AETHER: OPEN 5G-CONNECTED EDGE CLOUD

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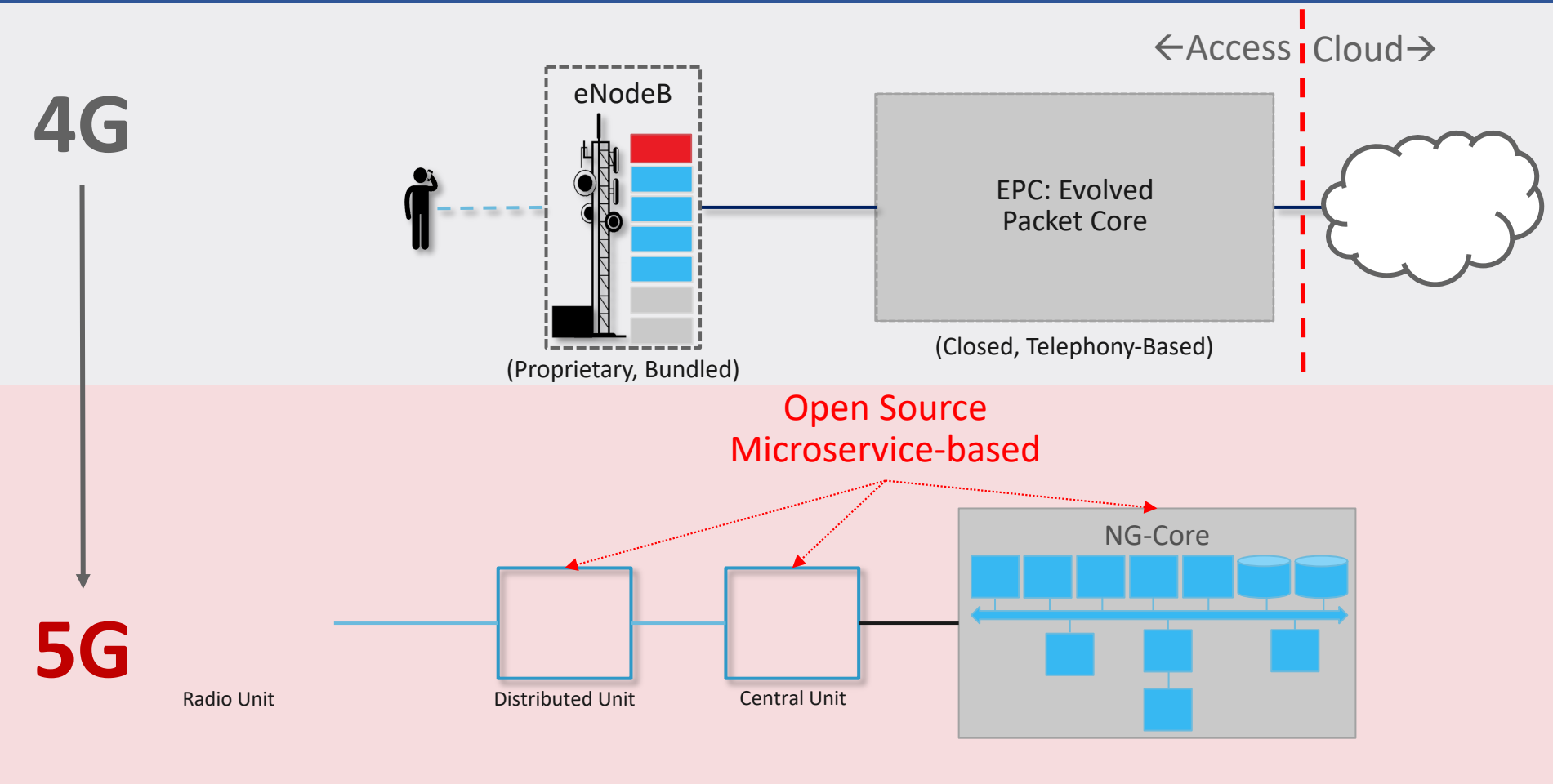
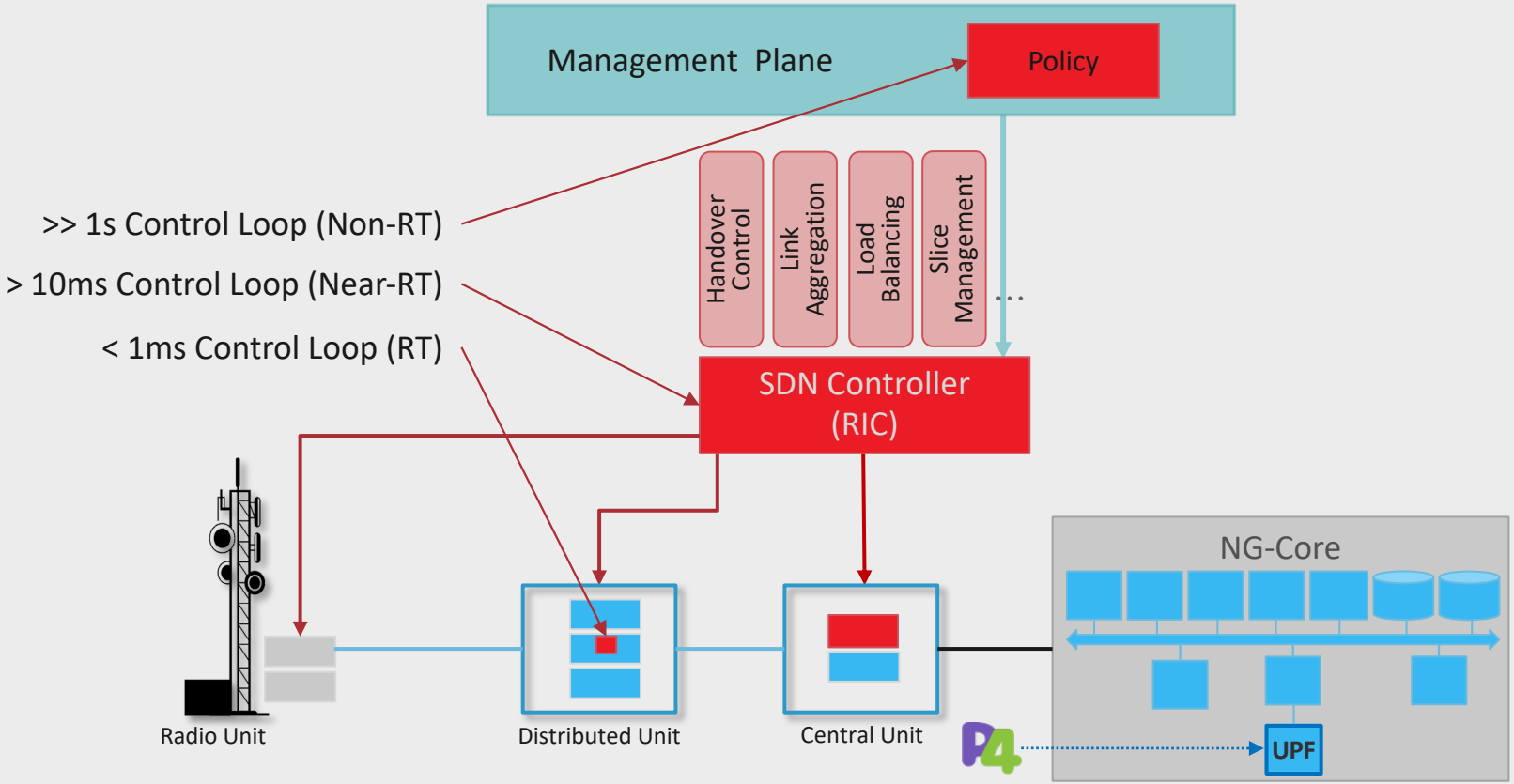
Open Networking Foundation
Princeton University

