A performance comparison of containerbased technologies for the cloud

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Containers vs Virtual machine(VMs)

Containers

- Lightweight
- All containers share the same OS.
- OS virtualization
- Takes less time to start

VMs

- Heavyweight
- Each VM runs on its own OS.
- Hardware level virtualization
- Slow start











CPU Performance	

Table 2

pbzip2 compressor results.

Platforms	Wall clock (s)
Native	13.7
Docker	14.8
Flockport (LXC)	14.9

- Based on pbzip2 compressor.
- ► File size 100MB
- 900 kB BWT block size and 900 KB File Block size.
- Flockport, average elapsed time is 14.9 s and standard deviation is ±0.03 s.
- Docker, average time is 14.8 s and standard deviation is±0.01 s

CPU Performance

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Multi-core efficiency results from Y-cruncher.

Platform	Multi-core efficiency
Native	99.2%
Docker	99.3%
Flockport	99.4%

> Y-Cruncher, stress-testing tool for CPUs

 Calculate Pi value, multi-core efficiency, computation time, and total execution time.

Docker shows better performance.



CPU Performance - Geekbench





Multi-core testing





Disk I/O Performance

- Random write speed and random seeks result set.
- Flockport has 100% better results than Docker and is almost 6% better than the native platform.
- Sysbench tool is also used to test the input output from file performance.
- ▶ Found same results.

Table 4
Random write speed and random seeks.

Platform	Random wr	ite speed (kb/s)	Random se	eks
Native	24829	%	3741	%
Docker	22 494	-9.4%	389.2	-89.6%
Flockport	24524	-1.2%	3961	+5.9

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Disk I/O Performance Sysbench results. Platform Read (Gb) Written (Mb) Total transferred (Gb) Throughput (Mb/s) Elapsed time (s) Native 1.22 834.17 2.04 20.85 27.568 Docker 1.21 829.38 2.02 20.73 27.488 19.92 27.491 Flockport 1.17 796.88 1.95





Network I/O Performance

Table 8

Netperf TCP_RR and UDP_RR results.

Platform	TCP_RR (Transfer rate per second)	UDP_RR (Transfer rate per second)
Docker	44363.03	45093.28
Flockport	39321.02	40625.07
Native	48451.11	49221.17

Network I/	O Perform	nance		
Table 9				
Iperf results.		ТСР		
Iperf results. Platform Docker	Interval Transfer Bandwidth	TCP 0.0-10.0 s 966 MB 810 Mb/s	UDP 0.0-10.0 s 11.9 MB 10.0 Mb/s	
Iperf results. Platform Docker Flockport	Interval Transfer Bandwidth Interval Transfer Bandwidth	TCP 0.0-10.0 s 966 MB 810 Mb/s 0.0-10.0 s 1.34 GB 1.15 Gb/s	UDP 0.0-10.0 s 11.9 MB 10.0 Mb/s 0.0-10.0 s 11.9 MB 10.0 Mb/s	

