

UPDATE ON NFV PLUGTEST

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ETSI Centre for Testing and Interoperability

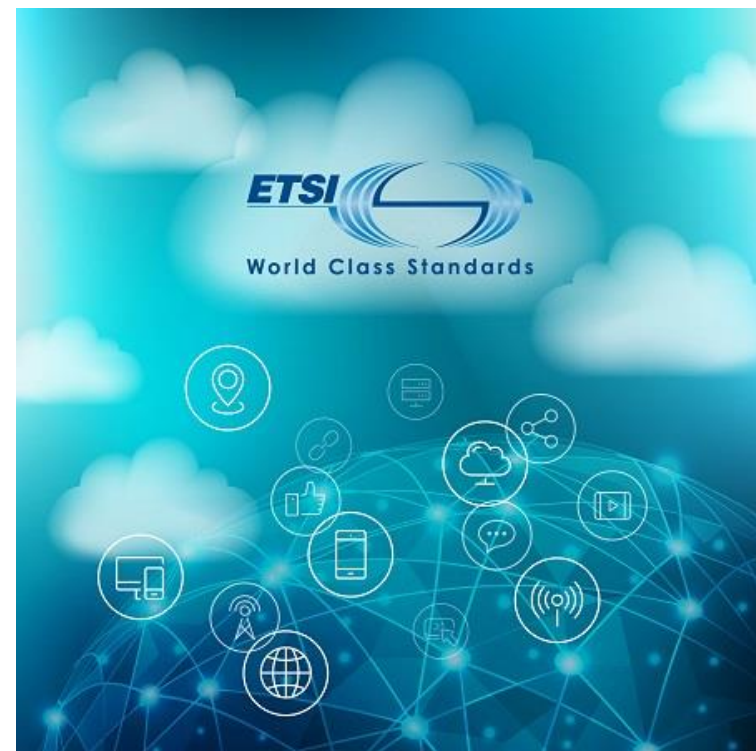
OSM#2 Santa Clara

4-7 October 2016

1st NFV Plugtest



- Organised by 
- Hosted by **5TONIC** in Leganes
 - near Madrid, Spain
- 23rd Jan – 3rd Feb 2017
 - Preceded by remote integration
 - Registration closed on 30 September
- Free & Open
 - to any VNF, MANO, VIM&NFVI implementation
- Several supporting Open Source projects



www.etsi.org/nfvplugtest



🌐 Interoperability Test Sessions

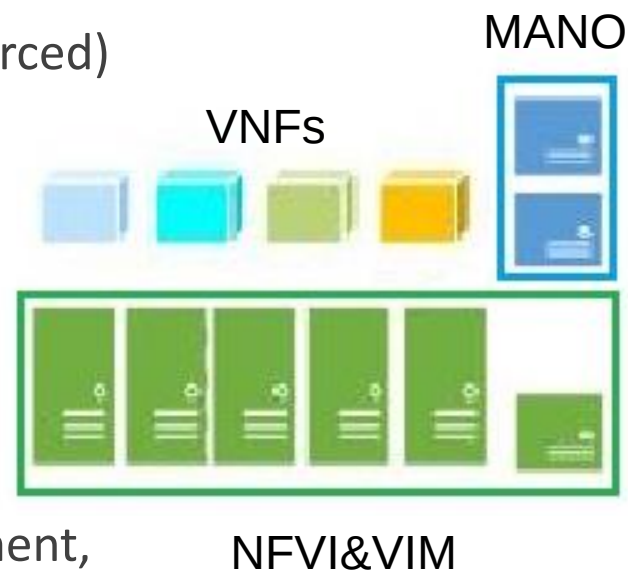
- Among different combinations of Functions Under Test (FUTs)
- 3 types of FUTs: VNFs, MANO, NFVI&VIM
- At a functional level (conformance not enforced)

🌐 “Early” Plugtest

- Stage 3 incomplete
- IOP Through open APIs, plugins, ...
- ...and remote integration

🌐 Validate basic **NFV Rel 2 capabilities**:

- VNF Package, SW Image and NSD Management,
- VNF & NS Life Cycle Management,
- VNF & NS Fault & Performance Management.



25 Participants



A10 Networks

Amdocs Ltd.

Canonical USA Inc.

Cisco Systems

EANTC

Ensemble (ADVA Optical Networking)

Ericsson LM

F5 Networks

Fortinet

Fraunhofer FOKUS

Hewlett-Packard Enterprise

Huawei Technologies Co. Ltd

Ixia

Keynetic Technologies

Mahindra Comviva

Mirantis

Netrounds

Openet

Palo Alto Networks

Red Hat Limited

RIFT.io

Sandvine Inc.

