



SC Series Flex Port Functionality Reference Architecture

Dell Storage Engineering
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A Dell Reference Architecture

Revisions

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Executive summary

Specific SAN environments with the SCv2000 or SC4000 Series storage arrays may need to leverage the management (MGMT) port for an additional front-end iSCSI data port. Dell Storage software includes a new technology called Flex Port that allows the MGMT port to be used simultaneously for both management and iSCSI data traffic within a single physical port.

Flex Port is enabled by default on the SC4000 Series while the SCv2000 Series requires an additional license to enable this feature.

Audience

This paper is intended for storage administrators, network administrators, SAN system designers, storage consultants, or anyone tasked with configuring a SAN infrastructure for Dell SC Series storage systems. It is assumed the readers have experience in designing and/or administering a shared storage solution. Also, there are some assumptions made in terms of familiarity with all current Ethernet standards as defined by the Institute of Electrical and Electronic Engineers (IEEE) as well as TCP/IP standards as defined by the Internet Engineering Task Force (IETF).



1 SC Series Flex Port

Flex Port is a feature introduced with the release of SCOS v6.6 on the SCv2000 and SC4000 arrays that allows the use of a single physical port to function as both a management port and front-end iSCSI data port.

1.1 Overview

Flex Port provides the ability to configure the existing MGMT port on the SCv2000 and SC4000 to handle management and front-end iSCSI data traffic rather than just management traffic. Functionality is accomplished through the creation of virtual MAC addresses on the physical controller port, labeled MGMT, for use within a Fault Domain. When Flex Port is enabled, the port labeled MGMT is assigned three MAC addresses associated with it: BMC, MGMT and iSCSI. The Flex Port front-end iSCSI data port only supports IPv4 addressing. Currently the SCv2000 does not support the configuration of IPv6 addresses on any of the front-end data ports.

Without Flex Port, the SCv2000 and SC4000 models provide two iSCSI or FC front-end data ports: iSCSI 1/iSCSI 2 or FC1/FC2 as well as a dedicated MGMT Ethernet port and a dedicated REPL (Replication) Ethernet port.

With the Flex Port feature enabled, the MGMT port on either controller version is now capable of iSCSI front-end traffic. When paired with the REPL port (also running the iSCSI protocol by default) – for fault tolerance – the iSCSI-based array now has a total of 4 front-end ports per controller, and the FC-based arrays can now support FC and iSCSI in a fault tolerant solution.”

One of the benefits of enabling Flex Port is having an additional iSCSI front-end data port set for high availability on iSCSI traffic. Customer networks only supporting 10BaseT will benefit from enabling Flex Port by allowing the MGMT port to handle both management and front-end iSCSI traffic.

When Flex Port is enabled, its use as an additional front-end data port requires the use of an alternate port on the SCv2000 and SC4000 for fault tolerance. This is supported by the replication (REPL) port or the iSCSI ports.

An example use case of leveraging Flex Port on an SCv2000 would be a 10BaseT network that has four segments of the organization, each configured within their own SAN iSCSI network (segment 1: 10.10.10.0/24, segment 2: 10.10.20.0/24, segment 3: 10.10.30.0/24 and segment 4: 10.10.40.0/24). With the installation of an SCv2000, the customer can ensure each segment of the organization has access to the available storage on the SCv2000. Configuring the two dedicated iSCSI ports (iSCSI1 & iSCSI2) for the first two segments the customer will need additional front-end iSCSI data ports for segments 3 and 4. Enabling Flex Port for the fourth network segment (10.10.40.0/24) and configuring the replication (REPL) port for the third network segment (10.10.30.0/24) ensures access to the SCv2000 across the organization while keeping traffic for each segment isolated from the other. Each network segment is considered a Fault Domain, further discussed in Section 1.4



1.2 Licensing

Flex Port functionality is enabled by default in an SC4000 Series array. During initial configuration of the SC4000, create a new fault domain for the Flex Port or associate it to an existing fault domain. With the SCv2000, Flex Port functionality is an additional licensed feature that can be selected at time of purchase or afterwards.

1.3 VLAN tagging

VLAN tagging is allowed on all of the iSCSI front-end data ports on the SCv2000 and SC4000 arrays. When Flex Port is enabled, the MGMT port carries both iSCSI and management traffic, but the VLAN tag only applies to the iSCSI traffic. The VLAN tag is not applied to the management traffic, and therefore all management traffic on the MGMT port remains untagged.

To use Flex Port VLAN tagging, the iSCSI SAN switch must be programmed to allow both tagged and untagged traffic on the switch ports that are connected to the SCv2000 and SC4000 MGMT ports. Configuring VLAN assignments per fault domain is shown in Section 2.2.4 on page 17.

1.4 Fault domain

Enabling Flex Port functionality in the SCv2000 or SC4000 and integrating it into the SAN environment requires additional network configuration. Keep the iSCSI traffic isolated from the LAN and management traffic with dedicated iSCSI switches. By leveraging the Flex Port feature, minimal network topology changes are needed to maintain the storage array SupportAssist capability to phone home and management access to the SCv2000 or SC4000.

To keep the SupportAssist and management capabilities functional, configure the dedicated iSCSI switches with uplinks to the corporate network while implementing VLANs that isolate the iSCSI traffic and allow management traffic on the corporate network.

A fault domain is used to create redundant paths between a host server and the storage array. The implementation of multiple fault domains prevents a single point of failure in the network so that I/O is never impacted during times of hardware failure. The fault domains can also be configured to use unique network subnets and allow an administrator to segment server access to the array.

The SCv2000 and SC4000 support up to four unique Fault Domains. However, on the SCv2000, the fourth fault domain is only available when Flex Port is enabled. Continuing from the example provided in Section 1.1, the customer would create a fault domain on the SCv2000 for each segment in the organization to ensure storage resources are available for each respective fault domain. However, if four unique fault domains in the SAN environment are unnecessary, the customer can configure each iSCSI front-end port to work in the existing fault domains.

If this customer wanted to leverage the additional iSCSI front-end data port that Flex Port provides, yet only has two unique SAN networks in the organization, they may consider configuring the Flex Port and iSCSI1 interface in Network A, while configuring the replication and iSCSI2 interface in Network B. This

would provide twice the redundancy on each of the SCv2000 controllers. Detailed IPv4 information and network topology of this example design is referenced in Section 3.1.2 and with Figure 7 (in Section 3.1.2).



2 Reference architecture

This section provides an understanding of how to enable and configure the Flex Port feature in an iSCSI switching environment. The enablement and configuration of the Flex Port feature is applicable to both the SCv2000 and SC4000.

2.1 SCv2000 Series array

The SCv2000 is a 2U storage system with built-in storage that supports up to 12 internal 3.5-inch hot-swappable SAS hard drives installed in a four-column, three-row configuration supporting 10BaseT networking interfaces. The SCv2000 contains two redundant power supply/cooling fan modules and up to two storage controllers with multiple I/O ports that provide access for servers and expansion enclosures.