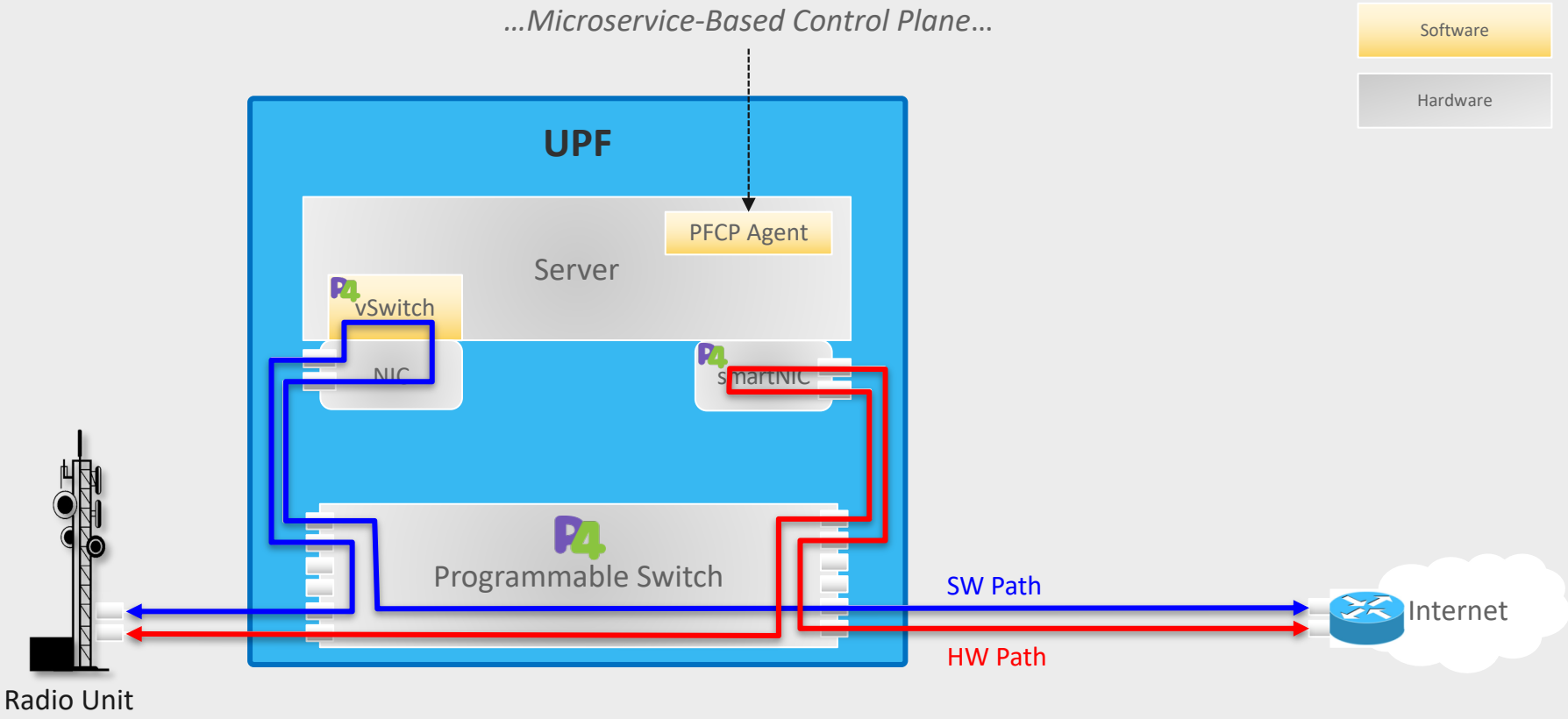
5G Transformation



Programmable End-to-End & Top-to-Bottom

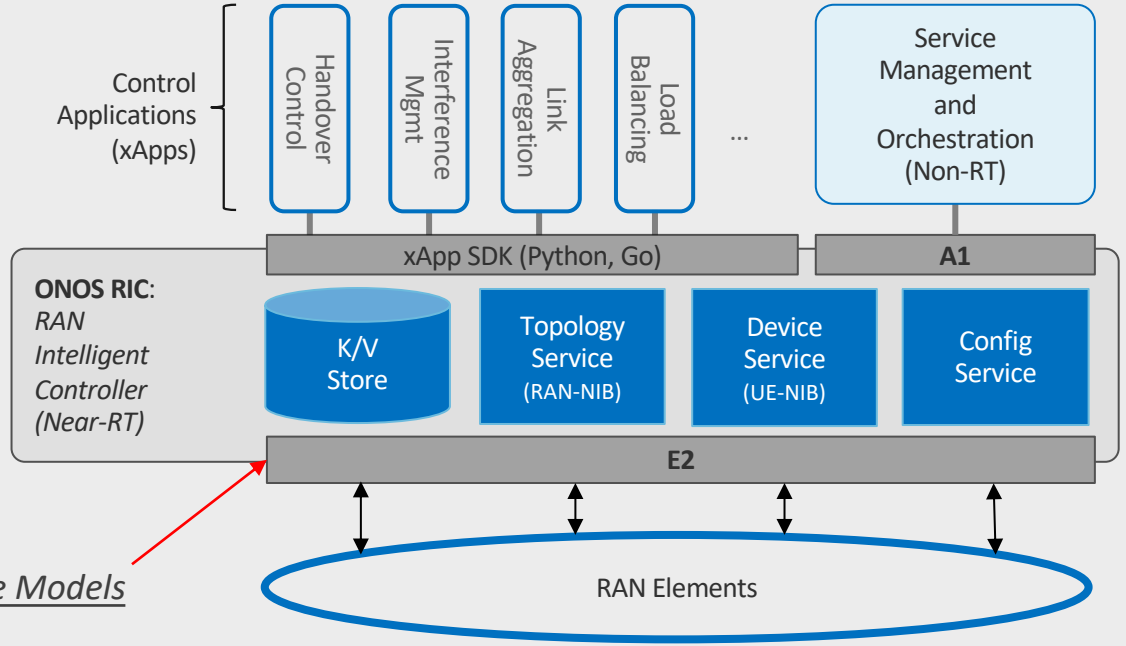


SD-CORE: P4-BASED UPF



SD-RAN: ONOS-Based RIC

Running in Berlin Open RAN Field Trial (since Oct 2021)



