What's New in ONAP Frankfurt

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Topics

- Quick Facts
- ONAP Overview
- Release Highlights
- What's Next

Quick Facts

ONAP Frankfurt, Most Comprehensive, Secure, and Collaborative Platform for Network Automation

- Most comprehensive & secure release
- 5G with Network Slicing
- O-RAN, GSMA, ETSI, TMF collaboration & harmonization
- Edge & Cloud Native support

ONAP's 6th Release, 'Frankfurt,' Available Now – Most Comprehensive, Secure and Collaborative Software to Accelerate 5G Deployments

- *Rich feature set including End-to-end 5G network slicing, security and deployment-ready automation anchored in Frankfurt*
- *Collaborative and diverse contributions for 27 sub-projects, across 34 organizations and 400+ developers, and accelerated commercial activity*
- *Increased implementation of standards – including 3GPP, ETSI, GSMA, MEF, TMF, and collaboration with Cloud Native, Edge, and ORAN SC*

SAN FRANCISCO – **June 18, 2020 –** LF Networking (LFN), which facilitates collaboration and operational excellence across open source networking projects, today announced the availability of the ONAP Frankfurt release. The most comprehensive ONAP release to date, the arrival of Frankfurt coincides with increased commercial activity, deployments into production, and community participation and diversity.

The Evolution of ONAP— the De Facto Automation Platform

Nov'17 Jun'18 Dec'18 July'19 Oct'19 Jun'20

Amsterdam—
Ik ben hier
"I am here"

Beijing—
用例
"Use Cases"

Casablanca—
معايير التعاون
"Standards Collaboration"

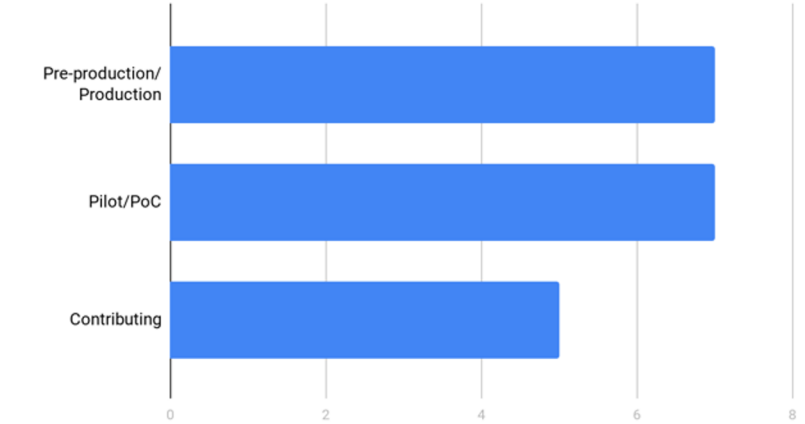
Dublin—
Gníomhaíocht tráchtála
"Commercial Activity"

El Alto—Mayor Estabilidad
"Stability"

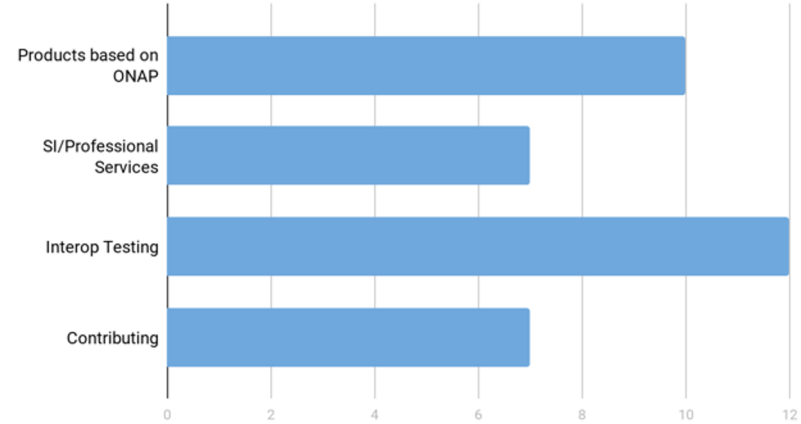
Frankfurt—
5G
"5G" ;-)