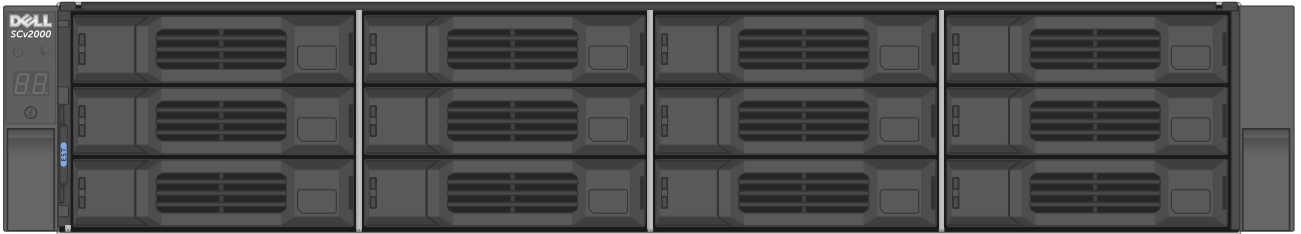


Figure 1 SCv2000 front view showing 12 x 2TB 7K SAS drives

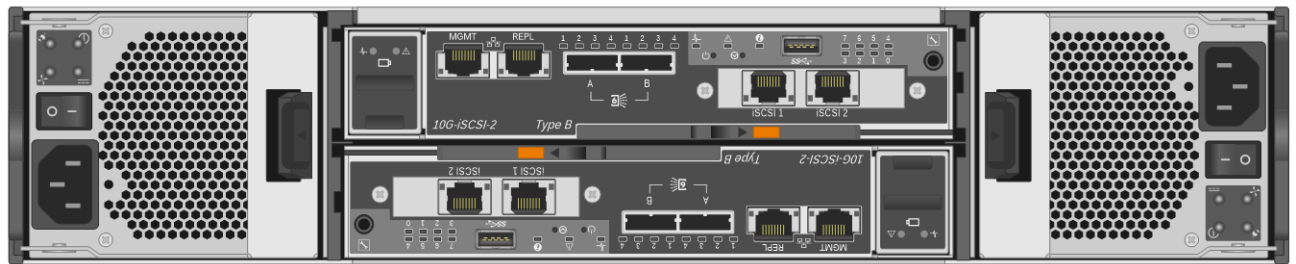


Figure 2 SCv2000 rear view showing 10GbE iSCSI 2-port controllers

2.2 Reference architecture environment

The environment presented in this paper consisted of a single SCv2000 array (without Flex Port enabled) that was configured with two fault domains connected to two iSCSI switches. Management uplinks were run from the SCv2000 to the Top of Rack (TOR) corporate network switch from each controller to enable SupportAssist and management capabilities. A single server was connected to both iSCSI switches using iSCSI software initiators for provisioned storage.

For the purposes of this document, only two fault domains are used within the SCv2000 rather than four. If desired, a unique fault domain for each front-end iSCSI port within the SCv2000 can be used.

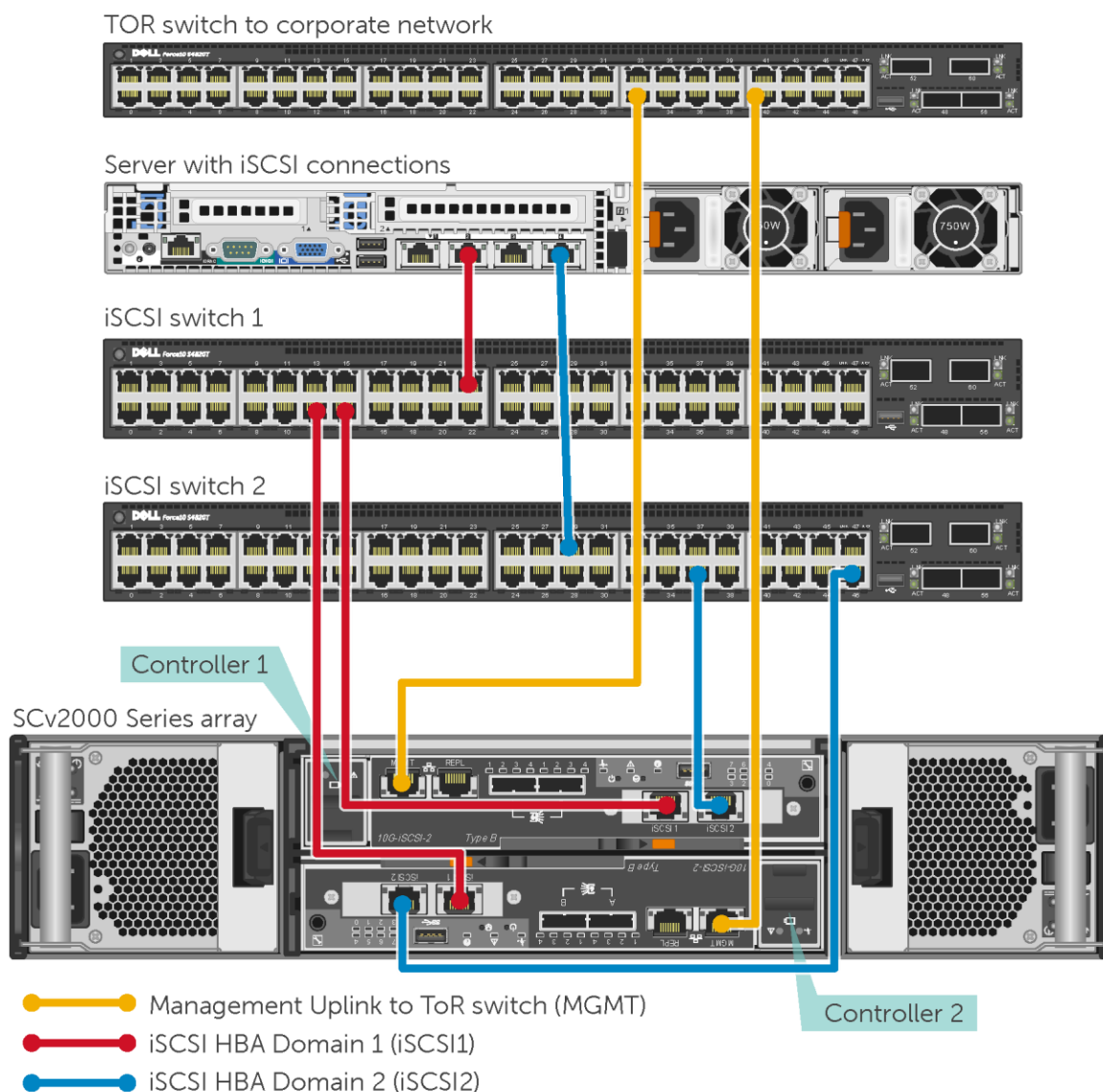
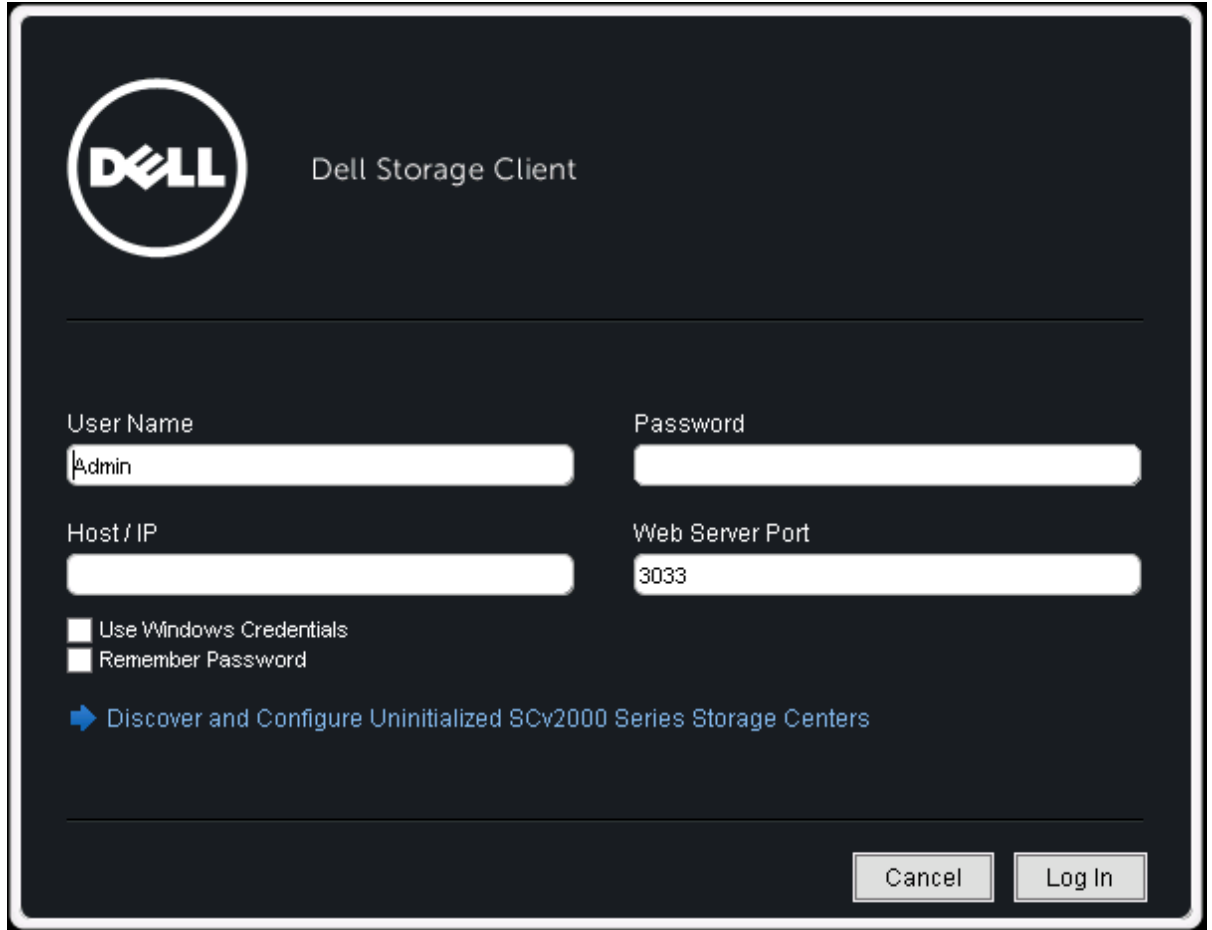


