

Software Definovaný Networking jako řešení pro účinné zabezpečení Vašeho IT

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Agenda

- Transformace IT
- Co je SDN?
- SDN řešení

Digital transformation is happening now

Last 15 years

IT-centric

Systems of record

Traditional applications

Transactional data and reporting

Internet

Next 15 years

Business-centric

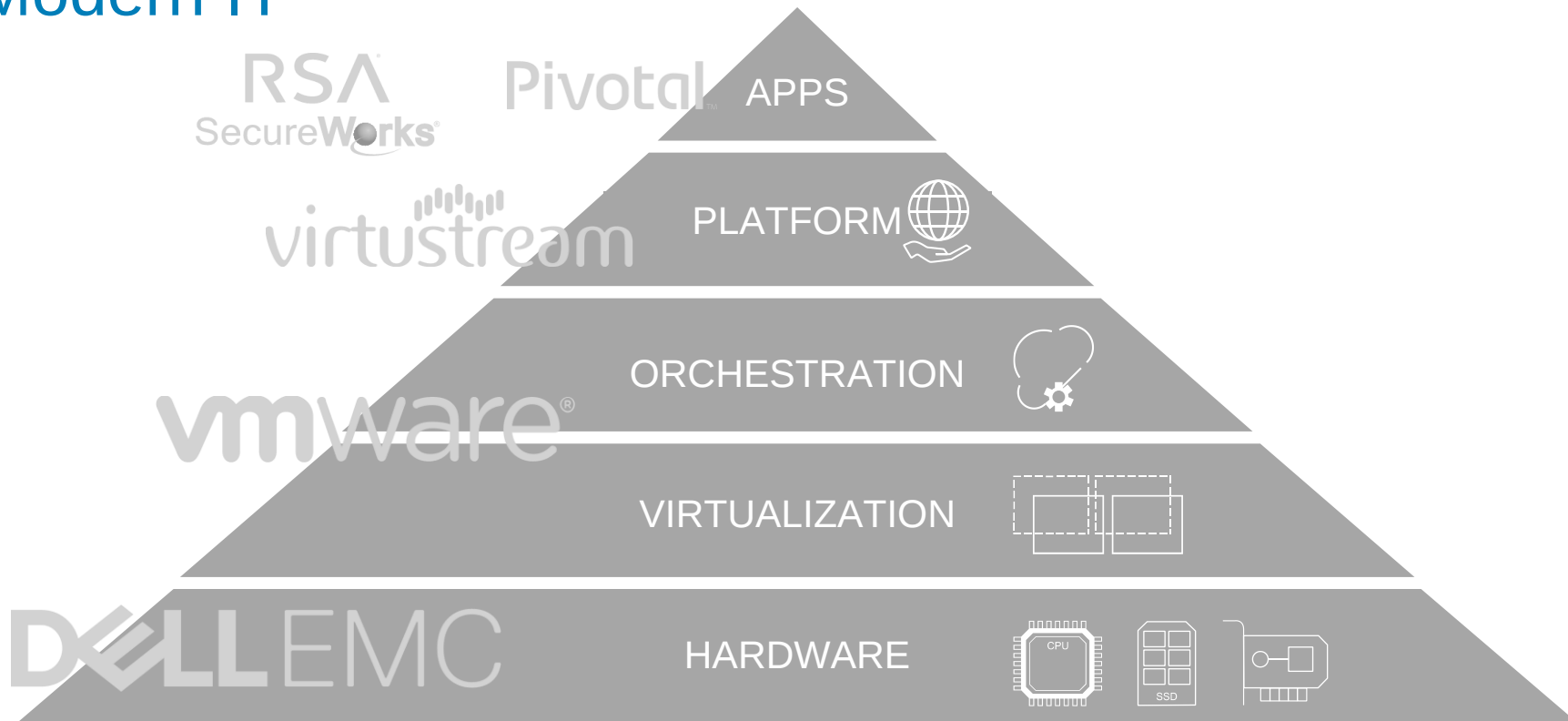
Systems of engagement and insight

Cloud-native apps

Streams of data and analytics

Internet of Everything

Dell Technologies – The building blocks of Modern IT



