OPEN ORCHESTRATION & INTEROPERABILITY

LEVERAGING POCs, OPEN SOURCE AND PLUGTESTS

Presented by Silvia Almagia ETSI, for TNC17
ABOUT ETSI

We are:

• Specialists in making ICT standards
• Non-for-profit made in Europe for Global use
• Enablers to *develop, publish, test and validate standards* needed to build products and services
• Open: All the specs are publicly available

We are not:

• A telecom operator, equipment vendor, software vendor, system integrator, research body, university, business analysts, test lab...

.... but our 800+ members are!
CTI: Centre for Testing and Interoperability

We are specialists in testing and validating the standards, ensuring *interoperability, conformance and implementability*, through several tools and practices:

- Development of interoperability and conformance test methodologies and specifications
- Plugtests™ (interop events)
- HIVE (Hub for Interoperability and Validation and ETSI)
- Proof of Concept Frameworks
- Open Source project and community hosting and development
- Open API development, hosting and validation
ETSI is working on a number of enablers for future networks:

- NFV (Network Functions Virtualization)
- OSM (Open Source MANO)
- MEC (Multi-access Edge Computing)
- NGP (Next Generation Protocols)
- ENI (Experiential Networked Intelligence)
- ...

With strong support from CTI

All of these groups and activities are open to ETSI members and non-members
Launched in 2013 with the first set of NFV end-to-end documents, main goals:

- Look for practical results & get feedback
- Demonstrate and disseminate NFV capabilities
- Explore technology options
- Facilitate gap analysis
- Help to guide future ETSI NFV activities
- Foster ecosystem and cross-company collaboration

43 multi-vendor NFV PoCs:

- +120 organisations involved
- 100% key NFV use cases demonstrated
- ALL NFV architectural elements under study

Followed by several other PoC Frameworks:

- MEC, NTECH, OSM, ...
Community project developing an Open Source MANO stack aligned with ETSI NFV Information Model

- Feb 2016 OSM launch & code seeds demo
- May 2016 Rel ZERO
- Oct 2016 Rel ONE
- Jan 2017 OSM participates to 1st NFV Plugtests
- Apr 2017 Rel TWO
- Oct 2017 Rel THREE

osm.etsi.org
OSM REMOTE LABS

**HIVE**: Hub for Interoperability and Validation at ETSI

Connects OSM CI/CD platform and demo servers with community labs running different combinations of infrastructure, VIMs and SDN controllers.
1st NFV Plugtests

In Leganes, near Madrid, Spain
23rd January to 3rd February 2017
  • Preceded by a remote integration phase
Hosted by 5TONIC Laboratory, with technical support from Telefónica
Organised by ETSI Centre for Testing and Interoperability (CTI)
  • ETSI does not certify or endorse participating companies or products
  • We provide the framework, the means, the methodology, the procedures, the test plan...
  • Actual testing is run collaboratively by participants

www.etsi.org/nfvplugtest
**Interoperability** Test Sessions

- Among different combinations of Functions Under Test (FUTs)
- 3 types of FUTs: VNFs, MANO, NFVI&VIM
- At a functional level (conformance not enforced)

Validate basic **NFV Rel 2 capabilities**:

- NSD, VNF Package and SW Image Management
- NS and VNF Life Cycle Management, VR Management

“Early” Plugtest

- ETSI NFV Data Models and APIs still under development
- IOP through open APIs, plugins, ...
- ...and remote integration

**Open** and **free** to any organisation a FUT or test/support function
TEST PLAN DEVELOPMENT

- Open & continuous process following NFV-TST002 methodology
- Led by CTI with the technical support from the UPV/EHU, EANTC and NFV TST
- Implementation agnostic
PARTICIPATION

31 participating companies
35 Functions Under Test (commercial and open source):
• 15 VNFs,
• 9 MANOs,
• 11 NFVI&VIM

Several supporting open source communities:
• ETSI OSM,
• Open Baton,
• OPNFV,
• Open-O
HIVE interconnecting 29 Remote labs
- FUT documentation
- Remote integration and pre-testing procedure documentation
- Test Plan development
- Weekly conf-calls to sync-up and track progress

