



Enabling Next-Generation
Virtualized Data Center

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Deploy ESXi ISCSi Boot on UCS Blade with Pure Storage FlashArray

Document Version: 0.4

December 2015



ATTENTION

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About this Document

This document provides the latest information about the Pure Storage Connector for Cisco UCS Director.

It includes information on how to execute the workflow in UCS Director to deploy ESXi iSCSI Boot on UCS blade with Pure Storage FlashArray.

Intended Audience

This user guide addresses users of the Pure Storage Connector for Cisco UCS® Director. This user guide assumes that the reader is an experienced user of Cisco UCS Director.

It is assumed the Administrator installing the Connector is well versed in administration of Pure Storage FlashArray, including: creating accounts, licensing of hardware and software & storage configuration. Content related to the administration of Pure Storage is not duplicated in this document.

Revision History

Version	Release Date	Author	Reviewed By	Approved By
1.0	7-Jan-2016	Saifur & Saravanan	Sudheesh	Sudheesh



Introduction

This workflow deploys ESXi host on UCS Blade server using iSCSI SAN Boot with Pure FlashArray. It will do End to End provisioning on FlashStack

Getting Started with the Workflow

To begin with, you should first import the workflow in UCS Director.

Complete the following steps to import the workflow:

1. Download the attached .ZIP file onto your computer.
2. Unzip the file on your computer. Once you unzip; **.WFDX** file will be extracted.
3. Log in to UCS Director as a user with the **system-admin** privileges.
4. Go to **Policies > Orchestration** and click **Import**.
5. Click **Browse** and navigate to the location on your computer where the **.WFDX** file is located. Select the **.WFDX** file and click **Open**.
6. Click **Upload**.
7. Once the file is uploaded click **Ok > Next**.
8. Click **Import**.

A new folder called "**Pure Storage Flash Array**" is created in "**Policies > Orchestration**".

The **Pure Storage Flash Array** folder contains the imported workflow. You can update the included tasks with information about the specific environment.

Workflow

Deploy ESXi host on UCS Blade iSCSI SAN boot with Pure Storage FlashArray

This workflow provisions ESXi Host on Cisco UCS Blade booting from iSCSI SAN and Integrates with vCenter Server on Pure Storage FlashStack.

UCSD Versions

The version of UCSD that is compatible with this workflow is UCS Director 5.4

Category

Virtualization

Compute

Network and

Storage

Components

Cisco UCS Director

Cisco UCS Director Baremetal Agent

Pure Storage FlashArray 4.6

Prerequisites

Before you execute the Workflow in the UCS Director, ensure the following conditions are met.

1. Pure Storage Open Automation Module must be added and active in UCS Director.
2. The FlashStack Infrastructure components such as VMware vCenter, Cisco UCSM, Cisco Nexus 5Ks/MDS Switches and Pure Storage FlashArray must be added to UCS Director.
3. UCS Director BMA with the following configuration must be integrated into UCS Director.
 - DHCP Scope configured
 - ESXI ISO Image uploaded
 - ESXI OS Templates and Kick-start configuration files created.

Refer [Configure ESXi PXE Image](#) for more information on configuring ESXI ISO Image.

4. Enable ESXi Install on SAN Boot LUN. To do so, modify the **ks.cfg** file in **/opt/cnsaroot/templates/<ESXi_Image_Name>** folder.
 - 4.1 Remove # from the following line:
install --firstdisk --overwritevmfs
 - 4.2 Change the above line as mentioned below:
install --firstdisk=remote --overwritevmfs
5. Ensure the UCS blade used for provisioning do not have any local hard disk
6. Ensure vNIC and vHBA templates are created in UCSM
 - vNIC Template** - Create vNIC templates as per your requirement. We have used 2 vNIC Templates for eth0 and eth1.
Select **PXE VLAN** as native in any one of the template which will be used for PXE booting.
 - vHBA Template** - Create vHBA templates as per your requirement. We have used 4 vHBA templates for vHBA-A, vHBA-B, vHBA-C & vHBA-D
7. Ensure the following ISCSI Boot Configurations are done in UCSM:
 - o Enable QOS System Class ISCSI **Gold**
 - o Create a QOS Policy for ISCSI Adapter
 - o Create an Adapter Policy for ISCSI Adapter
 - o Create Initiator IQL Pool

