

(SRA)Storage Replication Adapter for VMware SRM (category)

Ido Dubovi

Exported on 08/28/2019

Table of Contents

1	(SRA)Introduction to INFINIDAT InfiniBox Storage Replication Adapter	6
1.1	(SRA)What is INFINIDAT InfiniBox Storage Replication Adapter	6
1.1.1	INFINIDAT InfiniBox Storage Replication Adapter for VMware SRM.....	6
1.1.1.1	Terminology	6
1.1.1.2	Revision	6
1.1.1.3	InfiniBox SRA release types	6
1.1.1.4	Installation prerequisites	7
1.1.1.5	Download	7
1.1.1.6	InfiniBox SRA support matrix	7
1.1.1.7	Supported replication types	7
1.1.1.8	Guide supported versions.....	7
1.1.1.9	Related documentation.....	7
1.2	(SRA)Storage Replication Adapter Release Notes.....	7
2	(SRA)Configuring the Storage Replication Adapter	8
2.1	(SRA)Preparing a vSphere environment with SRM	8
2.1.1	About	8
2.1.2	Environment configuration	8
2.1.3	Setting InfiniBox Best Practices for vSphere environment	9
2.1.3.1	Using INFINIDAT Host PowerTools for VMware.....	9
2.2	(SRA)Installing the Storage Replication Adapter	10
2.2.1	Installation Procedure	10
2.2.1.1	SRM for Windows	10
2.2.1.2	SRM Appliance.....	10
2.3	(SRA)Upgrading the Storage Replication Adapter	10
2.3.1	Upgrade instructions	10
2.3.1.1	SRM for Windows	10
2.3.1.2	SRM Appliance.....	11
3	(SRA)Protecting vSphere using Storage Replication Adapter	12
3.1	(SRA)Configuring Array Managers (Array Pairs).....	12
3.1.1	About	12
3.1.1.1	Prerequisites	12
3.1.1.2	Instructions	12

3.2	(SRA)Enabling Sync & Async replication protection	12
3.2.1	About	12
3.2.2	Step1: InfiniBox Configuration	13
3.2.2.1	InfiniBox Replication.....	13
3.2.2.2	Viewing the replication status.....	13
3.2.3	Step 2: SRM Configuration	13
3.2.3.1	SRM Protection groups and Recovery plans	13
3.3	(SRA)Enabling Active-Active replication protection.....	13
3.3.1	About	13
3.3.1.1	Terminology	14
3.3.1.2	Prerequisites	14
3.3.1.3	Before you begin	14
3.3.2	Design Considerations	14
3.3.2.1	Host Access.....	14
3.3.2.2	VMs should run only on the Protected site	15
3.3.3	Configuring Active-Active Protection - Step 1: InfiniBox Configuration.....	15
3.3.3.1	Preparing ESXi hosts for Active-Active Volumes.....	15
3.3.3.2	Replication	15
3.3.3.3	Viewing the replication status.....	16
3.3.4	Configuring Active-Active Protection - Step 2: SRM and vCenter Configuration	16
3.3.4.1	SRM Protection groups and Recovery plans	16
3.3.4.2	Instructions	16
3.3.5	How InfiniBox Handles Failures	17
3.3.5.1	InfiniBox Witness.....	17
3.3.5.2	Preferred system	17
3.3.5.3	Storage Failover	17
3.3.5.4	Storage Replication Resynchronization and Recovery.....	17
3.4	(SRA)Running Recovery plans	18
3.4.1	About	18
3.4.2	Test	18
3.4.2.1	Cleanup.....	18
3.4.3	Planned migration and Disaster recovery	18
3.4.3.1	Planned migration	19
3.4.3.2	Disaster recovery.....	19
3.4.3.3	Recovery process for Async & Sync replication	19

3.4.3.4 Recovery process for Active-Active replication	20
3.5 (SRA)Discovering new replicated volumes.....	20
3.5.1 About	20
3.5.1.1 Instructions	20

1 (SRA)Introduction to INFINIDAT InfiniBox Storage Replication Adapter

1.1 (SRA)What is INFINIDAT InfiniBox Storage Replication Adapter

1.1.1 INFINIDAT InfiniBox Storage Replication Adapter for VMware SRM

The INFINIDAT InfiniBox Storage Replication Adapter (SRA) is a software add-on that integrates with the VMware vCenter Site Recovery Manager (SRM) platform, enabling site-to-site failovers over InfiniBox systems that are deployed on remote sites. The InfiniBox SRA extends the VMware vCenter Site Recovery Manager capabilities by leveraging the InfiniBox replication feature, assuring continuous storage availability at both the primary site and secondary site. INFINIDAT InfiniBox Storage Replication Adapter is a trademark of INFINIDAT.