Figure 3 SCv2000, without Flex Port enabled, two fault domains, two iSCSI switches, and management uplinks from SCv2000 connected to corporate network

2.2.1 Apply a Flex Port license to an installed SCv2000

Upon receiving the license file to enable Flex Port on your existing SCv2000, the following steps need to be completed:

1. Launch Dell Enterprise Manager Client and connect to your pre-configured SCv2000.

The image shows the Dell Storage Client login window. It has a dark blue background with the Dell logo and "Dell Storage Client" text at the top. Below this, there are four input fields: "User Name" (containing "Admin"), "Password", "Host / IP", and "Web Server Port" (containing "3033"). There are two checkboxes: "Use Windows Credentials" and "Remember Password", both of which are unchecked. Below the checkboxes is a blue link that says "Discover and Configure Uninitialized SCv2000 Series Storage Centers". At the bottom right, there are two buttons: "Cancel" and "Log In".

Dell Storage Client

User Name: Admin

Password:

Host / IP:

Web Server Port: 3033

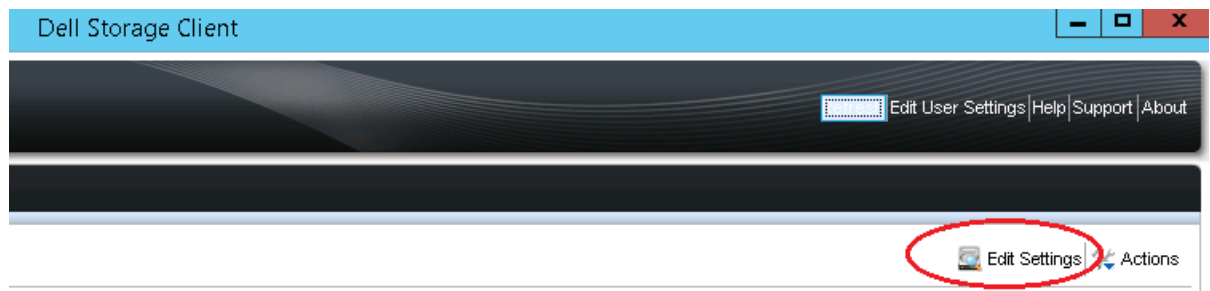
☐ Use Windows Credentials

☐ Remember Password

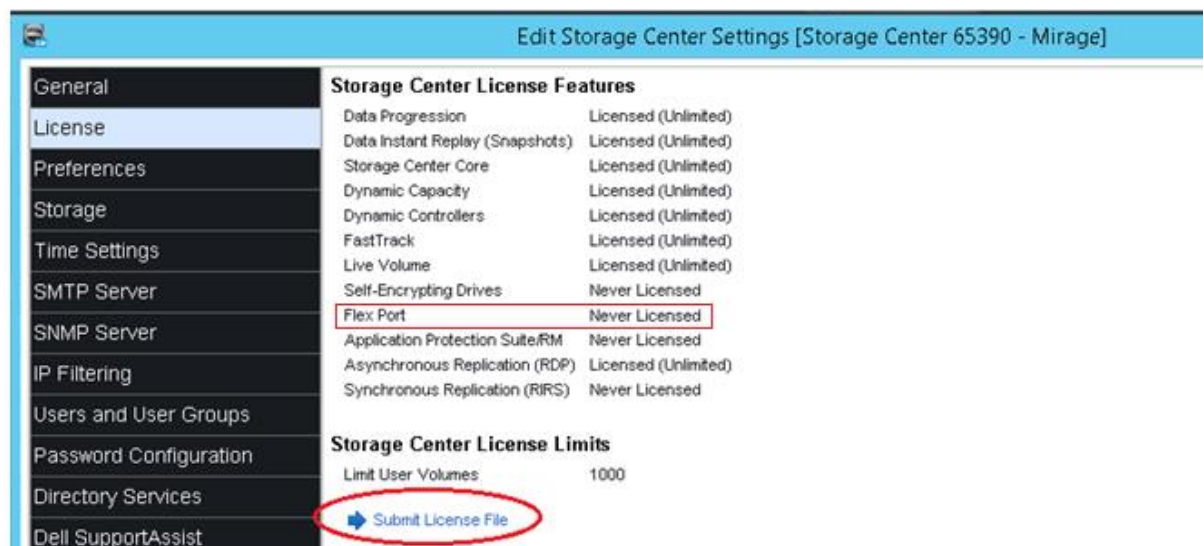
[Discover and Configure Uninitialized SCv2000 Series Storage Centers](#)

Cancel Log In

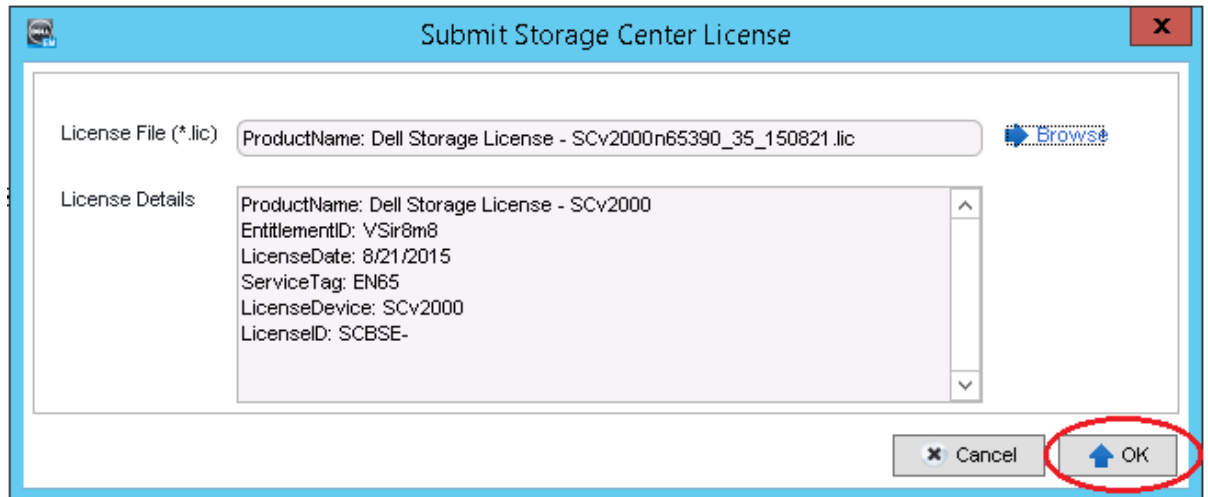
2. Click **Edit Settings** to review or add the licensed features on the array.



