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Enterprise

Technical Documentation

HPE Synergy Image Streamer - Capture RHEL 7.3

Edition: 2
Published: July 2017

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HPE Synergy Image Streamer – Capture RHEL 7.3

This document provides a step-by-step example of how to capture a RHEL 7.3 golden image with HPE Synergy Image Streamer that can be used with the RHEL 7.3 Image Streamer example artifacts.

HPE Synergy Image Streamer – Capture RHEL 7.3

- 1 Download the RHEL 7.3 .iso image
- 2 Add HPE Image Streamer sample artifacts
- 3 Prepare compute module for RHEL 7.3 installation
- 4 Create a Server Profile with an empty OS volume
- 5 Install RHEL 7.3 to the empty OS Volume
- 6 Capture the Golden Image from the Installed Volume
- 7 Congratulations!

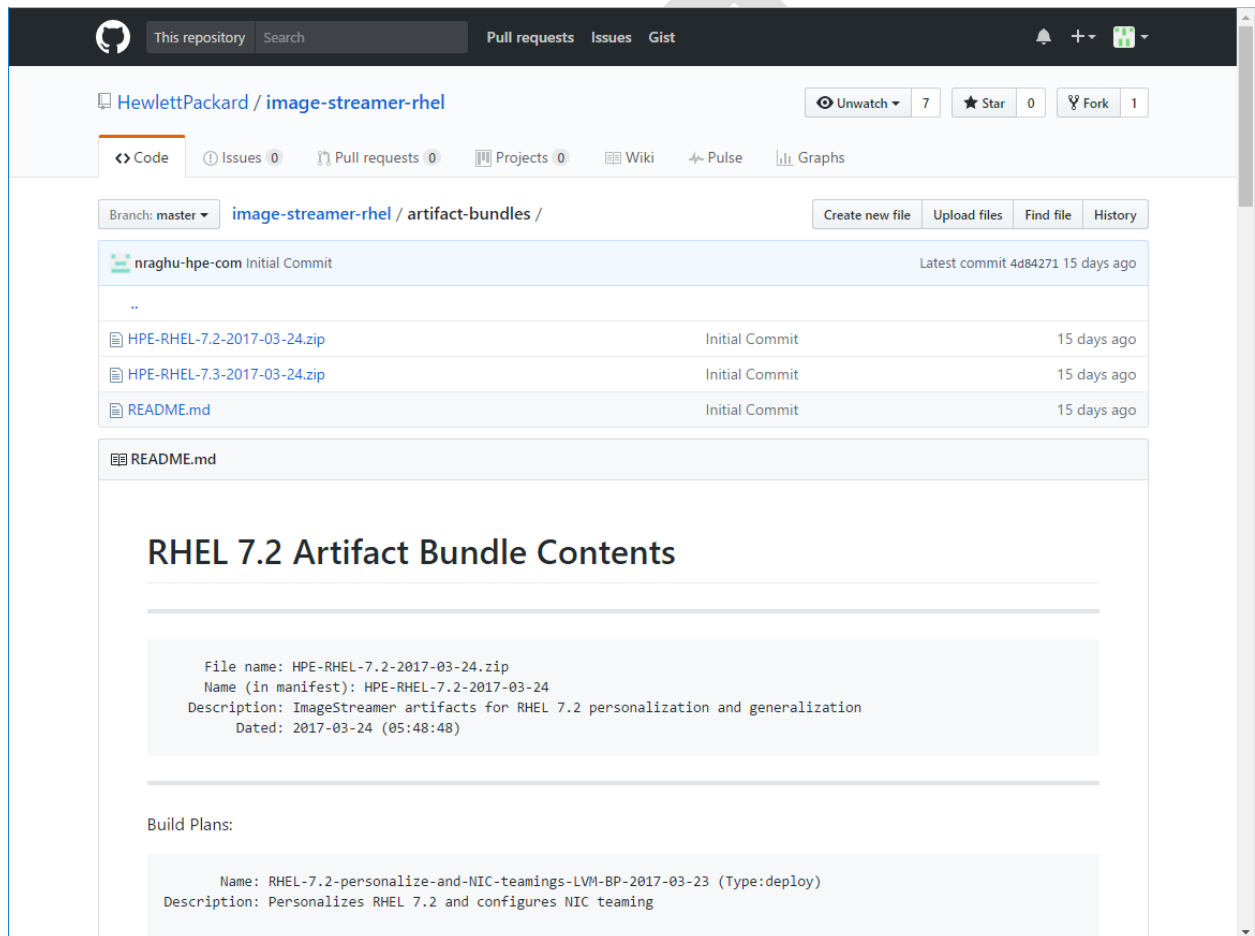
1. Download the RHEL 7.3 .iso image

A. Obtain RHEL 7.3 .iso image.

Download the RHEL 7.3 server install .iso image to the same system where the web browser running HPE OneView on the HPE Synergy Composer is running.

2. Add HPE Image Streamer sample artifacts

A. Download artifacts from the HPE GitHub site.



Download the image-streamer-rhel RHEL-7.3 sample artifact bundle:

<https://github.com/HewlettPackard/image-streamer-rhel/tree/master/artifact-bundles>

Download the image-streamer-tools-foundation sample artifact bundle if it is not already added to HPE Image Streamer:

<https://github.com/HewlettPackard/image-streamer-tools/tree/master/foundation/artifact-bundles>

B. Add artifact bundles to HPE Image Streamer

Image Streamer Search

Artifact Bundles 4

+ Add artifact bundle
+ Create artifact bundle

Name	Size
HPE-Support-Artifacts-2017-03-24	108.8 KiB
HPE-Foundation-Artifacts-2017-03-24	5.1 KiB
HPE-ImageStreamer-Developer-2017-03-24	115.8 KiB
HPE-RHEL-7.3-2017-03-24	23.1 KiB

Storage remaining 59.4 GiB

HPE-RHEL-7.3-2017-03-24

General

Created Apr 8, 2017 12:05 am
Modified Apr 8, 2017 12:05 am
Description ImageStreamer artifacts for RHEL 7.3 personalization and generalization.(c) Copyright 2017 Hewlett Packard Enterprise Development LP. Licensed under the Apache License, Version 2.0 (the "License");you may not use this file except in compliance with the License.You may obtain a copy of the License at http
Size 23.1 KiB
SHA-1 checksum d706cdd235eb70f9e77de30f2d1b025455ef8750
Read-only Yes

Deployment plans

none

OS build plans

Name	Description	Read-only
▶ RHEL-7.3-generalize-2017-03-23	Remove personalization settings from RHEL 7.3. (c) Copyright 2017 Hewlett Packard Enterprise Development LP Licensed under the Apache License, Version 2.0 (the "License");...	Yes

Actions
Add
Create
Download
Extract
Delete

Navigate to the HPE Image Streamer Artifact Bundles page.

Use Add artifact bundle to load the previously downloaded bundles.

Use the Extract Action to on each artifact bundle to extract their artifacts.

3. Prepare compute module for RHEL 7.3 installation

There are many viable means to install RHEL 7.3 on to the compute module which will be used to capture the golden image. In this example HPE iLO virtual media will be used to mount the RHEL 7.3 .iso server install image to the compute module.

A. Attach RHEL 7.3 .iso to compute module

The screenshot shows the HPE OneView interface. On the left, a table lists server hardware. The first row is highlighted in green. On the right, the details for 'CN7515049F, bay 1' are shown. The 'Actions' menu is open, showing options like 'Launch console', 'Power on', 'Refresh', 'Reset iLO', 'Edit remote support settings', and 'Collect Remote Support data'.

Name	Model	Server Profile
CN7515049F, bay 1	SY 480 Gen9	none
CN7515049F, bay 2	SY 660 Gen9	none
CN7515049F, bay 5	SY 480 Gen9	none
CN7515049F, bay 6	SY 480 Gen9	none
CN7515049F, bay 7	SY 480 Gen9	none
CN7515049F, bay 9	SY 480 Gen9	none
CN7515049F, bay 10	SY 480 Gen9	none
CN7515049F, bay 11	SY 480 Gen9	none
CN7515049F, bay 12	SY 480 Gen9	none

Hardware >

State: No Profile Applied
Server profile: [Create profile](#)
Server power: Off
Model: Synergy 480 Gen9
Server hardware type: SY 480 Gen9

