Employing Storage QoS to Use Flash Resources Efficiently

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Storage QoS

Why do we Need it?

Corporate data increasing at 50% per year

Storage Budgets are not keeping pace

Data Volumes

Storage Budgets

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Aggregated Analyst Data (IDC, Gartner, Forrester)
Which Means That
Rip & Replace

Single Vendor All-Flash Data Center

- Wasteful
- Storage Capacity
- Storage Performance
- Storage Complexity
- Expensive
But! Flash with Storage QoS

Optimized Use of Flash
Cost-Effective with No Waste
No Manual Data Migration
Storage QoS
What do we Actually Mean?
Let’s Compare with Home Internet

Usage

Time

Max

Your Neighbor

You

Result:

Neighbors Game of Thrones Download

Your Work from the Home Office
First Came Bandwidth Limits

Usage

Time

Max

Individual Limit

You

Your Neighbor
Bandwidth Limits

Result:

- Neighbors Game of Thrones Download
- Your Work from the Home Office
Which is the Current State of Storage QoS

Ensure one application can not steal all the storage performance

IOPS Limit

This is good, but it’s not enough
But Internet Found a Financial Opportunity
And a Customer Satisfaction Opportunity

- Ensure Streamed Movie has Bandwidth
- Limit Torrent Downloads

Graph:
- Usage vs Time
- Max
- HD Stream
- Neighbors Download
- Your Movie & Misc.
Storage QoS Needs to Get Here

Define QoS Per Application

- Performance
- Capacity
- Protection

Profile All Storage Resources

- Flash Media
- Hard Drives
- Cloud

Utilize All Media to Deliver All QoS

- Active/priority data on high-performance flash
- Stale/archive data on inexpensive hard drives

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Storage QoS

Why is it Good for Flash?
The Challenge

- The market is conditioned to think \$/GB
- Concern of more performance than needed (1M+ IOPS PCIe)
- Fear of flash endurance

The QoS Solution

- **Automatic utilization.** Flash for active data only, stale on HDD
- **Shared flash.** Flash becomes a resource that all apps can use
- **Best usage.** Writes to high-endurance, reads to lower cost
## The Use of Flash

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<th>The Challenge</th>
<th>The QoS Solution</th>
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<td>Customers manually deciding what apps, what data</td>
<td><strong>Automatic utilization.</strong> Flash use decided by QoS settings</td>
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<tr>
<td>Where to place flash? In the array, an appliance, direct attached?</td>
<td><strong>Shared flash.</strong> Place flash anywhere and data will move to it based on QoS settings</td>
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</table>
The Deployment of Flash

The Challenge

- Manual migration of application data to flash
- Customers still see flash as disruptive

The QoS Solution

- Automatic utilization. No manual provisioning/migration
- Hybrid data center. Flash front-ends traditional storage systems, seamlessly
ioFABRIC Vicinity

Flash-optimized software-defined storage delivering data center agility and ongoing cost savings through industry leading QoS-driven automation across existing and future storage investments

“Automation is the key to the next generation data center”
– George Crump, Storage Switzerland

“QoS means effectiveness, storage reuse means efficiency: the two main buying drivers in IT today”
– Mark Peters, ESG