Dell EMC is challenging the networking status quo

Traditional Networking

Proprietary
architectures

Proprietary
software

Proprietary
ASICs



Open Networking



Investment
protection

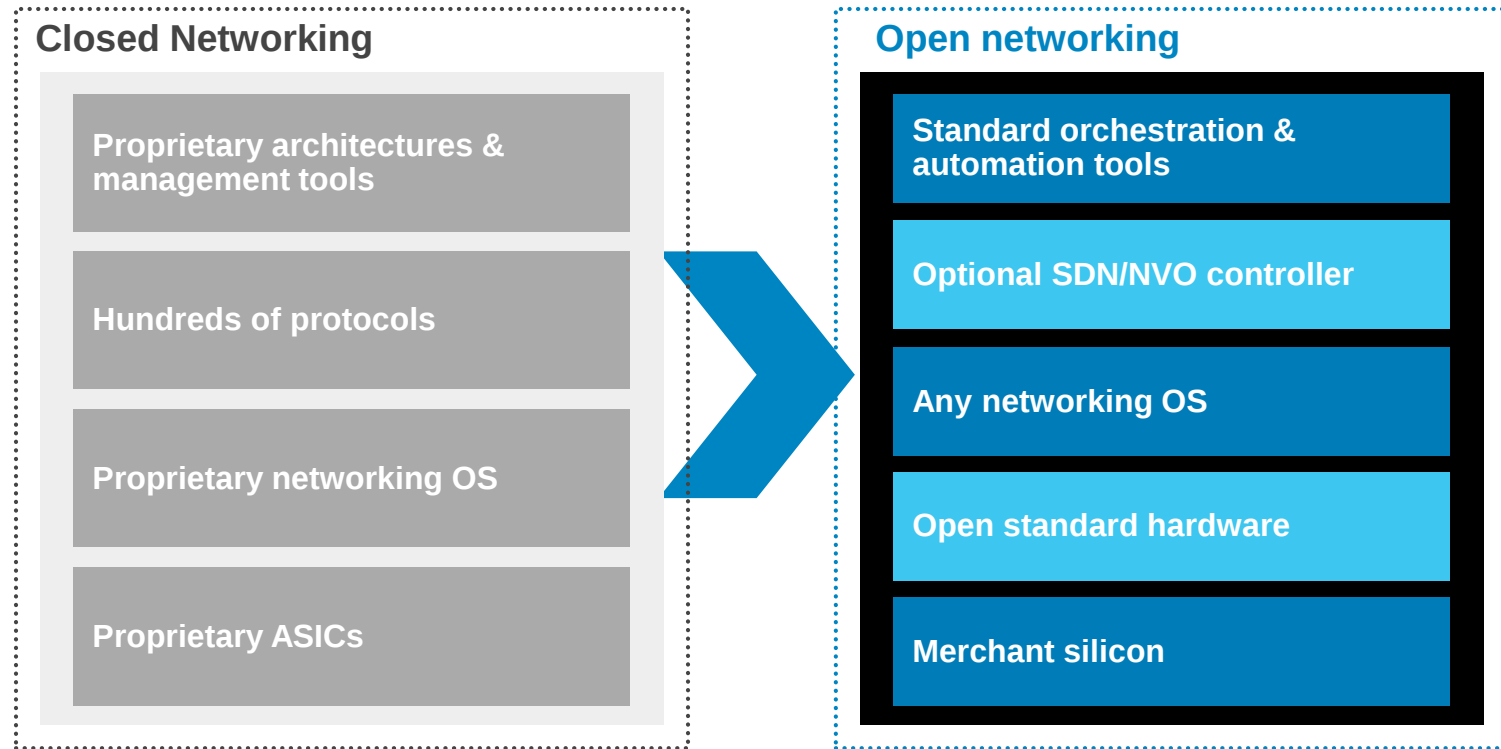
Innovation
velocity

Business
agility

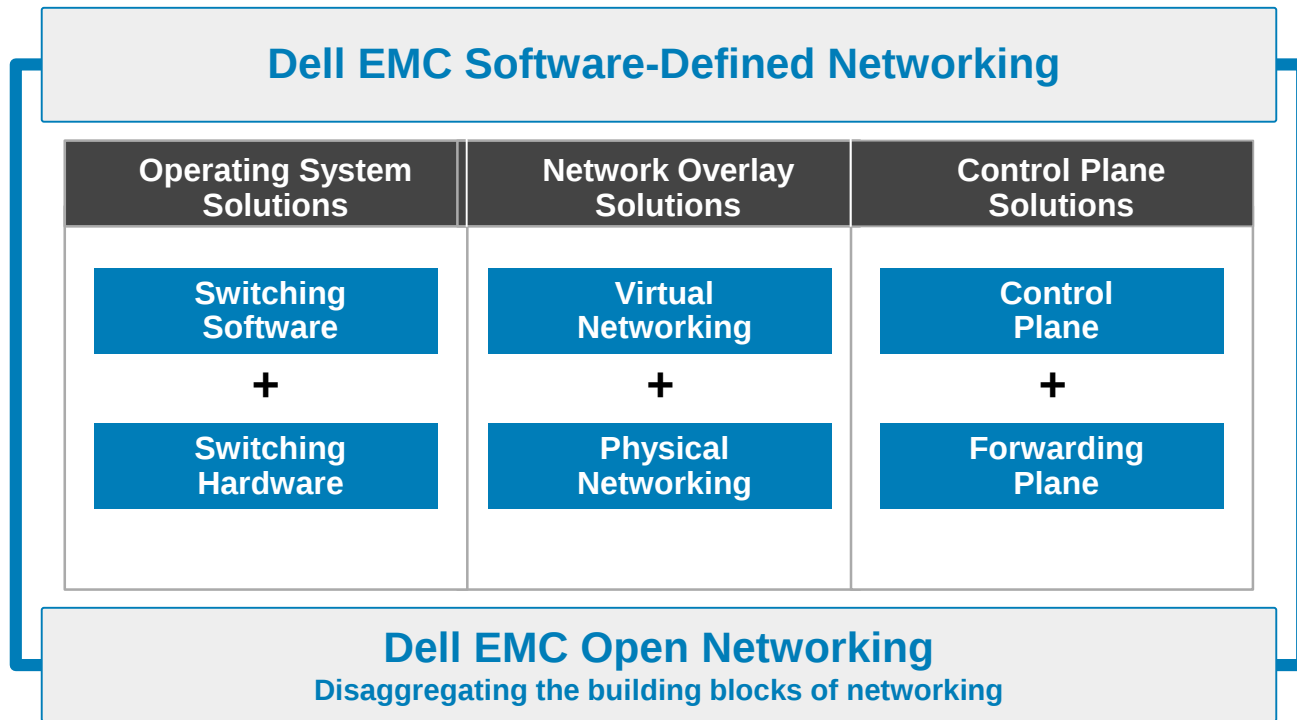
Shifting the paradigm



Our vision for the network is open



Open EMC Networking—The foundation for our solutions in the data center





RISK ASSESSMENT —

A simple command allows the CIA to commandeer 318 models of Cisco switches

Bug relies on telnet protocol used by hardware on internal networks.

