Gestión de Application Fluent Networks

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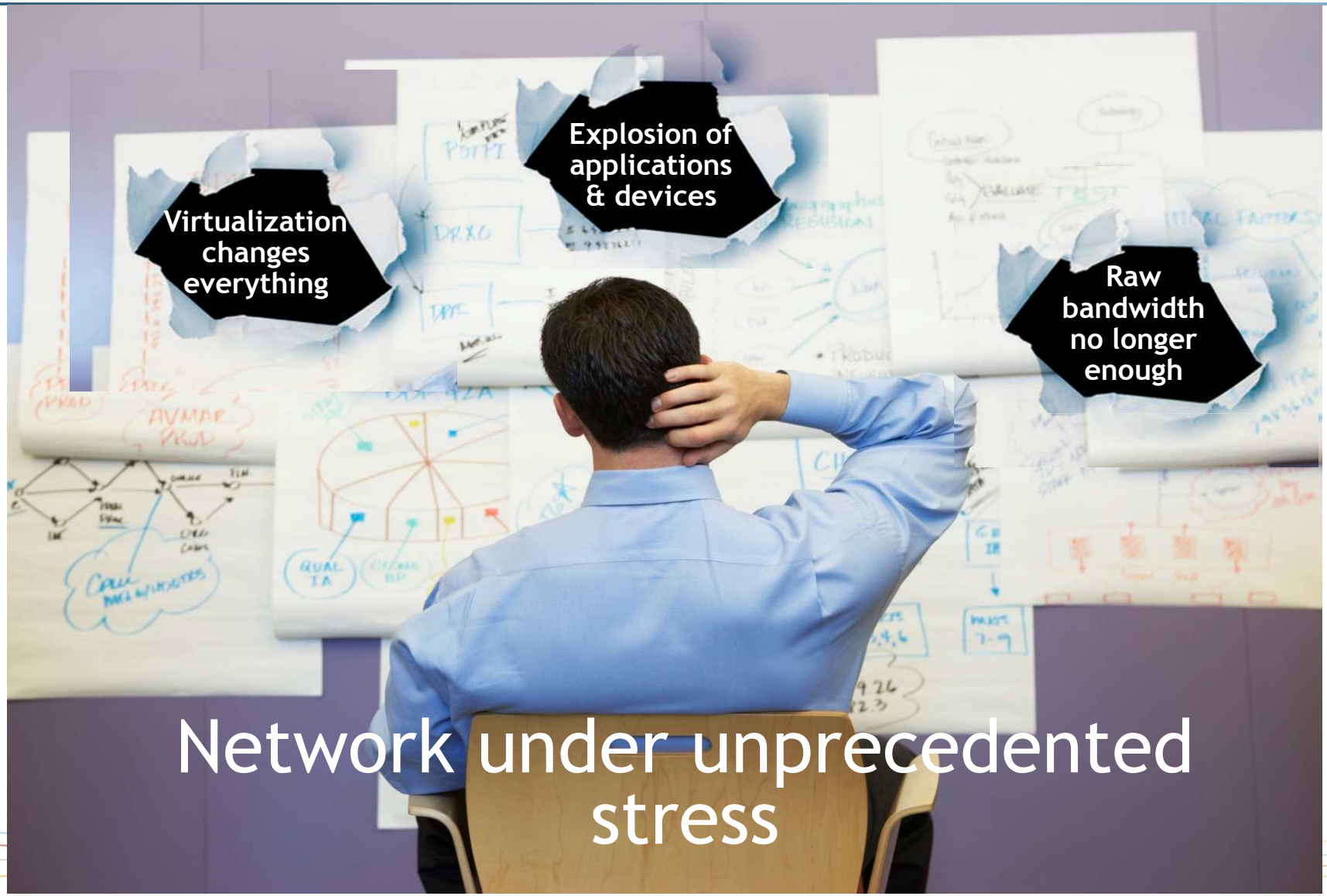
Noviembre 2010

