

# Veritas InfoScale™ 7.1

## What's new in this release

### - AIX, Linux, Solaris

# Veritas InfoScale 7.1 What's new in this release

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## Veritas Services and Operations Readiness Tools (SORT)

Veritas Services and Operations Readiness Tools (SORT) is a website that provides information and tools to automate and simplify certain time-consuming administrative tasks. Depending on the product, SORT helps you prepare for installations and upgrades, identify risks in your datacenters, and improve operational efficiency. To see what services and tools SORT provides for your product, see the data sheet:

[https://sort.veritas.com/data/support/SORT\\_Data\\_Sheet.pdf](https://sort.veritas.com/data/support/SORT_Data_Sheet.pdf)

# What's new in this release

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## About this document

This document covers the major new branding, licensing, and installation changes that are introduced in .

## About the Veritas InfoScale product suite

The Veritas InfoScale product suite addresses enterprise IT service continuity needs. It draws on Veritas' long heritage of world-class availability and storage management solutions to help IT teams in realizing ever more reliable operations and better protected information across their physical, virtual, and cloud infrastructures. It provides resiliency and software defined storage for critical services across the datacenter infrastructure. It realizes better Return on Investment (ROI) and unlocks high performance by integrating next-generation storage technologies. The solution provides high availability and disaster recovery for complex multi-tiered applications across any distance. Management operations for Veritas InfoScale are enabled through a single, easy-to-use, web-based graphical interface, Veritas InfoScale Operations Manager.

The Veritas InfoScale product suite offers the following products:

- Veritas InfoScale Foundation
- Veritas InfoScale Storage
- Veritas InfoScale Availability
- Veritas InfoScale Enterprise

## About Veritas InfoScale Foundation

Veritas InfoScale™ Foundation is specifically designed for enterprise edge-tier, departmental, and test/development systems. InfoScale Foundation combines the industry-leading File System and Volume Manager technology, and delivers a complete solution for heterogeneous online storage management while increasing storage utilization and enhancing storage I/O path availability.

Storage features included in InfoScale Foundation products are listed below:

- No restriction on number of Volumes or File Systems being managed
- Veritas InfoScale Operations Manager Support
- Supports file systems upto 256 TB

- Device names using Array Volume IDs
- Dirty region logging
- Dynamic LUN expansion
- Dynamic Multi-pathing
- Enclosure based naming
- iSCSI device support
- Keyless licensing
- Online file system defragmentation
- Online file system grow & shrink
- Online relayout
- Online volume grow & shrink
- Data Management Application Programming Interface
- File Change Log
- Mount lock
- Named data streams
- Partitioned directories

Storage features included in InfoScale Storage and Enterprise products, but not included in the InfoScale Foundation product are listed below:

- Hot-relocation
- Remote mirrors for campus clusters
- SCSI-3 based I/O Fencing
- SmartMove
- Split-mirror snapshot
- Thin storage reclamation
- File system snapshots
- Full-size instant snapshots
- Oracle Disk Manager library
- Portable Data Containers
- Quick I/O
- SmartIO support for read or write

- Flexible Storage Sharing
- Space-optimized instant snapshot
- User and group quotas

## About Veritas InfoScale Storage

Veritas InfoScale™ Storage enables organizations to provision and manage storage independently of hardware types or locations. InfoScale Storage delivers predictable Quality-of-Service by identifying and optimizing critical workloads. InfoScale Storage increases storage agility enabling you to work with and manage multiple types of storage to achieve better ROI without compromising on performance and flexibility.

## About Veritas InfoScale Availability

Veritas InfoScale™ Availability helps keep organizations' information available and critical business services up and running with a robust software-defined approach. Organizations can innovate and gain cost benefits of physical and virtual across commodity server deployments. Maximum IT service continuity is ensured at all times, moving resiliency from the infrastructure layer to the application layer.

