

Designing Scalable Large Data Center for Workload Mobility using Cisco FabricPath

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Evolving Applications Impact Data Center and Beyond

Emerging Challenges



Sophisticated
Virtualization



Application
Complexity



Cloud Computing
and XaaS



Impact



Network/ Storage

- Higher I/O requirements
- Greater east-west bandwidth
- Rapid provisioning/ re-provisioning



Physical Infrastructure

- 10G ready wiring
- Server/cabling density



Application Performance/ Security

- WAN optimization
- Application Acceleration
- Security

Cisco Data Center

Architectural Pillars

Unified Fabric

Ethernet Network
Storage Network
L4-L7 Services
Network Virtualization

Unified Compute System

Compute
Network
Storage Access
Server Virtualization

Architectural
Flexibility

Systems
Approach

Investment
Protection

Lower
TCO

Cisco Unified Fabric Evolution

Continued Architectural Innovation

2010

SIMPLE

FabricPath

Architectural flexibility and scale

New!

OTV

Workload mobility

FEX-link

Simplified Management

VN-Link

VM-aware networking

AGILE

DCB/FCoE

Consolidated I/O

EFFICIENT

vPC

Active-Active uplinks

2008

Introducing Cisco FabricPath

An NX-OS Innovation Enhancing L2 with L3

Layer 2 strengths



- Simple configuration
- Flexible provisioning
- Low Cost



Layer 3 strengths

- All links active
- Fast Convergence
- Highly Scalable



"The FabricPath capability within Cisco's NX-OS offers dramatic increases in network scalability and resiliency for our service delivery data center. FabricPath extends the benefits of the Nexus 7000 in our network, allowing us to leverage a common platform, simplify operations, and reduce operational costs."

Mr. Klaus Schmid, Head of DC Network & Operating,
T-Systems International GmbH



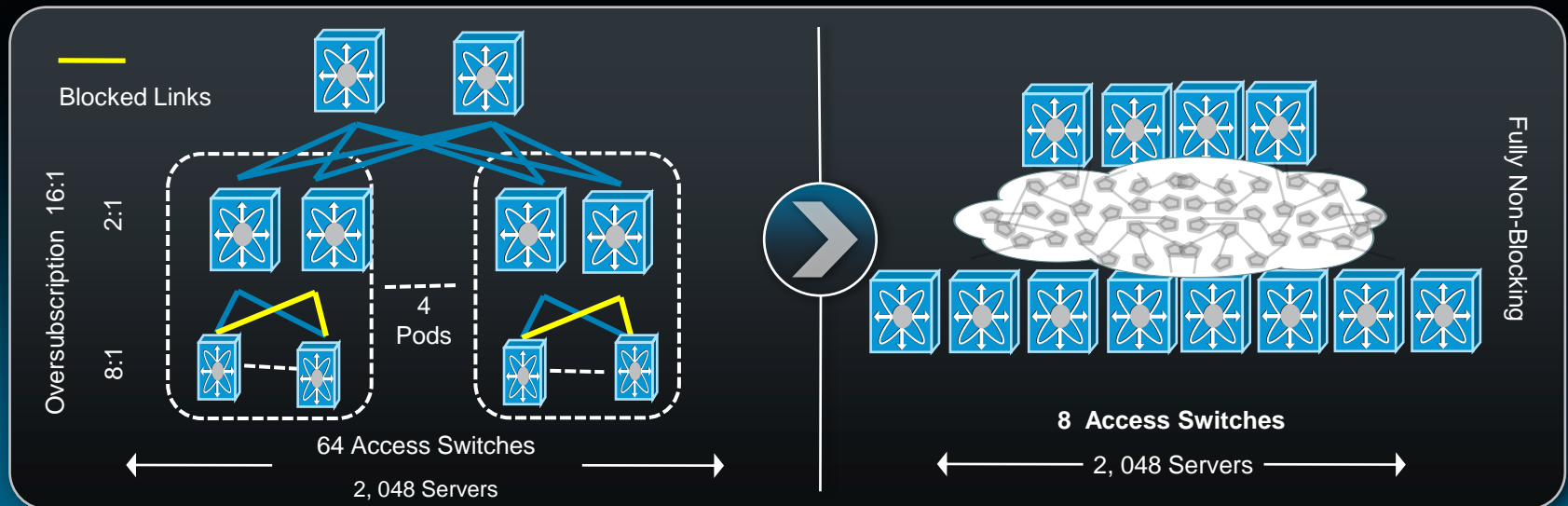
#1: Scaling Bandwidth with FabricPath

Example: 2,048 X 10GE Server Design

- 16X improvement in bandwidth performance
- From 74 managed devices to 12 devices
 - Lower power, lower latency
- 2X+ increase in network availability
- Simplified IT operations and workload flexibility

