8 expansion slots, Power Supply and FAN FRUABLE
Throughput	Line Rate Layer 2 / Layer 3
Latency	~1 Usec Latency on Fiber Ports
Data Analytics	SPAN on Latency and Drop Packets, Burst Monitoring, Network Latency Measurement

VXLAN Ready

40G		12p 40G QSFP+
40/10Gigabit Ethernet/FCoE		
10G		20p 10G SFP+ Unified Ports
10Gigabit Ethernet/FCOE and 8/4/2G FC		
100G	Future	4p 100G CXP
100/40/10Gigabit Ethernet/FCoE		

Power Supply

AC/DC 1100W PSU with Port Side Intake and Exhaust

Cisco Nexus 2000 Series

Simplified Operations with Revolutionary Scale

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2014

2013

2012

2011

2010

2009

100M/1G FEX

N2K-C2248TP-E-1GE
Expanded Memory FEX

N2K-C2224TP-1GE

100M/1G FEX

N2K-C2248TP-1GE

N2K-C2232TM-10GE
RJ45 downlinks

N2K-C2232PP-10GE
SFP+ downlinks

1/10G FEX

N2K-C2348UP
48 port 1/10G FEX
SFP+ 6xQSFP

N2K-C2248PQ
48 port 1/10G FEX SFP+
4xQSFP

N2K-C2232TM-E-10GE
RJ45 downlinks

Blade FEX

B22 HP FEX
1/10G FEX for
HP Blade servers

B22F FEX
1/10G FEX for
FTS Blade servers

B22 Dell FEX
1/10G FEX for
Dell Blade servers

Introducing Nexus 2300

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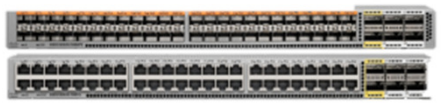


Nexus 2300

Nexus 2000

Parent Nexus 9-2K Switch

G Uplinks

buffers

t Density

t Capable

t Capable

TCAM

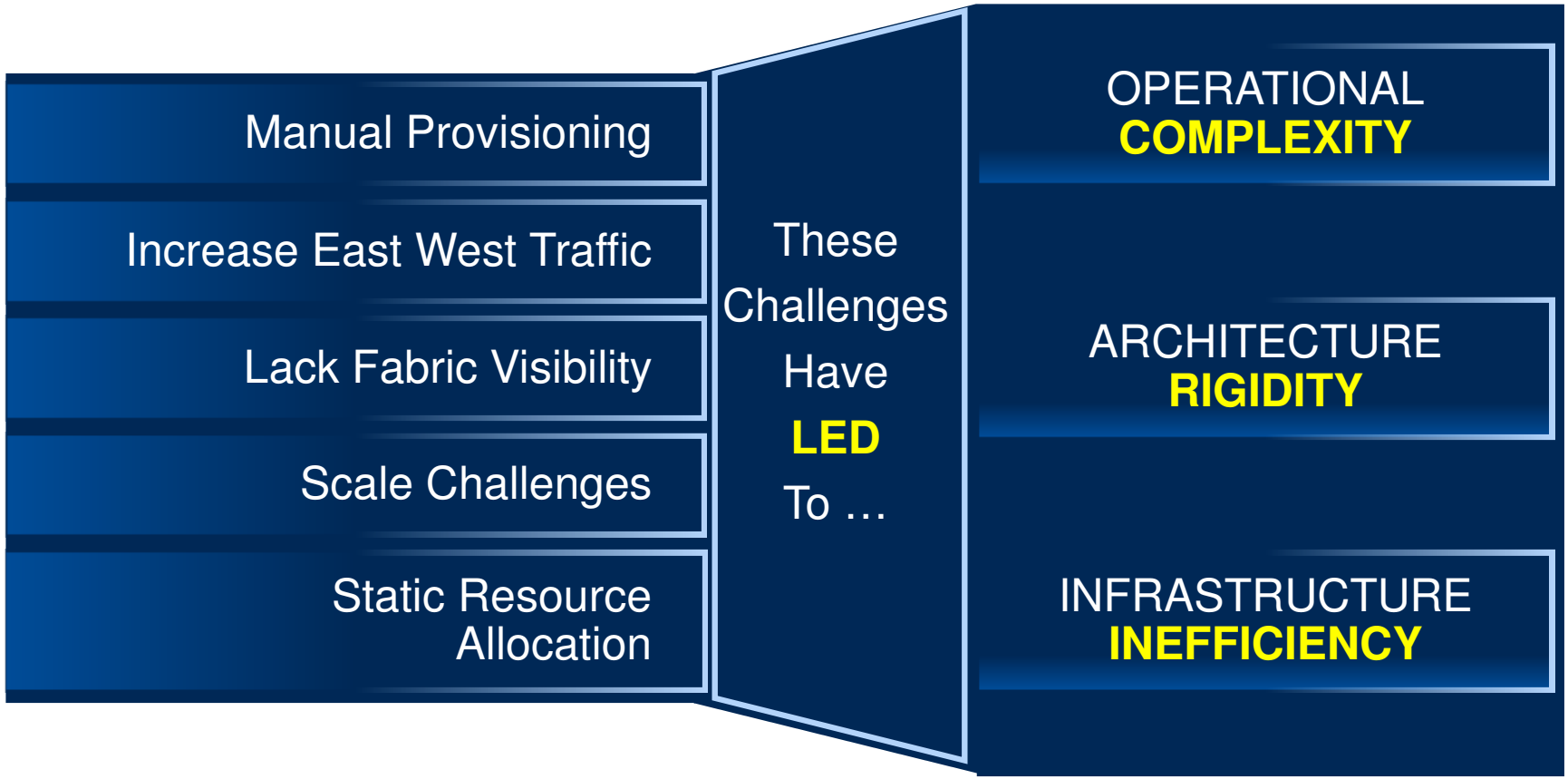
SPOM | Scalability | Flexibility | FCoE

- **20 Million+** Ports Shipped
- **10,000+** Customers
- **400K+** Chassis till date

