Hewlett Packard Enterprise

Technical Document

HPE Synergy Image Streamer

Windows Artifact Bundle

Document Revision History

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Change Request# (Optional)	Document Version	Date	Prepared / Modified by	Reviewed by	Approved by	Section and Text Revised
Initial Version	1.0	Sep 2018	Satya Reddy			

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Sep 2018

Contents

Document Revision History 2
Image Streamer Overview 4
  Image Streamer Building Blocks 4
Coverage 6
Initial Setup 6
Working with Artifacts 6
  User roles for Image Streamer 7
  Artifact Bundle Creation/Download/Upload 14
  Developing Windows Artifacts 30
  Creation of OS Build Plan 32
Modifying Artifacts 36
  OS Build Plan, Server Profile and Deploying the Image 39
Upload Golden Image 43
Create Deployment Plan 44
OS Deployment using Server Profile 48
Capture Functionality 55
  Create Empty OS volume on HPE Synergy Image Streamer Appliance 55
Golden Image Capture 59
  Golden Image Compatibility 69
  Pagefile Size 69
Troubleshooting Techniques 69

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Image Streamer Overview

HPE Synergy Image Streamer is an appliance used to host, configure and serve operating systems to HPE Synergy compute modules. This appliance provides a truly stateless experience for the HPE Synergy compute modules. The HPE Synergy compute modules boot and run out of the HPE Synergy Image Streamer hosted OS volume.

Stateless servers are physical servers without a local boot disk. To achieve statelessness, the physical state and deployed software state of the compute modules are maintained separately. Physical state contains the firmware configuration, network configuration, shared data/storage configuration, boot settings and ILO configuration. With HPE Synergy Image Streamer, the deployed software state will also be managed outside of the compute module using server profiles.

The OS volume (boot volume hosted on the HPE Synergy Image Streamer appliance) contains the Golden Image (a combination of bootable operating system, applications and IO driver versions) and personality details (hostname, IP configuration and other OS based custom setting).

An HPE Composer domain can have multiple HPE Synergy Image Streamer appliances. Each appliance pair can serve all the compute modules in one logical enclosure. For a pair of appliances, the Artifacts management and OS deployment functions are served by an Active-Standby Cluster, whereas the OS volume storage is served by an Active-Active storage cluster.

Image Streamer Building Blocks

HPE Synergy Image Streamer appliance uses following artifacts for development.

Golden Image
A block-by-bock copy of the Operating System Volume (combination of Bootable OS, applications and I/O drivers).

Plan Script
Guest fish script used to accomplish deployment & capture of an operating system for the HPE Synergy compute modules. A Plan Script can be of type General, Deploy & Capture. It personalizes / generalizes the Operating System and contains Custom attributes that can be configured through a Build Plan / Deployment Plan / Server Profile.

Build Plans
Set of Plan Scripts ordered as steps used to add, modify, or remove the configuration of an OS volume during the deployment and capture process.

Deployment Plans
A combination of Golden Image and OS Build Plan that serves as an input to a server profile (used for deployment of operating system for Synergy compute modules).

Artifacts Bundles
A bundle allows all the artifacts to be packaged into a single archive file. It can then be moved to other appliances too. This format is used by Hewlett Packard Enterprise to release the artifacts for supported Operating Environments.

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Technical Document

See HPE Synergy Image Streamer User Guide available at Hewlett Packard Enterprise Information Library

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Coverage

This technical document covers HPE Synergy Image Streamer Artifact Bundle for Microsoft Windows Server. This includes artifacts that can be used to capture, deploy and personalize Microsoft Windows Server 2016 or Microsoft Hyper-V Server 2016 Operating Systems.

With this guide, we will be covering

- Artifacts creation, download/upload & extraction.
- Working with Artifacts.
- Upload Artifacts / Modifying Artifacts.
- Upload Golden Image.
- Create Deployment Plan.
- OS Deployment using Server Profile.
- Capture Functionality.

Initial Setup

We assume that the users already have a running HPE Synergy Image Streamer setup.

- All the components in HPE Synergy frames are running qualified firmware as per the GARFS/SERFS/TERFS recipe
- With supported Build versions of HPE OneView and HPE Synergy Image Streamer.
- With valid network configuration.
- HPE OneView and HPE Synergy Image Streamer appliances are up and running.
- OS Deployment Server is created.
- Logical Interconnect Group (LIG), Enclosure Group (EG) and Logical Enclosure (LE) are created with HPE Synergy Image Streamer intent.

Working with Artifacts

Login into HPE Synergy Image Streamer

From HPE OneView Main Menu, go to OS Deployment Servers.

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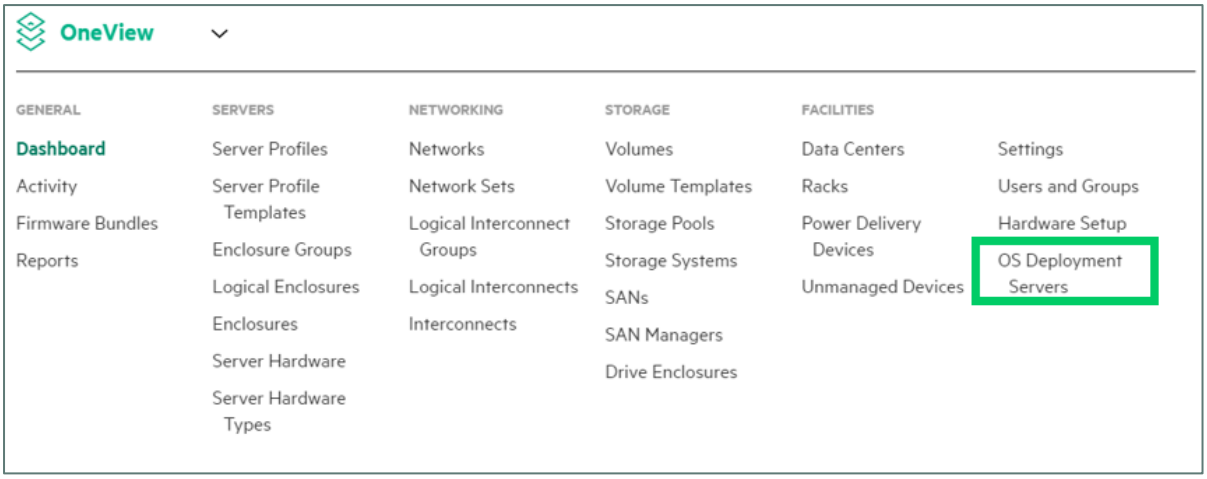
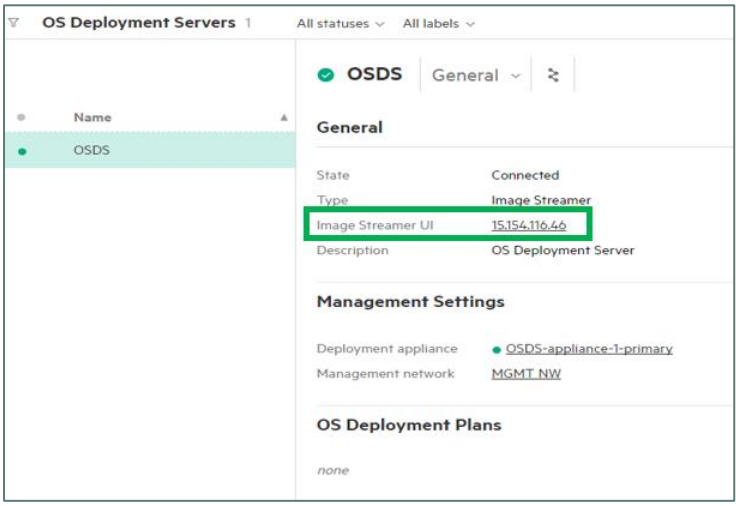


Click on Image Streamer UI to access HPE Synergy Image Streamer.



OS Deployment Server (OSDS) state must be connected, otherwise, the OSDS will not be created.

User roles for Image Streamer

The following user roles exist for configuring and accessing HPE Synergy Image Streamer using HPE OneView:

Infrastructure Administrator

This user will have complete Administrative privileges to configure HPE Image Streamer and HPE Synergy Composer (OV).

Server Administrator

This user will perform server provisioning and OS deployment from the Server Profile in HPE OneView.

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Software Administrator

This user can perform following actions.

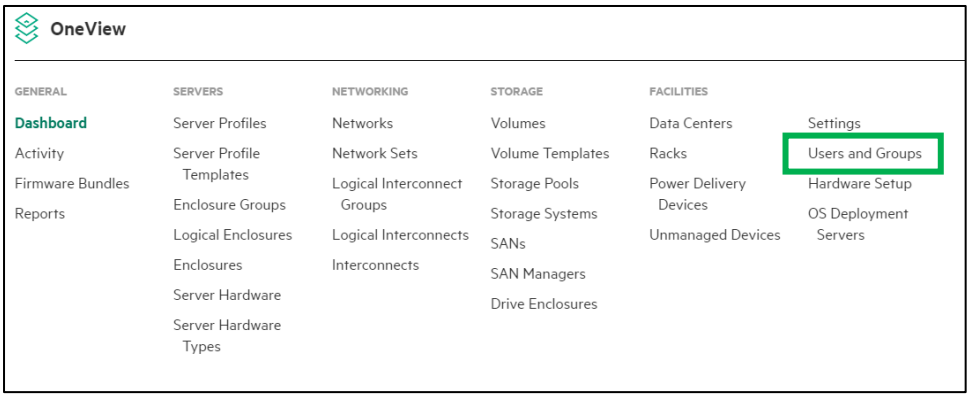
- Create and manage Artifacts such as Plan Scripts, Build Plans, Deployment Plans and Golden Image.
- Manage and load Artifacts Bundles.
- Capture Golden images from OS volumes.
- Set default configuration that server administrator needs for Server provisioning/deployment.

Note

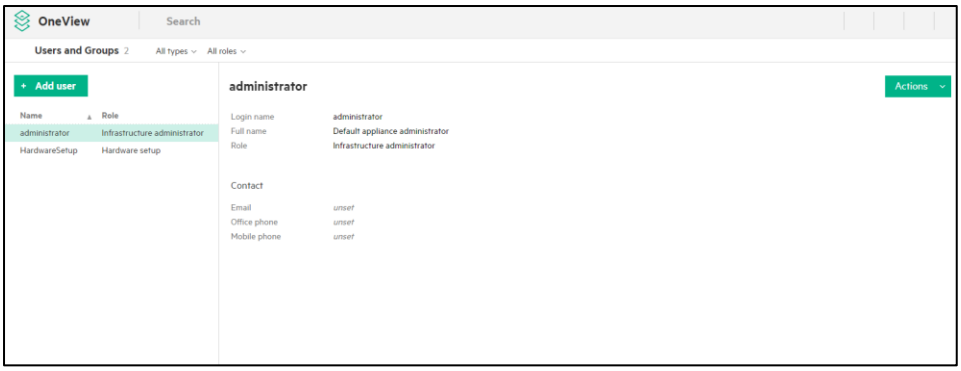
Software Administrator cannot create the Server profile. And Server Administrator cannot create/manage artifacts. Please note that these users will be created in HPE OneView.

Create HPE Synergy Image Streamer Users in HPE OneView:

Login to HPE OneView.
Click Users and Groups from main menu.



To create user, click Add user and enter the following details.



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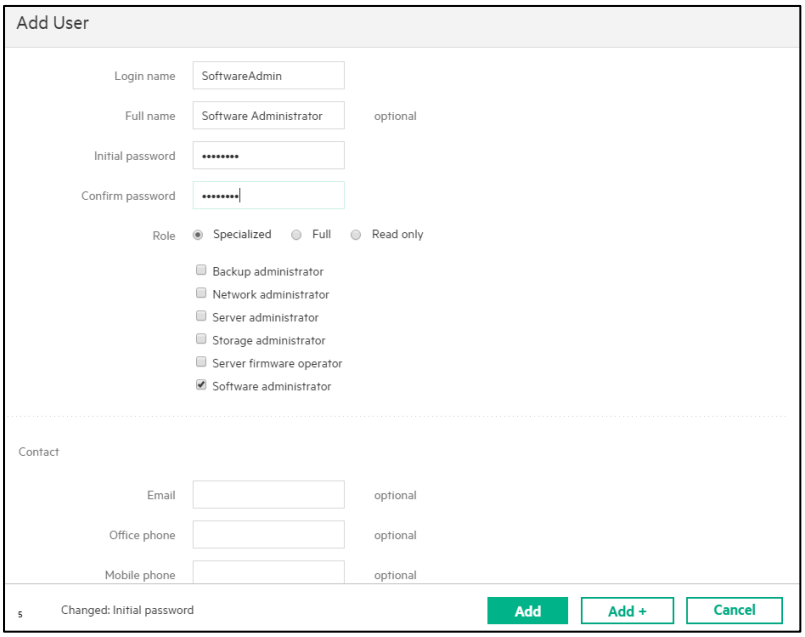
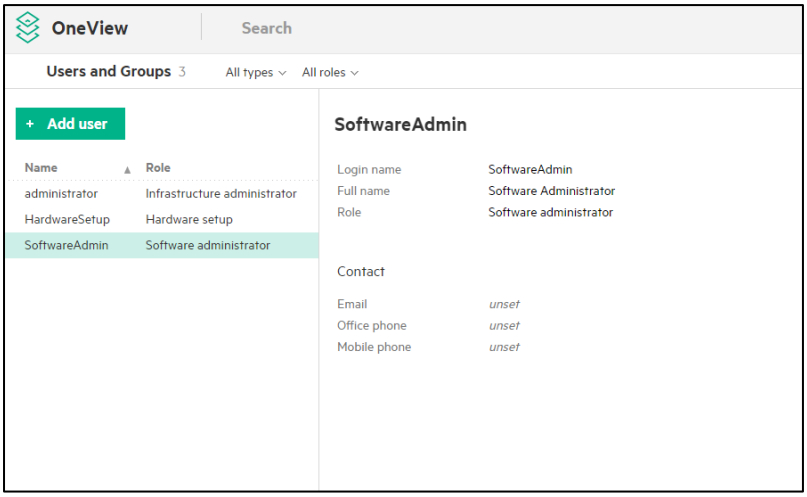
Login Name : SoftwareAdmin_TeamX //where X is your team number
Full Name : Team X Lab
Passwords : (must be minimum of 8 characters)
Role : Specialized (Choose the role “Software Administrator” from the list).

Click Add



The New user will appear on the “Users and Groups” page.



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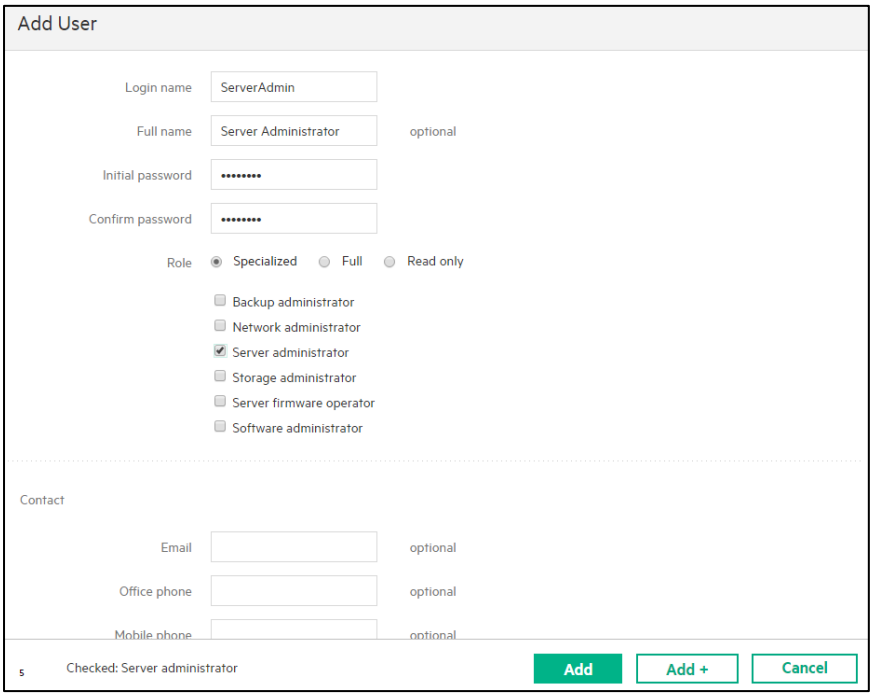
Click Add user to add another user (Server Administrator) and enter the following details

Login Name	:	ServerAdmin_TeamX //where X is your team name
Full Name	:	Team X Lab
Passwords	:	(a minimum of 8 characters)

Role : Specialized (Choose the role “Server Administrator” from the list)

Click **Add**

Note: The Server Administrator dialog screens are shown in the screenshots below (please use the Team designation that you were given).



The New user will appear on the “Users and Groups” page.

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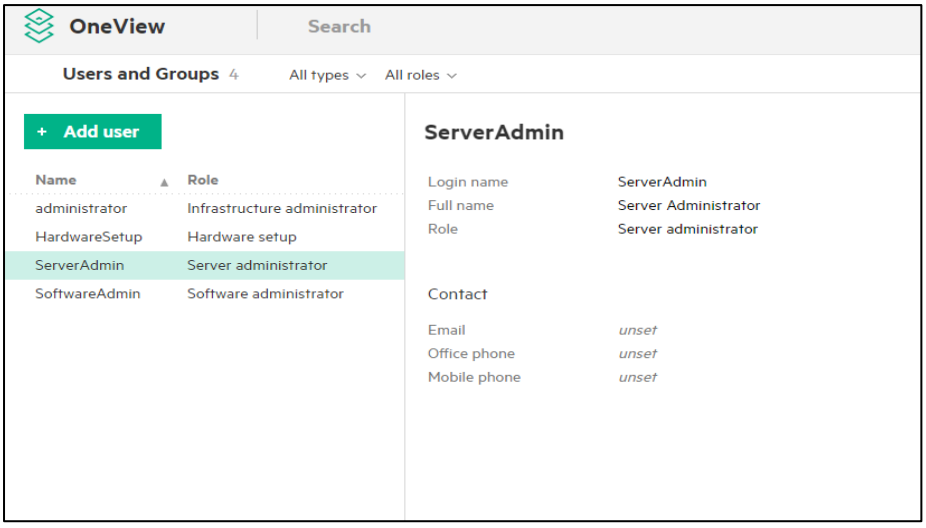
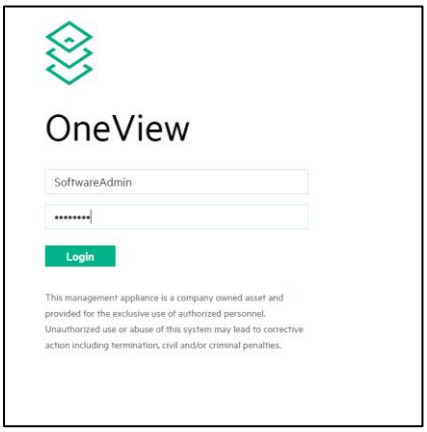


Logout and Login to HPE OneView using you Software Administrator credentials.



Once logged in, Click Server profiles from the HPE OneView main menu. Software Admin does not have authorization to provision /deploy server.
Note: The Software Administrator has all the access to create/manage Artifacts.

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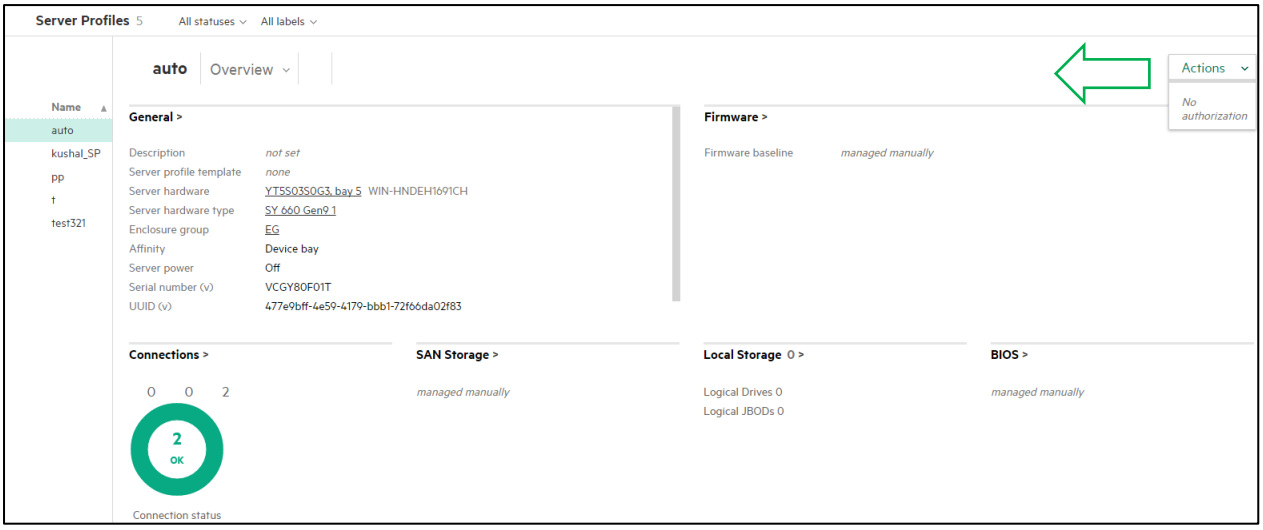
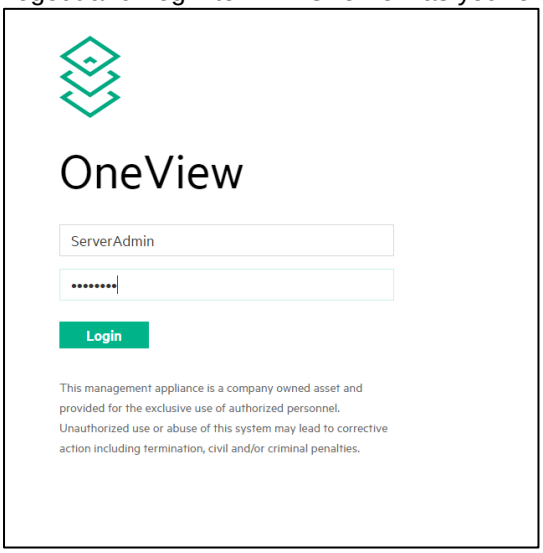


Click – OS Deployment Servers from the HPE OneView main menu and access the HPE Synergy Image streamer user interface. On the HPE Synergy Image Streamer main menu, Click **Plan Scripts**.

