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## Benefits

- Resilient and secure backups of Oracle databases with built-in encryption and the ability to help protect a single copy of the data from site-loss
  - Seamless integration with Oracle Recovery Manager (RMAN) to direct database backup and restore activity to IBM Cloud Object Storage
  - Decreased reliance on primary storage and offsite tapes to help reduce costs and complexity
  - Simplified management structure with a feature-rich management graphical user interface that allows you to better secure your storage system with reduced intervention
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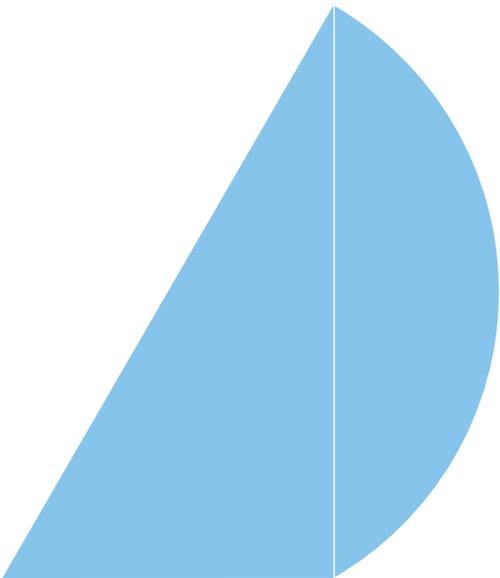
# IBM Cloud Object Storage for Oracle RMAN Backup

## IBM Cloud Object Storage for simplified Oracle database backup and recovery

Your databases hold the most critical company assets, including customer information, corporate financials, human resources information and various other critical data sources. Many companies today are dealing with a proliferation of Oracle databases, with decentralized backup processes using primary storage as a backup target, making it a challenge to reliably protect corporate data and control costs. Oracle customers now can back up their databases using IBM Cloud Object Storage (S3) as their offsite backup storage destination to help reduce cost and storage complexity.

## The high cost and complexity of traditional backup storage

Many IT organizations perform full Oracle backups on a nightly basis — often together with an incremental backup strategy throughout the day. Organizations have traditionally managed this by writing backups to tape and shipping the tapes offsite. This process is costly and operationally complex, requiring expensive hardware, specialized staff and detailed procedure. In addition, database administrators often perform their own backups and restore operations using primary storage as a backup target, which adds tremendous costs and may run outside of the corporate data protection policy. Adding to the complexity, a given company may be using multiple backup solutions for critical data. The result is often multiple backup processes to protect the various applications and endpoints in play, adding complexity and redundancy in the data protection process.



Traditional backup operations can lead to:

- Higher cost by using expensive network-attached storage (NAS) or storage area network (SAN) for backup
- Complexity in maintaining multiple vendors, traditional hardware and tape infrastructure
- Extra cost from allocating primary storage as a “dump” area for temporary backup
- Downtime and data loss due to reliance on tape for database restores
- Inability to scale seamlessly
- Long recovery times from offsite backups

IT organizations need more flexibility, efficiency and consolidation. They need to meet the needs of their internal customers and to control and manage the most critical and sensitive information, but do so economically.

### About IBM Cloud Object Storage

IBM Cloud Object Storage offers the flexibility, scalability and simplicity needed to store, manage and access today’s rapidly growing volumes of unstructured data in a private, public or hybrid cloud environment. Users can access data from virtually anywhere in the world through IBM’s RESTful S3-compatible application programming interface (API). IBM Cloud Object Storage is integrated with Recovery Manager (RMAN) for secure and reliable backup of Oracle databases, helping enterprises reduce cost and complexity associated with traditional back up storage strategies.