Unified Fabric Innovation

Simplified, Automated And Optimized Networking

Today's Data Center Challenges



Unified Fabric Innovation

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Fabric Management

Workload Automation

Optimized Networking

Virtual Fabrics

Bundled functions are modular, simplified for scale and automation and progressive adoption

Unified Fabric Innovations – Delivers

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Optimizing For Cloud Ready Architectures

- ✓Visibility for Fabric and workload
- ✓Seeking Flexibility on Workload placement
- ✓Automation framework for Virtualized and non-Virtualized Workloads
- ✓Open integration with Orchestration Tools (Cisco or 3rd Party)
- ✓Increase Fabric Stability by reducing Failure Domains
- ✓Ability to scale Data Center Fabric from very Small to very Large
- ✓IPv4- and IPv6-aware fabric technology

Simplifying Fabric Management

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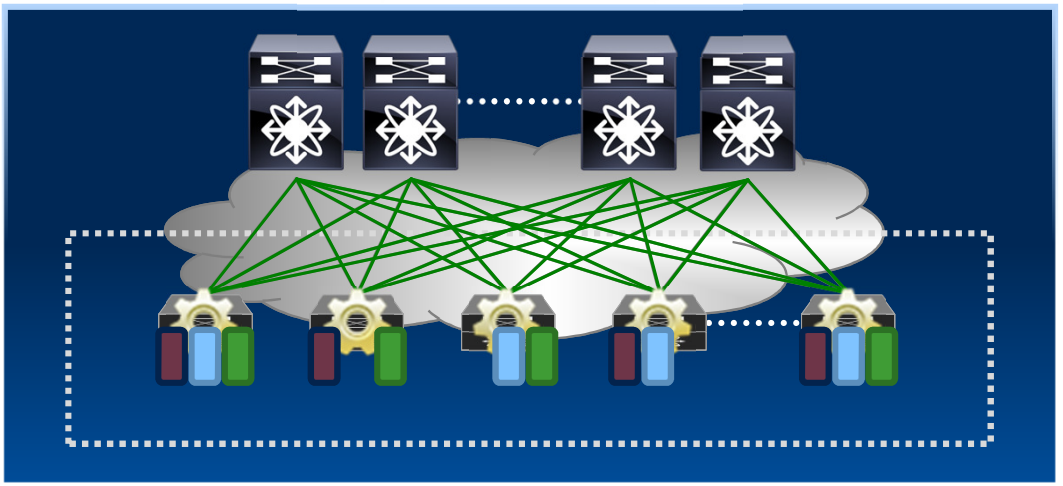
Customer Use Case

- Reduce Deployment and Down Time
- Manual Process Error Prone
- Fabric, Host and Tenant Visibility Required
- Loops and network issue – incorrect cabling
- Minimize touch points



Device Auto-Configuration – POAP
(Power On Auto Provisioning)

DCNM 7.0

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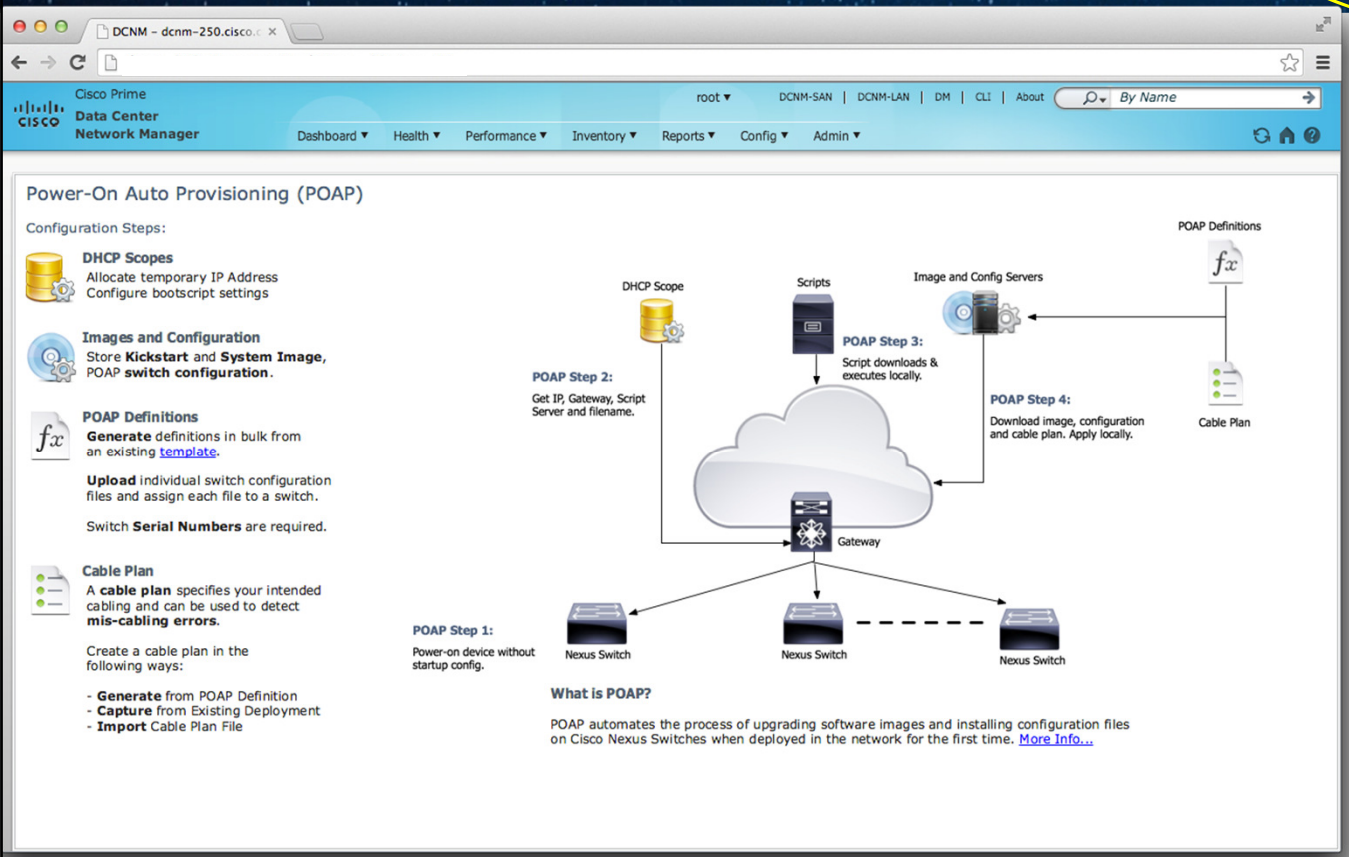

