2013 ONS Tutorial 2: SDN Market Opportunities

SDN Vendor Landscape and User Readiness

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Goals & Non-Goals

- Goals:
  - Describe the movement to software based IT functionality
  - Discuss the overall SDN strategy and the go to market SDN strategy of representative vendors – identify differences and points of emphasis
  - Describe the current enterprise SDN market and predict how that will change over the next 2 years
- Non-Goals:
  - To be exhaustive
  - To read every bullet on every slide; e.g., Go to market strategies

Agenda

- The Shift to Software
- Market Strategies
- State of the Market & Predictions

The Traditional Data Network

- Network functionality is typically implemented either in a dedicated appliance or in an ASIC
- The appliances are proprietary
- Each appliance is configured individually
- Policy is often administered using a proprietary CLI or API
- Scripting languages can automate some tasks
- Provisioning, change and de-provisioning are very time consuming and error prone

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The Shift to Software

- Many traditional network functions that were once done in dedicated appliances are now a software application running on a general purpose CPU.
- This includes:
  - WAN Optimization Controllers
  - Application Delivery Controllers
  - Routers
  - Firewalls
  - IDS/IPS

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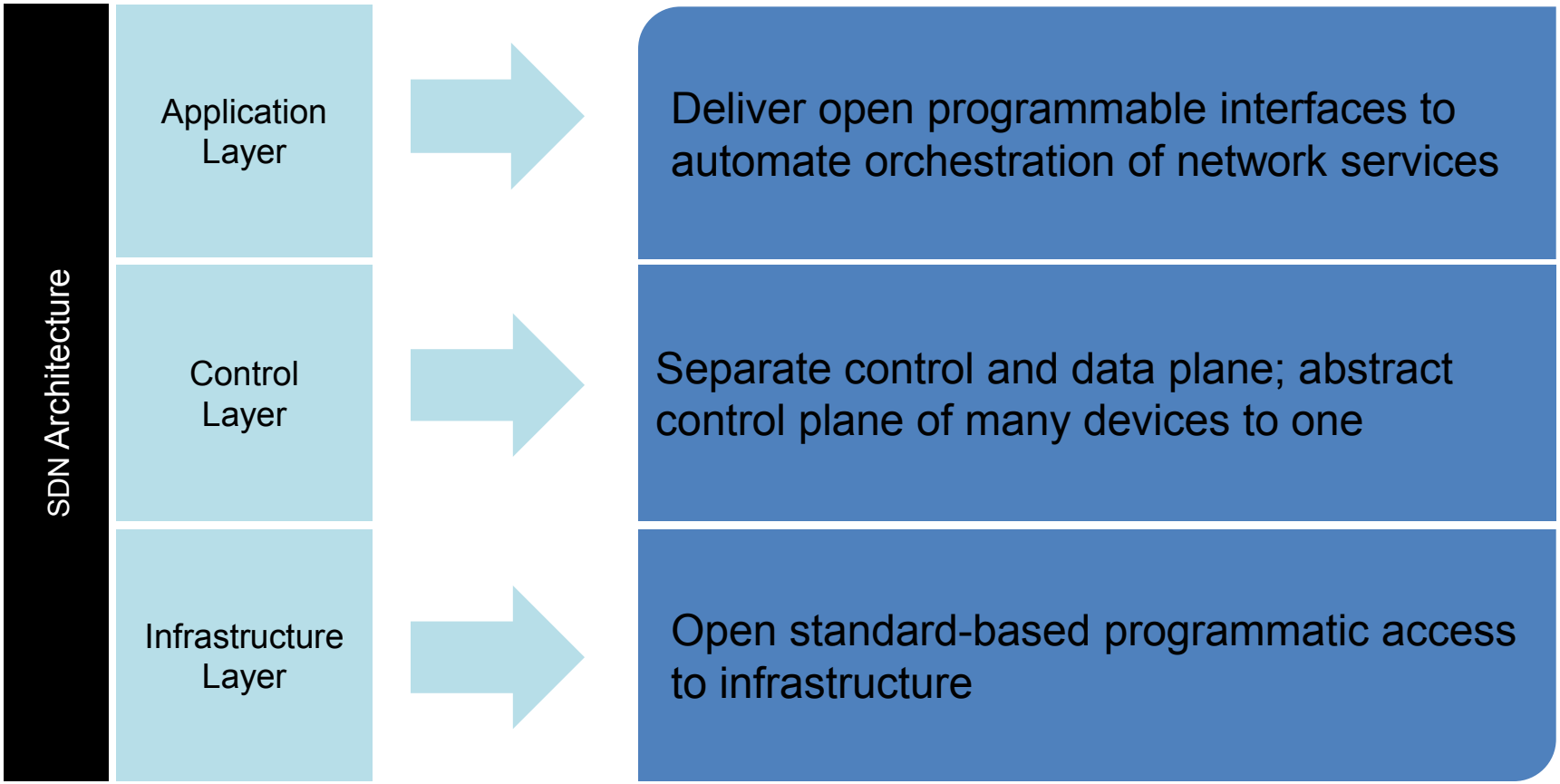
HP SDN Strategy