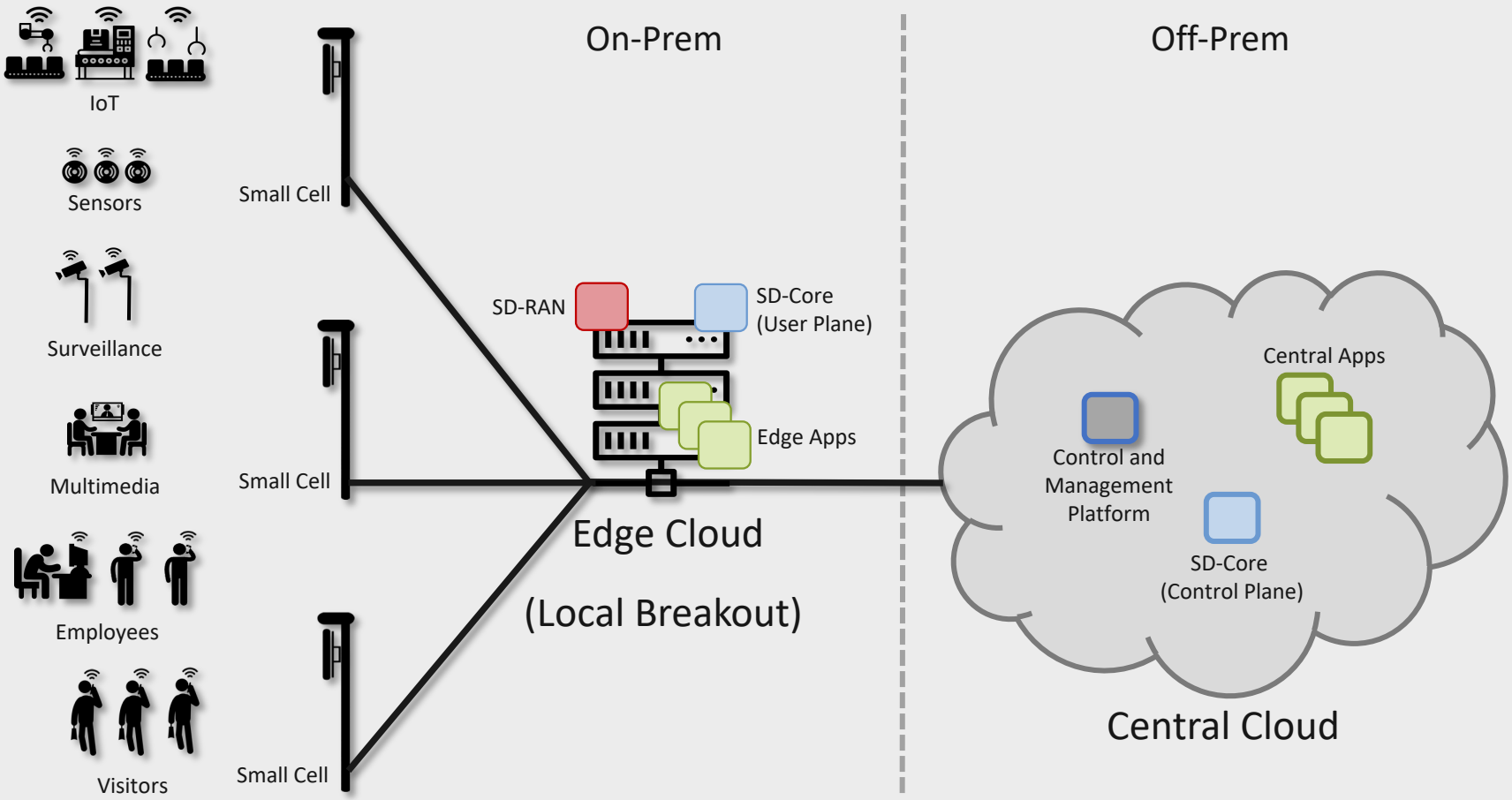
Supports O-RAN Service Models

- *E2SM-KPM*
- *E2SM-RC*

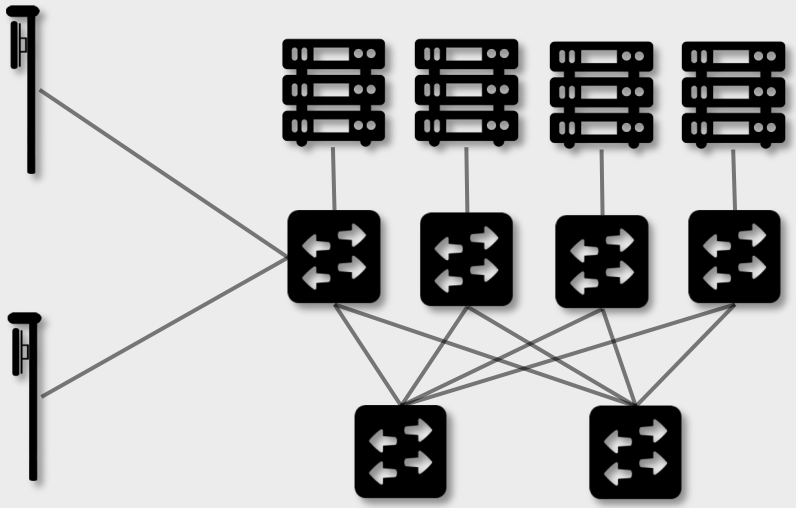
Private 5G as a Cloud-Managed Service

(An Open Source Project at ONF)