Refer the following links for detailed procedure on how to create the policies mentioned above.

http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/sw/gui/config/guide/2-0/b_UCSM_GUI_Configuration_Guide_2_0/b_UCSM_GUI_Configuration_Guide_2_0_chapter_0_11101.html#concept_D7BF302366F24CF5A602B0E0BD18787C

<http://www.cisco.com/c/en/us/support/docs/servers-unified-computing/ucs-manager/116003-iscsi-ucs-config-00.html>

<http://www.ccierants.com/2012/03/boot-from-san-iscsi-with-cisco-ucs-20.html>

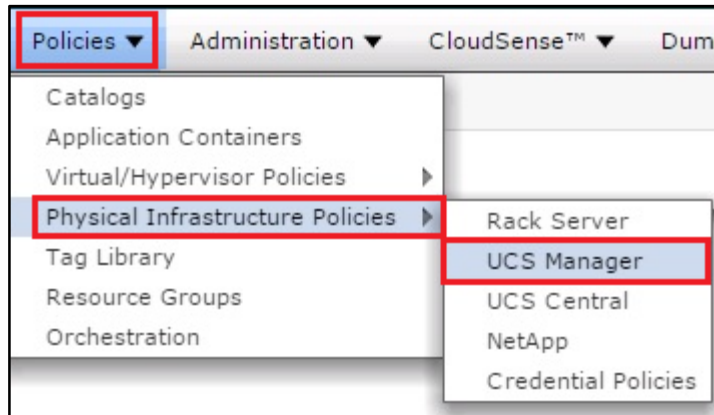
8. Ensure that an IP Pool is created for ISCSI initiator.

Note: UCSD will only use the default ISCSI Initiator IP Pool available in the UCS Manager named as **iscsi-initiator-pool**. You should add an IP block to this IP pool.

Creating UCS Manager Policies in UCS Director

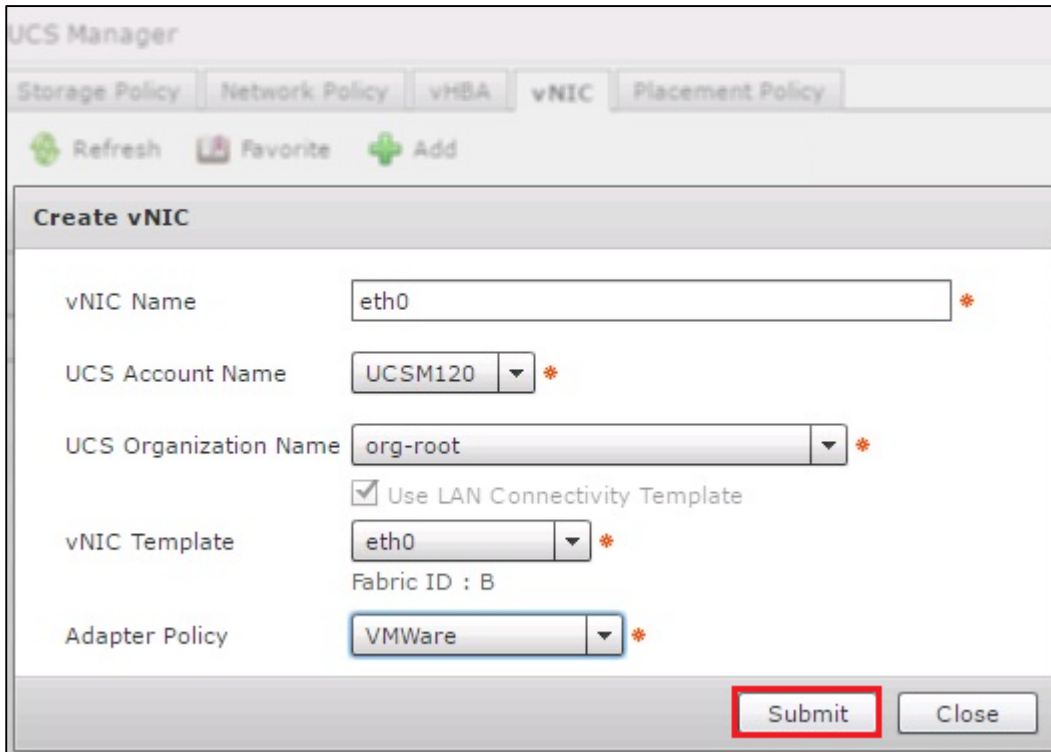
Before executing the workflow, ensure UCS Manager Policies are created in UCS Director.

