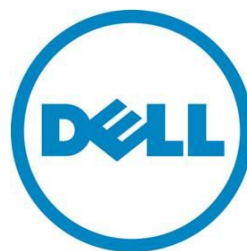# Dell OpenManage Essentials –Install Operating system.

This Dell Technical White Paper describes the process of installing an operating system on a Dell PowerEdge 12th generation server using Dell OpenManage Essentials.RedHat Enterprise Linux 6.x operating system is used an an example throughout this paper.

Ashish Suyal

Dell Enterprise Solutions Group

Contents

Executive Summary

OpenManage Essentials (OME) is a systems management console that provides simple, basic Dell hardware management features.
However, the IT management is very complex in today's era as administrators use multiple consoles or tools to do operating system deployment and hardware management.
This whitepaper describes a process, that leverages existing OME features to deploy a RedHat Enterprise Linux 6.x version on a Dell PowerEdge 12th generation server.

Introduction

OpenManage Essentials have an existing feature called as "Generic command line" task that can be used to deploy an operating system on Dell PowerEdge 12th generation server.

The task will leverage some execueble scripts that can be downloaded from Dell techcenter website.

Prerequisites

1. OME 1.1 or greater version is installed. Please refer the install whitepaper for detailed steps to install OME.

2. An NFS or CIFS fileshare is available.

3. All the Dell PowerEdge 12th generation servers where operating system needs to be deployed, have similar hardware configuration.

4. A DHCP server is used for the assignment of IP addresses.

5. All the iDRAC devices present in the target Dell PowerEdge 12th generation systems are having same username and password.

6. All the target Dell PowerEdge 12th generation systems are having latest version for iDRAC, BIOS and Lifecycle controller firmware version. OME can be used to update the system components if required. Please refer the System update whitepaper for details.

7. All the target Dell PowerEdge 12th generation systems have integrated RAID controller and a minimum of 2 RAID capable harddrives connected to it.

8. An existing RHEL 6.x system is present. The system can be a virtual machine with RHEL 6.x installed. This system will be used to create a boot ISO.

9. All the required scripts are downloaded on the OME system from Dell techcenter.

10. Latest RHEL 6.x install ISO is available.

Steps for installing RedHat Enterprise Linux 6.x using OME

Downloading the required scripts

1. Extract the scripts downloaded in Step 9 of "Prerequites" section on the system where OME is installed. After the scripts are extracted, following folders as shown in the screenshot should be present. The "Config" folder contains the required configuration files (The configuration changes required are discussed later in the document), and "Executables" folder contains the required commands to install operating system using OME (For example createRAID.exe is the command to create RAID, bootToNetworkISO.exe is the command to install the operating system etc.)
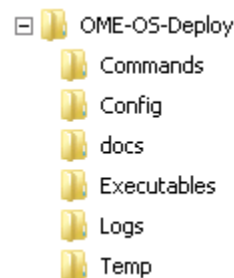
Creating the RHEL 6.x Boot ISO

2. Login to the existing RHEL 6.x system (as mentioned in "Prerequisites" section step 6) using any SSH client (e.g. putty).

3. Copy the RHEL 6.x install ISO to /tmp folder in the system.

4. Create a folder on the system using following command:

    mkdir -p /mnt/linux

5. Mount the RHEL 6.x install ISO to the folder created above. Use the following command:

    mount -o loop /tmp/<RHEL ISO FILE NAME> /mnt/linux

6. Copy the contents of the RHEL install ISO to a local folder using following set of commands:

    # cd /mnt/

    # tar -cvf - linux | (cd /var/tmp/ && tar -xf -)

7. Copy the kickstart configuration file to the root of the folder created above. Use the following command:

    # cp /tmp/ks.cfg /var/tmp/linux

    The above command assumes that a kickstart file is present in /tmp folder. If you do not have a kickstart file, the sample kickstart file provided with the scripts downloaded in Step 1 can be

used. Please copy the "ks.cfg" file present in "Config" folder (as shown in Step 1) to the /tmp folder of the present RHEL system.

8. Update the isolinux.cfg file present in "/var/tmp/linux/isolinux" directory to mention the location of kickstart file as "ks=cdrom:/ks.cfg". If you are not sure about updating this file, the sample isolinux.cfg file provided with the scripts downloaded in Step 1 can be used. Please copy the "isolinux.cfg" file present in "Config" folder (as shown in Step 1) to the /tmp folder of the present RHEL system and use the following command.

