BROCADE

Aktívna sieťová infraštruktúra pre dátové centrá s optimalizáciou pre Cloud Computing

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Product & Sales Manager
PROFIcomms

Telco Conference 2012
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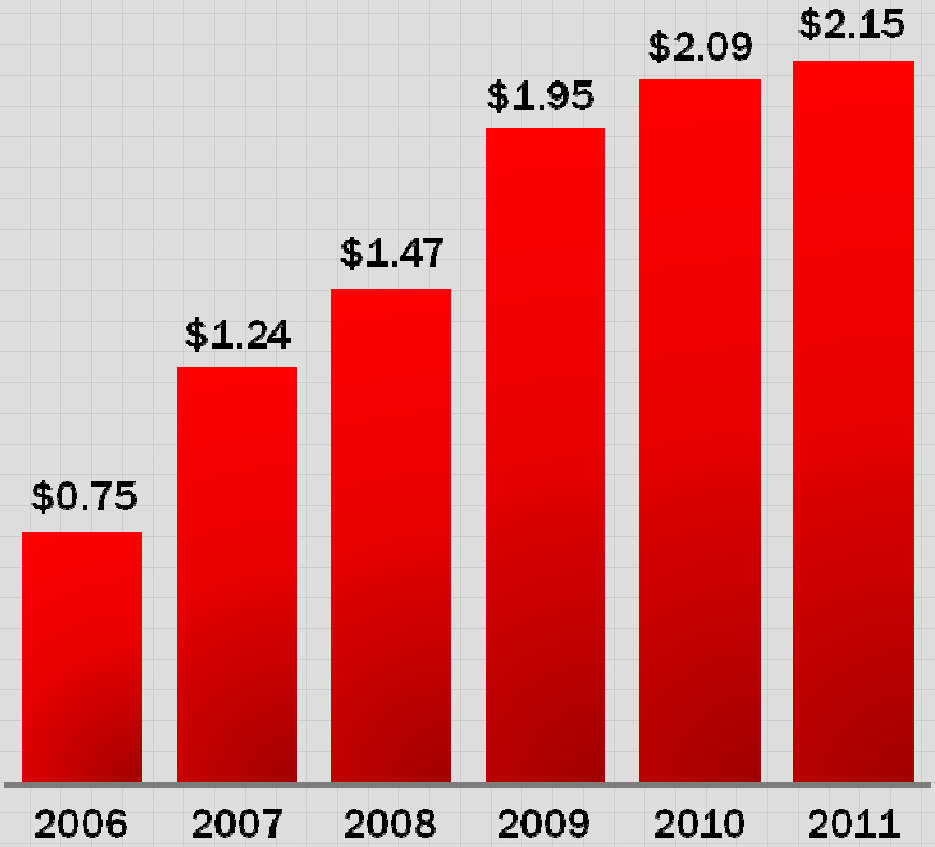
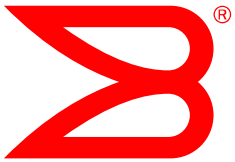
Brocade at a Glance

- Founded in 1995
- 4,500+ employees worldwide
- Headquartered in San Jose, CA
- Operating in more than 160 countries
- $2+ billion in annual revenue





BROCADE

Acquired Foundry 2008

- Data center networking experts
- Storage networking pioneer and leader
- 70% SAN market share

- Price/performance leader in IP networks
- Powering 90% of Internet Exchange Points
- 15,000+ customers worldwide

Brocade Product Portfolio

Campus LAN

Layer 2–3 (Wired + Wireless)


Brocade ICX 6400 / 6610 Series


Brocade Mobility Series


ocade FastIron WS Series


Brocade FCX Series


Brocade FastIron SX Series


Brocade 6910 Ethernet Access Switch


Brocade NetIron CES/CER Series


Brocade NetIron MLXe Series


Brocade VDX Series


Brocade ADX Series

Service Provider

Data Center LAN

Layer 2–3

Chassis


Brocade BigIron RX Series


Brocade MLXe Series


Brocade VDX 8770

VCS Fabric


Brocade VDX 6710


Brocade VDX 6720


Brocade VDX6730

Fixed


Brocade FCX Series


Brocade TurboIron 24X


Brocade ICX 6650 series

Layer 4–7


Brocade ADX 1000

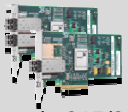

Brocade ADX 4000

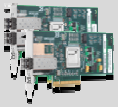

Brocade ADX 10000

Ethernet/IP


Brocade 1860 Fabric Adapter


Brocade 1010/1020 CNA


Brocade 815/825 HBA


Brocade 415/425 HBA

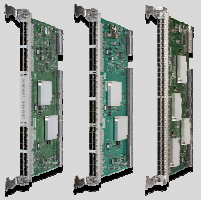
Adapters


Brocade VDX series


Brocade FCOE10–24 Blade

DCB/FCoE/FC


Brocade DCX 8510 Backbones


FC16–32, –48 FC8–64 Switch Blade


FS8–18 Encryption Blade


FX8–24 Extension Blade


Brocade Blade Server Switches


Brocade 6510 (16 Gbps) Switch


Brocade 300 Switch


Brocade 5100 Switch


Brocade 5300 Switch

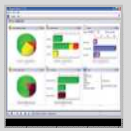

Brocade 7800 Extension Switch


Brocade Encryption Switch

Fibre Channel

Data Center SAN

Brocade Network Advisor Unified Management (SAN, LAN, Wireless)

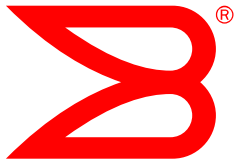


Plug-ins and Integration

World-class Solution Ecosystem

- Enterprise networks require an ecosystem
- 10+ year relationships
- Over $1B in cooperative development and testing
- Open standards and partnerships mean choice

VMware Authorized Consulting Partner since 2005



BROCADE

Europeen References

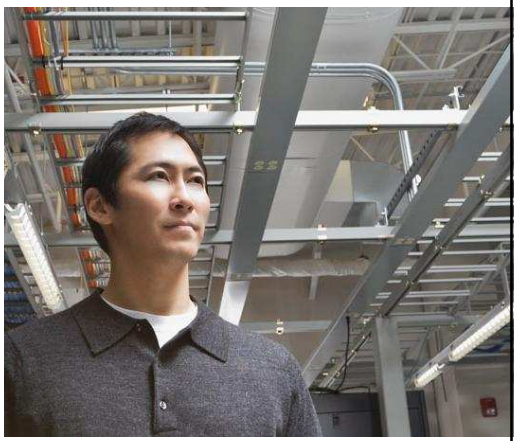
- Motorola Data Centers
- All IX's – LINX, AMSIX, DCIX
- Volkswagen Data Center
- CERN
- Hurricane Electric (US) (first IP v6 network)
- KIT Digital in Prague
- City of Milano (> 100 x MLX)

Why Brocade

- Reasonable alternative to Cisco or Juniper
- Complete products portfolio for DC, ISP, Enterprises
- Investment protection (strong R&D, 24 hours TAC support, clear rules and procedures), competitive pricing
- **Major differentiator are:**

- very high ports density
- wire speed (no oversubscription)
- open standards compliant
- unified software platform
- compact size
- low power consumption/low heating emission

- Leader in ADC market for telco and hosting
- Leader in Data Center (cloud computing)



PROFICOMMS
value added distributor

- Value Added Distributor established in 1993
- Private company
- Headquarter in Brno, office in Prague

- **Applications:**
  LAN / MAN / WAN / SAN and CCTV / security

- **Product Areas:**
  CPE – Edge/Access – Aggregation/ Transport – Core / Carrier, Security (UTM), Mobility

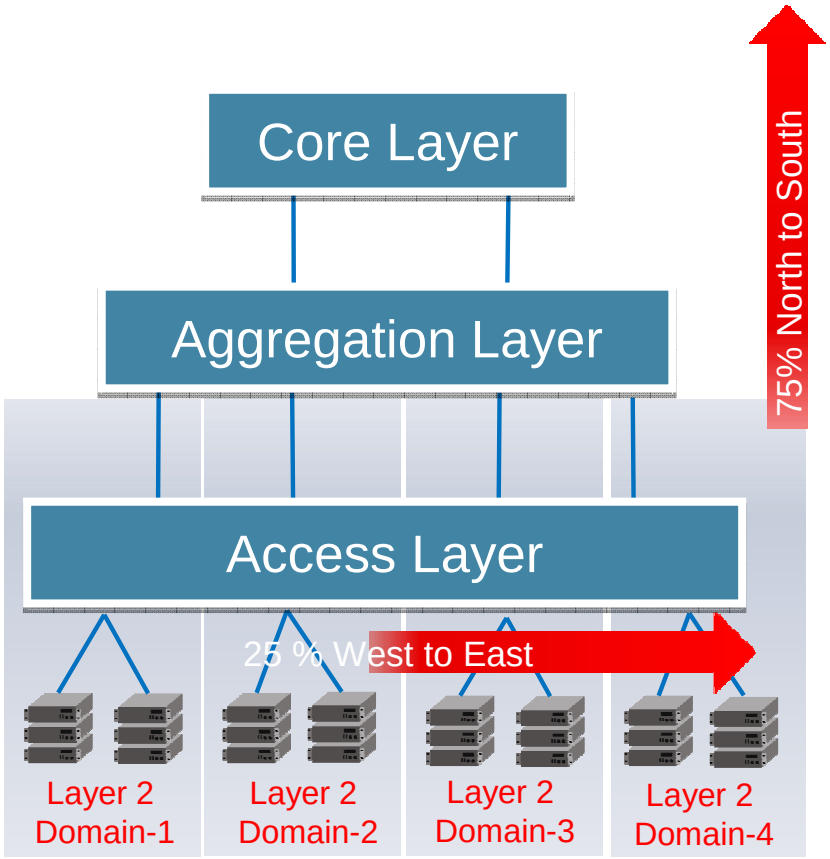
- **Technologies:**
  Ethernet / PDH / SDH / PON, SAN and CCTV

PROFICOMMS
value added distributor

- Authorized Brocade Distributor for CZ / SK
- Sales Certified Engineers
- Technical Support:
  - 2 engineers with BCNE certificates
  - 2 engineers with BCNP + BCLE certificates
  - Service Delivery Partner
  - Training Centre
- Support to Select / Premier / Elite partners:
  - Project Support
  - Sales Support
  - Marketing Support
  - Trainings and Certifications

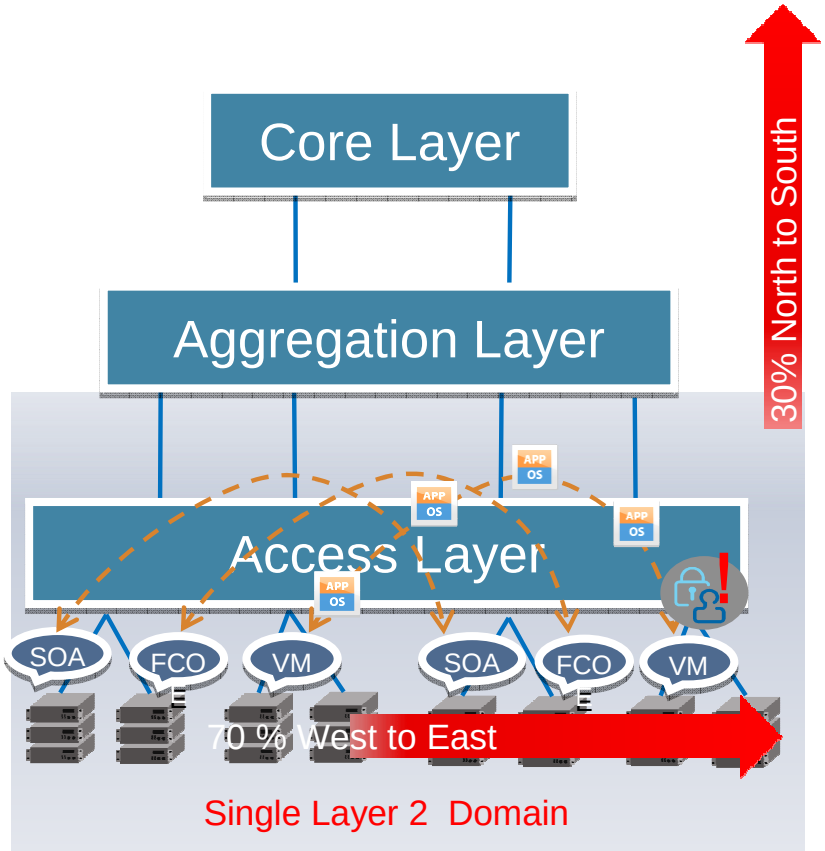
The Data Center is Changing

Classis Data Centre



- Generation One Data Centre
  - Designed for North to South Traffic
  - Client to Server traffic model
  - Designed for transport, not the application
- Generic Enterprise Solution
  - Enterprise technologies -stacking
  - Enterprise topologies- STP, MSTP
  - Enterprise limitations – STP, stacking
  - Minimize Layer 2 fault domains
  - Increased Management footprint
  - Multi-layered, multi-protocol architectures for scalability