NOV-JAN: REMOTE INTEGRATION & PRE-TESTING

- HIVE Nomad
- Remote Platforms
- Remote MAIO
- OSM Remote Labs
- Local Platforms
- OSM Lab
- Plugtests Remote sites
PLUGTESTS

- On-site setup
- Access to Remote Labs network (HIVE)
- + Some additional local instances (FUTs), tools, support functions
- + 1-2 representatives per FUT, max 64 people at a time
# ON-SITE PLANNING

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<thead>
<tr>
<th>Time</th>
<th>Monday 23</th>
<th>Tuesday 24</th>
<th>Wednesday 25</th>
<th>Thursday 26</th>
<th>Friday 27</th>
<th>Saturday 28</th>
<th>Sunday 29</th>
<th>Monday 30</th>
<th>Tuesday 31</th>
<th>Wednesday 1</th>
<th>Thursday 2</th>
<th>Friday 3</th>
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<tbody>
<tr>
<td>08:30</td>
<td>10:00</td>
<td>LOCAL SW/HW</td>
<td>LOCAL SW/HW</td>
<td>WELCOME</td>
<td>WARM UP</td>
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<tr>
<td>10:00</td>
<td>10:15</td>
<td>INSTALLATION</td>
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<td>LOCAL SW/HW</td>
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<td>TEST SESSIONS</td>
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<td>TEST SESSIONS</td>
<td>TEAR DOWN</td>
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<td>17:30</td>
<td>18:30</td>
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<td>WRAP UP</td>
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- 2 days of local installation and pre-testing
- 7.5 days of testing
- 35 Functions Under Test: 1485 possible combinations
- Schedule built daily with the Plugtests Scheduler:
  - Maximise number of Test Sessions
  - Fair and balanced combinations of FUTs
  - Taking into account major (in-)compatibilities
  - All participants busy all the time!!
DAILY SCHEDULE

- 10 parallel tracks, an average of 22 Test Sessions per day
  - 1 MANO + 1 VIM&NFVI + 1-2 VNFs on each track anytime
- Warm-up 1.5 h
  - Sanity check SUT for the day
  - MANO to VIM connectivity, credentials, descriptors, images...
- Morning / Afternoon Test Sessions (2 x 3h)
  - 1 Test Session Report per MANO/VIM/VNF
- Wrap-up 1h
  - Among all participants and organisers
  - Findings of the day, schedule and arrangements for the next day
- "Freestyle" test sessions also possible
TEST SESSION REPORTS

ETSI Test Reporting Tool

Test groups:
- NFV
  - Setup & Instantiation
- Scale
- Scale VNF
- Update
- Terminate & Teardown

Test ID: TD_NFV_SETUP_ONBOARD_VNF_PKG_001
Summary: To on-board a VNF Package
Result: OK

Test ID: TD_NFV_SETUP_ONBOARD_NSD_001
Summary: To onboard a NSD
Result: OK

Test ID: TD_NFV_NS_LCM_INSTANTIATE_001
Summary: To verify that an NS can be successfully instantiated
Result: OK

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PLUGTESTS RESULTS

Setup & Instantiation

Scale (+/- VNF i)

Scale VNF (+/- VNFC i)

NS Update

Terminate & Teardown

160 Test Sessions
+1500 individual test results
Feedback to ETSI NFV
The NFV Plugtests has proved to be a great opportunity for vendors and open source projects ...

- Hands-on collaboration to “make it work”
- Meet and test with many other players in the Ecosystem
- Understand usage of own products by 3rd parties, fix a lot of bugs!!

.... and a very powerful tool for standards validation!!

- Reality check: **align** expectations
- **Gather consolidated feedback**
- Help to **reduce gaps** between standards and implementations

More information:

- [Test Plan](#)
- [Plugtests Report](#)
- 2-3 mins [video](#)
NEXT STEPS

Consolidate and capitalise learnings from this first NFV Plugtests experience into a semi-permanent set-up.

Align calendars and mutualise efforts with other Open Source, Testing and Validation hands-on activities.

Plugtests Program as an neutral and open meeting point for industry, open source and standards.
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Thank you!