



Planning

ONTAP 9

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Planning

Prerequisites

There are several prerequisites that you should consider as part of planning a SnapMirror Business Continuity solution deployment.

Hardware

- Only two-node HA clusters are supported
- Both clusters must be either AFF or ASA (no mixing)

Software

- ONTAP 9.8 or later
- ONTAP Mediator 1.2 or later
- A Linux server or virtual machine for the ONTAP Mediator running one of the following:

Mediator version	Supported Linux versions
1.3	Red Hat Enterprise Linux: 7.6, 7.7, 7.8, 7.9, 8.0, 8.1, 8.2, 8.3 CentOS: 7.6, 7.7, 7.8, 7.9
1.2	Red Hat Enterprise Linux: 7.6, 7.7, 7.8, 8.0, 8.1 CentOS: 7.6, 7.7, 7.8

Licensing

- SnapMirror synchronous (SM-S) license must be applied on both clusters
- SnapMirror license must be applied on both clusters



If your ONTAP storage systems were purchased before June 2019, click [NetApp ONTAP Master License Keys](#) to get the required SM-S license.

Networking environment

- Inter-cluster latency round trip time (RTT) must be less than 10 milliseconds

Supported protocols

- Only SAN protocols are supported (not NFS/CIFS)
- Only Fibre Channel and iSCSI protocols are supported
- The default IPspace is required by SM-BC for cluster peer relationships. Custom IPspace is not supported.

ONTAP Mediator

- Must be provisioned externally and attached to ONTAP for transparent application failover.
- For more information about the ONTAP Mediator, see [Installing or upgrading the ONTAP Mediator service](#).

Read-write destination volumes

- SM-BC relationships are not supported on read-write destination volumes. Before you can use a read-write volume, you must convert it to a DP volume by creating a volume-level SnapMirror relationship and then deleting the relationship. For details, see [Converting existing relationships to SM-BC relationships](#)

Large LUNs and large volumes

- Large LUNs and large volumes greater than 100TB are supported only on All SAN Arrays



You must ensure that both the primary and secondary cluster are All SAN Arrays, and that they both have ONTAP 9.8 installed. If the secondary cluster is running a version earlier than ONTAP 9.8 or if it is not an All SAN Array, the synchronous relationship can go out of sync if the primary volume grows larger than 100 TB.

Additional restrictions and limitations

There are several additional restrictions and limitations when using the SnapMirror Business Continuity solution.

Consistency groups

From ONTAP 9.8 to 9.9.1, the maximum number of SnapMirror Synchronous consistency group relationships in a cluster is five, a limit which is platform-independent. Beginning with ONTAP 9.10.1, the maximum number of SnapMirror Synchronous consistency group relationships in a cluster is 20. If you reach or attempt to exceed this limit, an error message will display.

Volumes per consistency group

From ONTAP 9.8 to 9.9.1, the maximum number of volumes supported per SnapMirror Synchronous consistency group relationship is twelve, a limit which is platform-independent. Beginning with ONTAP 9.10.1, the maximum number of volumes supported per SnapMirror Synchronous relationship is sixteen. If you reach or attempt to exceed this limit, an error message will display.

Volumes



The limit is on the number of endpoints and not the number of relationships. A consistency group with 12 volumes contributes 12 endpoints on both the source and destination. A SnapMirror Synchronous relationship with both source and destination volumes on the same HA pair contributes 2 endpoints.

The maximum endpoints per platform are included in the following table.

S. No	Platform	Endpoints per HA for SM-BC		Overall sync and SM-BC endpoints per HA	
		ONTAP 9.8-9.9	ONTAP 9.10.1	ONTAP 9.8-9.9	ONTAP 9.10.1
1	AFF	60	200	80	200
2	ASA	60	200	80	200

SAN object limits

The following SAN object limits are included in the following table and apply regardless of the platform.

Limits of objects in an SM-BC relationship	Count
LUNs per volume	256
LUN maps per node	2048
LUN maps per cluster	4096
LIFs per VServer (with at least one volume in an SM-BC relationship)	256
Inter-cluster LIFs per node	4
Inter-cluster LIFs per cluster	8

NTFS Security Style

NTFS security style is not supported on SM-BC volumes.

Solaris Host setting recommendation for SM-BC configuration

Beginning with ONTAP 9.10.1, SM-BC supports Solaris 11.4. In order to ensure the Solaris client applications are non-disruptive when an unplanned site failover switchover occurs in an SM-BC environment, the following setting needs to be configured on Solaris 11.4 host. This setting will override the failover module – `f_tpgs` in order to prevent the code path that detects the contradiction from being executed.

