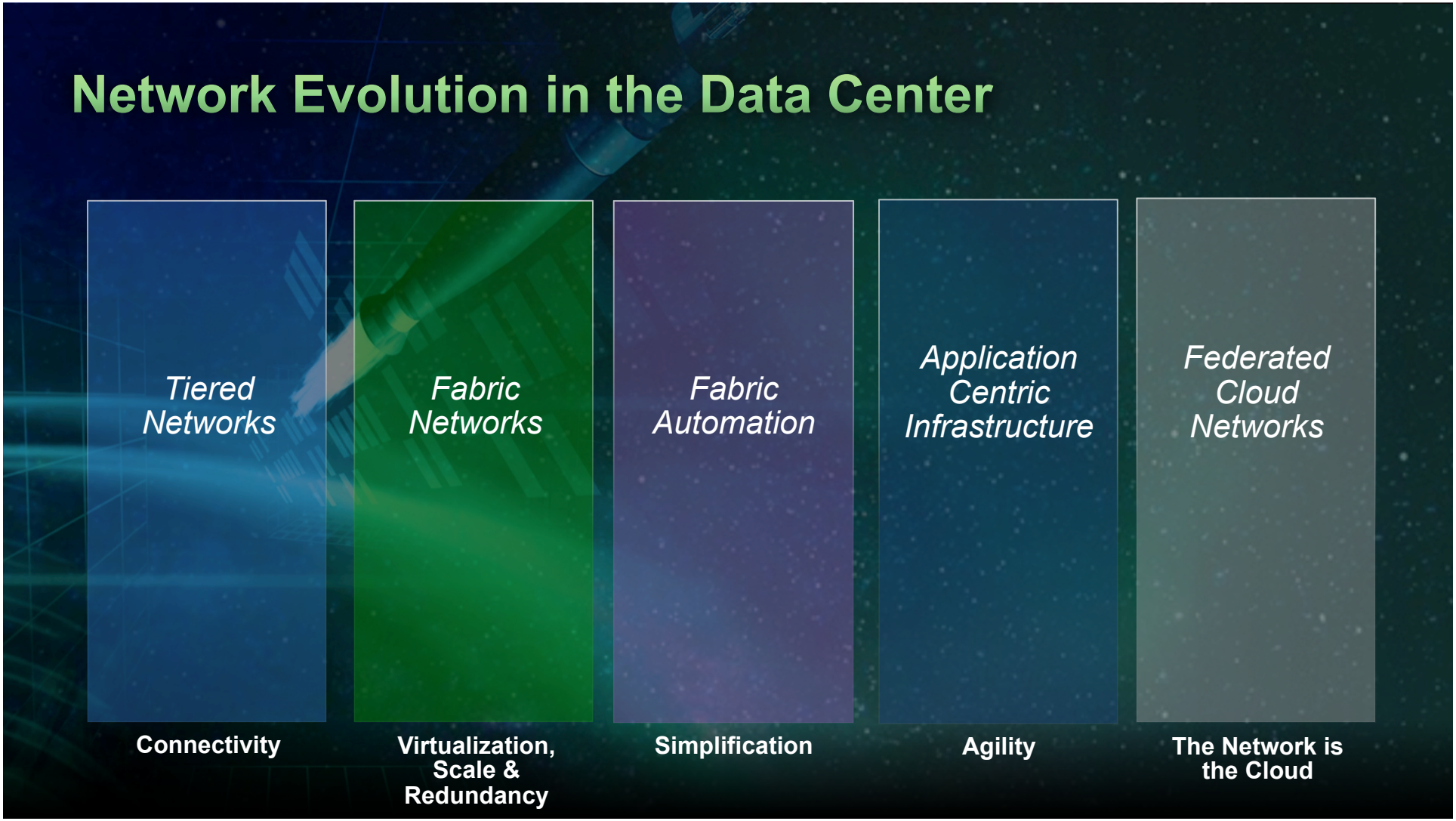
The Network is the Cloud

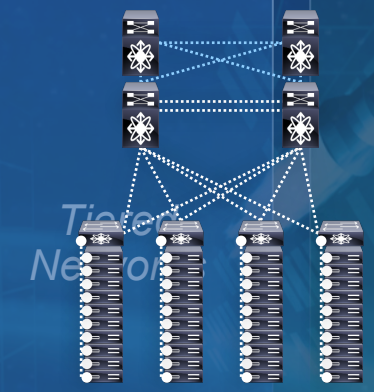
David Yen, Ph.D.
SVP & GM, Data Center Group

