Review on ONOS Mini-Summit and ONS

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ONOS/CORD WG Seminar

Agenda

- ONOS Mini-summit Review
- ONS Review

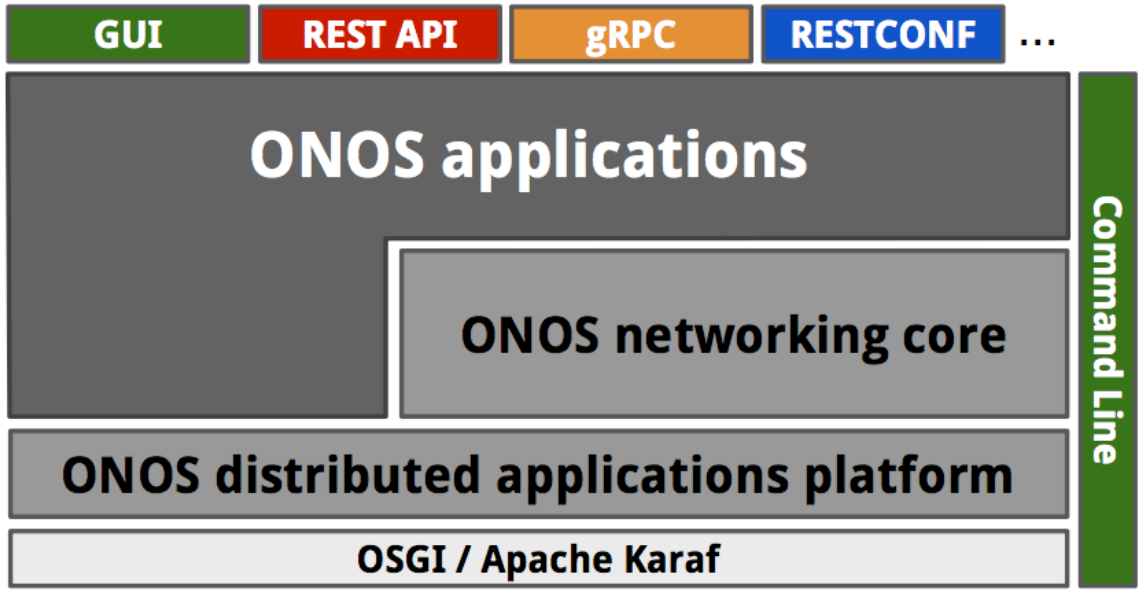
Schedules on ONOS Mini-summit

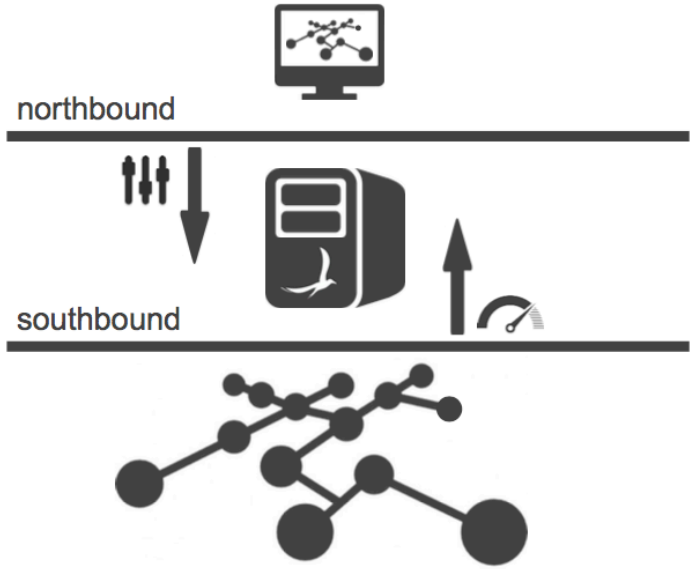
- Updates on New ONOS Brigades
- Updates on Use Cases from Partners and Collaborators

Title	Speaker	Organization
Introduction to ONOS	Thomas Vachuska	ON.LAB
Use Case: Telefonica	Farid Singh	Telefonica
Use Case: Argela	Metin Balci	Argela
Use Case: Ciena Production Ready ONOS	Soumen Chatterjee	Ciena
Use Case: Huawei Agile Controller and Gluon	Henry Jiang, Robert Tao	Huawei
ONOS Roadmap	Uyen Chau	ON.LAB
How to Get Involved in the ONOS Community	William Quiviger	ON.LAB
ONOS Deployment Brigade	Luca Prete	ON.LAB
ONOS Dynamic Configuration Brigade	Patrick Liu	Huawei
ONOS Virtualization Brigade	Yoonseon Han	POSTECH

