

Teaching brigade, ONF



# ONOS Installation and Build

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# Slides and VM download Links



**Slides :** <https://goo.gl/1BjLWa>

**VM :** <https://goo.gl/i1d9Rs>



# Outline

## **Import Ubuntu VM in VirtualBox**

## **Download and install ONOS**

Install prerequisites, set environment variables, run ONOS

## **Install Mininet**

Create a topology for ONOS

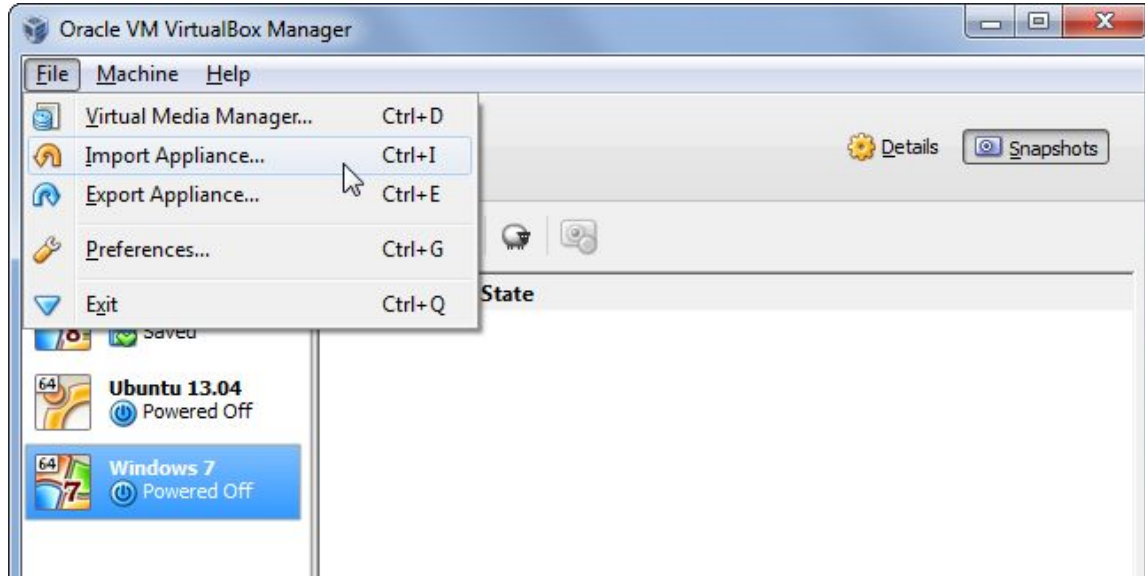
## **ONOS Ecosystem**

Basic commands and interfaces (CLI, GUI, REST)

