

# Combining Open Source and Open Standards

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# Why Standards?

- Standards have played key role many/most industries
- Industry demand standards compliance from vendors
  - Ensure interoperability, avoid lock-in
- Vendors work together defining standards
  - Establish credibility for products
  - Ensure interoperability with partners and competitors



# Why Open Source?

- Industry demands open source story from vendors
  - Open source contributions bring credibility and seat at table w/ customers
- Open source based defense
  - Use standards to drive demand for your products and solutions
  - Support for standards in open source projects protects leadership position
- Open source based offense
  - Use open source offering to commoditize position of competitor
  - Change playing field to align with your strengths



# Traditional Standards Process

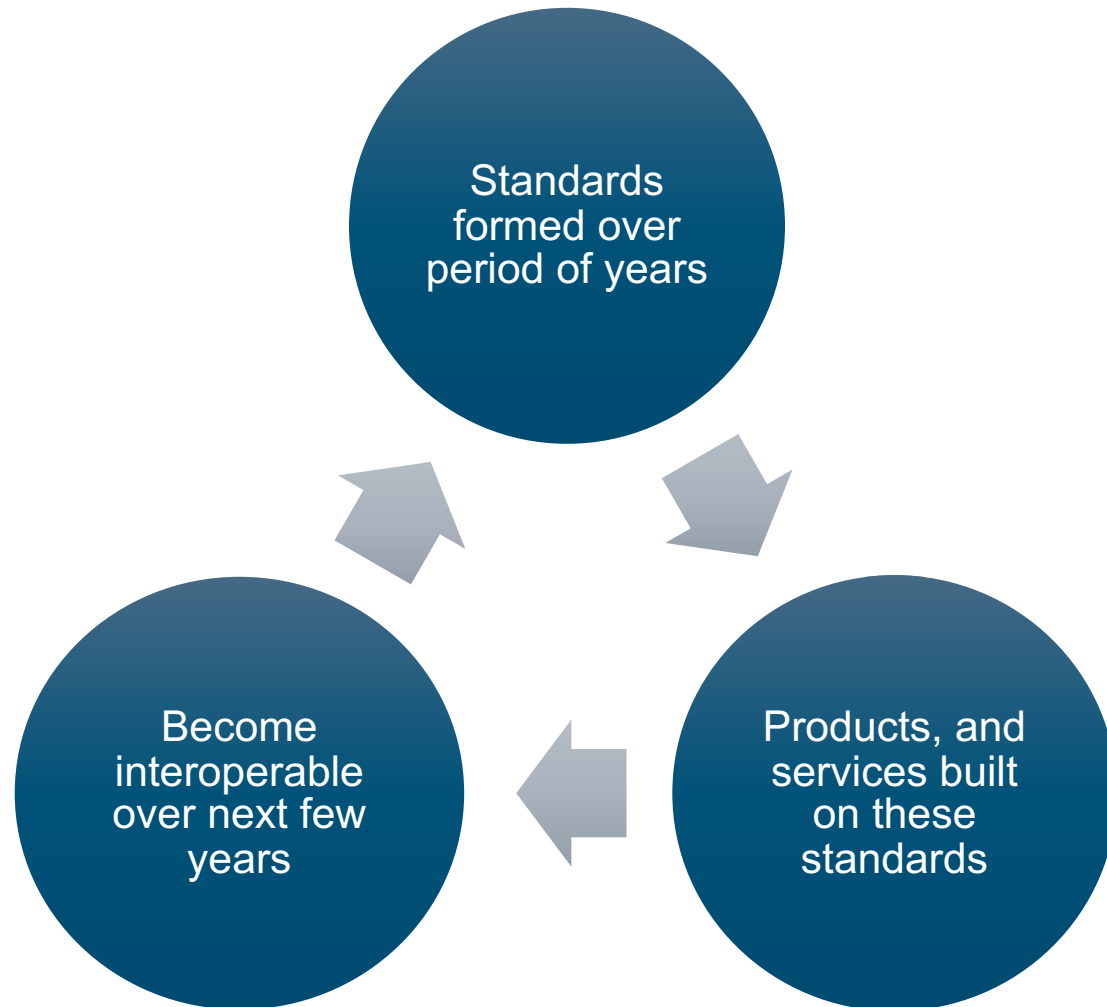


Photo credit:  
<https://play.google.com/store/apps/details?id=com.mobilerise.hourglass>



