



Embrace the Future of Data Center Networking

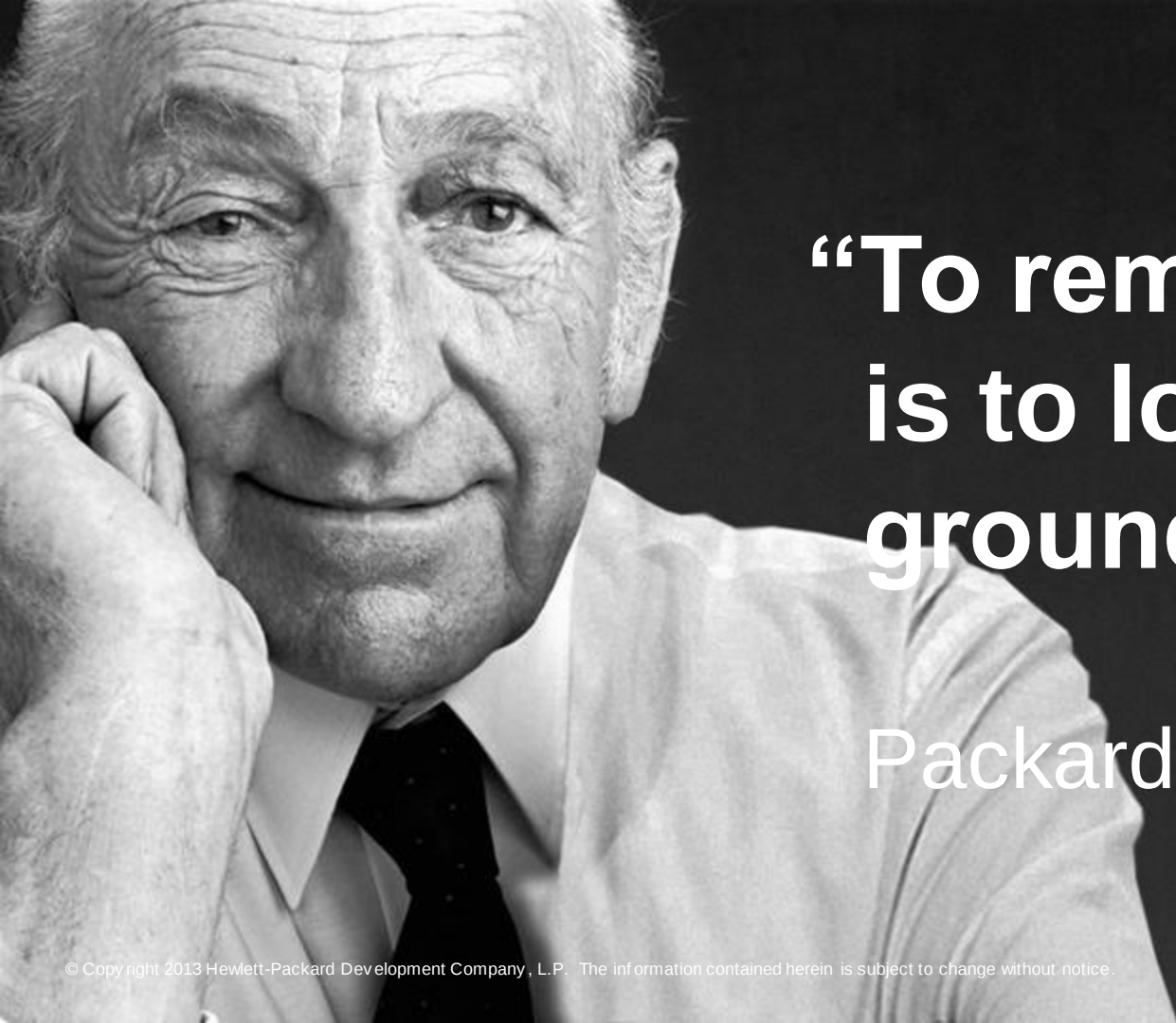
Craig Hinkley

Vice President and General Manager,

HP Networking Americas

3 July 2013





**“To remain static
is to lose
ground.”**

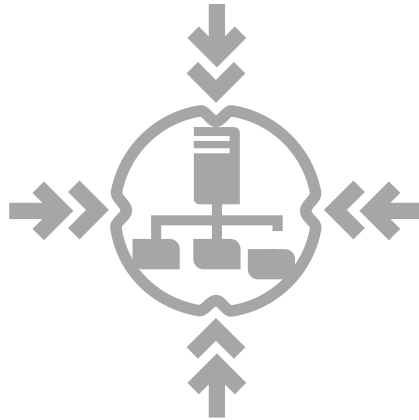
David
Packard

Legacy data center networks are at a breaking point

Complex



Constrained



Manual



What's driving change in higher education data center networks

Big Data



Security



Cloud



HP Software Defined Data Center

Software Defined Servers

Project Moonshot



Software Defined Storage

HP StoreVirtual VSA



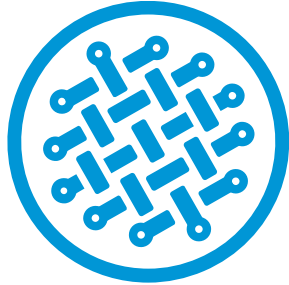
Software Defined Networking

HP SDN



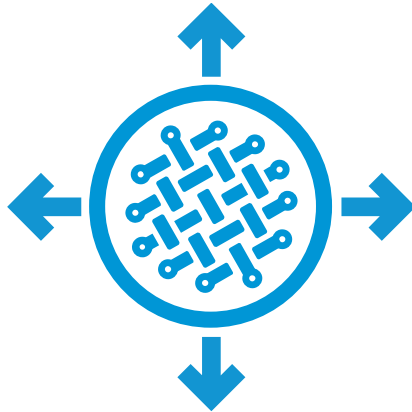
FlexFabric – the future of data center networking

