OCP TECH WEEK

Edgecore Device Manager

OPEN Compute Project®

Edgecore Device Manager

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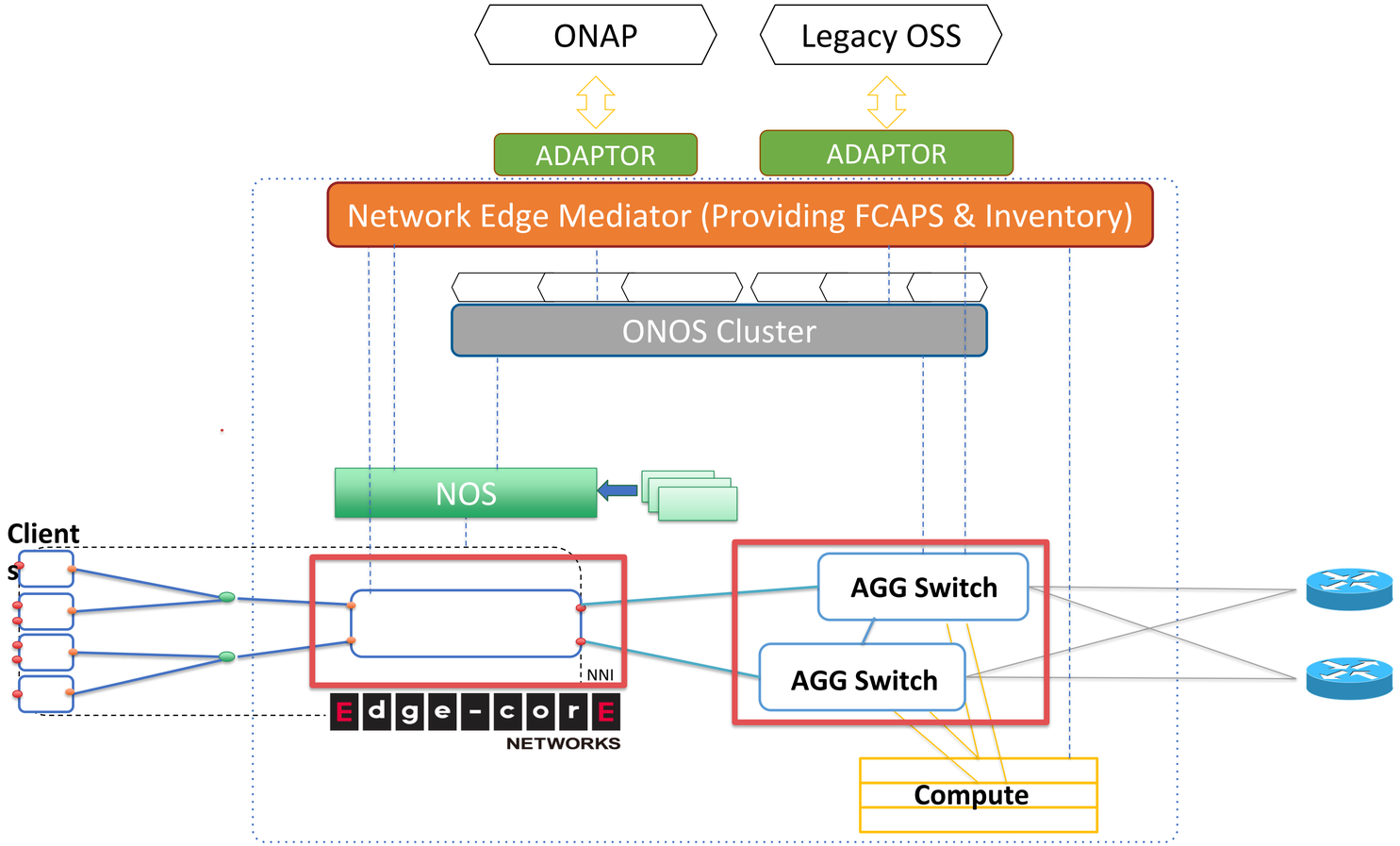
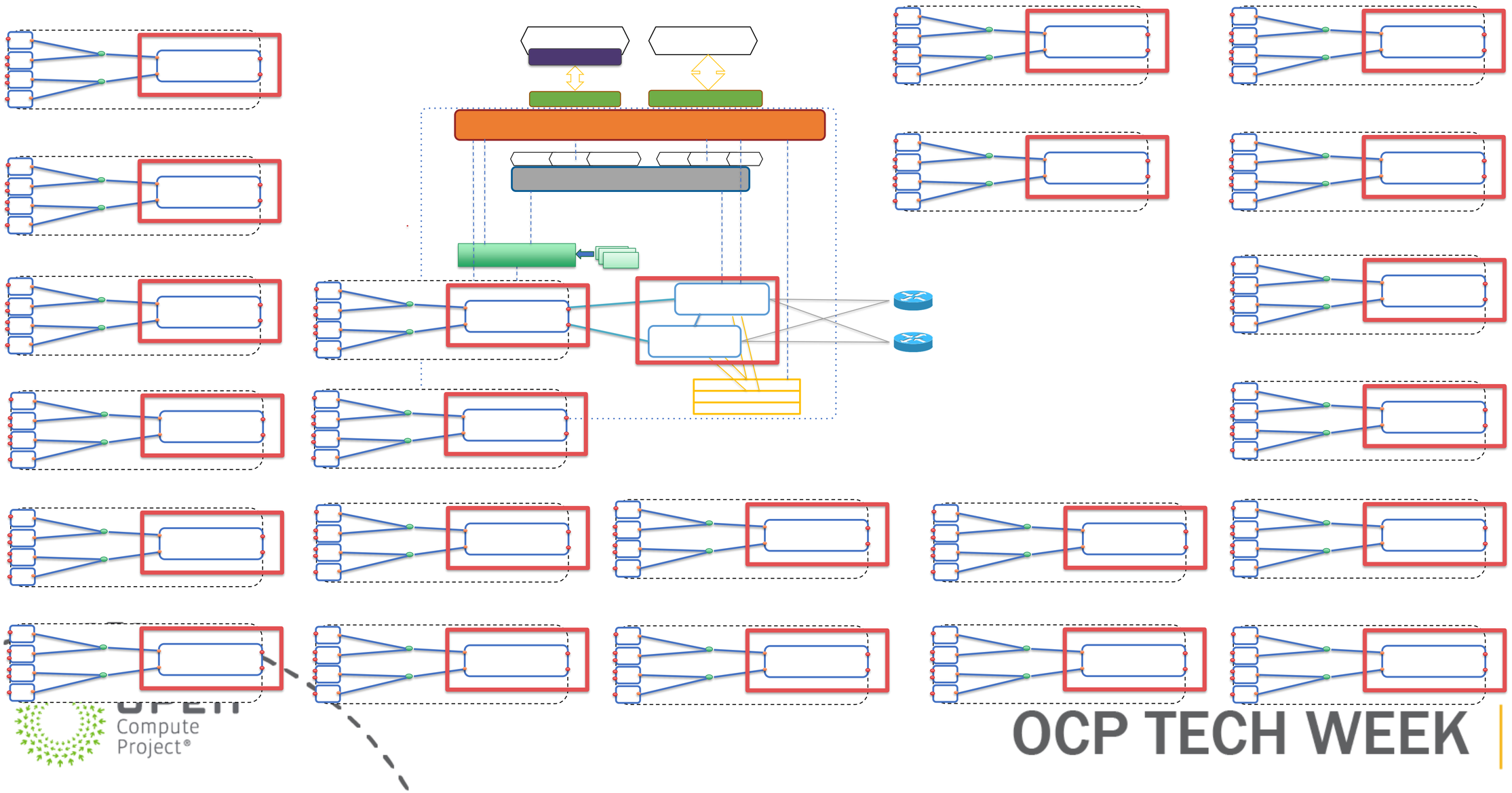
OPEN PLATINUM®

