SUSE® Enterprise Storage 4
Powered by Ceph Technology
Agenda

Enterprise Data Storage Challenges

SUSE Enterprise Storage

Introduction to SUSE Enterprise Storage 4

SUSE Enterprise Storage and “Large Data”

SUSE Enterprise Storage Sample Use Cases

SUSE Enterprise Storage Deployment

Summary
Enterprise Data Storage Challenges
Common Limitations of Traditional Enterprise Storage

Unable to Scale and Manage Data Growth
Expensive
Won’t Extend to the Software-defined Data Center
## Data management challenges

What are your key challenges in terms of data management in your organisation?

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security and data governance</td>
<td>56%</td>
</tr>
<tr>
<td>Increasing volumes of data</td>
<td>54%</td>
</tr>
<tr>
<td>Challenges with back up, disaster recovery and archiving</td>
<td>46%</td>
</tr>
<tr>
<td>Performance / availability</td>
<td>46%</td>
</tr>
<tr>
<td>Cost of storage</td>
<td>45%</td>
</tr>
<tr>
<td>Storage capacity planning</td>
<td>39%</td>
</tr>
<tr>
<td>Complex administration</td>
<td>35%</td>
</tr>
<tr>
<td>Silos of storage</td>
<td>26%</td>
</tr>
<tr>
<td>None of the above</td>
<td>3%</td>
</tr>
</tbody>
</table>

*1202 senior IT decision makers across 11 countries completed an online survey in July / August 2016*
Data Volume Growth

Over two thirds surveyed see the volume of data increasing each year – of these, nearly three quarters estimate data to increase by up to 30% each year.

Overall, Organisations estimated the increase in data to be 27% - similar increases are estimated across all countries: US (32%), Canada (34%), UK (27%), Germany (25%), France (25%), Italy (23%), Nordics (28%), China (25%), Japan (28%), Australia (21%) & India (29%)

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Overall, an average 7% of IT budgets are allocated to data storage – which is quite consistent across all countries.

IT budget allocated to data storage

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A growing challenge in 2016: LARGE data storage

Individual piece of data that is enormous (100s GB+)

Massive, unstructured data types:
• Video, Audio, Graphics, CAD, etc

Does not require real time or fast access

Applications include:
• Energy: Seismic Exploration Maps
• Healthcare: X-Ray Libraries, 3D Ultrasound
• Media: Video storage, Streaming Media
• HPC: Shared Research Storage
• CCTV, Police Body Cams, Security Surveillance, more
Why traditional storage is not best for LARGE data

Runs out of storage capacity quick
• Appliances usually hold ~500TB of total capacity – Large data eats into that quick

Not designed to scale in the multiple 100TB+ range
• Designed when data and storage requirements were lower
• typically ~500TB in total capacity

Not designed to support unstructured data types
• Better suited for data that is structured
• Better suited for data that can exist in a relational databases

Expensive
• typically ~$3M - 5M per appliance

The sooner you use up storage space in your appliance, the sooner you need to make another expensive storage decision!
“Object Storage” technology handles LARGE data much better

Object storage was designed…
• To handle storage of large, unstructured data by from the ground up
• To handle both structured and unstructured data - traditional storage was designed for structured data
• On cloud principles, so it can scale to TB, PB, and beyond – no known capacity limit.

And when using open source software vs proprietary software
• The economics of the whole solution become even better without software licensing costs.
• Open source projects bring rapid levels of innovation, so open source object storage technology is improved frequently and collaboratively

Since scale-out, open source object storage is essentially software running on commodity servers with local drives, you should never run out of space in the object store – if more capacity is needed, you just add another server.
Open Source Ceph as the Base

Network

Client Servers (Windows, Linux, Unix)

Applications

File Share

Block Devices

Object Storage

File Interface

RADOS (Common Object Store)

Cluster

OSD

Storage Server

MON

Server

OSD

Storage Server

MON

Server

OSD

Storage Server

MON

Server

OSD

Storage Server

MON

Server

OSD

Storage Server

MON

Server

Applications

RADOS

(Object Store)

S3

SWIFT

CephFS

Code Developers

782

Core

Regular

Casual

22

53

705

Total downloads

160,015,454

Unique downloads

21,264,047
Reduce IT Costs with an Intelligent Software-Defined Storage Solution

Reduce IT costs with an intelligent software-defined storage management solution that uses commodity off-the-shelf servers and disk drives

- Significant CAPEX savings
- Reduce IT operational expense
- Optimize infrastructure without growing IT staff
SUSE Enterprise Storage
SUSE Enterprise Storage

