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# Oracle ZFS Storage Benefits for Replacing Tape as Mainframe Backup/Archive Through VSM (Air-Gapped Environment)

Executive Summary

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Oracle ZFS Storage is a high-performance, enterprise storage solution that is ideal for backing up and archiving data on mainframe computers especially in environments where there is no internet access. It is faster, cheaper, easier to use, and more secure than tape storage that are the traditional backup and archive medium for mainframes for many years, but it has several drawbacks, including cost, scalability, reliability, and performance. Oracle ZFS Storage also integrates seamlessly with Oracle's StorageTek Virtual Storage Manager System Virtual Tape Storage Subsystem (VTSS), providing a comprehensive and unified storage platform for mainframe environments.
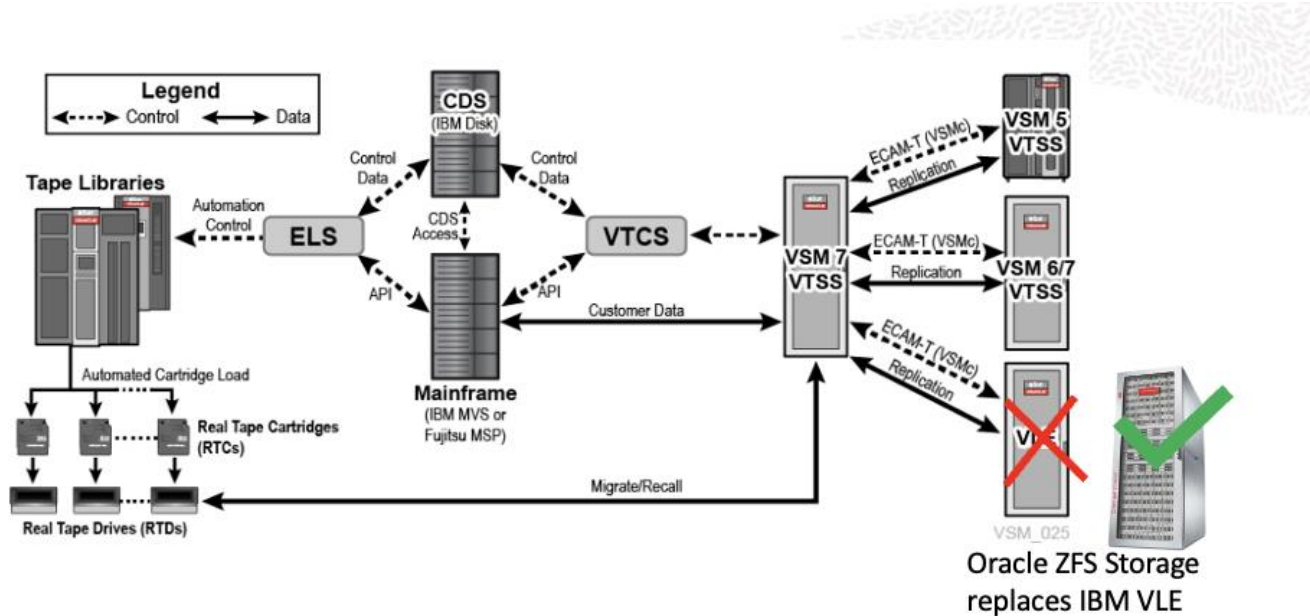
"Oracle ZFS Storage as an IBM mainframe backup/archive through Oracle's StorageTek VSM" use case depicts VMS7 VTSS supporting emulated tape connectivity to IBM MVS hosts and attachment to Real Tape Drives (RTDs), Virtual Library Extensions (VLEs), and other VTSSs to provide virtual tape device emulation, virtual tape cartridge images, and additional buffer capacity for the IBM MVS environment.

VLE is storage virtualization solution from IBM that allows multiple mainframes to share a single set of tape libraries. VLEs are physical appliances that manage the connection between the mainframes and the tape libraries. Replacing VLEs with Oracle ZFS Storage behind VSM 7 could translate into roughly 8 times cheaper than the IBM variant.

Oracle ZFS Unified Storage Platform: Optimized for Space and Cost Efficiency

Oracle ZFS Storage delivers superior space and cost efficiency, best-of-breed performance and scalability for block, file, and object workloads, and robust data protection both on premises.

Key Benefits:

- Reduce storage costs by up to 3x with data compression, deduplication, even for mainframe and tape workloads.

- Improve application performance and reduce downtime with faster read and write speeds.