DAN GOODIN - 3/20/2017, 5:35 PM



Recognized for our vision and execution

Gartner

Data Center Networking

2013



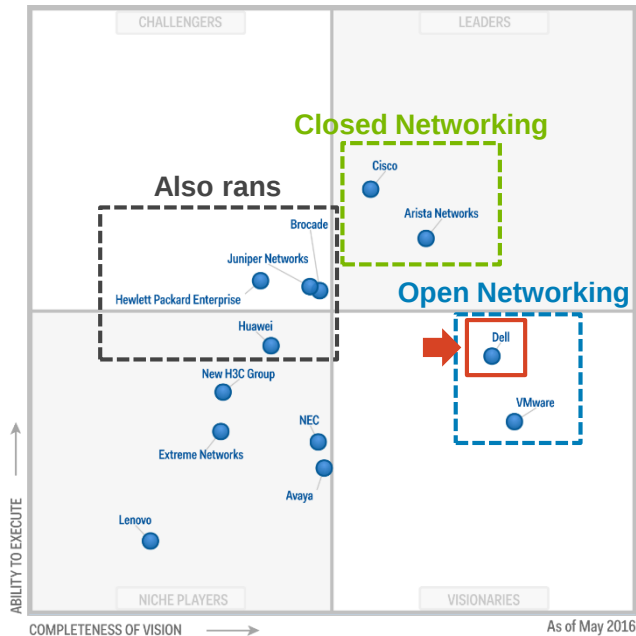
2014



2015



2016



<http://www.dell.com/learn/us/en/uscorp1/analyst-relations-research-and-reports>

Dell - Internal Use - Confidential

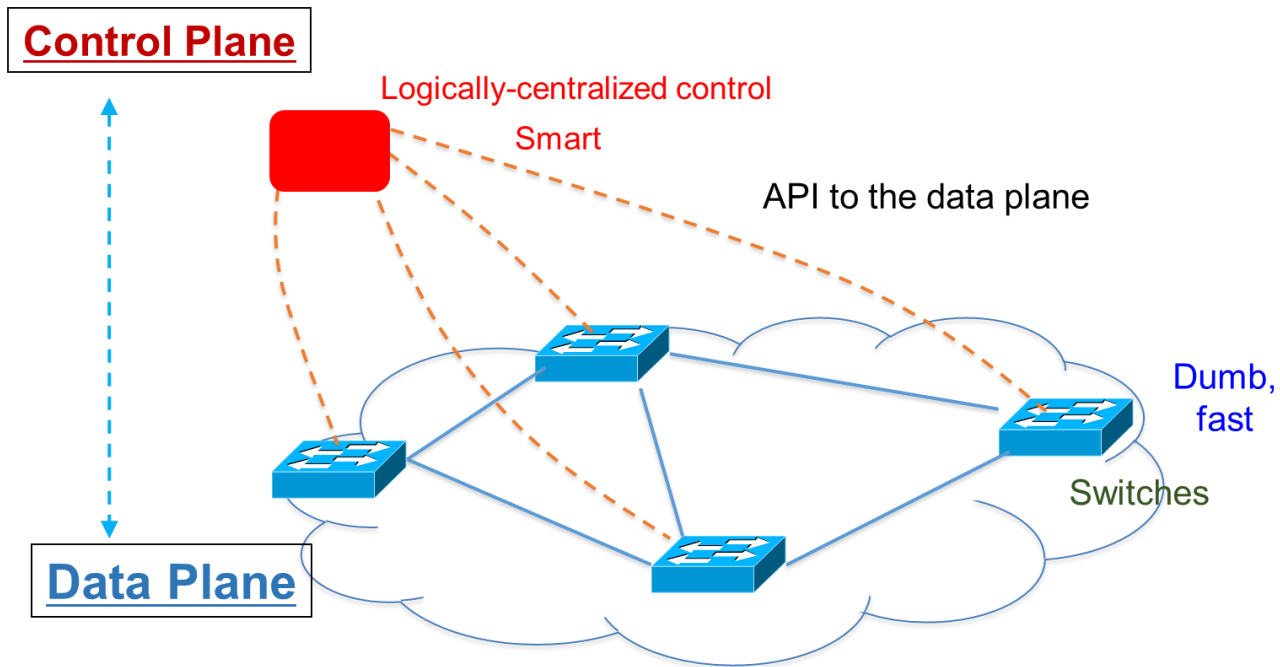
DELL EMC

Co je SDN?

Software Defined Networking (definition)

- *Software-defined networking (SDN) is an approach to computer networking that allows network administrators to manage network services through abstraction of lower-level functionality.*
- *SDN is meant to address the fact that the static architecture of traditional networks doesn't support the dynamic, scalable computing and storage needs of more modern computing environments such as data centers.*
- *This is done by decoupling or disassociating the system that makes decisions about where traffic is sent (the control plane) from the underlying systems that forward traffic to the selected destination (the data plane).*

What if networks looked like this...