1. Login to **UCS Director** with **admin** credentials.
2. Go to **Policies > Physical Infrastructure Policies > UCS Manager**.



3. Click **vNIC** tab > **Add**.

The **Create vNIC** page appears.



UCS Manager

Storage Policy | Network Policy | vHBA | **vNIC** | Placement Policy

Refresh Favorite Add

Create vNIC

vNIC Name: eth0 *

UCS Account Name: UCSM120 *

UCS Organization Name: org-root *

☒ Use LAN Connectivity Template

vNIC Template: eth0 *

Fabric ID : B

Adapter Policy: VMWare *

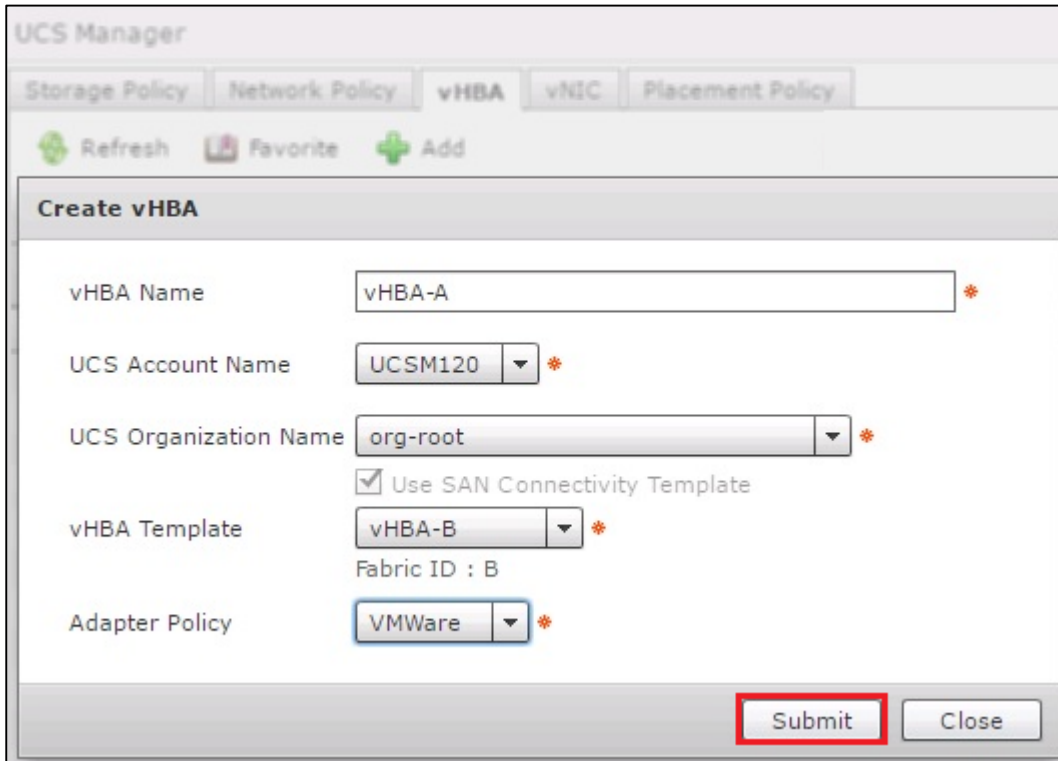
Submit Close

4. Enter the following information:

Field	Description
vNIC Name	Enter eth0
UCSM Account Name	Select the UCSM account
UCS Organization Name	Select the organization according to your environment
vNIC Template	Select the template according to your environment
Adapter Policy	Choose VMware from the drop-down list

- Click **Submit**.
- Repeat step 4 to create **eth1**.
- In the UCS Manager, click **vHBA** tab > **Add**.

The **Create vHBA** page appears.



