



# **ONOS Overview**

*Tenets, Roadmap, Deployments*

*March, 2018*



# What is ONOS?

Open Network Operating System (ONOS) is an open source SDN network operating system.

Our mission is to enable Service Providers to build real SDN/NFV Solutions.



## **distributed core**

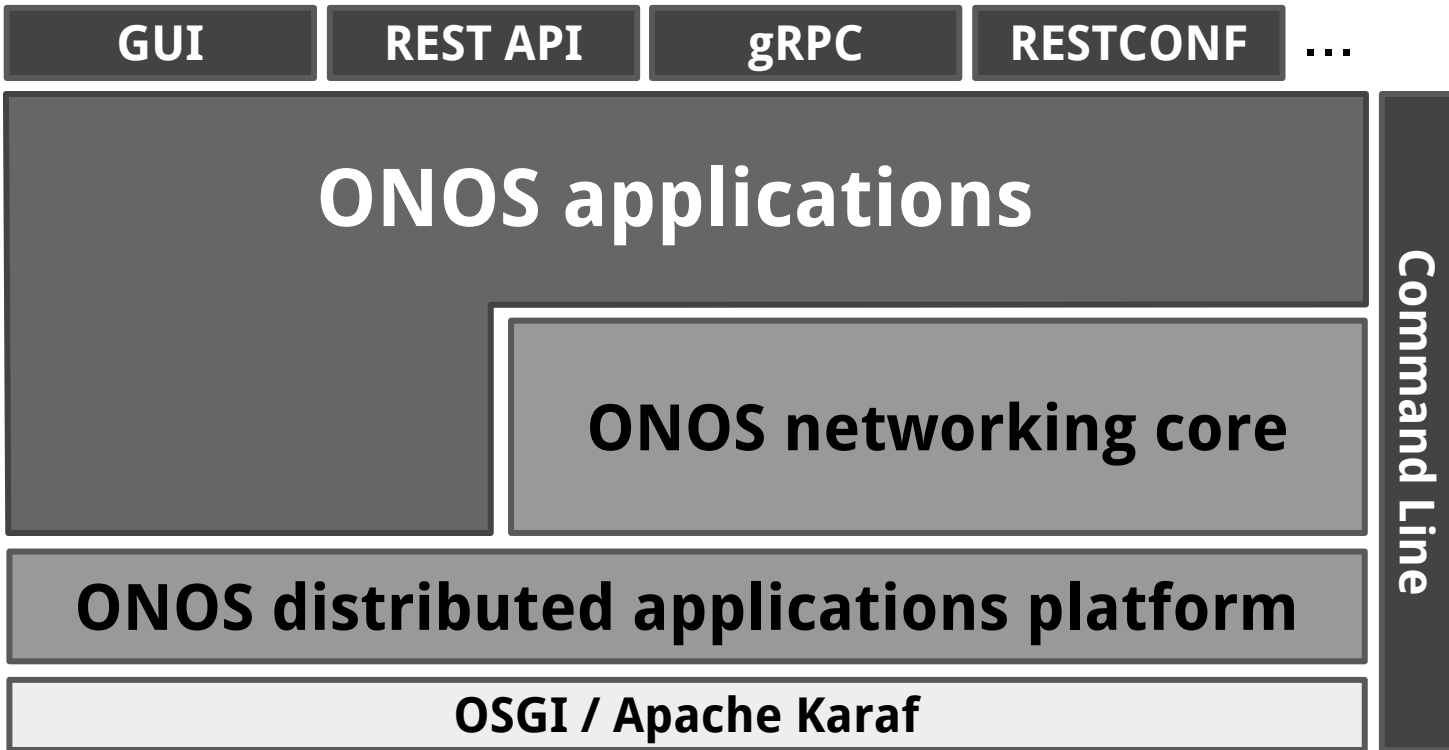
provides high-availability, scalability and performance

