Technical Documentation

Hewlett Packard Enterprise

HPE Synergy Image Streamer RHEL 7- EFI Artifact Bundle Documentation

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1 HPE Synergy Image Streamer Artifact Bundle of RHEL 7

The HPE Synergy Image Streamer Artifact Bundle of RHEL 7 includes artifact which is helpful to personalize the RHEL 7.x OS.

1.2 Prerequisite:

1.2.1 Filesystem:

With the EFI based artifacts, ImageStreamer can support all the filesystems including XFS/BTRFS for RHEL Operating System.
As we are using EFI partition (/boot/efi) to execute the script we assume that root partition (/) is mounted on /dev/sda1 (which is the EFI partition).

1.2.2 NIC Teaming:

For NIC teaming the user should add two network connection with same VLAN ID for teaming in the add network section of server profile. And while selecting the **Team0NIC1** and **Team0NIC2** the network should be of same VLAN ID.

NOTE: It is recommended to enable NIC teaming when RHEL is deployed in a multi frame environment.

1.2.3 Adding Multiple NIC's:

While selecting the **MgmtNIC1**, **MgmtNIC2**, **MgmtNIC3** and **MgmtNIC4** the user should select the different network. User should not use the same network for selecting the MgmtNIC's.

1.2.4 Adding the user:

The user can add one or more users. User can add more users either with comma separated or semicolon separated or space separated and the password will be same for all the user. User can change password on their first login, though it is not enforced.

1.3 Build Plans

1.3.1 Build Plan: HPE-RHEL7-EFI-personalize-and-configure-NICs.

Build Plan personalizes the RHEL 7 server by creating a new users, applying multiple nic configuration, allowing the network to access from outside world, updating the hostname, creating partition on the disk, enabling SELINUX service, server hardening and changing the root password as per user parameters.

Steps: Plan Script Names	**Attributes**
HPE-RHEL7-EFI-Mount	Mounts /dev/sda1 /
HPE-RHEL7-Wrapper-EFI	This Is wrapper scripts where all the other scripts will be executed.
HPE-RHEL7-EFI-personalize-and-configure-NICs	MgmtNIC1(NIC) MgmtNIC2(NIC) MgmtNIC3(NIC) MgmtNIC4(NIC) TotalMgmtNICs(Option)
HPE-RHEL7-EFI-Hostname	DomainName(FQDN) and Hostname
HPE-RHEL7-EFI-Users	NewRootPassword(Password) NewUserName(String) NewUserPassword(Password)
HPE-RHEL7-EFI-Security-Services	Ssh (enable/disable) Selinux (Enable)
HPE-RHEL7-EFI-Unmount	To unmount the EFI partition

1.3.2 Build Plan: HPE-RHEL7-EFI-Personalize-configure-deployment-Mmgt-NIC-teaming

Build Plan personalizes the RHEL 7 server by creating a new users, creating multiple nic teaming, allowing the network to access from outside world, updating the hostname, creating partition on the disk, enabling SELINUX service, server hardening and changing the root password as per user parameters.

Steps: Plan Script Names	Attributes
HPE-RHEL7-EFI-Mount	Mounts /dev/sda1 /
HPE-RHEL7-Wrapper-EFI	This Is wrapper scripts where all the other scripts will be executed.
HPE-RHEL7-EFI-configure-management-NIC-teaming	FirstNicTeamName(String) SecondNicTeamName Team0NIC1(NIC) Team0NIC2(NIC) Team1NIC1(NIC) Team1NIC2(NIC) TotalNicTeamings(Option)
HPE-RHEL7-EFI-Hostname	DomainName(FQDN) and Hostname
HPE-RHEL7-EFI-USERS	NewRootPassword(Password) NewUserName(String) NewUserPassword(Password)

HPE-RHEL7-EFI-Security-Services	SSH(Option)
HPE-RHEL7-EFI-Unmount	To unmount the EFI partition

1.4 Plan Scripts

1.4.1 Plan Script: HPE-RHEL7-EFI-Mount

This Plan Script mounts the /boot/efi partition as root.

