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Cloud Object Storage 101

Live Webcast
July 14, 2016
10:00 am PT

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Live Webcast July 14th

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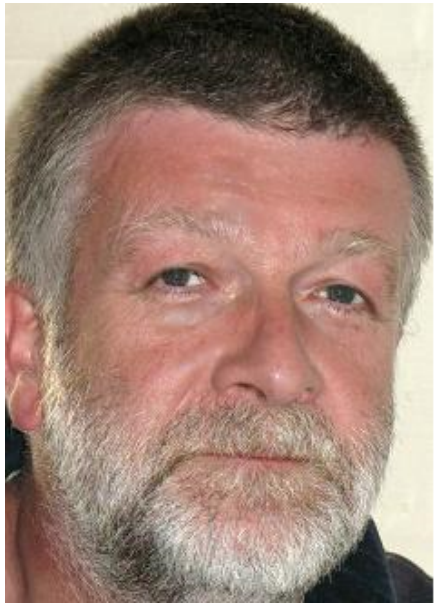
Nancy Bennis
Director, Partner Sales
IBM Cloud Object Storage



Alex McDonald
Chair - SNIA Cloud Storage
NetApp

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Agenda

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Gain understanding of:

- **Current storage landscape**
- Object storage and the movement to cloud
- Benefits and economics of object storage
- Use cases and solutions
- Application ecosystem and cloud deployment

Unstructured data growth created The need for cloud storage

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Key issues

- Traditional storage designed for transaction, not unstructured data
- "Growth on growth"
  - Storing bigger data objects
  - Storing more data objects
  - Every new technology creates new data

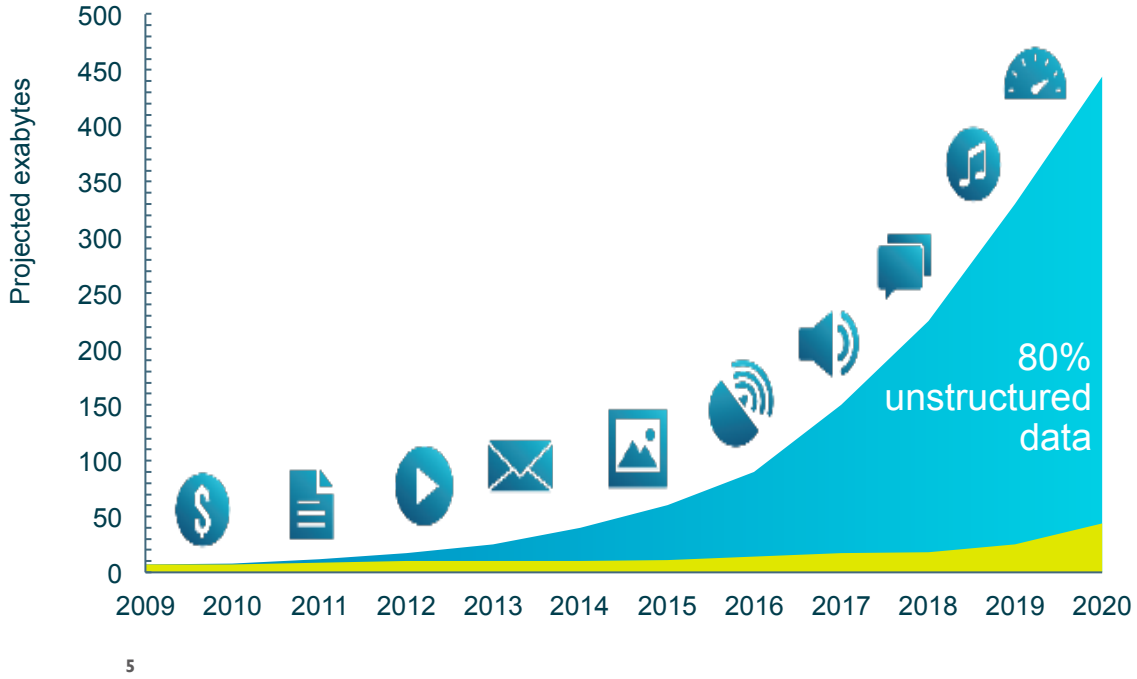

Chart source: IDC, March 2014

Data growth is massive

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A confluence of forces and sources—including cloud, mobile, social, analytics—create exponential data growth.

332%

growth in mobile data traffic between 2015 and 2018[1]

90%

of total mobile data traffic will be cloud apps by 2019[2]

10x

growth of the amount of data on the planet by 2020[3]

80%

of all data is unstructured (web, social, video, audio, pictures, scans, email)[4]

1. Extrapolated from Gartner press release, http://www.gartner.com/newsroom/id/3098617
2. Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2014-2019
3. IDC annual Digital Universe study, http://www.computerweekly.com/news/2240217788/Data-set-to-grow-10-fold-by-2020-as-internet-of-things-takes-off
4. IBM data.

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The evolving storage landscape

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Block

- Transactional data
- Database data
- High I/O Performance

File

- Unstructured data
- Hierarchical
- Directory defined files

Object

- Large volumes and objects
- Unstructured data files
- No system overhead

Define object storage
Everyone is moving to Cloud

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- Software defined storage (SDS)
- Low cost server/disk arrays
- Single virtual pool of storage
- Distributed access
- Unprecedented scale
- Data protection using Erasure coding or RAID
- Increased data integrity and availability

**Object storage refers to a system where data is stored in discrete buckets or "objects," in contrast to the directories and subdirectories of a traditional file system.*

By 2019, 30% of midsize organizations will leverage public cloud IaaS for backup.

Up from today

By 2018, 70% of business and application owners will have more self-service control over their data protection services.

Up from today

By 2018, the number of enterprises using the cloud as a backup destination will double.

