StorageTek Virtual Storage Manager System

Release Notes

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F39589-01
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StorageTek Virtual Storage Manager System Release Notes, Release 7

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Contents

Preface

This publication provides release guidelines and requirements for StorageTek Virtual Storage Manager (VSM) System Release 7. It also provides updates and enhancements to the original product documentation.

When applicable, use the procedures and information in this guide in place of the original documentation. Any applicable references to the original documentation are provided.

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Product Guidelines and Requirements

This section provides product guidelines and installation requirements for Virtual Storage Manager (VSM) System release 7.

Product Highlights

This section highlights key VSM features and functionality.

Oracle's StorageTek Virtual Storage Manager (VSM) solution is the collection of hardware and software products that comprise a disk-based virtual tape system to provide enterprise-class storage management capabilities for the IBM mainframe environment. VSM optimizes streaming workloads and backup and recovery functions, reduces management overhead, and maximizes tape capacity utilization to reduce data protection costs in a wide range of storage environments.

Additionally, VSM includes the VSM Extended Storage (ExS) feature that allows the VTSS to access and utilize storage external to the VTSS, including access to the Oracle Cloud.

The VSM solution includes the following subsystems:

- VTSS hardware and software
  The VSM 7 VTSS supports emulated tape connectivity to IBM MVS hosts over FICON interfaces, Fibre Channel or FICON attachment to Real Tape Drives (RTDs), IP attachment to other (VSM 7, VSM 6, or VSM5) VTSSs and VLEs, and remote host connectivity using ECAM over IP and VTSS-to-VTSS replication.
- Virtual Tape Control Software (VTCS)
  VTCS controls virtual tape creation, deletion, replication, migration and recall of virtual tape images on the VTSS and also captures reporting information from the VTSS.
- Enterprise Library Software (ELS)
  ELS is the consolidated suite of StorageTek mainframe software that enables and manages Oracle's StorageTek Automated Cartridge System (ACS) and Virtual Storage Manager (VSM) hardware in the IBM MVS environment. ELS includes the Host Software Component (HSC), Storage Management Component (SMC), and HTTP Server.
- Virtual Tape Library Extension (VLE) hardware and software

VLEs are IP-attached to the VSM 7 VTSS and function as a migrate and recall target for VTSS Virtual Tape Volumes (VTVs).

- Real Tape Drives (RTDs) connected to physical tape libraries
  RTDs serve as migrate and recall targets for VTSS Virtual Tape Volumes (VTVs). RTDs are FC-attached or FICON-attached to the VSM 7 VTSS.

Product Documentation

This *Release Notes* publication provides supplemental updates to the original documentation for Virtual Storage Manager (VSM) System, release 7. The information in this publication supersedes the information found in the existing VSM publication set:

- *VSM Planning Guide*
- *VSM Safety and Compliance Guide*
- *VSM Security Guide*
- *VSM Licensing Information User Manual*

These publications are available for download via the Oracle Help Center.

VSM 7 Platform

The VSM platform provides increased performance and greatly expanded storage capacity compared to previous VTSS versions, and it is can be scaled to meet a customer's current needs while providing a path for future growth.

The VSM 7 VTSS is packaged as a standard rack mount system built on existing Oracle server, storage, and service platforms. The servers, storage disk enclosures, and standard rack mount enclosure are delivered as a packaged system.

The Solaris 11 operating system is the foundation of the VSM 7 VTSS software environment, which also includes Solaris infrastructure components and VTSS function-specific software. The VSM 7 software environment is pre-installed and pre-configured for VTSS functionality so that limited site-level configuration is required to integrate the product into the customer’s managed tape environment.

