VERITAS

Veritas InfoScale Operations Manager 7.0: What's New

New Features and Enhancements to VIOM 7.0

This is the "New Features and Enhancements to VIOM 7.0" module in the "Veritas InfoScale Operations Manager 7.0: What's New" course.

Content outline

Overview of VIOM 7.0

- Challenges, benefits, highlights, branding changes

Support for SF features

- Extended support for SmartIO, Flexible Storage Sharing operations

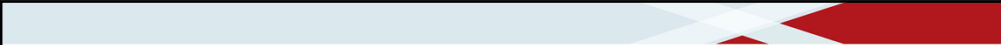**Support for high-availability solutions**

- Extended support for Cluster server, Cluster Volume replication operations

VIOM discovery and supportability enhancements

- Improved add-host operation, faster discovery of Vmware, support for 2048-bit SSL certificate, fault generation for MAC address change, alert for duplicate hosts in VMware virtualization environment

VERITAS

In this lesson, you learn about the enhancements to SmartIO and Flexible Storage Sharing operations using the Operations Manager console. You also learn about the enhancements to cluster server operations and cluster volume replication support using Operations Manager 7.0 console. In addition, you learn about enhancements introduced in Operations Manager discovery and supportability.
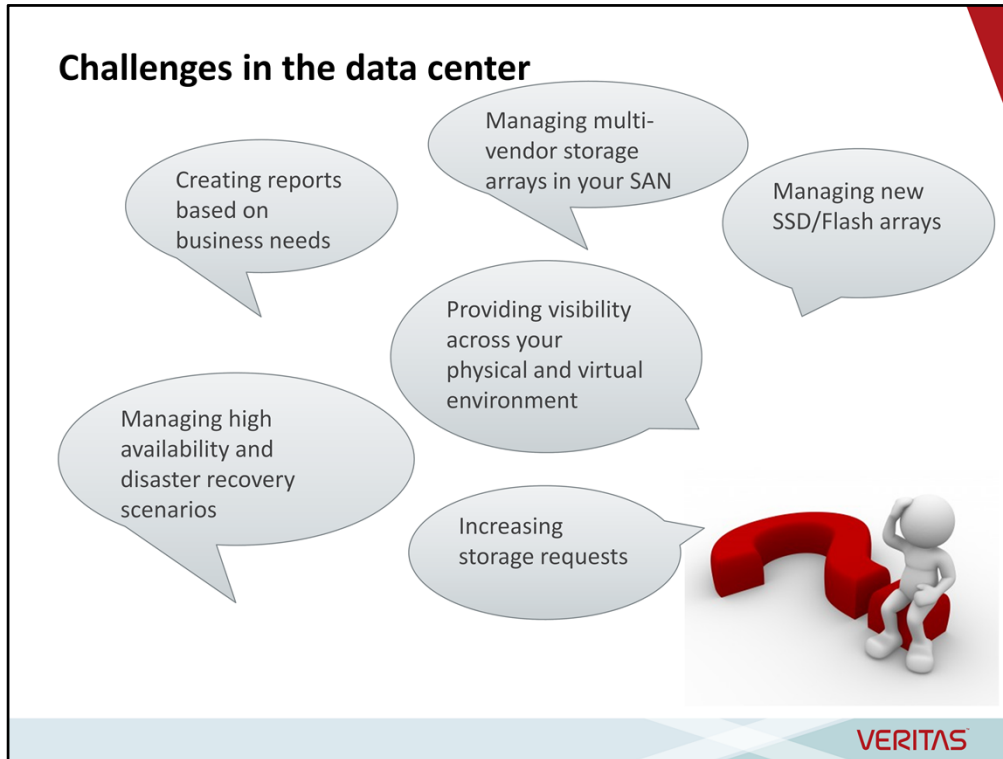
Topic: Overview of VIOM 7.0

After completing this topic, you will be able to describe the purpose and benefits of VIOM 7.0.

This is the "Overview of VIOM 7.0." topic.

Think about all the things you need to do in your data center to keep the business up and running. Manage multi-vendor storage arrays in your SAN, introduce and manage new S-S-D/Flash arrays whether in server or in SAN or as DAS, support increasing storage requests from multiple cost centers without approvals to buy new storage and that's only on the storage side. What about having visibility across your physical and virtual environments, managing high availability and disaster recovery scenarios including failover and testing, and finally having the ability to create reports that you can feed back to business based on their needs?

Key benefits of operations manager

- Improved availability
- Increased agility
- Optimized asset utilization

Veritas InfoScale Operations Manager is a role-based, graphical management framework that not only provides an easy-to-use interface for the core InfoScale products but also adds value to the offerings. With improved availability, operations manager helps in protecting data and enhancing system uptime. The main benefit is increased agility which enables Symantec's customers to be more responsive to changing business needs. And the most beneficial factor is optimized asset utilization which helps to leverage investment in availability and storage infrastructure for the best returns.

