SRDF and NDM

Interfamily Connectivity Information

Rev. 09
February 2021

This document defines the versions of PowerMaxOS, HYPERMAX OS, and Enginuity that make up valid SRDF replication and SRDF/Metro configurations. Also, there is information about the versions that can participate in Non-Disruptive Migration (NDM) and NDM Updates.

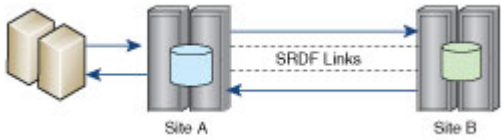
DELL EMC

SRDF

These sections show the valid combinations for SRDF remote replication and SRDF/Metro configurations.

Connectivity table

An SRDF configuration consists of one or more pairs of storage arrays.



This table shows the valid combinations of PowerMaxOS, HYPERMAX OS, and Enginuity that can form an SRDF pair in replication or SRDF/Metro configurations.

For VMAX systems running Enginuity, the version that is valid in an SRDF configuration depends on the version of Windows that runs on the service processor. The suffixes (WES7) and (XP) differentiate between these versions like this:

(WES7): the service processor runs Windows 7.
(XP): the service processor runs another version of Windows.

NOTE: Dell Technologies recommends that both sides of the RDF pair run the latest GA Cumulative Epack. This ensures that both sides have the latest set of RDF-related patches.

Table 1. SRDF interfamily connectivity

When one array runs...	The code level of an RDF partner is...	
	SRDF two- and three-site	**SRDF/Metro[a]**
PowerMaxOS 5978.711.711	PowerMaxOS 5978.221.221 and later	PowerMaxOS 5978.221.221 and later
	HYPERMAX OS 5977.1131.1131	HYPERMAX OS 5977.1131.1131
	Enginuity 5876.309.401 (WES7) Enginuity 5876.309.196 (XP) VMAX 20K in a mainframe environment: see Knowledge Base article 516383	
PowerMaxOS 5978.669.669	PowerMaxOS 5978.144.144 and later	PowerMaxOS 5978.144.144 and later
	HYPERMAX OS 5977.1131.1131	HYPERMAX OS 5977.1131.1131
	Enginuity 5876.309.401 (WES7) Enginuity 5876.309.196 (XP) VMAX 20K in a mainframe environment: see Knowledge Base article 516383	
PowerMaxOS 5978.479.479 [b]	PowerMaxOS 5978.144.144 and later	PowerMaxOS 5978.144.144 and later
	HYPERMAX OS 5977.1125.1125 and later	HYPERMAX OS 5977.1125.1125 and later
	Enginuity 5876.309.401 (WES7) Enginuity 5876.309.196 (XP) VMAX 20K in a mainframe environment: see Knowledge Base article 516383	
PowerMaxOS 5978.444.444	PowerMaxOS 5978.144.144 and later	PowerMaxOS 5978.144.144 and later
	HYPERMAX OS 5977.1125.1125 and later	HYPERMAX OS 5977.1125.1125 and later

Table 1. SRDF interfamily connectivity (continued)

When one array runs...	The code level of an RDF partner is...	
	SRDF two- and three-site	**SRDF/Metro[a]**
	Enginuity 5876.309.401 (WES7) Enginuity 5876.309.196 (XP) VMAX 20K in a mainframe environment: see Knowledge Base article 516383	
PowerMaxOS 5978.221.221	PowerMaxOS 5978.144.144 and later	PowerMaxOS 5978.144.144 and later
	HYPERMAX OS 5977.952.892 and later	HYPERMAX OS 5977.952.892 and later
	Enginuity 5876.309.401 (WES7) Enginuity 5876.309.196 (XP) VMAX 20K in a mainframe environment: see Knowledge Base article 516383	
PowerMaxOS 5978.144.144	PowerMaxOS 5978.144.144 to 5978.669.669	PowerMaxOS 5978.144.144 to 5978.669.669
	HYPERMAX OS 5977 952.892 and later	HYPERMAX OS 5977.952.892 and later
	Enginuity 5876.309.401 (WES7) Enginuity 5876.309.196 (XP) VMAX 20K in a mainframe environment: see Knowledge Base article 516383	
HYPERMAX OS 5977.1131.1131	PowerMaxOS 5978.144.144 and later	PowerMaxOS 5978.144.144 and later
	HYPERMAX OS 5977.814.786 and later	HYPERMAX OS 5977.814.786 and later
	Enginuity 5876.309.401 (WES7) Enginuity 5876.309.196 (XP) VMAX 20K in a mainframe environment: see Knowledge Base article 516383	
HYPERMAX OS 5977.1125.1125	PowerMaxOS 5978.144.144 to 5978.479.479	PowerMaxOS 5978.144.144 to 5978.479.479
	HYPERMAX OS 5977.814.786 and later	HYPERMAX OS 5977.814.786 and later
	Enginuity 5876.309.401 (WES7) Enginuity 5876.309.196 (XP) VMAX 20K in a mainframe environment: see Knowledge Base article 516383	
HYPERMAX OS 5977.952.892	PowerMaxOS 5978.144.144 to 5978.221.221	PowerMaxOS 5978.144.144 to 5978.221.221
	HYPERMAX OS 5977.691.684 and later (FBA) HYPERMAX OS 5977.811.784 to 5977.952.892 (CKD and mixed)	HYPERMAX OS 5977.813.785 to 5977.952.892
	Enginuity 5876.288.400 or 5876.309.401 (WES7) Enginuity 5876.288.195 or 5876.309.196 (XP)	
HYPERMAX OS 5977.945.890	HYPERMAX OS 5977.691.684 and later (FBA)	HYPERMAX OS 5977.813.785 to 5977.952.892

