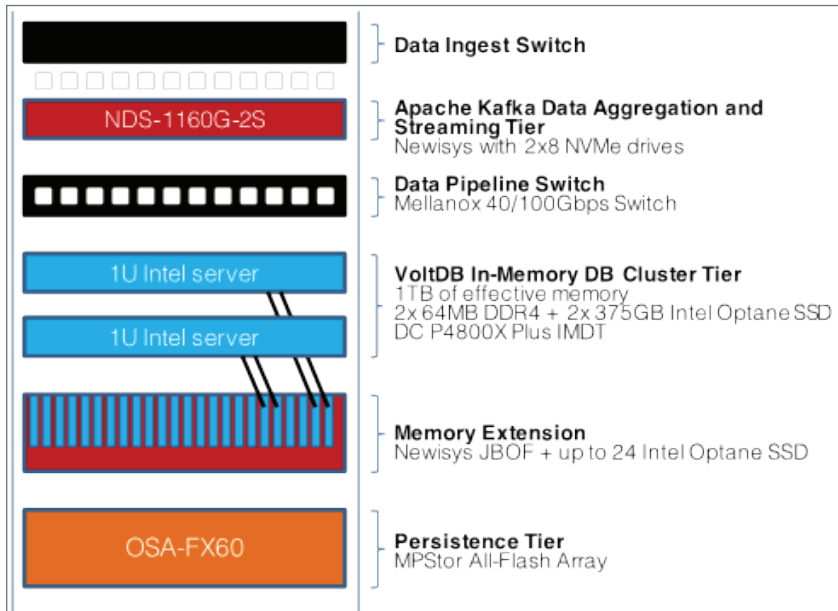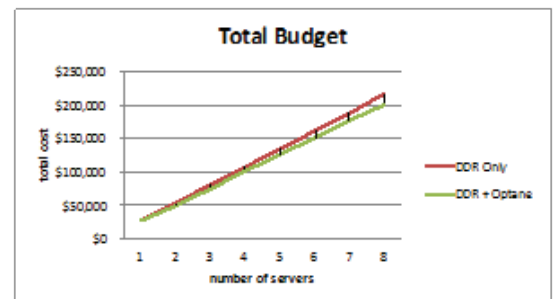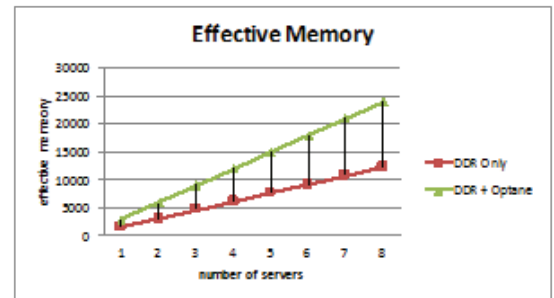# FLASH MEMORY SUMMIT 2018

VIKING ENTERPRISE SOLUTIONS® REAL-TIME ANALYTICS SOLUTION DEMONSTRATION

Scaling of real-time data analytics often involves the addition of server nodes to expand the aggregate amount of memory (RAM) available in the cluster, but adding servers unnecessarily increases compute (CPUs) and this negatively impacts return on investment (ROI). The Viking Enterprise Solutions Real-Time Analytics Engine solution overcomes this dilemma by allowing non-volatile memory (NVM) to complement RAM to expand the addressable memory available for server nodes running in-memory databases.

+100%
Addressable Memory

~0%
Budget Change

- **Data Ingest Switch**

- NDS-1160G-2S — **Apache Kafka Data Aggregation and Streaming Tier**
  Newisys with 2x8 NVMe drives

- **Data Pipeline Switch**
  Mellanox 40/100Gbps Switch

- 1U Intel server / 1U Intel server — **VoltDB In-Memory DB Cluster Tier**
  1TB of effective memory
  2x 64MB DDR4 + 2x 375GB Intel Optane SSD
  DC P4800X Plus IMDT

- **Memory Extension**
  Newisys JBOF + up to 24 Intel Optane SSD

- OSA-FX60 — **Persistence Tier**
  MPStor All-Flash Array

Effective Memory

Total Budget

VIKING Enterprise Solutions	VIKING Enterprise Solutions	VIKING Enterprise Solutions	(intel)	Mellanox TECHNOLOGIES
NDS1160 storage server for Kafka distributed streaming	NDS2244 NVMe storage array for memory extension via IMDT	OSA-Fx60 all-flash array for persistent storage	Industry-standard servers for in-memory DB clustering	40/100Gbps data pipeline switch for networking

BACKGROUND

Real-time data analytics, sometimes referred to as a fast data application, rely on three vital functional components to meet requirements:

1) high throughout storage for data ingestion,

2) distributed in-memory database for data processing, and

3) low-latency high-bandwidth networking for clustering of servers.

Scaling of these deployments involves the addition of server nodes to expand the aggregate amount of memory (RAM) available in the cluster, but adding servers unnecessarily increases compute (CPUs) and this negatively impacts return on investment (ROI). The Viking Enterprise Solutions Real-Time Analytics Engine solution overcomes this dilemma by allowing non-volatile memory (NVM) to complement RAM to expand the addressable memory available for server nodes running in-memory databases.

SOLUTIONS INCORPORATING NEW TECHNOLOGIES

A key enabler is Intel® Memory Drive Technology (IMDT), a revolutionary software that transparently integrates Intel Optane™ solid-state drives into the memory subsystem and makes SSDs appear like DRAM to the OS and applications. IMDT reduces the need to add server cluster nodes to increase available RAM—instead, scaling occurs by complementing RAM with Optane SSDs—and no changes are required to the OS or applications.

The benefits of the Viking Enterprise Solutions Real-Time Analytics Engine solution include greater scalability at lower prices with low impact on performance. For example, the demonstration shows a 100% increase of addressable memory with minimal change to budget requirements versus a conventional RAM-centric solution. The Viking Enterprise Solutions Real-Time Analytics Engine is among the first production solutions to incorporate Intel® Memory Drive Technology and Intel Optane™ solid-state drives while demonstrating a significantly beneficial return on investment.

ABOUT VIKING ENTERPRISE SOLUTIONS

Viking Enterprise Solutions storage and server systems are ideally suited for the extreme requirements of real-time analytics, whether using IMDT or not, due to their industry-leading performance and incorporation of the latest technologies including NVM Express (NVMe), NVMe over Fabrics, persistent memory including Optane, and more.

VIKING™
Enterprise Solutions

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