Configuration Options

VSM 7 may be installed in the following configurations, depending on whether optional upgrades have been applied:

- Base Configuration
- Storage Capacity Upgrade
- FC/FICON Upgrade

Base Configuration

VSM 7 consists of a base unit and optional capacity upgrades. The base unit is a VSM 7 in its minimum configuration, including:

- A standard Sun Rack II cabinet, Model 1242
- Full height Sun Rack 10 KV AMP (North America or International)
- Two Oracle SPARC T7-2 servers in a specific configuration and factory preconfigured for VSM 7, including 10GbE Ethernet NICs, FC/FICON HBAs, SAS3 HBAs and TDX cards
- Two Oracle Storage Drive Enclosure DE3-24C storage disk enclosures, each with five 200GB Flash SSDs and 19 8TB SAS HDD drives, representing 150TB native capacity
- Two Oracle Switch ES1-24 10GbE Ethernet switches in a highly available top-of-rack redundant configuration for network management
- SFPs, either SR or LR, installed into T7-2 FC HBAs
- Depending on country, two VLE50HZ-POWER-Z or two VLE60HZ-POWER-Z power Power Distribution Units (PDUs)

Storage Capacity Upgrade

Storage capacity upgrades are either base capacity upgrades that are factory-built when the base unit is assembled, or field capacity upgrades that are installed in the field. They add capacity to the base unit, which has two storage disk enclosures (150TB native capacity).

A storage capacity upgrade kit is packaged as two storage disk enclosures. Up to three upgrade kits can be installed in a VSM 7 base unit, for a total of four (375TB), six (600TB), or eight (825TB) storage disk enclosures in the unit.

Capacity Upgrade with Oracle DE3-24C Storage Disk Enclosures

For a VSM 7 with Oracle DE3-24C storage disk enclosures, a capacity upgrade kit has two Oracle DE3-24C storage disk enclosures, each containing 24 8TB SAS HDD drives and no Flash SSDs.

The native capacity for each possible VSM 7 configuration with Oracle DE3-24C storage disk enclosures is as follows:

- VSM 7 base unit (two storage disk enclosures total): 150TB
- VSM 7 base unit plus one capacity upgrade kit (four storage disk enclosures total): 375TB
- VSM 7 base unit plus two capacity upgrade kits (six storage disk enclosures total): 600TB
- VSM 7 base unit plus three capacity upgrade kits (eight storage disk enclosures total): 825TB

FC/FICON Upgrade

When initially built, the VSM may have been configured with either Long Wave or Short Wave SFPs for the FICON ports. This may have been upgraded in the field with a field upgrade kit containing eight Long Wave or Short Wave SFPs:

- The VSM 7 Long Wave FC/FICON field upgrade option has eight single LW SFPs.

- The VSM 7 Short Wave FC/FICON field upgrade option has eight single SW SFPs.

VSM 7 Ethernet (IP) Data Path Connectivity

In VSM 7, the customer network uplinks connect to the two ES1-24 switches, which in turn connect to the Ethernet ports on the two VSM 7 server nodes. This differs from VSM 6, where the customer networks are connected directly to the VSM 6 server nodes.

Refer to the *VSM Planning Guide* for information about Ethernet (IP) and network switch port assignments and VSM 7 customer network integration.

VSM 7 FC/FICON Data Path Connectivity

FC and FICON ports connect the two VSM 7 nodes to the ELS host software and VTCS interface software on the MVS host systems, and to Real Tape Drives (RTDs) in the tapeplex. Attachment may be direct or through a switch.

There are four FC/FICON ports per VSM 7 node, a total of eight for the VTSS. For FICON, each port supports IBM Control Unit (CU) and IBM Channel Mode (CH) images concurrently, so that when connected through a switch each port may attach to both hosts and RTDs. Sharing a HOST port with an RTD connection does not reduce logical pathing.

For FC, two FC ports on each node are dedicated for host connections and two ports are dedicated for RTD connections.

Functionality

- The link between the VSM 7 and VTCS is the RTD NAME.
- The link between VTCS and the RTD is the FC/FICON cable to the relevant DEVNO in the relevant drive bay.
- VSM 7 CLI commands define the connections to the VSM 7.
- VTCS commands define the connections to the VTCS configuration.
- VTCS uses the RTD name defined on the FCPPATH or FICONPATH command used in the VSM 7 CLI.
- Multiple FCPPATHs/FICONPATHs can route to the SAME RTD.
- Physical RTDs are defined to VTCS as FC or FICON devices with CHANIF ids.
- The CHANIF id is not used to reference the device but must be present to meet VTCS syntax rules. Each CHANIF id must be unique and with valid syntax for each VSM 7 defined in VTCS.
- VTCS allows 32 unique CHANIF ids. Each VSM 7 can have a maximum of 32 physical RTDs defined.