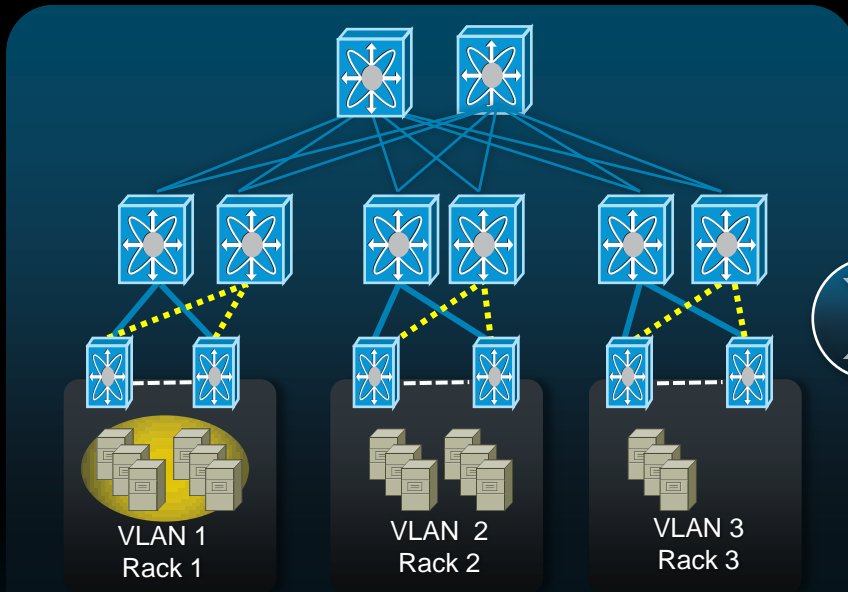
Traditional Spanning Tree Based Network

FabricPath Based Network

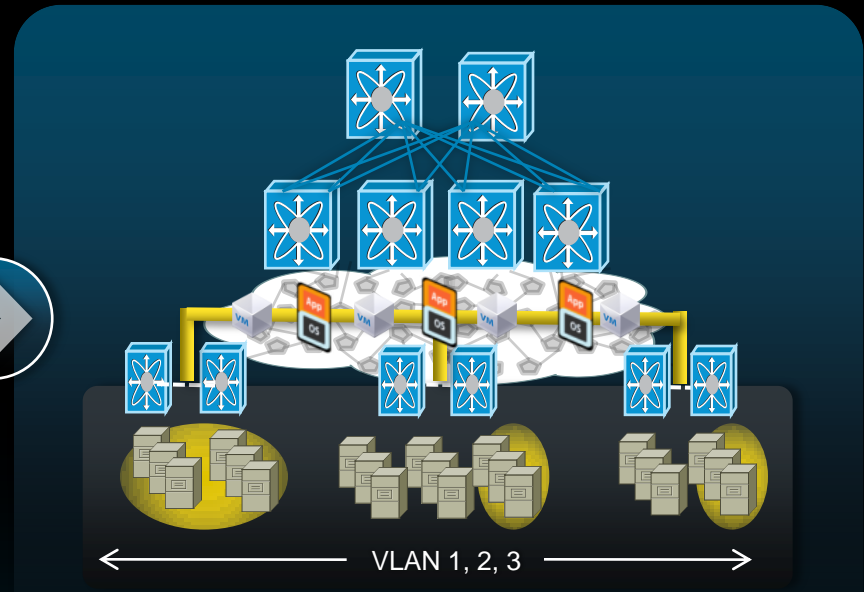


#2: Handling Application Growth

Scenario: Application grows beyond currently compute capacity and allocated rack space causing network disruptions and physical changes



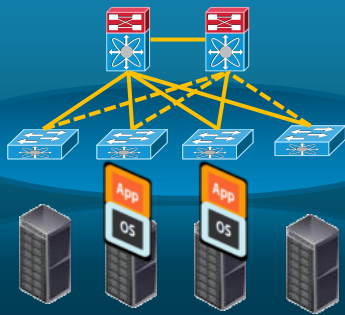
- Adding additional server capacity while maintaining layer 2 adjacencies in same VLAN
- Disruptive - Requires physical move to free adjacent rack space



- VLAN Extensibility – any VLAN any where!
- Location independence for workloads
- Consistent, predictable bandwidth and latency with FabricPath.