Simple



Up to 75% simpler

Scalable



Up to 2X fabric scaling

Automated

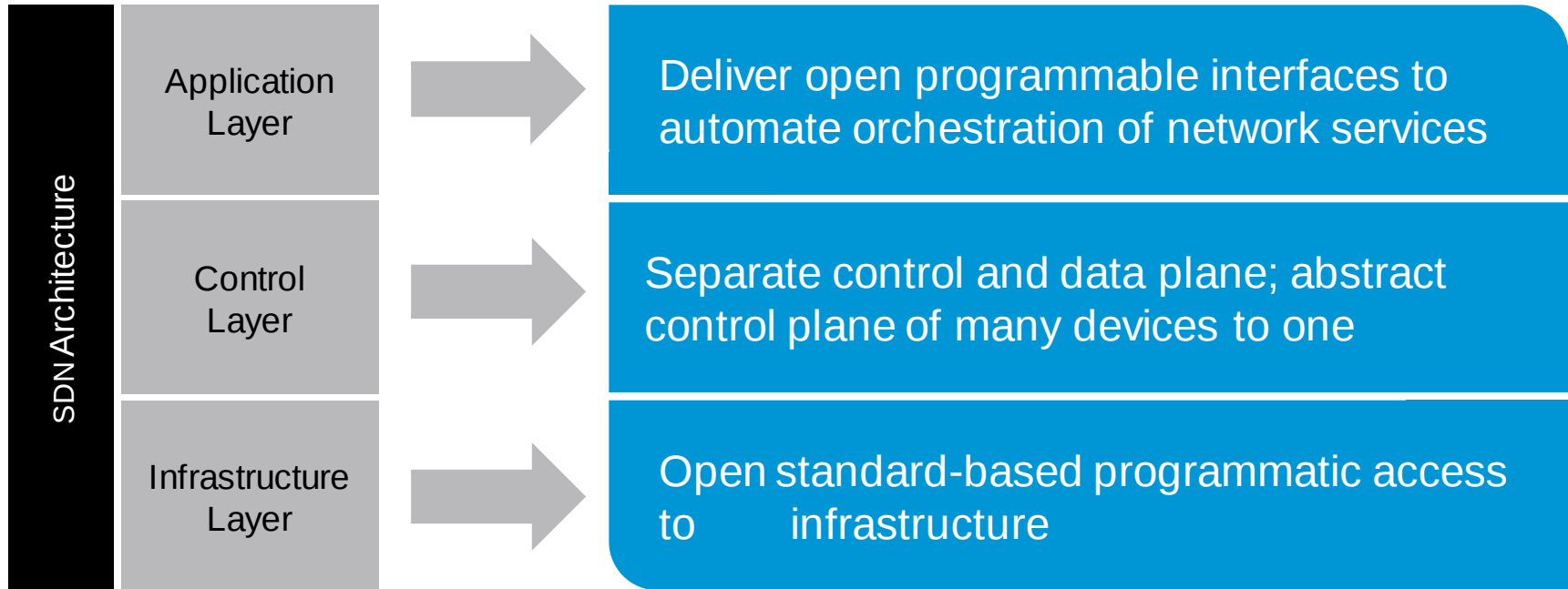
HP Virtual Application Networks



Months to minutes

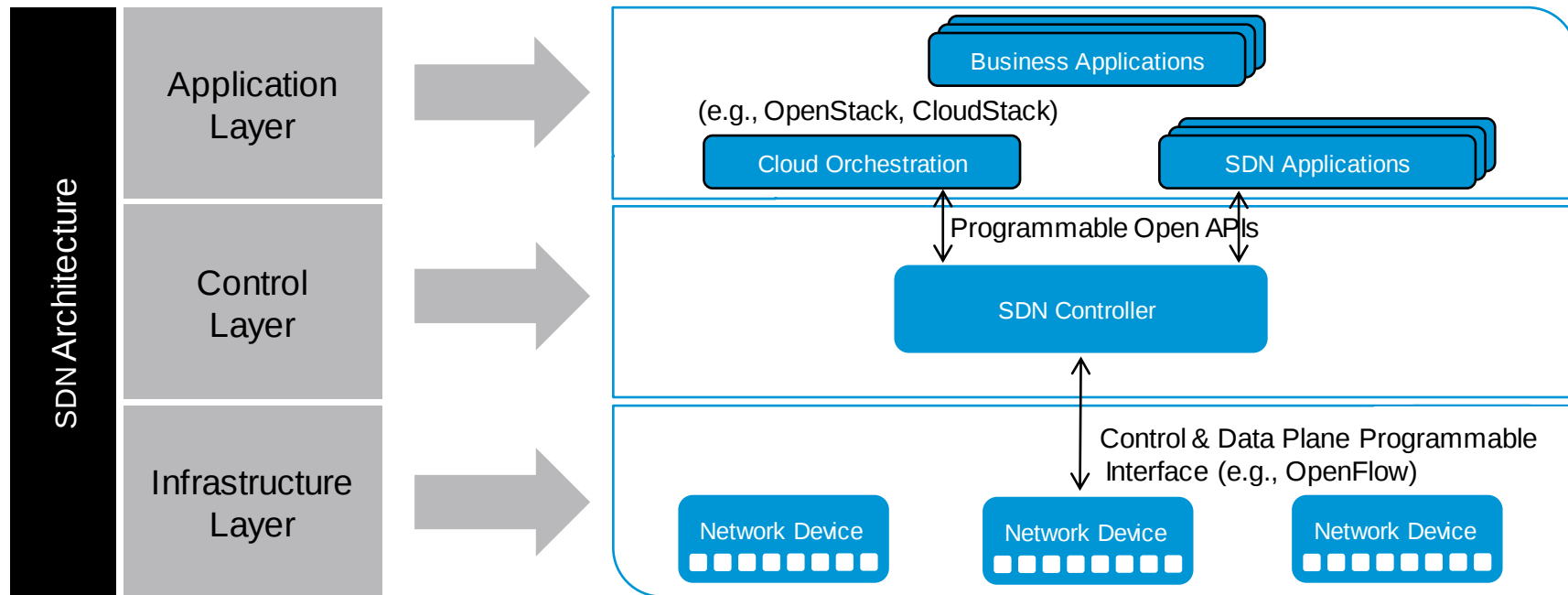
HP delivers SDN to achieve agility

Ability to apply business logic to network behavior in dynamic fashion



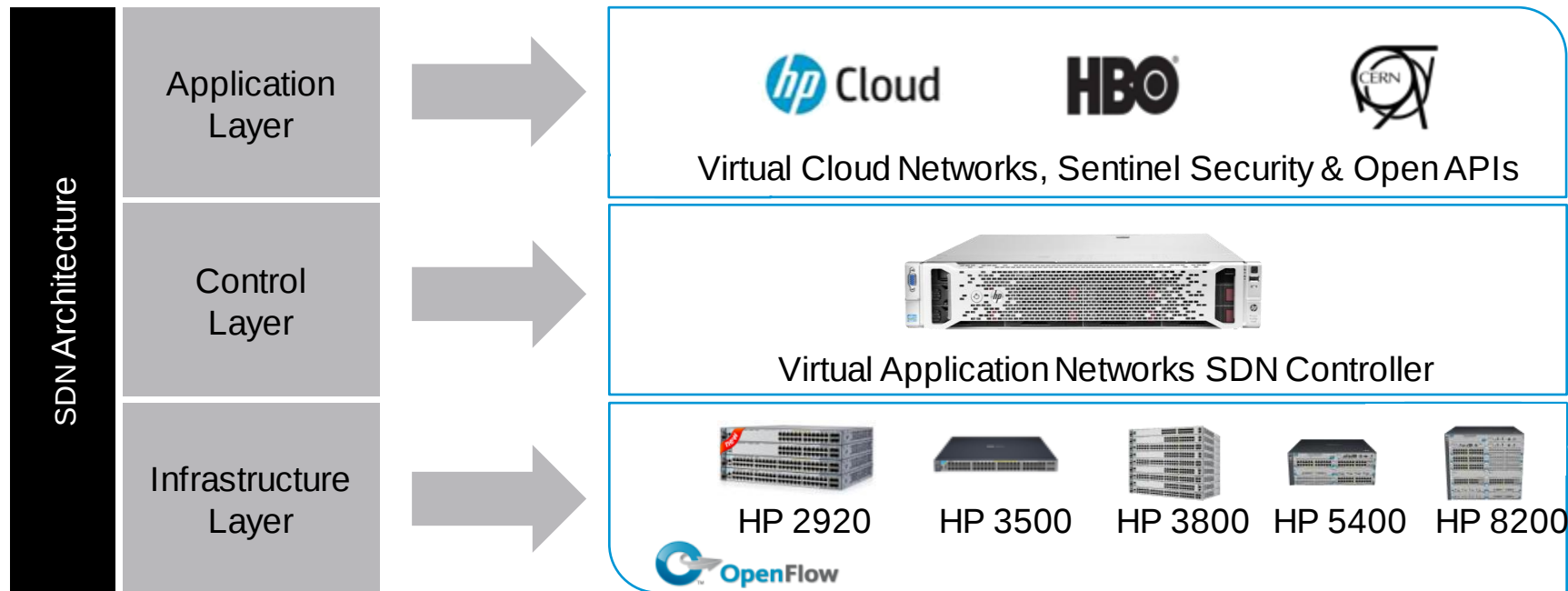
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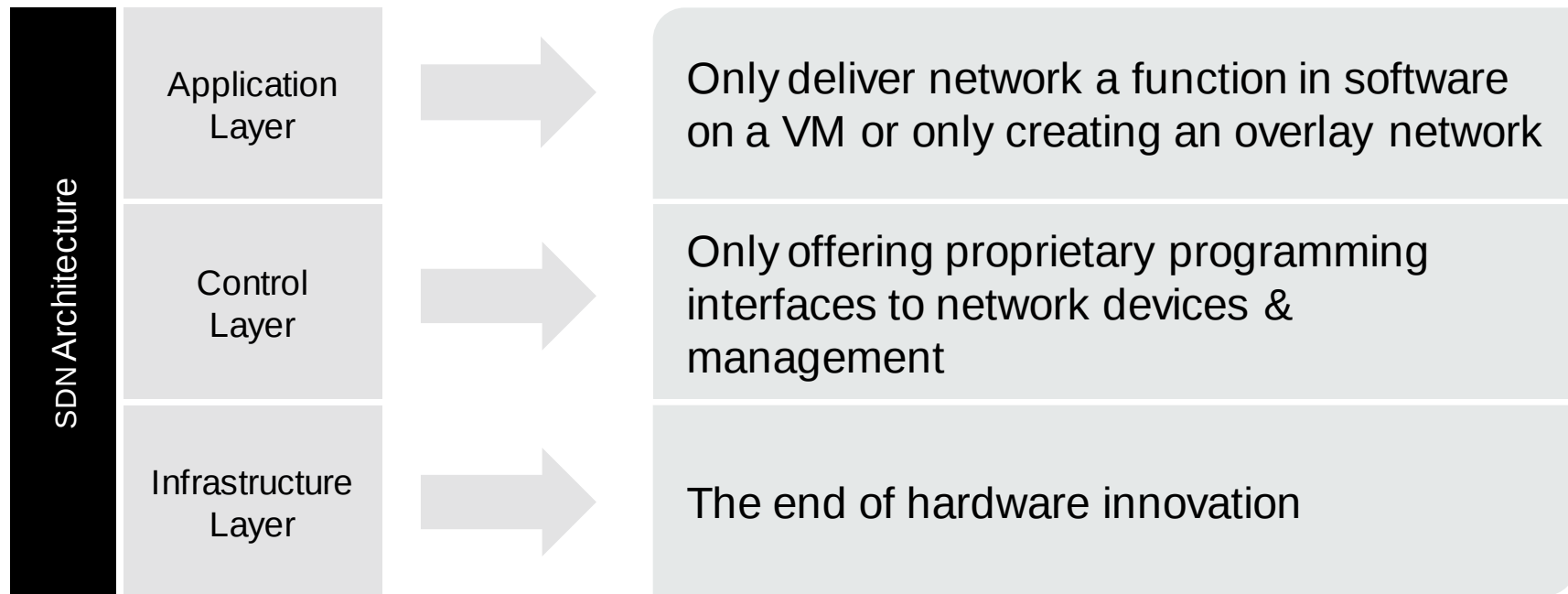


HP SDN solutions delivering network agility

Ability to apply business logic to network behavior in dynamic fashion



Debunking some SDN myths



HP Software Defined Networking in the data center

HP will be the only vendor pursuing an **SDN strategy** which **comprehends** the entire path from **user-to-datacenter** and the entire technology stack from **infrastructure-to-management**.

Service-Centric Management

Extensible Application Ecosystem

Logically Centralized Network OS

FlexBranch

FlexCampus

Flex Fabric

Comprehensive SDN Portfolio



HP commitment to software-defined networks

Software-defined Network Leadership

Open Network
Foundation

OpenFlow
Leadership

NFV
Leadership

OpenStack
Leadership



“Believe you can change the world”

**SDN is a
transformation
in networking**

**HP Networking
is leading this
transformation**

**We deliver the
data center
solutions
required for
big data,
security, cloud**

**We're investing
in architectures
to meet your
needs today
and into the
future**





Make it matter.