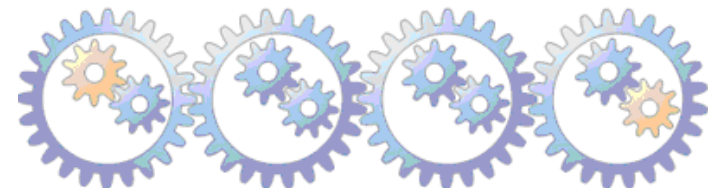
Sonus Networks

VMware

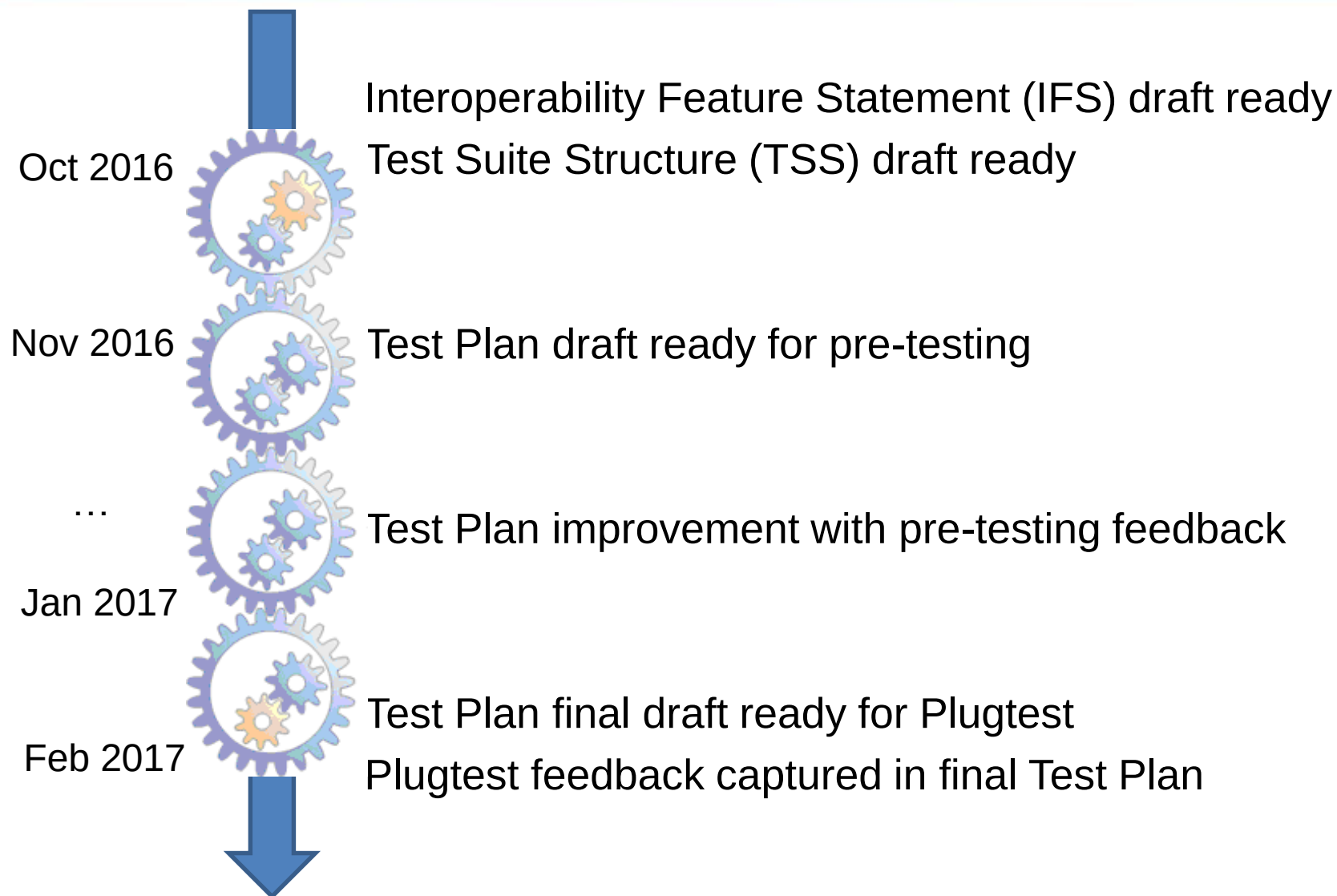
WindyCitySDR



- Test Plan development driven by ETSI
 - inline with ETSI NFV work
 - in collaboration with participants and supporting open source projects
 - in coordination with NFV TST WG
- Test Plan development is an open and continuous process through the different Plugtest preparation phases :
 - integration, remote pre-testing, Plugtest, ...
- Plugtest Test Plan is implementation agnostic
 - Should apply to any (combination of) FUT(s)
- Plugtest Test Plan is a potential source of input for
 - NFV-TST007 IOP Guidelines for MANO
 - Guidelines for automatic testing and CI/CD pipelines in NFV projects