Table 1. SRDF interfamily connectivity (continued)

When one array runs...	The code level of an RDF partner is...	
	SRDF two- and three-site	**SRDF/Metro[a]**
	HYPERMAX OS 5977.811.784 to 5977.952.892 (CKD and mixed)	
	Enginuity 5876.288.400 or 5876.309.401 (WES7) Enginuity 5876.288.195 or 5876.309.196 (XP)	
HYPERMAX OS 5977.814.786	HYPERMAX OS 5977.691.684 and later (FBA) HYPERMAX OS 5977.811.784 to 5977.952.892 (CKD and mixed)	HYPERMAX OS 5977.811.784 to 5977.814.786
	Enginuity 5876.288.400 or 5876.309.401 (WES7) Enginuity 5876.288.195 or 5876.309.196 (XP)	
HYPERMAX OS 5977.813.785	HYPERMAX OS 5977.691.684 to 5977.952.892 (FBA) HYPERMAX OS 5977.811.784 to 5977.952.892 (CKD and mixed)	HYPERMAX OS 5977.811.784 to 5977.814.786
	Enginuity 5876.288.400 or 5876.309.401 (WES7) Enginuity 5876.288.195 orb 5876.309.196 (XP)	
HYPERMAX OS 5977.811.784	HYPERMAX OS 5977.691.684 to 5977.952.892 (FBA) HYPERMAX OS 5977.811.784 to 5977.952.892 (CKD and mixed)	HYPERMAX OS 5977.811.784 to 5977.814.786
	Enginuity 5876.288.400 or 5876.309.401 (WES7) Enginuity 5876.288.195 or 5876.309.196 (XP)	
HYPERMAX OS 5977.810.784 **FBA only**	HYPERMAX OS 5977.691.684 to 5977.952.892	HYPERMAX OS 5977.691.684 to 5977.810.784
	Enginuity 5876.288.400 or 5876.309.401 (WES7) Enginuity 5876.288.195 or 5876.309.196 (XP)	
HYPERMAX OS 5977.691.684 **FBA only**	HYPERMAX OS 5977.596.583 to 5977.952.892	HYPERMAX OS 5977.691.684 to 5977.810.784
	Enginuity 5876.286.194 and later	
HYPERMAX OS 5977.596.583 **FBA Only**	HYPERMAX OS 5977.596.583 to 5977.691.684 If the SRDF partner runs HYPERMAX OS 5977.691.684, HYPERMAX OS 5977.596.583 requires e-Pack 5457 that contains N-X connectivity fixes.	—
	Enginuity 5876.272.177 and later	
Enginuity 5876.309.401	PowerMaxOS 5978.144.144 and later	—
	HYPERMAX OS 5977.952.892 and later	
	Enginuity 5876.288.195 and later	
Enginuity 5876.309.196	PowerMaxOS 5978.144.144	—
	HYPERMAX OS 5977.952.892 to 5977.952.892	
	Enginuity 5876.288.195 and later	

Table 1. SRDF interfamily connectivity (continued)

When one array runs...	The code level of an RDF partner is...	
	SRDF two- and three-site	**SRDF/Metro[a]**
Enginuity 5876.288.400	HYPERMAX OS 5977.810.784 to 5977.952.892	—
	Enginuity 5876.159.102 and later	
Enginuity 5876.288.195	HYPERMAX OS 5977.810.784 to 5977.952.892	—
	Enginuity 5876.159.102 and later	
Enginuity 5876.286.194	HYPERMAX OS 5977.591.684	—
	Enginuity 5876.159.102 and later	
Enginuity 5876.272.177	HYPERMAX OS 5977.596.583	—
	Enginuity 5876.159.102 and later	
Enginuity 5876.269.175	Enginuity 5876.154.130 and later	—
Enginuity 5876.268.174	Enginuity 5876.154.130 and later	—
Enginuity 5876.229.145	Enginuity 5876.154.130 and later	—
Enginuity 5876.229.145	Enginuity 5876.154.130 and later	—

a. SRDF/Metro is available with PowerMaxOS 5978 or HYPERMAX OS 5977.691.684 and later.
b. PowerMaxOS 5978.444.444 requires fix 102137 for 32G SRDF connectivity with PowerMaxOS 5978.479.479.