Utilization >

CPU: 0%
Power: 0 W
Temperature: 68 °F

Ports >

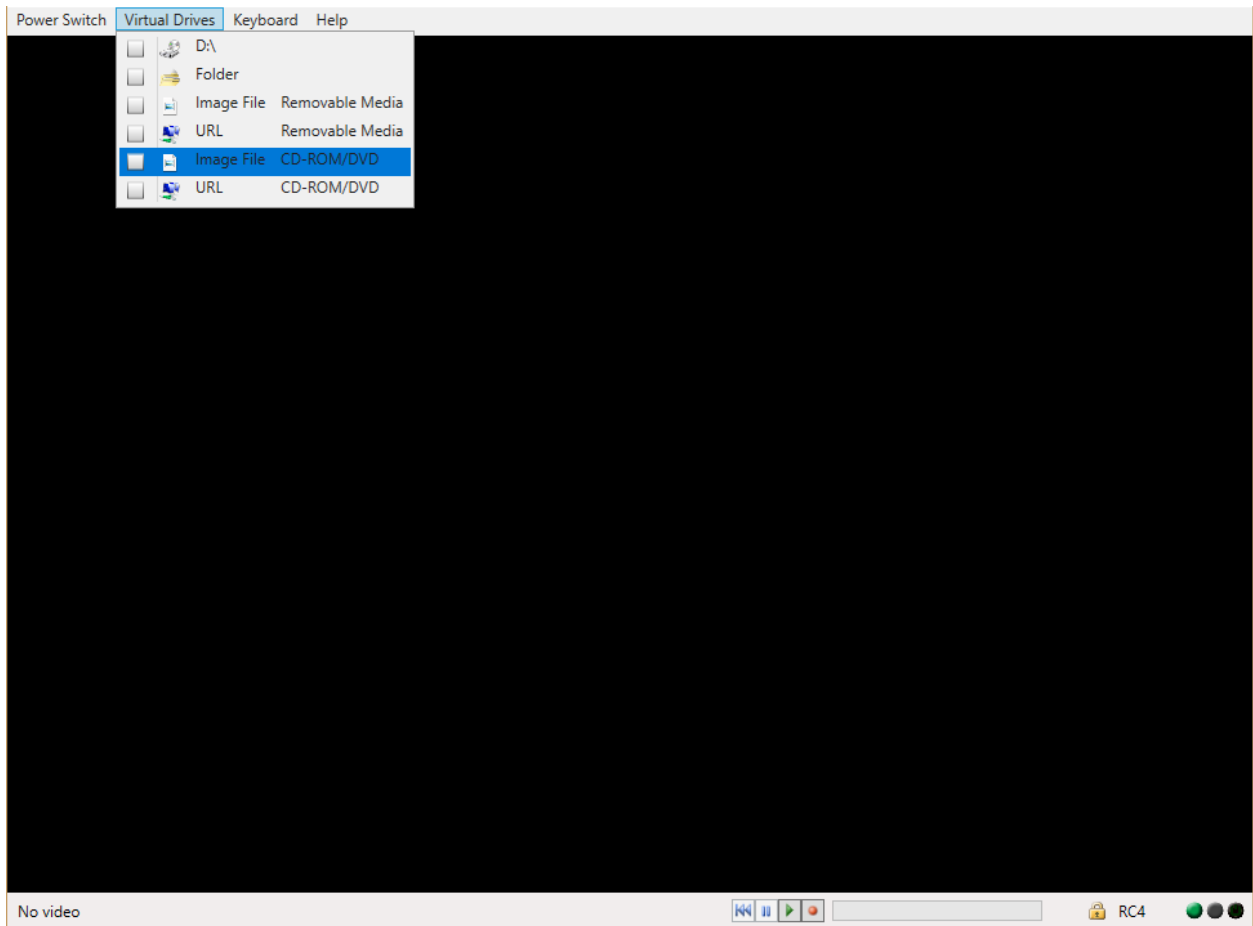
Slot	Model	Port	Interconnect
Mezzanine 1	Smart Array P542D Controller	1	CN7515049F, interconnect 1
		2	CN7515049F, interconnect 4
Mezzanine 2	Synergy 3830C 16G FC HBA	1	CN7515049F, interconnect 2
		2	CN7515049F, interconnect 5
Mezzanine 3	HP Synergy 3820C 10/20Gb CNA	1	CN7515049F, interconnect 3
		2	CN7515049F, interconnect 6

Select the Server Hardware to be used to create the RHEL 7.3 golden image.

Select Launch console from the Actions menu to launch the iLO Remote Console.

Note: It is recommended to not configure any local or remote DAS (Direct Attached Storage via D3940) or SAN (Storage Area Network) storage connected to the compute module prior to capturing a golden image. This storage will generally be configured when compute modules are provisioned using server profiles and deployment plans based on the captured golden image. The deployment plans should include artifacts which configure the storage during the HPE Image Streamer root/boot volume personalization process.

B. Mount the RHEL 7.3 .iso image with iLO Virtual Media

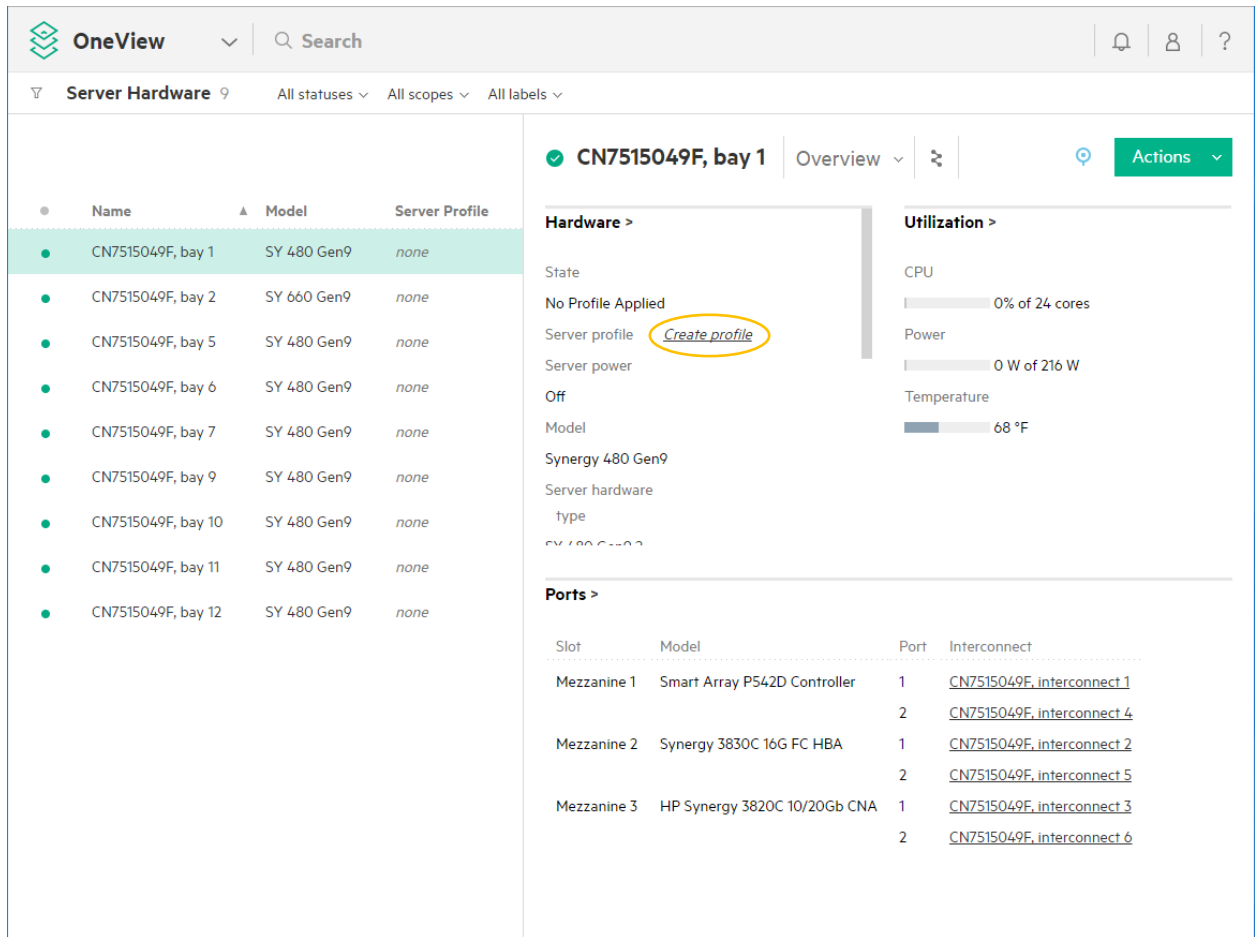


On the iLO Integrated Remote Console menu select Virtual Drives.

Use the "Image File CD-ROM/DVD" option to locate and Open the RHEL-7.3 .iso image previously downloaded.

4. Create a Server Profile with an empty OS volume

A. Start creation of a Server Profile



The screenshot displays the HPE OneView interface for managing server hardware. The left pane shows a list of servers under the 'Server Hardware' section. The right pane provides details for the selected server, 'CN7515049F, bay 1'.

Server List:

Name	Model	Server Profile
CN7515049F, bay 1	SY 480 Gen9	none
CN7515049F, bay 2	SY 660 Gen9	none
CN7515049F, bay 5	SY 480 Gen9	none
CN7515049F, bay 6	SY 480 Gen9	none
CN7515049F, bay 7	SY 480 Gen9	none
CN7515049F, bay 9	SY 480 Gen9	none
CN7515049F, bay 10	SY 480 Gen9	none
CN7515049F, bay 11	SY 480 Gen9	none
CN7515049F, bay 12	SY 480 Gen9	none

Server Details: CN7515049F, bay 1

Hardware >

- State: No Profile Applied
- Server profile: [Create profile](#)
- Server power: Off
- Model: Synergy 480 Gen9
- Server hardware type: SY 480 Gen9

Utilization >

- CPU: 0% of 24 cores
- Power: 0 W of 216 W
- Temperature: 68 °F

Ports >

Slot	Model	Port	Interconnect
Mezzanine 1	Smart Array P542D Controller	1	CN7515049F, interconnect 1
		2	CN7515049F, interconnect 4
Mezzanine 2	Synergy 3830C 16G FC HBA	1	CN7515049F, interconnect 2
		2	CN7515049F, interconnect 5
Mezzanine 3	HP Synergy 3820C 10/20Gb CNA	1	CN7515049F, interconnect 3
		2	CN7515049F, interconnect 6

Select Create profile in the Hardware section of the page.

B. Specify Server Profile settings

Create Server Profile General

General

Name: Rhel 7.3 Capture

Description:

Server hardware: CN7515049F, bay 1

Server hardware type: SY 480 Gen9 2

Enclosure group: is-eg

Affinity: Device bay

OS Deployment

OS deployment plan: HPE - Foundation 1.0 - create empty OS Volume-201

Deployment Settings

Setting	Value
VolumeSize	20000 MiB

Firmware

Firmware baseline: managed manually

The appliance firmware repository is empty. To set a firmware baseline, visit the [Firmware Bundles](#) page. This page can be used to download firmware bundles from HPE and to upload them into the

Add Connection: is-deploy

Create Create + Cancel

a. Give the Server Profile a name

Type a name for the Server Profile in the Name field.

b. Specify an OS Deployment plan

Use the dropdown box to select:

HPE – Foundation – create empty OS volume

The plan name may include version number details not shown here.

c. Modify deployment settings

Enter a volume size for the golden image.