An intelligent software-defined storage management solution, powered by Ceph technology, that enables IT to transform their enterprise storage infrastructure to deliver highly scalable and resilient storage that is cost-efficient and able to seamlessly adapt to changing business and data demands.
SUSE Enterprise Storage
Seamlessly adapt to changing business and data demands

- Reduces IT capital and operational costs with an intelligent software-defined storage management solution
- Delivers a highly scalable and resilient storage environment
- Consolidates block, object and file storage requirements
- Utilizes commodity off the shelf hardware
- Open
- Best solution of OpenStack, Large Data and bulk storage requirements
SUSE Enterprise Storage
Unlimited Scalability with Self Managing Technology

Increase capacity and performance by simply adding new storage or storage nodes to the cluster.
SUSE Enterprise Storage
Enterprise Class Storage Using Commodity Servers and Disk Drives

Latest hardware

Hardware flexibility

Reduce capital expense
When it comes to LARGE data, data that is unstructured and individually large (100s GB or TB+), such as video, audio, and graphics,

**SUSE Enterprise Storage**

provides a more open, scalable, cost-effective, and performant storage experience,

than traditional storage products,
than commercial object storage software,
and than other Ceph-based solution vendors.
SUSE Enterprise Storage 4 for LARGE data
SUSE Enterprise Storage
Enable Transformation

**Mode 1 – Gartner for Traditional**

- Legacy Data Center
  - Network, compute and storage silos
  - Traditional protocols – Fibre Channel, iSCSI, CIFS, NFS
- Process Driven
  - Slow to respond
- This is where you probably are today

**Mode 2 – Gartner for Software Defined**

- Software-defined Data Center
  - Software-defined everything
- Agile Infrastructure
  - Supporting a DevOps model
  - Business driven
- This is where you need to get to

Support today’s investment  Adapt to the future
Introducing SUSE Enterprise Storage 4
Introducing SUSE Enterprise Storage 4

SUSE Enterprise Storage 4 - The ideal solution for “Large Data” Storage Management. Customers can simplify and scale without limitations the storage of large data applications, such as; video surveillance, CCTV, online presence and training, streaming media, medical (x-rays, mammography, CT, MRI etc), seismic processing, genomic mapping, CAD and backup datasets.

Truly unify enterprise storage requirements with SUSE Enterprise Storage 4, the first production release of CephFS. Enabling customers to run production workloads for Block, Object and File storage within a single cluster, further reducing capital and operation costs.
SUSE Enterprise Storage 4: Engineered to Reduce Storage Frustrations

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Major new features and benefits with SUSE Enterprise Storage 4

• Further reduce capital and operational costs for your storage infrastructure with a truly unified block, object and files solution with production ready Ceph filesystem (CephFS) adding native filesystem access.
• Expand hardware-platform choice to enterprise and hyper-scale customers with the added support for 64 bit ARM.
• Long distance replication for block storage and multisite object storage replication for enhanced data protection and improved disaster recovery.
• Enhanced cluster orchestration using Salt for simplified storage cluster management.
• Customers get early access to NFS Ganesha support*, NFS access to S3 buckets*, CIFS Samba support* and RDMA/Infiniband support*.
• Optimised for “Large Data” use cases
Major new features and benefits with SUSE Enterprise Storage 4

- Advanced graphical user interface for simplified management and improved cost efficiency, using the openATTIC open source storage management system.
Truly Unified – Supports Object, Block and File System Storage in the Same Cluster

- Automated management
- Heterogeneous OS Access
- Data Encrypted at Rest
- Monitor Nodes
- Management Node

Object Storage  Block Storage  File System
Enterprise Ready SUSE Enterprise Storage - Major Feature Summary

SUSE ENTERPRISE STORAGE 4

Service

- Object Storage
- Block Storage
- File System

Features Legend:
- Included
- Partial
- Coming

- Industry Leading Storage Functionality
- Simple Install, Management and Monitoring
- Heterogeneous OS Access

Infrastructure

- Management Node
- Monitor Nodes
- Storage Nodes
- Remote Cluster

- Highly Redundant Data Cluster
- Unlimited Scalability
- Policy Based Data Placement
- Stretch Cluster Replication
- Security
- Data Encrypted in Flight
- Data Encrypted at Rest
- Data Compression
- Data Deduplication
- Async Remote Data Replication
How Can SUSE Enterprise Storage Help You?

