

# Veritas™ Resiliency Platform 3.0 Overview and Planning Guide

# Veritas Resiliency Platform: Overview and Planning Guide

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# Overview of Resiliency Platform

This chapter includes the following topics:

- [About Veritas Resiliency Platform](#)
- [About Resiliency Platform features and components](#)

## About Veritas Resiliency Platform

Veritas Resiliency Platform offers a unified solution that helps you proactively maintain business uptime across private, public, and hybrid clouds. Resiliency Platform gives you complete automation for all resiliency operations involving the virtual machines, applications, and multi-tier business-services in your data center. It safeguards the current technology investments by plugging into your existing environments and infrastructure.

For data replication, you can use the Resiliency Platform Data Mover or any third-party solution that is supported by Veritas Resiliency Platform. For a list of supported vendors and products, see *Veritas Resiliency Platform Hardware and Software Compatibility Guide*.

Resiliency Platform Data Mover is a separately licensed feature of Veritas Resiliency Platform. It provides data replication between geographically separated data centers facilitating an effective disaster recovery solution. The Resiliency Platform Data Mover can be used for the following purposes:

- For recovery of VMware virtual machines to on-premises data center
- For recovery of VMware and Hyper-V virtual machines to cloud data center

Resiliency Platform has the following core capabilities:

Security and Compliance	Veritas Resiliency Platform provides enhanced data encryption for data-in-flight.
Predictability	Customers can predictably meet critical business Recovery Time Objectives (RTOs) and Recovery Point Objectives (RPOs).
Compliance	Customers can prove compliance to internal and external business continuity mandates with audit reporting and non-disruptive, real-time disaster recovery testing.
Automation	Customers get complete automation for all resiliency operations including recovery run books, and start and stop recovery orchestration for multi-tier applications. This reduces risk of downtime from human error.
Flexibility	Customers get the flexibility to keep their existing infrastructures and can innovate on their terms, with the flexibility that Resiliency Platform provides, to enable workload migration across sites and even to the cloud.

See [“About Resiliency Platform features and components”](#) on page 6.

## About Resiliency Platform features and components

The following is a brief introduction to Veritas Resiliency Platform key components and their relationships. Administrators responsible for deploying and configuring the product need to understand these in more detail.

Resiliency Manager	<p>The component that provides resiliency capabilities within a resiliency domain. It is composed of loosely coupled services, a distributed data repository, and a management console. The Resiliency Manager is deployed as a virtual appliance.</p> <p>See <a href="#">“Resiliency Manager”</a> on page 8.</p>
Infrastructure Management Server (IMS)	<p>The component that discovers, monitors, and manages the asset infrastructure within a data center. The IMS transmits information about the asset infrastructure to the Resiliency Manager. The IMS is deployed as a virtual appliance.</p> <p>To achieve scale, multiple IMSs can be deployed in the same data center.</p> <p>See <a href="#">“Infrastructure Management Server (IMS)”</a> on page 9.</p>

Veritas InfoScale Operations Manager Management Server	<p>The component that allows discovery of InfoScale applications that are already configured in Veritas InfoScale Operations Manager, also referred to as Veritas InfoScale Operations Manager server. You can manage the InfoScale applications that are already configured in Veritas InfoScale Operations Manager on Linux, Solaris, AIX as well as Windows platform.</p> <p>You need to add this component only if you want to manage and recover the Infoscale applications that are already configured in Veritas InfoScale Operations Manager.</p>
NetBackup Server	<p>The component that allows restoration of virtual machines to a local or remote data center using NetBackup generated backup images.</p> <p>You need to add this component only if you want to restore the virtual machines using NetBackup generated backup images.</p>
Replication Gateway	<p>The component of Veritas Resiliency Platform Data Mover that is deployed as a virtual appliance on both data centers and used to perform replication between the data centers.</p> <p>If you plan to use any third party replication technology, you do not need to deploy Replication Gateway.</p> <p>See <a href="#">“Replication Gateways”</a> on page 10.</p>
resiliency domain	<p>The logical scope of a Resiliency Platform deployment.</p> <p>It can extend across multiple data centers.</p> <p>See <a href="#">“Resiliency domain”</a> on page 11.</p>
data center	<p>For a disaster recovery use case, the resiliency domain must contain at least two data centers in different locations, a production data center and recovery data center. Each data center has a Resiliency Manager and one or more IMSs. If you are using Resiliency Platform Data Mover for replication, each data center must also have at least one Replication Gateway.</p>
asset infrastructure	<p>The data center assets that you add to Resiliency Platform for discovery and monitoring by the IMS.</p> <p>The asset infrastructure can include hosts (Windows or Linux servers), virtualization servers for Hyper-V and VMware, and enclosures (storage arrays). Once the asset infrastructure is discovered by the IMS, the discovered virtual machines or applications are listed in the console as assets to manage or protect.</p>