Complex Networks (ONF)



Complex Networks (ONF)



Edgecore Device Management

- Manage HW
  - Asset management
  - Monitor early warning signs
  - Help with Fault Isolation
  - Take preventive actions
  - Manage SW
- Client-server architecture
  - Device Manager
  - Redfish® Service
- Not a Dashboard

Vision

HW MANAGEMENT

- Help Customers, Partners, and the Community
- Implement Best-In-Class Tools and Practices for Deployment and Management of Networked Devices
  - EdgeCore Partners
  - Telcos
  - Cloud Operators
  - Enterprises
- Enable Quick and Painless Deployment
- Reduce Development and Support Cost

Edgecore's Device Manager

Fully Open Sourced Implementation

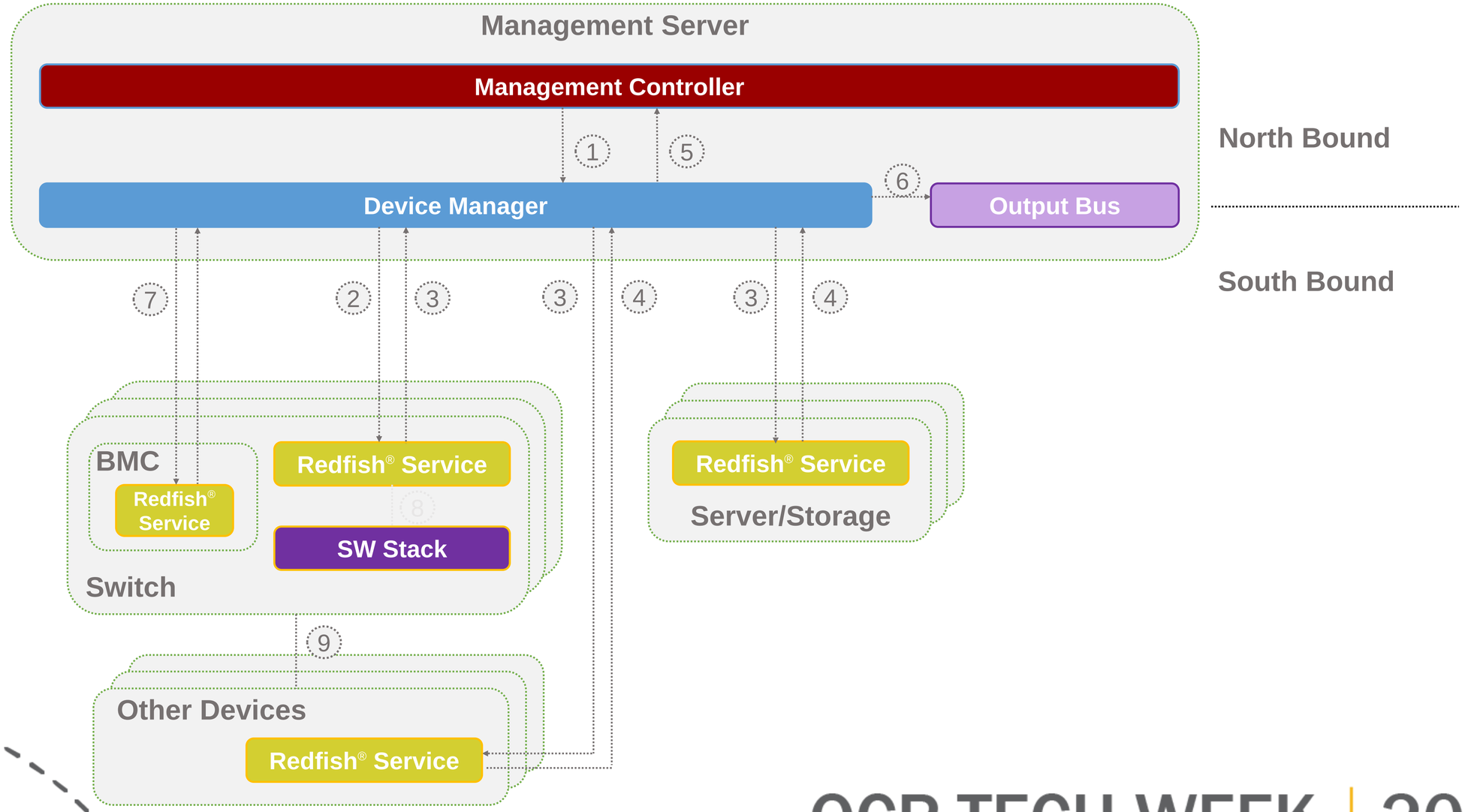
- Tracks devices
- Collects data from devices and publishes to consumers
  - On-demand
  - Periodically

  (manages cached device data)
- Manages events from devices, and notifies listeners
- Updates FW/SW

Managing Devices with Redfish®

- Adopt a common set of specifications
- Use a standard protocol
- Manage
  - Networking
  - Servers
  - Storage
  - Any converged infrastructure