HP SDN Go To Market

SDN Architecture

Application Layer

Control Layer

Infrastructure Layer

Management

hp Cloud HBO CERN

Virtual Cloud Networks, Sentinel Security & Open APIs

Virtual Application Networks SDN Controller

HP 2920

HP 3500

HP 3800

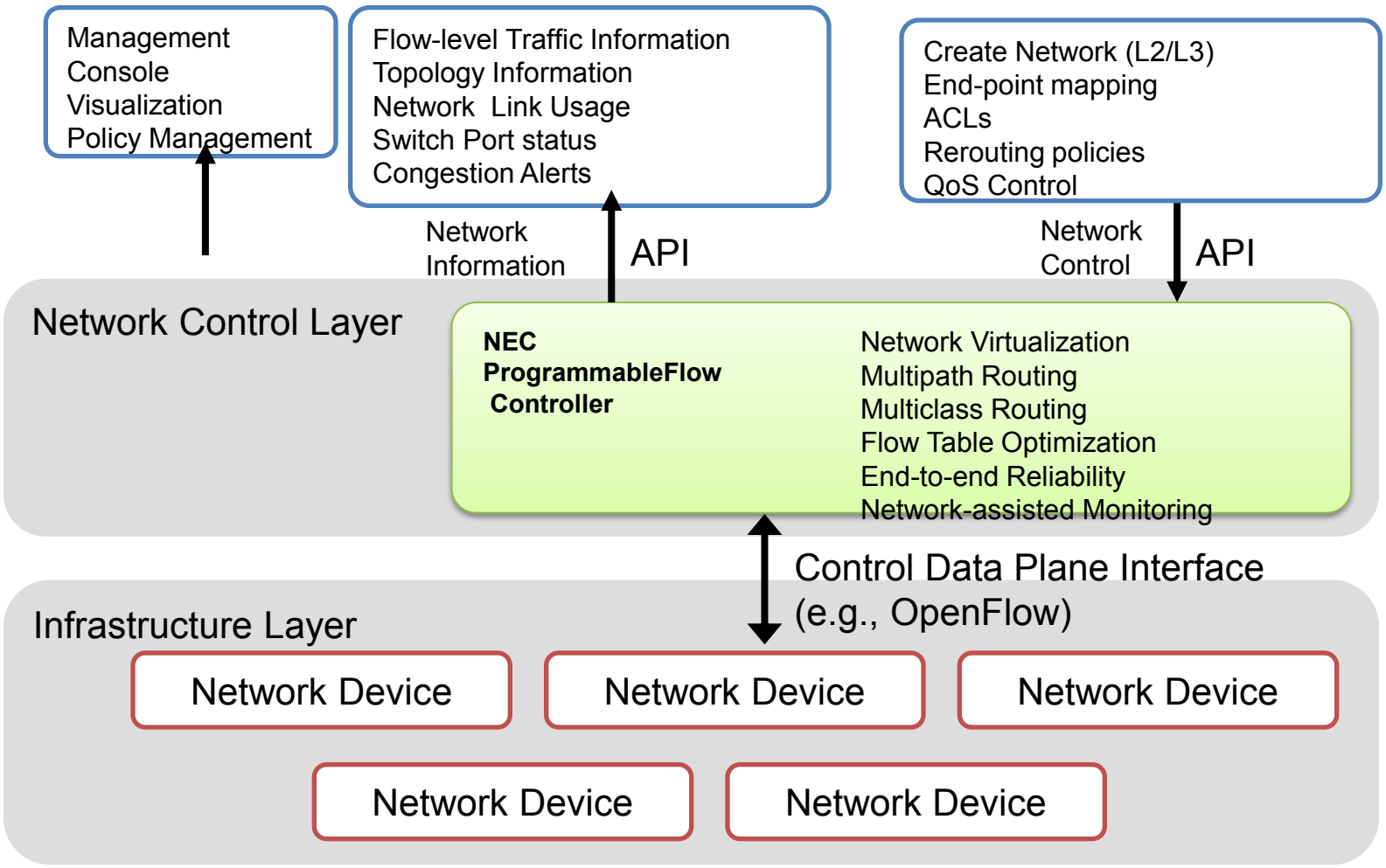
HP 5400

HP 8200

OpenFlow Support on 29 Switches

Intelligent Management Center (IMC) & Virtual App Networks Manager

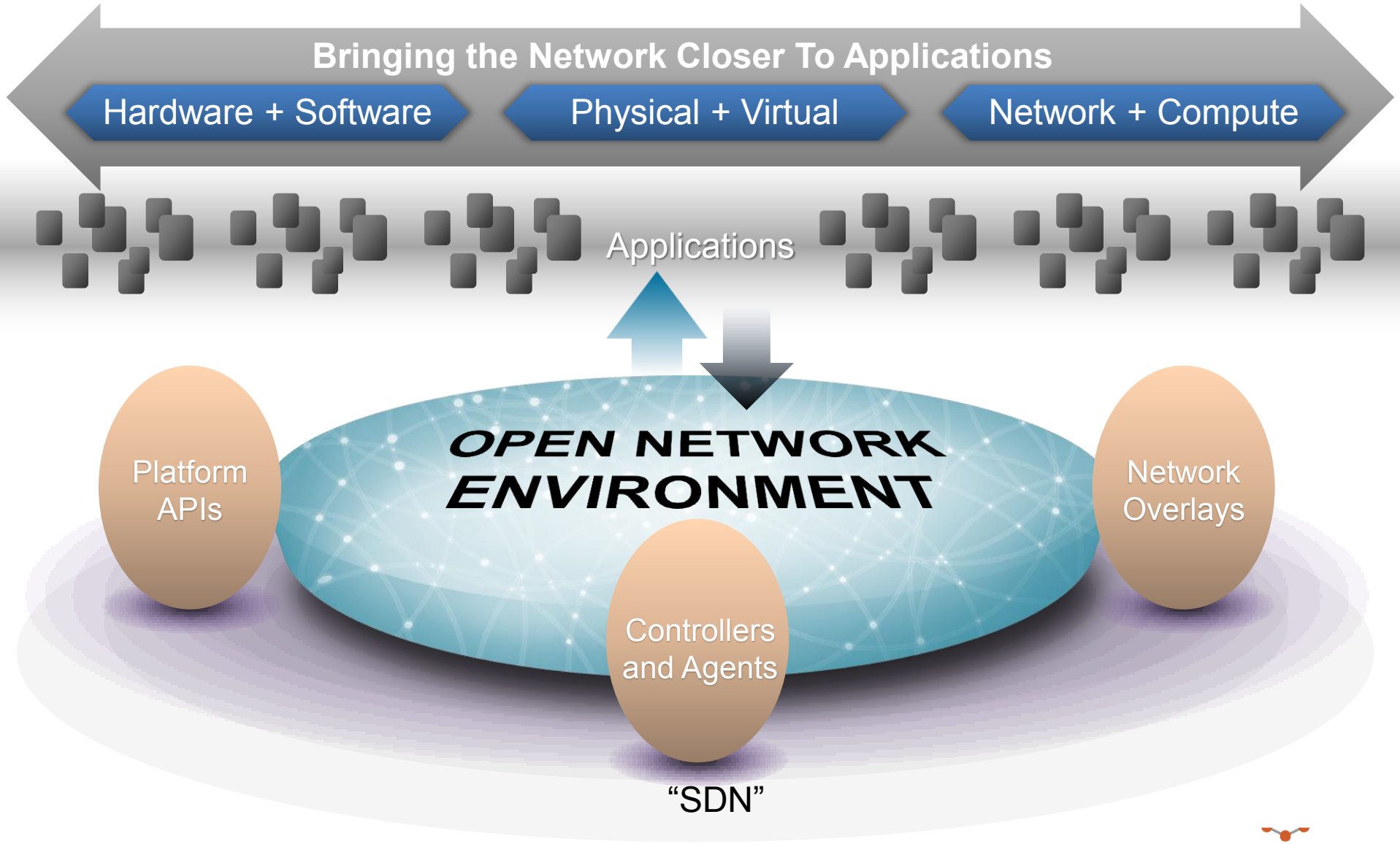
NEC SDN Strategy: ProgrammableFlow



NEC Go to Market

- PF5240, PF5248 Hybrid SDN Switches
- PF5820: 10 GbE Pure OpenFlow Switch
- PF1000: Virtual SDN switch for HyperV environments
- PF6800: SDN Controller
- SDN Professional Services:
  - Design, installation, monitoring
  - SDN Systems integration
- Relationships with IBM and Brocade

Cisco's SDN Strategy



Cisco ONE – Execution Progress

Expanded Platform Support (as of Feb 1st, 2013)

Platform APIs

onePK Platforms

- ISR G2 1H13
- ASR 1000 1H13
- ASR 9000*
- Nexus 300 1H13
- Nexus 7000*

Controller/Agents

ONE Controller 1H13

OpenFlow Agents

- Catalyst 3000*
- Catalyst 6500*
- Nexus 3000 1H13
- Nexus 7000*
- ASR 9000*

Overlay Networks

CSR 1000V 1Q13

Nexus 1000V Updates

- N1KV Hyper-V 1H13
- N1KV KVM*
- VXLAN Gateway 1H13

Cisco Edition of OpenStack 2Q13

N1KV InterCloud

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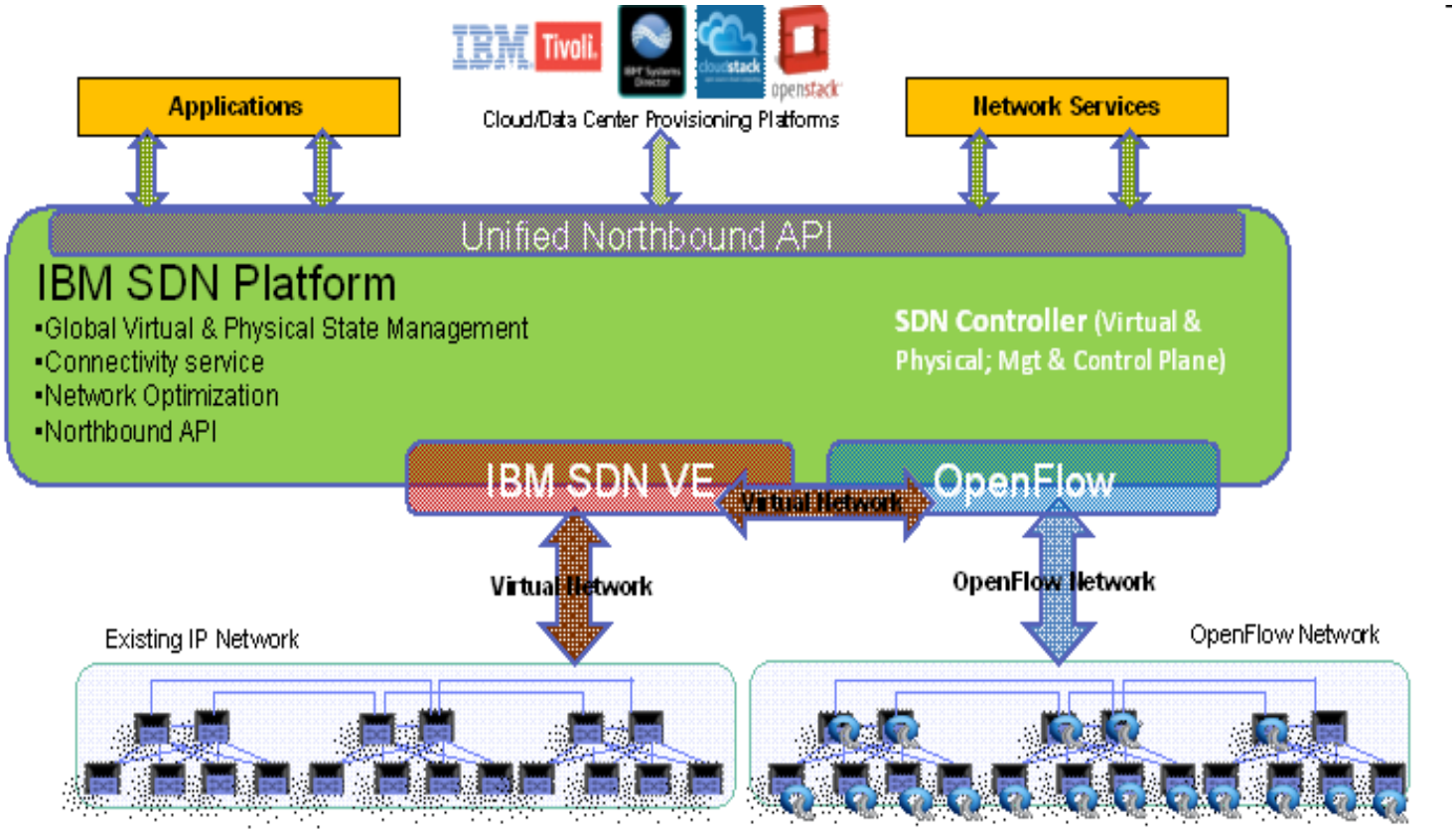
IBM's SDN Strategy