Agenda

1. The Application Fluent Network
2. The DataCenter Challenge
3. DataCenter Topology Management
4. The Next Step

1 The Application Fluent Network

Challenges



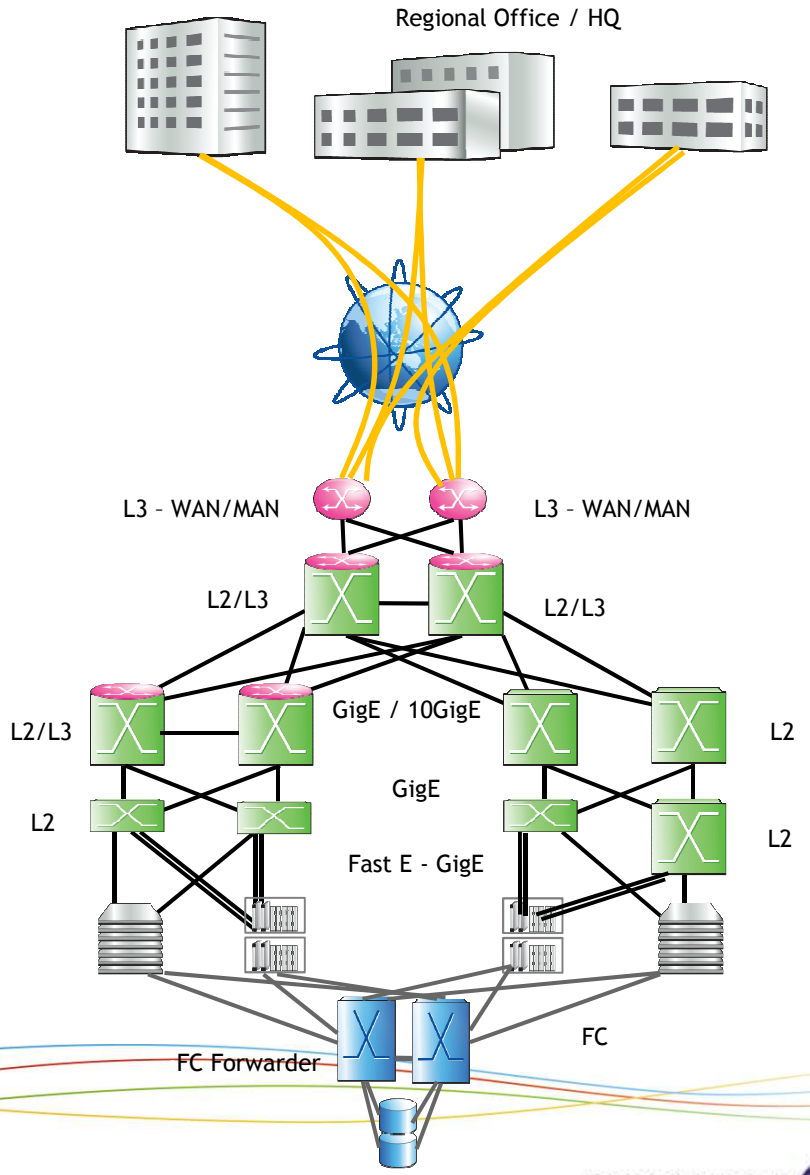
DataCenter Consolidation – Drivers and Impact on Network Infrastructure

Consolidation Drives Costs Down

- High speed WAN/MAN links affordable
- Centralized operation team

Stress on the Infrastructure

- Efficiency of Servers and Storage – Drives Virtualization
- Power Consumption
- Raw Bandwidth
- Scalability of topology and control protocols
- Manageability of large scale network