While HPE Image Streamer uses thin provisioning for all storage volumes this will be the maximum size the volumes deployed from this golden image can achieve.

In this example 20000 MiB (20 GiB) is used.

d. Complete Creation of Server Profile

Select Create to complete server profile creation.

Once Create is selected OS Deployment will begin as an early step in the Server Profile create process. OS Deployment will typically be completed in 15 seconds. Additional Server Profile work is needed to complete server provisioning. The Server Profile create process will take a several minutes depending on the configuration work to be done.

5. Install RHEL 7.3 to the empty OS Volume

A. Power on the server

The screenshot displays the HPE OneView interface for a server profile named 'Rhel 7.3 Capture'. The profile is in a 'Create Completed' state, indicated by a green checkmark and the text 'Create Completed 4m29s'. The 'General' tab is active, showing various configuration details. The 'Firmware' tab shows the baseline as 'managed manually'. The 'Connections' tab shows 0 failed, 0 warning, and 1 successful connection. An 'Actions' menu is open on the right, showing options: Create, Edit, Copy, Launch console, Power on, and Delete.

Select Power on from the Actions menu.

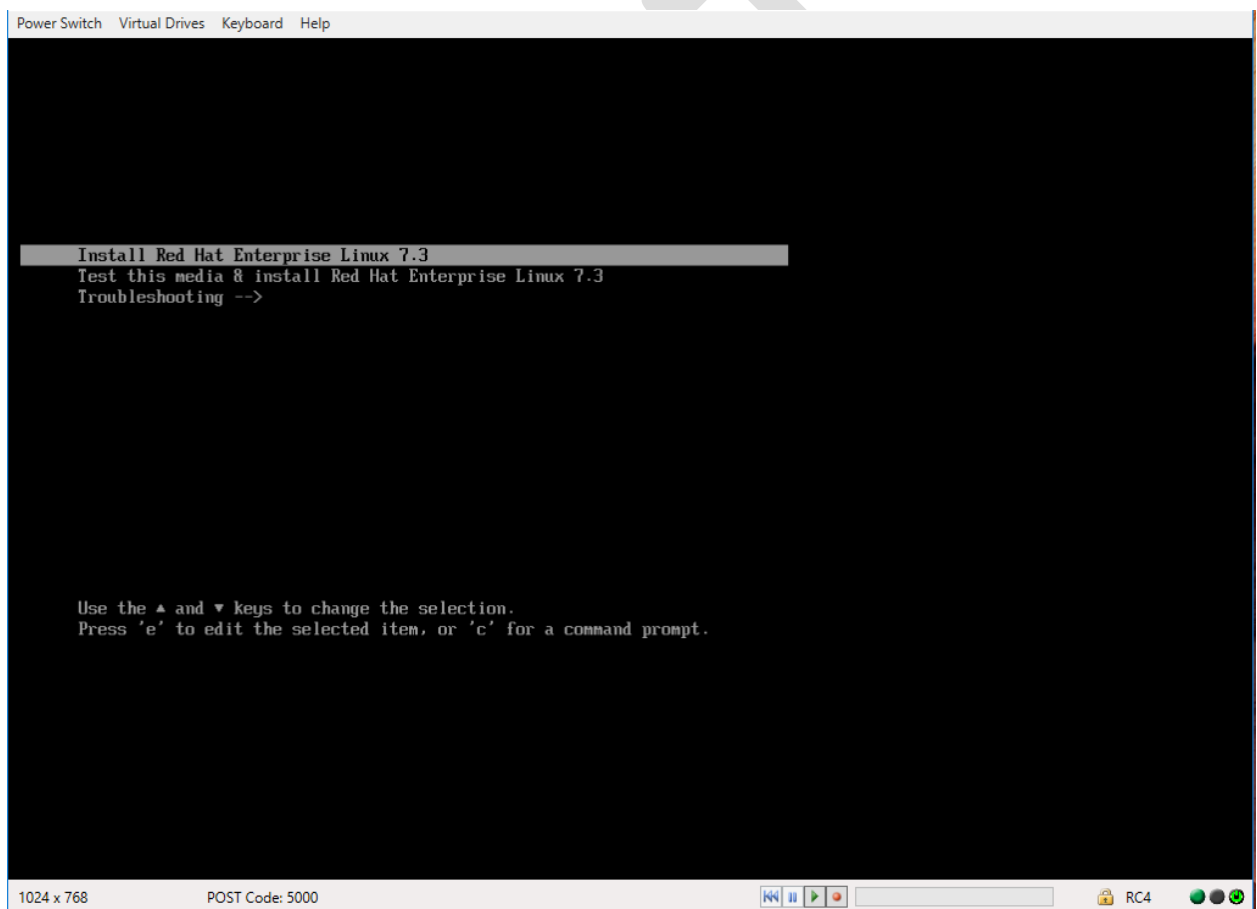
Note: The server will report BIOS configuration changes during boot up for the Image Streamer iSCSI connection and will then reboot.

B. Modify the install kernel parameters

The RHEL 7.3 install kernel will not recognize the HPE Image Streamer iSCSI empty OS volume by default. The kernel parameter “rd.iscsi.ibft=1” needs to be added to tell the kernel to get the OS volume iSCSI configuration parameters from the compute module firmware set by the Server Profile.

Using the iLO Remote Console once the RedHat 7.3 boot loader screen appears:

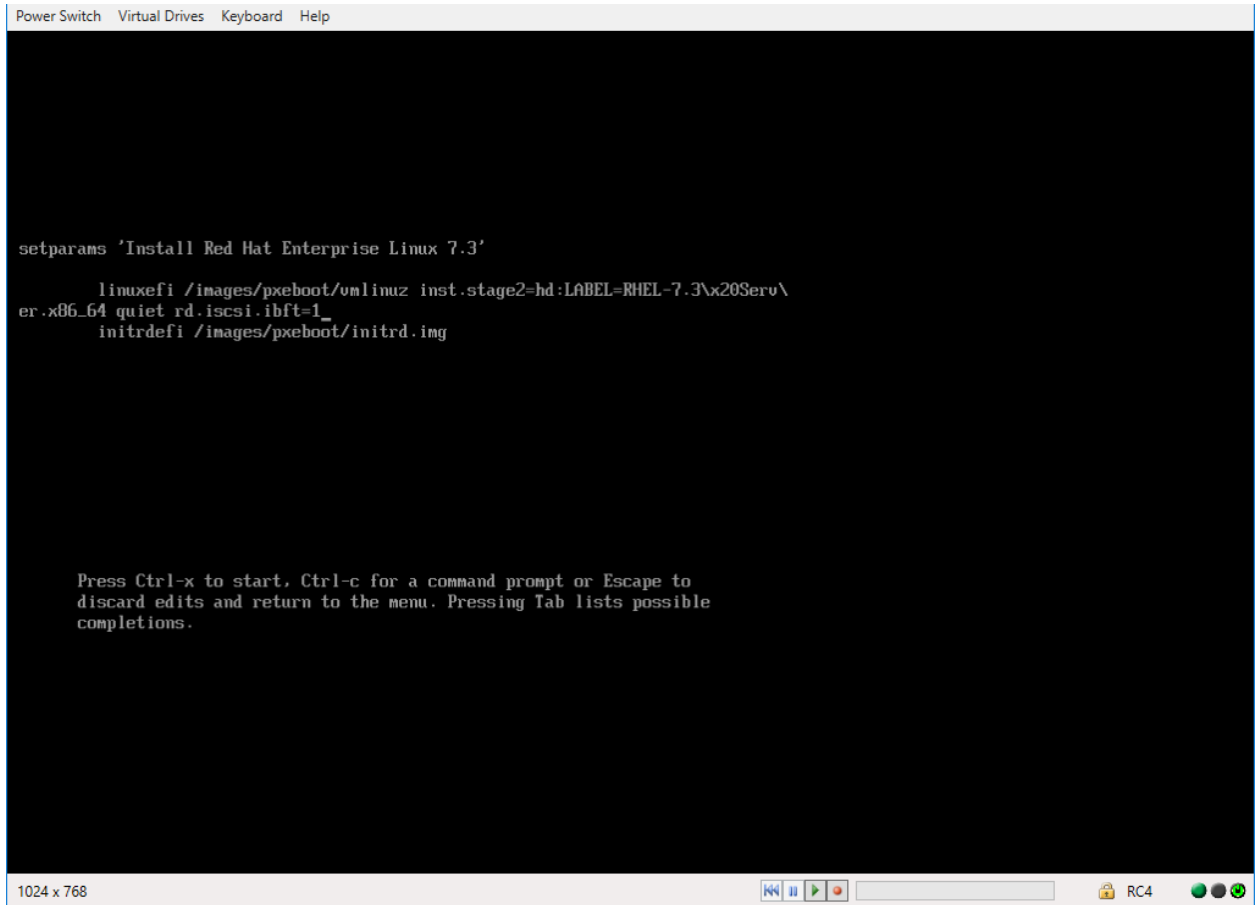
a. Select install boot option to edit



Select desired install option.