## **abstractions & models**

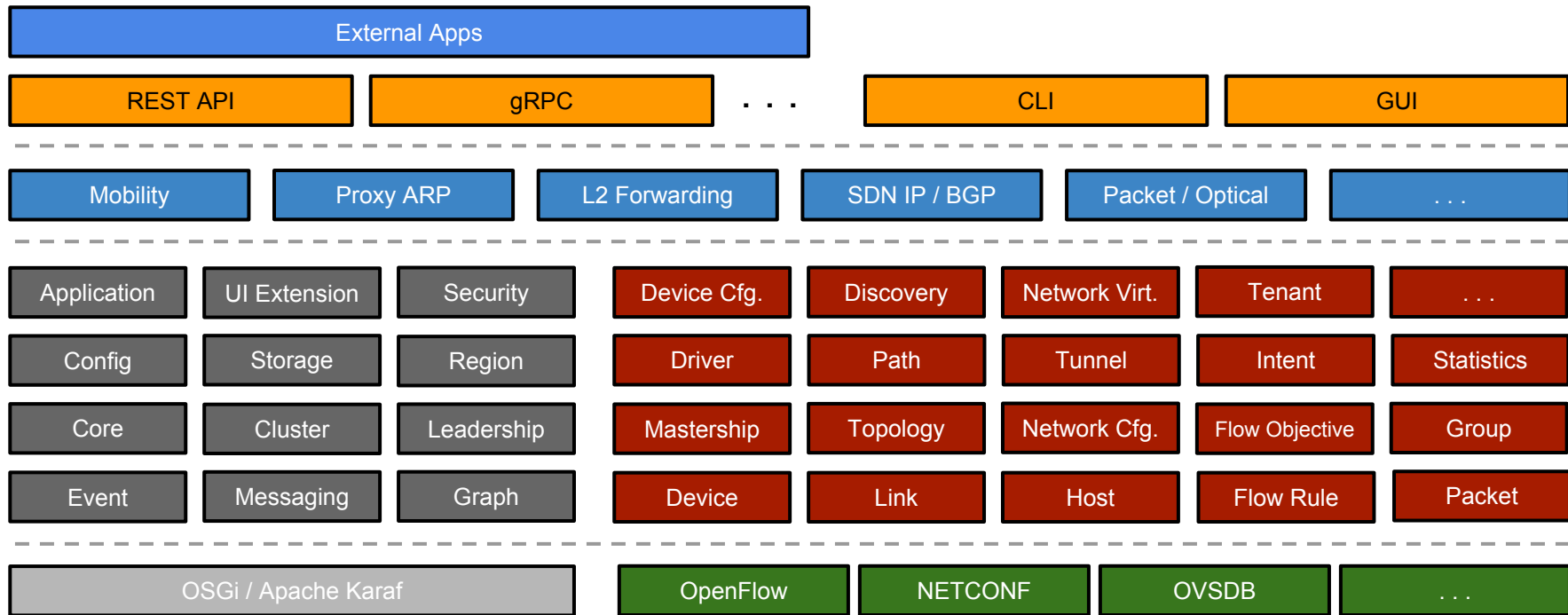
allow applications to configure and control the network  
without becoming dependent on device specifics