Introduction to ONOS

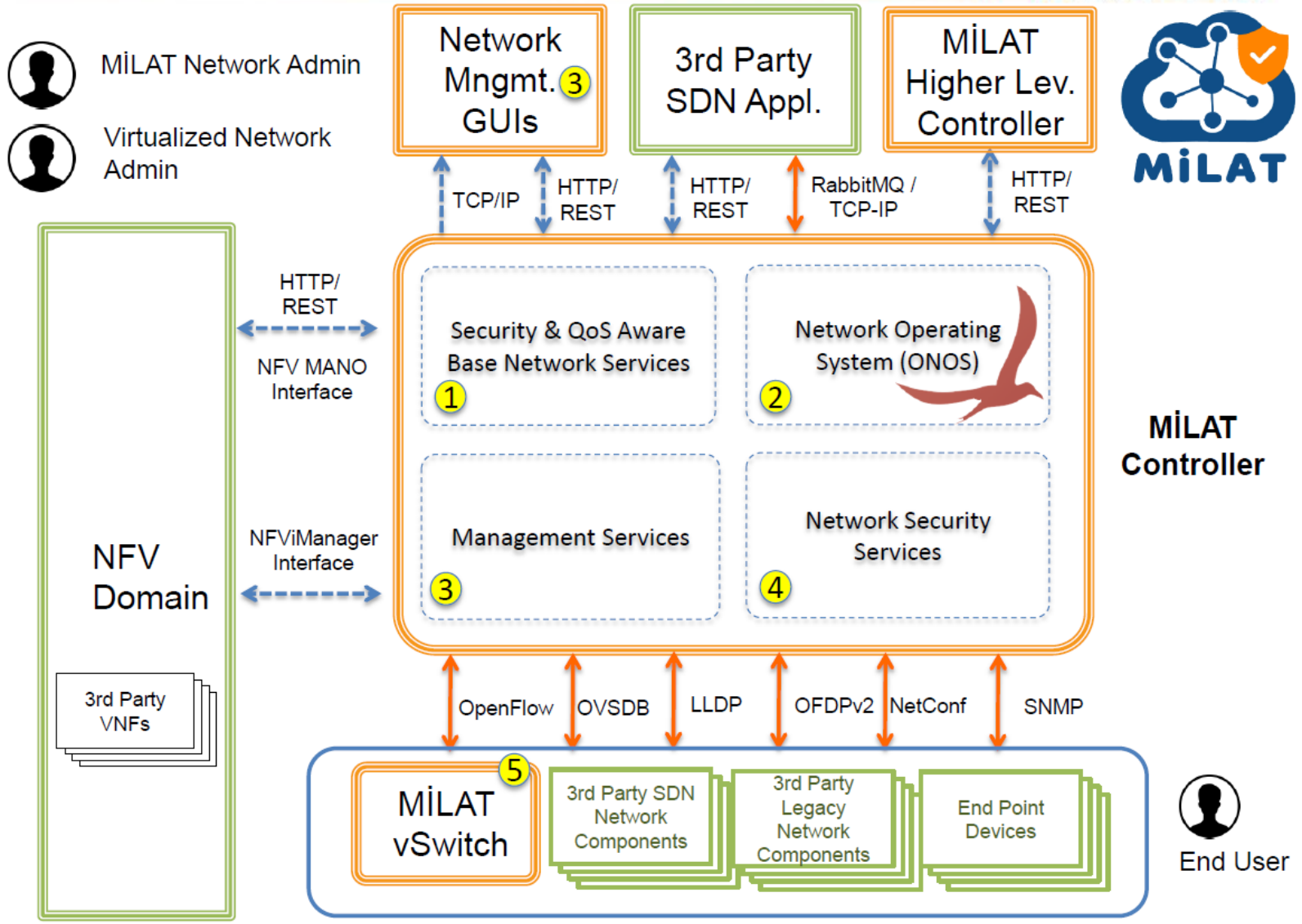
- Distributed Core
  - Provides high-availability, scalability and performance
- Abstractions & Models
  - Allow applications to configure and control the network without becoming dependent on device specifics
- Application Platform
  - Allow developers to dynamically extend the base capabilities





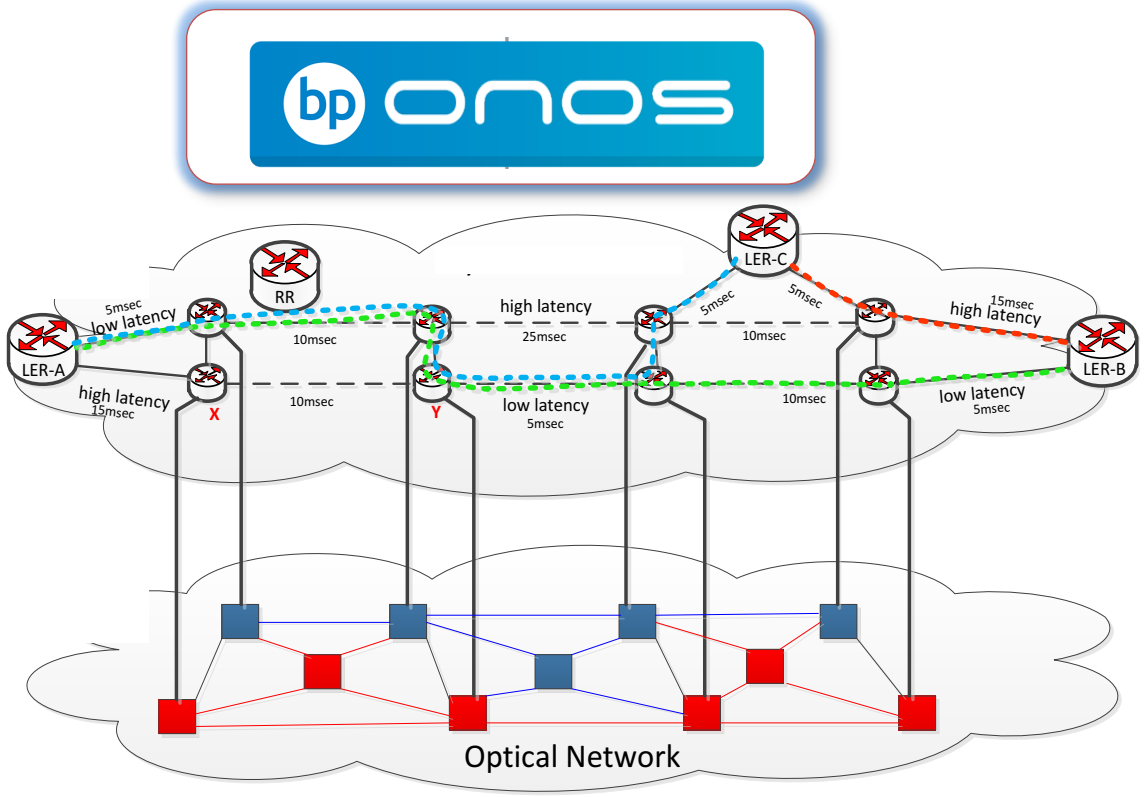
Use Case: Argela

- Objectives of MiLAT
  - Dynamic resource mgmt. in emergency situations
  - Prioritization among users and hierarchy support w.r.t. real-time requirements
- Features
  - Security & QoS aware profile based NS
    - RT monitoring, topo discovery
    - Traffic management
    - Disaster recovery w MANO
  - Network sharing
    - VNM, network slicing
  - Network security mgmt.
    - Enhanced IPS, IDS

