

OCP의 소프트웨어 프로젝트

2020. 11.



OPEN
Compute Project®

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목차

1. 개요
2. OCP Overview
3. OCP 재단 구성
4. OCP Marketplace
5. Collaborating with OCP
6. Software Projects
7. SONiC

1. 개요

2. OCP Overview

3. OCP 재단 구성

4. OCP Marketplace

5. Collaborating with OCP

6. Software Projects

7. SONiC

1. 개요

1) News

- **AT&T Taps DriveNets for Core Routing Software Deployment**
- **Distributed disaggregated chassis (DCC) white box router to the Open Compute Project (OCP)**

AT&T Taps DriveNets for Core Routing Software Deployment



Matt Kapko | Editor

September 29, 2020 8:01 AM

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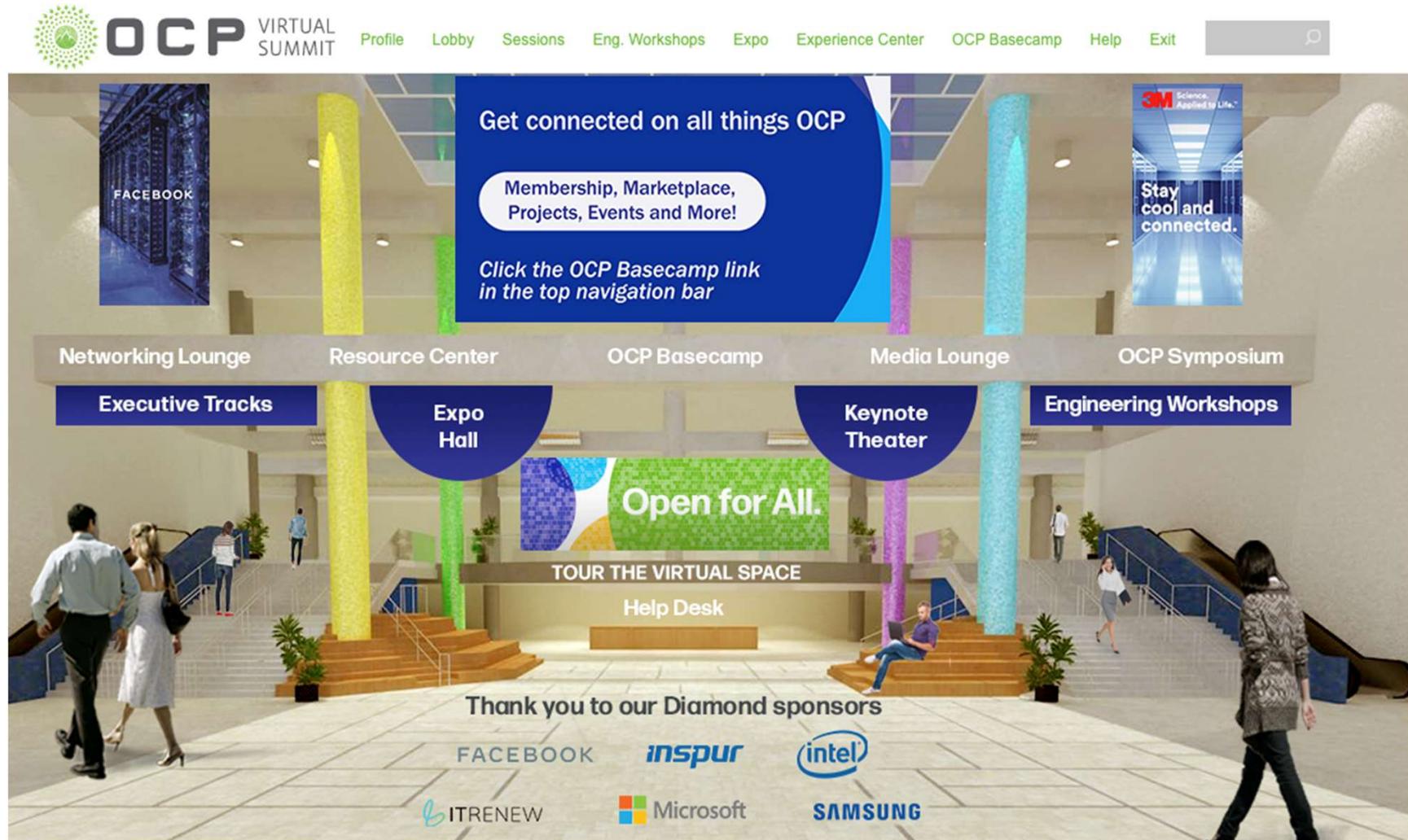


<https://www.sdxcentral.com/articles/news/att-taps-drivenets-for-core-routing-software-deployment/2020/09/>

1. 개요

2) Virtual Summit

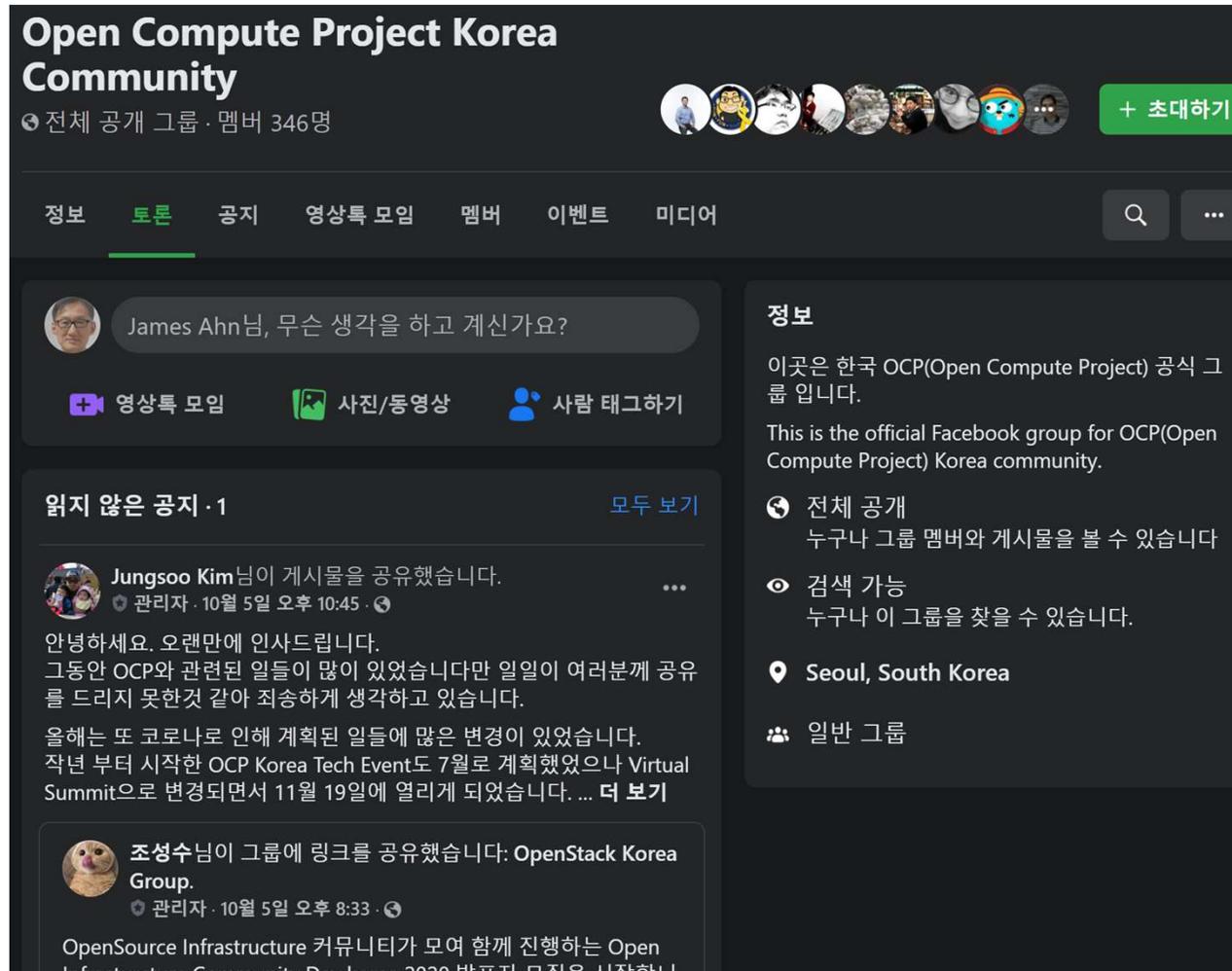
- OCP Virtual Summit



1. 개요

3) Community in Korea

- OCP Korea Community @ Facebook



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1. 개요
 2. **OCP Overview**
 3. OCP 재단 구성
 4. OCP Marketplace
 5. Collaborating with OCP
 6. Software Projects
 7. SONiC

2. OCP Overview

1) OCP의 시작

- OCP의 시작 배경

- 페이스북에서 컴퓨팅 인프라 확장을 위해 가장 효율적이고 경제적으로 가능한 방법을 찾던 팀에서 시작
- Clean Slate 로 직접 제작한 서버, 전원공급, 랙, 배터리 백업을 제작
- 적용한 Prineville data center에 38% 에너지 절감과 24% 비용 절감

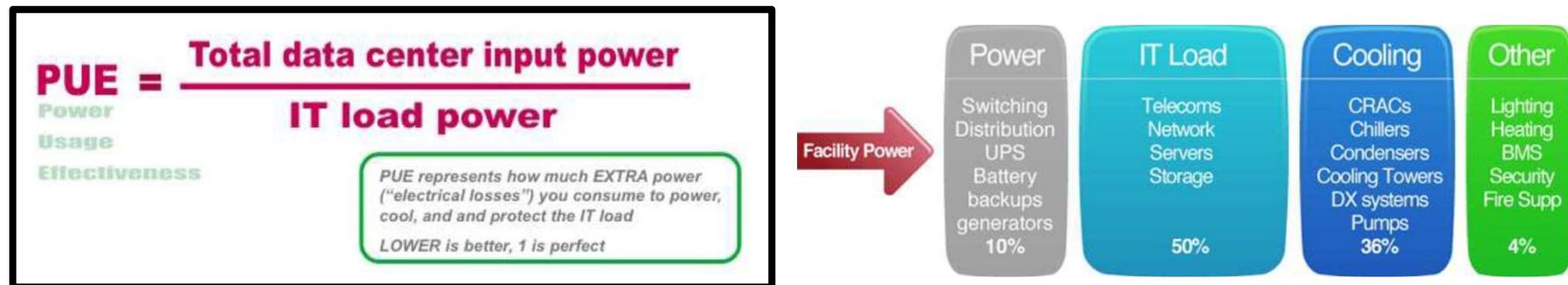


2. OCP Overview

1) OCP의 시작

■ OCP의 시작 배경

- 전기 분배 시스템의 480-volt 사용
- 서버의 효율에 기여 하지 않는 것의 제거
- 겨울에 통로의 더워진 공기를 사무실 난방에 재사용, 외부 공기를 데이터센터 내에 흐르게 함
- 중앙 무중단 전기 공급의 필요성을 제거

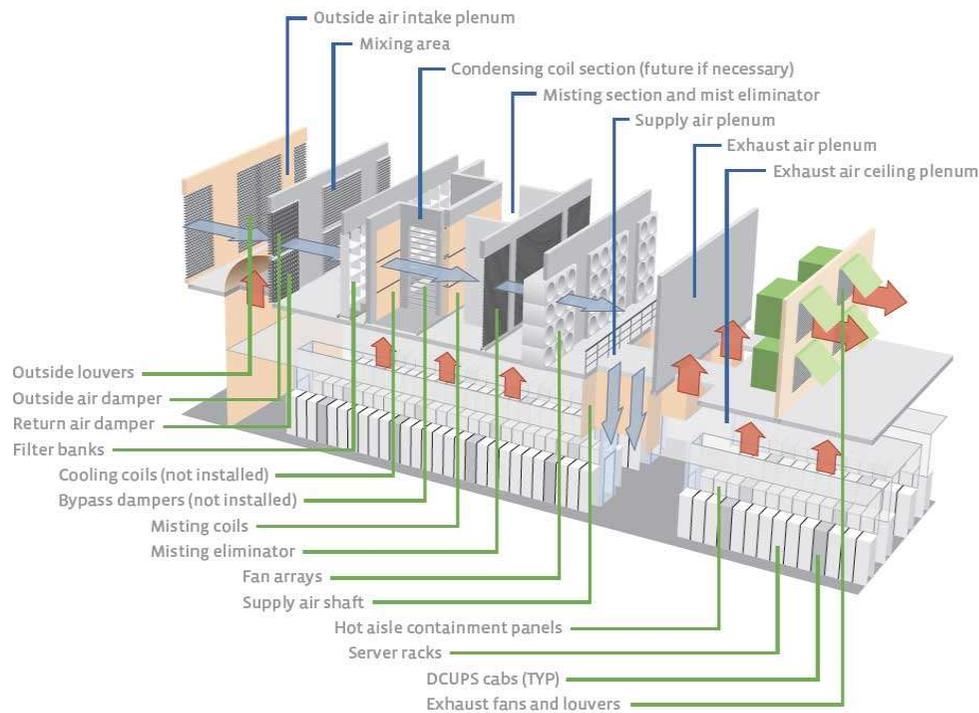


2. OCP Overview

2) Facebook data centers

- All Facebook data centers are 100% OCP

Open Compute Project Data Center



Facebook OCP Prineville Data Center
PUE = 1.06



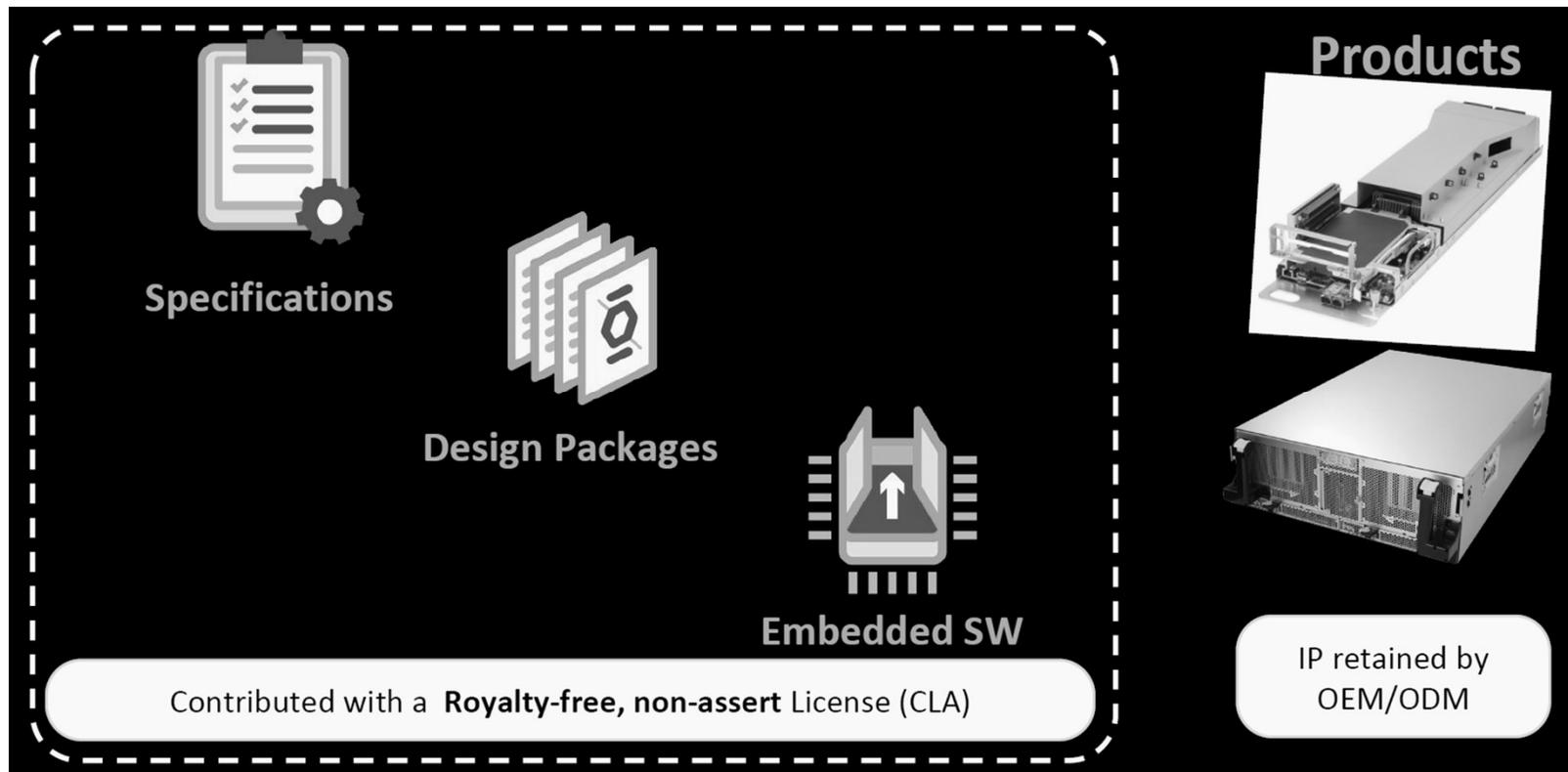
Typical Data Center
PUE > 1.4

2. OCP Overview

3) OCP의 발전

- OCP의 발전

- OEM/ODM은 지적 자산을 소유하나, 로열티나 라이선스 없이 기술사양/설계/내장소프트웨어를 기부



2. OCP Overview

4) Hardware

- Open Hardware from OCP

- 스위치는 처음으로 2015년 Wedge를 발표하였고, 이후 6-pack과 Backpack등을 발표



-
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 4. OCP Marketplace
 5. Collaborating with OCP
 6. Software Projects
 7. SONiC