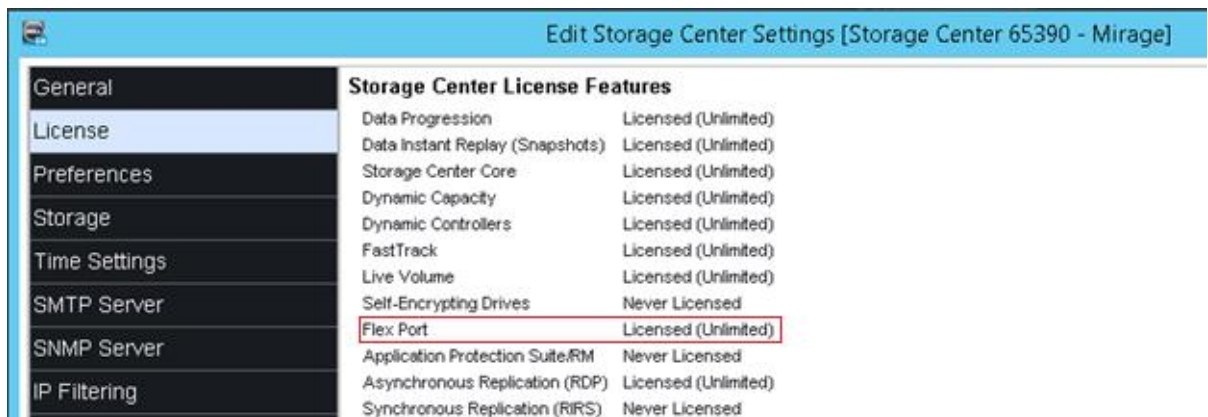
3. From the Edit Storage Center Settings dialog box, select the **License** menu tab, and then click **Submit License File**. In the dialog box that is displayed, navigate to the Flex Port license file.



4. Verify all information is correct in the dialog box displaying the details and click **OK**.



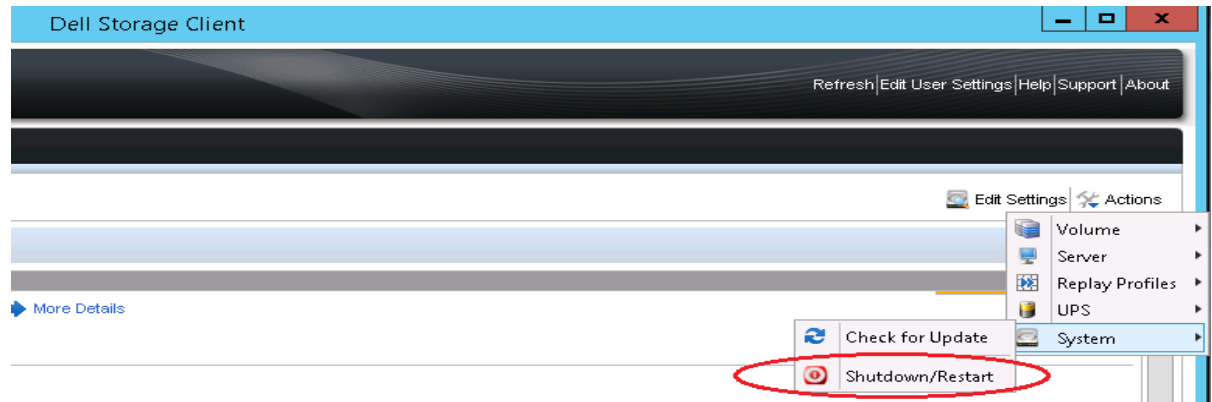
5. Check the **Storage Center License Features** section of the Storage Center Setting screen to verify that the Flex Port license submission was successful.



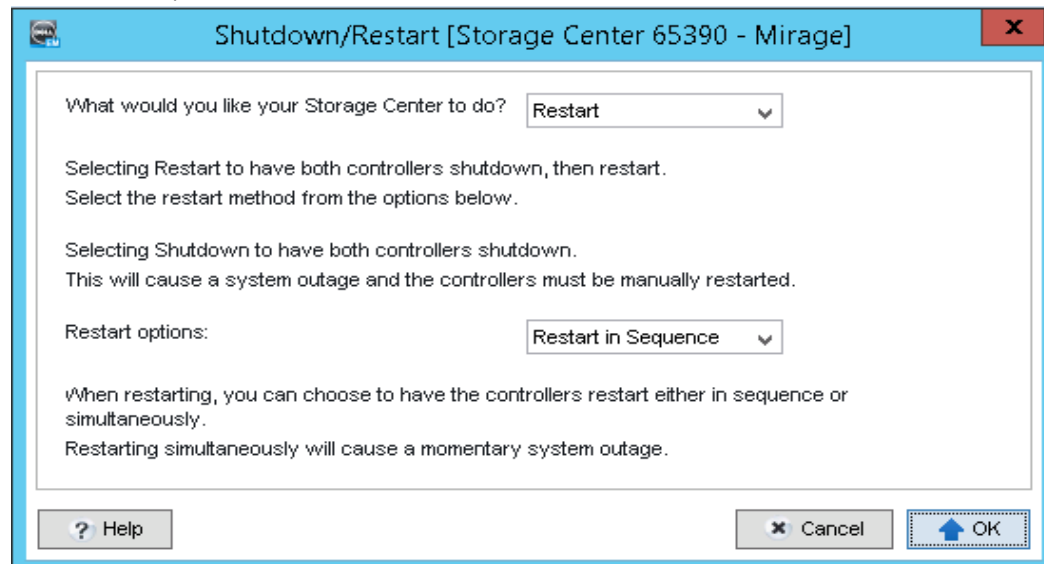
6. Restart the SCv2000 to apply the new licensing feature to both controllers.

Note: As a best practice, quiesce all I/O before restarting the SCv2000.

- a. In the Dell Storage Client, open the Summary tab and click **Actions > System > Shutdown/Restart**.



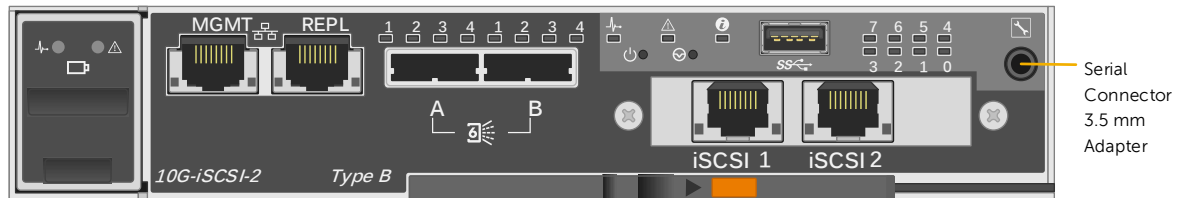
- b. In order to restart the controllers in sequential order, click **Restart in Sequence** from the Restart Options menu.



2.2.2 Establish a serial connection to the top storage controller

Create a serial connection from a computer to the top storage controller using the provided RS232 serial cable (DB9 female to 3.5 mm male adapter).

1. Use the supplied RS232 serial cable, and if needed a USB to DB9 male serial adapter, to connect a computer to the 3.5 mm serial port on the top storage controller.



2. Open a terminal emulator program on the computer.
3. Configure the serial connection in the terminal emulator as shown in the following table.

Table 1 SCv2000 Series top controller serial connection settings

Setting	Value
Emulation	VT220
Column Mode	132
Line Wrapping	Off
Connection	Serial Port
Connection Type	Direct
Baud Rate	115200
Parity	None
Data Bits	8
Stop Bits	1
Flow Control	XON/XOFF

2.2.3 Create a Flex Port fault domain

With the computer connected to the storage controller, use the command line interface (CLI) to create a fault domain for the newly licensed Flex Port feature. Run the following commands on the top controller.