Refer to the *VSM Planning Guide* for information about VSM 7 FC/FICON port assignments and RTD connectivity examples.

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Documentation Updates

This section provides supplemental updates to the original documentation for Virtual Storage Manager (VSM) System release 7. This information supersedes the information found in the existing VSM publication set.

topics include:

- Enhanced Replication (RLINKS) Feature
- Extended Storage (ExS) Encryption Feature

Enhanced Replication (RLINKS) Feature

VSM 7 supports an Enhanced Replication feature that extends the replication capabilities of the VSM 7 product. With Enhanced Replication, synchronous replication begins replicating data to the target VTSS upon first host write to the VTV and provides host acknowledgment to the rewind unload operation once all data has been successfully replicated to the target VTSS.

A new replication facility, RLINKs, is used for Enhanced Replication. An RLINK is composed of all IP paths defined to the target VTSS. There is only one RLINK between the primary and target VTSS. With RLINKs, the number of replications is limited only to the number of virtual tape devices (VTDs) supported within the VTSS.

> **Note:**
>
> RLINK functionality cannot be used concurrently with synchronous CLINK replication.

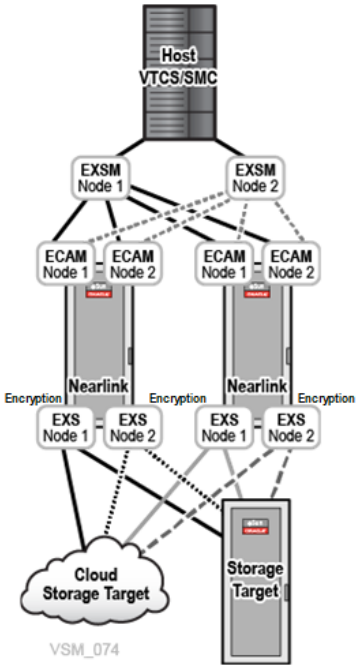
Enhanced Replication is initially available for use between clustered VSM 7 or VSM 6 VTSSs, where each VTSS can be both a primary and a target for bi-directional synchronous VTV-level replication. Subsequent releases provide support for three-target synchronous replication and file-level synchronous replication.

Extended Storage (ExS) Encryption Feature

VSM Extended Storage (ExS) Encryption is an enhancement to VSM Extended Storage that allows the VTSS to encrypt the data before sending the data out to the extended storage. This allows the customer to manage their own keys using Oracle Key Manager (OKM) or EXS VSM Key Manager (VSM Key Store).

ExS Encryption is included in the base VSM6 or VSM7 code and is configured by Oracle Services personnel as part of the VSM configuration. ExS encryption is a separate feature from VTSS encryption, which encrypts data residing in the VTSS disk buffer.

Figure 2-1 VSM ExS Configuration with Encryption



As shown in the figure above, ExS Encryption occurs between the Nearlink and the Extended Storage (ExS) nodes, before the ExS nodes send data to physical and cloud storage targets across the IP network.

Encryption keys are handled differently depending on the type of Key Store used:

- When using VSM Key Store, encryption keys are created and stored on each VTSS in the EXS complex. Multiple VMVCs will share the same encryption key. The encryption key used to migrate new data to a VMVC can be changed over time by creating a new key. Deletion of a VSM key is not supported.
- When using OKM, keys are automatically generated, stored and managed external to the VTSS and the EXS storage. Each VMVC will have its own encryption key.

The VSM ExS Encryption feature introduces two new constructs, **keystore** and **key**.

- The keystore identifies the Key manager type (OKM or VSM) to use for encryption. Specifies a name for the Key Store that is shared on all systems in the EXS complex. For keystores of type VSM, the keystore construct also specifies the label name of the key to use for subsequent migrations (the current key).
- The key construct is only applicable to a VSM keystore. It associates an encryption key with a named VSM keystore, specifies a label name associated with the encryption key, and specifies the encryption key value.

If you wish to utilize the VSM Extended Storage (ExS) Encryption feature in your VSM configuration, contact Oracle Services.