IBM's SDN Go To Market Strategy

- Architecture
  - All IBM switches are OpenFlow compliant
  - IBM's OpenFlow controller is OpenFlow compliant
  - Uses VXLAN for virtual overlays
  - Uses proprietary control plane for overlays
- Products
  - OpenFlow switches: Oct. 2011
  - Edge Virtual Bridging (802.1Qbg): Jan 2012
  - Distributed vSwitch: Feb. 2012
  - OpenFlow controller: Nov. 2012

Alcatel-Lucent Strategy (Enterprise BU)

Programmability

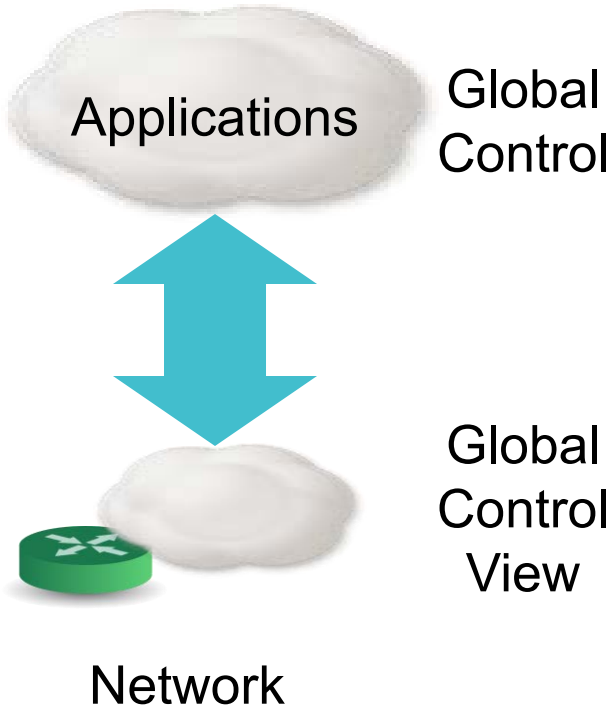
- Link between application and network
- Orchestrated activity to optimize performance
- Cross-referenced performance visibility

From Application Awareness to Application Fluency

- Network automatically reacts to virtualized workloads
- Dynamic tuning of network traffic handling

Global Control View

- Improve local decisions making
- Export view to application control

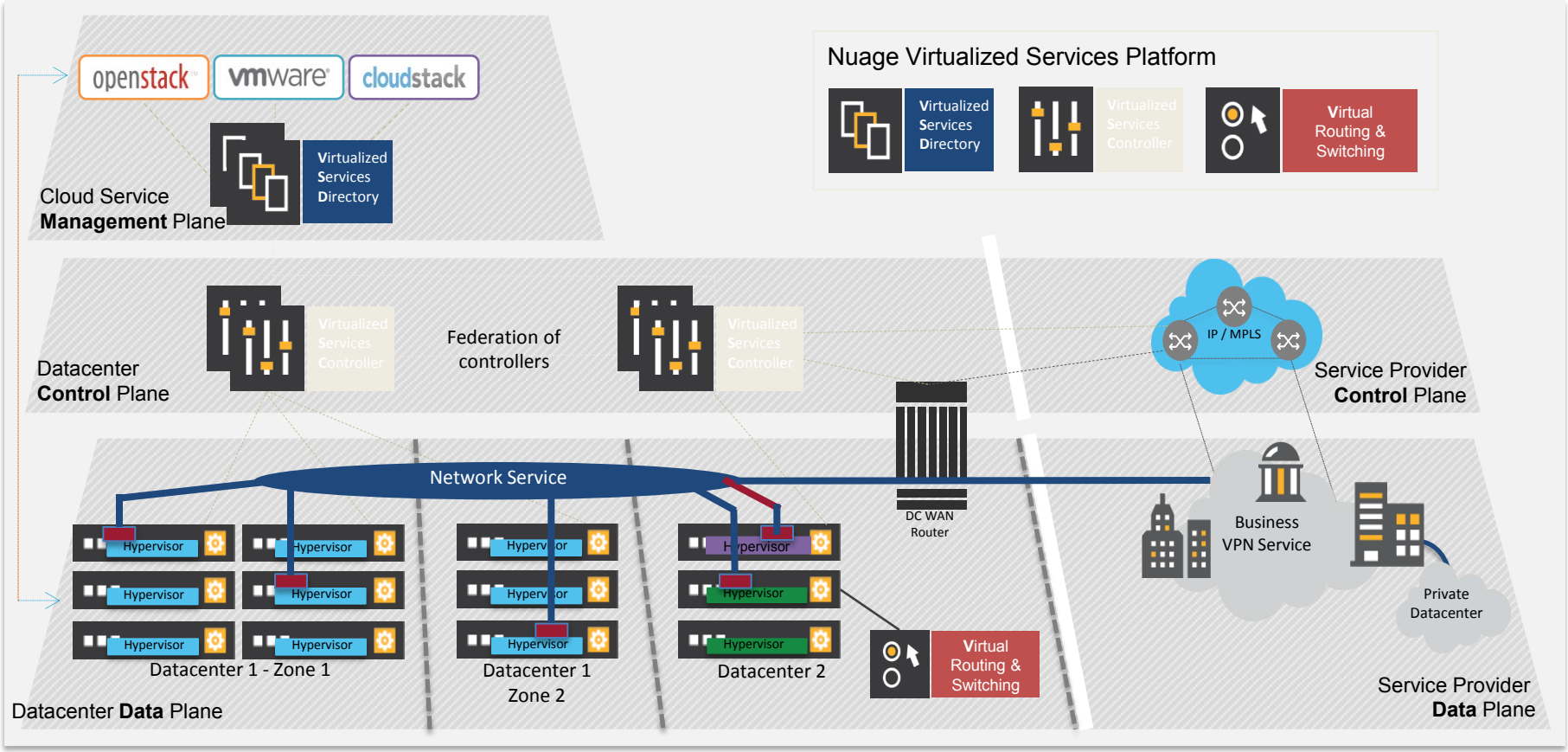


Alcatel-Lucent Go to Market Strategy (Enterprise BU)

- Problem to be solved
- Architecture
- Control
- Data Forwarding
- Data Plane to Control Plan Comms

- Automated provisioning; High quality user experience
- 3 Tier: Data, control, apps
- Centralized view shared with physical network and apps
- Sophisticated and autonomous policy driven switching
- Based on RESTful interfaces and existing protocols