UCS Manager

Storage Policy Network Policy **vHBA** vNIC Placement Policy

Refresh Favorite Add

Create vHBA

vHBA Name

UCS Account Name

UCS Organization Name

☒ Use SAN Connectivity Template

vHBA Template

Fabric ID : B

Adapter Policy

Submit Close

8. Enter the following information:

Field	Description
vHBA Name	Enter vHBA-A
UCSM Account Name	Select the UCSM account
UCS Organization Name	Select the organization according to your environment
vHBA Template	Select the template according to your environment
Adapter Policy	Choose VMware from the drop-down list

9. Click **Submit**.

10. Repeat the Setup 8 for creating vHBA-B, C & D.

11. To create a Network Policy, in the UCS Manager; click **Network Policy** tab > **Add**.

The **Add UCS Network Policy** page appears.

UCS Manager

Storage Policy Network Policy vHBA vNIC

Refresh Favorite Add

Add UCS Network Policy

Policy Name *

Policy Description

UCS Account Name *

UCS Organization Name *

Dynamic vNIC Connection Policy

LAN Connectivity Type *

Add vNIC *

Template for vNIC1 *

Template for vNIC2 *

Submit Close

12. Enter the following information:

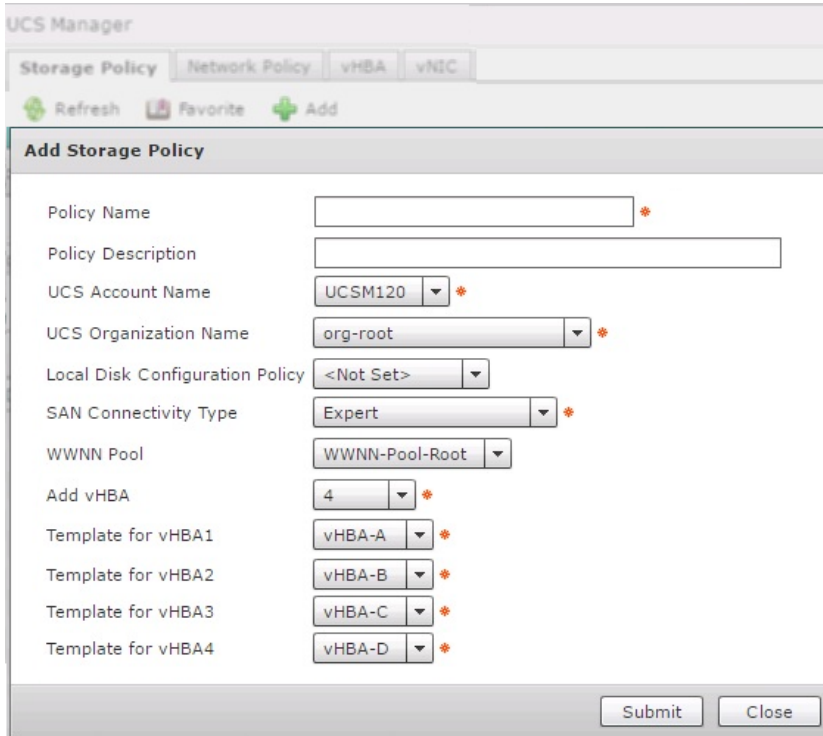
Field	Description
Policy Name	Enter policy name
Policy Description	Enter description for the policy
UCSM Account Name	Select the UCSM account
UCS Organization Name	Select the organization according to your environment
Dynamic vNIC Connection Policy	Choose <Not Set>
LAN Connectivity Policy	Choose Expert

Add vNIC	Choose 2 (select numbers as required)
Template for vNIC1	Choose eth0
Template for vNIC2	Choose eth1

13. Click **Submit**.

14. To create a Storage Policy, in the UCS Manager; click **Storage Policy > Add**.

The **Add Storage Policy** page appears.



