

Overview and Frequently Asked Questions about Oracle's StorageTek Virtual Storage Manager (VSM) System

Overview

Oracle's StorageTek Virtual Storage Manager (VSM) System is the industry leading high availability virtual storage solution to the problem of inefficient utilization of physical tape drive, tape library, and media resources within System z (mainframe) enterprise environments. This industry-leading product has been on the market for more than 10 years with numerous enhancements added during that time period.

The solution incorporates both disk and physical tape resources. Data is initially stored within disk, and the disk in turn presents virtual magnetic tape file images to the host. Think of it as disk that pretends to be physical tape drives, but the tape drives are virtual.

StorageTek VSM provides tremendous data storage flexibility by allowing customer data, depending upon where it resides within its lifecycle, to reside within disk, tape or any combination thereof. If the customer wants the data to reside within disk only — what is known as “tapeless” virtual tape — VSM can support that requirement. VSM also provides the ability to migrate data to real physical tape as a background task for less expensive, longer-term storage.

This technology has proven to increase performance and provide very cost – effective mainframe storage through the utilization of storage tiers of disk and tape drive technologies. This has been enhanced through the introduction of Oracle's StorageTek Virtual Library Extension (VLE) by now allowing customers a unique flexibility to keep more active data sets within disk for longer periods of time and at the same time complement tape storage.

As data becomes less active over time, the probability of re-use diminishes and it will migrate to tape or be deleted. Without the VLE there is more physical tape activity as data is being more frequently migrated and recalled from tape. By reducing tape activity, VLE will reduce wear and tear on tape resources and further improving reliability of the VSM 5 subsystem. User defined policies enable certain applications to be directed to VLE such as backup where recovery times are critical while archival and tier 3 applications can be directed to the VSM 5

and subsequently reside on tape library storage. VLE provides the optimal way to seamlessly integrate backup and archive capabilities.

StorageTek VSM has demonstrated itself as a very reliable, proven technology in the most demanding, data-intensive data centers. Besides optimizing customers' physical tape environments, VSM has become an effective technology for customers wanting to dramatically improve their disaster recovery capabilities.

Customer Benefits

StorageTek VSM provides transparent tape storage optimization for Enterprise Mainframe customers. It is well suited for disaster recovery, data consolidation, data protection and data sharing. VSM and VLE protects and manages active data, active archive and fixed-deep archive data appropriately while controlling TCO and energy consumption.

Key Benefits:

- Providing up to 4 storage tiers, 2 disk tiers (VSM & VLE) and 2 tape tiers (9840 & T10000)
- Scalable performance/capacity within a single system image
- Investment protection – Supports all Oracle enterprise tape drives & libraries
- Reduce operating costs such as power, maintenance and operations and support staff
- Industry leading disaster recovery/business continuity capabilities
- Sophisticated data manageability (policy management driven)
- Unsurpassed system reliability/availability

Frequently Asked Questions

What is Oracle's strategy for StorageTek VSM?

To continue its strong growth in the Virtual Tape market with differentiating technology innovation in hardware, software, services and system design — radically simplifying the way you manage your storage, with breakthrough cost, performance and scale.

Can StorageTek VSM be utilized in an open systems environment?

No. VSM only supports Mainframe System z operating systems.

I hear about disk-only tapeless solutions. Can StorageTek VSM provide that capability?

Yes. VSM goes beyond just tapeless by providing the ability to manage tiers of storage. One such tier is disk — if disk-only is all that is required, VSM can provide that support. However, depending upon the access characteristics of the data, other storage tiers can be provided with the use of physical tape drives. VLE provides businesses with even more additional disk and buffering capability to keep more active data sets resident on disk for even longer periods of time.

Why would I want a tapeless solution?

Some applications require fast response times. Examples of these applications include HSM, SAR, backup, or imaging type of applications. For these types of applications, keeping the active data within disk for longer periods of time (from hours to months) provides the fast response that the application demands.

What advantages does tape provide, and why would I want to keep in my shop at all?

The ratio between disk and tape can change depending upon the application, but a good understanding of the lifecycle of a data set can help answer this question. Shortly after the dataset is created it has a high probability of recall. The range of time could be from hours/days/weeks or months — this data should reside within disk. However, after some point the probability of recall diminishes dramatically and having a tape tier of storage would be the most cost effective storage. Having options with different storage tiers provides a wide range of flexibility, which can have a

direct impact on your storage total cost of ownership (TCO). Plus, having tape in the storage tier can provide “overdraft protection” in the event your disk fills up. In this situation you would not need to over provision the available disk in order to assure disk buffers are not filled up which results tape jobs being terminated.

What Oracle tape drive and library technologies are supported?

