

IEEE NFV-SDN 2018 : Tutorial

Target Audience: Those who are new to VSPERF and would like to try it out locally.

If you are attending a VSPERF-training session (ex: IEEE NFVSDN tutorial), kindly download and install following, **before the training-sessions**.

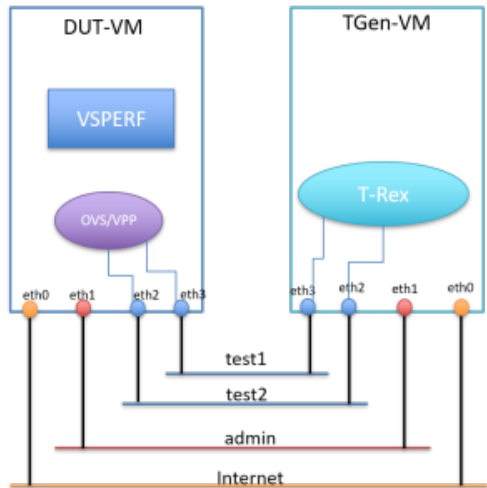
(Note: Of the three options described below, we'll only use Option-1 for IEEE NFVSDN Tutorial).

System / Software	Source / Image / command /	Comments
Virtualization /Hypervisor	Oracle Virtualbox	To run VMs.
Virtual Machine Image DUT-VM	http://releases.ubuntu.com/16.04/ubuntu-16.04.5-desktop-amd64.iso	Please install Docker on this system* Reuse of http://nof2020.dnac.org/tutorials/ his VM to try NFVBench
TGen-VM	http://trex-tgn.cisco.com/trex/T_Rex_162_VM_Fedora_21.ova	T-Rex Traffic Generator VM.
OPNFV/NFVBench Docker Image	<code>docker pull opnfv/nfvbench</code>	This should be done on DUT-VM
Exchange of SSH-Keys between VMs	Step-3 below. (option-1)	To allow pwd-less access b/w VMs
New Version of T-Rex	Step-5 below (option-1)	This should be done on TGen-VM
VSPERF	Step-4 below (option-1)	This should be done on DUT-VM

The Installation and configuration details are provided below.

Option-1: Experimenting VSPERF with Oracle Virtualbox:

You would need two VMs in this scenario. Figure below shows the setup.



Network	Network/Adapter Type (Virtualbox)	Interfaces on DUT-VM	Interfaces on TGen-VM	Comments
test1	Internal	eth3	eth3	Interface used for data-traffic
test2	Internal	eth2,	eth2,	Interface used for data-traffic
admin	Bridged	eth1	eth1	Interface used by VSPERF to manage TGen.
Internet	NAT	eth0	eth0	Interface used for connect to Internet - for downloads, and updates.

Step-1: Downloading VM-Images

Download following images for the two VMs:

1. DUT-VM: Any Linux image. Ex: Ubuntu 16.04 (<http://releases.ubuntu.com/16.04/ubuntu-16.04.5-desktop-amd64.iso>)
2. TGen-VM: http://trex-tgn.cisco.com/trex/T_Rex_162_VM_Fedora_21.ova.

Step-2: Installing VMs:

1. DUT-VM: This is just a standard VM-from-ISO installation procedure. You will find many step-by-step description (, <https://itsfoss.com/install-linux-in-virtualbox/>) of this, including Videos (Ex: <https://www.youtube.com/watch?v=QbmRXJJKsvs>) .
 - a. **Please ensure that number of interfaces are 4 and configured according to the figure above.**
2. TGen-VM: The details of installation of the OVA can be found here: https://trex-tgn.cisco.com/trex/doc/trex_vm_manual.html, under TRex inside Virtual Box.
 - a. **Please ensure that number of interfaces are 4 and configured according to the figure above.**

The names of the interfaces maybe different - for example on Ubuntu it may be enp0s2/3/4...

Step-3: Copying SSH keys between VMs.

To ensure smoother access, ensure DUT-VM can ssh to TGen-VM without password-probe, copy the SSH public keys. The step to follow:

1. If no identity is created yet (ex: if you don't find id_rsa.pub in ~/.ssh folder) Run ssh-keygen. It will generate the necessary identify.
2. Use ssh-copy-id command. ssh-copy-id username_of_tgen_vm@ipaddress_of_tgen_vm

Step-4: Installing VSPERF on DUT-VM

Instructions to install and configure (including tuning) VSPERF can be found [here](#)

You may have to configure hugepages before running the install script - by running following commands:

1. mkdir -p /mnt/huge
2. mount -t hugetlbfs nodev /mnt/huge
3. echo "vm.nr_hugepages=64" >> /etc/sysctl.conf

Step-5: Updating T-Rex on TGen-VM

Download the latest T-Rex: wget --no-cache <http://trex-tgn.cisco.com/trex/release/latest>. to the home (/home/trex) folder.

Untar it.

Step-6: Docker Installation on DUT-VM

Install Docker on DUT-VM. You can follow the steps described [here](#) for Ubuntu.

Step-7: Running Tests

Instructions to run tests can be found [here](#). This would be covered during the training session.

Option-2: Experimenting with Single Physical System

In this scenario, both the DUT (vswitch with/without VNFs) and the Traffic-Generator run on same System.

1. vsperf distribution: Downloaded from [here](#)
2. OS: Linux (ex: centos, fedora, suse, ubuntu, RHEL)
3. Hypervisor: Qemu (> 2.3)
4. RAM: 8-16GB
5. TGen-VM: TRex-VM (VSPERF includes this image as part of its artifacts - https://artifacts.opnfv.org/vswitchperf/vnf/vloop-vnf-ubuntu-16.04_trex_20180209.qcow2)
6. VNF: vloop-VNF (VSPERF includes this image as part of its artifacts - http://artifacts.opnfv.org/vswitchperf/vnf/vloop-vnf-ubuntu-14.04_20160823.qcow2)

Option-3: Experimenting with Two Physical Systems

In this scenario, DUT runs on first system and the Traffic-generator runs on a different system. (Note: The second system could be a hardware traffic-generator - Spirent, Ixia, Xena, etc.)

System-1:

1. vsperf distribution: Downloaded from [here](#)
2. OS: Linux (ex: centos, fedora, suse, ubuntu, RHEL)
3. Hypervisor: Qemu (> 2.3)
4. RAM: 8-16GB
5. NICs: 2 for data-traffic
6. VNF: vloop-VNF (VSPERF includes this image as part of its artifacts - http://artifacts.opnfv.org/vswitchperf/vnf/vloop-vnf-ubuntu-14.04_20160823.qcow2)

System-2:

There are multiple options here - user can choose any one of the following

1. Hardware Traffic Generator: Ixia, Spirent, Xena, Etc.
2. T-Rex: Instructions to install can be found [here](#)
3. Moongen: Instructions to install can be found [here](#)
4. NICs: 2 for data-traffic.