Up from today

SOURCE: Gartner Magic Quadrant for Data Center Backup and Recovery Software 08 June 2016

How Object Storage Technology Works

Geographically Dispersed Erasure Coding

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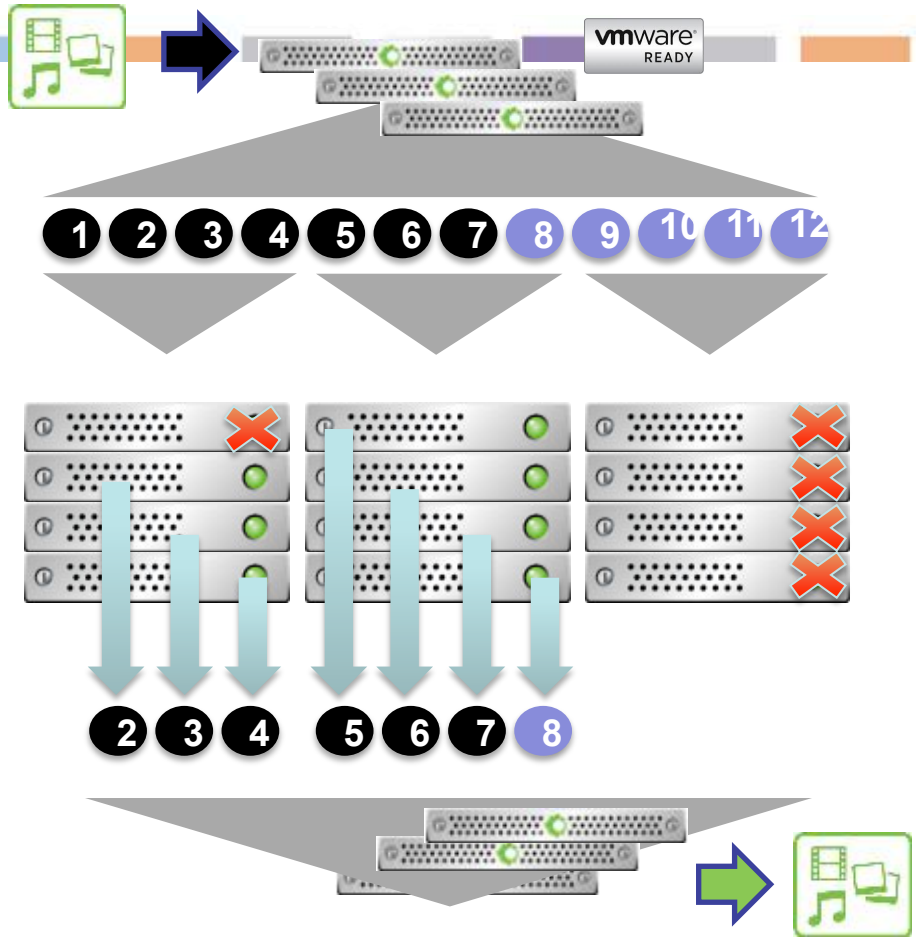

1 Data is virtualized, encrypted, and sliced using Information Dispersal Algorithms.

2 Slices are dispersed to separate disks, storage nodes and geographic locations.

3 Even with individual servers or entire sites down, real time bit perfect data is retrieved from a subset of slices.

SCALABLE **RELIABLE** **SECURE**

Geographically Dispersed Erasure Coding

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Life-Cycle Cost
‘05 Erasure Coding

Security

Reliability
‘06 Slice Rebuilder
‘07 Perfect Bits Data Integrity
‘07 Sixteen 9s
‘09 Strong Data Consistency Guarantees
‘10 Multi-Fault Rebuild

Confidentiality
‘07 KeyInside Threshold Encryption
‘13 Secure Multi-tenancy
‘13 LDAP
‘13 Multi-AD Domains

Future: ZIG Rebuilder

Simplicity

Administration
’08 HTTP/REST Manager Interface
’11 Zero Downtime Adds, Moves, Changes
‘12 Zero Downtime Upgrades
‘12 One Admin per 25PB

Integration
‘12 OpenStack Swift
‘12 Hadoop HDFS
‘12 Partner Solution Network
‘12 S3 Interface Support

Future: IRODS

Carrier Grade Scalability
10,000 use cases

Performance
‘07 SmartClient
‘10 Coast-to-Coast Network
‘11 10GB Accessers
‘12 Distributed Rebuilder
‘13 Multipart Uploads
‘14 Cooperative Rebuilder

Future: Automated Tiering

System Scale
’08 Petabyte Excellence
’09 Namespace Registry
‘09 No-Database Address
’10 Stateless Accesser
’10 Distributed Multi-Writer
’12 Ten Exabyte Support

Future: Zettabyte Scale

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A highly reliable storage system for massive data

More efficient utilization of storage

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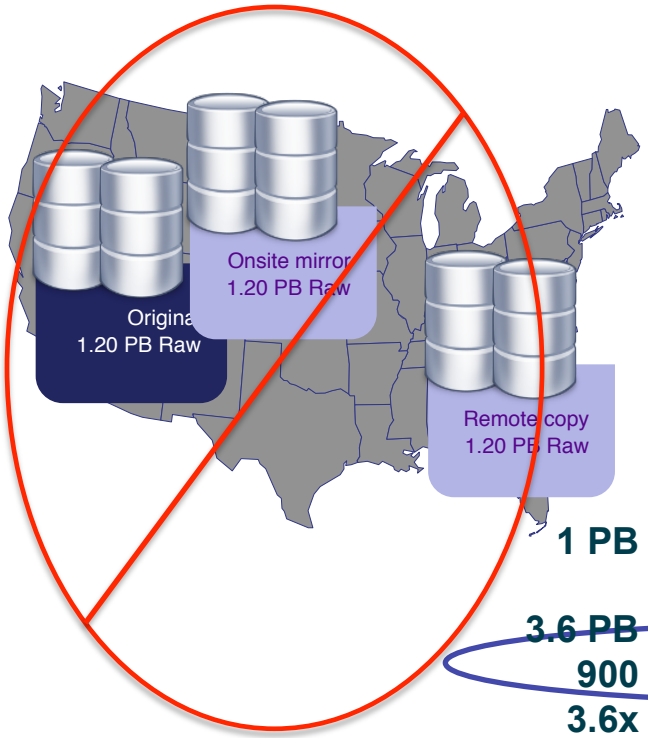
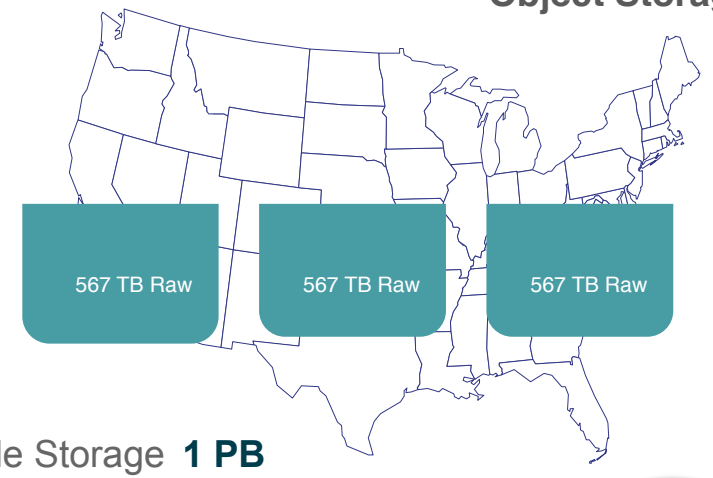