1.4.2 Plan Script: HPE-RHEL7-Wrapper-EFI

This Plan script Is a wrapper script where all other scripts gets executed.
Wrapper script executes personalization scrips in ISROOT/scripts directory which is created in GI

- invoke all executables in sub-directory ./scripts (in lexographic order)
- all scripts handle their own logging (for later debugging)
- HPE-ImageStreamer.bash.log is created to verify if all the scripts all executed without errors

1.4.3 Plan Script: HPE-RHEL7-EFI-personalize-and-configure-NIC's

This script gives the user an option of configuring four NICs and user as to select the total number of NICs to configure as DHCP or Static as per their requirement. User has to add public network while creating server profile.

Attributes:

MgmtNIC1 (NIC)

This attribute is of type NIC and has the following four sub-attributes:

- MgmtNIC1.dhcp
- MgmtNIC1.gateway
- MgmtNIC1.ipaddress
- MgmtNIC1.mac
- MgmtNIC1.netmask

These sub-attributes are used to edit the network file of the first NIC in RHEL 7.3.

MgmtNIC2 (NIC)

This attribute is of type NIC and has the following four sub-attributes:

- MgmtNIC2.dhcp
- MgmtNIC2.gateway
- MgmtNIC2.ipaddress
- MgmtNIC2.mac
- MgmtNIC2.netmask

These sub-attributes are used to edit the network file of the second NIC in RHEL 7.3.

MgmtNIC3 (NIC)

This attribute is of type NIC and has the following four sub-attributes:

- MgmtNIC3.dhcp
- MgmtNIC3.gateway
- MgmtNIC3.ipaddress
- MgmtNIC3.mac
- MgmtNIC3.netmask

These sub-attributes are used to edit the network file of the third NIC in RHEL 7.3.

MgmtNIC4 (NIC)

This attribute is of type NIC and has the following four sub-attributes:

- MgmtNIC4.dhcp
- MgmtNIC4.gateway
- MgmtNIC4.ipaddress
- MgmtNIC4.mac
- MgmtNIC4.netmask

These sub-attributes are used to edit the network file of the fourth NIC in RHEL 7.3.

TotalMgmtNICs (Option)

This attribute is of type option where user must select the number of NICs to configure the server.

1.4.4 Plan Script: RHEL-7.3-configure-multiple-NIC-teaming

1.4.4

This script gives the user an option of configure two NIC teaming and user as to select the total number of NICs for teaming as DHCP or Static as per their requirement. User has to add public network while creating server profile and can also specify the name for teaming the NICs.

Attributes:

FirstNicTeamName

(String)

User can specify the name for first NIC teaming.

SecondNicTeamName (String)

It is of type string and can specify the name for second NIC

teaming. Team0NIC1 (NIC)

This attribute is of type NIC which has three sub attribute

- Team0NIC1.gateway,
- Team0NIC1.ipaddress
- Team0NIC1.mac

- Team0NIC1.netmask

All these attributes are used for network teaming Team0NIC1 and Team0NIC2 as static or dhcp.

Team0NIC2 (NIC)

This attribute is of type NIC which has three sub attribute

- Team0NIC2.gateway,
- Team0NIC2.ipaddress
- Team0NIC2.mac
- Team0NIC2.netmask

All these attributes are used for network teaming Team0NIC1 and Team0NIC2 as static or dhcp.

Team1NIC1

This attribute is of type NIC which has three sub attribute

- Team1NIC3.gateway,
- Team1NIC3.ipaddress
- Team1NIC3.mac
- Team1NIC3.netmask

All these attributes are used for network teaming Team1NIC1 and Team1NIC2 as static or dhcp.

