

Lessons Learned from Starting an Open Source Based Compliance Verification Program

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Background



 Many industries gain tremendous value from standardization through a formal process, often overseen by well established institutions. • E.g. 3GPP, IETF, IEEE etc. for the Networking Industry As these industries start to adopt Open Source Software that are originally developed elsewhere, significant challenges emerge as how to use general purpose Open Source while maintaining benefits from standardization. • I have been involved in starting a Compliance Verification program since 2015 within, now known as, LF Networking and here are some tentative lessons that, I hope, could be applicable to other industries as well. E.g. Financial Services, Automotive, Industrial IoT / Edge It's an ongoing journey...





The telco industry started embracing virtualization first with NFV through ETSI NFV ISG (Industry Specification Group) (2012)



An Introduction, Benefits, Enablers, Challenges & Call for Action

OBJECTIVES

This is a non-proprietary white paper authored by network operators.

The key objective for this white paper is to outline the benefits, enablers and challenges for Network Functions Virtualisation (as distinct from Cloud/SDN) and the rationale for encouraging an international collaboration to accelerate development and deployment of interoperable solutions based on high volume industry standard servers.

October 22-24, 2012 at the "SDN and OpenFlow World Congress", Darmstadt-Germany.

- Network operator driven
- Try not to be a standard body
- Try to limit to a two year term
- Multifaceted and ambitious goals "transform"
- The term "open source" was never used, but "software" was mentioned 32 times, "virtualisation", 86 times, and "Openstack" and "OpenFlow" were cited.





Applying Open Source to Industries



 Two years later, OPNFV, an LF open source community was formed by many of the same network operators, participants of ETSI NFV, and broader technology providers (telecom/networking, IT, software) (2014)









The Beginning of a Compliance Verification Program

- March 2015: I proposed the initial idea to the Board of OPNFV. Formed a Board committee to drive the initiative.
- August 2015: Proposed community led bi-annual PlugFest events to bring developers together and facilitate integration and testing. First PlugFest was hosted in May 2016. Six PlugFests had taken place by now.
- September 2015: A technical project was created to develop/consolidate necessary test tools and test suites for use by the program.
- December 2016: The Board approved the program scope and governance.
- October 2017: The community completed its first test spec "2018.01".
- January 2018: The OPNFV Verified Program (OVP) was launched with the first wave of products. Second version followed in September 2018.
- January 2018: Program expanded to ONAP following the formation of LF Networking umbrella.
- Today: ONAP is getting ready to launch its Compliance Verification to VNFs (Virtual Network Functions), probably soon this year (Check out ONS next month in San Jose).





What We Have Created



- An open source framework for verification testing
- A set of upstream test projects that develop quality test cases
- A community procedure to approve the official test suites, supervised by the TSC and approved by the Governing Board
- Software tools for automating all verification steps
- A volunteer committee to review all test results
- A branded mark and a public web site for listing certifications

OPNFV Verified Products Directory

Company	Product	Category	Version
Enea Software AB	Enea NFV Core 1.1	Infrastructure	2018.09
LG U ⁺ LG Uplus	U+Stack Cloud	Infrastructure	2018.01
ERICSSON 2 Ericsson AB	Ericsson Cloud Execution Environment (CEE)	Infrastructure	2018.01
NOKIA Nokia	Nokia AirFrame Cloud Infrastructure for Real- time applications (NCIR)	Infrastructure	2018.01
Wind River	Titanium Cloud	Infrastructure	2018.01
We HUAWEI Huawei	FusionSphere Cloud Operating System	Infrastructure	2018.01
ZTE ZTE	TECS Cloud OS	Infrastructure	2018.01
NOKIA Nokia	Nokia AirFrame Data Center Solution	Infrastructure	2018.01

https://verified.opnfv.org/#/



What can we learn from this process?



Lesson #1: Have Clarity on Value Proposition

OPEN SOURCE

- Surprisingly more difficult than we expected
- Standard and open source communities formulate the "values" in different ways
- "Disruptive", "Transformation", means the ground rules are unclear
 Can we incrementally bootstrap?
 - Help build the market for
 - o LFN-based SDN/NFV/automation infrastructure
 - o applications or other devices designed to interface with that infrastructure
 - Reduce adoption risks for end-users
 - Decrease testing costs by verifying hardware and software platform interfaces and components
 - Enhance interoperability





Instead of Specification, code and API

- To accomodate, we "documented" code back to loose "description"
- Avoiding code makes one "illiterate"
- Instead of RFP, Jira, issue, or better yet, pull request
 - Put requirements in a format that reaches developers, make them actionable
 - Scratch your own itch (e.g. operators can contribute lab qualification tests)
- Upstream, downstream, sidestream, or just confusion?
- Don't try to repeal laws of economics, engineering, mathematics...



Lesson #3: A Rising Tide Lifts All Boats

- Except those that sink...
- It's better to have a low bar initially, than no expectation at all
 - The trusted open process is more important
 - The expectation of interoperability and other goals
 - The consensus of adhering a community standard
- Unless you are willing to wait for a 5-10 year long industry process
 - Waterfall model vs. Continuous delivery
 - Fully automated test suites allow any time testing with minimum friction
- Get on board. Be part of the tide.



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Lesson #4: Put the Horse before the Cart

- The Horse: the force unleashed by open source (free to innovate)
- The Cart: the goals an industry is trying to achieve via open source (e.g. standardization)
- <u>OR</u>,
- The Horse: open source, as I like to shape it to be
- The Cart: the goals (business goals) that I like to achieve
- Philosophizing: does the *productive force* dominate?
- Time to clarify the value proposition again
- This horse is a mighty force



/tborash.wordpress.com/2012/10/14/always-pu

t-the-cart-before-the-horse

tborash: Learning to lead learning





Lesson #5: Verify Behavior. Code May Need A Different Mechanism.



- Verify behavior, because our "value proposition", e.g. interoperability, is behavior based.
- We can "mandate" but it's hard to "Verify" code.
 - Mandate without verification seems to mean very little
- Code needs a different mechanism. Overloading may not be helpful.
 - Commercial products have inherent incentive not to fork to avoid accruing debt
 - A community is healthier to always be reminded not to give others reason to fork
- Behavior can be tested to "cloud services" as well.



Lesson #6: Verify APIs and Use Cases



- Simple API verification leaves too big a gap
- Common use cases and design patterns are needed to meet the objectives. Examples,
 - High availability
 - Resource allocation, optimization, migration
 - Stress load
 - Security best practice
 - Performance characterization (predictability)
 - Networking diversity
 - Operational procedures
- This is where industry specialization can be adopted



Lesson #7: "Free as in Freedom" Is Not Enough



- Freedom to propose, code, test any part of the system behavior characteristics
- Having a freedom and effectively exercising the freedom are different things
- Who has a stake in it?
- Is it a present itch?
- Deployments?
- Tragedy of the commons.
- Skin in the game.



Lesson #8: Keep Calm and Carry On



- There will be many contentious moments and low points along the way.
- It could take a long time.
- It's an ongoing journey...





"If you want to go quickly, go alone. If you want to go far, go together."

African Proverb



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