The Next Generation Data Centre

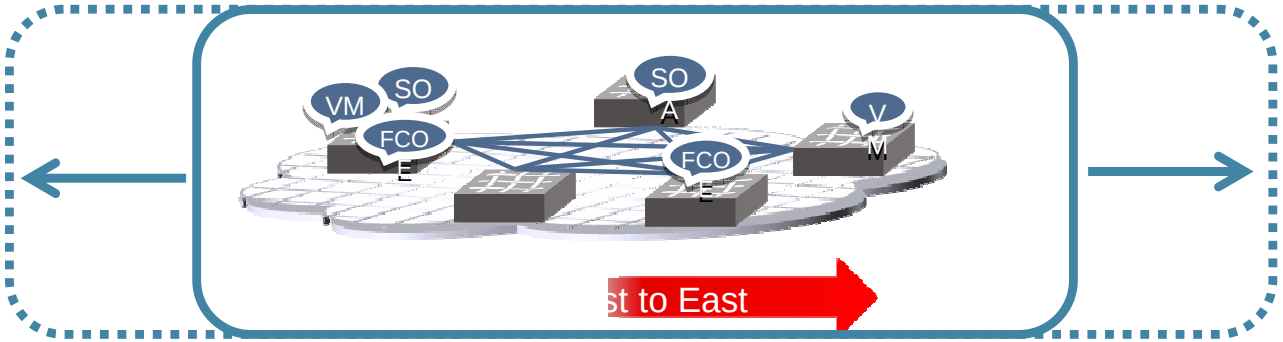


- Increased West to East traffic
  - Next Generation Apps (SOA, SAS. Web 2.0)
  - Server Virtualisation (VM)– Server to Server
  - Convergence (FCOE) – Server to Storage
- Drive for applications awareness
  - Applications the business enabler
  - DC designed around the application
  - Network needs to be aware of the apps
- The New DC needs to be flat
  - Single scalable Layer 2 Domain

Solution: Ethernet Fabric

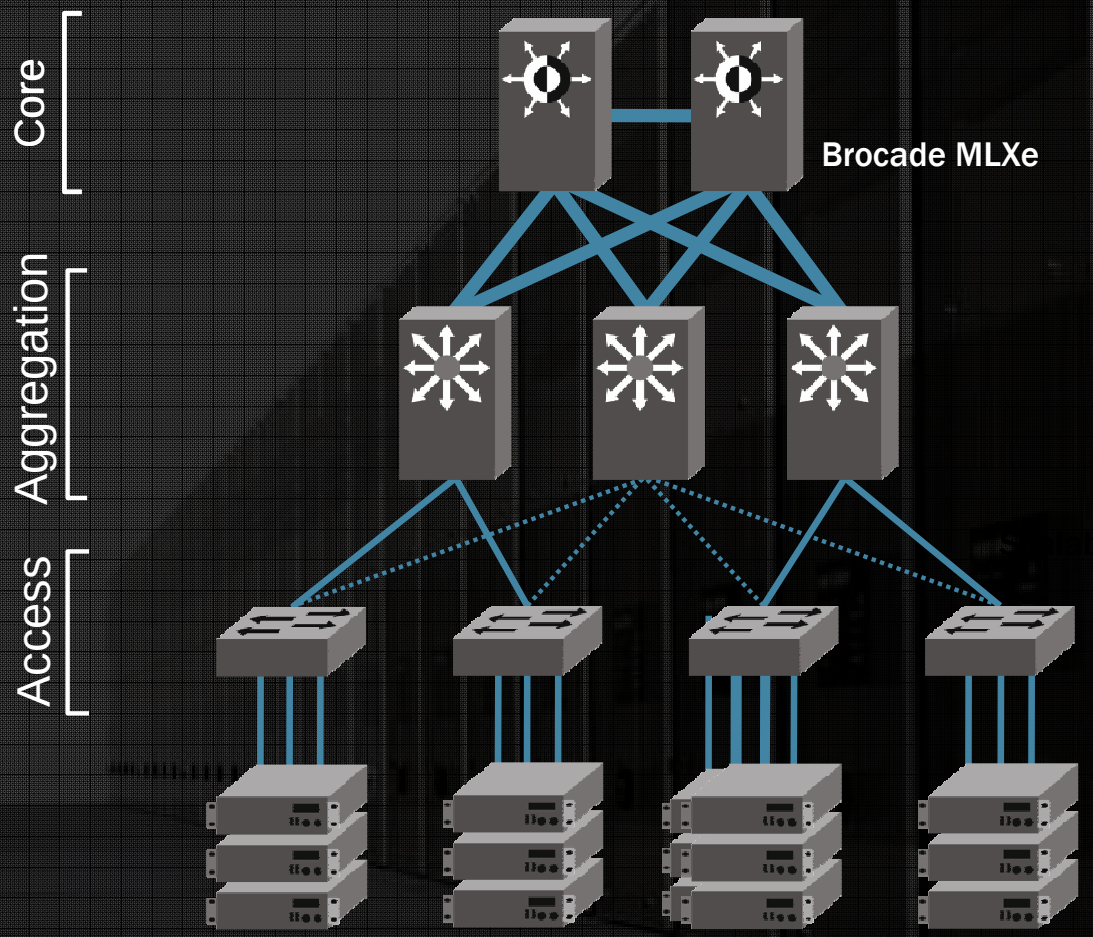
The Next Generation Data Centre is a **Fabric** Architecture

- Fabric is a single logically flat Layer 2 network
- Wire-once, plug-in-play management
- End to end application awareness within the fabric
- Active-active, non-stop forwarding, zero downtime
- Delivering optimal any-to-any forwarding across the fabric

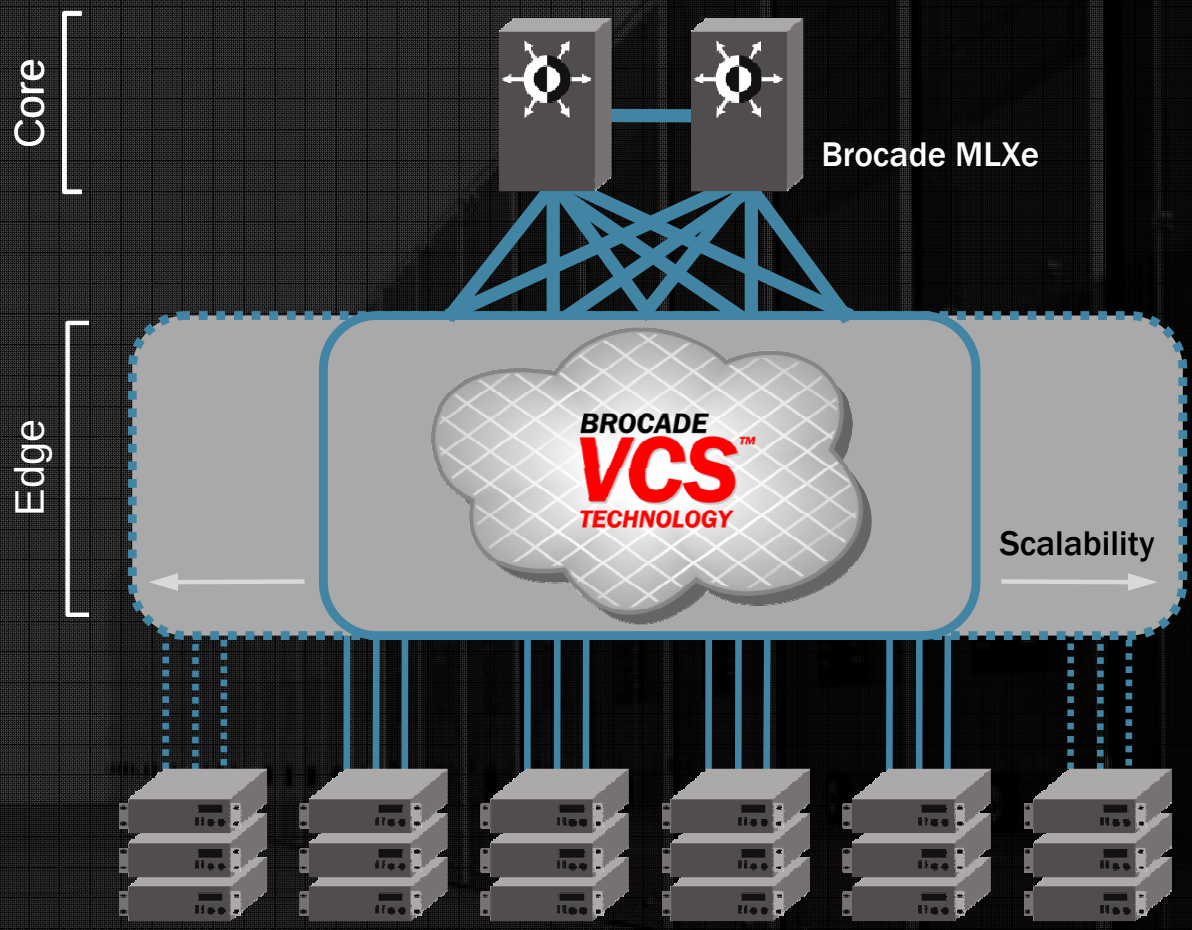


The Fabric architecture purpose built for the challenges of East-to-West traffic

CLASSIC HIERARCHICAL ETHERNET ARCHITECTURE



BROCADE ETHERNET FABRIC ARCHITECTURE



Brocade VDX product family

The Flexible Choice for the Evolving Data Center

VDX 6710

VDX 6710-54

- 48x 1GbE RJ45
- 6x SFP+ (1GbE/10GbE)

VDX 6720

VDX 6720-24
VDX 6720-60

- 16 / 24/ 40 / 50 / 60x SFP+ (1GbE/10GbE)

VDX 6730

VDX 6730-32
VDX 6730-76

- 16 / 24/ 40 / 50 / 60x SFP+ (1GbE/10GbE)
- 8 / 16 x 2/4/8 Gb FC

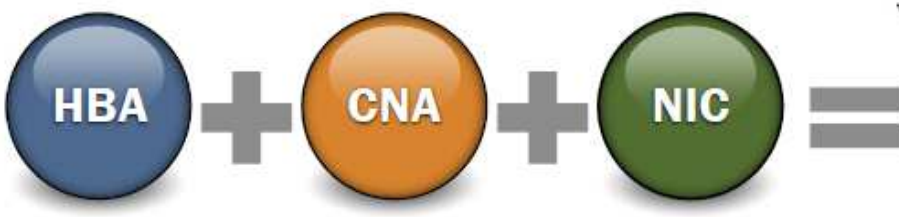
VDX 8770

VDX 8770-4
VDX 8770-8

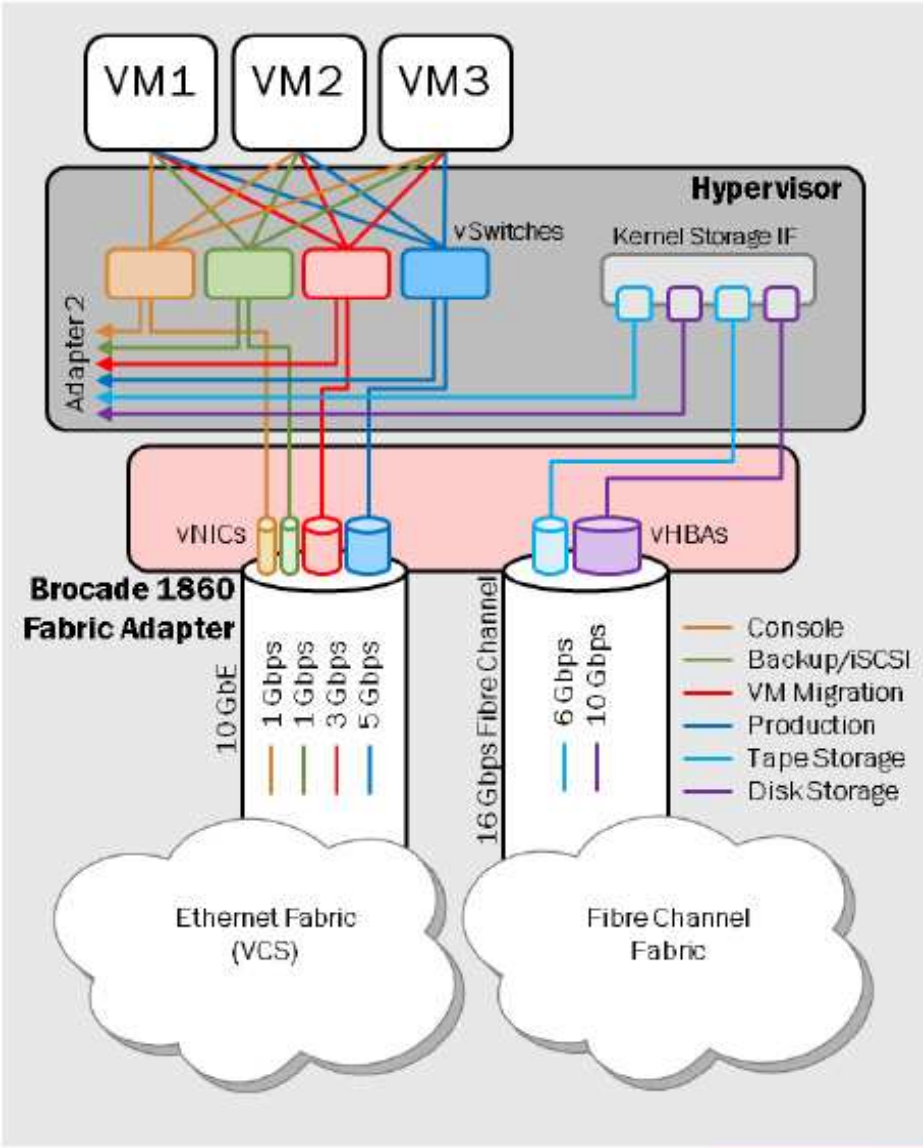
Modules:
- 48x 1GbE SFP
- 48x 10GbE SFP+
- 12x 40GbE QSFP+

- Non-blocking, cut-through architecture, wire-speed
- Ultra-low latency for unmatched performance (600 ns port-to-port latency; 1.8 us across port groups)
- Superior size and power efficiency critical for today's data center
- Flexible storage connectivity for FCoE, iSCSI, and NAS