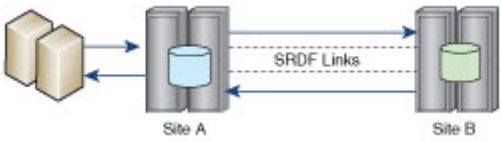
SRDF Remote Replication

Use this section to determine valid SRDF replication configurations and understand any limitations that are associated with those configurations.

How to determine valid SRDF configurations

These procedures show how to use SRDF interfamily connectivity on page 2 to determine valid configurations for two-site and three-site SRDF. Follow the appropriate procedure.

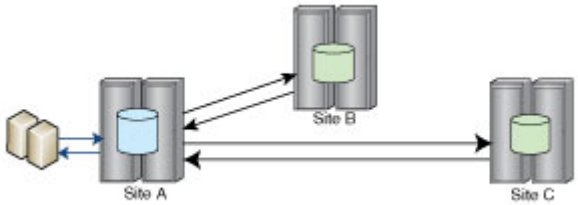
Two-site



1. Locate the version of PowerMaxOS, HYPERMAX OS, or Enginuity that one side runs in the **When one array runs** column.
2. The corresponding entries in the **SRDF two- and three-site** column show the versions of PowerMaxOS, HYPERMAX OS, and Enginuity that can be on the other side. Choose one of those versions.

For example, one side of an FBA configuration runs HYPERMAX OS 5977.952.892. From SRDF interfamily connectivity on page 2, the versions that other side can run are PowerMaxOS 5978.144.144 to 5978.222.222, HYPERMAX OS 5977.691.684 to 5977.952.892, Enginuity 5876.288.400 or 5976.309.401(when the service processor runs Windows 7), or Enginuity 5876.288.195 or 5976.309.196 (when the service processor runs Windows XP).

Three-site concurrent



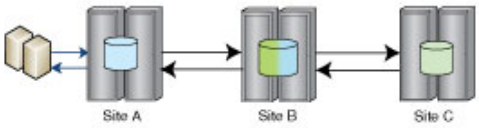
1. Locate the version of PowerMaxOS, HYPERMAX OS, or Enginuity that Site A runs in the **When one array runs** column.
2. The corresponding entries in the **SRDF two- and three-site** column show the versions of PowerMaxOS, HYPERMAX OS, and Enginuity that can be on Sites B and C. Choose one of those versions for each site.

   Sites B and C can run different versions of PowerMaxOS, HYPERMAX OS, and Enginuity.

For example, Site A in an FBA configuration runs HYPERMAX OS 5977.1125.1125. From SRDF interfamily connectivity on page 2, the minimum versions that Sites B and C can run are:

PowerMaxOS 5978.144.144 to 5978.479.479
HYPERMAX OS 5977.814.786 or later
Enginuity 5876.309.401 (when the service processor runs Windows 7), or Enginuity 5876.309.196

Three-site cascaded



1. Locate the version of PowerMaxOS, HYPERMAX OS, or Enginuity that Site A runs in the **When one array runs** column.
2. The corresponding entries in the **SRDF two- and three-site** column show the versions of PowerMaxOS, HYPERMAX OS, and Enginuity that can run at Site B. Choose one of those versions or one of its successors.
3. Locate the chosen Site B version of PowerMaxOS, HYPERMAX OS, or Enginuity in the **When one array runs** column.
4. The corresponding entries in the **SRDF two- and three-site** column show the versions of PowerMaxOS, HYPERMAX OS, and Enginuity that can run at Site C. Choose one of those versions or one of its successors.

