

Open Platform for Network Functions Virtualization

Project Case Study – A path to open source success with The Linux Foundation



ABOUT OPNFV

Open Platform for NFV (OPNFV) facilitates the development and evolution of NFV components across various open source ecosystems. Through system-level integration, deployment, and testing, OPNFV creates a reference NFV platform to accelerate the transformation of enterprise and service provider networks. As an open source project, OPNFV is uniquely positioned to bring together the work of standards bodies, open source communities and commercial suppliers to deliver a de facto standard open source NFV platform for the industry. Participation is open to anyone.

www.opnfv.org

HIGHLIGHTS

- Leveraged open source guidance to create project with key industry support
- Successfully pivoted from traditional standards approach to open development
- Collaborative development has helped speed innovation and troubleshooting

NFV Background

Network functions virtualization (NFV) is a systems architecture that implements diverse network functions with technologies and techniques of IT virtualization. By contrast, legacy telecom products built on proprietary systems, are hampered by long product cycles and contentious standards development. Ultimately, competition from internet-based service providers (Google, Skype, Netflix) disrupted the legacy ecosystem, with equipment and services providers seeking a new (virtualized) paradigm.

In 2012 the Network Functions Virtualisation specification group published a paper on Software-Defined Networking (SDN). Part of the European Telecommunications Standards Institute (ETSI), the group comprised representatives from Europe, North America and beyond. This paper and others that followed formed the foundation for SDN and ultimately NFV.

SDN and NFV

SDN uncouples control and data planes on networking and telecoms systems, with control residing centrally and forwarding components distributed logically and physically. The control plane abstracts the network, presenting APIs to applications, and dictates forwarding behavior of the data plane at the device level.

While NFV shares many technical and economic aims with SDN, NFV does not depend upon the same mechanisms. NFV instead leverages modern, high-performance commodity computer hardware to virtualize many/most node types, gaining flexibility, implementation cost advantage, and smoother upgrade paths.

The Challenge

Like most standardization efforts, NFV began as an abstract effort, where early investments in design and documentation only later yield a usable, interoperable physical kit. But unlike traditional standards, NFV made an early, conscious decision for rapid, incremental implementation, ultimately as open source software.

Actually, the nascent OPNFV group faced a number of related challenges in going from white board to white box:

- Member companies, while expert in telecoms, lacked experience in working with, building, and nurturing open source communities
- Traditional standards bodies emphasize collaboration in developing original requirements specifications and elaborating standards documentation, but in implementation – once the standard is “baked” – the members all go their own way (until the standard itself needs to be revised)
- Legacy standards are “leading” – they are aspirational and define how systems “should work”, setting a specific (not too high) bar for compliance, and eschewing much deep specificity. Implementations, after reaching compliance, almost always fragment, as vendors work to add “secret sauce” to their versions and derived products

Member companies also wanted to invigorate telecoms with young engineers and spur innovation. And open source looked like the answer.

The Approach

Along the way, OPNFV project founders explored a range of options to host the project and to foster its growth and success as open source:

- Host an Open Source Software (OSS) project with standards member companies – attempted unsuccessfully: hosting members seen as too dominant
- Start a new OSS foundation – too daunting: not enough applicable experience among founders
- Join an existing OSS foundation – couldn't find the right mix of organizational competence and direct involvement

Then they connected with The Linux Foundation.

OPNFV member companies saw in The Linux Foundation a chance to jump-start collaborative development of a unified OPNFV implementation. What they found most attractive was:

- The Linux Foundation's “full service package” of organizational tools, training, and dedicated staff
- Available expertise to recommend tool chains, governance models, marketing, and best practices
- Track record in helping to found and sustain other groups in parallel technology areas

“Working with The Linux Foundation on the OPNFV project has given Ericsson the opportunity to collaborate openly with our competitors, together using open source to address a common industry concern.”

-Christopher Price, Technologist and Open Source Evangelist, Ericsson; OPNFV Board of Directors

The Results

Choosing an open source path and coming to The Linux Foundation has yielded a number of benefits for OPNFV:

Four Major Releases to Date – the latest release, Danube, brings together NFV components from across the entire open networking stack and introduces faster and more agile technologies that meet the needs of network operators to enable accelerated NFV

Integrated Testing Infrastructure – OPNFV brings DevOps methodologies to NFV via collaborative upstream development, integration, deployment, and significant Continuous Integration/Continuous Development (CI/CD) testing automation

Continued incremental improvements in core NFVI/VIM functionality – IPv6, Service Function Chaining (SFC), Virtual Private Network (VPN), hardware architecture support, KVM improvements, fault management, and installer support are also included in the Danube release

Meet ongoing integration challenges – as OPNFV grows, integration becomes more complex. Collaboration under The Linux Foundation umbrella helps accelerate troubleshooting to solve problems “in the open” and reduce churn from regressions

With integration across the networking stack, automated testing and deployment, and new features - OPNFV is a shining example of how a legacy industry and ecosystem can benefit from open source-based collaboration and from the stewardship of The Linux Foundation.

“With our partners, we are contributing to the key OPNFV open source projects, which aim to jointly build a telco-grade reference implementation platform. With interoperability and openness at the core of our strategy, this platform will be an important milestone in turning the NFV promise into a reality.”

-Alain Maloberti, Senior Vice President, Orange Labs Networks

For more information on OPNFV, visit www.opnfv.org.

To learn more about hosting your open source project at The Linux Foundation, please contact us at membership@linuxfoundation.org.