Brocade 1860 - Fabric Adapter

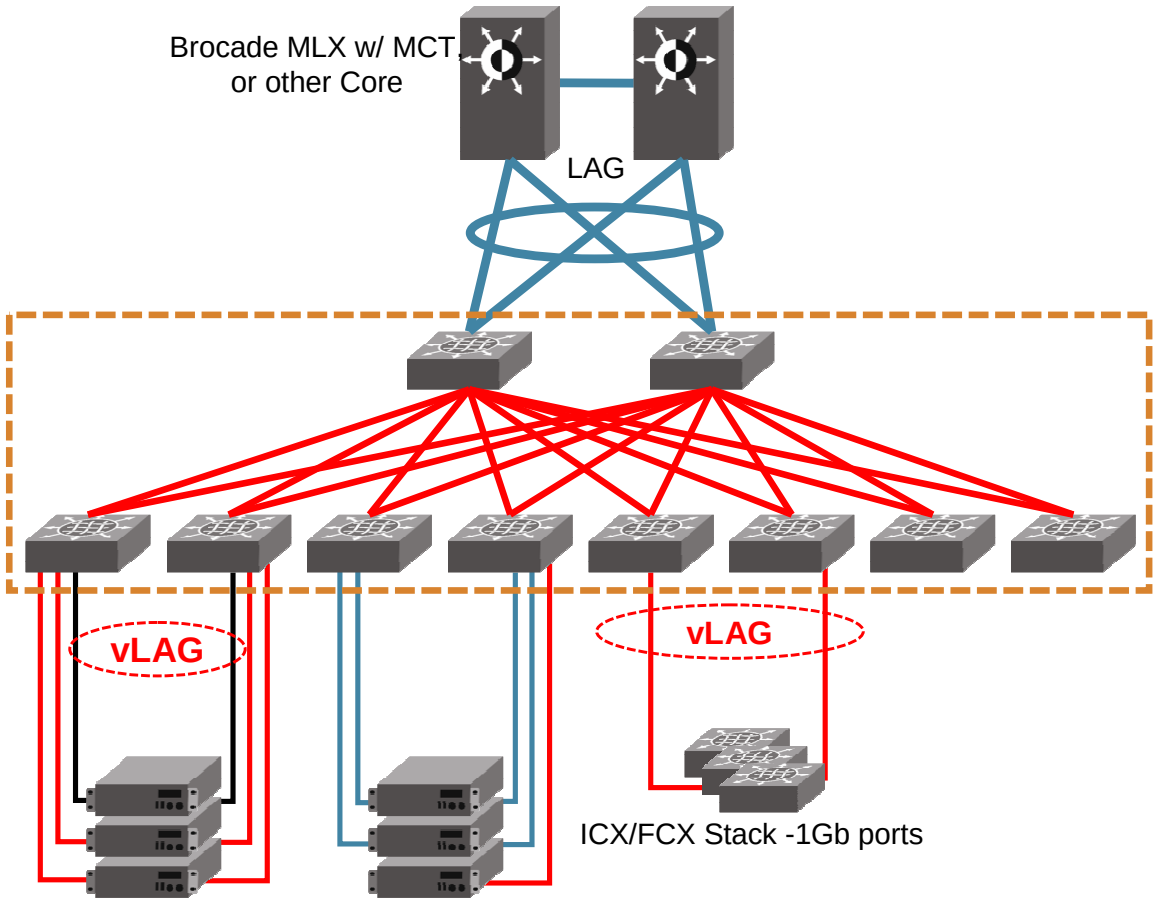


AnyIO technology:
- 16/8/4/2 Gb Fiber Channel
- 10GbE DCB, FCoE, TCP/IP, iSCSI
- virtualizace: 4x vNIC / vHBA per port



Brocade VCS examle design

1/10 Gbps Access; Collapsed Network – Topology – Clos Fabric



1 GbE
10 GbE DCB
10 GbE
Logical Chassis

Access/Aggregation fabric

Self aggregating, flattens the network

Clos Fabric topology for flexible subscription ratios

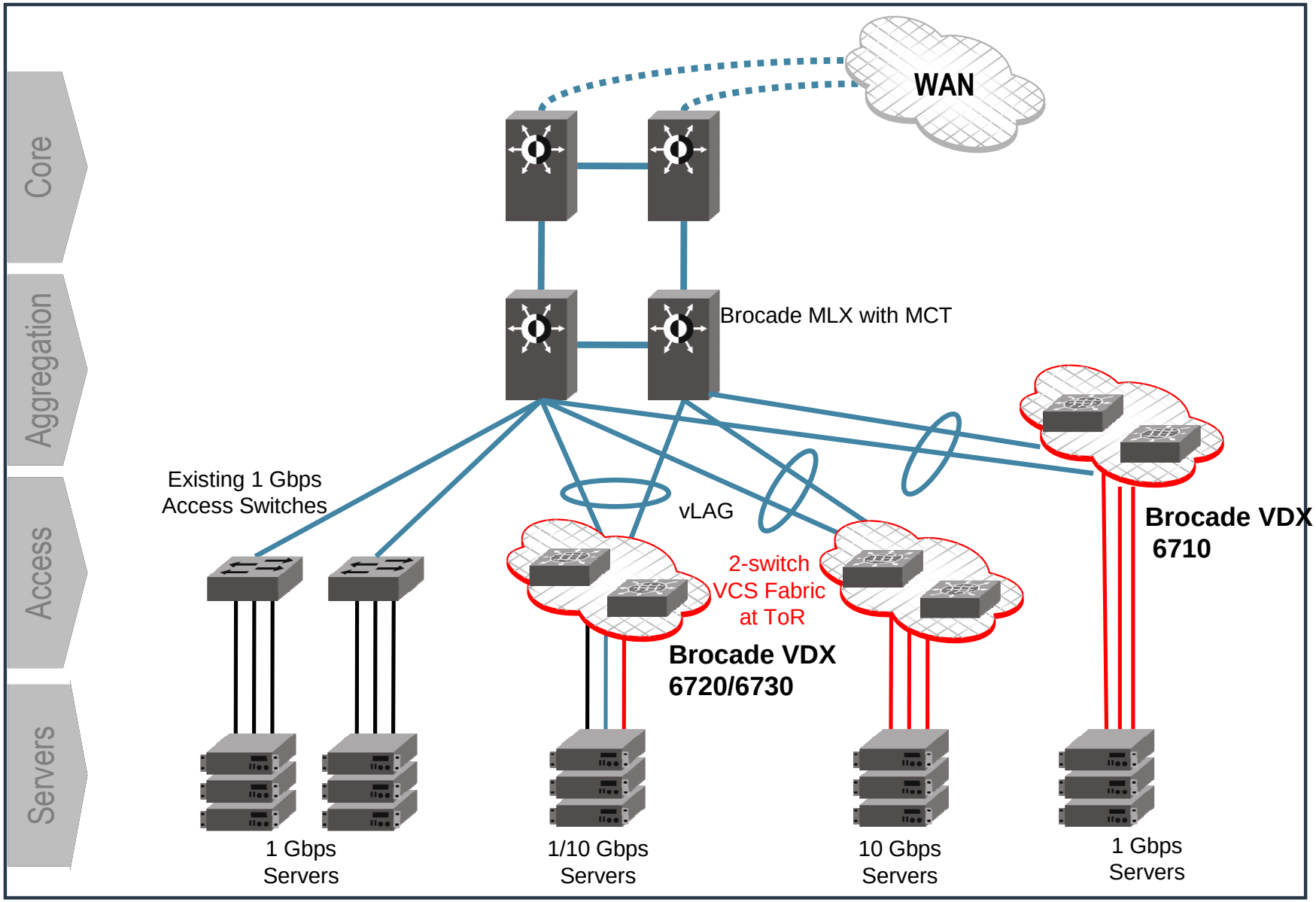
Drastic reduction in management

Each VCS managed as a single logical chassis

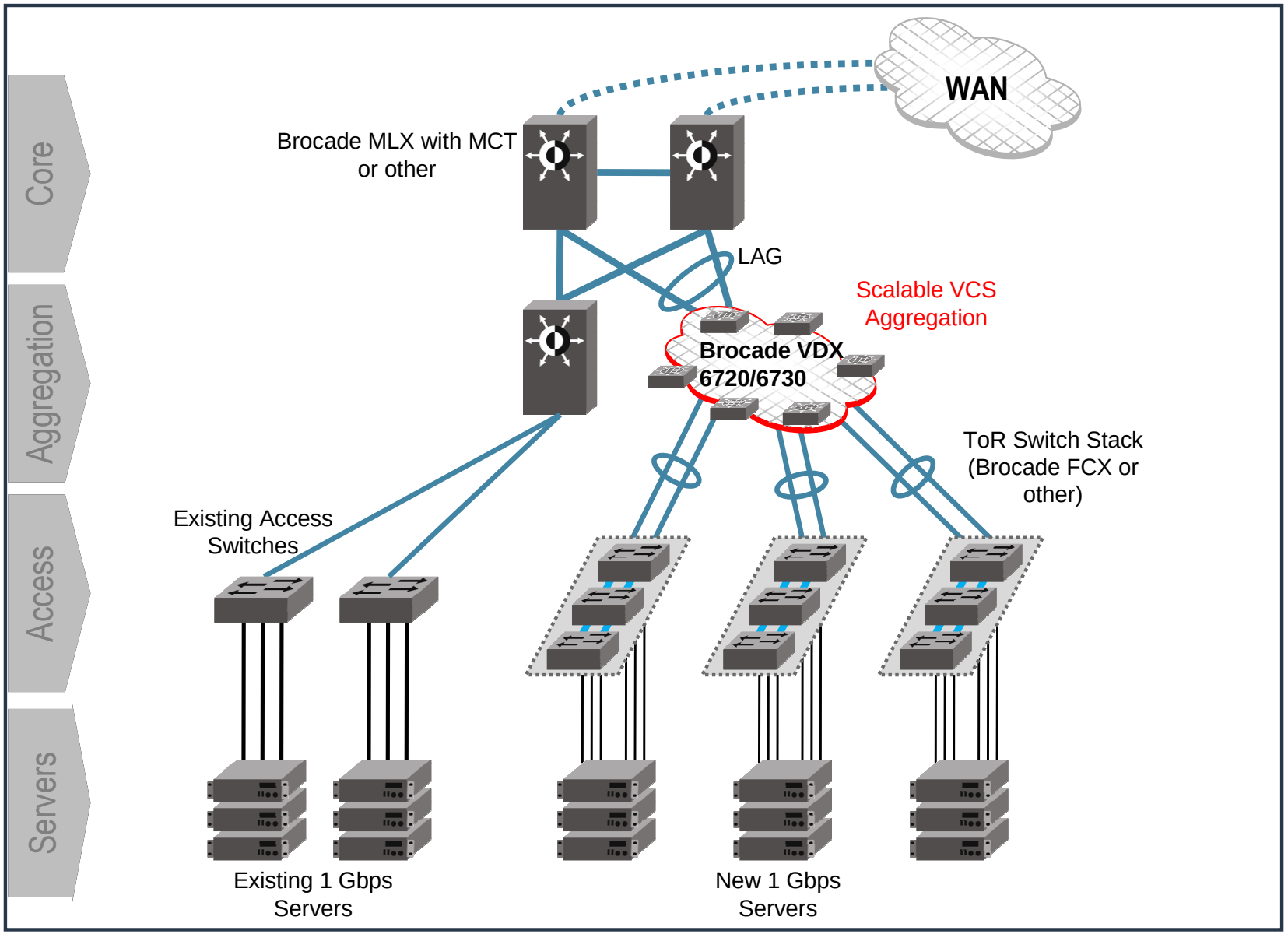
Enables network convergence

DCB and TRILL capabilities for multihop FCoE and enhanced iSCSI

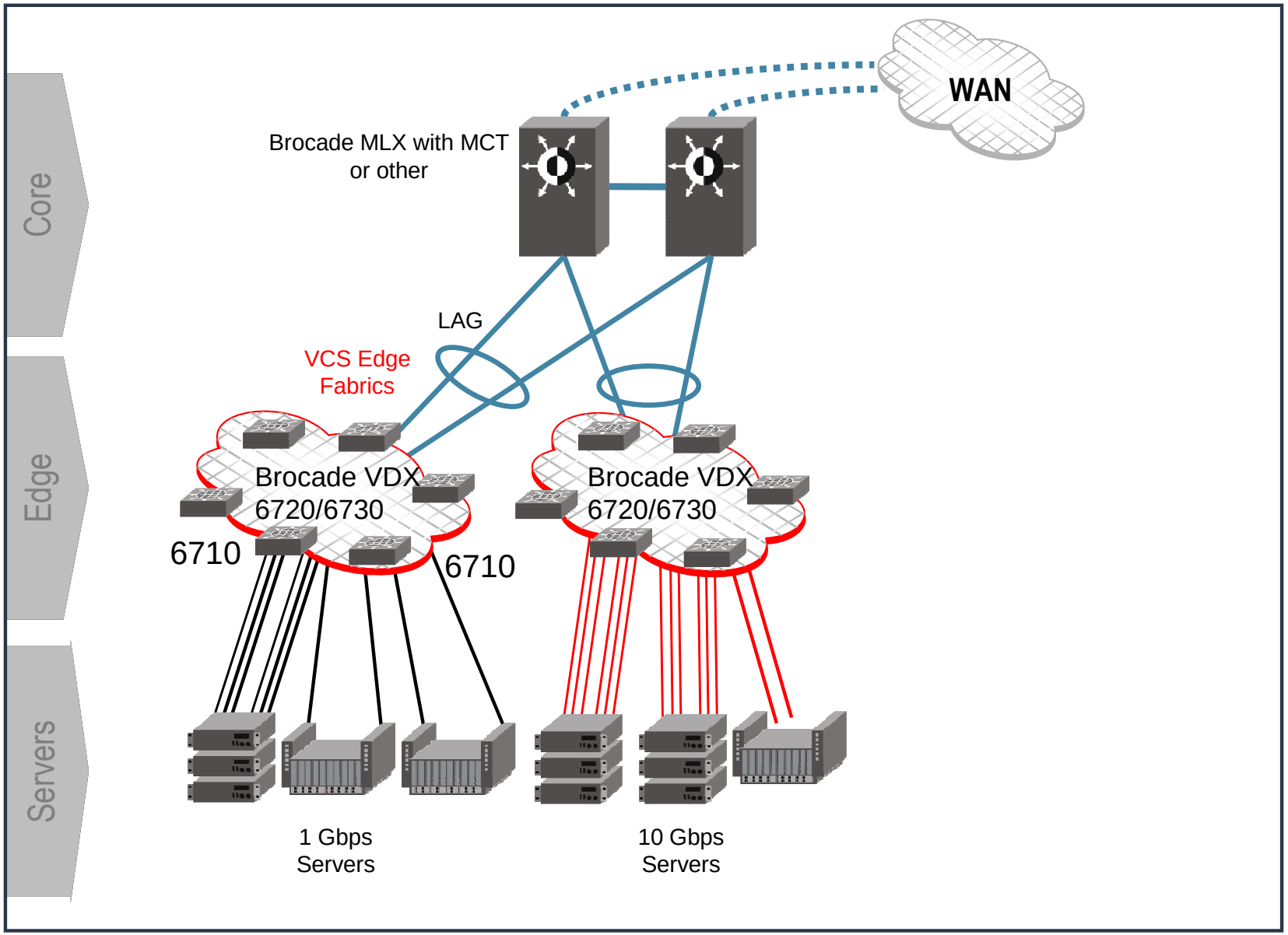
Brocade VDX with VCS Technology for ToR Server Access



