Benchmarking Methodology for Virtualization Network Performance

draft-liu-bmwg-virtual-network-benchmark-00

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Testing Considerations

- Virtualization Network performance in China Mobile IDC field try.
- DUT(VxLAN and VSwitch) and Virtual tester are on the same platform and share the same resources.
- Tester's calibration without DUT is essential in benchmarking testing in a virtual environment.

Key point in this test:

- ✓ Hypervisor type is ultimate importance to test results
- ✓ The VNIC speed will have impact on test results.
- ✓ VM allocation of CPU resources and memory will affect test results
- ✓ Packet sizes will affect test results

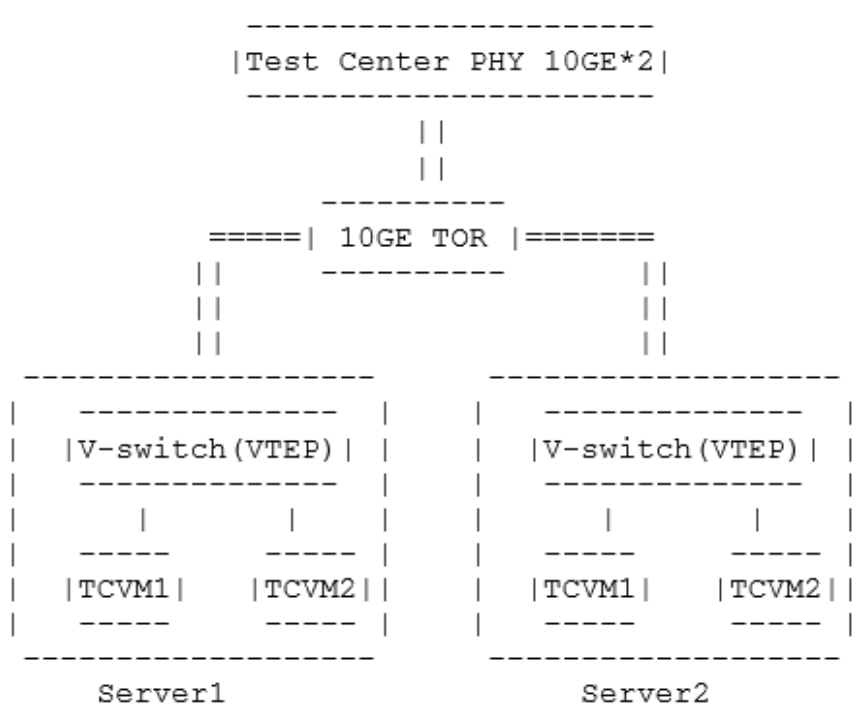
Hypervisor Type	VM VNIC Speed	VM Memory CPU Allocation	Packet Size	No Drop Throughput
ESXi	1G/10G	512M/1Core	64	
			128	
			256	
			512	
			1024	
			1518	

Sample calibration permutation ♪

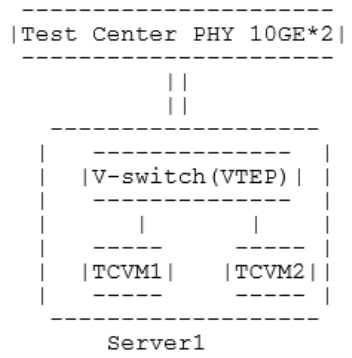
Key Performance Indicators

- No drop throughput under various frame sizes:
  - Forwarding performance under various frame sizes is a key performance index of interest. Once this performance number is obtained, vendors can always allocate more CPU and memory for mission critical applications where line rate performance is expected.
- DUT consumption of CPU and memory:
  - when adding one or more VM. With addition of each VM, DUT will consume more CPU and memory (need to add more contents how to relate to above table – TBC)
- Latency readings:
  - Some applications are highly sensitive on latency. It's important to get the latency reading with respective to various conditions.