Alcatel-Lucent's Application Fluent Network

Resilient Architecture

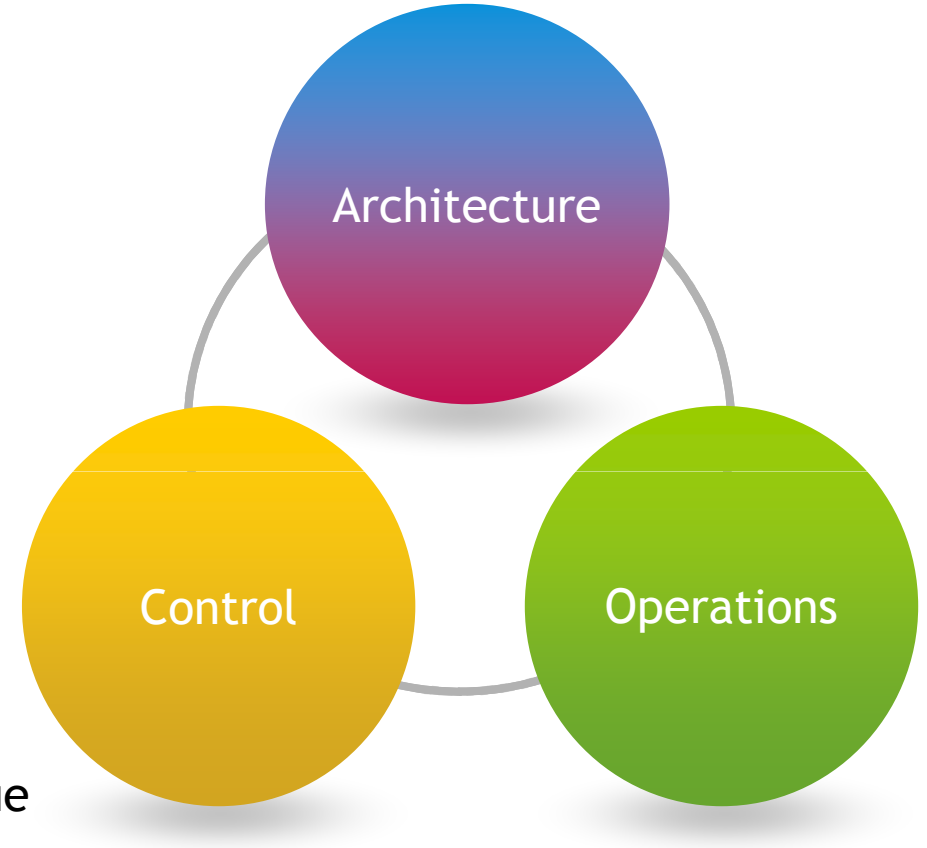
- A simplified, optimized and resilient network with market-class leading capacity and built-in security

Automatic Control

- Provides unique dynamic tuning of network performance to ensure high quality real-time application delivery

Streamlined Operations

- Reduced complexity through unique automation, consistency of features, and integrated troubleshooting tools



Resilient Architecture

Simplified Network with Reduced Layers

- A single flat network for voice, video, data and storage

Virtualization

- Virtualization of switch fabric and network links delivers optimization

Transparent Resiliency

- Recovery from link and switch failure without impact to application traffic

Embedded Security & QoS

- Built-in network QoS, access control, intrusion detection and prevention

Key features
▪ Port Density ▪ Wire Rate Non-blocking
▪ Chassis and Link Virtualization
▪ Recovery Time < 50ms ▪ ERP, mc-lag, DHL, MPLS
▪ Endpoint and user profiling ▪ ACL & QoS control

Automated Control

Profile Directed

- Knowledge base of user, endpoint, application and security requirements for quality application delivery

Auto-sensing

- Ability to recognize users, endpoints and applications independent of location and apply correct profile

Policy Driven Performance

- Built-in intelligence to dynamically interpret network status events and tune network performance based upon user, endpoint, application and location

Key features

- Network Profile
- Fine Grained QoS
- VLAN and ACLs

- User Recognition
- Device Recognition
- AutoQoS (Voice, Mgmt)

- Policy Engine
- Authentication
- Flow based QoS

2 The DataCenter Challenge

The Stress of the Application Fluent Network

DataCenter Virtualization – Drivers and Impact on Network Infrastructure

Server Virtualization – Efficiency

- Increased server exploitation(10-20% to 40-60%)