resiliency group	The unit of management and control in Resiliency Platform. You organize related assets into a resiliency group and manage and monitor them as a single entity.
service objective	<p>A template to define the type of operations and technologies that are supported for a group of assets. You apply a service objective to each resiliency group.</p> <p>A template which identifies the characteristics of a service. These could be availability related characteristics such as local redundancy, and number of nodes in a cluster or DR characteristics such as remote recovery, Recovery Point Objective (RPO) SLAs, rehearsal support etc. Service objective is applied when a group of assets are being added to a resiliency group.</p> <p>Resiliency Platform monitors the resiliency groups based on the service objective definition and raises the risks as applicable.</p>
Virtual Business Service (VBS)	A multi-tier business service where each VBS tier hosts one or more resiliency groups. A VBS lets you group multiple services as a single unit for visualization, automation, and controlled start and stop in the desired order. VBS uses the vertical grouping mechanism to group the multiple services. You can perform the disaster recovery operations on the entire VBS.

## Resiliency Manager

The Resiliency Manager includes a set of loosely coupled services, a distributed data repository, and a management web console. The Resiliency Manager provides the services required for protecting assets, such as virtual machines, within a resiliency domain. It also provides workload automation services.

You start by deploying one Resiliency Manager and creating the resiliency domain. You can then add more Resiliency Managers to the resiliency domain for efficiency of local access and for fault tolerance. You can deploy multiple Resiliency Managers in the same data center or in separate geographical locations.

The Resiliency Manager discovers and manages information about data center assets from an Infrastructure Management Server (IMS), which is another required Resiliency Platform component. The Resiliency Manager stores the asset information in its data repository and displays the information in its management console.

Multiple Resiliency Managers that are part of the same domain synchronize their databases using built-in replication. Each Resiliency Manager has its own web console but because the data is synchronized, all consoles show the same data.



Operations can be performed from any console and the results show in all the consoles in the resiliency domain.

See [“Resiliency domain”](#) on page 11.

See [“Infrastructure Management Server \(IMS\)”](#) on page 9.

## Infrastructure Management Server (IMS)

Each Resiliency Manager requires one or more Infrastructure Management Servers (IMSS). An IMS discovers and monitors assets within a data center. You use the web console to add the asset infrastructure to Resiliency Platform so that assets can be discovered and monitored by an IMS.

The asset infrastructure can include objects such as hosts, virtualization servers, and enclosures (storage arrays).