Highlights of VIOM 7.0
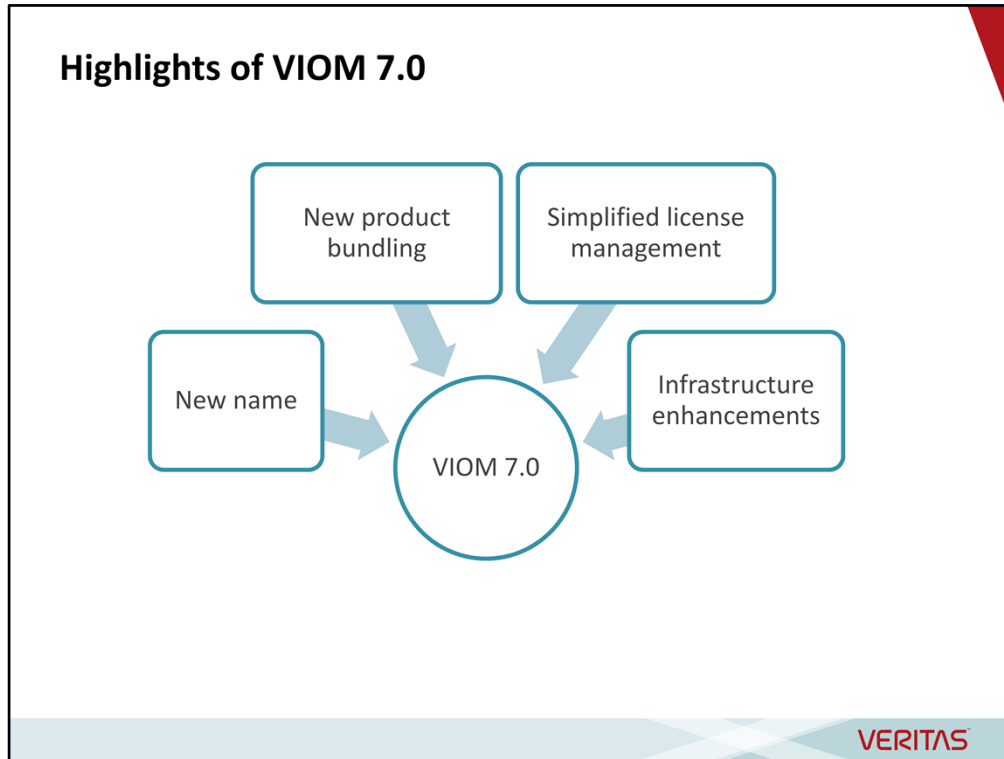
With 7.0 release, Symantec is rebranding S-F-H-A family of products with a new family name, Veritas InfoScale. To reduce complexity of sales and simplify customer buying experience, the Veritas InfoScale 7.0 release introduces four new products, Veritas InfoScale Foundation, Veritas InfoScale Storage, Veritas InfoScale Availability, and Veritas InfoScale Enterprise. Management operations for Veritas InfoScale are enabled through a single, easy-to-use, web-based graphical interface, Veritas InfoScale Operations Manager.

Yes, with 7.0 release, Veritas Operations Manager is renamed as Veritas InfoScale Operations Manager (VIOM) to reflect new family name. The 19 solutions are bundled in four new products and operations manager provides the single graphical management tool for visualizing storage and availability solutions in the data center. The simplified license management helps to scale storage and availability solutions and discover new InfoScale licenses with the help of additional reports. Along with renaming, operations manager also includes necessary changes in the user interface. There are key enhancements such as improved functionality for add host operations and faster discovery of VMware virtualization environment to manage infrastructure challenges. Let's see the essentials of operations manager 7.0 release and its benefits.

Branding changes

Modifications corresponding to InfoScale products:
- Online help and product guides
- Information/ Warning/ Error messages displayed on CLI and UI
- Display name of services
- Package description
- Installer, configuration screens and scripts
- Replaced abbreviations used with complete product name

Modified product logo

Updated color scheme

With 7.0 release, Symantec has modified all references of S-F-H-A products to corresponding InfoScale products. To comply with new release and branding guidelines, all the references to online help and product guides are modified. The changes in branding covers information/warning/error messages displayed on command line and user interface, display name of services, package description, Installer, configuration screens and scripts. The abbreviations are replaced with complete product name. The product logo is modified as per branding guidelines. In addition, the console has an updated color scheme and css used in wizards or popups.

What's new in VIOM 7.0?

Enhancements to the discovery mechanism

Enhancements to cluster server operations

Extended support on storage stack

Simplified license management

The slide provides a high-level list of some of the new features and enhancements that are introduced with operations manager 7.0 release. The next slides cover each section briefly. For more information on these and other new features, refer to the *Veritas InfoScale Operations Manager 7.0 Release Notes.*

What's new in VIOM 7.0?

Enhancements to the discovery mechanism

Enhancements to cluster server operations

Extended support for storage features

Simplified license management

- Improved functionality for add-host operation
- Faster discovery of VMware
- Support for 2048-bit SSL certificate
- Fault generation for MAC address change
- Alert for duplicate hosts in VMware virtualization environment

VERITAS

The infrastructure is discovered by the enhanced discovery mechanism. Operations Manager 7.0 provides two major improvements for the 'add host' operation. Firstly, the console enables faster addition of large number of hosts with the 'parallel add host' operation support. You can click **Clone** option to add rows with multiple hosts having same credentials or with similar host names. If the managed host package is not already present on the host, the host package can be pushed and installed on the host before performing the 'add host' operation.

VMware discovery time has significantly reduced with Operations Manager 7.0. This is done by skipping the datastore browsing during VMware discovery, and discovering only those virtual disks that are attached to some VMware virtual machines. Some of the virtual disks attributes such as **Physical Allocation**, **Used Capacity**, **% Utilization**, and **thin/non-thin** are not discovered.

From version 7.0 onwards, Operations Manager supports 2048-bit certificates for communication between Management Server and the managed hosts. In case you upgrade your Management Server to 7.0, you need to migrate the entire Management Server domain to 2048-bit certificates after the M-S upgrade, by running a script at the Management Server. You cannot add a managed host version lower than 7.0 to a management server that has been upgraded to 7.0.

Prior to 7.0, if the MAC address of the managed host was changed, operations manager used to report the managed host in disconnected state and a fault was generated on the host. The exact reason for this behavior was not known to the user. With 7.0, a proper fault is raised if the hostguid is changed because of the change in MAC address of the host. The user is asked to remove the host from the domain, and again add it to the domain to resolve this issue.

And finally, Operations Manager 7.0 provides the functionality to detect duplicate managed hosts in VMware virtualization environment and raise a fault for such situations.

What's new in VIOM 7.0?

Enhancements to the discovery mechanism

Enhancements to cluster server operations

Extended support for storage features

Simplified license management

- Atleast count dependency
- Faster VCS real-time state updates

VERITAS

Operations Manager 7.0 introduces some enhancements to the cluster server operations using the console. The Management Server console provides the functionality of Atleast Count dependency where the parent resource depends on a set of child resources. You can configure a minimum number of child resources for the parent resource. The configured child resources must be online for the parent to be brought online or to remain online.

V-C-S discovery performance is improved with the real-time state notification of V-C-S cluster nodes by separating the V-C-S state changes and configuration changes from the Operations Manager managed host. V-C-S near real-time discovery allows users to cater only real-time state changes of V-C-S, and reports the latest state changes to the management server immediately.