Network Evolution in the Data Center



Tiered Networks

Tiered Networks



Catalyst

MDS

Fabric Networks

Fabric Automation

Application Centric Infrastructure

Federated Cloud Networks

Connectivity

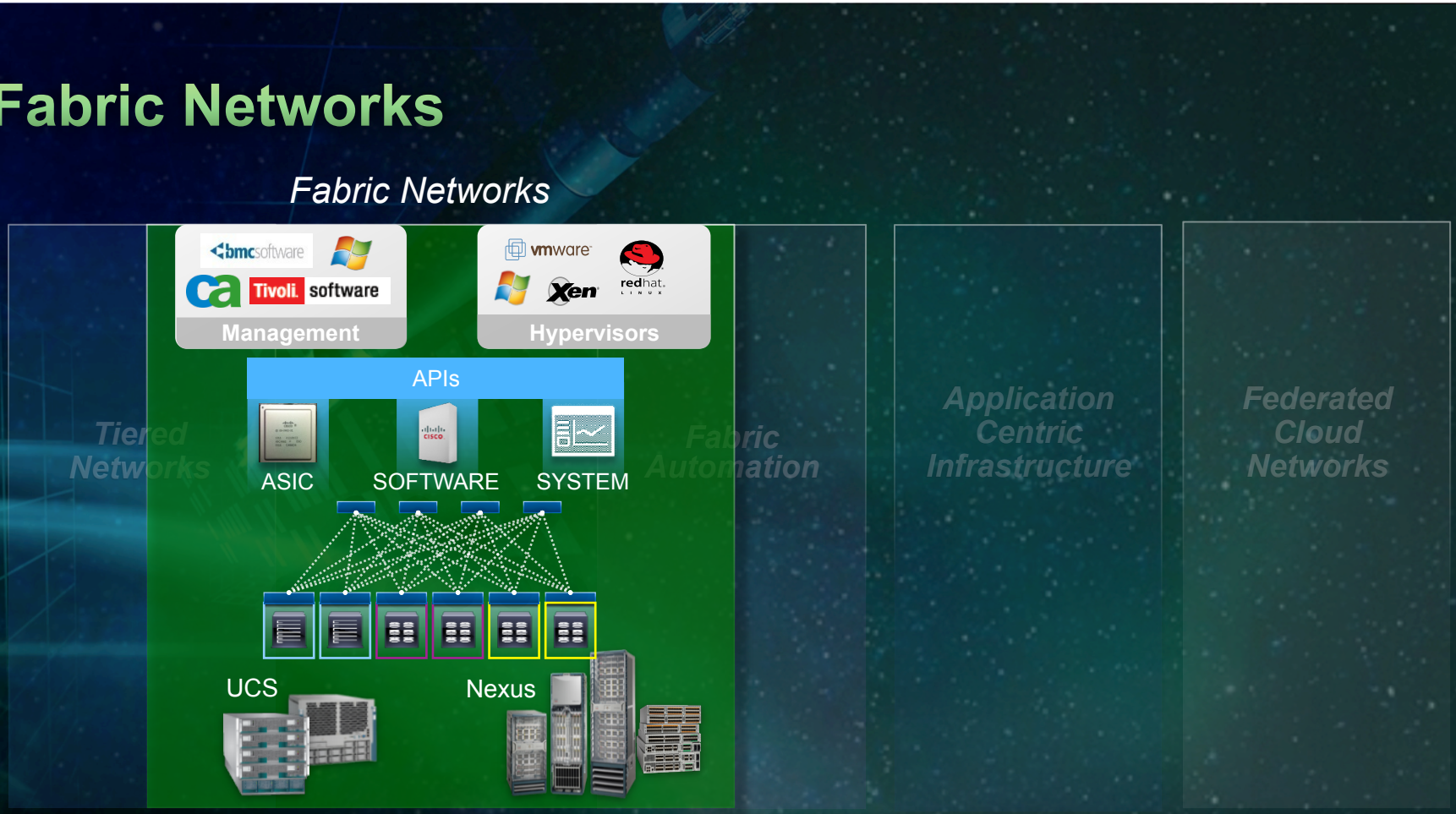
Virtualization, Scale & Redundancy

Simplification

Agility

Flexibility

Fabric Networks

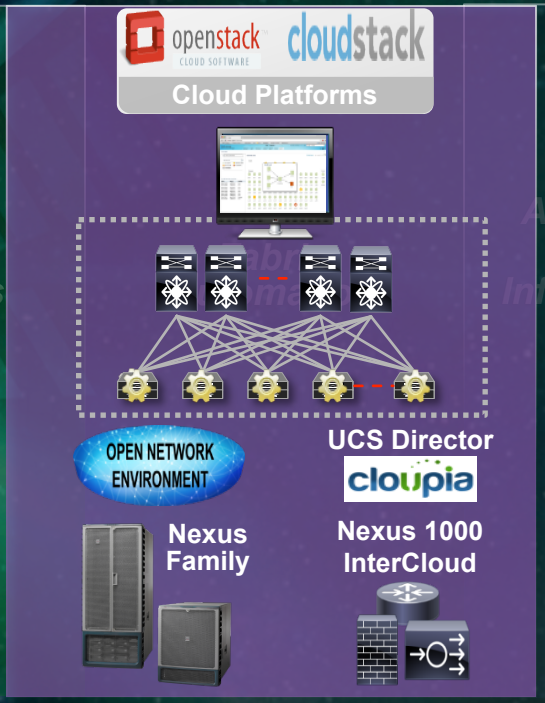


Fabric Automation

Fabric Automation

