

# Physical Labs

## Minimal Assets for Physical Lab

- On Line Labs:
- Intel ONAP Integration and Deployment Labs - Oregon, USA
- Name of the Lab/Company China Mobile ONAP Lab
- Reliance Jio R&D Labs
- China Telecom ONAP Lab
- Orange Integration Center
- DISCONTINUED
- (iol.unh.edu) at University of New Hampshire

## Community Labs: Incubation

Name	Organization	Location	Contact	POD	Role	Status	VPN or public access? for CD access	Note
							<div>TSC-25 - Getting issue details...</div> <div>STATUS</div>	
Azure Lab	Community	Azure Cloud	onap-discuss@lists.onap.org		Community lab	Up&running	No, Access with SSH key from Internet	
China Mobile ONAP Lab	China Mobile	Beijing, China	Yan Yang (yangyanyj@chinamobile.com)		Use Case E2E Test & POC	On Line	Public access through openVPN	ONAP Casablanca and Casablanca maintenance installed
Reliance Jio R&D Labs	Reliance Jio Infocomm	Maharashtra, India						
China Telecom ONAP Lab	China Telecom	Beijing, China	Yi Yang (yangyi.bri@chinatelecom.cn) Luman Wang (wanglm.bri@chinatelecom.cn)		Integration & Testing  mainly support for subproject Benchmark & SFC	Jump server to access by internal team and vendors	Public access through Jump server, then can access ONAP env through openVPN	ONAP Casablanca and Casablanca maintenance installed  ONAP Beijing installed also
TLAB	AT&T Advanced Technologies		Rich Bennett (RB2745@att.com) John Murray (JM2932@att.com)					have upgraded TLAB to Open Stack Queens and added a bare metal Kubernetes cluster. working on an example deployment of an ONAP component into a Kubernetes namespace, using ingress ports and persistent volume claims on network storage instead the NFS server in a VM. When this example is proven we will offer namespaces for other ONAP components that have stable artifacts ready for deployment.
Intel ONAP Integration Lab	Sponsored by: Intel  Managed by: Wind River	Intel HF2, Hillsboro, OR, USA	Stephen Gooch (stephen.gooch@windriver.com) Eddy Raineri (Eddy.Raineri@windriver.com)	ONAP-POD-01	Integration and Deployment	Decommissioned on 01 Apr 2022		
ONAP UNH-IOL Lab	University of New Hampshire	Durham NH, 03824 USA	onap-unh-lab@onap.org		Integration and Deployment	Operational 21 Mar 2022	openVPN	

Auto Lab	CIA ONAP Project. Multi-arch support in ONAP.	UNH-IOL (University of New Hampshire, USA  Interoperability Lab)	Paul Vaduva (paul.vaduva@enea.com)  nfv-lab@iol.unh.edu	unh-pod1	Development and Test on arm64 architecture  vFW usecase	On Line  <a href="#">Auto Arm Pod at IOL-UNH</a>	Public access through openVPN.  Ask for access: by sending a mail to: <a href="mailto:nfv-lab@iol.unh.edu">nfv-lab@iol.unh.edu</a>	OPNFV-deployed OpenStack environment.  ARM64 onap images not yet build for deployment.
VMware OpenLab	VMware	Wenatchee (near Seattle), USA	Primary contact: TBD  Secondary contact: Ramki Krishnan, ramkik@vmware.com		Integration and Deployment	In Progress		6 physical servers  Individual server configuration – Dell R640 <ul style="list-style-type: none"> <li>• 2x 10core cpu 4114 (Skylake) @2.2GHz</li> <li>• 128GB RAM</li> <li>• 960GB SSD</li> </ul>
ONAP Lab for OVP (ONAP Validation Program)	Lenovo Labs  (ONAP Managed By: Arana Networks)		<a href="#">Sriram Rupanagunta</a>		ONAP OVP VNF Validation Test Setup	On Line		

## On Line Labs:

### Intel ONAP Integration and Deployment Labs - Oregon, USA

- **Sponsored By:** [Intel](#)
- **Hardware Managed By:** [Intel](#)
- **Software Managed By:** [Wind River](#)
- **Clouds:**
  - **Integration:** <http://10.12.25.2>, running Titanium Cloud R5
  - **Deployment:** <http://10.12.11.1>, running Distributed Cloud R5
  - **K8s:** <http://TBD>, running StarlingX release 2
- **Responsible Party:** [Stephen Gooch](#) and [Eddy Raineri](#)