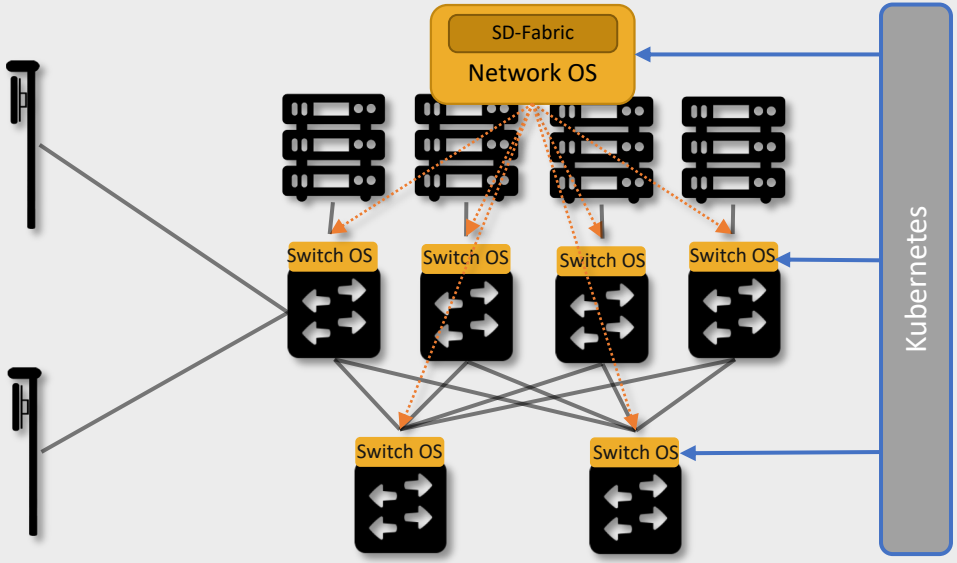
AETHER OVERVIEW



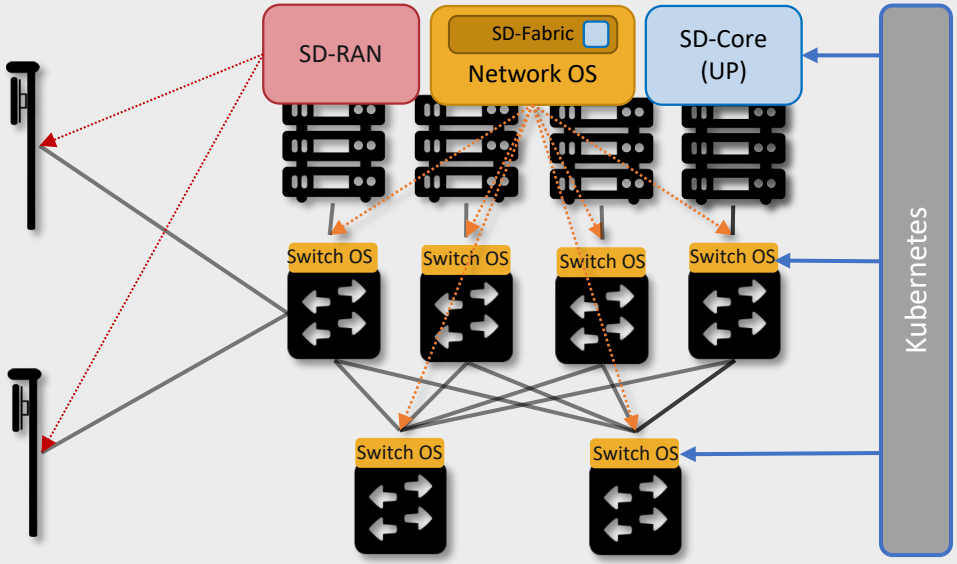
AETHER HARDWARE



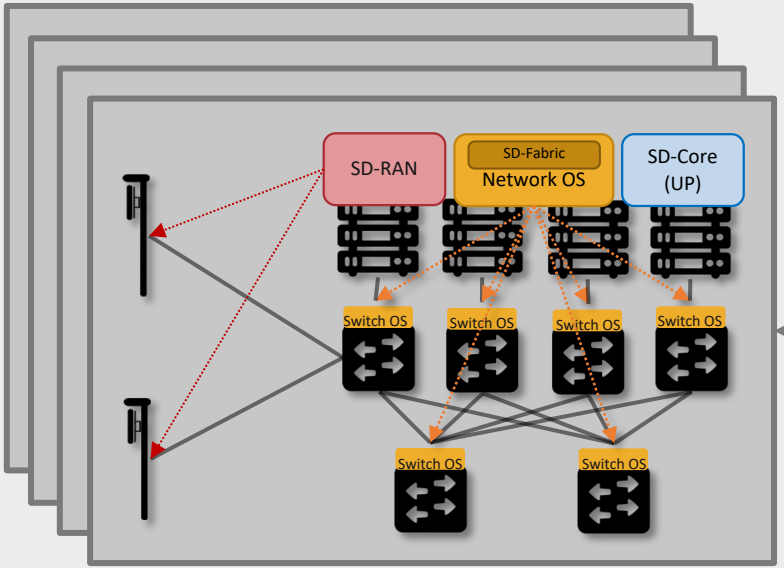
AETHER PLATFORM