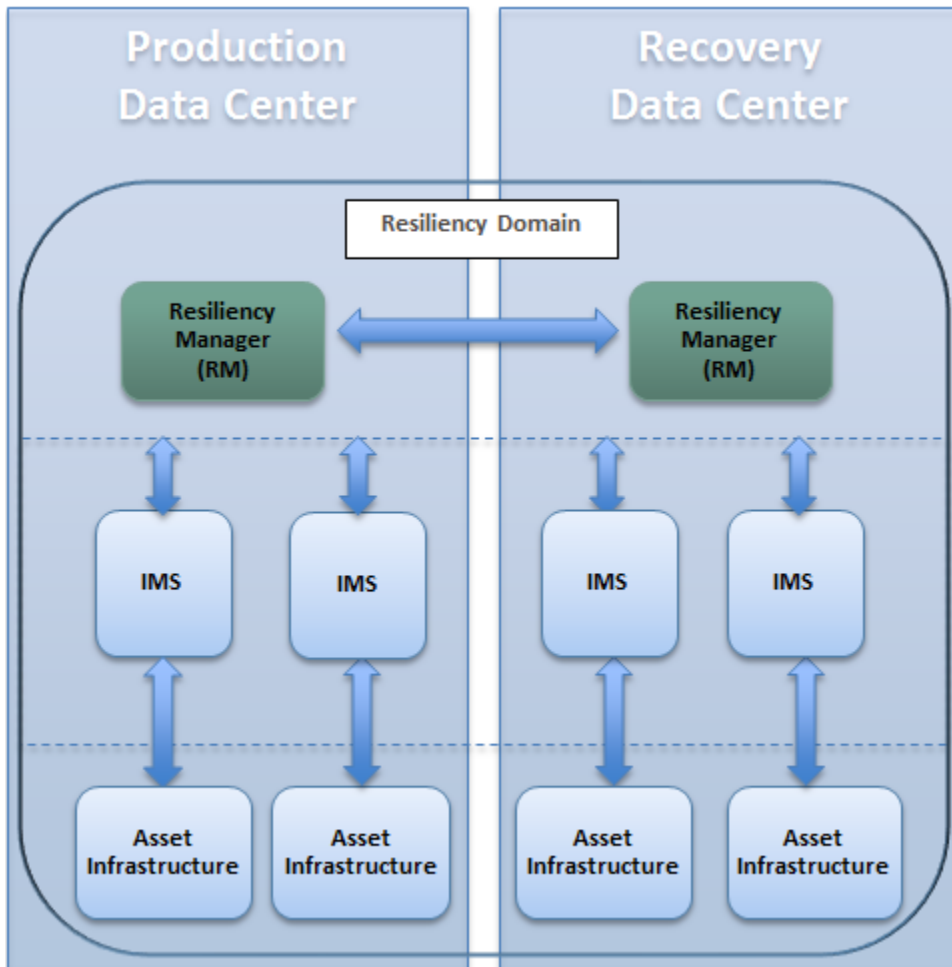
The IMS sends information about the assets to the Resiliency Manager so that the Resiliency Manager can manage the assets. Management operations on assets (for example, starting or stopping virtual machines) that you initiate from the web console are carried out by the IMS.

If there are multiple data centers in different geographical locations, a separate IMS is deployed and configured for each geographical data center location.

Each IMS connects to only one Resiliency Manager at a time. If a Resiliency Manager failure occurs, an IMS can automatically connect to another Resiliency Manager within the same domain.

You can also configure multiple Infrastructure Management Servers in the same data center. For example, to achieve scale, you can add a separate IMS for a separate business unit such as Human Resources or Finance. More than one IMS can be managed by the same Resiliency Manager.

**Figure 1-1** Multiple Infrastructure Management Servers in a data center



See [“Resiliency domain”](#) on page 11.

See [“Resiliency Manager”](#) on page 8.

## Replication Gateways

If you plan to use Resiliency Platform Data Mover for replication of data in your environment, you need to deploy and configure at least one Replication Gateway in your production as well as recovery data center.

The Replication Gateway component of Veritas Resiliency Platform is a staging server that aggregates and batches data from multiple virtual machines during replication. The Gateway also performs data optimization like write cancellation. The Gateway on production data center is always paired with a Gateway on recovery data center. The recovery data center Gateway is a staging server that applies the data on the recovery data center storage.

Each Replication Gateway includes the following components:

- I/O receiver  
Receives the application I/Os that were tapped and sent by the application host in a continuous fashion.
- Transceiver  
Transfers and receives data over the WAN link periodically.
- Applier  
Applies the data to the storage after it is received on the cloud Gateway.
- Scheduler  
Manages the jobs and policies in the Gateway.
- Engine  
Maintains the state of replication and also coordinates with all other components.

## Resiliency domain

A resiliency domain is the management domain of a Veritas Resiliency Platform deployment. It represents the scope of the deployment, which can spread across multiple data centers and can include multiple Resiliency Managers and other components, along with the infrastructure that is being managed and protected. Within the resiliency domain, Resiliency Platform can protect assets, for example, virtual machines and applications, and orchestrate automation of workload tasks for the assets.

The resiliency domain is a logical object that you create from the web console after you deploy the Resiliency Manager.

For disaster recovery, the resiliency domain must contain at least two data centers, a production data center and a recovery data center that can be on-premises or in the cloud.

A resiliency domain can optionally be implemented at a single data center for automation of workload tasks.

See [“Resiliency Manager”](#) on page 8.

See [“Infrastructure Management Server \(IMS\)”](#) on page 9.