What's new in VIOM 7.0?

Enhancements to the discovery mechanism

Enhancements to cluster server operations

Extended support for storage features

Simplified license management

- Ability to monitor impact of SmartIO on host
- Improved support for Flexible Storage Sharing (FSS) operations
- Improved cluster volume replication (CVR) functionality

VERITAS

The support for SmartIO functionality is enhanced to show upfront performance improvement in customer environment. Using Veritas InfoScale Operations Manager 7.0, you can view the impact of enabling SmartIO on a host in an interactive graph. You can view the graphs for a host and an application.

The 7.0 release also provides additional capabilities to support Flexible Storage Sharing or F-S-S operations. You can view private storage from cluster view and get simplified volume creation support through the console.

In addition, there is an improved support for Cluster Volume Replication (CVR) operations. The Cluster Volume Replication or C-V-R functionality in 7.0 enables simplified replication configuration and C-V-R support for existing V-V-R operations. Using the console, you can unconfigure replication with a single-click, and perform operations such as, associate volumes to existing replication, and resynchronize secondaries.

What's new in VIOM 7.0?

Enhancements to the discovery mechanism

Enhancements to cluster server operations

Extended support for storage features

Simplified license management

- Discover InfoScale licenses
- Find chargeable licenses from multiple InfoScale licenses deployed on same host.
- Find core-to-license value for each chargeable InfoScale product
- Deployment summary and details for InfoScale products
- Tracking deployment of InfoScale products against cores-to-license
  - 'Per-core license information' report
  - 'What-if Analysis' report

VERITAS

The Operations Manager console is enhanced to help customers understand what is deployed in their datacenter, map between S-F-H-A family of products and new InfoScale family of products in case of upgrade, and how it is charged. The Management Server console provides reports showing the new pricing meter along with the gain/loss against cores to license.

There are two new reports added to the Licensing section of operations manager console. The 'Per Core License Information' report lists the total cores used by each product. The 'What-if Analysis' report gives information about entitled products and cores after upgrading to 7.0

Topic: Supporting SF features

After completing this topic, you will be able to describe enhancements to SmartIO and FSS operations using the VIOM 7.0 console.

This is the "Supporting SF features" topic.

Use case for FSS operations

In 6.1 release, all CVM clusters in UNIX environment were visible through the MS console and support was provided for SF operations. The 6.1 MS console contains wizards for 'exporting/unexporting disks for shared use in the CVM cluster', 'enabling/disabling FSS for an existing disk group', and 'adding exported disks in FSS DG'.

- Context-specific volume to ease operations
- Overall storage visualization from Cluster view
- FSS volumes with preferred configuration

- Simplify volume creation
- Visualize private storage from cluster context

| Customer need | Improved FSS operations in 7.0 |

VERITAS

Flexible Shared Storage (FSS) allows the hosts in a CVM cluster to use the storage that is local to a host or is partially shared. In 6.1 release, all CVM clusters in unix environment were visible through the MS console and support was provided for storage foundation operations. However, CVM clusters in Windows environment were visible but without support for SF operations. So there was a business need for context-specific volume creation to ease operations. The cluster view was unable to provide overall storage visualization which included private as well as shared storage from all nodes. Additionally, FSS volumes did not have preferred configuration. Considering all these requirements and to meet customer's expectations, Operations Manager Management Server console continues to support FSS with two new additional capabilities in 7.0 release. Now, there are volume layout options added in the console to simplify tasks of creating volumes. Moreover, you can visualize private storage from cluster context.

Simplified volume creation process using VIOM
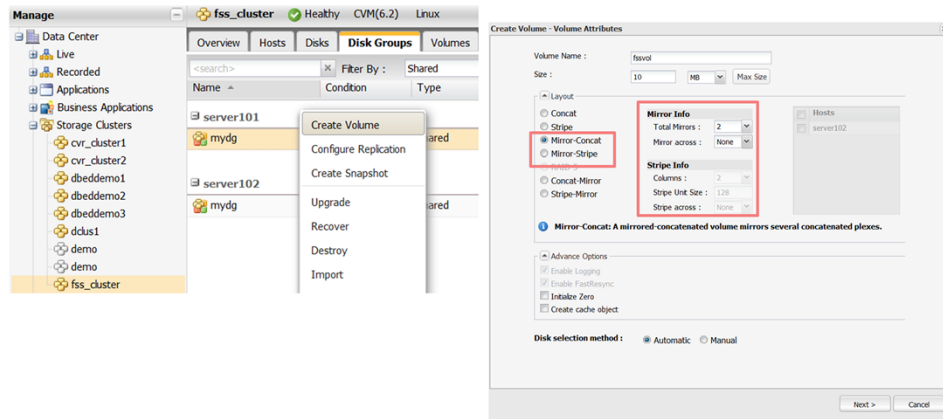
- Provided preselected preferred options for FSS/non-FSS diskgroup
- Added two options to make layout selection simple
  - Mirror-concat
  - Mirror-stripe
- Provided options for mirroring/striping across hosts for FSS volume

In the **Create Volume** panel, two options are added upfront for layouts like **mirror-concat** and **mirror-stripe**. The shared disk groups tab is renamed to **Disk Groups**. By default, it lists down shared disk groups in cluster by host. You can select option to view shared/private/all diskgroups. The **Volumes** tab displays shared volumes in cluster by default. You can select option to view the volumes on shared/private/all disk groups.

SmartIO impact analysis overview

VIOM 7.0 console:

- Provides visual representation of improvement in workload performance
- Allows to compare IO utilization of workloads where SmartIO is enabled with others
- Helps in deciding where SmartIO deployment is more beneficial for other workloads

VERITAS

The new functionality in 7.0 allows to monitor impact of SmartIO on the host. This feature helps to show upfront performance improvement in customer environment.

In the 7.0 MS console, you can view the impact of enabling SmartIO on a host in an interactive graph. You can review the performance of a host for different durations - one week, one month, or one year.