Test Plan Timeline

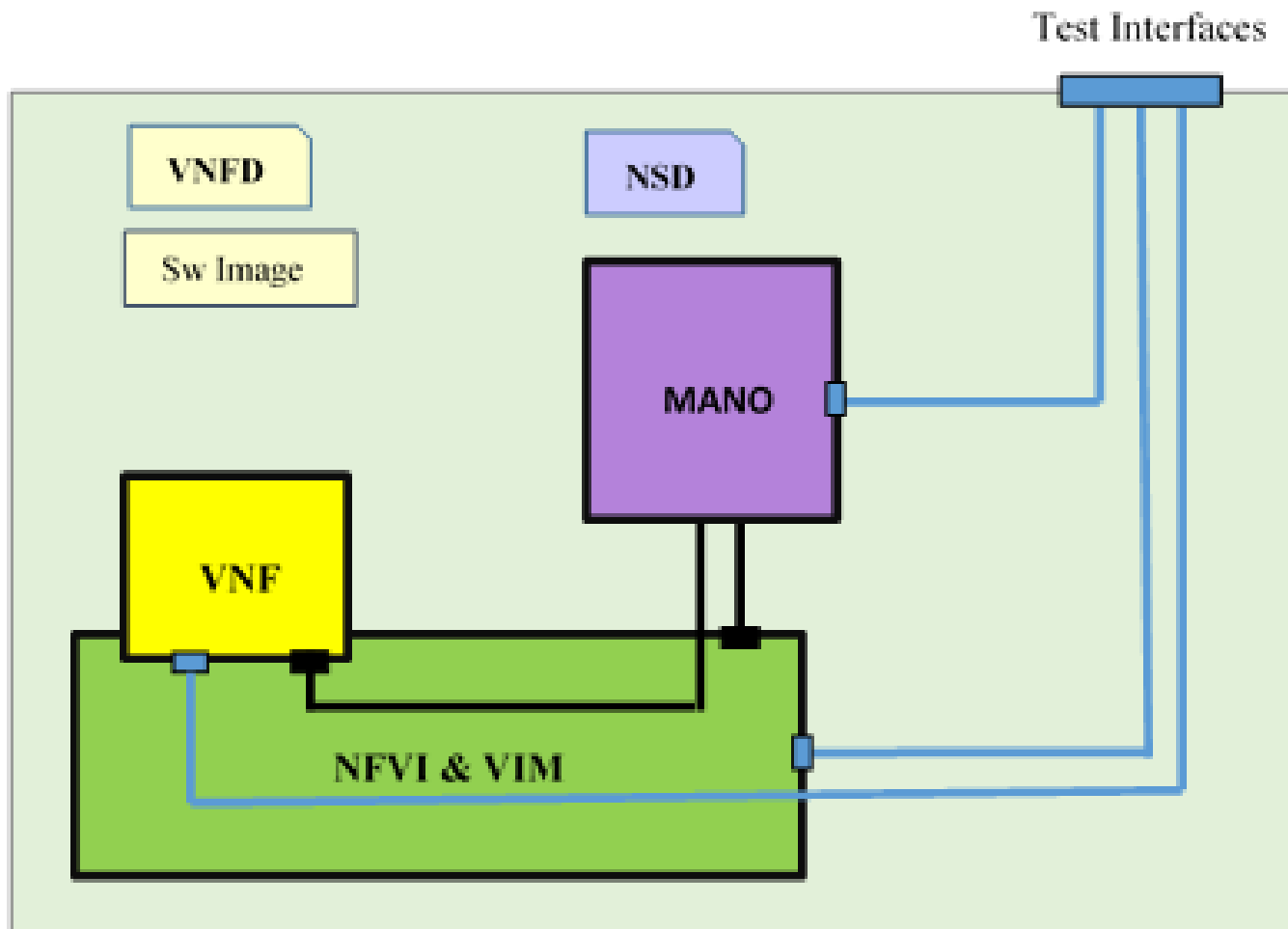


Test Suite Structure (early draft)