UCS Manager

Storage Policy Network Policy vHBA vNIC

Refresh Favorite Add

Add Storage Policy

Policy Name

Policy Description

UCS Account Name UCSM120

UCS Organization Name org-root

Local Disk Configuration Policy <Not Set>

SAN Connectivity Type Expert

WWNN Pool WWNN-Pool-Root

Add vHBA 4

Template for vHBA1 vHBA-A

Template for vHBA2 vHBA-B

Template for vHBA3 vHBA-C

Template for vHBA4 vHBA-D

Submit Close

15. Enter the following information:

Field	Description
Policy Name	Enter policy name
Policy Description	Enter description for the policy
UCSM Account Name	Select the UCSM account
UCS Organization Name	Select the organization according to your environment
Local Disk Configuration Policy	Choose <Not Set>
SAN Connectivity Policy	Choose Expert
WWWN Pool	Choose the Pool according to your environment
Add vHBA	Choose 4 (select numbers as required)
Template for vHBA1	Choose vHBA-A
Template for vHBA2	Choose vHBA-B
Template for vHBA3	Choose vHBA-C
Template for vHBA4	Choose vHBA-D

16. Click **Submit**.

17. To create a Placement Policy, in the UCS Manager; click **Placement Policy > Add**.
The **Add Placement Policy** page appears.

Add Placement Policy

Placement Policy Details

In this page, you can specify Placement Policy details for a selected UCS Organization. Additionally you can specify Virtual Network Interface Selection Preference depending on the Placement Type.

Virtual Interface Order

Policy Name

Policy Description

UCS Account Name

UCS Organization Name

Storage Policy

Network Policy

Select Placement Type

UCSM120

org-root

Pure_SP

Pure_NP

Let System perform Placement

Next

Close

18. Enter the placement policy details:

Field	Description
Policy Name	Enter policy name
Policy Description	Enter description for the policy
UCSM Account Name	Select the UCSM account
UCS Organization Name	Select the organization according to your environment
Storage Policy	Select the storage policy that you created in step
Network Policy	Choose Policy create in step 11
Select Placement Type	Choose "Let System perform Placement"

19. Click **Next**.

Add Placement Policy

✓ Placement Policy Details

Virtual Interface Order

In this page, you can select the virtual interface and change its Order, Move UP/ DOWN(Changes virtual interface's priority). Order of the Virtual Interface is displayed in the braces for reference.

Virtual Interfaces

	Interface Type	Name	Desired Order
<input checked="" type="checkbox"/>	vHBA	vHBA-A-1	1
<input type="checkbox"/>	vHBA	vHBA-B-2	2
<input type="checkbox"/>	vHBA	vHBA-C-3	3
<input type="checkbox"/>	vHBA	vHBA-D-4	4
<input type="checkbox"/>	vNIC	eth0-1	5
<input type="checkbox"/>	vNIC	eth1-2	6

Total 6 items

Virtual Interface Order: 1

Move UP Move DOWN

Back **Submit** Close

20. In the **Virtual Interface** option, choose the following options:

Field
vHBA-A-1
Eth1-2
vHBA-B-2
vHBA-C-3
vHBA-D-4

21. Select the Virtual Interface Order as 1.

22. Click **Submit** to save the Policy.

The UCS Manager Policies are created in UCS Director. Now you can execute the workflow in UCSD.

Workflow Tasks

The following are the UCSD tasks mentioned that are part of the workflow.

1. Create UCS Service Profile
2. Add vNIC to UCS Service Profile
3. Add iSCSI vNIC to UCS Service Profile
4. Create Service Profile iSCSI Boot Policy
5. Associate UCS Service Profile
6. Setup PXE Boot
7. Create Volume
8. Create Host
9. Create HostGroup
10. Connect Volume to Host
11. Connect Host to HostGroup
12. UCS Blade Power ON Action

13. Monitor PXE Boot
14. Modify UCS Service Profile Blade Policy
15. Wait for Specified Duration
16. Collect Inventory
17. UCS Blade Power ON Action
18. Wait for Specified Duration
19. Reset UCS Server
20. Register Host with vCenter
21. Create Volume
22. Connect Volume to HostGroup
23. Get VMware Host Node
24. Rescan Storage Adaptor
25. Add Pure Volume to ESXi Host

Editing Admin Inputs

The Admin Input values are pre-defined in the workflow by the admin user.

You need to edit the admin inputs before you execute the workflow.

Click **Edit the Workflow properties**, go to **User Inputs** section and modify the following inputs as applicable.