## About Veritas InfoScale Enterprise

Veritas InfoScale™ Enterprise addresses enterprise IT service continuity needs. It provides resiliency and software defined storage for critical services across your datacenter infrastructure. Realize better ROI and unlock high performance by integrating next-generation storage technologies. The solution provides high availability and disaster recovery for complex multi-tiered applications across any distance in physical and virtual environments.

## About the Dynamic Multi-Pathing for VMware component

Dynamic Multi-Pathing for VMware 7.1 (VxDMP) is a multi-pathing solution integrated with VMware's vSphere infrastructure, which brings the established and proven enterprise-class functionality to VMware virtual environments.

In Veritas InfoScale 7.1, there are two installers. The Veritas InfoScale installer does not install the Dynamic Multi-Pathing for VMware component. To install the Dynamic Multi-Pathing for VMware component, you must use one of the following:

- Veritas\_InfoScale\_Dynamic\_Multi-Pathing\_7.1\_VMware.zip
- Veritas\_InfoScale\_Dynamic\_Multi-Pathing\_7.1\_VMware.iso

For the procedure to mount an ISO image,

For more information about the Dynamic Multi-Pathing for VMware component, refer to the following guides:

- *Dynamic Multi-Pathing Installation Guide - VMware ESXi*
- *Dynamic Multi-Pathing Administrator's Guide - VMware ESXi*

## Components of the Veritas InfoScale product suite

Each new InfoScale product consists of one or more components. Each component within a product offers a unique capability that you can configure for use in your environment.

[Table 1-1](#) lists the components of each Veritas InfoScale product.

**Table 1-1** Veritas InfoScale product suite

Product	Description	Components
Veritas InfoScale™ Foundation	Veritas InfoScale™ Foundation delivers a comprehensive solution for heterogeneous online storage management while increasing storage utilization and enhancing storage I/O path availability.	Storage Foundation (SF) Standard (entry-level features)
Veritas InfoScale™ Storage	Veritas InfoScale™ Storage enables organizations to provision and manage storage independently of hardware types or locations while delivering predictable Quality-of-Service, higher performance, and better Return-on-Investment.	Storage Foundation (SF) Enterprise including Replication Storage Foundation Cluster File System (SFCFS)
Veritas InfoScale™ Availability	Veritas InfoScale™ Availability helps keep an organization's information and critical business services up and running on premise and across globally dispersed data centers.	Cluster Server (VCS) including HA/DR



**Table 1-1** Veritas InfoScale product suite (*continued*)

Product	Description	Components
Veritas InfoScale™ Enterprise	Veritas InfoScale™ Enterprise addresses enterprise IT service continuity needs. It provides resiliency and software defined storage for critical services across your datacenter infrastructure.	Cluster Server (VCS) including HA/DR Storage Foundation (SF) Enterprise including Replication Storage Foundation and High Availability (SFHA) Storage Foundation Cluster File System High Availability (SFCFSHA) Storage Foundation for Oracle RAC (SF Oracle RAC) Storage Foundation for Sybase ASE CE (SFSYBASECE)

## Changes related to Veritas Cluster Server

The following section describes the changes introduced in Veritas Cluster Server (VCS) 7.1.

### VCS agent for Oracle supports Oracle 12c Pluggable database detail monitoring

VCS agent for Oracle supports detail monitoring for Oracle database 12c Pluggable database. You can enable detail monitoring by setting the `LevelTwoMonitorFreq` attribute to 1 for PDB resources configured under VCS. For detail monitoring, Oracle agent requires a test table created under that particular pluggable database with common user of Container Database. For more info on creation of test table, refer to *Cluster Server Agent for Oracle Installation and Configuration Guide*.

### VCS agent for Oracle supports Oracle Flex ASM

VCS agent for Oracle supports the Oracle Flex ASM feature. It detects the Flex ASM in your installation and extends the high availability support to the configuration. The disk group status is reported based on the configured ASM cardinality.