Logout and Login to HPE OneView as your own **Server Administrator**.



Once logged in, Click Server profiles from the HPE OneView main menu.
Server Administrator can perform server provisioning and OS deployment from server profile.

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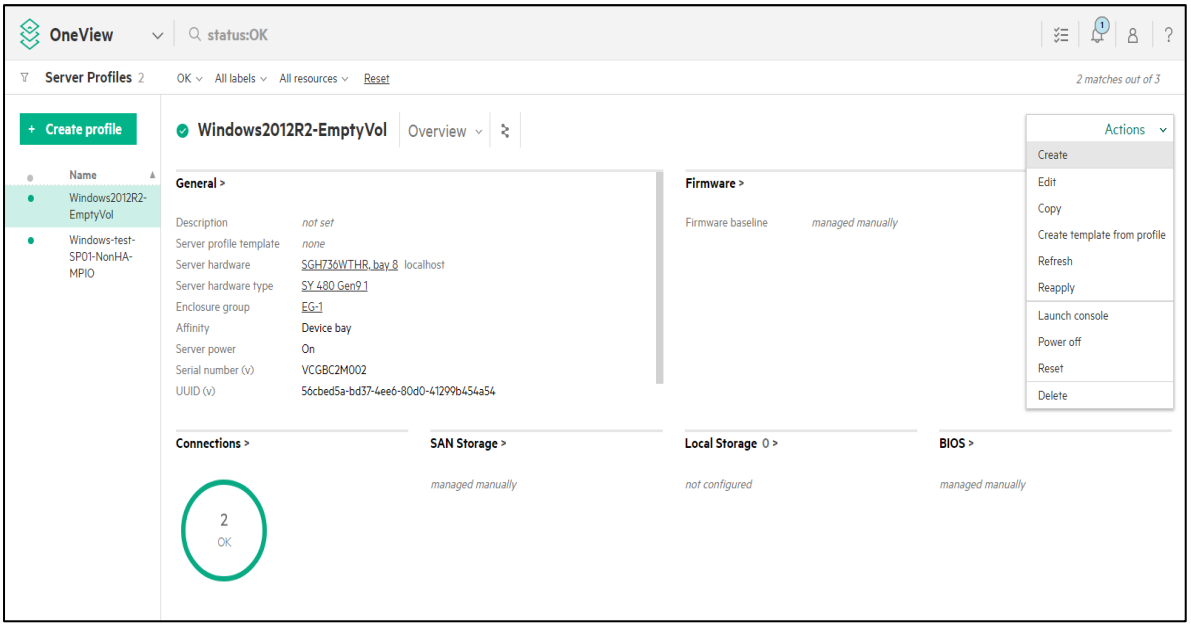
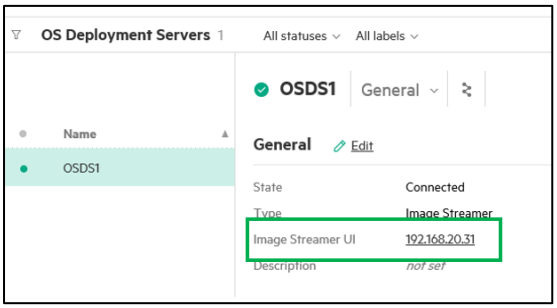


Click “OS Deployment Servers” from the HPE OneView main menu and access the Image streamer UI (see below)



On the HPE Synergy Image Streamer main menu (which will open as another tab), Click **Plan Scripts**.
Note: The Server Administrator does not have the access to create/manage Artifacts.

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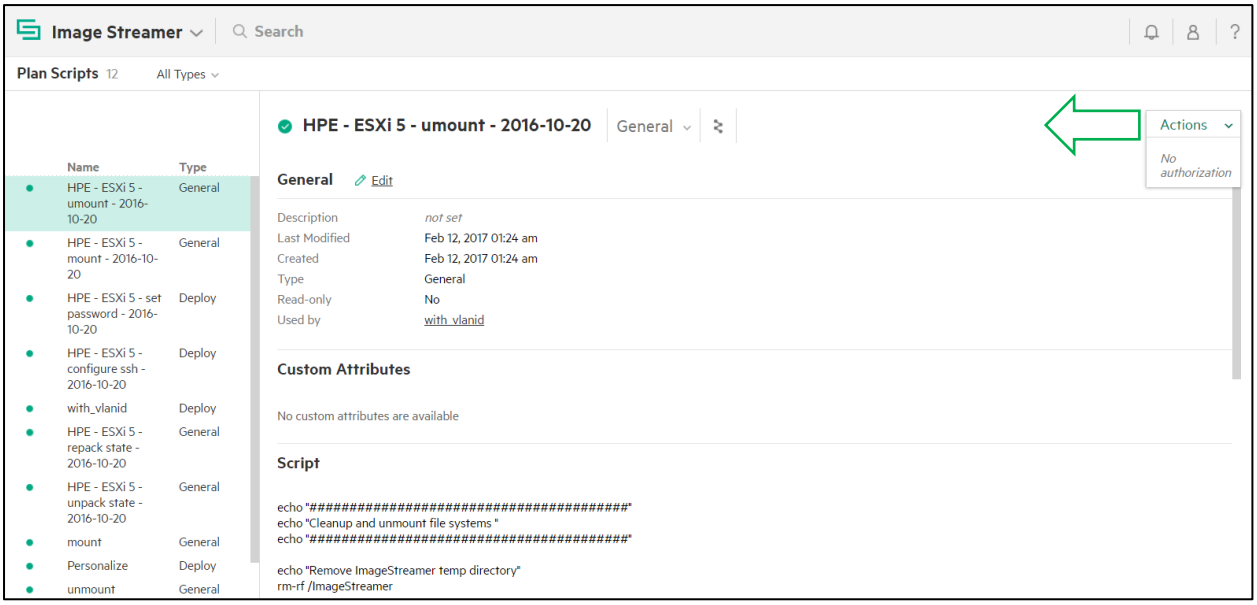
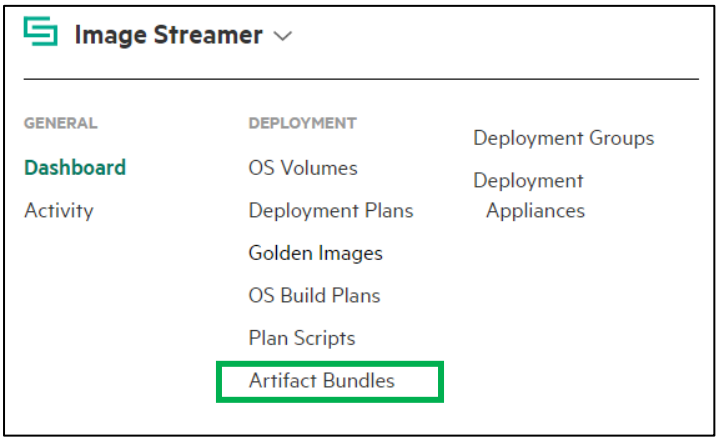


Artifact Bundle Creation/Download/Upload

You are currently logged in as "**Server Administrator**" who doesn't have the privilege to manipulate artifacts. Log into HPE OneView as the "**Software Administrator**" user you created in the previous lab, and launch the HPE Synergy Image Streamer UI again.

From the HPE Synergy Image Streamer menu, Click on the Artifact Bundle.



In your browser review the latest Windows Artifacts bundle from Windows Artifact Bundle - Github. Download the latest bundle to your desktop.

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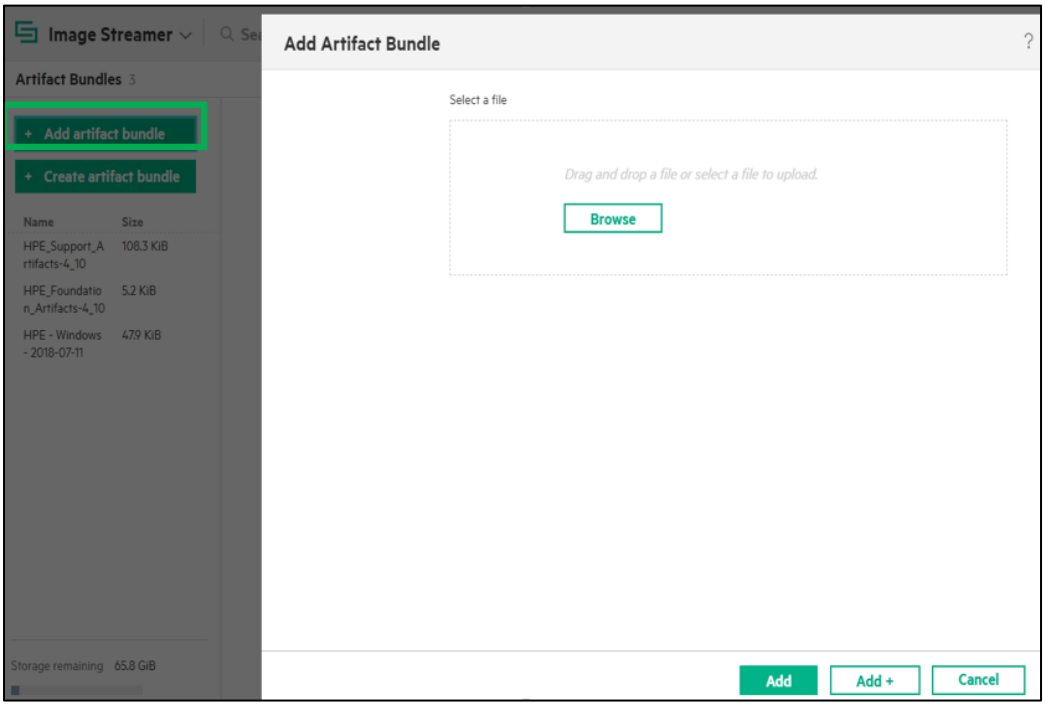
Rename the Artifact Bundle in the folder you saved it to in order to include your team name at the end –e.g HPE - Windows - 2018-07-11.zip to HPE - Windows - 2018-07-11.zip_TeamX. This will allow you to import the artifacts.

Click on “Add Artifacts Bundle”.



Highlight the listed Artifacts bundle that was just added on the left hand side pane. Go to Actions menu and “**Extract**” the Artifacts bundle. Extraction of bundle will populate the artifacts from the bundle on the UI.

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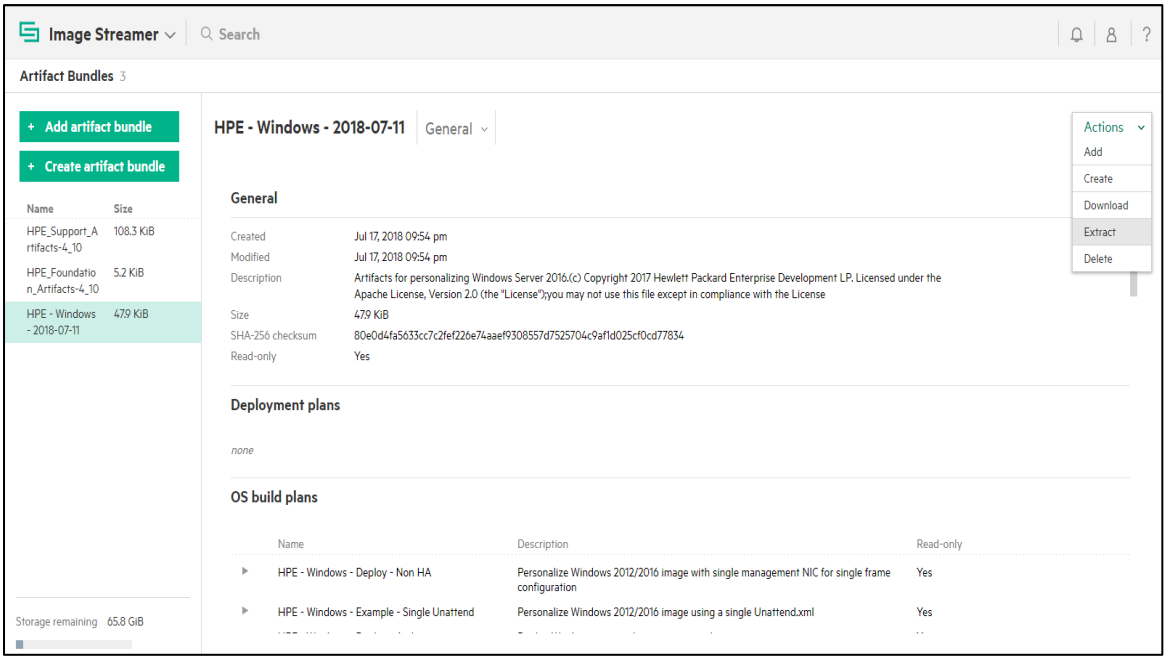

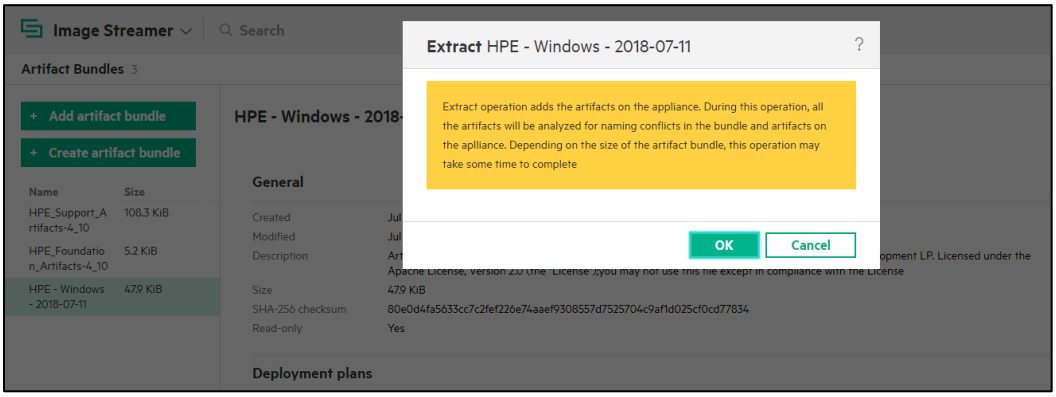

Please note, you will receive the following notification that the bundle already exists, this is because other teams would have pre-populated the HPE Synergy Image Streamer with the scripts.

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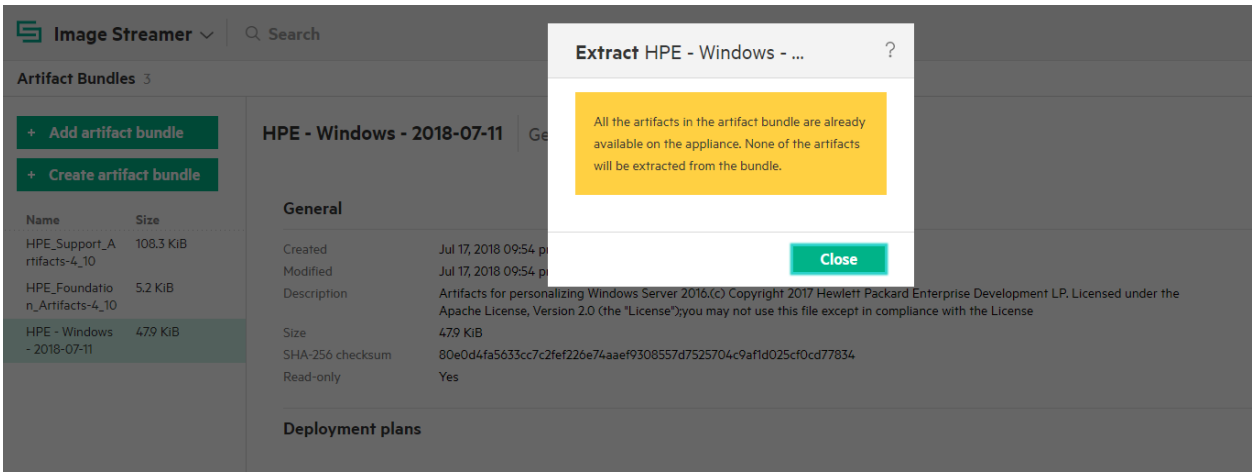
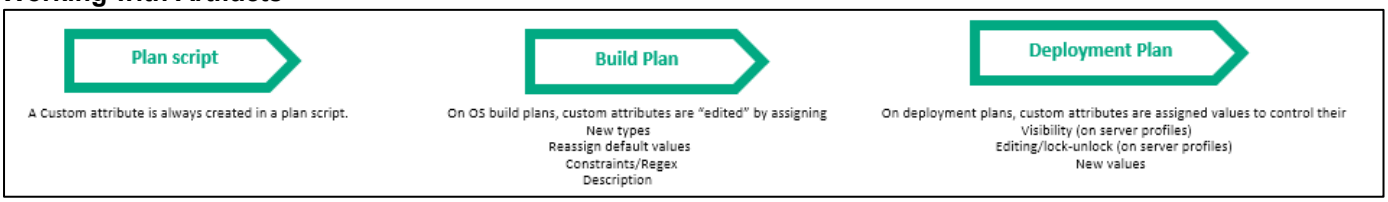


Note
With Extraction of Artifact Bundle, all the Plan Scripts, Build Plans and their association will get populated in HPE Synergy Image Streamer. The artifacts will be read only (in case you want to change, you need to edit the Plan Script, copy the contents and create new Plan Script (with different name). And since there is association between the Plan Scripts and Build Plans, you will need to copy the Build Plan to a new name and then add new Plan Scripts as required.

Using this procedure, multiple users can utilize the same bundle (and changes made by them would need new artifacts creation and users do not run into each other's work).

Working with Artifacts



Plan Script: This type of script can be General, Deploy & Capture, Script personalizes / generalizes the Operating System / Hypervisor. Custom attributes can be configured through Build Plan / Deployment Plan / Server Profile.

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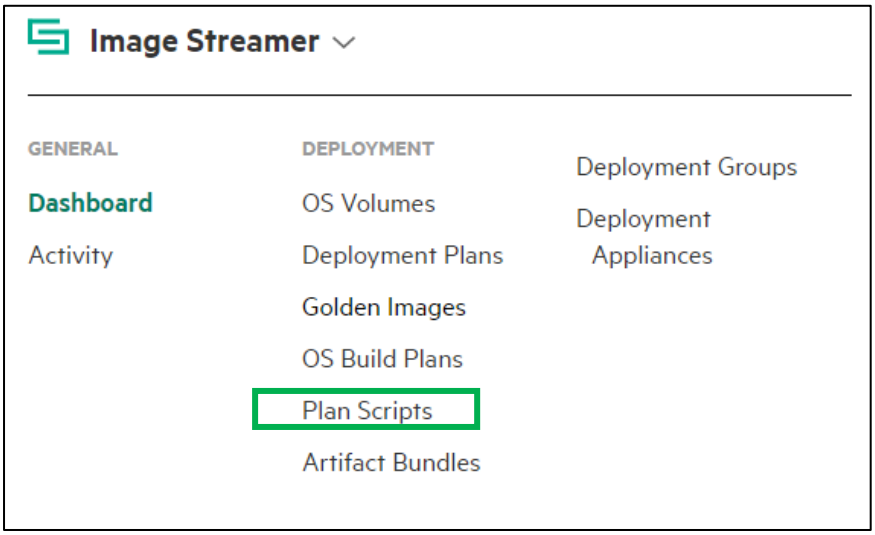
Copy of a Plan Script

Login to HPE OneView as the "**Software Administrator**" User created in your previous labs if not already done so, and access the Image Streamer UI from OSDS page.

Click "Plan Scripts" from the HPE Synergy Image Streamer main menu.