Object Storage



Usable Storage	**1 PB**	**1 PB**
Raw Storage	**3.6 PB**	**1.7 PB**
4TB Disks	**900**	**432**
Racks Required	**3.6x**	**1.7x**
Floor Space	**3.6x**	**1.7x**
Ops Staffing	**3 FTE**	**5 FTE**
	Replication/backup	**None**

$

70% +

TCO Savings

Object storage economics

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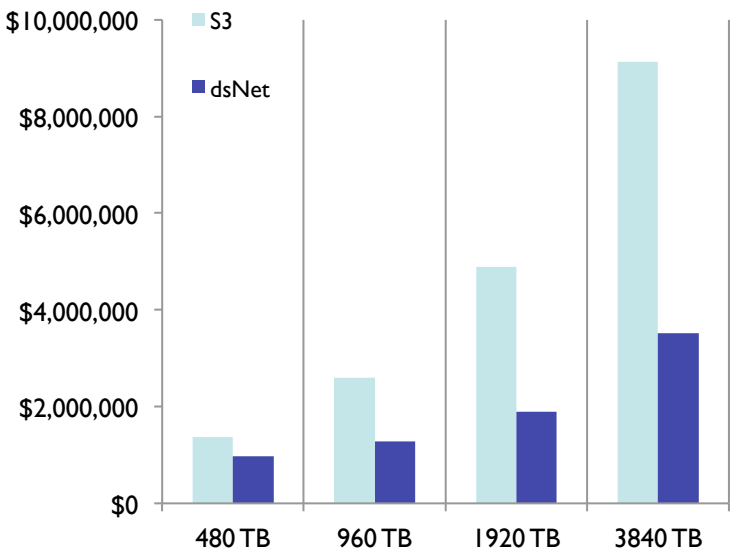
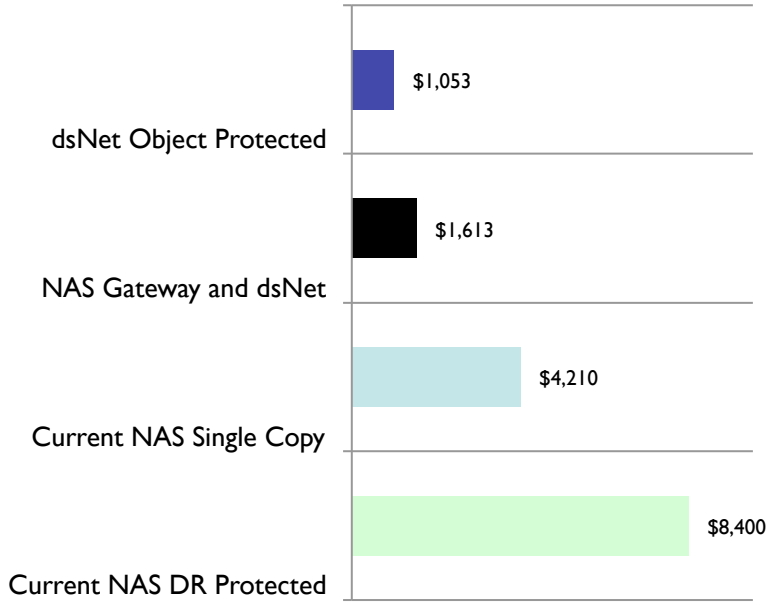
Object Storage vs S3



- 5 Year TCO comparison
- Amazon S3 published prices and capacity discounts
  (pricing as of 10/31/14, assumes 20% reads)

Cost: 29–61%+ lower

Object Storage vs NAS



- $/TB comparison
- Analysis by IBM Cloud Object Storage customer

Cost: 80%+ lower

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Scalable, shared, secure cloud Storage for the enterprise

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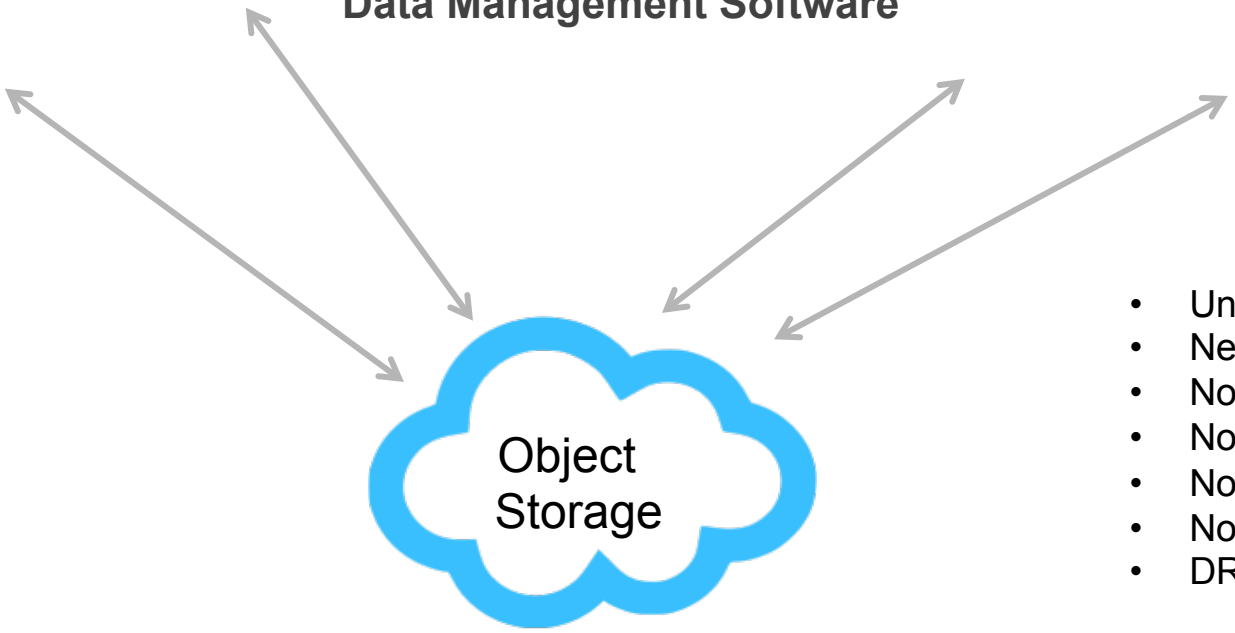
Business Applications