Tiered Networks

Fabric Networks



Application Centric Infrastructure

Federated Cloud Networks

Consolidation

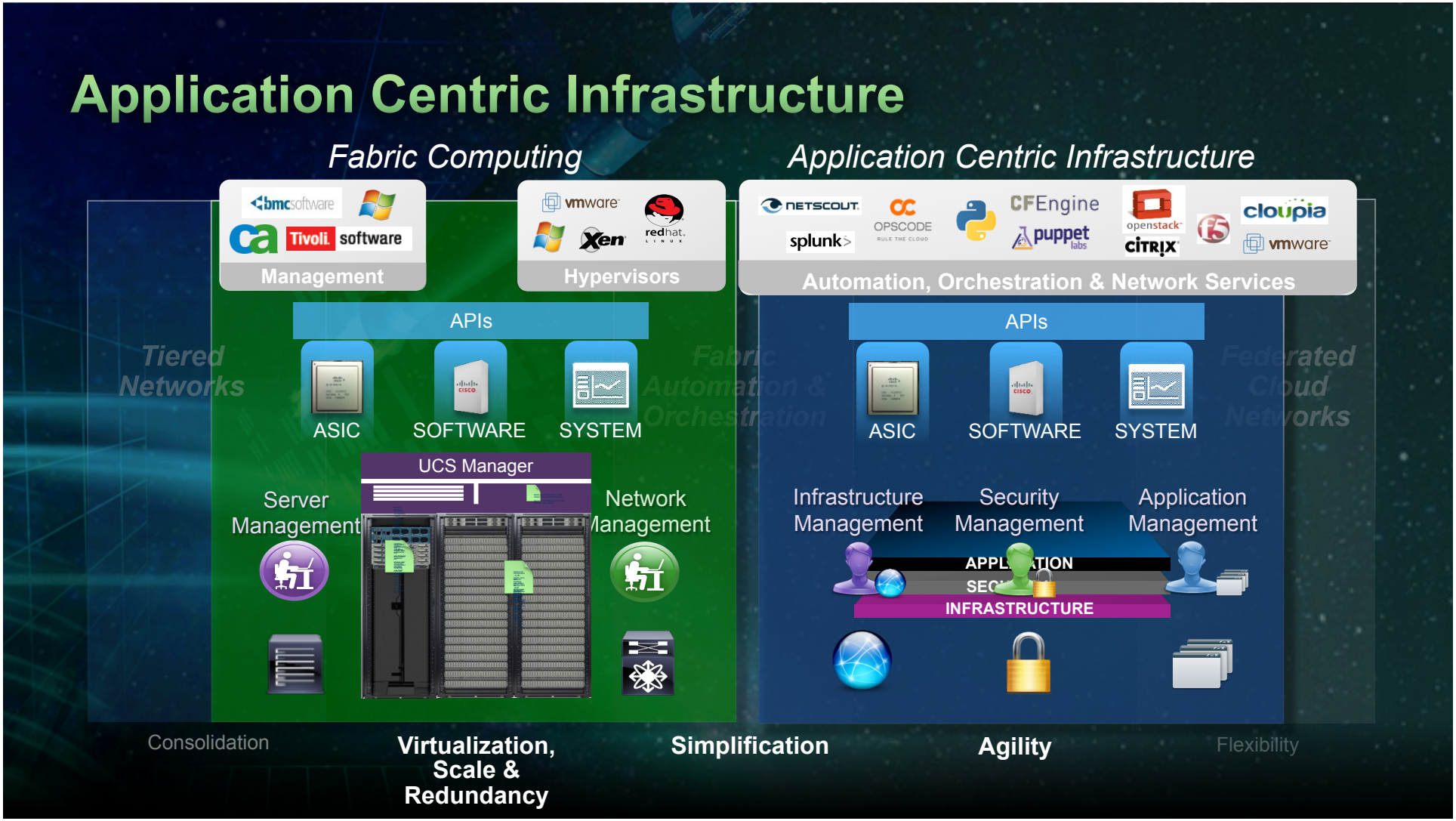
Virtualization, Scale & Redundancy

Simplification

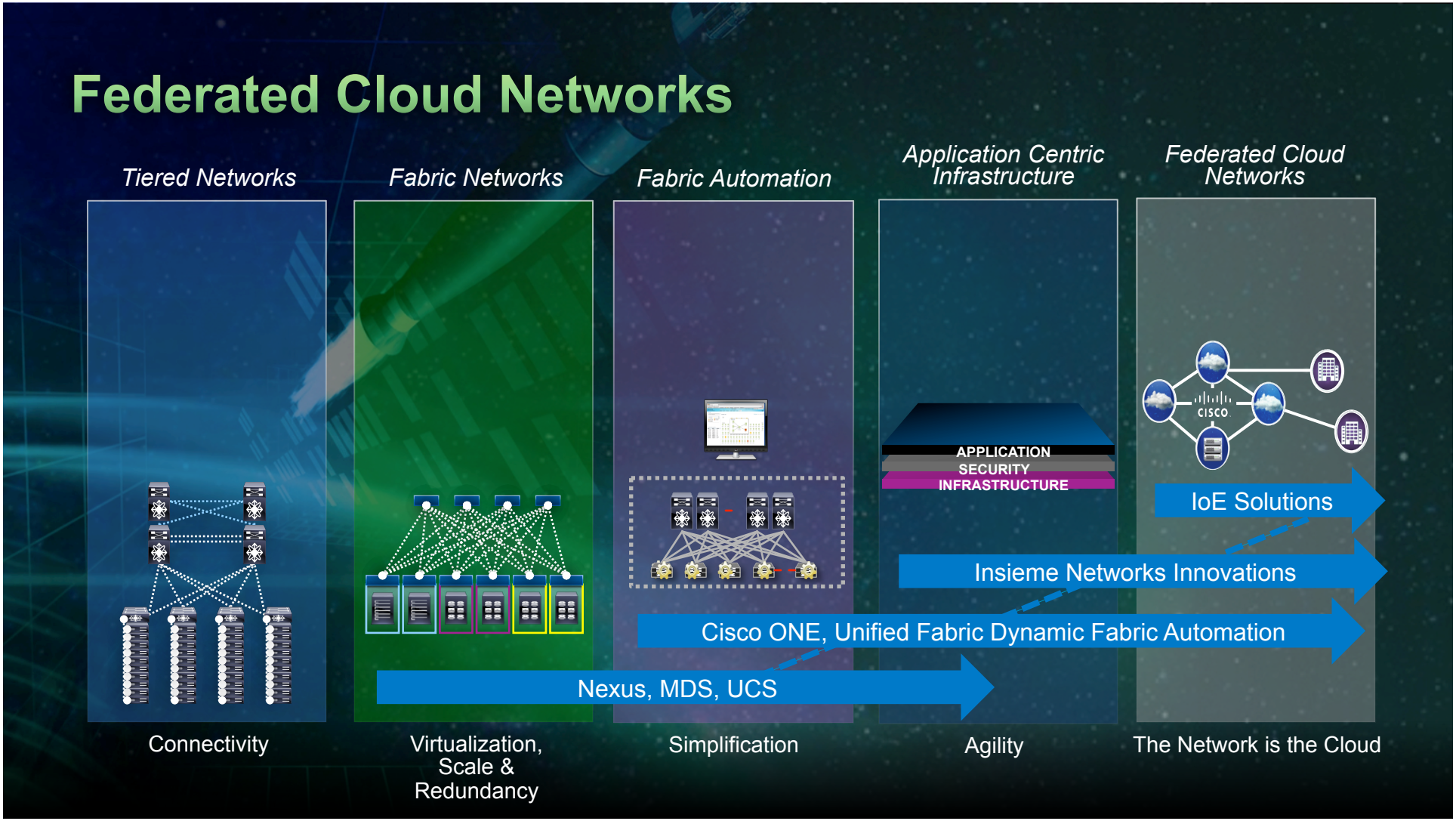
Agility

Flexibility

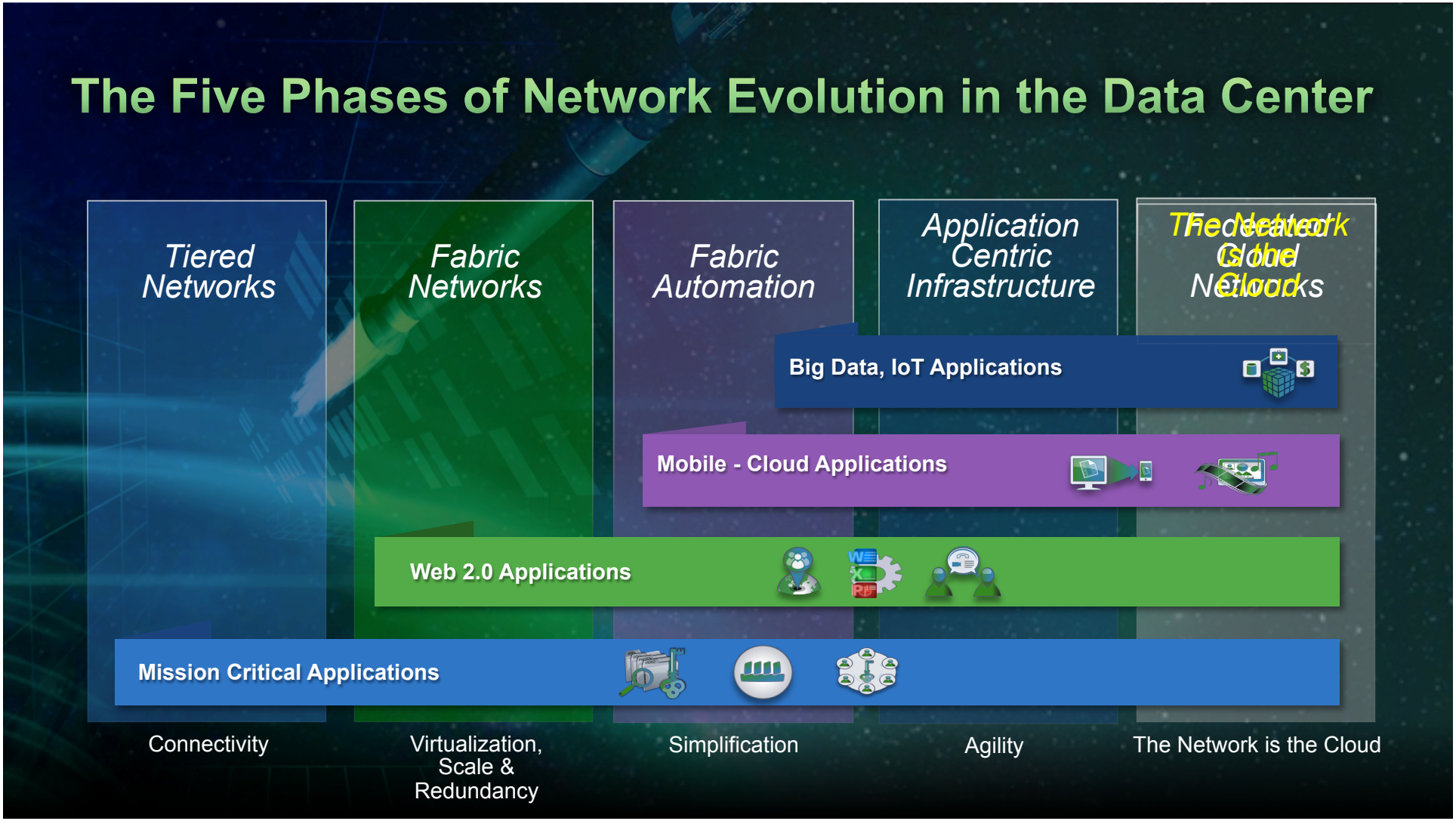
Application Centric Infrastructure

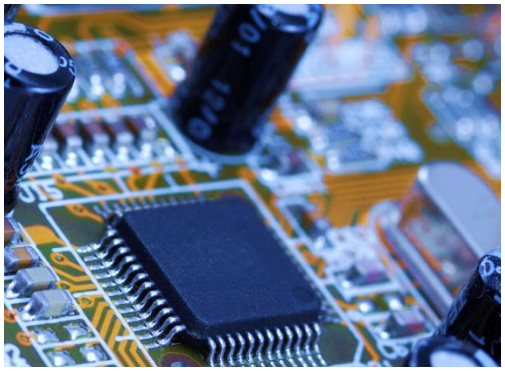
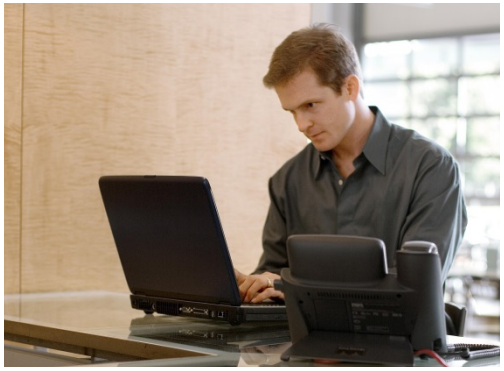