- Automates deployment and replacement of devices
- Pre-Defined as well as fully scriptable Configuration Templates
- Easy POAP Switch Definition Workflow
- DHCP Scope-Definition
  - Own DHCP-Daemon
- Image & Configuration Repository
  - Embedded SCP and TFTP Server

Cabling Plan Consistency Check

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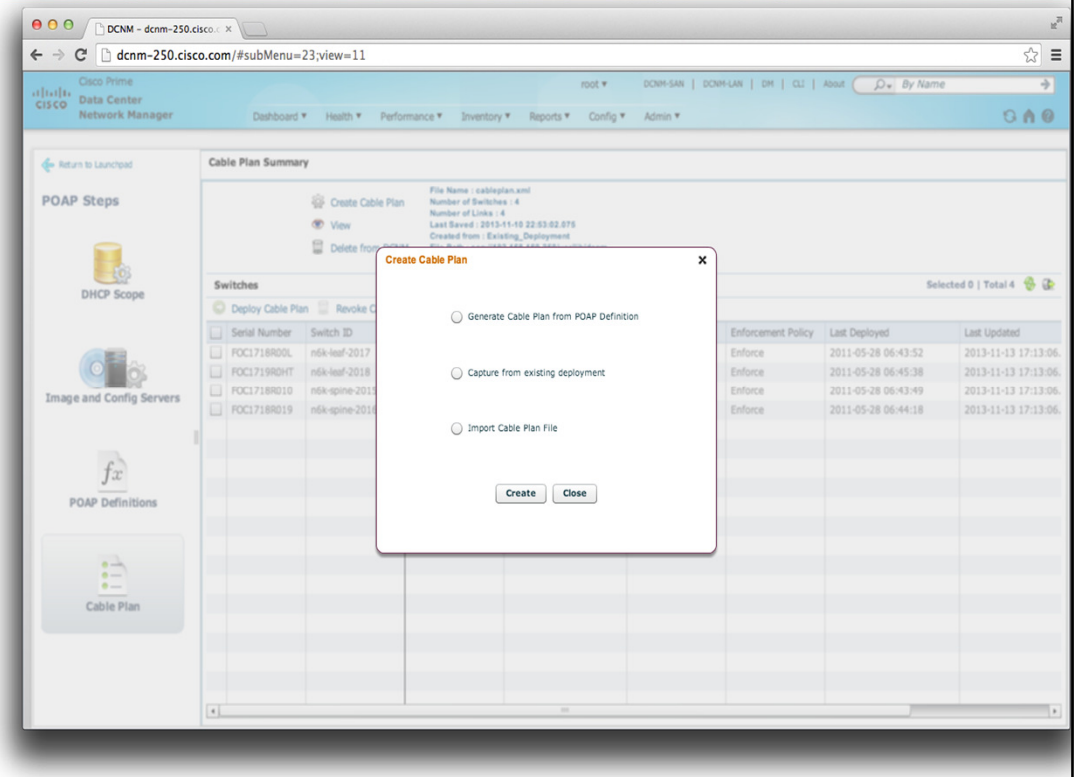
- Ensure physical and logical mapping is aligned
- Detects Cabling anomalies – post deployment
- Flexible
  - Cable plan can be deployed global or device-specific
  - Enforcement on one side
- Auto Generation, Import, Export
- Granular – Per port Validation



XMPP - Logical Grouping of Devices

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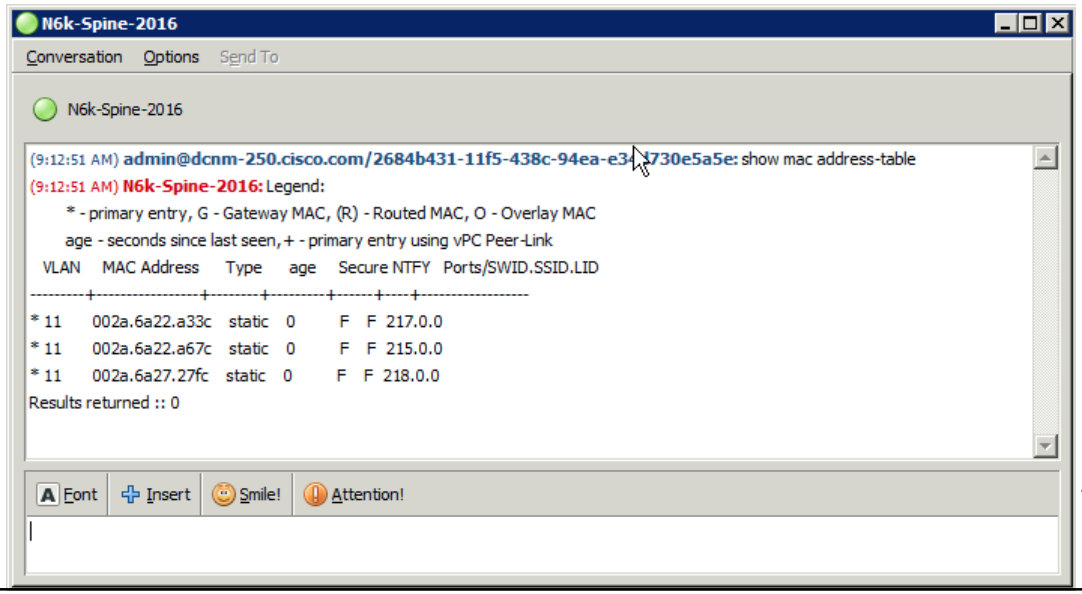
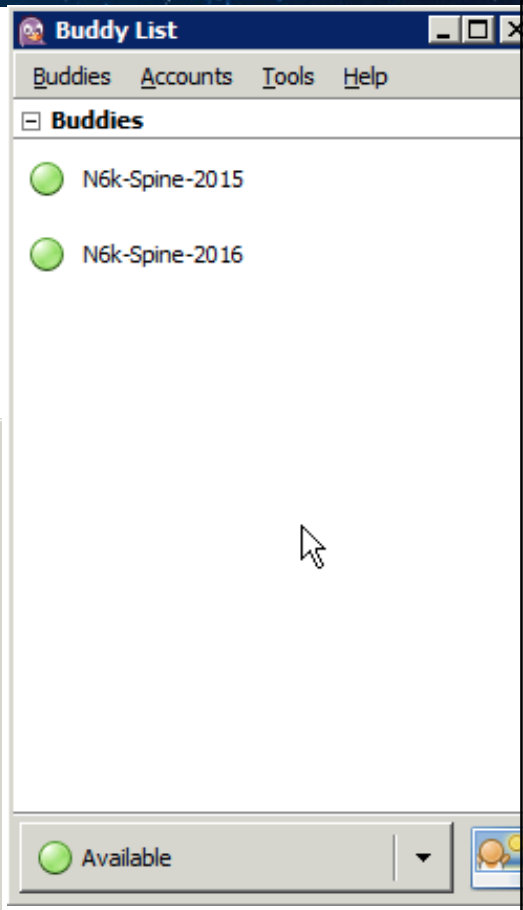
- Ability to target logical group of devices based on roles
- Gather statistical information or On-demand provisioning
- Provides Human-to-machine interface (HMI) as well as programmatically through automation