Strong Commercial Activity*

CSP Activity



Vendor/Academic Institution Activity



*Based on self reporting

ONAP Overview

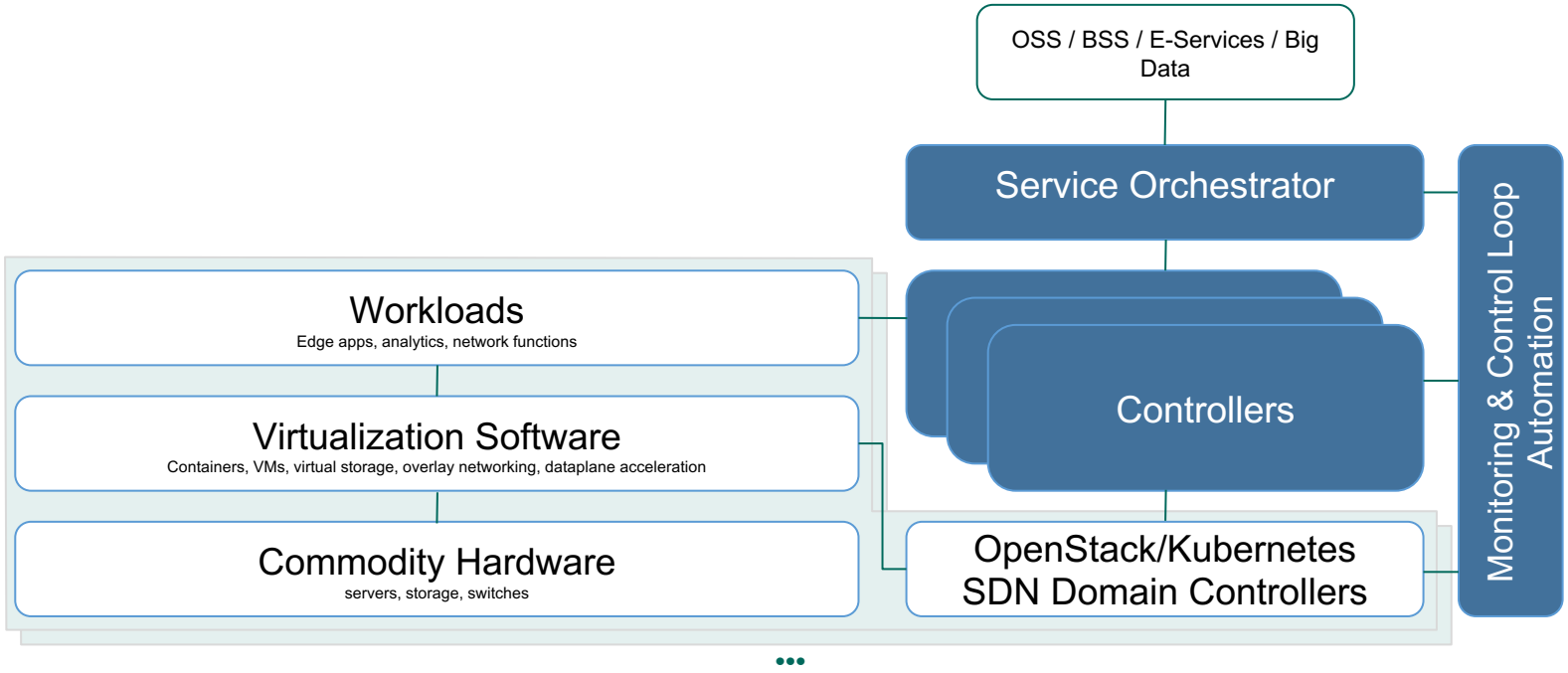
What is ONAP?

ONAP is an open source software platform that provides a comprehensive platform for real-time, policy-driven orchestration and automation of physical and virtual network functions that will enable software, network, IT and cloud providers and developers to rapidly automate new services and support complete lifecycle management. By unifying member resources, ONAP is accelerating the development of a vibrant ecosystem around a globally shared architecture and implementation for network automation–with an open standards focus–faster than any one product could on its own.

Long-term Roadmap: https://wiki.onap.org/x/VIAP

Which CSPs are Involved With ONAP?