Admin Input	Description
ISCSI TARGET IQN	Select the Target Port IQN from table
ISCSI TARGET PORT IP	Select the Target Port IP Address from table
UCS ACCOUNT	Select UCS Manager Account
HOST GROUP NAME	Enter Host Group Name (consist of letters, numbers, and hyphen -)
VMware Account	Select the VMware account

Configuring Additional Workflow Tasks (Mandatory)

Open the Workflow using **Workflow Designer** and complete the following steps:

Create UCS Service Profile (Create Service Profile for UCS Blade)

1. Open the particular Task.
2. Click **Next > Next > Revalidate**.
3. Select appropriate **Org Unit** and **Policies**.
4. Click **Next > Submit**.

Add vNIC to UCS Service Profile

1. Open the particular Task.
2. Click **Next > Next**.
3. Enter the following details:

Field	Description
vNIC Name	iscsi0 (default)
MAC Pool	Select the MAC Pool according to your environment
Fabric ID	Select the Fabric ID according to your environment
Enable Failover	enable this option if you need failover
VLANs	Select the ISCSI VLAN according to your environment (VLAN where the Storage target ISCSI subnet is configured)
Set as Native	Select this option
MTU	Enter 9000
QoS Policy	Select the ISCSI QoS Policy created during prerequisites

4. Click **Next > Submit**.

Add ISCSI vNIC to UCS Service Profile

1. Open the particular Task.
2. Click **Next > Next**.
3. Enter the following details:

Field	Description
ISCSI vNIC Name	Enter iscsi0
ISCSI Adapter Policy	Select the default ISCSI Adapter Policy or according to your environment
MAC Pool	Do not select any MAC Pool

- Click **Next > Submit**.

Create Service Profile ISCSI Boot Policy

- Open the particular Task.
- Click **Next > Next > Revalidate**.
- Enter the following details:

Field	Description
Initiator Name Assignment	Select the IQN Pool created in UCSM according to your environment
LUN Id	Optionally change the LUN ID. The default value is 1

Leave the other inputs with default values.

- Click **Next > Submit**.

Register Host with vCenter

- Open the particular Task.
- Click **Next > Next > vCenter Account**.
- Select **Datacenter/Cluster for ESXi Host**.
- Click **Next > Submit**.

Configuring Additional Workflow Tasks (Optional)

Connect Volume(s) to Host (Connect Boot Volume to Host)

- Open the particular Task.
- Click **Next > Next**.
- Choose **Specify LUN** option.

4. Specify the LUN ID for the Boot LUN (1-9).
5. Click **Next > Submit**.

Connect Volume(s) to HostGroup (Connect Datastore Volume to Host Group)

1. Open the particular Task.
2. Click **Next > Next**.
3. Choose **Specify LUN** option.
4. Specify the LUN ID for the Datastore LUN (10-255).
5. Click **Next > Submit**.

Executing the Workflow

To complete the process of executing the workflow, carryout the following steps:

1. Go to **Policies > Orchestration > Workflows**.
2. Expand **Folder Pure Storage FlashArray**.
3. Right click on the appropriate workflow and select **Validate**. The workflow should be valid.
4. Right click and select **Execute Now**.
5. Provide the following user input details:

User Input	Description
HOST NAME	Enter Host name (Service Profile name consist of letters, numbers and hyphen -)
UCS_SERVER_BLADE	Select UCS Server blade to install VMware ESXi hypervisor
OS TYPE	Select OS type for the blade
ESXI_MANAGEMENT_IP or IPPool	Enter ESXi Management Network IP Address or IP Pool
SUBNET MASK	Enter Subnet Mask for IP address
GATEWAY	Enter Gateway for IP address
NAME SERVER	Enter the name for the domain server
ESXi ROOT PASSWORD	Enter the root password for ESXi
FLASHARRAY ACCOUNT	Select the FlashArray account



BOOT VOLUME NAME	Enter the Boot Volume name (consist of letters, numbers, hyphen – and underscore _)
SIZE UNIT	Enter the volume size unit
SIZE NUMBER	Enter the volume size number
DATASTORE NAME	Enter the Datastore name (consist of letters, numbers, hyphen – and underscore _)
SIZE UNIT	Enter the volume size unit
SIZE NUMBER	Enter the volume size number

6. Click **Submit**.

The workflow is executed to provision ESXi Host on Cisco UCS Blade booting from iSCSI SAN and Integrated with vCenter Server on Pure Storage FlashStack.