1.1.1.1 Terminology

InfiniBox	The INFINIDAT storage system whose data is replicated by the VMware SRM.
Pool	The pool is a logical space that contains volumes, snapshots and clones. The pool allocates physical and virtual storage space for these entities. The pool also determines a policy for automatic extension in case of space depletion.
Volume	A set of disk blocks presented to an operating environment as a range of consecutively numbered logical blocks with disk-like storage and I/O semantics.
Host PowerTools for VMware	INFINIDAT Host PowerTools™ for VMware is an application that provides the VMware administrator with provisioning capabilities by assisting and easing the process of volumes backup and recovery.
Array Manager	The way the VMware vCenter Site Recovery Manager (SRM) refers to InfiniBox.

1.1.1.2 Revision

Last updated on: July 28, 2019.

1.1.1.3 InfiniBox SRA release types

- **InfiniBox SRA** for SRM Windows - Windows installer.
 - Latest version - 5.0. (Final release)
- **InfiniBox Docker SRA** for SRM Appliance - Docker container.

- Starting from version 5.1.

1.1.1.4 Installation prerequisites

INFINIDAT InfiniBox Storage Replication Adapter for VMware SRM can be installed directly on the VMware SRA and has no additional requirements.

1.1.1.5 Download

The INFINIDAT InfiniBox Storage Replication Adapter installation packages are available on <https://repo.infinidat.com/home/main-stable#infinidat-infinibox-storage-replication-adapter>

1.1.1.6 InfiniBox SRA support matrix

For the complete support matrix of the InfiniBox Storage Replication Adapter with VMware SRM versions please visit: [INFINIDAT Interoperability Matrix](#)¹.

1.1.1.7 Supported replication types

- Synchronous and asynchronous replication for volumes.
- Asynchronous replication for filesystems.
- Active-Active replication for volumes.
 - Using InfiniBox Docker SRA only.

1.1.1.8 Guide supported versions

This guide applies to INFINIDAT InfiniBox Storage Replication Adapter 4.0 or later.

1.1.1.9 Related documentation

- All INFINIDAT user documentation is available on support.infinidat.com².
- For more information about SRM, see VMware documentation: <https://docs.vmware.com/en/Site-Recovery-Manager/>

1.2 (SRA)Storage Replication Adapter Release Notes

For the release notes please visit: [InfiniBox Storage Replication Adapter Release Notes](#)³

¹ <https://support.infinidat.com/hc/en-us/articles/206973969-Interoperability-Matrix>

² <https://infinidat.zendesk.com/hc/en-us>

³ <https://wiki.infinidat.com/display/TW/InfiniBox+Storage+Replication+Adapter>

2 (SRA)Configuring the Storage Replication Adapter

2.1 (SRA)Preparing a vSphere environment with SRM

2.1.1 About

Protecting vSphere environment using SRM (with SRA installed) is based on the storage array replication (InfiniBox replication) along with SRM orchestration capabilities.