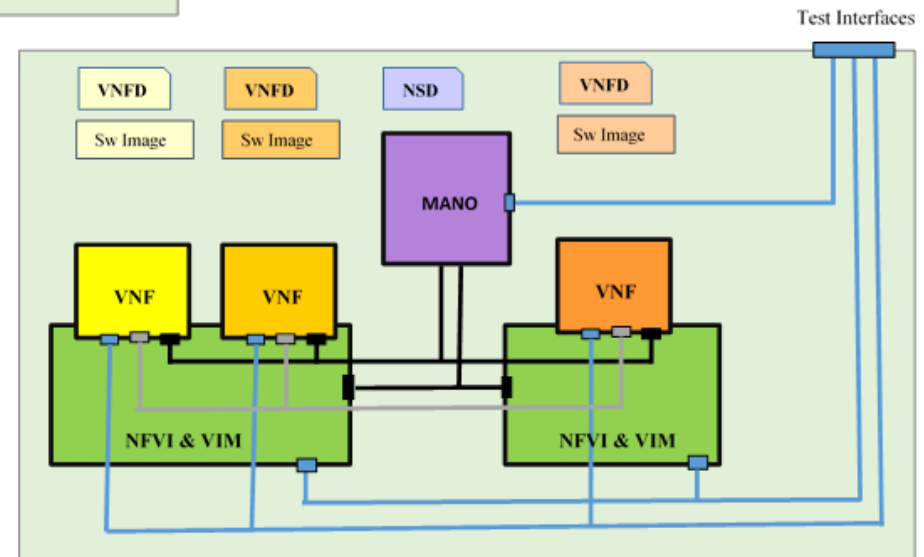
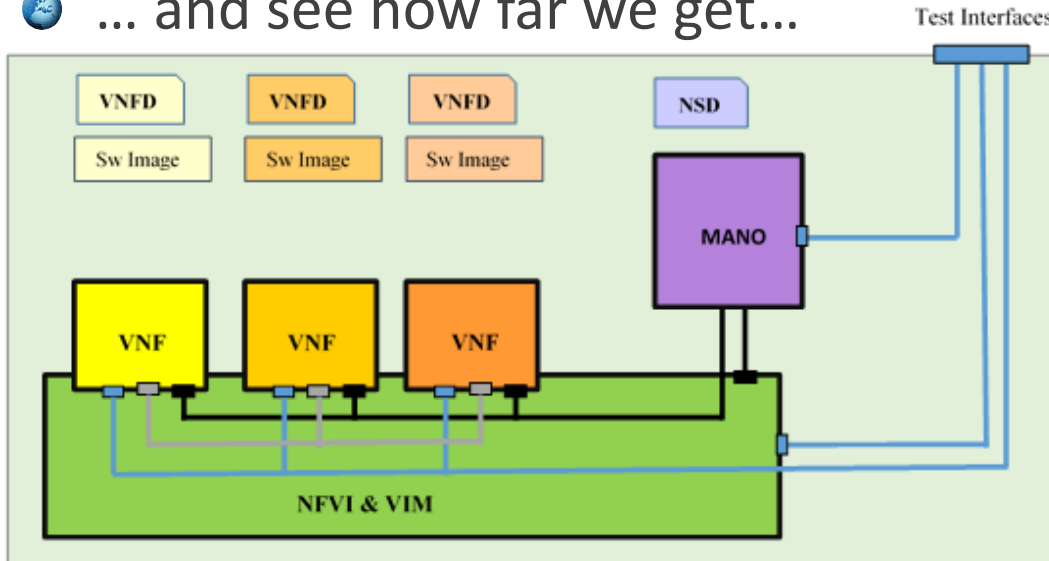
Test Id	Test Purpose	NS Config	SUT Config
TD_NFV_MANO_VIM_SETUP_001	To verify that a single VIM and a single MANO components can communicate and expose interfaces and resources	N/A	SUT_1
TD_NFV_MANO_VIM_SETUP_002	To verify that a single VIM and multiple MANO components can communicate and expose interfaces and resources	N/A	SUT_1
TD_NFV_MANO_VIM_SETUP_003	To verify that a multiple VIM and a single MANO components can communicate and expose interfaces and resources	N/A	SUT_1
TD_NFV_VNF_PKG_ONB_001	On-board a VNF package onto MANO	N/A	SUT_1, SUT_2
TD_NFV_VNF_PKG_UPD_001	Update a given VNF package	N/A	SUT_1, SUT_2
TD_NFV_VNF_PKG_DEL_001	Delete a given VNF package	N/A	SUT_1, SUT_2
<i>Onboard Network Service (pre-test condition)</i>			
TD_NFV_NS_LCM_INSTANTIATE_001	To verify that a NS with 1 VNF is successfully instantiated	NS_1	SUT_1, SUT_2
TD_NFV_NS_LCM_INSTANTIATE_002	To verify that a NS with multiple VNFs are successfully instantiated	NS_2	SUT_1, SUT_2
TD_NFV_NS_LCM_SCALE_UP_001	To verify that a NS can scale up compute resources	NS_1	SUT_1, SUT_2
TD_NFV_NS_LCM_SCALE_UP_002	To verify that a NS can scale up memory resources	NS_1	SUT_1, SUT_2
TD_NFV_NS_LCM_SCALE_UP_003	To verify that a NS can scale up storage resources	NS_1	SUT_1, SUT_2
TD_NFV_NS_LCM_SCALE_UP_004	To verify that a NS can scale up network resources	NS_1	SUT_1, SUT_2
TD_NFV_NS_LCM_SCALE_DOWN_001	To verify that a NS can scale down compute resources	NS_1	SUT_1, SUT_2
TD_NFV_NS_LCM_SCALE_DOWN_002	To verify that a NS can scale down memory resources	NS_1	SUT_1, SUT_2
TD_NFV_NS_LCM_SCALE_DOWN_003	To verify that a NS can scale down storage resources	NS_1	SUT_1, SUT_2
TD_NFV_NS_LCM_SCALE_DOWN_004	To verify that a NS can scale down network resources	NS_1	SUT_1, SUT_2
TD_NFV_NS_LCM_SCALE_OUT_001	To verify that a NS can scale out	NS_1	SUT_1, SUT_2
TD_NFV_NS_LCM_SCALE_IN_001	To verify that a NS can scale in	NS_1	SUT_1, SUT_2
TD_NFV_NS_LCM_UPDATE_ADD_VNF_001	To verify that a single VNF can be added to an existing NS	NS_1	SUT_1, SUT_2
TD_NFV_NS_LCM_UPDATE_OPSTATE_VNF_001	To verify that the operational state of a single VNF can be modified	NS_1	SUT_1, SUT_2
TD_NFV_NS_LCM_UPDATE_REM_VNF_001	To verify that a single VNF can be removed from an existing NS	NS_2	SUT_1, SUT_2
TD_NFV_NS_LCM_TERMINATE_001	To verify that a NS with 1 VNF is successfully terminated	NS_1	SUT_1, SUT_2
TD_NFV_NS_LCM_TERMINATE_002	To verify that a NS with multiple VNF is successfully terminated	NS_2	SUT_1, SUT_2

Start simple...



Systems Under Test

... and see how far we get...



Participation Timeline



Oct 2016

Regular participant conf-calls from October 6th

- review the Test Plan
- compile technical details
- identify arrangements and remote integration process

Nov 2016

Request VPN connection to HIVE (VPN HUB)

- setup VPN
- support remote integration
- run pre-testing

...