- Scale up to 25PB on the on-premises ZFSSA and up to 1PB of data in OCI without sacrificing performance.

- Protect data with robust data protection features, including immutable snapshots, data encryption, and audit logging.

Network-Attached Security for Air gapped Environments

Oracle ZFS Storage provides robust security features, including immutable snapshots, data encryption, audit logging, and raw crypto replication, making it an ideal solution for protecting air-gapped environments from external and internal threats.

Key Benefits:

- Protect against unauthorized changes and deletions with immutable snapshots.

- Safeguard data at rest with data encryption.

- Track all access and modifications to data with audit logging.

- Replicate encrypted data to and from air-gapped environments without compromising security with raw crypto replication.

Seamless Integration with Oracle's Virtual Storage Manager System (VSM)

Seamless integration of Oracle ZFS Storage with Oracle's Virtual Storage Manager System (VSM) creates a unified storage platform tailored for mainframe environments, streamlining storage management, and reducing the need for multiple storage systems.

Key Benefit:

- Simplifies operations and enhances overall efficiency.

Enhanced Performance and Efficiency

Oracle ZFS Storage offers significantly enhanced performance compared to traditional tape storage, excelling in both backup and restore operations. This improved efficiency translates to higher productivity and streamlines operations for organizations relying on mainframe environments with VSM.

Key Benefits:

- Reduced downtime for mainframe operations

- Faster backup and restore speeds

- Improved application performance

- Increased productivity

- Streamlined operations

Robust Data Protection

Oracle ZFS Storage data protection is secured by role-based access control. It provides robust data protection through integrated snapshots that are immutable and therefore immune to ransomware and can be rolled back to recover from attacks. It also offers snapshot retention features to meet data governance, legal hold, and regulatory requirements.

Key Benefit:

- Customers can be confident that their data is protected from ransomware, malicious or accidental deletion, and data governance violations. They can also easily manage and retain snapshots to meet their specific need.

This is a great value proposition because it addresses several key customer concerns:

- **Security:** Customers are increasingly concerned about the threat of ransomware and other cyberattacks. Oracle ZFS Storage's integrated snapshots that are immune to ransomware provide peace of mind knowing that data can be recovered quickly and easily in the event of an attack.

- **Data integrity:** Accidental data deletion can be a costly and time-consuming problem to recover from. Oracle ZFS Storage's snapshot retention features make it easy to restore data to a previous point in time, even if it has been accidentally deleted.

- **Compliance:** Many organizations are subject to data governance and regulatory requirements that mandate certain data retention practices. Oracle ZFS Storage's snapshot retention features make it easy to comply with these requirements.

- **Manageability:** Oracle ZFS Storage's snapshots are easy to manage and retain. Customers can create, manage, and delete snapshots through a simple graphical user interface.

Flexible Snapshot Retention

Oracle ZFS Storage provides flexible and efficient snapshot retention for VSM environments, enabling organizations to comply with rigorous data retention regulations and protect their data at critical junctures.

Key Benefits:

- Flexible snapshot retention options: Schedule snapshots at regular intervals or take manual snapshots on an as-needed basis.

- Efficient storage utilization: ZFS snapshots are incremental and copy-on-write, meaning that they only store the changes that have been made to the data and never modify the original data.

- Data integrity and security: ZFS snapshots are immutable, meaning that they cannot be accidentally or maliciously changed.

- Retention lock at snapshot, file and object level retention policies: Provides granular control over retention policies to meet specific compliance requirements.

Compliance Ready

Many organizations are subject to data governance and regulatory requirements that mandate certain data retention practices. Oracle ZFS Storage's snapshot retention features make it easy to comply with these requirements. Oracle ZFS Storage's snapshots are easy to manage and retain. Customers can create, manage, and delete snapshots through a simple graphical user interface.

Key Benefit:

- Oracle ZFS can help companies avoid costly fines and reputational damage by ensuring that their data is archived and retained in compliance with all relevant regulations.

A report released by Cohasset Associates, a leading compliance consulting firm, confirms that the Oracle ZFS Storage Appliance is compliant with these regulations when using the appliance's file retention policies. Download the Cohasset's Compliance Assessment report to learn more about how Oracle ZFS can help your company comply with relevant data archiving regulations.

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Conclusion

Oracle ZFS Storage is a compelling solution for replacing tape as mainframe backup/archive in air-gapped environments. It's a scalable, secure, and cost-efficient solution that can help organizations to meet their mainframe backup and archive requirements.

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