High Availability Datacenter Using SolidFire

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Endicia

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Senior Product Manager
SolidFire
All-Flash Storage for the Next Generation Data Center
Bringing Flash to the Data Center

<table>
<thead>
<tr>
<th>Disk Characteristics</th>
<th>Flash Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Read</strong></td>
<td><strong>Random Reads (IOPs)</strong></td>
</tr>
<tr>
<td>Awful Random Reads</td>
<td>150</td>
</tr>
<tr>
<td>Good Sequential Reads</td>
<td>10,000 +</td>
</tr>
</tbody>
</table>

Why Is Flash Alone Not Enough?

Struggled with: Cost – Reliability – Density

Raw Flash Performance
Scarce resource only for select workloads

Flash Performance + Guaranteed (QoS) Control
Enabling technology of the Next Generation Data Center
A Massive Transformation in IT Delivery
(from a Siloed to Shared Infrastructure)

Isolated Workloads ➔ Mixed Workloads
Manual Provisioning ➔ Automated
Project Based ➔ Self Service
Rigid Infrastructure ➔ Agile Resources
Evolution of the Data Center

Compute
- Stand Alone
- Virtualized
- Orchestrated

Network
- Isolated
- Consolidated
- Converged

Storage
- Dedicated
- Shared

Next Generation Data Center
- Scalable
- Predictable
- Automated
The Next Generation Data Center

- Increased application performance and predictability
- Greater automation and end-user self-service
- Improved operational efficiency and reduced costs
- More agile and scalable infrastructure
- Rapid application and service deployment
- Scalable
- Predictable
- Automated
SolidFire: Purpose built for the Next Generation Data Center

> Consolidate Tier 1 and Tier 2 Applications
  Manage Capacity and Performance Independently

> Enable Complete Storage Automation
  Native REST-based API, deep OpenStack integration

> Scale-Out Investment Protection
  100% Compatibility Guarantee, mix / match any nodes

Guaranteed Storage Performance
Powering the most demanding data centers in the world
Enterprise Outcomes

Rapidly respond to business and application demands

Improve Productivity

Reduce Complexity and Cost

Consolidation
Automation
Scale
Guaranteed Storage Performance
Endicia Case Study

Mitul Patel
IT Manager and Chief Infrastructure Architect
Our Mission

To deliver value by creating breakthrough shipping technologies and services that help global businesses, small and big, reach their customers, and thrive.
Innovation-Driven Market Leader

The Back Story

• Technology firm **founded in 1987** by Stanford engineers
• **Strategic** technology investment for Newell Rubbermaid in 2007
• Over **200 partners**, 200 employees
• **14 years** as USPS®-approved PC postage software partner
• Customers have printed >$12B in cumulative postage

The First Company to...

• Prototype PC Postage for the USPS (1991)
• Integrate parcel insurance, international customs forms, APO/FPO forms
• Offer electronic refunds
• Provide electronic delivery & signature confirmation
• Support USPS regional rate & critical mail solutions

# Key Endicia Shipping Markets

*Like Our Customers, Our Software is Not “One Size Fits All”*

<table>
<thead>
<tr>
<th>Profile</th>
<th>Shipping Needs</th>
<th>Service Needs</th>
<th>Benefits Sought</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Passion Purveyor</strong></td>
<td>• Basic USPS shipping</td>
<td>• Quick to get started</td>
<td>• Ease of use</td>
</tr>
<tr>
<td>1-20 packages/day</td>
<td>• Simplification of shipping complexities</td>
<td>• Access to best USPS rates</td>
<td>• Time savings</td>
</tr>
<tr>
<td>SOHO, SMB</td>
<td></td>
<td></td>
<td>• Cost reduction</td>
</tr>
<tr>
<td><strong>Online Professional Seller</strong></td>
<td>• 20-250+ packages/day</td>
<td>• Easy file &amp; database access</td>
<td>• Systems integration</td>
</tr>
<tr>
<td>~2-20 employees</td>
<td>• Pick &amp; pack</td>
<td>• Ecommerce platform integration</td>
<td>• Cost reduction</td>
</tr>
<tr>
<td>USPS shippers</td>
<td>• Batch print</td>
<td></td>
<td>• Efficiency</td>
</tr>
<tr>
<td><strong>Professional Warehouse Shipper</strong></td>
<td>• 250-500+ packages/day</td>
<td>• Multi-feature</td>
<td>• High speed, high volume</td>
</tr>
<tr>
<td>Use free private carrier software</td>
<td></td>
<td>• Rate comparisons</td>
<td>• Choice</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Endicia**
At the Core:
Software for All-in-one Shipping Labels