# Power of Open Source Software

- Fuel industry transformation
- Leverage a vast community
- Innovate at rapid pace
- Result in de facto standard



# Complexity of Open Source

- Some assembly required
- Poor documentation
- Projects fade away
- Fragments



# Combine Standards with Open Source

- Bring speed and collaborative spirit to open source to standards
- Add support for key standards to open source projects
- Use open source projects in reference implementations
- Hackathons, interop events



Photo credit: dreamstime.com

Graphical User Interface Application and Toolkit (DLUX / NeXT UI)

AAA AuthN Filter

OpenDaylight APIs REST/RESTCONF/NETCONF/AMQP

Northbound APIs to  
Orchestrators and  
Applications

## Base Network Functions

- Host Tracker
- L2 Switch
- OpenFlow Forwarding Rules Mg
- OpenFlow Stats Manager
- OpenFlow Switch Manager
- Topology Processing

## Enhanced Network Services

- |                                |                            |                             |
|--------------------------------|----------------------------|-----------------------------|
| AAA                            | Messaging 4Transport       | SNMP4SDN                    |
| Centinel – Streaming Data Hdlr | NetIDE                     | Time Series Data Repository |
| Controller Shield              | Neutron Northbound         | Unified Secure Channel Mgr  |
| Dev Discovery, ID & Drvr Mgmt  | OVSDB Neutron              | User Network Interface Mgr  |
| DOCSIS Abstraction             | SDN Integration Aggregator | Virtual Private Network     |
| Link Aggregation Ctl Protocol  | Service Function Chaining  | Virtual Tenant Network Mgr. |
| LISP Service                   |                            |                             |

## Network Abstractions

- ALTO Protocol Manager
- Fabric as a Service
- Group Based Policy Service
- NEMO
- Network Intent Composition

Controller Platform  
Services/Applications

Data Store (Config & Operational)

Service Abstraction Layer/Core

Messaging (Notifications / RPCs)

- |                         |           |       |         |      |     |      |        |        |     |      |     |      |                  |      |               |
|-------------------------|-----------|-------|---------|------|-----|------|--------|--------|-----|------|-----|------|------------------|------|---------------|
| OpenFlow<br>1.0 1.3 TTP | OF-Config | OVSDB | NETCONF | LISP | BGP | PCEP | CAPWAP | OPFLEX | SXP | SNMP | USC | SNBI | IoT<br>Http/CoAP | LACP | PCMM/<br>COPS |
|-------------------------|-----------|-------|---------|------|-----|------|--------|--------|-----|------|-----|------|------------------|------|---------------|