SDN advantages

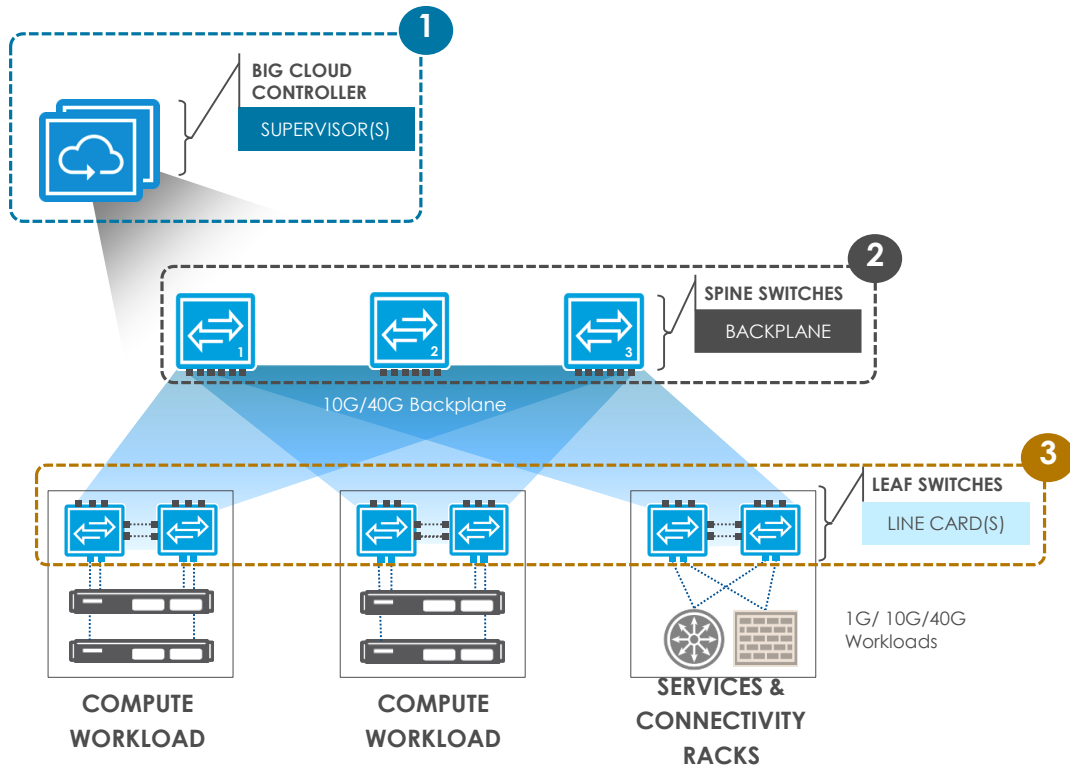
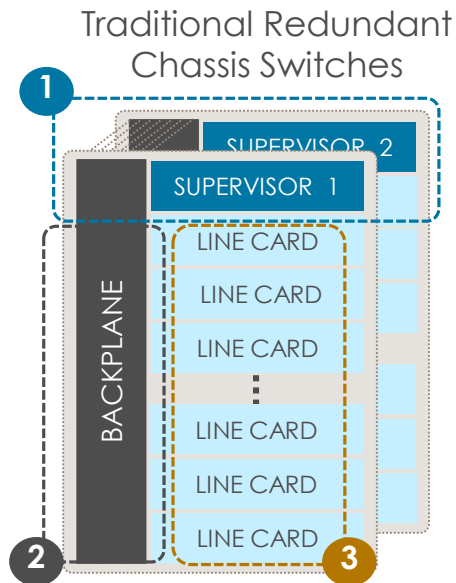
- Operational Efficiencies
- Consolidation of IT Resources
- Business Agility
- Increased Network Availability and Performance
- Enhanced Management and Visibility
- Improved Security

SDN řešení

Big Switch Networks

- Big Cloud Fabric
- Big Monitoring Fabric / BigSecure Architecture

BIG Cloud Fabric AS “ONE BIG SWITCH”



- Aggregation of smaller switches
- Single point of management

- Disaggregated Chassis Pair – One “Big Switch”
- Extend all the benefits of chassis to SDN Clos fabric

BIG Cloud Fabric AS “ONE BIG SWITCH”

Extending All the Benefits of Chassis Switches to SDN Clos Fabrics



Traditional Redundant
Chassis Switches

- ✓ User does not log into **Linecards**
- ✓ No L2/L3 protocols inside the Chassis
- ✓ No user access to **Backplane** or Fabric cards
- ✓ Single point of control and management from **Supervisor** cards

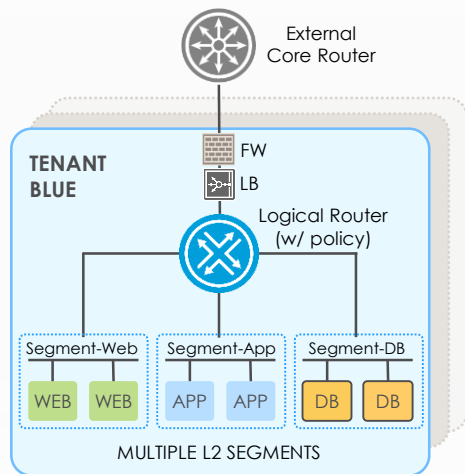


Big Cloud Fabric

- ✓ User does not log into **Top-of-Rack Switches**
- ✓ No L2/L3 protocols inside the Leaf-Spine Clos Fabric
- ✓ No user access to **Spine Switches**
- ✓ Single point of control and management from **Controllers**

Big CLOUD FABRIC: simple, simple, simple

Application Centric



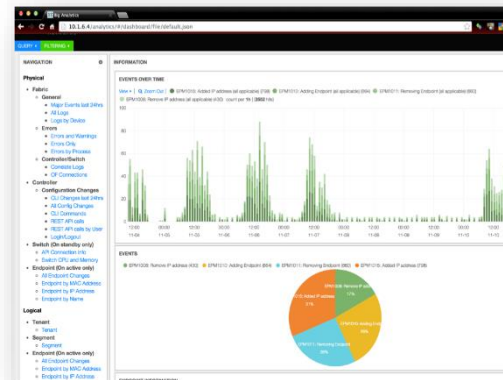
Logical Networking

Zero Touch Operations



GUI, CLI, REST APIs

Fabric Visibility



Analytics & Telemetry

FABRIC HITLESS UPGRADE

Best in class upgrade speed, no connectivity impact

Upgrading the software on a 38 switch / 16 rack pod takes about the same amount of time as upgrading the software on an iPhone

(single command, no fabric downtime, ~15 minutes)



VS.

