

RackSim™ Virtualized Data Center Simulation



Solution Highlights

- Emulates large number of virtualized server hosts running various hypervisor types such as ESX and KVM
- Provision VMs with various profiles
- Emulates VM Manager to generate various VM events such as start, stop, deploy, destroy, and migrate
- Responds to VM events such as deploy, start, stop, destroy, and migrate
- Realistic NS-EW application traffic from VMs
- VM migration at scale to verify disaster recovery
- Measure network convergence time
- Lower CAPEX and OPEX for large data center validation by replacing real host

Technology Overview

Server and storage virtualization technology has revolutionized the data center in recent years. With the introduction of software defined networking (SDN), cloud service providers (CSPs) can now leverage even greater benefits from their data centers. New categories of data center switching/inter-connect devices are also emerging. These devices are capable of connecting servers, virtual assets, and networks, as well as storage devices. The software-defined virtual data center provides:

- Application defined networking (ADN) – application-specific network optimization
- Cloud federation – ability to share resources/services across clouds
- Dynamic provisioning – increase virtual machine (VM) capacity to handle traffic demands
- Workload learning – how fast network learns about changing workload and reacts to the change
- Resource optimization – latency and load balancing optimization
- Malice containment – firewalling and security
- Simplified management – centralized management of the network provides greater control of all the above

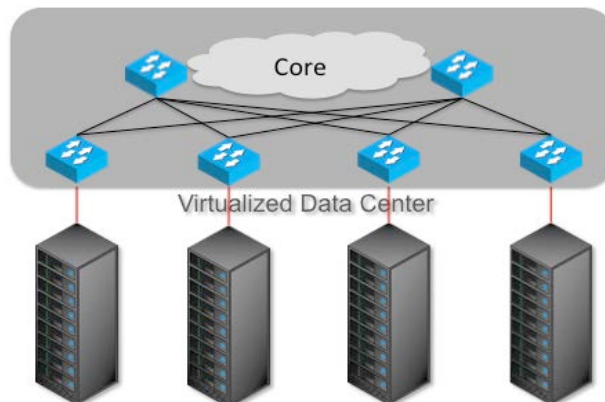


Figure 1 – Virtualized Data Center

RackSim™ Virtualized Data Center Simulation

Ixia RackSim is a "first-of-its-kind" test solution that emulates a virtualized data center environment with all of its complexities. A single RackSim appliance can simulate a rack full of servers/hosts with various hypervisor flavors. The emulated hypervisors can be setup to host simulated virtual machines with all VM events, in addition to generating traffic from the simulated VM.

Using RackSim, a user can verify the functionality of the data center assets, test-drive massive configurations involving virtualized assets, and model a variety of environments. RackSim's functional testing scope spans the full virtual data center and cloud-based service delivery model, including:

- Large-scale cloud computing installations
- Virtualized server hosts, with virtual machines
- Disaster recovery scenarios
- On-demand provisioning scenarios
- Network virtualization models
- Shared resources/services (federated cloud)
- Application-specific traffic management/optimization