Workload Automation & Open Environment

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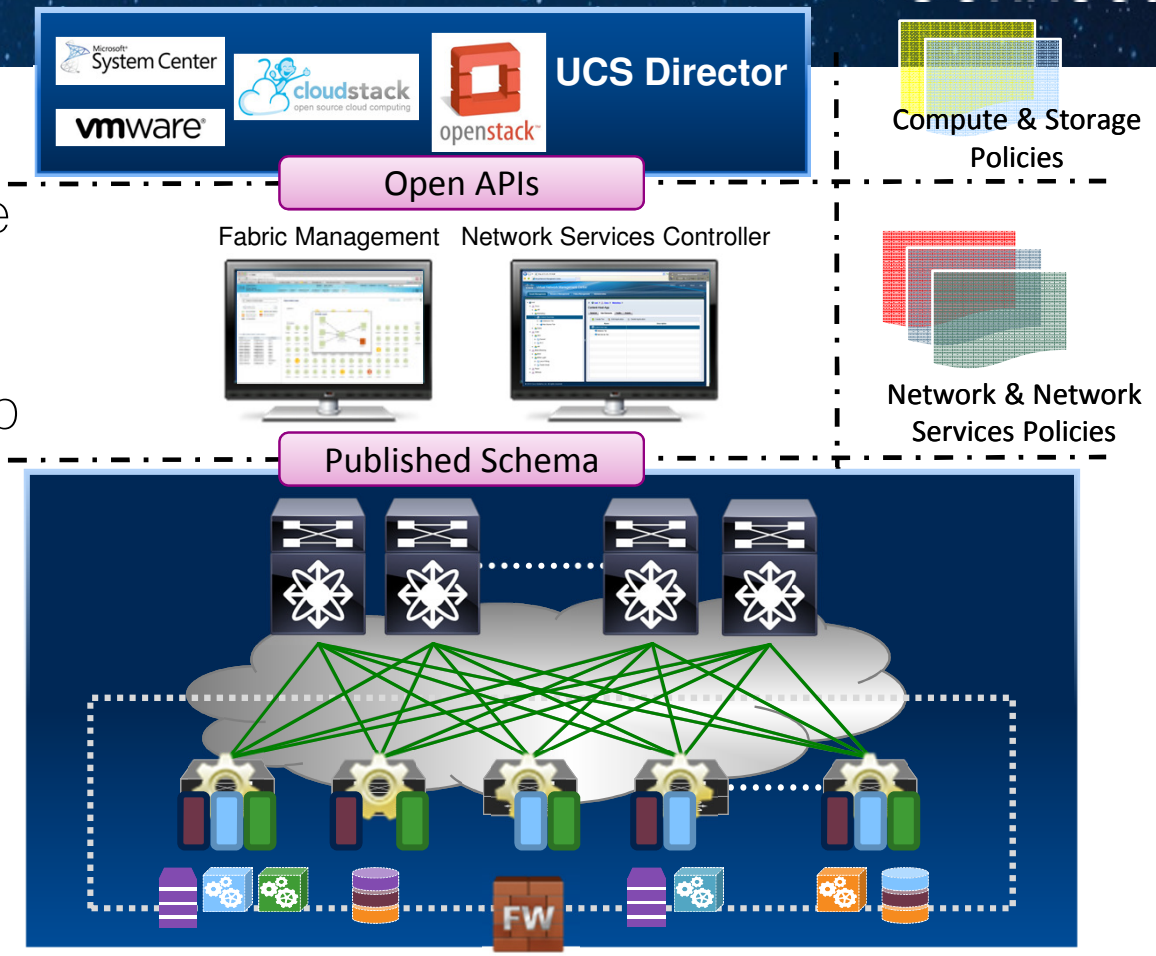
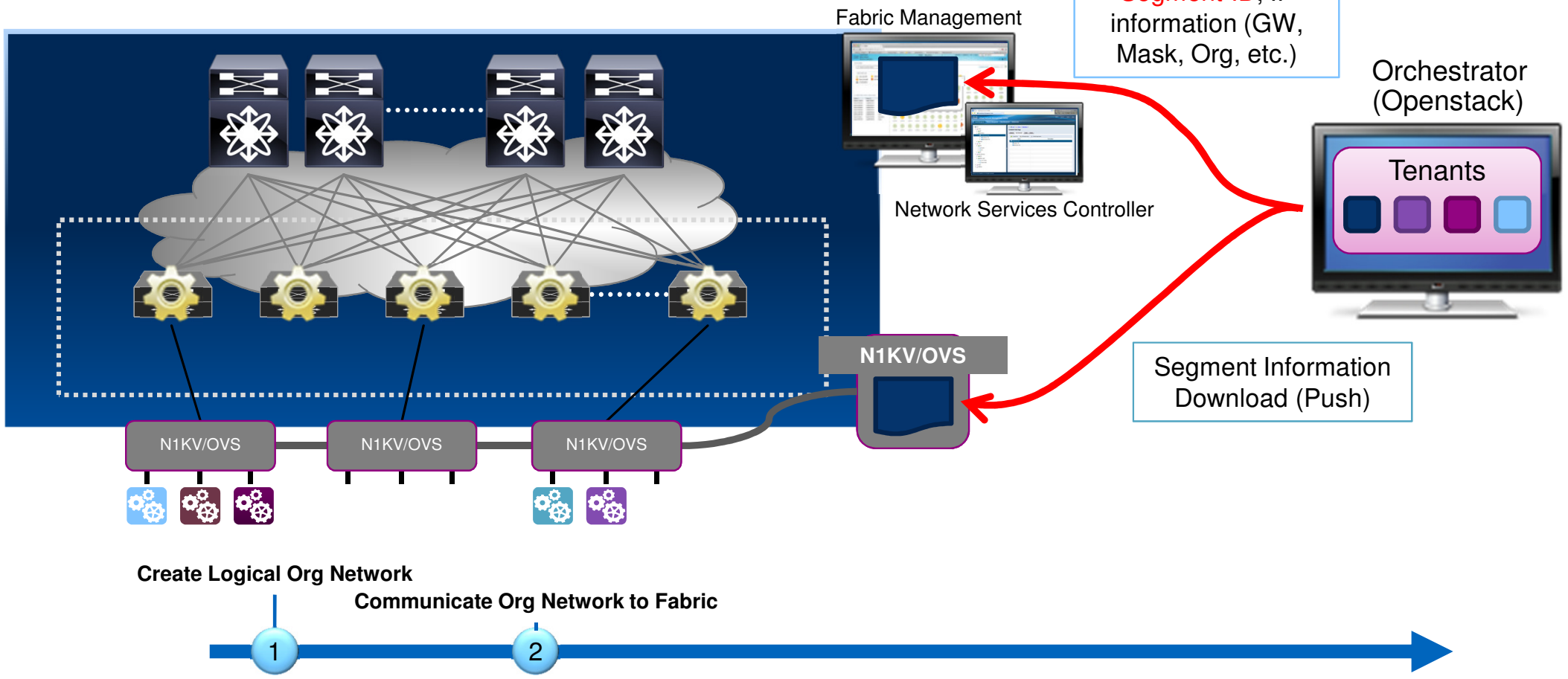
Customer Use Case