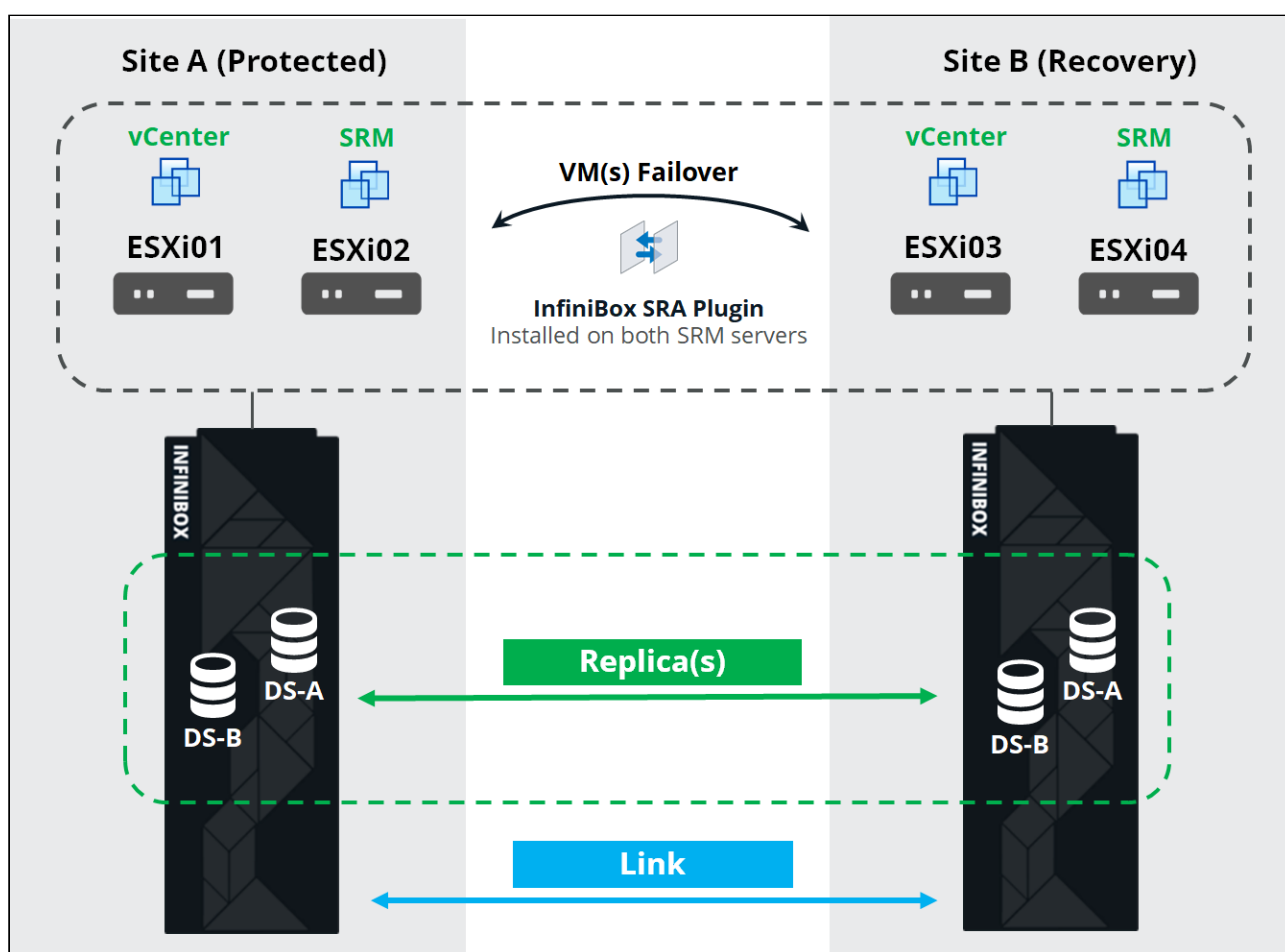
- The vSphere environment has to be configured according to SRM requirements in advance.
 - At least two InfiniBox systems are required.
 - For more information about SRM requirements, see VMware SRM documentation.

2.1.2 Environment configuration

SRM configuration consists of:

1. Two InfiniBox systems, one in each site. (Protected and Recovery)
 - The InfiniBox systems should be configured with a replication link.
 - For more information on how to configure links, see: [InfiniBox Best Practices for Setting up Services](https://support.infinidat.com/hc/en-us/articles/207057109-InfiniBox-best-practices-guides)⁴
2. vCenter server in both sites.
3. ESXi server(s) in both sites.
4. SRM server in both sites.
 - After SRM is installed in both sites, a site pair should be created.
5. It is strongly recommended to deploy Host PowerTools for VMware in both sites.

⁴ <https://support.infinidat.com/hc/en-us/articles/207057109-InfiniBox-best-practices-guides>



2.1.3 Setting InfiniBox Best Practices for vSphere environment

Validate that the vSphere clusters and hosts are configured according to the InfiniBox best practices for vSphere:

- The simplest method to apply the InfiniBox best practices is by using Host PowerTools for VMware. For instruction see the following guide: [ESXi hosts and clusters readiness](https://support.infinidat.com/hc/en-us/articles/115000246369-ESXi-hosts-and-clusters-readiness)⁵
- In order to manually configure the ESXi hosts according to InfiniBox best practices, please refer to the following guide: [List of items being checked by Host PowerTools for VMware](https://support.infinidat.com/hc/en-us/articles/360001671177-List-of-items-being-checked-by-Host-PowerTools-for-VMware)⁶

2.1.3.1 Using INFINIDAT Host PowerTools for VMware

It is highly recommended to install Host PowerTools for VMware with every vCenter Server. Host PowerTools for VMware provides:

- Ease-of-use.
- Storage and host automation.
- Best practices validation.

For more information on how to install and use Host PowerTools for VMware see: [Host PowerTools for VMware](https://support.infinidat.com/hc/en-us/articles/36000102145-What-is-INFINIDAT-Host-PowerTools-for-VMware)⁷

⁵ <https://support.infinidat.com/hc/en-us/articles/115000246369-ESXi-hosts-and-clusters-readiness>

⁶ <https://support.infinidat.com/hc/en-us/articles/360001671177-List-of-items-being-checked-by-Host-PowerTools-for-VMware>

⁷ <https://support.infinidat.com/hc/en-us/articles/36000102145-What-is-INFINIDAT-Host-PowerTools-for-VMware>

2.2 (SRA)Installing the Storage Replication Adapter

2.2.1 Installation Procedure

This section instructs you how to download and install the SRA.

