### Open Networking 2.0 – Disaggregating the Software Stack



### Your Presenters for Today



Stefan Bokaie Vice President, Network Engineering





Shriraj Gaglani EVP, Business Development

**Metaswitch Networks** 



Roy Chua Co-Founder Chief Product Officer

**SDxCentral** 



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### Welcome to the SDxCentral Webinar

	Relevant Industries	Who Should Attend?	Key Takeaways
•	Telecommunications	<ul> <li>Mobile Operators</li> </ul>	<ul> <li>Gain insights into the architectural elements for the modern networking software stack and the role of open source technologies</li> <li>Hear what real customers would like see from the industry and the 'open' community moving forward</li> </ul>
•	Enterprise Webtech	Communication     Service Providers	
	Consumer Webtech	Mobile Service	
	Large Enterprises	Providers	
			<ul> <li>Find out more about Dell EMC's solutions in this space and how they can help your real-world business and technical challenges</li> </ul>
			Learn more about Dell EMC OS10 Open Edition

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### **Open Source in Networking Report**

Driving a revolution in networking



Report available for download today https://www.sdxcentral.com/reports/

- sdx central<sup>™</sup>
- Application/data consumption models driving move towards software-defined infrastructure
- Cloud service providers bring new innovation which trickles down into enterprises and crosses over to telcos
- Key drivers of change:
  - Virtualization
  - Automation
  - Cloud scale
  - Disaggregation
  - SDN and NFV



# Long History between Networking and Open-Source

- Not a new trend
- Historically primarily embedded and lower-level libraries
- Why open-source? Core reasons:
  - Accelerate time-to-market
  - Frees-up resources for differentiation/innovation
  - Address customer lock-in concerns
  - Marketing and recruiting cachet

T ARE THE MOST IMPORTANT BUSINESS DRIVERS FOR OPEN SOURCE





### What's Different with Open-Source in SDN and NFV?

Pre-SDN and NFV



#### Localized

 Usually used in specific parts of the solution. E.g. using OpenSSL as encryption library for communications

#### Lower-Level

 Many open-source components were communications libraries, or part of operating system

#### Simpler

 Most components used had only a few moving parts and performed a single function, e.g. BIND, Quagga

#### SDN and NFV

#### More pervasive

 Across all components of a solution- data-plane to control plane, management plane and infrastructure

#### Higher-level

 Not just embedded or base OS but providing significant application and features like a full SDN controller

#### More comprehensive

- Full-stack solutions like OpenStack
- Large projects like OpenDaylight with numerous components

# Significant Role of Open-Source Software in the Networking Ecosystem



Туре	Components	Examples
Dataplane L2-3	Switching/NV	OVS, OVN, OpenSwitch, Calico
Dataplane L4-7	IDS, IPS, DPI, ADC/SLB	Nginx, SNORT, Bro, Suricata
Control Plane	SDN Controllers, L2 Stack, L3 Stack	ODL, ONOS, OpenContrail, Ryu, Linux L2 (LLDP, IGMP etc), Quagga/FRR
Infrastructure	VIM, NFV-I	OpenStack, OPNFV
Management Plane	MANO	ONAP, OSM
Hardware Abstraction	Network Operating System etc	ONIE, ONL, SAI

Open-source Hardware Design has a Role too – e.g. OCP



### SDN and the White Box Wave







- Disaggregation allows independent paths of innovation at each layer
- SDN helped kick-start process but not prerequisite for disaggregation
- Open-source helped accelerate the process (like Linux for servers, Android for mobile devices)
- More flexibility, lower HW costs, but increased costs in coordination and integration
- Changes value chain and opens up ecosystem to new players



### Open Source: Coming to a Product Near You!

HAVE YOU INCORPORATED ANY OPEN SOURCE NETWORKING PROJECTS INTO YOUR PRODUCTS OR SOLUTIONS?







# Open Networking 2.0 : Disaggregating the Software Stack

Stefan Bokaie, VP Engineering, Dell EMC Networking

Shriraj Gaglani, EVP Business Development, Metaswitch Networks

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### Agenda

- 1. Impact of Open Source on Networking
  - Why Open Networking
  - Open Networking Vision for the Industry
  - Disaggregation
  - Dell EMC OS10
- 2. Composing New Networks
  - About Microservices
  - Composable Networks
  - Commercial Availability

# Impact of Open Source on Networking

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## Why Open Networking?



- 1. Fundamentally disruptive technology – Flexible architectural and GTM models
- 2. Restructures CAPEX, OPEX spend and resets TCO models
- 3. Redefines R&D funding and innovation models through open source

## Open Networking Is the vision for the industry

### Gartner

### **Data Center Networking**

#### **Open Networking**

There is a growing willingness to move away from proprietary solutions. Our end-user survey (n = 83) indicated that 42% of clients consider open standards and multivendor interoperability support a mandatory requirement, 34% consider it very important, and 20% consider it somewhat important, so **openness is a relevant buying criterion for 96% of the end users.** 

These results are quite impressive, but in addition, 75% of the end users indicated that they expect an increase in relevance of open networking in their purchasing decisions in the next 24 months



### **Open Source Networking**



### OS10 – Modern software for modern operations

#### **Open Networking** Linux/Open Source OS10 **Enterprise Edition** Standard orchestration & automation tools OS10 Linux Foundation OCP **Optional SDN/NVO controller** $\leftarrow$ Switch OPX **Open Edition** SONiC DELLEMC Any networking OS OPEN **OS10** Compute Project **Open standard hardware** OPEN **Merchant silicon** Open Networking Install Environment (ONIE) OPEN

### **Dell EMC Open Networking Evolution**



### Dell EMC LF OpenSwitch Engagement

- 1. Oct 2016 : Joined the project
- 2. OpenSwitch Technical Chair
- 3. July 2017 : Version 2.1 released
- 4. 2017 : Launch of Formal Support
- 5. Support for diverse hardware architecture



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### **Composing New Networks**

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Over 1,000 customers, including tier 1 CSPs and major OEMs

### --**...**...

Pioneering disaggregated networking software for 30+ years

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Backed by Sequoia & Francisco Partners; consistent growth & profitability World-renowned professional services and support

## **Microservices in cloud computing**



#### metaswitch

## **Microservices in switching and routing**

Metaswitch N-BASE: Foundational for composable networks

- N-BASE provides a common architecture for control and routing µservices:
  - Execute independently, don't share memory
  - Communicate asynchronously across well defined APIs
  - Can be multiply instantiated scale indefinitely
- Supports flexible, runtime distribution across containers/CPUs/cores
  - Scales from tiny embedded systems to geo-distributed solutions
- Protocols designed and split into distinct microservices
  - Eg. BGP neighbour management split from routing calculations
  - Eg. Telemetry and other horizontal capabilities added independent of protocols

### metaswitch

## **Composable Networks**



Completely separate routing and control from NOS: ISSU



Mix & match protocols from different vendors



Compose and consume only the protocols you need



## What we deliver | Who we deliver it to

Field Proven, Robust And Reliable, Routing And Control Planes EVPN BGP LDP PIM MPLS RIP RSVP-TE IGMP OSPF VPLS VPNS IS-IS

# to **200+** OEMs

250+ NOS/silicon combinations





# Thank you!

## Learn more: sdxcentral.com/dellemc metaswitch.com/solutions

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## **Questions & Answers**