In the graph, you can view the number of SmartIO enabled volumes and, the date and time when SmartIO was enabled or disabled on the host. The green arrow on the graph indicates the date on which SmartIO was enabled. In the **Volumes** chart, when you hover the mouse on the line graph, you can view the IO gain percentage.
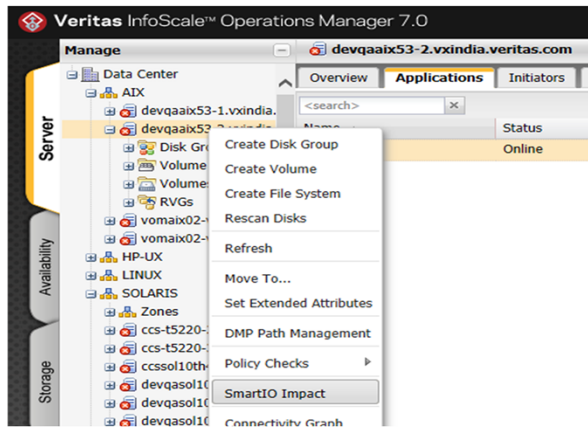
SmartIO impact analysis graph on the database
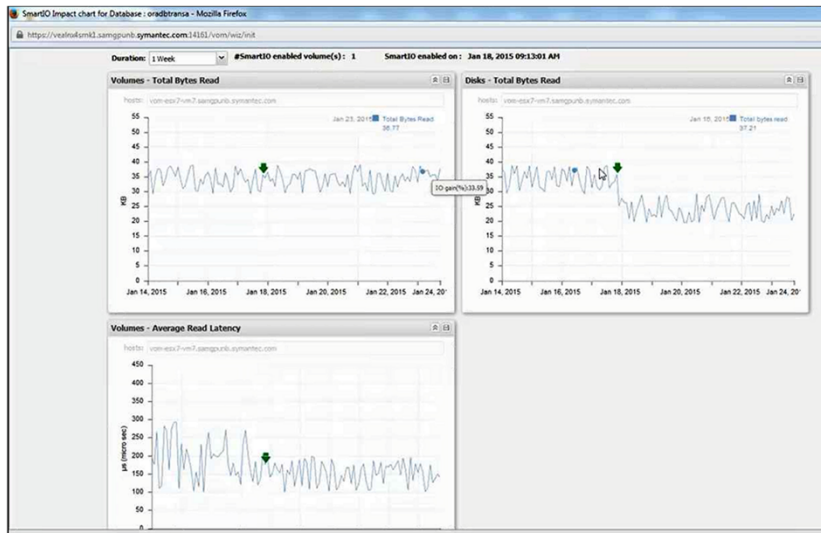
The **Volumes** chart shows reads for the SmartIO enabled volumes on the database. The **Disks** chart shows reads from the disks of the SmartIO enabled volumes. When SmartIO is enabled, reads are served from the SmartIO cache, and hence the number of reads from the disk reduce.

Viewing the SmartIO impact analysis chart

- Guest role must be assigned on the **Server** perspective or on the organization

To view the SmartIO impact analysis graph, go to the **Server** perspective and expand **Manage** in the left pane. Right-click the database or the host and select **SmartIO Impact**.

Viewing IO utilization report

To view **IO Utilization** report, go to **Reports** and click **IO Utilization**. The SmartIO impact chart shows total bytes read from volume as well as from disk.

Topic: Supporting high availability solutions

After completing this topic, you will be able to:
- **Describe enhancements to VCS operations using the VIOM console.**
- **Explain how cluster volume replication works in VIOM 7.0.**

This is the "Supporting high availability solutions" topic.

Atleast resource dependency overview

- New feature introduced in VCS 6.2
  - Configure multiple child resources to a parent
  - Specify the number of child resources which must be online to start the parent resource
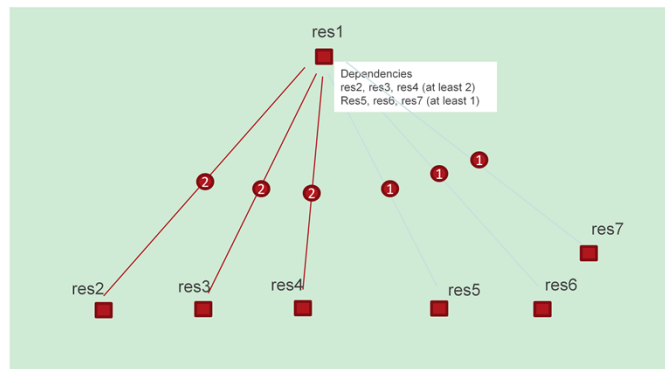
VCS 6.2 introduced a new feature to configure atleast dependency between resources. Earlier there was 1:1 mapping between the parent and the child resources. With VCS 6.2, you can configure multiple child resources to a parent and specify the number of child resources which must be online to start the parent resource. Let's consider an example where Res1 (parent) is dependent on three child resources (Res2, Res3, Res4) with the criteria that when any two child resources are online, the parent resource can stay online.
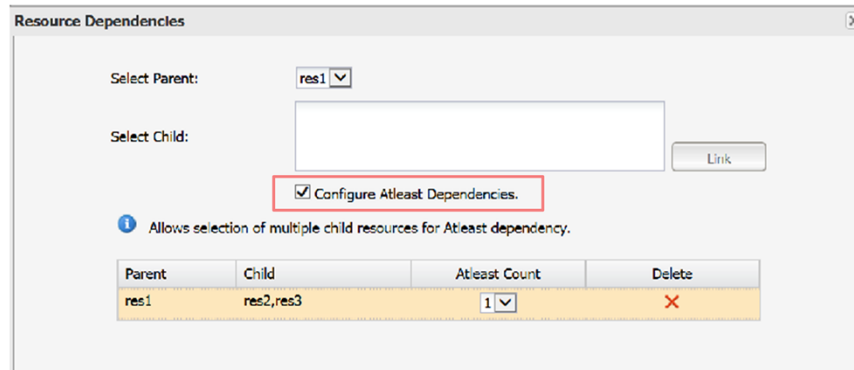
While bringing the service group online, VCS can bring the parent resource online as soon as the minimum number of child resources defined in the atleast resource dependency are online. Later, even if Res4 faults and Res2, Res3 are still online, no action is taken on Res1 as the atleast dependency criteria of 2 is still met. Without atleast dependency this would have resulted in fault action to be initiated for Res1.