ONAP Scope in the Modified ETSI Framework



Frankfurt

ONAP

OPEN NETWORK AUTOMATION PLATFORM

OSS / BSS / Other

NBI

Legend: Design | Orchestration & Management | Operations

Design-Time

VNF Validation: VVP | VNF SDK

Service Design & Creation (SDC)

- Service/xNF Design
- xNF Onboarding
- Workflow Designer
- Controller Design Studio
- DCAE Design Studio
- Catalog

Run-Time

Portal | O&M Dashboard (VID) | Use-Case UI | External APIs | CLI (Deprecated) | Interfaces

Control Loop Automation (CLAMP) | Policy Framework | Service Orchestration (SO) | Active & Available Inventory (AAI) | External System Register (ESR)

Microservice Bus (MSB) / Message & Data Routers (DMaaP)

DCAE
- Holmes (Deprecated)
- Collectors

Infrastructure Adaptation (Multi-VIM/ Cloud)

SDN Controller (SDNC)

Application Controller (APPC)

Virtual Function Controller (VFC)

Manage ONAP

ONAP Operations Manager (OOM)

Frankfurt ONAP

Shared Services
- AuthN/AuthZ (AAF)
- Optimization (OOF)
- Logging (Deprecated)
- Audit (POMBA) (Deprecated)
- Multi-Site State (MUSIC)
- & Others ...
- ...

ONAP Shared Utilities
- CCSDK
- Model Utilities
- TOSCA Parser

External Systems: Third Party Controllers | sVNFM | EMS

Network Function Layer: VNFs ... | PNFs

Hypervisor / OS Layer: OpenStack | Commercial VIM | Kubernetes | Public Cloud

Private Edge Cloud — MPLS — Private DC Cloud — IP — Public Cloud

Managed Environment

Last updated: Jun, 2020

ONAP Use Case Blueprints

- 5G
- Residential
  - Virtual CPE
  - Broadband Service
- Optical Networking
  - Cross Domain Cross Layer VPN
  - Multi-Domain Optical Networking Service
- Voice-over-LTE

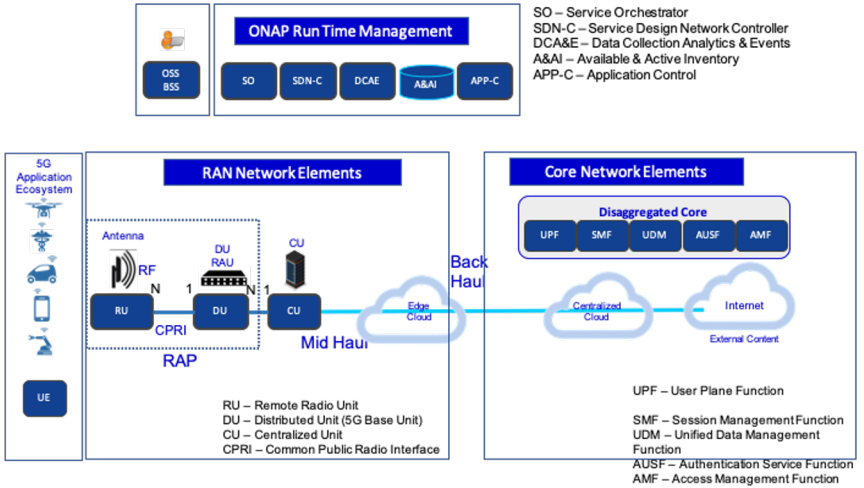
Release Highlights

The most Comprehensive, Collaborative ONAP Release to Date

- 27 Sub projects, 34 organizations and 438 developers.
- Commits: 13,500+, Features, Security & Defect issues addressed: 4,400+