For example, Site A in a CKD environment runs HYPERMAX OS 5977.1131.1131. SRDF interfamily connectivity on page 2 shows that the code levels at Site B are:

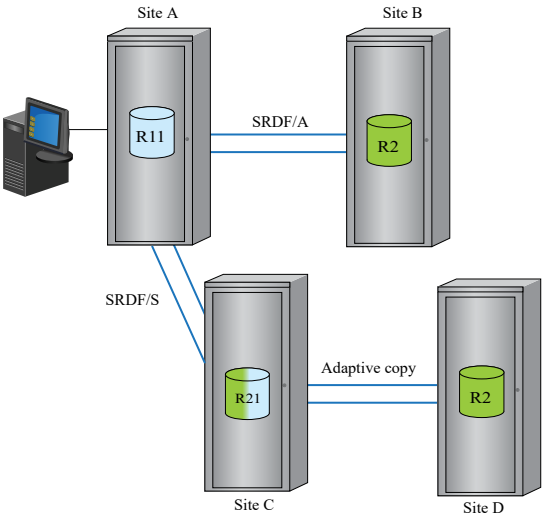
PowerMaxOS 5978.144.144 and later
HYPERMAX OS 5977.814.786 and later
Enginuity 5876.288.401 (when the service processor runs Windows 7), or Enginuity 5876.288.196

Assume that Site B runs HYPERMAX OS 5977.952.892. Locating the row with that version in the **When one array runs** column of SRDF interfamily connectivity on page 2 shows that the minimum code levels that Site C can run are:

PowerMaxOS 5978.144.144 to 5978.221.221
HYPERMAX OS 5977.811.784 to 5977.952.892
Enginuity 5876.288.400 or 5876.309.401 (when the service processor runs Windows 7), or Enginuity 5876.288.195 or 5876.309.196 (when the service processor runs Windows XP)

Four-site

A four-site FBA configuration is an extension of a three-site cascaded or concurrent configuration that combines both cascaded and concurrent technologies. For example, this diagram shows a three-site concurrent configuration that has a fourth array cascaded from Site C:



First determine the arrays that form the three-site configuration that the overall configuration is based on (see Three-site concurrent on page 6 and Three-site cascaded on page 7). The rules for SRDF connectivity between the basic configuration and the fourth array (between sites C and D in this example) are the same as a regular two-site SRDF replication configuration.

Limitations

There are some limitations to SRDF communications in these environments:

- Two-site
- Cascaded
- Concurrent

Two-site

- R1 and RecoverPoint Continuous Data Protection coexistence is not supported on an array running Enginuity 5876 when the R2 device is on an array running PowerMaxOS 5978 or HYPERMAX OS 5977.

  An SRDF R1 device can be tagged as a RecoverPoint Continuous Data Protection source device. In this case, disable RecoverPoint consistency before performing any SRDF operations that may cause data to flow from the R2 device to the R1 device.

  An SRDF device cannot also be part of a RecoverPoint snapshot-based Replication configuration.
- There is no support for FAST coordination propagation between a VMAX3 array running HYPERMAX OS 5977 and Enginuity 5876.
- An update operation may occur on the source (R1) side after a failover where the target (R2) side is still operational to the hosts. Such an operation is not supported when the R1 side is a VMAX 10K, 20K, or 40K array running Enginuity 5876.
- Remote Pair FlashCopy for CKD devices is not supported between a VMAX3 array running HYPERMAX OS 5977 and an array running Enginuity 5876.
- Thick-to-thin connectivity requires at least Enginuity 5876.159.102 on VMAX arrays.
- In thin-to-thick and thick-to-thin configurations of arrays running Enginuity 5876 and PowerMaxOS 5978 or HYPERMAX OS 5977, the thick devices reside on the array running Enginuity 5876.
- Online Device Expansion (ODE) is available only when both sides run PowerMaxOS 5978.144.144 or later.

Cascaded

- ODE is available only when all arrays in the configuration run PowerMaxOS 5978.144.144 or later.

  In addition, the size of R1 must be less than or equal to the size of R21. The size of R21 must be less than or equal to the size of R2.
- When a VMAX 10K is part of a configuration, it must run at least Enginuity 5876.159.102 to connect to thick FBA devices on VMAX 40K, VMAX 20K, or VMAX arrays running 5876.159.102 or later.
- When the R21 site is a VMAX 10K, it must run Enginuity 5876.159.102 or later.

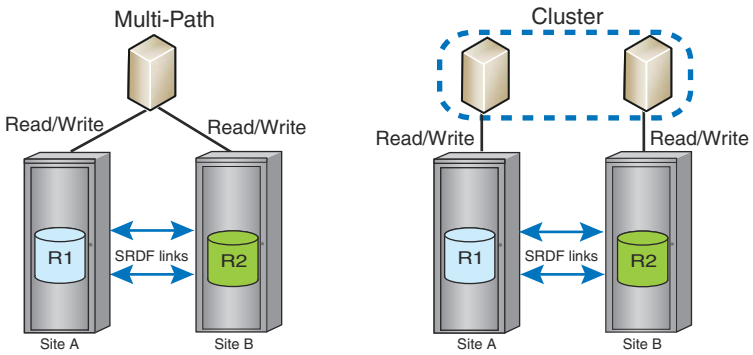
Concurrent

- ODE is available only when all arrays in the configuration run PowerMaxOS 5978.144.144 or later.