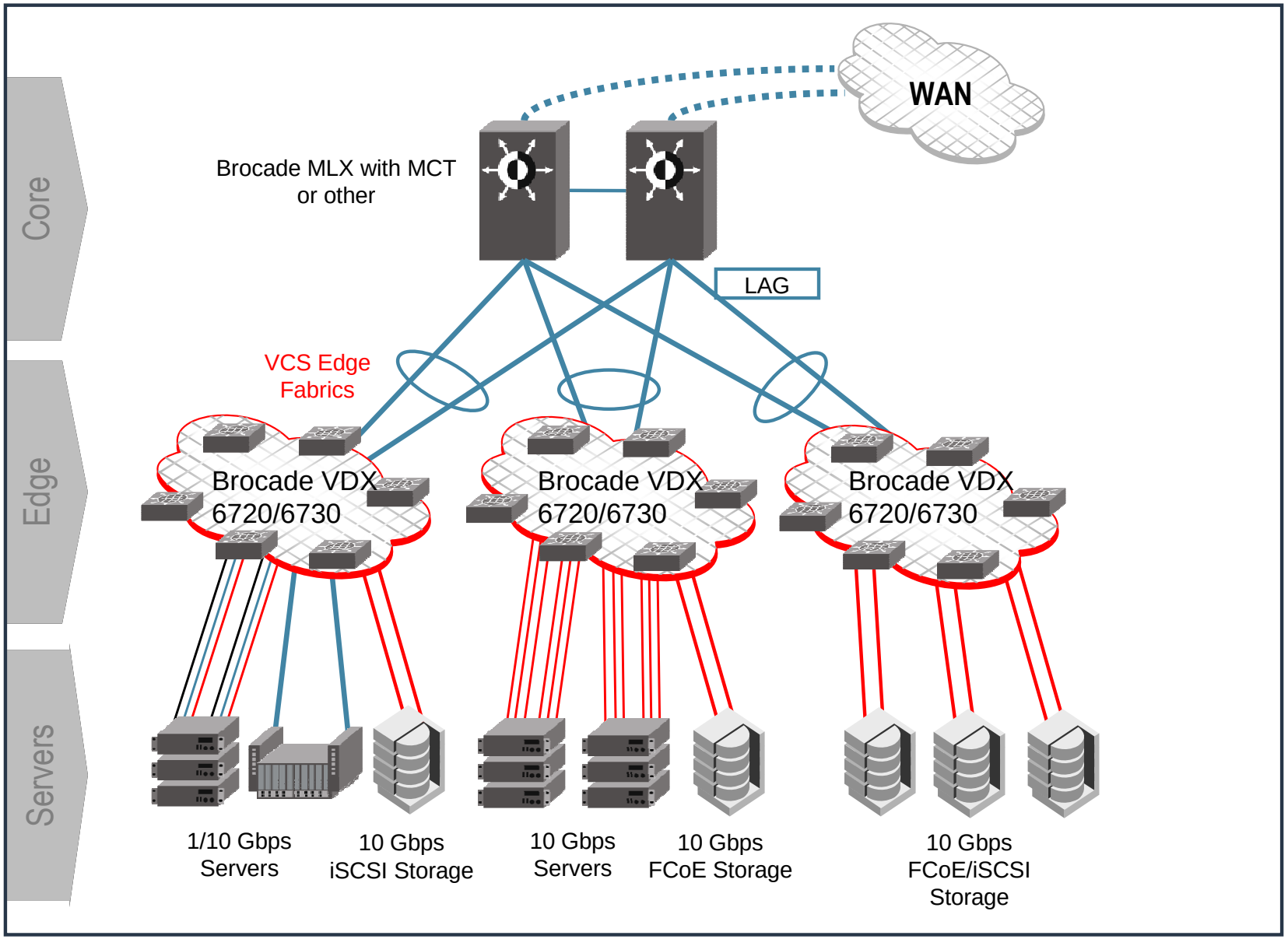
Brocade VDX with VCS Technology for Aggregation



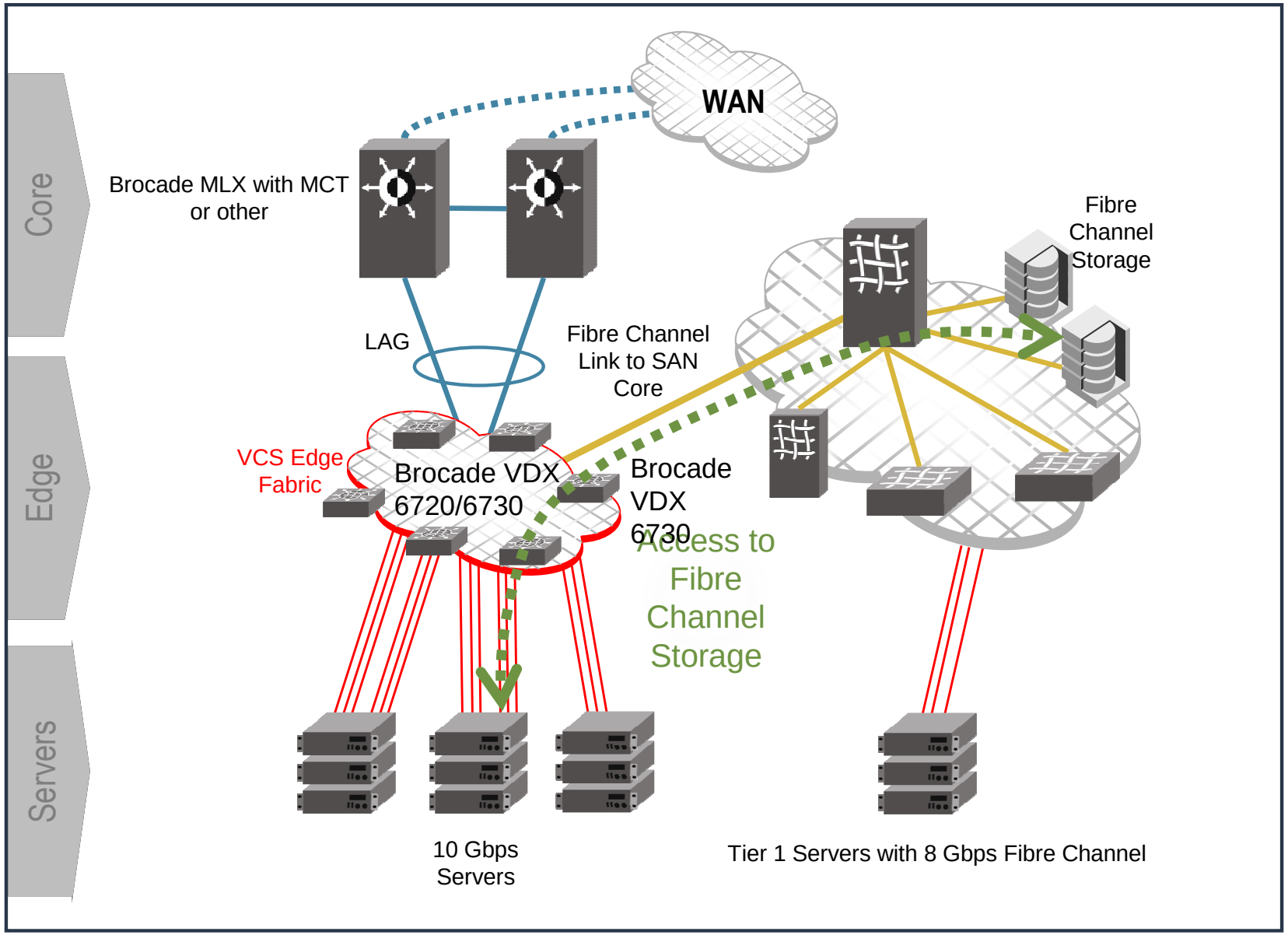
Brocade VDX with VCS Technology for Edge Fabric



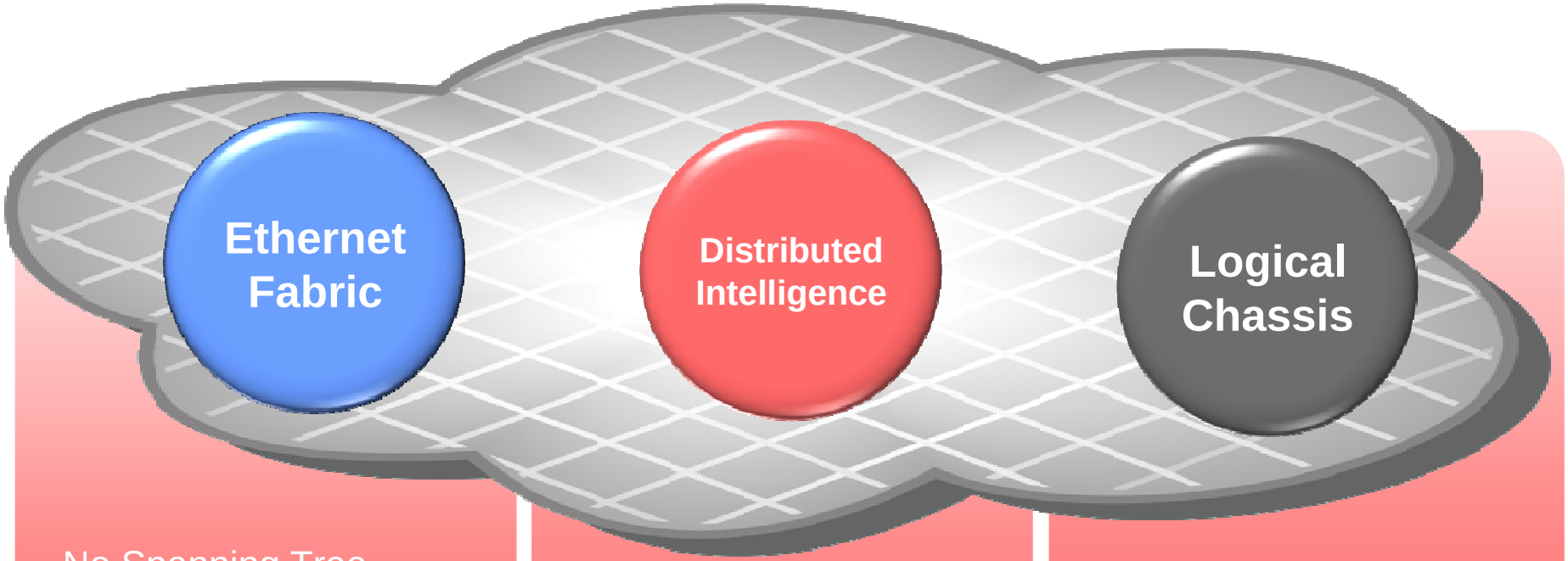
Brocade VDX with VCS Technology for FCoE



Brocade VDX 6730 with VCS Technology for Native Fibre Channel Bridging



Virtual Cluster Switching (VCS) technology



No Spanning Tree Protocol

Multi-path, deterministic

Auto-healing, non-disruptive

Lossless, low latency

Convergence-ready

Self-forming

Arbitrary topology

Fabric is aware of all members, devices, VMs

Masterless control, no reconfiguration

VAL interaction

Logically flattens and collapses network layers

Scale edge and manage as if single switch

Auto-configuration

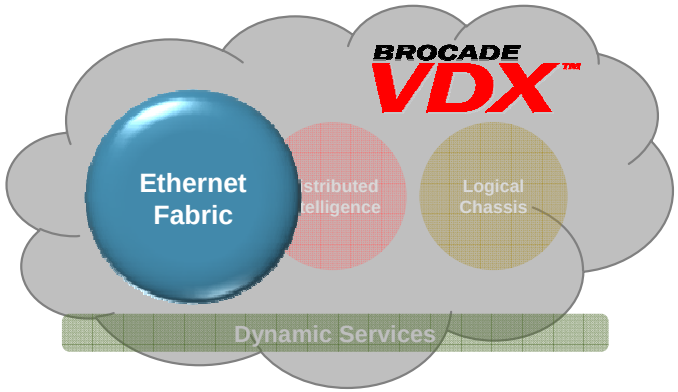
Centralized or distributed mgmt; end-to-end