Atleast Resource Dependency feature enables customer to specify dependencies with atleast criteria. Earlier customer either had to mark some resources as non-critical or not add those entities to resource dependencies. An application can typically depend on multiple IP resources. Even if few of the IP resources are available, the application can stay online. This can be configured with Atleast Resource Dependency.

Configuring Atleast resource dependency using MS 7.0 console

Requirement:

- Cluster version must be 6.2 or above
- The MS and MH version is 7.0 and above

Resource Dependencies   ☒

Select Parent: res1 ▼

Select Child: [   ]   Link

☑ Configure Atleast Dependencies.

ⓘ Allows selection of multiple child resources for Atleast dependency.

Parent	Child	Atleast Count	Delete
res1	res2,res3	1 ▼	✕

VERITAS

Veritas InfoScale Operations Manager 7.0 provides the functionality of **Atleast Count dependency** where the parent resource depends on a set of child resources. Atleast count dependency can be configured by checking an option while configuring resource dependency. This option is available only if the cluster version is 6.2 or above and the MH version is 7.0 and above.

The command used to perform the operation is different than the regular resource dependency command. Discovery changes to understand the atleast dependency are made in the 7.0 MH, so this feature can work only with the 7.0 versions of both Management Server and Managed Host on the cluster nodes.

To create Atleast Count dependency for a resource in a service group, go to the **Availability** perspective and expand the **Uncategorized Clusters** to locate the cluster. Right-click on the required cluster and select **Create Service Group**. In the **Resource Dependencies** panel, you can configure a minimum number of child resources for the parent resource. The configured number of child resources must be online for the parent to be brought online or to remain online.

Comparison VCS vs VCSNR Discovery

Existing VCS discovery	Functionality provided with 7.0
• Discovers Resource and Service-Group State Changes • Performs Application-SG correlation	• Discovers SG and Resource state changes only • Introduces new family VCSNR (VCS Near Real-time)
Trigger discovery when SG/Resource operation performed from VIOM UI or `HAREG` notification are received about the state change	• Trigger VCSNR Discovery instead of VCS Discovery as done previously • Trigger VCS discovery from VCSNR to report configuration and other changes
Discovery Time includes: • Time spent in loading agentlet and related libraries/tables • Time spent in executing commands and performing discovery • Calculating the difference and reporting data to MS	Limited number of tables loaded and commands fired to minimize run time

VERITAS

Traditional VCS discovery performs detailed configuration change detection. With 7.0, there is new VCSNR family introduced for handling the state update changes. After completion of VCSNR family, full discovery is triggered by invoking VCS family. The VCS family continues to discover all configuration and correlation related changes. No dependency on the VCS version. Once MH is upgraded to 7.0, this feature is available.

Faster VCS real-time state updates

- Provides a better end-user experience as the state changes are reflected quicker in UI.
- Changes are applicable for any state-based change (Online/Offline/Switch etc. operations) performed on any VCS object from UI or CLI.

Configuration	VCS Discovery	VCS NR Discovery
Setup with 8 Service-groups	11 seconds	2 seconds
Setup with 176 Service-groups	20 seconds	5 seconds

VERITAS

With Operations Manager 7.0 release, VCS discovery performance is improved with the real-time state notification of VCS cluster nodes by separating the VCS state changes from the configuration changes. The VCS near real-time discovery allows users to cater only real-time state changes of VCS, and reports the latest state changes to Operations Manager management server immediately.

Improved VCS Near Real Time discovery provides a better end user experience as the state changes are reflected quickly in the console. These changes are applicable for any state based changes such as Online, Offline, Switch etc. operations performed on any VCS object using the console or the command line interface.

Enhancements to support cluster volume replication

- CVR overview
  - Volume replication in cluster volume manager (VVR + CVM) environment
  - Visualize the replication environment and its objects from hosts.
  - Perform operations to manage replication environment.

VIOM 6.1 console	Functionality provided with 7.0
• Provides replication configuration for existing setups. • Supports operations such as Start, Stop, Pause, Resume, Switch, Takeover • Allows adding and removing secondary site	• Simplified replication configuration and CVR support • CVR support for existing VVR operations • Single click un-configuration of replication • Associating volumes to existing replication • Resynchronize secondaries

VERITAS

In general, server admins are responsible for managing the hosts and they use Operations Manager console to monitor and manage the replication environment configured under CVM as well as non-CVM environment. Operations Manager 6.1 allowed discovery of VVR objects and CVM clusters. Some changes were needed to some of the existing replication management/configuration/monitoring/operations.

The discovery and visualization in Operations Manager is enhanced to support volume replication in cluster volume manager environment. With the discovery changes in Operations Manager 7.0, the users can view the cluster volume replication or CVR objects from all the nodes in the cluster. They can configure the replication environment and also can manage it through various operations, such as associating volumes to existing replication, resynchronizing secondaries, and unconfiguring replication with a single-click.

Requirements for supporting CVR

For supporting existing CVR operations:
- Storage Foundation 5.0 onwards
- Managed Host 6.0 onwards.

For Associate Volume, Unconfigure Replication, Resynchronize Secondaries operations :
- VIOM Managed Host 7.0
- VIOM Management Server 7.0
- Valid license copy of VVR must be installed on the MHs.

VERITAS

The existing CVR operations are supported with Storage Foundation 5.0 onwards and Managed Host 6.0 onwards. For the operations such as, associate volume, unconfigure replication, resynchronize secondaries, you need Operations Manager Managed Host and Management Server 7.0 version. Also a valid license copy of VVR must be installed on the managed hosts.