  In addition, the size of R11 must be less than or equal to the size of both R2 devices.
- In SRDF/A mode, you cannot move dynamic SRDF devices between groups.
- Arrays running Enginuity 5876 with CKD zBoost require extra fixes to be able to connect to HYPERMAX OS 5977.811.784 and 5977.813.785. Contact your Dell Technologies representative for more information.

SRDF/Metro

Use this section to determine valid SRDF/Metro configurations.



How to determine valid SRDF/Metro configurations

1. Locate the version of PowerMaxOS or HYPERMAX OS that one side runs in the **When one array runs** column of SRDF interfamily connectivity on page 2.
2. The corresponding entries in the **SRDF/Metro** column show the versions of PowerMaxOS or HYPERMAX OS that can be on the other side. Choose one of those versions.

For example, one side runs PowerMaxOS 5978.144.144. From SRDF interfamily connectivity on page 2, the versions that the other side can run are PowerMaxOS 5978.144.144 and later or HYPERMAX OS 5977.952.892 and later.

Application host support

The host support matrix lists the hosts that are supported for each combination of operating environment.

Limitations

- SRDF/Metro does not support:
  - CKD device pairs
  - PowerProtect Storage Direct on storage arrays that run Enginuity 5876, HYPERMAX OS 5977, or versions of PowerMaxOS earlier than PowerMaxOS 5978.444.444.
  - CloudArray
  - Some Mobility Safe ID with ALUA environments

    See the E-Lab Interoperability Navigator for more information.

  - Microsoft ODX
  - Microsoft Cluster with nonuniform connection (without cross-connects)

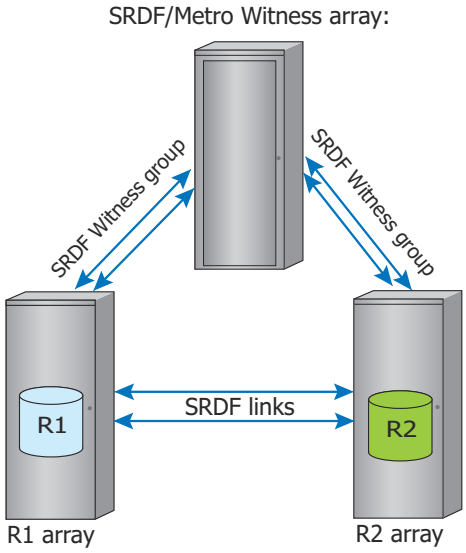
    See the SRDF/Metro support matrix for information about support with Windows Server 2016.

  - RecoverPoint snapshot-based replication
  - SRDF with Consistency with ODX
  - FCoE front-end capabilities
- A R2 device cannot be larger than its corresponding R1 device.
- You cannot change the SRDF Consistency state once it is enabled for all SRDF devices.
- Consistency Group (CG) SRDF control and set operations are allowed on one SRDF group at a time.
- VAAI commands are available with PowerMaxOS 5978.144.144 and later or HYPERMAX OS 5977.811.784 and later. The only exception is xCopy/ODX which is available in PowerMaxOS 5978.144.144 and later or HYPERMAX 5977.952.892 and later.
- SCSI 2 and 3 reservations are available on PowerMaxOS 5978.144.144 and later or HYPERMAX OS 5977.811.784 and later only.
- Online Device Expansion (ODE) is available only when both arrays run PowerMaxOS 5978.444.444 or later.

Array Witness

If one or more device pairs become Not Ready or connectivity is lost between the arrays, SRDF/Metro must decide which side of the pair remains accessible to the hosts. One of the available methods is the Array Witness which uses a third array to help choose the side that remains available.

NOTE: Deploy the array witness in a failure domain that is separate from the failure domains that contain the two SRDF/Metro arrays. This measure ensures that a single failure impacts only one of these entities and guarantees continuous availability to the applications.

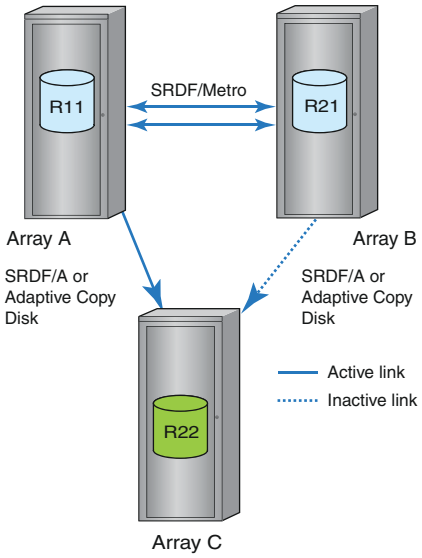


The version of PowerMaxOS, HYPERMAX OS, or Enginuity that runs on the witness array must be compatible with that running on each SRDF/Metro array. The rules for SRDF connectivity between an SRDF/Metro array and an Array Witness are the same as a regular two-site SRDF replication configuration. However, the version of the operating environment that runs on the Array Witness must be compatible with the versions that run on both SRDF/Metro arrays.