Federated Cloud Networks



The Five Phases of Network Evolution in the Data Center

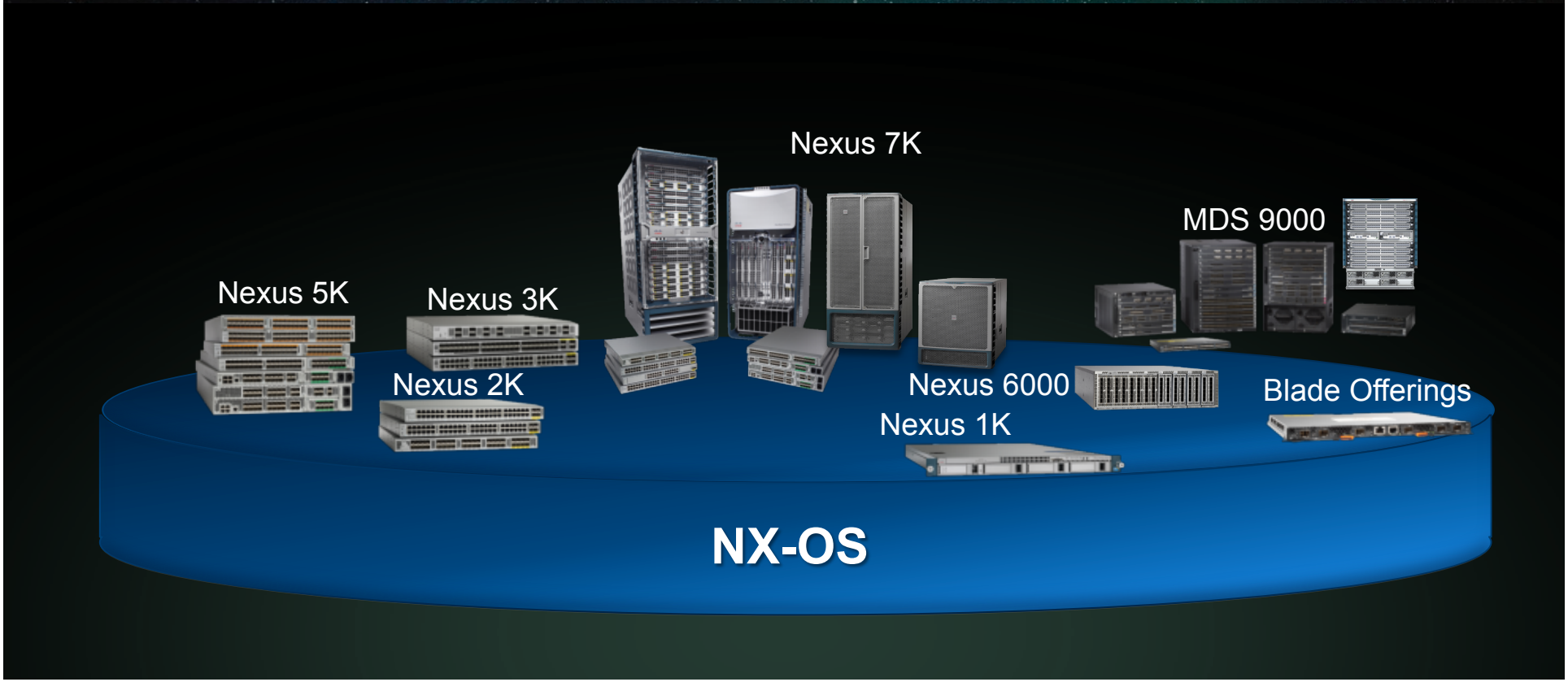


Unified Fabric

Cisco's Nexus Switching Product Portfolio

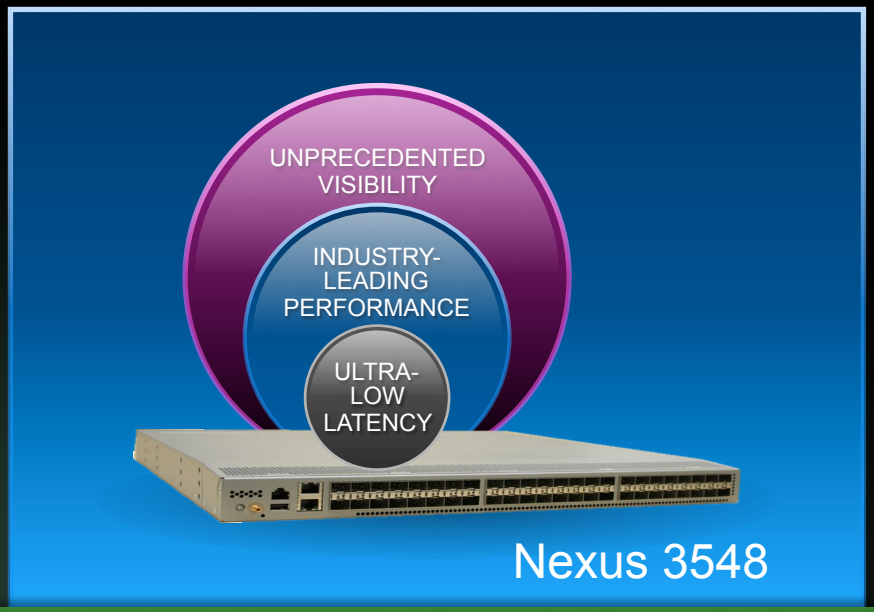
Leading with Innovation



Enhancing Cisco High Performance Trading Fabric

Introducing the First Nexus with Cisco Algo Boost

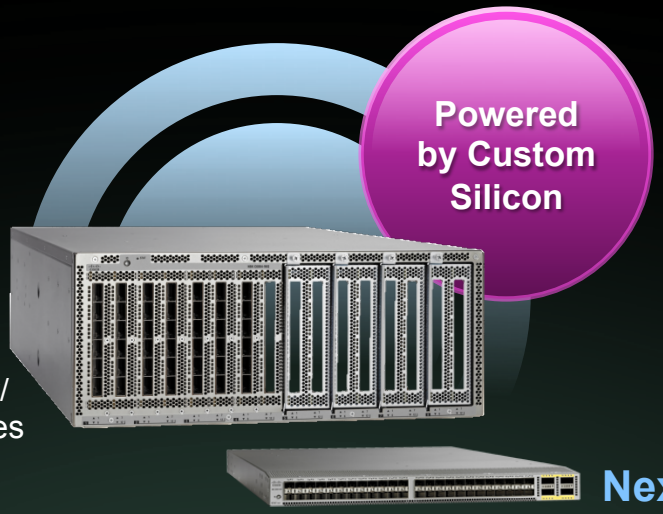
- Based on Proven NX-OS
- 48 SFP+ ports: 10G/1G/100M
- Ultra-low latency: <250 ns
- Line rate L2/L3 unicast/multicast
- 18 MB buffering; flexible ACL/QoS
- Cisco Algo Boost: active buffer monitoring, NAT, PTP, ERSPAN



Delivering **Competitive Advantage** to High-Performance Trading

Nexus 6000 Series

Highest 10GbE/40GbE Density for Cloud-Scale Fabrics



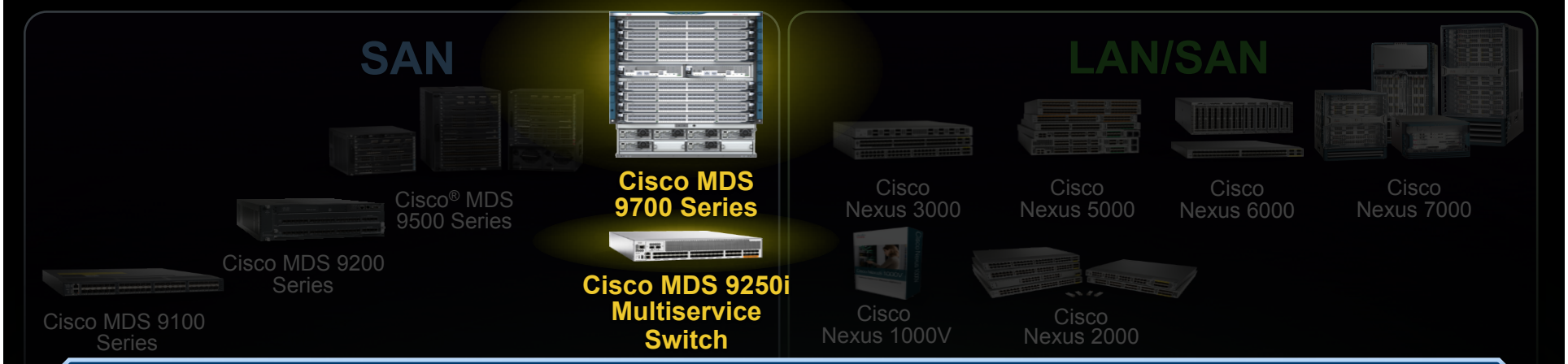
Nexus 6004
48x40GbE Ports w/
4 Expansion Modules

Nexus 6001
48x10GE + 4x 40GE Ports

384 X 10GbE ports line rate L2/L3 **96 X 40GbE ports line rate L2/L3**	**1,536 GbE/10GbE ports via FEX**	**1 µs latency port-to-port**

Cisco Multi-Protocol Architecture for LAN and SAN

Industry's Broadest Switching Portfolio



10+ Years of Proven NX-OS Operating System
From Hypervisor to Core

Cisco Prime Data Center Network Manager (DCNM)
Single Point of Management

CONSISTENT and SIMPLIFIED

Features, Management and Programmability

Extending The Nexus 7000 Family

Introducing the Nexus 7700 Series

INDUSTRY'S HIGHEST SCALE

83 Tbps switching
384 40G and **192 100G**

UNPRECEDENTED SIMPLICITY

Consolidation of modules and systems

ENVIRONMENTAL EFFICIENCY

33% LESS rack space with front to back airflow
60% MORE energy efficient

7+Million Ports Shipped

40,000+ Chassis

8,000+ Customers

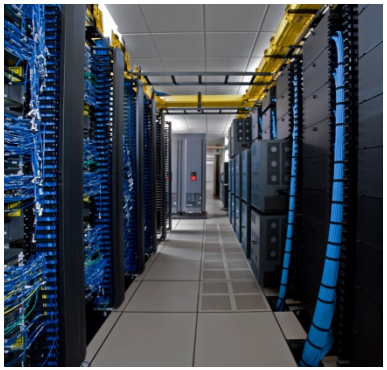
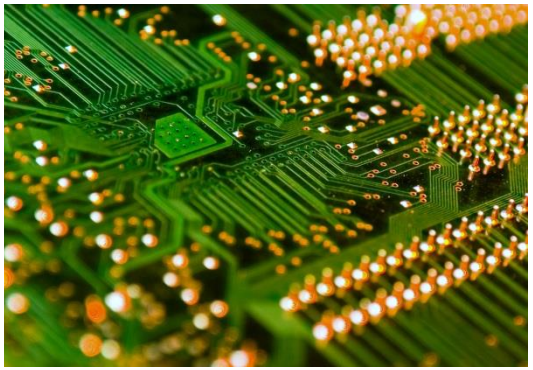
Cisco Nexus 7000

Broadest Deployments

Cisco Nexus 7700

Cloud Optimized

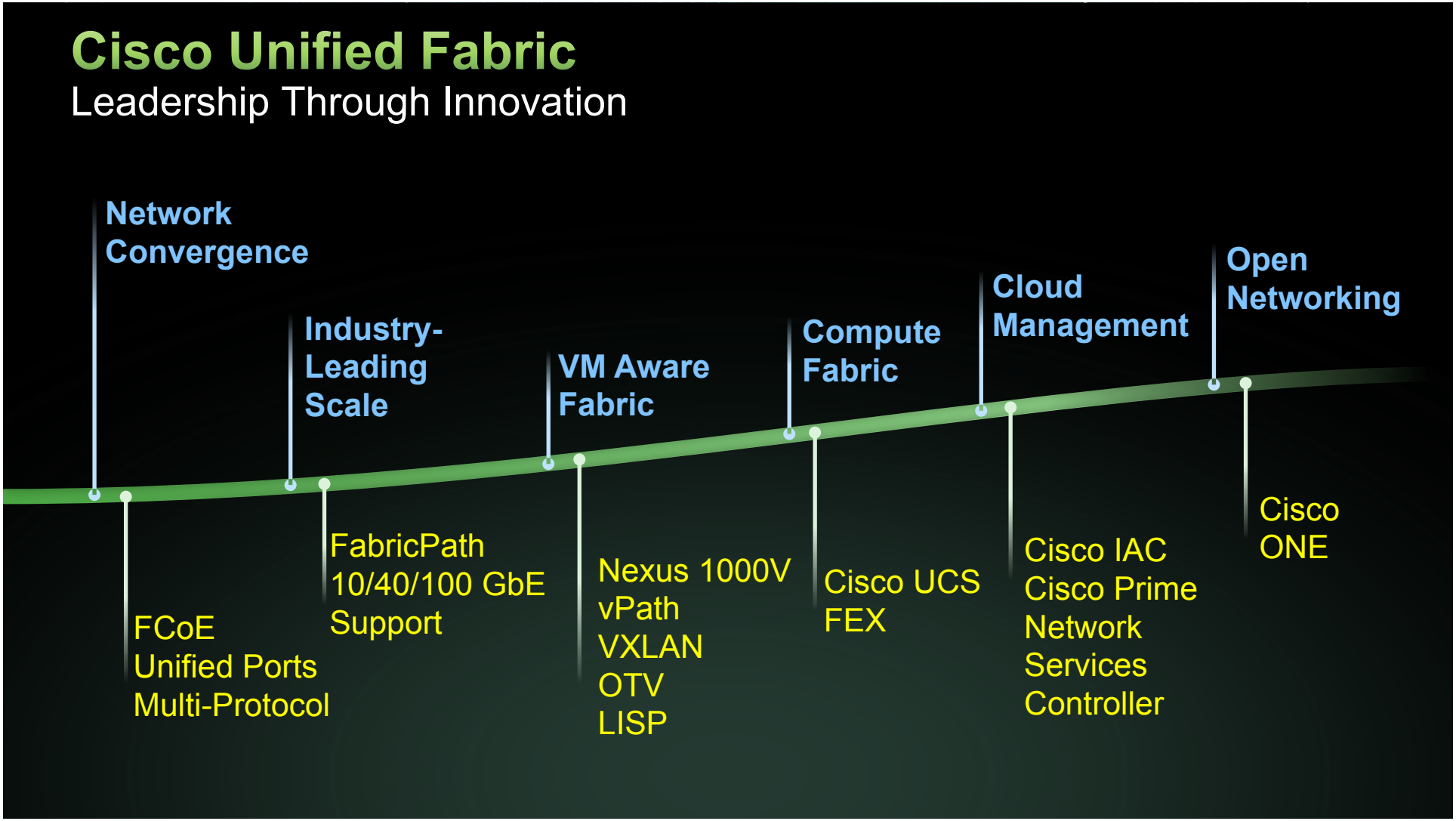
HIGHEST AVAILABILITY | FEATURE RICHNESS | INVESTMENT PROTECTION