Southbound Interfaces  
&  
Protocol Plugins

OpenFlow Enabled  
Devices



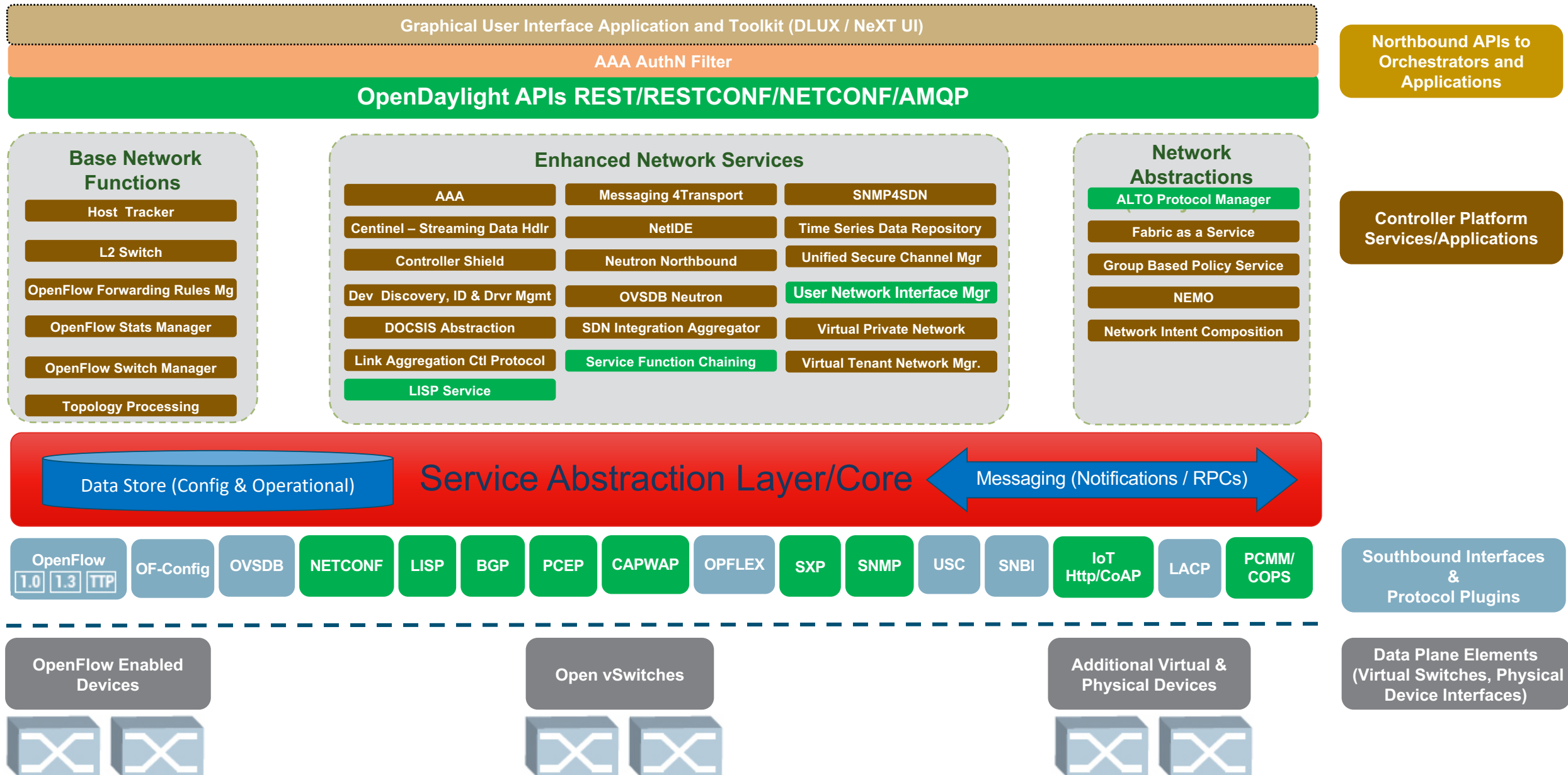
Open vSwitches



Additional Virtual &  
Physical Devices



Data Plane Elements  
(Virtual Switches, Physical  
Device Interfaces)



# IETF

- Internet Engineering Task Force
- Founded in 1986
- Goal – Make the Internet Work Better
- Definition of Internet Drafts (I-Ds) and RFCs
- Networking protocols, e.g. TCP/IP, DNS, HTTP, TLS, YANG, NETCONF, RESTCONF, VXLAN, GRE, ...



*We reject kings,  
presidents and voting.  
We believe in rough  
consensus and  
running code.*