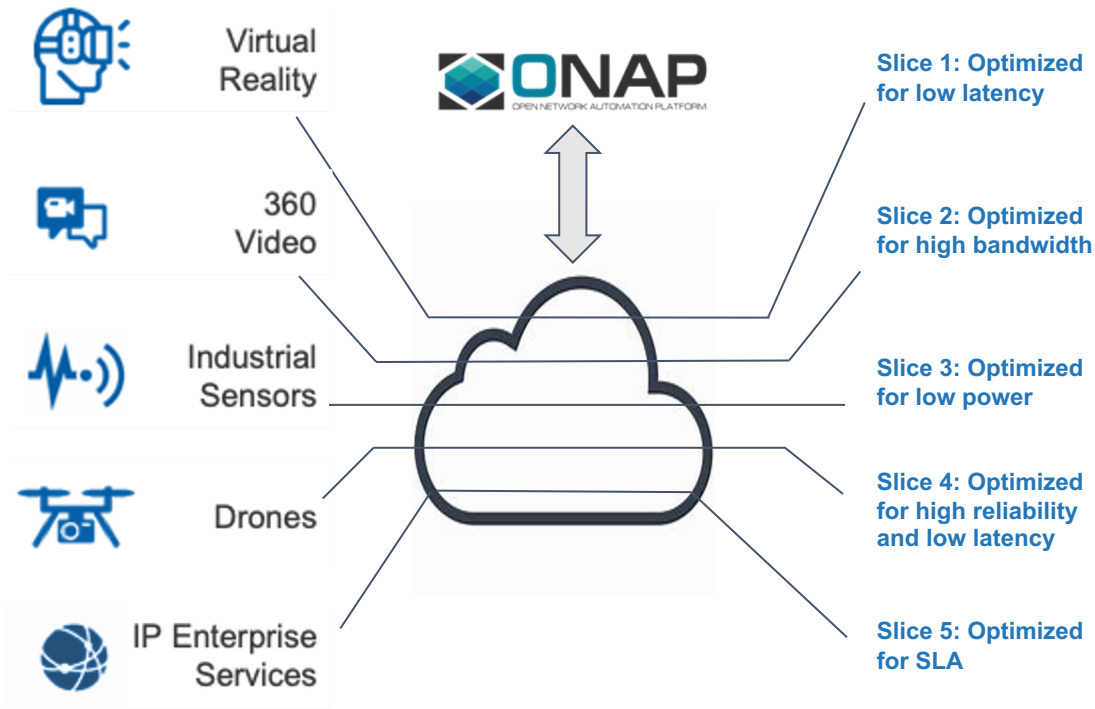
ONAP Blueprint: 5G

- End-to-end 5G service orchestration
  - ETSI/3GPP aligned models
- End-to-end network slicing (see next slide)
- Self organizing network (SON) support
  - Physical cell ID (PCI) and automated neighbor relations (ANR) optimization
- Improvements in data collection (performance and fault mgmt.)
- Configuration management over different protocols (YANG/NETCONF, REST)
- O-RAN Software Community harmonization (O1, A1 interfaces)
- PNF upgrade without an EMS
- PNF, RAN simulators created to help with development



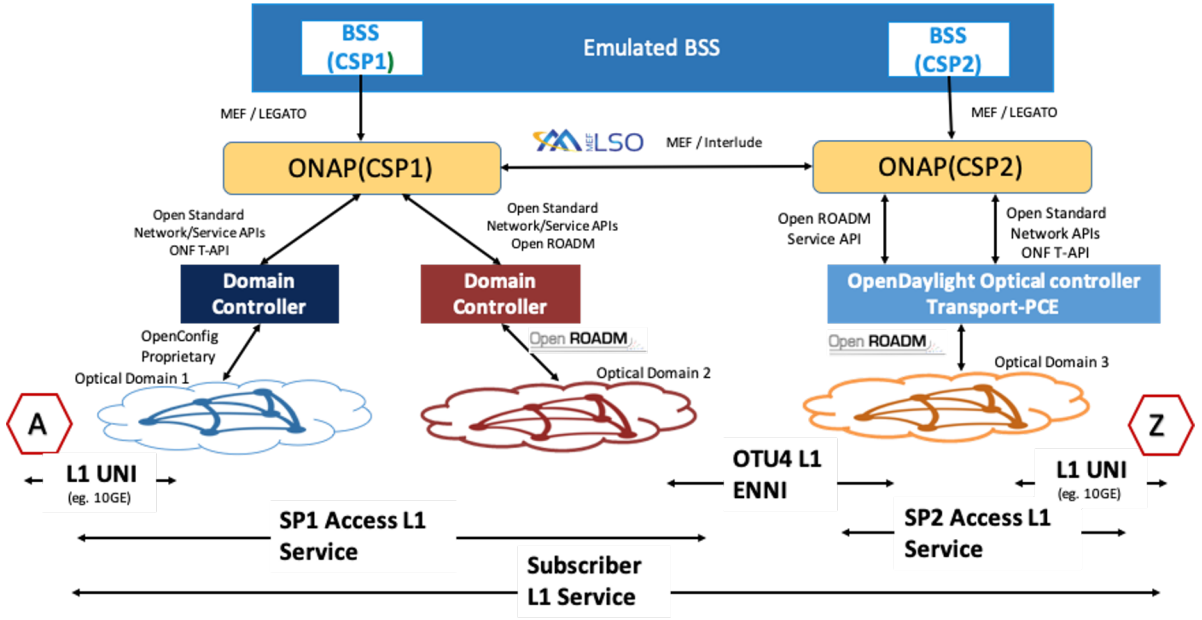
5G Network Slicing - Quick Overview

- RAN, core, transport slicing to create and end-to-end slice
- ONAP includes:
  - Communication Service Management Function (CSMF)
  - Network Slice Management Function (NSMF)
  - Adapter to per domain Network Slice Subnet Management Functions (NSSMF)
- Work done on GUI, modeling, and slice instance selection