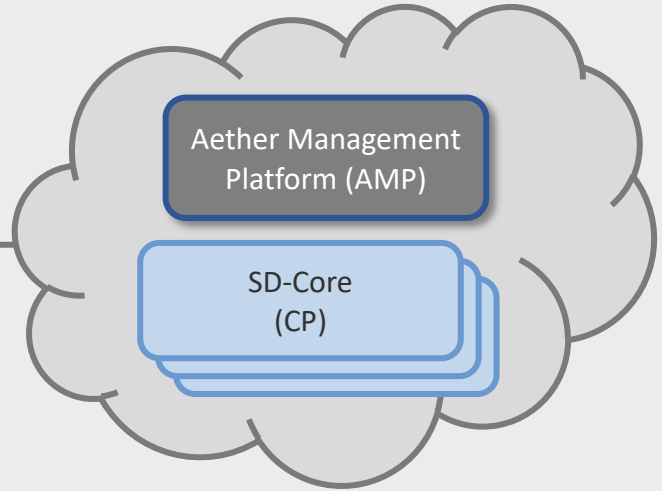
AETHER CONNECTIVITY SERVICE



AETHER AS A MANAGED SERVICE

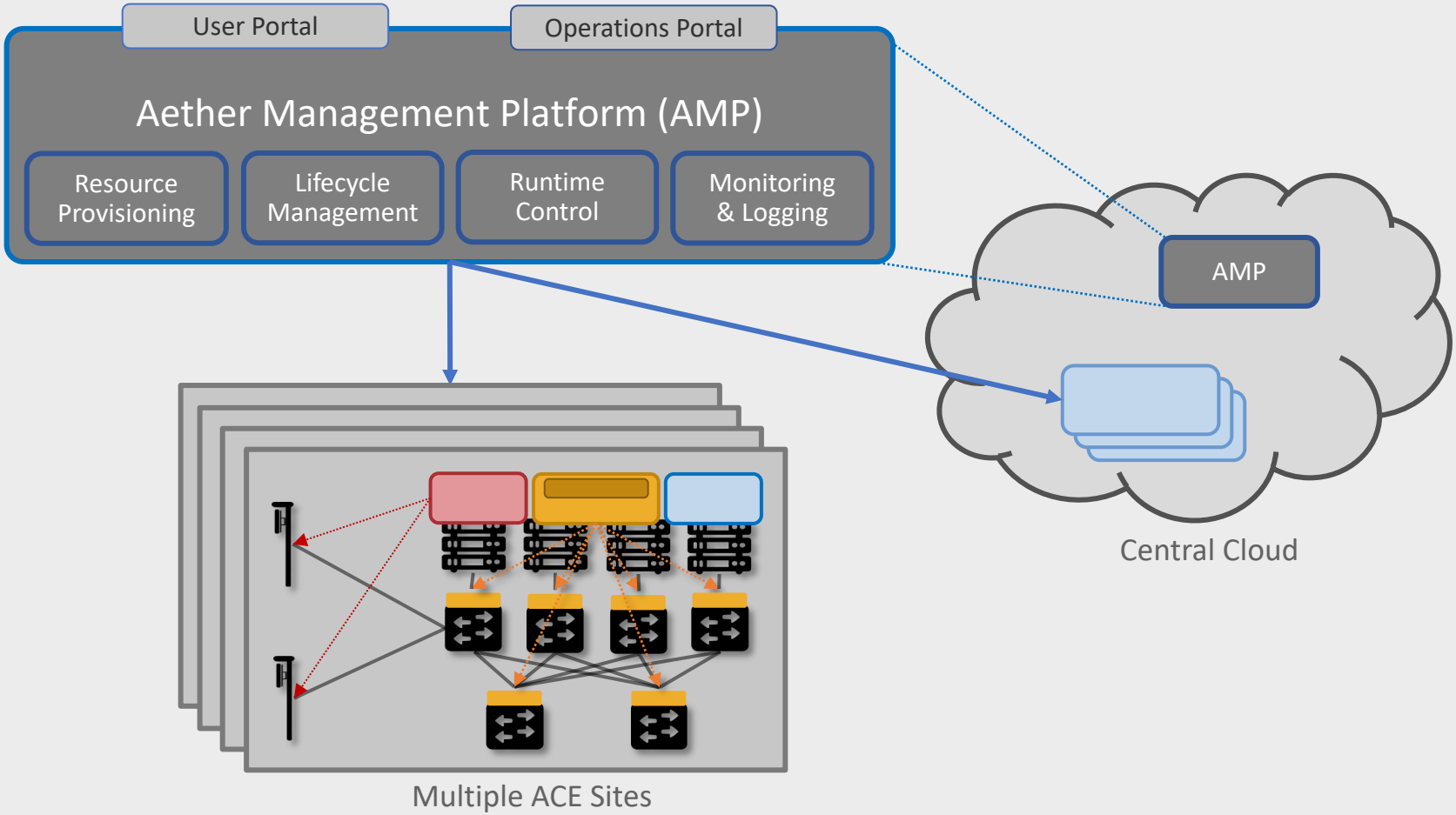


Aether Connected Edge (ACE)