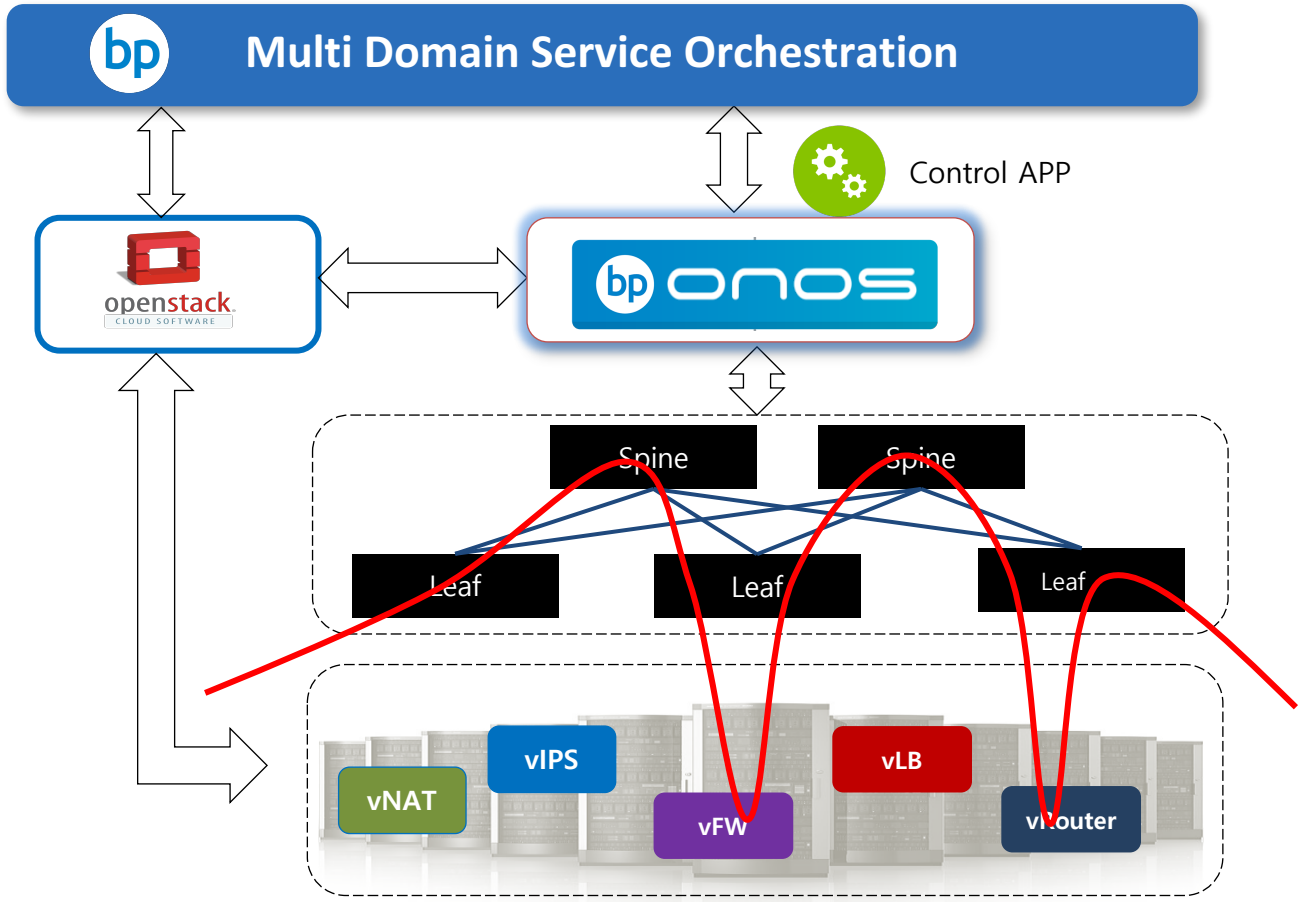


Use Case: Ciena Production Ready ONOS

- Domain Controller
  - Segment routing
  - Network topology discovery (BGP-LS)
  - Path computation and optimization