Press the “e” key to edit.

b. Add the rd.iscsi.ibft=1 install kernel boot parameter



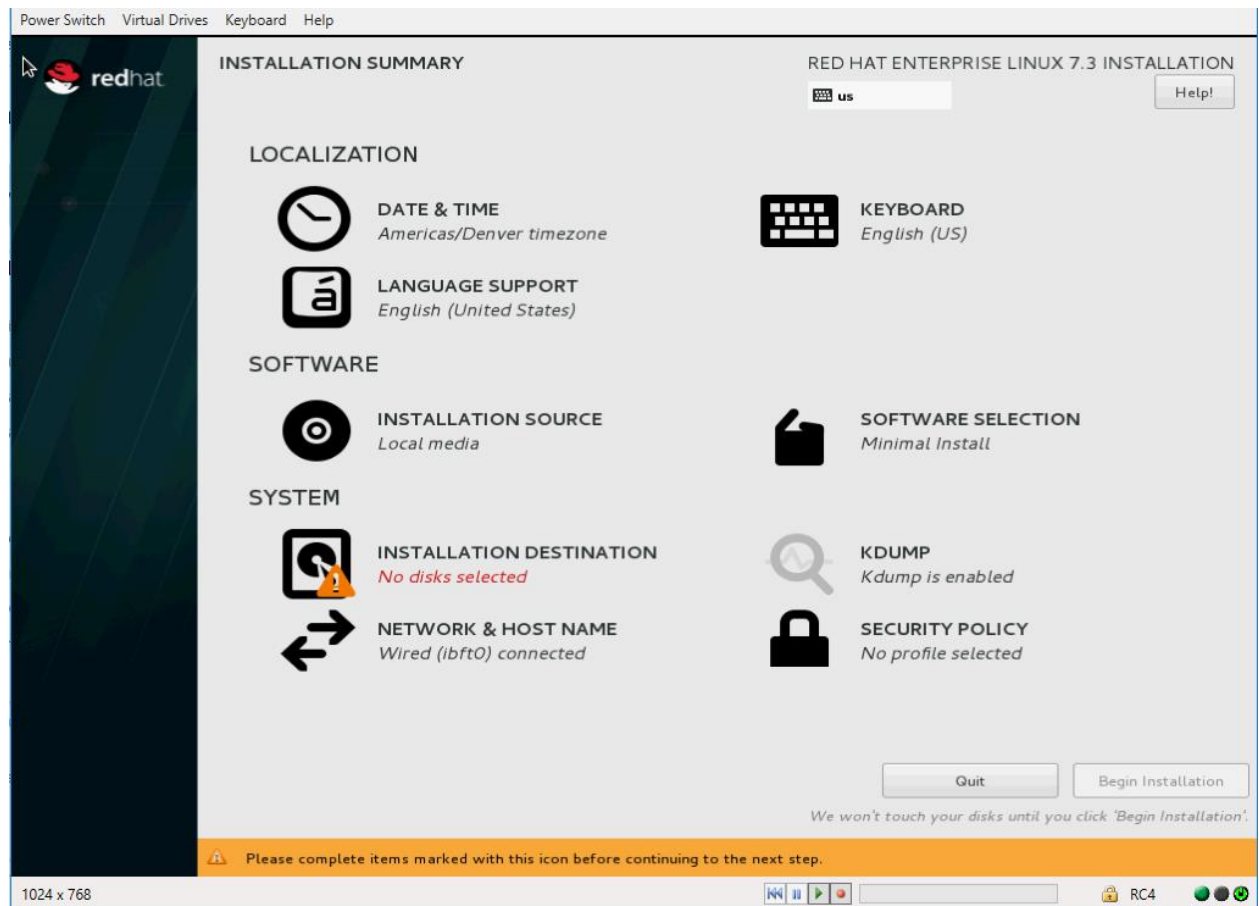
Modify the install kernel vmlinuz line by adding rd.iscsi.ibft=1 at the end.

c. Continue the install kernel boot process

Press Ctrl-x to start.

C. Set the installation configuration parameters

When the installer starts, set the local language and proceed to the Installation Summary page.



Since this installation is going to be used to create a golden image, choices made here will become part of every boot/root volume deployed when using this golden image in the OS Deployment process.

a. For Localization:

Set Date & Time (timezone), Keyboard and Language Support as desired for the golden image.

b. For Software:

When using iLO Virtual Media as in this example leave the setting as Local media.

Add additional Software as desired to be in every boot/run volume deployed from this golden image.

c. For System:

It is recommended to not make changes to Network and Host name settings as these are usually set in the HPE Image Streamer OS Deployment personalization process.

Note: The `rd.iscsi.ibft=1` parameter added as an option to the install boot kernel resulted in the iSCSI connection to the deployed empty volume being automatically configured.

Set kdump and Security policy as desired for the golden image.

Note: See section [F.c.](#) for additional details regarding kdump configuration.

Click on Installation Destination and proceed to the next step.

Note: Continue using only one of the following two sections:

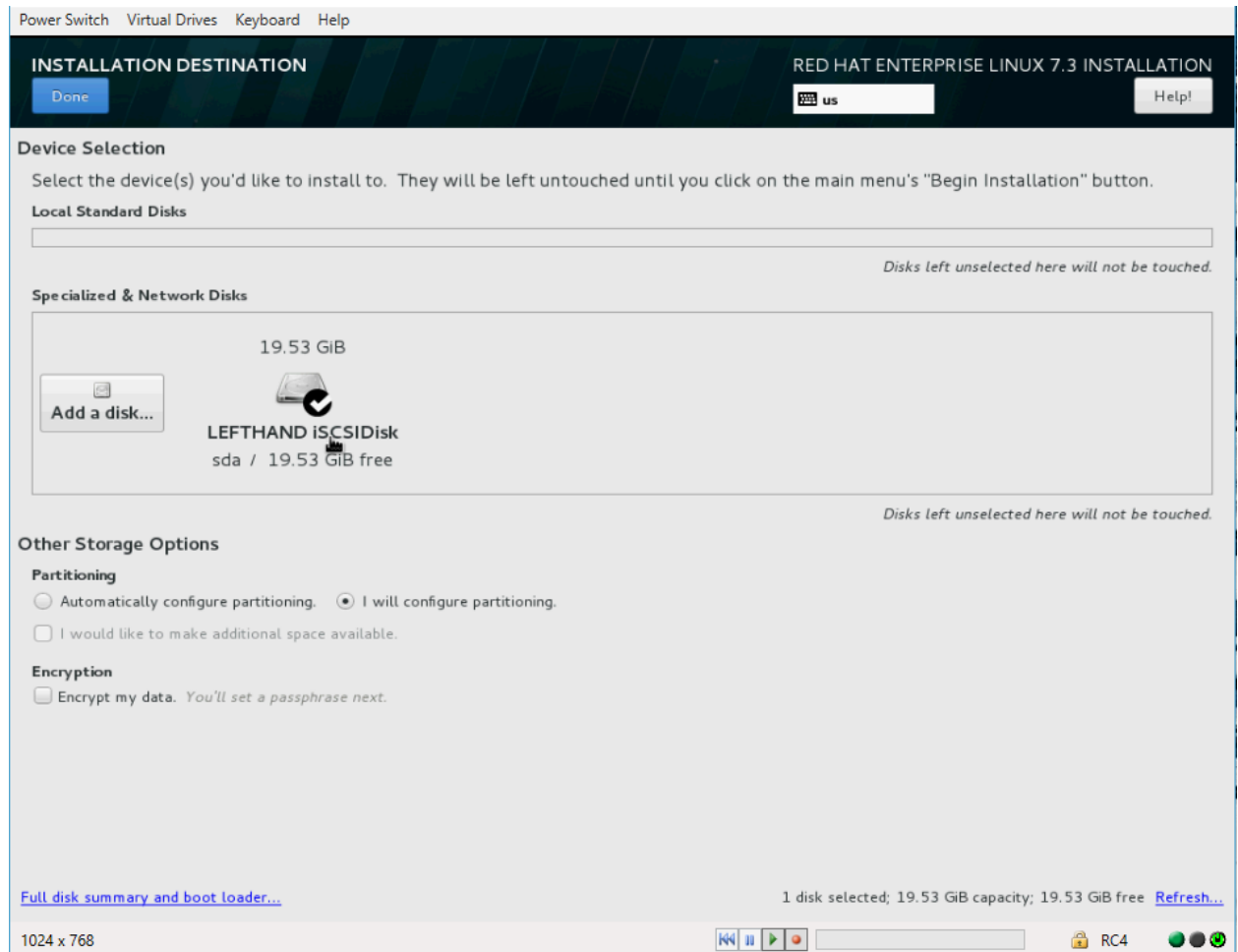
[Select installation device – Servers without local or DAS storage](#)

[Select installation device – Servers with local or DAS storage](#)

D. Select installation device – Servers without local or DAS storage

The empty OS volume for installation to create the golden image will be in the Specialized & Network Disks as:

LEFTHAND iSCSIDisk



a. Specialized and Network Drives

Select the LEFTHAND iSCSIDisk if not already selected by default.

b. Partitioning

Select the "I will configure partitioning option"