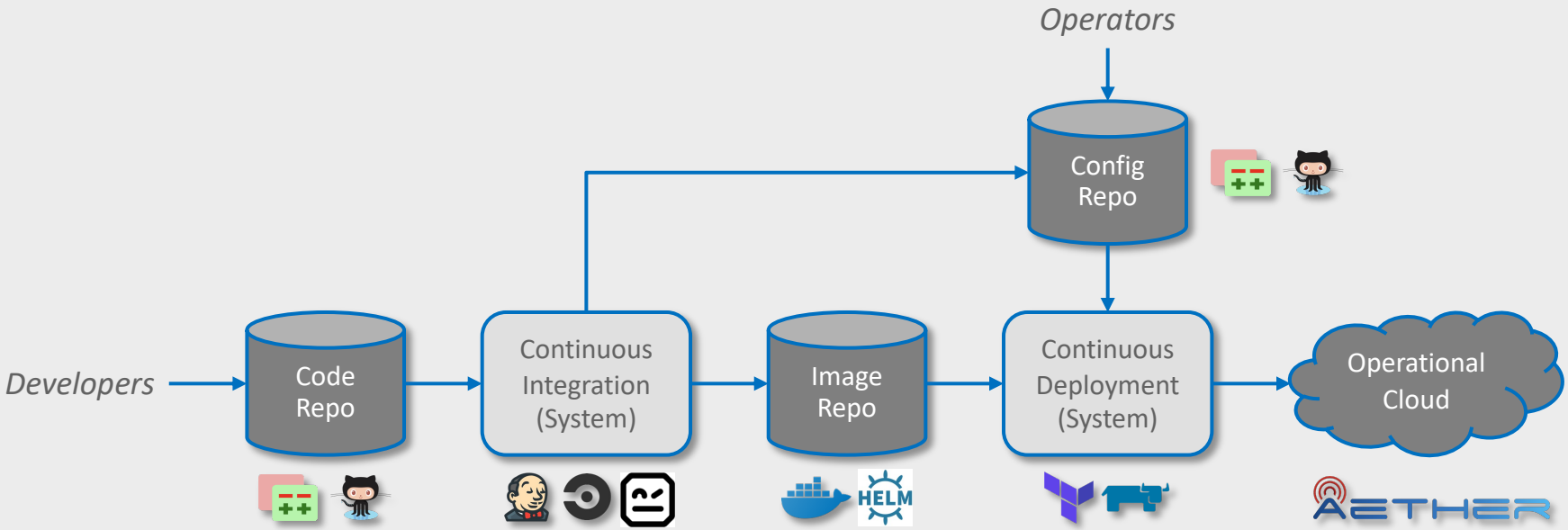
Central Cloud

Aether Management Platform

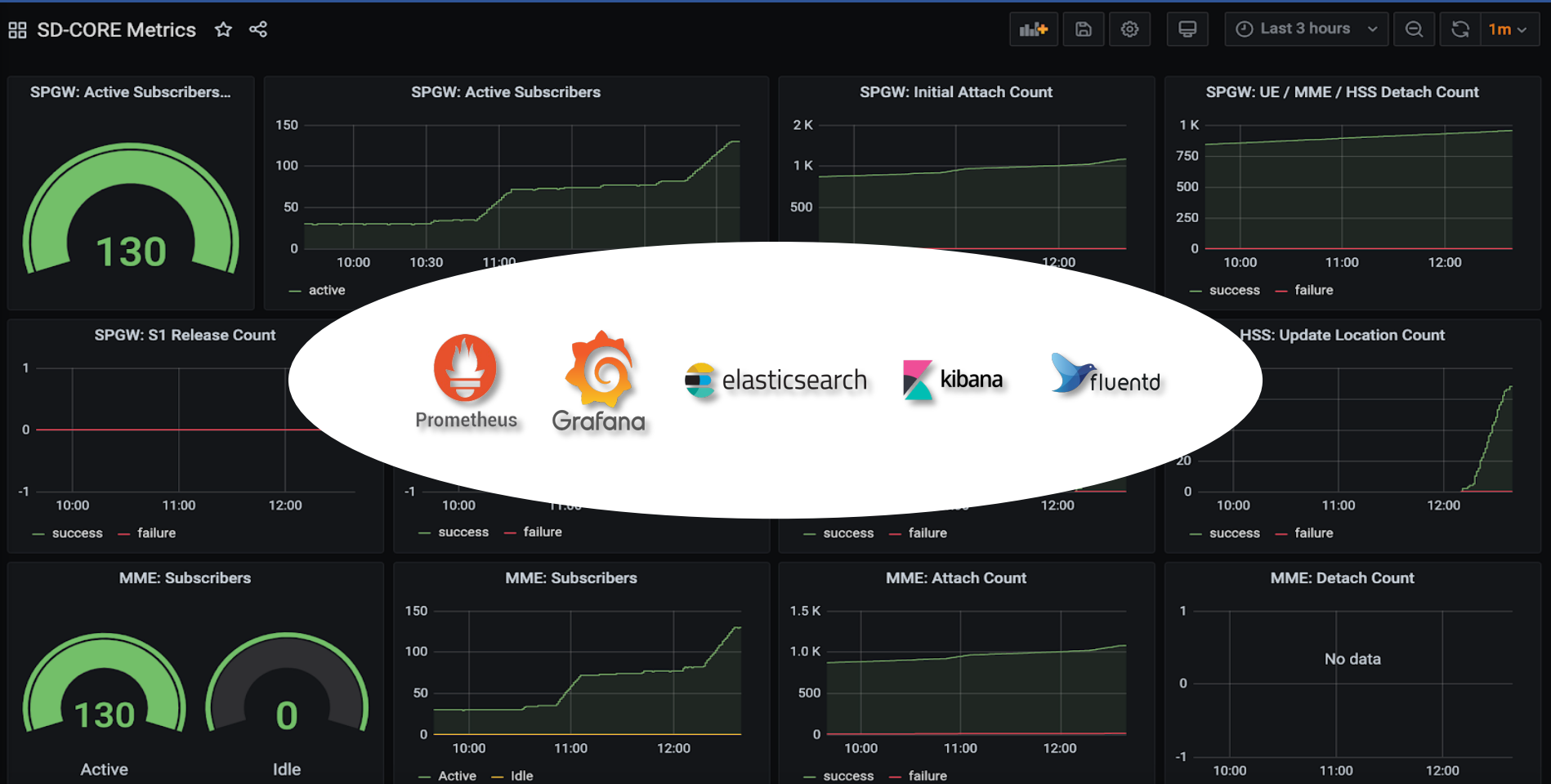


LIFECYCLE MANAGEMENT

(Continuous Integration / Continuous Deployment)



