

Spirent TestCenter

OpenFlow Controller Emulation

Features

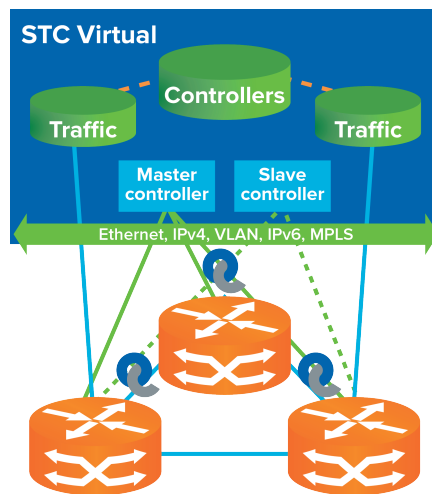
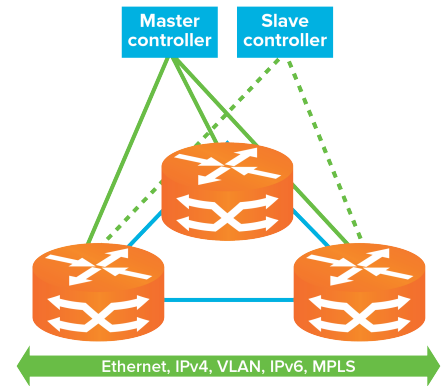
- With Spirent's high-scale of Controllers, Flows and Switches, we can test a large switch network with large amounts of flows and traffic analysis on each data path for verification.
- Test all aspects of your OpenFlow 1.3 network design with our high scaled and fully featured controller including features such as: Multi-Table, Group Table, Metering, Master & Slave
- Validate all type of Flows including IPv4, IPv6, VLAN, MPLS, ARP with Spirent's comprehensive traffic generation and routing support.
- Test in a secure network environment under heavy load with Spirent's support of TLS 1.2 secure OpenFlow Channel.

Benefits

- Test your Switches' Test Flows under load. Spirent's OpenFlow Controller Emulation works independently of the data ports but with full knowledge of what is defined.
- Test your large Switch network in both directions. Spirent's Bound Flow Editor combined with the Switch Topology Discovery automatically sets up Flows on all switches in both directions.
- Test Controller failover with OpenFlow's master-slave function. Spirent's Command Sequencer can take multiple Controllers defined with specific roles, change the roles and bring the controllers up and down over time.
- Test Flow add rate and validate. Spirent can measure the flow-add rate and then verify the flow was added or modified with traffic defined on both sides of the switch.

Spirent's OpenFlow controller emulation is an industry leading solution that allows companies to benchmark flow scalability and forwarding performance of High Speed Ethernet in addition to virtual OpenFlow network devices. OpenFlow controller emulation solution delivers the required empirical data to determine if OpenFlow compatible network devices and Software-Defined Networking (SDN) applications can deliver business benefits without degrading the user experience.

As networks evolve to being software-defined, OpenFlow devices must co-exist with traditional Ethernet switches running VLANs, MPLS, and routing protocols like BGP, OSPF, and IS-IS. OpenFlow network devices must also prove scalability and performance across multi-site data centers, virtualized cloud computing and big data networks.



Spirent's OpenFlow controller emulation is able to stress-test OpenFlow network switches, providing insight into the throughput and capacity under load. It measures performance, availability, security and scalability of OpenFlow network devices and end-to-end SDN application scale by defining millions of flows and exercising them with traffic patterns and behavior.