Data Center Switching Fabric Architecture

Cisco Unified Fabric

Leadership Through Innovation



Today's DC Challenges

Raising the Bar with Cisco Unified Fabric

Dynamic Fabric Automation:

Simplified Networking for Enhanced Efficiency at Scale,
Simplified Fabric Management for Ease of Operations,
and Simplified Automated Provisioning

A Single NW Architecture for Physical, Virtual and Cloud Workloads

Every leaf switch node connects to every spine switch to ensure any VM or PM is within no more than two hops

Predictable Latency

Layer 3 boundary moved down to leaf nodes providing distributed gateway

Optimal Performance

IP addresses used within or between traditional layer 2 subnets

Enhanced Forwarding

External connectivity through border leaf nodes

Routing Efficiency

Automated Provisioning of NW Fabric and its Services

DCNM 7.0

Central Point of Management (CPOM)

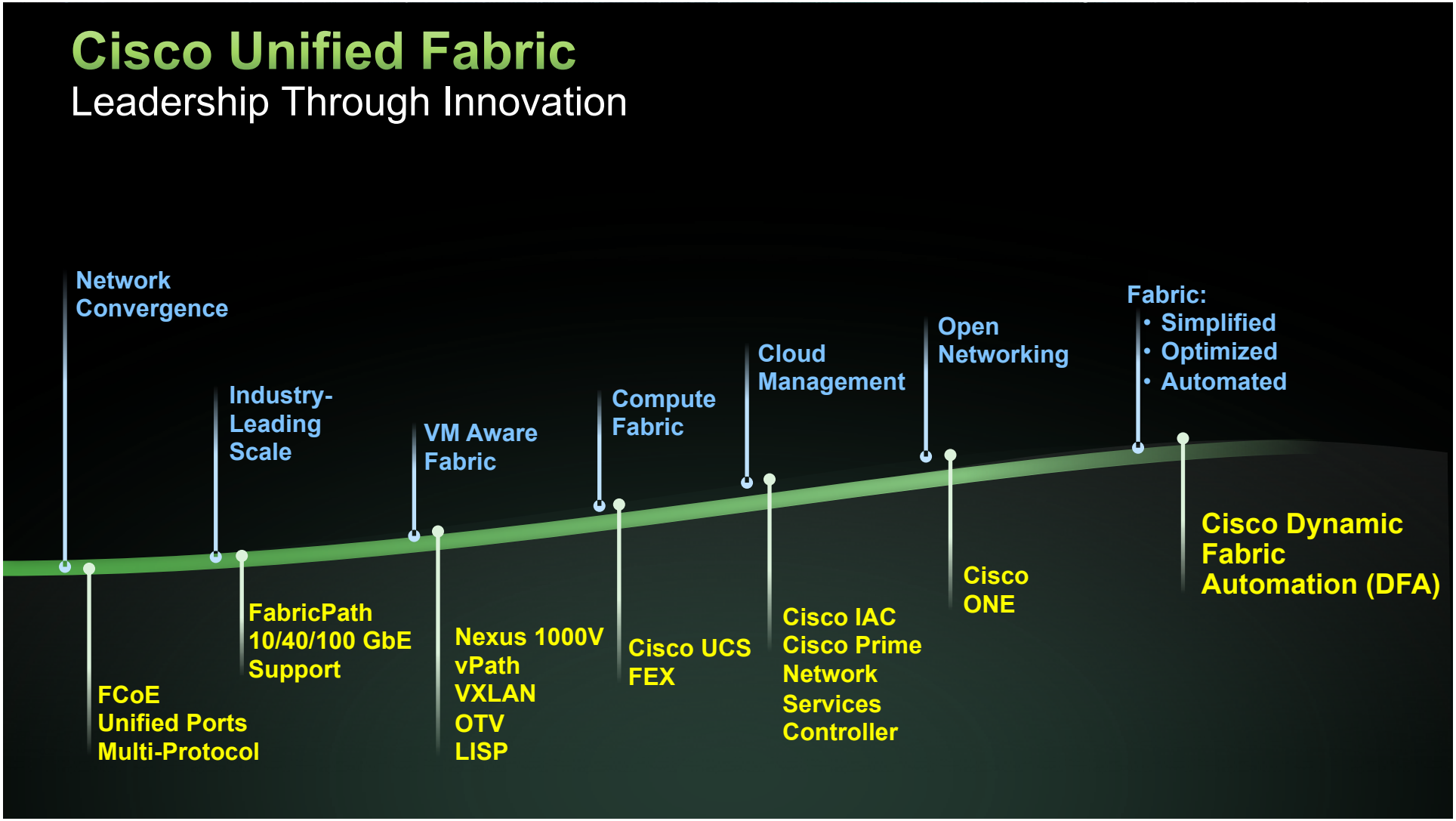
Power-on Automated Provisioning (POAP)

Single touch large scale policy updates

Simplified NW Expansion and Management

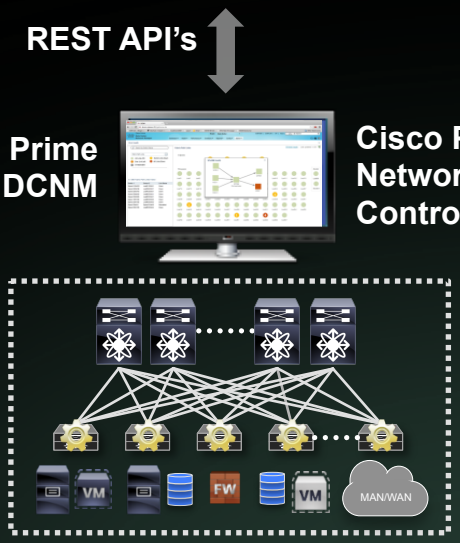
Cisco Unified Fabric

Leadership Through Innovation



#1 – Simplify Fabric Management

openstack CLOUD SOFTWARE | vmware | cloudstack | Microsoft System Center | cloupia