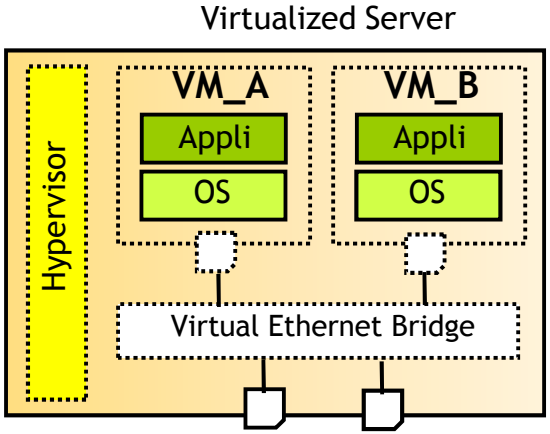
Network Infrastructure must manage

- VM moves – dynamically create network services on the fly
- East-West communication, requires L2 connectivity
- VM in redundancy mode – need low latency
- Hypervisor introduces virtual switch – visibility, management and troubleshooting challenges

Xen CITRIX

Microsoft Hyper-V Server 2008 R2

vmware



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Data Center LAN standardization efforts

IEEE 40 and 100 Gigabit Ethernet	Standard
Edge Virtual Bridging (incl. former VEPA)	In work
Transparent Interconnection of Lots of Links (TRILL)	In work
Shortest Path Bridging (SPB)	In work
Data Center Bridging (PFC, QCN, ETS, DCBX)	In work
Internet Small Computer System Interface (iSCSI)	Standard
Fiber Channel over Ethernet (FCoE)	
FC-BB-5	Standard
FC-BB-6	In work

3 DataCenter Topology Management

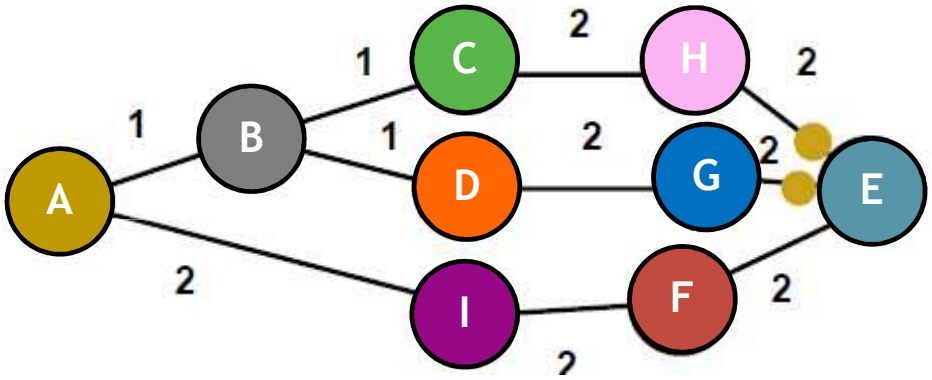
Transparent Interconnection of Lots of Links (TRILL)

In work

IEEE Shortest Path Bridging (SPB)

In work

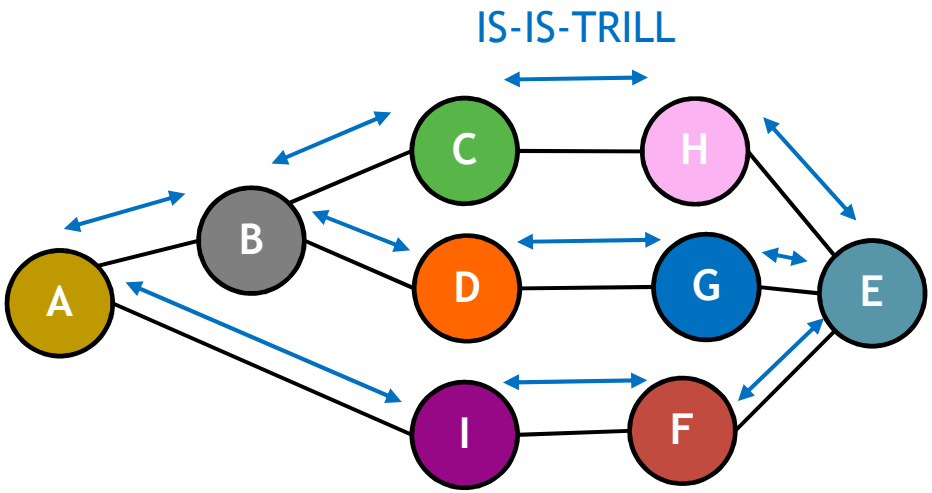
Legacy Spanning Tree Protocol (STP) >> Sub-optimal forwarding