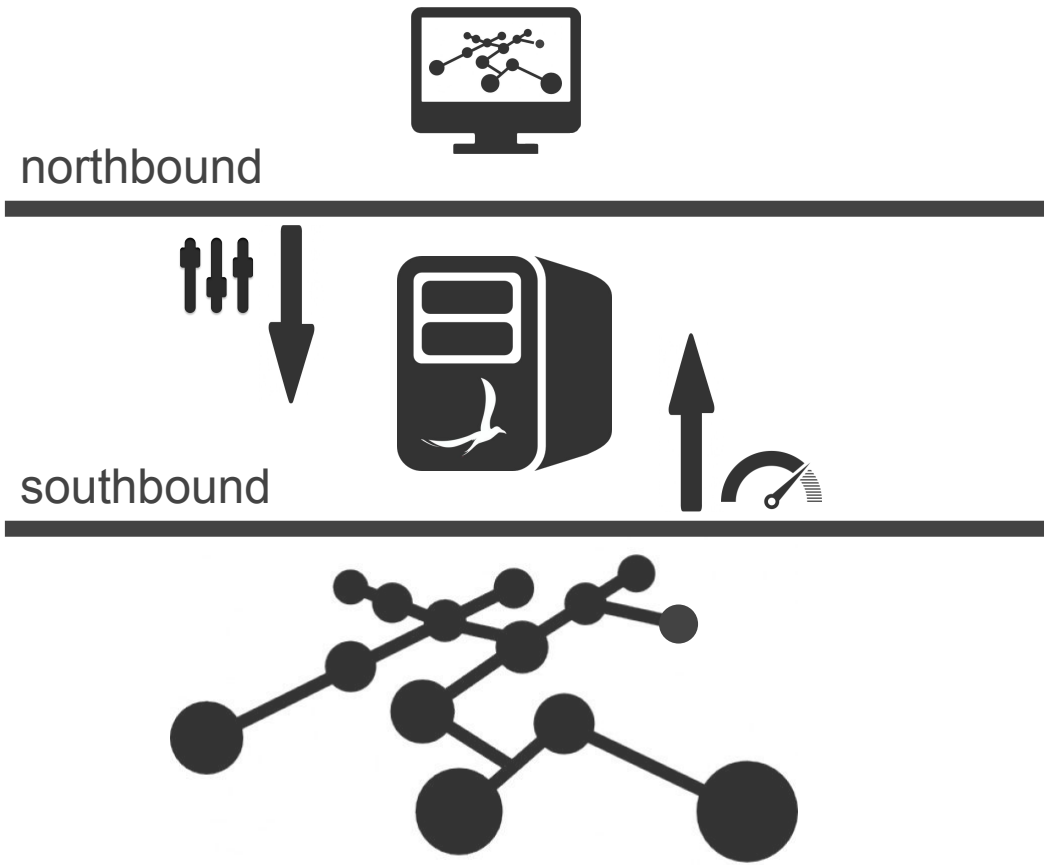
## **applications platform**

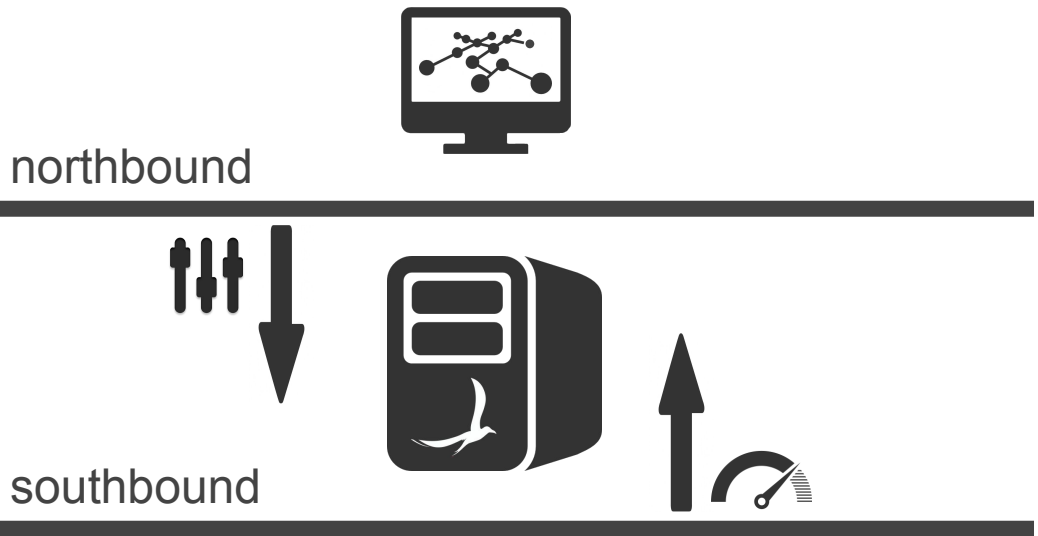
allows developers to dynamically extend the base capabilities



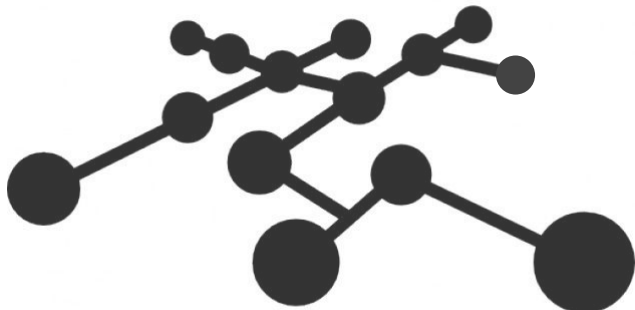
# ONOS Core Subsystems







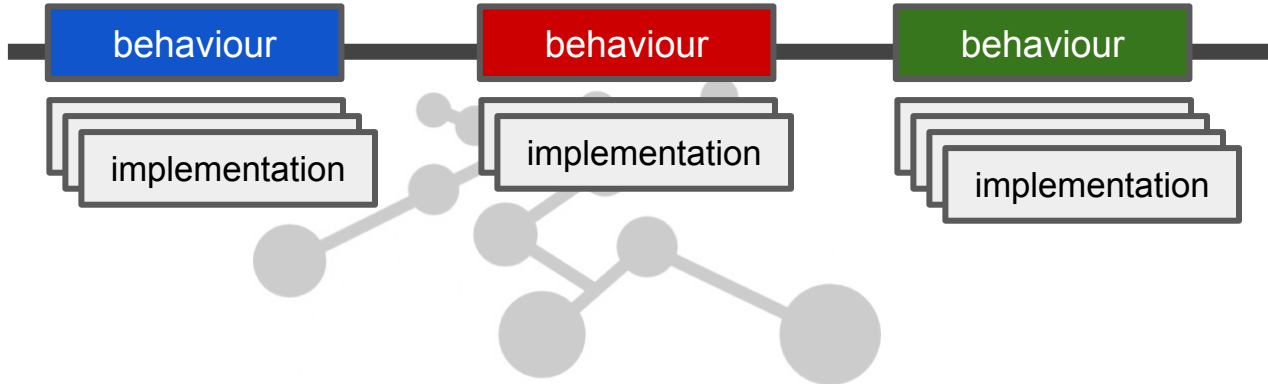
- OpenFlow
- OVSDB
- NETCONF
- P4



- BGP
- OSPF
- PCEP
- TL1
- ...