Exchange Email | Sharepoint | NFS File Servers | Audio/VIdeo | Content

Applications

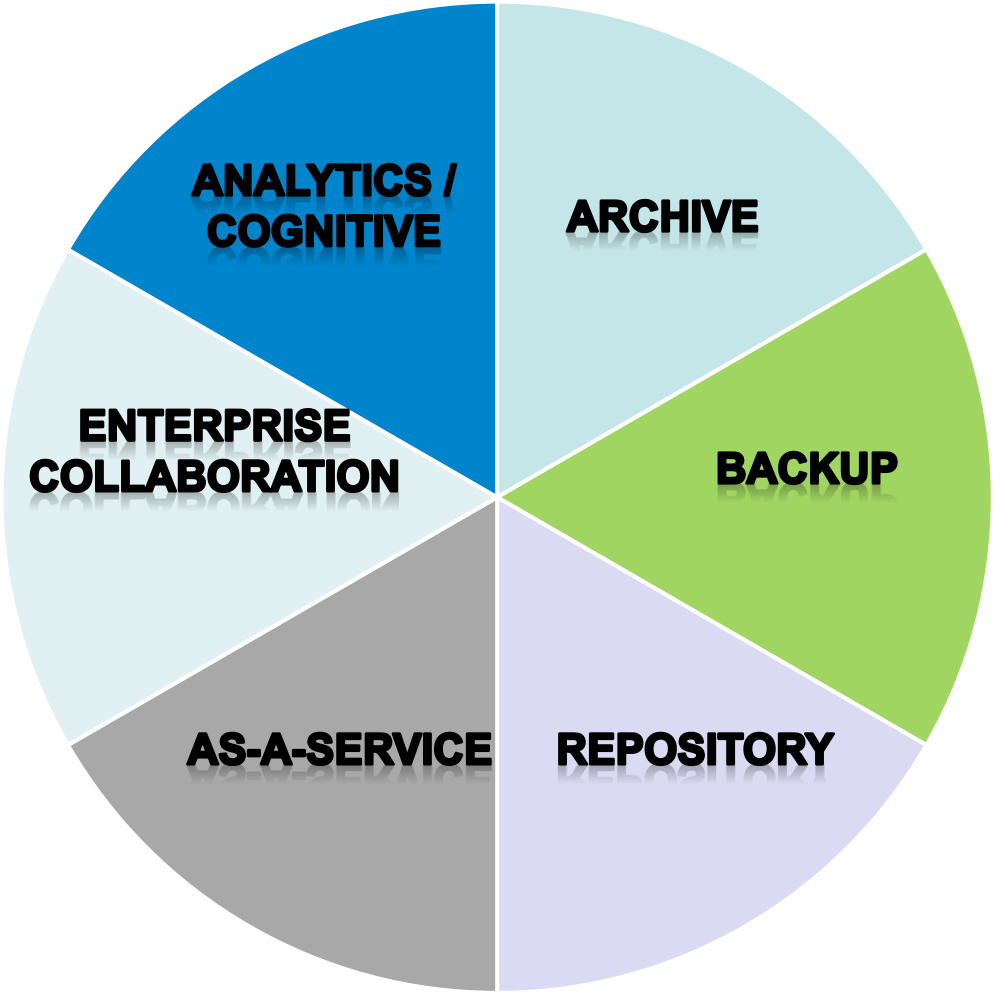
Data Management Software

Cloud Storage



- Unstructured data
- Nearline performance
- No backup required
- No limit to scale
- No replication
- No downtime
- DR built-in

Enterprise solutions



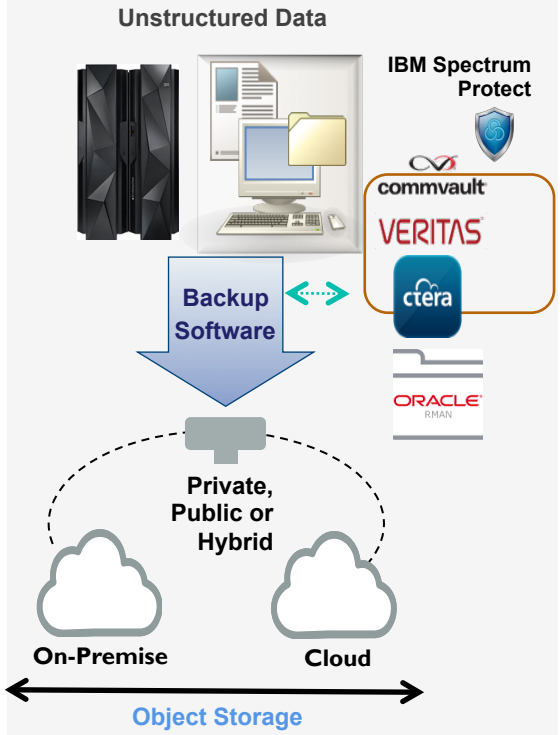
Use Case: Backup

Leverage low-cost, balanced performance commodity disk storage for weekly/ monthly snapshots with higher rates of access requirements

Challenge

- Cost of storing recent backups too high cost proprietary disk storage systems
- Complexity of backup infrastructure today
- Expensive disk to disk to tape backup
- Time consuming backup processes
- Difficult to scale backup with explosive data growth
- How to backup BYOD, ROBO, file sharing

Solution



Benefits

- Scalable backup and always-on data availability for dependable recovery and security
- Secure data at rest without replication
- Restore and recover from disasters faster
- Efficient distributed backups across sites (Cross-Region offerings)
- Complete data protection for BYOD, ROBO