Overall Architecture



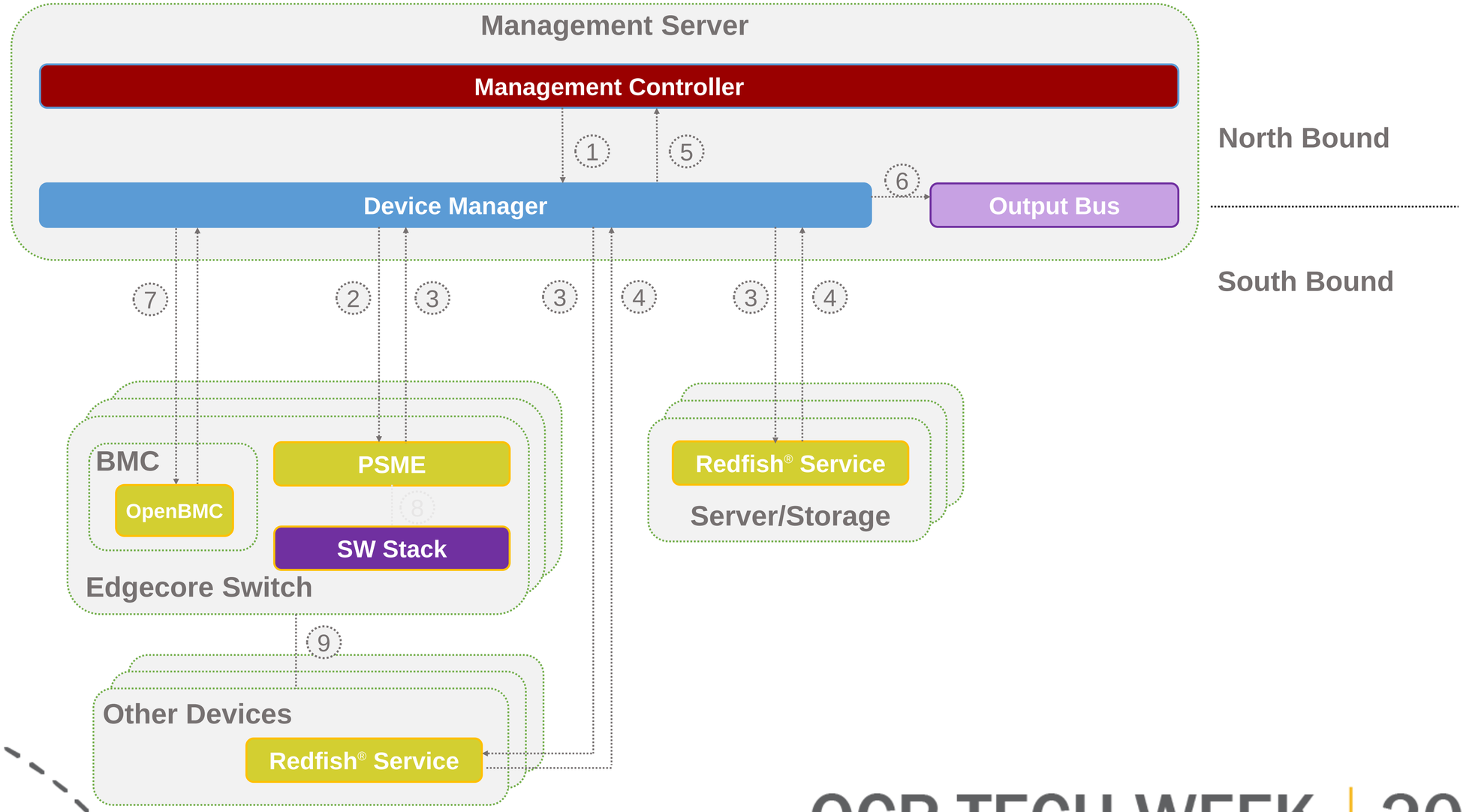
Redfish® through OpenBMC & PSME

OpenBMC 2.8

Pooled System Management Engine (Intel RSD 2.1.3)

- Implement Redfish® service
- Support Redfish® REST API
- Query devices for Asset Management
- Monitor devices for alertable events
- Update SW (firmware, ONIE, Linux)
- Reboot Devices
  - Dual partition
  - Reboot target

Overall Architecture



Manage Assets

Seattle Data Center

Limit Results 100

Status	Device	Device Type	Details
✓	Client01 (10.5.1.201)		Serial#: 12876jhbd35
✗	Client02 (10.5.1.202)		Serial#: 12876jhbd42
✓	Server (10.5.1.203)		Serial#: 1746jowijh5
✓	Client03 (10.5.1.204)		Serial#: 12876jhbd43
✓	Client04 (10.5.1.205)		Serial#: 12876jhbd44
✓	Client06 (10.5.1.206)		Serial#: 12876jhbd47
✓	Client07 (10.5.1.210)		Serial#: 12876jhbd51