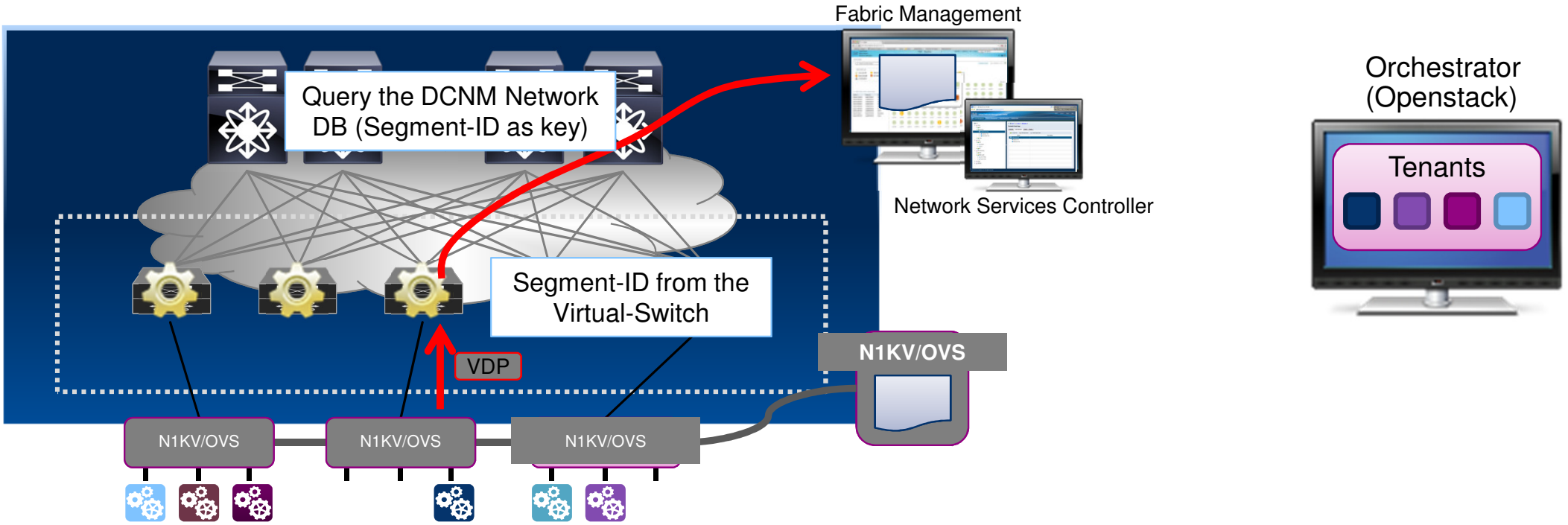
- Reduce Workload Deployment Time
- Flexible Workload Placement
- Eliminate Static Provision & Clean up
- Open Integration: Orchestration