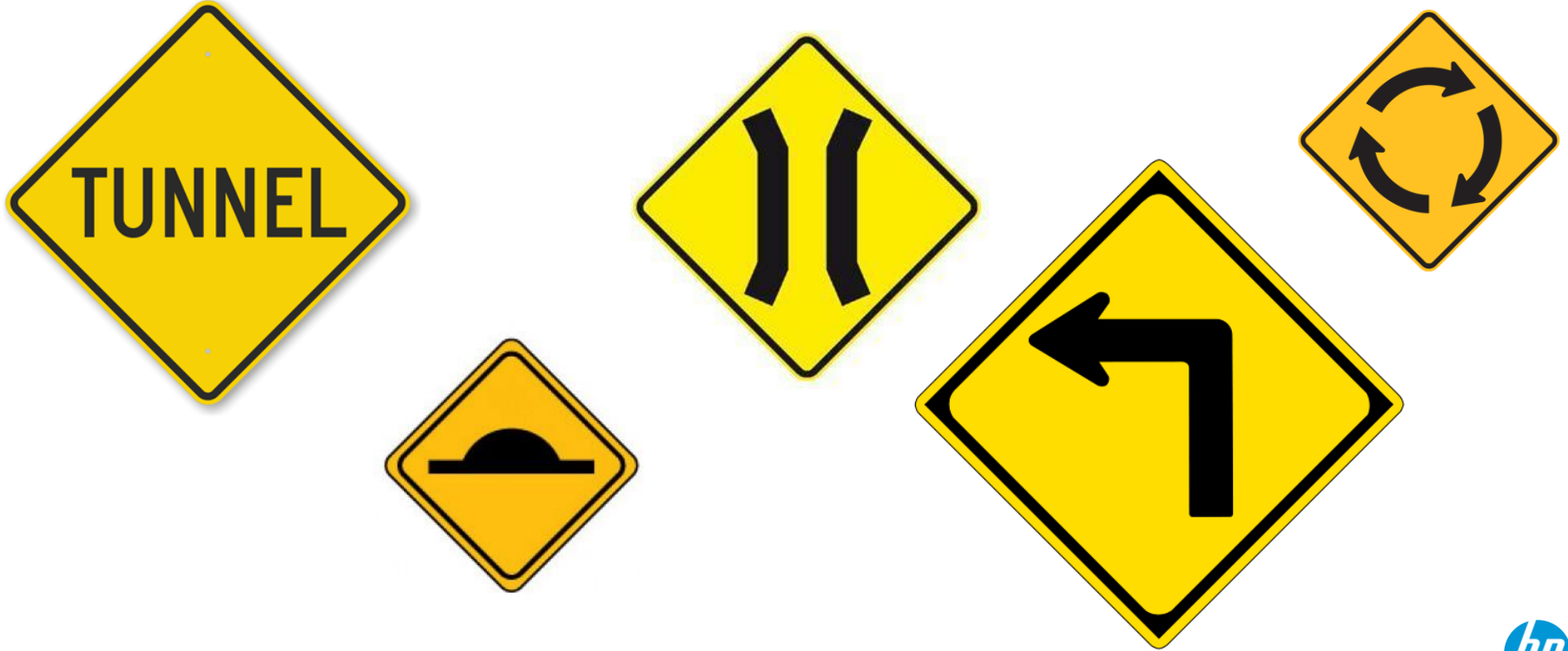


RMIT University



Typical University Networks

If your drive to work was this complex, wouldn't you take a different path



University Networks with SDN

Getting out of the way

**All users can
be treated
together**

**Dynamically
treat traffic
even if it is
unknown**

**Traffic will
route direct
unless it
needs
treatment or
is unknown**

**Stop worrying
about who
owns the
device and
focus on what
its doing**



SDN Applied

Conditional routing - Http traffic to a well known site



Rule 1: Route http direct to proxy

SDN Applied

Conditional routing – Unknown traffic to a new research resource



Rule 3: Res. A Is Safe - Route direct



Rule 2: Route unknown to IDS



University Networks with SDN

Benefits – Reduce costs, enable innovation and support collaboration

Reduce Costs

Removing hard-wired configurations