Dynamic Services

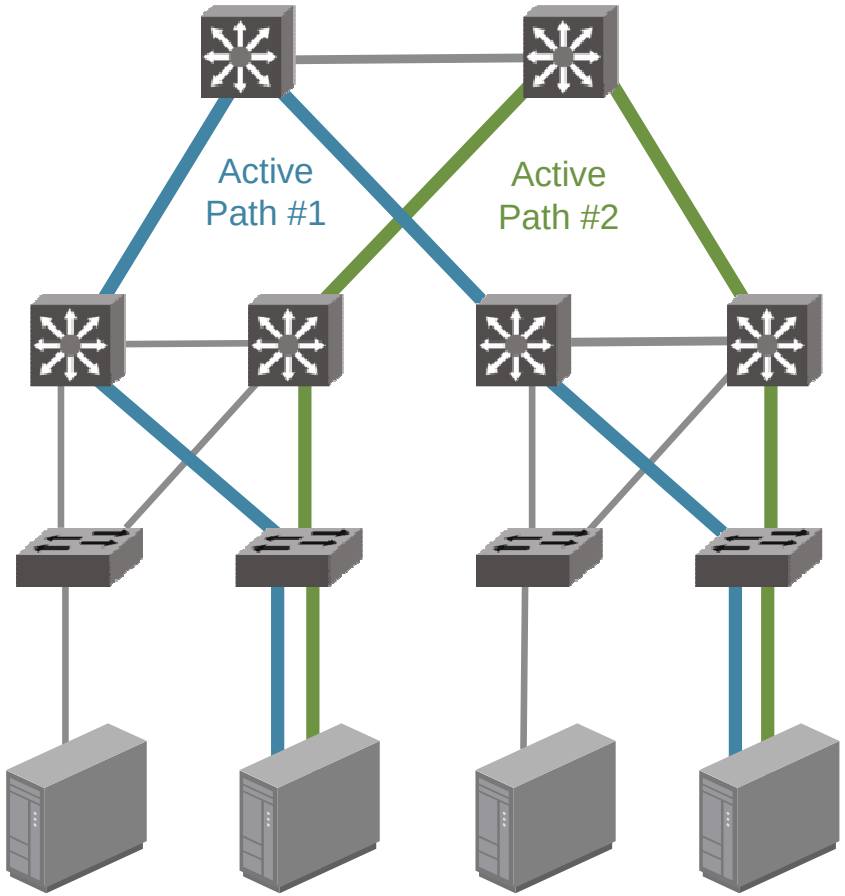
Connectivity over Distance, Native Fibre Channel, Security Services, Layer 4-7, etc.

Ethernet Fabric Details

Transparent Interconnection of Lots of Links (TRILL)



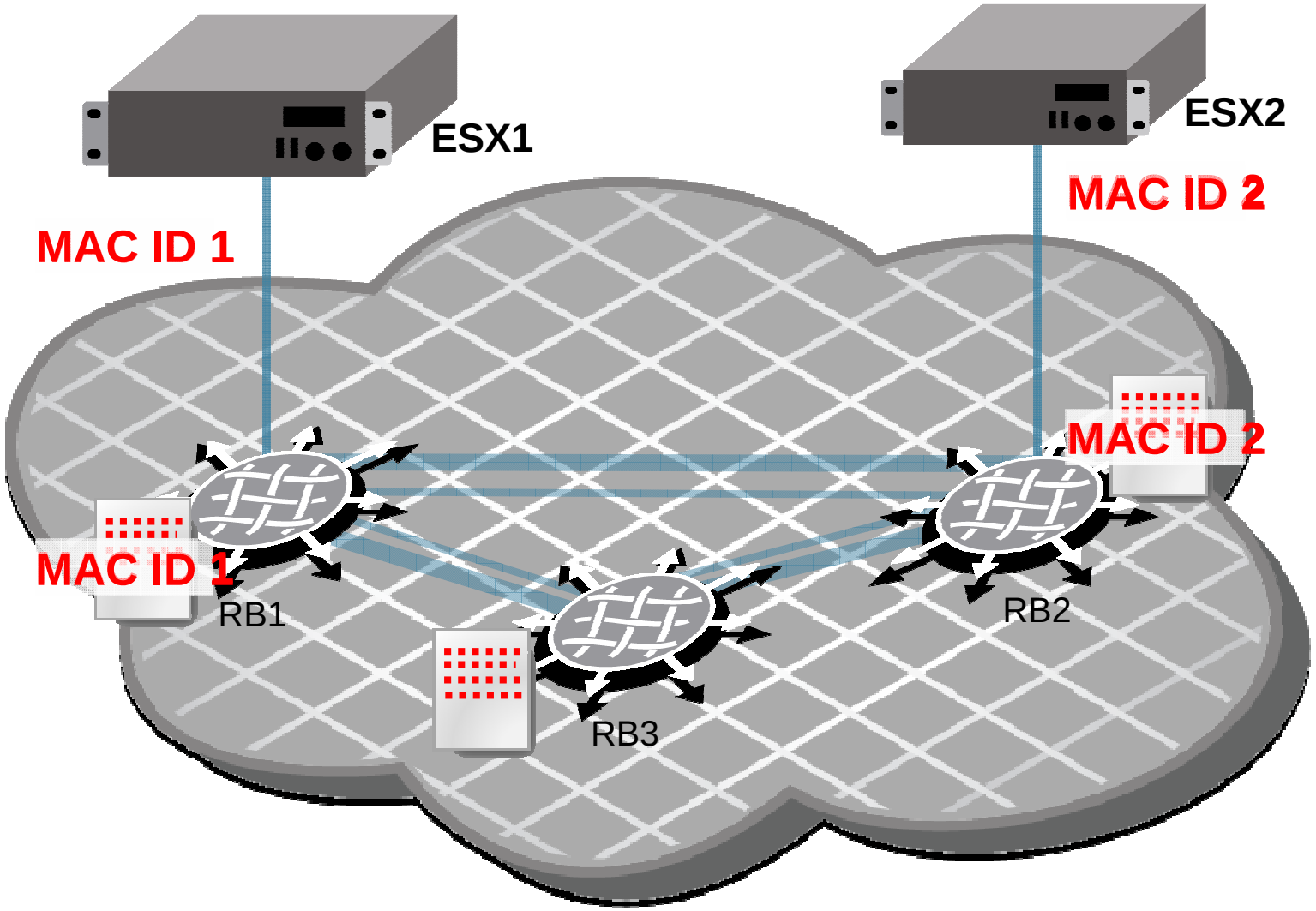
Layer 2 Multiple Paths



- Multipath Layer 2 switching
  - All paths are active and traffic is distributed across all paths
  - Fully utilize all fabric bandwidth
- Establishes shortest paths through the Layer 2 fabric
- Uninterrupted response to link failures
- Backward-compatible and connects into existing infrastructures
- Delivers multiple hops for all traffic types (including FCoE)