Backup: Example business challenge

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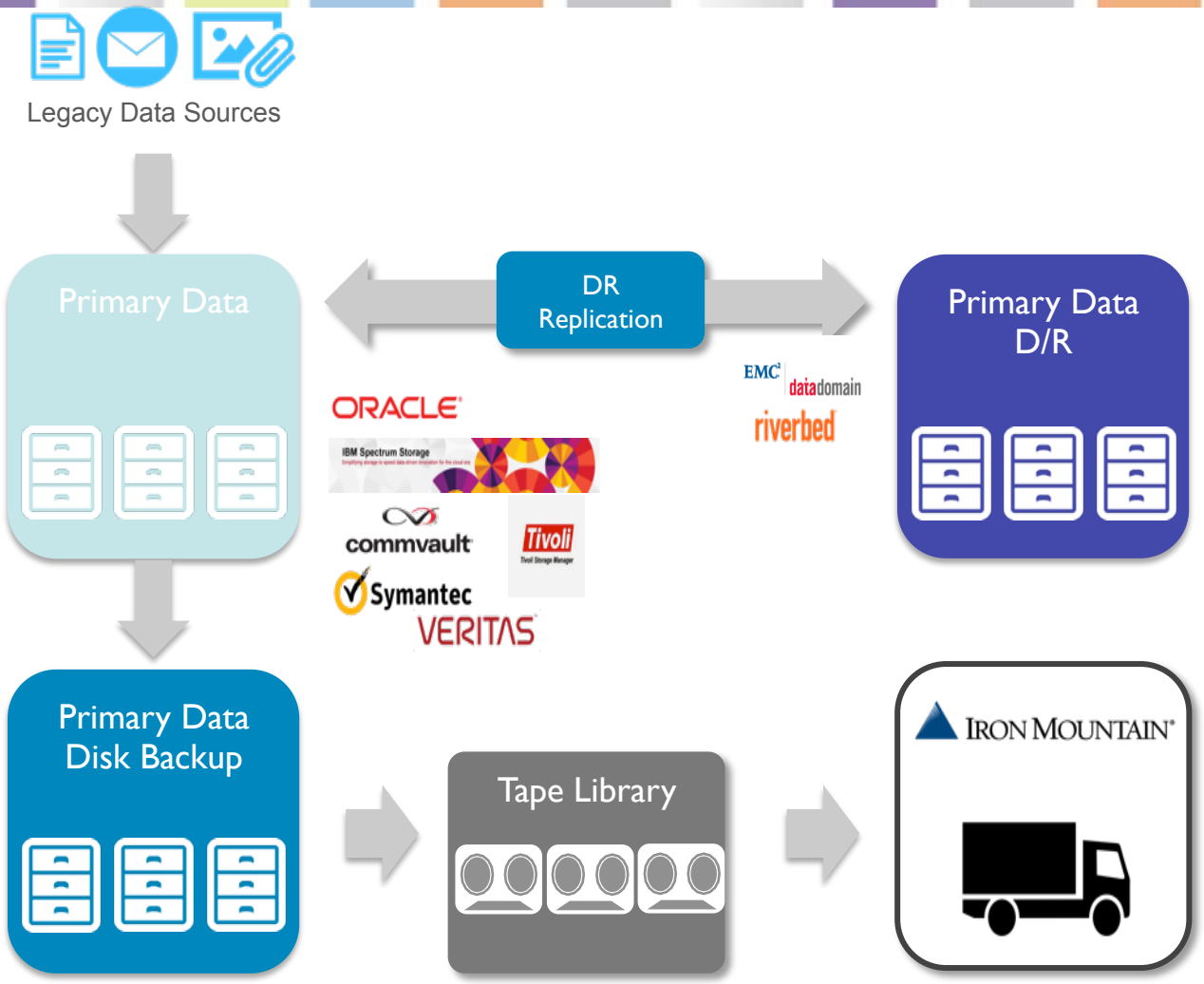
BEFORE: Backup and disaster recovery



Challenges

- Time consuming & expensive
- Redundant data
- Protecting PB's Data via copies, replication & encryption
- Storage sprawl
- 18 – 24 month tech refresh
- Data security
- Expensive
- Difficult to manage

Backup: Example solution value

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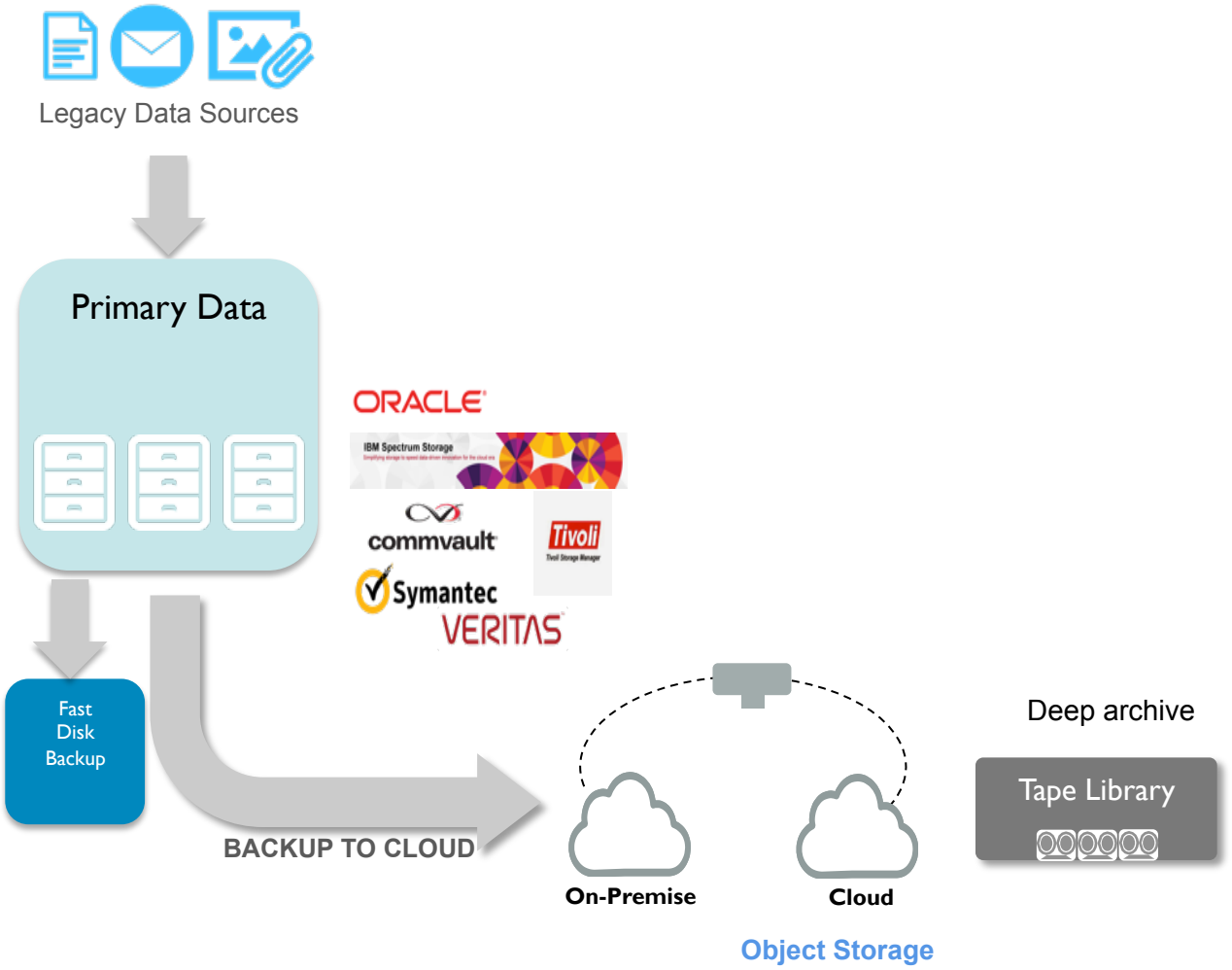
AFTER: Optimized backup and disaster recovery