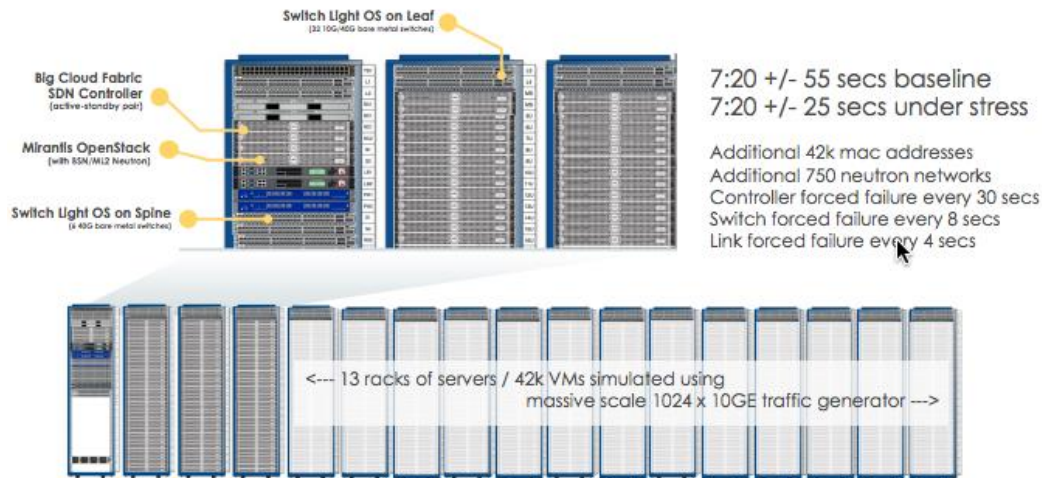


Chaos Monkey Resilience

Best in class HA at scale

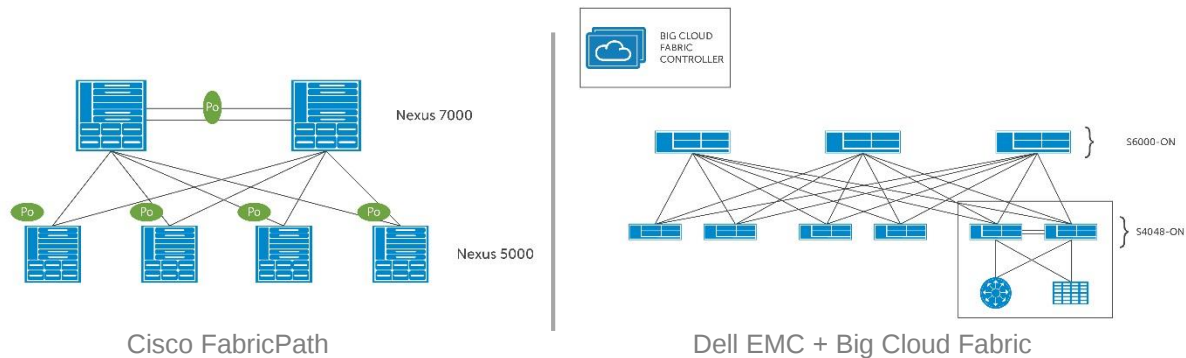
Chaos Monkey Testing: 42k simulated End-points/VMs of background load and 640+ forced component failures during the “under stress” test runs

- 32 leaf / 6 spine / 16 rack pod
- Controller fail-over every 30 seconds
- Switch fail-over every 8 seconds
- Link fail-over every 4 seconds



Conclusion: 640 component failures in 30 minutes with no impact on application performance

Cisco vs. Dell EMC + Big Switch Networks

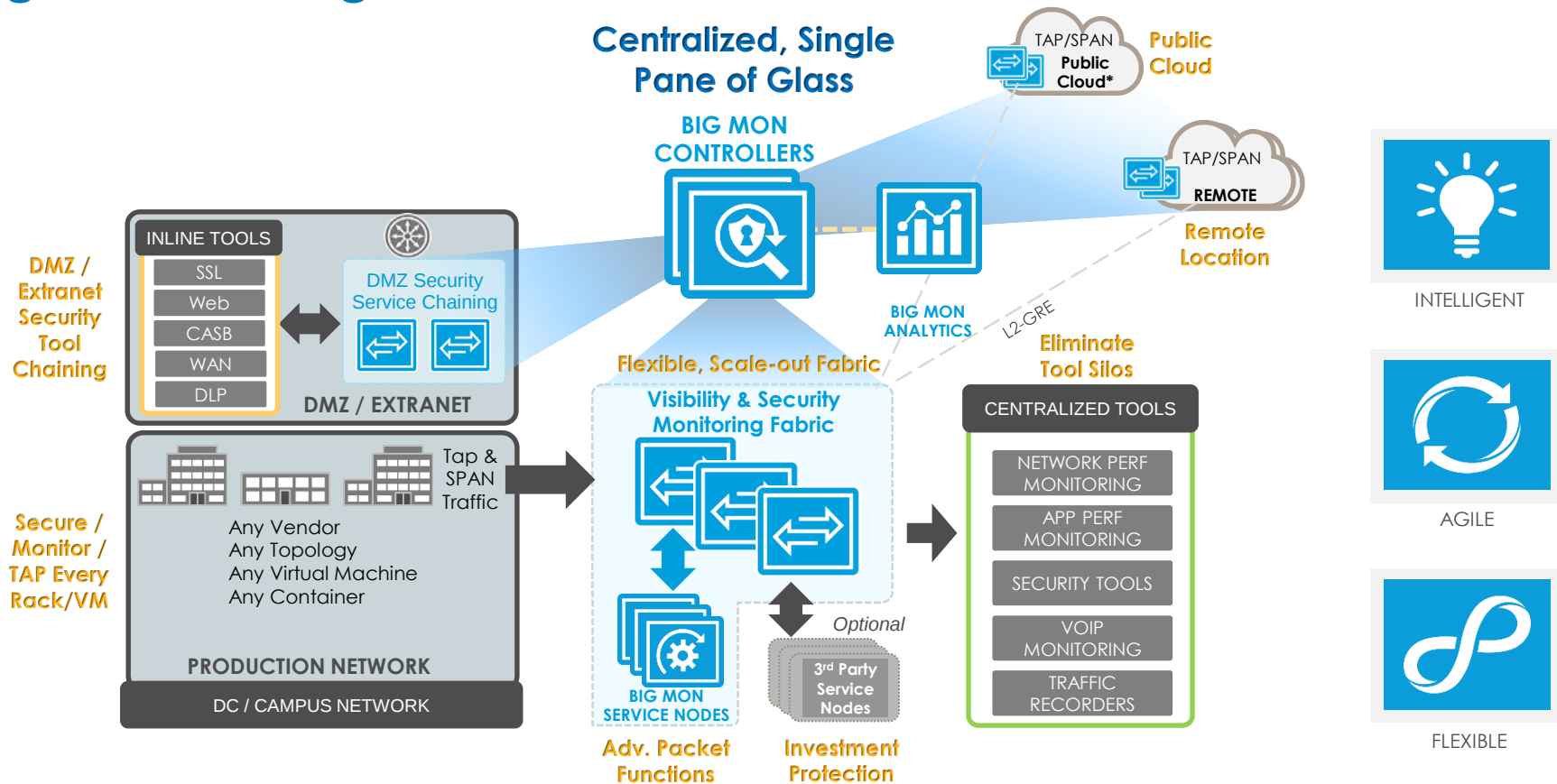


Savings

- 55% on space
- 72% on power
- 69% on cooling
- 46% on networking cost

	Big Cloud fabric	FabricPath
Configuration management points	1	44
Ubiquitous L2	Yes	Yes
L3 boundary	Everywhere	Only at top layer
Device image upgrade	Single hitless	Per device
Multi-tenancy	Yes	No
RESTful API	Yes	No
End-to-end analytics	Yes	No
VMware integration	Yes	No
OpenStack integration	Yes	No
Rack units	20	44
Power (Watts)	5233	19020
BTU/HR	17858	57040