## Changes in the Veritas Cluster Server Engine

The following section describes the changes introduced in the Veritas Cluster Server Engine.

### **LDAP and Active Directory user groups can perform cross-cluster operations**

The LDAP and Active Directory users with Administrator or Operator privileges on both the clusters in GCO setting can perform cross-cluster operations. You can therefore add user groups instead of individual users to both the cluster for performing a service group switch from one cluster to another in a GCO.

### **Priority based failover**

Priority based failover can be used to ensure that the load requirement of the high priority service group is met before the group is failed over. If the load requirement of the high priority service group is not met, VCS will offline some of the low priority service groups till the load requirement is met. VCS chooses the system with least disruption by performing a priority based failover of a high priority service group. Even though the priority based failover gets configured for all the service groups in a cluster, you must enable the feature at the cluster level.

You can enable a service group for priority based failover using the following command:

```
# haclus -modify EnablePBF 1
```

The default value of EnablePBF attribute is 0 (zero). Note that Priority and Load attributes need to be set at Group level for priority based evaluation and failover to succeed at the cluster level.

## Attributes introduced in VCS 7.1

The following section describes the attributes introduced in VCS 7.1.

### **Cluster level attribute**

EnablePBF  
 (User defined)

Enables or disables priority based failover. When set to 1 (one), VCS gives priority to the online of high priority service group, by ensuring that its Load requirement is met on the system.

Type and dimension: Boolean-scalar

Default value: 0 (zero)

## Service group level attributes

<p>EvacList (System use only)</p>	<p>Contains list of pairs of low priority service groups and the systems on which they will be evacuated.</p> <p>For example:</p> <pre>Grp1 EvacList grp2 Sys0 grp3 Sys0 grp4 Sys4</pre> <p>Type and dimension: string-association.</p> <p>Default: Not applicable.</p>
<p>EvacuatingForGroup (System use only)</p>	<p>Displays the name of the high priority service group for which evacuation is in progress. The service group name is visible only as long as the evacuation is in progress.</p> <p>Type and dimension: string-scalar.</p> <p>Default: Not applicable.</p>

## Auto refresh of fencing registrations on the coordination points

When a fencing event occurs, the racing node may lose a coordination point(s) during the race despite winning the majority of them. Subsequent failures might cause the preferred nodes to come offline, as they do not have registrations on such coordination points.

The CoordPoint agent is enhanced to put the missing registrations on the coordination points where it is found to be missing. In the monitor cycle, if the agent detects that the corresponding node does not have a registration on a coordination point, it launches the `vxfsenwap -p hacli` command to refresh the registrations of all the nodes on the coordination points. This feature is disabled by default. You can enable it by adding `ActionOnCoordPointFault = RefreshRegistrations` in the `/etc/VRTSvcs/conf/config/main.cf` file under the CoordPoint resource type which belongs to the vxfen service group.

The CoordPoint agent is also enhanced to detect the following situations:

- When there is an addition of a disk(s) to a coordinator DG, CP agent detects that and faults the resource.
- Whenever there is a change in the device number of a coordinator disk (for example, due to SAN outage), the CP agent detects that and faults the resource.

It also tries to correct the second case if the attribute `ActionOnCoordPointFault` is set to `RefreshRegistrations`. You can find more information about it under the "CoordPoint agent" section in the *Cluster Server Bundled Agents Reference Guide*.