Follow the instructions to configure the override parameter:

1. Create configuration file `/etc/driver/drv/scsi_vhci.conf` with an entry similar to the following for the NetApp storage type connected to the host:

```
scsi-vhci-failover-override =
"NETAPP LUN", "f_tpgs"
```

2. Use `devprop` and `mdb` commands to verify the override has been successfully applied:

```
root@host-A:~# devprop -v -n /scsi_vhci scsi-vhci-failover-override
scsi-vhci-failover-override=NETAPP LUN + f_tpgs
root@host-A:~# echo "*scsi_vhci_dip::print -x struct dev_info devi_child
| ::list struct dev_info devi_sibling| ::print struct dev_info
devi_mdi_client| ::print mdi_client_t ct_vprivate| ::print struct
scsi_vhci_lun svl_lun_wnn svl_fops_name"| mdb -k`
```

```
svl_lun_wnn = 0xa002a1c8960 "600a098038313477543f524539787938"
svl_fops_name = 0xa00298d69e0 "conf f_tpgs"
```



conf will be added to the svl_fops_name when a scsi-vhci-failover-override has been applied.

For additional information and recommended changes to default settings, refer to NetApp KB article [Solaris Host support recommended settings in SnapMirror Business Continuity \(SM-BC\) configuration](#).

ONTAP access options

You have several access options available when configuring the ONTAP nodes participating in an SM- BC deployment. You should select the option that best matches your specific environment and deployment goals.



In all cases, you must sign in using the administrator account with a valid password.

Command line interface

The text-based command line interface is available through the ONTAP management shell. You can access the CLI using secure shell (SSH).

System Manager

You can connect to the System Manager using a modern web browser. The web GUI provides an intuitive and easy-to-use interface when accessing the SnapMirror Business Continuity functionality. For more information about using System Manager, see [System Manager documentation](#).

REST API

The ONTAP REST API exposed to external clients provides another option when connecting to the ONTAP. You can access the API using any mainstream programming language or tool that supports REST web services. Popular choices include:

- Python (including the ONTAP Python client library)
- Java
- Curl

Using a programming or scripting language provides an opportunity to automate the deployment and management of a SnapMirror Business Continuity deployment. For more information, see the ONTAP online documentation page at your ONTAP storage system.

Prepare to use the ONTAP CLI

You should be familiar with the following commands when deploying the SnapMirror Business Continuity solution using the ONTAP command line interface.



SM-BC does not support the `snapmirror quiesce` and `snapmirror resume` commands for relationships with active sync policy.

For more information about the following ONTAP commands, see [NetApp Documentation: ONTAP 9](#).

Command	Description
<code>lun igroup create</code>	Create an igroup on a cluster
<code>lun map</code>	Map a LUN to an igroup
<code>lun show</code>	Display a list of LUNs
<code>snapmirror create</code>	Create a new SnapMirror relationship
<code>snapmirror initialize</code>	Initialize an SM-BC consistency group
<code>snapmirror update</code>	Initiates a common snapshot creation operation
<code>snapmirror show</code>	Display a list of SnapMirror relationships
<code>snapmirror failover</code>	Start a planned failover operation
<code>snapmirror resync</code>	Start a resynchronization operation
<code>snapmirror delete</code>	Delete a SnapMirror relationship
<code>snapmirror release</code>	Remove source information for a SnapMirror relationship

Prepare to use the ONTAP Mediator

The ONTAP Mediator establishes a quorum for the ONTAP clusters in an SM-BC relationship. It coordinates automated failover when a failure is detected and helps to avoid split-brain scenarios when each cluster simultaneously tries to establish control as the primary cluster.

Prerequisites for the ONTAP Mediator

The ONTAP Mediator includes its own set of prerequisites. You must meet these prerequisites before installing the mediator. For more information, see [Installing or upgrading the ONTAP Mediator service](#).

Network configuration

By default, the ONTAP Mediator provides service through TCP port 31784. You should make sure that port 31784 is open and available between the ONTAP clusters and the mediator.

Summary of deployment best practices

There are several best practices that you should consider as part of planning an SnapMirror Business Continuity deployment.

SAN

The SnapMirror Business Continuity solution supports only SAN workloads. You should follow the SAN best practices in all cases.

In addition:

- Replicated LUNs in the secondary cluster must be mapped to the host and the I/O paths to the LUNs from both the primary and secondary cluster must be discovered at the time of host configuration.
- After an out of sync (OOS) event exceeds 80 seconds, or after an automatic unplanned failover, it is important to rescan the host LUN I/O path to ensure that there is no I/O path loss. For more information, see the respective host OS vendor's documentation on rescan of LUN I/O paths.

Mediator

To be fully functional and to enable automatic unplanned failover, the external ONTAP mediator should be provisioned and configured with ONTAP clusters.

When installing the mediator, you should replace the self-signed certificate with a valid certificate signed by a mainstream reliable CA.

SnapMirror

You should terminate an SnapMirror relationship in the following order:

1. Perform `snapmirror delete` at the destination cluster
2. Perform `snapmirror release` at the source cluster

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