Cloud Storage Decision Making – More than Cost per Capacity
Location (On/Off-Premise), Resiliency/Durable, PACE Attributes, Functionality, SLAs

Everything Is Not The Same, Why Treat Everything The Same?

Block, Blob/Page
File, Queue, Table, Object
Object/Blobs
Everything Is Not The Same, Why Treat Everything The Same?
Have It Your Way To Meet Your Needs, Bridge Past, Present and Future

Cloud and Storage Decisions

Mix of Technologies
Different Abstractions

Trend

No Cloud
All Legacy

Some Legacy
Some Clouds

Trend

Some Inter-Cloud
(using more than one)

Hybrid

All Cloud
All In

Examples among others Alibaba, AWS, Azure, Backblaze, Box, Crashplan/Code42, Virtustream, Dropbox, Google, IBM Bluemix/Softlayer, Mega, Oracle, Rackspace, Yandex

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Common Challenge = Sustained Growth Demands
How To Address Demands, Challenges and Mandates?

Legacy and Emerging
Application and Workloads

Data Growth Demand
Relative Forecast

Constraints, Mandates
Security, Budgets
Common Challenge = Technology Evolution Trend Options
How To Navigate and Leverage Available Resources

Insight Awareness, Analytics (Avoid Flying Blind)

Solution

On-prem And Cloud

Hypervisor

Physical Servers

Tape

Server StorageIO Datadog Dashboard
Common Challenge = Enabling Growth Without Compromise
Address Challenges (Left), Leveraging Experience (Center), Balance Solutions (Right)

- **Challenge**
  - Legacy and Emerging Application and Workloads
  - Data Growth Demand Relative Forecast
  - Constraints, Mandates Security, Budgets

- **Solution**
  - Tradecraft Skills Tools, Technologies Techniques, Best Practices Policies
  - Insight Awareness, Analytics (Avoid Flying Blind)

- **On-prem And Cloud**
  - Physical Servers
  - Tape
  - Hypervisor
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No Cloud
All Legacy

Data Infrastructures
Resources (Server, Storage, I/O Networks)

Some Legacy
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(using more than one)

Tape

Adapters

VM

Hypervisor

VM

Hyervisor

VM

Hypervisor

VM

VM

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What Is Your Cloud Objective?
How and Why Are You Using (or going to use) Clouds?

• To reduce, move, shift or hide costs?
• To improve scalability, remove complexity?
• For storage, networking, applications, compute, all of these?
• For IaaS, PaaS, SaaS, AaaS or Something else as a Service?
• As a destination for data protection (backup, archives, BC, DR)?
• As a peer site for resiliency, elasticity, bursting of workloads?
• As a place where applications run or can failover to?
• As a hub repository for various sites to collaborate?
• AS a place for logs, events, telemetry, messages?
• As a management plane for local and remote?
• As an authoritative copy for local cached data?
• Single Availability Zone (AZ), single region, multiple clouds?
Cloud Storage Decision Making – What Are Your Requirements?
Local, On-site/On-Premise, Public, Private and Hybrid-Cloud

• Where and what are your applications?
• What are your application PACE characteristics?
• How will your applications use cloud?
• What type of cloud storage and access?
  o Application/Service, Object, File, Block
  o High performance, Bulk/capacity
  o Update/Mutable or Append

PACE = Performance, Availability, Capacity, Economics
## Cloud Storage Decision Making – More than Cost per Capacity

Location (On/Off-Premise), Resiliency/Durable, PACE Attributes, Functionality, SLAs

<table>
<thead>
<tr>
<th>High Performance</th>
<th>Good Performance</th>
<th>Some Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good Capacity</td>
<td>Good Capacity</td>
<td>High Capacity</td>
</tr>
<tr>
<td>Efficient and Effective</td>
<td>Cost Efficient</td>
<td>Very Cost Efficient</td>
</tr>
<tr>
<td>Hot/Active</td>
<td>Warm/Active</td>
<td>Warm, Cool, Frozen</td>
</tr>
<tr>
<td>Geo-Resilient</td>
<td>Resilient</td>
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</tbody>
</table>

Cloud Storage Does Not Have To Be All or Nothing, One Size Fits All! Have it Your Way, When, Where, What, How Needed For Your Applications

- Mix of Services and functions
- Mix of PACE attributes
- Various media/mediums tiers
- (RAM, SSD, HDD, Tape)
- On-instance, non-instance

- Append or Update
- Support different use scenarios
- Avoid one size/approach fits all
- Mix of on-/off-premise
- Move beyond cost per capacity
How Will You and Your Applications Manage As Well As Access Cloud Storage?

- CLI/GUI/UI/API
- HTTP/HTTPS, REST
- JSON, XML, S3, NFS
- SMB3, iSCSI, NBD
- FUSE, S3FS, POSIX
- Block, File, Object
- Table, Queues, Service
- Storage Application

```
sudo s3fs -o passwd_file=/home/greg/.passwd-s3fs -o use_sse -o nonempty -o use_cache=/tmp/cache sioubuntu / media/s3mnt
```
An example: My Hybrid Cloud and SDDI Environment
Walking The Talk, Eating My Own Dog Food – Supporting My New Book Project

AWS
EC2, EBS, S3/Glacier
Route 53, LightSail

GCS

Azure
VM, Blobs, Files, DBs

Bluehost
DPS

Microsoft, VMware
OpenStack many others

On-premise

Some data in cloud (SSD, HDD, cold storage ;)
Some data on premise (SSD and HDD)
Active Data and Archive Data
Files, Objects, Images, VMs

Other Sites

Other Services

Other Sites

www.storageio.com/book4

Software-Defined Data Infrastructure Essentials
Cloud, Converged, and Virtual
Fundamental Server Storage I/O Tradecraft

Greg Schulz

www.storageio.com/book4
Preparing For Our Wrap-up (landing) – What can you do today!
IT has been on a journey for decades, IT will continue to be on journeys for decades

Head in the clouds (vision, strategy), Feet on the ground (plan, implement, manage)

Head In the Clouds

- Don’t be afraid, be prepared, do your homework
- Expand your tradecraft, skills, experiences
- Identify your concerns and questions
- Ask new and additional questions
- Talk with others today

Feet On The Ground

- Understand your needs, know your options
- Establish metrics to compare and optimize SDx
- You need to know (have insight into)
  - Where you are going, what you have
  - When you are there, what is needed
  - Service management, how performing
- Learn the language and trends of SDx
- Plan what you need to take with, what to leave behind
- What resources (HW, SW, people, services) are needed
- What needs to be converted or adapted to the destination
- Reduce your footprint, travel light, bulk ship things if needed
Closing comments, for now...

Know where you are going, why and what are your objectives

Expand your Data Infrastructure and Cloud Tradecraft Experiences

• Avoid flying blind, have insight and awareness
• Growth demands need multiple resource types
• Tape remains relevant, its location and use is changing
• Do not be scared of clouds, be prepared
• What can you do today:
  ✓ Ask questions, identify new questions or concerns, then address them
  ✓ Learn from mistakes of others, as well as from the past
  ✓ Do a POC, gets some insight, awareness and experience, have some fun


Where to learn more

• Fujifilm and its partners along with other presenters at this event
• www.storageio.com (articles, videos & webcasts)
• Feel free to call, IM, tweet, or email greg@storageio.com