iSCSI

iSCSI SAN Concepts

iSCSI SANs use Ethernet connections between computer systems, or host servers, and high performance storage subsystems. SAN components include iSCSI Host Bus Adapters (HBAs) or Network Interface Cards (NICs) in the host servers, switches, and routers that transport the storage traffic, cables, storage processors, and storage disk systems.

iSCSI SAN uses a client-server architecture. The client, called iSCSI initiator, operates on the host. It initiates iSCSI sessions by issuing iSCSI commands and transmits them, encapsulated using the iSCSI protocol, to a server. The server is known as the iSCSI target. The iSCSI target represents a physical storage system on the network. It can also be provided by a virtual iSCSI SAN, for example, an iSCSI target emulator running in a virtual machine. The iSCSI target responds to the initiator's commands by transmitting the required iSCSI data.

Connecting iSCSI to Cisco HX Domain

Connect FC Storage Connection to FI and Configure as a FC Storage Port

In the UCS Manager, perform the following steps:

Step 1 In the **Navigation** pane, click **Equipment**.

Step 2 Expand **Equipment** > **Fabric Interconnects** > **Fabric_Interconnect_Name**.

Step 3 Expand the node for the ports that you want to configure.

Step 4 Under the **Ethernet Ports** node, select a port.

Step 5 Select **Configure as Appliance Port** from the drop-down list.

    a) If a confirmation dialog box appears, click **Yes**.

Step 6 In the **Configure as Appliance Port** dialog box, complete the required fields.

Step 7 In the **VLANs** section, do the following:

a) In the **Port Mode** field, you can click the **Create VLAN** link to create a new VLAN.

Access—Cisco UCS Manager GUI displays the Select VLAN drop-down list that allows you to choose a VLAN to associate with this port or port channel.

Note	If traffic for the appliance port needs to traverse the uplink ports, you must also define each VLAN used by this port in the LAN cloud. For example, you need the traffic to traverse the uplink ports if the storage is also used by other servers, or if you want to ensure that traffic fails over to the secondary fabric interconnect if the storage controller for the primary fabric interconnect fails.

b) Choose a VLAN from the **Select VLAN** drop-down list.

Step 8 Click **OK**.

Creating VLAN for Adding iSCSI Storage to HX FI Domain

Step 1 Open a web browser and enter the IP address for Cisco UCS Manager. Enter the login credentials.

Step 2 Navigate to **LAN tab** > **LAN** > **LAN Cloud** > **VLANS**.

Step 3 Right-click and select **Create VLANs** as shown in the following table:

VLAN Name	Description	Multicast Policy Name	VLAN ID (by default)
hx-extstorage-iscsi	Used for adding external storage connectivity	HyperFlex	Sample Value: 4201

Note	• Configuration option is Common/Global. It applies to both fabrics and uses the same configuration parameters in both cases.
	• Sharing type is set to None.

Step 4 Click **Ok**.

Configuring External Storage on a New Cluster with HX Installer Missing

If the HX cluster is not yet created, perform the following steps to add vNIC and VLAN for iSCSI traffic.

SUMMARY STEPS

1. In the HX Data Platform installer on the UCSM Configuration page, check the **Enable HX** option.
2. In the **iSCSI Storage** box, check the **Enable iSCSI Storage** checkbox.

DETAILED STEPS

Step 1 In the HX Data Platform installer on the UCSM Configuration page, check the **Enable HX** option.

The **iSCSI Storage** box appears.

Step 2   In the **iSCSI Storage** box, check the **Enable iSCSI Storage** checkbox.

Configuring External Storage on an Existing Cluster

If the HX Cluster is already Created, you may use the following tasks to add vNics and VSAN manually.

Creating MAC Address Pools for External Storage

Change the default MAC address blocks to avoid duplicate MAC addresses that already exist. Each block contains **100 MAC addresses** by default to allow for up to 100 HX servers for deployment per UCS system. We recommend that you use one MAC pool per vNIC for easier troubleshooting.

| **Note** | The 8th digit is set to A or B. The *A* is set on vNICs pinned to Fabric Interconnect (FI) A. The *B* is set on vNICs pinned to FI B. |

Step 1   Open a web browser and enter the IP address for Cisco UCS Manager. Enter the login credentials.

Step 2   In Cisco UCS Manager, navigate to **LAN tab** > **Pools** > **root** > **Sub-org** > **hx-cluster** > **MAC Pools**.

Step 3   Right-click **MAC Pools** and select **Create MAC Pool**.