Highlight the Script named "mount" on the left hand pane. At the Actions Menu Click "Copy" and enter the text details below

Name : Mount Script
Description : "Script for Mount Operation"
Type : Deploy

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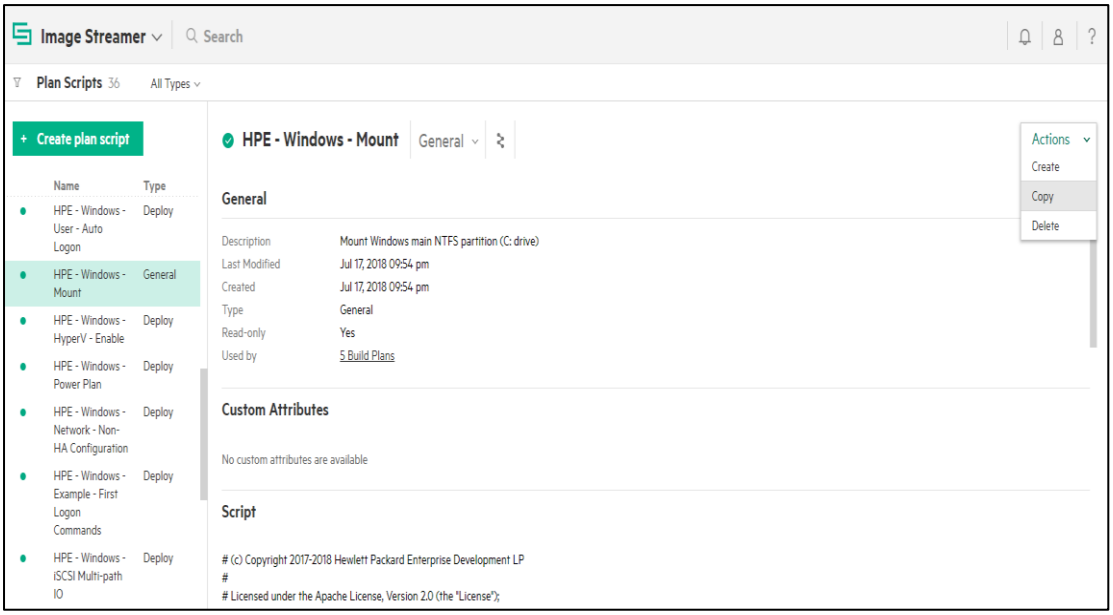

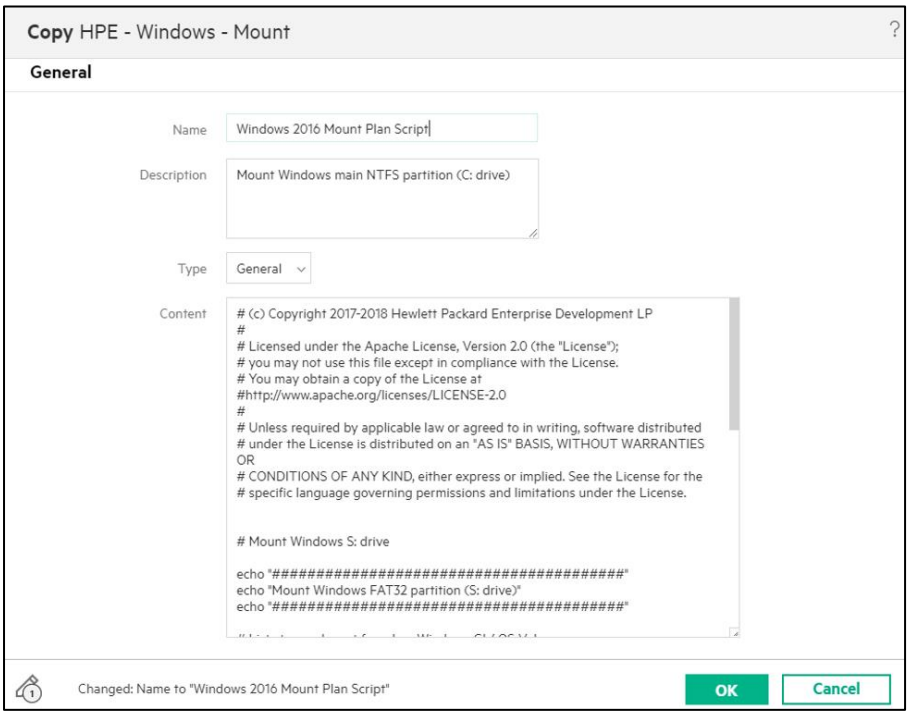

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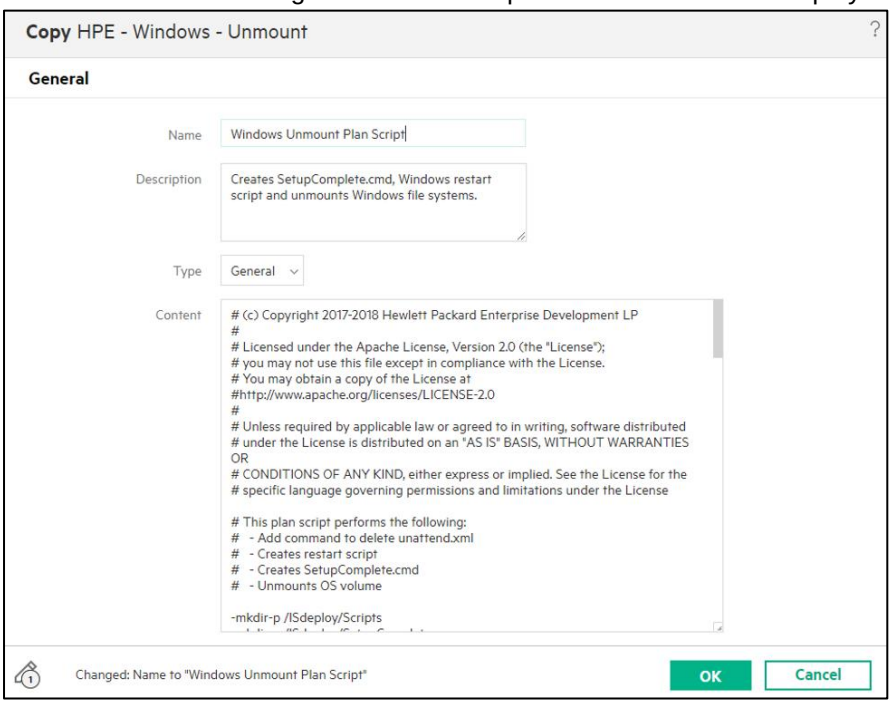
Contents : The contents will be derived from the original mount artifact
Press “**OK**” to finish the copy (note Create/Create+ is shown in the dialog, but a “Copy” will have a dialog on OK or Cancel)

Highlight the “**unmount**” script in the left hand pane, and press “**Copy**” from the Actions list to add the unmount Plan Script.

Name : Unmount Script
Description : “Script for Unmount Operation”
Type : Deploy
Contents : The original unmount script artifact contents are displayed.



Click “OK” to complete the Copy.

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Create (instead of copy) a “personalize” script and modify the text below.

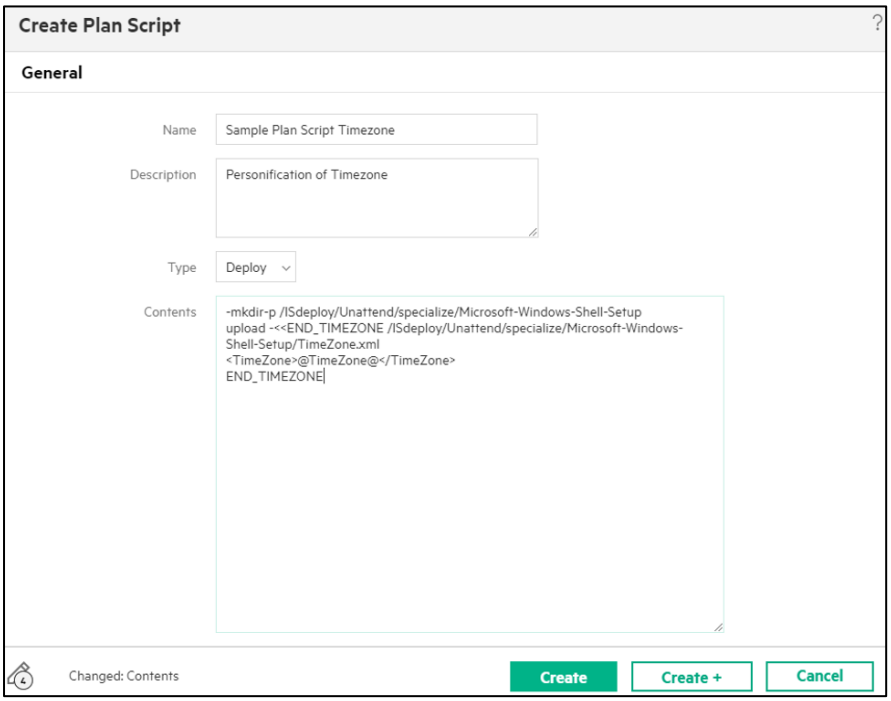
Name : Personalize Script
Description : “Script for Personalize Operation”
Type : Deploy
Contents : Add Personalize script contents below in the contents section.
Edit the Bay number to be your bay number (seen twice below)

Sample Personalize script:

```
# Default value: @TimeZone:GMT Standard Time@

# List of Time zones: https://technet.microsoft.com/en-us/library/cc749073(v=ws.10).aspx

-mkdir-p /ISdeploy/Unattend/specialize/Microsoft-Windows-Shell-Setup
upload -<<END_TIMEZONE /ISdeploy/Unattend/specialize/Microsoft-Windows-Shell-Setup/TimeZone.xml
<TimeZone>@TimeZone@</TimeZone>
END_TIMEZONE
```



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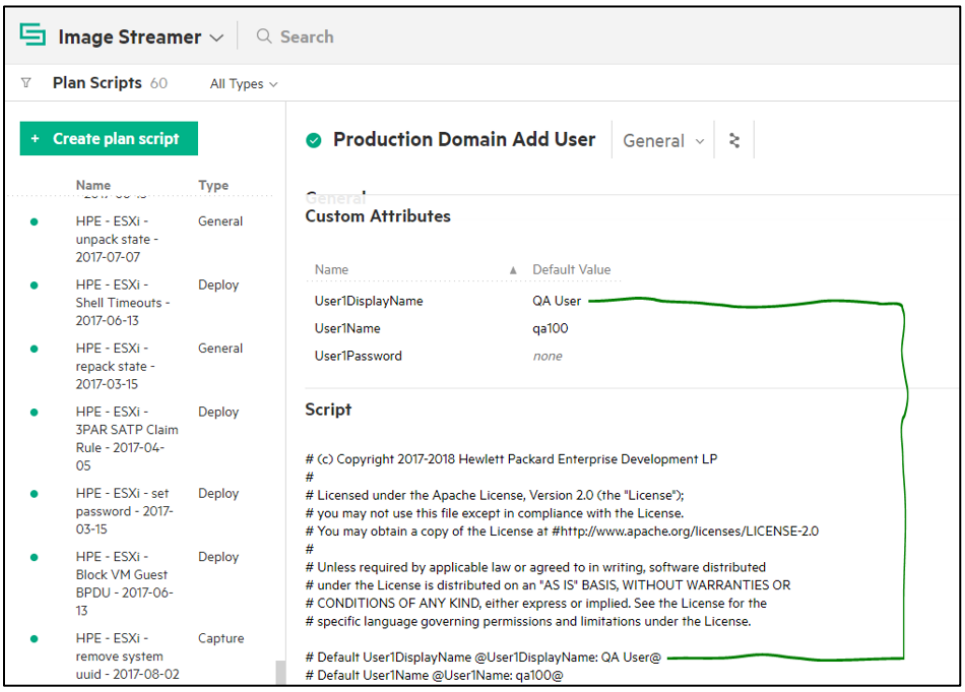
Press “**Create**” to create the personalize script.
All 3 Plan Scripts (Mount, Unmount and Personalize) have now been created.

Note
The custom attributes are derived from the Personalize Script and will appear when you use the Plan Script in Build Plan or Deployment Plan or Server profile.



OS Build Plan: This type of script can be Deploy and Capture, or a Build plan associated with one or more Plan Scripts. Below Build Plans are bundled inside the extracted Artifact Bundle.

1. Build Plan: HPE - Windows - Capture - As-Is

This Build Plan can be used to create a Golden Image from a Windows volume without performing any modifications on the volume contents.

2. Build Plan: HPE - Windows - Deploy - As-Is

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This Build Plan can be used to deploy a Windows Golden Image without any personalization. It does not perform any modifications on the volume contents.

3. Build Plan: HPE - Windows - Deploy - HA

This Build Plan can be used to deploy a Windows Golden Image with management NICs teamed for high-availability.

Steps: Plan Script Names	Attributes
HPE - Windows - Mount	
HPE - Windows - Initialize	
HPE - Windows - HyperV - Enable	
HPE - Windows - iSCSI Multi-path IO	
HPE - Windows - Locale	DisplayLanguage (Option) Keyboard Layout (Option)
HPE - Windows - Network - HA Configuration	ManagementNIC1 (NIC) ManagementNIC2 (NIC)
HPE - Windows - Network - Proxy	ProxyServerAddress (String) ProxyServerPort (Number) ProxyServerSkipForAddresses (String)
HPE - Windows - Power Plan	PowerPlan (Option)
HPE - Windows - Remote Desktop	RemoteDesktop (Option)
HPE - Windows - Time Zone	TimeZone (Option)
HPE - Windows - User - Add - 1	User1DisplayName (String) User1Name (String) User1Password (Password)
HPE - Windows - User - Administrator	Password (Password)
HPE - Windows - Unattend - Save	
HPE - Windows - Unmount	

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4. Build Plan: HPE - Windows - Deploy - Non HA

This Build Plan can be used to deploy a Windows Golden Image with management NIC without high-availability.

Steps: Plan Script Names	Attributes
HPE - Windows - Mount	
HPE - Windows - Initialize	
HPE - Windows - HyperV - Enable	
HPE - Windows - Locale	DisplayLanguage (Option) Keyboard Layout (Option)
HPE - Windows - Network - Non HA Configuration	ManagementNIC
HPE - Windows - Network - Proxy	ProxyServerAddress (String) ProxyServerPort (Number) ProxyServerSkipForAddresses (String)
HPE - Windows - Power Plan	PowerPlan (Option)
HPE - Windows - Remote Desktop	RemoteDesktop (Option)
HPE - Windows - Time Zone	TimeZone (Option)
HPE - Windows - User - Add - 1	User1DisplayName (String) User1Name (String) User1Password (Password)
HPE - Windows - User - Administrator	Password (Password)
HPE - Windows - Unattend - Save	
HPE - Windows - Unmount	

5. Build Plan: HPE - Windows - Example - Deploy

This Build Plan uses all Plan Scripts from the artifact bundle and demonstrates how to use the example Plan Scripts for personalization. This can be used as a reference to create custom Windows artifacts.

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Steps: Plan Script Names	Attributes
HPE - Windows - Mount	
HPE - Windows - Initialize	
HPE - Windows - Computer Name	Hostname (String)
HPE - Windows - Example - Commands in Unattend	
HPE - Windows - Example - First Logon Commands	
HPE - Windows - Example - Logon Commands	
HPE - Windows - Example - PowerShell	
HPE - Windows - Example - Registry Edit	
HPE - Windows - Example - Registry Edit with .reg	
HPE - Windows - HyperV - Enable	
HPE - Windows - Locale	DisplayLanguage (Option) Keyboard Layout (Option)
HPE - Windows - Network - Non HA Configuration	ManagementNIC
HPE - Windows - Network - Proxy	ProxyServerAddress (String) ProxyServerPort (Number) ProxyServerSkipForAddresses (String)
HPE - Windows - OEM Information	OEMManufacturerName (String) OEMModelName (String)
HPE - Windows - Owner Info	OrganizationName (String) OwnerName (String)
HPE - Windows - Pagefile - Custom Size	PagefileMaximumSizeMB (Number) PagefileMinimumSizeMB (Number)
HPE - Windows - Power Plan	PowerPlan (Option)
HPE - Windows - Remote Desktop	RemoteDesktop (Option)
HPE - Windows - Time Zone	TimeZone (Option)

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HPE - Windows - User - Add - 1	User1DisplayName (String) User1Name (String) User1Password (Password)
HPE - Windows - User - Add - 2	User2DisplayName (String) User2Name (String) User2Password (Password)
HPE - Windows - User - Administrator	Password (Password)
HPE - Windows - User - Auto Logon	AutoLogonUsername AutoLogonPassword
HPE - Windows - Unattend - Save	
HPE - Windows - Unattend - Debug	
HPE - Windows - Unmount	

6. Build Plan: HPE - Windows - Example - Single Unattend

This Build Plan is an example of personalizing Windows using a single Unattend.xml file

Steps: Plan Script Names	**Attributes**
HPE - Windows - Mount	
HPE - Windows - Example - Single Unattend	UserDisplayName (String) UserName (String) UserPassword (String)
HPE - Windows - Unmount	

7. Plan Scripts

7.1 HPE - Windows - Mount

This Plan Script lists all mount partitions and mounts the FAT32 partition (S: drive) of the image. It also creates directories used by other Plan Scripts for personalization.

7.2 HPE - Windows - Initialize

Creates initial (default) configuration for Unattend.xml.

7.3 HPE - Windows - Hostname

Sets the Computer Name (Hostname)

Attributes:

Hostname (String)

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Computer Name (Hostname) to set. Can be maximum 15 characters in length.
To automatically generate a computer name, specify * (asterisk).

7.4 HPE - Windows - Hyper - V - Enable
Enables Hyper-V if it is not already enabled. Enabling Hyper-V requires reboot.

7.5 HPE - Windows - iSCSI Multi-path IO
Enables multi-path I/O for iSCSI

7.6 HPE - Windows - Locale
Sets the display language and keyboard layout
Attributes:
DisplayLanguage (Option): The display language to set
KeyboardLayout (Option): The keyboard layout to set

7.7 HPE - Windows - Network – Domain
Joins the domain with credentials
Attributes:
DomainAccount (String) Username for joining domain.
DomainName (FQDN) Domain to join.
DomainPassword (Password) Password for the specified DomainAccount username for joining domain.

7.8 HPE - Windows - Network - HA Configuration
Configures the management network with high-availability
Attributes:
ManagementNIC1 (NIC)
This attribute is of type NIC and has the following four sub-attributes:
ManagementNIC1.dns1
ManagementNIC1.dns2
ManagementNIC1.gateway
ManagementNIC1.ipaddress
ManagementNIC1.mac
ManagementNIC1.netmask
These sub-attributes are used to configure network settings.
ManagementNIC2 (NIC)
This attribute is of type NIC and has the following four sub-attributes:
ManagementNIC2.mac
These sub-attributes are used to configure network settings.

7.9 HPE - Windows - Network - Non-HA Configuration
Configures the management network without high-availability.
Attributes:
ManagementNIC (NIC)
This attribute is of type NIC and has the following four sub-attributes:
ManagementNIC.dns1
ManagementNIC.dns2
ManagementNIC.gateway
ManagementNIC.ipaddress
ManagementNIC.mac
ManagementNIC.netmask

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These sub-attributes are used to configure network settings.

7.10 HPE - Windows - Network - Proxy

Configures the proxy server address and port. Also sets the list of addresses that bypass the proxy server.

Attributes:

ProxyServerAddress (String): The address of the proxy server, without http(s)://

ProxyServerPort (Number): The port of the proxy server. For example: 8080

ProxyServerSkipForAddresses (String)

List of hostnames or IP addresses that bypass the proxy server.

Multiple addresses must be separated by semicolons (;).

Include string <local> to bypass the proxy server for all intranet addresses.

7.11 HPE - Windows - OEM Information

Sets the OEM manufacturer name and model of the server

Attributes:

OEMManufacturerName (String)

The OEM manufacturer name. For example: Hewlett Packard Enterprise

OEMModelName (String)

The server model. For example: Synergy 480 Gen9

7.12 HPE - Windows - Owner Info

Sets the computer owner's name and organization.

Attributes:

OrganizationName (String): Computer owner's organization

OwnerName (String): Computer owner's name

7.13 HPE - Windows - Pagefile - Custom Size

Sets the minimum and maximum pagefile size.

Attributes:

PagefileMaximumSizeMB (Number)

Maximum size of the pagefile.

PagefileMinimumSizeMB (Number)

Minimum size of the pagefile.

7.14 HPE - Windows - Pagefile - Disable

Disables the pagefile.

This script must not be used with "HPE - Windows - Pagefile - Custom Size" Plan Script.

7.15 HPE - Windows - Power Plan

Sets the power plan to "Balanced", "High Performance" or "Power Saver"

Attributes:

PowerPlan (Option): Power plan to use

7.16 HPE - Windows - Product Key

Sets the Windows product key

Attributes:

WindowsProductKey (String): The Windows product key.

7.17 HPE - Windows - Remote Desktop

Enables or disables remote desktop

Attributes:

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RemoteDesktop (Option)
Option to allow or disallow remote desktop.

7.18 HPE - Windows - Time Zone
Sets the time zone.
Attributes:
TimeZone (Option):Option to specify time zone.

7.19 HPE - Windows - Unattend – Debug
Validates Unattend.xml's XML syntax and logs the contents in deployment log.
This script logs the passwords in plain text, so it should be used only for debugging purpose during Windows artifact development.

7.20 HPE - Windows - Unattend - Save
Generates a single Unattend.xml file from the fragments created by other Plan Scripts.
Should be placed just above the unmount script in the OS Build Plan steps.

7.21 HPE - Windows - Unmount
Generates the SetupComplete.cmd file which executes scripts created by other Plan Scripts.
Should be the last step in the OS Build Plan. Unmounts the FAT32 partition.

7.22 HPE - Windows - User - Add - 1
Creates an additional administrator user account.
Attributes:
User1DisplayName (String): User's display name.
User1Name (String): Username of the account.
User1Password (Password): Account password.

7.23 HPE - Windows - User - Add - 2
Creates an additional administrator user account.
Attributes:
User2DisplayName (String): User's display name.
User2Name (String): Username of the account.
User2Password (Password): Account password.

7.24 HPE - Windows - User - Administrator
Configures the "Administrator" user account.
Attributes:
Password (Password): The "Administrator" user's password.

7.25 HPE - Windows - User - Auto Logon
Sets the username and password for automatic logon at startup.
Attributes:
AutoLogonPassword (Password)
The password of the user with which to automatically logon.
AutoLogonUsername (String)
Username with which to automatically logon.

7.26 HPE - Windows - Example - Commands in Unattend
Example of running commands/scripts from Unattend.xml

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7.27 HPE - Windows - Example - First Logon Commands
Example of running commands the first time a user logs in

7.28 HPE - Windows - Example - Logon Commands
Example of running commands every time a user logs in

7.29 HPE - Windows - Example - PowerShell
Example of running a PowerShell script during Windows deployment

7.30 HPE - Windows - Example - Registry Edit
Example of modifying the Windows registry during deployment

7.31 HPE - Windows - Example - Registry Edit with .reg
Example of modifying the Windows registry during deployment using a .reg file

7.32 HPE - Windows - Example - Single Unattend
Example of personalizing windows by directly creating Unattend.xml with a single Plan Script.
It creates a user account as an example.
Attributes:
UserDisplayName (String): User's display name.
UserName (String): Username of the account.
UserPassword (Password): Account password.

Developing Windows Artifacts

New Plan Scripts should follow the following method/conventions for personalization that are used by the existing Plan Scripts.

Personalization method

The Plan Scripts provided in this artifact bundle use two methods of personalization:
→Unattend.xml.This is an answer file that stores the custom settings that are applied during Windows setup.
→SetupComplete.cmd script. This is a script where commands can be added to run at the end of Windows setup.

The Plan Scripts either generate parts of Unattend.xml or generate scripts that are invoked from SetupComplete.cmd.

Directory conventions

→ /ISdeploy/SetupComplete Scripts created in this directory will be executed through SetupComplete.cmd in alphabetical order (more details below)
→/ISdeploy/Unattend Unattend.xml will be generated based on files and directories in this location (more details below)
→/ISdeploy/Scripts Scripts executed by Unattend.xml or other scripts are created here
→/ISdeploy/Files Files used by any scripts are created here
→/ISdeploy/Temp Temporary files and scripts created during personalization are stored at this location. These are deleted after personalization is completed

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Unattend.xml conventions
→Temporary directory (TMPDIR) used by "HPE - Windows - Unattend - Save" is /ISdeploy/Unattend/"
→HPE - Windows - Unattend - Save" script generates the entire Unattend.xml based on the parts generated by other scripts. This script must be added just before the "HPE - Windows - Unattend - Debug" (if included) and "HPE - Windows - Unmount" steps in OS Build Plan.

If a pass is to be included in Unattend.xml, TMPDIR/pass directory should exist.
For example: For specialize and oobeSystem passes, "/ISdeploy/Unattend/specialize" and "/ISdeploy/Unattend/oobeSystem" directories must be created by a Plan Script.
If a component is to be included, TMPDIR/pass/component directory should exist.
For example: /ISdeploy/Unattend/specialize/Microsoft-Windows-Shell-Setup

→If TMPDIR/pass/component.xml file exists, it is considered as the contents of start tag of that component. If it doesn't exist, start tag is automatically generated.