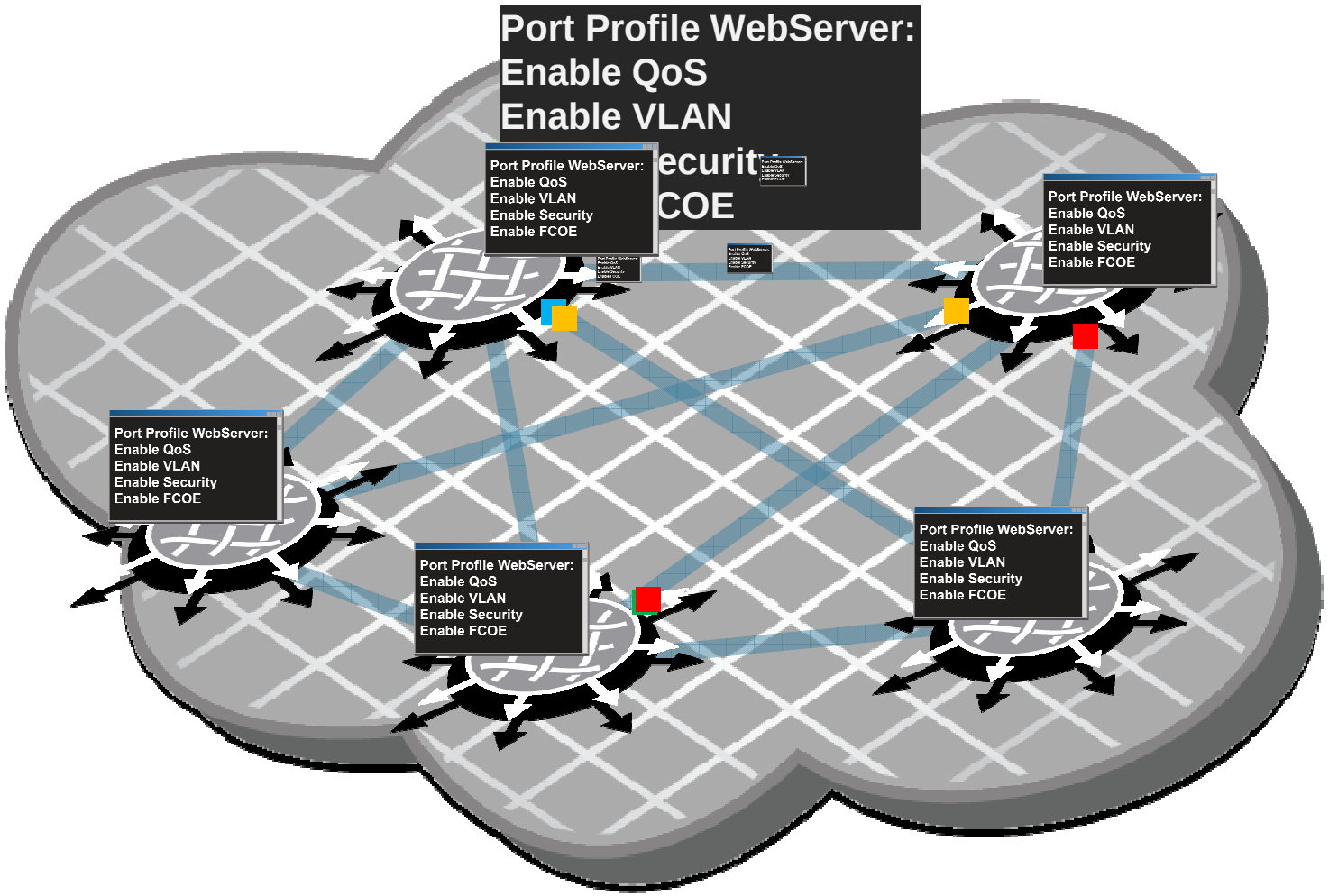
Distributed Intelligence Details

Distributed MAC address tables



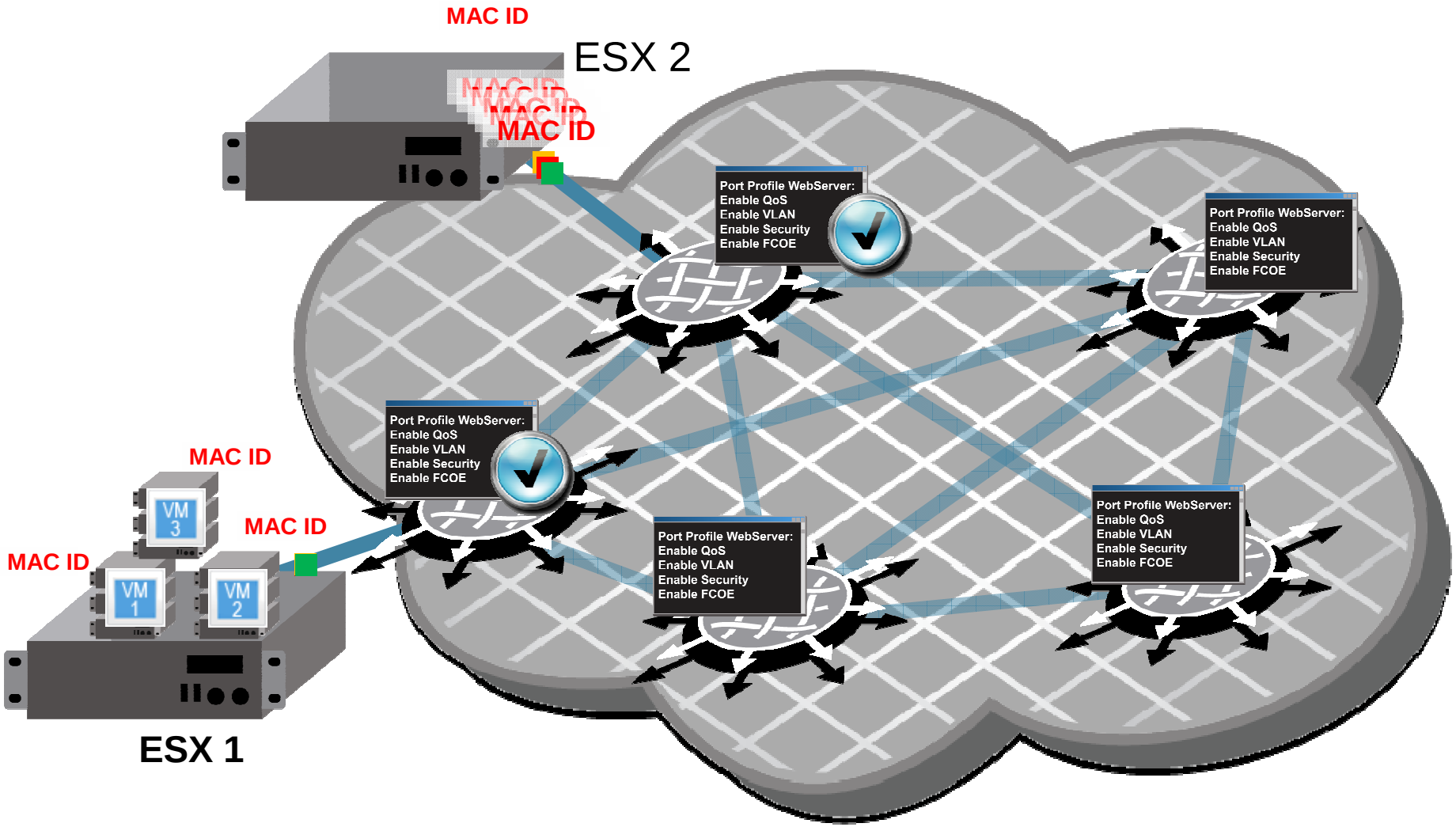
Distributed Intelligence Details

Sharing Port Profiles



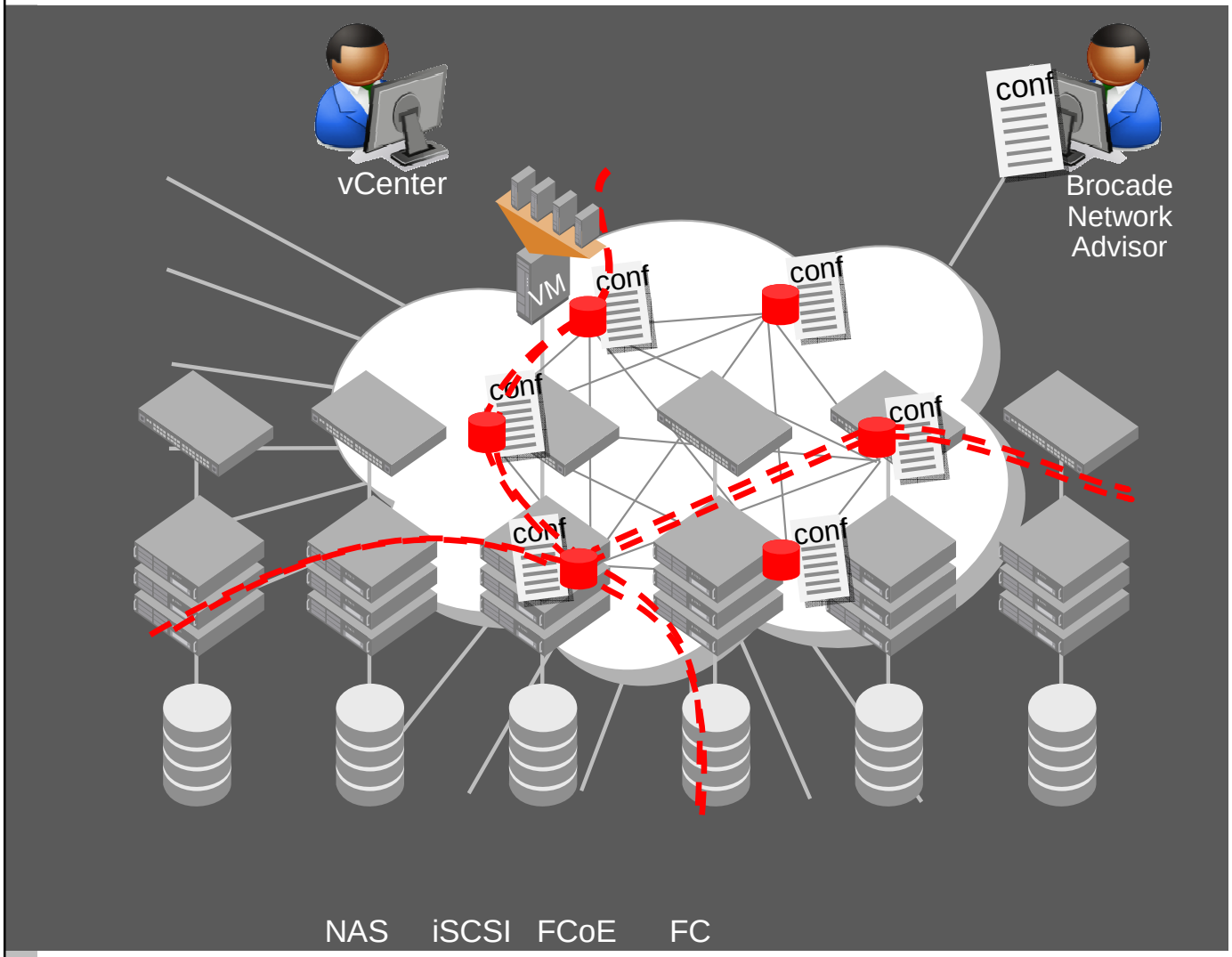
Distributed Intelligence Details

VM Migration with Automatic Migration of Port Profiles



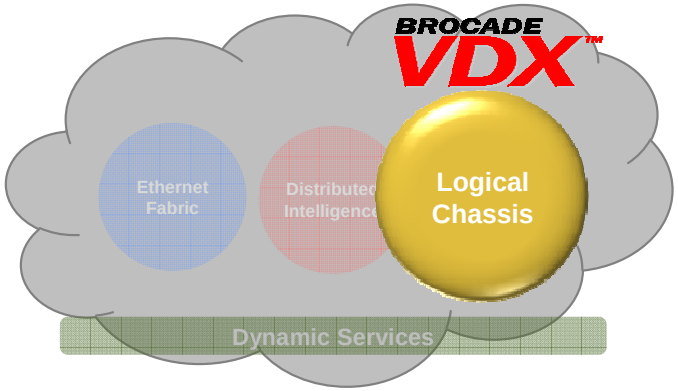
Brocade VM-Aware Network Automation Migration

Dynamic configuration and secure communication

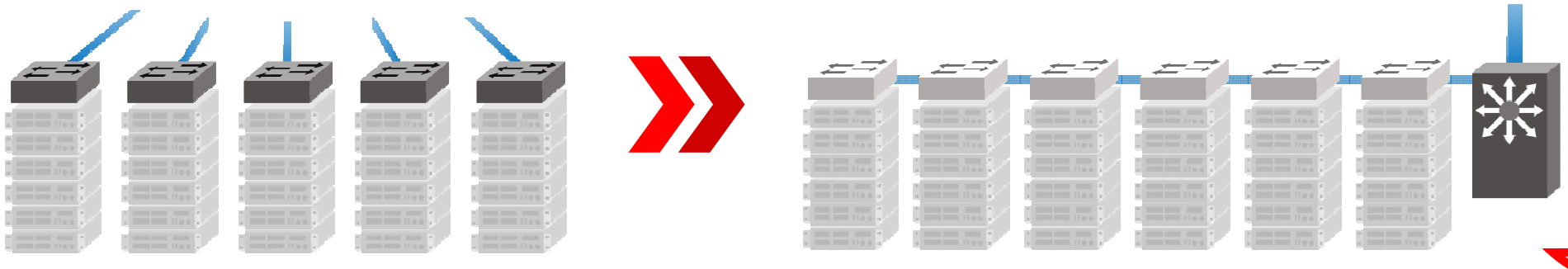


- No need for manual configuration of MAC addresses and port profiles; less error-prone
- Minimizes procedural delays between server and network IT teams
- Eases configuration of multiple VCS fabrics
- Protection against VM/MAC spoofing via secure vCenter communication

Logical Chassis Details

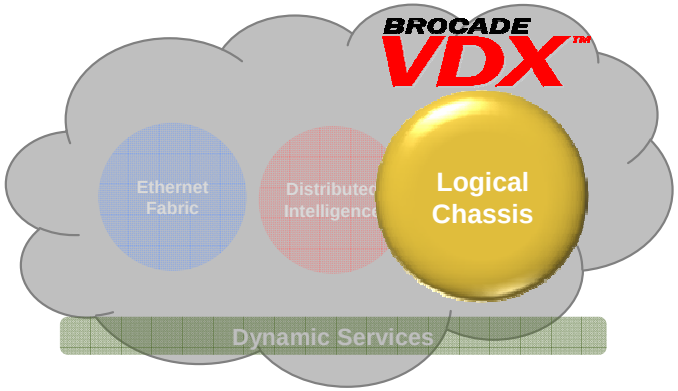


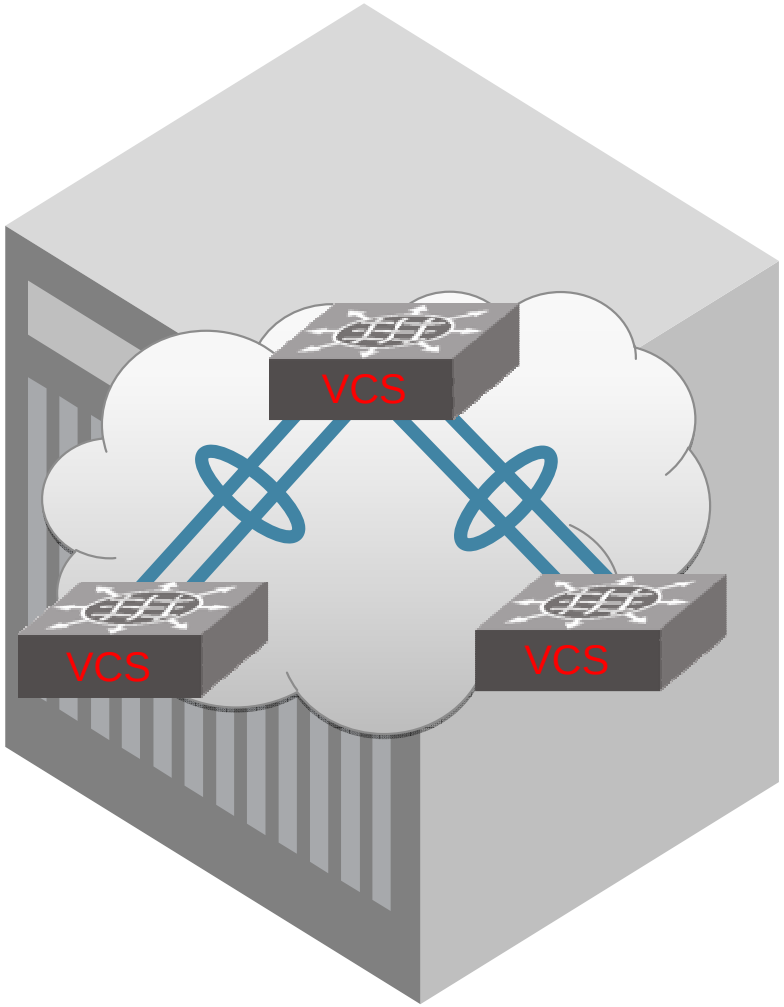
- Fabric auto-configures
  - Once VCS is enabled, no fabric necessary
- Fabric behaves/managed as a single logical chassis
  - Aggregation (or core) layer sees one logical element
  - Fabric members act like a blade in a chassis
- Logically flattens and collapses network layers
  - Fabric is self-aggregating
  - Flexible fabric topologies
- Scales without added management complexity



Logical Chassis Details

Auto-Configuration

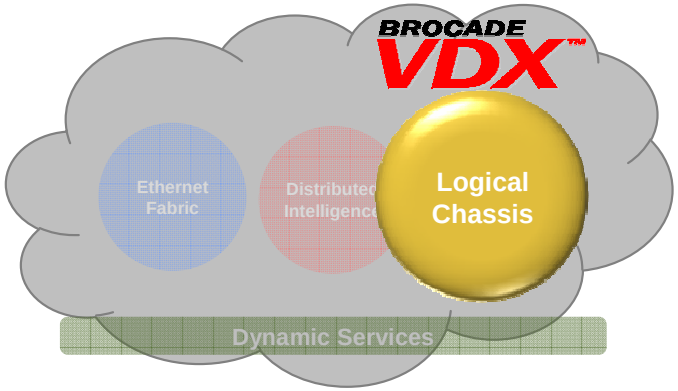


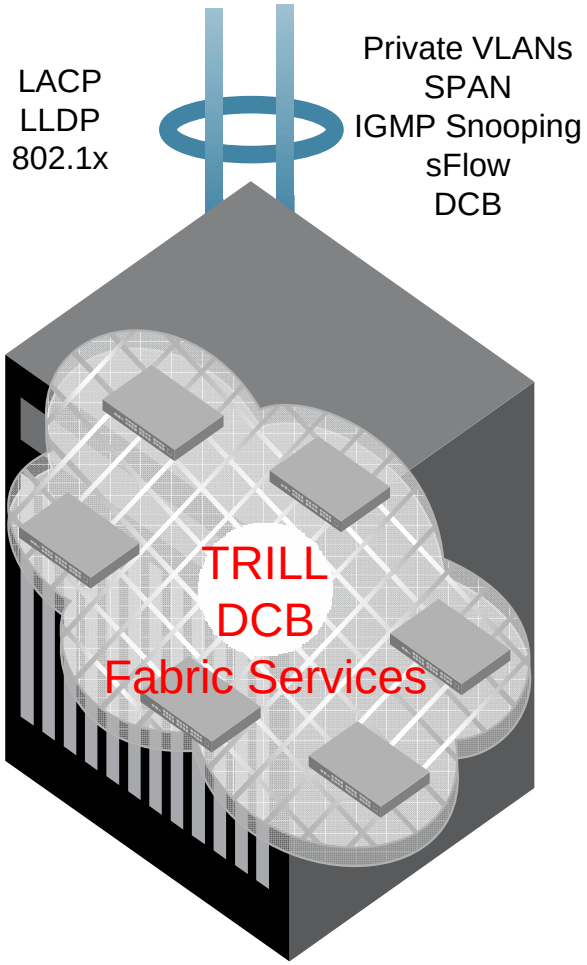


- Simplified VCS fabric deployment, scalability, and management of the network
- Enable VCS capabilities on each switch (on by default)
- Connect the switches
- Fabric automatically forms
  - Common configuration across all switches, ISL Trunks auto-form
- Managed as a single logical chassis