3. OCP 재단 구성

1) Board

- Board Members



Mark Roenigk
Chairman & President
Facebook



Rocky Bullock
Secretary
OCP Foundation



Andy Bechtolsheim
Board Member
Individual



Jim Hawkins
Board Member
Rackspace



Partha Ranganathan
Board Member
Google



Kushagra Vaid
Board Member
Microsoft



Rebecca Weekly
Board Member
Intel

3. OCP 재단 구성

2) Incubation

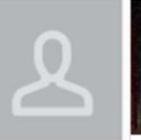
- Incubation Committee

 <p>Dharmesh Jani Co-Chair Open Compute Project</p>	 <p>Jeff Catlin Co-Chair Open Compute Project</p>	 <p>Jessica Gullbrand Co-Chair Open Compute Project</p>	 <p>Brevan Reyher Data Center Facility Open Compute Project</p>
 <p>John Leung Hardware Management Open Compute Project</p>	 <p>Lihua Yuan Networking Open Compute Project</p>	 <p>Ron Minnich Open System Firmware Open Compute Project</p>	 <p>Steve Mills Rack & Power Open Compute Project</p>
 <p>Elaine Palmer Security Open Compute Project</p>	 <p>Jia Ning Server Open Compute Project</p>	 <p>Matt Shumway Storage Open Compute Project</p>	 <p>Craig White Telco Open Compute Project</p>

3. OCP 재단 구성

4) Projects

- Project Leads
- <https://www.opencompute.org/about/project-leads>

 Rob Coyle Open Compute Project Data Center Facility	 Anand Ramesh Open Compute Project Data Center Facility	 Bob Stevens Open Compute Project Hardware Management	 Homal Shah Open Compute Project Hardware Management	 Dave Landman Open Compute Project Storage	 Loren Staley Open Compute Project Telco	 Marko Heikkinen Open Compute Project Telco	 Ahmad Byagowi Open Compute Project Time Appliances Project (TAP) - Incubation	 Bob Oliver Open Compute Project Modular Data Center	 Damian Cheng Open Compute Project Mass (NIC)	 Whitney Zhao Open Compute Project Open Accelerator Infrastructure	 Tianyi Gao Open Compute Project Open Accelerator Infrastructure
 Omar Balsonado Open Compute Project Networking	 Roopa Prabhu Open Compute Project Networking	 Anjaney Chagam Open Compute Project Open System Firmware	 Ryan O'Leary Open Compute Project Open System Firmware	 Eiad Wind Open Compute Project Time Appliances Project (TAP) - Incubation	 Coran Svensson Open Compute Project Critical Facility Operations - Incubation	 Eric Shobe Open Compute Project Hardware Management Module - Incubation	 Jared Mednick Open Compute Project Hardware Management Module - Incubation	 Bapi Vinakota Open Compute Project Open Domain-Specific Architecture	 Allen Cantle Open Compute Project High Performance Computing - Incubation	 Alex Doyle Open Compute Project DNV	 John Leung Open Compute Project
 Caleb Lusk Open Compute Project Rack & Power	 Hamid Keyhani Open Compute Project Rack & Power	 Bryan Kelly Open Compute Project Security	 Nate Klein Open Compute Project Security	 Don Mitchell Open Compute Project Advanced Cooling Facilities - Incubation	 John Menoche Open Compute Project Advanced Cooling Facilities - Incubation	 Jacob Na Open Compute Project ACS Door Heat Exchanger	 Rolf Brink Open Compute Project ACS Immersion	 Mike Moore Open Compute Project Rigs	 Han Wang Open Compute Project OpenNIC	 Xin Liu Open Compute Project S&I SDMC	 Lukasz Lukowski Open Compute Project Regional Project Community - Europe
 John Struvs Open Compute Project Server	 Mark Danic Open Compute Project OCP Ready™ Facility Recognition Program	 Stamat Tevalesi Open Compute Project Server	 Jason Adrian Open Compute Project Storage	 Michael Borkold Open Compute Project ACS Cold Plate	 Rama Shimanadhuni Open Compute Project Hardware Fault Management - Incubation	 Zhongyu Yang Open Compute Project Hardware Fault Management - Incubation	 Yogesh Varma Open Compute Project Hardware Fault Management - Incubation	 Jungsoo Kim Samsung Electronics Regional Project Community - Korea	 Kaoru Yamaguchi AS Regional Project Community - Japan	 George Tchaperian Sageant Networks Regional Project Community - Taiwan	 Steven Wen MTZ Regional Project Community - Taiwan

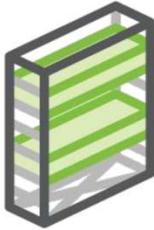
3. OCP 재단 구성

5) Projects & Sub-Projects

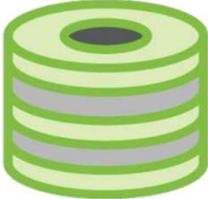
- OCP Community: Projects & Sub-Projects



NETWORKING
ONL, ONIE, SAI, SONiC



RACK & POWER
ADV COOLING SOLUTIONS
POWER SHELF INTEROP
OPENRACK V3



STORAGE
CLOUD FAST FAIL
ARCHIVAL



SERVER
PCI 3.0 MEZZ
OPEN ACCELERATOR I/F
OPEN DOMAIN SPECIFIC ARCHITECTURE



DC Facility
MODULAR DC



TELCO
OPENEDGE



HW MGMT
OPENRMC



Open Sys FW

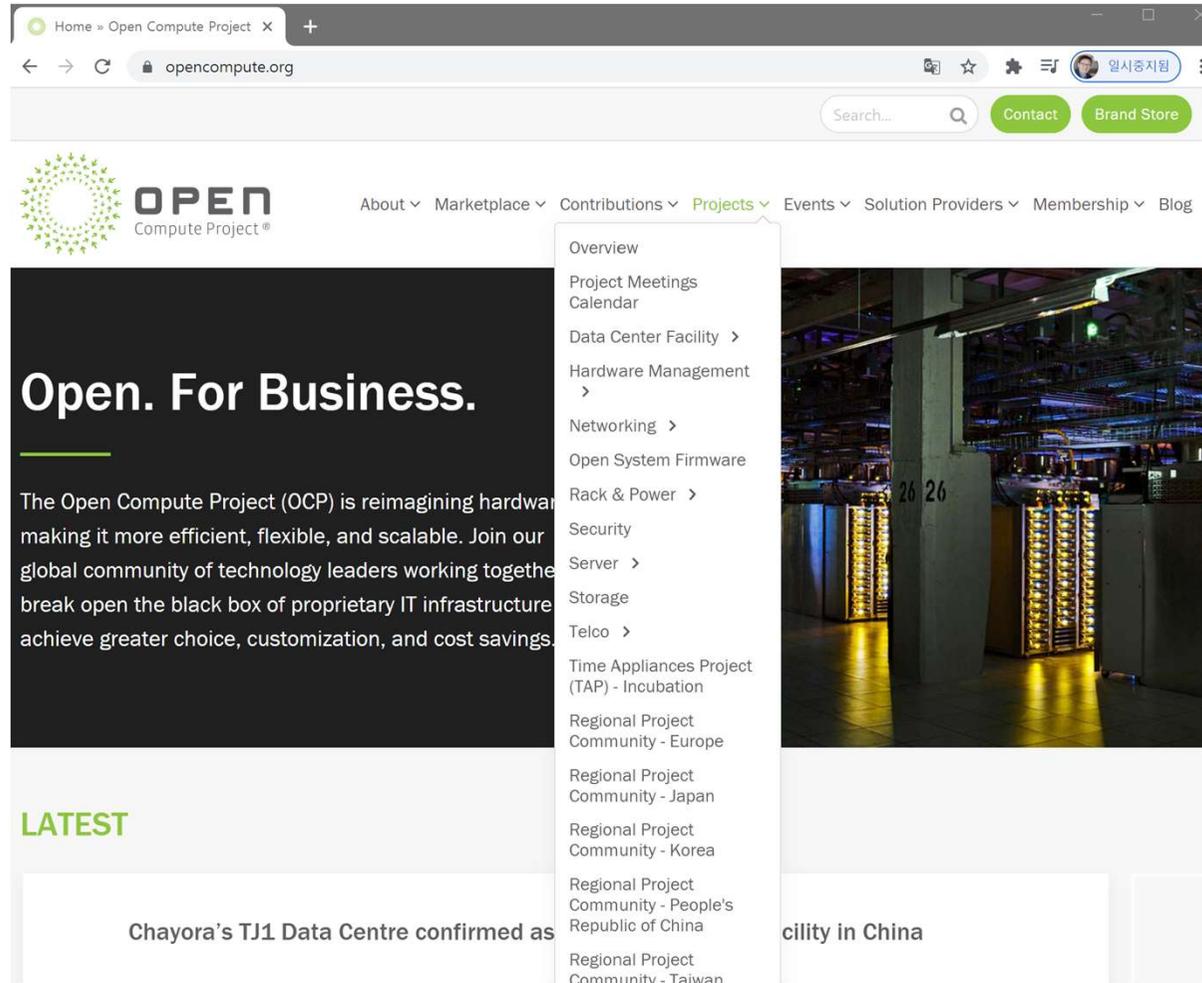


SECURITY

3. OCP 재단 구성

5) Projects & Sub-Projects

- Open Compute Projects



3. OCP 재단 구성

6) Share

- Shared via a **Royalty Free Patent Non-Assert CLA**(Contributor License Agreement), any **OSI license** or **Copyright License**



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4. OCP Marketplace

1) PRODUCT RECOGNITION PROGRAM

- **OCP PRODUCT RECOGNITION PROGRAM**
 - **Products that carry the OCP Accepted™ recognition comply 100% with an OCP approved specification and the design files are open sourced and available.**
 - **Products that carry the OCP Inspired™ recognition comply 100% with an OCP approved specification and are available from a Gold, Silver or Platinum member of OCP.**



4. OCP Marketplace

2) Products and Data centers

- Marketplace – Products and Data centers

Software

- SONiC (7)
- ONIE (35)
- Cumulus (34)
- Netris (21)
- ONL (20)
- PICOS (15)
- OcNOS (13)

[Show more](#)

Status

- OCP Accepted™ Products (6)
- OCP Inspired™ Products (1)

Category

- Network (7)

Solution Provider

- Atlancis Technologies (4)
- Celeris Informatique (4)
- Circle B (4)
- ECI Networks (4)
- EPS Global (4)
- Edgecore Networks (4)
- Hyve Solutions (4)

Comments
VIEW

Software for Open Networking in the Cloud (SONiC)

Open Network Install Environment (ONIE)

Netris , automatic net-ops platform

Open Network Linux (ONL)

OCP-compliant integrated network OS. "OcNOS™"

Part #: BF6064X-T-XXX

+ More

[Specifications](#)

OCP
ACCEPTED™

Edgecore Networks Wedge 100S 100GbE Data Center Switch

A commercial product based on Facebook's Wedge 100 design. Top-of-Rack switch optimized for web-scale data centers. Compatible with...

Solution Providers: Edgecore Networks, Hyve Solutions, ITOCHU Techno-Solutions Corporation, Circle B, Vesper Technologies, ECI Networks, Atlancis Technologies, EPS Global, Celeris Informatique

Part #: Wedge100S-32X

+ More

[Specifications](#)

OCP
ACCEPTED™

4. OCP Marketplace

3) Integrated Solutions

- Marketplace – Integrated Solutions

Integrated Solutions » Open Co x Past Summits » Open Comput x Networking/SONIC - OpenCom x +

opencompute.org/solutions?refinementList%5Bcategory%5D%5B0%5D=Network&page=1

Software

- ONIE (5)
- Cumulus (4)
- ONF SEBA (3)
- ONL (3)
- Ceph (2)
- ONF (2)
- OcNOS (2)

Show more

Category

- Network (7)
- Server (5)
- Storage (3)
- GPU (2)
- Edge (1)
- Rack & Power (1)

Solution Provider

- Circle B (5)
- ITOCHU Techno-Solutions Corporation (5)
- Vesper Technologies (5)
- Atlancis Technologies (4)
- ECI Networks (4)
- EPS Global (4)

View the 1st OCP Ready™ Facility in North America! GIGA DATA CENTERS

SDN Enabled Broadband Access (SEBA)

Open Network Install Environment (ONIE)

Based on the Open Networking Foundation's (ONF) SDN Enabled Broadband

The Open Networking Foundation (ONF)

Solution Providers: MiTAC, Edgecore Networks, Circle B, ECI Networks, ITOCHU Techno-Solutions Corporation, Vesper Technologies, Atlancis Technologies, EPS Global

Model #: Edge Solution for Telco Central Office

kubernetes ONF SEBA

Open Networking Mobile Lab

Open Networking Mobile Lab is a self sufficient demo system showcasing fully disaggregated ethernet fabric. This mobile lab is modelled after the disaggregate...

Solution Providers: Edgecore Networks, Atlancis Technologies, Circle B, EPS Global, ECI Networks, ITOCHU Techno-Solutions Corporation, Vesper Technologies, Celeris Informatique

Model #: Open Networking Mobile Lab

one + More

4. OCP Marketplace

4) Circular Economy

Marketplace – Circular Economy

Circular Economy » Open Comp. x Past Summits » Open Compute x Networking/SONiC - OpenCom. x +

opencompute.org/circular-economy?refinementList%5Bsoftware.name%5D%5B0%5D=ONIE&page=1

Software

- ONIE (5)
- Ceph (5)
- Apache Tomcat (3)
- JBoss by Red Hat (3)
- Kubernetes (3)
- OpenStack (2)
- Apache Cloudstack (1)

Show more

Member

- Atlancis Technologies (4)
- Celeris Informatique (1)

Clear all filters

ITRenew Report: "THE FINANCIAL & SUSTAINABILITY CASE FOR CIRCULARITY"

VIEW

Sernvah Public Cloud Platform for CSPs

Atlancis has developed an integrated cloud platform that can be deployed by Cloud Service Providers (CSP) on one or multiple sites without going through the rigors o...

Member: Atlancis Technologies
Model #: Sernvah Public Cloud Platform for CSPs

Apache Tomcat ceph onie JBoss by Red Hat



Pegasus Ceph Cluster Platform

A cost-effective Ceph Cluster Platform. Ceph is an aggregate of Open Source software, running on Sesame by ITRenew rack-scale solutions, to facilitate highly ...

Member: Celeris Informatique
Model #: Pegasus Ceph Cluster Platform

ceph onie

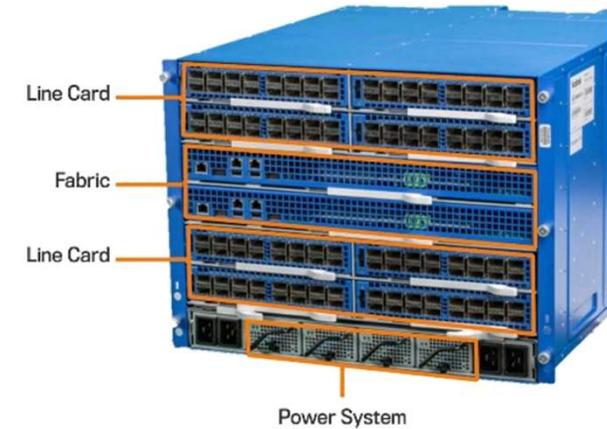


4. OCP Marketplace

5) 6-pack, Backpack

- 6팩 (6-pack): 페이스북이 2015년 2월12일 공개
- Backpack: 100G Datacenter용

6팩 (6-pack)



Backpack



4. OCP Marketplace

6) Minipack

- **Minipack**

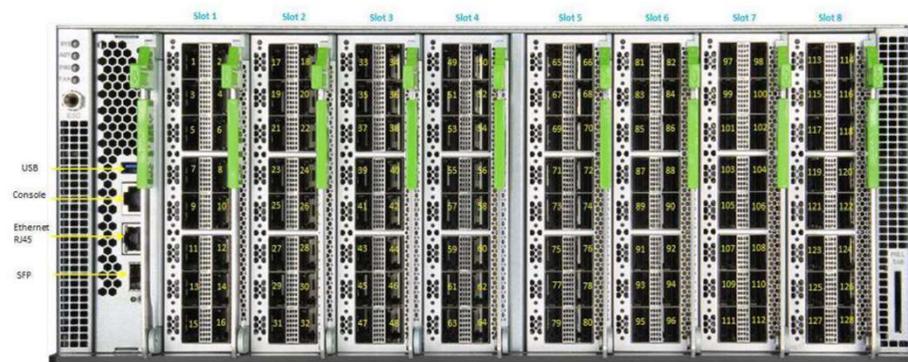
- 20%+ switches in data centers are white box + open source software
- First OCP 400G port white box switch
- A new building block switch based on Broadcom Tomahawk 3 ASIC
- Support 2 types of port interface modules (PIM), 100G and 400G
- PIM card plug and play hardware enabled
- Smaller size
- Lower power



4. OCP Marketplace

6) Minipack

- Minipack
- 2 types of PIM cards
 - 128 X 100G, 12.8T switching bandwidth
 - 32 X 400G, 12.8T switching bandwidth