→TMPDIR/pass/component directory can contain directories or files. Directories are used for nested elements inside components. For example: oobeSystem > Microsoft-Windows-Shell-Setup > UserAccounts > LocalAccounts
→Contents of all files (preferably created having .xml extension) are added inside the component XML. This is done in alphabetical order of filenames (as listed by the "ls" command in Linux).
→If any directories exist in TMPDIR/pass/component/, the names are considered as element names. An element is added in the XML for each directory name. These directories can have further levels of nesting and directories at all levels can contain .xml files.
→ The .xml filenames should preferably match the element name whose XML they contain. In case an element has nested elements, then care should be taken to ensure that one Plan Script does not overwrite the XML file or other files created by another Plan Script.
→ "HPE - Windows - Unattend - Save" will recursively traverse this directory structure to generate Unattend.xml.
→If "HPE - Windows - Unattend - Debug" script is added, the final generated XML is logged in the deployment log, which can be used for debugging. It also checks the XML for valid XML syntax.

SetupComplete.cmd conventions
→Scripts created in /ISdeploy/SetupComplete/ directory are executed by SetupComplete.cmd in alphabetical order (same as order of files listed by "ls" UNIX/Linux command without any options).
→SetupComplete.cmd with commands to execute scripts in the above directory is generated by the unmount Plan Script.
→A reboot script for Windows is also executed at the end of SetupComplete.cmd which restarts Windows if an empty file exists at "S:\ISdeploy\Restart-required" (/ISdeploy/Restart-required" in Guestfish)

Creating new OS Build Plans
If a fresh new OS Build Plan is created, the type and the settings (constraints) for the custom attributes must be properly assigned for the HPE-provided Plan Scripts. The HPE-provided OS Build Plans can be used as reference for

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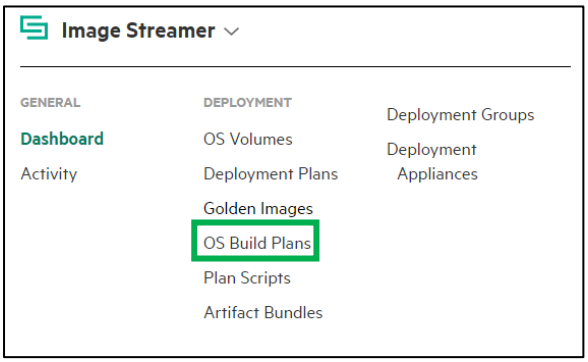
the same. The OS Build Plan “Copy” operation can be used instead of creating a new OS Build Plan and steps modified, to retain type/constraints for the custom attributes.

Unattend.xml reference
https://docs.microsoft.com/en-us/windows-hardware/customize/desktop/unattend/components-b-unattend

Creation of OS Build Plan

Login to HPE OneView and access HPE Synergy Image Streamer UI from OSDS page.
Click OS Build Plan from HPE Synergy Image Streamer main menu.



Click **“Create OS Build Plan”** and enter the following details:

Name : Windows 2016 Deployment Build Plan.
Description : Windows 2016 Deployment Build Plan.
Type : Deploy.

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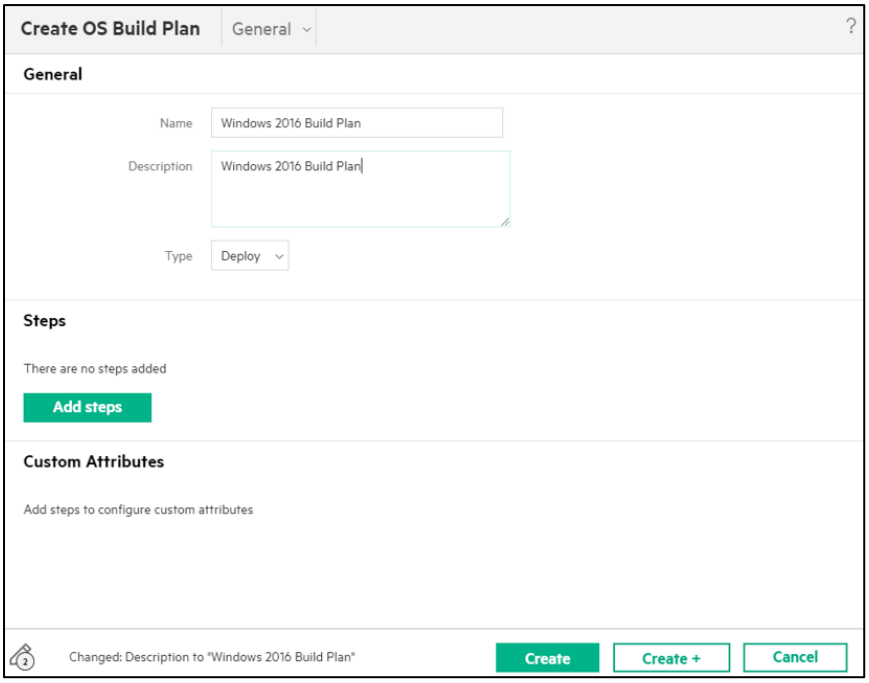
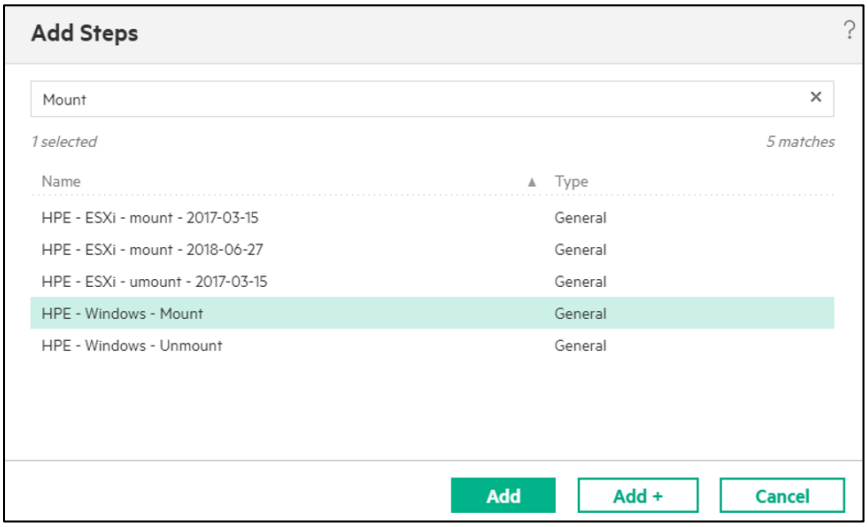


Click Add Step, Choose (Mount, Unmount, Personalize) Plan Scripts and click Add.



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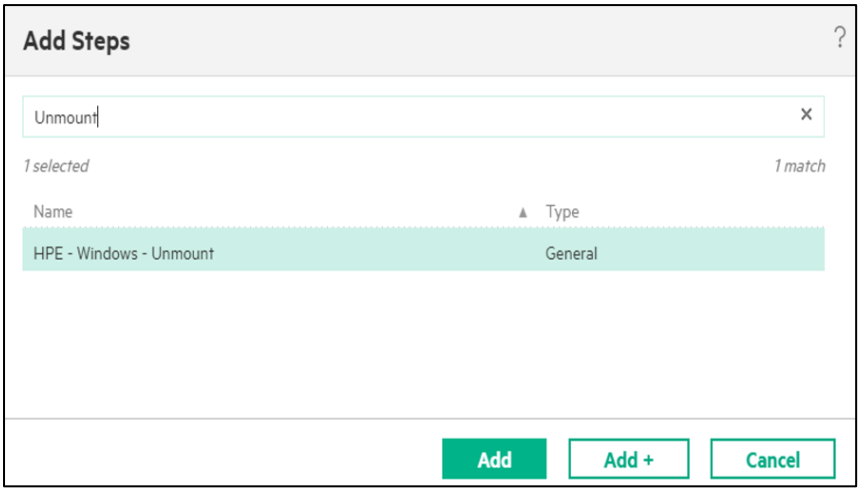

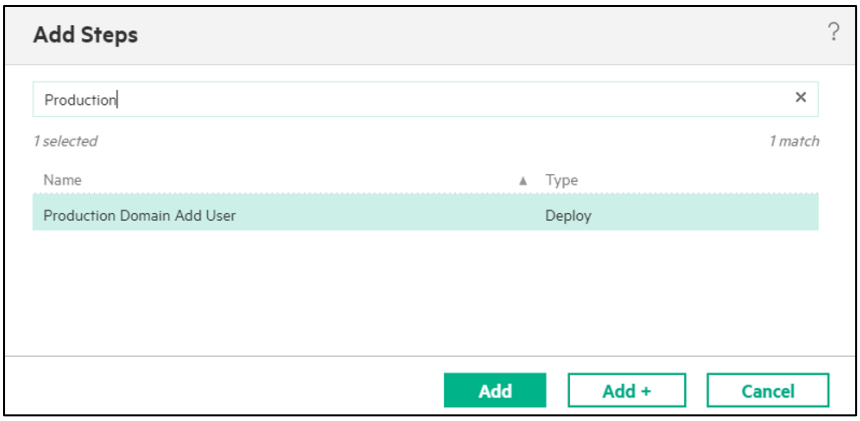

Note
While Plan Scripts are added to the Build Plan, we will always need to maintain the order in which the operations should be performed. Here, operations will be performed in the below order. 1. Mount Script 2. Personalize Script 3. Unmount Script

In case the order is not correct, please correct using below procedure:

Click on the arrow symbol ⇕ and drag the Plan Script to desired step.

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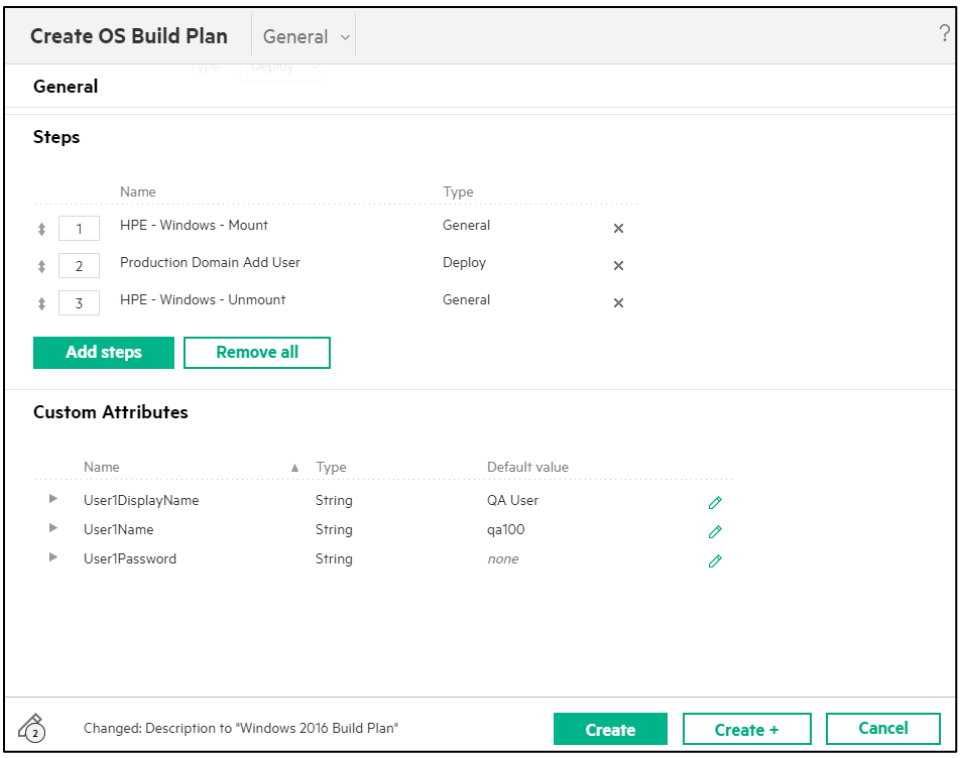
Further Below in Custom Attributes section, you can further refine custom attributes.



Click on Edit to assign Custom Attribute and Enter the following details:

New type : User1 Display Name
Description :
Regular expression : String
Default Value : QA User

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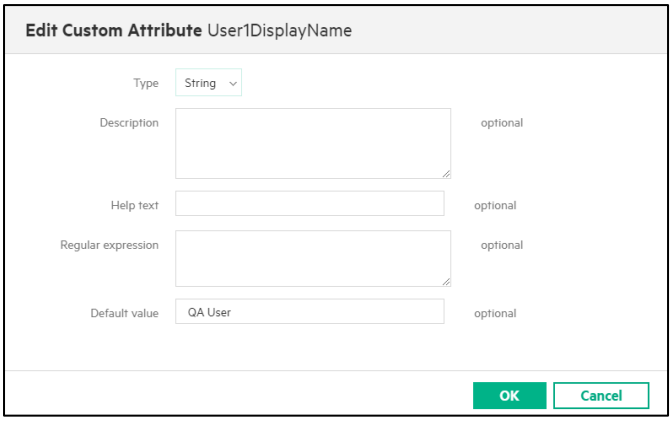


Press OK to save the changes.

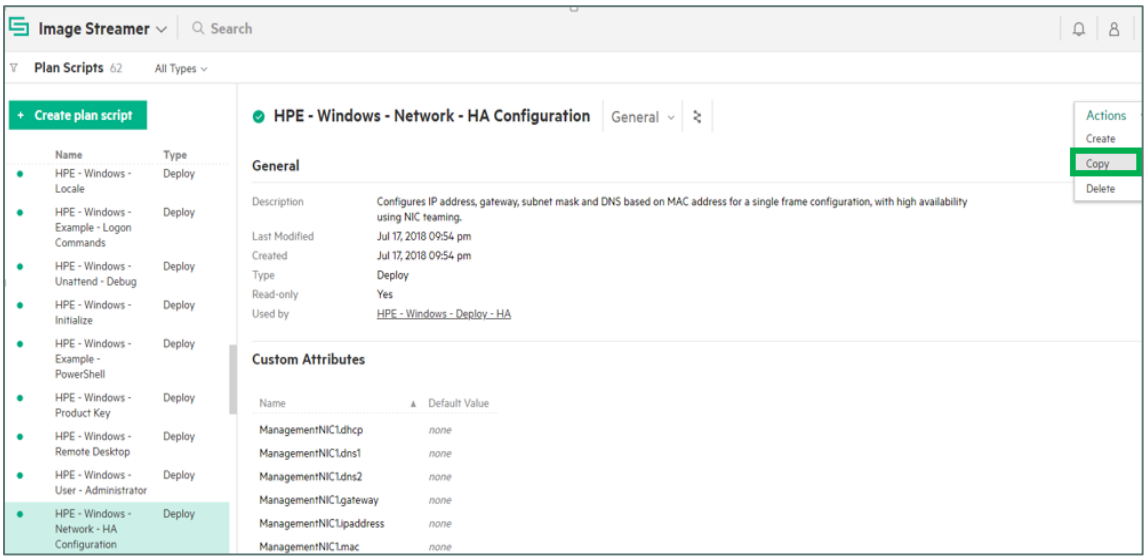
Modifying Artifacts

The artifacts are downloaded from Github, and will be read only. In case you want to change them, you will need to edit the Plan Script, copy the contents and create new Plan Script (with a different name).

From HPE Synergy Image Streamer menu, click on the Plan Scripts.

Choose the Plan Script that needs modification.

From right top corner, Click Action and choose copy.



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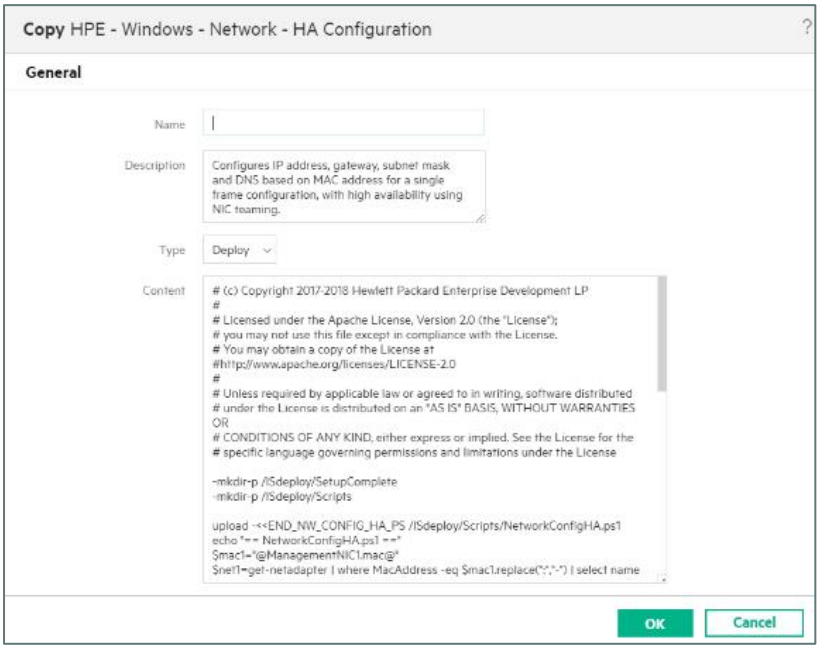
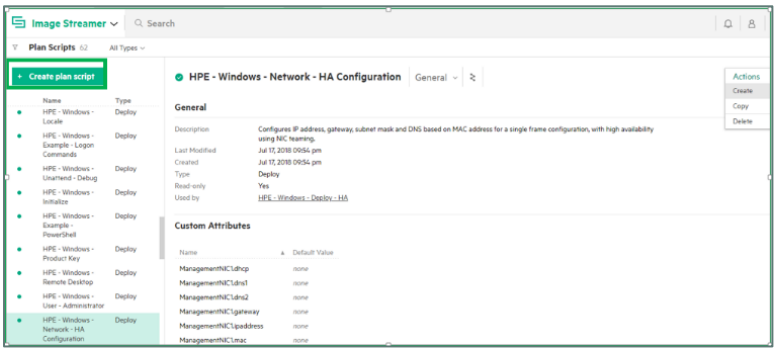
Copy the content and press cancel.



Click Create Plan Script.



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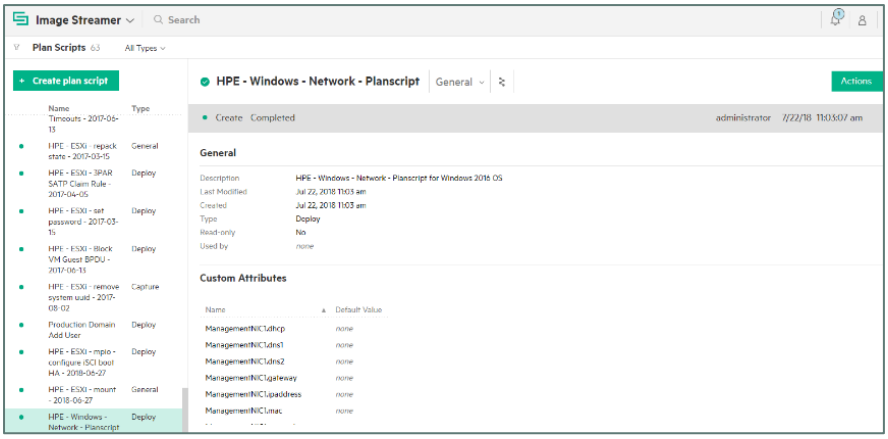
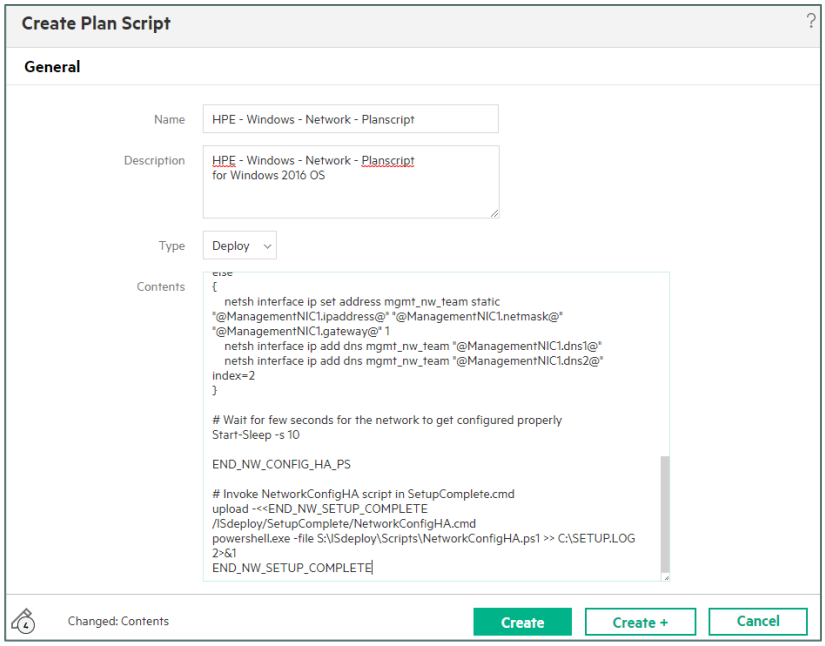


Add Name, Type – Deploy, and paste the content copied into the content section.

Use the Name: Copy Of Plan Script.



Make any modifications if required and Click Create.