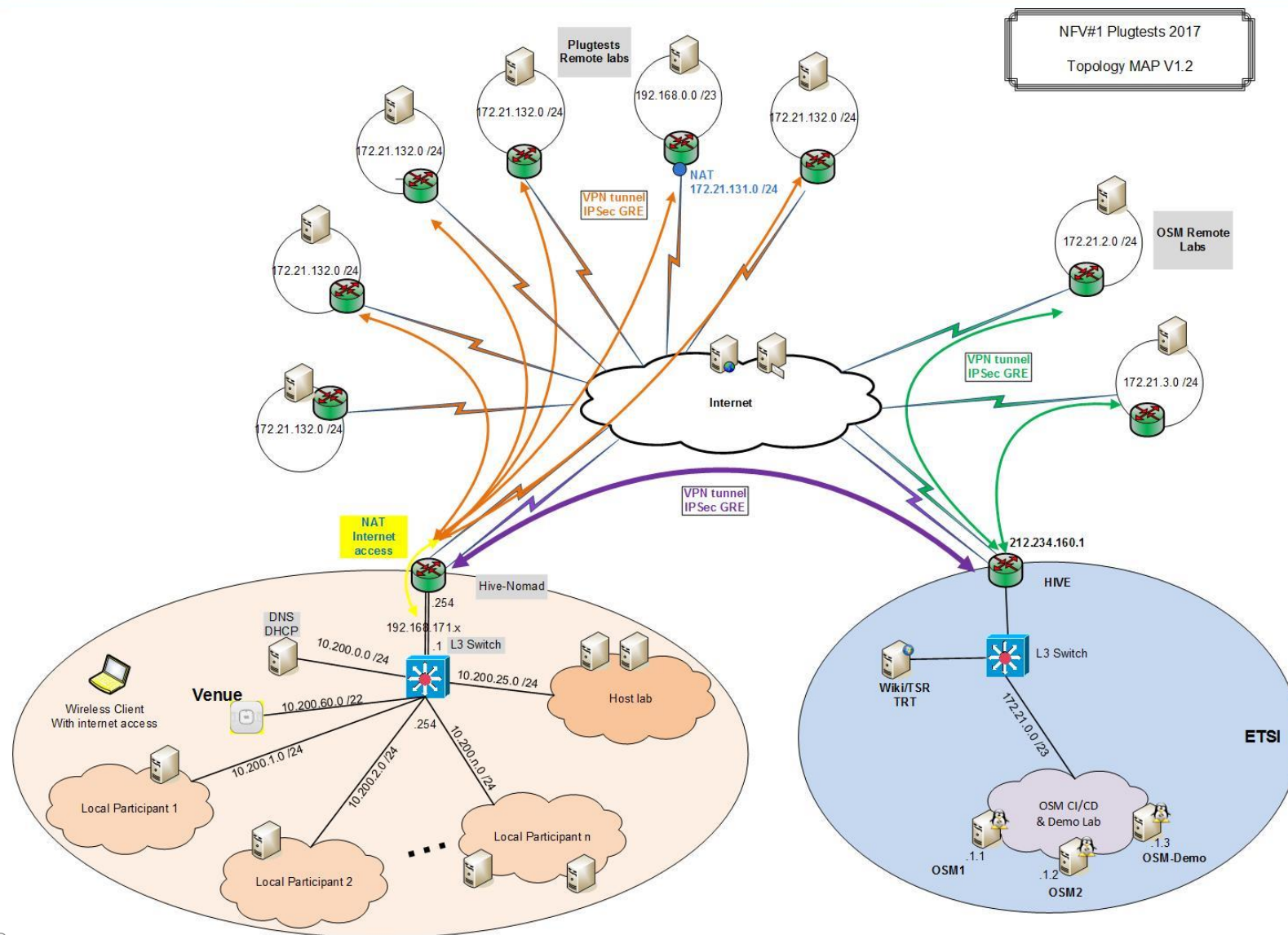
Jan 2017

Ship infrastructure (if applicable)

Attend the Plugtest

Feb 2017

- 1st week (23-27 Jan) – local infra deployment (if applicable)
- 2nd week (30 Jan – 3 Feb) – IOP test sessions



Connecting to HIVE



- Participants request VPN connection and monitor VPN status through a web portal:
 - OSM DevOps => to connect NFVI&VIM through the OSM Remote Labs network (permanent)
 - NFV PLU 1 => to connect any remote implementation to the Plugtests network (tear down after Plugtest)
- ETSI can provide pre-configured routers to support and speed up remote connection to HIVE

A screenshot of a web browser displaying the "HIVE VPN request form". The browser's address bar shows the URL "https://vpn.etsi.org/request.php?Event_ID=6". The page has a dark blue header with the "HIVE" logo and the text "Hub for Interoperability and Validation at ETSI" and "Site-to-Site remote access". Below the header, there is a "VPN Request" section with a "Business Information" tab. The "Event*" dropdown menu is set to "5 - ITS-CMS5 2016". Below this, there is a "Contacts" section with fields for "Company name*", "City/Country where VPN tunnel is set*", "Password*", and "Confirm Password*". A warning message at the bottom states: "Warning: This password will be shared by the three contacts listed below." A blue "HOME PAGE" button is visible in the top left corner of the page content area.

HIVE
Hub for Interoperability and Validation at ETSI
Site-to-Site remote access

VPN Request

Business Information

Event*: 5 - ITS-CMS5 2016

Contacts

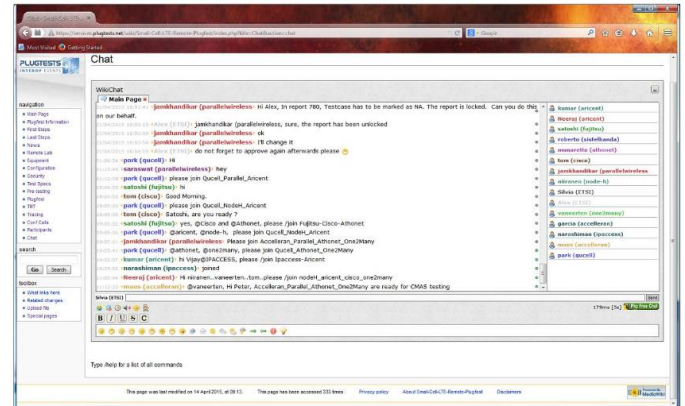
Company name*: City/Country where VPN tunnel is set*:

Password*: Confirm Password*:

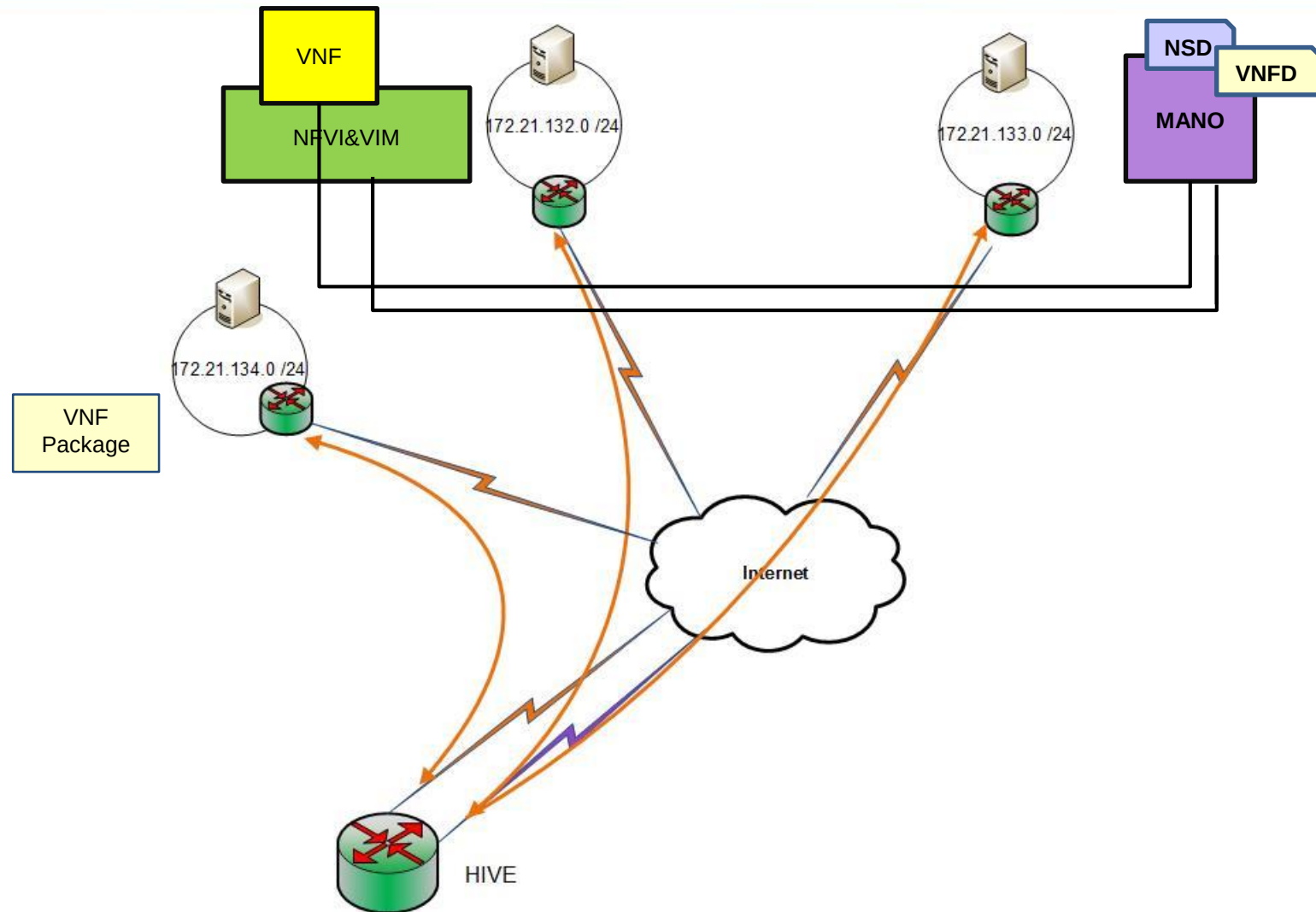
Warning: This password will be shared by the three contacts listed below.

