OPEN NETWORKING FOUNDATION

2016 SDN Controller Landscape
Is there a Winner?

Agenda

Key SDN and NFV use case drivers

The SDN controller landscape – open-source and commercial

ODL and ONOS, Cisco and VMware

What does this mean for you?

Core Use Cases Driving SDN and NFV Today

https://www.sdxcentral.com/sdn-nfv-use-cases/ for details

	Carrier/SP	Cloud/Data center	Enterprise campus and access
Network Access Control		✓	✓
Network Virtualization	✓	✓	✓
Virtual Customer Edge	✓		✓
Dynamic Interconnects	✓	✓	✓
Virtual Core and Aggregation	✓		
Datacenter Optimization		✓	
Networking Monitoring	✓	✓	✓

2016 Controller Landscape – OPEN-SOURCE

Active	Not Active (Apparently)
Floodlight	Beacon
LOOM	FlowER
OpenContrail*	NOX/POX
OpenDaylight*	NodeFlow
OpenMUL	
ONOS*	
Ryu*	
Trema	

* - more prominent

2016 Controller Landscape - COMMERCIAL

ODL-based	ODL-friendly	Non-ODL Based
ADVA	NEC	Big Switch
Avaya	Nokia/Nuage Networks	Juniper (Contrail/Northstar)
Brocade	Oracle	Midokura
Ciena (also proprietary)	Pluribus	Plexxi
Cisco (also proprietary)		PLUMgrid
Coriant		Sonus (Vello Systems)
Dell		VMware NSX
Ericsson		
Extreme		
Fujitsu		
HPE (also proprietary)		
Huawei (also proprietary)		
Inocybe		

Updated in 2016 Feb from original source: https://www.sdxcentral.com/reports/sdn-controllers-2015/

2016 – Status of ODL and Rise of ONOS

- OpenDaylight continues to show momentum
  - OPNFV – embedded (so is ONOS, OpenContrail)
  - Over 600 developers supporting and contributing
  - Increasing number of customer deployments worldwide (AT&T, KT, Tencent etc)
  - Mostly datacenter-centric
- ONOS rises to top of WAN controller heap
  - Customer deployments in SP-space for transport offerings
  - Increasing commercial backers – Huawei, Ciena etc
- Not one winner – but multiple winners
  - Every ONOS partner is also ODL member
  - OpenContrail has some limited production
  - Ryu is still very active, especially in datacenter virtualization

2016 – Battle of the Commercial Giants

Cisco	VMware
Cisco ACI/Cisco ONE (APIC, APIC-EM, IWAN)	VMware NSX
1100+ customer wins	900+ customer wins
15-20% in production	10-20% in production

Reality is that both are roughly in same ball-park from a commercial deployment standpoint. Lots of FUD and confusion in the space in terms of actual deployments and scale of deployments.

Hybrid Commercial Strategies Going Forward

Based on best available external information – subject to validation

Proprietary + Open-Source	ODL + ONOS
Big Switch	Ciena (ODL commercial)
Cisco (ODL + APIC)	Ericsson (ODL commercial)
HPE (DCN*, ODL, ContextNet, VAN)	Fujitsu
Huawei	Huawei
Juniper	NEC
Midokura	Nokia
Oracle	

Does the SDN Controller Matter? DC-view

Standard Application Stack in DC

- Business Orchestration
- Applications
- Infrastructure + Orchestration
- SDN Applications
- SDN Controllers
- Network Devices

?

Future Application Stack in DC

- Business Orchestration
- Applications
- Infrastructure + Orchestration and SDN Controller
- Network Devices

CPLANE, PLUMgrid, Midokura, Nuage, NSX – being baked into orchestration layer and focusing on becoming full-stack solution.
WAN orchestration could go the same way?

What Does This Mean to End Users?

Open May Not Matter

- Does the solution meet your use-case needs? DC vs WAN
- Does the solution meet your business goals – TCO, availability, support?
- Can you create leverage against lock-in?

Focus on Fast ROI Use Cases

- Implement a constrained solution – do not boil the ocean
- Focus on use-cases that are already well-understood with existing POCs
- In 2016 there are already production deployments to learn from

Compatibility and Ecosystem are Critical

- ODL-based doesn't mean it's fully-tested
- Ensure vendor ecosystem rich enough to support apps you need in future
- Is an integrator using ODL or ONOS more appropriate for you?

Maturing Market but Buyer Beware

- OpenDaylight and ONOS have changed the landscape but don't count out OpenContrail, Ryu and others
- Controller wars are not over – and may become irrelevant as orchestration stacks win

Thoughts on SDN Controller Landscape 2016-2017

ODL and ONOS both have Momentum

- ODL has widest vendor support – both in shipping products and vendor-stated support
- Will be interesting to see how ONOS-based commercial strategy emerges

Northbound, Intent and Policy are Still Early

- Everyone's working hard to define, re-define the appropriate Northbound API
- Intent and policy were hot in 2015 and are still undefined in 2016 – it's going to take a while

Revenue Driven by Cloud and WAN

- DC – network virtualization continues to be main money generator, and WAN SDN will follow. Limited value in branch and campus deployments
- Forget the "app" market for now – treat as software catalog, monetization of controllers continue to be challenge

Expect Continued Uncertainty

- ODL vs proprietary balance, ONOS vs ODL balance
- Revenue models will morph, more SIs will step in and sell service offerings
- Orchestration stacks will continue to expand their coverage – OpenStack/Neutron and SDN controllers in tug-of-war

OPEN NETWORKING FOUNDATION

Thank You!

Visit **www.sdxcentral.com** to stay updated on SDx, SDN and NFV news

Twitter: @WireRoy
Email: rchua@sdxcentral.com