VSM supports a wide range of tape and library technologies that can be mixed and matched, as well as different generations within those technologies. Oracle's High performance StorageTek T9840A, B, C and D drives are supported. High capacity tape technology also is supported through Oracle's StorageTek T10000A and B drives. Library support consists of Oracle's StorageTek SL8500, as well as Oracle's smaller StorageTek SL3000. All can be mixed and matched within a single VSM subsystem. That is truly investment protection.

How can StorageTek VSM lower the demand on robotics and tape transports?

By utilizing a hybrid disk/tape solution, VSM can satisfy most data recalls directly from the disk thus reducing recalls from physical tape. These data sets typically need to be stored within the disk longer because of their usage patterns, which could be from 45 to 90 days, before the probability of re-use diminishes. Without VLE there is more reliance upon tape storage, which often creates situations where data is being constantly migrated and recalled back and forth from tape. This is not an effective use of tape resources.

How does StorageTek VSM scale both from a virtual tape drive, performance and capacity perspective?

VSM's flexible architecture provides the ability to be highly scalable in these areas. Each VSM system has its own virtual tape drive, performance and capacity characteristics and up to 256 VSMs can run in tandem under a single point of control. By allowing interconnections within the subsystem, VSM can provide capacities up to 23 petabytes of effective storage with more than 65,000 virtual tape drive to choose from. Performance can be scaled because each VSM system has its own performance characteristics. This is expanded further with the introduction of VLE.

What investment protection is provided when moving from one generation of Sun StorageTek VSM to another?

VSM was designed for investment protection. All generations of VSM systems can co-exist within a single subsystem. Data created on one VSM system can be recalled into another thus providing complete data interchange. In addition, existing Oracle enterprise tape drives as well as tape libraries will work with VSM as integrated tape.

I have heard there have been very little enhancements added over the past several years for this product?

Quite the contrary, throughout the past year Sun StorageTek VSM has added a record number of enhancements to the current flagship product known as VSM 5, including:

- A new entry-level VSM 5e system, which further reduces the cost of VSM.
- A higher capacity VSM 5. Now a VSM 5 customer can attain up to 90TBs of effective storage within a single VSM. With the higher capacity, data can reside within the disk for longer periods of time before being migrated or recalled.
- Improved configuration flexibility that allows integration with tape, without tape, or a mix of the two can be provided.
- New channel interfaces were added for greater cost savings and flexibility. VSM 5 originally supported just FICON. Now it supports Native IP and ESCON as well. You can mix and match as you see fit within a single VSM subsystem.
- DR capabilities, which were improved with the addition of several new data replication options. Clustering between VSM systems has been enhanced, as well as the ability to do Electronic Export/Import between TapePlexes.
- The entire mainframe software suite of products has been refreshed, allowing for greater functionality and enhanced ease of installation and operation.
- Now there is a second tier of disk storage capability option through the introduction of VLE working with VSM5.

What BR/DR options are available?

This is where Sun StorageTek VSM truly out-distances the rest by providing a comprehensive hierarchy of BC/DR capabilities.

With VSM, there is a wide range of options ranging from the simplest to the more complex, depending upon each customer's recovery time objectives and budget. All options are controlled by policy management, which allows customers to pick and choose what functionality works best for them. If customers want to physically or electronically migrate data to a remote site or multiple sites, VSM can do it all.

What is Virtual Library Extension (VLE)?

Oracle is introducing the StorageTek Virtual Library Extension (VLE), the industry's first massively scalable second tier of disk storage for mainframes. VLE works in conjunction with the already released Virtual Storage Manager Version 5 (VSM5) to bring a cost-effective, dense and highly available additional tier of disk storage to mainframe environments. Oracle's StorageTek VLE expands Oracle's StorageTek VSM to provide a massively scalable second tier disk storage appliance allowing customers to economically keep active data on disk media for increased data recall performance before being migrated to tape for optimal longer term storage.

New enhancements have been added to VLE. What are they and what added benefits do they provide?

On July 29th, 2011 we dramatically expanded VLE scalability and replication capabilities. VLE scalability is increased over the previous version by a factor of 64X. Prior to this announcement the maximum number of VLEs that could be attached within a VSM tapeplex was 4 single-node systems. The number of nodes within single VLE system is being increased to 64, with the ability to attach 4 VLE systems within tapeplex being retained. Each VLE node provides up to 1320TB of effective storage and now up to 256 of nodes can be attached for a total capacity of 338PBs of storage within a single tapeplex.

In addition, the system can now manage data transfers independently of the VSM5, which frees up VSM5 resources for front-end (host) workloads, which improves the overall VSM5 throughput. For example to migrate two VTV copies to separate, interconnected VLE's, user can utilize Management and Storage Class to migrate one copy using VSM5 to VLE



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FICON connections and the second copy using VLE to VLE TCP/IP connections. The second migration, therefore, uses no VTSS resources, and VLE to VLE data transfers are performed over TCP/IP, which reduces or eliminates the requirement for extended FICON connections. In addition housekeeping tasks like reclaim or audit of a VMVC no longer consumes VSM5 resources.



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