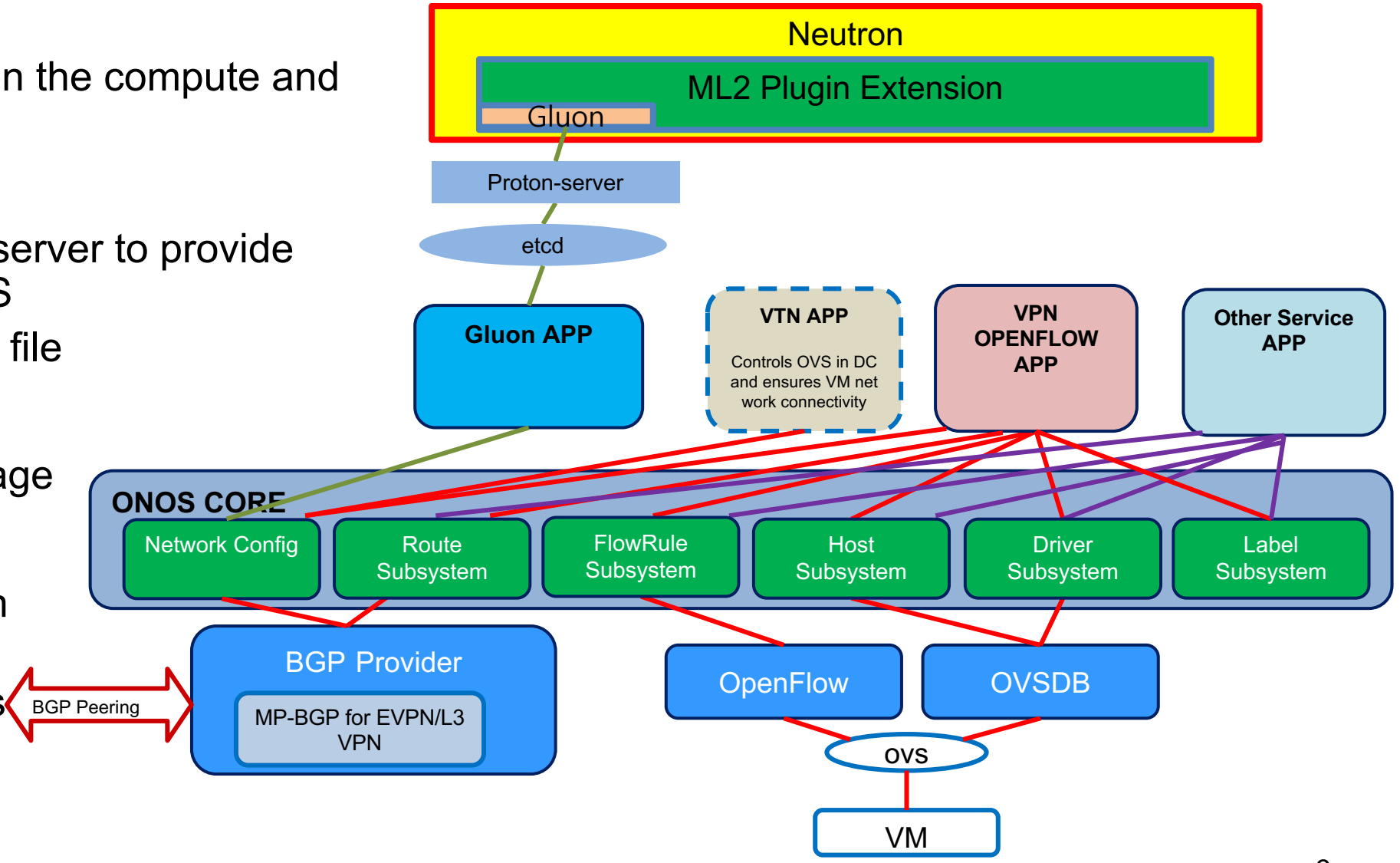


- NFV Pod
  - White box switching fabric
  - Commodity servers



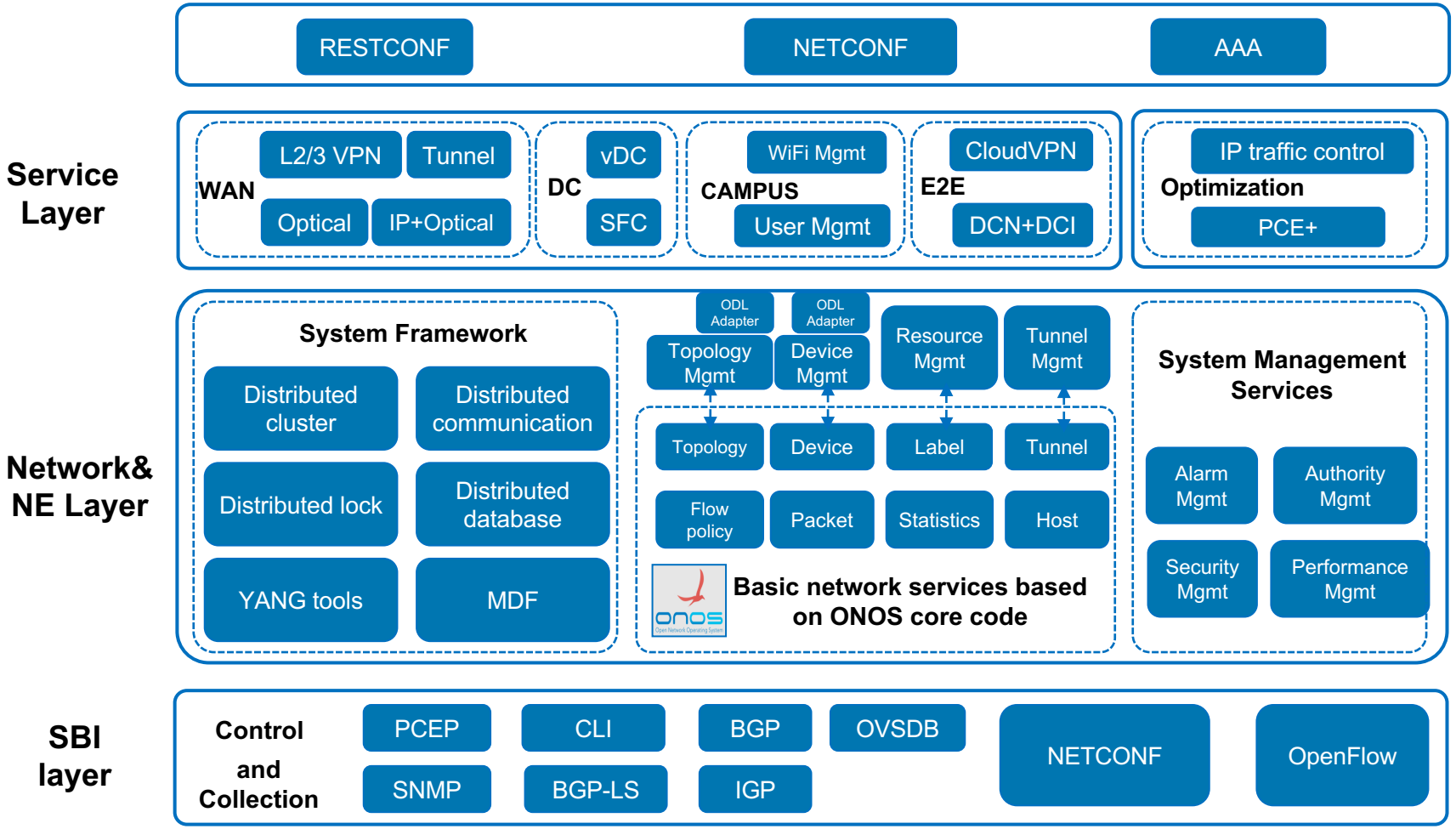
Use Case: Huawei Gluon

- Gluon
  - A small app between the compute and network services
- Protons
  - Simple, REST API server to provide ports for specific NS
  - Modeled in a YAML file
- Etcd
  - Distributed k/v storage
- Gluon App
  - Responds to Proton data model
  - Adapts to backends



Use Case: Huawei Agile Controller

- Agile Controller



1. Based on the ONOS architecture; Compatible with ODL
2. Modular, loosely coupled architecture; allows flexible feature orchestration
3. Distributed cluster, DB, communication, and lock quickly implemented through mature IT technology
4. Basic network services and NBI/SBI standardization; open interoperation with 3rd party for ecosystem
5. Designed for commercial use; builds reliable, high-performance and secure controller.

ONOS Roadmap

- Roadmap

Kingfisher

Platform enhancements

Features

Dynamic Configuration
- *NETCONF & RESTCONF SB*
- *RESTCONF NB*
- *Distributed Store*
- *Live Compiler*

Virtualization
- *OF Agent*
- *External Connectivity*
- *Embedding*

GUI
- *Regions & Layouts*
- *Dark Theme*

QA – *Performance whitepaper*

QA - *Incorporate OF1.3 * 1.5 features, Enhance Delta security test suite*

Loon

Platform hardening

Features

Dynamic Configuration
- *Transactions & Optimizations*
- *Configuration Synchronizer*

Virtualization
- *Snapshotting & Embedding*
- *OpenStack Integration*

GUI
- *Additional overlays*

gRPC
- *Core subsystems*

Codebase Disaggregation

Intent
- *Domain & Transactions*

QA -
- *TestON/Mininet automation enhancements*

Features (incubation)