### How IBM Cloud Object Storage IT works with Oracle Recovery Manager for database backup

Recovery Manager (RMAN) is the native Oracle Database client that performs backup and recovery tasks for local and clustered databases, and automates administration of configured backup strategies. RMAN includes Oracle’s Secure Backup (OSB) cloud module with an SBT (Secure Backup) interface that enables the use of the S3 protocol for data backup to IBM Cloud Object Storage. With the OSB Cloud Module the RMAN commands that are used for backups remain unchanged, except for the “destination” parameter, which can point to IBM Cloud Object Storage rather than tape. The SBT interface allows external backup libraries to be seamlessly integrated with RMAN. As a result, backups can be easily directed to IBM Cloud Object Storage with no measurable impact on current backup processes.

As many organizations may choose to use a phased approach to migrate backups to the cloud, RMAN can keep track of metadata regarding Oracle database backups and write this metadata to database tables. From there, it is possible to query which databases are backed up to tape, and which are backed up to IBM Cloud Object Storage. You can also determine the number of bytes per backup destination, distribution of backups by data center and more. As a result, you will be able to monitor where your data resides, giving you flexibility and insight into your backup environment.

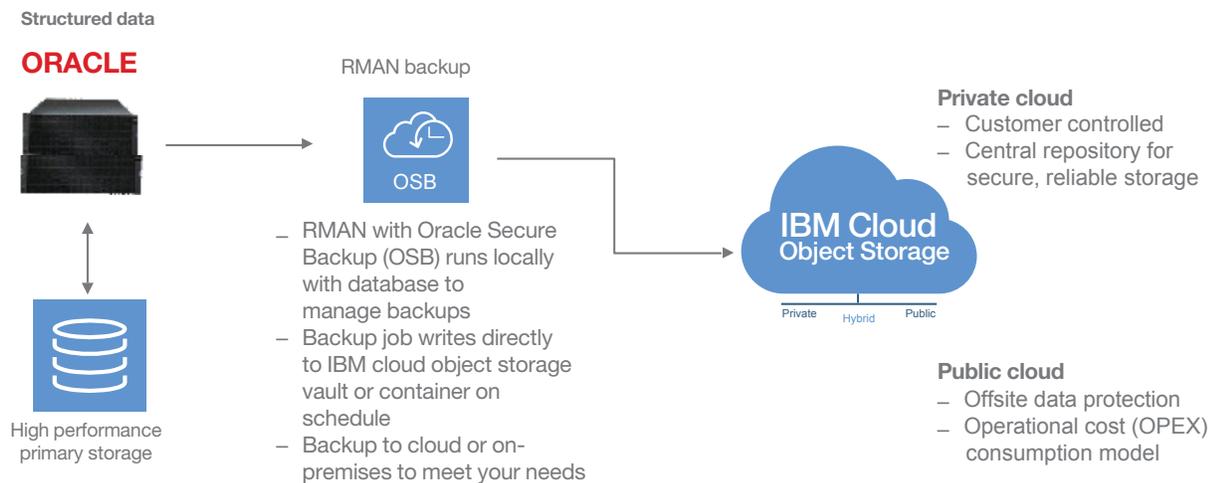


Figure 1. Architectural overview of Oracle RMAN and IBM Cloud Object Storage

## IBM Cloud Object Storage for Oracle database backup with industry-leading flexibility, scalability and simplicity

**Flexible deployment options:** Gain unmatched flexibility by choosing deployment options that meet your needs. Choose among, private, public or hybrid cloud options that use a common software infrastructure with complete license and interface flexibility:

- **On-premises:** Deploy object storage on-premises for optimal performance and control. IBM software runs on industry-standard hardware within your data center.
- **Dedicated cloud:** Choose an isolated, single-tenant system in the IBM Cloud that uses dedicated bare metal servers to optimize control and performance.
- **Public cloud:** Choose a public cloud deployment for unpredictable data growth. The IBM Cloud offers object storage in a shared, multi-tenant infrastructure.
- **Hybrid cloud:** Expand the object storage system in your data center through integration with the IBM Cloud. Customize the hybrid deployment to meet your precise requirements.