- David Clark, Tao of the IETF

# Challenges

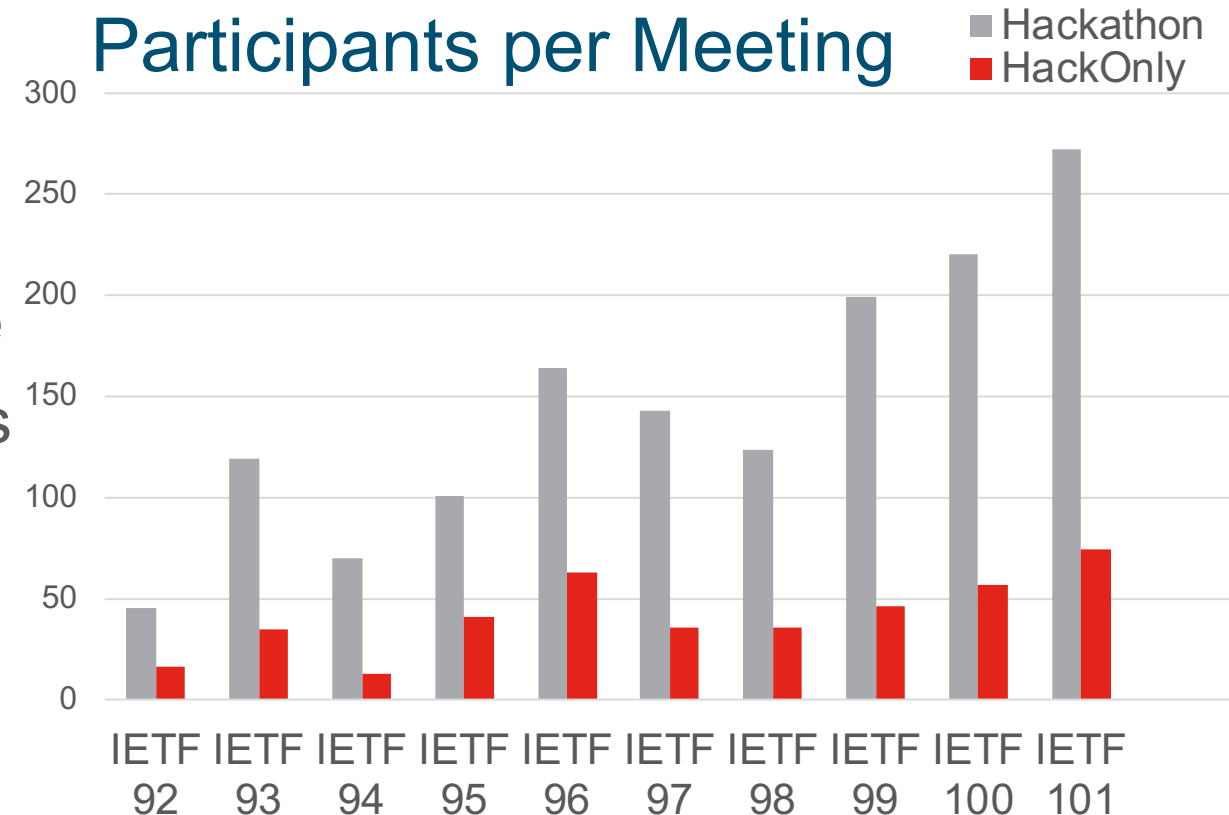
- Slow
- Aging community
- Too much time on rough consensus, not enough on running code
- Overrun by pace of innovation
- Code (potentially open source) as de-facto standard

# IETF Hackathons

- Advance pace and relevance of IETF standards
  - Flush out ideas, feed into working group
  - Produce reference implementations, libraries
- Attract developers, young people
  - Team newcomers with IETF veterans
  - University engagement
- Collaborative event, any competition is friendly



## Participants per Meeting





<https://github.com/ietf-hackathon>



## IETF-Hackathon

Repository for sharing code, presentations, and other artifacts at IETF hackathons

✉ [hackathon@ietf.org](mailto:hackathon@ietf.org)

📁 Repositories 10

👤 People 32

👥 Teams 0

📁 Projects 0

⚙️ Settings

### Pinned repositories

[Customize pinned repositories](#)

≡ [delaydns](#)

● C ★ 3

≡ [ietf100-project-results](#)

Presentations of project results at end of hackathon

★ 1

≡ [ietf101-project-presentations](#)

Presentations of project results at end of hackathon

● HTML ★ 4 🍴 4

≡ [smartcards4dnssec](#)

Code to allow stock BIND to use smartcards

● C ★ 1 🍴 1

≡ [webrtc-e911-psap](#)

WebRTC Emergency Services with Indoor Location

● JavaScript ★ 1 🍴 4

≡ [Yang-Catalog](#)