- Make sure you have admin privileges for both InfiniBox systems.

2.2.1.1 SRM for Windows

1. Download the InfiniBox SRA ([See here](#)(see page 6)).
2. Install the InfiniBox SRA on the SRM servers in both sites.
3. After the installation is complete, log in to SRM, and run **Rescan Adapters**.

2.2.1.2 SRM Appliance

Download the InfiniBox Docker SRA.


- The InfiniBox Docker SRA packages are available at - <http://repo.infinidat.com/home/main-stable#infinidat-infinibox-storage-replication-adapter>
- The Docker SRA files are distributed as .tar.gz archives.

The Following steps should be applied on SRM in both sites:

1. Log in to the **SRM Appliance Management** Interface as admin.
2. In the Site Recovery Manager Appliance Management Interface, click **Storage Replication Adapters**, and click **New Adapter**.
3. Click **Upload**, navigate to the directory where you saved the updated InfiniBox Docker SRA file, and select it.
4. When the process finishes, click Close.
 - The Storage Replication Adapter card appears in the Site Recovery Manager Appliance Management Interface.
5. Log in to **SRM**.
6. Select a **site pair**, and click **View Details**.
7. In the Site Pair tab, go to Configure → Array Based Replication → Storage Replication Adapters , and click the **Rescan Adapters** button.

2.3 (SRA)Upgrading the Storage Replication Adapter

2.3.1 Upgrade instructions

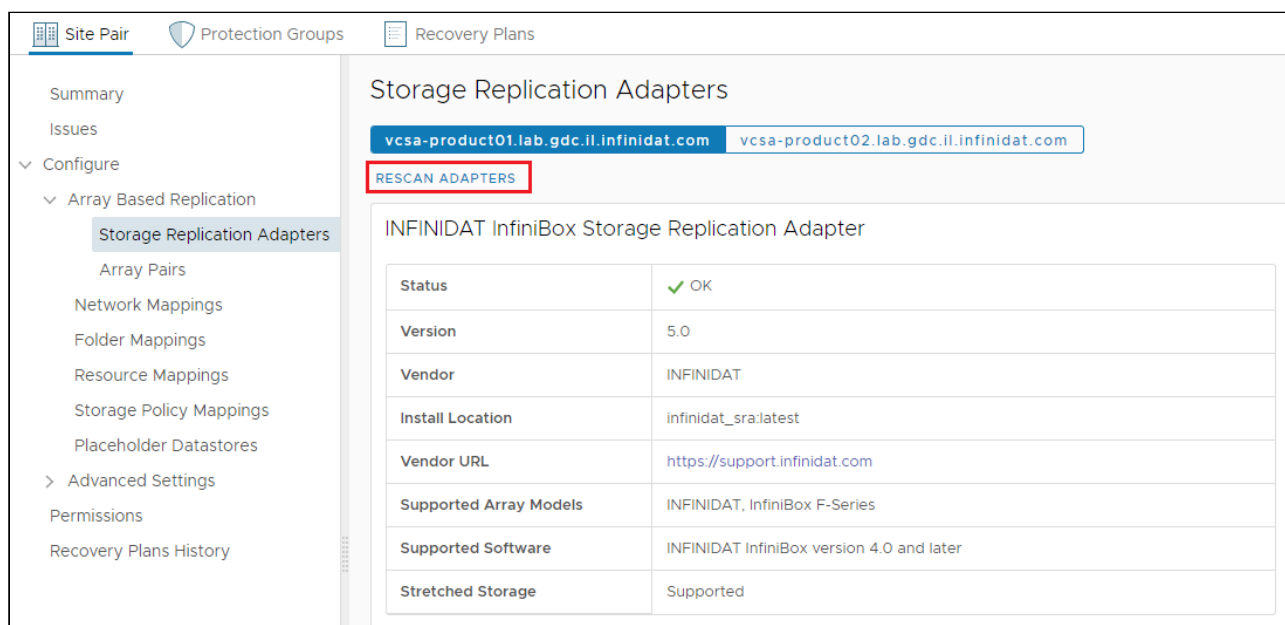
 Perform SRA upgrades only when no SRM operations are running.