Down-sizing security infrastructure

Enable Innovation

Removing restrictive configurations

Support Collaboration

Allowing more device types

Supporting user preferred collaboration channels



Thank you



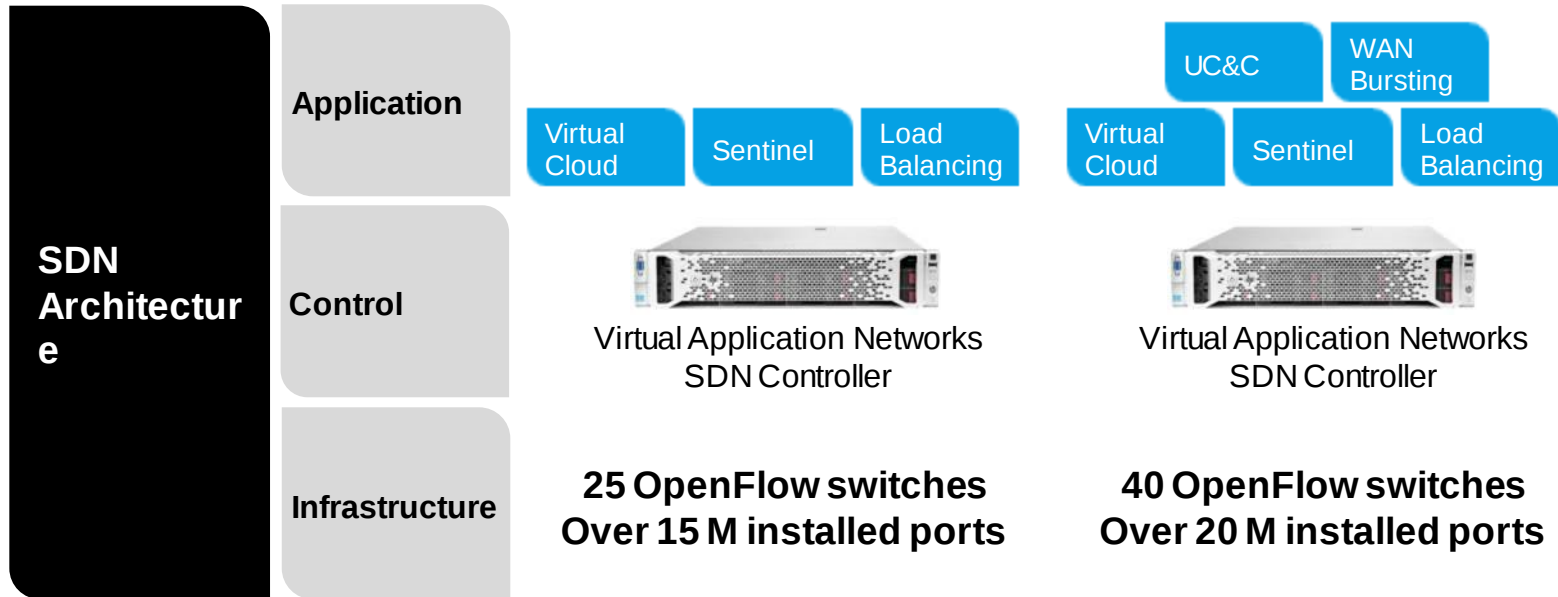
HP leads in software-defined networking



*Winner of prestigious
Ethernet Innovation Award
for Sentinel Security application*

2H 2012

1H 2013

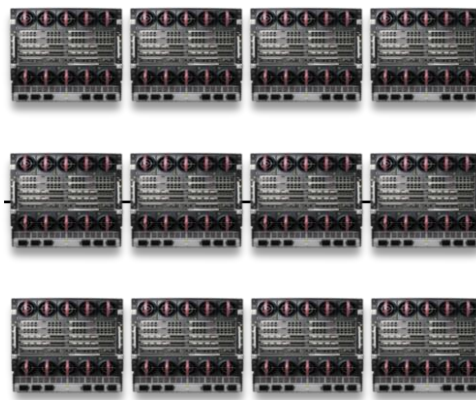


HP FlexFabric solutions can double your fabric capacity

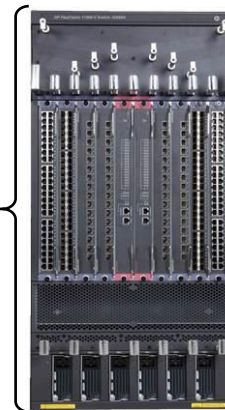
improve virtual Machine mobility performance and increasing reliability

- FlexFabric 11900 provides 34% higher GbE port density at 31% lower cost per port¹
- Can connect up to 92 C-Class Servers to one 11900 switch
- FlexFabric 5900 delivers nearly 60% improvement in virtual machine mobility performance²