c. Encryption

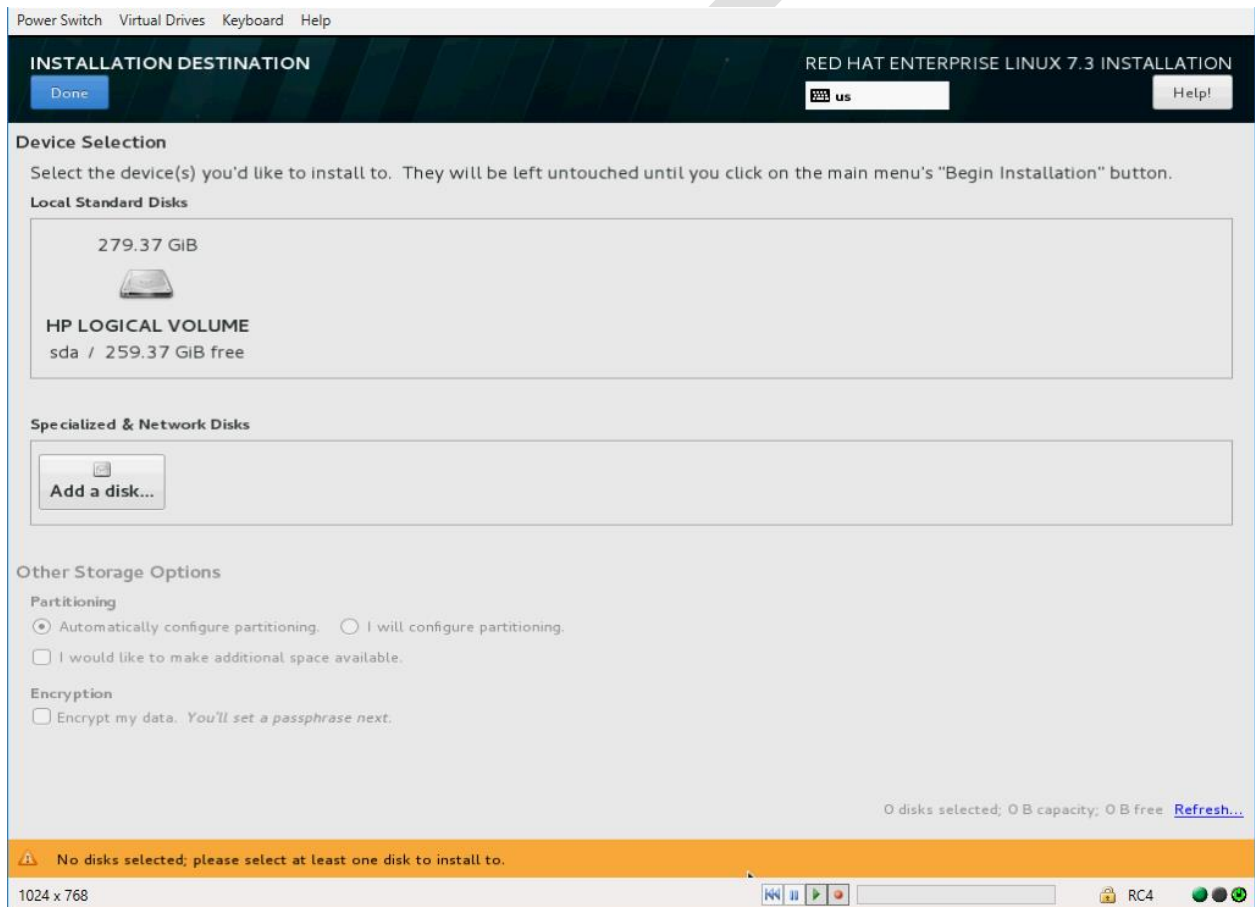
Do not select Encrypt my data.

d. Proceed to:

[Configure partitions for the HPE Image Streamer empty volume](#)

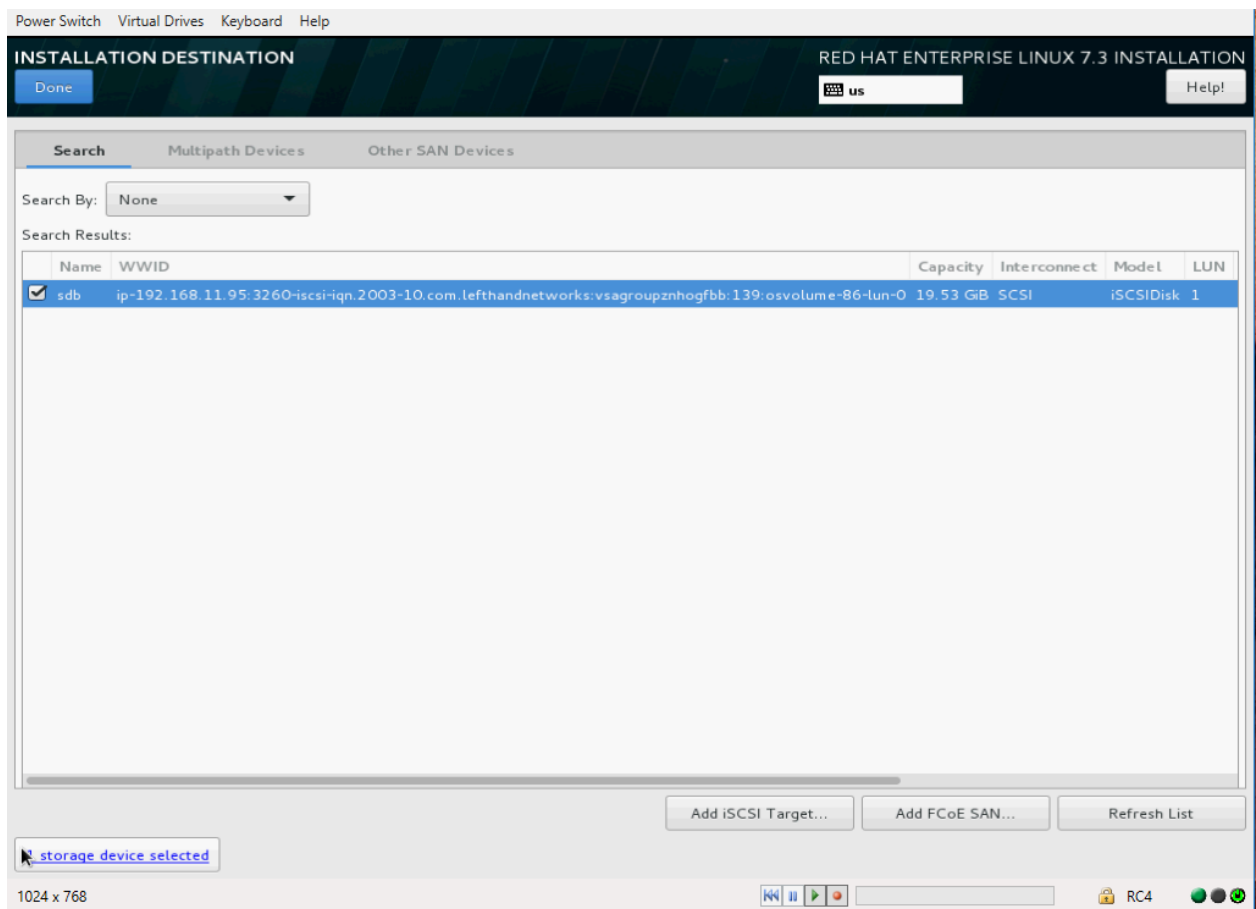
E. Select installation device – Servers with local or DAS storage

When local attached or DAS (Direct Attached Storage via D3950) is present the Installation Destination will generally list it by default and the iSCSI OS Volume deployed by HPE Image Streamer will need to be added as a Specialized & Networked Disk.



a. Specialized and Network Drives

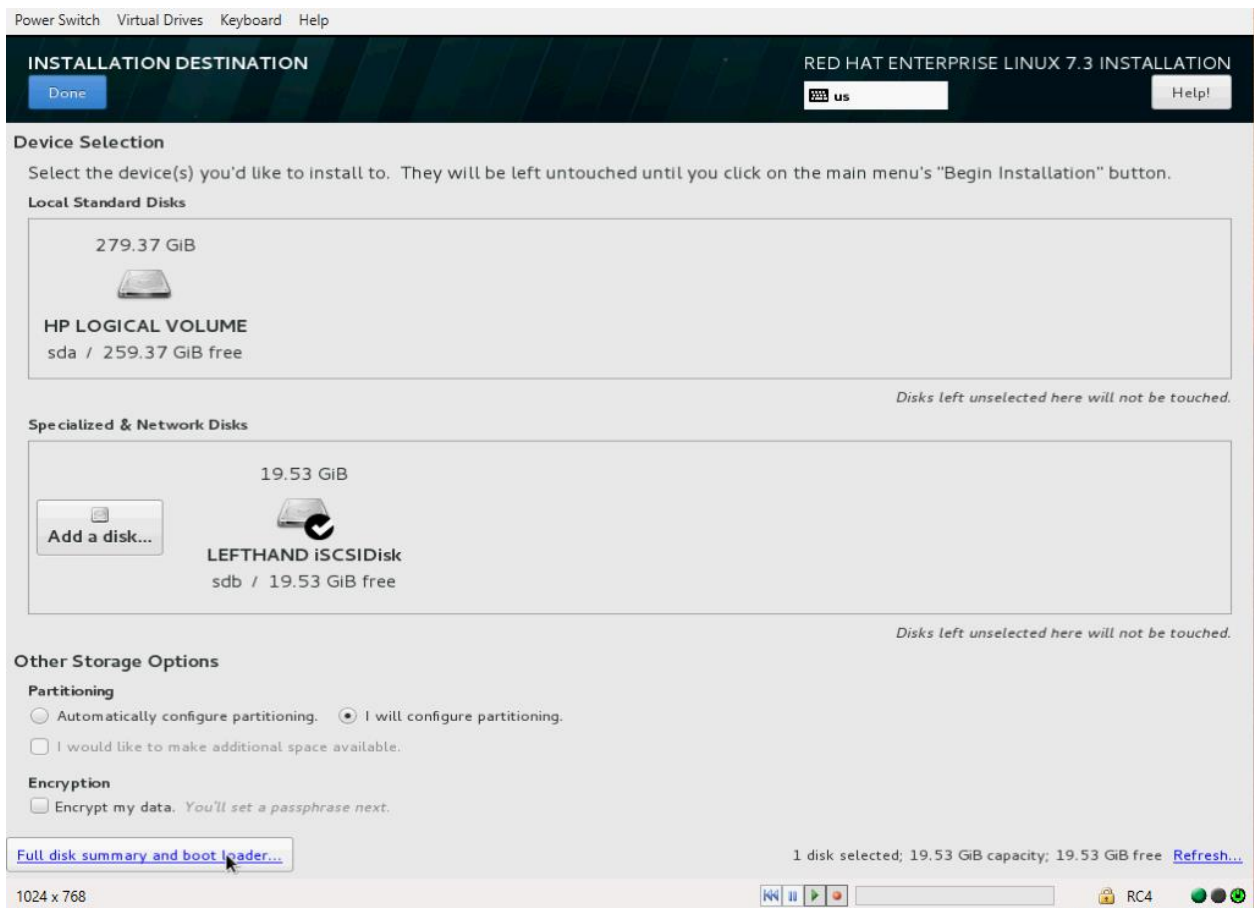
Select Add a disk...



b. Select the empty OS volume

Check the box with the lefthandnetworks WWID.