---

**Note:** This feature does not apply to Solaris 10 x86 and Solaris 11 x86 platforms.

---

## About Just In Time Availability

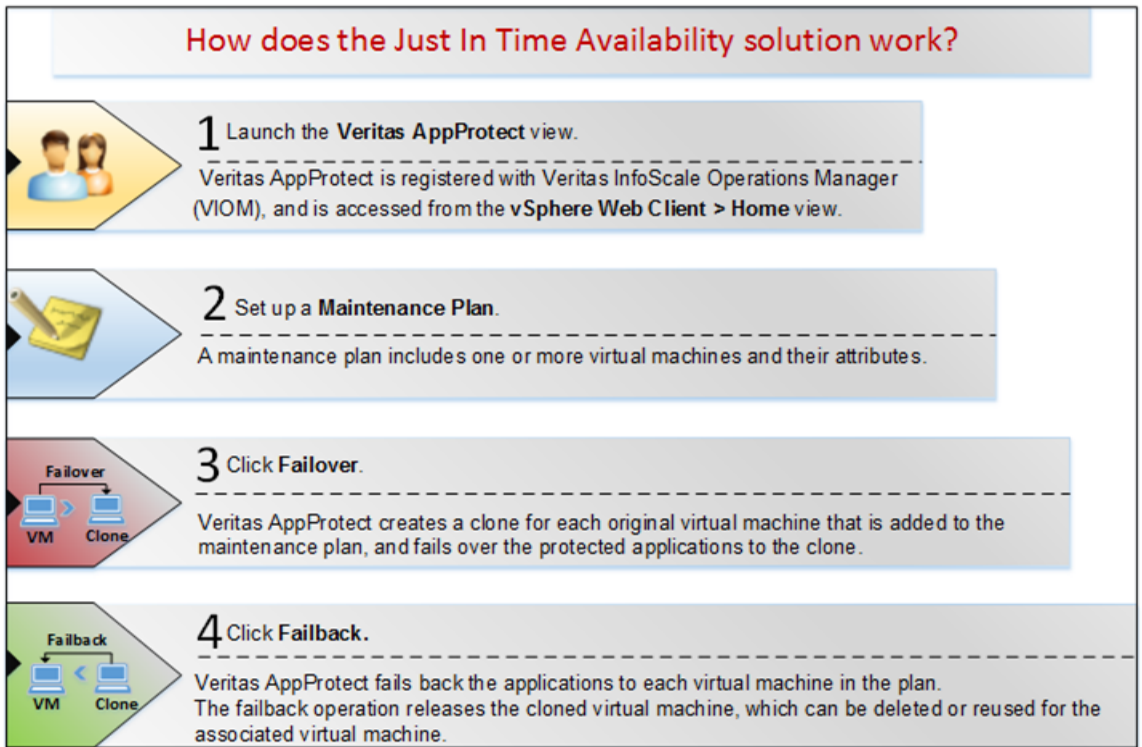
This section applies to Linux platform.

The Just In Time Availability solution provides increased availability to virtual machines in a single node InfoScale Availability cluster in virtual environments.

In the event of planned maintenance, the Just In Time Availability solution enables you to clone a virtual machine, bring it online, and fail over the applications running on that virtual machine to the clone on the same node. After the maintenance procedure is complete, you can failback the applications to original virtual machine. Besides failover and failback operations, the solution lets you set up a maintenance plan, delete a virtual machine clone, view the properties of the virtual machine and its clone, and so on.

The Just In Time Availability solution is operational from the **vSphere Web Client > Home view > Veritas AppProtect**.

**Figure 1-1** Workflow of the Just In Time Availability solution



## New utility to synchronize the zone configuration across cluster

This section applies to Solaris platform.

A new utility `hazoneconfigsnc` can be used to propagate any changes that are made to the zone configuration on one node to other cluster nodes.

See the man page for `hazoneconfigsnc` for details.

## Pluggable Database (PDB) migration between container databases

Perform an end-to-end migration of an Oracle Pluggable Database (PDB) across containers running on the same database version in the same cluster. Use the `hapdbmigrate` utility from the `$VCSHOME/bin` directory to initiate the migration. The utility takes care of offlining the resources dependent on the migrating PDB resource and brings them online on the same PDB resource when it comes online on the target container.

See the *Storage Foundation for Oracle RAC 7.1 Administrator's Guide* and *Cluster Server 7.1 Agent for Oracle Installation and Configuration Guide* for procedures on PDB migration

## Application Monitoring Inside Docker containers

This section applies to Linux platform.