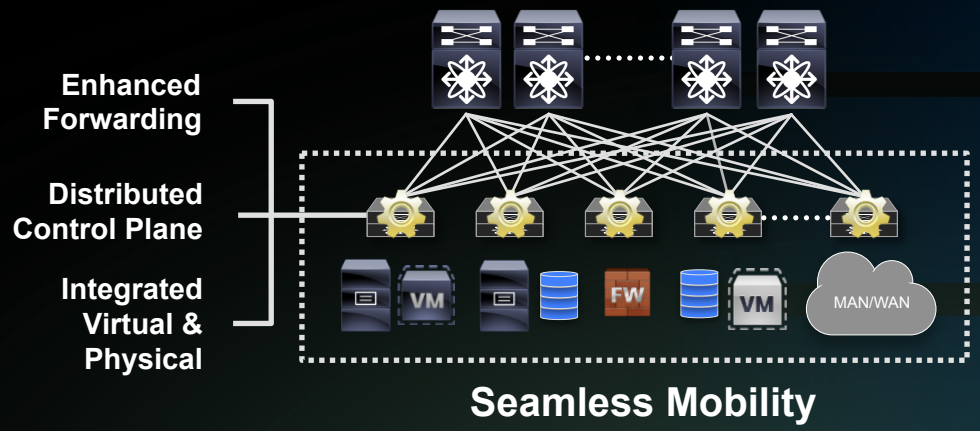
AUTOMATED
NETWORK PROVISIONING

COMMON POINT OF
FABRIC ACCESS

HOST, NETWORK & TENANT
VISIBILITY

Simplified Management for Ease of Operations

#2 – Optimize Fabric



ANY **NETWORK ANYWHERE** — VM/PM Mobility, NW Extensibility

EXTENSIBLE RESILIENCY — Smaller failure domains

Multi-Tenant **SCALE** — Greater than 10K Tenants/Networks

Simplified Networking with Flexibility and Efficiency at Scale

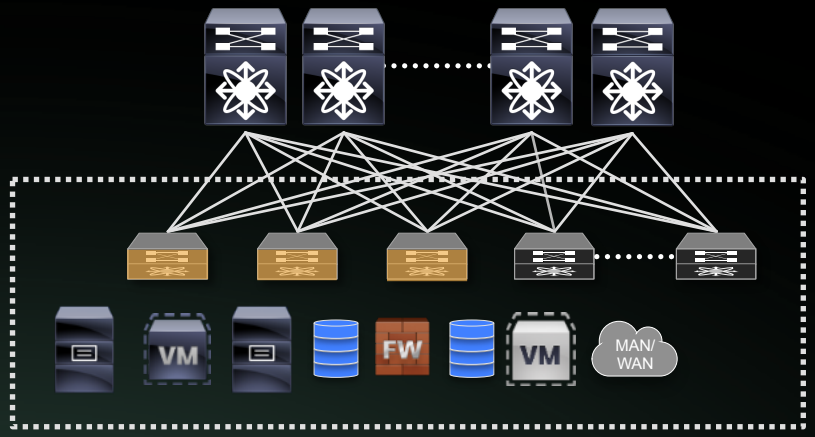
#3 – Automate Provisioning

Network Admin

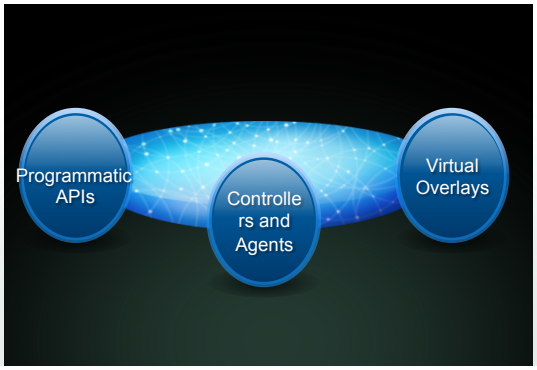
Subnet
QoS
Security
Policy-based
routing

Server Admin

openstack™ CLOUD SOFTWARE vmware cloudstack Microsoft System Center cloupia



1. Network Admin defines Network Profile Template for VMs/PMs in projects
2. Instances of Network Policies are automatically created in DCNM when a Server Admin provisions VM's/PMs
3. When a VM/PM pertaining to a project is detected, Network Policy is applied to the leaf
4. When VM moves, the Network Policy is applied automatically to the leaf



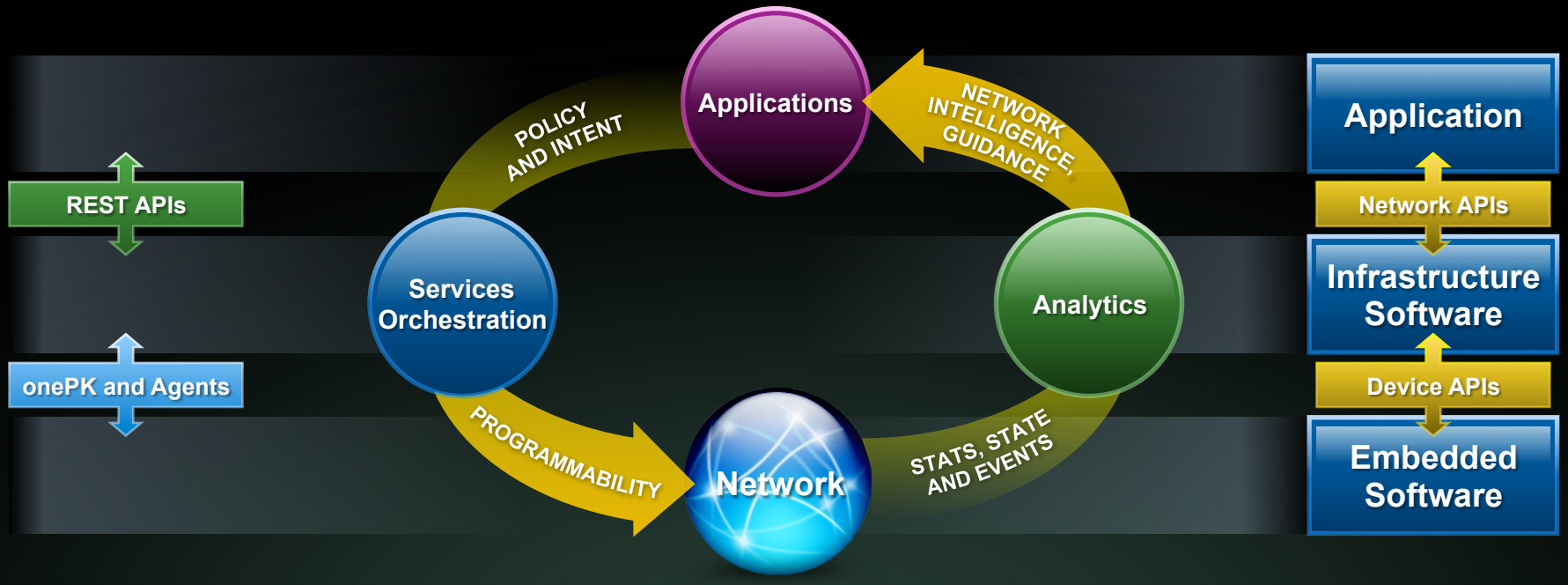
Leading the Way

Cisco Open Network Environment

Flexible. Programmable. Application-aware.