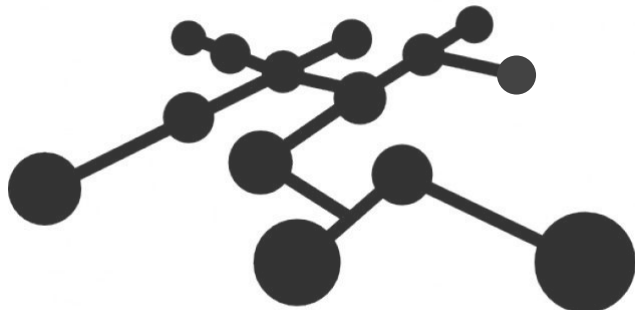
device-centric







network-centric



# Brief Retrospective



- Started with a minimal platform with only a few apps
  - built with sound structure and solid code & minimalistic REST API
  - 4 apps and 1 SB plugin, ~50K SLOC
- Now a platform with many features and apps
  - new capabilities, distributed primitives and even greater extensibility
  - now ~150+ apps, including SB plugins, drivers, models, etc.
  - ~500K SLOC
- Added new core functionality and apps with each release
  - deliberately balancing investments in platform vs. use-cases and apps
  - show innovation, but also take pragmatic steps to be deployment-ready
  - maintain coherence of architecture and quality of code

# ONOS Releases



- **Avocet** (1.0.0) 2014-12
- **Blackbird** (1.1.0) 2015-03
- **Cardinal** (1.2.0) 2015-06
- **Drake** (1.3.0) 2015-09
- **Emu** (1.4.0) 2015-12
- **Falcon** (1.5.0) 2016-03
- **Goldeneye** (1.6.0) 2016-06
- **Hummingbird** (1.7.0) 2016-09
- **Ibis** (1.8.0) 2016-12
- **Junco** (1.9.0) 2017-02
- **Kingfisher** (1.10.0) 2017-05
- **Loon** (1.11.0) 2017-08
- **Magpie** (1.12.0) 2017-12

Moving to 4-month release cycles

- **Nightingale** (1.13.0) 2018-04 *(in progress)*

# Present Focus



- Hardening 1.11, 1.12 & 1.13 releases in support of a pending trials & full scale deployment
  - HA of platform & apps in face of node failures and net partitions
  - Scalability optimizations
  - ISSU of platform & apps

# Deployments

- Research & Education

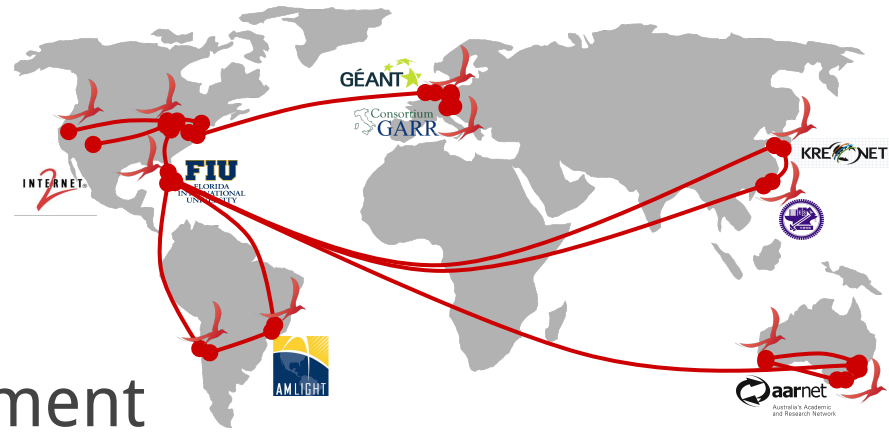
- SDN-IP, VPLS apps

- SDN in Air-Traffic Management

- Safety-critical, ATM-grade deployment in Brazil (~22M km<sup>2</sup>)
- Radar relays, remote control towers, pilot voice, etc.
- NetBroker from Frequentis developed on ONOS
- Brown-field & OpenFlow

- Access network for residential customers

- Trials with a major US telecom provider
- Edge fabric: ~10K clients, ~150K routes, ~1.5M flows
- OpenFlow





**onos**  
Open Network Operating System

Software Defined Transformation of Service Provider Networks

*Join the journey @ [onosproject.org](https://onosproject.org)*