Application Agent is enhanced to support application monitoring in Docker containers. With this enhancement, you can now monitor the applications running inside Docker containers with MonitorProgram.

For configuring the Docker Container and the Docker Daemon resource, see *Veritas InfoScale 7.1 Virtualization Guide*.

For configuring the Application resource, see *Cluster Server 7.1 Bundled Agents Reference Guide*.

For writing your own custom agent to monitor resources inside the docker container, see *Cluster Server 7.1 Agent Developer's Guide*.

## VirtualDiskMode: the Optional Attribute of the VMwareDisks agent

This section applies to Linux and Solaris platforms.

Specifies the mode to be used when the disk is attached.

You can set the value of this attribute to `persistent`, `independent_persistent` or `independent_nonpersistent`. You must modify the value after you configure application monitoring.

---

**Note:** The VMwareDisks agent does not detect the mode in which the disk is configured. After a failover, the disk is attached in the mode that is defined in the attribute value. For details about the disk modes, refer to the VMware documentation.

---

Default value: `persistent`

Type and dimension: string-association

## Support for 64-bit architecture

This topic applies to Linux.

Veritas InfoScale packages are now compatible with 64-bit architecture.

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**Note:** The Infoscale 32-bit VxFS libraries are deprecated in this release. They will be removed in the next release.

---

## Changes related to installation and upgrades

The following changes are introduced to the installation and upgrading of Veritas Infoscale 7.1.

### Installer can automatically download and install the patches for new minor operating system versions

This section applies to Linux platform.

The Veritas installer has the capability to validate if the product being installed is compatible with the minor operating system version updates.

You are no longer required to find the right minor operating system version support information on SORT and download the support patch from SORT separately and install it.

Veritas has added a minor operating system support metric on SORT which is updated on a real-time basis.

If you have a SORT connection and try to install on a newer operating system version (compared to the version supported when the product is released):

- If the new operating system version is supported, the installer continues the installation procedure.
- If you need a patch to support the new operating system version, the installer automatically downloads the patch and installs it.
- If the new operating system version is not supported, the installer exits with a warning.

If you do not have a SORT connection and try to install on a newer operating system version, the installer gives the following warning:

The following warnings were discovered on the systems:

```
CPI WARNING V-9-40-1401 Kernel Release 2.6.32-504.el6.x86_64 is detected
on cpirhel-vm21. Additional patches may be required to deploy this product
on the Kernel Release 2.6.32-504.el6.x86_64. It is strongly recommended to
check it on SORT (https://sort.veritas.com) before you continue.
```

```
Do you want to continue? [y,n,q] (y)
```

You can choose **y** to install the product first and then download and install the required patches.

## Mounting the ISO image

An ISO file is a disc image that must be mounted to a virtual drive for use. You must have superuser (root) privileges to mount the Veritas InfoScale ISO image.

For AIX platform, follow the steps:

### For AIX platform, to mount the ISO image

- 1 Log in as superuser on a system where you want to install Veritas InfoScale.
- 2 Create a loopback device to which you can bind the ISO image file:

```
# mkdev -c loopback -s node -t loopback
loop0 Available
```

- 3 Bind the ISO image to the loopback device and mount the device:

```
# loopmount -i <ISO_image_path> -l loop0 \
-o "-V cdrfs -o ro" -m /mnt
```

Where *<ISO\_image\_path>* is the complete path to the ISO image

### For Linux platform, to mount the ISO image

- 1 Log in as superuser on a system where you want to install Veritas InfoScale.
- 2 Mount the image:

```
# mount -o loop <ISO_image_path> /mnt
```

### For Solaris platform, to mount the ISO image

- 1 Log in as superuser on a system where you want to install Veritas InfoScale.
- 2 Associate the ISO image to a block device:

```
# lofiadm -a <ISO_image_path> <block_device>
```

Where:

*<ISO\_image\_path>* is the complete path to the ISO image

*<block\_device>* is the complete path to the block device

- 3 Mount the image:

```
# mount -F hsfs -o ro <block_device> /mnt
```



## Rolling upgrade and phased upgrade are supported, and live upgrade is supported only on Solaris platform

Rolling upgrade and phased upgrade are supported from this release. Live upgrade is supported only on Solaris platform.

