

OCP U.S. SUMMIT 2016

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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

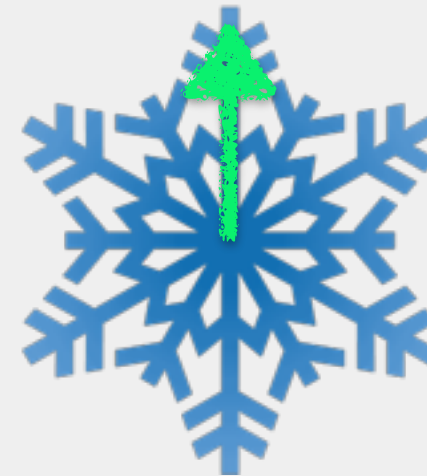
Torc - Top-of-Rack Controller

- 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

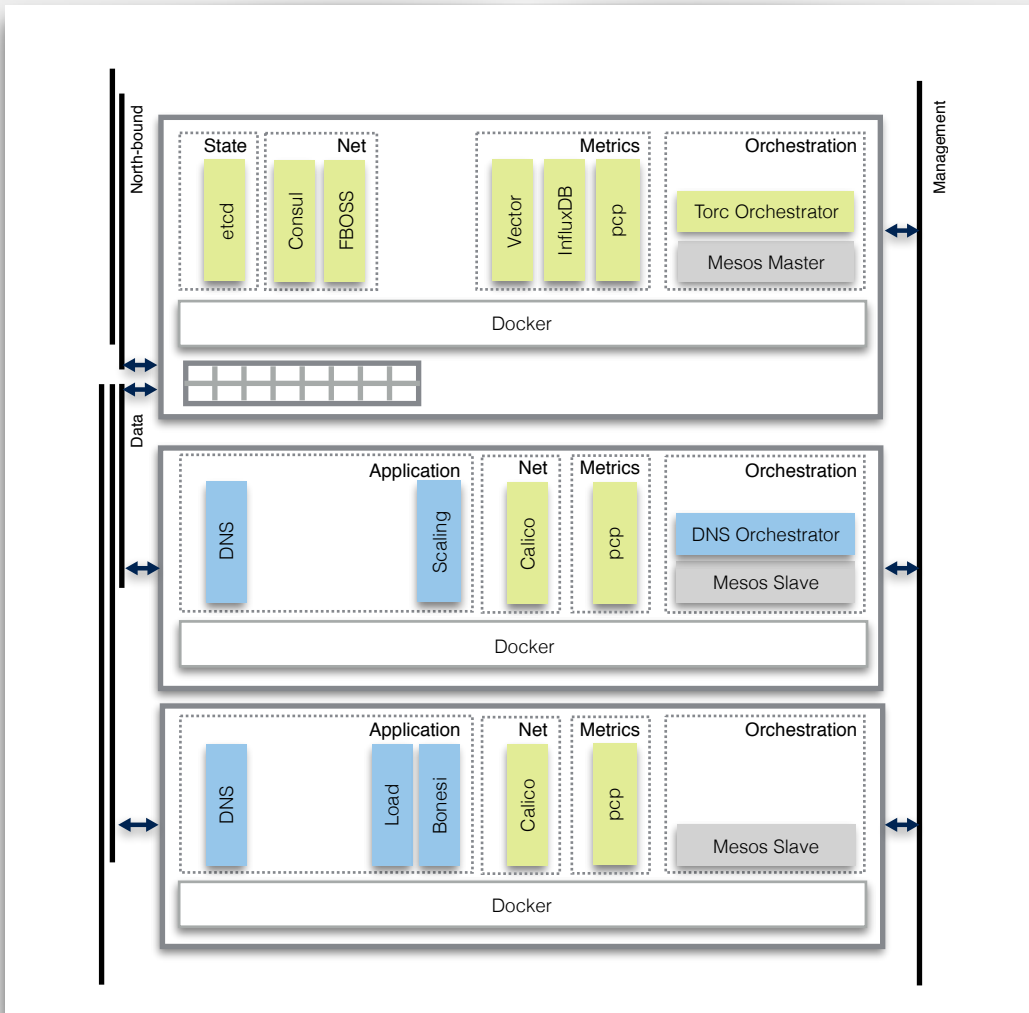


Motivation Enablers - OCP Hardware and Open Source Software

- 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



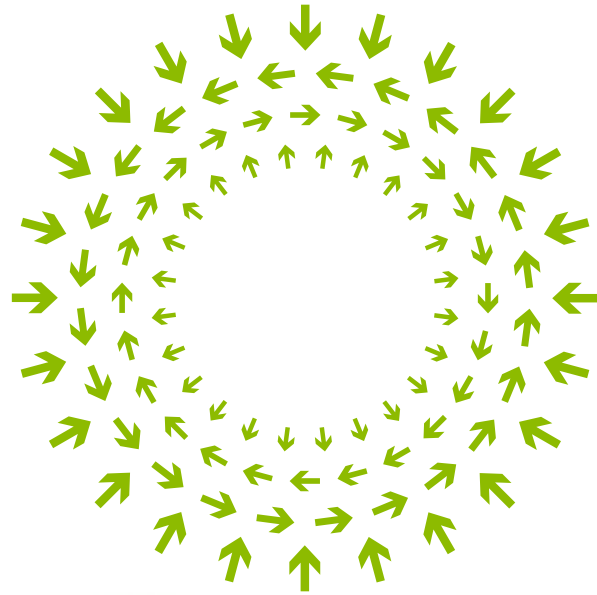
Active Collaborations .. Thank You!

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