# Planning your Resiliency Platform environment

This chapter includes the following topics:

- [Replication in a Resiliency Platform deployment](#)
- [Recovery options using Resiliency Platform](#)
- [Planning a resiliency domain for efficiency and fault tolerance](#)
- [On-boarding with Resiliency Platform](#)

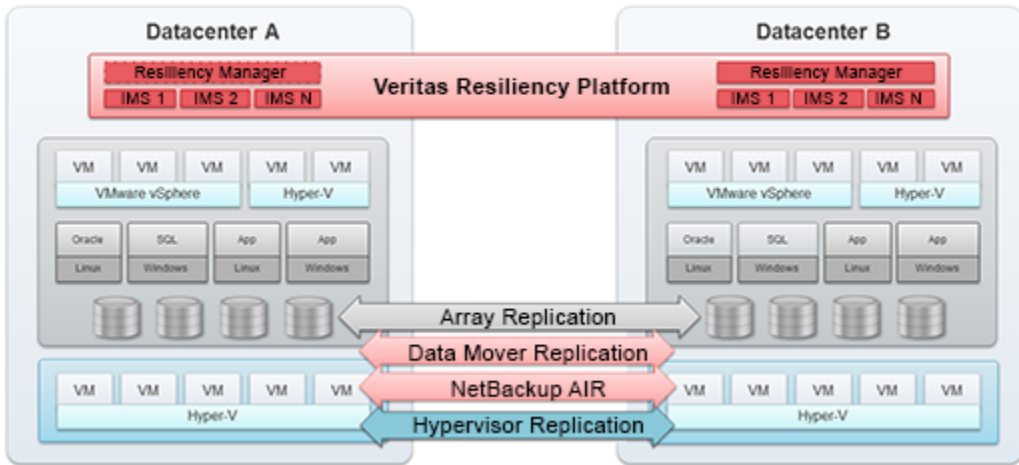
## Replication in a Resiliency Platform deployment

Veritas Resiliency Platform supports several forms of replication for data recovery from your production data center to your recovery data center.

- Array-based replication (block-based replication) using supported arrays
- Hypervisor-based replication using Hyper-V Replica
- NetBackup Auto Image Replication (AIR)
- Resiliency Platform Data Mover (separately licensable feature of Resiliency Platform)

For details on supported replication hardware and software, refer to the *Hardware and Software Compatibility List*.

**Figure 2-1** Replication in a Resiliency Platform deployment



## Recovery options using Resiliency Platform

There are various recovery options available with Resiliency Platform. You can use any of the supported third-party replication technologies, NetBackup, or Resiliency Platform Data Mover to replicate and recover your data across data centers. You can also recover your InfoScale applications using Resiliency Platform.

**Table 2-1**

Category	Recovery options
Using third-party replication	Recovery to on-premises data center: <ul style="list-style-type: none"> <li>Recovery of VMware virtual machines to on-premises data center</li> <li>Recovery of Hyper-V virtual machines to on-premises data center</li> <li>Recovery of applications to on-premises data center</li> </ul>
Using NetBackup	Recovery to local and remote data center: <ul style="list-style-type: none"> <li>Recovery of VMware virtual machines to local and remote data center</li> </ul>

Table 2-1 (continued)

Category	Recovery options
Using Resiliency Platform Data Mover	<ul style="list-style-type: none"> <li>Recovery to on-premises data center: <ul style="list-style-type: none"> <li>Recovery of VMware virtual machines to on-premises data center using VAIO</li> </ul> </li> <li>Recovery to AWS data center: <ul style="list-style-type: none"> <li>Recovery of VMware virtual machines to AWS data center</li> <li>Recovery of Hyper-V virtual machines to AWS data center</li> </ul> </li> <li>Recovery to vCloud data center: <ul style="list-style-type: none"> <li>Recovery of VMware virtual machines to vCloud data center</li> <li>Recovery of Hyper-V virtual machines to vCloud data center</li> <li>Recovery of VMware virtual machines to vCloud data center without adding the vCenter Server</li> <li>Recovery of Hyper-V virtual machines to vCloud data center without adding the Hyper-V Server</li> </ul> </li> <li>Recovery to Azure data center: <ul style="list-style-type: none"> <li>Recovery of VMware virtual machines to Azure data center</li> <li>Recovery of Hyper-V virtual machines to Azure data center</li> </ul> </li> </ul>
Using Veritas InfoScale Management Server	Recovery to on-premises data center: <ul style="list-style-type: none"> <li>Recovery of InfoScale applications to on-premises data center</li> </ul>

Planning a resiliency domain for efficiency and fault tolerance

Before you deploy Veritas Resiliency Platform, you should plan how to scale the deployment for efficiency and fault tolerance.