Changes for CVR operations

Visualization changes:

- In **Server** perspective > select **Storage Cluster** > select node
  - New tab called **Replication** to view all VVR/CVR replication in cluster
  - RVG on host lists down all nodes in primary as well as secondary site and specifies the `logowner` for cluster

Operation changes:

1. Configure Replication
   - Creating SRL on primary with striped layout and disk selection for better performance
   - Creating disk group/volume on secondary host from same UI
   - Creating VCS configuration for primary as well as secondary with prespecified attributes
   - Rolling back created object from primary as well as secondary, if operation fails in between
2. UnConfigure Replication
   Removes all secondary as well as primary along with VCS configuration(if exists) from each site
3. Associate Volume
   Creates volume on all sites (if volumes do not exist) and associates them to an RVG
4. Resynchronize Secondaries

VERITAS

The slide describes the visualization changes and operation changes introduced in 7.0 release. To support CVR operations, there are some GUI enhancements in the **Server** perspective. In the **Storage Clusters** a new tab called **Replication** is introduced which displays the RVGs in that cluster. This provides a consolidated picture of the replication environment in the cluster. In case of the CVM environment, the RVG created on shared disk group is visible on all the nodes in the primary as well as in the secondary site. This enables you to view information and perform operations on such an RVG from any node in the cluster. When you navigate to a specific RVG, all the hosts on the primary as well as on the secondary site are displayed. In case a host is the **logowner,** then its role is indicated as primary (**logowner**) or secondary (**logowner**).

Logowner is the host in the cluster, which is responsible for doing the replication. The CVM master is the **logowner** by default. **Logowner** is defined only in case of a clustered environment.

And then there are additional operations supported. Using Operations Manager 7.0 MS console, you can configure and unconfigure replication. You can also associate a volume and resynchronize the secondaries.

Topic: VIOM discovery and supportability enhancements

After completing this topic, you will be able to describe the enhancements to VIOM discovery and supportability.

This is the 'Operations Manager discovery and supportability enhancements' topic.

Support for 2048-bit SSL certificate

- Enhanced security by adding support of 2048 bit encryption.

- Run the `at_migration.pl` script on MS
  To migrate the MS domain (all the managed hosts reporting to MS) to 2048-bit certificate.

- Run the `at_migration.pl` script on selected MH
  To manually migrate that particular host
  - If MH was not reporting to MS
  - If MH fails to migrate when the script was run

Don't FORGET!

All those managed hosts that fail to migrate after running the script, may not be able to communicate with Management server unless they are manually migrated to 2048-bit certificates.

VERITAS

The security enhancement is done by adding support of 2048 bit encryption. In version 7.0, Operations Manager supports 2048-bit certificates for communication between Management Server and the managed hosts. The fresh install has 2048 bit keys by default. In case you want to upgrade from older versions of Operations Manager and/or require support for 2048 bit keys, the AT Migration script is included in the install binary for upgrading 1024 keys to 2048 bit keys.

This AT migration script needs to be executed only once on the Management Server. This will push the 2048 bit keys to all the 7.0 version of Managed Hosts which are actively reporting to the Management Server. For all the servers which are currently not reporting to Management Server or are having older versions of Managed Host need to be manually upgraded to 7.0 and later the AT migration script needs to be manually run on the Managed Hosts.

Remember, all those managed hosts that fail to migrate after running the script, may not be able to communicate with Management Server unless they are manually migrated to 2048-bit certificates.

In case you upgrade your Management Server to 7.0, you need to migrate the entire Management server domain to 2048-bit certificates after the Management Server upgrade, by running the script on the Management Server. You cannot add a managed host version lower than 7.0 to a Management Server that has been upgraded to 7.0.

Enhancements to 'add MH'

- Parallel 'add host' allows faster addition of large number of hosts.
- Push install
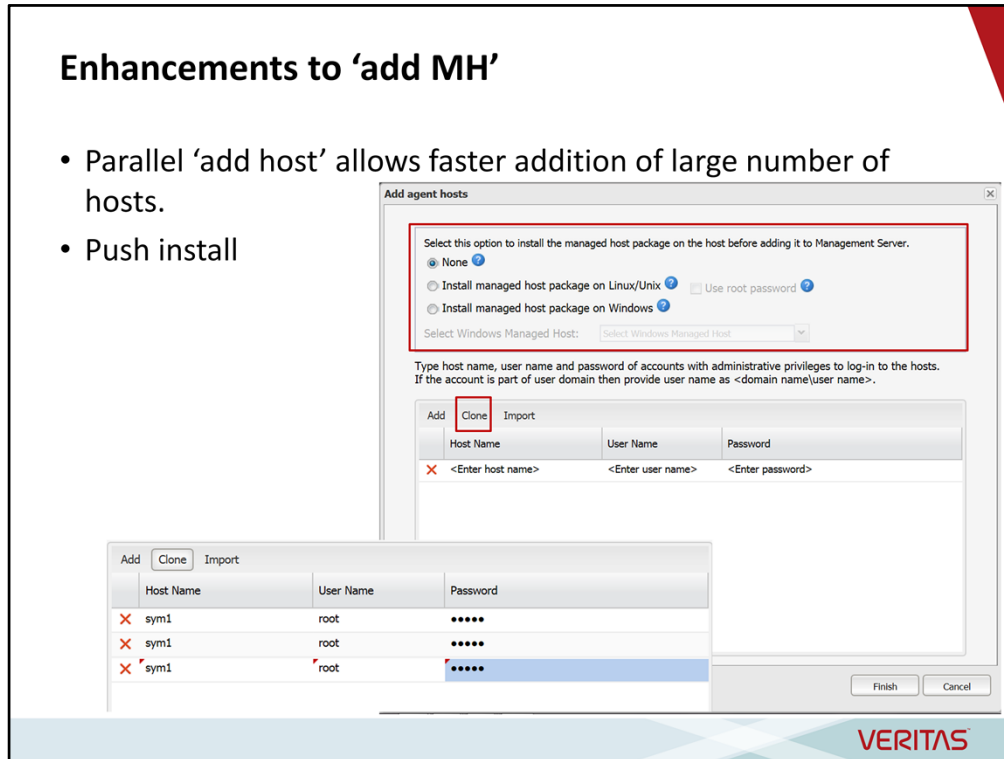
Veritas InfoScale Operations Manager 7.0 provides two major improvements for the 'add host' operation, such as 'parallel add host' and 'push install'.