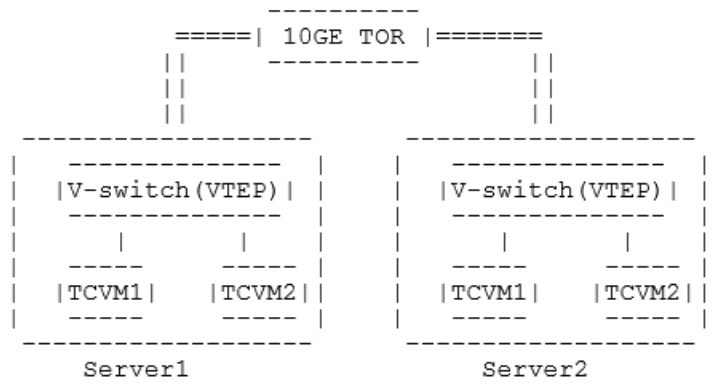
Test Bed Setup



Basic test topology



Test Model A: Benchmark test



Test Model B: E2E virtual network test

Basic test topology is consists of Test Model A and Test Model B.
Test Model A is connect a server with physical tester to make a benchmark.
Test Model B is connect two server to E2E virtual network test.
Server 1 CPU: E5-2460 Server 2 CPU: E5-1430

Proposed Benchmark Tests

- Throughput
- CPU consumption
- Memory consumption
- Latency

Throughput

- Objectives
  - Under the condition of certain hardware configuration, test the DUT(virtual switch) can support maximum throughput.

- The test parameters
  - test repeated times
  - test packet length

- Testing process
  - Configure the virtual tester to output traffic through V-Switch.
  - Increase the number of vCPU in the tester until the traffic has no packet loss.
  - Record the max throughput on VSwitch
  - Change the packet length and repeat step1 and record test results.

- Test Results formats

Byte	Throughput (GE)
0	0
128	0.46
256	0.84
512	1.56
1024	2.88
1518	4.00

CPU Consumption

- Objectives
  - The operation of DUT (VSwitch) can increase the CPU load of host server. Different V-Switches have different CPU occupation. This can be an important indicator in benchmark the Virtual network performance.
- The test parameters
  - test repeated times
  - test packet length
- **Testing process**
  - Configure the virtual tester to output traffic through V-Switch.
  - Increase the number of vCPU in the tester until the traffic has no packet loss.
  - Record CPU load value on VSwitch
  - Change the packet length and repeat step1 and record test results.
- Test Results formats

Byte	Throughput(GE)	Server CPU MHZ	VM CPU
0	0	515	3042
128	0.46	6395	3040
256	0.84	6517	3042
512	1.56	6668	3041
1024	2.88	6280	3043
1450	4.00	6233	3045

Memory Consumption

- Objectives
  - The objective of this test is to verify the memory consumption by the DUT (VSwitch) on the Host server.
- The test parameters
  - test repeated times
  - test packet length

- Testing process
  - Configure the virtual tester to output traffic through V-Switch.
  - Increase the number of vCPU in the tester until the traffic has no packet loss.
  - Record memory consumption value on VSwitch
  - Change the packet length and repeat step1 and record test results.

- Test Results formats

Byte	Throughput(GE)	Host Memory	VM Memory
0	0	3042	696
128	0.46	3040	696
256	0.84	3042	696
512	1.56	3041	696
1024	2.88	3043	696
1450	4.00	3045	696

Latency

- Objectives
  - The objective of this test is to verify the DUT (VSwitch) for latency of the flow. This can be an important indicator in benchmark the Virtual network performance.
- The test parameters
  - test repeated times
  - test packet length
- Testing process
  - Configure the virtual tester to output traffic through V-Switch.
  - Increase the number of vCPU in the tester until the traffic has no packet loss.
  - Record latency value on VSwitch
  - Change the packet length and repeat step1 and record test results.
- Test Results formats
  - TBD.

Next Step…

Solicit comments and suggestions…

THANKS

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