

# VirtuCache Case Study



## USE CASE

- Storage Performance

## LOCATION

- USA

## VIRTUALIZATION AND STORAGE ENVIRONMENT

- Twenty Fujitsu Primergy RX2x rack servers with 256GB RAM running bare-metal Centos 6.x. These servers were re-purposed to run VMware.
- Storage – a total of 85 TB of storage was provisioned across Dell Equallogic appliances.
- Financial and analytics applications running on Oracle 11G that were migrated from physical servers to virtual servers

## CHALLENGES

- Oracle database servers were not virtualised due to perceived storage performance problems in VMware VMs

## BENEFITS

By alleviating storage performance issues, VirtuCache helped Dun & Bradstreet to migrate their IO intensive Oracle Database workload from physical Linux servers to a VMware environment

## VirtuCache Improves Oracle Performance on Equallogic Appliances for VMware VMs

By deploying VirtuCache in Dun & Bradstreet's VMware environment, we demonstrated sub 10ms VM latencies for high, write-intensive, random storage IO, which in turn facilitated the P2V of their database servers.

Dun & Bradstreet is in the business of managing and commercializing credit and other financial and corporate data about private and publicly listed companies in the US and Europe.

### Main Challenges

Dun & Bradstreet's IT staff wanted to virtualize their data intensive applications where possible, and without deteriorating application performance when these applications were P2Ved from their existing bare-metal physical Linux servers to VMware VMs.

### Workload Characteristics

D&B runs various financial and business analytics applications on underlying Oracle 11G databases. These applications ingest 10-12TB of new data every day and between 1 and 2 TB of reporting runs against 60TB of usable dataset every day. As result of such large amounts of ingest (write) and reporting (read) operations, D&B's administrators were concerned that virtualizing these applications would put further pressure on their storage infrastructure for VMware, and as a result not only would these applications perform poorly in VMs, but that they will also negatively impact other VMs in the VMware cluster. Steps taken to assure the customer that latencies in VMs will be lower than in their existing physical servers

**Step 1:** We ran Linux Top command as a cron job for two weeks to profile D&B's bare-metal Oracle workload. This exercise provided us with read and write latencies and throughput data at the Linux OS level for two weeks.

**Step 2:** We installed VirtuCache on VMware hosts caching to Samsung 845DC Pro SSDs. Samsung 845 DC Pros are high performing SATA SSDs and clock in at 90,000 IOPS reads and 50,000 IOPS writes for random workload.

**Step 3:** Before we migrated D&B's Oracle workload from physical to virtual, we simulated this workload using Linux FIO utility within VMs, keeping the same VM density, transfer size, read/write mix, peak and average read and write throughput. This was done to show D&B that VM level latencies were lower and the throughput higher when their workload would migrate from physical servers to VMs on VMware hosts that had VirtuCache running.

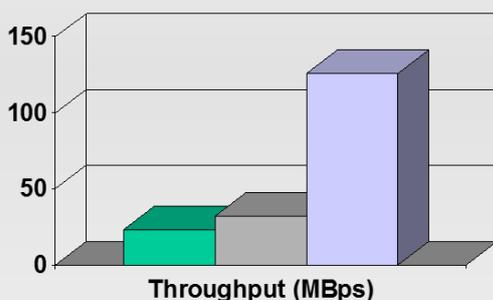
**Step 4:** Once D&B's administrators were assured that the performance within VMs would far exceed the storage performance in their existing physical infrastructure, they P2Ved their Oracle VMs.

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## Benefit to Dun & Bradstreet

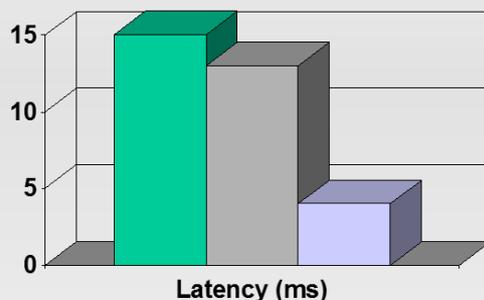
As you can see from the below charts, when VirtuCache accelerates the performance of underlying Dell Equallogic storage for the VMware host hosting the Linux VMs, the performance improvement versus when applications were running on bare-metal servers, is considerably higher at 4X improved throughput and 3X improved latencies.

### Throughput In Bare-Metal Server; VMware VM; and VM accelerated by VirtuCache



■ Throughput from VM without VirtuCache accelerating host  
■ Throughput from bare-metal Linux server without VirtuCache accelerating server  
■ Throughput from VM with VirtuCache accelerating host

### Latencies In Bare-Metal Server; VMware VM; and VM accelerated by VirtuCache



■ Latencies in VM without VirtuCache accelerating host  
■ Latencies in bare-metal Linux server without VirtuCache accelerating server  
■ Latencies in VM with VirtuCache accelerating host