Note: Before enabling the Flex Port fault domain through the console CLI, be sure to apply the Flex Port license through Dell Enterprise Manager Client, and the controllers must have been restarted.

Steps:

1. Enter the command: `tran globals UpdateAutoConfigUserInfo`

Output:

```
Welcome to Dell Compellent Storage Center
sn65390> tran globals UpdateAutoConfigUserInfo
```

2. Display the `autoConfigUserInfo` table by entering the command:

```
tran autoConfigUserInfo show
```

3. For any port entry displaying the value "(2) ConfigureAsFE" in the **PortStatus** column, change the value to "(0) LeaveAsIs" using the command:

```
tran autoConfigUserInfo set <index> PortAction LeaveAsIs
```

For example, in the `autoConfigUserInfo` table below, change the three "ConfigureAsFE" **PortStatus** entries by referencing each row index value (found in the first column).

Output:

```
sn65390> tran autoConfigUserInfo show
sn65390> [65390] Transport:AutoConfigUserInfo 09/21/2015 02:58:29 PM
```

Index	ObjectType	ProtocolType	ControllerId	Slot	SlotPort	PortGroupI	IpAddressIpv4	IpSubnetMaskIpv	IpGatewayIpv4	PortStatus	PortAction	DomainIndex	Active Controller
5 (1)	PortHBA	(3) iSCSI	65390	1	1	1	10.10.30.10	255.255.255.0	10.10.30.1	(3) ConfiguredAsFE	(0) LeaveAsIs	1	65390
7 (1)	PortHBA	(3) iSCSI	65390	1	2	2	10.10.20.10	255.255.255.0	10.10.20.1	(3) ConfiguredAsFE	(0) LeaveAsIs	2	65390
6 (1)	PortHBA	(3) iSCSI	65391	1	1	1	10.10.30.11	255.255.255.0	10.10.30.1	(3) ConfiguredAsFE	(0) LeaveAsIs	1	65390
8 (1)	PortHBA	(3) iSCSI	65391	1	2	2	10.10.20.11	255.255.255.0	10.10.20.1	(3) ConfiguredAsFE	(0) LeaveAsIs	2	65390
11 (2)	PortEmbedded	(3) iSCSI	65390	3	1	4	10.10.30.8	255.255.255.0	10.10.30.1	(3) ConfiguredAsFE	(2) ConfigureAsFE	1001	65390
9 (2)	PortEmbedded	(3) iSCSI	65390	3	2	3	10.10.20.8	255.255.255.0	10.10.20.1	(3) ConfiguredAsFE	(0) LeaveAsIs	1002	65390
12 (2)	PortEmbedded	(3) iSCSI	65391	3	1	4	10.10.30.9	255.255.255.0	10.10.30.1	(3) ConfiguredAsFE	(2) ConfigureAsFE	1001	65390
10 (2)	PortEmbedded	(3) iSCSI	65391	3	2	3	10.10.20.9	255.255.255.0	10.10.20.1	(3) ConfiguredAsFE	(0) LeaveAsIs	1002	65390
2 (3)	FaultDomainHBA	(3) iSCSI	0	0	0	2	10.10.20.12	255.255.255.0	10.10.20.1	(3) ConfiguredAsFE	(0) LeaveAsIs	2	65390
1 (3)	FaultDomainHBA	(3) iSCSI	0	0	0	1	10.10.30.12	255.255.255.0	10.10.30.1	(3) ConfiguredAsFE	(0) LeaveAsIs	1	65390
3 (4)	FaultDomainEmbedded	(3) iSCSI	0	0	0	3	10.10.20.100	255.255.255.0	10.10.20.1	(3) ConfiguredAsFE	(0) LeaveAsIs	1002	65390
4 (4)	FaultDomainEmbedded	(3) iSCSI	0	0	0	4	10.10.30.100	255.255.255.0	10.10.30.1	(3) ConfiguredAsFE	(2) ConfigureAsFE	1001	65390

Walk: Display 12 of 12



4. Display the autoConfigUserInfo table again to ensure all values have been changed to "(0) LeaveAsIs" by entering the command: `tran autoConfigUserInfo show`

Output:

```
sn65390> tran autoConfigUserInfo set 11 PortAction LeaveAsIs
sn65390> tran autoConfigUserInfo set 12 PortAction LeaveAsIs
sn65390> tran autoConfigUserInfo set 4 PortAction LeaveAsIs
sn65390> tran autoConfigUserInfo show
sn65390> [65390] Transport:AutoConfigUserInfo 09/21/2015 02:59:25 PM
```

Index	ObjectType	ProtocolType	ControllerId	Slot	SlotPort	PortGroupI	IpAddressIpv4	IpSubnetMaskIpv	IpGatewayIpv4	PortStatus	PortAction	DomainIndex	Active Controller
5 (1)	PortHBA	(3) iSCSI	65390	1	1	1	10.10.30.10	255.255.255.0	10.10.30.1	(3) ConfiguredAsFE	(0) LeaveAsIs	1	65390
7 (1)	PortHBA	(3) iSCSI	65390	1	2	2	10.10.20.10	255.255.255.0	10.10.20.1	(3) ConfiguredAsFE	(0) LeaveAsIs	2	65390
6 (1)	PortHBA	(3) iSCSI	65391	1	1	1	10.10.30.11	255.255.255.0	10.10.30.1	(3) ConfiguredAsFE	(0) LeaveAsIs	1	65390
8 (1)	PortHBA	(3) iSCSI	65391	1	2	2	10.10.20.11	255.255.255.0	10.10.20.1	(3) ConfiguredAsFE	(0) LeaveAsIs	2	65390
11 (2)	PortEmbedded	(3) iSCSI	65390	3	1	4	10.10.30.8	255.255.255.0	10.10.30.1	(3) ConfiguredAsFE	(0) LeaveAsIs	1001	65390
9 (2)	PortEmbedded	(3) iSCSI	65390	3	2	3	10.10.20.8	255.255.255.0	10.10.20.1	(3) ConfiguredAsFE	(0) LeaveAsIs	1002	65390
12 (2)	PortEmbedded	(3) iSCSI	65391	3	1	4	10.10.30.9	255.255.255.0	10.10.30.1	(3) ConfiguredAsFE	(0) LeaveAsIs	1001	65390
10 (2)	PortEmbedded	(3) iSCSI	65391	3	2	3	10.10.20.9	255.255.255.0	10.10.20.1	(3) ConfiguredAsFE	(0) LeaveAsIs	1002	65390
2 (3)	FaultDomainHBA	(3) iSCSI	0	0	0	2	10.10.20.12	255.255.255.0	10.10.20.1	(3) ConfiguredAsFE	(0) LeaveAsIs	2	65390
1 (3)	FaultDomainHBA	(3) iSCSI	0	0	0	1	10.10.30.12	255.255.255.0	10.10.30.1	(3) ConfiguredAsFE	(0) LeaveAsIs	1	65390
3 (4)	FaultDomainEmbedded	(3) iSCSI	0	0	0	3	10.10.20.100	255.255.255.0	10.10.20.1	(3) ConfiguredAsFE	(0) LeaveAsIs	1002	65390
4 (4)	FaultDomainEmbedded	(3) iSCSI	0	0	0	4	10.10.30.100	255.255.255.0	10.10.30.1	(3) ConfiguredAsFE	(0) LeaveAsIs	1001	65390