2.3.1.1 SRM for Windows

1. Download and install the updated package of the InfiniBox SRA on the SRM servers in both sites.

- The InfiniBox SRA packages are available at - <http://repo.infinidat.com/home/main-stable#infinidat-infinibox-storage-replication-adapter>

2. Log in to **SRM** and run **RESCAN ADAPTERS**.



2.3.1.2 SRM Appliance

Download the updated package of the InfiniBox Docker SRA.

- The InfiniBox Docker SRA packages are available at - <http://repo.infinidat.com/home/main-stable#infinidat-infinibox-storage-replication-adapter>

The Following steps should be applied on SRM in both sites:

1. Log in to the **SRM Appliance Management** Interface as admin.
2. In the Site Recovery Manager Appliance Management Interface, click **Storage Replication Adapters**, and click **New Adapter**.
3. Click **Upload**, navigate to the directory where you saved the updated InfiniBox Docker SRA file, and select it.
4. When the process finishes, click Close.
 - The Storage Replication Adapter card appears in the Site Recovery Manager Appliance Management Interface.
5. **Delete** the old adapter instance.
6. Log in to **SRM**.
7. Select a **site pair**, and click **View Details**.
8. In the Site Pair tab, go to Configure → Array Based Replication → Storage Replication Adapters, and click the **Rescan Adapters** button.

3 (SRA)Protecting vSphere using Storage Replication Adapter

3.1 (SRA)Configuring Array Managers (Array Pairs)

3.1.1 About

Once you pair the protected and the recovery site (site pair), their respective InfiniBox storage arrays should be configured so that SRM can discover the replicated devices. (and later initiate storage operations)


- You typically configure array managers (storage array pair) only once after you connect the sites.
- You do not need to reconfigure them unless storage array connection information or credentials change, or you want to use a different set of arrays.

3.1.1.1 Prerequisites

- Site pair was created. (sites are connected)
- SRA is installed at both sites.

3.1.1.2 Instructions

Use the Add Array Manager wizard to configure the InfiniBox storage array in each site (Array Pair).

 Set the same credentials (user and password) for both InfiniBox systems.

1. Log in to **SRM** user interface.
2. On the Site Recovery home tab, click **View Details** of the desired site pair.
3. On the Site Pair tab, click Configure → Array Based Replication → Array Pairs.
4. Click the **Add** button to add an array manager.
5. Select the "**INFINIDAT InfiniBox Storage Replication Adapter**" storage replication adapter and click Next.
 - If the InfiniBox SRA does not appear, rescan for SRAs or validate that you have installed the InfiniBox SRA on the SRM Server.
6. Enter a name for the **local** InfiniBox array, provide the required information, and click Next.
 - Use a descriptive name that makes it easy to identify the InfiniBox associated with this array manager.
7. Enter a name for the **remote** InfiniBox array, provide the required information and click Next.
 - **Note:** Set the same credentials (user and password) as the local InfiniBox system.
8. On the Array pairs page, select the **array pair** to enable, then click Next.
9. Review the configuration and click **Finish**.

3.2 (SRA)Enabling Sync & Async replication protection

3.2.1 About

InfiniBox Synchronous / Asynchronous replication should be set for each datastore to protect.

3.2.2 Step1: InfiniBox Configuration

First, set replication for the corresponding volumes (the volumes on which the datastores reside).

3.2.2.1 InfiniBox Replication

InfiniBox replication is set directly from the InfiniBox management consoles (InfiniShell, GUI).

- Instructions for setting up replication using the InfiniBox management consoles, are available on the INFINIDAT support site: [InfiniBox Replication](#)⁸
- No other steps are required on the InfiniBox side.

Protecting VMs that span on multiple datastores

All the corresponding volumes must be in the same consistency group.

- The replication than should be set on the consistency group level.

3.2.2.2 Viewing the replication status

The replication status is available directly from the InfiniBox management consoles.

3.2.3 Step 2: SRM Configuration

Once the InfiniBox replication is configured:

- Validate that SRM successfully discovered the new replicated volumes. For instruction see: [\(SRA\)Discovering new replicated volumes](#)(see page 20)
- Create **protection groups** so that SRM can protect virtual machines, and a **recovery plan** which coordinates how virtual machines should be recovered.

3.2.3.1 SRM Protection groups and Recovery plans

Creating protection groups and recovery plans is performed directly from the VMware SRM user interface.

- For more information, see VMware documentation for SRM.

3.3 (SRA)Enabling Active-Active replication protection

3.3.1 About

InfiniBox Active-Active replication provides zero-RPO and zero-RTO, enabling mission critical business-services to keep operating even through a complete site failure:

- Symmetric synchronous replication solution, applications can be geographically clustered.

⁸ <https://support.infinidat.com/hc/en-us/sections/115001623505-Replication>

- Fully integrated into InfiniBox, allows simple management of application spread across data centers.

