spirent™

Spirent TestCenter Virtual™ on QEMU Quick Start Guide

Procedures to guide the first-time user from installation through running a simple Layer 3 traffic test using Spirent TestCenter Virtual on the QEMU platform.

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Contents

Virtual Controller Setup

Refer to these guides for detailed instructions on how to set up these types of Virtual Controllers, and how to install the Virtual Licenses on the Virtual Controllers:

Spirent TestCenter™ Virtual Controller Set up Guide (DOC10606)

Spirent Virtual Controller – VM (USB dongle or UUID versions) Quick Start Guide (DOC10586)

These guides are available in the Spirent TestCenter Documentation installer (.exe) and on the CSC/Knowledge Base (https://support.spirent.com). Use the DOC number (noted above) to find the guide you need easily.

Important: Without proper installation of the Virtual Controller and Virtual Licenses, you will not be able to run tests on your virtual ports.

QEMU Set up and Installation

QEMU Installation

- Please check the Spirent TestCenter *Release Notes* for the current list of supported Linux distributions and versions.

- You must have root privileges to run the installation

  - e.g. su root or sudo bash

- Create a folder for which you will grant write privileges on the target machine to install the package

  - e.g. mkdir /spirent; cd /spirent

- Copy the Spirent TestCenter QEMU package to the target machine

- tar -xvzf the archive

  tar -xvzf Spirent_TestCenter_Virtual_QEMU_<version>.xxxx.tgz

  cd stcqemu

Installation of QEMU and Bridge Utilities

- QEMU and some additional utilities will be installed on your machine.
  You can skip this step, if you have installed a previous QEMU release.
  Note: You must have an internet connection for this step.

- Run the following script as root:

  ./installer/install_pkgs.py -n <NTP_SERVER_IP>

  - e.g. installer/install_pkgs.py -n 10.10.10.11

Network Configuration

- Use the following procedure to configure the network settings on the target machine.

  Note: This procedure cannot be performed remotely, because it causes the network interfaces to be momentarily disabled. The network configuration must be set up locally, using root privileges.

- Network Set up

  Run the following script as root:

  installer/setup_mgmt_bridge.py -n <NET_INTERFACE> -b <ADMIN_BRIDGE>

  - e.g. installer/setup_setup_mgmt_bridge.py –n eth0 –b admin

  This configures the host to use eth0 as the physical port to control the admin interfaces of the VMs.

QEMU Installation – Finished

○ Check the environment after the installation by using **ifconfig**. If the configuration was successful, the following devices will have been created:

- <ADMIN_BRIDGE>

  This device should have the IP address of the host.

- brctl show

  This should show the network interface enslaved on the ADMIN_BRIDGE.

VM Launcher Script

Spirent provides a script to make the job of configuring the VMs, bridges, and interfaces easier. This section describes the general usage of the scripts you use to configure and launch VMs.
Help is available with the -h option.

- **./launchvm.py**

  This script makes a copy of the master VM image and launches a VM using the default setting in the /usr/spirent/stcqemu/default.txt file.

- **./launchvm.py –m**

  The –m option runs an interactive menu that allows you to change the default parameters of the launching VM.

- **./launchvm.py –mc**

  The –mc option runs the interactive menu; it will also connect you to the console of the VM after it is launched. You can release from the console connection by pressing the **Ctrl** and **]** keys simultaneously.

Minimum CPU and Memory STCv VM requirements

- STCv 5GE and higher multi-port VM (where P is the number of ports):

  Memory = P * 512MB

  CPU = P * 2 + 1 cores or processors (=> 2Ghz)

- STCv 1GE and 2.5GE multi-port VM (where P is the number of ports):

  Memory = P * 512MB

  CPU = P * 2 cores or processors (=> 2Ghz)

- STCv 100M multi-port VM (where P is the number of ports):

  Memory = P * 512MB

  CPU = P * 1 cores or processors (=> 2Ghz)

Note: If the Driver Mode is dpdk, the minimum configuration is **1G RAM** and **2 CPU** cores per test port.