## Connection: VPN

- Update [Integration / Developer Lab Access](#), then open a JIRA for Open Labs project:
  - Choose component MULTI\_GEOLAB
  - List which project you belongs to, and update [Integration / Developer Lab Access](#)
  - Assign to Stephen Gooch

- From the JIRA, a form letter is sent with an encrypted zip file. There are two files in this zip:

1. login.txt (your username and password)
2. pod-onap-01.ovpn (Open VPN CA same for all)

Edit pod-onap-01.ovpn to include login information:

1. **Linux/Mac:** auth-user-pass login.txt
2. **Windows:** auth-user-pass "C:\\Program Files\\OpenVPN\\config\\login.txt"

(You may need to add "http-proxy url:port" or "socks-proxy url:port". Discuss with your IT representative.)

- Execute:

1. **Linux/Mac:**

```
$ sudo openvpn --config pod-onap-01.ovpn
```

2. **Windows:** Install the Open VPN client  
Import pod-onap-01.ovpn  
Select Connect

- 600 Cores, 5T RAM, 70TB Storage
- Infrastructure Software = Wind River Titanium Cloud (Openstack Newton Based)
- After connecting the VM. You can use a local Linux machine or the supplied jumpstation for OpenStack CLI access.
- Download OpenStack RC File from UI:
  - Project -> Compute -> Access & Security -> API Access
- Upload file to jumpstation (or local machine). If running on local machine, ask [stephen.gooch@windriver.com](mailto:stephen.gooch@windriver.com) for remote CLI SDK.
- Source and run OpenStack commands

```
user@pod-onap-01-vjhost:~$ source ./Integration-openrc.sh
```

Please enter a path for your CA certificate pem file, #or press enter if you are not using HTTPS  
Please enter your OpenStack Password for project integration as user username:

```
$ sudo openvpn --config pod-onap-01.ovpn
```