ISSU
- *Portable Kryo serialization*
- *Upgrade Coordinator*

P4
- *P4 Runtime*

gNMI
- *OpenConfig*

M

Platform enhancements

Features

Dynamic Configuration
- *Sharding of Subtrees*
- *Performance Improvements*

Virtualization
- *Additional SB*
- *Resiliency*

GUI
- *Global Search*

gRPC
- *Select apps*
- *Explore automated gen*

ISSU
- *Portable Kryo serialization*
- *Upgrade Coordinator*

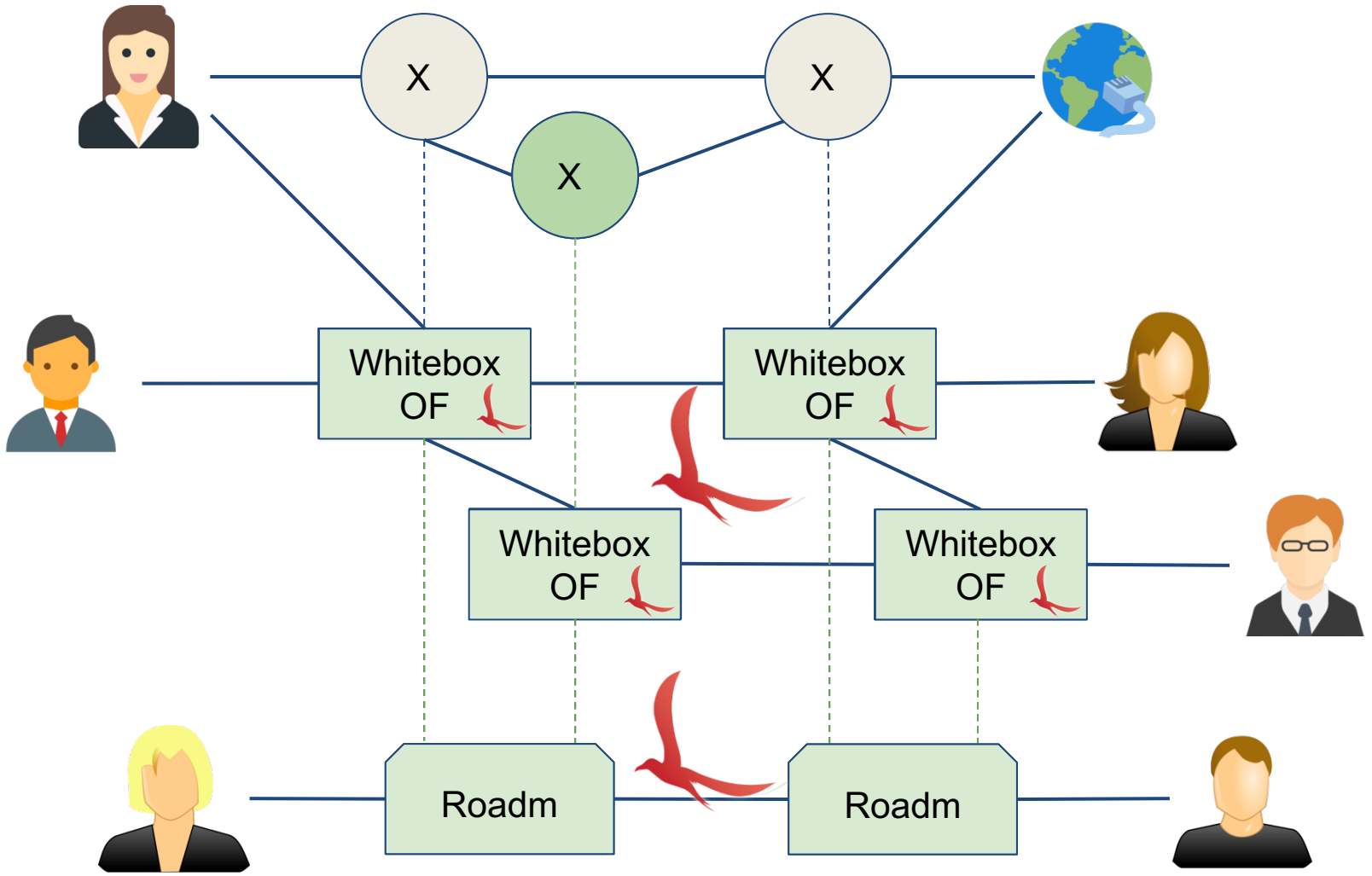
P4 - *P4 Runtime*

gNMI - *OpenConfig*

QA

ONOS Deployment Brigade

- Migrating to ONOS



Incrementally introduce **white-box switches**

ONOS runs on the switch to provide L2 services

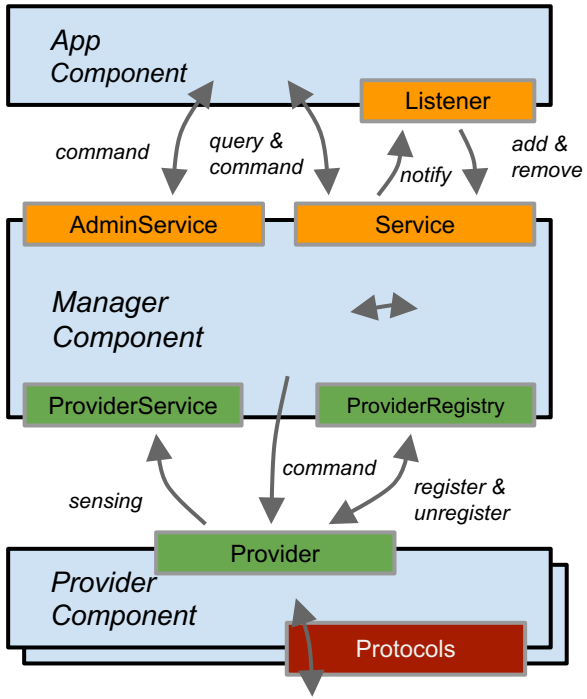
ONOS runs on a **centralized cluster**

Routers get removed
ONOS provides **BGP**, **L3 services** using the same switches

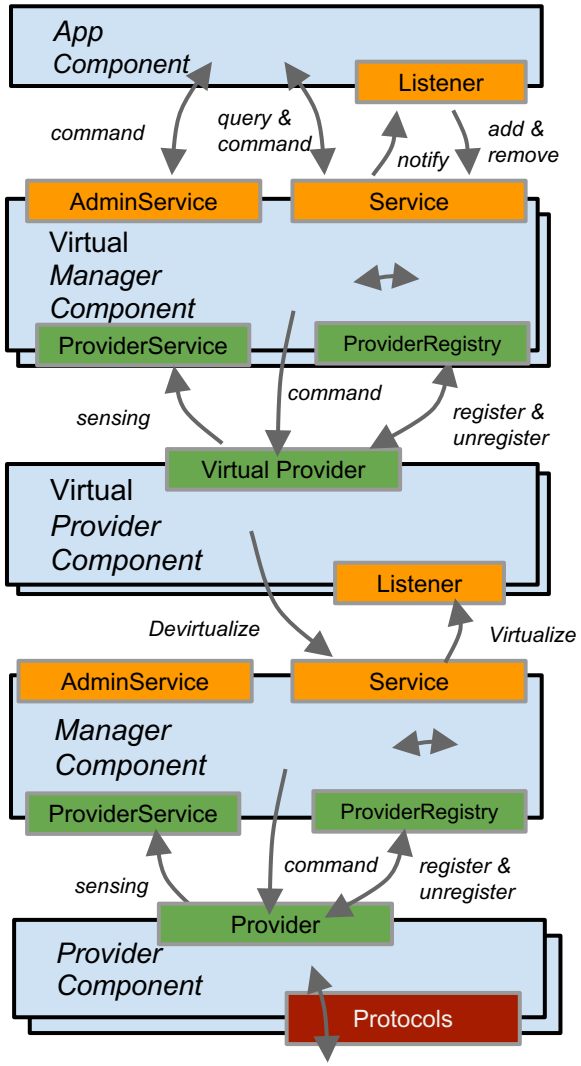
ONOS coherently controls both the **packet and the optical layers**

ONOS Virtualization Brigade

- Virtual Network Subsystem
  - Provider
    - Interfaces with network via protocol-specific libs
  - Manager
    - Receives information from Providers and feed it to virtual provider
  - Virtual provider
    - Translate virtual constructs into physical network elements
  - Virtual manager
    - Receives information from virtual providers, and serve it to applications
    - Stores
  - On-platform application
    - Provides wide range of functionality
    - Consumes and manipulates information aggregated by the managers