3.3.1.1 Terminology

- **Active-Active volume:** a volume that is undergoing Active-Active replication.
- **Peers:** a pair of volumes that are undergoing Active-Active replication relationship, are also referred as "peers".
 - **Peer:** one of the volumes in the pair.
- **Active-Active datastore:** a datastore that resides on an Active-Active volume.

3.3.1.2 Prerequisites

- Requires two Infinibox systems version 5 or later.
- The InfiniBox system are linked.
 - Link must support Active-Active replication. For more information on how to configure an Active-Active link, see: [InfiniBox Best Practices Guide for Setting Up a Replication Service](#)⁹
- Maximum of 5ms RTT latency between the InfiniBox systems.
- Minimal ESXi version: 6.0 EP 20.
- Supported using InfiniBox Docker SRA only.

3.3.1.3 Before you begin

Prior to setting up InfiniBox Active-Active replication it is advised to read the INFINIDAT InfiniBox documentation for [Active-Active replication](#)¹⁰.

3.3.2 Design Considerations

3.3.2.1 Host Access

The vSphere hosts can access Active-Active volumes in one of two ways:

- **Uniform access** - vSphere hosts on both sites are all connected to the InfiniBox systems across both sites (both peers). Datastore LUN paths are presented to vSphere hosts from both across the sites.
- **Non-uniform access** - vSphere hosts at each site are connected only to the local InfiniBox system at the same site (one of the peers). Datastore LUN paths are presented to vSphere hosts only from the local site.

InfiniBox supports both types, yet for a SRM with Stretched Storage configuration only the **Uniform access** is recommended.

- Uniform access provide the most resilient solution for data availability in any disaster scenario, due to the nature of Active-Active replication.



Host Access

It is recommended to deploy the vSphere environment with the **Uniform** host access type when configuration SRM protection with Stretched Storage.

⁹ <https://support.infinidat.com/hc/en-us/articles/207057109-InfiniBox-best-practices-guides>

¹⁰ <https://support.infinidat.com/hc/en-us/articles/360002108357-Active-Active-replication>

3.3.2.2 VMs should run only on the Protected site

All VMs that reside on a stretched storage datastore (Active-Active datastore) should run only on the **Protected** site.

3.3.3 Configuring Active-Active Protection - Step 1: InfiniBox Configuration

3.3.3.1 Preparing ESXi hosts for Active-Active Volumes

When using Active-Active volumes on a vSphere environment it is required to set all the related ESXi hosts objects on InfiniBox to "ESXi" type.

- i** "ESXi" type - Makes InfiniBox issue a PDL SCSI sense response to the host in case a mapped Active-Active peer no longer synchronized. (cannot serve R/W IO, becomes "offline")
- If the host type is not set to "ESXi", vSphere HA cannot properly detect that a mapped Active-Active peer is no longer synchronized ("offline").
 - Therefore, in a **non-uniform** environment, vSphere HA will not try to recover affected VMs that are running on hosts which can access only the "offline" peer.
 - In a uniform environment, although all hosts should have access to both peers, settings this is still required for proper functioning of the ESXi servers.

Setting host objects on InfiniBox to "ESXi"

To set the ESXi hosts objects on InfiniBox to the "ESXi" type:

1. **Login** to the InfiniBox systems (on both the protected and recovery sites) using the management console.
2. **Set** the InfiniBox host objects which represents the ESXi hosts, to the **"ESXi" type**.
 - Use the following InfiniShell command:

```
host.set_host_type host=<esxi-host-name> host_type=ESXi
```


- This is settable only using InfiniShell or Host PowerTools for VMware.
- The simplest method to set hosts to the "ESXi" type is by using Host PowerTools for VMware. For instruction see the following guide: [Preparing ESXi hosts for Active-Active volumes](#)¹¹

3.3.3.2 Replication

1. InfiniBox Active-Active replication should be set for each desired datastores to protect.
 - Set the **Preferred** system of the Active-Active replication to the InfiniBox in the **Protected Site**.
 - InfiniBox Active-Active replication is set directly from the InfiniBox management consoles (InfiniShell, GUI).
 - Instructions for setting up replication using the InfiniBox management consoles, are available on the INFINIDAT support site: [InfiniBox Replication](#)¹²
2. **Map** the Active-Active datastore peers on the InfiniBox in the **Recovery site** to the ESXi hosts in the Recovery site.