PIM-16Q 100Gb



PIM-4DD 400Gb



4. OCP Marketplace

7) OCP Rack

❖ OCP Rack and Servers and Storage System

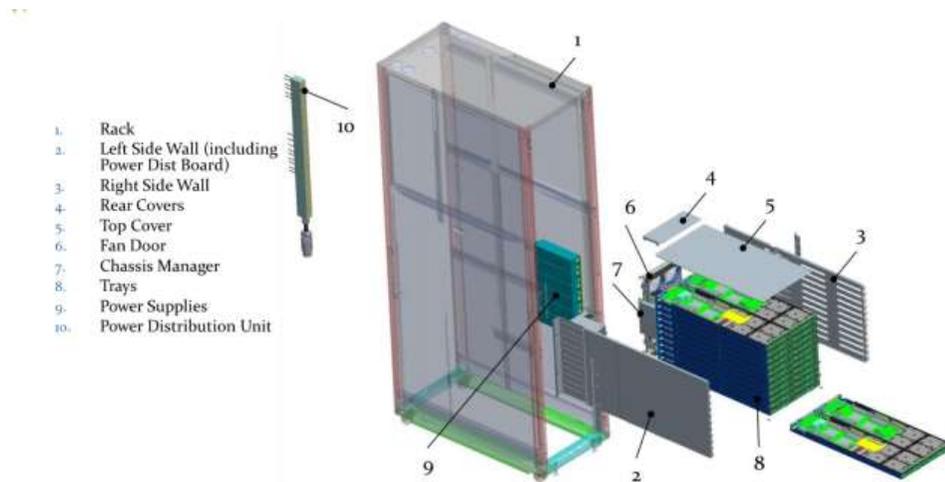
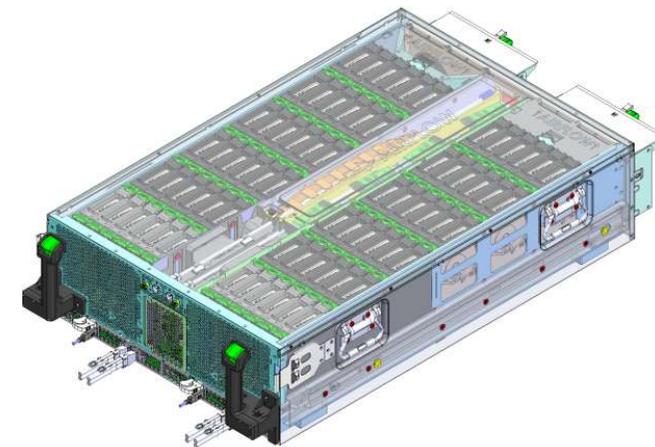


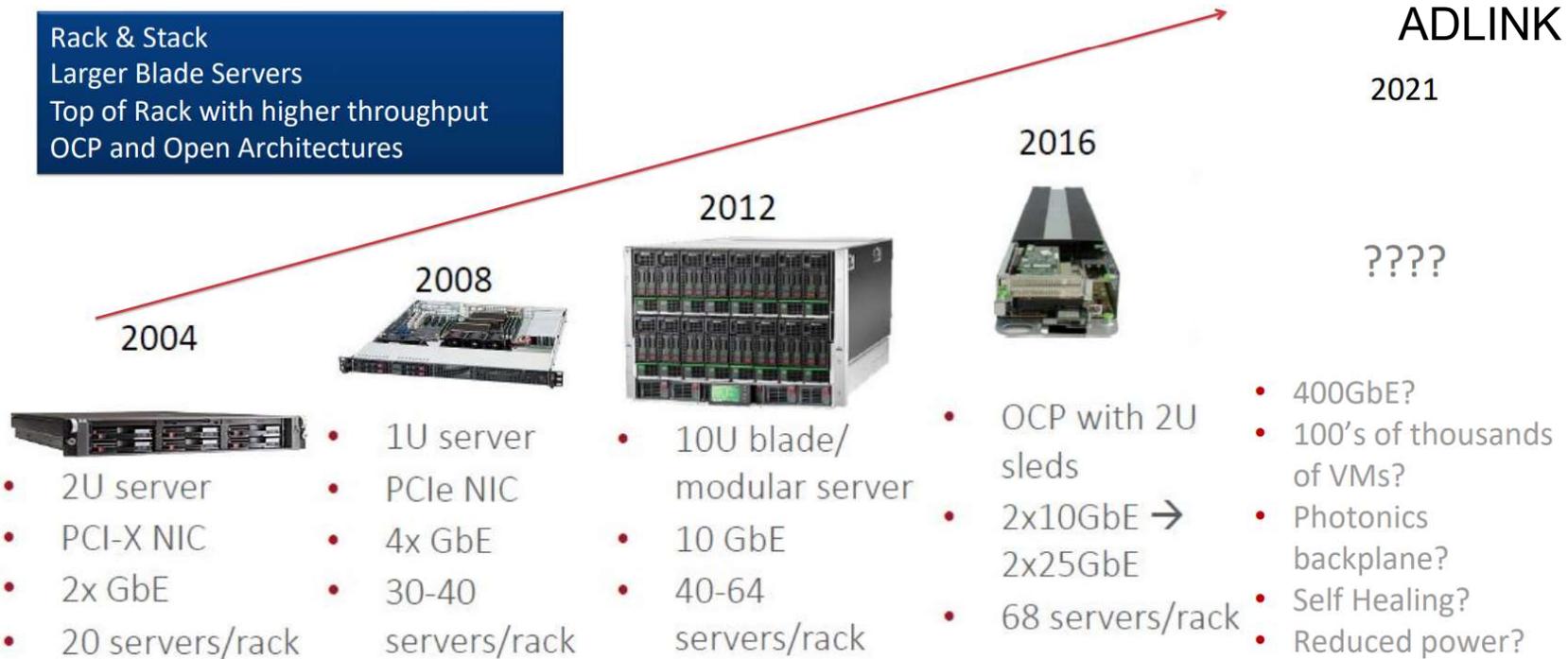
Figure 1: View of OCS with rack



4. OCP Marketplace

8) 하드웨어 발전

- 컴퓨팅 하드웨어 발전과 OCP
 - 서버 네트워크 연결의 발전 방향 (ADLINK)



4. OCP Marketplace

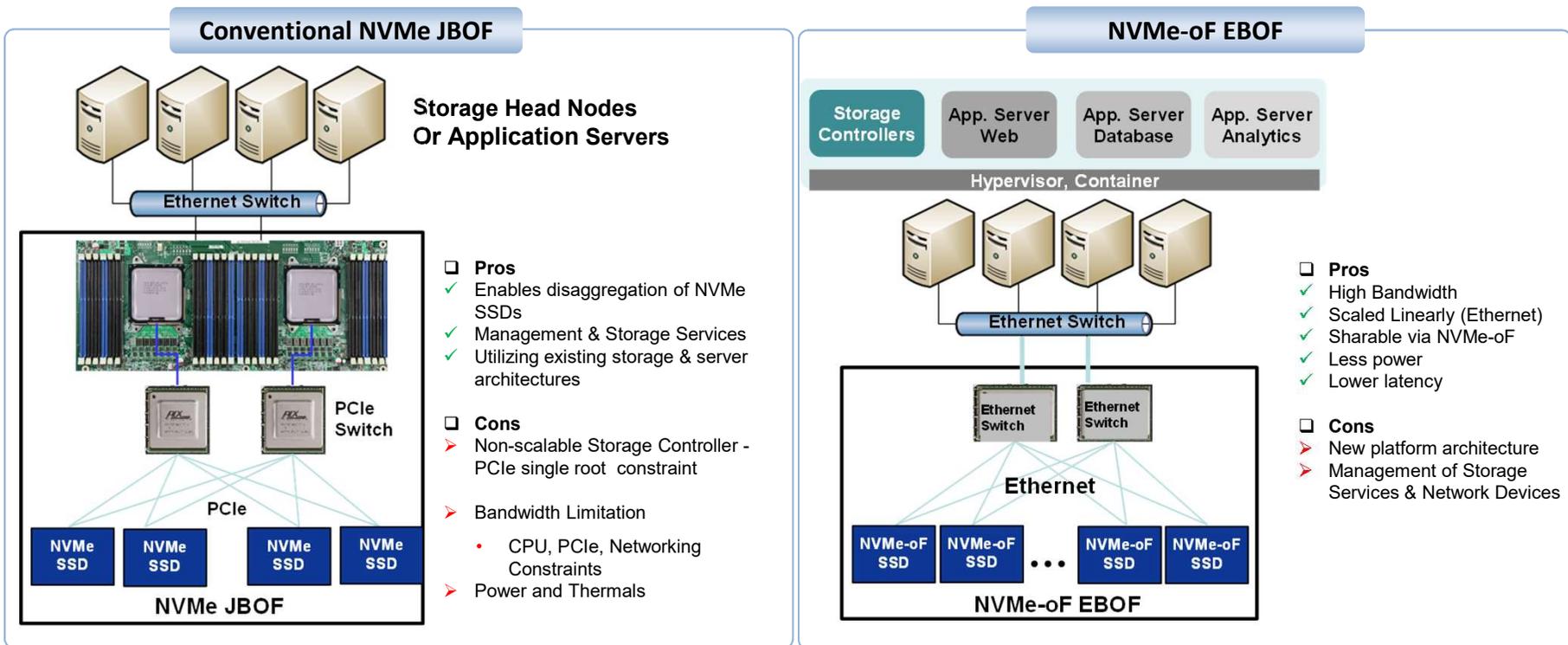
9) NVMe-oF SSD based EBOF

- **NVMe-oF SSD based EBOF**

- **NVMe-oF** (NVMe over Fabrics)
- **EBOF** (Ethernet Bunch of Flash)

JBOF (just a bunch of flash)

EBOF (Ethernet Bunch of Flash)



- ❑ **Pros**
 - ✓ Enables disaggregation of NVMe SSDs
 - ✓ Management & Storage Services
 - ✓ Utilizing existing storage & server architectures
- ❑ **Cons**
 - Non-scalable Storage Controller - PCIe single root constraint
 - Bandwidth Limitation
 - CPU, PCIe, Networking Constraints
 - Power and Thermals

- ❑ **Pros**
 - ✓ High Bandwidth
 - ✓ Scaled Linearly (Ethernet)
 - ✓ Sharable via NVMe-oF
 - ✓ Less power
 - ✓ Lower latency
- ❑ **Cons**
 - New platform architecture
 - Management of Storage Services & Network Devices

4. OCP Marketplace

10) Telecom Infra Project

- **Telecom Infra Project**
 - Backhaul Projects
 - Access Projects
 - Core & Management Projects

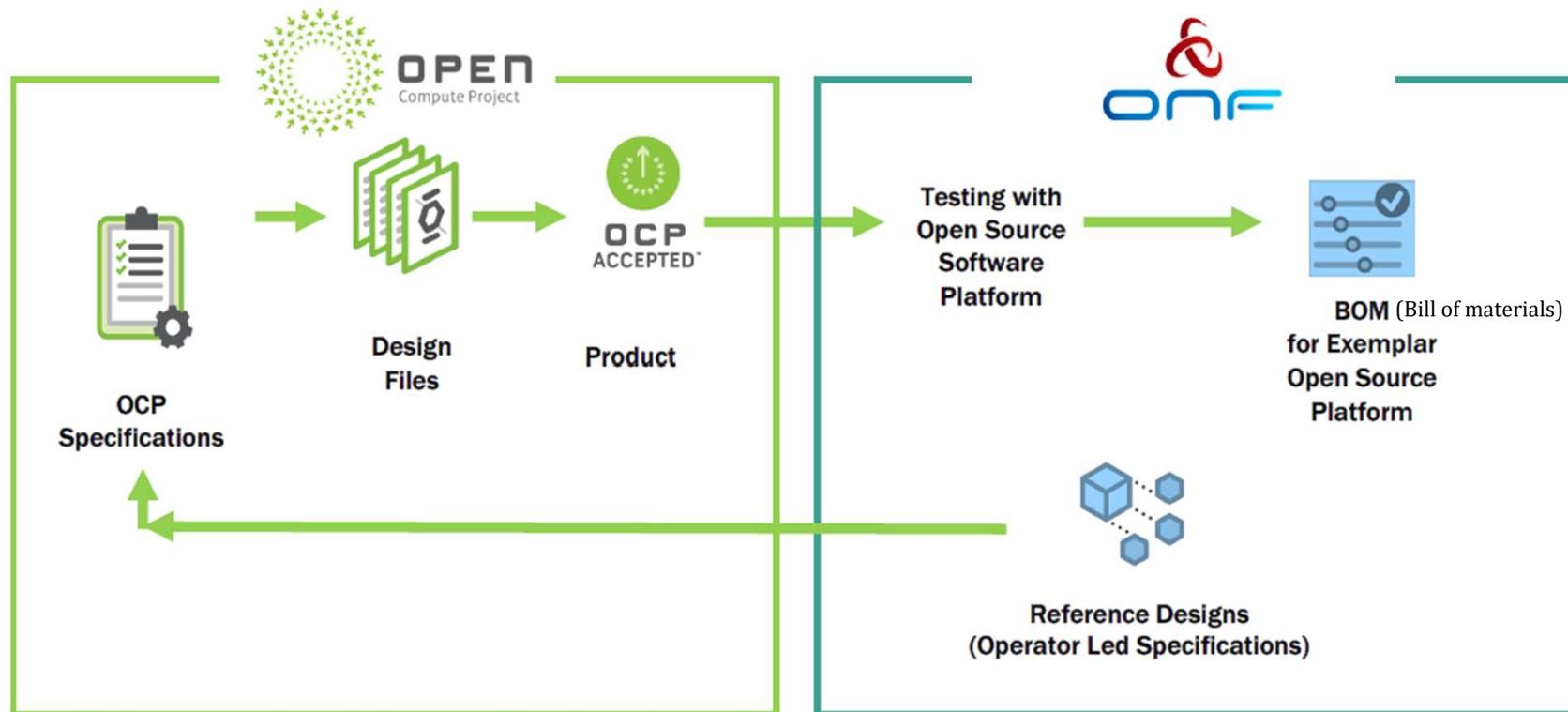


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5. Collaborating with OCP

1) OCP and ONF

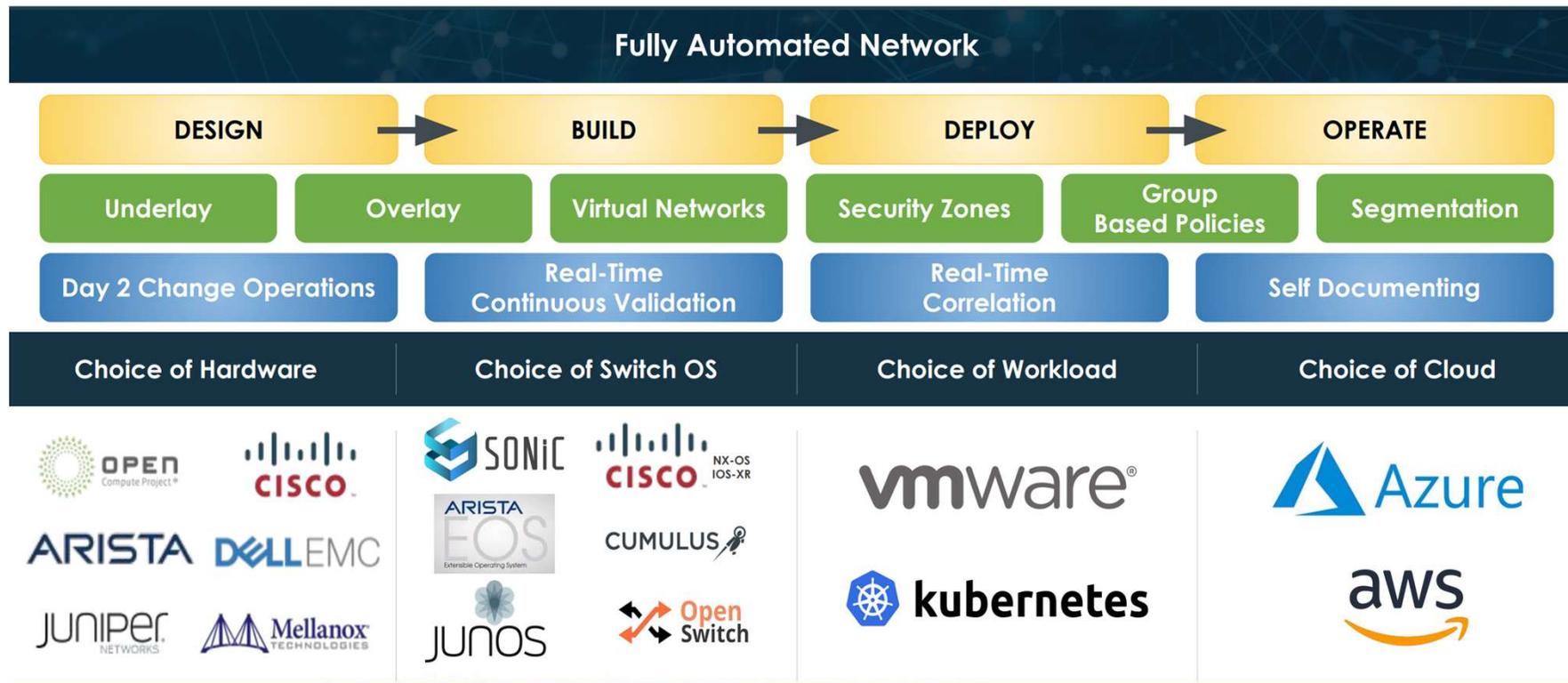
- Collaborating with OCP solutions
 - OCP and ONF