ONAP Blueprint: MDONS (Optical Network)

- ONAP peering for optical network service orchestration across CSPs or different operational units
- Orchestration/mgmt over standard T-API or OpenROADM APIs
- Complements CCVPN for a complete solution



Frankfurt: Standards to Code

The Frankfurt release supports SOL005, SOL002 and has API improvements for the SOL003 adapter. There is also improved support for the ETSI Catalog specification, ETSI package extraction, and VNF package subscription and notification.

Additional TM Forum APIs implemented to support 5G network slicing. The VTP REST API was contributed to TMF Test API Specification 704-710 / 913 v19.5.

The ONAP community continues harmonization of northbound APIs with MEF Legato and Interlude APIs.

Support for 5G network slicing standards and collaboration around VES specifications for fault management and performance management telemetry collection.

Increased support for the O1 interface for fault, performance, and configuration management. Initial support for the A1 interface. (ORAN SC, Hosted by The Linux Foundation)

Integration Project Improvements

- Patch submission gating
  - 4,000 automated ONAP deployments and more than 70,000 test suites
  - Significantly improves the velocity and stability of the project
- Testing improvements
  - Expanded testing
  - Test framework improvement (test API, test result DB and visualization, classifying types of tests, test KPIs, Python SDK); leveraged from OPNFV
  - Requirements/gap analysis on types of tests and KPIs

Security Improvements

- Security: area of rapid improvements
  - Converting HTTP to HTTPS ports
  - Removal of hard coded passwords
  - Running K8s pods with non-root privileges (exceptions documented)
  - Reducing vulnerabilities
  - Upgrade of libraries for improves security (e.g. Java, Angular, OpenDaylight)
  - Greater CII badging
  - Integration with AAF for automatic certificate generation
  - Sonar Cloud code scanning service

Key Design Time Updates

Inventory service models & visualization	• A&AI includes new or updated models for 5G service design, 5G network slicing, CCVPN, MDONS, PNF enhancements, external dependencies • Better visualization, design support with Papyrus XMI UML
Self-service control loops	• Create complete control loops without waiting for an official ONAP release • New DCAE Microservice Onboarding & Design (MOD) to onboard DCAE components, compose flows, and distribute dynamic blueprints to run time • TOSCA model for control loops makes them easier and more consistent • Policy based reconfiguration of DCAE microservices and a blueprint generator tool to simplify deployment artifact creation
Config/LCM templating	• CDS component includes package list search & package creation • Make it easier to create and manage the controller blueprint archive (CBA) package via CDS user interface

Key Run Time Updates

Config/LCM	• CDS component is now a 1st class citizen via integrations with SO, CLAMP, and Policy projects • CDS has new run time features such as a rolling upgrade of blueprint (BP) processor, error catalog library integration with BP processor, and certification of BP processor imperative workflows, support a Python script executor, CLI based commands for network functions
Kubernetes NFVI support	• The K8s plugin in the MultiCloud project supports CNFs and CNAs, including provider networks and multiple virtual networks per cluster, that span across multiple K8s clouds • The K8s plugin now also supports StarlingX

Additional Notable Updates 1/2

AAF	CMPv2 integration
APP-C	Resource resolution via CDS and 16 new lifecycle management (LCM) commands such as ConfigScaleIn, PostEvacuate, StartTraffic
CLAMP	Moving to an end-to-end fully model driven control loop and support for CDS as an actor
DCAE	MOD platform, new microservices—Event processors (PM subscription handler, DataLake handler), analytics/RCA (TCA Gen2), Experimental support to onboard Acumos models into ONAP
DMaaP	Protect update operations in Kafka for message routing
Ext. API	Network slicing and service ordering APIs
MSB	Registration of Frankfurt APIs

Additional Notable Updates 2/2

OOF	Slice/slice subnet selection for network slicing, model driven route optimization for OTN paths between two domains for the CCVPN use case blueprint
Policy	Policy update notifications, streamlined health check for the Policy Administration Point (PAP), configurable pre-loading/pre-deployment of policies, new APIs (e.g. to create one or more Policies with a single call), new experimental PDP monitoring GUI
Portal	Enhanced UI via an Angular.js upgrade from 1.x to 7.0, improved backend performance, added reporting features
SO	ETSI SOL002, SOL003, SOL005 support, PNF software upgrade without EMS, new workflows: NSMF, CSMF, and an NSSMF adapter for network slicing, CCVPN ELINE/MDONS
VF-C	Supports the ETSI Catalog specification
UUI	CSMF, NSMF UIs, Monitor Module enhancements for 5G slice monitoring; CCVPN E-LINE over OTN inter domain links and MDONS support

What's Next

What's Next?