Workload Automation – Fully Automated



Workload Automation – Fully Automated



Create Logical Org Network

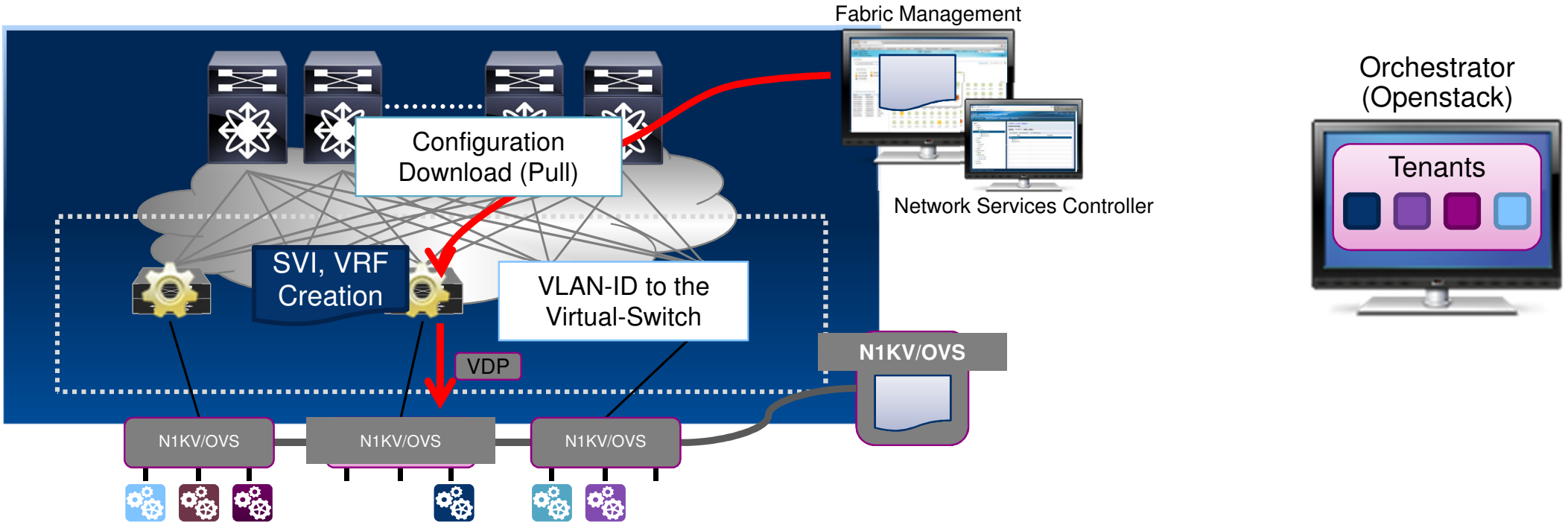
Communicate Org Network to Fabric

New VM gets created in Red Network

Instantiate Red Network

1 2 3 4 5

Workload Automation – Fully Automated



Create Logical Org Network

Communicate Org Network to Fabric

New VM gets created in Red Network

VDP information exchange

Instantiate Red Network

1 2 3 4 5

Optimized Network

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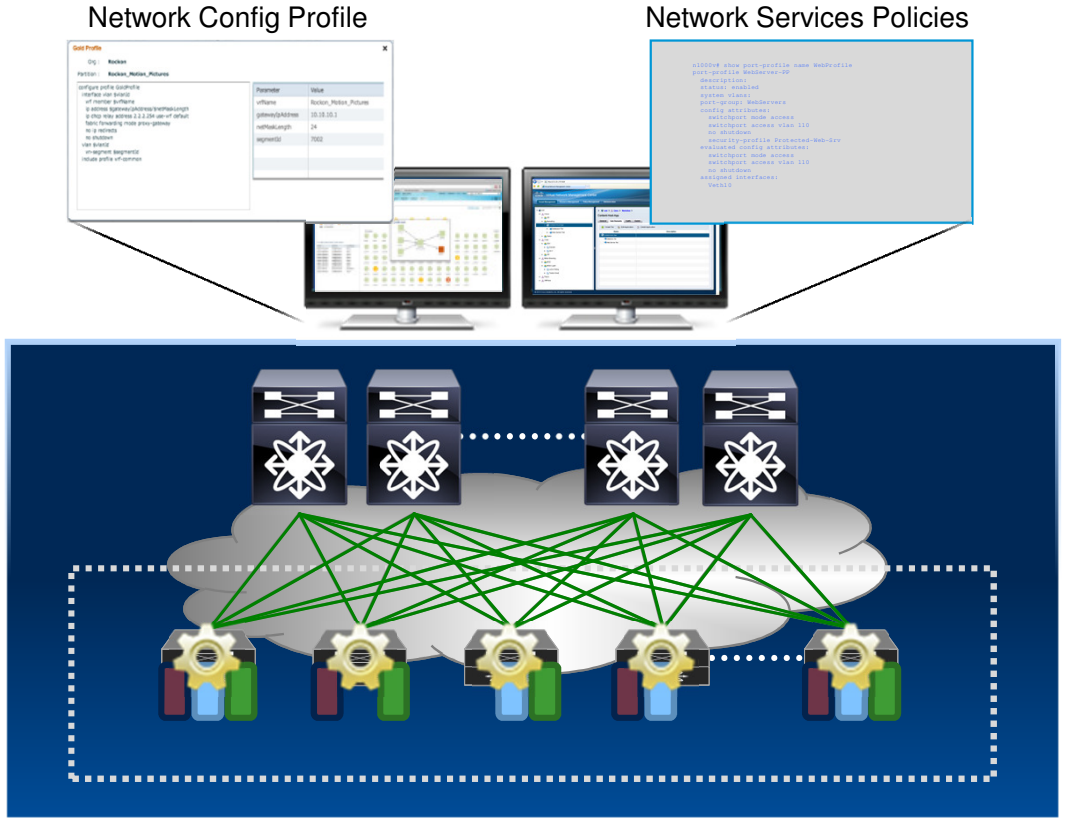
Customer Use Case

- Scalable and Resilient Fabric
- Efficient fabric forwarding
- Avoid Unnecessary traffic
- Deterministic latency