- Traffic from A to E is forwarded optimally
- Traffic from E to G is not
- Becomes a problem as traffic patterns become more meshed (E-W/N-S)

Transparent Interconnection of Lots of Links (TRILL)
Draft-ietf-trill-rbridge-protocol-16

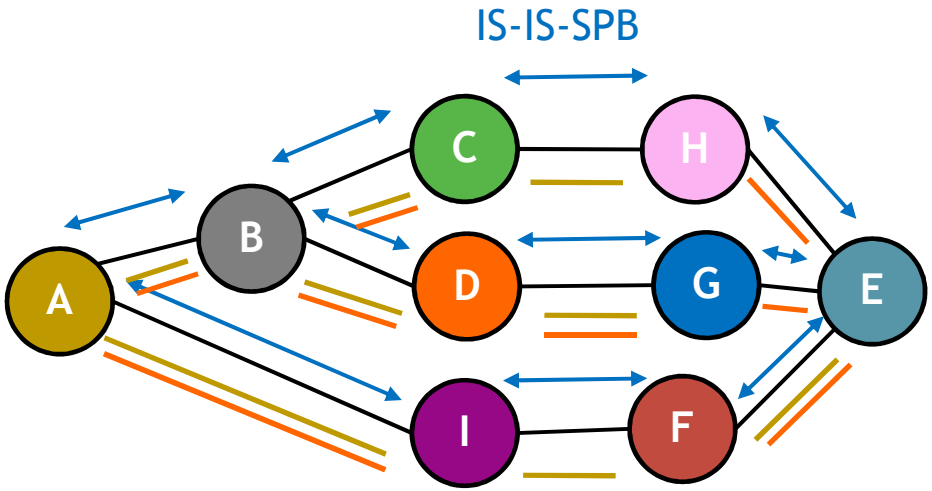
In work



- Nodes are called “RBridges”
- Network topology discovered and distributed using IS-IS
  - Shortest Path calculation
- Dynamic learning possible (bcast for unknown DA) or ESADI messages
- TRILL specific header required
- Basic inter-op with legacy STP domains