## Changes related to Veritas File System

The following changes are introduced to Veritas File System (VxFS) of Veritas InfoScale 7.1.

### Online migration of a native file system (ext4) to VxFS file system

This section only applies to Linux platform.

The online migration feature provides a method to migrate a native file system (ext4) to the Veritas File System (VxFS). The migration takes minimum amounts of clearly-bounded, easy-to-schedule downtime. Online migration is not an in-place conversion and requires a separate storage area. During the online migration process, the application remains online and the native file system data is copied over to the VxFS file system. Both file systems are kept in sync during the migration. This makes online migration back-out and recovery seamless.

See the *Veritas InfoScale 7.1 Solutions Guide - Linux* for more information.

### SmartIO supports for multiple VxFS cache areas

SmartIO now supports multiple file system cache areas. Hence there can be more than one file system cache area online on the system at the same time.

Now, each VxFS file system can use separate cache areas for themselves. Also, a VxFS file system can have one cache for the Read caching as well as one cache area for the write-back caching. All the functionality can be accessed through the Veritas InfoScale Operations Manager (VIOM) also.

The `CacheArea` attribute of `SFCache` resource can take more than one name. Its format is

```
Read <cachearea1> Writeback <cachearea2>
```

For detailed information, refer to the *Veritas InfoScale Solutions SmartIO for Solid-State Drives Solutions Guide*.

## Iostat collection for files is disabled by default

Collection of I/O statistics for files is disabled by default in this release. The `fiostat` command prints an error message in such a scenario. To enable the file iostat collection, use the `fiostats_enable` tunable in the `vxtunefs` command. Enablement can occur at the file system level.

See the `vxtunefs(1M)` manual page for more details.

## A new flag is added for the `fsapadm(1M)` commands `define` option

The new flag added is the `locality` flag. It specifies the `locality-aware` policy. This flag is currently supported with the `round-robin` policy order. `Locality-aware` policies consider volume locality, either local or remote, during the allocations from `fss` volumes. They give preference to the local volumes during the allocations.

---

**Note:** This flag is not supported with the `subpolicy` flag, and is applicable for DLV  $\geq 11$ .

---

## Support to mount an inconsistent file system

In older DLVs an inconsistent file system would have stayed mounted and functional. However, if the same was unmounted for any reason, it was not possible to mount the same without a complete `fsck`. In 7.1, it is possible to attempt to mount an inconsistent file system, so that any immediate need of data availability is met. Also, a full `fsck` can be scheduled at a more convenient time. For more info see the `delayfsck` option in the `mount_vxfs(1M)` command.

## The `nodisable` option behaves similar to `mwdisable ioerror` policy

If the `nodisable` option is selected, the behavior is same as the `mwdisable ioerror` policy. For more information see the `mwdisable` option in the *Storage Foundation Administrator's Guide*.

## Disk layout version (DLV) 11 is the default DLV for VxFS

Version 11 is the default DLV. DLV 11 enables support for the following:

- DLV 11 enables support for mounting a corrupted or inconsistent file system in the read-write mode.
- Support for defining locality-aware allocation policies is added for DLV 11.

- Supports multiple SmartIO cache area, and also supports independent cache areas for read and write back caching of a file system.
- Supports storing file type as part of the directory entry.

## Changes related to Veritas Volume Manager

The following changes are introduced to Veritas Volume Manager (VxVM) of Veritas InfoScale 7.1.

### Managing application noise with MAXIOPS settings

This section applies to Linux platform.