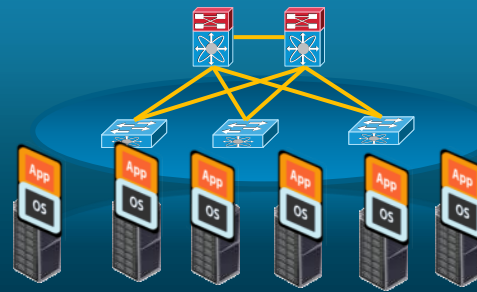
Architecture Flexibility Through NX-OS

Spanning-Tree



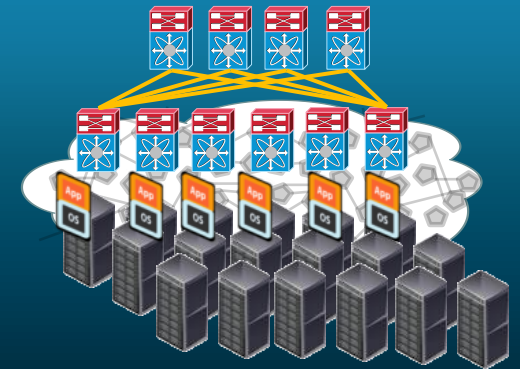
Single

vPC



Dual

FabricPath



16 Way

Active Paths

Up to 10 Tbps

Up to 20 Tbps

Up to 160 Tbps

POD Bandwidth

Layer 2 Scalability

Infrastructure Virtualization and Capacity

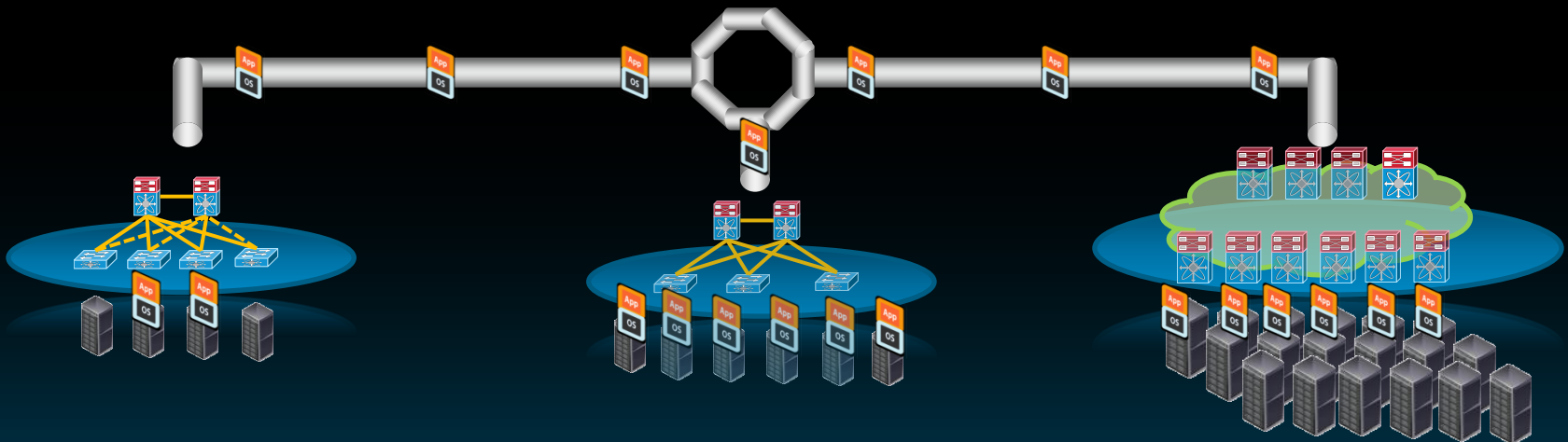
Architecture Flexibility with NX-OS Innovations

Common Infrastructure for flexible deployment models

Complimentary Innovations:

- *OTV : Extending Layer 2 over Layer 3 for Workload Mobility*
- *FabricPath: Building Scalable Fabrics for Clustered Applications*

Data Center Interconnect Extension Overlay Transport Virtualization



Classical Pod
Spanning Tree Protocol

Scalable Pod
vPC & FEXLink

Highly Scalable Pod
FabricPath



CISCO