5. Collaborating with OCP

2) Intent-Based Data Center

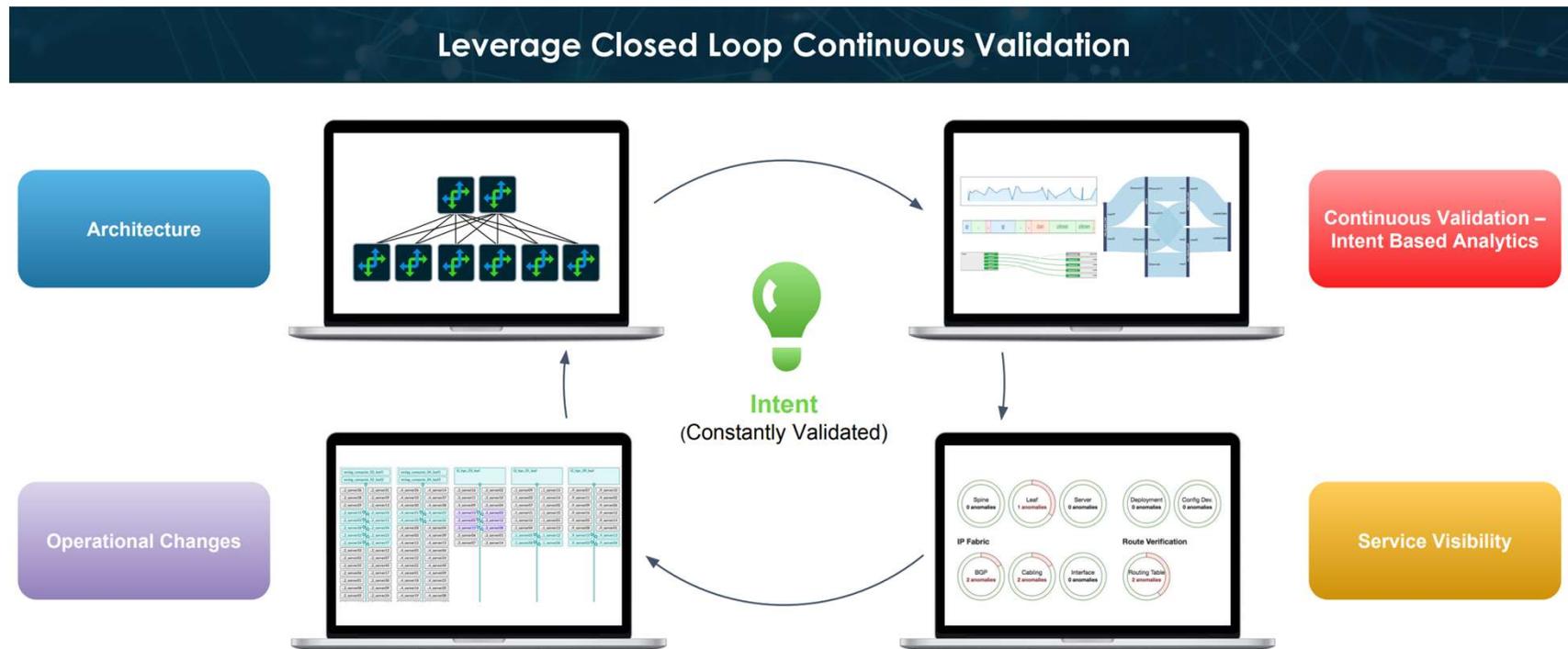
- Intent-Based Data Center Automation



5. Collaborating with OCP

3) Intent-Based Networking

- Intent-Based Networking Analytics



5. Collaborating with OCP

4) Barefoot OCP Ecosystem

- Collaborating with OCP solutions
 - Barefoot OCP Ecosystem

Network Operating Systems



White Box Hardware (ODMs)



Barefoot ASICs



Supported Devices and Platforms

Lihua Yuan edited this page 2 days ago - 48 revisions

Following is the list of platforms that support SONiC. Last updated Mar 2018.

Switch Vendor	Switch SKU	ASIC Vendor	Switch ASIC	Port Configuration	SONiC Image
WNC	OSW1800	Barefoot	Tofino-T10-018D	48x25G+6x100G	SONiC-ONIE-Barefoot ⁶
Edgecore	Wedge 100BF-32X	Barefoot	Tofino-T10-032D	32x100G	SONiC-ONIE-Barefoot ⁶
Edgecore	Wedge 100BF-65X	Barefoot	Tofino-T10-064Q	65x100G	SONiC-ONIE-Barefoot ⁶

5. Collaborating with OCP

5) 아리스타

- Collaborating with OCP solutions

- 아리스타

SONiC on Arista Hardware



2016

Arista EOS on Facebook Wedge100S



2017



Arista 7368X
128x100G

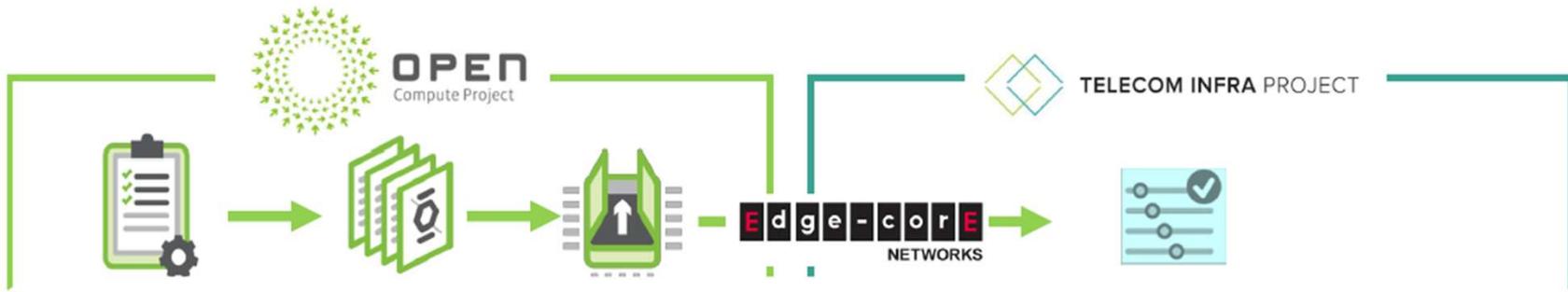


FB Minipack
128x100G

5. Collaborating with OCP

6) 에지코어

- Collaborating with OCP solutions
 - 에지코어



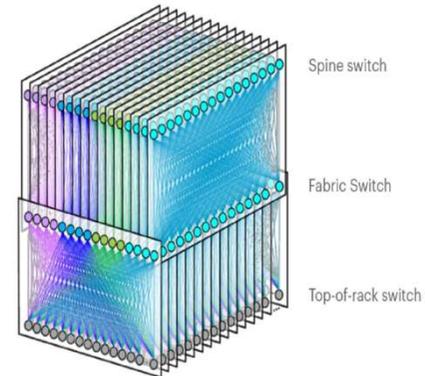
AS7316-26XB Open Cell Site Router

5. Collaborating with OCP

7) SONiC

- Collaborating with OCP solutions

- SONiC



Facebook F16 data center network topology

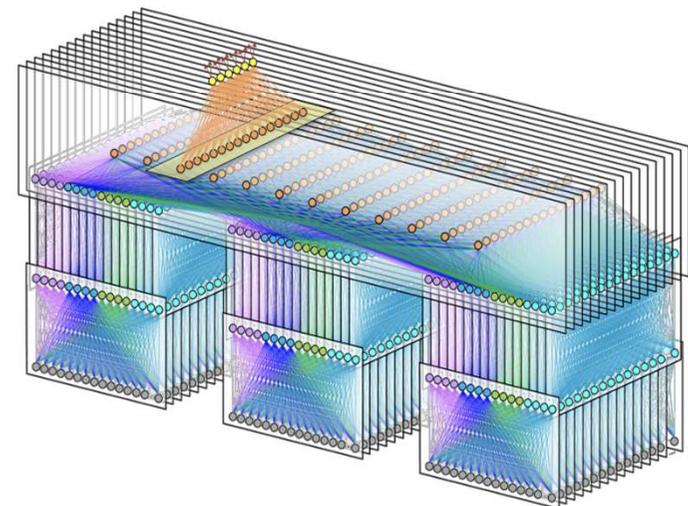


Arista 7368X
128x100G



FB Minipack
128x100G

2018-2019

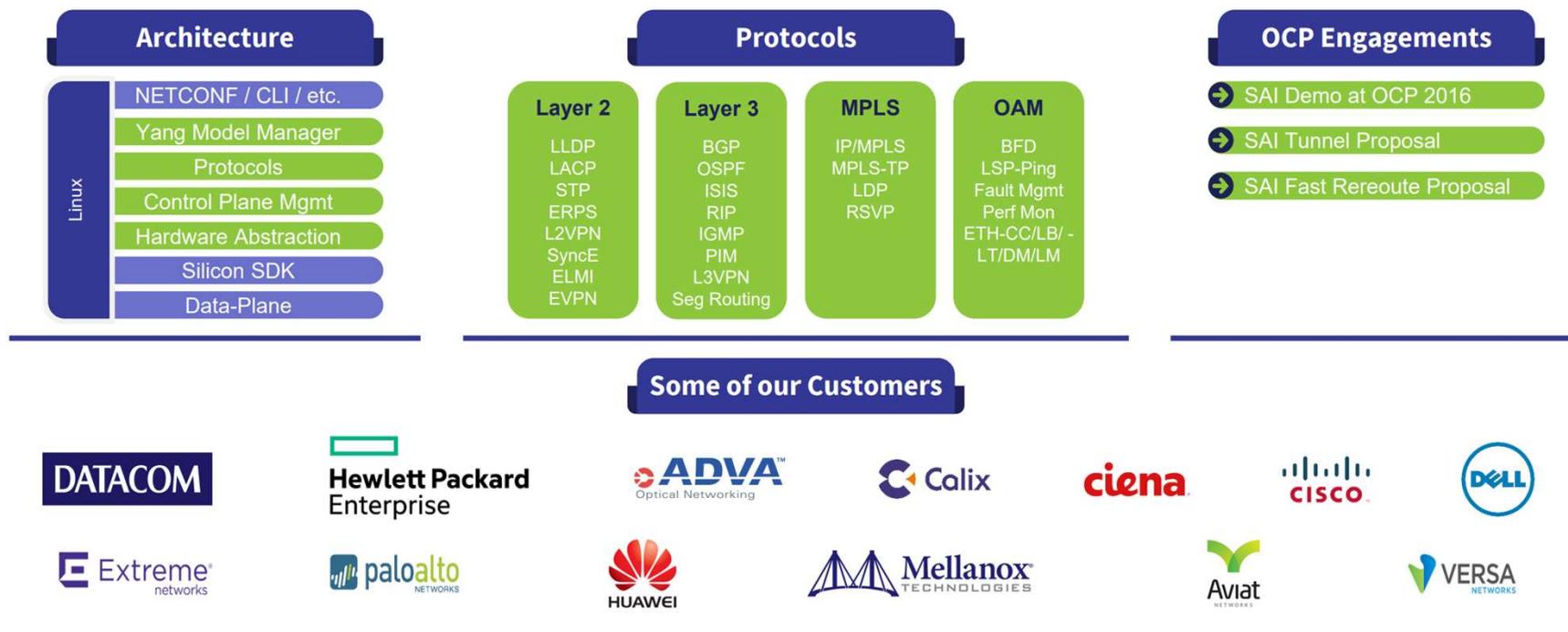


페이스북 다계층 Leaf-Spine 패브릭

5. Collaborating with OCP

8) Metaswitch

- **Distributed Data Plane**
- **Metaswitch Networking Software**
- <https://www.metaswitch.com/products/protocol-stacks>

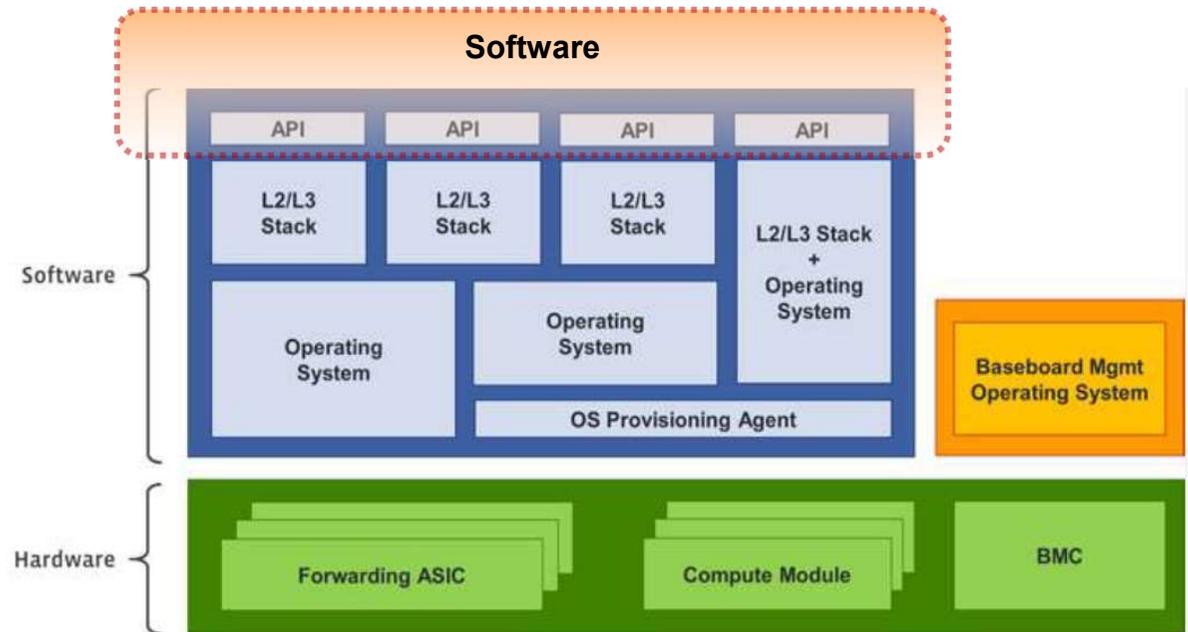
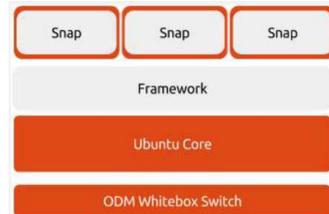
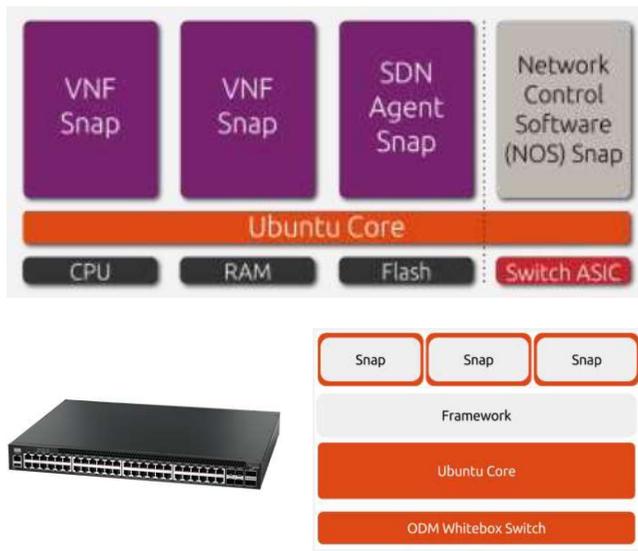


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6. Software Projects

1) Software Project 개요

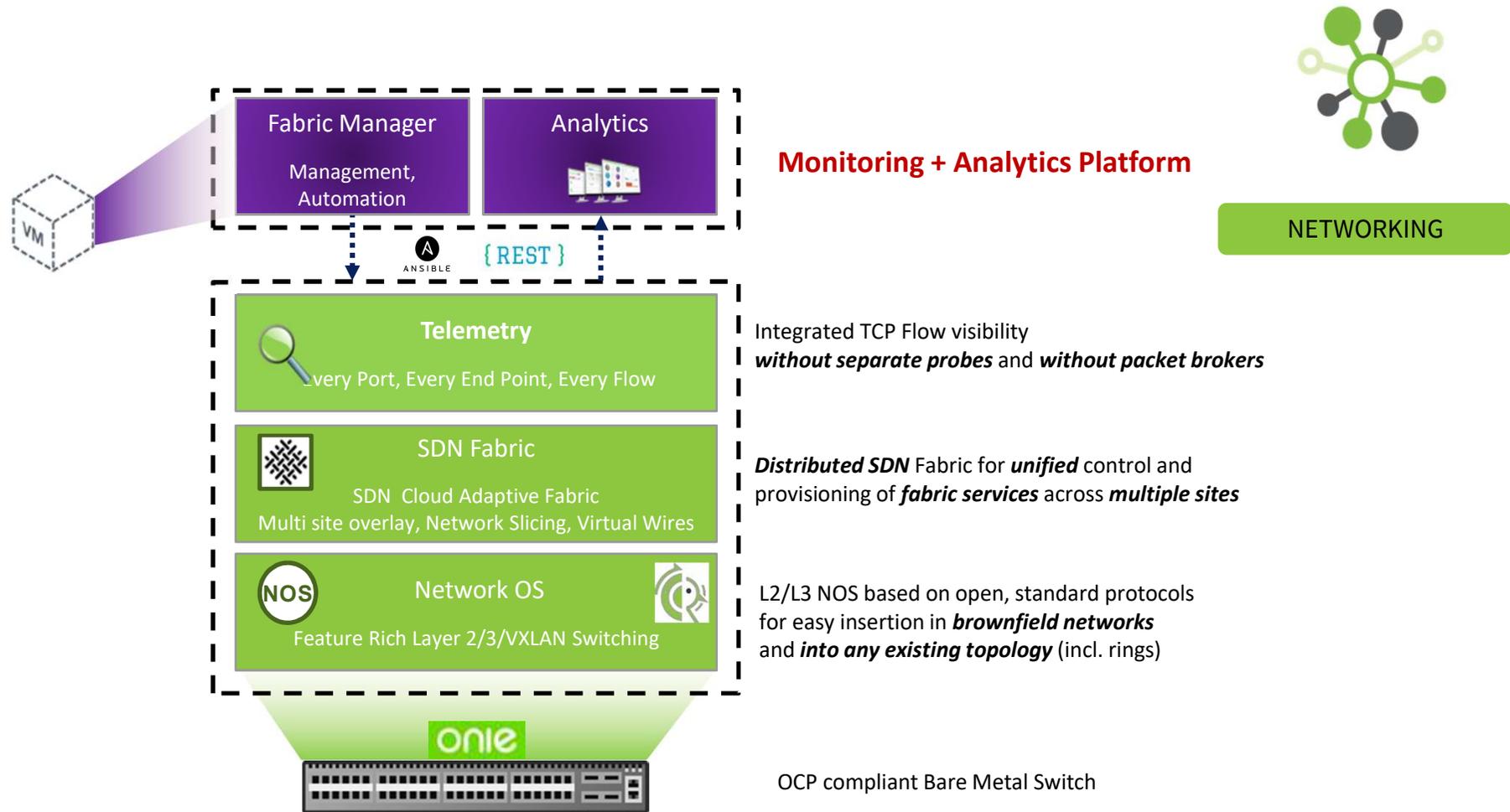
- Hardware and Software



6. Software Projects

2) Monitoring and Analytics for Disaggregated Networking

- Open – Disaggregated Networking



Monitoring + Analytics Platform

NETWORKING

Integrated TCP Flow visibility
without separate probes and *without packet brokers*

