

# OCP U.S. SUMMIT 2016

March 9-10 | San Jose, CA

OCP U.S. SUMMIT 2016

# Torc

Applications, Microservices, VNFs controlled by Top-of-Rack Controller  
AT&T Foundry, “where ideas are made”

**Julius Mueller**

Senior Member of Technical Staff

**Marcel Neuhausler**

Principal Software Engineer



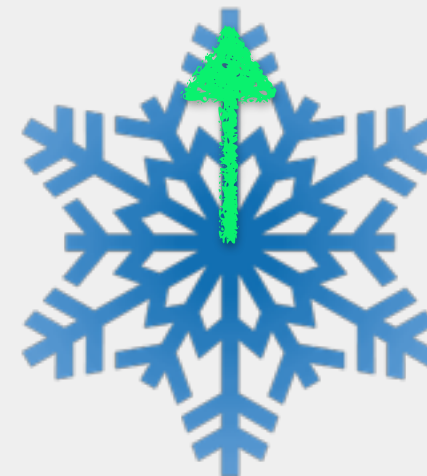
# Torc - Top-of-Rack Controller

- Proof of Concept - Goals
  - Demonstrate and verify feasibility of proposed Torc architecture
  - Demonstrate resource-efficient and on-demand management of services and VNFs at the edge of the network utilizing Facebook Wedge
- Deliverable
  - Demo and presentation at OCP Summit, March 2016



# Motivation    Mobility - Increase efficiency and lower operational costs

- Movement to the **Center** of the Network
  - Where (still) all the important things happen
  - SDN controller
  - Cloud controller
  - Enterprise-wide OS
- Movement towards the **Edge** of the Network
  - Where all the interesting things happen
  - Support for latency critical application, IOT
  - Video-caching
  - Anomaly detection and mitigation
  - Mobile, LTE, EPC