Although a resiliency domain requires only one Resiliency Manager, you can add multiple Resiliency Managers instances to the domain. For example, you can distribute Resiliency Managers geographically for efficiency of local access. For resiliency, you can even have multiple Resiliency Managers in one data center.

The recommended minimum deployment for disaster recovery to premises data center would be four virtual appliances: a Resiliency Manager and Infrastructure Management Servers (IMS) in the production data center and a Resiliency Manager and IMS in the recovery data center.

The recommended minimum deployment for disaster recovery to cloud data center would be three virtual appliances: an IMS in the production data center and a Resiliency Manager and IMS in the recovery data center.

The production and recovery data centers do not require a one-on-one mapping of IMSs. For example, you can have two IMSs in the production data center and one IMS in the recovery data center.

You can add multiple Infrastructure Management Servers (IMS) to a resiliency domain. For example, if there are multiple data centers in different geographical locations to be managed, you configure a separate IMS for each geographical data center location. You can also configure more than one IMS in the same data center.

If you plan to use Resiliency Platform data mover for replication, then additionally you need minimum one Replication Gateway in each data center. Resiliency Platform supports asymmetric pairing of Replication Gateways. This feature facilitates deployment of only the required number of Gateways on each side, based on data transfer rate and technology specific limits. One Gateway on production site can be paired with multiple Gateways on recovery site and vice versa. One Gateway can be paired with up to 16 gateways on the peer site.

See [“Resiliency domain”](#) on page 11.

See [“Resiliency Manager”](#) on page 8.

See [“Infrastructure Management Server \(IMS\)”](#) on page 9.

## On-boarding with Resiliency Platform

The following table describes the various steps that are involved in the customer on-boarding with Resiliency Platform and what to expect during each of these steps:

**Table 2-2** On-boarding with Resiliency Platform

Step	Description
Deploy	<ul style="list-style-type: none"><li>■ Deploy Resiliency Platform virtual appliances and configure them as Resiliency Manager, Infrastructure Management Server (IMS), or Replication Gateway</li><li>■ Define the resiliency domain through Getting Started wizard</li><li>■ Add assets to your resiliency domain for discovery:<ul style="list-style-type: none"><li>■ Virtual machines</li><li>■ Applications</li><li>■ Storage enclosures</li></ul></li></ul>

**Table 2-2** On-boarding with Resiliency Platform (*continued*)

Step	Description
Discover	<ul style="list-style-type: none"> <li>Resiliency Platform's deep discovery enables identification of the following:                             <ul style="list-style-type: none"> <li>Virtual machines</li> <li>Applications</li> <li>Storage enclosures</li> <li>Software/hardware replication</li> <li>Virtual networks (vSwitches)</li> </ul> </li> </ul>
Define service level objective	<ul style="list-style-type: none"> <li>Configure service level objective based on the intended Recovery Point Objective (RPO). service level objective driven configuration enables the following capabilities:                             <ul style="list-style-type: none"> <li>Basic monitoring of assets</li> <li>Recovery of assets</li> <li>Recovery of multi-tier business services (VBS)</li> <li>Health status reporting of assets</li> <li>Risk alerts and notifications for protected assets</li> </ul> </li> </ul>
Manage	<ul style="list-style-type: none"> <li>Single-click rehearsal for resiliency groups and VBS validates disaster readiness:                             <ul style="list-style-type: none"> <li>Automated rehearsal</li> <li>Automated rehearsal cleanup</li> <li>Option of network isolation for workloads during rehearsal</li> </ul> </li> <li>Single-click recovery or migration of resiliency groups and VBS:                             <ul style="list-style-type: none"> <li>Automated recovery or migration based on the service level objective</li> <li>Recovery with predefined network customization</li> <li>Recovery based on predefined grouping or order</li> <li>Controlled recovery using Resiliency Plans</li> </ul> </li> <li>Single-click evacuation plan for resiliency groups and VBS:                             <ul style="list-style-type: none"> <li>Option of defining priority levels for VBS</li> <li>Automated rehearsal or cleanup rehearsal for evacuation plan</li> </ul> </li> </ul>