Walk: Display 12 of 12

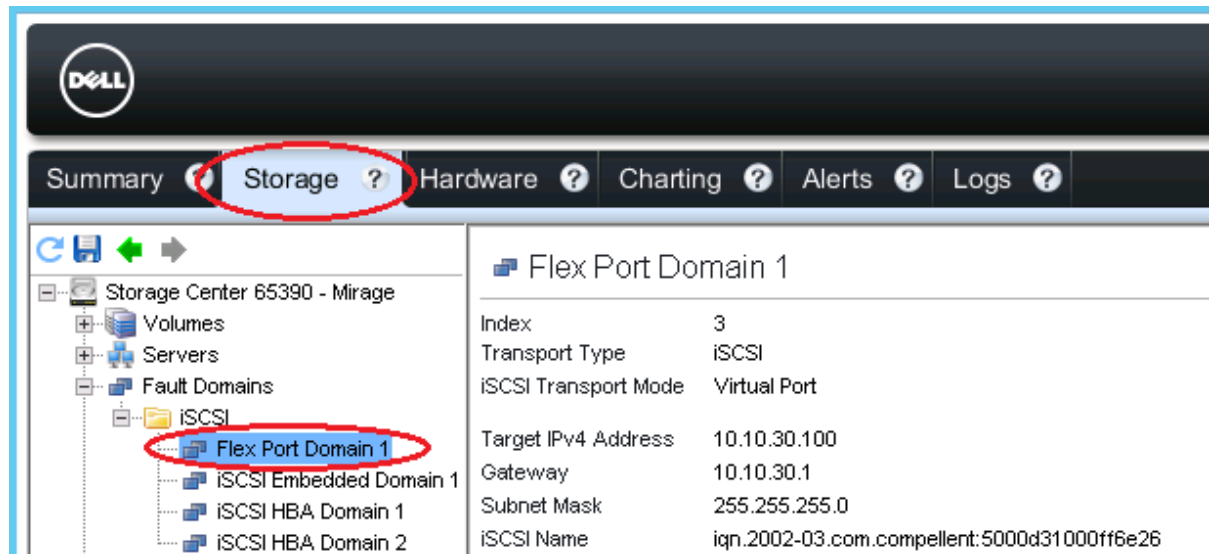
5. Create the new Flex Port fault domain with the command:

```
tran globals portAutoConfig
```

2.2.4 Configure the Flex Port fault domain

1. After enabling the Flex Port fault domain, configure the iSCSI network properties for the physical ports associated with it. In the Dell Enterprise Manager Client, select the **Storage** tab and then select **Fault Domains > iSCSI > Flex Port Domain 1**.

Note: If **Flex Port Domain 1** does not immediately display, click Refresh  in the upper left-hand pane of Dell Enterprise Manager Client.



2. With **Flex Port Domain 1** selected, click **Edit Settings** in the top right-hand portion of the Flex Port Domain 1 pane.

Flex Port Domain 1				Show	Edit Settings	Edit iSCSI IO Ports
Index	3	MTU	9000 (Jumbo)			
Transport Type	iSCSI	Fault Domain Type	Physical			
iSCSI Transport Mode	Virtual Port	VLAN ID	Untagged			
Target IPv4 Address	10.10.30.100	Class of Service Priority	0			
Gateway	10.10.30.1					
Subnet Mask	255.255.255.0					
iSCSI Name	iqn.2002-03.com.compellent:5000d31000ff6e26					

The **Edit Fault Domain Settings** dialog box displays network properties that need to be configured on the Flex Port fault domain. The target IPv4 address (or virtual port) represents the fault domain iSCSI control port that enables iSCSI access to the controllers. The use of VLAN tags is optional, and discussed in Section 1.3. As a Dell best practice, use an MTU size of 9000 Jumbo frames in the iSCSI network.

During Flex Port configuration, decide whether the Flex Port fault domain will have a new subnet, or be added to an existing fault domain that was previously configured on the SCv2000. For basic functionality purposes, this paper will detail configuration steps for two fault domains (two subnets).

Edit Fault Domain Settings [Storage Center 65390 - Mirage] [Flex Port Domain 1]

Name	Flex Port Domain 1
Transport Type	iSCSI
Notes	
Target IPv4 Address	10.10.30.100
Subnet Mask	255.255.255.0
Gateway	10.10.30.1
VLAN Tagged	<input type="checkbox"/>
VLAN ID	0
MTU	9000 (Jumbo)

[Edit Advanced Port Settings](#)

[? Help](#) [Cancel](#) [OK](#)

- After all settings have been configured for the Flex Port fault domain, configure the iSCSI network properties for the physical ports associated with the Flex Port fault domain. Right-click one of the non-configured ports in the **Flex Port Domain 1** pane and then click **Edit Settings**

Flex Port Domain 1

Show Edit Settings Edit iSCSI IO Ports Configure NAT Port Forwarding

Index	3	MTU	9000 (Jumbo)
Transport Type	iSCSI	Fault Domain Type	Physical
iSCSI Transport Mode	Virtual Port	VLAN ID	Untagged
Target IPv4 Address	10.10.30.100	Class of Service Priority	0
Gateway	10.10.30.1		
Subnet Mask	255.255.255.0		
iSCSI Name	iqn.2002-03.com.compellent:5000d31000ff6e26		

Physical Ports

Name	Controller	Slot	Slot Port	IP Address	Subnet Mask	Gateway	iSCSI Name	Purpose	Status
5000D31000FF6E24	Bottom Co...	3	1	10.10.30.8	255.255.255.0	10.10.30.1	iqn.2002-03.com.compellent:5000d31000ff6e24	Front End	Up
5000D31000FF6E25	Top Contr...	3	1	10.10.30.9	255.255.255.0	10.10.30.1	iqn.2002-03.com.compellent:5000d31000ff6e25	Front End	Up

Edit Settings Ping Address

Edit Controller Port Settings [5000D31000FF6E24]

Name 5000D31000FF6E24 Reset name to WWN

IP Address 10.10.30.8

Subnet Mask 255.255.255.0

Gateway 10.10.30.1

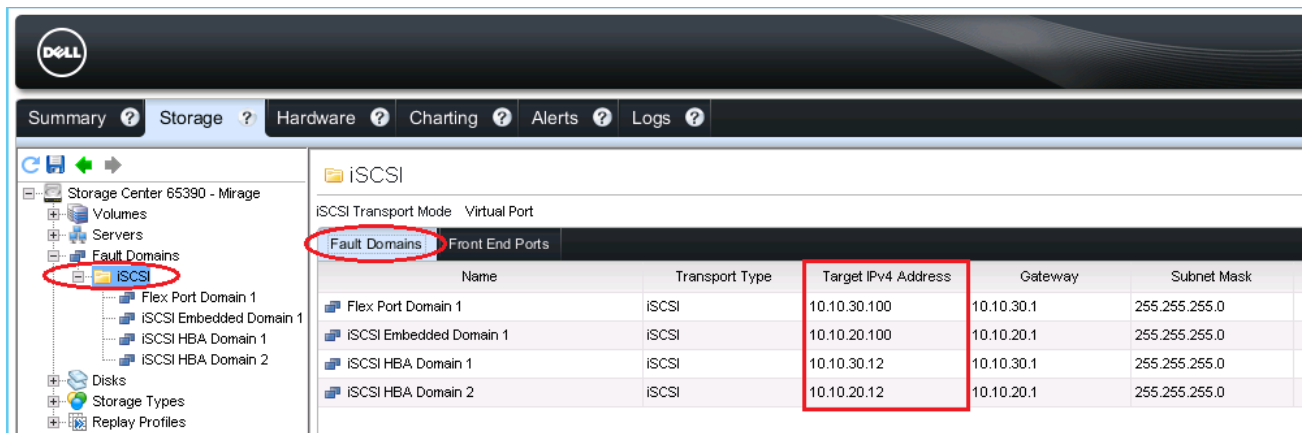
? Help Cancel OK

Note: The SCv2000 does not support the configuration of IPv6 networks on front-end data ports.

- Repeat this process for the next physical port associated with the Flex Port fault domain (in this example, the top controller). Configure it with an additional IPv4 address in the same Flex Port fault domain subnet.

This completes the configuration for the Flex Port Fault Domain for both the top and bottom controllers.

To view network address assignments on all SCv2000 fault domains, select the **Storage** tab in the Dell Enterprise Manager Client, navigate to **Fault Domains > iSCSI**, and then click the **Fault Domains** tab in the iSCSI pane.