C-Class Blades with
Virtual Connect FlexFabric
Modules



FlexFabric 11900
End-of-Row Switch



FlexFabric 5900
Top-of-Rack
Switch



¹FlexFabric 11908 compared with Nexus 7009 with M2 Modules

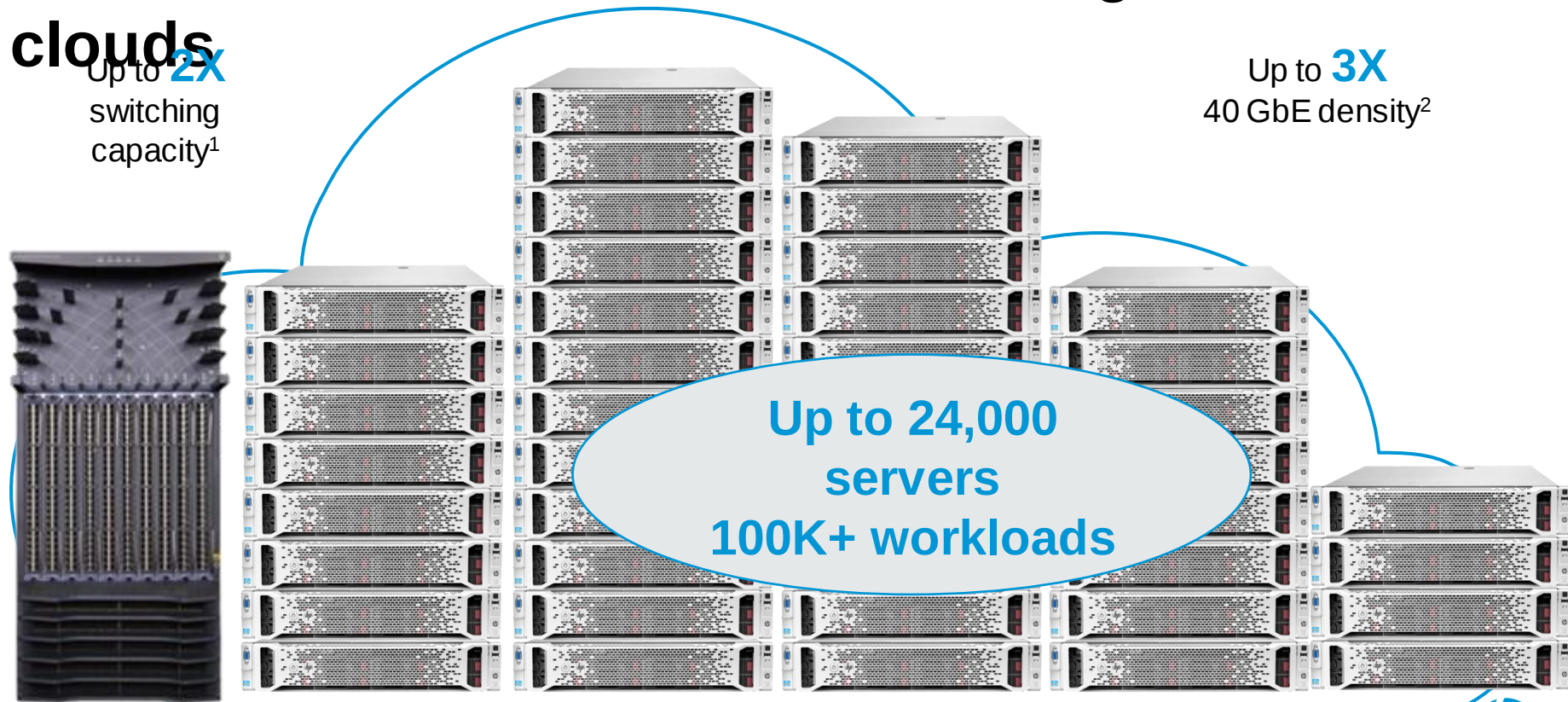
²Network Test report, August 2011



FlexFabric 12900 Switch enables large-scale clouds

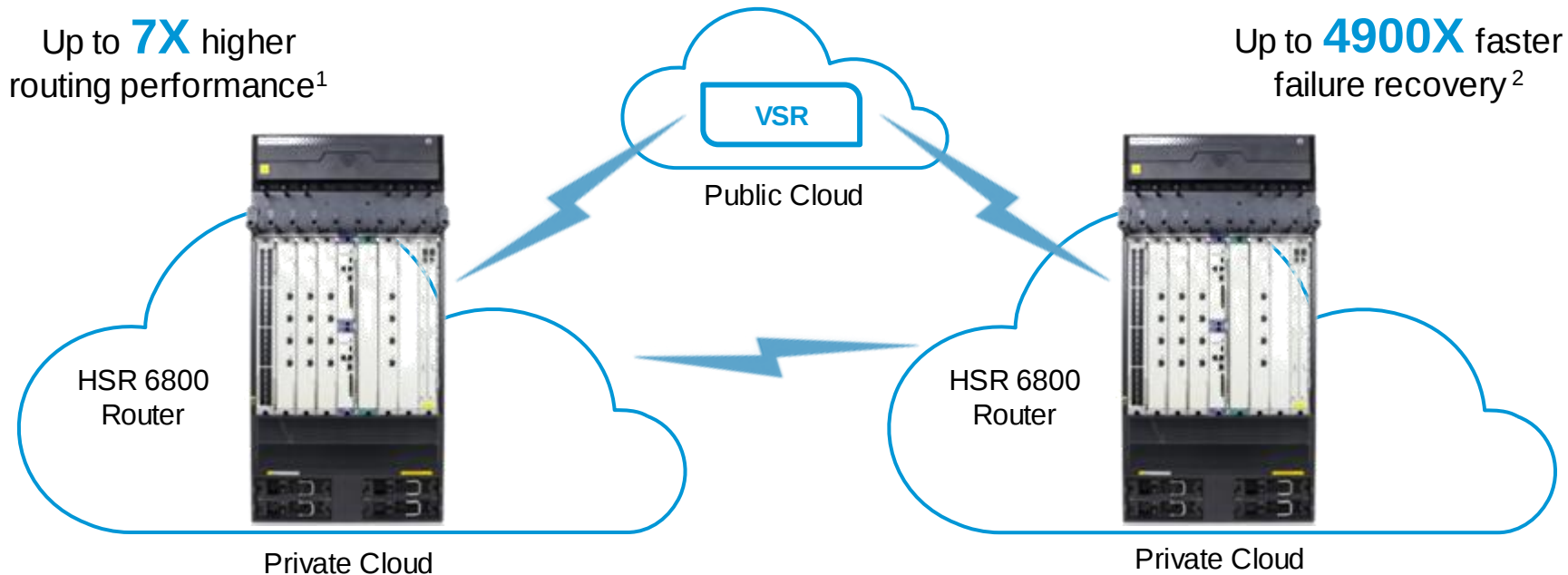
Up to **2X**
switching
capacity¹

Up to **3X**
40 GbE density²



Physical and virtual routers for clouds

Virtual Services Router delivers Network Function Virtualization technology



New innovations for data center networks

Simple

FlexFabric Virtual
Switch 5900v with
EVB/VEPA



FlexFabric 5900 Series Switch
with EVB/VEPA

Scalable

Virtual Services Router



HP FlexFabric 11900 Switch HP FlexFabric 12900 Switch HSR 6800 Router

Automated

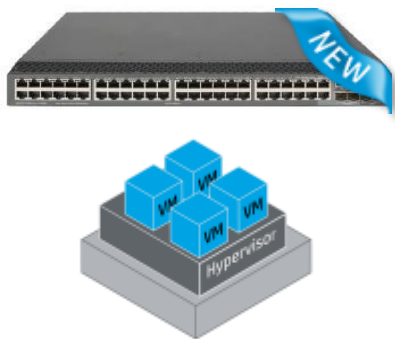
OpenFlow 1.3

IMC SDN Manager¹

¹Coming soon

FlexFabric Virtual Switch 5900v with EVB/VEPA

Delivers standards-based automated VM network policy management



- **Unifies** physical & virtual data center fabric
- **Advances** networking beyond basic hypervisor vSwitch
- **Simplifies** operations with separation of switch &

server functions
Single policy &
management
for physical & virtual

Zero dedicated
management
appliances

¹Compared with Cisco Nexus 1010 Virtual Services Appliance



FlexFabric 11900 switch series

Delivers leading 40 GbE End-of-Row scaling for server-to-server traffic flows



- Industry's first **TRILL/SPB** for scalability
- Industry's first **OpenFlow 1.3-enabled** for SDN
- **Cost-effective** scale-out for Hadoop environments

50% lower
latency¹

Up to **31%** lower cost
per 40 GbE port²

Up to **34%** higher
40 GbE density³

HP internal comparative analysis based on Cisco public web site. ¹FlexFabric 11908 compared with Nexus 7010 with F2 modules ²FlexFabric 11908 compared with Nexus 7010 with M2 modules ³FlexFabric 11908 compared with Nexus 7009 with M2 modules. All data HP internal comparative analysis based on Cisco public web site