When multiple applications use the same storage, it is important to balance the workload between them in a way that allows judicious use of storage resources. Toward this end, VxVM lets you control the number of input-output operations per second that volumes can process from an application by assigning a MAXIOPS value to the application volume group. An application volume group comprises a volume or group of volumes that are associated with an application. The MAXIOPS setting determines the maximum number of I/Os per second that can be serviced for an application. When applications exceed this group limit, the I/O request is throttled. Only application-based I/Os can be managed with MAXIOPS. I/Os resulting from internal VxVM administrative operations are excluded. This capability is supported only with the protocol versions supported in this release.

For more information including the use cases, see the *Storage Foundation Cluster File System High Availability 7.1 Administrator's Guide*.

### Updating DAS disk names to include the host name in FSS environments

The VxVM disk names, in the case of DAS disks in FSS environments, are regenerated to include the host name as a prefix. The host prefix helps to uniquely identify the disk and avoid disk naming conflicts during export operations. For example, the device name for the disk *disk1* on the host *sys1* is now displayed as *sys1\_disk1*.

If you upgrade from a version earlier than 7.1, you must regenerate the disk names by running the following command on each node in the cluster after the upgrade:

```
# vxddladm -c assign names
```

---

**Note:** In case of shared virtual devices, each node of the cluster would provide its own host prefix. Due to this, the cluster-wide naming consistency may be not valid. To avoid confusion, you can set the host prefix to empty string by typing the following commands:

```
# vxdctl set hostprefix=  
# vxddladm -c assign names
```

---

## New option `-o cluster` in `vxdisk(1M)` command

The `-o cluster` option with the `vxdisk` command provides a global view of local and shared disks in the cluster. This allows for better visibility of available storage and greater efficiency in storage provisioning operations.

To obtain a global view of all the available disks in a cluster:

```
# vxdisk -o cluster list
```

To obtain a detailed listing for a specific disk in the cluster:

```
# vxdisk -o cluster list disk_name
```

## Support for mapping remote storage to a node in the cluster

You can map disks or disk groups that are available on remote nodes in the cluster on a local node. The remote storage can be used just like locally connected disks though they are not directly connected to the node. You can map the same storage, if required, to multiple nodes in the cluster. The mapped storage can also be used to create shared or private disk groups on the local node. After mapping the device successfully, the remote storage appears just like any other visible local storage on the node.

When you map a disk group, all the disks present in the disk group are mapped to the node.

---

**Note:** This feature only applies to the Cluster Volume Manager (CVM).

---

## Support for volume encryption

This topic applies to Linux.

VxVM provides advanced security for data at rest through encryption of VxVM data volumes. Encryption is a technology that converts data or information into code that can be decrypted only by authorized users.

You can encrypt VxVM data volumes to:

- Protect sensitive data from unauthorized access
- Retire disks from use or ship them for replacement without the overhead of secure wiping of content

The implementation uses the Advanced Encryption Standard (AES) cryptographic algorithm with 256-bit key size validated by the Federal Information Processing Standard (FIPS) Publication 140-2, (FIPS PUB 140-2) security standard.

You can encrypt volumes or disk groups in your storage environment. VxVM generates a volume encryption key at the time of volume creation. The volume encryption key is encrypted (wrapped) using a different key that is either derived from a passphrase, or retrieved from a Key Management Server. The wrapped key is stored with the volume record. The volume encryption key is not stored on disk.

If you encrypt a disk group, all volumes in the disk group are encrypted. Any volume created later on the disk group will also be encrypted by default.

Only new volumes that are created using disk group version 220 or later can be encrypted by VxVM.

You can encrypt VxVM volumes using one of the following methods:

- Using Passphrases (PBE)
- Using Key Management Service (KMS)

For more information, see the component administration guides.

## Changes to the `vxdisk list` output

The default output of `vxdisk list` CLI now shows the information of the name of the associated disk group even if the disk group is not imported. It shows in parentheses, just like the way it is shown with `vxdisk -o alldgs list` output. The advantage is that you do not need to run a rescan of all disks connected to the system using the `-o alldgs` option to check if the disk belongs to a deport disk group. Instead, you can quickly get this information gathered from the previous scan.