The Data Center Fabric Journey

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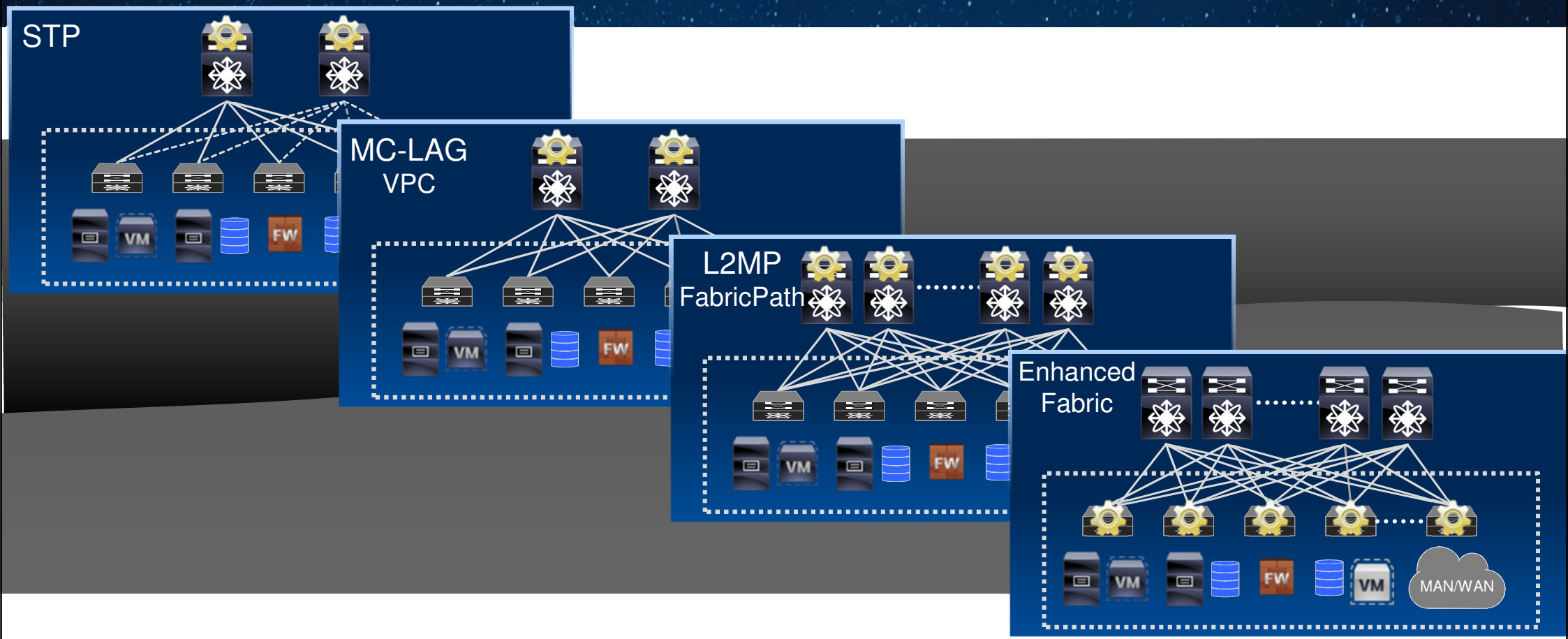
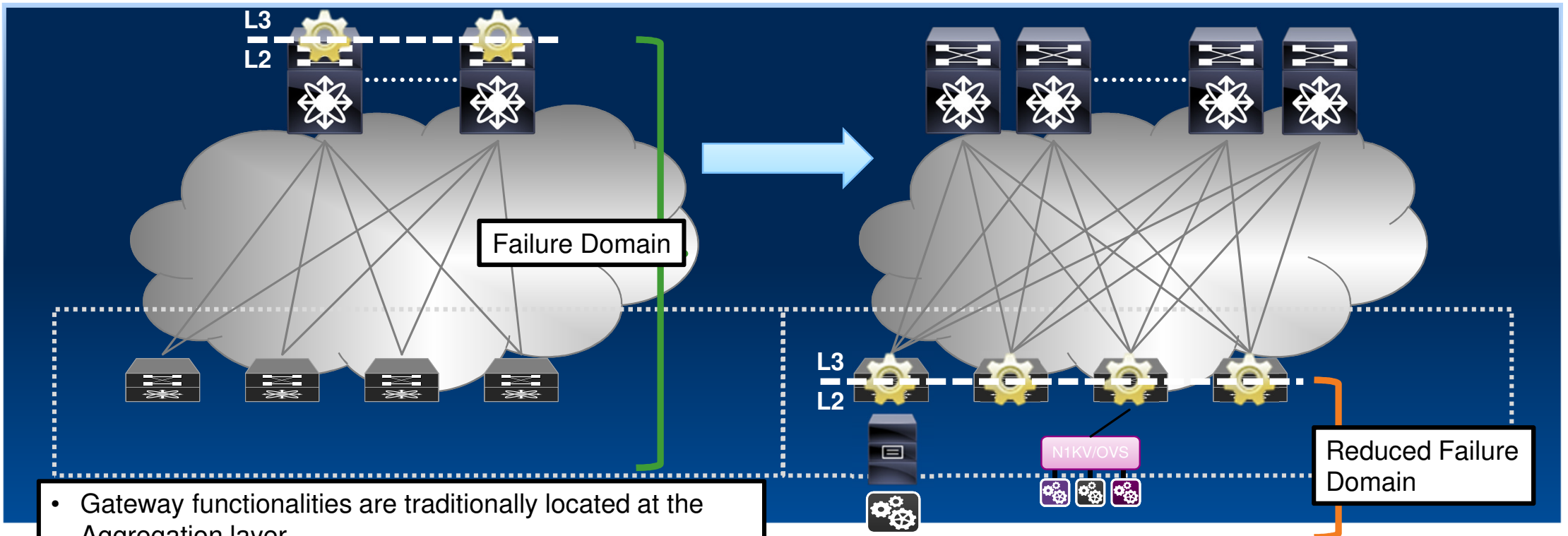


Traditional Fabric vs. Optimized Fabric



- Gateway functionalities are traditionally located at the Aggregation layer.
- Failure domain extends between the entire Layer-2 to Layer-3 boundary

- Distributed Gateway at leaf reduces failure domain
- Fabric scales as more server ports grows