FlexFabric 12900 switch series

Sets new benchmark for core data center fabric scaling



- Ideal for **large-scale cloud deployments**
- First core **OpenFlow-enabled** switch for SDN
- Industry's first **TRILL/SPB** for scalability

Up to **2X**
switching capacity¹

Up to **3X**
40 GbE density²

400% lower
power per port²

HP internal comparative analysis based on Cisco public web site. ¹FlexFabric 12916 compared with Nexus 7018 with F2 modules. ²FlexFabric 12910 compared with Nexus 7010 with M2 modules



HSR 6800 router series – breakthrough performance



- Comprehensive **routing**, **firewall** and **VPN**
- High-density WAN router – **32 10 GbE ports**
- Carrier-class reliability with IRF – **687 μ s recovery**

Up to **4900X** faster
failure recovery¹

Up to **7X** higher
routing performance²

Up to **5X** higher
firewall scaling²

¹Network Test: "HP HSR6800 Router Series: Data Center Scalability and Reliability," April 2013. ² HSR 6808 vs. Cisco ASR 1000 Series. HP internal comparative analysis based on Cisco public web site.



Virtual Services Router

Industry's first Network Function Virtualization (NFV) technology

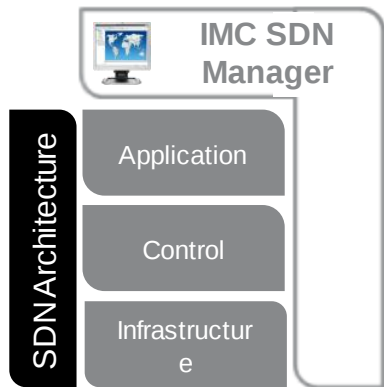


- Deployment **flexibility** across branch, data center and cloud
 - **Agile services** delivery for faster time to revenue
 - **Virtualized router** for multi-tenant, hosted public clouds
- | | | |
|---|---|--|
| 10X faster
time to revenue ¹ | Up to 87% operating
cost reduction ¹ | 50% less
power & rack space ¹ |
|---|---|--|

¹Compared to physical routers

IMC Virtual Application Networks SDN Manager

Delivers the industry's first comprehensive SDN management tool



- One application for managing **SDN** & **traditional networks**
- **Configuration**, **monitoring** & **policy mgmt** for all SDN layers
- **10X** acceleration of **SDN Controller** & **3X** faster **OpenFlow switch** troubleshooting¹ At least **50%** less management complexity¹

¹HP Internal Research