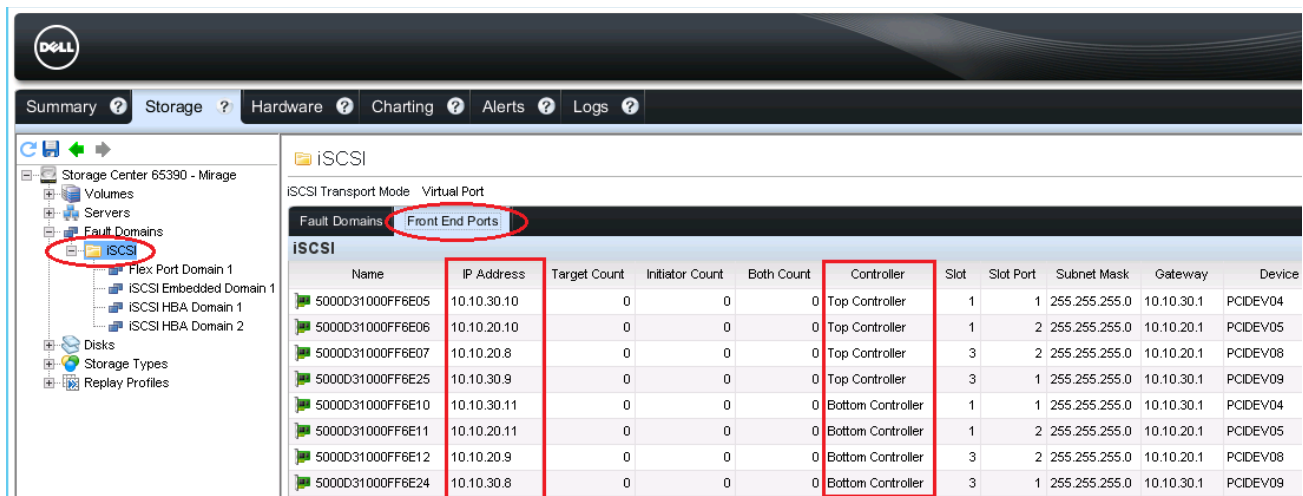


The screenshot shows the Dell Enterprise Manager Client interface. The left sidebar shows a tree view with 'Storage Center 65390 - Mirage' expanded, and 'iSCSI' selected under 'Fault Domains'. The main pane shows the 'iSCSI' configuration with the 'Fault Domains' tab selected. A table lists the network address assignments for all SCv2000 Fault Domains.

Name	Transport Type	Target IPv4 Address	Gateway	Subnet Mask
Flex Port Domain 1	iSCSI	10.10.30.100	10.10.30.1	255.255.255.0
iSCSI Embedded Domain 1	iSCSI	10.10.20.100	10.10.20.1	255.255.255.0
iSCSI HBA Domain 1	iSCSI	10.10.30.12	10.10.30.1	255.255.255.0
iSCSI HBA Domain 2	iSCSI	10.10.20.12	10.10.20.1	255.255.255.0

Figure 4 Network address assignments for all SCv2000 Fault Domains

To view network address assignments of all the SCv2000 fault domains physical ports, select the **Storage** tab, navigate to **Fault Domains > iSCSI**, and then click the **Front End Ports** tab in the iSCSI pane.



The screenshot shows the Dell Enterprise Manager Client interface. The left sidebar shows a tree view with 'Storage Center 65390 - Mirage' expanded, and 'iSCSI' selected under 'Fault Domains'. The main pane shows the 'iSCSI' configuration with the 'Front End Ports' tab selected. A table lists the network address assignments for all SCv2000 physical ports within configured fault domains.

Name	IP Address	Target Count	Initiator Count	Both Count	Controller	Slot	Slot Port	Subnet Mask	Gateway	Device
5000D31000FF6E05	10.10.30.10	0	0	0	Top Controller	1	1	255.255.255.0	10.10.30.1	PCIDEV04
5000D31000FF6E06	10.10.20.10	0	0	0	Top Controller	1	2	255.255.255.0	10.10.20.1	PCIDEV05
5000D31000FF6E07	10.10.20.8	0	0	0	Top Controller	3	2	255.255.255.0	10.10.20.1	PCIDEV08
5000D31000FF6E25	10.10.30.9	0	0	0	Top Controller	3	1	255.255.255.0	10.10.30.1	PCIDEV09
5000D31000FF6E10	10.10.30.11	0	0	0	Bottom Controller	1	1	255.255.255.0	10.10.30.1	PCIDEV04
5000D31000FF6E11	10.10.20.11	0	0	0	Bottom Controller	1	2	255.255.255.0	10.10.20.1	PCIDEV05
5000D31000FF6E12	10.10.20.9	0	0	0	Bottom Controller	3	2	255.255.255.0	10.10.20.1	PCIDEV08
5000D31000FF6E24	10.10.30.8	0	0	0	Bottom Controller	3	1	255.255.255.0	10.10.30.1	PCIDEV09

Figure 5 Network address assignments for all SCv2000 physical ports within configured fault domains

3 Best practices

Whether performing an initial installation and configuration or enabling licensed features such as Flex Port on the SCv2000 Series or SCv4000 Series storage arrays.

3.1.1 SCv2000 installation worksheet

Use the Storage System Deployment Guide installation [worksheet](#) to record SCv2000 installation information in your SAN environment. The information recorded on the installation worksheet is referenced during [discovering and configuring the storage center](#).

For more information, see the *Dell Storage Center SCv2000 and SCv2020 Storage System Deployment Guide* available on dell.com/support/manuals/.

3.1.2 SCv2000 management cabling change for Flex Port integration

Starting with a configured SCv2000 and MGMT ports connected to the TOR corporate network switch requires minimal re-cabling in order for Flex Port to function properly. The diagram in Figure 6 represents these standard cabling corrections.

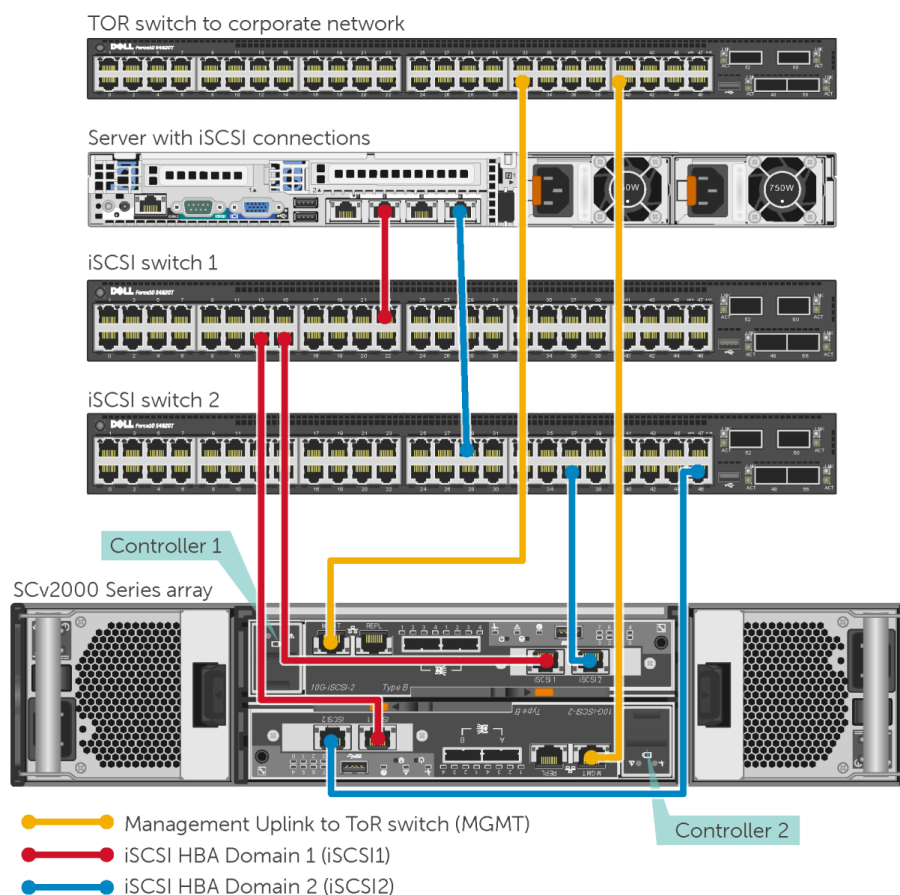


Figure 6 Initial cabling for an existing SCv2000 without Flex Port enabled

After enabling the Flex Port feature on the SCv2000, the MGMT cables that are currently connected to both controllers from the TOR corporate switch need to be moved to the iSCSI switches, as shown in Figure 7.