- Prepaid labels
- Hidden postage amounts
- All USPS mail classes
- Customizable labels
- Verified addresses
- Electronic delivery & signature confirmation
Supporting All USPS Products

Endicia only!
Marketplace Integrations

Introducing seamless and direct integrations with the Amazon Marketplace and eBay store

Customers can:

- Connect Amazon and/or eBay stores to their Endicia client
- Import and view order information
- Print shipping labels, including eBay GSP labels
- Automatically post-back tracking information to Amazon and/or eBay
- Combine up to three orders into one shipment
- Manually mark orders as shipped with no label print
Endicia’s Business Needs

A solution that:

• Did not require shutting down the real-time environment when changes needed to be made.

• Scaled seamlessly without downtime.

• Had a high level of performance in regards to response time.

• Did not require a large amount of resources.

• Was extremely secure and provided monitoring.
Approach & Strategy

• Leverage existing vendor relationships for recommendations.

• Evaluate options:
  ○ Traditional Storage – spinning disk and hybrid storage.
  ○ Other key Flash vendors in the market.

• Leverage current technologies:
  ○ Virtualized Hyper-Visor, High Performance Database, cutting edge network setup.

• Deploy in corporate IT first, then integrate into the production environments.
## Storage Requirement Evaluation

<table>
<thead>
<tr>
<th>Endicia Requirements</th>
<th>Solidfire Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale without customer impact and downtime related to SAN. High capacity/density to</td>
<td>Scale Out capability without downtime. Adding or removing a node can be done live. Inline Deduplication and compression gives us more storage capacity per 1U node. Not dependent on controller resources</td>
</tr>
<tr>
<td>save on rack space and cost.</td>
<td></td>
</tr>
<tr>
<td>Guaranteed performance for customer transactions.</td>
<td>Guaranteed QoS capability on the SolidFire allowed us to feel secure in delivery performance even with noisy applications on the same SAN</td>
</tr>
<tr>
<td>Multiple layers of security for customer data with no loss in performance.</td>
<td>Encryption feature on the SAN allows us to add one more layer of security to our setup without losing performance</td>
</tr>
<tr>
<td>Hypervisor Integration.</td>
<td>Good Hypervisor Integration which allows daily tasks to be completed with ease</td>
</tr>
<tr>
<td>Reliability of the setup.</td>
<td>Helix Data Redundancy and Self Healing Capability</td>
</tr>
<tr>
<td>Monitoring and support</td>
<td>Solidfire has a separate VM for monitoring the SAN which works well. Good Rest API to integrate with other monitoring tools</td>
</tr>
<tr>
<td>Initial capital cost and cost of ownership for the long run.</td>
<td>Liked the all inclusive pricing. By using standard flash disks, Solidfire has been able to keep costs down and keep it affordable</td>
</tr>
</tbody>
</table>

![Endicia Logo](image)
SolidFire’s Solution

SF9010

- 1U form factor – scale unit for Endicia.
- Large scale SaaS platforms
- Highest density platform
- 35 TB effective capacity
- 75,000 IOPS
- Mix and Match with other node capacity
How Does This Compare?

SolidFire Advantages

89% less rack space
77% less power and cooling cost

SF9010
173TB

VS

Legacy SAN
173TB

<table>
<thead>
<tr>
<th></th>
<th>SF9010</th>
<th>Legacy SAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>IOPS</td>
<td>375,000</td>
<td>52,000</td>
</tr>
<tr>
<td>Storage Arrays/Clusters</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total Raw (TB)</td>
<td>48</td>
<td>346</td>
</tr>
<tr>
<td>Operating Power (KW)</td>
<td>1.2</td>
<td>5.5</td>
</tr>
<tr>
<td>Power &amp; Cooling Cost/3Yr.</td>
<td>$7,938</td>
<td>$34,965</td>
</tr>
<tr>
<td>Watts/TB</td>
<td>7.23</td>
<td>31.46</td>
</tr>
<tr>
<td>IOPS/Watt</td>
<td>300</td>
<td>9.44</td>
</tr>
</tbody>
</table>
Lessons Learned

• Understand current and future business needs

• Size more capacity up-front.

• Identify where guaranteed performance will allow you to consolidate and maximize ROI.

• Standardize your environment. Less Management overhead and reduces cost
questions?