# Importing the Ubuntu VM



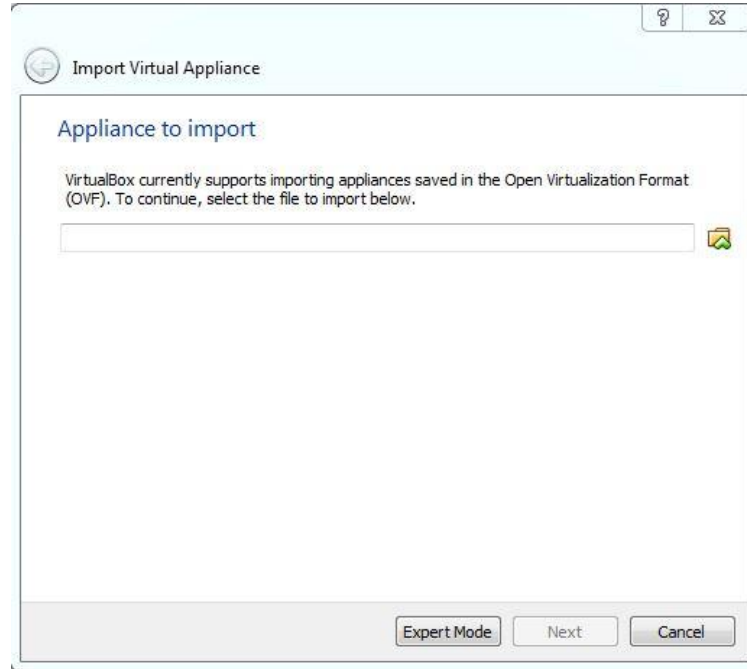
Click Import Appliance



# Importing the Ubuntu VM



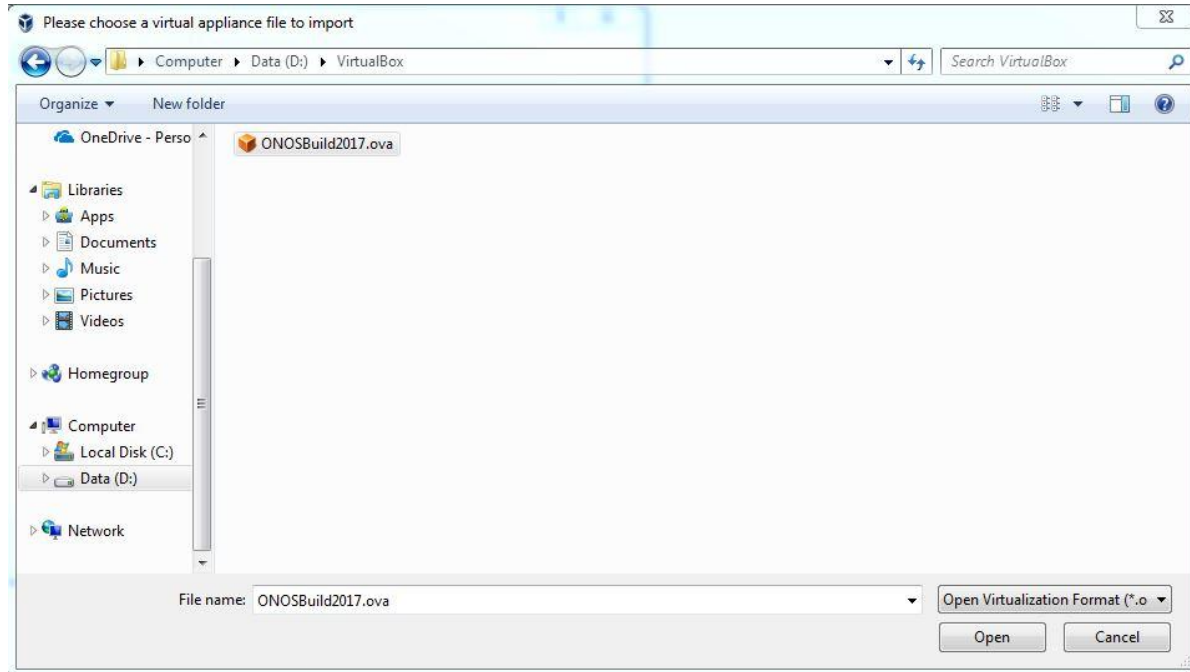
Click the folder icon on the right



# Importing the Ubuntu VM



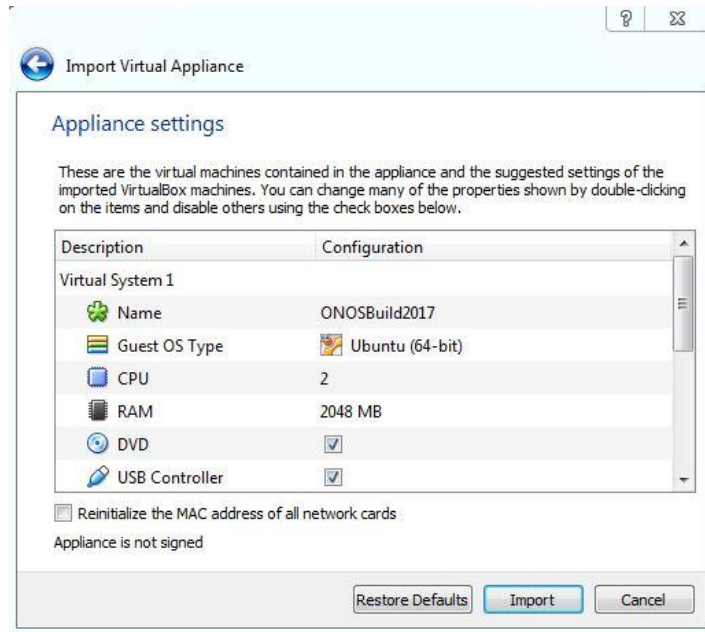
Browse to the .ova file and click open



# Importing the Ubuntu VM



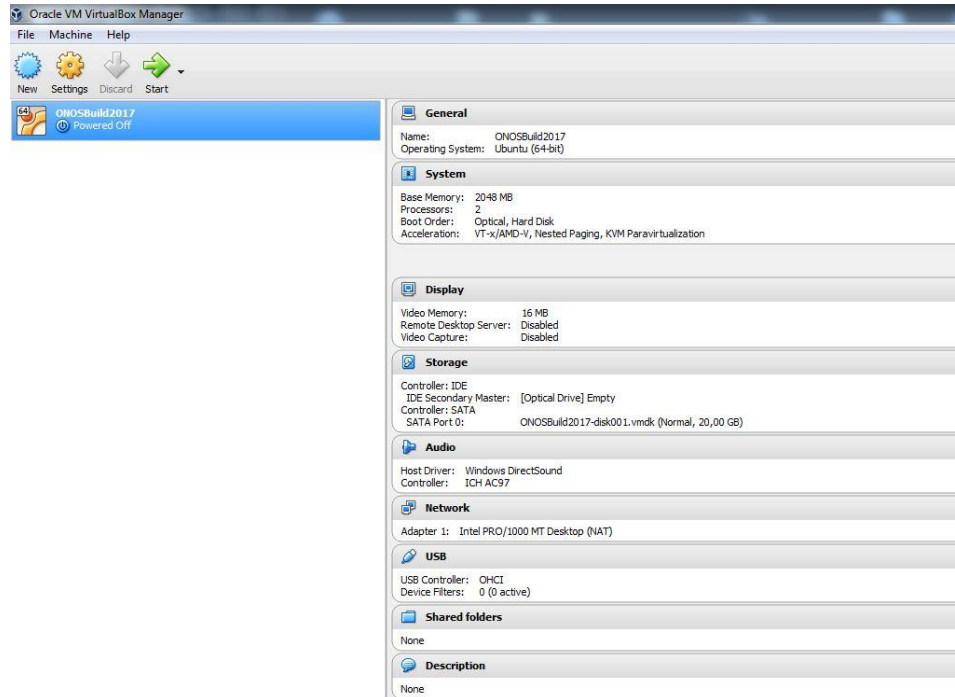
Click Import



# Booting the Ubuntu VM



Click Start





# Mininet Setup



**Password: onos**

**Download and Install Mininet:**

```
$ git clone https://github.com/mininet/mininet
```

```
$ cd mininet
```

```
~/mininet$ git tag (optional)
```

```
~/mininet$ git checkout 2.2.2
```

```
~/mininet$ ./util/install.sh -fnv
```

**-fnv: Openflow, Dependencies/Core Files, OVS Switch**

# ONOS Setup



## Download ONOS:

```
~/mininet$ cd ~
```

```
$ git clone https://github.com/opennetworkinglab/onos.git
```

## Setup ONOS Environment Variables:

```
$ echo '. ~/onos/tools/dev/bash_profile' >> ~/.bashrc
```

```
$ source ~/.bashrc
```