Distributed SDN Fabric for *unified* control and provisioning of *fabric services* across *multiple sites*

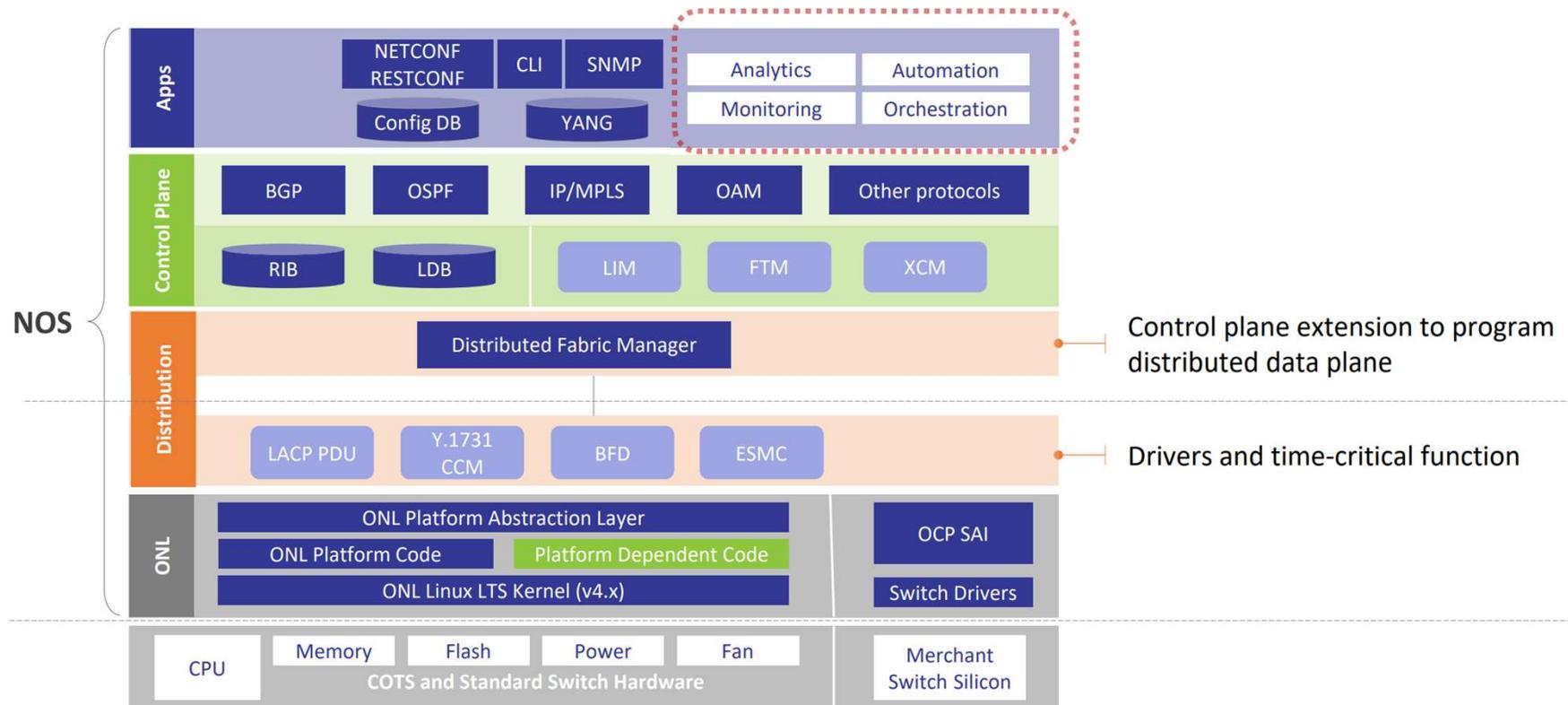
L2/L3 NOS based on open, standard protocols for easy insertion in *brownfield networks* and *into any existing topology* (incl. rings)