ONOS subsystem



VN subsystem

Review of Open Networking Summit (ONS)

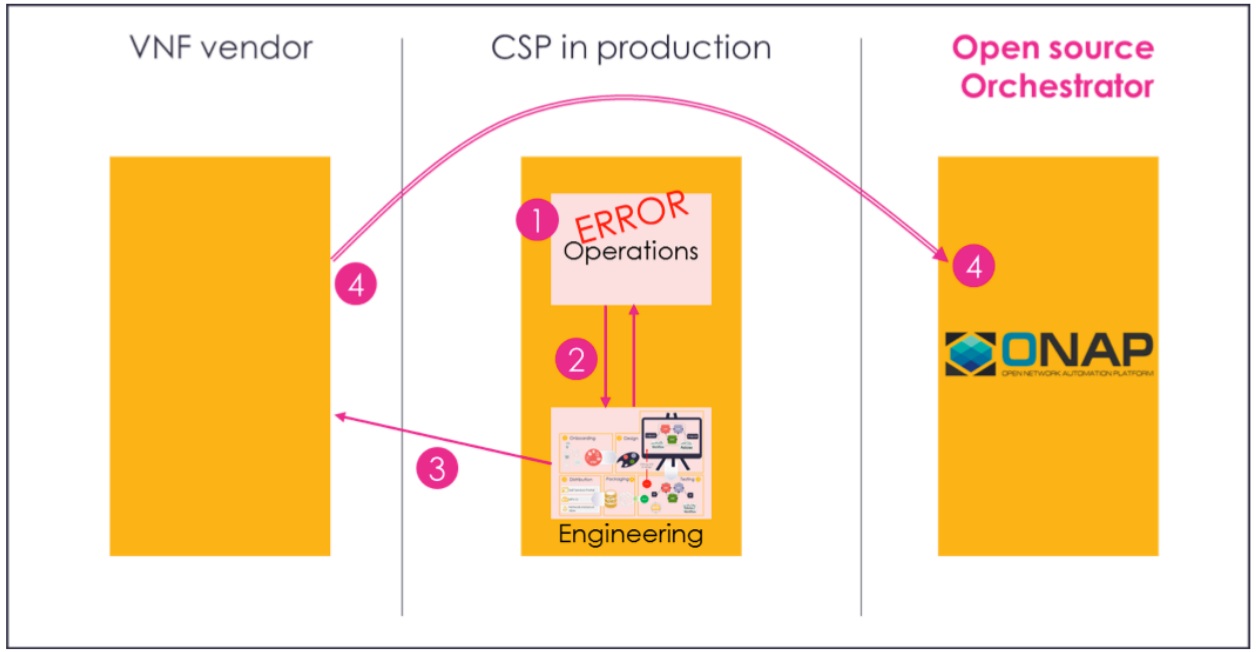
- ONS 2017 Best of Show Winners
  - Open Network Automation Platform (ONAP)
  - Programmable Data Plane (P4)

Award	Winner	% of Votes	Finalists
Most Buzzed About Project	ONAP	57.3%	CORD, ONOS and OPNFV
Best Exhibit Booth	Barefoot Networks	70.2%	Dell, Ericsson and Huawei
Best Announcement/Coverage	ONAP Project Release Code	50.4%	Alibaba Joins the Microsoft SONiC community; Espresso Makes Google Cloud Faster
Most Innovative DEMO	ONAP	38%	CORD, PNDA, etc.
Most Disruptive Networking Technology	Barefoot Networks	42.2%	AT&T& China Mobile (ONAP), Google (Bringing SDN to public internet), etc.

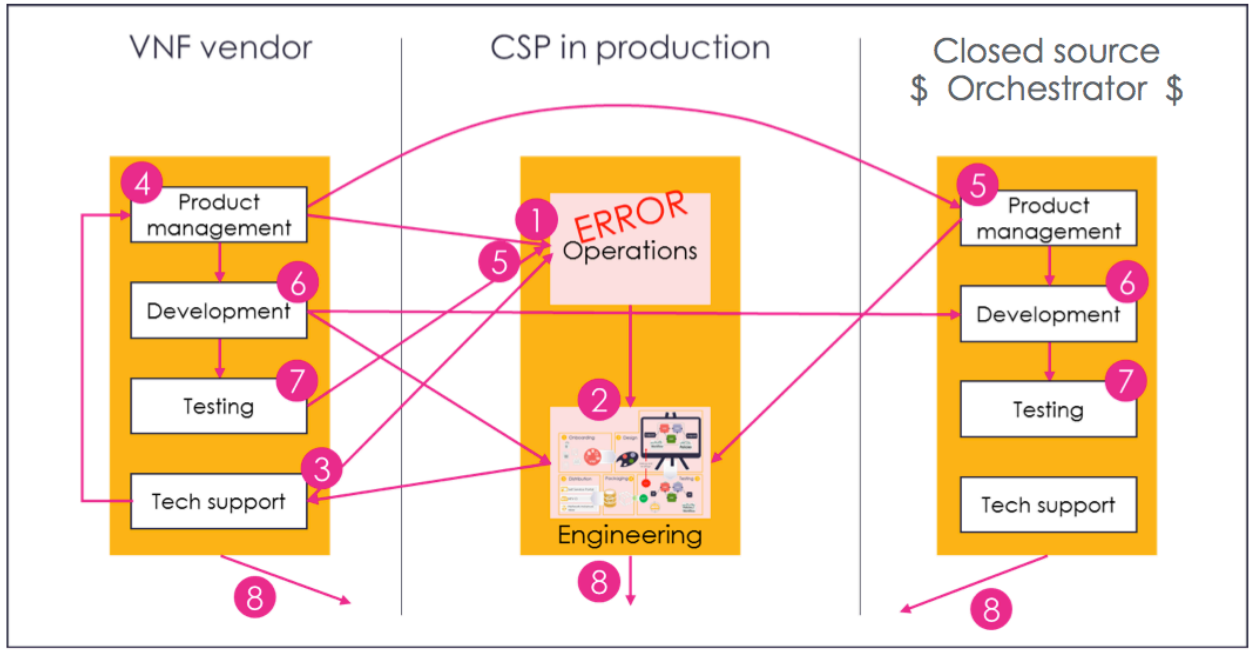
ONAP (1/2)