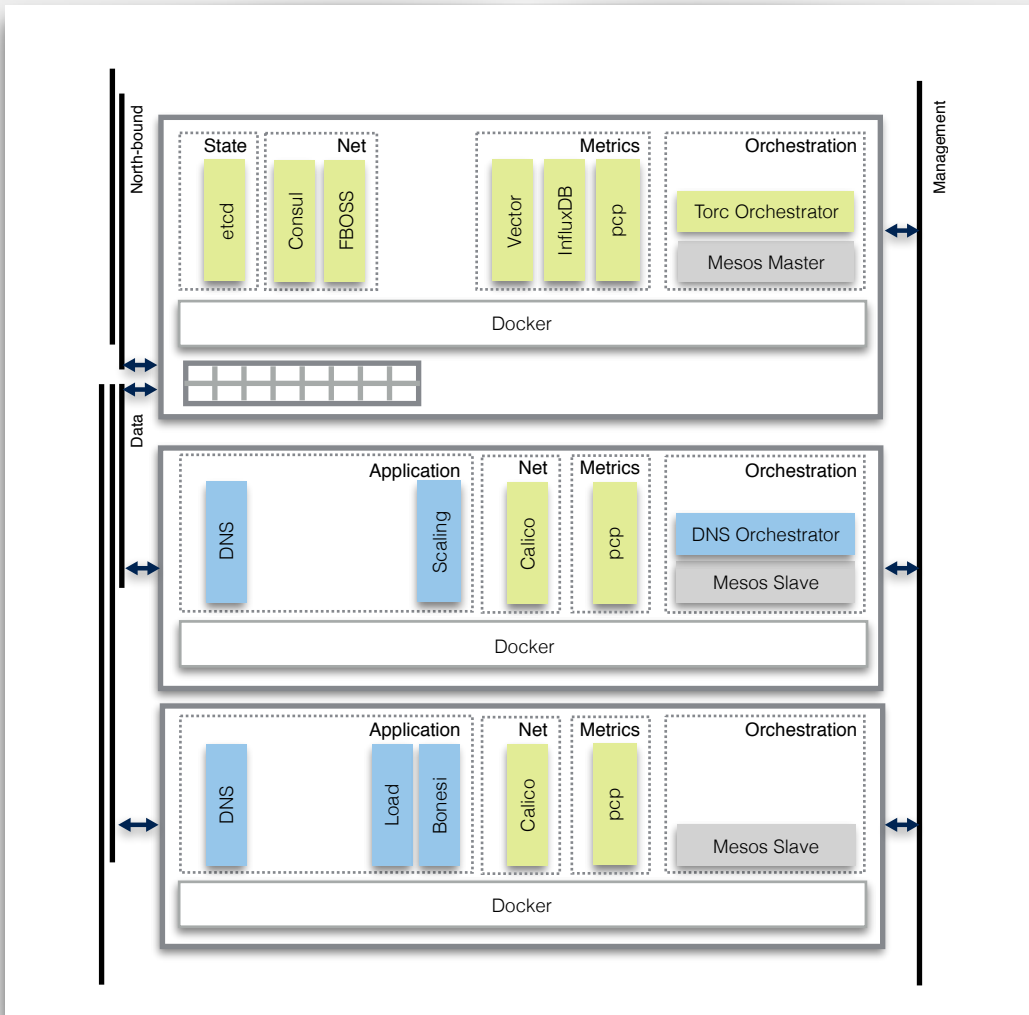


# Motivation    Enablers - OCP Hardware and Open Source Software

- Open Hardware
  - Facebook Wedge
    - uServer, Intel Atom, 8GB memory, 120GB SSD
    - BMC
    - Switching Silicon
  - Three-way disintegration, separation of control
- Open Software
  - Docker - “Build, ship, and run any app, anywhere”
  - Mesos - Resource manager and scheduler platform
  - FBOSS - Facebook Open Switching System
  - OpenNSL - Open Network Switch Library
  - ONL - Open Network Linux
  - OpenBMC - Open Baseboard Management Controller
  - Calico - Open L3 fabric solution for interconnecting Virtual Machines or Linux Containers



# OCP Demo Setup - DNS Infrastructure



- Torc - Services
  - Orchestrator
  - Metrics / Timeseries
  - Network / DNS
  - State
- DNS - Services
  - Orchestrator
  - DNS Server (bind9)
  - Autoscaling and Detection
  - Load Generator
- Scenarios
  - Autoscaling
  - “Turn Off Lights”



# Demo



# What's Next

- Proposed Next Steps
  - Open-Source all our code (Torc-orchestrator, sync-agent ..)
  - Select an extended use-case
  - Integrate OCP switch from Cavium
  - Include additional OCP hardware from Facebook: Yosemite, JBOD with integrated micro-server
  - Evaluate consistency needs (strong versus eventual), and aspects of a federated approach for orchestration
  - Use Torc platform for projects with external partners





# Torc - Initial Conclusions

- Switch seems to be a natural fit for a controller function
  - “Turn off the lights” - demand-driven energy-efficient data-center
  - Other services that could be placed on a switch: PXE/DHCP, encryption, audit, monitoring ..
  - Rack seems to be a natural “unit of independent control” for mesh of smaller data-centers
  - “Build, ship, and run any app, anywhere” with Docker and Mesos
  - FB OCP Hardware: Having a BMC and a micro-server/server across all network, compute, storage devices provides a foundation for autonomous operation
- Did we go too far?
  - Up for discussion
  - Gained valuable insides into development on and with OCP Hardware and Software
  - .. and it turned out to be a competitive and lively platform for verifying autonomous control-mechanism at the edge of a network



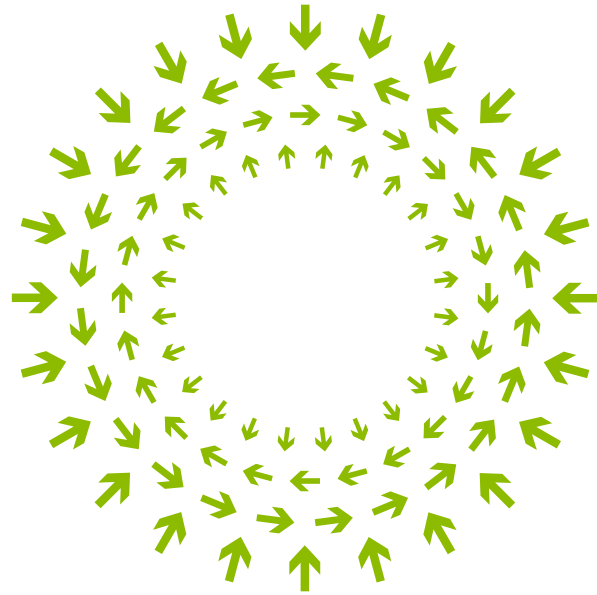
## Active Collaborations .. Thank You!

Company	Product / Project	Comment
Facebook	Wedge and FBOSS	FBOSS collaboration
Big Switch	ONL	FBOSS packaging Docker-support
Metaswitch	Calico	IPAM Extended Mesos and Docker integration
Netflix	Vector	Extended support for Docker metrics AT&T is contributor to the open source project
Redhat	Performance Co-Pilot	Extended support for Docker metrics
Broadcom	OpenNSL	OpenNSL support Help with containerizing OpenNSL-based applications
Accton	Switch	Facebook Wedge
Cavium	Switch	Cavium 100GB OCP Switch



# Q&A .. “where ideas are made”





# OPEN

Compute Project