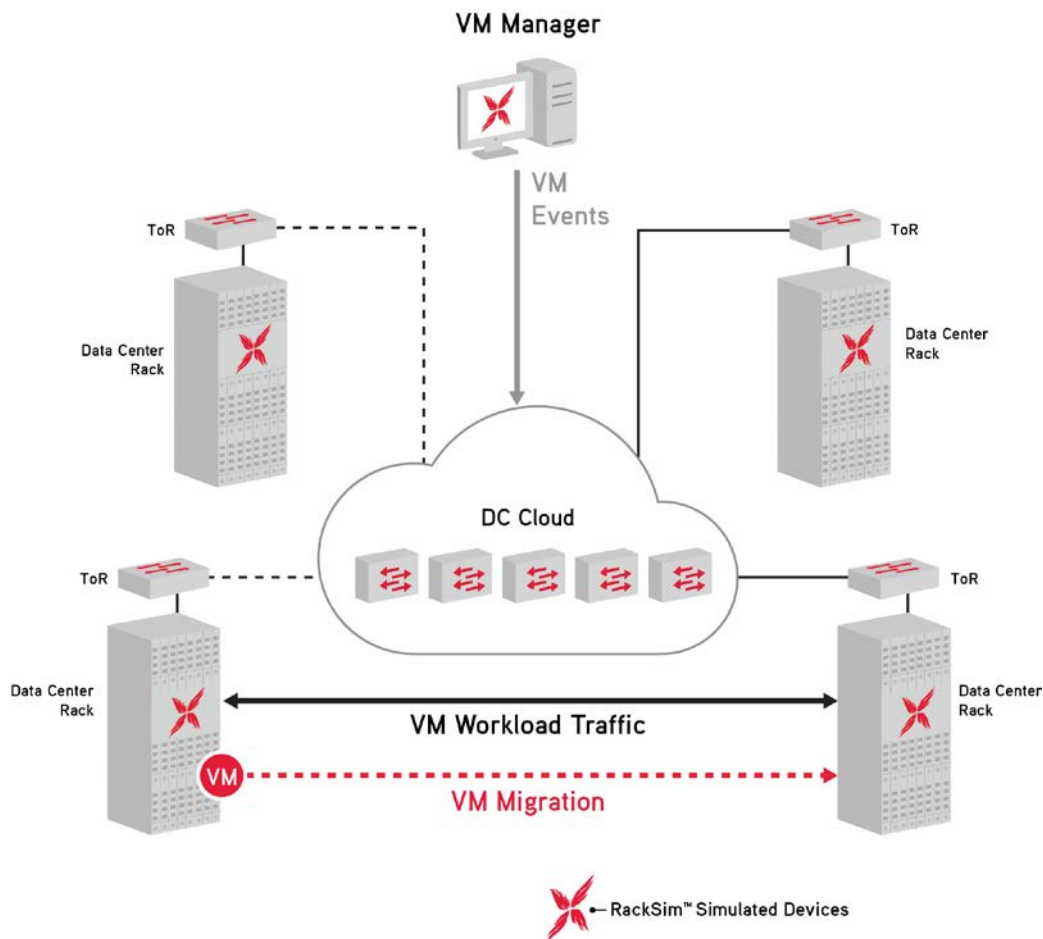


Figure 2 – RackSim Solution

Key Features

- Emulate thousands of VMs from a single 2U appliance
- Graphical configuration and representation of the test topology

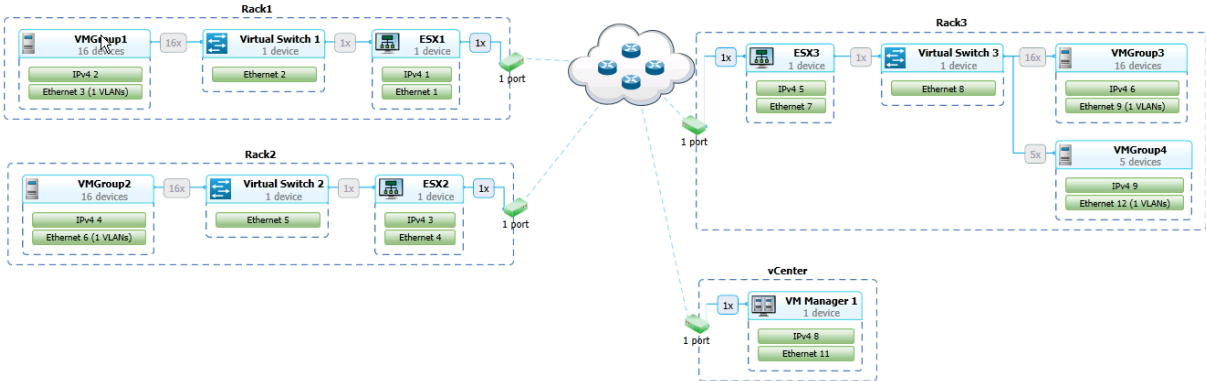


Figure 3 – RackSim Topology

- Perform various events on VMs such as Start, Stop, and Migrate from emulated VM Manager

Command Type	Command String
Execute	Rack Simulation Power Off VMs
Execute	Rack Simulation Power On VMs
Execute	Rack Simulation Migrate VMs
Execute	Rack Simulation Migrate VMs
Execute	

