Firebox Workloads Analysis

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Outline

Workloads

Set of benchmarks / workloads running in Firebox-0

- Aerospike (YCSB)
- Ramcloud (YCSB, Clusterperf)
- Network (latencies, bandwidths)

Spark, Cassandra (YCSB, Terasort)

BigDataBenchmark Impala, Hive, Tez, Redshift

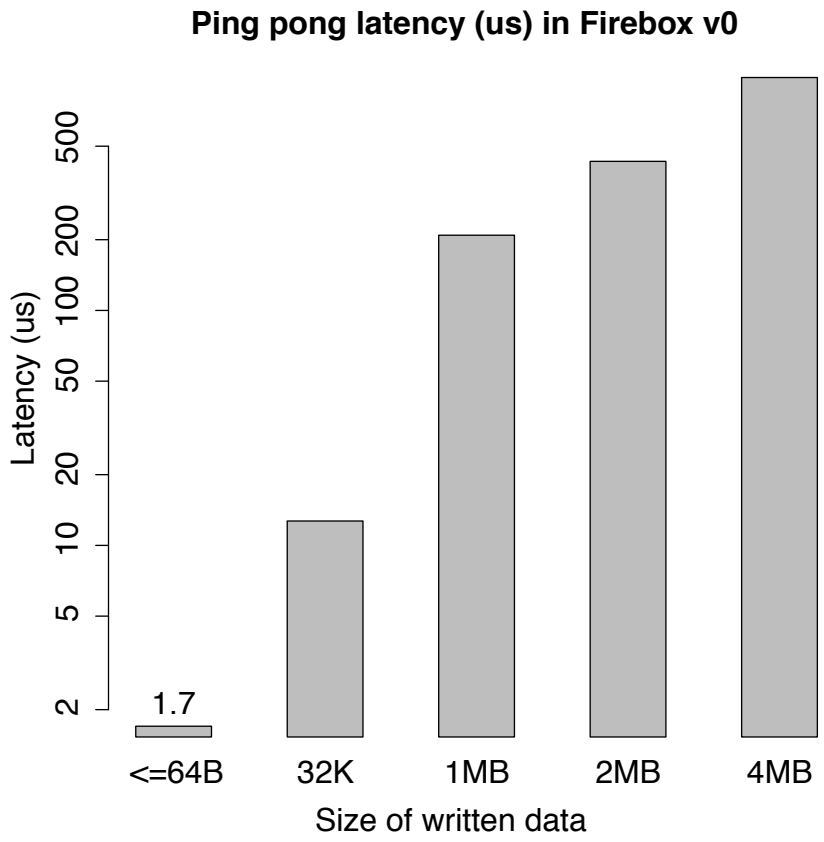
What is Firebox – 0?

- Firebox – 0:
  - 16-node cluster
  - Infiniband interconnect

- Node configuration:
  - Intel Ivy Bridge 8Cores / 16Threads 3.0GHz 25MB
  - 64GB RAM
  - 2 SSDs (120GB + 480GB)
  - Infiniband: Mellanox ConnectX-3 VPI MCX354A-FCBT FDR QSFP 56Gbps
  - Ethernet: Mellanox ConnextX-3 EN MCX314A-BCBT QSFP 40Gb
  - Running Ubuntu 14.04 (Linux 3.13.0)

- Each node is connected to 1 Infiniband and 1 Ethernet switch

Firebox Network



SockPerf Ping Pong Latency in Fbox

Without VMA*	4.8 us
With VMA	1.3 us

RDMA Ping Pong Latency

Firebox v0	1.7 us
Ramcloud HW	3.1 us

***VMA = Mellanox socket library with kernel bypass**

RAMCloud Read/Write benchmark (Bandwidth/Latency)

ClusterPerf (read/write latencies and bandwidths)

PCIe card is bottleneck for bandwidth

AeroSpike

YSCB latencies and bandwidths with two types of SSDs

Big Data Benchmark

Spark SQL,

SSD vs PCIe Samsung Drives Benchmark

IO Ping Average Latency (us) Benchmark

PCIe	152
SSD	118

Buffered Reads Bandwidth (MB/s) Benchmark

PCIe	1135
SSD	435

Discussion