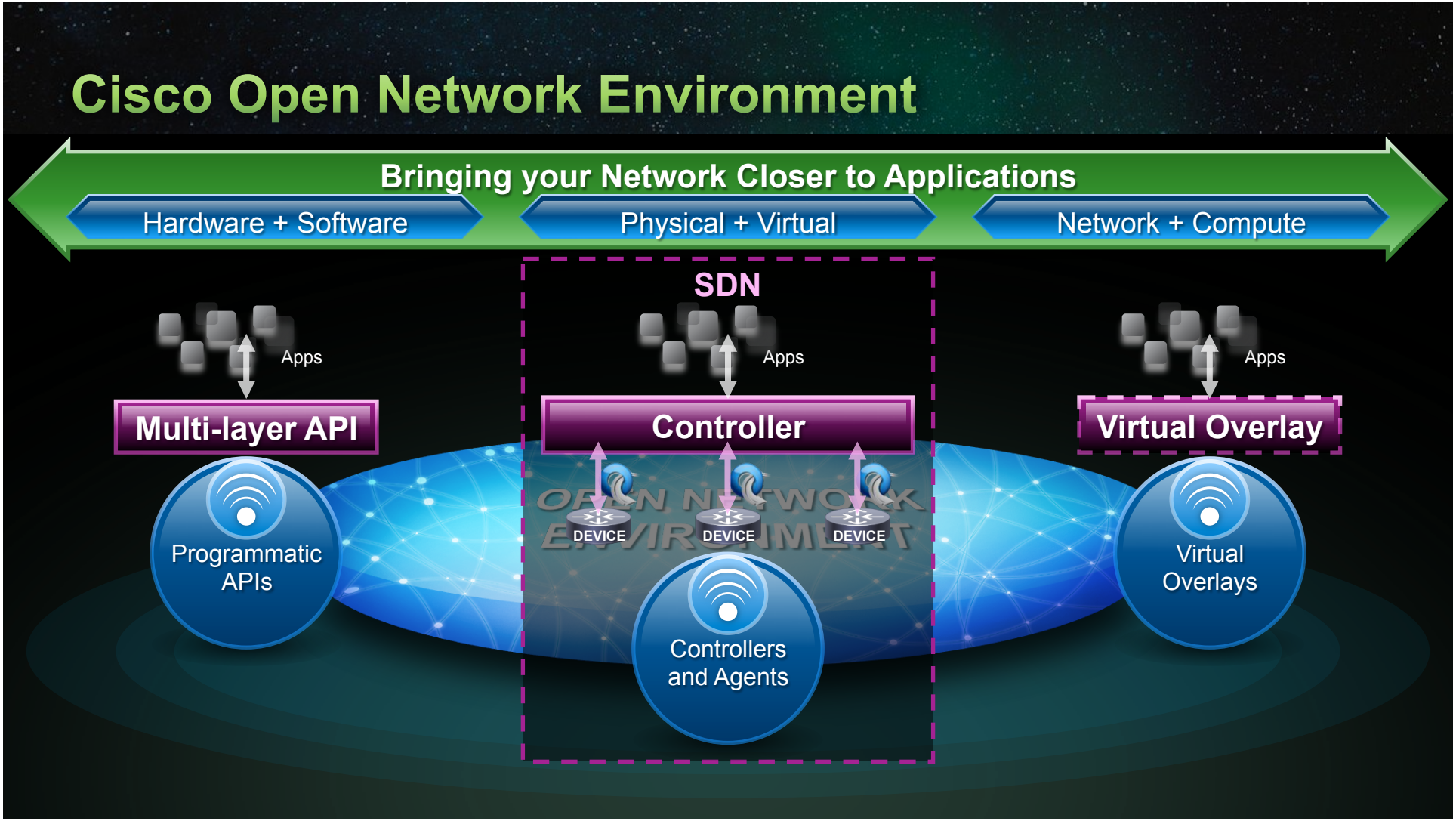
Cisco Open Network Environment

Network Intelligent Applications



→ Extending the Network Access → Evolving Software Solutions

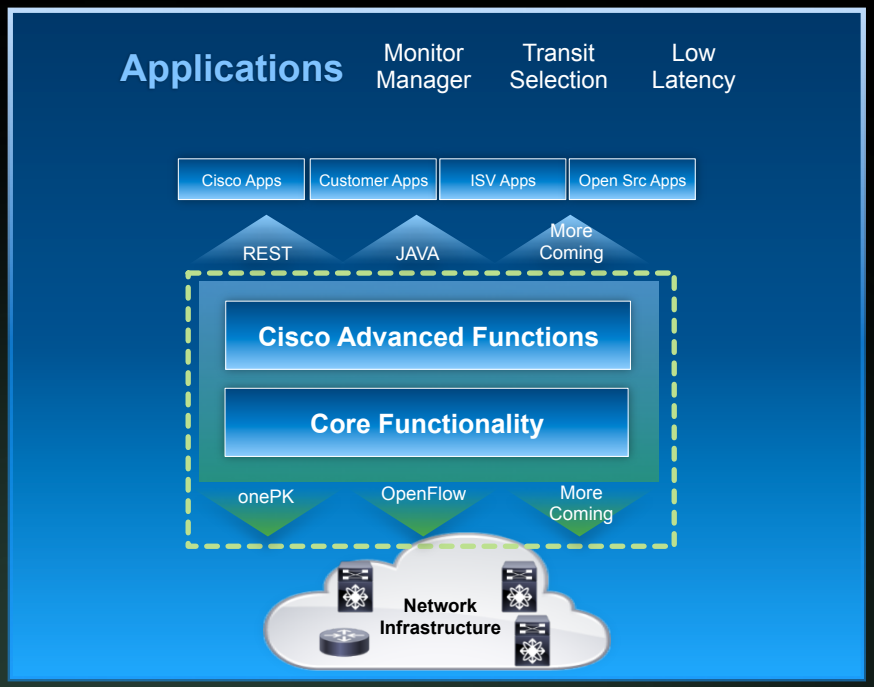
Cisco Open Network Environment



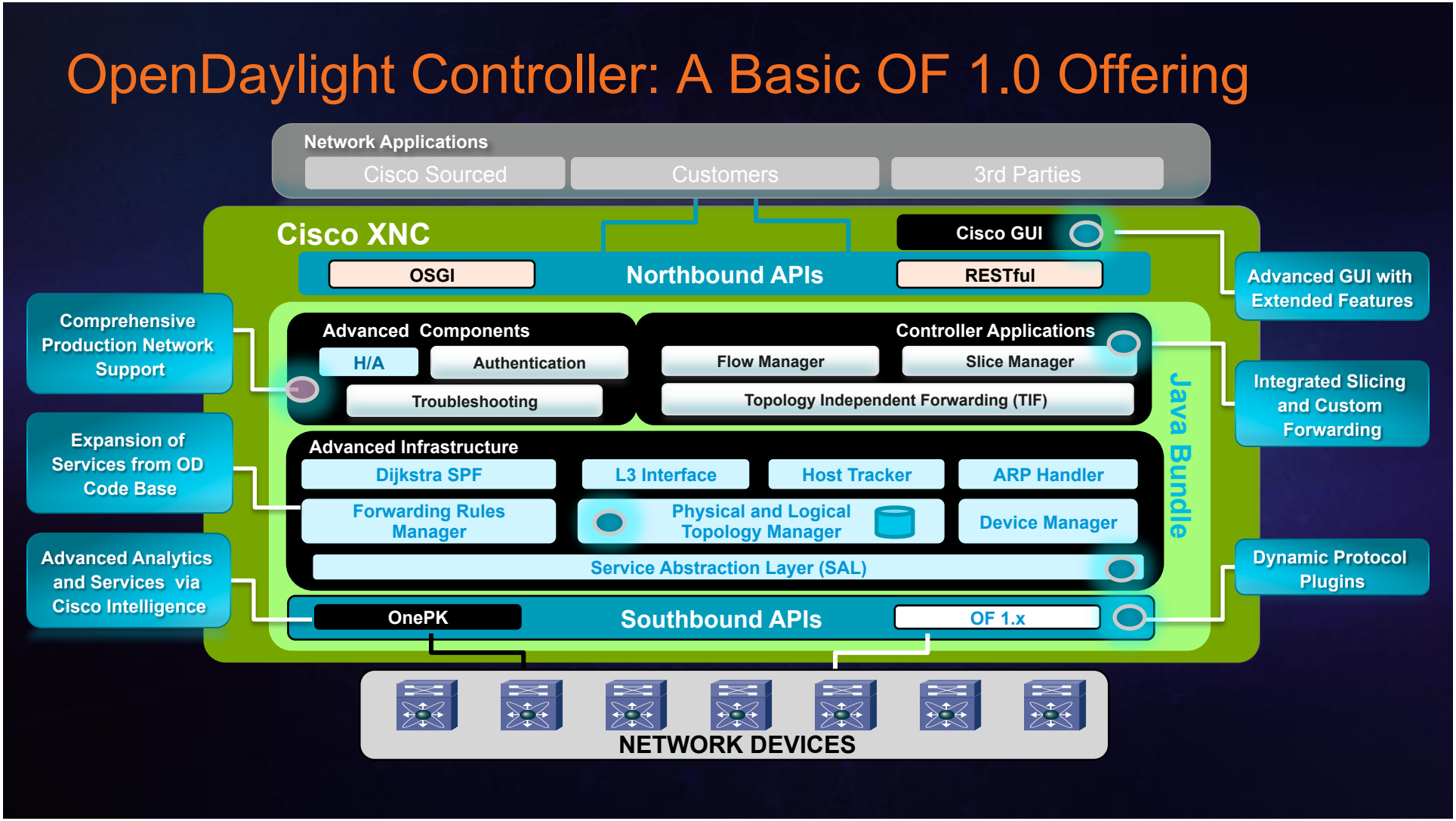
Cisco ONE eXtensible Network Controller (XNC)

Industry's Most Extensible Controller Architecture

- Extensive, modular architecture
- XNC Provides advanced functionality for production deployments:
  - Advanced flow management
  - Flow based troubleshooting
  - Role based authentication
  - onePK support
  - Scalabilty
  - Advanced GUI
  - Cisco TAC support