Team1NIC2

This attribute is of type NIC which has three sub attribute

- Team1NIC3.gateway,
- Team1NIC3.ipaddress
- Team1NIC3.mac
- Team1NIC3.netmask

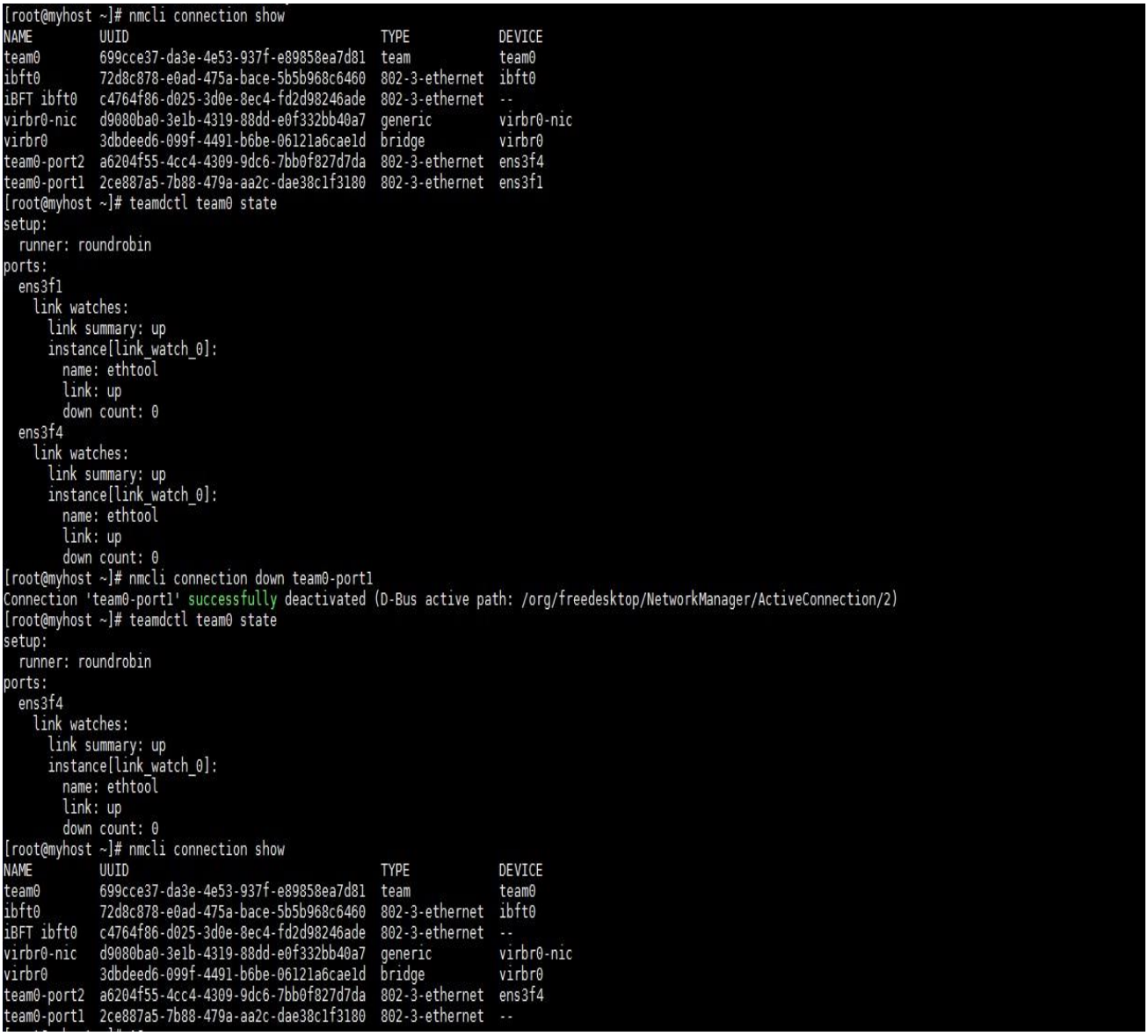
All these attributes are used for network teaming Team1NIC1 and Team1NIC2 as static or dhcp.