The 'parallel add host operation' support is added using the console. This allows faster addition of large number of Hosts. If the managed host package is not already present on the host, the host package can be pushed and installed on the host before performing the add host operation. You can view new options added in the console. Click **Clone** to add a new entry and copy the details of the selected managed host into the new row. Once the information is copied in to a new row, you can edit the information, if required. You can use this option if you have multiple hosts with similar host names, user names, and passwords.

You can specify the option to install the managed host package on the host before adding it to the Management Server. Select **None**, if the Managed Host package is already installed on the Linux/Unix or Windows hosts. If you select **Install managed host package on Linux/Unix** option, the **Use root password** option is enabled. Select this option if you want to install the host package on a Linux/Unix host as a non-root user. Provide the non-root username, non-root password, and root password for the specified host. You can use this option if the Secure Shell or S-S-H access is disabled for the root login on the host where you want to install the host package and perform the Add Host operation. Use **Install Managed Host package on Linux/Unix** option if you have only Linux/Unix hosts that you want to add to the Management Server. If a lower version of M-H package is already installed, it is upgraded to the latest version. The **Select Windows Managed Host** option is enabled only when you select the option **Install managed host package on Windows** and there is at least one Windows managed host in the domain. Select a Windows managed host which you want to use as a Control Host. The Control Host add-on is installed on the specified Windows managed host, if it is not already installed.
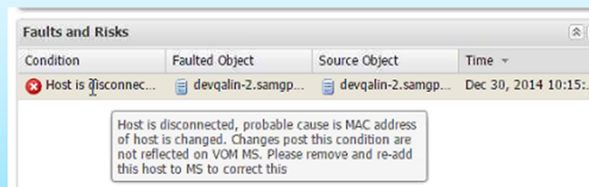
Generate fault for host when `hostguid` is changed

Term	Description
`hostguid`	A unique identifier for a host in VIOM. For Windows system `hostguid` is generated using MAC address and Serial number of system drive. For Unix systems, `hostguid` is generated using MAC address, platform identifier and host-id.
`host-id`	This is another identifier available on host and used to generate `hostguid` on Unix platform. The host-id for Linux host can be found using command- `/usr/bin/hostid`
`biosuuid`	An unique identifier given to VMware virtual machines.

mh.log

```
2014-12-30 22:15:07 [debug] 18779 Agent: Discovering
2014-12-30 22:15:07 [debug] 18779 S10Ping: Perform initialize and discover for agentlet named [VRTS::NR::S10Ping]
2014-12-30 22:15:07 [debug] 18779 S10Ping: Managed Host devqalin-2.samgpunb.symantec.com is disconnected because hostguid is changed, probable
reason is MAC address of host is changed. Old hostguid (00010015-174a-46ae-0000-000000000000). New hostguid (00010015-174a-48ae-0000-000000000000)
2014-12-30 22:15:08 [debug] 18779 S3faults: Perform initialize and discover for agentlet named [VRTS::NR::S3faults]
2014-12-30 22:15:08 [debug] 18779 S7nrvvr: Perform initialize and discover for agentlet named [VRTS::NR::S7nrvvr]
```

Go to **Server** perspective, click **Overview** tab > Check **Faults and Risks** panel.

Faults and Risks

Condition	Faulted Object	Source Object	Time
⊗ Host is disconnec...	🗐 devqalin-2.samgp...	🗐 devqalin-2.samgp...	Dec 30, 2014 10:15:...

Host is disconnected, probable cause is MAC address
of host is changed. Changes post this condition are
not reflected on VOM MS. Please remove and re-add
this host to MS to correct this

VERITAS

In Operations Manager, a host is uniquely identified using **hostguid**. The **hostguid** is generated using MAC address. So if the MAC address of a host changes the **hostguid** for that host also changes.
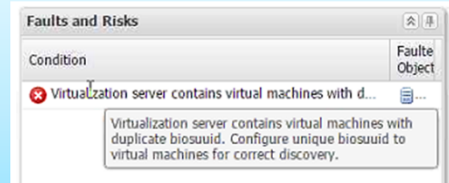
In the current mechanism of Operations Manager, when a **hostguid** change is detected for a physical host, the host goes into **Disconnected State** and a fault is generated for the host saying "Host is disconnected; probable cause is host has been reinstalled." For virtual hosts the above fault is generated when their **biosuuid** is changed along with the **hostguid**. User needs to remove and re-add host to M-S to start managing the host again. However the above fault causes confusion to user because host has not been actually reinstalled.

With Operations Manager 7.0 onwards, a proper fault is raised if the **hostguid** is changed because of a change in the MAC address of the host. The host **Overview** page under **Server** Perspective displays fault stating that "Host is disconnected, probable cause is change in MAC address. Changes post this condition are not reflected on Operations Manager Management Server. Please remove and re-add this host to Management Server to correct this." As a result, the user is asked to remove the host from the domain, and again add it to the domain to resolve this issue.

Duplicate host detection in VMware

Problem prior to 7.0	Functionality provided with 7.0
The MS console:	
Fails to uniquely identify VMs in vCenter discovery	Along with `biosuuid`, vCenter also reports attribute called `instanceUuid` for each VM.
Fails to correlate VMs discovered by vCenter to VMs running VIOM Agent	Use `instanceUuid` instead of `biosuuid` of VMs to uniquely identify VMs in vCenter discovery.

Go to **Virtualization** perspective, click **Overview** tab > Check **Faults and Risks** panel.

Faults and Risks

Condition	Faulte Object
❌ Virtualization server contains virtual machines with d...	🗎...

Virtualization server contains virtual machines with duplicate biosuuid. Configure unique biosuuid to virtual machines for correct discovery.

VERITAS

In VMware technology, multiple virtual machines may have same **biosuuid** across vCenters and due to this Operation Manager faces two issues. The MS console fails to uniquely identify VMs in vCenter discovery and fails to correlate VMs discovered by vCenter to virtual machines running Operation Manager agent. To solve this issues, a new functionality is added where along with **biosuuid**, vCenter also reports attribute called **instanceUuid** for each VM. Unlike **biosuuid**, **instanceUuid** is a unique attribute across vCenters. Thus, Operations Manager 7.0 provides the functionality of detecting duplicate managed hosts in VMware virtualization environment and raising a fault for such scenarios.