Shortest Path Bridging (SPB) 802.1aq

In work



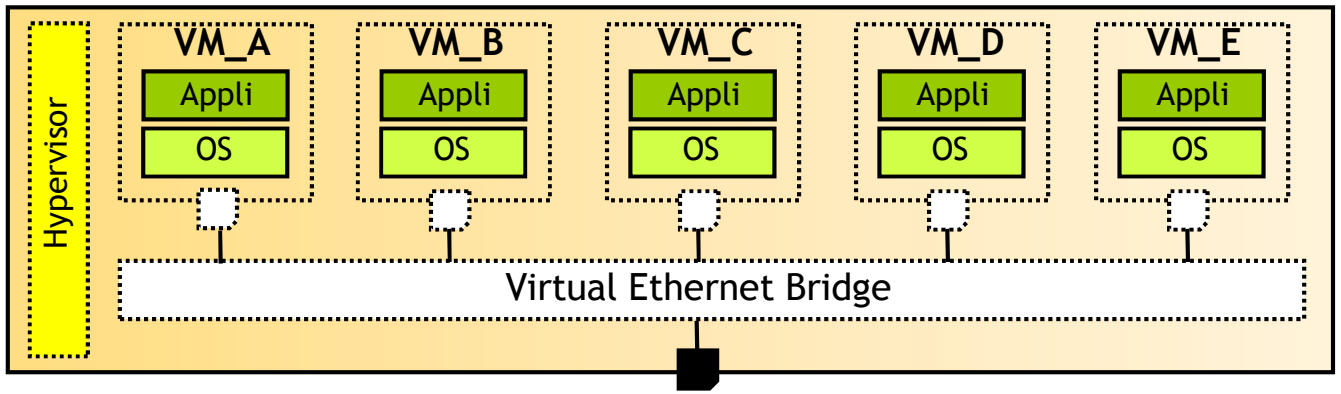
- Network topology discovered and distributed via IS-IS
  - Per-node Spanning Tree is determined >> optimal path forwarding
- Learning can be performed dynamically
- Two SPB operation modes
  - SPB-V: regular Ethernet header >> 100 nodes domain
  - SPB-M: PBB header >> 1000 nodes in domain
- Full inter-op with legacy STP domains

3 HiperVisor and Vmove Management

IEEE Edge Virtual Bridging (incl. former VEPA)