For example, the R1 and R2 sides both run HYPERMAX OS 5977.811.784. SRDF interfamily connectivity on page 2 shows that the Array Witness can run HYPERMAX OS 5977.691.684 or to 5977.952.892, Enginuity 5876.288.400 or 5876.309.401 (when the service processor runs Windows 7), or Enginuity 5876.288.195 or 5876.309.196 (when the sevice processor runs Windows XT).

Highly available disaster recovery (SRDF/Metro Smart DR)

SRDF/Metro Smart DR maintains a single, disaster recovery (DR) copy of the data in a SRDF/Metro pair on a third, remote array. Either of the devices in a SRDF/Metro pair can maintain the DR copy. This diagram shows an example of a SRDF/Metro Smart DR configuration:



Arrays A and B both have SRDF/Asynchronous or Adaptive Copy Disk connections to the DR array (Array C). However, only one of those connections is active at any point in time (in this example, the connection between Arrays A and C).

If a problem prevents Array A replicating data to Array C, the link between Array B and Array C becomes active and data replication continues. Arrays A and B keep track of the data that has been replicated to Array C to enable replication to continue and to avoid data loss.

Operating environment

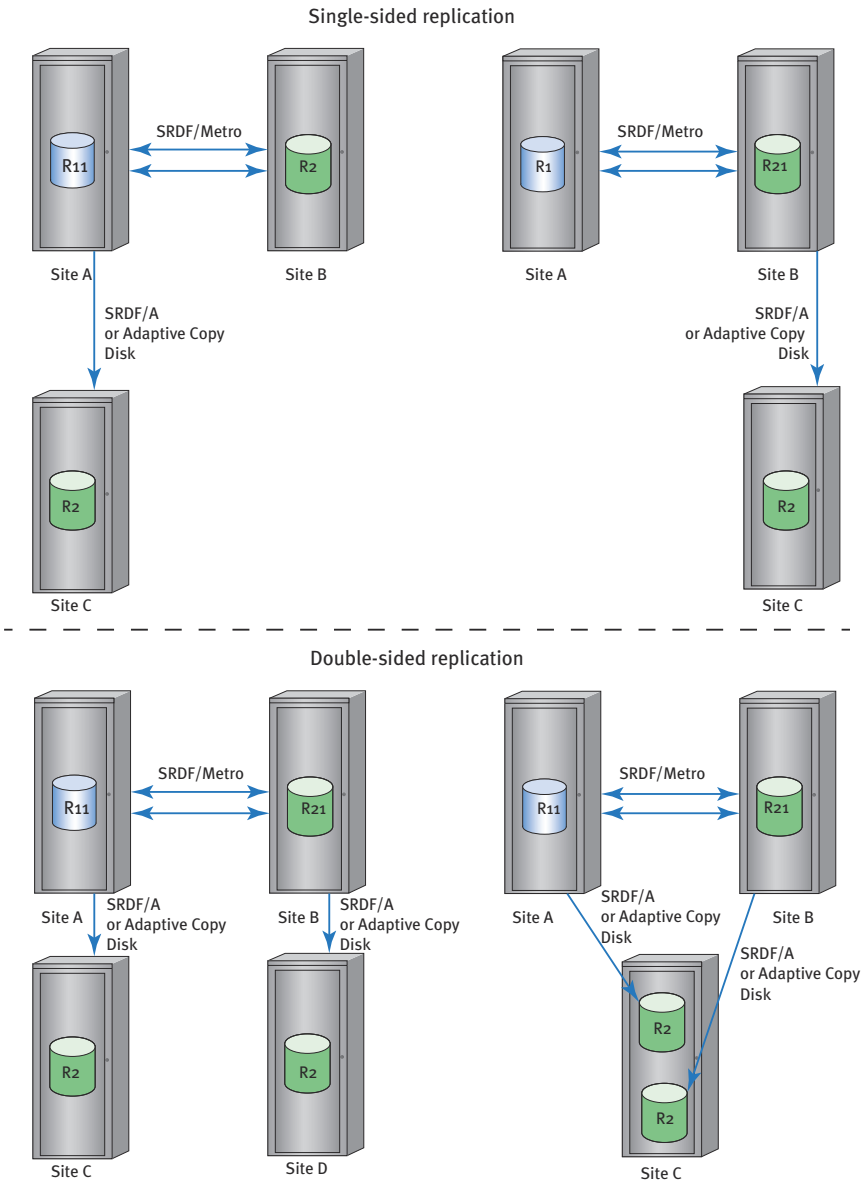
The three arrays in a SRDF/Metro Smart DR configuration run PowerMaxOS 5978.669.669 or later.