- Troubleshooting an NFV issue

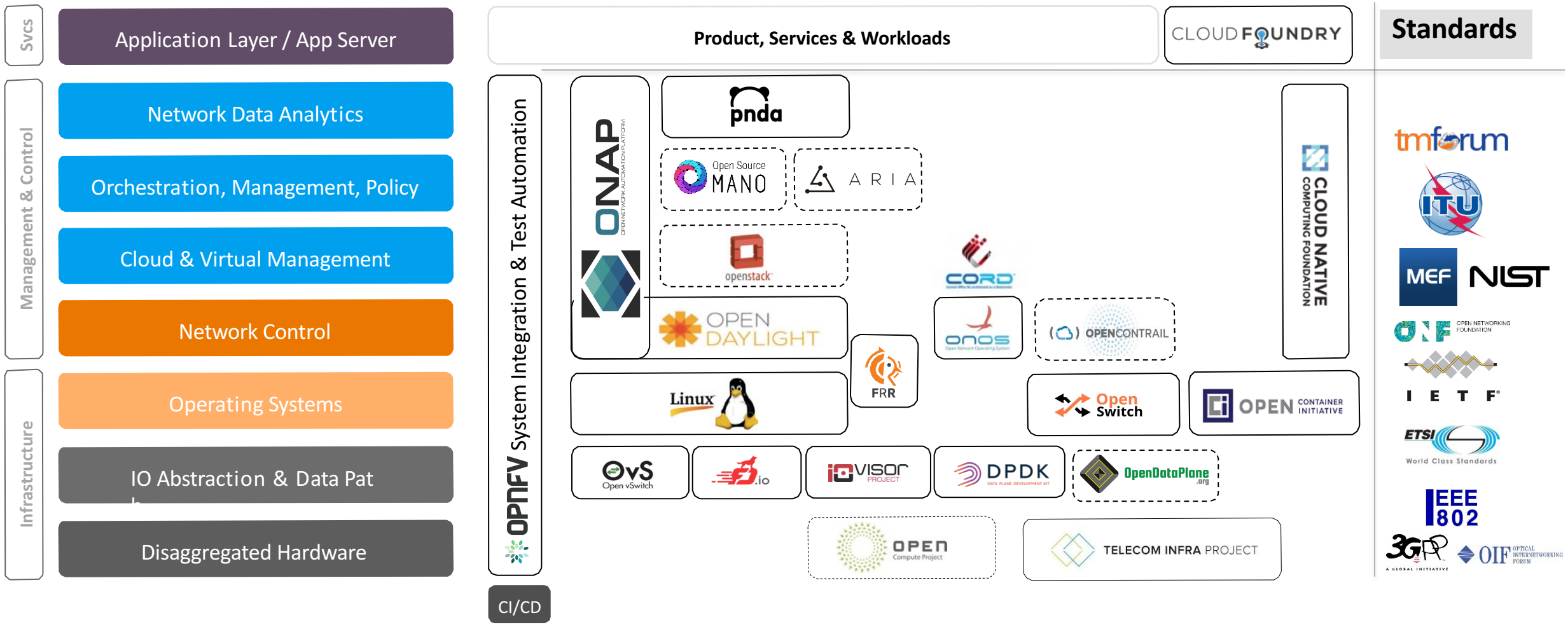
Massively deployed open source



Closed source solution



ONAP (2/2)


Svcs
Application Layer / App Server
Management & Control
Network Data Analytics
Orchestration, Management, Policy
Cloud & Virtual Management
Network Control
Infrastructure
Operating Systems
IO Abstraction & Data Pat
Disaggregated Hardware
OPNFV System Integration & Test Automation
CI/CD
Product, Services & Workloads
CLOUD FOUNDRY
Standards
ONAP
pnda
Open Source MANO
ARIA
openstack
CORD
OPEN DAYLIGHT
onos
OPENCONTRAIL
CLOUD NATIVE COMPUTING FOUNDATION
FRR
Linux
Open Switch
OPEN CONTAINER INITIATIVE
OvS Open vSwitch
.io
VISOR PROJECT
DPDK
OpenDataPlane.org
OPEN Compute Project
TELECOM INFRA PROJECT
tmforum
ITU
MEF
NIST
OPEN NETWORKING FOUNDATION
IETF
ETSI World Class Standards
IEEE 802
3GPP
OIF
Automation of Network + Infrastructure + Cloud + Apps + IOT
Linux Founda<on Hosted
Outside Linux Foundation

- Introduced Several Hardware P4 switches
  - Models (100Gbps), Facebook OCP Wedge series
    - Wedge 100BF-65X (65 x 100GbE)
    - Wedge 100BF-32X (32 x 100GbE)
  - Rely on Tofino switch chipset
    - Processing speed is up to 6.5Tb/s
    - p4c-tofino compiler can compile P4-14 and P4-16 P4 programs to Tofino executable artifacts
- Presented Two Use Cases
  - Switch.p4
    - Embedded several well-known protocols
      - L2/L3, VxLAN, QoS, etc.
    - Inter-operates with Network OS via switch API by Snaproute
  - Inband-Network-Telemetry (INT)
    - Demonstrated that each P4 switch aggregates its queue status into INT packet