OpenFlow Flows/Meter Mods/Group Entries

Select Devices: Add Group Entry Add Group Action Bucket Delete

Name	Active	Group ID	Group Type	OpenFlow Switches	Weight	Watch Group	Watch Port	Group Action Type	Output Group ID	Output Port Action Type	Output Port Number
GroupEntry1	✓	1	All	Select switch	0	FFFFFFFF	FFFFFFFF	Group, Output	1	Port Number	1
ActionBucket1	✓				0	FFFFFFFF	FFFFFFFF	Group, Output	2	Port Number	2
ActionBucket2	✓				0	FFFFFFFF	FFFFFFFF	Group, Output	3	Port Number	3
ActionBucket3	✓				0	FFFFFFFF	FFFFFFFF	Group, Output	4	Port Number	4
ActionBucket4	✓				0	FFFFFFFF	FFFFFFFF	Group, Output	5	Port Number	5
ActionBucket5	✓				0	FFFFFFFF	FFFFFFFF	Group, Output	6	Port Number	6
ActionBucket6	✓				0	FFFFFFFF	FFFFFFFF	Group, Output	7	Port Number	7
ActionBucket7	✓				0	FFFFFFFF	FFFFFFFF	Group, Output	8	Port Number	8
ActionBucket8	✓				0	FFFFFFFF	FFFFFFFF	Group, Output	9	Port Number	9
ActionBucket9	✓				0	FFFFFFFF	FFFFFFFF	Group, Output	10	Port Number	10
ActionBucket10	✓				0	FFFFFFFF	FFFFFFFF	Group, Output	11	Port Number	11
ActionBucket11	✓				0	FFFFFFFF	FFFFFFFF	Group, Output	12	Port Number	12
ActionBucket12	✓				0	FFFFFFFF	FFFFFFFF	Output	Port Number	13	
ActionBucket13	✓				0	FFFFFFFF	FFFFFFFF	Output	Port Number	13	

Name	Value
Frame	
Table (int)	0
Idle Timeout (int)	0
Hard Timeout (int)	0
Priority (int)	32768
Match	
IPV4 Source (nw_src)	192.0.0.1
IPV4	False
Use Mask (int)	255.255.255.255
Mask	255.255.255.255
Instructions	
Write-Metadata (write_metadata)	
Metadata (int)	0
Metadata Mask (hex)	FFFFFFFFFFFFFFFF
Write-Action (write_action)	
Actions	
Modify VLAN ID (mod_vlan_id)	
Meter (meter)	
Meter ID (int)	1

Applications

- High Speed Ethernet networks: Test end-to-end performance and scale of OpenFlow networks by populating multi device forwarding tables, physical and virtual, with several thousands of flows combined with end-to-end traffic benchmarking.
- Hybrid Ethernet switches: Test switch ability to process OpenFlow flow traffic in combination with Spanning Tree, BGP, MPLS-TP and other protocols and determine hybrid environment throughput and latency.
- Virtual switches: Test OpenFlow capable virtual switch for flow scale and data plane throughput performance.

OpenFlow Controller Emulation highlights

Technical specifications

- Open Networking Foundation OpenFlow 1.0 /1.3 specifications
- Push 1 million + flows to switches
- Emulate up to 20 controllers per port running v1.3 or v1.0
- Control up to 1000+ switches with a single controller
- Proactive mode controller support
- Data path verification of switch flow tables
- Test hybrid switches supporting traditional and OpenFlow forwarding planes
- Run multiple protocols concurrently on each OpenFlow traffic port to test scalability and protocol functionality
- Comprehensive results for analysis including Flow Add rates
- Add Flows using traffic already defined, Text Editor, or Graphical Flow Creation
- Support for IPv4, IPv6, VLAN, MPLS, VXLAN Flows
- Switch Topology Discover using LLDP
- Multiple Table Support with Metadata
- Flow Metering Support
- Master / Slave support for all controllers
- Group Table Support for types: All, Select, Indirect, and Fast-FailOver
- Secure OpenFlow Channel Support with TLS v1.2

Supported modules & platforms

- Supported on the Spirent MX, MX2, FX, FX2, DX and DX2 Family modules
- Supported on Spirent TestCenter Virtual
- Supported on Spirent TestCenter C1 and C50

Ordering information

- OpenFlow Controller Emulation BPK-1193A

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