Figure 4 – VM Manager Commands

- Easily migrate VM(s) with a single click from emulated VM Manager

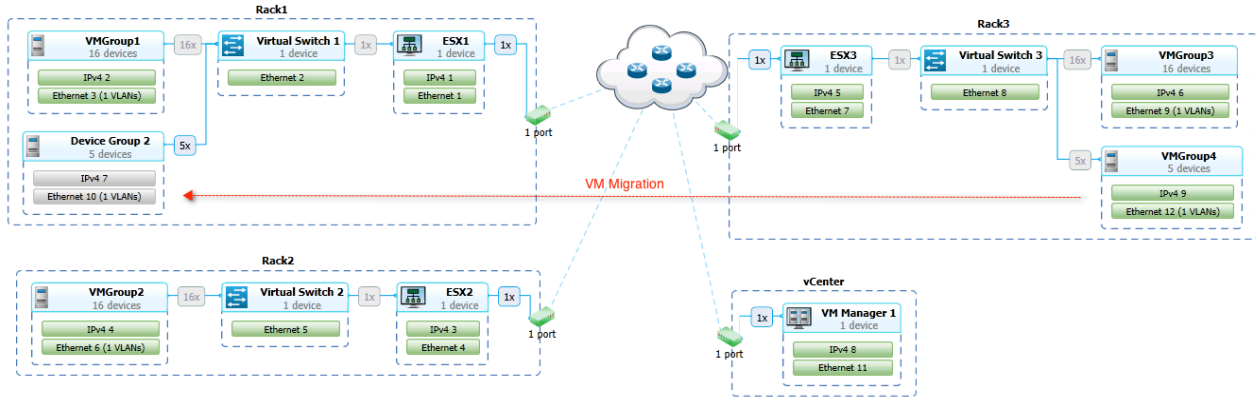


Figure 5 – VM Migration in Action

- Real-time high-level summary of test topology state

Hypervisor and VMs Statistics						
Hypervisor	Total VMs Deployed	VMs Power On	VMs Power Off	VMs Suspended	VMs Moving	
1 ESX1\esx_rack1_group1_session0	21	16	0	0	5	
2 ESX2\esx_rack2_group4_session0	16	16	0	0	0	
3 ESX3\esx_rack3_group7_session0	21	16	0	0	0	

Figure 6 – Hypervisor and VM Statistics

- Convergence Time Measurement View provides VM Migration DP and CP convergence time

Convergence Time Measurements-Paged							
Key	Guest IP	Frames Received	Frames Received Rate	DP convergence time (ms)(t1-t2)	CP convergence time (ms)(t1-t0)		
1	1,728,118,799	103.1.0.15	4,036,473	998.500	-4,002,562.436	0.173	
2	1,728,118,800	103.1.0.16	4,036,473	999.000	-4,002,561.436	0.251	
3	1,728,118,801	103.1.0.17	4,036,473	999.000	-4,002,561.436	0.332	
4	1,728,118,802	103.1.0.18	4,036,473	999.000	-4,002,561.438	0.413	
5	1,728,118,803	103.1.0.19	4,036,473	999.000	-4,002,561.439	0.494	
6	1,728,118,804	103.1.0.20	4,036,473	999.000	-4,002,561.438	0.575	
7	1,728,118,805	103.1.0.21	4,036,473	999.000	-4,002,561.439	0.657	
8	1,728,118,806	103.1.0.22	4,036,473	999.000	-4,002,561.438	0.740	
9	1,728,118,807	103.1.0.23	4,036,472	998.500	-4,002,561.437	0.823	
10	1,728,118,808	103.1.0.24	4,036,472	998.500	-4,002,561.438	0.904	

Figure 7 – VM Convergence View

Specifications

Software

Area	Features
Hypervisor	<ul style="list-style-type: none"> • ESX 4.0 • KVM 1.2
VM Manager	<ul style="list-style-type: none"> • vCenter (emulated) • Virt Manager (emulated, external)
VM Event	<ul style="list-style-type: none"> • Start, Stop, Deploy, Migrate (emulated VM Manager) • Start, Stop (external VM Manager)
Statistics	<ul style="list-style-type: none"> • Convergence measurement • Hypervisor and VM statistics

Hardware

Appliance Models	10G8S
Hardware Specification	
Number of Ports	8 x 10GE SFP+
Number of Appliance Nodes	4
Number of Users	Up to 4 users
Physical	
Form Factor	2U rackmount
Mounting Rails	2U rail set, quick/quick, for 2U 17.2"W; the rail will fit a rack between 26.5" and 36.4" deep that follows the EIA industry standard keep-out zone
Height	3.5" (89mm)
Width	17.2" (437mm)
Depth	28.5" (724mm)
Gross Weight	85 lbs (38.6kg)

Power Supply	
Description	Redundant 1400W high-efficiency power supply with PMBus
AC Input	1200W: 100 - 140V, 50 - 60Hz, 10.5 - 14.7 Amp 1400W: 180 - 240V, 50 - 60Hz, 7.2 - 9.5 Amp
DC Output +5V Standby	6 Amp
DC Output +12V	100 Amp @ 100-140V 116 Amp @ 180-240V
Operating Environment / Compliance	
RoHS	RoHS compliant
Environmental Specification	Operating temperature: 10°to 35°C (50°to 95°F) Non-operating temperature: -40°to 70°C (-40°to 158°F) Operating relative humidity: 8% to 90% (non-condensing) Non-operating relative humidity: 5 to 95% (non-condensing)

Product Ordering Information

941-1001

RackSim 10GS8, 2U Appliance, 8x10GE, SFP+ test interfaces; REQUIRES (8) SFP+ transceivers, (948-0013) 10GBASE-SR/SW or (948-0014) 10GBASE-LR/LW.

930-4601

RACKSIM, Rack Simulation Software Solution. Enables Rack Simulation functionality of various Hypervisors, VM Managers and VM events. Requires purchase of 941-1001 - RackSim 10G8S Appliance.