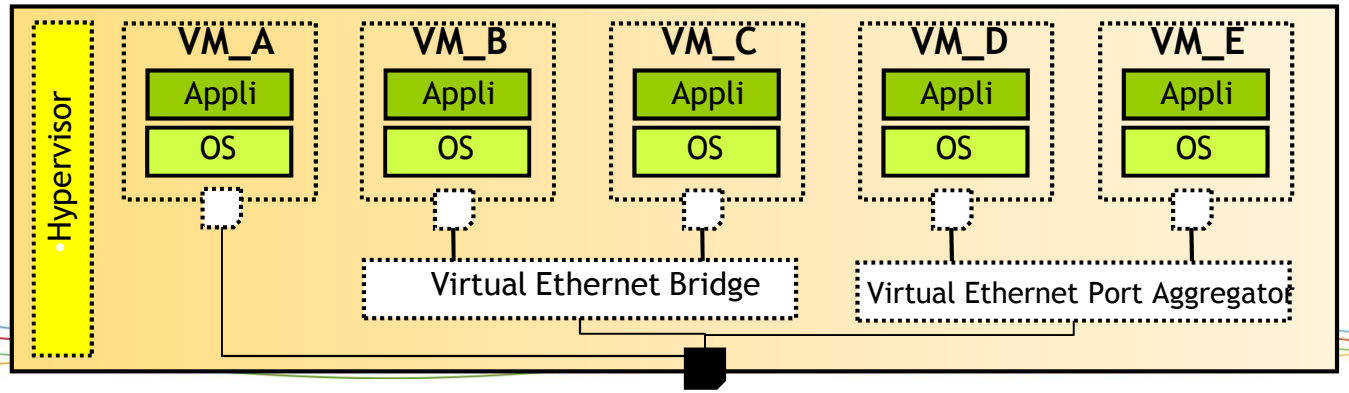
In work

Virtualized Server with Virtual Ethernet Bridge

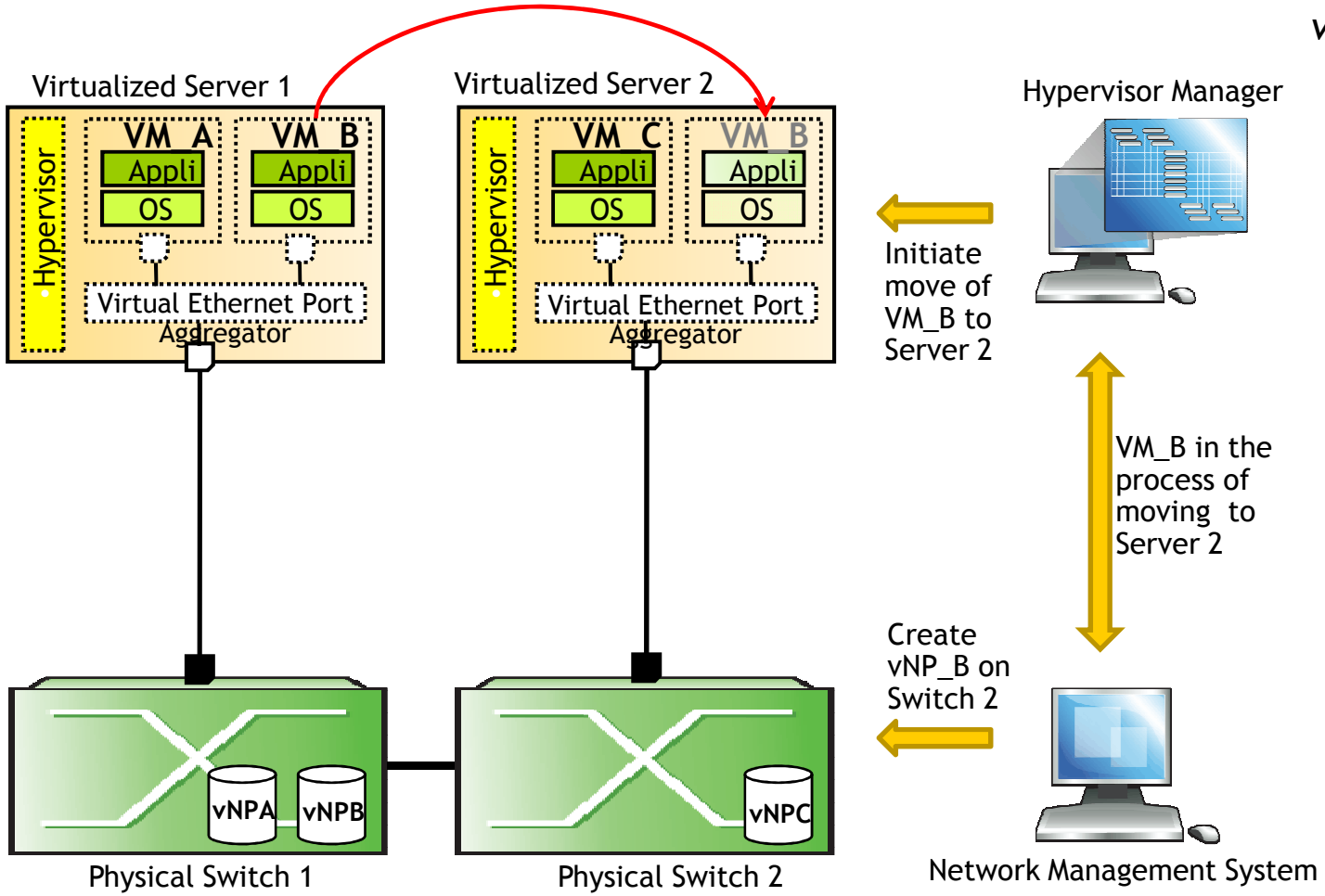


Virtualized Server with combination of Virtual Ethernet Bridge, Virtual Ethernet Port Aggregator, Virtual Station Interface

Per IEEE 802.1Qbg – Edge Virtual Bridge



VM mobility and Virtual Network Profile (vNP)



vNP defines:

- *VLAN membership*
- *QoS rules*
- *ACL*
- *Flow mirroring*
- *Works on Q tagged links*

4 The Next Step

Application Context Networking Management

Application Context Recognition

The Communication Context

- Example, video streams can have differing contexts in a hospital.

The Challenge

- Dynamically detect context
  - Intelligent distributed arichitecture
- Reconfigure network topology based on application context
  - Appropriate control, QoS
    - Dynamic virtualized services
- Management Eco-System
  - Exists in the “CLOUD”
  - Talks to multiple systems
  - Dynamically scaleable management services

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