# Run ONOS



**Running ONOS single instance using buck:**

```
$ cd onos
```

```
~/onos$ buck run onos-local -- clean debug
```

**Wait until the running log stops**

# Run Mininet



**Running Mininet using a tree topology:  
Open a new terminal:**

```
$ cd mininet  
~/mininet$ sudo mn  
--controller=remote,ip=127.0.0.1,port=6633 --mac  
--topo=tree,2,2 --switch=ovsk,protocols=OpenFlow13
```

# Run Mininet



**Running Mininet using a tree topology:  
Open a new terminal:**

```
$ cd mininet  
~/mininet$ sudo mn  
--controller=remote,ip=127.0.0.1,port=6633 --mac  
--topo=tree,2,2 --switch=ovsk,protocols=OpenFlow13
```

# Basic Mininet Commands



**Ping all hosts:**

```
mininet> pingall
```

**From H1 ping H4:**

```
mininet> h1 ping h4
```

**Ctrl + c to stop the ping**

# ONOS GUI



<http://localhost:8181/onos/ui> user: onos password: rocks

The screenshot shows the ONOS GUI interface in a Mozilla Firefox browser window. The browser address bar displays `localhost:8181/onos/ui/index.html#/topo`. The ONOS logo and "Open Network Operating System" text are visible in the header. A sidebar on the left contains various application icons. The main area displays a network topology diagram with three blue ONOS controller icons connected to four host icons. The host IP addresses are 10.0.0.3, 10.0.0.2, 10.0.0.1, and 10.0.0.4. A summary panel on the right provides the following data:

ONOS Summary	
Version :	1.11.0*
Devices :	3
Links :	4
Hosts :	4
Topology SCCs :	1
Intents :	0
Tunnels :	0
Flows :	15

# ONOS CLI



Enter ONOS CLI:

```
$ cd onos
```

```
~/onos$ onos localhost
```



# ONOS CLI



## ONOS CLI Interface:

```
Welcome to Open Network Operating System (ONOS)!
```



```
Documentation: wiki.onosproject.org  
Tutorials:    tutorials.onosproject.org  
Mailing lists: lists.onosproject.org
```

```
Come help out! Find out how at: contribute.onosproject.org
```

```
Hit '<tab>' for a list of available commands  
and '[cmd] --help' for help on a specific command.  
Hit '<ctrl-d>' or type 'system:shutdown' or 'logout' to shutdown ONOS.
```

```
onos> █
```

# ONOS CLI



## Basic CLI Commands:

```
onos> help
```

```
onos> "command" --help
```

```
onos> apps -a -s
```

```
onos> app deactivate, app activate org.onosproject.*
```

```
onos> devices, links, hosts
```

```
onos> flows
```

```
onos> paths <TAB>
```

```
onos> intents
```

# ONOS REST API



## Using a web browser:

<http://localhost:8181/onos/v1/docs>

### **flows** : Query and program flow rules

Show/Hide | List Operations | Expand Operations

DELETE	/flows/application/{appld}	Removes flow rules by application ID
GET	/flows/application/{appld}	Gets flow rules generated by an application
DELETE	/flows	Removes a batch of flow rules
GET	/flows	Gets all flow entries
POST	/flows	Creates new flow rules
DELETE	/flows/{deviceId}/{flowId}	Removes flow rule
GET	/flows/{deviceId}/{flowId}	Gets flow rules
GET	/flows/{deviceId}	Gets flow entries of a device
POST	/flows/{deviceId}	Creates new flow rule

# Multiple ONOS instances



```
$ sudo apt-get install mininet bridge-utils  
$ cd ~/onos/tools/dev/mininet  
$ sudo mn --custom onos.py --controller onos,3 --topo torus,4,4
```

Default url: <http://192.168.123.1:8181/onos/ui>

# Q&A



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Abdulhalim: [adandoush@gmail.com](mailto:adandoush@gmail.com)

# Documentation



- [Installing and running ONOS](#)
- [Basic ONOS Tutorial](#)
- [The ONOS Web GUI](#)
- [Appendix B: REST API](#)



**ONOS**  
Open Network Operating System