Select Done.



c. Specialized and Network Drives

Select the LEFTHAND iSCSIDisk if not already selected by default.

d. Partitioning

Select the “I will configure partitioning option”.

e. Encryption

Do not select Encrypt my data.

Select Done.

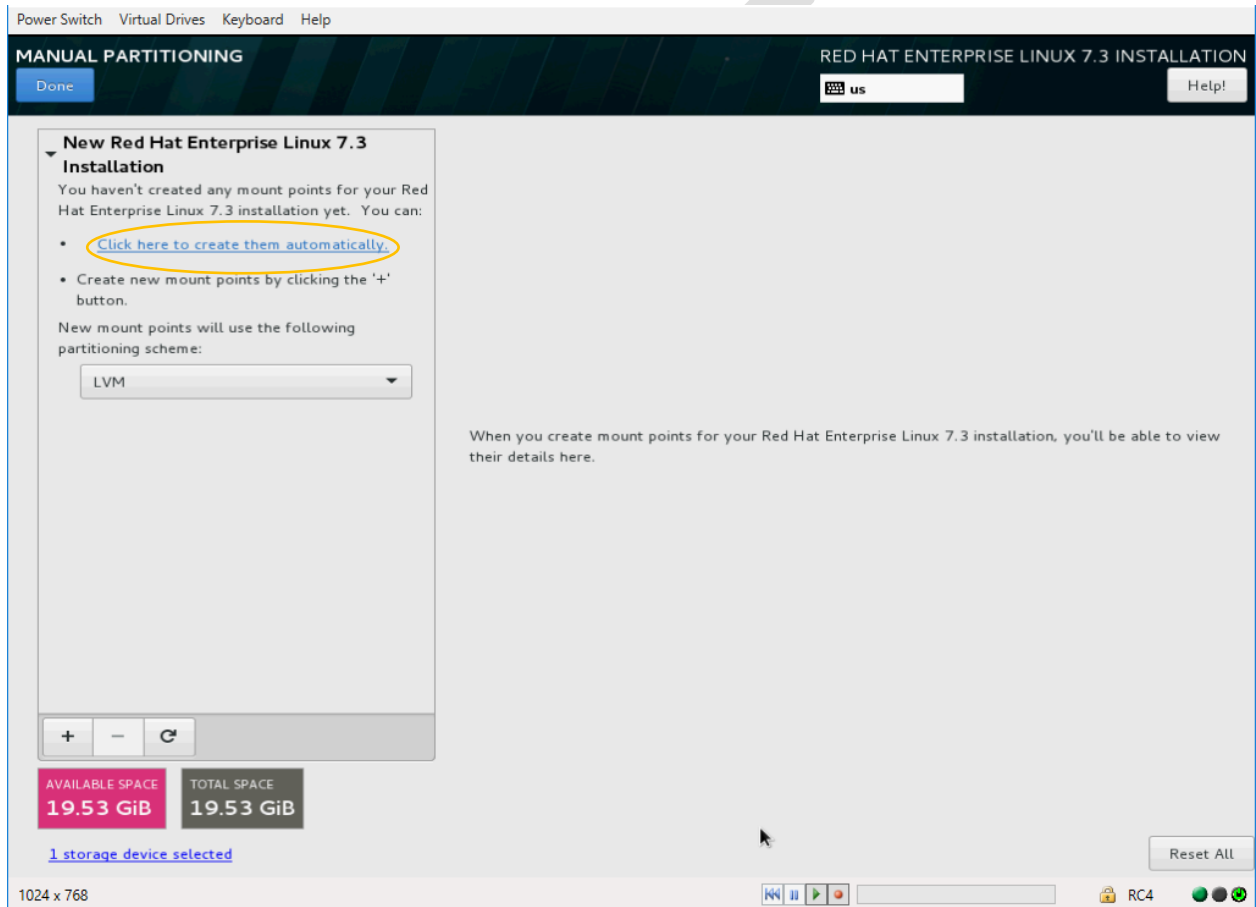
f. Proceed to:

[Configure partitions for the HPE Image Streamer empty volume](#)

F. Configure partitions for the HPE Image Streamer empty volume

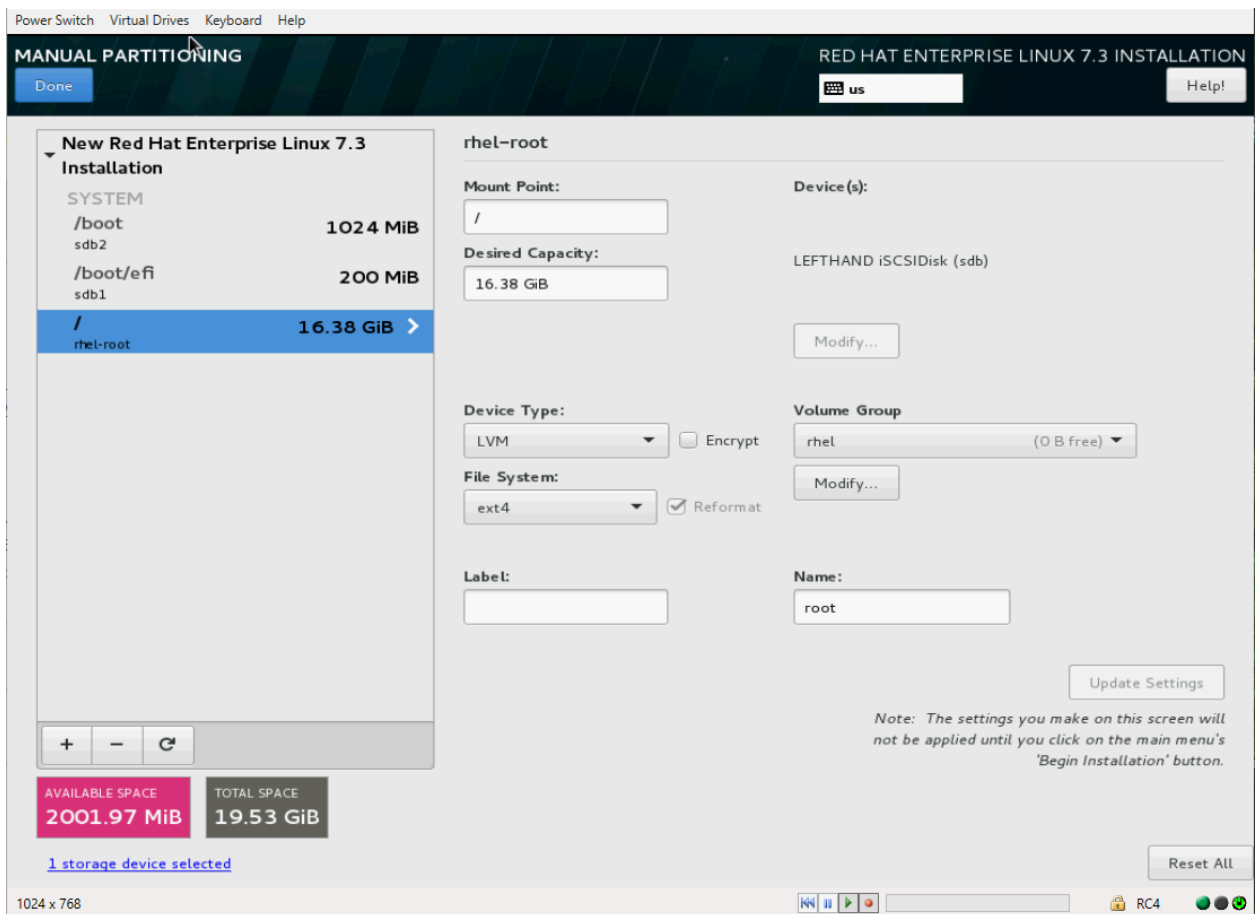
Create partitions as desired for the empty boot/run volume. Using LVM on one or a small number of partitions could provide flexibility to configure volumes for various applications later when creating the OS-application images that will ultimately be deployed and updated using HPE Image Streamer enabled lifecycle processes.

Note: At this time only ext3 and ext4 file systems can be used during the HPE Image Streamer boot/run personalization process of Linux OSs. RHEL 7.3 defaults partitions to use the xfs file system so be sure to change added partitions to ext3 or ext4 (this does not apply to the /boot/efi or swap partitions).



a. Create partitions:

In this example “Click here to create them automatically” was selected.



b. Change the / and /boot partition file systems

In this example the automatically created / and /boot partitions are changed to ext4 per the Note above. If additional partitions were created which will need to be personalized by HPE Image Streamer plan scripts, they too will need their file systems set to ext3 or ext4.