Benefits

Operational Gains

- Scalable
- Always ON
- Zero Touch Security
- Easy to Manage

Economic Advantage

- Minimize
  - Copies/Replication
  - Encryption Devices
  - Dedupe Hardware
- Simplify backup/restore process
- Reduce storage costs by 80%
- De-Duplication Included
- Archive and analytics ready

Use Case: Archive

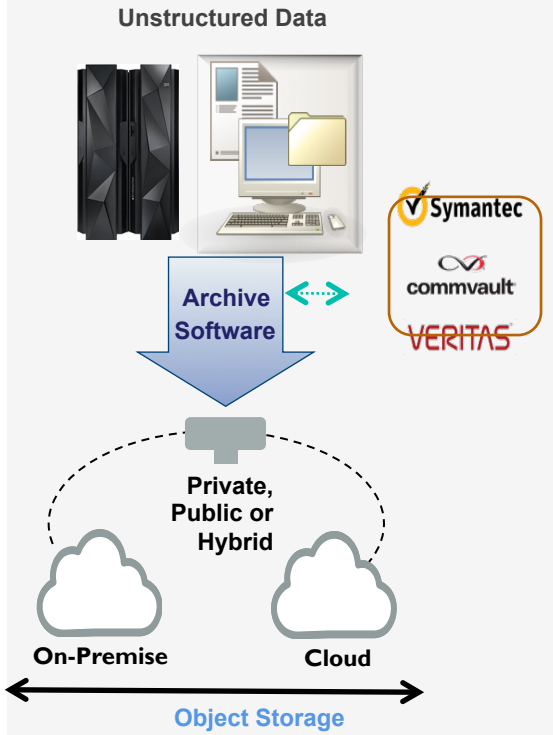
Keep content accessible with a scalable, reliable and secure long-term data archive / data retention

CHALLENGE

- Storage & management cost of traditional tape storage systems
- Retention and retrieval management
- Data retrieval time
- Lost tapes/media
- 80% of data on Tier 1 storage is not accessed after 90 days*
- Meeting compliance requirements

* IDC Research

SOLUTION



BENEFITS

- Keep content accessible in realtime with a scalable, reliable and secure always on data archive
- Support for all major archive software products directly or through gateway
- Rock-solid reliability and availability provide continuous access to data even in the event of site outages
- Keep data on the right tier at the right time: Lifecycle data management
- Decrease costs/reclaim of Tier 1 storage

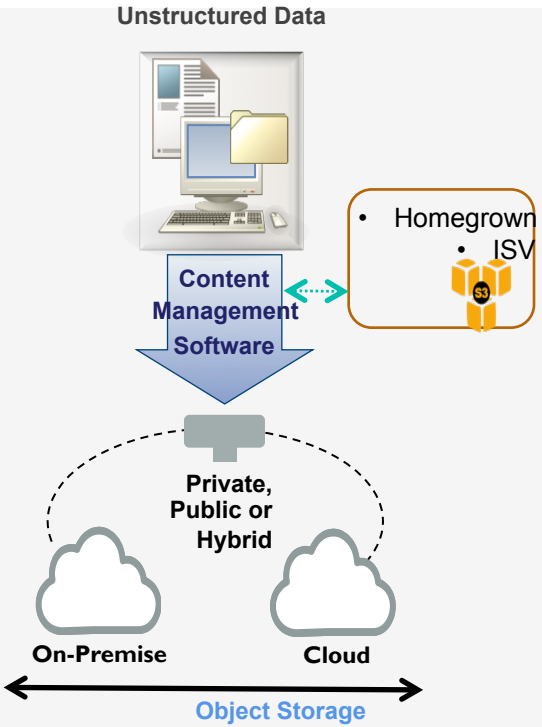
Use Case: Content Repository

Entrust business critical data to a reliable, scalable always-on, safe and secure storage platform with built-in fault tolerance

CHALLENGE

- Legacy storage won't scale and becomes cost prohibitive for storing petabytes-exabytes of unstructured data
- Traditional storage requires copies, replication, mirroring and disaster recovery (DR) - multiplying storage requirements and costs, and impacting performance and manageability

SOLUTION



BENEFITS

- Store a single digital copy of digital assets – no content replication necessary
- Access content globally
- Efficiently manage content
- Carrier grade system reliability
- Scales to 100's of petabytes, exabytes and beyond