Step 4   In the **Define Name and Description** page of the **Create MAC Pool** wizard, complete the required fields as shown in the following table:

MAC Pool Name	Description	Assignment Order	MAC Address block
hx-extstorage-a	MAC pool for adding external storage to HyperFlex System	Sequential	00:25:B5:XX:01:01-63

| **Note** | Make sure to check the last block of MAC addresses and use next order of block to create the new MAC pools for both fabrics. |

Step 5   Click **Next**.

Step 6   In the **Add MAC Addresses** page of the **Create MAC Pool** wizard, click **Add**.

Step 7   In the **Create a Block of MAC Addresses** dialog box, complete the following fields:

Name	Description
First MAC Address field	The first MAC address in the block.
Size field	The number of MAC addresses in the block.

Step 8   Click **OK**.

Step 9   Click **Finish**.

What to do next

Repeat steps to create MAC Pool - **hx-extstorage-b** for FI b.

Creating a vNIC Template for iSCSI Storage

This template is a policy that defines how the vNIC on a server connects to the LAN. It is also called a vNIC LAN connectivity template. You must include this policy in a service profile for it to take effect.

Before you begin

This policy requires that one or more of the following resources already exist in the system:

- Named VLAN

- MAC pool

- Jumbo MTU

- QoS policy

Step 1 In Cisco UCS Manager, navigate to **LAN tab > Policies > root > Sub-Organization > Hyperflex > vNIC Templates**.

Step 2 Right-click the **vNIC Templates** node and choose **Create vNIC Template**.

Step 3 In the **Create vNIC Template** dialog box, complete the following fields:

Name	Description
Name field	Enter **extstorage_iscsi-a**
	This name can be between 1 and 16 alphanumeric characters. You cannot use spaces or any special characters other than - (hyphen), _ (underscore), : (colon), and . (period), and you cannot change this name after the object is saved.
Description field	A user-defined description of the template.
	Enter up to 256 characters.
Fabric ID field	Select **A**
Redundancy drop-down list	Primary
Target	Adapter
Template Type field	Select **Updating Template**.
	vNICs created from this template are updated if the template changes.
VLAN field	hx-extstorage-iscsi (what you created above)
CDN Source	vNIC Name
MTU drop-down list	**9000**

Name	Description
MAC Pool	**hx-extstorage-a** (created earlier)
QoS Policy drop-down list	**Bronze**
Connection	**Dynamic**

Step 4   Click **Ok**.

What to do next

Create the vNIC template for FI B.

LAN Connectivity Policy

Connectivity policies determine the connections and the network communication resources between the server and the LAN in the network. These policies use pools to assign MAC addresses, to servers and to identify the vNICs that the servers use to communicate with the network.

Note   We do not recommend that you use static IDs in connectivity policies, because these policies are included in service profiles and service profile templates. Also, connectivity policies can be used to configure multiple servers.

Creating a LAN Connectivity Policy

Step 1   In the Navigation pane, click the **LAN** tab.

Step 2   On the **LAN** tab, expand **LAN > Sub-Org > hx-cluster > LAN Connectivity Policies> HyperFlex**.

Step 3   Click **Add vNICs**.

Step 4   In the **Create vNIC** dialog box, enter a name. **Check Use vNIC Template** and **Redundancy Pair**.

Example: iscsi-A

Step 5   Enter **Peer Name**.

Example: iscsi-B

Step 6   Select **vNIC Template** name *iscsi-A* from the drop-down list. Click **Ok**.

Step 7   Repeat steps 3 - 6 to create vNIC *iscsi-B* and assign *vNIC-b* template to it.

Step 8   Click **Save Changes**. In the Save Changes box that displays, click **Yes** to accept the changes.
Includes the LAN connectivity policy to the HX node service profile template.

Including LAN Connectivity Policy to the HX Node Service Profile Template

Step 1   Navigate to **Server** tab. Expand **root > Sub-Org > hx-cluster > Service Template hx-nodes**

Step 2 In the work pane, on **Network** tab, select `HyperFlex` from the drop-down list under the **LAN Connectivity Policy** section.

Step 3 Click **Modify vNIC/HBA Placement**. Check the iscsi vNIC for proper order. Make sure they are last in the order. Re-arrange as necessary.

Note If you are adding both FC and iSCSI storage, then the order of vHBAs will precede the order of the vNICs.

Step 4 Click **Save**.

This causes the Service Profiles associated with this SPT to require user acknowledgment and the HX node re-boots.

Adding Network Adapters for Hyper-V

Step 1 Open the Windows **Device Manager**.

Step 2 Right-click on **Network Adapters**.

Step 3 Scan the system for all hardware changes.