OCP compliant Bare Metal Switch

6. Software Projects

3) Management for Distributable NOS

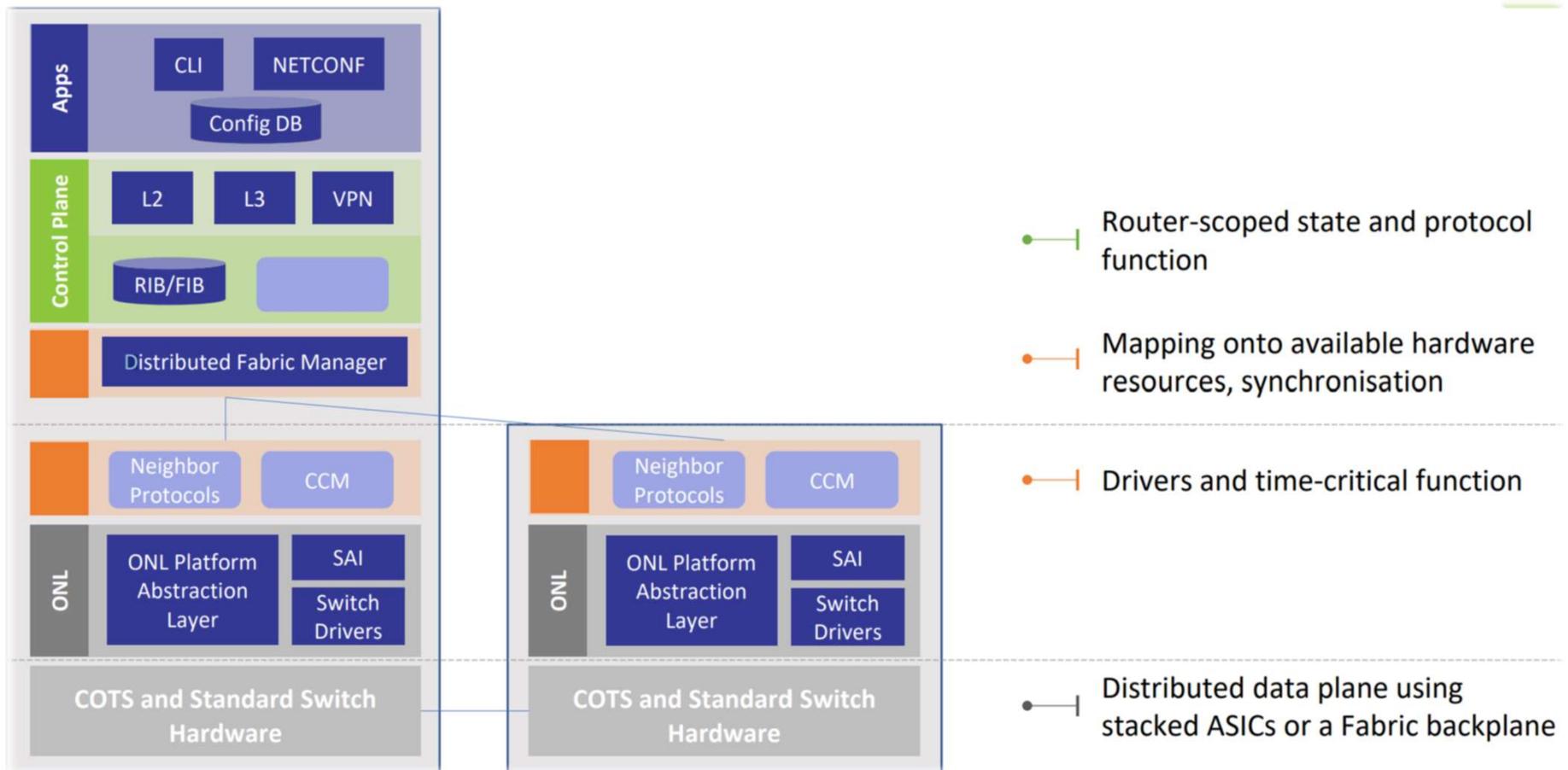
- Architecture of a Distributable NOS



6. Software Projects

4) Management for Distributed Data Plane

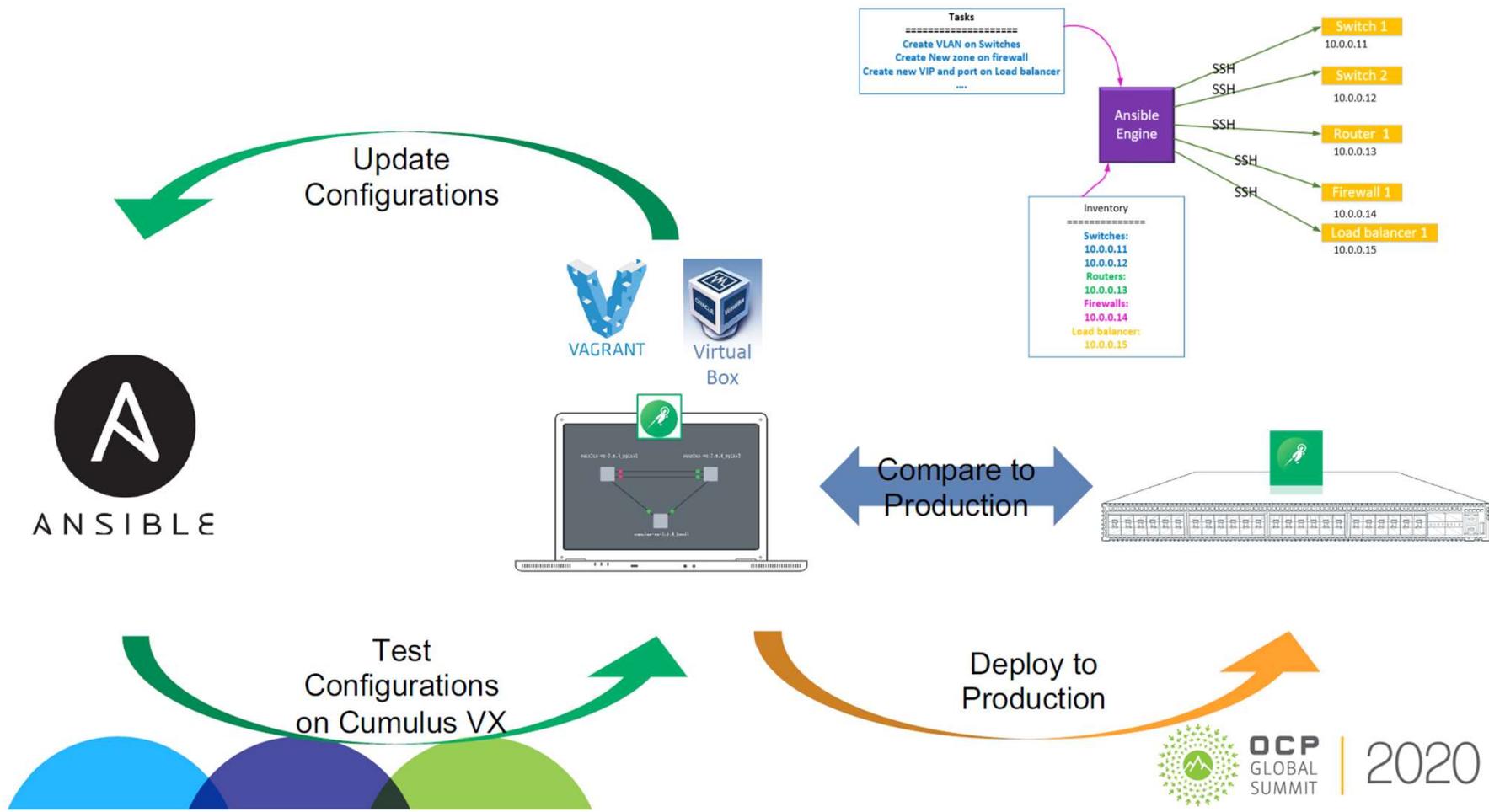
- **Distributed Data Plane**



6. Software Projects

5) Automation

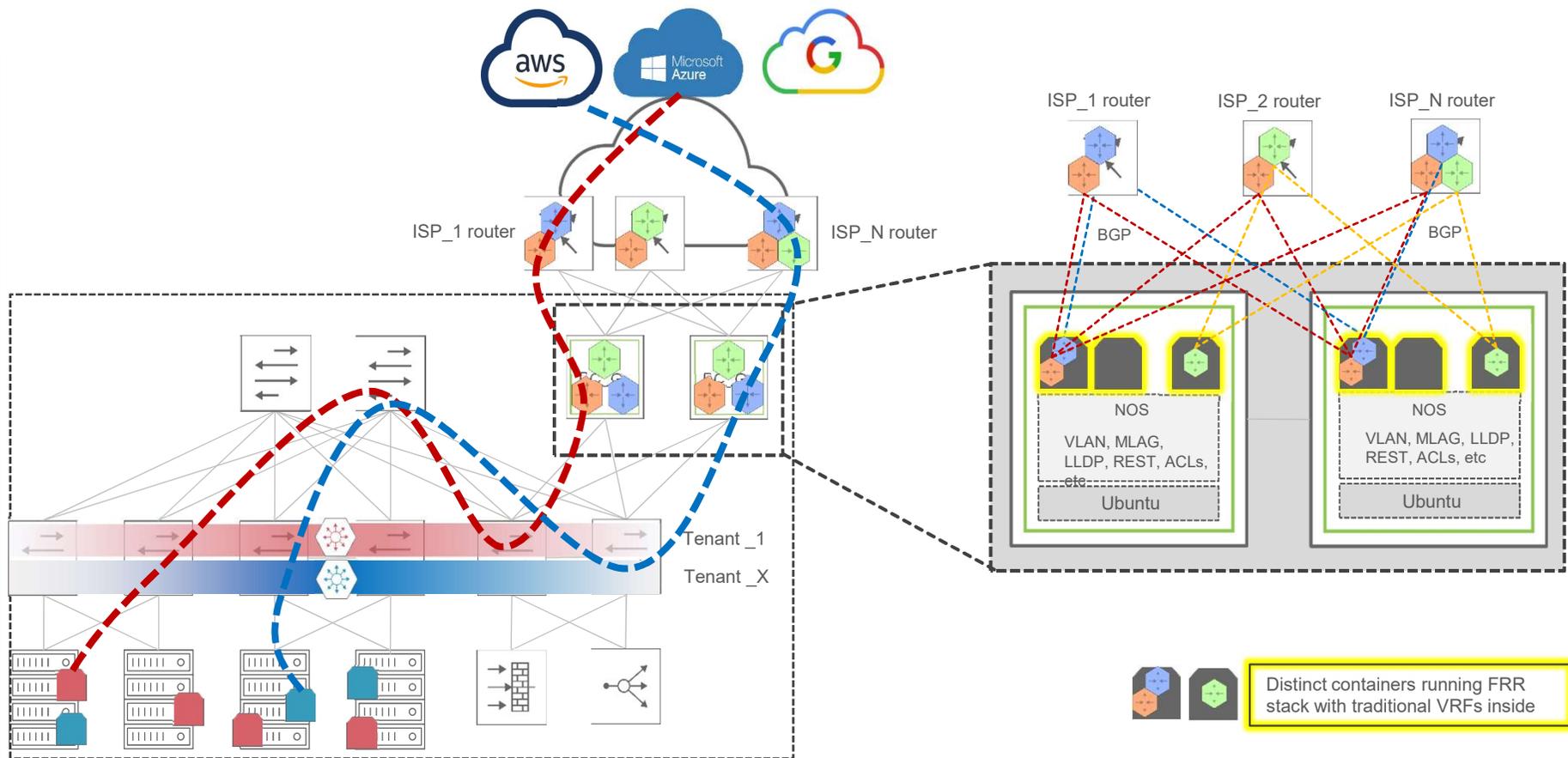
- Ansible



6. Software Projects

6) Hardware vRouter

- “Hardware vRouter” Based Multi-tenancy for DC Gateway Service

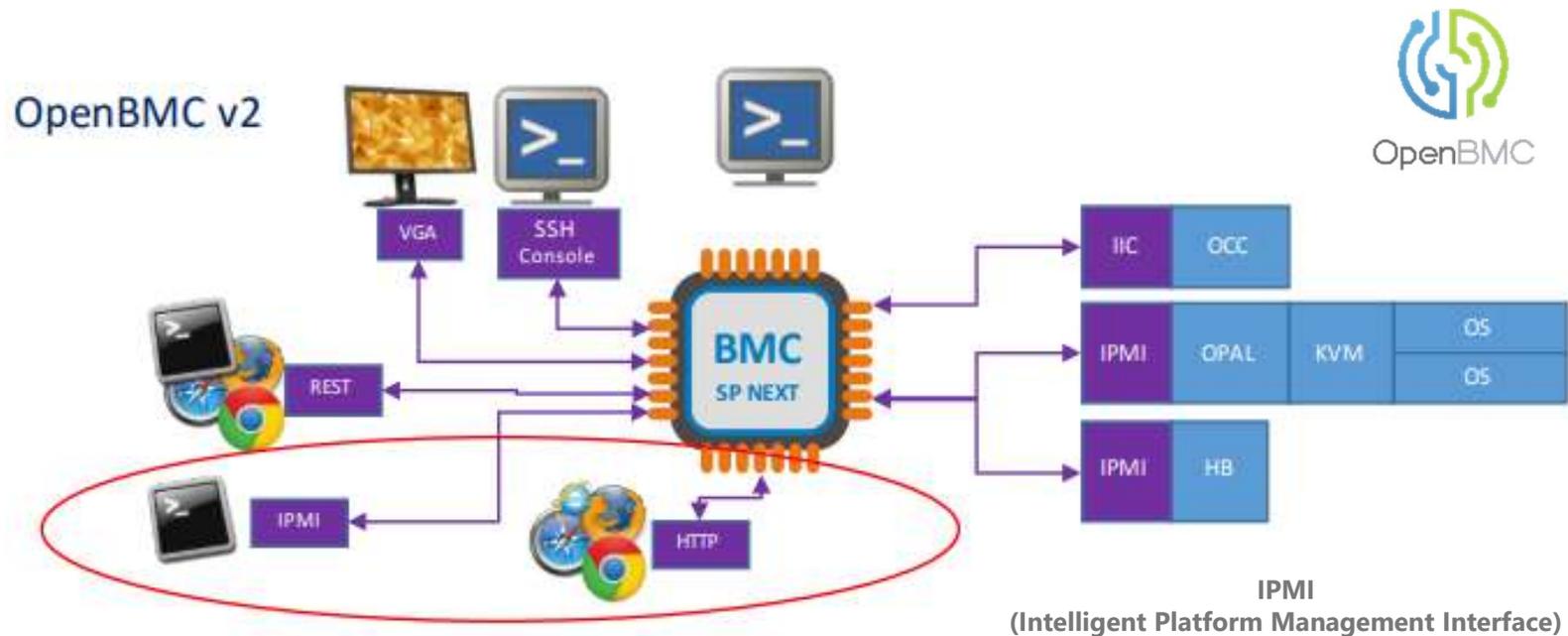


6. Software Projects

7) OpenBMC

- **The OpenBMC:**

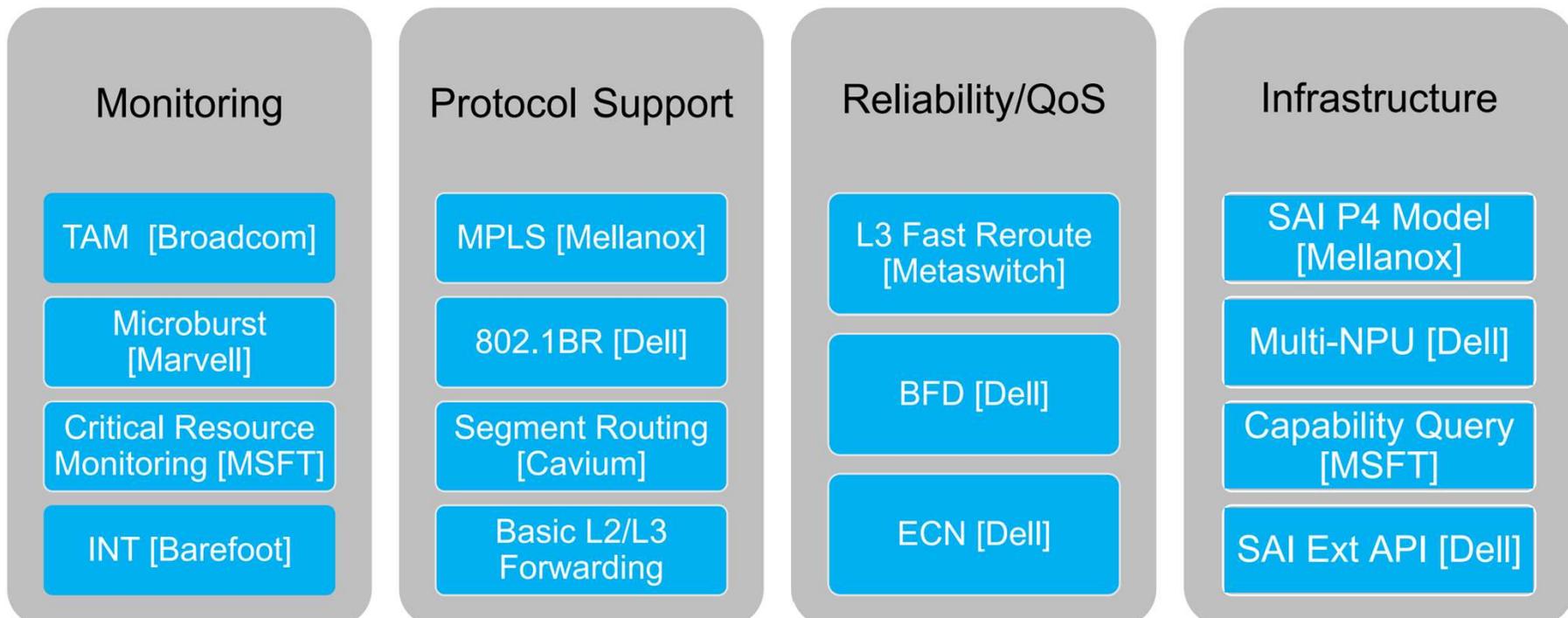
- Linux Foundation open-source project
- goal is to produce an open source implementation of the Baseboard Management Controllers (BMC) Firmware Stack.



6. Software Projects

8) Switch Abstraction Interface

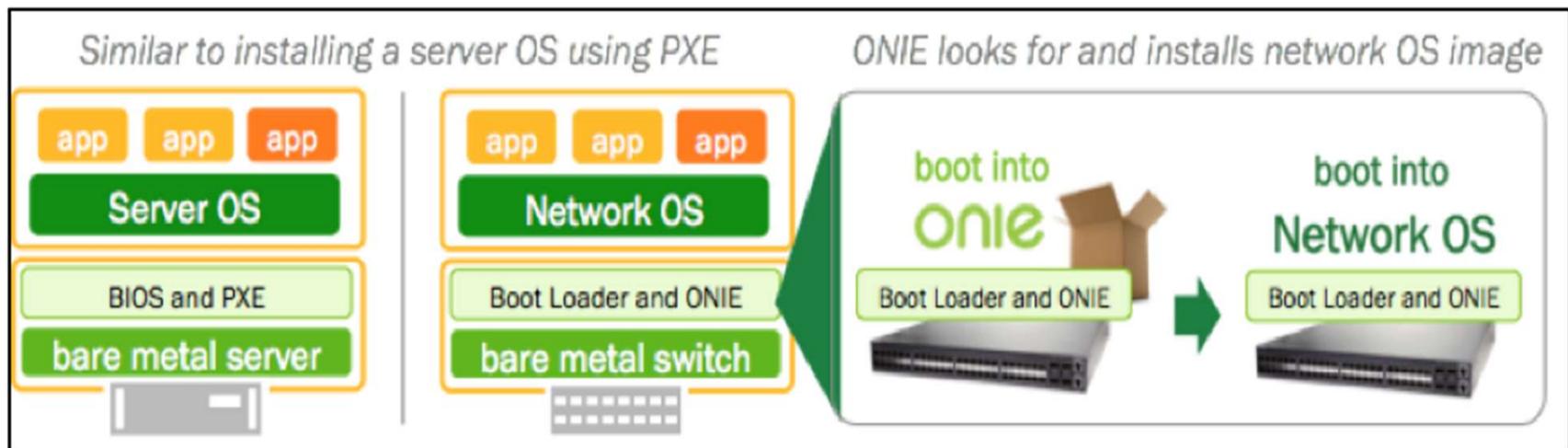
- What is in SAI (Switch Abstraction Interface)



6. Software Projects

9) ONIE

- Open Network Install Environment(ONIE)



6. Software Projects

10) NOS

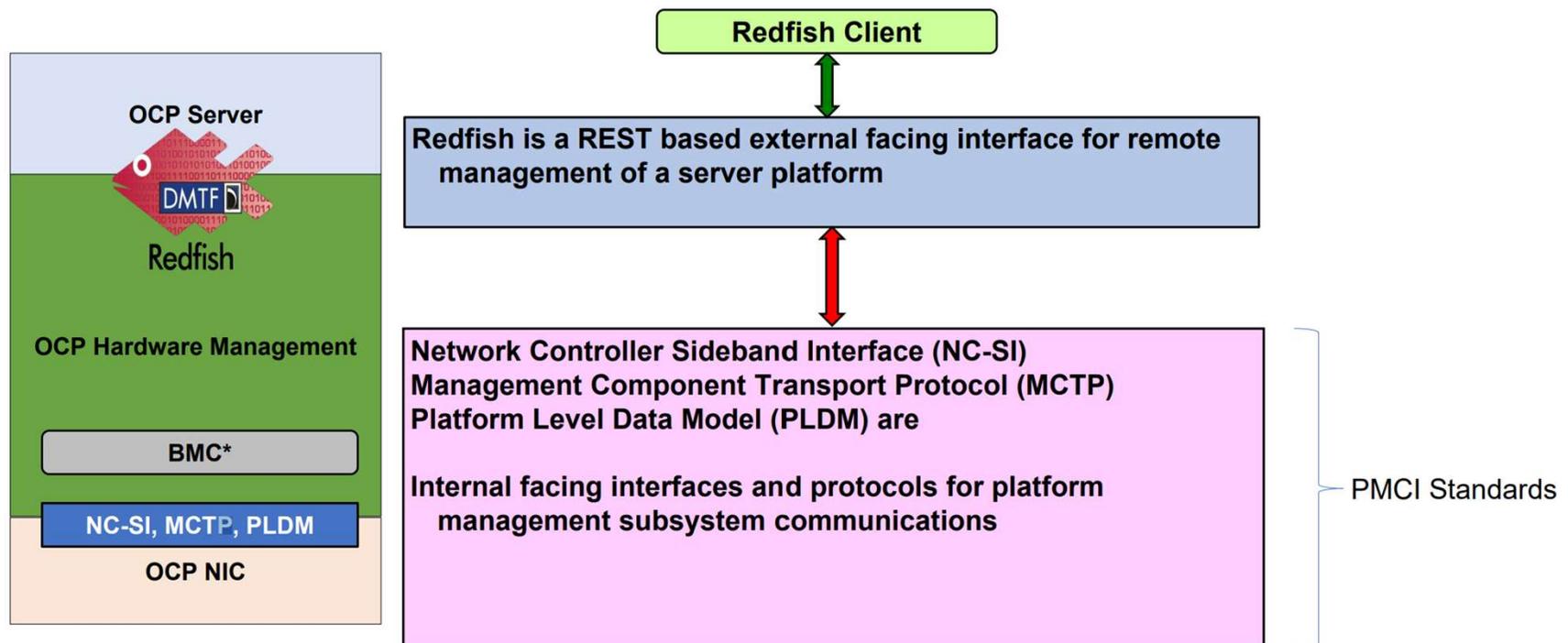
- OpenSwitch v.s. ONL (Open Network Linux)

OpenSwitch (ops) http://www.openswitch.net/		Open Network Linux (ONL) http://opennetlinux.org/	
Features / Functionalities			
Open NOS with full L2/L3 Switching Feature. Routing / OpenFlow agents are included.		Open Platform Distribution for NOS. Routing / OpenFlow agents NOT included. (only samples)	
Target Hardware			
OCP (Open Compute) switch, Bare metal (White Box) Switch			
Contributors			
Hewlett Packard, Accton, Broadcom Intel, Qosmos, VMWare, Arista		Big Switch Networks (Initial Source Code Contributor), Pica8, Accton	
License			
Apache License, v. 2.0		Eclipse Public License and GPL for Kernel	

6. Software Projects

11) DMTF

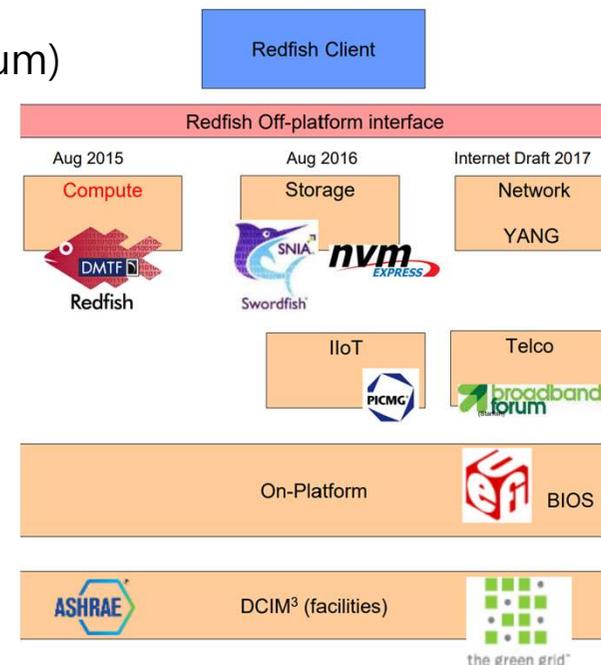
- **DMTF Standards Applicable to OCP Platforms**
 - The DMTF(Distributed Management Task Force) organization develops open manageability standards spanning diverse emerging and traditional IT infrastructures



6. Software Projects

12) Redfish

- **Redfish standard: SPMF**(sequential pattern mining framework), **DMTF**
- **Extending Redfish manageability**
 - **Domain experts from other SDO's are extending Redfish**
 - **Networked storage, storage services, and nonvolatile storage** (SNIA, NVMExpress)
 - **Ethernet Switch - map YANG to Redfish**
 - **BIOS interface** (UEFI)
 - **DC facilities infrastructure devices** (The Green Grid, ASHRAE)
 - **Industrial IoT** (PICMG)
 - **Customer Premise Equipment** (Broadband Forum)

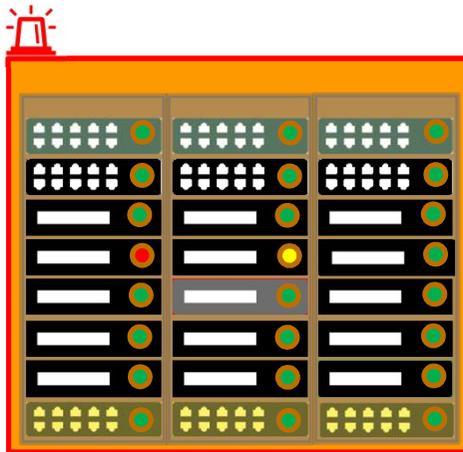


6. Software Projects

12) Rack Manager Service

- **Rack Manager Service**

- The Rack Manager service provides the front end through a Redfish-compliant REST API for automated management and a command-line interface for manual management. It manages all devices within the rack and communicates directly with the server management system through the network.



User Management (add, remove, etc.)

PMDU Management (power state, relay state, meter alert, throttling, etc.)

Rack Manager Services (Redfish, TFTP, NFS, NTP, JTAG, etc.)

Rack Manager (rack inventory, firmware update, log services, attention LED, etc.)

System / Blade Management (power state, boot order, BIOS configuration, TPM status, mezzanine card status, remote media mount, etc.)

System / Blade Serial Sessions (session management, etc.)

Switch Management (port information, firmware update, etc.)

UPS Management (voltage, power, current, alarm, etc.)