SRDF/Metro resilience

The SRDF/Metro pair must use a Witness resilience mechanism. If the pair uses an Array Witness, the version of the operating environment on the witness array must be compatible with that running on each SRDF/Metro array. Array Witness on page 10 has more information about ensuring that the witness array is compatible with a SRDF/Metro pair.

Independent disaster recovery

In PowerMaxOS 5978 and HYPERMAX OS 5977.945.890 or later, you can attach disaster recovery (DR) arrays to a SRDF/Metro configuration. Either or both sides of the configuration can replicate to another array:



Each DR copy is specific to the side of the SRDF/Metro pair that maintains it. The other side of the pair is unaware that there is a DR copy. So, if a problem prevents either side from replicating data to its DR copy, the other side cannot take over replication duties. So if replication problems occur in a single-sided configuration, the entire configuration is left with no DR copy.

Operating environment

The operating environment that runs on the disaster recovery array or arrays must be compatible with that running on the SRDF/Metro array it is connected to. The rules for SRDF connectivity between a SRDF/Metro array and a DR array are the same as a regular two-site SRDF replication configuration.

Both sides of the SRDF/Metro pair can connect to the same DR array. In this case, the operating environment on the DR array must be compatible with the ones on both arrays in the SRDF/Metro pair.

If each SRDF/Metro array is connected to its own DR array, treat each side as a separate, two-site configuration.

Example

A double-sided configuration replicates the SRDF/Metro arrays at Sites A and B to a shared array at Site C. Also, both the SRDF/Metro partners run HYPERMAX OS 5977.952.892. SRDF interfamily connectivity on page 2 shows that the disaster recovery array can run PowerMaxOS 5978.144.144 to 5978.221.221, HYPERMAX OS 5977.691.684 or later, Enginuity 5876.309.400 or 5876.309.401 (when the service processor runs Windows 7), or Enginuity 5876.309.195 or 5876.309.196 (when the service processor runs Windows XP).

NDM

NDM uses SRDF to migrate data from:

- An array that runs PowerMaxOS 5978 to another that runs PowerMaxOS 5978 [1]
- An array that runs HYPERMAX OS 5977 to another that runs PowerMaxOS 5978
- An array that runs HYPERMAX OS 5977 to another that runs HYPERMAX OS 5977 [1]
- An array that runs Enginuity 5876 to another that runs PowerMaxOS 5978
- An array that runs Enginuity 5876 to another that runs HYPERMAX OS 5977

Data is migrated from the *source array* to the *target array*.

NDM does not affect the operation of the application host, enabling applications to continue to run while the migration takes place. Once the migration is complete, the application host switches to using the target array. A typical use of NDM is when a data center has a technology refresh and replaces an existing array.

The nondisruptive nature of NDM is heavily dependent on the pathing software that manages the connections between the host and the two arrays. So NDM is not available in environments that do not use PowerPath or another supported product. NDM Updates is the variant of NDM that is used in those environments. The major difference from NDM is that for some time during the migration the application that uses the migrated data has to be stopped. Besides that, the migration process and the valid configurations are the same as NDM.

Connectivity table

This table shows the versions of PowerMaxOS 5978, HYPERMAX OS 5977, and Enginuity 5876 that can participate in NDM and NDM Updates. Knowledgebase article 303996 lists of the fixes that are required, if any, in each NDM configuration and indicates whether those fixes are part of an Epack.

NOTE: Dell Technologies recommends that both sides have the latest GA cumulative Epacks installed.This ensures that both sides have the latest NDM-related patches.

Table 2. Nondisruptive migration

Source array	Target array
PowerMaxOS 5978.711.711	PowerMaxOS 5978.711.711
PowerMaxOS 5978.669.669	PowerMaxOS 5978.711.711
	PowerMaxOS 5978.669.669
PowerMaxOS 5978.479.479	PowerMaxOS 5978.711.711
	PowerMaxOS 5978.669.669
	PowerMaxOS 5978.479.479
PowerMaxOS 5978.444.444	PowerMaxOS 5978.669.669
	PowerMaxOS 5978.479.479
	PowerMaxOS 5978.444.444
PowerMaxOS 5978.221.221	PowerMaxOS 5978.711.711
	PowerMaxOS 5978.669.669
	PowerMaxOS 5978.479.479
	PowerMaxOS 5978.444.444
PowerMaxOS 5978.144.144	PowerMaxOS 5978.669.669
	PowerMaxOS 5978.479.479
	PowerMaxOS 5978.444.444
HYPERMAX OS 5977.1131.1131	PowerMaxOS 5978.711.711

