What’s New in ONAP
Frankfurt

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Co-Founder Aarna Networks & ONAP Community Member
Topics

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

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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

- **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” ;-

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Nov’17  Jun’18  Dec’18  July’19  Oct’19  Jun’20
Strong Commercial Activity*

CSP Activity

- Pre-production/Production
- Pilot/PoC
- Contributing

Vendor/Academic Institution Activity

- Products based on ONAP
- SI/Professional Services
- Interop Testing
- Contributing

*Based on self reporting
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?

[Image showing logos of various CSPs]
ONAP Scope in the Modified ETSI Framework

- **Commodity Hardware**: servers, storage, switches
- **Virtualization Software**: Containers, VMs, virtual storage, overlay networking, dataplane acceleration
- **Workloads**: Edge apps, analytics, network functions
- **Service Orchestrator**
- **Controllers**: OpenStack/Kubernetes, SDN Domain Controllers
- **Monitoring & Control Loop Automation**: OSS / BSS / E-Services / Big Data
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
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

Slice 1: Optimized for low latency
Slice 2: Optimized for high bandwidth
Slice 3: Optimized for low power
Slice 4: Optimized for high reliability and low latency
Slice 5: Optimized for SLA
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
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

<table>
<thead>
<tr>
<th>Config/LCM</th>
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<tbody>
<tr>
<td>● CDS component is now a 1st class citizen via integrations with SO, CLAMP, and Policy projects</td>
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<tr>
<td>● 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</td>
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<table>
<thead>
<tr>
<th>Kubernetes NFVI support</th>
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<tr>
<td>● 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</td>
<td></td>
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<tr>
<td>● The K8s plugin now also supports StarlingX</td>
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## Additional Notable Updates

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

<table>
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<tr>
<th>Acronym</th>
<th>Description</th>
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<tr>
<td>OOF</td>
<td>Slice/slice subnet selection for network slicing, model driven route optimization for OTN paths between two domains for the CCVPN use case blueprint</td>
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<tr>
<td>Policy</td>
<td>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</td>
</tr>
<tr>
<td>Portal</td>
<td>Enhanced UI via an Angular.js upgrade from 1.x to 7.0, improved backend performance, added reporting features</td>
</tr>
<tr>
<td>SO</td>
<td>ETSI SOL002, SOL003, SOL005 support, PNF software upgrade without EMS, new workflows: NSMF, CSMF, and an NSSMF adapter for network slicing, CCVPN ELINE/MDONS</td>
</tr>
<tr>
<td>VF-C</td>
<td>Supports the ETSI Catalog specification</td>
</tr>
<tr>
<td>UUI</td>
<td>CSMF, NSMF UIs, Monitor Module enhancements for 5G slice monitoring; CCVPN E-LINE over OTN inter domain links and MDONS support</td>
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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
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
5G Support (and More)
Standards Harmonization
Deployment Readiness Through CI and Security Improvements
New Functionality
Improved ONAP Operations
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 provides an automation platform for managing services and resources throughout their entire life cycle. It provides a reference functional architecture, Component Definitions & Interfaces, source code, and 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

Strong Participation & Automation

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

**Northbound**
- E-Services
- OSS/BSS
- Big Data

**Southbound**
- Cloud Infra
- 3rd Party Controller
- VNFM/EMS

**Run Time**
- Service/NFV Orchestrator
- Inventory Services
- Network Controller
- Policy Engine
- Application Controller
- Monitoring & Analytics

**Design Time**
- Software Onboarding
- Service Design
- Policy Design
- Control Loop Design
- Workflow Design
- Config/LCM Template Design