Example - 2 10GE port configuration on one STCv VM:

  Memory: 2 * 512MB = 1024MB

  CPU: 2 * 2 + 1 = 5 cores or processors

launchvm.py Menu

Spirent Virtual Machine Launcher

1. Name stcvm1
2. Launch
3. Exit
4. CPUS 3
5. Memory 1048576
6. Speed 1G
7. Dest Image stcvm1.img
8. Source Image latest.img
9. Admin Bridge mgmt
10. Test Bridge virbr0
11. Test Network
12. Test Device
13. NTP Server 10.180.28.173
14. NTP6 Server
15. Emulator /usr/bin/qemu-system-x86_64
16. Address Mode dhcp
17. IP Address
18. Netmask
19. Gateway
20. IPv6 Address Mode

launchvm.py Menu (continued)

21. IPv6 Address

22. IPv6 Gateway

23. IPv6 Prefix Length

24. Ports 2

25. Port Type host

26. Telnet Service off

27. Driver sockets

Selection:

Note: If option 24 (Ports) is greater >1, you may have multiple comma separated bridges assigned in option 10 (Test Bridge):

testbridge1,testbridge2,testbridge3 etc.

Sample Configuration – Back to Back

These commands will launch two VMs, named stcvm1 and stcvm2, with their two test interfaces on the default bridge virbr0.

- ./launchvm.py

- ./launchvm.py

- virsh list

Sample Configuration – External Interface

The following set of commands configures a VM to send traffic to an external test port eth1, which is attached to bridge hostbr.

- brctl addbr hostbr

- brctl addif hostbr eth1

- ./launchvm.py –m

Select hostbr at the test bridge for a port.

Sample Configuration – PCI Passthrough

PCI passthrough allows direct mapping of PCI devices to the VM. The VM bypasses the hypervisor to send packets directly to the NIC.

- ./launchvm.py --driver dpdk --port-type hostdev --test-dev 0000:02:00.0,0000:02:00.1 --ports 2 --cpus 4

Note: Spirent TestCenter Virtual only supports PCI passthrough when using the DPDK driver.

Please refer to the readme.txt included with the launcher for detailed information.

Sample Configuration – Passthrough with SR-IOV

SR-IOV VFs may be used with PCI passthrough by specifying hostdev or sriovpool options.

The following command creates a VM with ports mapped to PCI address of the VFs on the SR-IOV NIC.

- ./launchvm.py --driver dpdk --port-type hostdev --test-dev 0000:04:10.1,0000:04:10.3 --ports 2 --cpus 4

SR-IOV VFs can also be assigned from a pool.

- ./launchvm.py --driver dpdk --port-type sriovpool --test-net x520_net,x520_net --ports 2 --cpus 4

Please refer to the readme.txt included with the launcher for detailed descriptions of all options.

Logging in to a Running VM

- Each VM instance has a console which you can access as follows:

  ./launchvm.py –c

  or

  virsh console <VM_NAME>

  Log in to the admin account (admin / spt_admin).

  This allows you to display or set the configuration parameters, such as the admin IP address.

  Configuration instructions are in the next section.

Configuring a Spirent TestCenter Virtual Machine

Spirent TestCenter Virtual Admin

Note: This section may not be required if all IP address options were used when running the create_vm.sh script.

- Each STC-Virtual instance acts as a Spirent TestCenter chassis

- Login: admin/spt_admin

- The commands are detailed on the following pages

- Complete these steps:

  - Configure IP Address. This address must be reachable from the PC that the Spirent TestCenter GUI resides on. It can be DHCP or Statically defined.

  - NTP Server. For time synchronization you need to point this to an NTP Server. The License server is also an NTP server and can be used.

  - After any changes, you must issue the **activate** command and then **reboot** the Spirent TestCenter Virtual Machine.