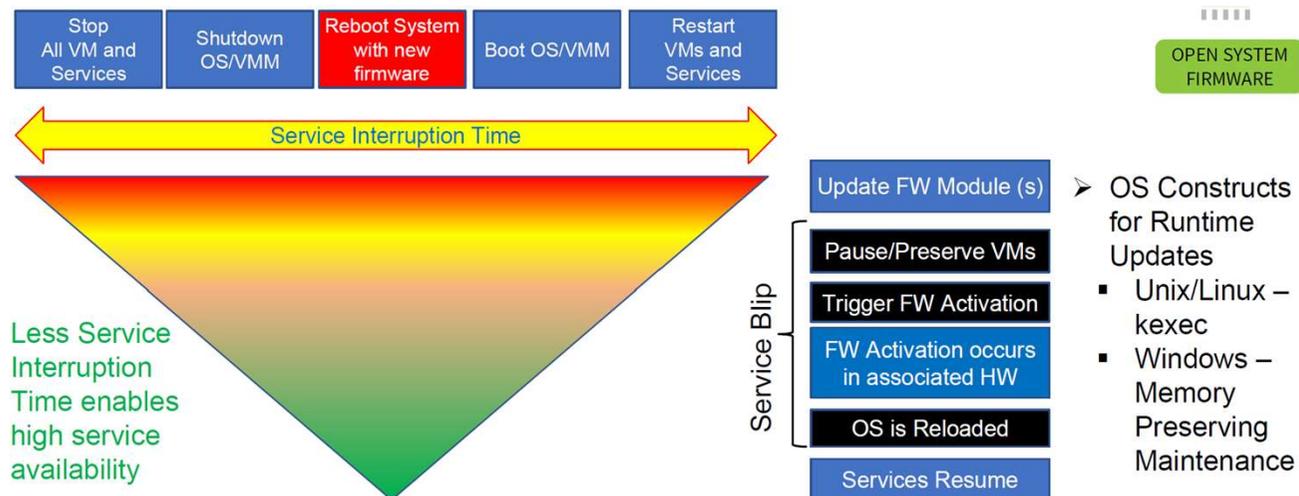
High-level functionality exposed by Redfish OCP profile



6. Software Projects

13) Cloud Firmware Updates

- Supply chain integrity
- Ease of deployment at scale
- Impact less updates
- Automatic Recovery / Rollback
- Audit trails
- Root of trust
- Low boot time
- Configuration / Policy management



Intel® is working with partners in OCP on improving FW upgrades

-
1. 개요
 2. OCP Overview
 3. OCP 재단 구성
 4. OCP Marketplace
 5. Collaborating with OCP
 6. Software Projects
 - 7. SONiC**

7. SONiC

1) SONiC 개요

- **SONiC (Software for Open Networking in the Cloud):**

- **redisDB with multiple tables**
 - **BGP Table:** Stores configuration related to BGP neighbors, advertisements.
 - **Port:** Contains configuration related to interfaces, speeds.
 - **PortChannel:** Contains configuration of Link Aggregations (bonding/etherchannel, port channel).
 - **VLAN:** Contains VLAN IDs, member ports.
 - **VLAN members:** Contains configuration for individual ports for 802.1q tagging.
 - **Layer 3 tables:** INTERFACE, PORTCHANNEL_INTERFACE, and VLAN_INTERFACE to store IP address details of Layer 3 interfaces.
 - **ACL_RULE:** Contains configuration of access lists.
 - ..
 - ..

7. SONiC

1) SONiC 개요

❖ SONiC (Software for Open Networking in the Cloud) Commands:

Show MAC:

```
admin@sonic:~$ show mac
No.      Vlan MacAddress          Port
-----  -
1       1000 E2:8C:56:85:4A:CD  Ethernet12
```

Configure VLANs and member ports:

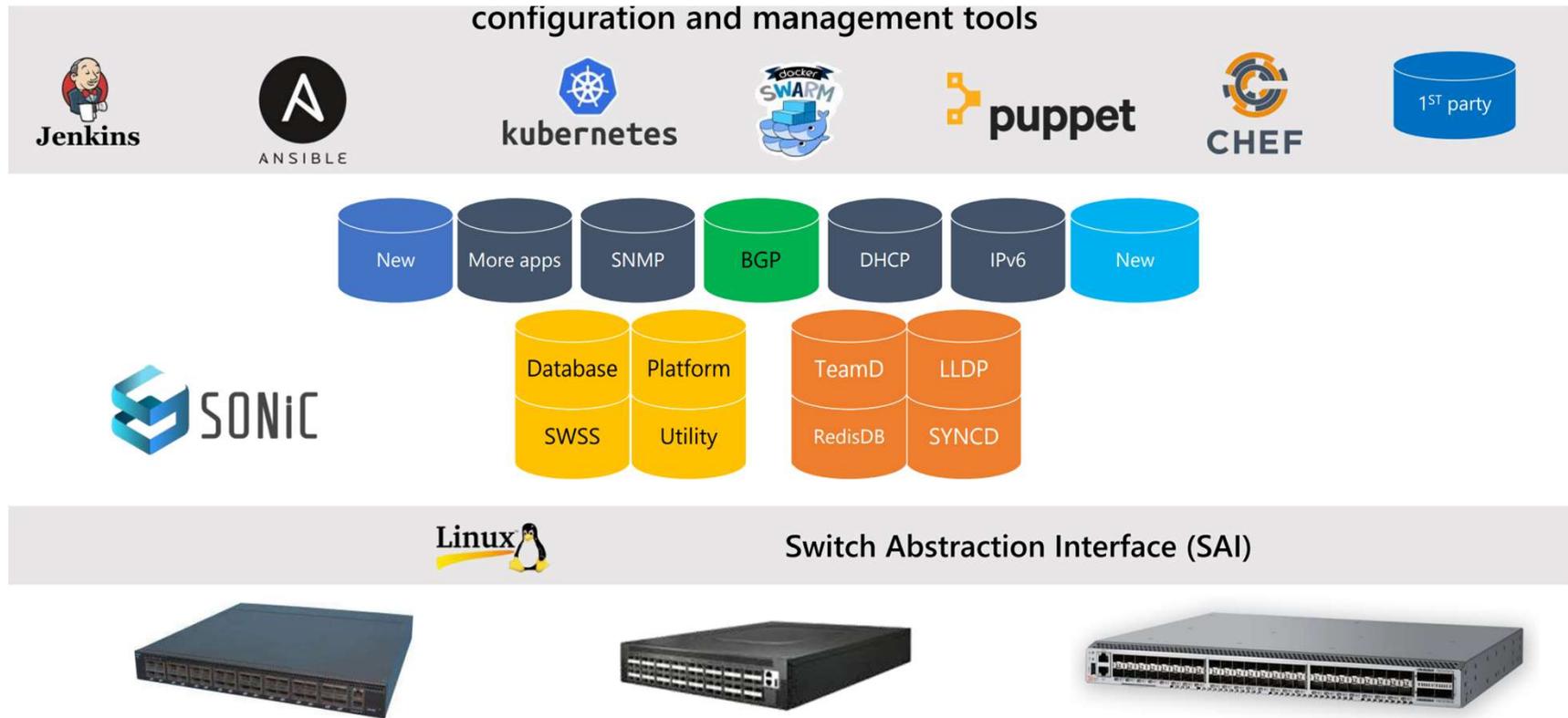
```
root@sonic:/# config vlan add 1200
root@sonic:/# config vlan member add 1200 Ethernet1
root@sonic:/# config vlan member add 1200 Ethernet9 -u      (Defining Untagged)
root@sonic:/# config vlan member add 1200 Ethernet8
```

BGP **show** commands:

```
admin@sonic:~$ show bgp neighbors 192.168.1.161
admin@sonic:~$ show bgp neighbors 192.168.1.161 advertised-routes
admin@sonic:~$ show bgp neighbors 192.168.1.161 received-routes
admin@sonic:~$ show bgp neighbors 192.168.1.161 routes
```

7. SONiC

1) SONiC 개요



7. SONiC

2) SONiC history



7. SONiC

3) SONiC +

❖ SONiC +

SONiC+ Load Balancer



- Load balancing @ switch line rate
- Can run on existing ToR switch excluding the extra load balancer servers hop
- can run in addition to all sonic functionality

SONiC+ You cannot fight what you cannot see



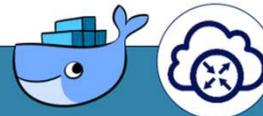
The Sepio security stand running on SONiC offers a unique solution that discovers, identifies and blocks malicious physical layer devices (active and passive)

Full protection against:

- Invisible network implants
- Manipulated firmware



SONiC+ Tunnel



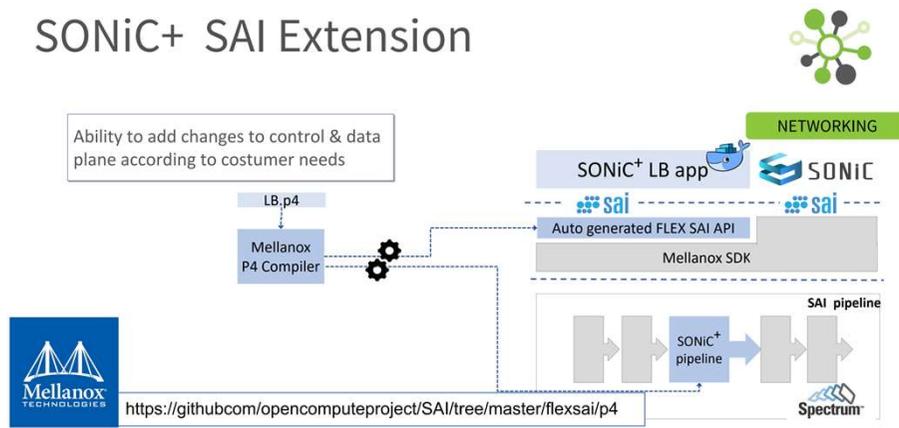
- Support tunnel mapping to overlay networks
- Support VRF peering to increase routing scale
- Use cases:
 - Connect bare metal servers to overlay networks
 - Map Customer Tunnel to tenant network

7. SONiC

3) SONiC +

❖ SONiC +

SONiC+ SAI Extension

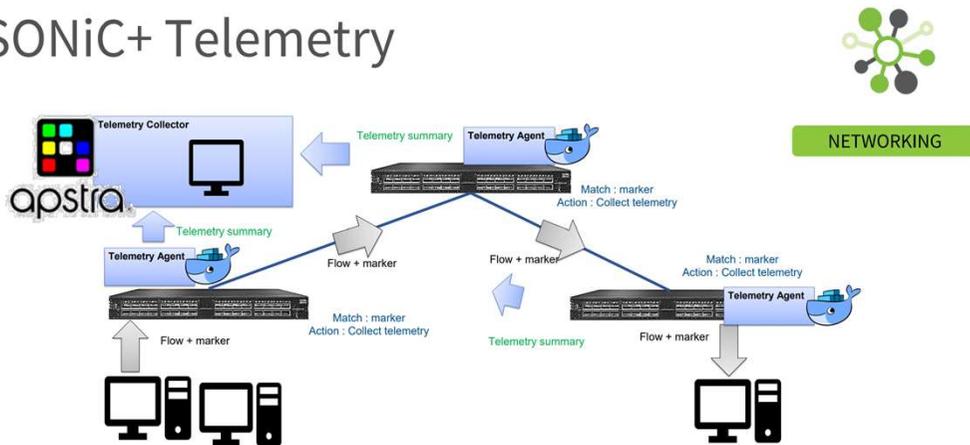


SONiC + ONL

- ONL is used by many NOS as a base OS
 - e.g) ONF Stratum, Facebook FBOSS
- building a solid base OS in the open source community benefits everyone
 - ODM only needs to port their hardware to ONL
 - SONiC gets wider hardware support

ONF Stratum	Facebook FBOSS	SONiC	ONF Stratum	Facebook FBOSS	SONiC
ONL	ONL		ONL	ONL	ONL
Current			Our proposal		

SONiC+ Telemetry

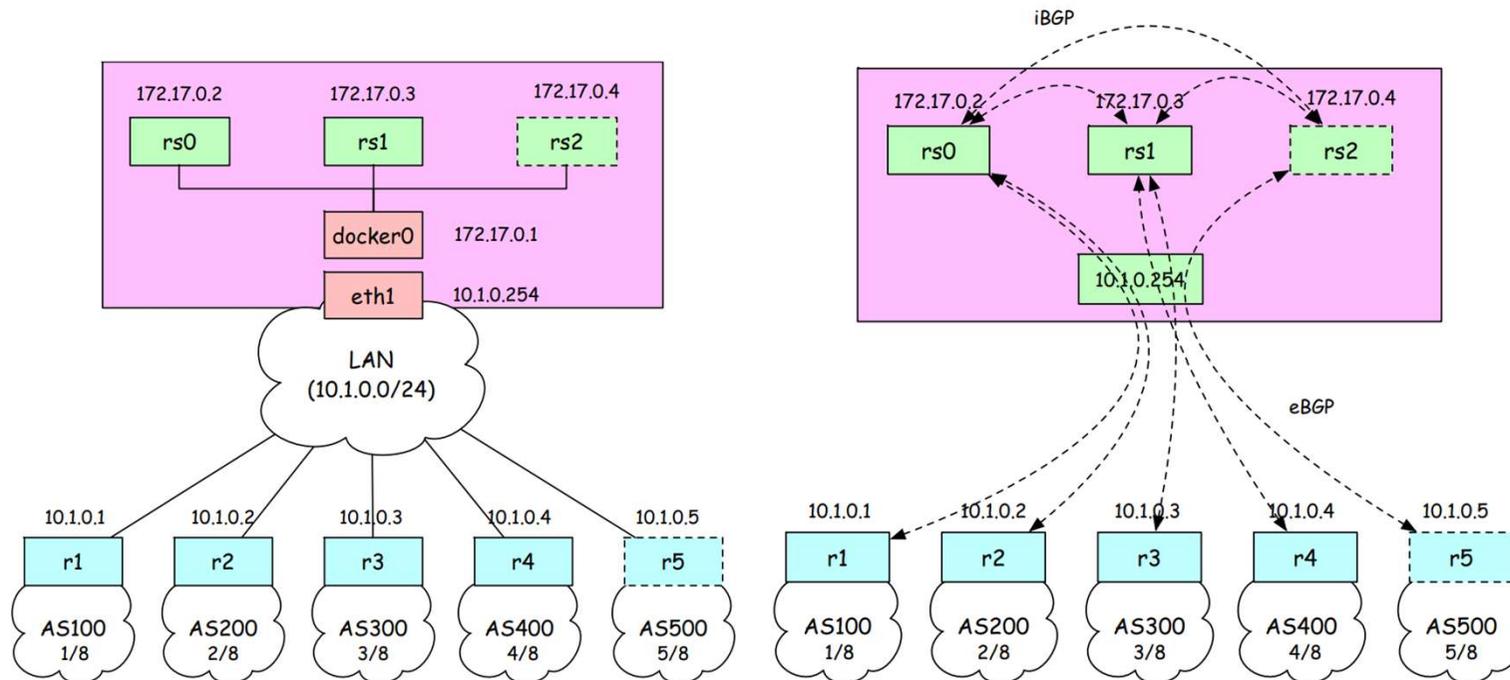


7. SONiC

4) containerized Routing Protocol Daemon

❖ Scale out Route Server

- Build a BGP route server that can service thousands of BGP clients
- Multiple instances of cRPD(containerized routing protocol daemon) behind a NATed bridge or load balancer
- Clients see all routes come from a single route server
- Support large number of BGP clients > 10K



7. SONiC

5) P4 for SONiC

❖ Sample Switch.P4 Features for SONiC

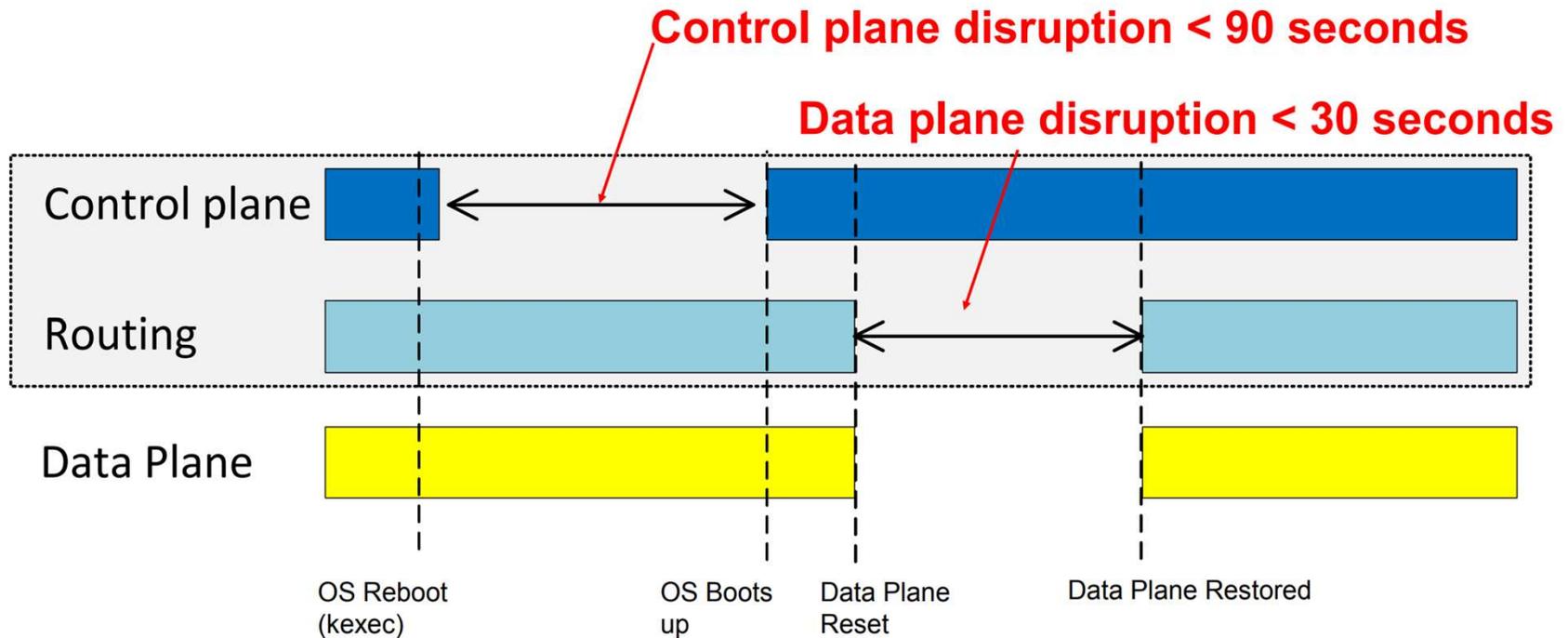
- **Ethernet switching**
 - VLAN Flooding
 - MAC Learning & Aging
 - STP state
 - VLAN Translation
- **IPv4 and IPv6 routing**
 - Unicast Routing
 - Routed Ports & SVI
 - VRF
 - Unicast RPF - Strict and Loose
 - Multicast - PIM-SM/DM & PIM-Bidir
- **QoS**
 - QoS Classification & marking
 - Drop profiles/WRED
 - RoCE v2 / PFC
 - CoPP (Control plane policing)
 - WRED-based ECN marking