## Smartassist – SmartIO Caching Profiler tool

Smartassist is now installed as part of Veritas Volume Manager (VxVM). It supports a large number of targets such as the VxVM volume, the VxVM disk group, the ZFS or VxFS mount point, the CFS mount point, the CVM volume, and the Database instance.

## Automatically provision storage for Docker Containers

This section applies to Linux.

The Veritas Volume driver enables the Docker Daemon to automatically provision storage to Docker Containers. By setting the volume size and volume layout value in the configuration file, a docker container automatically starts with storage provisioned. There is no need to manually provision storage for the docker container.

For more information, refer to the *Veritas InfoScale 7.1 Virtualization Guide – Linux*.

## Changes related to Dynamic Multi-Pathing

The following changes are introduced to Dynamic Multi-Pathing of Veritas InfoScale 7.1.

### DMP support for EMC VPLEX Metro or Geo synchronous configurations

With InfoScale 7.1 onwards, Dynamic Multi-Pathing (DMP) adds support for EMC VPLEX array-based Metro or Geo synchronous configurations. DMP now automatically differentiates the local and the remote paths of a Logical Unit (LUN) in such configurations. The remote paths of a LUN are automatically marked as standby and is only used if the local path is not available.

### Multi-controller ALUA support

Dynamic Multi-Pathing (DMP) supports the storage arrays using the Asymmetric Logical Unit Access (ALUA) standard. From Veritas InfoScale 7.1 onwards, DMP supports multi-controller (more than two storage array controllers) ALUA-compliant arrays. For ALUA arrays, the DMP management interfaces display the asymmetric access state of storage array controller for the Logical Unit (LUN) instead of PRIMARY or SECONDARY in the `PATH-TYPE [M]` column. The DMP management interfaces display the following ALUA states like:

- Active/Optimized
- Active/Non-optimized
- Standby
- Unavailable
- TransitionInProgress
- Offline

The default value of the `dmp_display_alua_states` tunable is on. You can change the display mode to show legacy PRIMARY or SECONDARY path type by turning off the `dmp_display_alua_states` tunable.

## Changes related to Replication

The following changes are introduced to replication of Veritas InfoScale 7.1.

The `delpri` command cleans RVG on both the primary and the secondary sites, if VVR configuration is not in an error state

The `delpri` command cleans RVG on both the sites, if VVR configuration is not in an error state. If it is in an error state, then the `delpri` command cleans up only the primary site, and you have to manually clean up the secondary site. To clean up RVG on the secondary site, please refer to *Veritas InfoScale Replication Administrator's Guide*.

## Changes related to Operating System

The following changes are related to Operating System (OS).

### End of life

This InfoScale release is the final version that supports AIX 6.1 and Solaris 10.

## Changes related to documentation

The following changes have been introduced to the documents in 7.1:

- The documents are not in the release distribution any more. You can go to the SORT website or Veritas Technical Support website for the documents.

For more information please see *Veritas InfoScale™ 7.1 Release Notes*.

## Platforms supported

For a detailed info of platforms supported see *Veritas InfoScale™ 7.1 Release Notes*.

## Not supported in this release

The following features are not supported in this release but they might be supported in the future release:

- The Deployment Server
- The `-makeresponsefile` option for installer

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**Note:** You can use the response file that is created by operating the installer.

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The following features will not be supported by the Veritas InfoScale products:

- Web-based installation
- The `dmp_native_multipathing` parameter has been deprecated.
- The push installation of the Veritas InfoScale Availability product using the vSphere client
- HA Console is not bundled with 7.1. You can use any earlier version.
- DiskReservation agent for Cluster Server
- Oracle RAC 10g Release 2 is not supported in Storage Foundation for Oracle RAC.