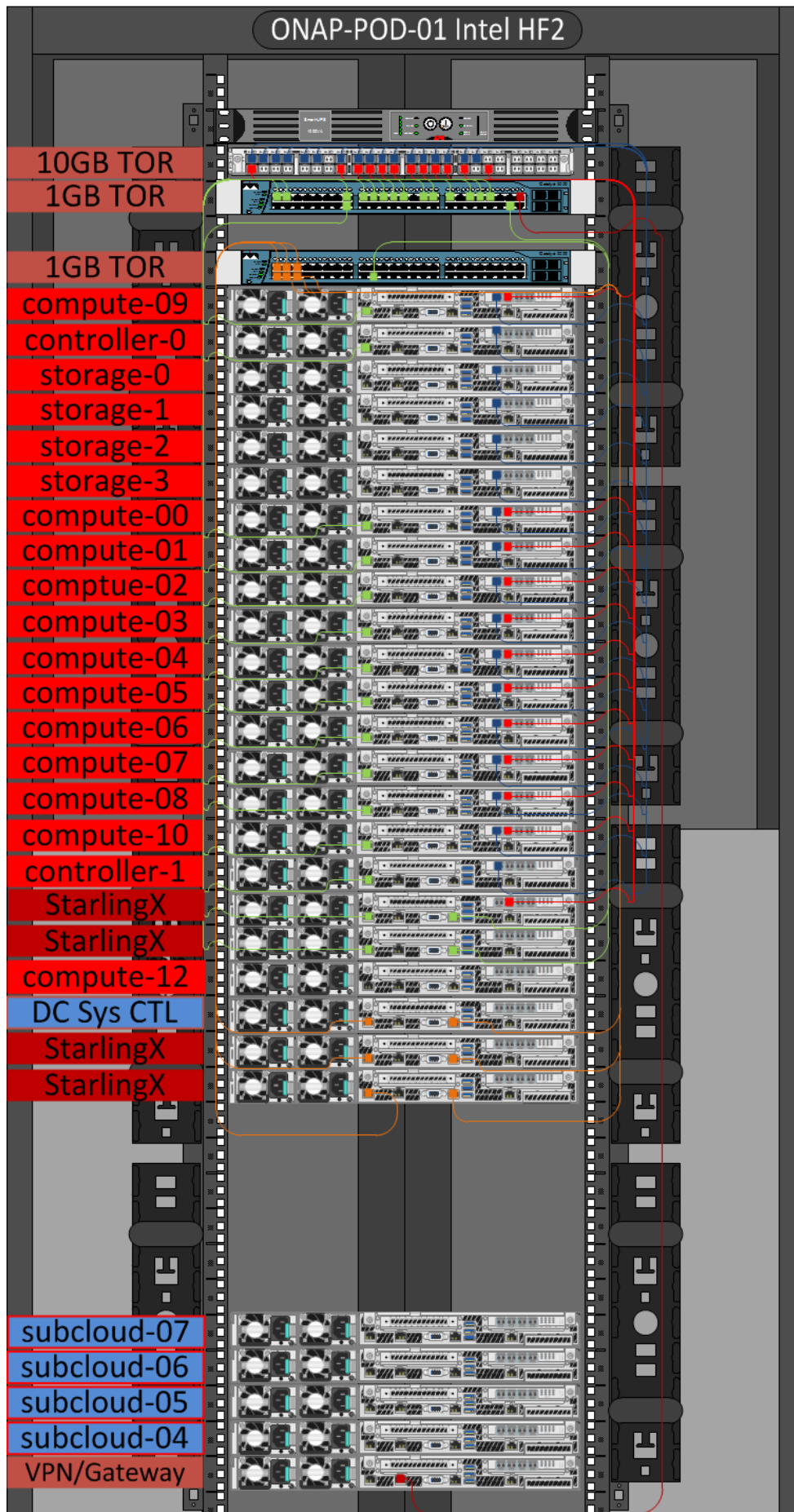
- Jumpstation IP 10.12.5.50

## Deployment testing with MultiVIM/Cloud

For testing with MultiVIM/Cloud use the following two clouds. Both are based on OpenStack

- Wind River Titanium Cloud - Distributed targets
- K8s based StarlingX release 2

- **Lab Infrastructure**





## Proposed Labs:

Proposal 1:

### Name of the Lab/Company

China Mobile ONAP Lab

#### Responsible Party

China Mobile, Contact: Chengli Wang [wangchengli@chinamobile.com](mailto:wangchengli@chinamobile.com), Wen Yao Guan [guanwenyao@chinamobile.com](mailto:guanwenyao@chinamobile.com)

#### Equipment available today and expected from ONAP

##### Available Equipment

###### Space:

- Laboratory room
- Rack

###### Hardware:

- Servers
- Router (SPTN/Router)
- Switch
- DC Gateway
- Thin CPE
- Access Point
- Communication Terminal

###### Software:

- VNFs (Commercial):

  - vCPE
  - vIMS
  - vEPC

- VIM:

  - Redhat
  - Ubuntu
  - VMware VIO
  - Wind River Titanium Cloud (OpenStack VIM)

- Controller:

  - DC Controller
  - SPTN Controller
  - WAN Controller

#### Expected Equipment from ONAP

Equipment for remote connection through VPN.

#### Power availability

Stable power supply is available.

**Networking availability**

Internal availability: available networking facilities with support for changes in case of use case requires

From external access: remote network access by VPN

**Technical support from your company and expected support from ONAP**

Laboratory operation and maintenance are available from China Mobile.

**Availability according to minimal assets requirement:**

Use Cases	VNFs	Server Pod number	Network Hardware	Software	Available Resources in CMCC lab
Development or vFW/vDNS demo apps	Open sourced vFW /vDNS	1 (Small)	No	Cloud OS	Yes
vCPE	vCPE	2 (Medium)	WAN/SPTN Router (2) DC Gateway (2) TOR (n) ThinCPE (1)	Cloud OS (for Edge and Core) WAN/SPTN Controller DC Controller Specific VNFM & EMS	Almost available (lack of 1 DC gateway)
VoLTE	vIMS/vEPC	2 (Large)	WAN/SPTN Router (2) DC Gateway (2) TOR (n) Wireless Access Point (2) VoLTE Terminal Devices (2)	Cloud OS (for Edge and Core) WAN/SPTN Controller DC Controller Specific VNFM & EMS	Almost available (lack of 1 DC gateway)

**Willing to support the ONAP use cases and member companies?**

Support VoLTE & vCPE use cases.