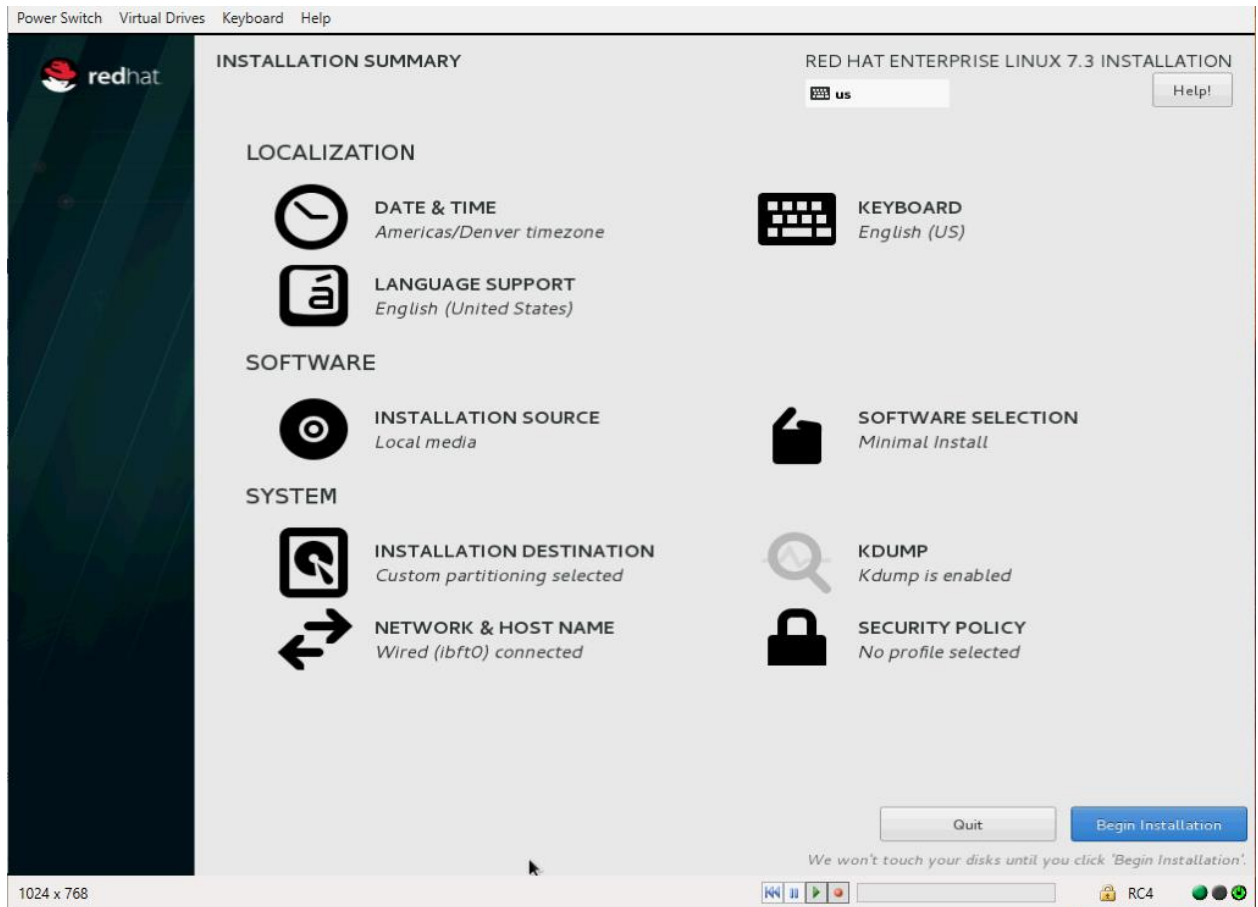
c. Swap partition configuration

Including a swap partition in HPE Image Streamer boot/run volumes can consume a large amount of its boot/run volume space, especially when used with many servers. With large memory servers the swap partition becomes a very small extension to physical memory and an evolving best practice is to not use it.

Consider the following swap partition options when using HPE Image Streamer:

- Delete the swap partition with kdump turned off.
- Configure a small, multi-MiB swap partition with kdump turned off.
- Delete the swap partition and configure a swap/kdump partition on a local disk drive in the deployment plan.

In this example the swap partition is deleted.



d. When partitioning is complete:

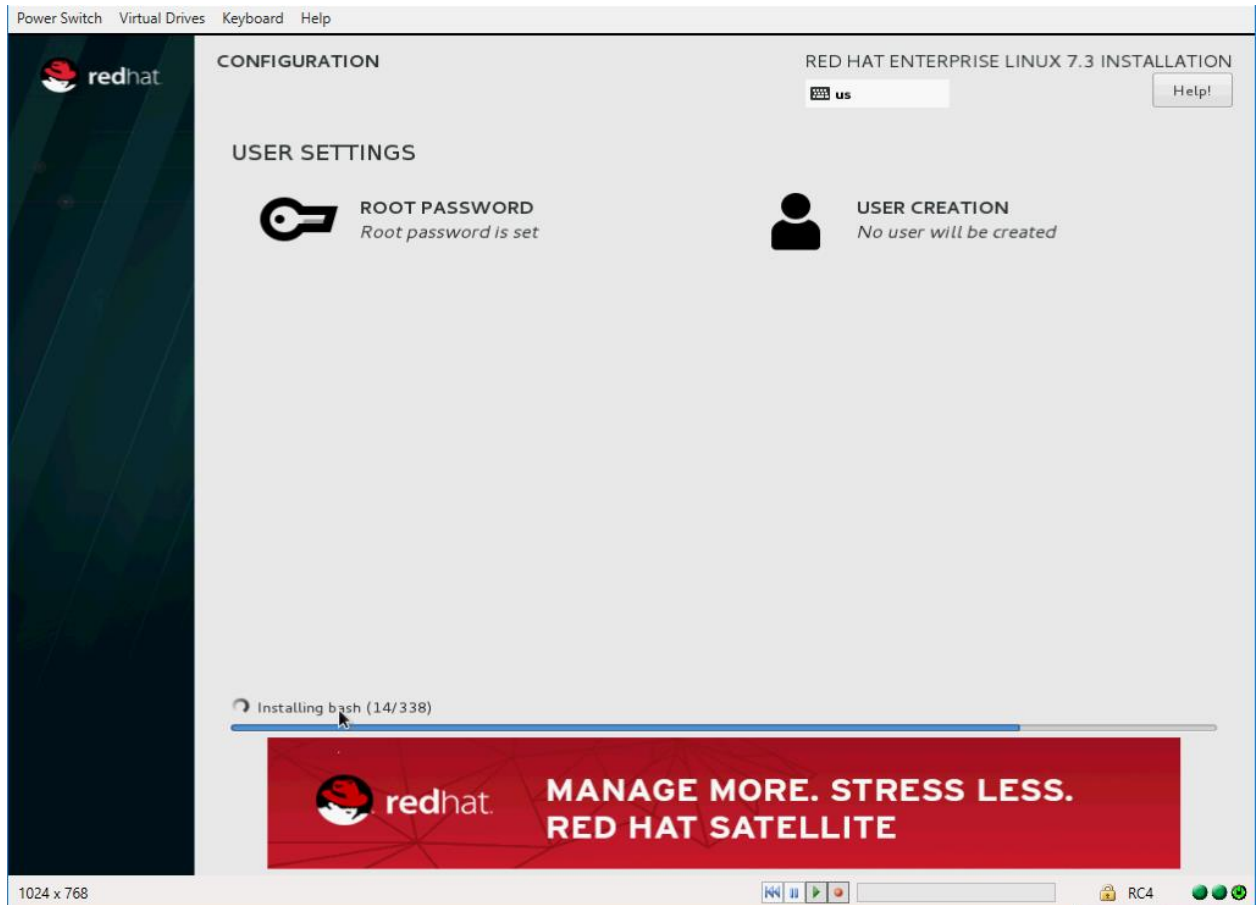
Select Done.

e. Continue with installation:

Select Begin Installation.

G. Configure User Settings and complete installation

Generally the personalization process for individual boot/run volumes will include setting the root password and adding users. However, to validate this base golden image is captured as intended a temporary root password should be set.



a. Set the root password

Select the Root Password option.

b. Finish configuration once installation is complete:

Select Reboot.

c. Validate installation

Once the server has rebooted login as root and validate that all installation options have been completed as desired.

d. Shut down and power off the server

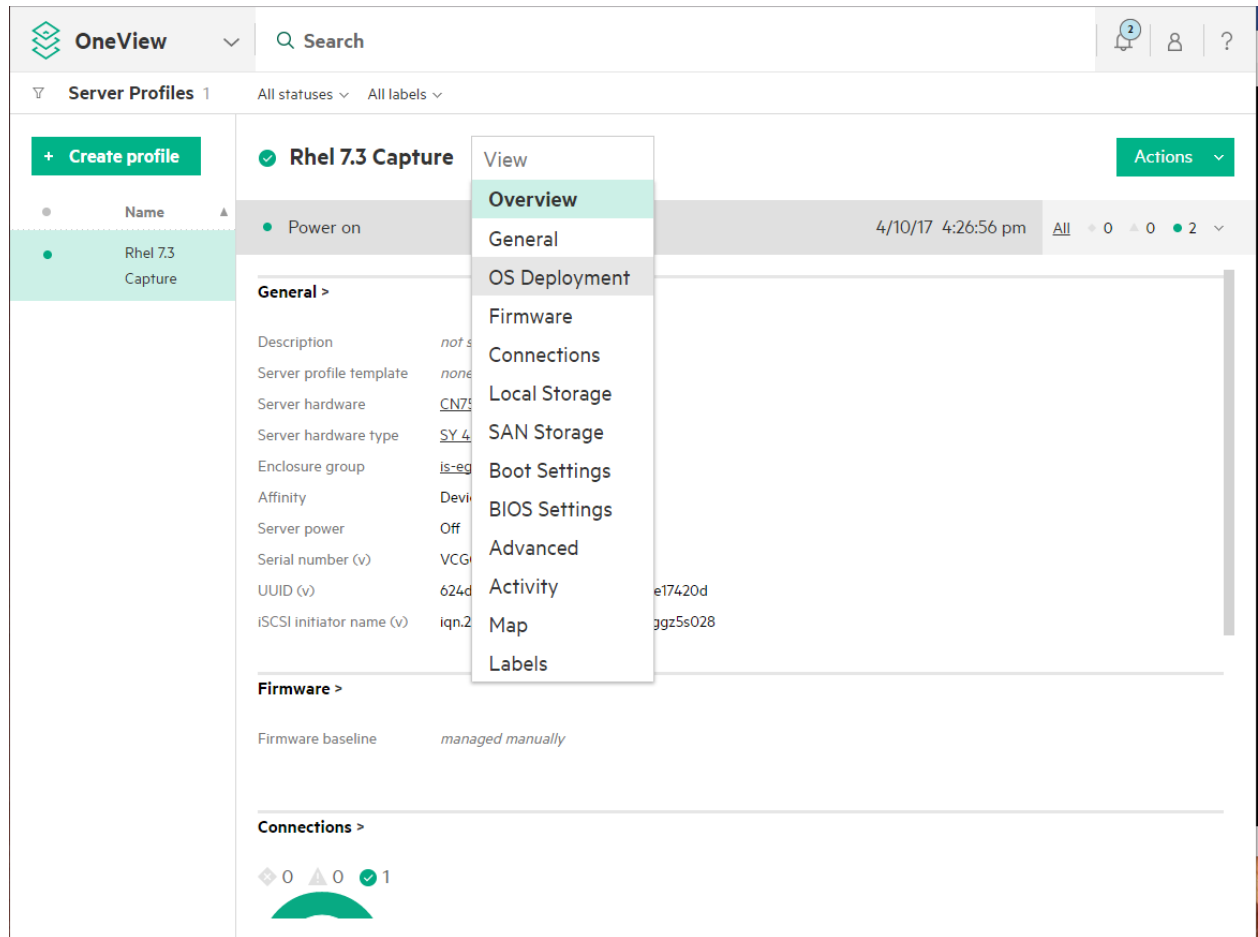
Once validation is complete shutdown and power off the server:

```
#shutdown -h 0
```