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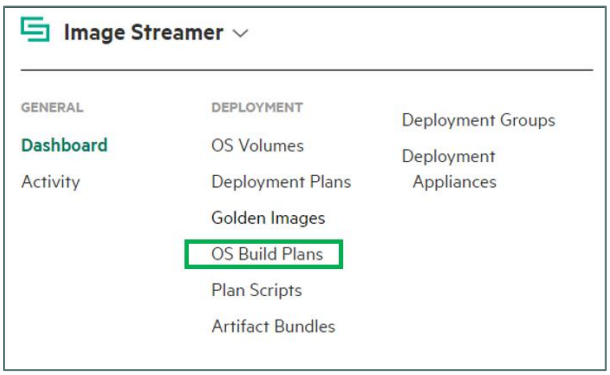
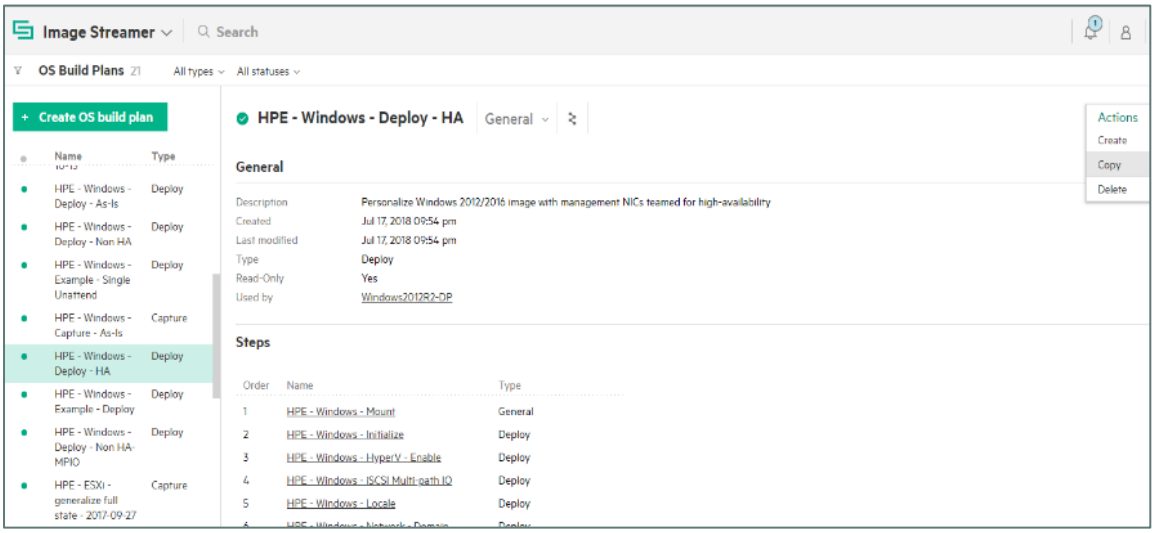
OS Build Plan, Server Profile and Deploying the Image

Login to HPE OneView and access HPE Synergy Image Streamer UI from OSDS page.
Click OS Build Plan from HPE Synergy Image Streamer main menu.



Select the Build Plan “HPE - Windows - Deploy - HA” in the left pane and click “Action”. Execute the “Copy” action on the Build Plan.



Enter a name of “OS Build Plan – TeamX” where X is your team name. Select “HPE-Windows-HA – Network Configuration” hit “x” to remove the Plan Script.Once removed, Click Add steps and select the “HPE-Windows-Network - Planscript” script. Click “Add”

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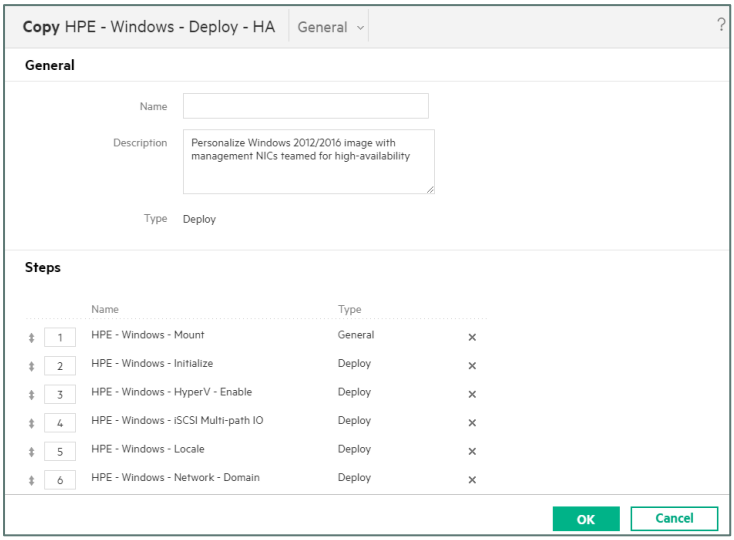
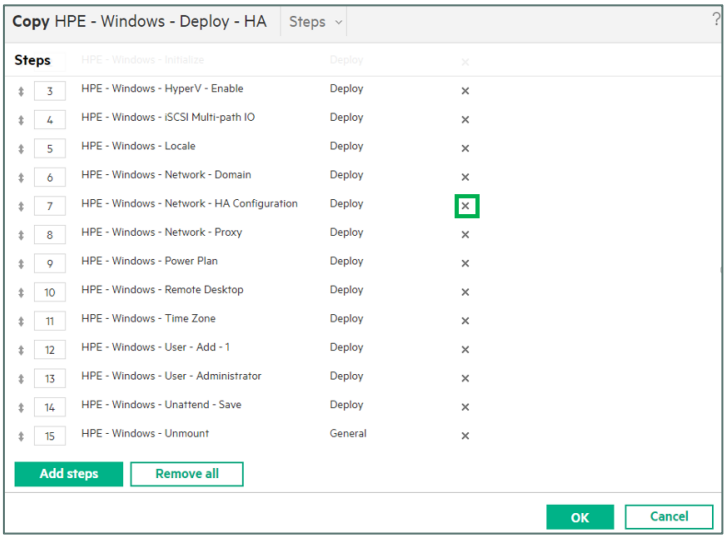
Add the newly added Script. You will notice that the new/modified Plan Script will be added as the last step.





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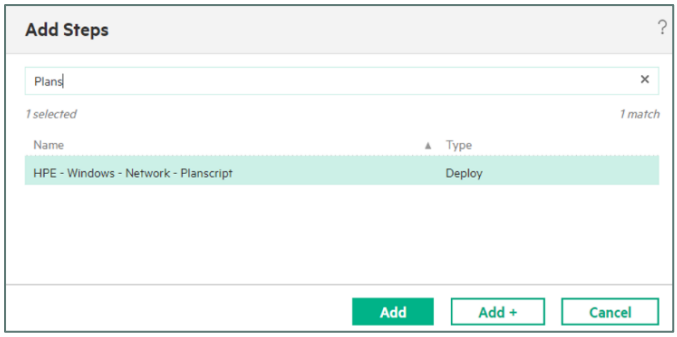

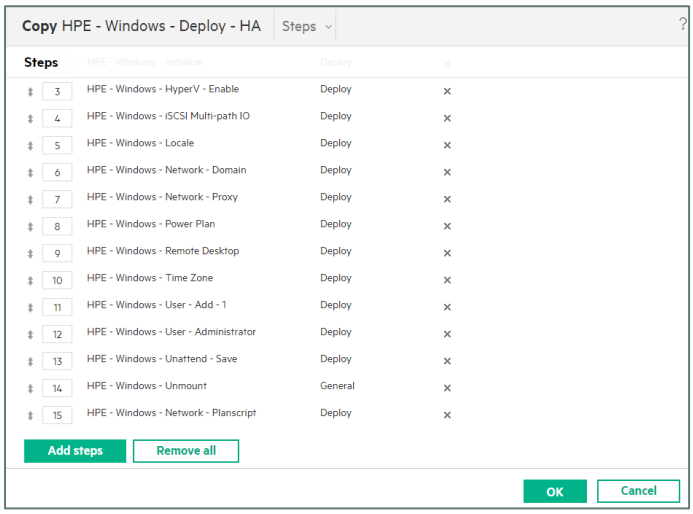

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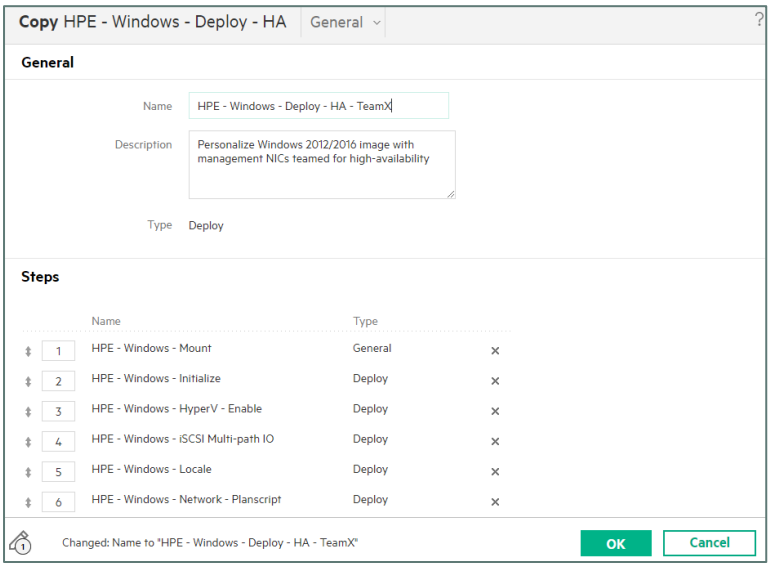
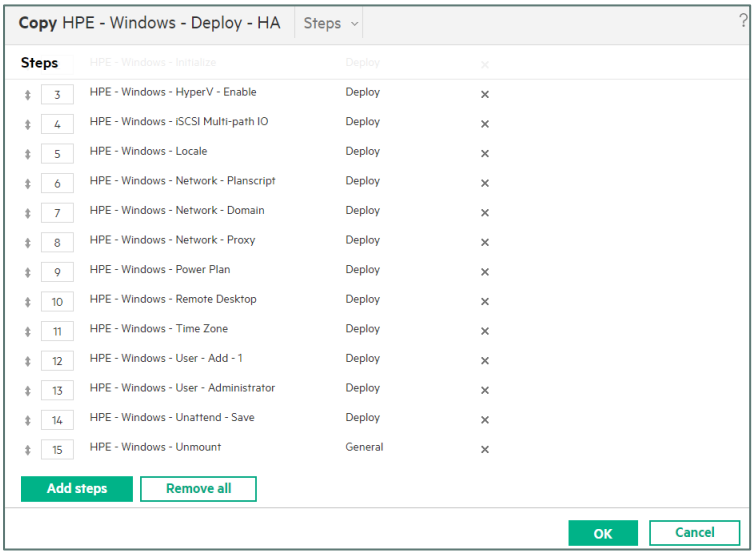
Note
While we add the Plan Script to the Build Plan we will always need to maintain the order in which the operations should be performed. Therefore we will need to move the new Plan Script to the 6rd step as below.

In case the order is not correct, please correct using below procedure:

Click on the arrow symbol and drag the Plan Script to desired step. Click **OK**.





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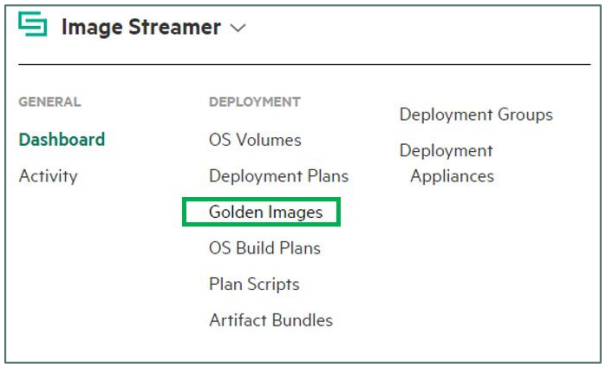
Upload Golden Image

Golden Image: A Golden Image of the Operating System to be deployed. When added to the HPE Synergy Image Streamer Appliance, a corresponding Golden Volume is created. Golden Image and Golden Volumes are replicated across all the appliances.

Note
Creation of Golden Image will be the Customer's responsibility. HPE will not provide any Golden Image to customers due to licensing issues, however the Golden Image creation procedure will be shared with the customer.

Login to HPE OneView and access the HPE Synergy Image Streamer UI from OS Deployment Server page.

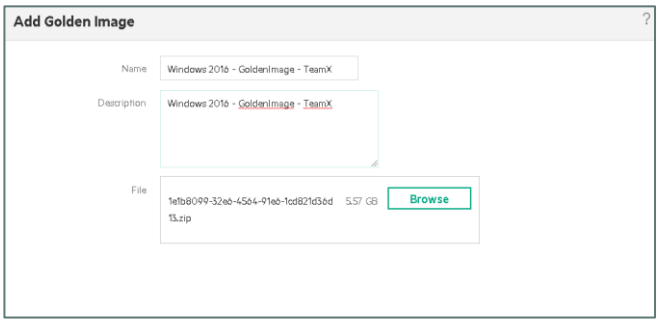
Click Golden Images from the HPE Synergy Image Streamer main menu.



Click Add Golden Image

Type a name of "Windows 2016. Add a suitable description.

Browse the Golden Images from your local file system and click "Add" for **"Golden-Images\1e1b8099-32e6-4564-91e6-1cd821d36d13ESXi 6.0 20161110.zip"**



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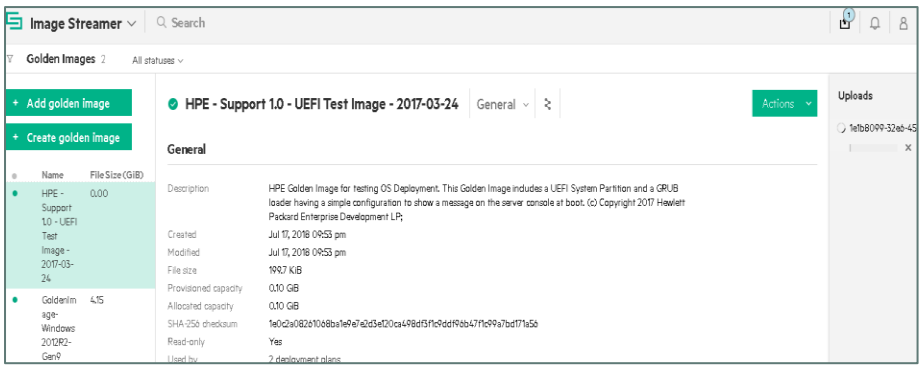


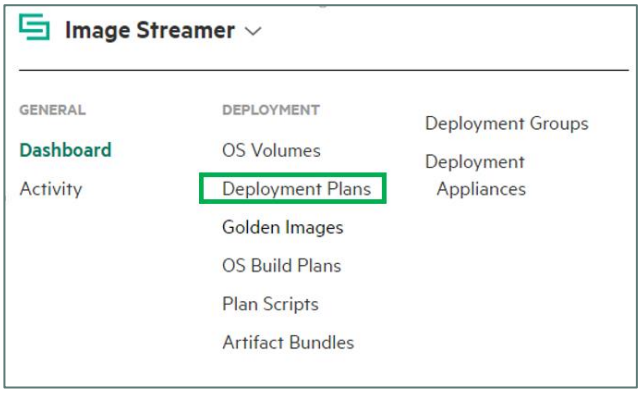
Upload progress can be monitored from the GUI.

Once uploaded, the Golden Image will show up in the GUI (under Golden Images section).

Create Deployment Plan

Login to HPE OneView using your Administrator credentials, and access the HPE Synergy Image Streamer UI from the OS Deployment Servers page.

Click Deployment Plans from the HPE Synergy Image Streamer main menu



Click Create Deployment Plan and Enter Below:

Name : Deploy Windows 2016

Description : Deploys Windows 2016 onto Synergy Compute nodes.

Choose OS Build Plan from the drop down list.

Choose the Golden Image “Windows 2016 Golden Image name.

Edit the “DomainName” in Plan Attributes to a value of “demolab.net”

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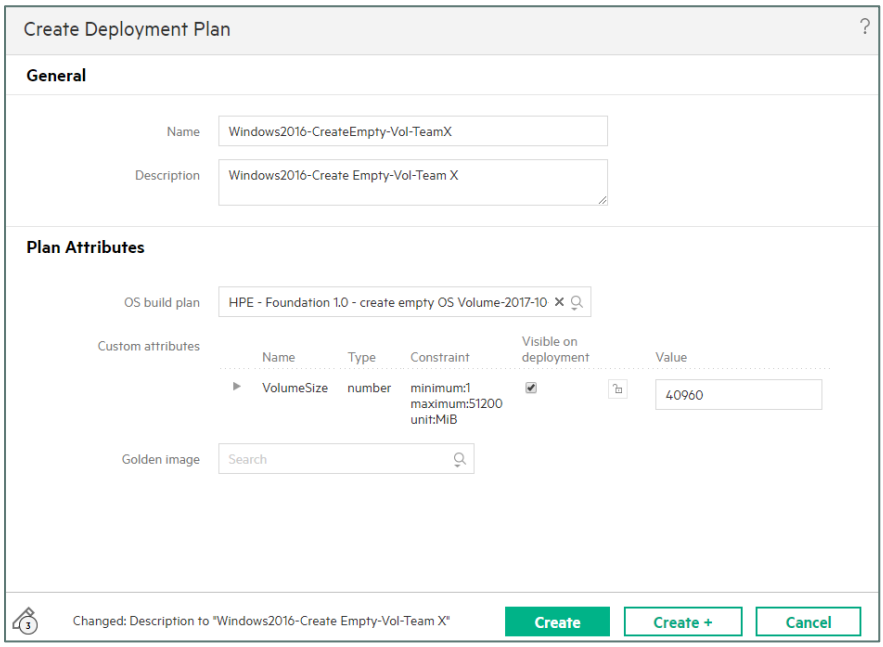

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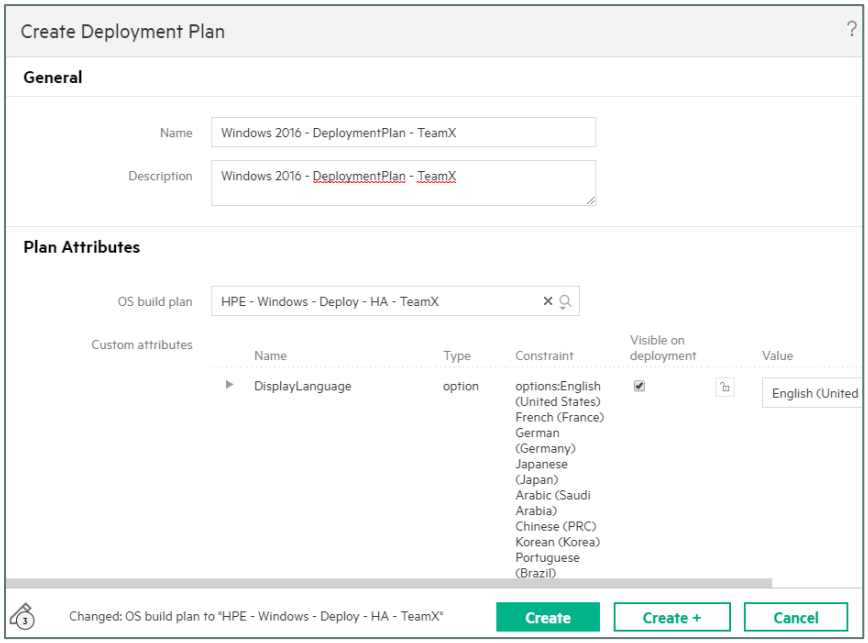
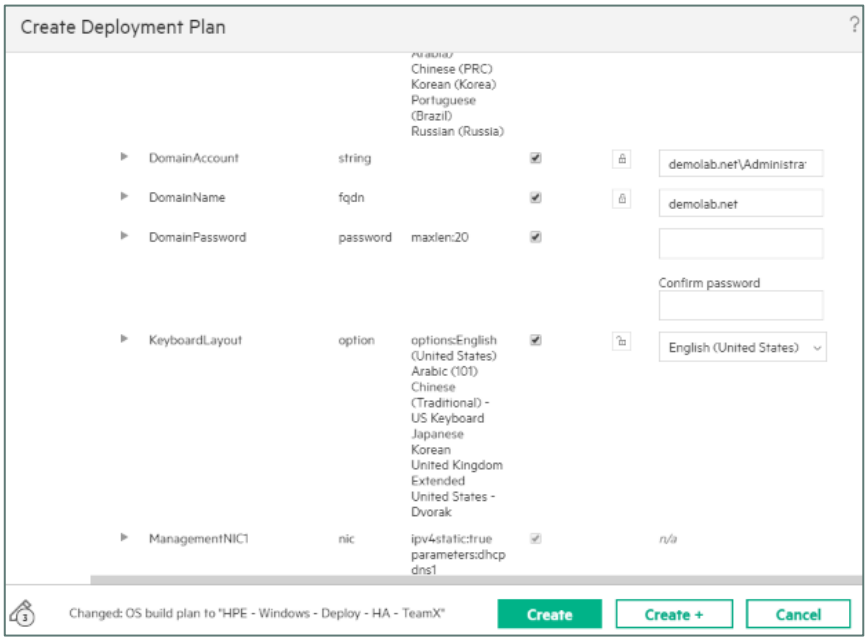


Click **Create.**



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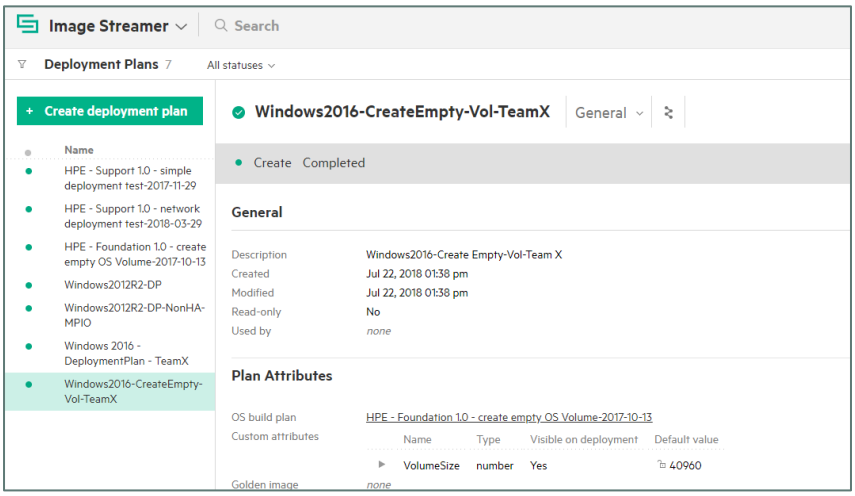
Note
We are making Domain Name Attribute non-editable during deployment.This can be changed by navigating directly to Deployment Plans and pressing the edit icon, where it can then be saved.