Events and Alerts

Event Types	Resource Added	Resource Removed	Alert
PSU Module Being Plugged In	✓		
PSU Module Being Pulled Out		✓	
FAN Module Being Pluged In	✓		
FAN Module Being Pulled Out		✓	
FAN Module Stopped Spinning			✓
CPU/Main Board Thermal Sensor Exceeding Critical Temp			✓
CPU/Main Board Thermal Sensor Exceeding Fatal Temp			✓
QSFP or XFP Transceiver Being Plugged In	✓		
QSFP or XFP Transceiver Being Pulled Out		✓	

FW/NOS Update, and Reboot

Edge-corE NETWORKS

Establish Connection → **Start Update** → **Update** → **Post Update**

Fully Automatable

Connection Type
- HTTP
- HTTPS

Accounts
- Admin
- Read-only

Session Based
- Security Token (optional)

Async API

BMC
- FW and OS

ONIE
- FW and OS

Maybe lengthy process

Firmware
- BIOS, CPLD, FPGA, ONIE, BMC, ADE …
- Multiple updates in a package

OS
- Linux (ONL)
- SONiC, SEBA
- Multiple partitions

Cleanup

Status
- Redfish® Alert
- Manual API call

Reboot
- Same boot source
- Different partition
- Different boot source
  - SSD
  - USB
  - PXE

OPEN Compute Project®

Call to Action

- OpenSource
  - Edgecore Device Manager
  - Edgecore's Redfish® Services; PSME & OpenBMC
  - OCP contribution started
- All vendors are invited to
  - Implement OCP Redfish® Services for their devices
  - Contribute to Device Manager
- When? **Now**…
- For additional information, please visit to

  https://github.com/opencomputeproject/DM-Redfish-PSME/

  https://github.com/opencomputeproject/Device-Manager

Open Discussion

OPEN Compute Project®

OCP Tenets

Efficiency:

Edgecore's Device Manager is a small footprint containerized application, providing several methods to efficiently manage network elements (switch, storage, server, …) It focuses on lowering its impact on the system performance, and minimizing the amount of data transfers between managed devices and management controllers, by enabling multi-update operations for FW/SW, virtually eliminating the need for manually updating individual components, and their FW dependencies, supporting active/passive partition SW updates (so that a passive partition can be updated while the active partition can maintain operations), and minimizing down times for maintenance.

It also supports caching the collected device data and making it available as a whole or per device on demand, (while allowing direct access for individual devices when requested.)

Scale:

Edgecore's Device Manager is a highly portable application, providing a highly scalable method to manage a very large number of disaggregated set of network elements. Because of DM's small footprint, operators can distribute the management of their network devices to one or more Device Managers, running on any x86 Linux based device (from Top of Rack switches (ToR) to large servers) in their networks. As their network expends, operators can provision additional Device Manager instances, sitting anywhere between the operators' EMS/user dashboard/Collector and managed devices, and thus horizontally scaling their management infrastructure.

OCP Tenets

Openness:

The OCP Device Manager is an open source containerized application, embracing open standards to manage a large number of disaggregated set of network elements by supporting standard OCP Redfish® Services, using standard grpc and RESTFULL APIs for operations and notifications running on any x86 devices' mainboards (using opensource PSME) and/or on a BMC daughter card (using OpenBMC.)

With this submission, Edgecore demonstrates its commitment to open source by providing an opensource, end-to-end solution, including

- Device Manager (the central device management orchestrator.)
- Redfish® Service App (a sample PSME implementation, supporting OCP Baseline Profile.)
- A Nagios Dashboard (a sample user management dashboard, demonstrating how to integrate with the Device Manager.)

OCP Tenets

Impact:

The OCP Device Manager is an open source application, providing a highly scalable method to manage network elements provided by multiple vendors. By utilizing open standard interfaces, the Device Manager unifies all end-end device management operations under a single interface, including

- asset management
- monitoring state changes and alertable events
- Help with fault isolation
- perform SW and FW deployments/upgrades
- Device reboots

This vendor agnostic, scalable, standards based, open implementation significantly reduces the cost of operating a very large number of divergent devices, through remote management facilities.