- **Tunneling: VxLAN (v4/v6), IP-in-IP, GRE**
- ACL
 - Ingress MAC ACL, IPv4/v6 ACL, RACL
 - Egress MAC ACL, IPv4/v6 ACL, RACL
 - QoS ACL, System ACL, PBR
 - Port Range lookups in ACLs
- Security Features
 - Storm Control,
 - IP Source Guard
- sFlow
- PTP
- Counters
 - Route Table Entry Counters
 - VLAN/Bridge Domain Counters
 - Port/Interface Counters
 - ACL stats
- **Barefoot Dataplane Telemetry**

7. SONiC

6) Fast Boot

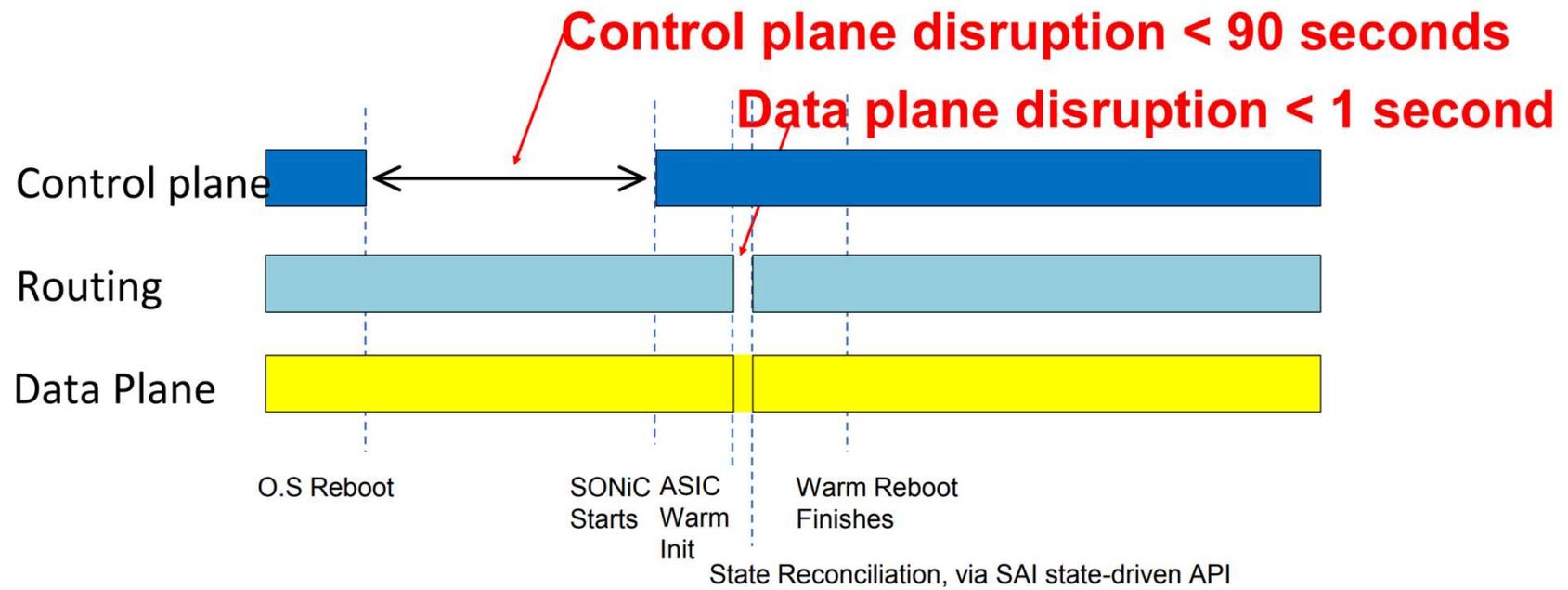
❖ Fast Boot



7. SONiC

7) Warm Boot

❖ Warm Boot

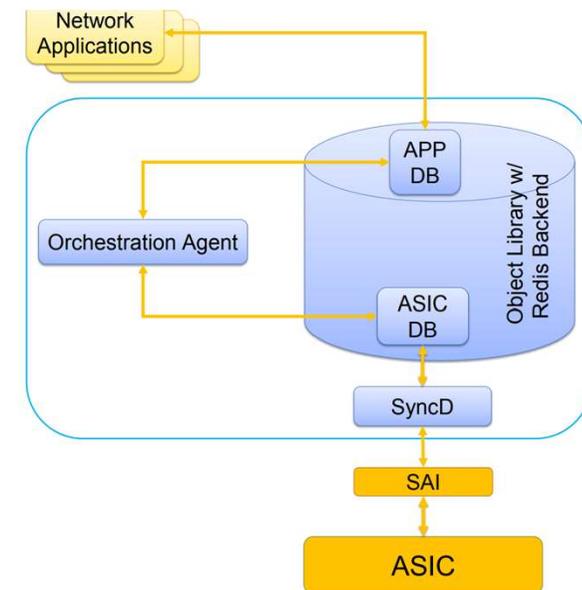


7. SONiC

8) Warm Boot Architecture

❖ Warm Boot Architecture

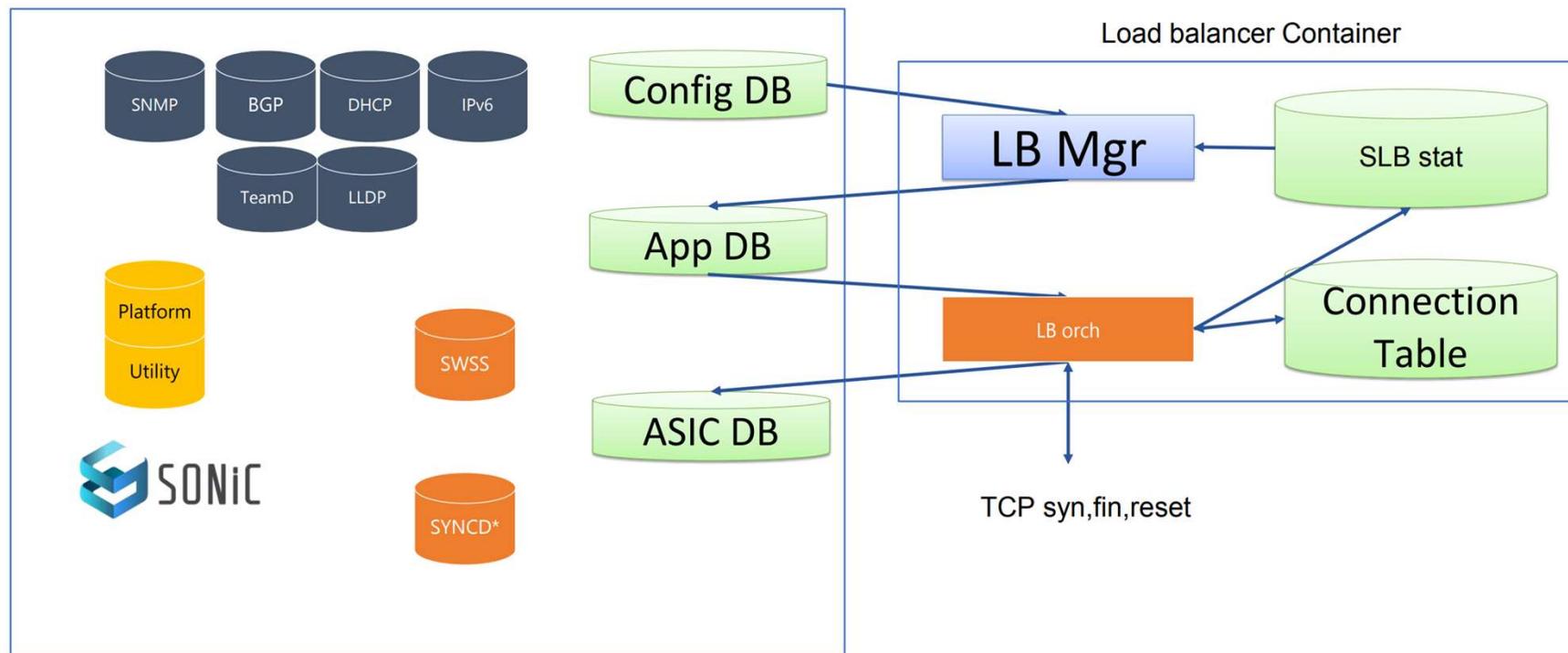
1. Warm boot script stores App/ASIC DB on disc
2. Redis restores App/ASIC DB after reboot
3. OA reads AppDB and compiles a new ASIC DB
4. SyncD compares old/new ASIC DB, and apply diff to the ASIC
5. Applications waking up in parallel
 - May staged changes to App DB
 - OA comes in as usual, updates ASIC dB
 - SyncD keeps syncing ASIC DB to hardware



7. SONiC

9) Load Balancer

❖ Load Balancer (Extending SwSS on SONiC)



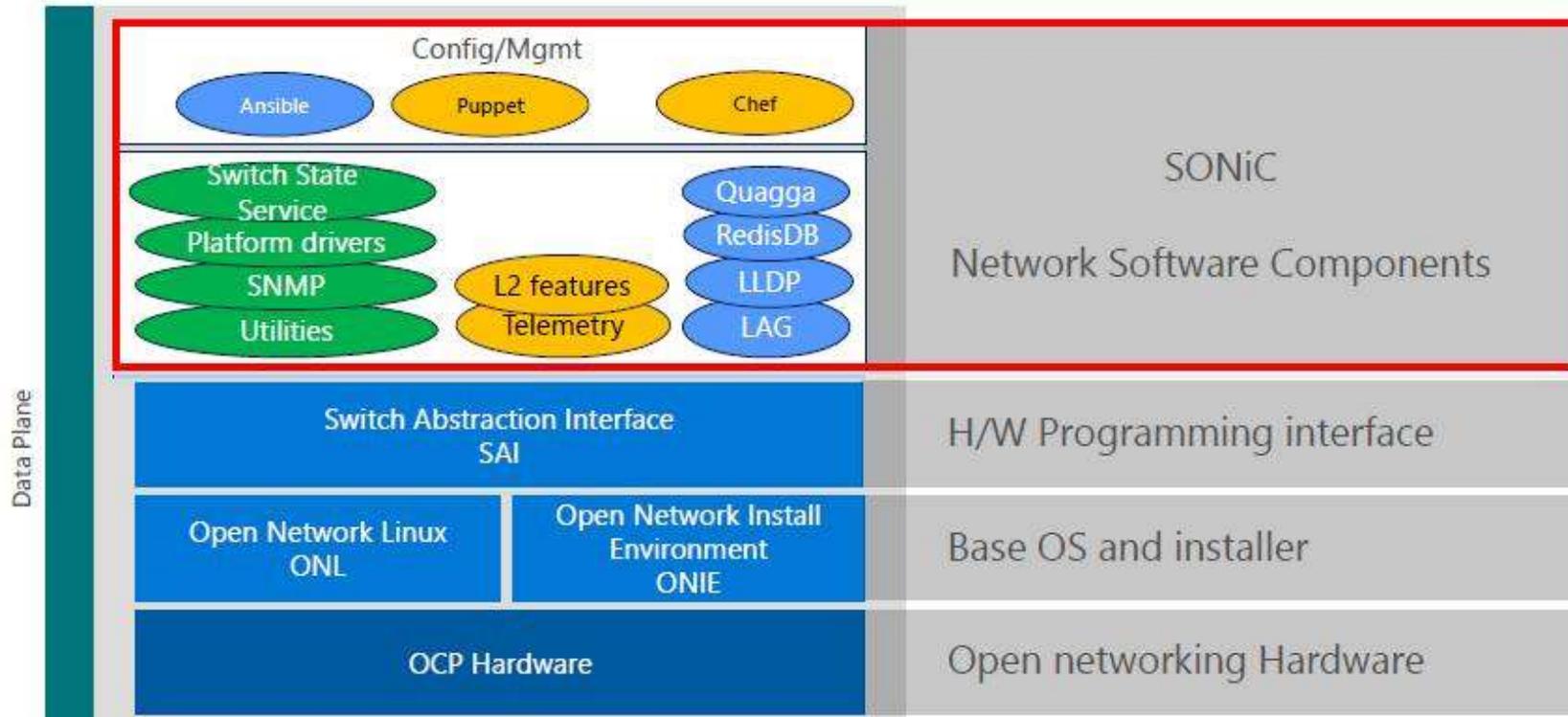
Software Support Service (SWSS)

7. SONiC

10) SONiC 구성

❖ SONiC Components

SONiC components

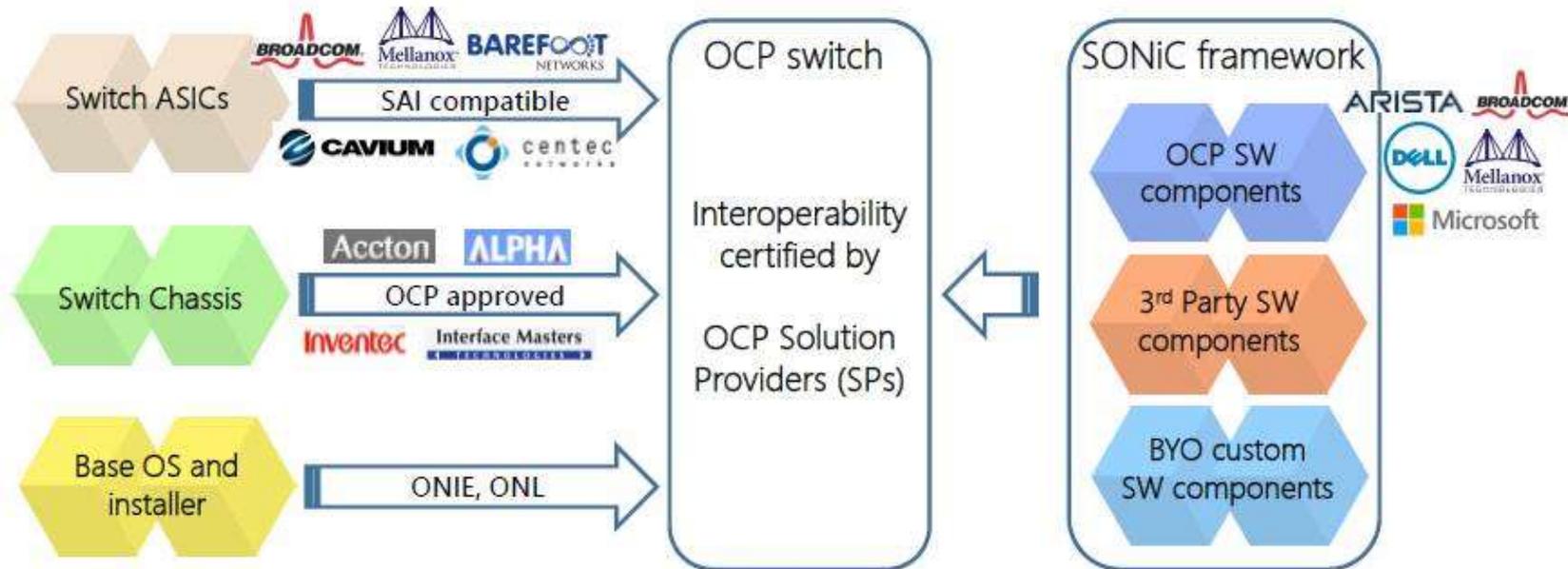


7. SONiC

11) SONiC 생태계

❖ SONiC ecosystem

SONiC vision for the OCP switch ecosystem



Fully Open Sourced switching platform - Increased choices for OCP end users

7. SONiC

11) SONiC Sub-Project

❖ SONiC Sub-Project Calls

- SONiC Kubernetes Workgroup - App Ext discussion: October 23rd, 2020
- SONiC Test Subgroup: October 21st, 2020
- SONiC Test Subgroup: July 15th, 2020
- PDDF v2.0 June 16th, 2020
- Sonic-mgmt pytest introduction (II) June 3rd, 2020
- BGP un-numbered and System health monitoring HLD June 2nd, 2020
- EVPN VXLAN HLD and ZTP config update HLD May 26th, 2020
- Sonic-mgmt pytest introduction (I) May 20th, 2020
- Dynamic buffer calculation HLD May 19th, 2020
- SONiC Configuration Replace HLD May 12th, 2020
- MLAG & Firmware utils May 5th, 2020
- Fine grained ECMP & L3 kernel programming enhancement April 28th, 2020
- D-Bus Host to Container Communications HLD April 14th, 2020
- Style Python Docstrings and cEOS April 8th, 2020
- AAA HLD Discussion April 7th, 2020
- System Health and System LED Monitoring March 31st, 2020
- PyTest and Testbed Routing Design March 25th, 2020
- Add QoS Scheduler and Shaper March 17th, 2020
- Code Coverage Rate for SONiC March 11th, 2020
- D-BUS HLD Discussion January 28th, 2020