Logical Chassis Details

Single Logical Switch behavior

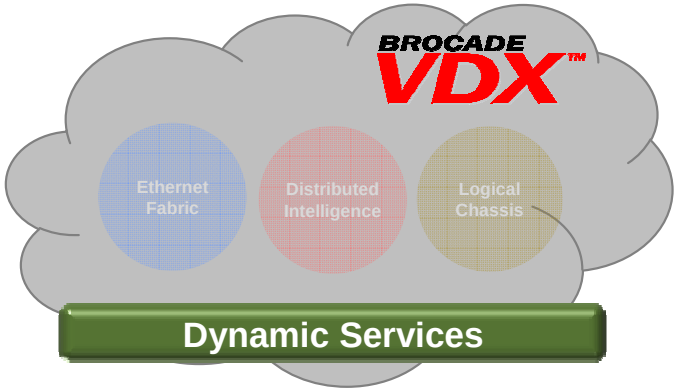




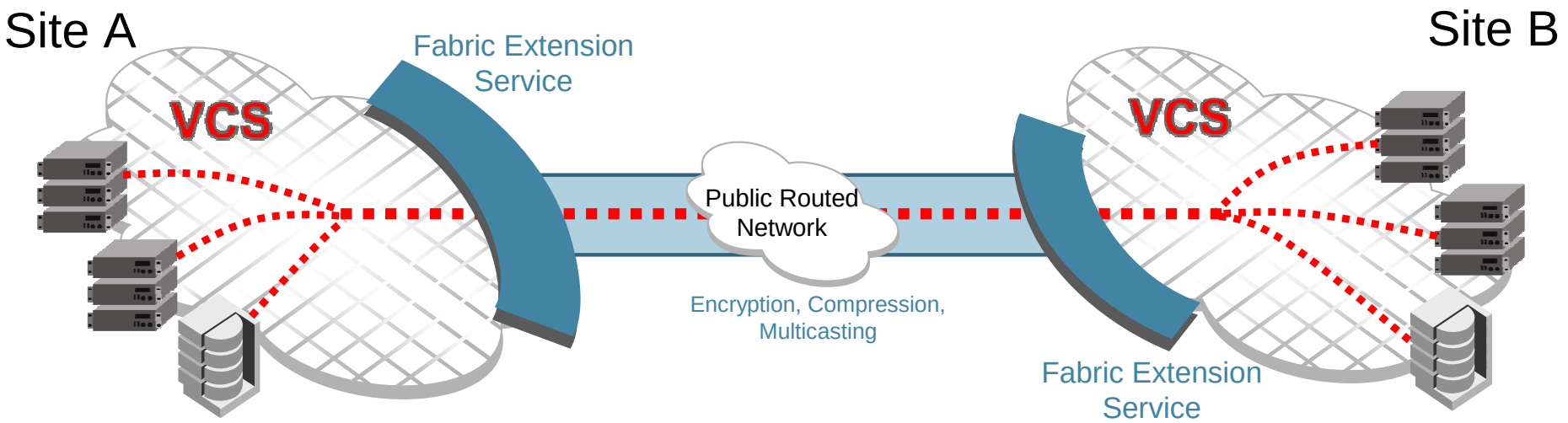
- VCS fabric behaves like a transparent LAN service
  - For example, BPDUs in STP environments are passed through the fabric
- Fabric protocols used within the fabric
  - TRILL, DCB, fabric services, etc.
- Industry-standard protocols used to communicate outside the fabric
  - LACP, 802.1x, sFlow, etc.

Dynamic Services Details

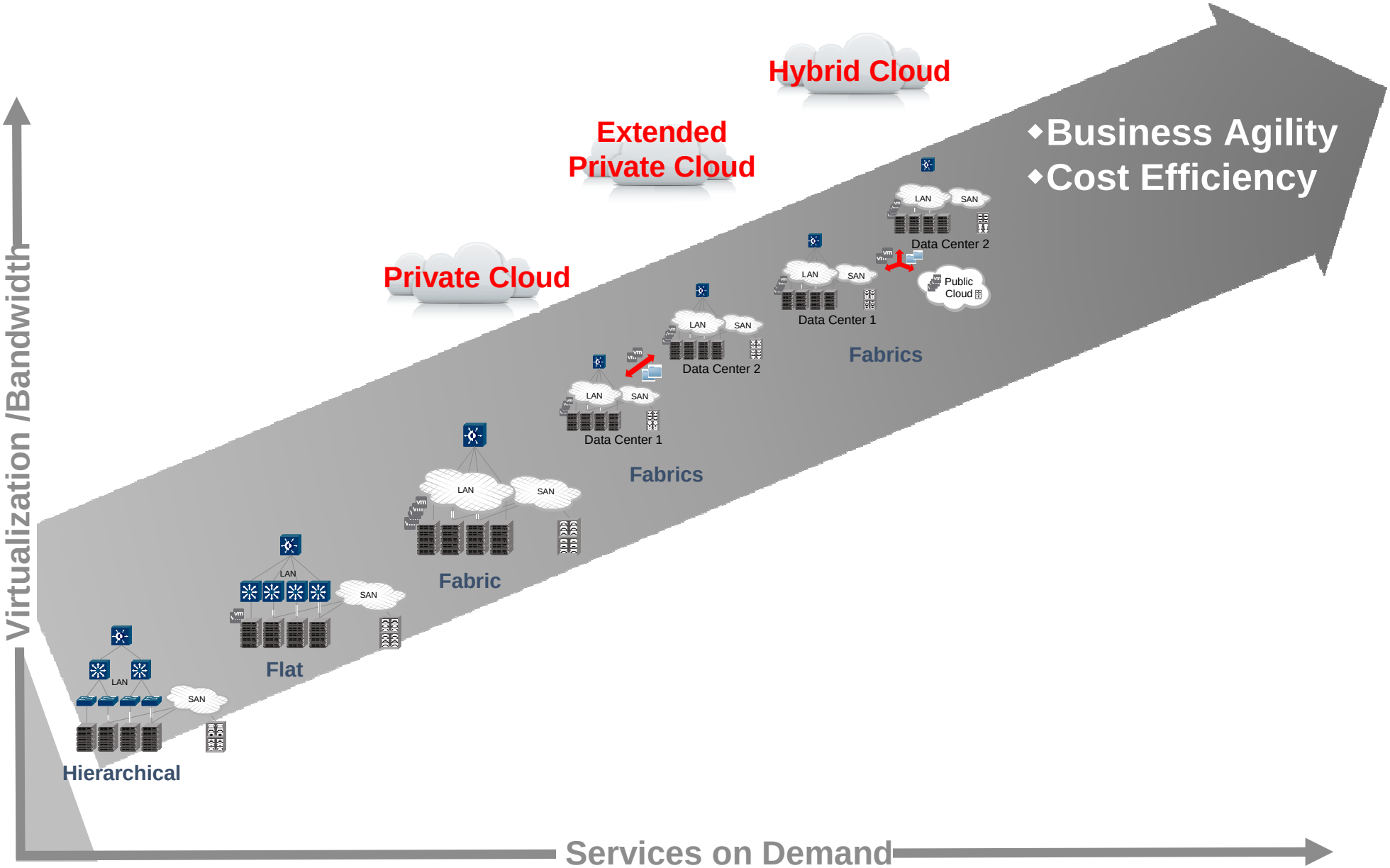
Data center to data center connectivity



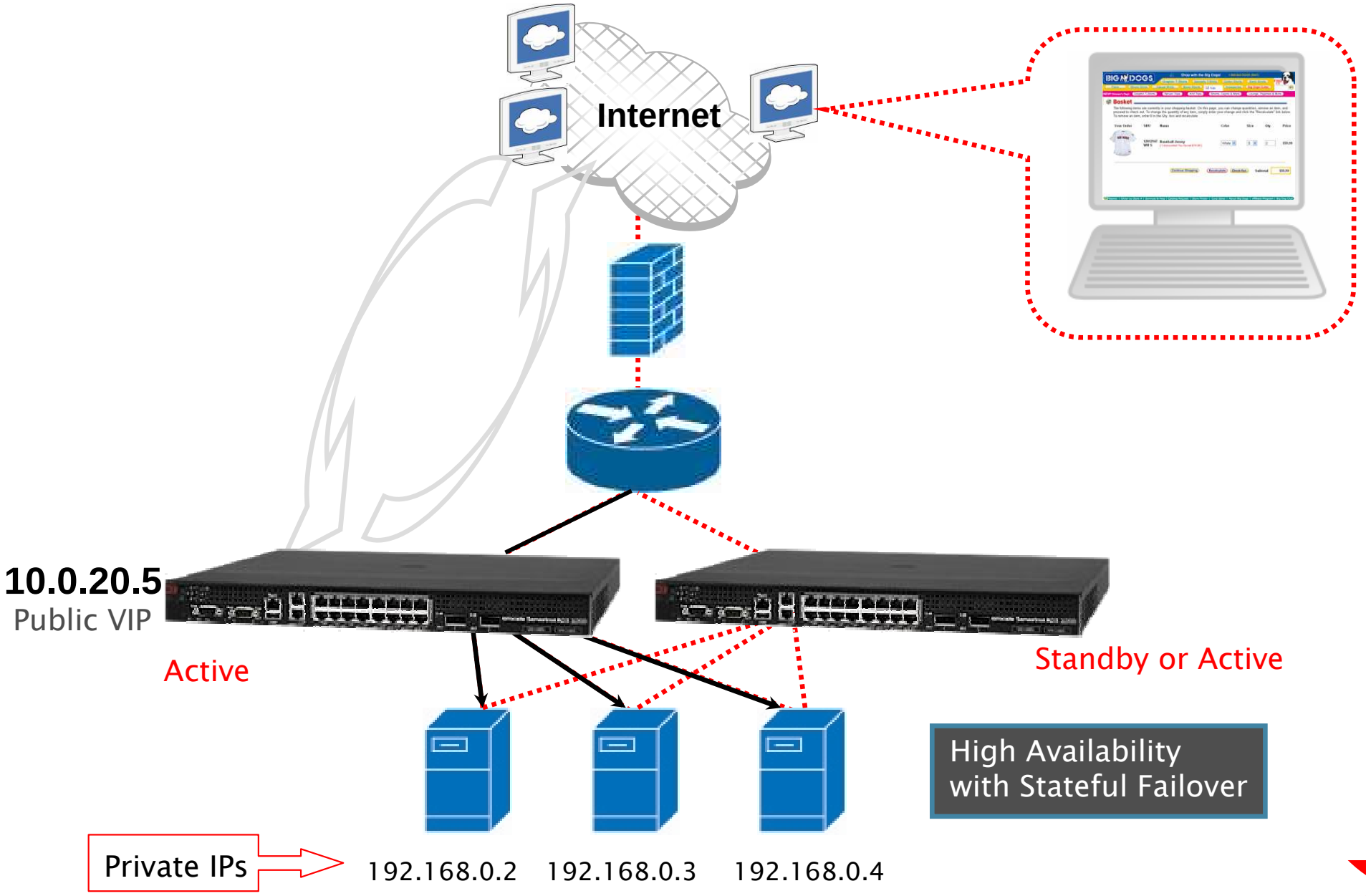
- Dynamic Service to connect data centers
  - Extend the Layer 2 domain over distance
  - Maintains fabric separation while extending VCS services to secondary site (e.g. discovery, distributed configuration, AMPP)
- VCS fabric extension capabilities
  - Delivers high performance accelerated connectivity with full line rate compression
  - Secures data in-flight with full line rate encryption
  - Load balances throughput and provides full failover across multiple connections



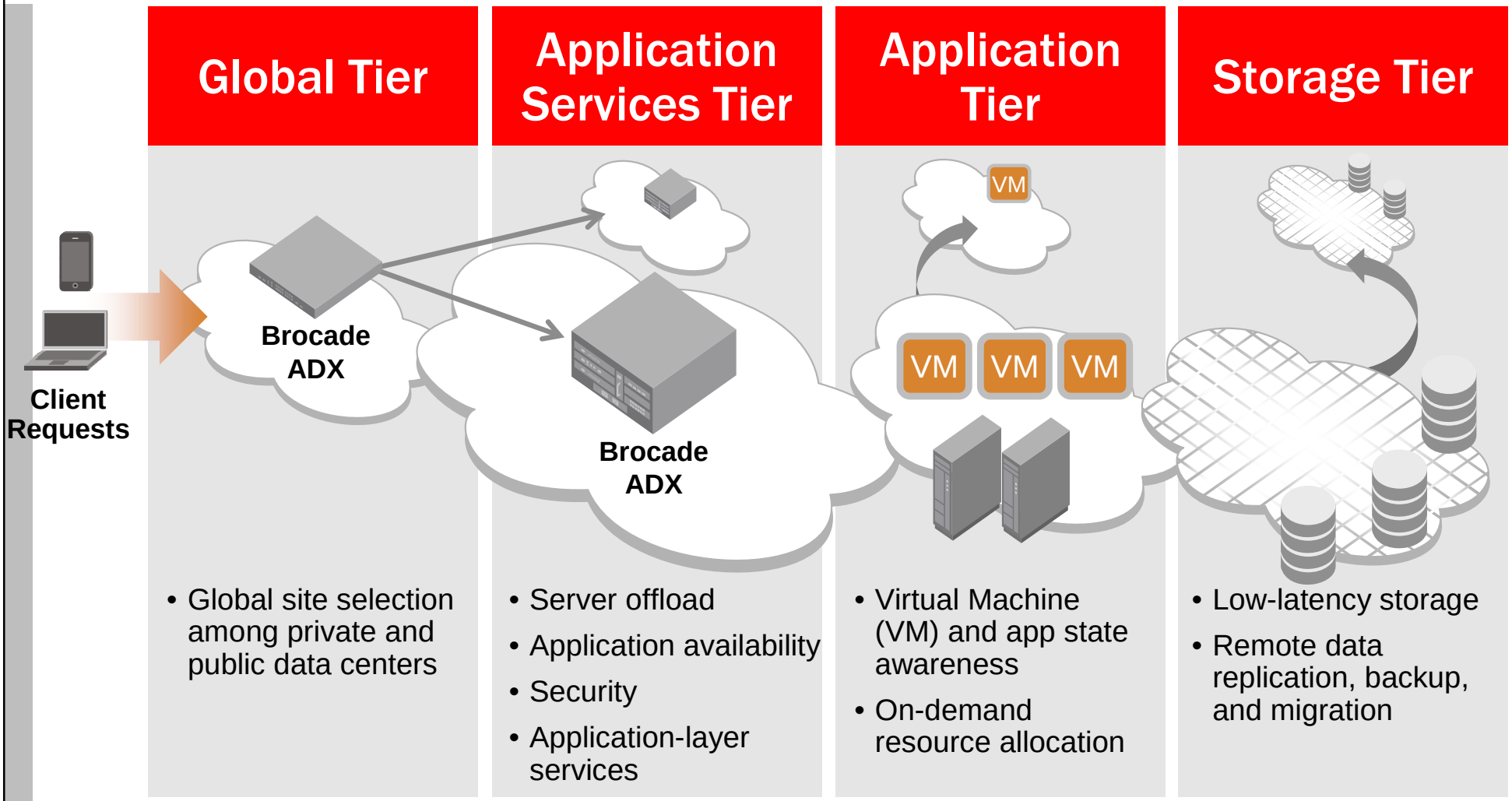
Data Center Transformation from Networks to Ethernet Fabrics