Replacing pogo with gSOAP for VMware Discovery

Problem prior to 7.0	Functionality provided with 7.0
Pogo is an Apache Axis based VMware vSphere web services client : • Implementation of datastore discovery is very inefficient • JREs for multiple platforms need periodic updates	The new gSOAP based vSphere web service client: • Performs faster VMware discovery • Is implemented with VM power on/off operations required by VRP

- Requirement:
  - If an MH having some vCenters configured is upgraded to 7.0, then the existing CH add-on on that MH is disabled.
  - The CH add-on on MH need to be upgraded to 7.0.

VERITAS

Pogo is an Apache Axis based VMware vSphere web services client implemented in Java. Prior to 7.0, Operations Manager was using pogo for discovering v-phere details, such as ESX servers, virtual machines, datastores, ESX clusters, etc. There were some problems observed with Pogo. Implementation of datastore discovery is very inefficient in pogo which causes majority of the discovery time to be spent on that activity. JREs for multiple platforms are required to be bundled with the Control Host add-on and need to be updated periodically. Considering these issues, a new gSOAP based vSphere Web services client is implemented in Operations Manager 7.0 release to replace pogo.

If a Managed Host, acting as Control host, has some vCenters configured and is upgraded to 7.0, then the existing CH add-on on that MH is disabled. To continue discovery of existing vCenter configuration, the CH add-on on the MH must also be upgraded to 7.0.

Changes in VMware Discovery flow

Changes in the discovery mechanism

- Datastore discovery is done in batches.
- A user defined timeout value (default 900 seconds) governs the maximum time spent on a datastore browse task.
  - In case of timeout, a fault is raised on corresponding hosts indicating that the discovery of a datastore has timed out and `vdisk` details are not discovered.
- The new vSphere web services client is single threaded.

Changes in the discovery flow

- Discovers only those virtual disks which are attached to some VMware virtual machine.
- Does not discover the virtual disks attributes, such as:
  - Physical Allocation
  - Used Capacity
  - % Utilization, and
  - Thin/non-thin

VERITAS

Though the data discovered by the new v-Sphere web services client is identical to what pogo discovers, there are changes in the discovery flow and mechanism in the new v-Sphere web services client.

1. Datastore discovery is done in batches. User defined value for datastore browse batch size which is 25 by default is used to create tasks on VCenter for browsing datastores in parallel. Processing of datastore browse results is not a time consuming activity.

2. A user defined timeout value which is default 900 seconds, governs the maximum time spent on a datastore browse task. If any datastore browse task takes longer than the timeout, discovery of that datastore is abandoned. Such datastores have only the basic information discovered without any virtual disks details. If the datastore browse task for any datastore times out, a fault is raised on the corresponding hosts indicating that the discovery of a datastore has timed out and v-disk details are not discovered.

3. Based on the performance analysis done, it is observed that most of the discovery time is spent in datastore browse activity. The discovery of information other than datastores takes less time. Thus, a single thread can take care of creating datastore browse tasks and processing results along with discovery of other details such as hosts, virtual machines, clusters etc. Hence, the new v-Sphere web services client is single threaded.

Skipping the datastore browsing causes differences in VMware discovery flow as compared to the previous versions of Operations Manager. It discovers only those virtual disks which are attached to some VMware virtual machine. Some of the virtual disks attributes such as Physical Allocation, Used Capacity, % Utilization, and thin/non-thin are not discovered.

Changes to configuration parameters

virtualization.conf

esx_max_threads
- Removed.
- Since the new gSOAP based client is single threaded, this configuration parameter is not needed.

esx_batchsize
- Newly added.
- Specifies the count of ESX servers to be discovered in a batch.
- Default value: 300

ds_browse_batchsize
- Newly added.
- Specifies the count of datastore browse tasks to be created on VCenter in a batch
- Default value: 25

VERITAS

With Operations Manager 7.0, VMware discovery time is significantly reduced. This is done by skipping the datastore browsing during VMware discovery. The **datastore_browse** flag in the **virtualization.conf** file indicates if datastores need to be browsed for discovering the details of virtual disks. Default value of this configuration parameter is 0 which means datastore browse is skipped. In case datastore browsing is required, set this parameter to 1. There are changes made to the configuration parameters in **virtualization.conf** file. Since the new gSOAP based client is single threaded, **esx_max_threads** is not needed. Hence this parameter is removed.

esx_batchsize is newly added with a default value of 300. This parameter specifies the count of ESX servers to be discovered in a batch. This parameter actually is a replacement for the concurrency attribute of a vCenter configuration in the Operations Manager Management Server database.

ds_browse_batchsize is newly added with a default value of 25. This parameter specifies the count of datastore browse tasks to be created on a VCenter in a batch.

Enhancements to licensing reports

In the 7.0 version, the licensing section provides additional functionality to discover InfoScale licenses and find chargeable licenses from multiple InfoScale licenses deployed on the same host. There are two additional reports **what-if analysis** and **Per-core license summary report** to track deployment of InfoScale products against cores-to-license.

The slide shows an example of a **what-if analysis** report. This report gives information about the entitled products and cores after upgrading to 7.0. The **Current Required** column shows information as per current product information. The **Future Required** shows value of the required core to license. And the last column **Potential Entitlement** displays value that is calculated using SPVU count.

Lesson summary

- Key points
  - In this lesson, you learned about the enhancements made to SmartIO and FSS operations with Operations Manager 7.0 release.
  - You also learned about the enhancements to VCS operations , VIOM discovery, and supportability.
  - In addition, you learned how CVR operations are supported with VIOM 7.0 release.

- Reference materials
  - *Veritas InfoScale Operations Manager 7.0 Release Notes*
  - *Veritas InfoScale Operations Manager 7.0 Installation and Configuration Guide*
  - *Veritas InfoScale Operations Manager Management Server 7.0 User Guide*
  - https://sort.symantec.com/vom

VERITAS

For more information about the topics discussed in this lesson, refer to the resources listed on the slide and remember to check the SORT Web site frequently.