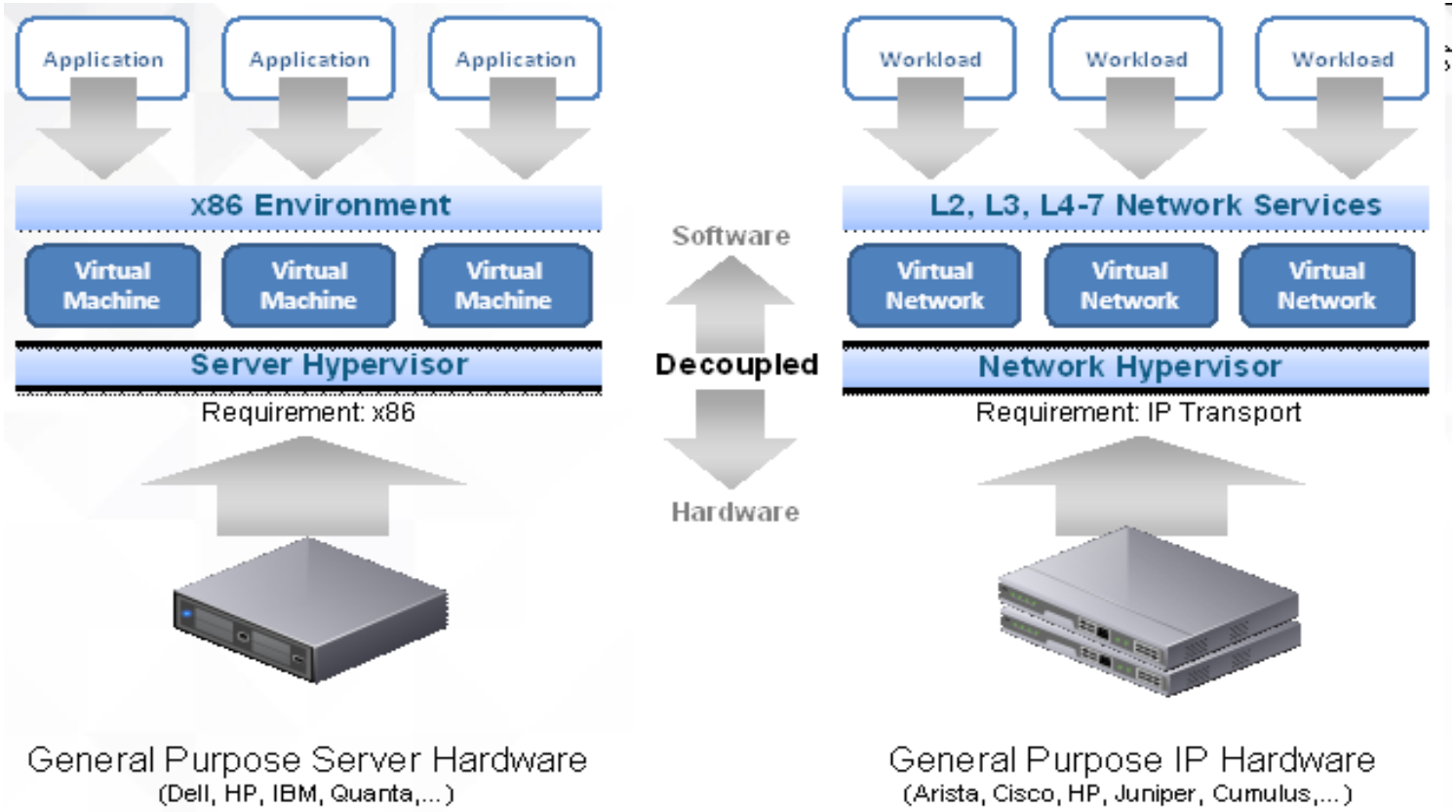
Nuage Networks Virtualized Services Platform (VSP)



Juniper's Emerging SDN Strategy

- In December 2012 Juniper acquired Contrail Systems
- Less of a focus on OpenFlow, more on BGP
- Has a focus on centralization, but carves out a role for distributed intelligence
- Expects to roll out products based on the Contrail acquisition in 2014
- March 2013 announced the EX9200 programmable switch

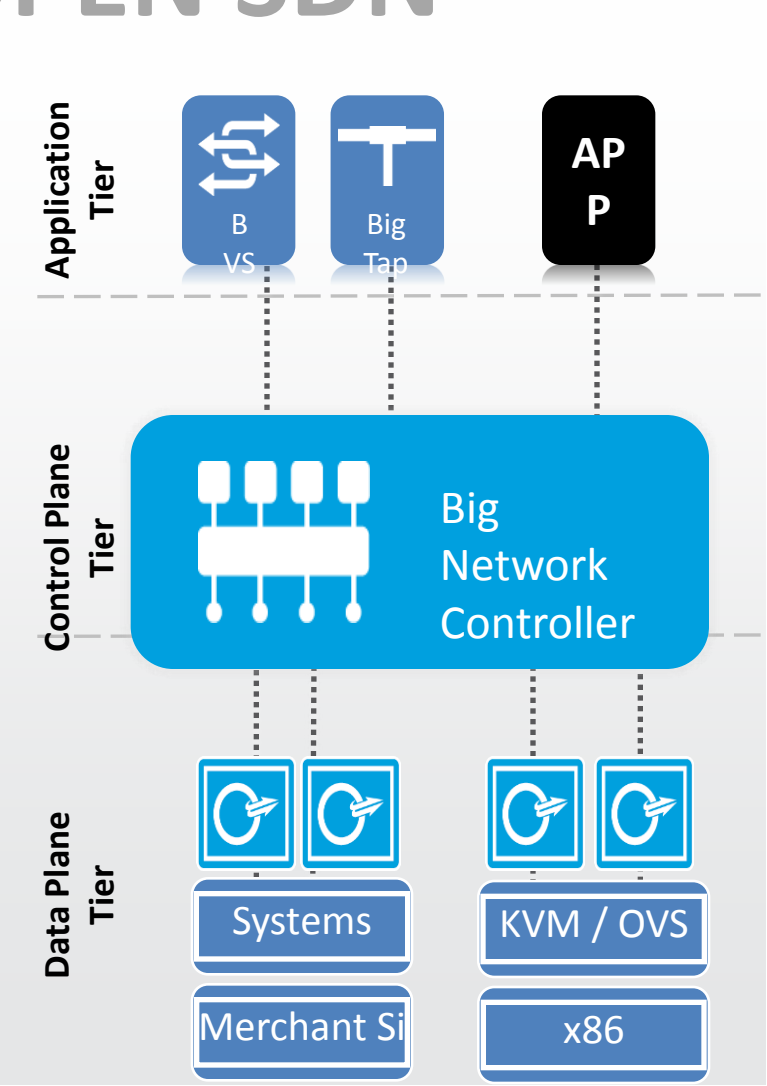
Nicira/VMWare Strategy: Network Virtualization