Unified Fabric – Virtual Fabric

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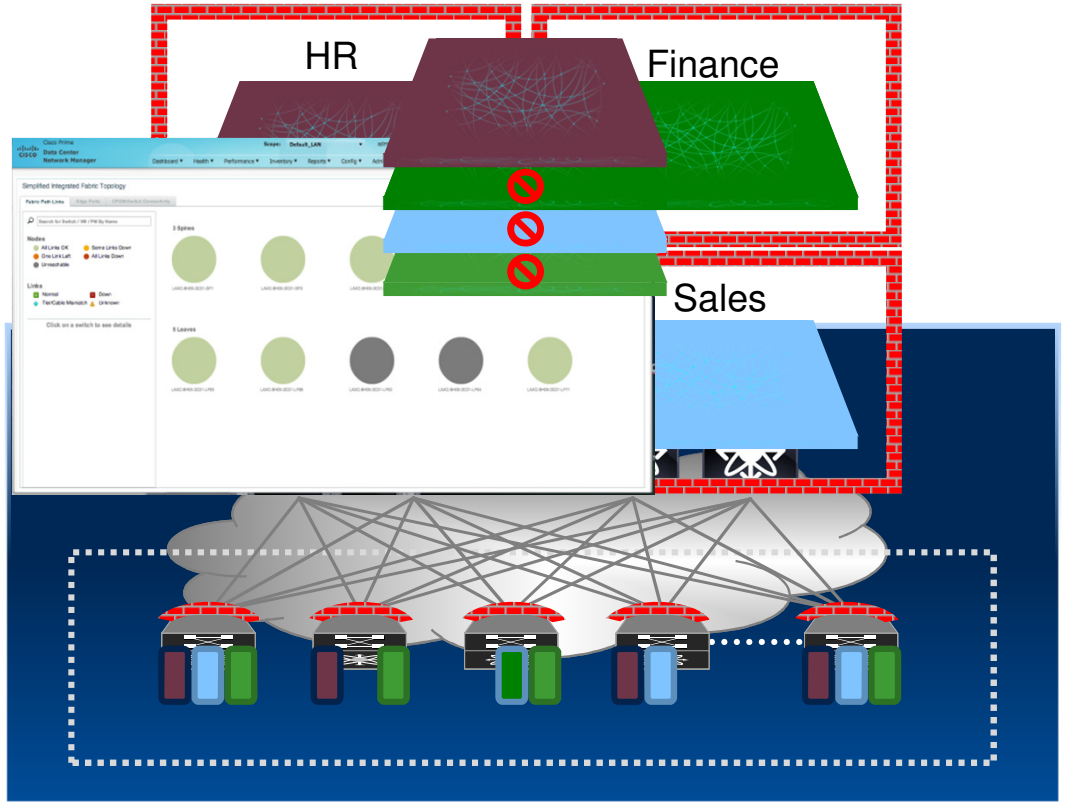
Customer Use Case

- Secure Virtual Fabrics
- Scale beyond 4K VLANs
- Virtual Fabric Tenant Visibility
- Routing/Switching Segmentation



Unified Fabric Innovation Available Now

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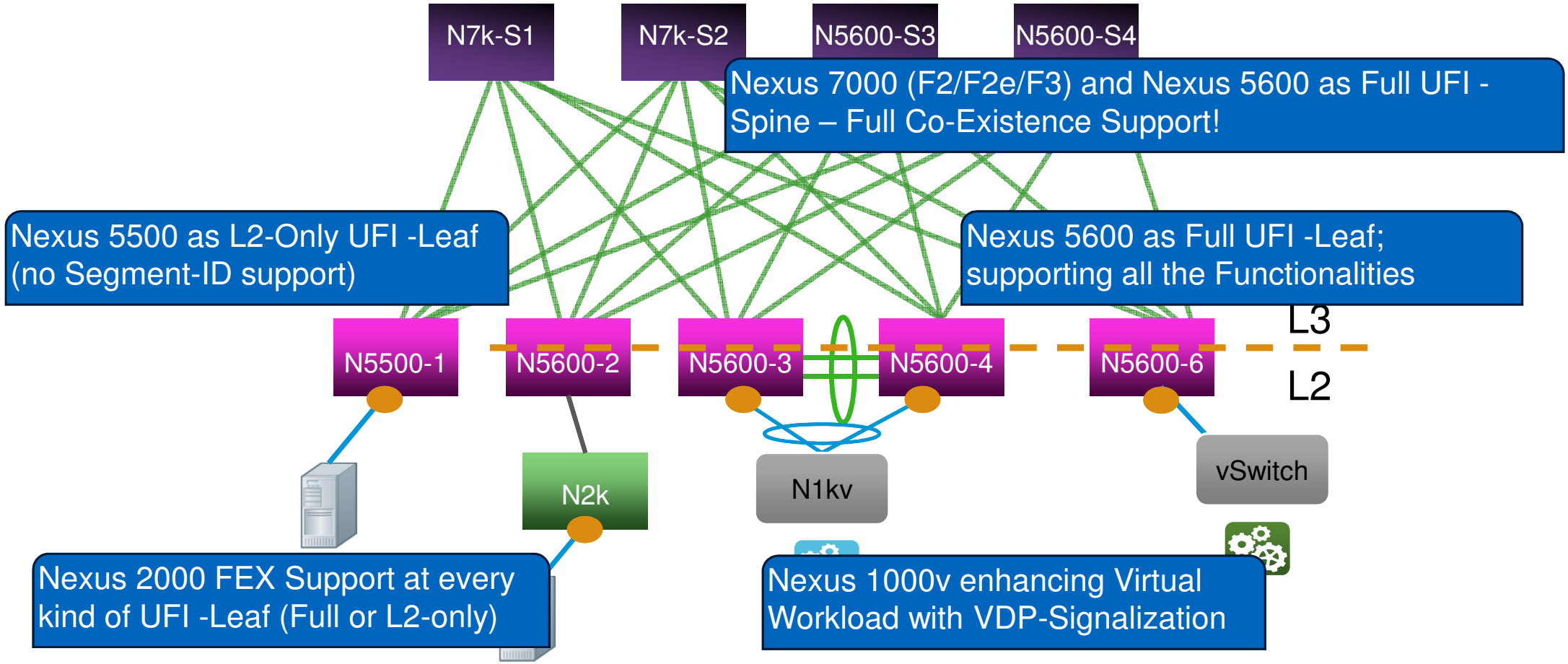

Cisco Unified Data Center: Key Takeaways

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Policy-based IT infrastructure simplifies deployment of IT infrastructure of any application, delivery model, or consumption model

An application-centric infrastructure gets you ready to leverage the world of many clouds

The Cisco approach delivers the promised benefits of business agility, financial efficiency, and IT simplification

Thank You