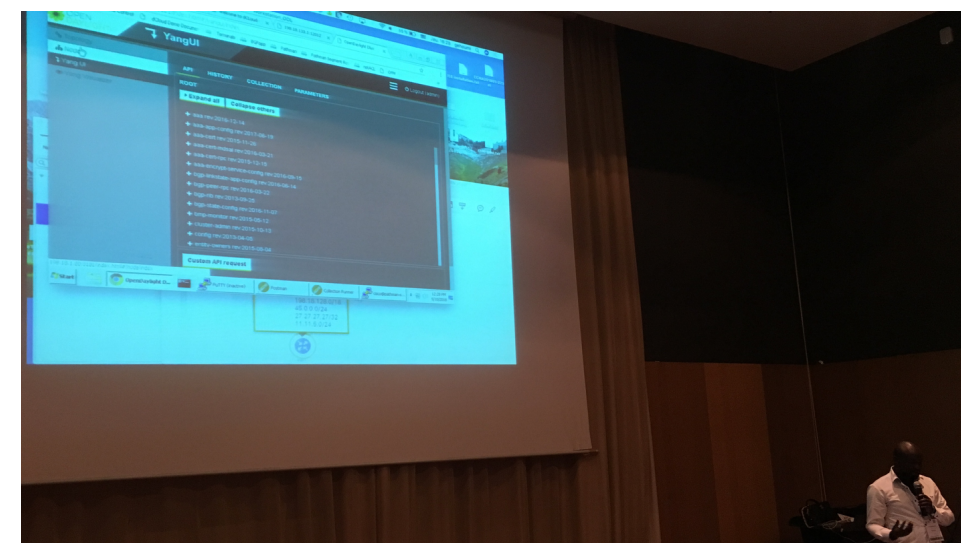
Yang Catalog

● Python ★ 1 🍴 1

# Hackathon @ AIS



- Goals
  - Build technical capacity around networking standards
  - Deployment of existing and evolving IETF standards
  - Encourage contribution to standards development process
- Projects related to IETF work
  - Network Programmability (YANG/NETCONF/RESTCONF)
  - NTP data minimization [draft-ietf-ntp-data-minimization](#)
  - Intelligent Transportation Systems [draft-ietf-ipwave-ipv6-over-80211ocb](#)



# MEF - A history of successful industry alignment

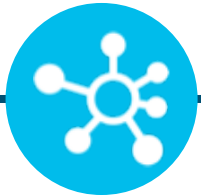


## MISSION

To enable the development and worldwide adoption of agile, assured, and orchestrated network services.



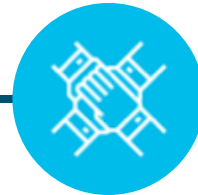
We are **global**  
with **200+**  
members



We focus on  
**services**



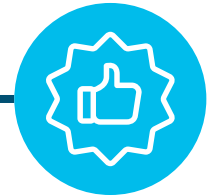
We accelerate  
alignment through  
**certification**



We are **non-profit**



We began in **2001**



We enabled the  
**\$80B Carrier**  
**Ethernet** market

# Extend CE 2.0 framework with Lifecycle Service Orchestration (LSO) and an open community



Global, interconnected suite of network-based services enabling the digital economy

APIs to automate, orchestrate and communicate subscriber intent to the network.





# LSO Hackathon

- Cisco DevNet introduced MEF to hackathon at GEN15, Nov 2015
- Transform LSO architecture and APIs into running code
- Validation of evolving APIs/standards, with feedback into technical committees
- Collaboration across SDOs and Open Source communities

## GEN15 LSO Hackathon

The place for hands-on collaboration and development of orchestrated Carrier Ethernet services!

The MEF is holding its first LSO Hackathon to accelerate the development of Lifecycle Service Orchestration (LSO) APIs, SDN controller plugins and LSO orchestration solutions. The LSO Hackathon will facilitate discussion, collaboration and the development of ideas, sample code and solutions that can be used through the Open Source community for the benefit of service providers and technology vendors.



Supported by:



MEF LSO Hackathons

> APAC18 LSO Hackathon

> MEF17 LSO Hackathon

> Euro17 LSO Hackathon

MEF16 LSO Hackathon

Euro16 LSO Hackathon

GEN15 LSO Hackathon

APAC18 LSO Hackathon Project Pr...