Components of Nicira/VMware Strategy

- Focused on the data center
- Network services supported at the virtual network layer do not need to be supported by hardware
- Traffic is transported using L2 in L3 tunnels
- Network agnostic, but recommends limited over-subscription
- Fully distributed controllers
- Marks packets for QoS so that the network can enforce

BIG SWITCH NETWORKS OPEN SDN



- Open APIs - Northbound
  - Accelerates partner app development
  - 2 BSN apps; several partner apps
  - Dynamic provisioning and automation
- Open Source Core
  - Unified data and policy model
  - Fully programmable fabric
  - More than 10K downloads YTD
- Standards-Based Protocols - Southbound
  - Support for Physical & Virtual Devices
  - 12 data plane vendors verified
  - Maximizes customer choice
  - Eliminates vendor lock-in
  - Maximum deployment flexibility

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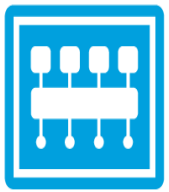
OPEN-SDN PRODUCT SUITE

Big Virtual Switch

Dynamically provisions Virtual Network Segments to make the network as agile and dynamic as your other cloud infrastructure. It delivers:

- Dynamic Network Provisioning for Cloud Workloads
- Dramatic Increase in Data Center Resource Utilization
- Ultimate Network Flexibility and Scalability
- ***Leverages OpenFlow & SWITCH-LIGHT to enable ZERO-TOUCH NETWORKING***



Big Network Controller

Leading Open SDN platform, delivers unified network intelligence, programmability and scalability:

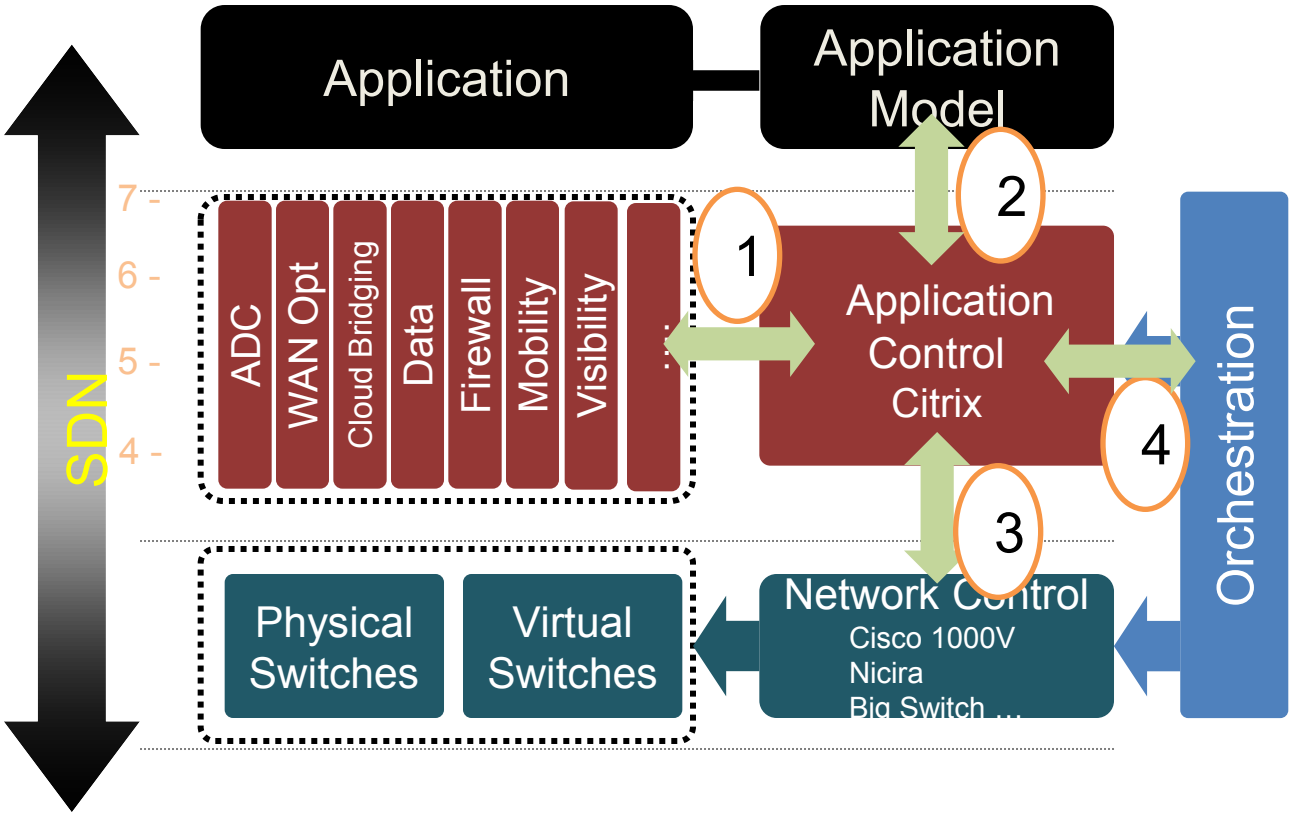
- Common network abstraction on network infrastructure
- Normalized policy and functions across fabric
- Standards-Based and 100% Open Source
- Enterprise Class Manageability, Scalability & Resiliency
- ***100% open source, based on the Floodlight Project***

Switch Light

Thin Switching Software that enables dramatic changes in network operations:

- Centralized deployment and automation of your SDN network
- Choice in networking hardware with a standards-based OpenFlow implementation
- Dramatically reduces costs of network operations through zero-touch networking
- ***100% open source, based on the Floodlight Project***

Citrix SDN Strategy



1. Leverage "existing" Application Control real estate (e.g. NetScaler)
2. Application-centric Design of new networks
3. Integrate Application-awareness into L2-3 Controllers
4. Orchestration across L2-7

Radware SDN Strategy

- Focused on QoE via availability, security and performance
- QoE is defined by a combination of policies
- Creating apps to run in a virtual environment
- Their apps sit on the controller and communicate via the northbound API and sometimes use OpenFlow to communicate directly with switches
- First version of their apps will use log monitoring and analysis as well as OpenFlow based monitoring
- App: DefenseFlow – dynamically scalable attack mitigation solution
- App: ElastiFlow – Address seasonal application usage patterns and Network Function Virtualization

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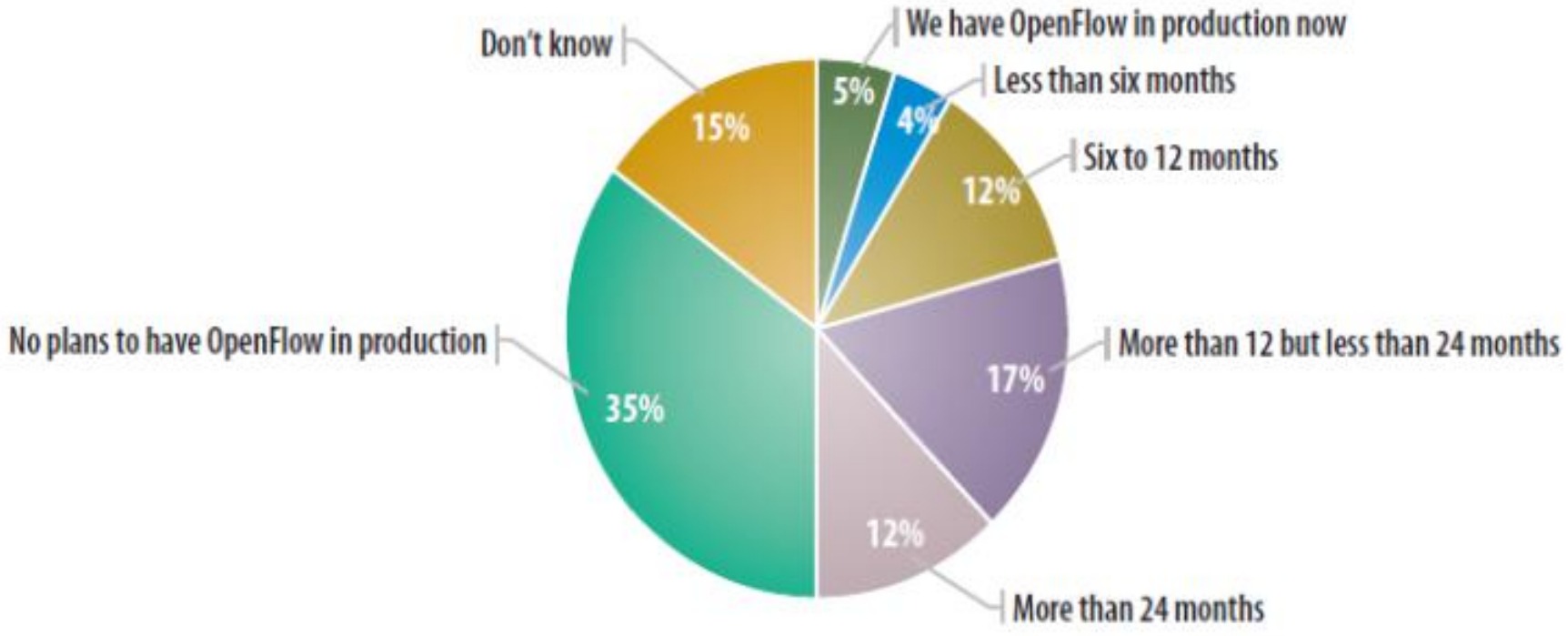
Enterprise SDN Deployment Plans



Base: 178 respondents familiar with OpenFlow
Data: *InformationWeek* 2012 Software-Defined Networking Survey of 250 business technology professionals, July 2012

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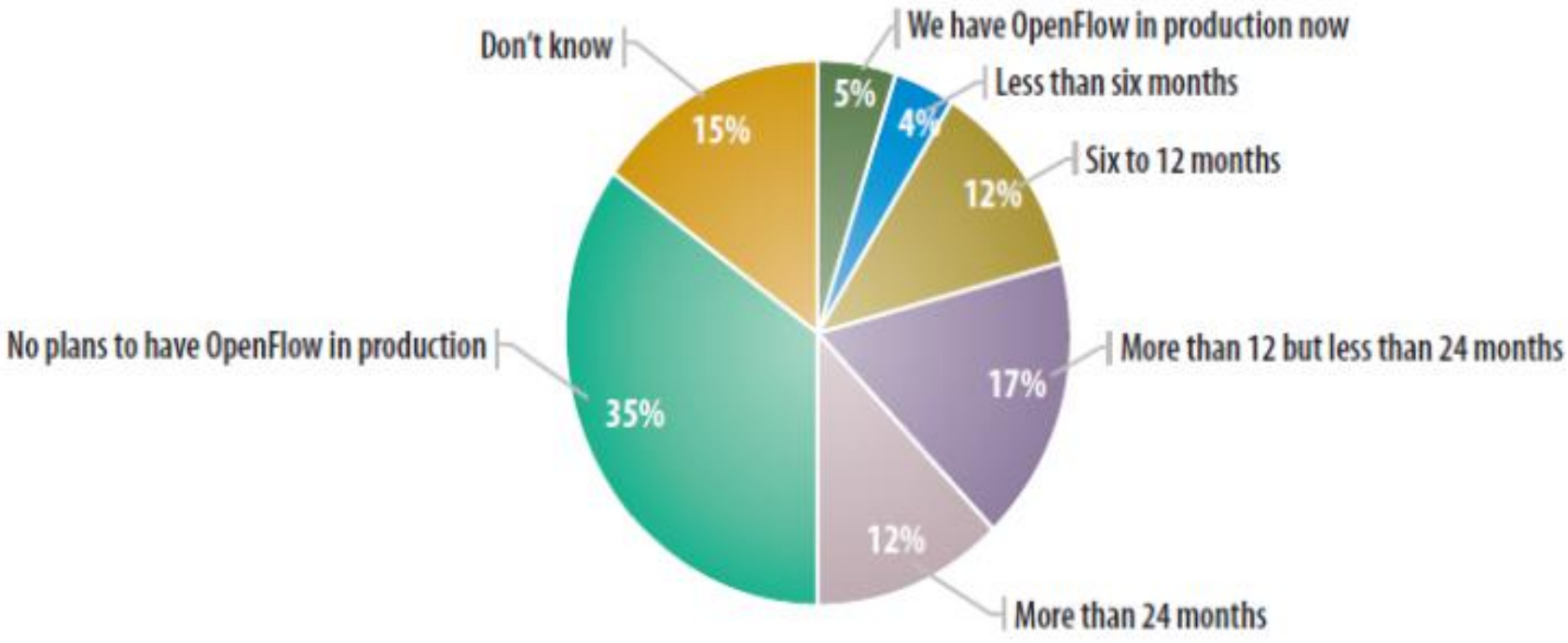
SDN Circa 2017