TotalNicTeamings (Option)

Gives option to select either one or two NIC teaming for the server.

1.4.4.1 Sample test screenshot:

(Note: The screenshot has been captured through SSH console)



1.4.5 Plan Script: HPE-RHEL7-EFI-Hostname

This scripts assigns the hostname given by user, adds the alias in /etc/hosts file with respective to the interface name present in the /tmp/interface name file and also delete the default gateway so that the network can be accessible from the outside world.

The hostname assignment is done in HPE Synergy Image Streamer only, but updating /etc/hosts should be done when the host is up. So the script for updating hosts is added in **rc.local** file which is present in /etc/rc.d folder. And this script has to be added next either to the Plan Script RHEL-7.3-configure-multiple-NIC-teaming or RHEL-7.3- configure-multiple-NICs.

Attributes:

DomainName (FQDN)

This attribute is of type FQDN the user must specify the full domain name to which the network should belong.

1.4.6 Plan Script: HPE-RHEL7-EFI-USERS

Changes the root password and adds new users with data given by the user while creating the server profile. This scripts are executed in the **rc.local** file to do the operations. Script takes new root password and new user details as parameters.

Attributes:

NewRootPassword (Password)

Attribute is used to change the root password of the server based on user input.

NewUserName (String)

String used to create a new users to the server. And multiple user name can also give by either comma separated or semicolon separated.

NewUserPassword (Password)

This attribute is of type Password and used to set for the newly created user. Same password is assigned to the multiple users given by the users.

1.4.8 Plan Script: HPE-RHEL7-EFI-Security-Services

This script enable the SELINUX service which supports access control security policies and also does the server hardening like enabling the ssh service and disabling the firewall service so, that the network can be access through the external network. It also gives option to user either to enable or disable the SSH.

Attributes:

SSH

(Option)

This attribute is an option either to enable or disable the SSH service of the server.

1.4.9 Plan Script: HPE-RHEL7-EFI-Unmount

Unmounts the /boot/efi partition from root.

1.5 Procedure for creating a Linux Golden Image

The following process explains how to create an RHEL 7-EFI golden image using HPE Synergy Image Streamer.

1. Ensure that you have access to RHEL 7 ISO installation file containing iSCSI device drivers.

2. Create a server profile with “HPE - Foundation 1.0 - create empty OS Volume” as OS Deployment plan and any available server hardware. Set an appropriate value for volume size in MiB units. The HPE Synergy Server will be configured for access to this empty OS Volume.

3. Launch iLO Integrated Remote Console of this server and set RHEL 7 ISO file as virtual CD-ROM/DVD image file. Power on the server.

4. RHEL installation starts and RHEL installer detects the configured empty OS Volume as an iSCSI disk device. Select this iSCSI disk device as the target for RHEL installation.

5. Follow onscreen instructions and complete the RHEL installation.

6. After the OS boots up Create the following directories.

   - mkdir /boot/efi/EFI/HPE
   - mkdir –p /boot/efi/EFI/HPE/isdeploy
   - mkdir –p /boot/efi/EFI/HPE/isdeploy/scripts
   - mkdir –p /boot/efi/EFI/HPE/isdeploy/tmp
   - mkdir –p /boot/efi/EFI/HPE/isdeploy/data

7. Modify /etc/rc.d/rc.local. Add below line

   - sh /boot/efi/EFI/HPE/isdeploy/HPE-ImageStreamer.bash

8. Change permission of the rc.local file. (chmod 755 /etc/rc.d/rc.local)

9. Power off the server.

10. Navigate to HPE Synergy Image Streamer -> Golden Images and Click ‘Create Golden image’

11. Select the OS volume corresponding to the server profile created for empty OS volume and choose “HPE - Foundation 1.0 - capture OS Volume as is” as the capture build plan.

12. HPE Synergy Image Streamer captures RHEL image and adds it as a golden image.