1 Requires Solutions Enabler Version 9.1 and later or Unisphere for PowerMax Version 9.1 and later.

Table 2. Nondisruptive migration (continued)

Source array	Target array
	PowerMaxOS 5978.669.669
	PowerMaxOS 5978.479.479
	PowerMaxOS 5978.444.444
	PowerMaxOS 5978.221.221
	PowerMaxOS 5978.144.144
	HYPERMAX OS 5977.1131.1131
Enginuity 5876.309.xxx	PowerMaxOS 5978.711.711
	PowerMaxOS 5978.669.669
	PowerMaxOS 5978.479.479
	PowerMaxOS 5978.444.444
	PowerMaxOS 5978.221.221
	PowerMaxOS 5978.144.144
	HYPERMAX OS 5977.1131.1131
	HYPERMAX OS 5977.1125.1125
	HYPERMAX OS 5977.952.892
Enginuity 5876.288.xxx	HYPERMAX OS 5977.952.892

Application host support

The host support matrix lists the hosts that are supported for each combination of operating environment.

Mixed VMAX 20K migrations

Migrating a mixed FBA and CKD VMAX 20K to HYPERMAX OS 5977.1125.1125 requires Enginuity 5876.309.401 or Enginuity 5876.288.400. See the Knowledgebase article 303996 for more information.

Disaster recovery

For disaster recovery (DR) purposes, either or both arrays in an NDM configuration can be connected to extra arrays using SRDF. The rules for SRDF connectivity between an NDM array and a DR array are the same as a regular two-site SRDF replication configuration. When both sides of the NDM configuration are connected to other arrays, treat each side as a separate, two-site configuration.

Point-to-point connections

This table shows the types of point-to-point connection that are available for SRDF operations.

Table 3. Point-to-point connections

Configuration	Types of connection	Maximum number of SRDF groups per connection
Both sides run PowerMaxOS 5978 or HYPERMAX OS 5977.	FC	250
	GbE	250
One side runs PowerMaxOS 5978 or HYPERMAX OS 5977, and the other side runs Enginuity 5876.	GbE[a]	250

a. Point-to-point is not available for FC because:
   - Dynamic SRDF on Enginuity 5876 does not support point-to-point fiber.
   - Static SRDF is not available in PowerMaxOS 5978 and HYPERMAX OS 5977.

The information in the table applies to configurations for disaster recovery or high-availability purposes. The information does not apply to NDM configurations since Solutions Enabler does not allow point-to-point SRDF groups that are part of an NDM operation.

Requirements for performing system upgrades

When upgrading PowerMaxOS or HYPERMAX OS in any SRDF configuration, ensure that the arrays remain in a supported scenario throughout the upgrade process. For example, in a two-site configuration upgrading Site A to HYPERMAX OS 5977.811.784 or later leaving Site B running HYPERMAX OS 5977.596.583 is not supported.

To avoid unsupported configurations, use an upgrade path similar to this example of a three-site SRDF configuration. Initially, all sites are running HYPERMAX OS 5977.596.583 and the aim is to upgrade to HYPERMAX OS 5977.814.786.

1. Upgrade Site A to HYPERMAX OS 5977.691.684.
2. Upgrade Site B to HYPERMAX OS 5977.691.684.
3. Upgrade Site C to HYPERMAX OS 5977.691.684.
4. Upgrade Site A to HYPERMAX OS 5977.814.786.
5. Upgrade Site B to HYPERMAX OS 5977.814.786.
6. Upgrade Site C to HYPERMAX OS 5977.814.786.

More information

These PowerMax, VMAX All Flash, VMAX3, and VMAX documents contain information about SRDF and NDM.

- *Dell EMC SRDF Introduction*
- *Dell EMC PowerMax Family Product Guide*
- *Dell EMC VMAX All Flash Product Guide for VMAX 250F, 450F, 850F, 950F with HYPERMAX OS*
- *EMC VMAX3 Family Product Guide for VMAX 100K, VMAX 200K, VMAX 400K with HYPERMAX OS*
- FBA environments: *Dell EMC Solutions Enabler SRDF Family CLI User Guide*
- CKD environments: *Dell EMC Mainframe Enablers SRDF Host Component for z/OS Product Guide*

Notes, cautions, and warnings

NOTE: A NOTE indicates important information that helps you make better use of your product.

CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

WARNING: A WARNING indicates a potential for property damage, personal injury, or death.