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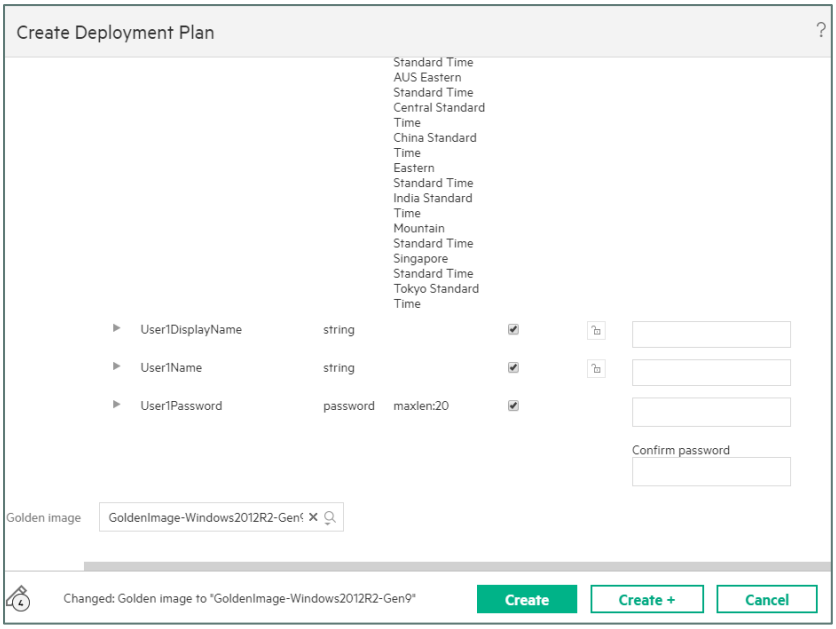
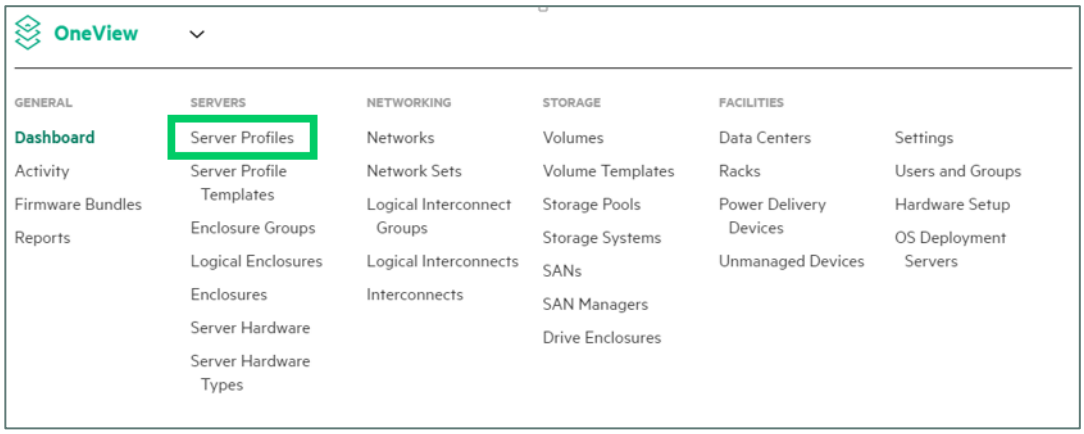


OS Deployment using Server Profile

From the HPE OneView Main Menu, go to Server Profile.



Server profiles can also be created from Server Hardware page. Go to Server Hardware and choose the server in left pane.Identify the Compute Node given to you as part of the Lab details.

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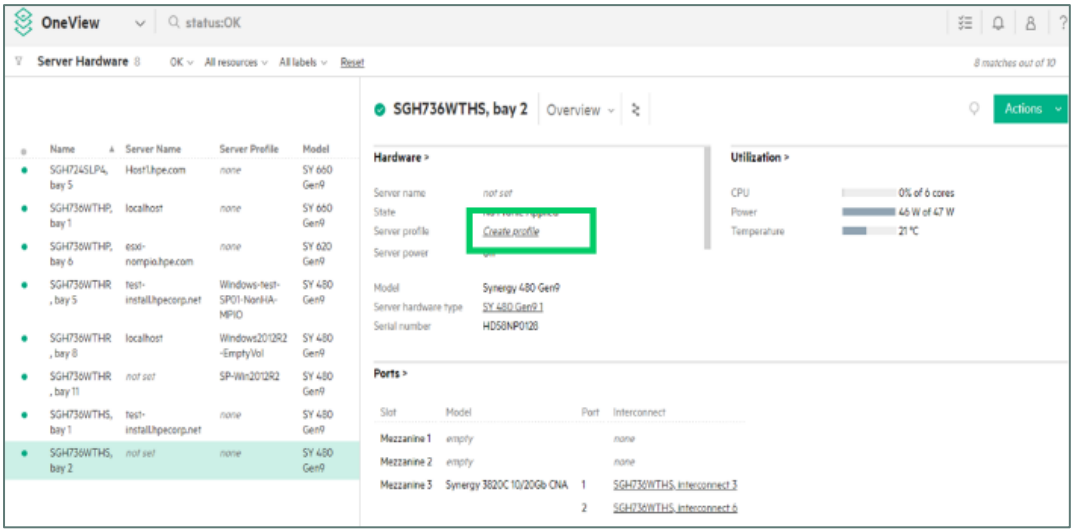
Navigate to that Compute Node and click on Create profile and Enter the following details:



Name	: Server Profile Name
Description	: Server Profile for Image Streamer Labs
Server Hardware	: SY480 (1, 2, 3 – review the hardware in the hardware tab)
OS Deployment Plan	: Deploy Windows 2016
Enclosure Group	: EG
Affinity	: Device Bay

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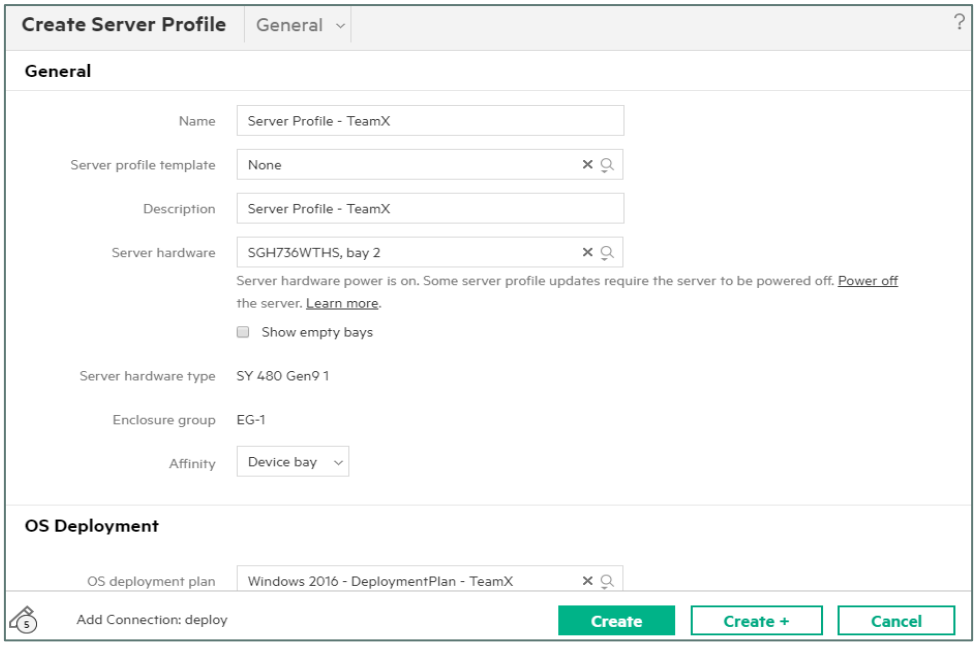

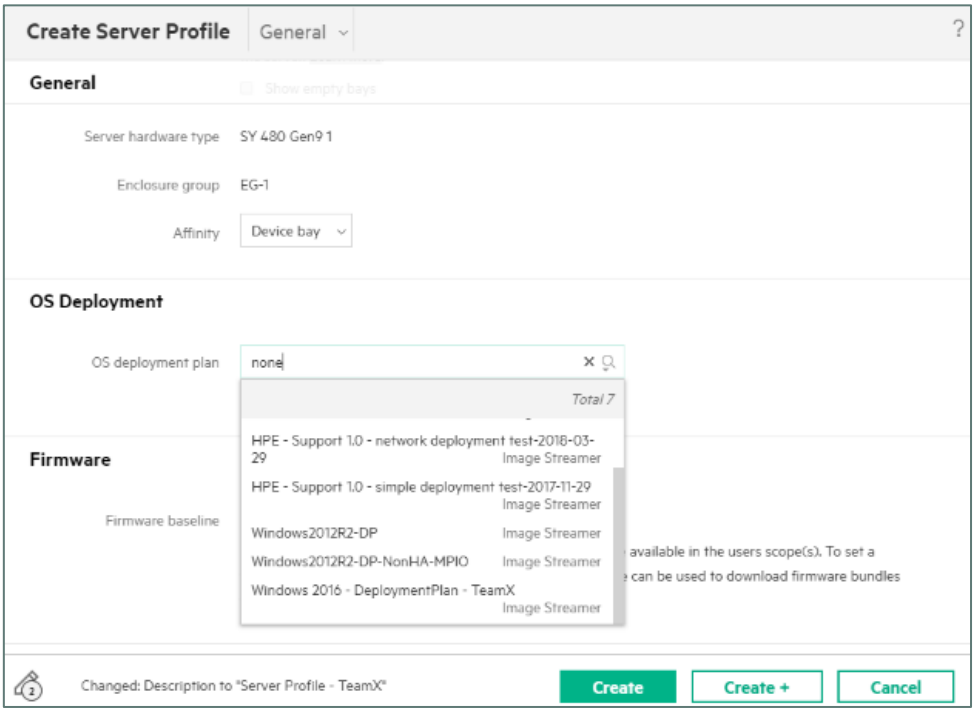

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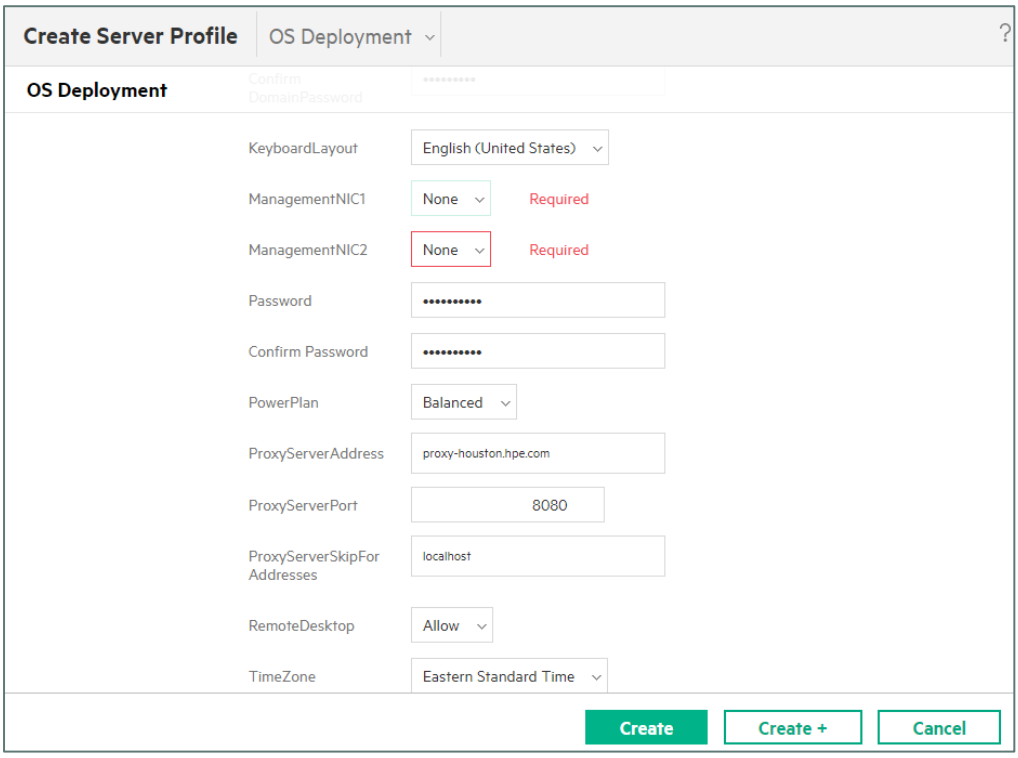
Note
Compute Modules need to be turned off before a server profile is applied.There is a constant sync between the HPE Synergy Image Streamer and HPE OneView for the Deployment Plan. The Deployment Plan once created on HPE Synergy Image Streamer will show up under the OS Deployment section in Server profile of HPE OneView.

With the selection of the Deployment Plan, the Custom attributes derived from Plan Scripts would appear.

Enter Custom Attribute values.



Note
Please note that the MgmtNic attribute does not show up for the connection (and the field is required). To make the MgmtNic work, you need to add the connection and choose the host management network that you created during initial setup.

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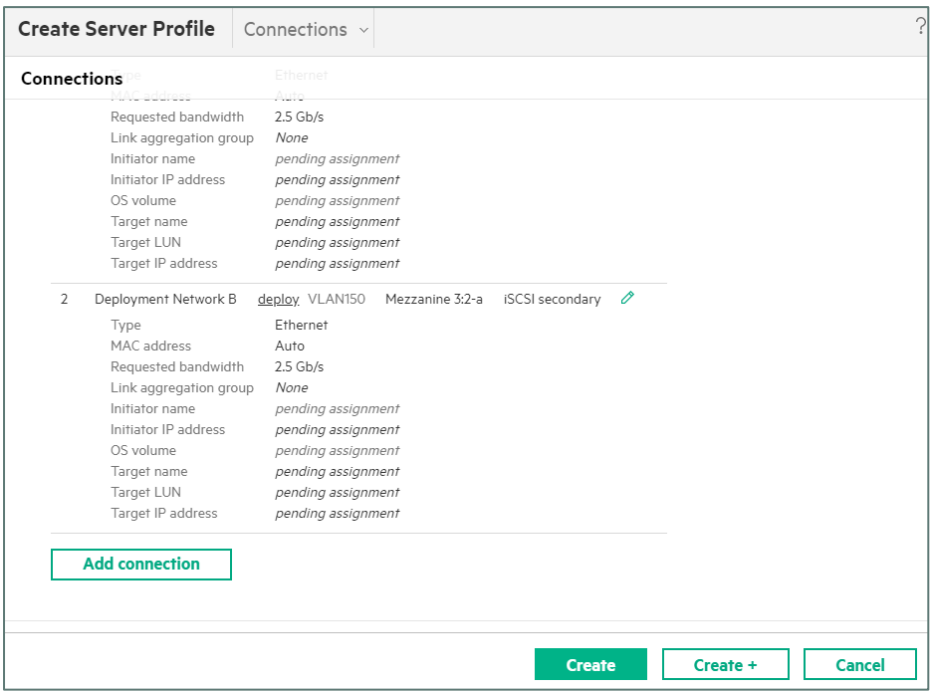
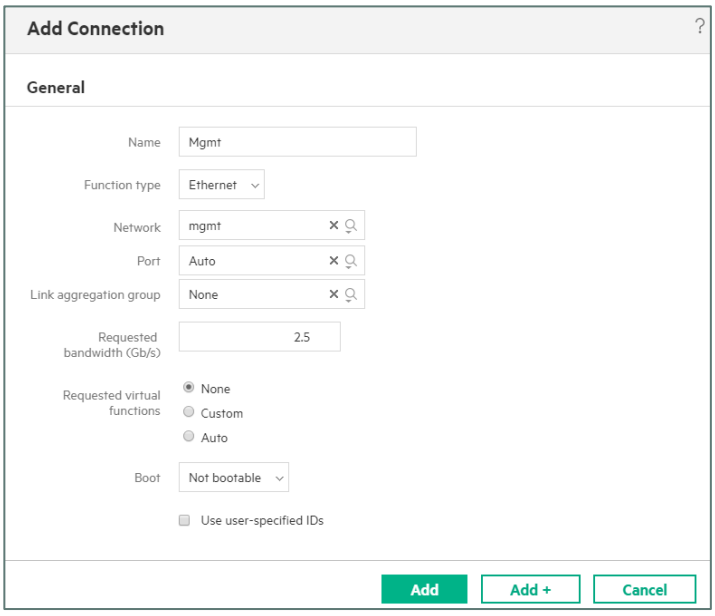
Click on Add Connection.





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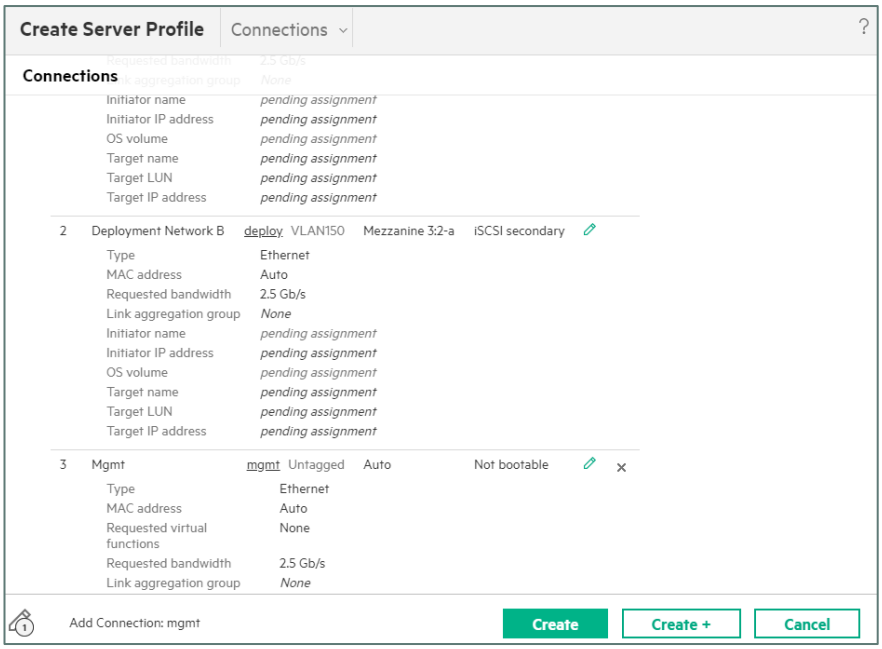
Click Add

Enter : Management Connection
Function Type: Ethernet.
Network : mgmt



Click Create. Once created, Connection will show up in ManagementNic Attribute in OS deployment section.

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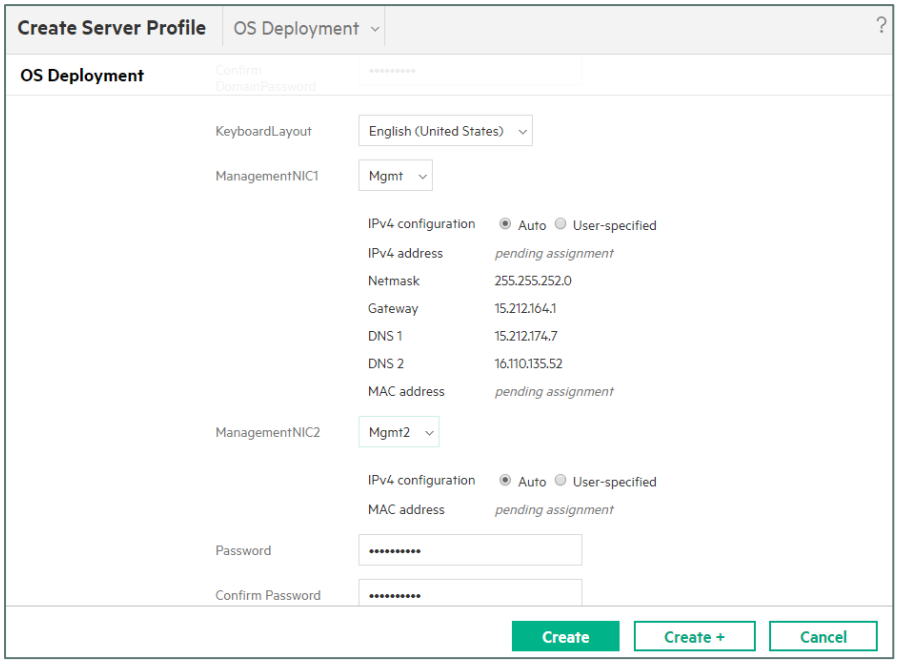
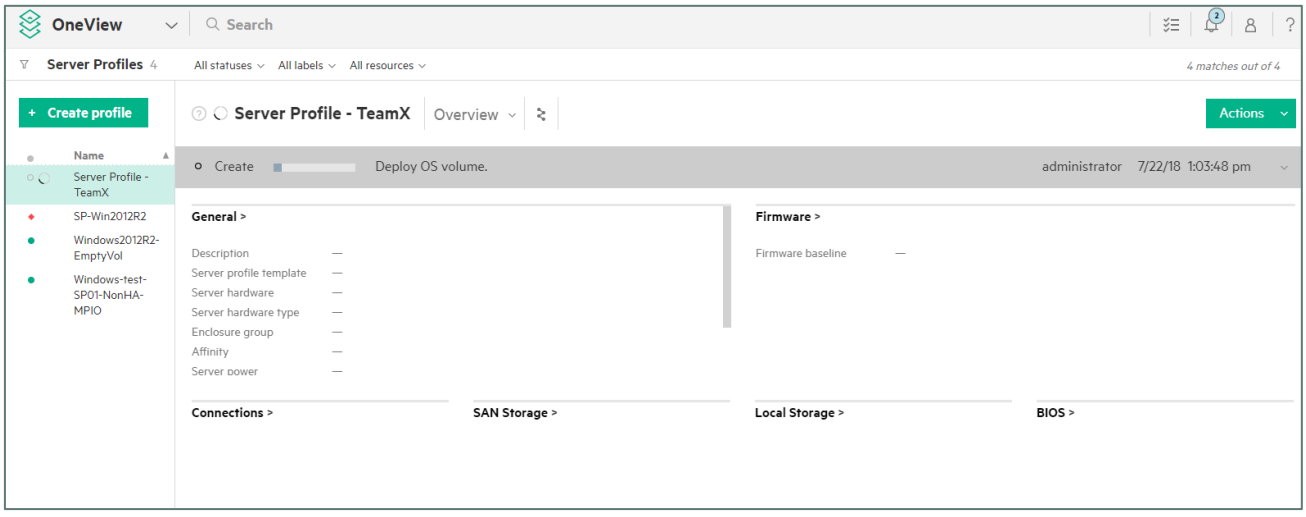


Click Create and check the progress.



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Server Profile creation should create the boot volume on HPE Synergy Image Streamer appliance, install the operating system and perform customization as derived from Deployment Plan.

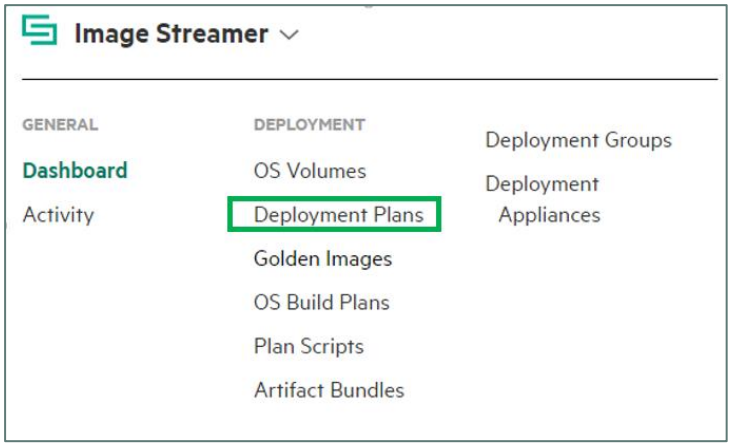
Capture Functionality

The capture functionality of the HPE Synergy image streamer appliance enables you to capture an existing instance of an operating system on the compute module. The HPE Synergy Image Streamer resource management interface removes all server specific information before creating a Golden Image from the installed operating system. The process is called generalization. Capture can be run only on an HPE Synergy Image Streamer hosted OS volume.