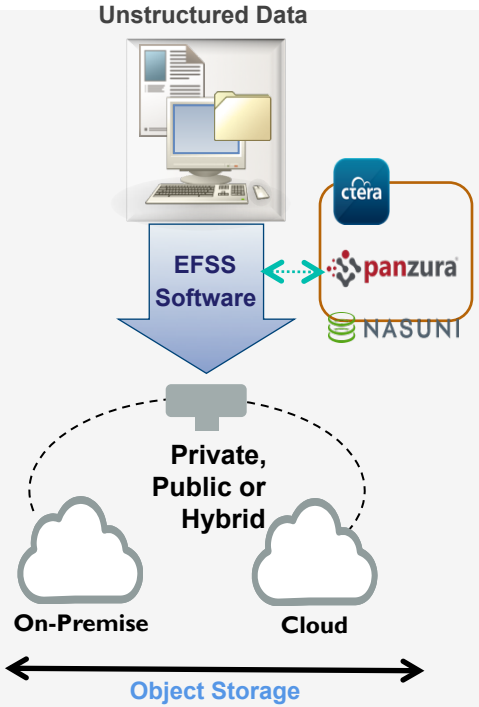
Use Case: Enterprise Collaboration

Fuel workplace productivity across the globe with secure, distributed access to valuable content

CHALLENGE

- Providing access to valuable data across multiple platforms
- Providing access to valuable data across geographies and organizations
- Sharing and synchronizing data across many mobile devices (BYOD) and Remote office locations
- Protecting data at the edge
- NAS Sprawl

SOLUTION



BENEFITS

- Easily manage storage costs and security and data protection for NAS File services
- Provide global data access to a variety of mobile, laptop and tablet devices
- Synchronize, share and manage file data worldwide
- Provide data protection for all edge devices and remote office locations
- Replace existing NAS

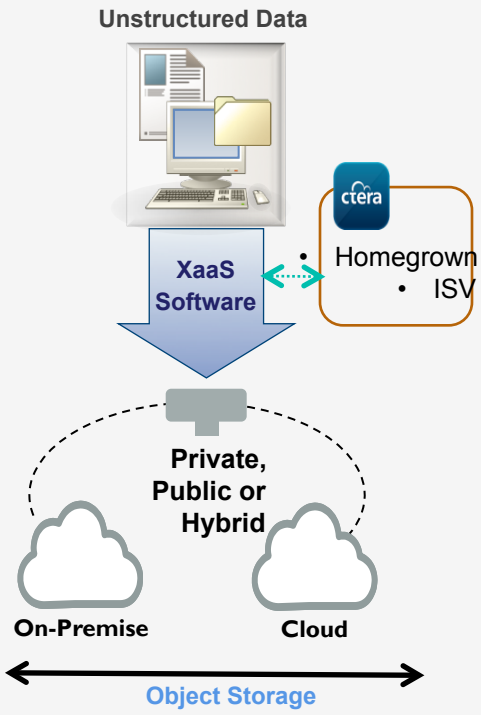
Use Case: As-a-Service

Deliver new levels of storage capacity and availability with carrier-grade security to your user base

CHALLENGE

- Efficiently manage storage costs and complexity
- Competitive pressure to offer new services with reliable and secure access
- Legacy storage won't scale and becomes cost prohibitive for storing petabytes-exabytes of unstructured data for STaaS
- Traditional storage requires copies, replication, mirroring and disaster recovery (DR) - multiplying storage requirements and costs, and impacting performance and manageability

SOLUTION



BENEFITS

- Reduce storage management costs and complexity
- Capacity optimized, cost effective, scalable from hundreds of terabytes to multiple petabytes at a fraction of the cost
- Always 'on," Secure and Encrypted means no downtime
- Flexible choice of cloud deployment options: on-premise, hybrid, and public cloud
- Extend services portfolio to add complementary new use cases

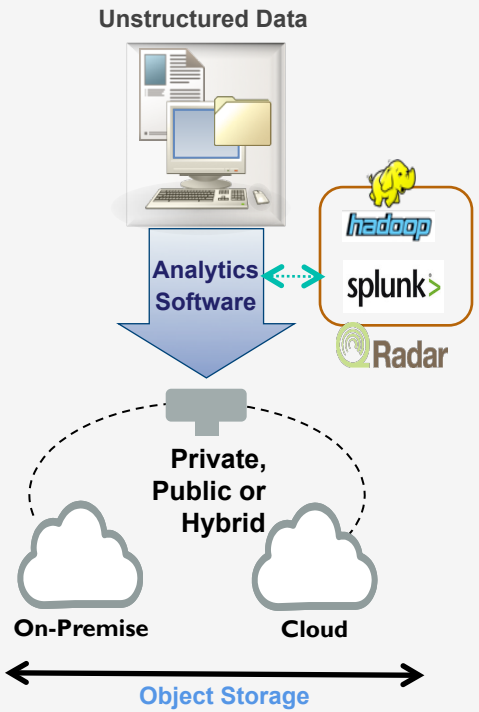
Use Case: Analytics / Cognitive

Deliver a cost effective, scalable and manageable solution for compute-centric data-intensive analytics

CHALLENGE

- Ability to store and process large volumes of unstructured data and integrate with Hadoop, Splunk and other data analytics services

SOLUTION



BENEFITS

- Cost effective
- Scales to 100's of petabytes, exabytes and beyond
- Store a single digital copy of digital assets – no content replication necessary
- Efficiently manage content
- Carrier grade system reliability

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Application Ecosystem

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Enterprise Collaboration

- Corporate "Dropbox"
- Mobile, Laptop
- Server File Services
- Remote Office File Services
- Content Distribution
- File Collaboration

ctera

panzura

NASUNI

ARCHIVE

- Email
- HPC & IRODS
- File
- HSM/ILM
- Call Center
- Video
- Social Media
- HDFS Hadoop
- Mainframe

AVERE

Symantec

VERITAS

hadoop

commvault

Rocket

BACKUP

- Backup to Cloud
  - Public, Private, Hybrid
- Tape Replacement
- NAS Replacement
- Remote Office Backup
- Server/Laptop backup

