Empowering Low Latency Flash Optimized NoSQL

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Aerospike
Aerospike history

- 2010 – Aerospike 2.0 deploys with first at-scale customers
- 2011 – Funding, company launch
- 2013 – Aerospike 3.0 adds indexes, analytics integration
- 2013 – Hot Analytics & Transaction Processing (now “HTAP”)
- 2014 – Open Source
- 2015 – Deployments in Financial Services, Telecom, etc
Modern Scale Out Architecture

LOAD BALANCER
Simple stateless

APP SERVERS
Fast, stateless

HIGH PERFORMANCE NoSQL

OPERATIONAL KEY VALUE
Session, authentication, account status, cookies, deviceID, IP address, location, segments, clicks, likes, tweets, friends, search terms...

REAL-TIME ANALYTICS
Best sellers, top scores, trending tweets

CONTENT DELIVERY NETWORK

RESEARCH WAREHOUSE
Long term cold storage

HDFS BASED

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The big data scale problem

Business Transactions

Web views

(Payments)
(Mobile Queries)
(Recommendation)
(etc)

“Real-time big data”
“decisioning”

Business Transactions 500/sec
(front page web views, etc)

2500 calculations per sec

1.25M Server Transactions / sec
Multiple engagements

- 10B to 50B objects
- 300 T before HA replication
- 2 M TPS
- 50 milliseconds per 5,000 queries
- Local and remote DR

What’s an Exadata license cost?
“AppNexus* operates at massive scale while paying close attention to the economics of the platform. Aerospike’s flash optimizations running on top of Intel® SSDs have given us the price, performance, reliability, and serviceability we need to grow our business.”

– Timothy G Smith, SVP Technical Operations

- 100ms from click to view
- 4.5 Million TPS
- Over 100 TB
- Data Centers around the World

Source: Intel
In-chassis solution

- **Supermicro 6037R-TXRF**
  - Intel P3700 2T x 10 → 20T
  - $2 per GB
  - 1M++ IOPs per server
  - 50M IOPs

- **Dell R720xd**
  - SS, Micron 1T SATA x 20 → 20T
  - $1 per GB
  - 200,000 IOPS per server

1 petabyte in 50 node cluster --- *100U? 150U?*
External Virtualized NVMe Fabrics

- Apeiron Shared DAS™
  Independent scaling of servers and storage

- Storage array:
  144T/2U enclosure
  18M IOPs per 144T
  72 GB/s of bandwidth
  90us read latency

- 1PB 8 enclosures
  100M IOPs

1 petabyte- 16U storage, 16U Aerospike

Ultra High IOP

Booth #819
InfiniFlash 3U 512G
1M IOPS
2 Aerospike servers
SAS cards

Example (qualifying)

1 petabyte in 6U InfiniFlash + 8U Aerospike
How can they do it?

$1$ per GB?

$1K$ per TB?

$1M$ per PB?
Commodity hardware + open source software

NoSQL achieves HA with replication

not enterprise storage managers
What about “3D Xpoint”?

- We already have “persistent RAM” through our “fast restart” feature

- We won’t treat Xpoint like NAND (nor like DRAM) perfect for our codebase

- Hint: Indexes! Indexes! Indexes!

We love 3D Xpoint!
Aerospike has the experience

- Flash optimized from day 1
- 5 9’s reliability
  (longest running cluster: 5 minutes of outage in 4.5 years)
- Multi-million TPS clusters in production today
- Enterprise Support of your POC & NoSQL design
- Used in financial services, telecom, gaming
  (and adtech of course)
Start a project with Aerospike today