Spirent TestCenter Virtual Admin Commands

- **Address Mode** – uses DHCP or static IP for the STCv VM
  - mode <none | static | dhcp>

- **IPv6 Address Mode** – uses DHCP, static, or SLAAC IP for the STCv VM
  - ipv6mode <none | static | dhcp | auto>

- **IP Address** – the IP address of the STCv VM (if mode is DHCP, this is automatically set)
  - ipaddress <ip>

- **IPv6 Address** – the IPv6 address of the STCv VM (if mode is DHCP, this is automatically set)
  - ipv6address <ipv6>

- **IPv6 Prefix Length** – the prefix length of the IPv6 address for the STCv VM
  - ipv6prefixlen <prefix_length> i.e. 64

Spirent TestCenter Virtual Admin Commands (continued)

- **IPv6 Gateway** – the IPv6 gateway for the STCv VM (if mode is DHCP, this is automatically set)

  - ipv6gwaddress <ipv6>

- **Netmask** - the netmask of the STCv VM (if mode is DHCP, this is automatically set)

  - Netmask <netmask> i.e. 255.255.255.0

- **Gateway** - the gateway for the STCv VM (if mode is DHCP, this is automatically set)

  - gwaddress <ip>

- **NTP Server** – the IP address of the NTP server used to synchronize the VM instances

  - ntp <ip>   The STC virtual controller may be used as an NTP server.

- **Telnet service** – enables telnet access. The default is *off* - which only allows ssh access.

  - Telnetd <off|on>

Spirent TestCenter Virtual Admin Commands (continued)

- **Portgroupsize** – the number of ports per port group that this STCv VM will support.
  - portgroupsize <1 - 10>

  Note: Do not change the portgroupsize to a number larger than the number configured in the launchvm.py script.

- **Driver Mode** – sockets is the default, dpdk can be chosen for performance.
  - driver <sockets | dpdk>

  Note: dpdk requires a minimum 1G of RAM and 2 CPU cores for each test port.

- **Speed** – the interface port speed that the STCv VM will support.
  - Speed <100M | 1G | 2.5G | 5G | 10G | 25G | 40G>

- **Promiscuous Mode** – enables all traffic to be received regardless of MAC address
  - Promisc <on | off>

Spirent TestCenter Virtual Admin Notes

- Make sure you configure the **Virtual Controller** properly. The STC port VMs cannot be reserved unless you have a Virtual Controller available with valid Spirent TestCenter Virtual Platform, Port and Feature licenses.

- If you are using DHCP to resolve the STC VM management port IP, make sure you use **ifconfig** to note the STC management IP addresses. You will use these IP addresses as the STCv chassis IP addresses in the Spirent TestCenter GUI.

- After you make any changes to the STC port VMs, you must use the commands **activate** and then **reboot** to apply the changes.

Using Spirent TestCenter GUI for STC Virtual Ports

TCP/UDP ports used by the STC GUI and STCv

- Ensure that the following TCP/UDP ports have been opened in any firewall between the Spirent TestCenter VM and GUI/BLL:

Ingress TCP port ranges:

- `TCP port 40004: chassis-level`

- `TCP port 51204: port group-level`

- `TCP port 1666: for Spirent TestCenter upgrade through STC UI (use Authentication mode to lock down this port if required by your IT dept)`

- `TCP port 9090: for chassis controller REST API (was used by some TEMEVA apps)`

- `TCP port 22: SSH for admin console access`

Egress TCP and UDP port ranges:

- `UDP port 123: NTP`

- `TCP ports 49100 – 65535: Ephemeral TCP/UDP port range`

Connect to the STC Virtual Ports using the GUI

- Launch a compatible Spirent TestCenter GUI version

- Add the chassis IPs of the STC virtual ports

- Select the STCv ports and reserve them
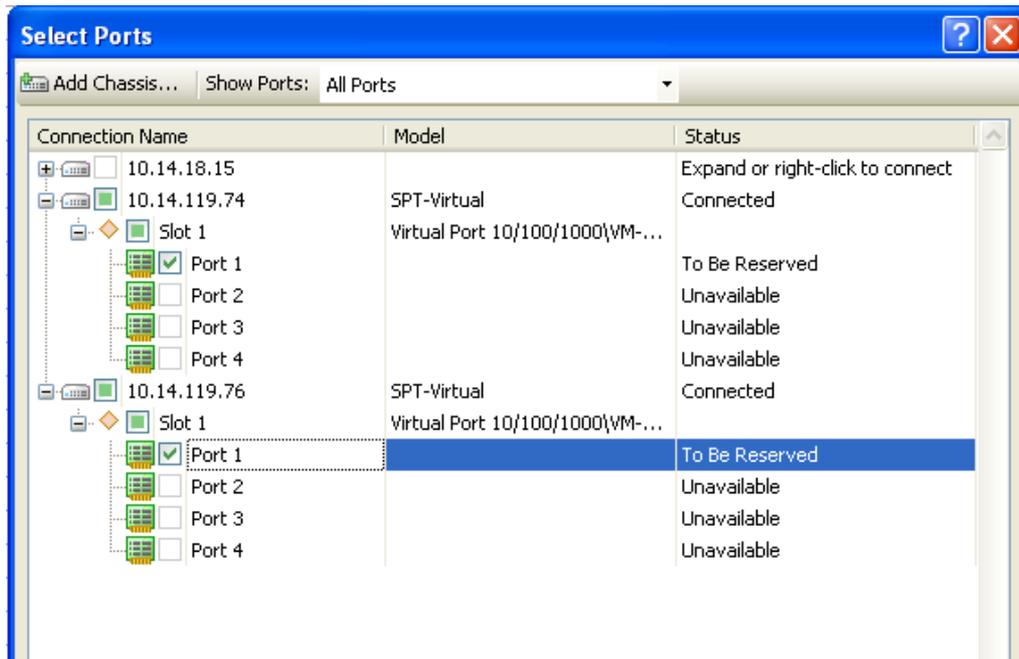
Use Physical MAC Address on Devices

- You must select the **Use Source MAC address from Physical Interface** option to successfully send traffic across the vSwitch. The GUI option on devices to use the physical MAC address of the network adaptor assigned to the VM is shown below.
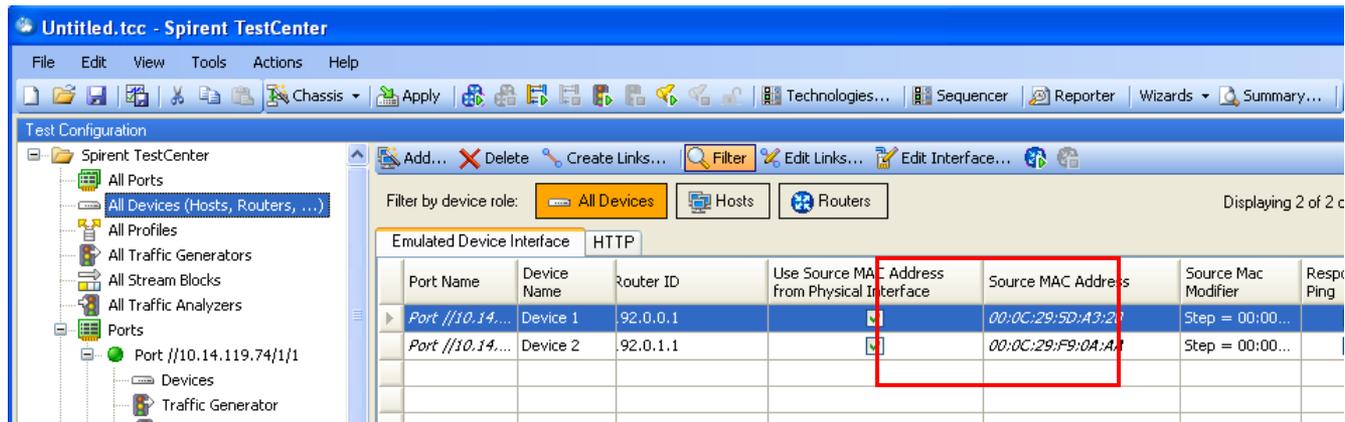
- Use the right-click **Start MAC Learning** option on the selected device(s) prior to running traffic, or right-click the **All Devices** icon in the tree and select **Start MAC Learning on All Devices**.

How to Contact Us

To obtain technical support for any Spirent Communications product, please contact our Support Services department using any of the following methods:

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Information about Spirent Communications and its products and services can be found on the main company website at https://www.spirent.com

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