Load-Balancers
Application Delivery, L4-L7 switching



Brocade Application Delivery Products



Brocade ServerIron ADX

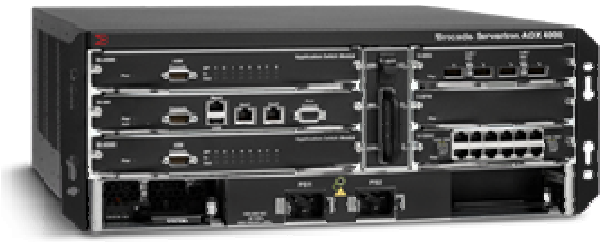
Product Overview

ServerIron ADX 1000

- 1 RU Fixed Scalable Configuration
- 2Gbps -> 9Gbps of L7 throughput
- Capacity on demand doubles or quadruples performance
- Up to 16 x 1GE Cu and 2 x10GE XFP
- Up to 8x 1GE Cu + 16x GE SFP and 2 x 10GE SFP+

ServerIron ADX 4000

- 4 RU Chassis
- Up to 35Gbps of L7 throughput
- Up to 2 ASMs
- Up to 8 x 10GE
- Up to 24 x GE
- Copper and fiber support

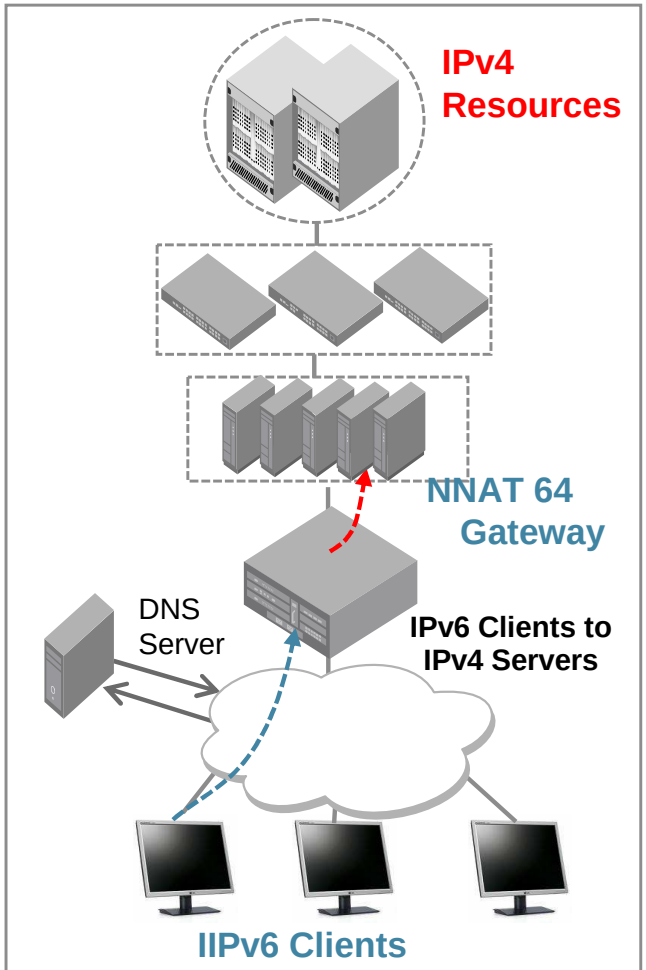


ServerIron ADX 10000

- 10 RU Chassis
- Up to 70Gbps of L7 throughput
- Up to 4 ASMs
- Common cards with ADX 4000
- Up to 24 x 10GE
- Up to 72 x GE
- Up to 120M DoS syn/sec

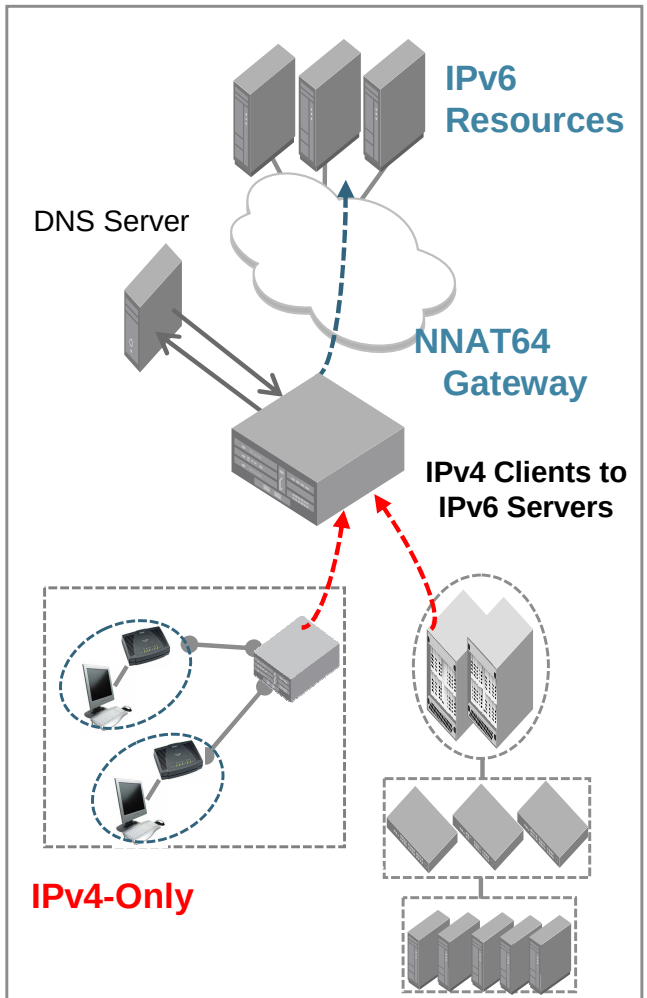
Enabling the Transition to IPv6

A cost-effective and non-disruptive migration path



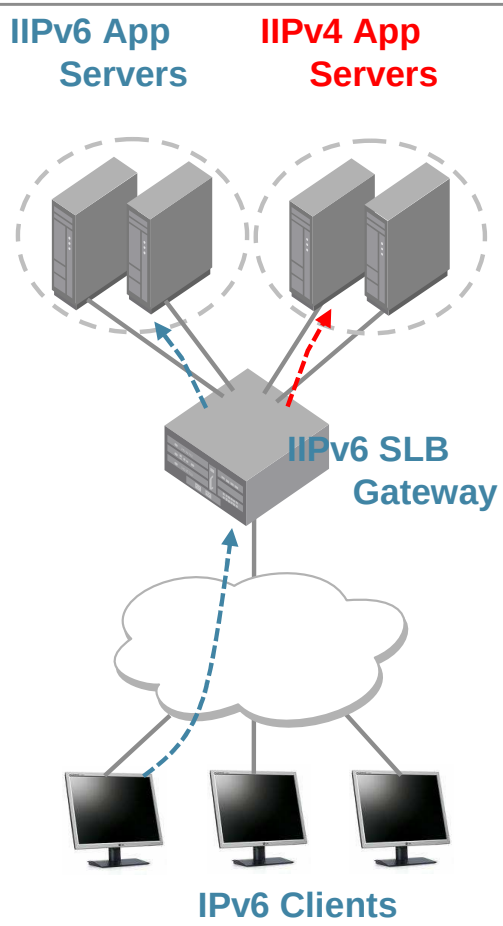
IPv6 → IPv4 NAT

Brings new IPv6 clients onboard for existing IPv4 applications



IPv4 → IPv6 NAT

Connects legacy IPv4 clients to new IPv6 resources

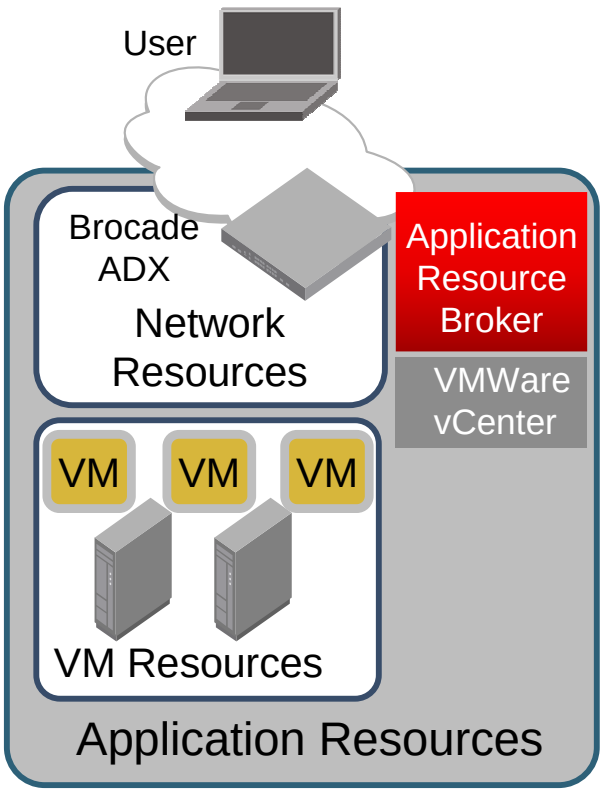


IPv6 → IPv4 SLB

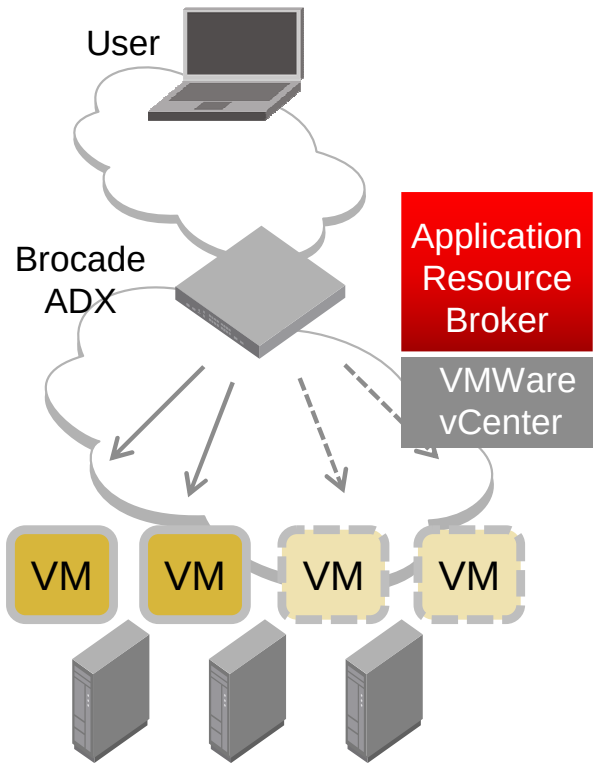
Load-balancing IPv4 application servers while enabling service for IPv6 clients

New: Brocade Application Resource Broker

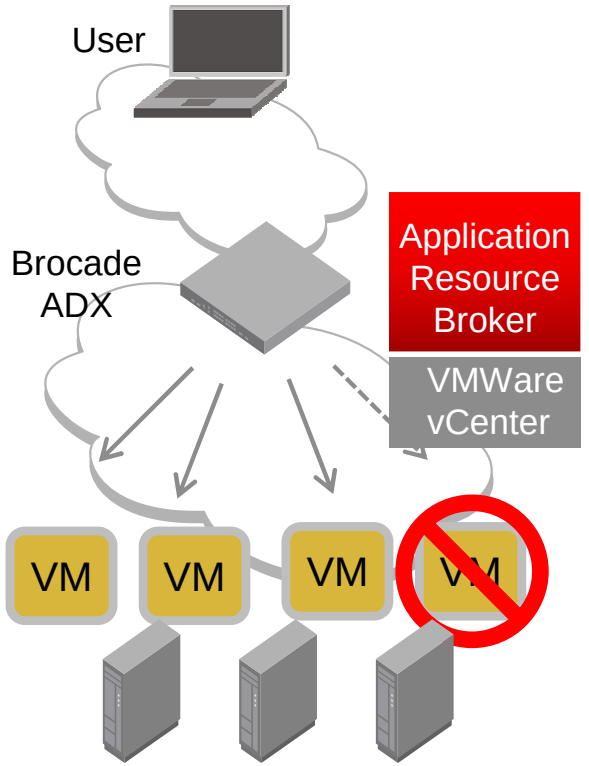
Brocade ADX Software Module for vCenter Enables Private Clouds



Application Resource Monitoring



Resource Commissioning When Load Increases



Resource De-commissioning When Load Decreases

BROCADE

Thank You

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