

PktBlasterTM SDN

Real World Network Emulation Testing and
Performance Benchmarking of SDN Controllers



Software based solution emulates large scale SDN networks with thousands of nodes and millions of flows. Industry's first tool aligned with IETF SDN Controller performance benchmarking draft.

KEY FEATURES

- Real world Network Emulation for SDN and legacy network elements
- Diverse real-world application traffic emulation
- Robustness tests simulate real-time failure scenarios to determine controller behavior
- Controller clusters support*
- Flow-mod and Packet-out based performance benchmarking
- Network Path Trace support
- Network Impairment support
- Supports OpenFlow (1.0 & 1.3)
- Programmatic API support for test automation
- Intuitive and user-friendly GUI

APPLICATIONS

- **Equipment Vendors**
 - Development Testing
 - QA Testing
- **Service Providers**
 - Proof of Concept
 - Acceptance Testing
- **Enterprise IT**
 - Piloting
 - Benchmarking

KEY BENEFITS

- Significant reduction in testing cycle duration
- Accelerate network applications development
- Reduce time-to-market of vendor offerings
- One stop test solution for functionality and performance
- Lower investment on test infrastructure

REPORTS & STATISTICS

- **Reporting and Analysis**
 - Comprehensive
 - Customizable
- **Test Statistics**
 - Complete Network visibility - Flow and device level statistics for real-time analysis and quick troubleshooting



Veryx PktBlaster SDN Controller Test is Industry's first integrated test solution for Benchmarking SDN Controller Performance and Emulating SDN networks in a single box. It runs on a Veryx hardware platform or on suitable commodity servers. It supports diverse real-world application traffic for performance testing and emulation. Further, the holistic reporting feature of the tool enables detailed analysis of the test results.

PktBlaster SDN Controller Test is Industry's first tool aligned with IETF SDN Controller performance benchmarking draft.

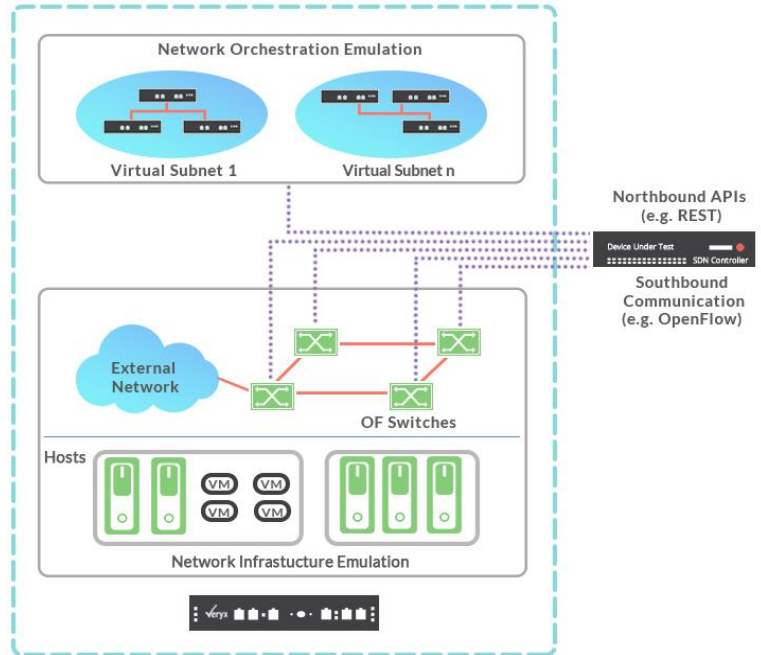


Figure 1: PktBlaster SDN Controller Test Deployment

SOLUTION HIGHLIGHTS

- **Benchmarking SDN Controller Performance**
 - Flow set-up rate and flow set-up time
 - Supports up to 1000 switches and 1,000,000 flows
 - Individual and consolidated test reports
 - Secure Channel (TLS) Connection Support*
 - Real-time network simulation using different switch groups (supporting different OF version and traffic types)
 - Accurate time-stamp based latency computation
 - Configurable time delays for test stability and accuracy of results
 - Configurable delay in generating barrier reply messages
 - Controller cluster testing*
 - Controller's Switch Discovery Time
 - Simulating multiple OF versions with different traffic types for a single test

- **SDN Network Emulation**
 - Tests any controller application
 - Emulates up to 100 SDN devices with 1,000,000 flows and 10 traffic end points
 - GUI based real-world network emulation
 - Ready-to-use predefined topologies
 - Flexibility to create user-defined topologies
 - Emulates multiple traffic flows from a single emulated port
 - Support for Flow Trace. Traffic flow reflected in GUI
 - Simulation of network failures (link level and switch level)
 - Captures impact on path re-provisioning capabilities of controller

* roadmap

The PktBlaster SDN Advantages

Precise Verification – PktBlaster SDN Controller Test enables verification of SDN functionalities including controller southbound and northbound communication, performance and scalability.

Outstanding Flexibility - PktBlaster SDN Controller Test provides the flexibility to define custom network topologies to test the controller. The custom network topology can have a mix of end-nodes (e.g., host or virtualized servers) and switches supporting OpenFlow and Non-OpenFlow protocols.

Superior Reporting and Analysis - The user can generate individual or consolidated test reports. Comparative test reports reflecting the performance of same controller for multiple configurations or different controllers for same configuration can be obtained.