- Training
  - Four ONAP courses now available
  - Certified ONAP Professional exam (Q3) Beta open until 7/31
- ONAP Guilin (2H 2020)
  - Increased 5G support in areas of network slicing and O-RAN integration, ETSI (e.g. SOL007) and 3GPP standards
  - Deeper cloud native integration with K8s

Get Involved

- Review ONAP architecture, release notes, and read the documentation https://docs.onap.org/en/frankfurt/
- Read use case blueprint solution briefs https://wiki.onap.org/
- Read the ONAP EUAG ONAP Consumption Perspective https://www.lfnetworking.org/publications/2020/06/17/onap-consumption-models-whitepaper/
- Read the Bell Canada ONAP Case Study https://www.lfnetworking.org/publications/2020/06/17/bell-canada-case-study/
- Join us:
  - Weekly project meetings https://wiki.onap.org/pages/viewpage.action?pageId=6587439
  - Virtual LFN Developer & Testing Forum (June 22-25) https://events.linuxfoundation.org/lfn-dev-test-forum/
  - Open Networking & Edge Summit (ONES), Sept 28-29, 2020, Virtual

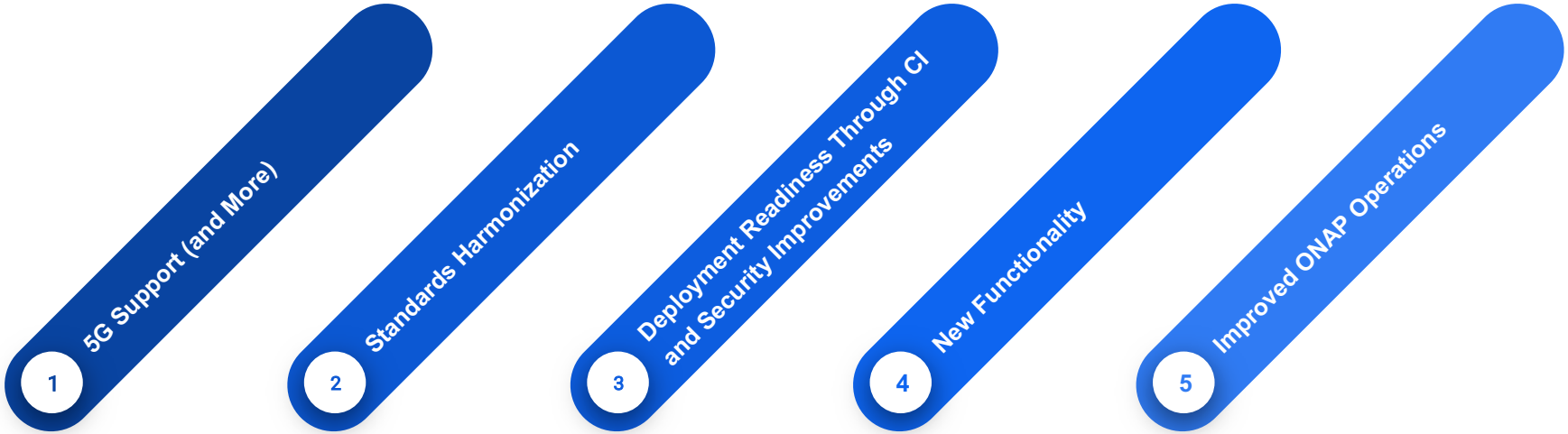
For more: https://wiki.onap.org/display/DW/Getting+Involved