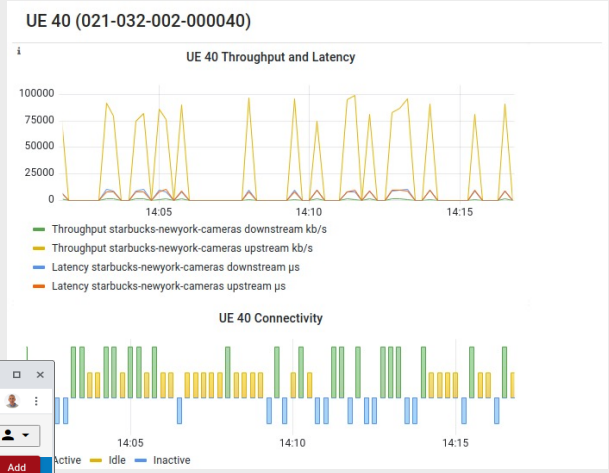
Monitoring & Logging

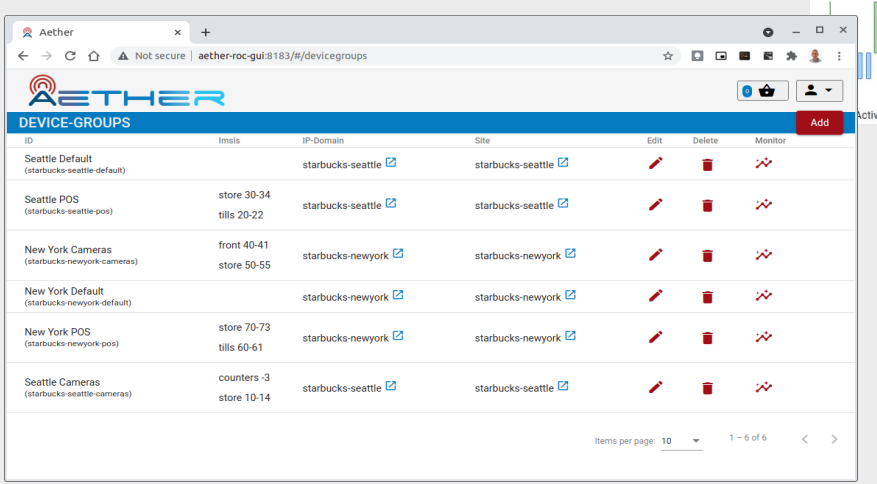


Runtime Control API

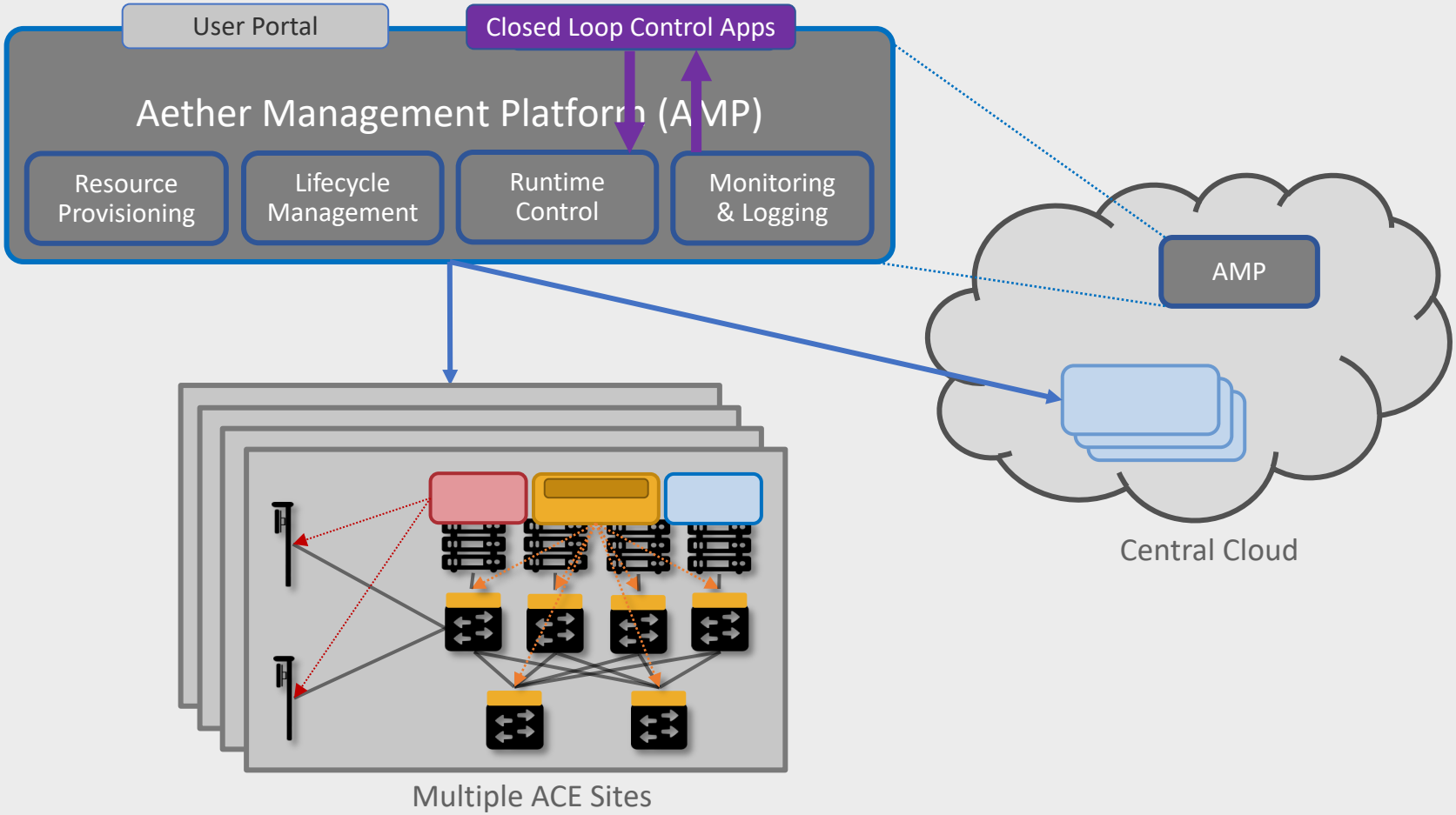
Programmatic API and Enterprise Portal to…

- *Manage Devices and Device Groups*
- *Define Slices to Isolate Traffic*
- *Set QoS Parameters for Slices*
- *Assign Device Groups & Applications to Slices*
- …