Pages

MEF LSO Hackathons

Created by Daniel Bar-Lev, last modified by Kirby Russell on Mar 22, 2018

MEF

LSO

LIFECYCLE SERVICE ORCHESTRATION

HACKATHON

THE STANDARD FOR TESTING

ECI

THE ELASTIC NETWORK

DEVNET

PCCW Global

SPARKLE

TATA COMMUNICATIONS

DEVNET

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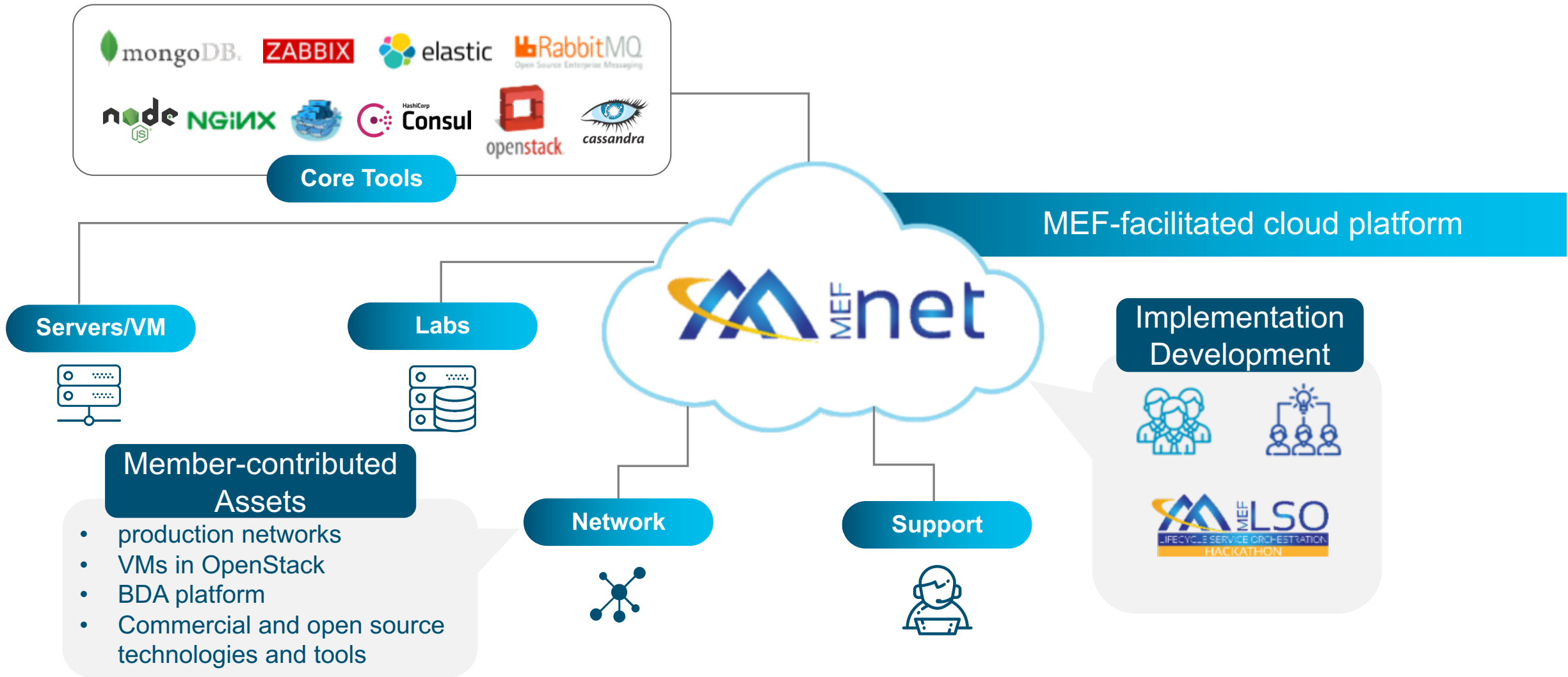
Overview

MEF LSO Hackathons encourage software developers and network experts to collaborate and develop utilities, ideas, sample code and solutions that show practical implementations of MEF-defined services and LSO APIs.

Calendar

Upcoming LSO Hackathons

Under Planning



# Call to Action

- Champion combination of standards and open source
- Make standards consumable by developers
- Make open source consumable by industry




News & blog Contact Search Tools

ABOUT TOPICS OF INTEREST HOW WE WORK INTERNET STANDARDS

Home > How we work > Running code > IETF Hackathons >

## IETF Hackathon Montreal

At IETF Hackathons developers and implementers collaborate, and develop utilities, ideas, sample code and solutions that show practical implementations of standards.



**When:** Saturday July 14 and Sunday July 15  
**Where:** Fairmont Queen Elizabeth Montreal  
**Room:** TBD  
**Signup for the Hackathon - [Here!](#)**  
**View the list of Hackathon Attendees - [Here!](#)**  
Keep up to date by subscribing to the [mail list](#).


IETF HACKATHONS  
IETF Hackathon London  
IETF Hackathon Singapore  
IETF Hackathon Prague  
IETF Hackathon Seoul

MEF 18 Oct. 29-Nov. 2, 2018

OVERVIEW NETWORKING HALL REGISTRATION VENUE SPONSORS MEDIA CONTACT

## MEF LSO Hackathon

Home > Overview > MEF18 LSO Hackathon




The place for hands-on collaboration and development of MEF 3.0 Implementation Projects!

MEF LSO Hackathons encourage software developers and network experts to collaborate and develop utilities, ideas, sample code and solutions that show practical implementations of MEF-defined services and LSO APIs.

MEF is holding its 7th LSO Hackathon at MEF18 to further the existing MEF 3.0 Implementation Projects as well as incubate new ones. This is a great opportunity to collaborate in a hands-on environment, share and learn from your peers, enhance your understanding of LSO, SDN, NFV in the context of working code.

**LSO Hackathon Topics**  
MEF LSO Hackathons cover a wide range of topics, as shown below. More information on specific projects



# Thank you!