DRAFT

6. Capture the Golden Image from the Installed Volume

A. Determine the OS volume name for the installed volume



a. Return to Server Profile page for the provisioned server

In this example the RHEL 7.3 Capture Server Profile created earlier.

Navigate to the OS Deployment section of the Server Profile.

The screenshot displays the HPE OneView interface for a 'Rhel 7.3 Capture' profile. The profile status is 'Create Completed' with a duration of '4m29s'. The 'OS Deployment' section is expanded, showing the following details:

- OS deployment plan: [HPE - Foundation 1.0 - create empty OS Volume-2017-03-24](#)
- OS volume: **OSVolume-86** (circled in yellow)
- VolumeSize: 20000

Other sections visible include:

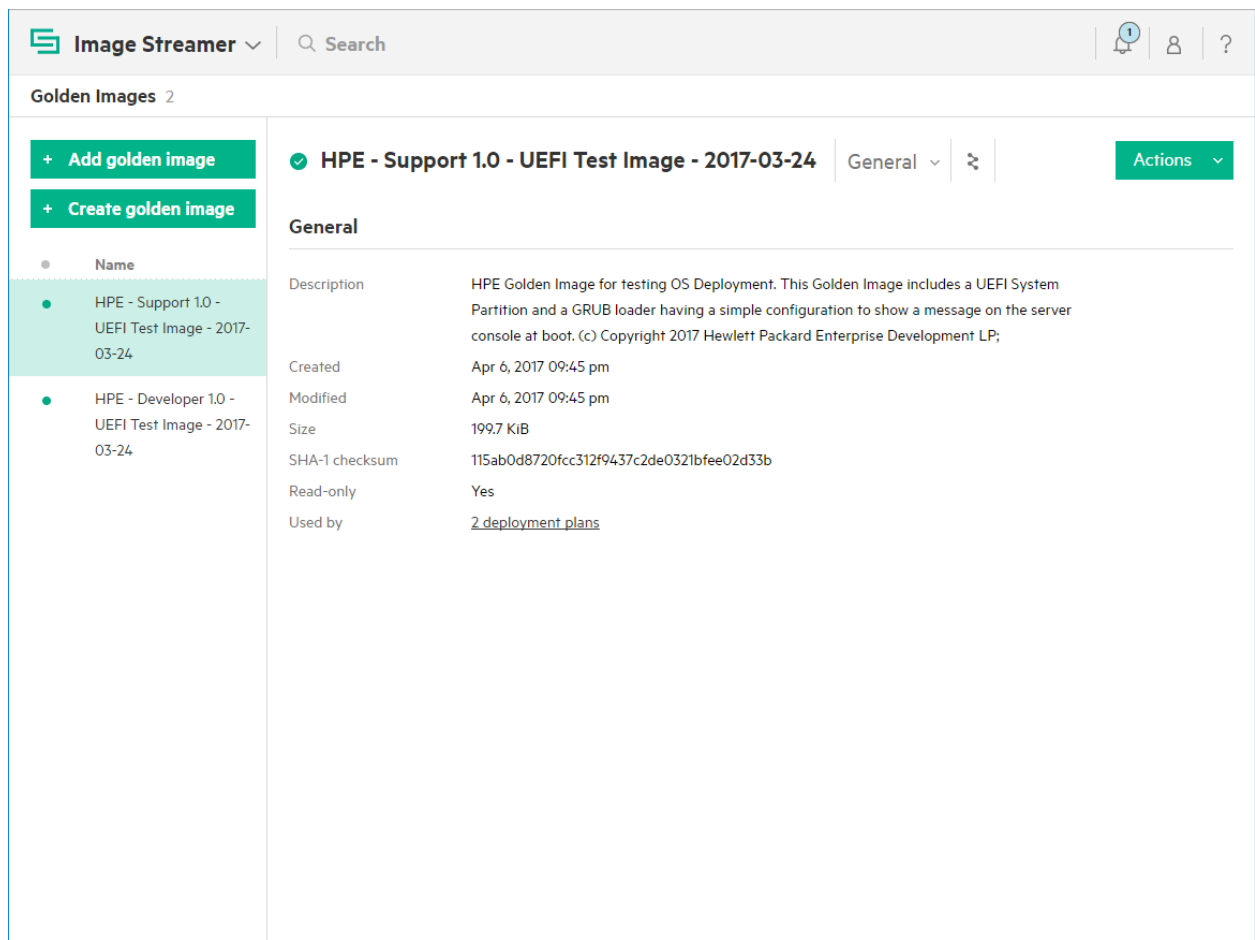
- Firmware:** Firmware baseline is *managed manually*.
- Connections:** A table with columns ID, Name, Network, Port, and Boot. It shows one connection with ID 1, Name 'Deployment Network A', Network 'js-deploy', Port 'vlan11', and Boot 'Mezzanine 3:1-a iSCSI primary'.
- Local Storage:** Integrated storage controller mode is *managed manually*.

b. Note the OS Volume name which was deployed

In this example OS Volume-86.

B. Capture the OS Volume

Navigate to the HPE Image Streamer Golden Images page.



The screenshot displays the HPE Image Streamer Golden Images page. The header includes the 'Image Streamer' logo, a search bar, and user icons. The main content area is titled 'Golden Images 2'. On the left, there are two buttons: '+ Add golden image' and '+ Create golden image'. Below these is a list of golden images with columns for 'Name' and 'Status'. The selected image is 'HPE - Support 1.0 - UEFI Test Image - 2017-03-24'. The right panel shows the details for this image, including a description, creation/modification dates, size, SHA-1 checksum, read-only status, and deployment plans.

Name	Status
HPE - Support 1.0 - UEFI Test Image - 2017-03-24	Active
HPE - Developer 1.0 - UEFI Test Image - 2017-03-24	Active

General	
Description	HPE Golden Image for testing OS Deployment. This Golden Image includes a UEFI System Partition and a GRUB loader having a simple configuration to show a message on the server console at boot. (c) Copyright 2017 Hewlett Packard Enterprise Development LP;
Created	Apr 6, 2017 09:45 pm
Modified	Apr 6, 2017 09:45 pm
Size	199.7 KiB
SHA-1 checksum	115ab0d8720fcc312f9437c2de0321bfee02d33b
Read-only	Yes
Used by	2 deployment plans

a. Select Create golden image

Create Golden Image

Name: RHEL 7.3 Capture

Description: RHEL 7.3 20 GiB golden image with one LVM partition

OS volume: OSVolume-86

Capture OS build plan: RHEL-7.3-generalize-2017-03-23

Changed: Capture OS build plan to "RHEL-7.3-generalize-2017-03-23-..."

Create Create + Cancel

b. Specify Name and Description

Enter a Name and Description as desired.

c. Specify the OS volume

Use the dropdown box to find the OS volume previously noted.

In this example OSVolume-86

d. Specify the Capture OS build plan

Use the dropdown box to select:

RHEL-7.3-generalize

The plan name may include version number details not shown here.

e. Start the capture process

Select Create.

7. Congratulations!

The screenshot displays the HPE Image Streamer web interface. At the top, there is a header with the 'Image Streamer' logo, a search bar, and user navigation icons. Below the header, the main content area is titled 'Golden Images 3'. On the left, there is a sidebar with two buttons: '+ Add golden image' and '+ Create golden image'. Below these buttons is a list of golden images under the heading 'Name'. The list includes three items: 'HPE - Support 1.0 - UEFI Test Image - 2017-03-24', 'HPE - Developer 1.0 - UEFI Test Image - 2017-03-24', and 'RHEL 7.3 Capture'. The 'RHEL 7.3 Capture' item is selected and highlighted. To the right of the sidebar, the details for the 'RHEL 7.3 Capture' image are shown. It includes a status bar with a green checkmark, the name 'RHEL 7.3 Capture', a 'General' tab, and an 'Actions' button. Below this, a progress bar shows 'Create Completed 6m7s' and the user 'Administrator' with a timestamp '4/10/17 5:59:22 pm'. The 'General' tab is active, displaying a table of image details.

General	
Description	RHEL 7.3 20 GiB golden image with one LVM partition
Created	Apr 10, 2017 11:59 pm
Modified	Apr 10, 2017 11:59 pm
Size	459.3 MiB
SHA-1 checksum	7ddc66215b86f9e8802570cf03fd00bcd879f6cf
Read-only	No
Used by	none

The golden image is now available for use in deployment plans based on RHEL 7.3.

If desired the server profile used to create the golden image can be deleted from the server hardware so the server hardware can be used for other purposes.