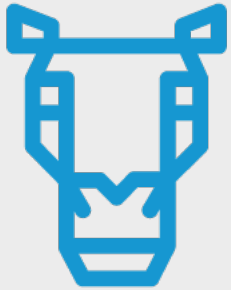




Closed-Loop Control



AETHER HAS BEEN OPERATIONAL SINCE DECEMBER ’19

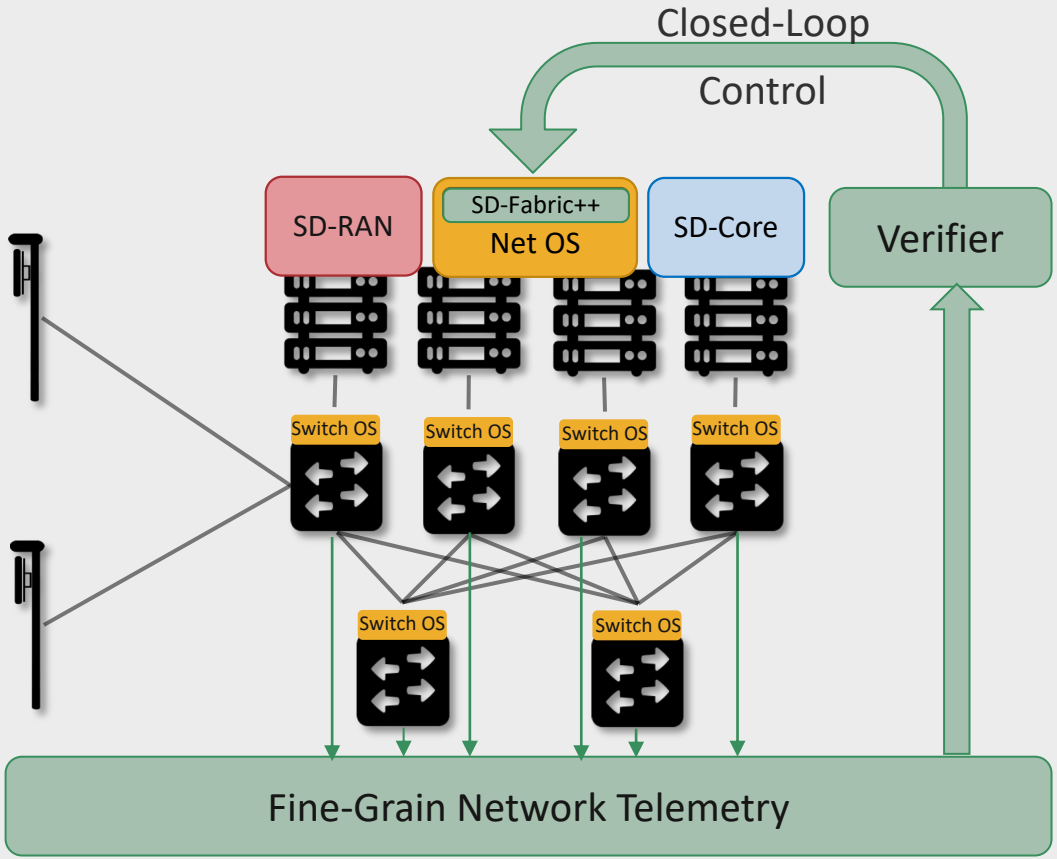


PRONTO

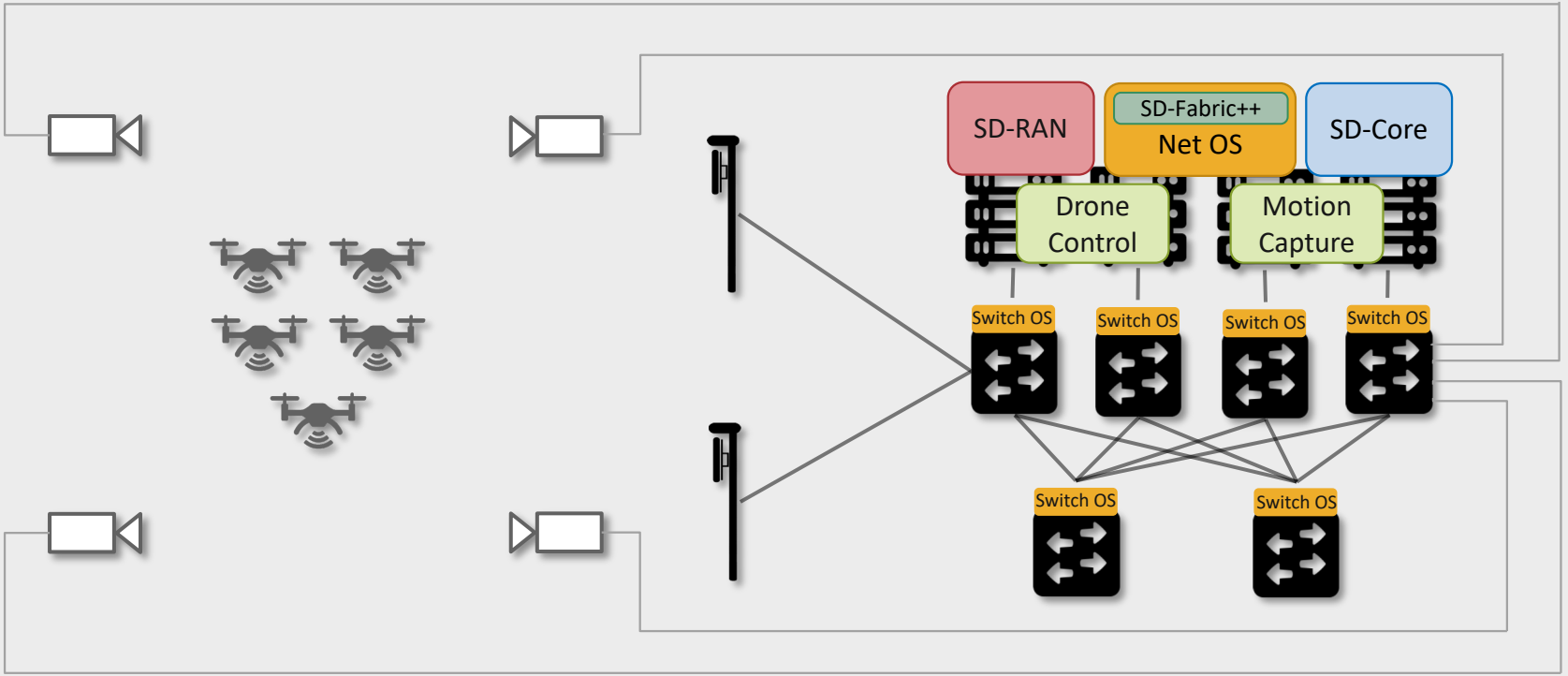
Securing the Internet Using Verifiable Closed-Loop Control

(A DARPA Research Project at Stanford, Cornell, Princeton, ONF)

Verifiable Closed-Loop Control



DEMONSTRATION



More Information

Research Position Papers

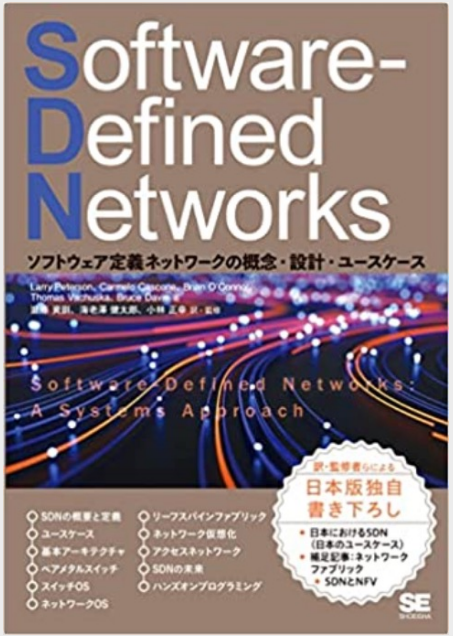
- *Deep Programmability: SIGCOMM CCR, Oct 2020.*
- *Formal Foundations for P4 Data Planes, ACM POPL, Jan 2021.*

Project Web Sites

- PRONTO: https://prontoproject.org
  - *Includes links to demo videos*
- AETHER: https://opennetworking.org/aether
  - *Includes links to SD-Fabric, SD-RAN, and SD-Core projects*

Background Reading

- https://5G.systemsapproach.org
- https://sdn.systemsapproach.org
- https://ops.systemsapproach.org



Bruce Davie, Motonori Shindo, and Kentaro Ebisawa
SDN Experience from the Asia-Pacific Region
ACM SIGCOMM's Network Channel on Nov 9th
https://networkingchannel.eu/