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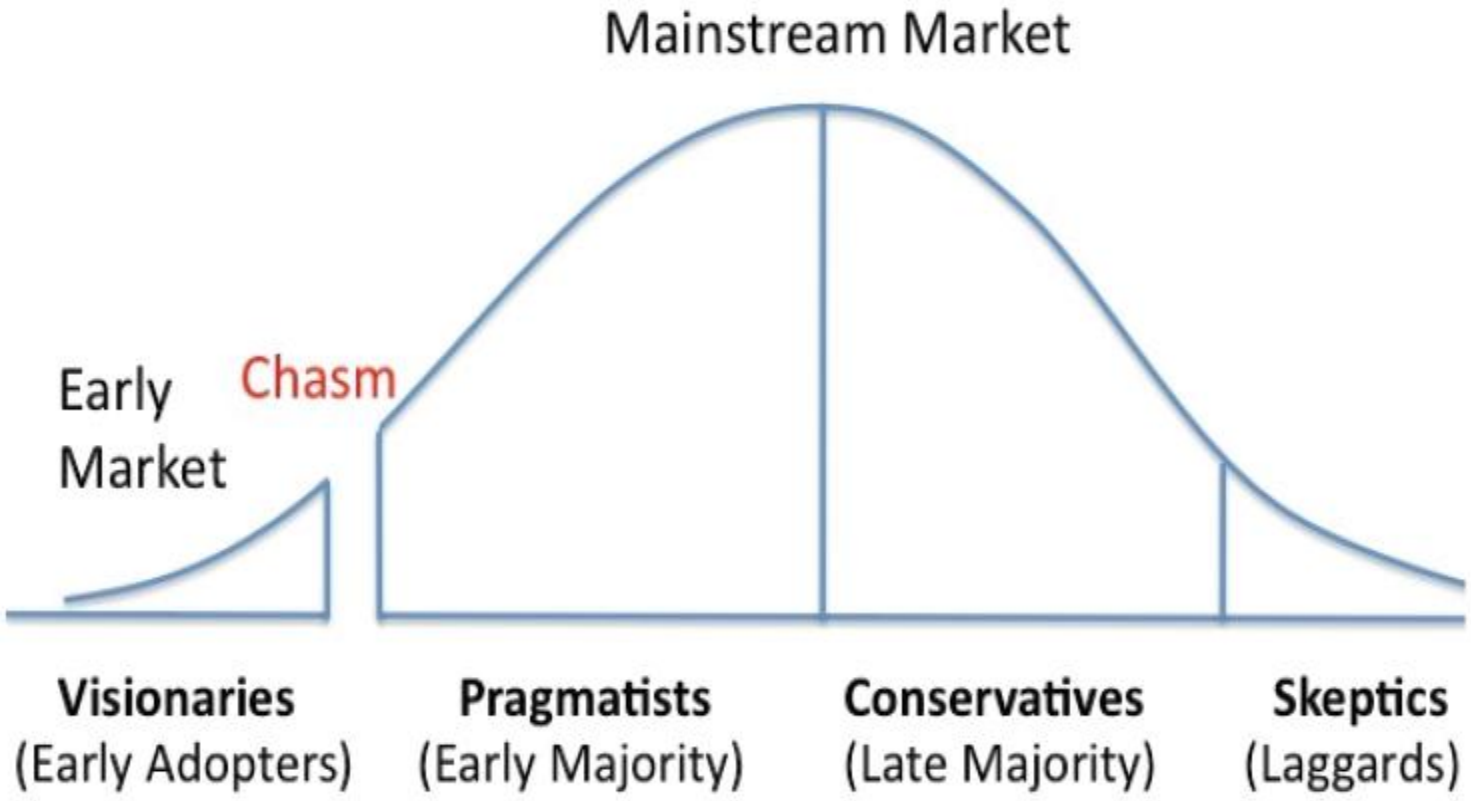
Crossing the Chasm



What will it take for SDN to Cross the Chasm?

- Compelling use cases
- Compelling business cases
- Creation of a developer community
- Increased consensus on what it is and how to implement it
- Robustness and stability of OpenFlow
- Minimum disruption of the existing environment

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What will it take for SDN to Cross the Chasm?

- Robustness and stability of Northbound APIs
- High degree of interoperability
- Certification programs
- Robust testing capabilities
- Development of new management and security procedures
- The lack of a major issue; e.g., security, performance

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Predictions

- In 2013 many of the products that were announced in 2012 come to market
- New announcements (products, partnerships, acquisitions, direction) on a frequent basis
- ASICs designed to support OpenFlow are available
- More vendors adopt OpenFlow v1.3
- The standards process broadens and moves forward slowly

Predictions

- More sophisticated testing enables NEMs to better test products
- Focus remains primarily the data center, but more attention on the branch office
- Vast majority of organizations that are trialing or using SDN remain quiet about what they are doing.
- At least one or two major surprises

Thank You

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