LFN ONAP Frankfurt Release: Summary

1. ONAP's 6th release - most comprehensive, secure and collaborative
2. Rich feature set including End-to-end 5G network slicing, optical integration, security and deployment-ready automation anchored in Frankfurt
3. Collaborative and diverse contributions for 27 sub-projects, across 34 organizations and 400+ developers, with CI/CD now embedded in ONAP — e.g. patches, auto tests etc.
4. Deployment ease accelerating commercial adoption with Increased implementation of standards — including 3GPP, ETSI, MEF, TMF, and collaboration with CNCF, LFE, and Open RAN Software Community

www.onap.org

Key Frankfurt Release Themes

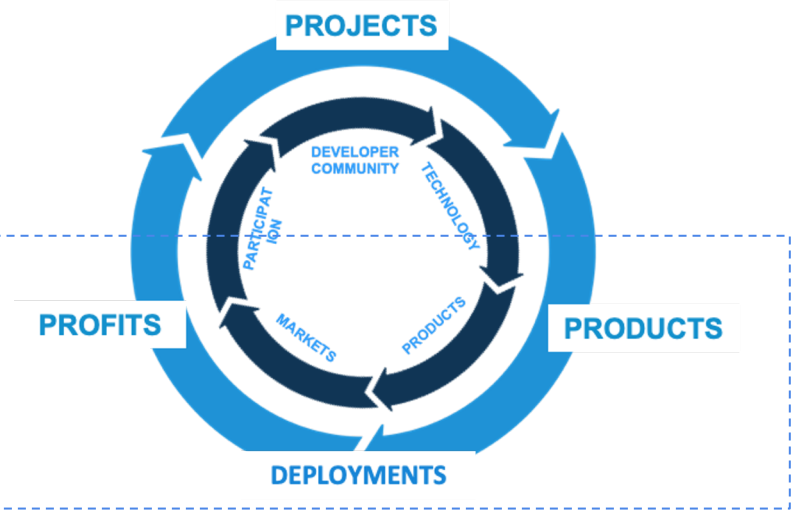


ONAP Frankfurt Blueprints

Successful Open Source Development depends on the complete life cycle of projects, products that market will adopt and deploy

ONAP Blueprints augment open source projects to address and accelerate Interoperability, Packaging, and Testing under open and neutral governance.

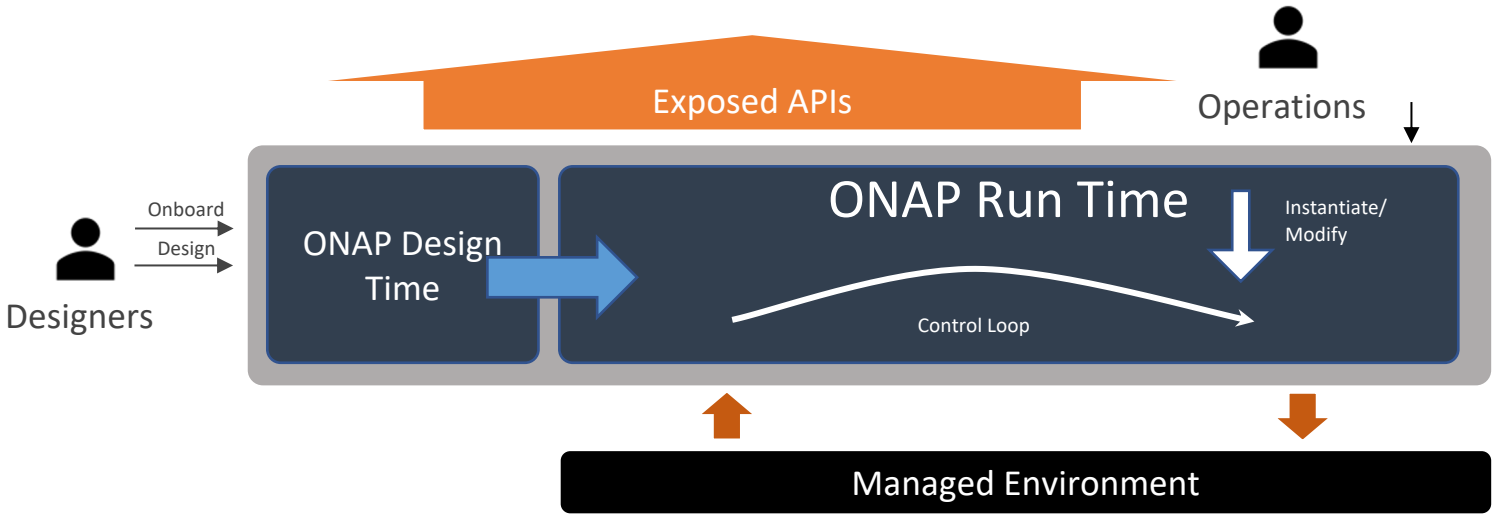
- **ENHANCED 5G – Slicing support**
  - End-to-end network slicing
  - Modeling and orchestration that includes 5G RAN, core, and transport
- **NEW Multi-Domain Optical Network Service (MDONS)**
  - Automated orchestration and management of optical network services
  - Focus is on L0/L1 layers that were largely manually set-up and managed
- **ENHANCED CCVPN – New features**
  - E-Line service support
  - Blueprints from previous 5 releases (Broadband service (BBS), vIMS, vCPE, voLTE…)