Big Monitoring Fabric - At A Glance



TOP 10 Reasons for Big Monitoring fabric

1 Eliminate **Span Port Contention**

Prevent span port shortages from hindering troubleshooting & diagnostics or limiting choices on which tool may be used.

2 Monitor **1G-100G with 1G-40G Tools**

Enable lower b/w tools to support higher b/w links and higher b/w tools to monitor traffic aggregated from multiple lower b/w links.

3 Purge **Tool Siloes**

Provide access to traffic from a large number of network links to a centralized, shared (monitoring / security) tool farm.

4 Boost **Network Tool Utilization**

Ensure tools are fully utilized by policing data from many network access points to the tools.

5 Thwart **Tool Oversubscription**

Ensure only the data that matters is sent to the tools by aggregating, filtering and policing the appropriate traffic flows to the tools.

6 Scale-out **Network Visibility**

Gain access to many network access points (taps/spans); allow the entire network to be mapped to all tools.

7 Provide **Single Panel of Glass Mgmt**

Complete simple, centralized data access simplifying change control, security burden, and IT group contention.

8 Increase **Operational Agility**

Simplify sharing of network access points, data, and tools among IT groups.

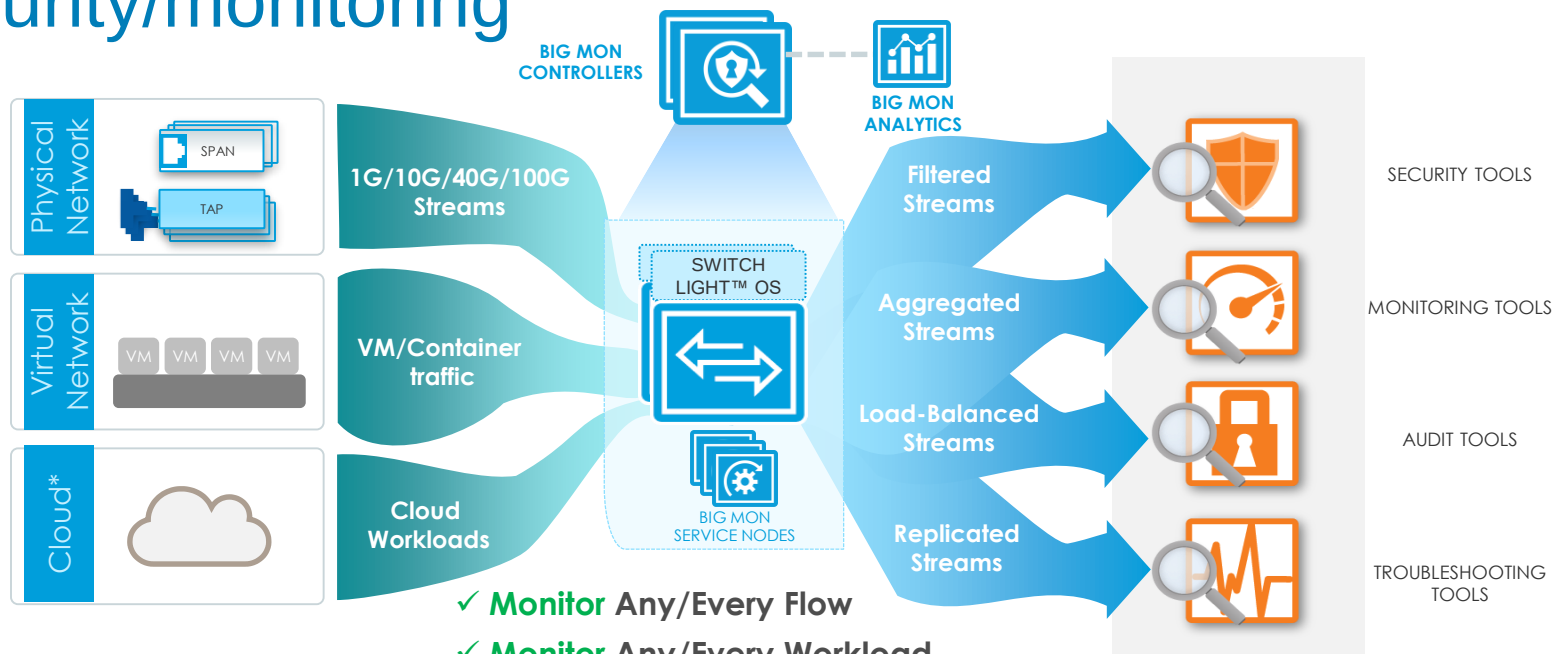
9 Reduce **Operational Costs**

Eliminate or delay tools upgrades, expedite troubleshooting and diagnostics, simplify data access burden, and enable infrastructure upgrades.

10 Open – **HW Vendor, Architecture**

We support any tool, any infrastructure, and any vendor with the next-gen simplicity, scalability, and reliability.