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# Glossary

<b>activity</b>	A task or an operation performed on a resiliency group.
<b>add-on</b>	An additional software package that can be installed on hosts by the Infrastructure Management Server (IMS) for specialized uses.
<b>asset infrastructure</b>	The data center assets that can be added to the Infrastructure Management Server (IMS) for IMS discovery and monitoring. For example, virtual machines or virtualization servers.
<b>assets</b>	In Veritas Resiliency Platform, the virtual machines or applications that have been discovered by the Infrastructure Management Server (IMS) and that can be grouped into resiliency groups.
<b>klish</b>	Command Line Interface SHell. Provides the command line menu on the virtual appliance for use after the initial bootstrap configuration.
<b>data center</b>	<p>A location that contains asset infrastructure to be managed by Veritas Resiliency Platform.</p> <p>For the disaster recovery use case, the resiliency domain must contain at least two data centers in different locations, a production data center and recovery data center. Each data center has a Resiliency Manager and one or more IMSs.</p>
<b>host</b>	<p>Physical servers, virtual machines, or Hyper-V servers that are added to the Infrastructure Management Server (IMS) as hosts.</p> <p>Adding the assets as hosts installs the host package that is used by the IMS for discovery and monitoring.</p>
<b>Infrastructure Management Server (IMS)</b>	The Veritas Resiliency Platform component that discovers, monitors, and manages the asset infrastructure within a data center. The IMS transmits information about the asset infrastructure to the Resiliency Manager.
<b>migrate</b>	A planned activity involving graceful shutdown of virtual machines at the production data center and starting them at the recovery data center. In this process, replication ensures that consistent virtual machine data is made available at the recovery data center.
<b>persona</b>	A user role that has access to a predefined set of jobs (operations). Used to assign permissions to users and groups for Veritas Resiliency Platform web console operations.
<b>product role</b>	The function configured for a Veritas Resiliency Platform virtual appliance.

	For example, a virtual appliance can be configured as a Resiliency Manager, Infrastructure Management Server (IMS) or both.
<b>production data center</b>	The data center that is normally used for business. See also recovery data center.
<b>recovery data center</b>	The data center that is used if a disaster scenario occurs. See also production data center.
<b>rehearsal</b>	<p>A zero-downtime test that mimics the configuration, application data, storage, and the failover behavior of the resiliency group.</p> <p>Rehearsal verifies the ability of the resiliency group to fail over to the recovery data center during a disaster.</p>
<b>resiliency domain</b>	The logical scope of a Resiliency Platform deployment. It can extend across multiple data centers.
<b>resiliency group</b>	The unit of management and control in Veritas Resiliency Platform. Related assets are organized into a resiliency group and managed and monitored as a single entity.
<b>Resiliency Manager</b>	The Veritas Resiliency Platform component that provides resiliency capabilities within a resiliency domain. It is composed of loosely coupled services, a distributed data repository, and a management console.
<b>resiliency plan</b>	A collection of tasks or operations, along with the relevant assets, which are performed in a predefined sequence.
<b>resiliency plan template</b>	A template defining the execution sequence of a collection of tasks or operations.
<b>take over</b>	An activity initiated by a user when the production data center is down due to a disaster and the virtual machines need to be restored at the recovery data center to provide business continuity.
<b>tier</b>	Within a virtual business service (VBS), resiliency groups are arranged as tiers. Tiers represent the logical dependencies between the resiliency groups and determine the relative order in which the resiliency groups start and stop.
<b>virtual appliance</b>	<p>An appliance that includes the operating system environment and the software application which are deployed together as a virtual machine.</p> <p>The Veritas Resiliency Platform virtual appliance is deployed as a virtual machine and then configured with basic settings and a role (for example, Resiliency Manager).</p>
<b>virtual business service (VBS)</b>	A multi-tier IT service where each VBS tier hosts one or more resiliency groups. A VBS groups multiple services as a single unit for visualization, automation, and controlled start and stop in the desired order. You can also migrate/takeover the entire VBS.
<b>web console</b>	The web-based management console on the Resiliency Manager that is used to configure the settings for the resiliency domain and perform operations.