Simplification: Get All Flash Performance Easily, Gradually, As Your Needs Grow

Scott Shadley
Sr. Product Line Manager
Micron Technology, Inc.

Nick Suh
Head of Product Marketing
PernixData
What’s Important To Customers?

A Look At CIOTop Priorities
Top 10 Priorities for CIOs: 2015

Source: Informationmanagement.com
1. Improve Security
2. Cloud Services
3. Consolidate and Optimize
4. Connectivity
5. Budget and Cost Control
6. Staff/Talent Management
7. Strategic Planning
8. Mobility
9. Disaster Recovery
10. Customer Relationship Management

Source: Information Week
1. IT Is Too Slow
2. Make IT "One" With Business
3. Break from 80/20 Spending
4. Harness Big Data
5. Prep For The Post-PC Era
6. Find The Right People
7. Social Media
8. Consumerization of IT
9. Cloud Computing
10. Improve Collaboration

Source: ComputerWorld
1. Analytics and BI
2. Mobility
3. Cloud and SaaS
4. Collaboration/Workflow
5. Legacy Modernization
6. IT Management
7. Customer Relationship Management
8. ERP Applications
9. Security
10. Virtualization

What Do Many Of These Have In Common?
Top Priorities for CIOs: 2015:

70%+ Improved With Flash

Source: Informationmanagement.com

Source: Information Week

Source: ComputerWorld

Flash can improve ~70% of Top 10 priorities

Flash can improve ~70% of Top 10 priorities

Flash can improve ~90% of Top 10 priorities
Majority of IT Priorities Improved w/Flash
Majority of Applications Virtualized

Yes, But…Where To Put The Flash?
Customer Example

Challenges

➢ Delays in being able to manage large files from cloud

➢ Avoid cost from storage upgrade and save Doctors time on reviews

Results

➢ Response time for images from 15 sec per image to instant results

➢ The average lifespan of our servers is four years, which works out to $640,000 more revenue per server over the life of each server
How Flash Helps

Centralized Flash: A Circuitous IO Path

IO Path Is Long…

Server
Driver
Bus
HBA
Interconnect
Switch
Interconnect
HBA
Driver
Bus
Flash

Centralized Flash Array
How Flash Helps

Centralized Flash:
Step-wise Build Out

Challenges
1. As servers are added, performance may drop
2. Adding centralized flash ‘boxes’ = large performance step
3. Moore’s law?
Benefits
1. As servers are added, performance can grow (w/each server added)
2. As servers w/local flash are added, small performance steps
3. Moore’s law in Full Force!

How Flash Helps

Server-Local Flash:
Step-wise Build Out

Aggregate Performance

Adding Servers w/Local Flash

Server Count
Aggregate Flash (and RAM) into a Data Acceleration Tier

Any server, any storage; No reboots, application rewrites or process changes

FC, FCoE, iSCSI, NFS
Scale-Out Storage Performance with Compute

Storage only
Storage w/ FVP + flash/RAM
Customer Example

Challenges

- Struggling to complete nightly data analysis within the allocated time window
- Avoid cost & disruption from storage upgrade

Results

- Critical business processes running more than 60% faster
- Nearly 1.8 billion IOs saved from array in the first 38 days
- Removed the need for a $80K storage upgrade

<table>
<thead>
<tr>
<th>Realtime</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>VM IOPS (Sum)</td>
<td>330</td>
</tr>
<tr>
<td>VM Throughput (Sum)</td>
<td>11971 KBps</td>
</tr>
<tr>
<td>VM Latency (Avg)</td>
<td>1.33 ms</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Historical (Since Dec 8, 2014 4:00:54 PM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IOs Saved from Datastore</td>
</tr>
<tr>
<td>Datastore Bandwidth Saved</td>
</tr>
<tr>
<td>Writes Accelerated</td>
</tr>
<tr>
<td>FVP Network Savings</td>
</tr>
</tbody>
</table>
So What?

Distinct Choices…Distinct Differences
Call To Action

- **Recognize**: Flash is not a panacea. Well-placed flash can help address IT Imperatives
- **Understand**: There can be architectural considerations
- **Persuade**: Flash is mainstream, use it where it fits, reap the benefits