Detailed Test Statistics - Veryx PktBlaster SDN Controller Test captures a wide range of controller metrics. This includes but not limited to flow set-up rate, flow set-up time, flow statistics, device level and port level statistics.

User-Friendly and Intuitive Test Interface - Veryx PktBlaster SDN Controller Test supports user friendly GUI for configuration and testing, and programmatic interface (REST API) for automation of test. Further, PktBlaster SDN Controller Test GUI comes up with options to create, save and load user defined test topologies. The GUI also supports creation of various real-world application data for testing the performance and functionality.

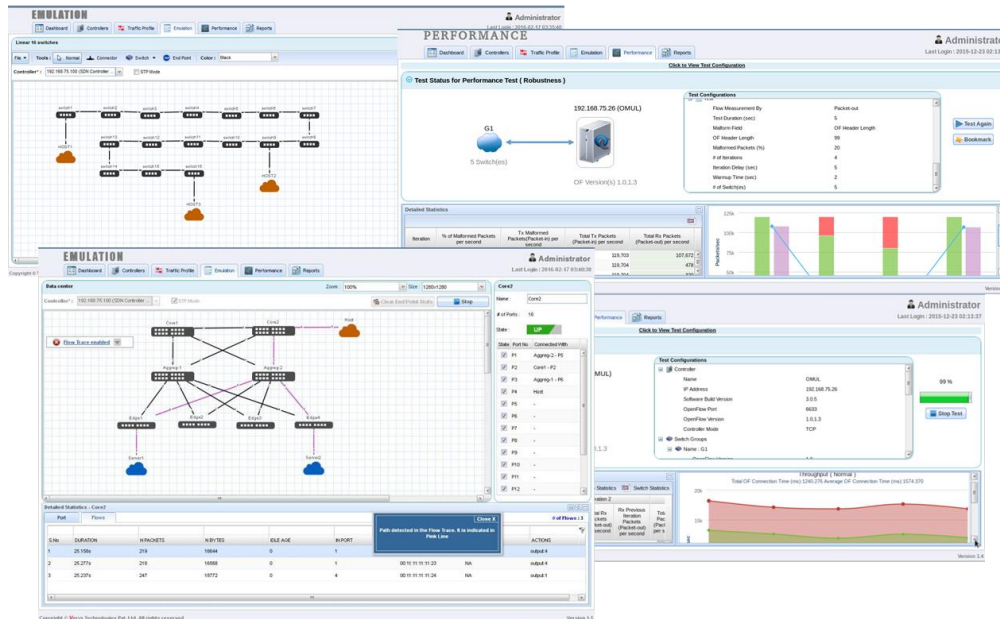


Figure 2: Veryx PktBlaster SDN Controller Test – Performance Testing and Emulation

PKTBLASTER SDN AT A GLANCE

Coverage	<ul style="list-style-type: none"> Aligned with IETF SDN Controller Benchmarking draft and supports <ul style="list-style-type: none"> Performance Benchmarking Network Emulation 	Traffic Generation	<ul style="list-style-type: none"> Predefined traffic profile templates User Customizable Traffic templates Flow modifier support
Test Scalability	<ul style="list-style-type: none"> Simulates up to 1000 switches and 1,000,000 flows 	Test Flexibility	<ul style="list-style-type: none"> User Configurable Test Iterations and Duration User Configurable Time Delays for Tests & Control Messages
Performance Benchmarking	<ul style="list-style-type: none"> Flow Response Rate Measurement Flow Response Time Measurement Robustness Tests - Controller Characterization under Network Exceptions 	Test Automation	<ul style="list-style-type: none"> Rest API for Automated Testing and Continuous Integration
Network Emulation	<ul style="list-style-type: none"> Predefined and User Customizable Network Topologies Network Path Traceability Network Impairments Controller and Application Testing Host and Network Endpoints Simulation 	Reporting & Analysis	<ul style="list-style-type: none"> Comprehensive Performance Test Statistics Detailed Switch/Flow Statistics
OpenFlow Features	<ul style="list-style-type: none"> OpenFlow 1.0 & 1.3 TCP & TLS Connection Support Heterogeneous Network Simulation (OF 1.0 & 1.3) Controller Clustering Switch Capabilities Configuration 	Deployment & Usage	<ul style="list-style-type: none"> Software Available as <ul style="list-style-type: none"> Virtualbox/KVM VM Bare Metal Installer Test Management via Web UI <ul style="list-style-type: none"> Firefox Chrome

** roadmap*

MINIMUM REQUIREMENTS

- Operating System:** Ubuntu 12.04.4 - 64 Bit
- CPU :** Xeon Dual Core
- RAM:** 16 GB

ORDERING INFORMATION

PRODUCT	PART NUMBER
PktBlaster SDN Controller Test – Performance Benchmarking Software	PBS-SDNCT-PB-B
PktBlaster SDN Controller Test – Emulator Software	PBS-SDNCT-EMU-B

About Veryx Technologies

Veryx Technologies is a provider of innovative testing, automation and monitoring solutions for network service providers, cloud service providers, data centers, Enterprise IT and network equipment vendors. Veryx offers solutions for network testing, performance monitoring and equipment testing applications for technologies such as Carrier Ethernet, IP, Cloud, SDN, NFV and Smart Networks.

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