For a new setup, to create the capture, you can create an empty OS volume, Assign it to the compute module, boot the server, install the OS manually, and install any additional drivers and then run the capture to create the Golden Image that can be used for subsequent OS deployment operations.

Create Empty OS volume on HPE Synergy Image Streamer Appliance

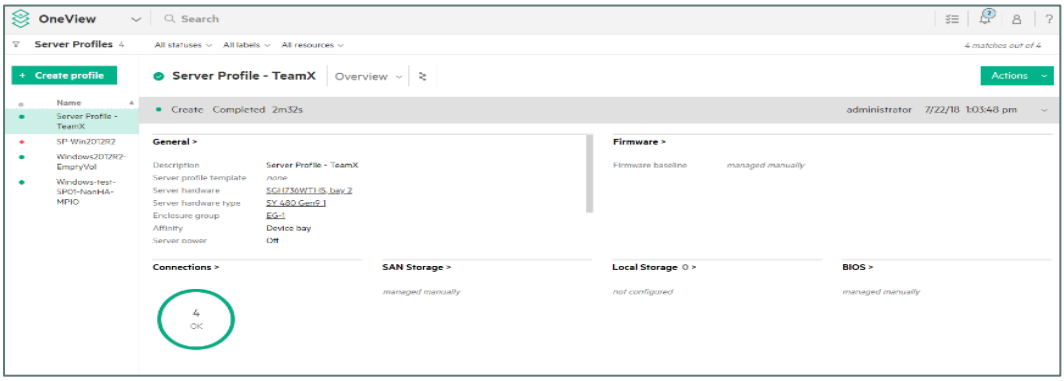
Click Deployment Plans from HPE Synergy Image Streamer main menu.



Click “Create Deployment Plan” and enter the following details:

Name : Empty OS Volume Creation

Description : Empty OS Volume Creation DP



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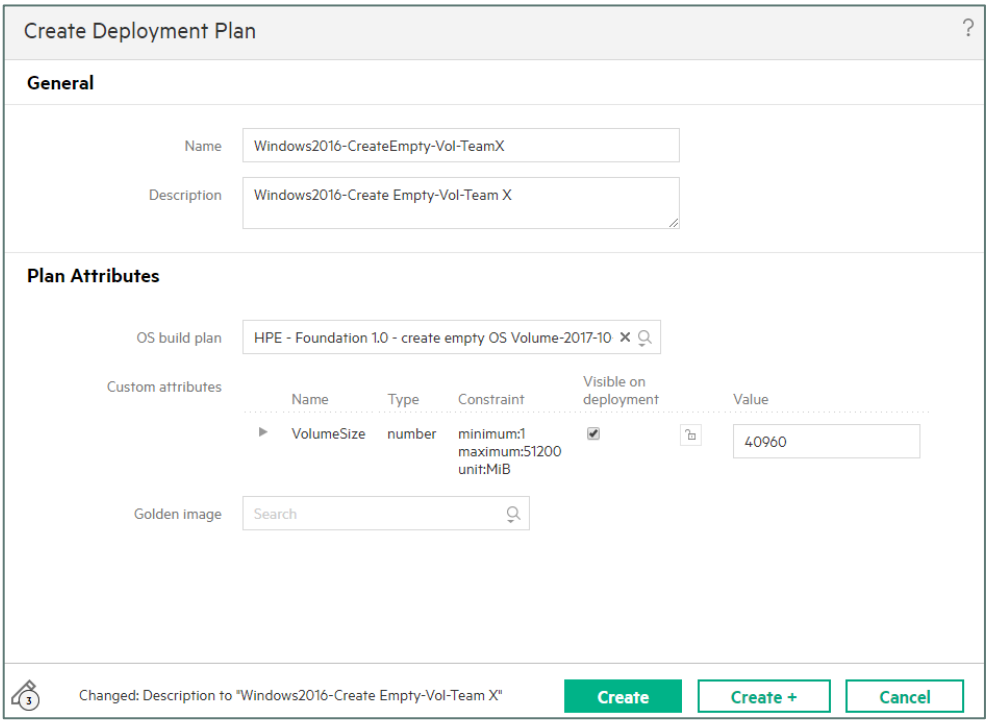
Choose OS Build plan from the drop-down HPE - Foundation 1.0 - create empty OS Volume-2017-10-13, and leave Golden Image section blank. Please note that this Build plan HPE - Foundation 1.0 - create empty OS Volume-2017-10-13 is part of the downloaded & extracted Windows artifact bundle.



Note: Volume Size should be 40GB (or) 40960MB

Click **Create**.

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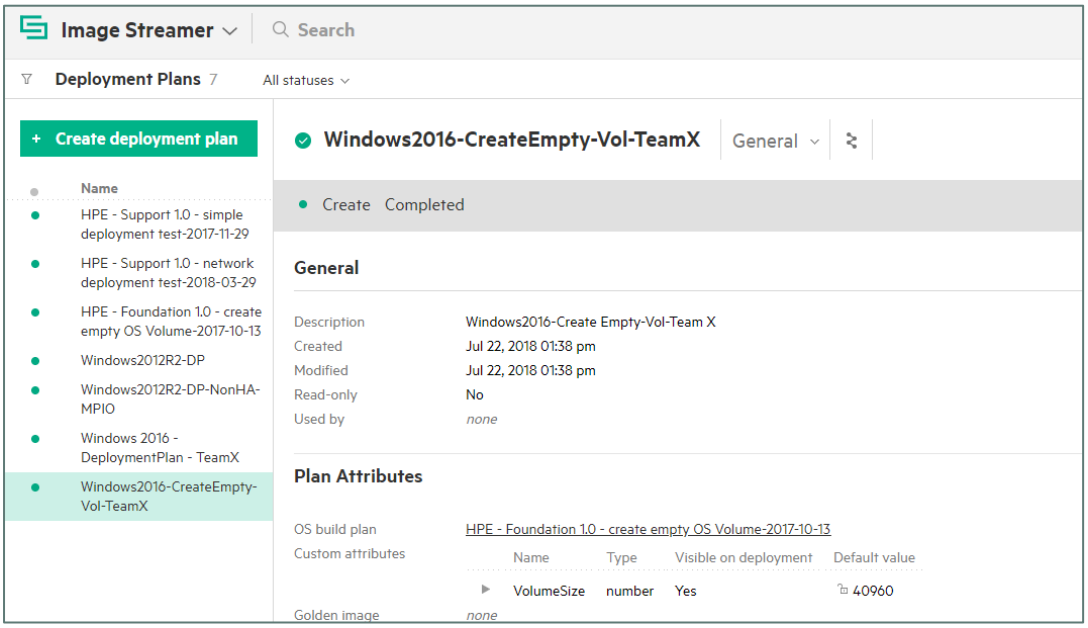

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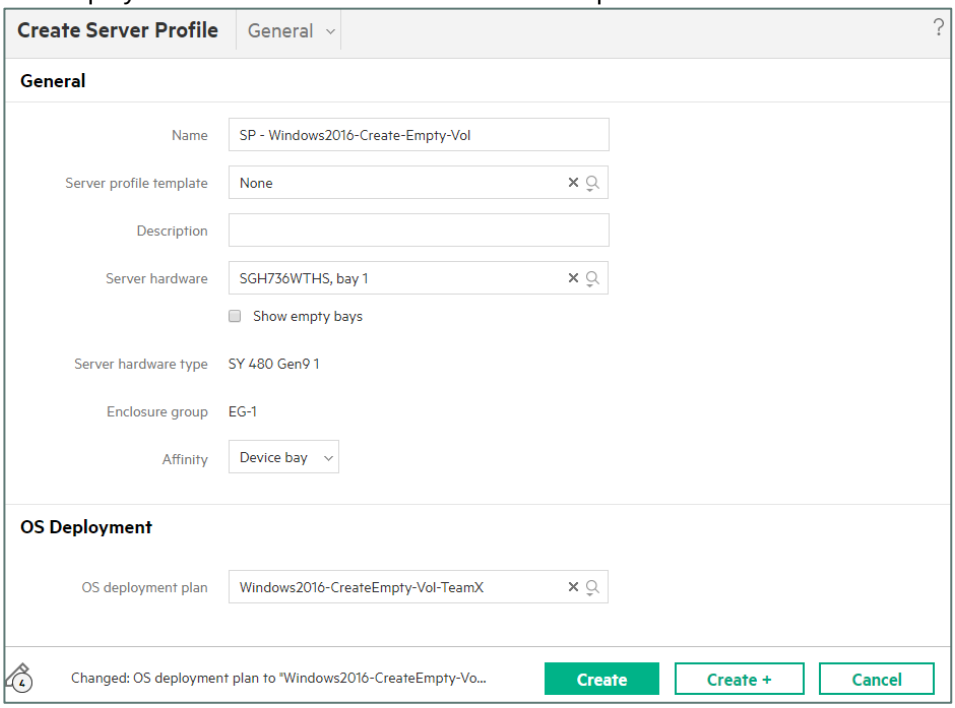
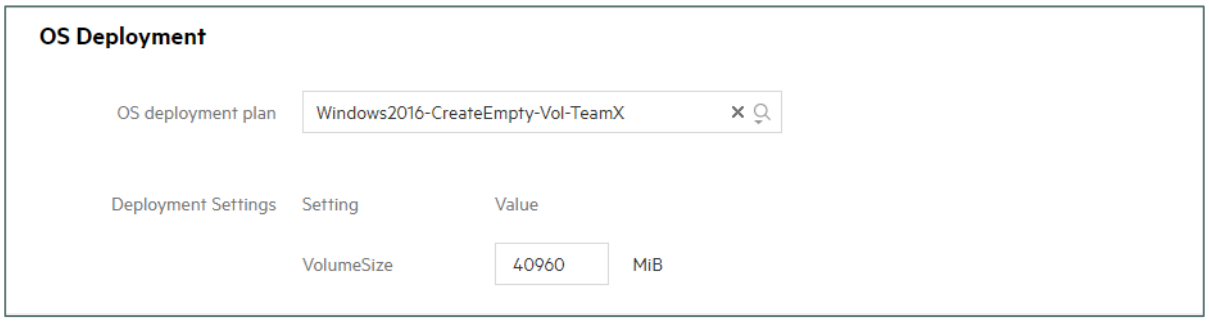
The Deployment Plan can now be chosen for Compute Module boot in HPE OneView using Server profile section.





The Server Profile when created using the Deployment Plan - “Empty OS volume creation” will create the 40 GB volume and assign it to the selected host.

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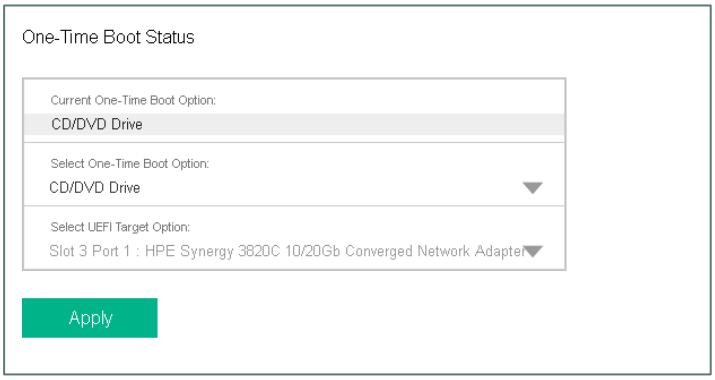
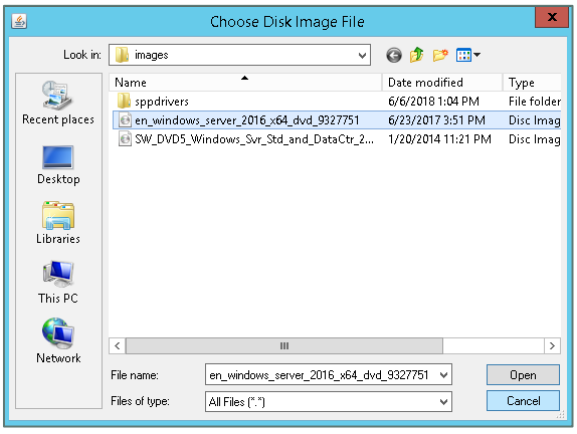
File System
The Windows image must contain a FAT32 partition which is assigned the drive-letter “S:” It is assumed that the FAT32 partition exists at dev/sda5 device path in guestfish. If the FAT32 partition is not on the mentioned device path, the “HPE - Windows - Mount” Plan Script has to be modified with the appropriate path. If the drive-letter assigned is different, all scripts with reference to paths on S: drive have to be modified.

Golden Image Capture

We assume that the users already have a running HPE Synergy Image Streamer setup.

- Ensure that you have access to Windows 2016 R2 ISO file.
- Create a Server Profile with “HPE - Foundation 1.0 - create empty OS Volume” as OS Deployment Plan and a server hardware of desired hardware type (see below section on Golden Image Compatibility below). Set an appropriate value for volume size in MiB units, say 40960 MiB. Please refer to the above section Create Empty OS volume on HPE Synergy Image Streamer Appliance
- The HPE Synergy Server will be configured for access to this empty OS Volume.
- Launch iLO Integrated Remote Console of this server and set the Windows 2016 R2 ISO file as virtual CD-ROM/DVD image file. Power on the server.





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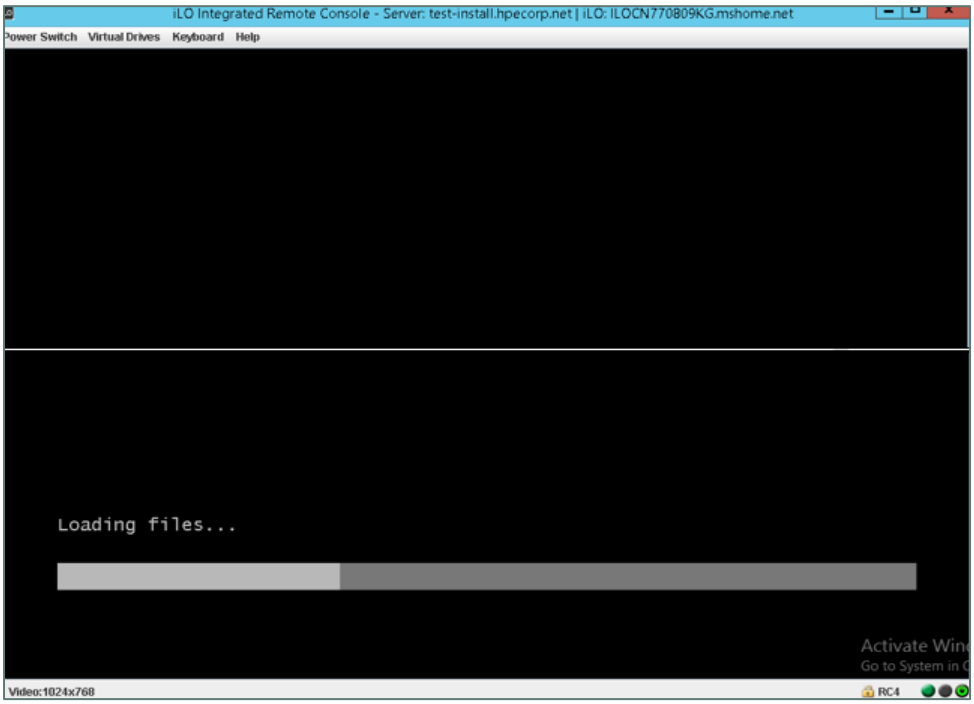
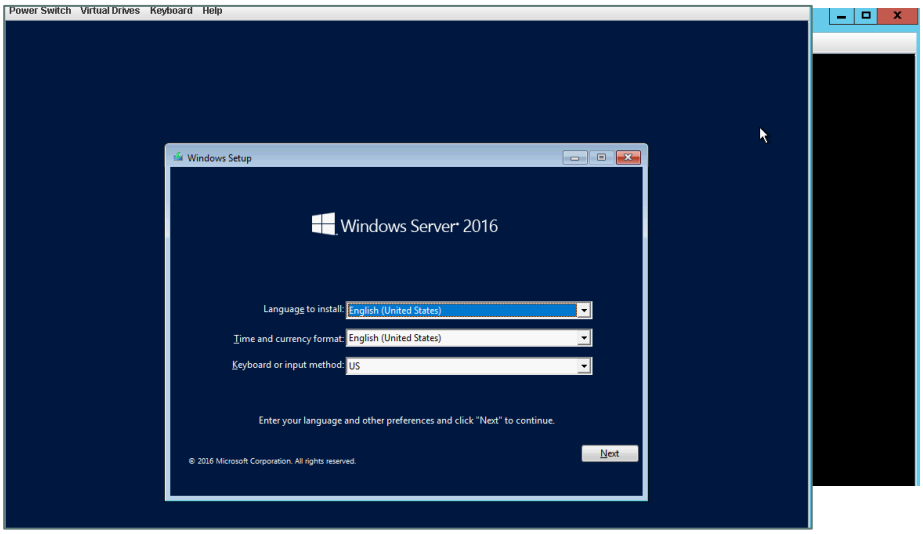
- Windows should present an option of installing from CD/DVD. Continue with this option.



- Install Windows 2016



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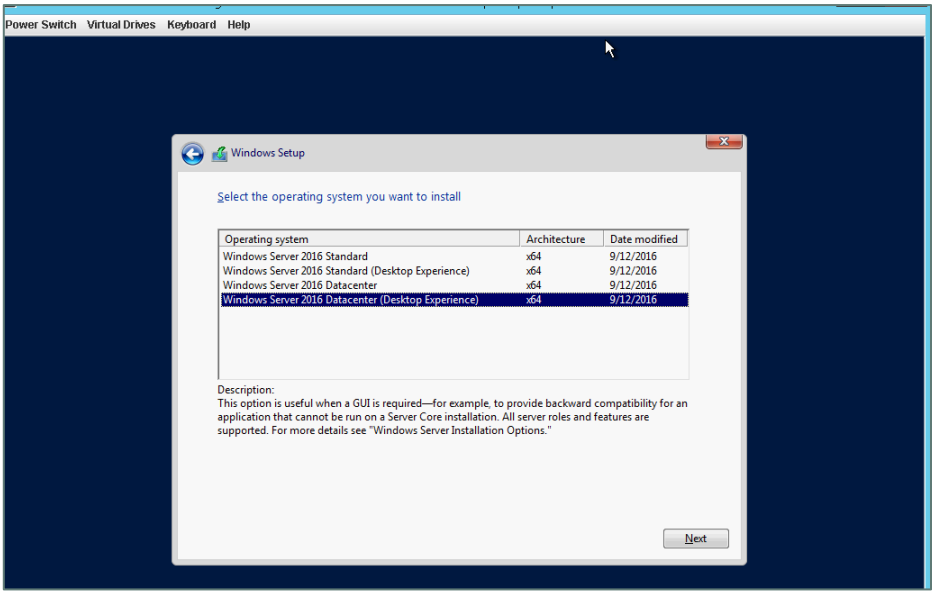

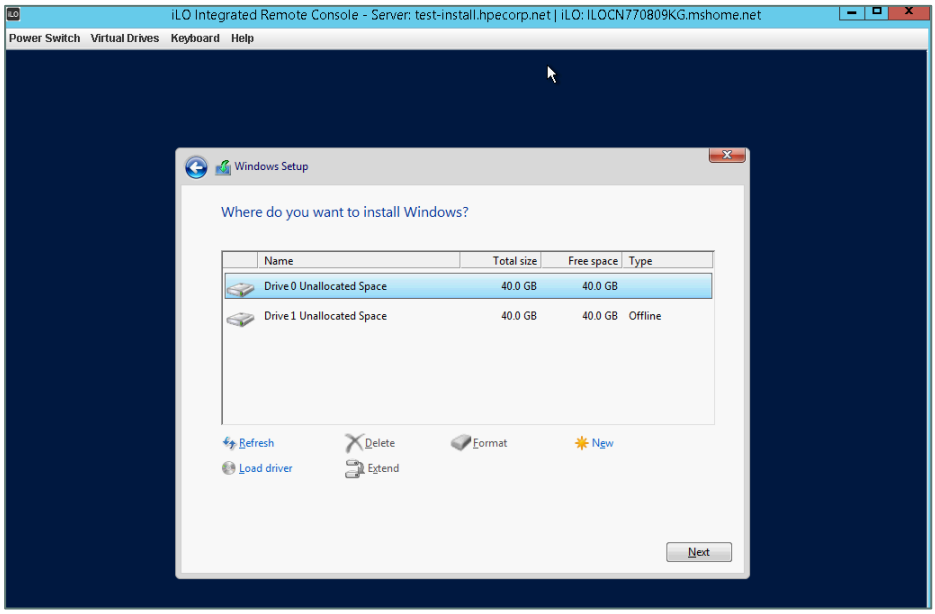

Please note that you will be seeing 2 unallocated space volumes. This is because of the VSA cluster. Please do not select the Volume that is offline.