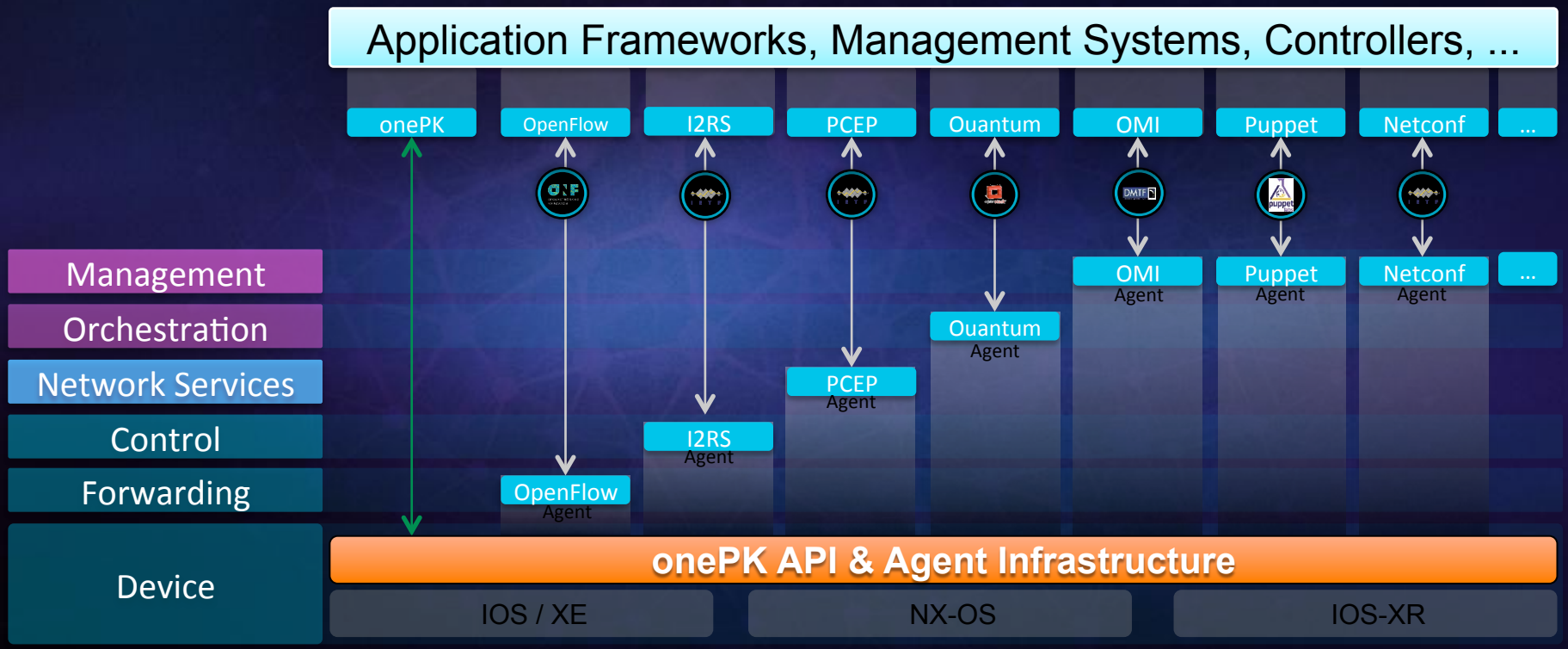


OpenDaylight Controller: A Basic OF 1.0 Offering



Programmatic Network Access

Agents as Flexible Integration Vehicles



New Controller Applications

Extending and Customizing with Cisco ONE Portfolio

Previously Announced

Network Slicing

Dynamic network partitioning of the network using logical associations provided by ONE Controller's centralized view

Phase 2 Apps

Network Tapping

Ability to monitor, analyze, and debug network flows using conventional network switches

Improved economics and more flexibility

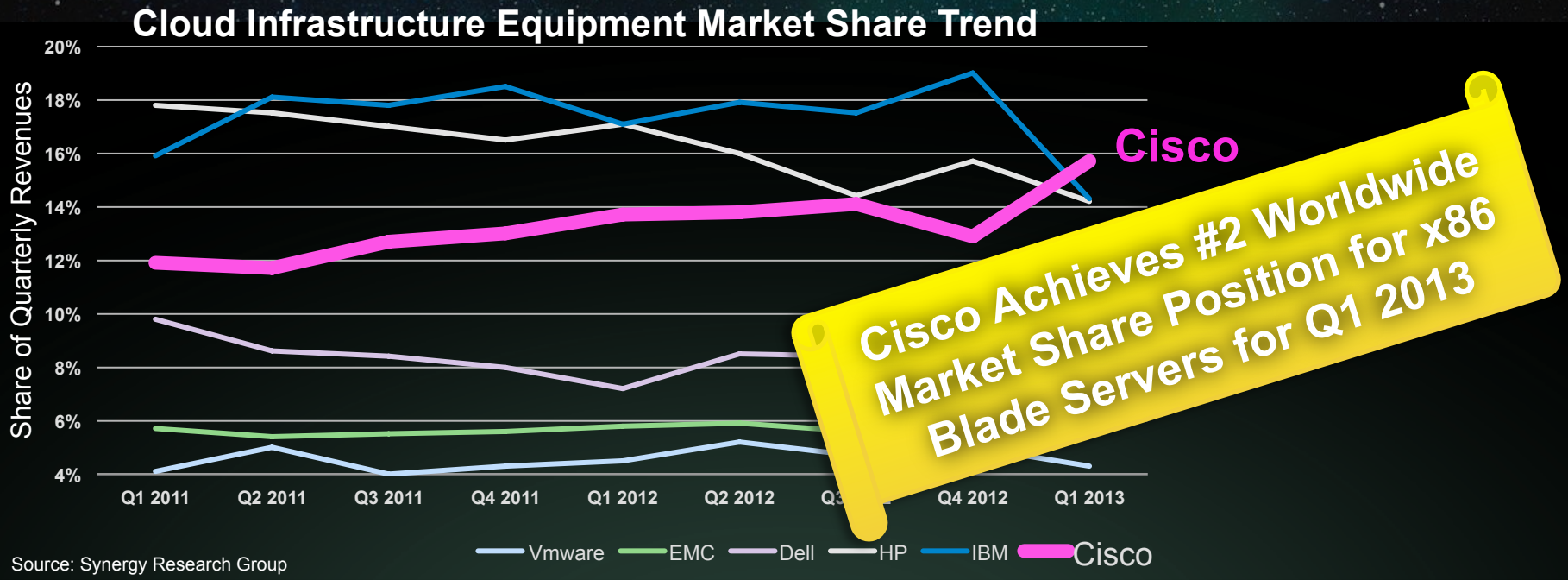
Custom Forwarding

Using unique parameters such as low latency to program specific forwarding rules across the network

Tie network behavior to business rules

All Controller Apps are in Customer PoC

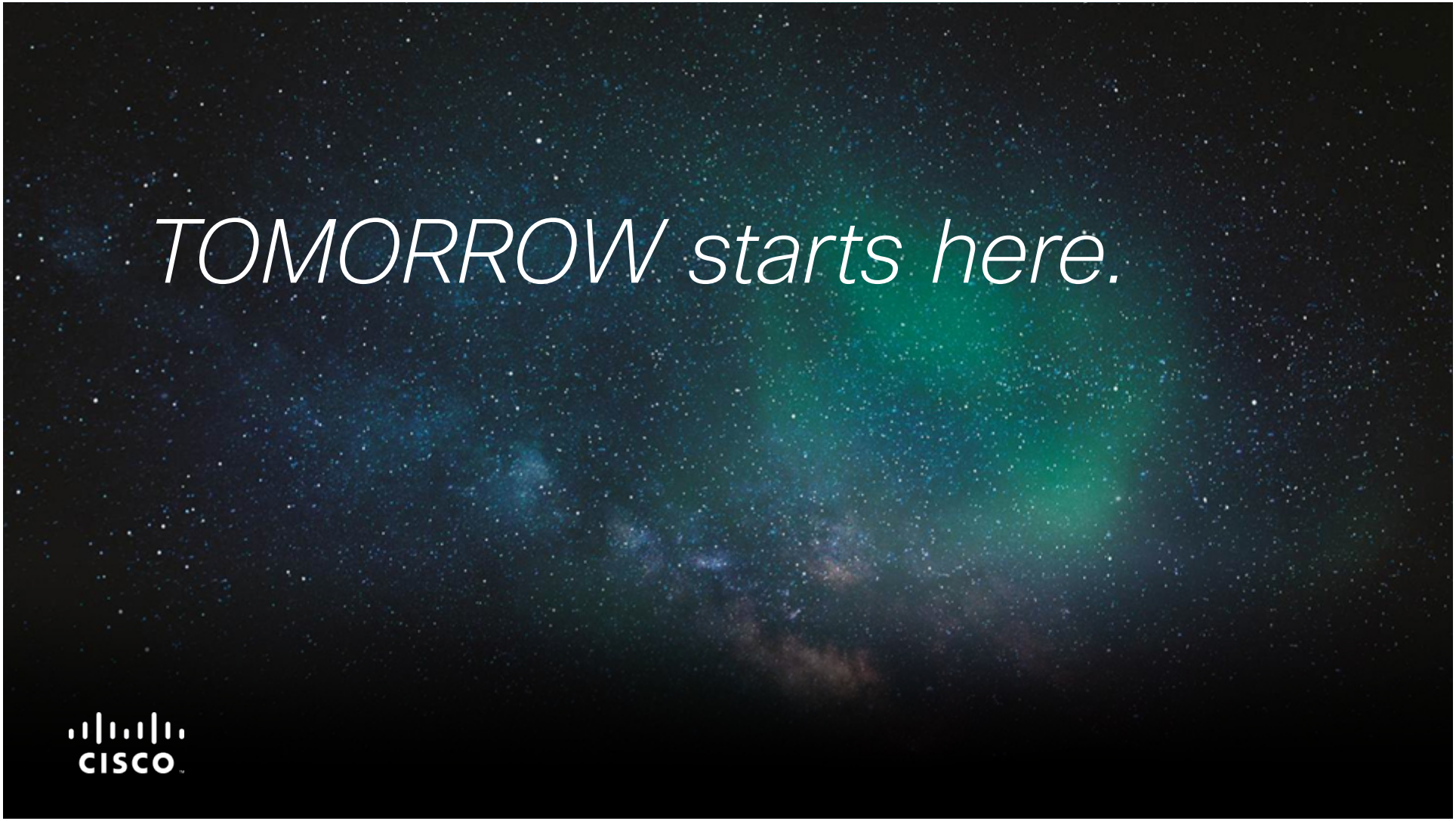
What the Analysts are Saying



Source: Synergy Research Group

Synergy **Press Release**:
"Cisco Grabs IBM Lead in Cloud Infrastructure Equipment"
June 10, 2013

"Cisco Overtakes IBM as Top Cloud Hardware Provider, Research Firm Says"


TOMORROW starts here.
cisco