¹¹ <https://wiki.infinidat.com/display/TW/Preparing+ESXi+hosts+for+Active-Active+volumes>

¹² <https://support.infinidat.com/hc/en-us/sections/360000572018-Replication>

-  The Active-Active replication **Preferred** system is set for the InfiniBox system in the **Protected** site.
- Therefore in case of failing to the Recovery site, it is important to fallback **as soon as possible** to the **original** Protected site. (As soon as the original Protected site is up and running)

3.3.3.3 Viewing the replication status

The replication status is available directly from the InfiniBox management consoles.

3.3.4 Configuring Active-Active Protection - Step 2: SRM and vCenter Configuration

Once the InfiniBox replication is configured:

- Validate that SRM successfully discovered the new replicated volumes. For instruction see: [\(SRA\)Discovering new replicated volumes](#)(see page 20)
- Create **protection groups** so that SRM can protect virtual machines, and a **recovery plan** which coordinates how virtual machines should be recovered.

Some configurations are also required on the vCenters.

Note:

- To use SRM with Stretch Storage (Active-Active replication), SRM requires the Enterprise license.
 - InfiniBox and InfiniBox SRA does not requires any licence.
- To use the SRM vMotion feature, the vCenters of the site pair must be in Enhanced Link Mode.
 - For more information please refer to the VMware vCenter documentation.
 - InfiniBox SRA does not have any affect on that feature.

3.3.4.1 SRM Protection groups and Recovery plans

To protect using stretched storage, SRM requires that the protection groups will be created using a Storage Policy Protection Group (SPPG).

- Creating protection groups and recovery plans is performed directly from the VMware SRM user interface.
 - For more information, please refer to VMware documentation for SRM.

3.3.4.2 Instructions

In vCenter:

1. **Tag** the Active-Active datastores.
2. Create a **VM Storage Policy** with the following settings: (required only if a VM Storage Policy was not already created)
 - a. Storage type: Virtual Volumes or traditional storage.
 - b. Policy Structure: Enable tag based placement rules.
 - c. Tag based placement: Choose the **Tag** category and the Tag which the Active-Active datastores were tagged with.
3. Set the created **VM Storage Policy** for each VM that requires protection.

In SRM:

1. Create a **protection group** using the "Storage policies (array-based replication)" type.

2. Select the **VM Storage Policy** that was created earlier.

3.3.5 How InfiniBox Handles Failures

InfiniBox has two mechanism to handle failures for Active-Active replication: Witness and preferred system.

- If an InfiniBox system becomes unavailable, e.g. power outage of the entire site, the peer system will provide access to all the volumes.
- If the replication link between the systems fails, then datastores will continue to serve I/O on one of the systems. Each datastore has a property in InfiniBox that defines its preferred-system, which will remain online.

3.3.5.1 InfiniBox Witness

The witness is an arbitrator entity residing in a 3rd site (separate from the two InfiniBox systems involved in Active-Active replication), that acts as quorum in case of replication link failures. The witness is a lightweight stateless software deployed as a VM.

- If the witness is down or inaccessible, replication link failure will result in InfiniBox systems keeping volumes online according to their preferred-system settings.

3.3.5.2 Preferred system

Each volume that is undergoing Active-Active replication has a definition for preferred system, which the witness uses to make correct decisions.

- If the witness is not available to the systems, the decision on which side stays active will be done per replica based on the preferred system.

3.3.5.3 Storage Failover

InfiniBox Active-Active replication failover is fully automatic and does not require any storage administrator intervention.

3.3.5.4 Storage Replication Resynchronization and Recovery

InfiniBox Active-Active recovery is completely automatic; no storage administrator intervention is necessary to trigger a re-sync and recover replication.

If the InfiniBox systems got disconnected, the replication will internally fallback to *async mode*. Once the connectivity between the systems recovers, synchronization jobs will start replicating the missing data to the lagging system. During this time, from disconnection and through the re-sync progress the Active-Active volumes on the synchronized system serve I/O operations, while the remote side will be in lagging state until all data is synchronized between the volumes.

- Once the volumes are nearly in sync, they will smoothly transition to Sync replication mode, with no I/O disruption. The host paths to the lagging side will be automatically restored, allowing the hosts to perform I/O operations through both systems again.

3.4 (SRA)Running Recovery plans

3.4.1 About


SRM allows running the recovery plans using one of the following modes:

- Planned migration, Disaster recovery and Test.
- For more information about each mode, see VMware documentation for SRM: <https://docs.vmware.com/en/Site-Recovery-Manager/>

Running recovery plans is performed directly from the VMware SRM user interface.

- When VMware SRM carries out the selected recovery plan it sends the relevant commands to the InfiniBox system on the Recovery / Protect site through the InfiniBox SRA.
- The commands are described below.

3.4.2 Test

 Running a plan in Test mode will attempt to recover the virtual machines in a test environment on the recovery site.