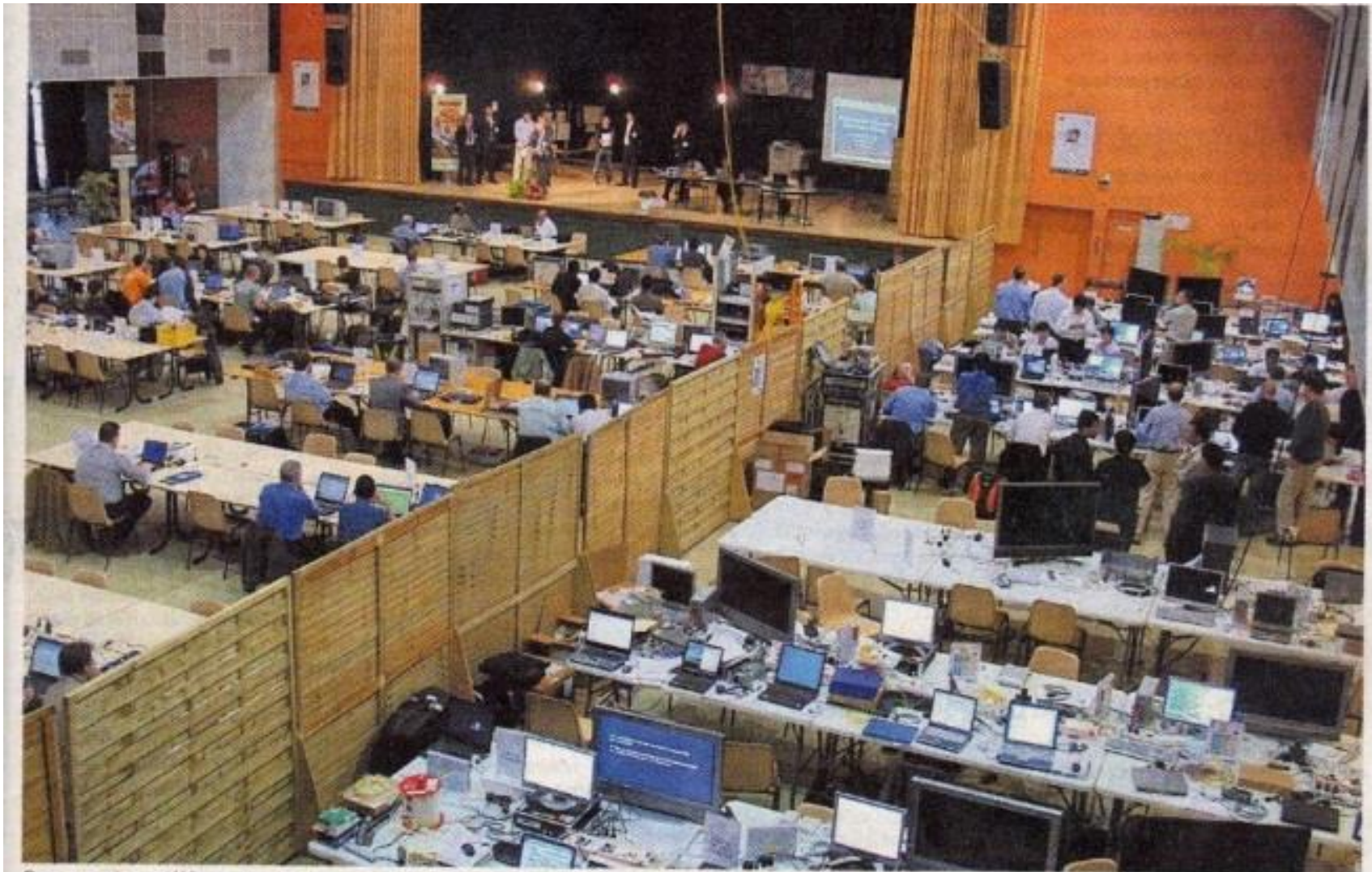
- With 1-2 simple reference VNFs

- Over own VIM&NFVI
- Over a reference VIM&NFVI

[illegible]

Remote pre-testing





Des experts en télécommunications venus de toute la planète testent entre eux aux Ursulines les produits qui seront demain sur le marché.

Test Sessions



Test Session 1

Track 1	Track2	Track3	Track4	Track5
MANO1	MANO2	MANO3	MANO4	MANO5
NFVI&VIM1	NFVI&VIM2	NFVI&VIM3	NFVI&VIM4	NFVI&VIM5
VNF1-VNF2	VNF3-VNF4	VNF5-VNF6	VNF7-VNF8	VNF9-VNF10

Test Session 2

Track 1	Track2	Track3	Track4	Track5
MANO1	MANO2	MANO3	MANO4	MANO5
NFVI&VIM1	NFVI&VIM2	NFVI&VIM3	NFVI&VIM4	NFVI&VIM5
VNF9-VNF10	VNF1-VNF2	VNF3-VNF4	VNF5-VNF6	VNF7-VNF8

....

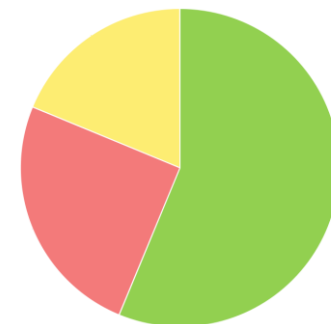
Test Session n

Track 1	Track2	Track3	Track4	Track5
MANO1	MANO2	MANO3	MANO4	MANO5
NFVI&VIM5	NFVI&VIM1	NFVI&VIM2	NFVI&VIM3	NFVI&VIM4
VNF5-VNF6	VNF7-VNF8	VNF9-VNF10	VNF1-VNF2	VNF3-VNF4

Test Results

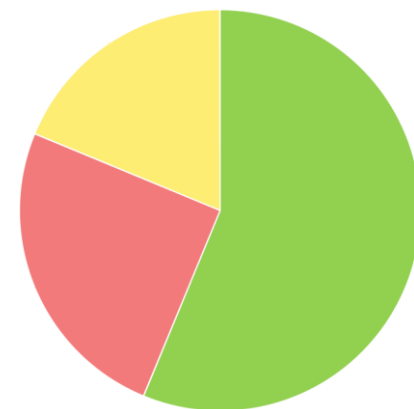


ETSI Test Reporting Tool							
Settings Reports Statistics Session Plan Silvia Almagia (Manager) Event timezone (Europe/P) Small-Cell-LTE-Remote-P logout							
id	status	date	duration	area	config	participants	commands
737		2015-04-13 09:00	180	Athlonet #2	HeNB	Node-H - HeNB Cisco - HeNB-GW Athlonet - ePC one2many - CBC	
738		2015-04-13 09:00	180	Cisco	eNB	Fujitsu - eNB Cisco - ePC	
740		2015-04-13 14:00	180	Cisco	HeNB	Node-H - HeNB	