Cyber security demands pervasive security/monitoring



- ✓ **Monitor** Any/Every Flow
- ✓ **Monitor** Any/Every Workload
- ✓ **Monitor** Any/Every Location
- ✓ **Send to** Any/Every Tool
- ✓ **Convert** Any Media (Fiber/Copper)
- ✓ **Convert** Any Speed (1G – 100G)

NEC

- Programmable Flow Controller (PFC)
- PFC Security Adaptor

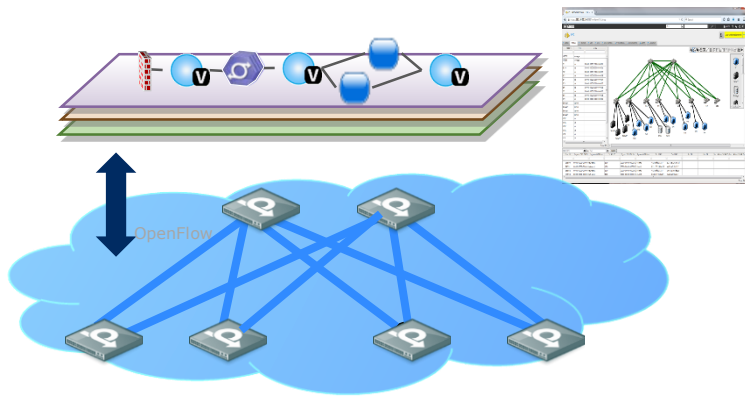
NEC ProgrammableFlow Controller

ProgrammableFlow

PF6800 ProgrammableFlow® Controller

Software Defined Network Automation and Virtualization for on-demand multi-tenant networks

600 Deployments Globally



The Simple Solution for Complex Networks

Dell - Internal Use - Confidential

Performance

- 1/10/40/100G L2/L3 Switching
- Distributed Virtual Routing
- Flexible/Any Network Topology
- ECMP/Policy Based Multipath
- Dynamic QoS

More Performance

Security

- Multi-Tenant Micro-Segmentation
- Smart ACLs
- Physical/Virtual Service Chains

Manageability

- Multi-Layer Network Virtualization
- Zero Touch Provisioning
- Network Topology Visualization
- End to End Flow Visibility

Easier to Deploy

Scalability

- Up to 10,000 Switches
- 640,000 L2 Networks
- 19M Endpoints

More Scalable

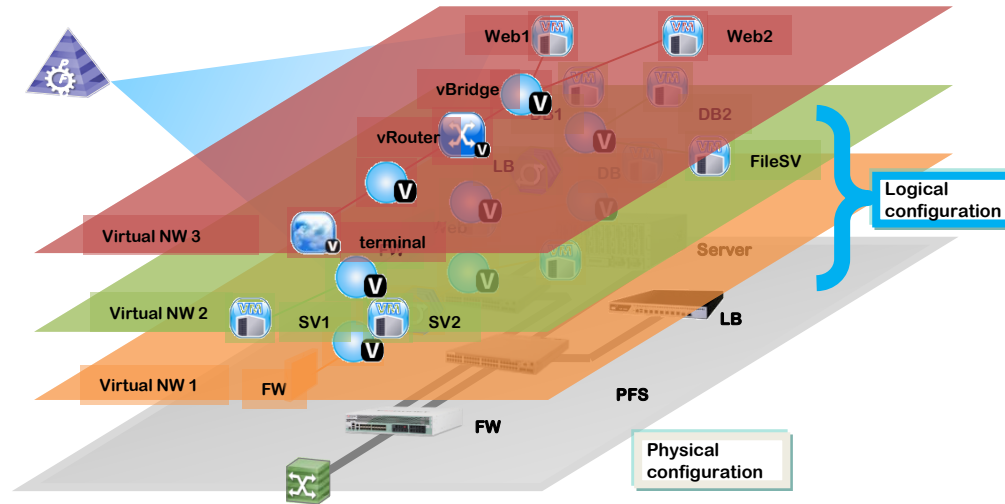
Availability

- Redundant Control Channel
- Highly Available Controller Cluster
- Multi Chassis LAG

Securing the Network through Virtualization

Benefits of Network Virtualization (Micro-Segmentation)

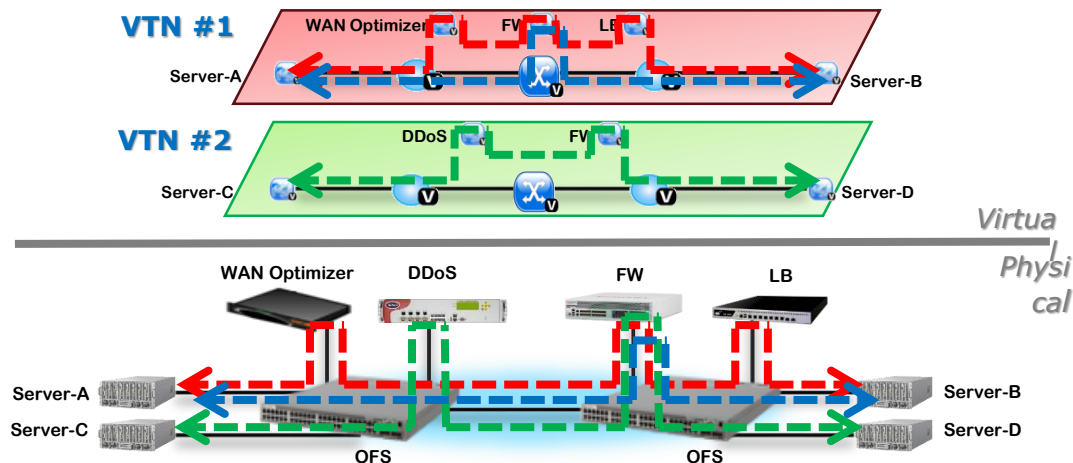
- Ease of Management
- Better Security
- Location free



Simplifying Network Service Provisioning

Benefits of Network Service Insertion

- Enables virtual network services to achieve benefits of SDI
- Quickly deploy new services
- Reduced application/capital cost through device consolidation

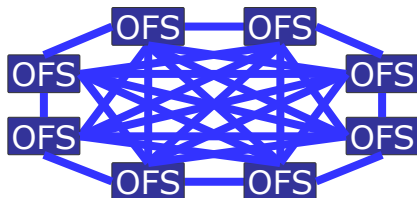


High Performance Network Design

Flexibility of Software Defined Networking Means Network Can be Designed to Meet Business Needs