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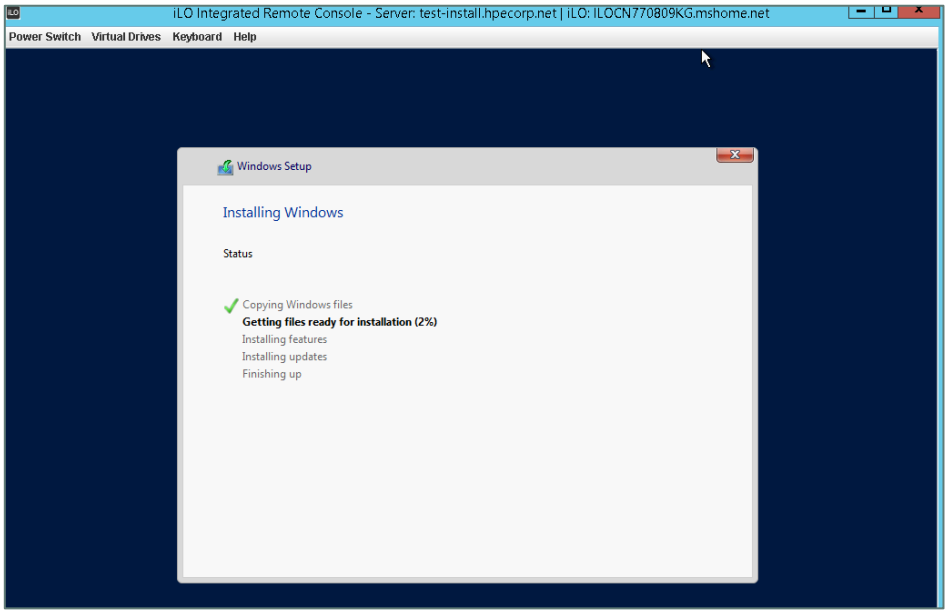

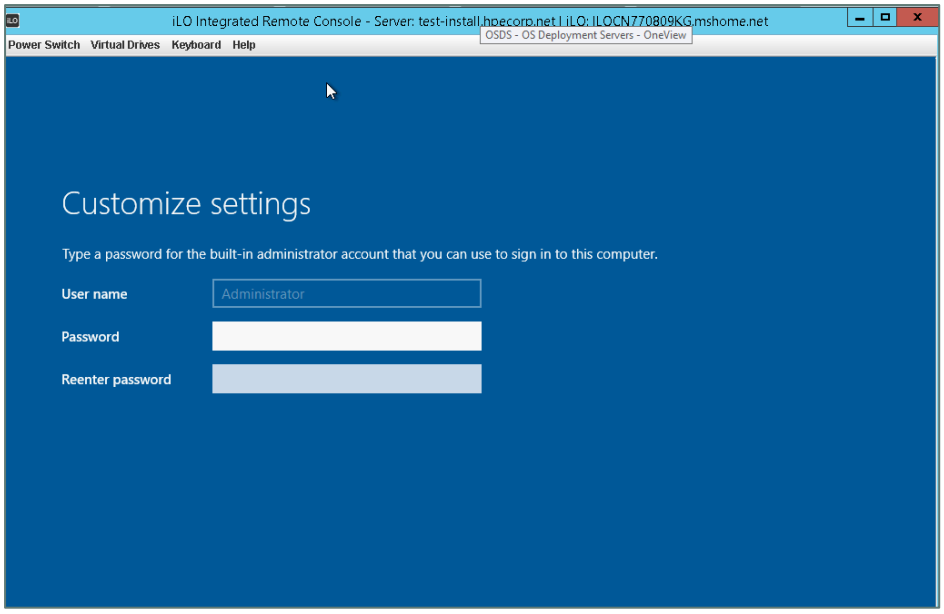

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- (Optional) To take a backup of this installation at this stage:
  a. Shutdown the server.
  b. Perform an as-is capture using "HPE - Windows - Capture - As-Is" Build Plan to create the "as-is" golden image of the OS.
  c. Deploy another server with the Golden Image captured in previous step and boot the server.

- Install any additional software or roles if required.
- Create a FAT32 partition which will be used by the artifacts for personalization:
  a. Open "Computer Management" > "Disk Management"
  b. Select C: partition
  c. Shrink volume.
  d. Change amount of space to shrink to 100 MB.
  e. Select Shrink.
  f. Select new unallocated space.
  g. Select New Simple Volume
  h. Leave size.
  i. Assign drive letter, (Choose S)
  j. Format as FAT32 file system type (this requires changing from the default)
  k. Give Volume label as "ISDEPLOY"
  l. Finish
  m. “ISDEPLOY (S:)” should be shown

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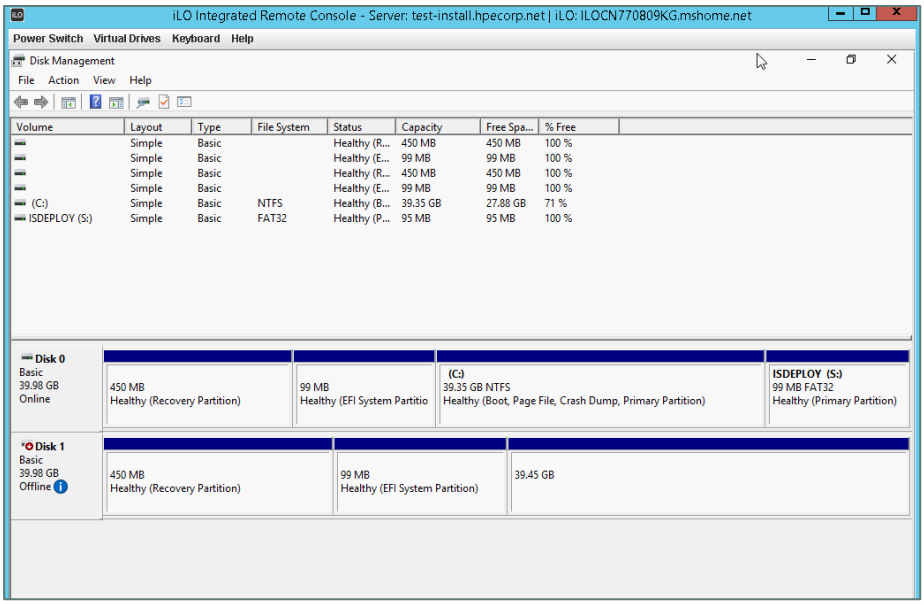

- Backup drive-letters.

```
reg export HKLM\System\MountedDevices C:\driveletters.reg
```

- Generalize Windows using sysprep

  Open Command Prompt window and run the following.

```
cd Windows\System32\Sysprep
Sysprep /generalize /oobe /quit
```

Warning
This operation is destructive and will remove all configuration. To take backup of the system at this stage, capture an as-is Golden Image.

This will take a few minutes to complete and will generalize the system. All settings will be lost. This does not remove any additional user accounts that are created. Any user accounts not required in the captured Golden Image must be manually deleted.

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- Restore drive-letters

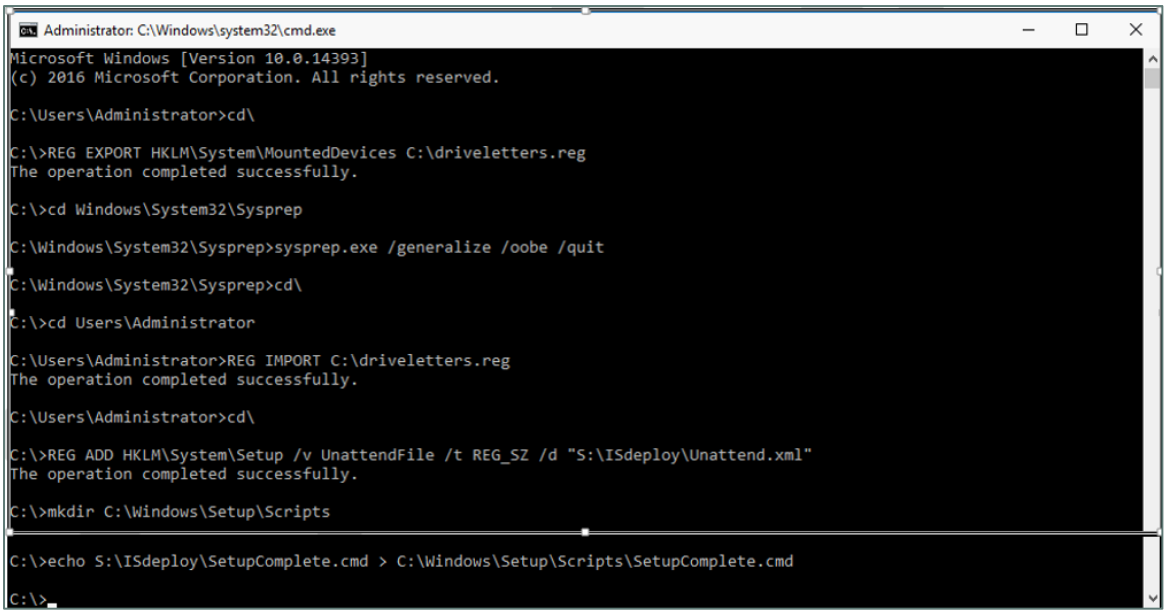
```
reg import C:\driveletters.reg
```

- Set Unattend.xml location to the FAT32 partition

```
reg add HKLM\System\Setup /v UnattendFile /t REG_SZ /d
"S:\ISdeploy\Unattend.xml"
```

- Set SetupComplete.cmd location to the FAT32 partition

```
mkdir C:\Windows\Setup\Scripts
echo S:\ISdeploy\SetupComplete.cmd >
C:\Windows\Setup\Scripts\SetupComplete.cmd
```



- Shutdown the server.
- Capture a Golden Image using the "HPE - Windows - Capture - As-Is" Build Plan. This will be the generalized Golden Image.

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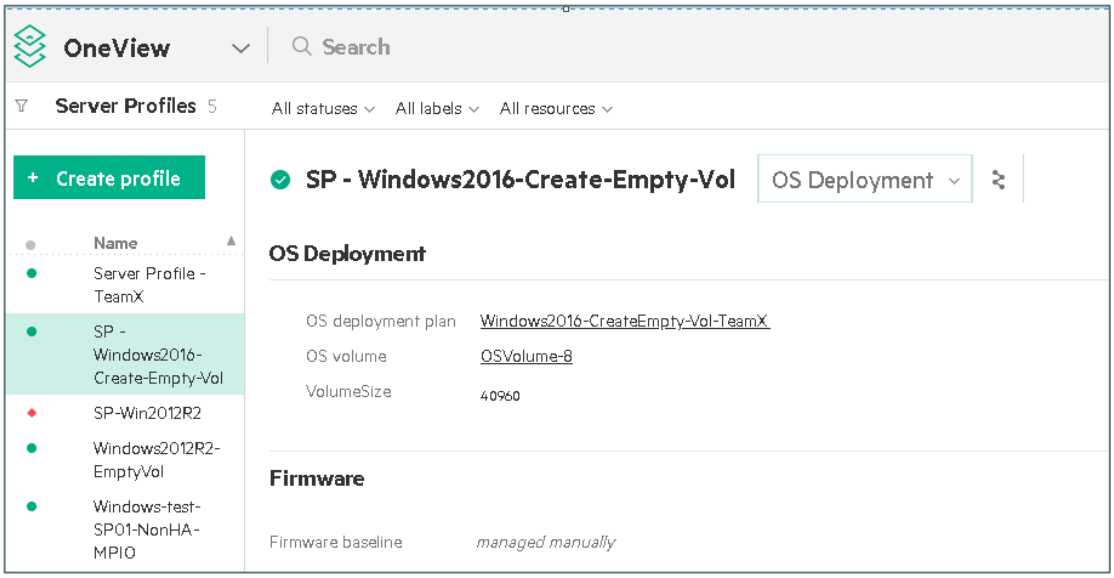
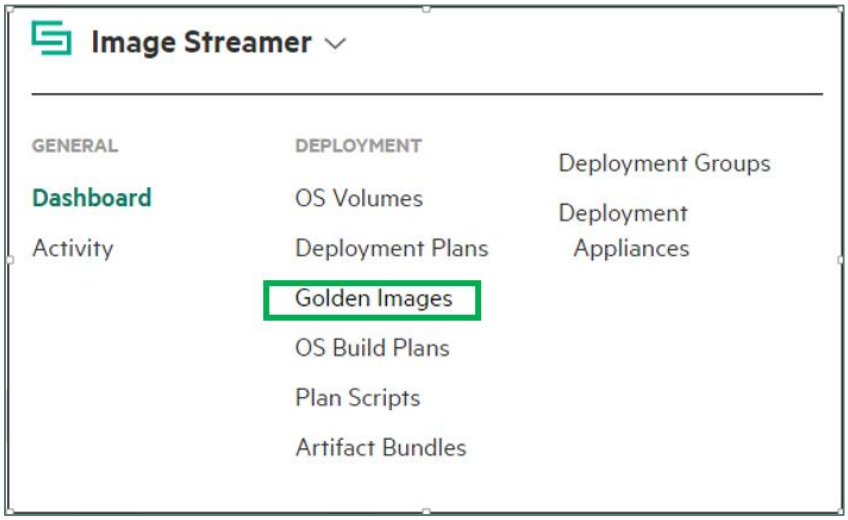
From your Server Profile deployment creating the Empty Volume make a note of the Volume number in HPE OneView as this will be needed. The example below shows it to be OSVolume-8



From HPE Synergy Image Streamer Menu, Click on “Golden Images”.



Click “Create Golden Image” and Enter Name, Description.

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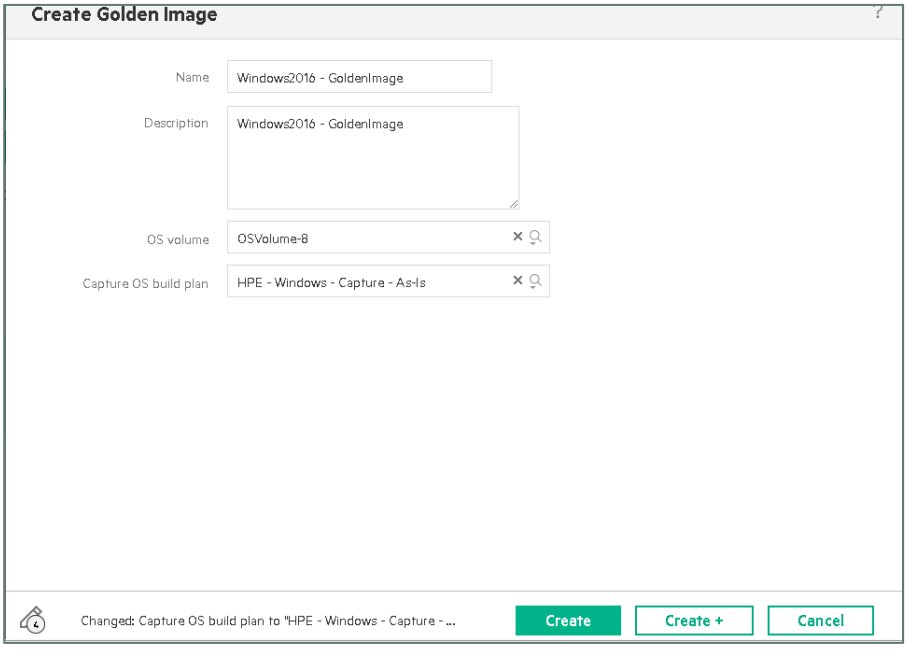
Sep 2018

Name : Windows2016 – Golden Image

Description : Capture the Golden Image from deployment

Choose the OS Volume that you deployed to the Compute Node to capture the image from.

Select the OS Build Plan "HPE - Windows - Capture - As-Is" to generalizing the image.



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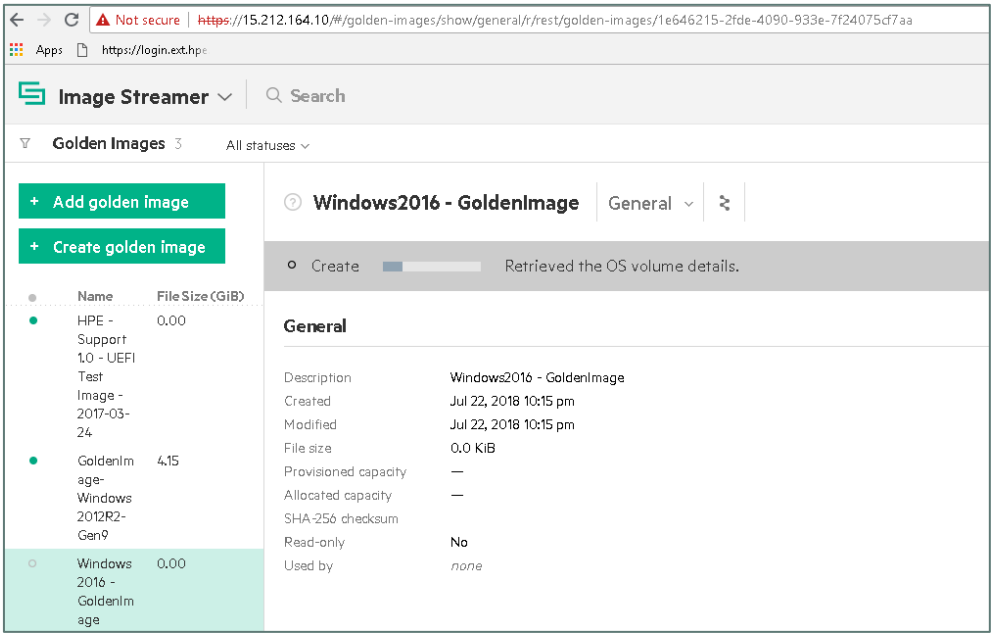
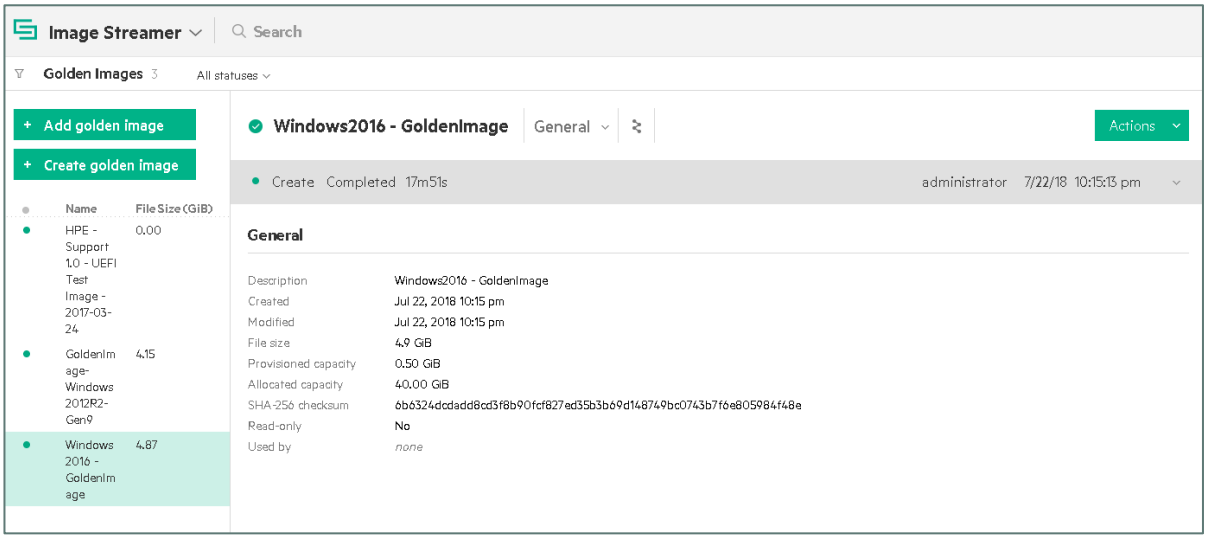
Click **Create**





You can use this Golden Image in the Deployment Plans for subsequent server deployments

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Important
Choose the Golden Image you just created, and delete it. This is in order to make sure there is enough space for other teams for their lab to work correctly. Navigate to Golden Images, and on the Actions menu and press Remove.

Golden Image Compatibility

The golden image created using the above method will work only on server hardware of the same model (for example: HPE Synergy 480 Gen9) containing same number of processors.

If the server hardware is of different model or contains different number of processors, or if the boot controller is moved from one CNA/slot to another, Windows will be unable to boot on the deployed server hardware.

Pagefile Size

Following is recommended for the size and location of the pagefile:

If the pagefile is going to be of small size (< 1 GiB), then it can be located on the OS volume.

If the pagefile is going to be large (> 1 GiB), then it should be located on local disk or SAN and configured appropriately.

If a large pagefile size is required and the above recommendations cannot be followed, then using Windows with HPE Synergy Image Streamer may require reconsideration as having a large pagefile on the OS volume may consume significant storage on HPE Synergy Image Streamer and limit the number of server profiles that can be deployed.

Troubleshooting Techniques

- Debugging personalization done using setcomplete.cmd

  C:\SETUP.LOG - it is a log file that has result of commands/scripts that runs through setupcomplete.cmd. All the components in HPE Synergy frames are running qualified firmware as per the GARFS/SERFS/TERFS recipe

- Debugging personalization done using unattend.xml

  If booting up of server fails with error in parsing unattend.xml

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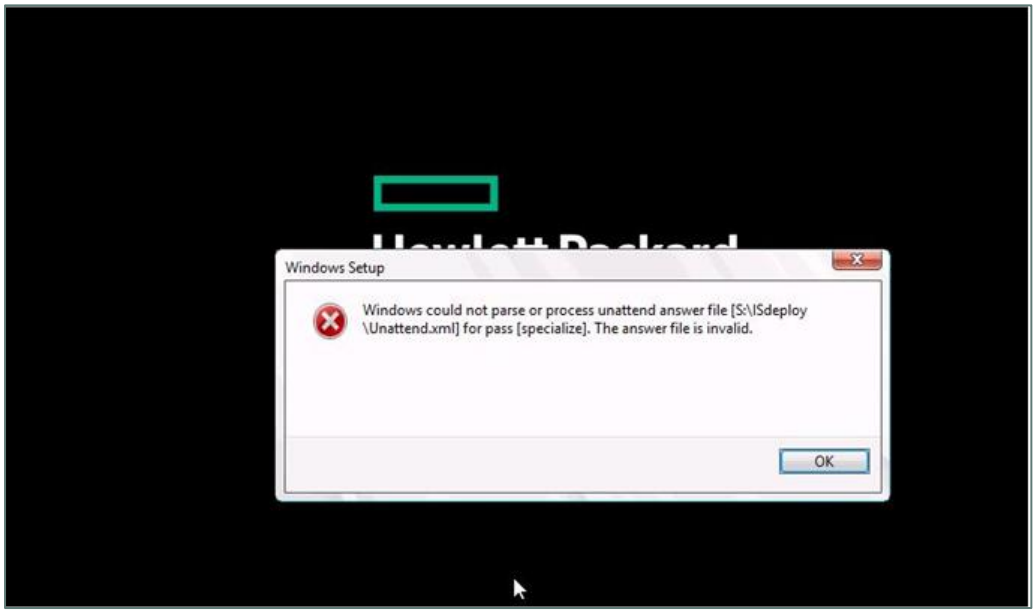

You can mount the volume NTFS partition in Appliance Management VM/appliance and look for the error in the following files:

C:\Windows\Panther\UnattendGC\setuperr.log

C:\Windows\Panther\UnattendGC\setupact.log

C:\Windows\Panther\setuperr.log

C:\Windows\Panther\setupact.log

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