Test groups:	Test ID	Summary	Result	Comment
SON	DSON/PCI/05	PCI Conflict / Confusion Detection: Detect PCI Confusion with X2 Neighbor Cells	OK NO NA OT	
	DSON/PCI/08	PCI Conflict / Confusion Resolution: PCI Confusion Resolution with X2 Neighbor Cells	OK NO NA OT	Comments here
	DSON/ANR/01	ANR in existing network with one LTE Macro Cell	OK NO NA OT	
	DSON/MRO/01	Basic Too Late Handover Test Case: Vendor A is a Small Cell eNB: Radio Link Failure occurs in Small Cell eNB (Cell 1)	OK NO NA OT	
	DSON/MRO/02	Basic Too Late Handover Test Case: Radio Link Failure occurs in Macro Cell eNB (Cell 2)	OK NO NA OT	

- Compiled by ETSI, reviewed by participants and shared with the industry / ETSI NFV:
 - Participants and implementations (FUTs)
 - Test Infrastructure & logistics
 - Lessons learnt during integration and pre-testing
 - Test Results (aggregated data)
 - Per SUT configuration
 - Per Test Group
 - Per Test Case
 - Feedback
 - On NFV Specifications (IFA, TST, ...)
 - On general IOP issues
 - Conclusions and Recommendations
- Target : NFV#17 February 2017

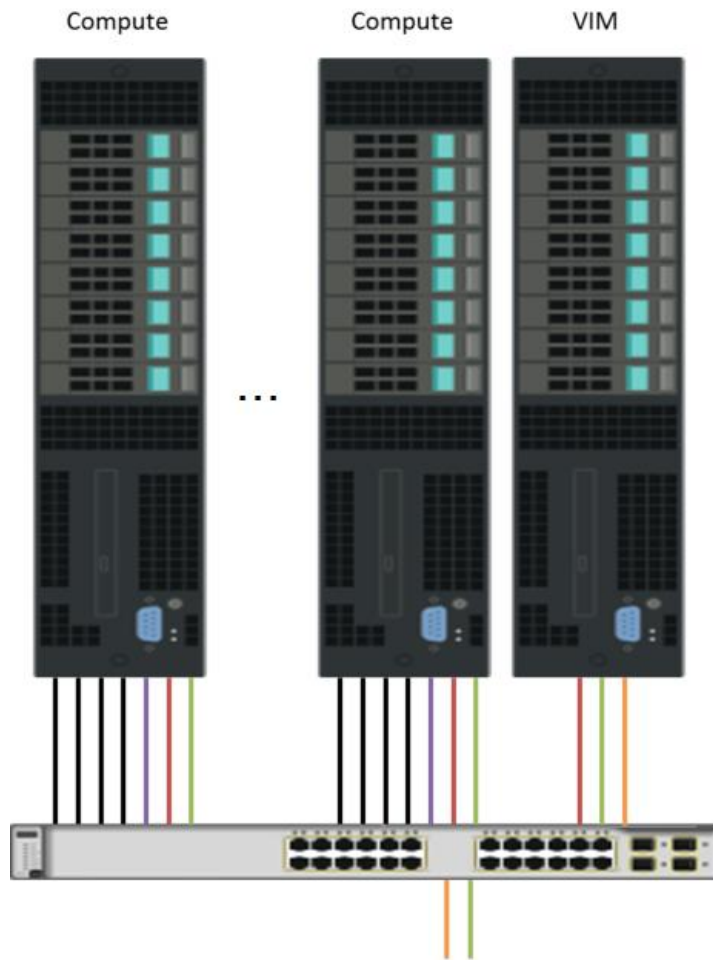




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plugtests@etsi.org

Thank you!

Functions Under Test – NFVI&VIM



- Pre-configured **compute nodes**

- Pre-integrated **VIM**

- Exposing **NBIs** to support the test plan and remote integration with MANO

- 1 or several **switches** to handle

- Data Plane Nws
 - Other virtual Nws (OVS based, etc..)
 - DC Infrastructure Mgmt Nw
 - **VNF Mgmt Nw (*)**
 - **VIM Mgmt Nw (*)**

- Can be deployed locally @ host lab

- Max 1 rack

- Or connected remotely

- From participant's lab

(*) VNF and VIM Management networks need to be accessible to participating MANO solutions

- IP address scheme defined by ETSI

- Pre-integrated NFVO & VNFM
- Deployed locally in the host's lab or running remotely on own HW
- Interacting with participating VNFs and VIMs
 - Via VNF management and VIM management networks
 - IP address scheme defined by ETSI
- Exposing descriptor templates
 - in line with NFV Information Model
 - supporting the test plan
- Supporting remote integration with participating VIMs and VNFs
 - VIM NBIs
 - VNF Packaging, methods for configuration and management



- Exposing
 - Descriptors, according to the participating MANO templates
 - Associated requirements: resources, VNFC interconnection, ...
 - Internal topology schema, connection points
 - Reference NS & topology schema
 - Functional and performance reference test
 - Test tool requirements



- Supporting integration with MANO
 - VNF Packaging, methods for configuration and management, ...