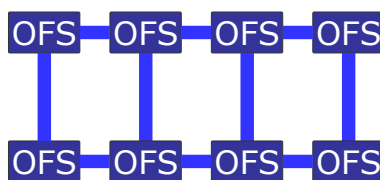
Full Mesh

Highest failure tolerance



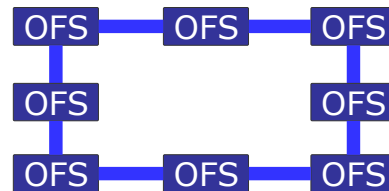
Ladder

Easy extension



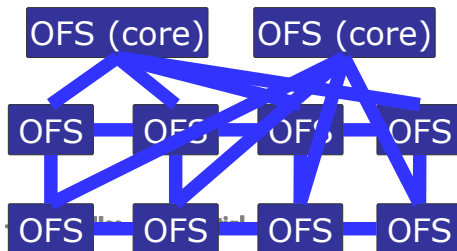
Ring

Saving ports/fibers



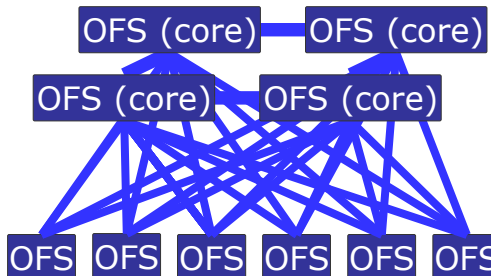
Suspension Bridge

Less bottleneck than Ladder with less hops



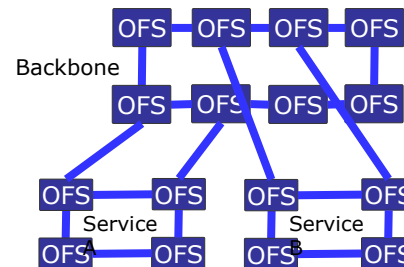
Fat Tree

Resolution of bottleneck by adding more core



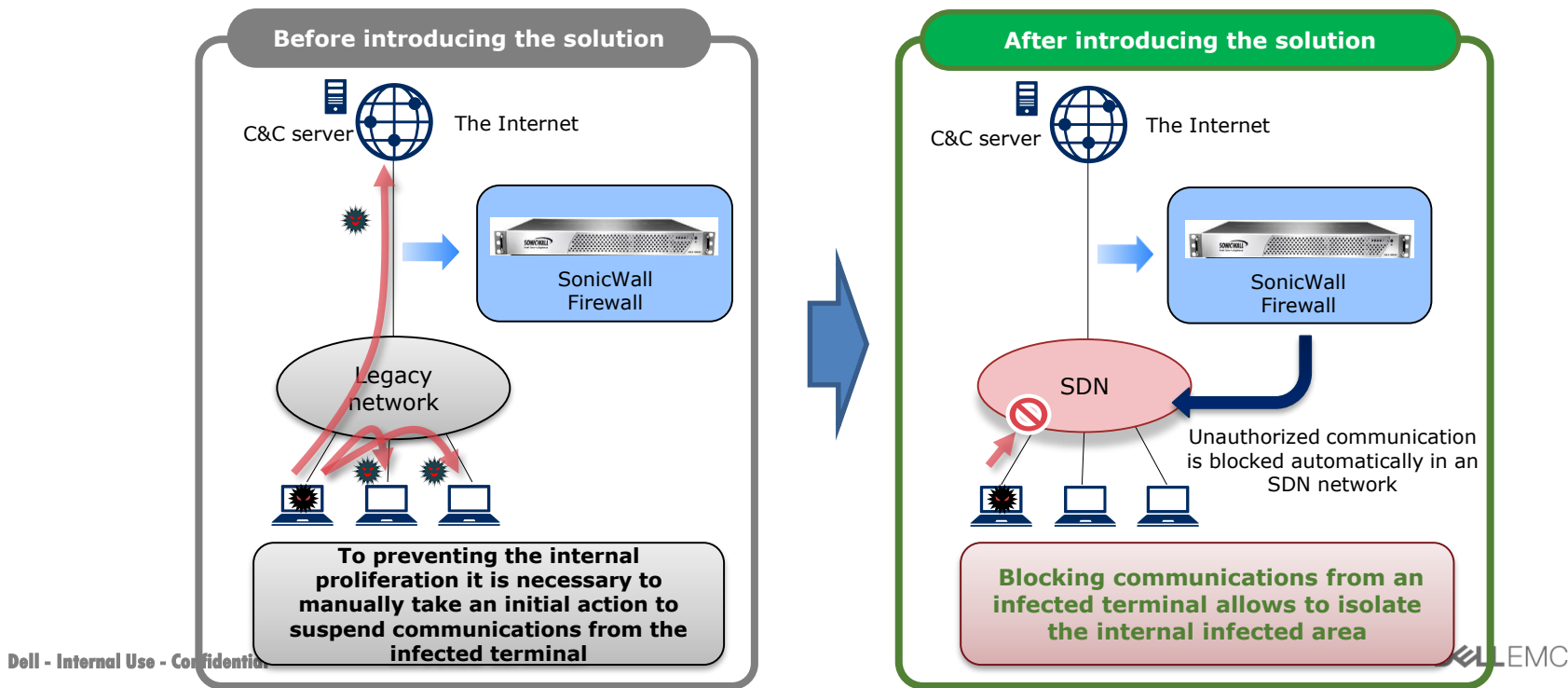
Multiple Ring

Flexible for rapid expansion of service



Advantages of Preventing the Internal Damage Spreading

SDN technology enables to block internal unauthorized communications, which cannot be prevented by a security appliance itself, at the entrance of an SDN network, and thus prevents the internal proliferation



Shrnutí

- Transformace IT
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- SDN řešení

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Learn more:
dell.com/networking