5G technologies will generate $17 trillion in economic growth in the period to 2035, with the initial stimulus coming from smart-city applications piggybacking on urban 5G rollouts. Source: ***ABI Research, 2019***

ONAP Overview

ONAP provides an automation platform for managing services and resources throughout their entire life cycle.



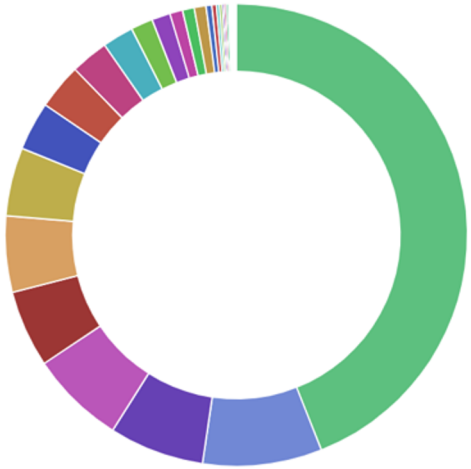
ONAP Automation Platform

It provides a reference functional architecture	It provides reference Component Definitions & Interfaces	It provides reference source code	It provides requirements on the managed V/P NFs

The ONAP Community - Highly Active, Highly Engaged

4 End User Operators in Top 10 contributors!

13.5K+ Commits
438 Code Authors



34 Organizations Contributing Code

- AT&T
- Samsung
- China Mobile
- Ericsson
- Orange
- Nokia
- Huawei
- IBM
- Bell Canada
- Linux Founda
- Intel
- AMDOCS
- ZTE Corporation
- High Street Tech.
- Wind River
- Wipro
- Fujitsu
- Individual
- QCT
- Tech Mahindra
- Deutsche Telekom
- Pantheon Technol...
- Unknown
- Tieto
- Swisscom
- T-Mobile
- Telstra
- Ciena
- Vodafone
- HCL
- Objectify
- VMWare
- ENEA AB
- Lenovo
- Verizon
- iconectiv

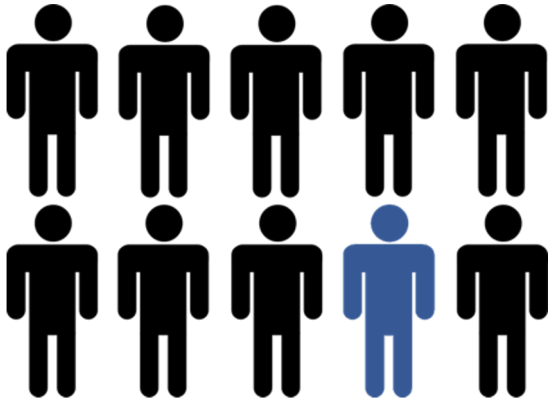
Strong Participation & Automation

	Jenkins	212,159 Builds, 2,431 Jobs, 119,802 Nodes
	Jira	6,174 Issues, 477 Submitters, 40 projects
	Gerrit	34,361 Code Reviews, 373 Reviewers
	Confluence	420 Editors, 13,235 Edits, 1,823 new pages,
	Groups.io	4,162 emails, 313 senders, 13 Lists

All stats measured from Nov 7, 2019 to June 8, 2020. Source https://onap.biterg.io

Why ONAP?

- Real-time policy driven closed loop automation
- Simple to use design tool—does not require developers
- Global SDN controller integrated
- Flexible orchestration functionality
- k8s support
- 5G use case
- Strong telco operator participation
- Open source (see next slide)



Why Open Source?

- Reference implementation for open standards
- High probability of meeting CSP requirements
- Assured interop; more xNF, faster onboarding
- Faster innovation
- Roadmap influence
- Reduced lock-in
- Transparency
- Security

High Level ONAP Functionality Diagram