Symantec

commvault

ORACLE RMAN

VERITAS

IBM Spectrum Protect

CONTENT REPOSITORY

- Document Management
- Big Data Analytics
- Music/Call Center
- Video Surveillance
- Machine Generated Data

hadoop

IBM Security QRadar

STORAGE AS A SERVICE

- Archive
- Backup
- Content Repository
- Enterprise Collaboration
- Other Cloud Applications
- Cloud DVR

ctera

CloudBerry Lab

ANALYTICS & COGNITIVE

- Social
- Mobile
- IoT
- Cloud applications

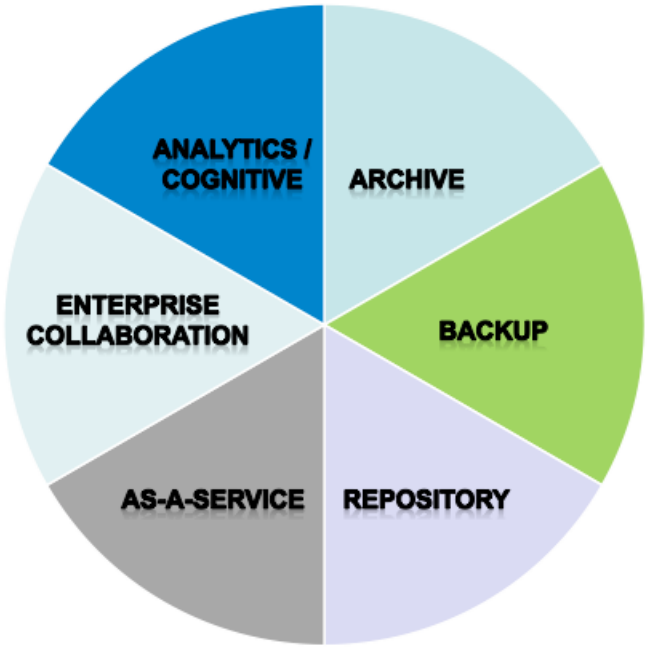
IBM Watson

hadoop

IBM Security QRadar

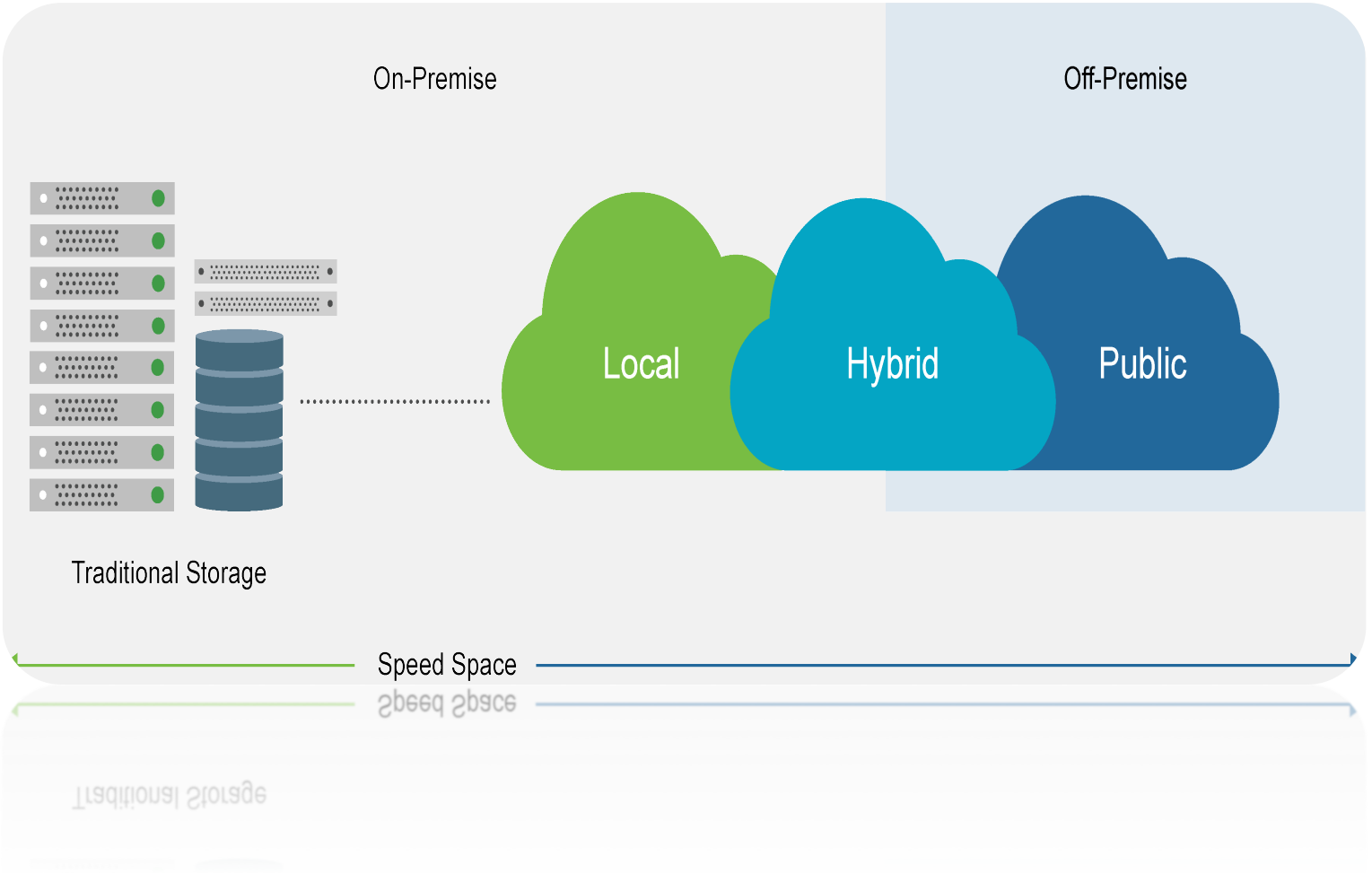
Industry solutions

Media & Entertainment Production & Distribution	Service Providers	Financial Services	Healthcare & Life Sciences	Government
Media Asset Management Transcoded data Distribute and share content	Provide "XaaS"	Secure data Compliance	Medical imaging PACs/VNA Genomic data Compliance	Secure data Surveillance Compliance



The answer is in the combination:

Object Storage hybrid deployment options.



After This Webcast

- Please rate this webcast, we value your feedback
- This webcast and a copy of the slides will be on the SNIA Cloud Storage website and available on-demand
  - http://www.snia.org/forum/csi/knowledge/webcasts
- A Q&A from this webcast, including answers to questions we couldn't get to today, will be on the SNIACloud blog
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Thank You