**Reduced backup and offsite storage costs:** Help reduces or eliminates the need for primary storage and off-site tapes. This can lead to significant savings in backup software licensing, support and offsite tape storage costs.

**Exabyte+ scale:** Scale as needed by directing multiple RMAN data streams to virtually unlimited capacity. The web-scale storage platform helps enable performance and capacity to scale independently — reaching exabyte levels and beyond. IBM's single addressable global namespace is designed to deliver a unified, single point of management and access that can scale beyond the limits of traditional centralized metadata servers. Therefore, users don't need to worry about provisioning adequate tapes or local storage to hold the

**No impact on current process:** This means you can avoid alterations to the RMAN interface. You can simply direct database backup and restore activity to IBM Cloud Object Storage, allowing administrators to continue to use existing backup tools to perform Oracle database backups.

**Always-on accessibility:** Backups stored in IBM Cloud Object Storage are always accessible. Designed with a shared-nothing architecture that allows industry-leading scalability, the software supports strong data consistency models that let you access your data across multiple time zones. The namespace is virtually unlimited, with no centralized metadata management process and no limit to metadata size or number of attributes. All metadata is treated in the same manner as data in that it is uniquely addressed and erasure-coded for protection. This helps ensure your data is available even when drives, nodes, networks or sites fail.

**Security rich:** Delivers patented SecureSlice® security with data encryption while at rest, and user credentials and digital certificates to help regulate access. Each object written into the system is divided into several slices, with no copy of the data residing in any single disk, node or location. Each object can be read bit perfectly by using a subset of those slices. Thus, even if one disk, node or location is physically breached, it is virtually impossible to decode the data using algorithmic computation.

**Simplified management:** A rich set of features that helps you easily manage hundreds of petabytes of data or more with a small staff. The core technology is designed with a robust management graphical user interface that allows you to provision, monitor, troubleshoot and better secure your storage system with reduced intervention. Built-in reports and interactive charts help to ensure that your system is operating efficiently. Physical and logical components of the entire system can be managed through a browser-based, single interface or a robust application programming interface (API)-based management system. This also allows for integration with other management systems or tools of your choice.

## Industry recognition for IBM Cloud Object Storage

IBM Cloud Object Storage is built on technology from object storage leader Cleversafe®, which was acquired by IBM in 2015. Some of the world's largest repositories rely on IBM Cloud Object Storage.

### Industry recognition:

- Gartner has awarded IBM Cleversafe dsNet (now IBM Cloud Object Storage) the highest scores in the Analytics, Archiving and Cloud Storage use cases in its March 2016 Object Storage Critical Capabilities report.<sup>1</sup>
- Cleversafe storage solutions are 72 percent less expensive than the equivalent Redundant Array of Independent Disks (RAID) solutions.<sup>2</sup>

## Take the next step

To learn more about IBM Cloud Object Storage and sign up for a cloud public services trial, visit [ibm.com/cloud-computing/products/storage/object-storage/cloud](http://ibm.com/cloud-computing/products/storage/object-storage/cloud).

For more information on Oracle database backup to IBM Cloud Object Storage (S3), please contact your IBM representative, or visit the following website [ibm.com/cloud-computing/products/storage/object-storage](http://ibm.com/cloud-computing/products/storage/object-storage).

### Endnotes:

1. Gartner. *Critical Capabilities for Object Storage 2016*. ID G00271719. March 31, 2016. ([www.ibm.com/marketing/iwm/dre/signup?source=mrs-form-8563&S\\_PKG=ov51769](http://www.ibm.com/marketing/iwm/dre/signup?source=mrs-form-8563&S_PKG=ov51769))
2. *The Total Economic Impact™ of Cleversafe, an IBM Company: Cost Savings and Business Benefits Enabled by Cleversafe Object Storage*. A commissioned study conducted by Forrester Consulting on behalf of Cleversafe. March 2015. ([www.cleversafe.com/documents/public/Forrester-TEI.pdf](http://www.cleversafe.com/documents/public/Forrester-TEI.pdf))



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