Proposal 2:

Reliance Jio R&D Labs

**Responsible Party**

Reliance Jio Infocomm

## **Equipment available today and expected from ONAP**

### **Available Equipment**

Available Equipment and facilities include the following for interop testing and performance testing:

VoLTE core network,  
WiFi Core Network  
EPC core network,  
FTTx Core network  
IP/MPLS Core Network - all topologies.  
OSS and BSS applications  
Access network functions - Radio, Fixed and WiFi  
Fully functional devices lab (LTE and Fixed) for UE support.  
Security Testing practice for aiding security aspects of the ONAP Platform installation and the VNFs on top of Openstack.  
Installation of ONAP and Openstack available for swift testing on a NFVI.

### **Expected Equipment from ONAP**

Based on the infra requirements, pods can be installed and commissioned for creating a infrastructure with remote connectivity via VPN for realizing the use cases and testing them end to end. Equipment would consist of Racks (Open CG Rack 19 compliant or others), Installation material and blade servers (Intel based).

### **Power availability**

Stable power supply is available - with redundancy.

### **Networking availability**

Networking facilities are available in the lab with support for on-demand changes if needed by a use case.

### **Technical support from your company and expected support from ONAP**

Laboratory operation and maintenance are available from Reliance Jio.

### **Willing to support the ONAP use cases and member companies?**

Willing to support the ONAP use cases on VoLTE and vCPE. Other use cases that may come up in the future can also be tried out.

## Proposal 3:

# China Telecom ONAP Lab

### **Responsible Party**

China Telecom, Contact: Yi Yang [yangyi.bri@chinatelecom.cn](mailto:yangyi.bri@chinatelecom.cn), Luman Wang [wanglm.bri@chinatelecom.cn](mailto:wanglm.bri@chinatelecom.cn)

## **Equipment available today and expected from ONAP**

### **Available Equipment**

#### **Space:**

Laboratory room  
Rack

#### **Hardware:**

Servers  
Router (IP Backbone and MPLS Backbone)  
Switch  
DC Gateway  
Firewall  
Thin CPE  
IPRAN

#### **Software:**

VNFs (Commercial):  
vCPE  
vEPC

#### **VIM:**

Redhat  
Ubuntu  
Wind River Titanium Cloud (OpenStack VIM)

#### **Controller:**

DC Controller  
WAN Controller

#### **Others:**

Internet IP address

**Power availability**

Stable power supply is available(AC and DC).

**Networking availability**

**Internal availability:**

Available networking facilities with support for changes in case of use case requires.

**From external access:**

Remote access to the network via VPN or direct access to the bastion host via a firewall.

**Technical support from your company and expected support from ONAP**

Laboratory operation and maintenance are available from China Telecom.

**Willing to support the ONAP use cases and member companies?**

Support VoLTE on vEPC, vCPE, vCPE extension & vFW use cases;

Use Cases	VNFs	Server Pod number	Network Hardware	Software	Available Resources in CT lab
Development or vFW/vDNS demo apps	Open sourced vFW /vDNS	1 (Small)	No	Cloud OS	Yes
vCPE & vCPE extension	vCPE	2 (Medium)	WAN (2) /IPRANRouter (8)  DC Gateway (2)  TOR (n)  ThinCPE (2)	Cloud OS (for Edge and Core)  WAN/IPRANController  DC Controller  Specific VNFM & EMS	Yes
VoLTE	vIMS/vEPC	2 (Large)	WAN (2) /IPRANRouter (8)  DC Gateway (2)  TOR (n)  Wireless Access Point (4)  VoLTE Terminal Devices (2)	Cloud OS (for Edge and Core)  WAN/IPRANController  DC Controller  Specific VNFM & EMS	Almost available (lack of servers)

Proposal 4 (more detailed information can be provided):

## Orange Integration Center

(used for OPNFV - Orange responsible of *functest* stream; also used for our operational needs – such as vEPC and all Orange PNF testing).

**Responsible Party**

Orange. Contact Eric Debeau ([eric.debeau@orange.com](mailto:eric.debeau@orange.com)), Odile Duthil ([odile.duthil@orange.com](mailto:odile.duthil@orange.com)), Anne Tréhu ([anne.trehu@orange.com](mailto:anne.trehu@orange.com))



## Equipment available today and expected from ONAP

### Available Equipment

#### Space:

Laboratory room (in our Lannion Premises)

#### Hardware:

Servers (capacity need to be assessed as the lab is also used for operational testing)

#### Software:

VNFs, VIM: opensource can be installed on demand. Commercials: need of supplier agreement. We have redhat, Mirantis

#### Interoperability

Available Equipment and facilities for interop testing/ performance testing: core network (IMS, Volte, EPC), IP and transmission, fixed and mobile access. Independently from ONAP, the lab is to be connected to major supplier integration labs to work in joint agile delivery mode.