- Simplifying storage: 54%
- Reducing operating expenses on storage: 48%
- Facilitation of collaboration / innovation / flexibility: 45%
- Addressing performance concerns: 43%
- Increasing resilience: 40%
- Reducing capital expenditure on storage: 37%
- Addressing scalability concerns: 31%
- None of the above: 3%

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SUSE Enterprise Storage
Sample Use Cases
Large Data - Content Store

Scientific Organizations
- Meteorological data
- Telescope recordings
- Satellite feeds

Media Industries
- TV stations
- Radio stations
- Motion picture distributors
- Web music/video content
Large Data - Video Surveillance

- Facility security surveillance
- Red light/traffic cameras
- License plate readers
- Body cameras for law enforcement
- Military/government visual reconnaissance
Object or Block Bulk Storage

• Data that constantly grows during the course of business

• SharePoint data

• D2D Backup
  - HPE Data Protector, CommVault, Veritas and others

• Financial records

• Medical records
Virtual Machine (VM) Storage

• Ceph is already the leading storage choice for OpenStack environments

• Low and mid i/o virtual machine storage for major hypervisor platforms
  • kvm – native RBD
  • Hyper-V – iSCSI
  • VMware - iSCSI
SUSE Enterprise Storage Deployments Guidelines
Example of SUSE Enterprise Storage Partners

HPE - OEM
- Apollo – Apollo 4200
- Proliant – DL380/DL360

Thomas-Krenn – SES Appliance

Integrated products via resellers
SUSE Enterprise Storage Pricing

**Base Configuration - $10000** (Priority Subscription)
SUSE Enterprise Storage and limited use of SUSE Linux Enterprise Server to provide:
- 4 storage OSD nodes (1-2 sockets)
- 6 infrastructure nodes

**Expansion Node - $2300** (Priority Subscription)
SUSE Enterprise Storage and limited use of SUSE Linux Enterprise Server to provide:
- 1 SES storage OSD node (1-2 sockets)
- 1 SES infrastructure node
4 SES OSD storage nodes
- 10 Gb Ethernet (2 networks bonded to multiple switches)
- 32 OSD’s per storage cluster
- OSD journal can reside on OSD disk
- Dedicated OS disk per OSD storage node
- 1 GB RAM per TB raw OSD capacity for each OSD storage node
- 1.5 GHz per OSD for each OSD storage node
- Monitor nodes, gateway nodes and metadata server node can reside on SES OSD storage nodes:
  - 3 SES monitor nodes (requires SSD for dedicated OS drive)
  - iSCSI gateway, object gateway or metadata server nodes require redundant deployment
  - iSCSI gateway, object gateway or metadata server require incremental 4 GB RAM and 4 Cores

Separate management node
- 4 GB RAM, 4 Core, 1 TB capacity

Minimum Recommended Configuration (Production)

7 SES OSD storage nodes (no single node exceeds ~15%)
- 10 Gb Ethernet (4 physical networks bonded to multiple switches)
- 56+ OSDs per storage cluster
- RAID 1 OS disks for each OSD storage node
- SSDs for Journal
  - 6:1 ratio SSD journal to OSD
- 1.5 GB RAM per TB raw OSD capacity for each OSD storage node
- 2 GHz per OSD for each OSD storage node

Dedicated physical nodes for infrastructure nodes:
- 3 SES Monitors; 4 GB RAM, 4 core processor, RAID 1 SSDs for disk
- 1 SES management node; 4GB RAM, 4 core processor, RAID 1 SSDs for disk
- Redundant physical deployment of gateway nodes or metadata server nodes:
  - SES object gateway nodes; 32 GB RAM, 8 core processor, RAID 1 SSDs for disk
  - SES iSCSI gateway nodes 16 GB RAM, 4 core processor, RAID 1 SSDs for disk
  - SES metadata server nodes (one active/one hot standby); 32 GB RAM, 8 core processor, RAID 1 SSDs for disk

Summary
SUSE Enterprise Storage
Business Benefits

SAVINGS: Total cost of ownership
• Reduced CAPEX expenditures
• Reduced OPEX expenditures

FLEXIBILITY: Adaptability to evolving business needs
• Reduced dependency upon proprietary “Locked In” storage

CONFIDENCE: Reliability and availability
• Leverage SUSE world-class support and services
Why SUSE and Software-defined Storage?

Open source cloud operating systems and software defined storage platforms are based on the Linux operating system.

SUSE is a Linux OS pioneer and successful software vendor with thousands of installations. Customers should expect to receive nothing less than expert support from SUSE for their software-based storage.

Learn more at suse.com/storage/
Questions and Answers