If "Replicate recent changes to recovery site" is used, the Test mode validates that the recent changes were successfully synced from the protected to the recovery site.

The Test mode performs the following actions on the InfiniBox in the **Recovery** site:


1. For each volume in the protection group - a **snapshot** is created on the replication target.
2. **Create** a child snapshot(s) on the previously created snapshot(s).
3. Make the child snapshot(s) **Write-enabled**.
4. **Map** the child snapshot(s) to an ESXi host.

3.4.2.1 Cleanup

Cleanup performs the following actions on the InfiniBox in the **Recovery** site:

1. **Unmap** the child snapshot(s) from the ESXi host(s).
2. **Delete** the snapshot(s) and the child snapshots(s).

3.4.3 Planned migration and Disaster recovery

 Running a plan in one of these modes will attempt to shut down the VMs at the protected site and recover the VMs at the recovery site.

- Then, when running the Reprotect operation SRM will commit the results of the recovery and configure protection in the reverse direction.

3.4.3.1 Planned migration

Both sites and the InfiniBox replication must be connected and available.

- Validates that the recent changes were replicated to the **Recovery** site.
- If errors are encountered the recovery process ceases.

3.4.3.2 Disaster recovery

Attempt to replicate recent changes to the recovery site, but otherwise use the most recent synchronized data that exists on the recovery site.


- The recovery process continues even if errors are encountered.

3.4.3.3 Recovery process for Async & Sync replication

Both modes performs the following InfiniBox actions:

On the Protected site

- Make the volume(s) in the protection group **Write-protected**. (if possible)

 During Planned migration the replication state of the volume(s) in the protection group will become **Auto Suspended**.

On the **Recovery** site

1. For each volume in the protection group (replication target) - **Suspend** the replication.
 - Volume's replication state becomes **Suspended**.
2. Make the volume(s) **Write-enabled**.
3. **Map** each volume to an ESXi host.

Reprotect

When running Reprotect, the InfiniBox replication is resumed in the reverse direction.

Reprotect performs the following InfiniBox actions:

On the **Protected** site

- **Unmap** each volume in the protection group from the ESXi host(s).

On the Recovery site

- **Resuming** the replication in the reverse direction.
 - The volume(s) are now the replication source.

 At the end of the Reprotect process, the Protected and the Recovery sites are swapped.

3.4.3.4 Recovery process for Active-Active replication

Due to the nature of Active-Active replication, SRM does not need not perform any operation directly on the InfiniBox systems. (by default)

On the **Recovery** site

SRM will:

1. Validate that each volume in the protection group is **mapped** to the ESXi hosts.
 - If an Active-Active peer is not mapped, it will be mapped.
2. Register and power-on (if configured) the protected VMs.



Isolating the Recovery site

In case SRM cannot power-on the protected VMs at the recovery site due to file locks, SRM tries to isolate the Active-Active peer on the Recovery site by **unmapping** the corresponding Active-Active peer on the Protected site.

Reprotect

When running Reprotect, no operations will be performed directly on the InfiniBox systems.



At the end of the Reprotect process, the Protected and the Recovery sites are swapped.



Failback as soon as possible to the original Protected Site

As the Active-Active replication **Preferred** system is set for the InfiniBox system in the **original** Protected site, it is important to **failback as soon as possible**. (As soon as the original Protected site is up and running)

3.5 (SRA)Discovering new replicated volumes

3.5.1 About

See the instruction below in order to make SRM discover new replicated volumes.

3.5.1.1 Instructions

1. Log in to **SRM**.
2. Select the desired **site pair**, and click **View Details**.
3. In the Site Pair tab, go to Configure → Array Based Replication → Array Pairs , and click the **Discover Devices** button.

Site Pair

Protection Groups

Recovery Plans

Summary

Issues

Configure

Array Based Replication

Storage Replication Adapters

Array Pairs

Network Mappings

Folder Mappings

Resource Mappings

Storage Policy Mappings

Placeholder Datastores

Advanced Settings

Permissions

Recovery Plans History

Array Pairs

+ ADD

ARRAY PAIR ▾

ARRAY MANAGER PAIR ▾

Array Pair	↑	▾
<div> <div>✓</div> <div>ibox2386 ↔ ibox628</div> </div> <div> <div>Storage replication adapter:</div> <div>INFINIDAT InfiniBox Storage Replication Adapter</div> </div> <div> <div>Stretched storage:</div> <div>Supported</div> </div>		

DISCOVER DEVICES

Device (vcsa-product01.lab.gdc.il.infinidat.com)	Datastore
A-A_DS	Local: [A-A_DS, A-A_DS]