## Expected Equipment from ONAP

Depending on needs, additional servers may be needed, as well as equipment for remote connection through VPN.

### Power availability

Stable power supply is available.

### Networking availability

Internal availability: available networking facilities with support for changes in case of use case requires

From external access: remote network access by VPN

## Technical support from your company and expected support from ONAP

Laboratory operation and maintenance are done by Orange.

## Willing to support the ONAP use cases and member companies?

Willing to support VoLTE (and related subcases such as EPC or end to end automation) & vCPE use cases. Other use cases are welcome.

## Proposal 5: ONAP-Test Lab (TLab)

## DISCONTINUED

AT&T Advanced Technologies; Contact Rich Bennett ([RB2745@att.com](mailto:RB2745@att.com)); John Murray ([JM2932@att.com](mailto:JM2932@att.com))

## Equipment available today and expected from ONAP

### Available Equipment

#### Space:

Laboratory room  
Rack/Power/Cooling/Network

#### Hardware:

Servers  
Router (SPTN/Router)  
Switches  
VPN Gateway  
JUMP Server/Boot Server

#### Software:

VNFs (Open Source):  
vFirewall  
vDNS  
Test/ characterization

#### VIM:

OpenStack  
Ubuntu

Automated Test Software: TBD

## Expected Equipment from ONAP

Equipment for remote connection through VPN.

### Power availability

Stable power supply is available.

### Networking availability

Internal availability: available networking facilities with support for changes in case of use case requires

From external access: remote network access by VPN

## Technical support from your company and expected support from ONAP

Laboratory operation and maintenance are available from AT&T Advanced Technologies.

## Availability according to minimal assets requirement:

Use Cases	VNFs	Server Pod number	Network Hardware	Software	Available Resources in TLab
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Development for vFW/vDNS demo apps	Open sourced vFW /vDNS	1 (Small)	No	Cloud OS	Yes
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## DRAFT Initial TLAB Focus for discussion 8/10/2017 openlab Meeting

Demonstrate new ONAP features to developers building production services,

Gather feedback on what developers need to use the ONAP features in production.

Identify ONAP platform issues that need to be resolved for production use

Support/provide an environment for ONAP community work collaboratively and efficiently together to resolve these issues.

This focus should accelerate adoption of ONAP, grow community engagement, and reduce time to deliver important platform features.

## Proposal 7: Auto Project Arm Pod (OPNFV project lab offered to ONAP Community)

### Name of the Lab/Company

1. ([iol.unh.edu](http://iol.unh.edu)) at University of New Hampshire
2. Auto project of OPNFV, sponsored by Arm

### Responsible Party

1. University of New Hampshire contact: NFV/IOL staff ([nfv-lab@iol.unh.edu](mailto:nfv-lab@iol.unh.edu))
2. Arm/OPNFV contact: Paul Vaduva ([paul.vaduva@enea.com](mailto:paul.vaduva@enea.com))

### Equipment available today

1. 6 Cavium servers make up the OPNFV Pod.
  - a. 48-core, 64G Servers
    - i. 1 Jump Host for deploying OPNFV/OpenStack
    - ii. 3 OpenStack Controllers for an HA configuration
  - b. 96-core, 128G Servers
    - i. 2 OpenStack Compute Servers

**Expected Equipment from ONAP** None at this time

**Power availability** N/A

### Networking availability

1. Internal: The networking availability for users of the lab is within the context of an OpenStack environment.
2. External: remote network access by VPN - request credentials by emailing: [nfv-lab@iol.unh.edu](mailto:nfv-lab@iol.unh.edu)

### Technical support from your company and expected support from ONAP

1. Laboratory operation and maintenance provided by UNH IOL staff ([nfv-lab@iol.unh.edu](mailto:nfv-lab@iol.unh.edu))
2. Access to the OpenStack environment and assistance with that environment is provided/coordinated through Paul Vaduva (Paul.Vaduva@enea.com).

### Willing to support the ONAP use cases and member companies?

1. At this time, the primary focus is ONAP component container development (porting and building), but testing is supported as well as containers are produced.
2. vFW usecase ported to arm64 openstack deployment.