VLAN tagging for iSCSI traffic on the enabled Flex Port MGMT port is discussed in Section 1.3.

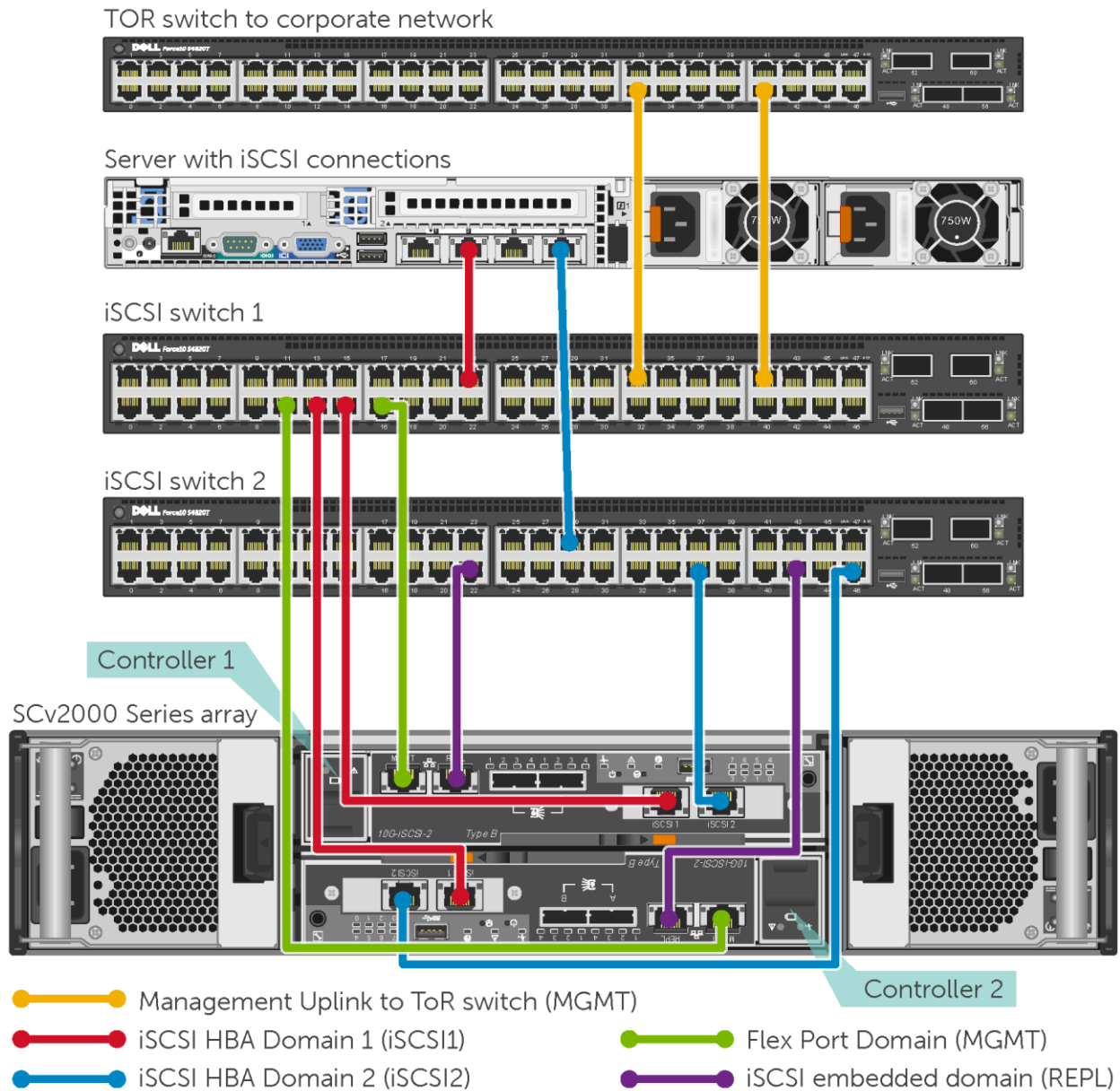


Figure 7 Corrected cabling for the existing SCv2000 required to enable Flex Port

Note: If the MGMT port on the active controller loses link connectivity, then management access to the chassis may be lost.

Table 2 Example IPv4 configuration of an SCv2000 with two fault domains (see Section 1.4)

Port Identification	Virtual Management IPv4 Address	Top Controller IPv4 Address	Bottom Controller IPv4 Address
Fault Domain 1 (10.10.30.0/24)			
MGMT (Flex Port)	10.10.30.100	10.10.30.8	10.10.30.9
iSCSI1 (iSCSI HBA Domain 1)	10.10.30.12	10.10.30.10	10.10.30.11
Fault Domain 2 (10.10.20.0/24)			
REPL (Replication)	10.10.20.100	10.10.20.8	10.10.20.9
iSCSI2 (iSCSI HBA Domain 2)	10.10.20.12	10.10.20.10	10.10.20.11

Note: the above IPv4 assignments are only for example.



A Glossary

Baseboard Management Controller (BMC): An independent connection to a specialized service processor for monitoring the physical state of a device using various sensors.

Dell Enterprise Manager Client: Windows-based application that connects to the Enterprise Manager Data Collector to provide a centralized management console for one or more storage devices.

Fault Domain: A measure of hardware components sharing the same single point of failure.

Flex Port: A licensed feature on the SCv2000 Series and SC4000 Series so the MGMT port can be simultaneously used for both management and iSCSI data traffic within a single physical port.

Front-End Data Port: A characterization of ports by which applications or servers interact with interfaces or services.

Management (MGMT): A physical port on the SCv2000 Series and SC4000 Series that can be used strictly for management without Flex Port licensing or used as both management and front-end iSCSI port when Flex Port is enabled.

SAN Environment: An environment whose primary purpose is the transfer of data between computer systems and storage devices.

Virtual Local Area Network (VLAN): A logical network acting as though it is physically separate than other physical and virtual LANs supported by the same switches and/or routers.



B Additional resources

Dell.com/support is focused on meeting your needs with proven services and support.

DellTechCenter.com is an IT Community where Dell employees connect with customers to share knowledge, best practices, and information about Dell products and installations.

Referenced or recommended Dell publications:

- *Dell Storage Center SCv2000 and SCv2020 Storage System Deployment Guide*
<http://www.dell.com/support/manuals/us/en/19/topic/storage-sc2000/SCv2000SCv2020DG-v3/en-us>
- *Dell Storage Center SCv2000 and SCv2020 Storage System Owner's Manual*
<http://www.dell.com/support/manuals/us/en/19/topic/storage-sc2000/SCv2000SCv2020OM-v3/en-us>
- *Setting Up Your Dell SCv2000 and SCv2020 Storage System*
http://downloads.dell.com/Manuals/Common/SCv2000_Series_Setup_en-us.pdf
- *Dell Storage Center SC4020 Storage System Owner's Manual*
<http://www.dell.com/support/manuals/us/en/19/topic/dell-compellent-sc4020/SC4020OM-v8/en-us>
- *Dell Enterprise Manager 2015 R1 Administrator's Guide*
http://www.dell.com/support/manuals/us/en/19/topic/storage-sc2000/EM2015R1_AG-v4/en-us
- *Dell Storage Compatibility matrix*
<http://en.community.dell.com/techcenter/storage/w/wiki/5069.dell-storage-compatibility-matrix-ps-series-sc-series-fs-series>