> *# cp /tmp/isolinux.cfg /var/tmp/linux/isolinux*

9. Repackage the files to a new boot ISO image using following set of commands.

> *# cd /var/tmp/linux*
>
> *# mkisofs -o ../RhelBootCD.iso -b isolinux/isolinux.bin -c isolinux/boot.cat -no-emul-boot -boot-load-size 4 -boot-info-table -J -R -V "<DISK_VOLUME_NAME>"*

10. Copy the ISO created in Step 9 to the NFS share. The ISO will be present in "/var/tmp" folder.

Note: These steps are applicable for other flavours of RedHat enterprise Linux (e.g. 5.x and 4.x). Also, we can use the steps provided by Operating system vendors like Novell and Microsoft to create correct boot ISO images for Suse and Windows operating systems. These ISO images should have the kick-start or the answer files in the root of the boot ISO, so that the operating system can be installed unattended using the steps mentioned further in this document. The steps mentioned in section "Installing Operating system using OME" below are independent of which operating system needs to be installed. They depend only on the boot ISO image provided to install the operating system.

Installing Operating system using OME

Refer to scripts downloaded in Step 1 of this section. At first, we have to configure the "Config.cfg" file present in "Config" folder. The various keys in the configuration file are defined in the table below. Also, an example configuration file can be seen in the screenshot following the table.

Name	Description	Supported values
RAID_Level	The RAID level to be created on target systems	1,5
Span_Depth	Span depth for RAID.	1
Span_Length	Number of Physical Disks to be used per span. Minimum requirements for given RAID Level must be met.	As per RAID level
Virtual_Disk_Name	The name of the RAID that we want to create remotly	Any alphaneumaric string value
Controller_FQDD	Leave the value blank.	None.
Log_Enable	Flag to enable logs	True,False
NFS_IP	IP address for NFS share	IP address

NFS_SHARENAME	Name of the share created on NFS server to share the boot ISO.	Provide the name of share.
NFS_USERNAME	Username for NFS share	Username. Leave blank if NFS share can be accessed without credentials
NFS_PASSWORD	Password for NFS share	Password. Leave blank if NFS share can be accessed without credentials
NFS_DOMAIN	Domain name for NFS share	Domain name. Type "WOKGROUP" if there is no domain.
NFS_MOUNTPOINT	Leave default value	Default value
BOOT_ISO	Name of the boot ISO copied to NFS share.	Name of ISO
USE_NFS	Flag to enabled NFS share. YES if you want to use NFS and NO if you want to use CIFS share.	YES,NO
CIFS_IP	IP address for CIFS share	IP address
CIFS_SHARENAME	Name of the share created on CIFS server to share the boot ISO.	Provide the name of share.
CIFS_USERNAME	Username for CIFS share	Username. Leave blank if NFS share can be accessed without credentials
CIFS_PASSWORD	Password for CIFS share	Password. Leave blank if NFS share can be accessed without credentials
CIFS_DOMAIN	Domain name for CIFS share	Domain name. Type "WOKGROUP" if there is no domain.
CIFS_MOUNTPOINT	Leave default value	Default value
BOOT_ISO	Name of the boot ISO copied to CIFS share.	Name of ISO
CIFS_NFS	Flag to enabled CIFS share. Value "YES" if you want to use CIFS and value "NO" if you want to use NFS share.	YES,NO

```
[RAID Parameters]

RAID_Level=1
Span_Depth=1
Span_Length=2
Virtual_Disk_Name=OS
CONTROLLER_FQDD=

[Logging]

Log_Enable=True

[NFS Parameters]

NFS_IP=10.94.103.160
NFS_SHARENAME=nfsshare
NFS_USERNAME=
NFS_PASSWORD=
NFS_DOMAIN=WORKGROUP
NFS_MOUNTPOINT=P
BOOT_ISO=RhelBootCD.iso
USE_NFS=NO

[CIFS Parameters]

CIFS_IP=10.94.103.155
CIFS_SHARENAME=OSShare
CIFS_USERNAME=ashish_suyal
CIFS_PASSWORD=Dell123$
CIFS_DOMAIN=spectre
CIFS_MOUNTPOINT=P
BOOT_ISO=RhelBootCD.iso
USE_CIFS=YES
```

Most of the configuration can be left default except NFS_IP,NFS_SHARENAME and BOOT_ISO keys. These keys should be updated with correct NFS server IP, NFS sharename created in Step 2 of "Pre-requisites" section and the boot ISO name created in Step 9 of current section respectively.

11. Discover the iDRACs of all the target Dell PowerEdge 12th generation servers using WSMAN protocol. All discovered iDRACs will classify as RAC in the Device Tree.

    Please refer the discovery whitepaper for detailed steps.

12. Create a generic command line task in OME for RAID configuration using following steps:

    a. Launch OME.

    b. Navigate to Manage > Remote Tasks.
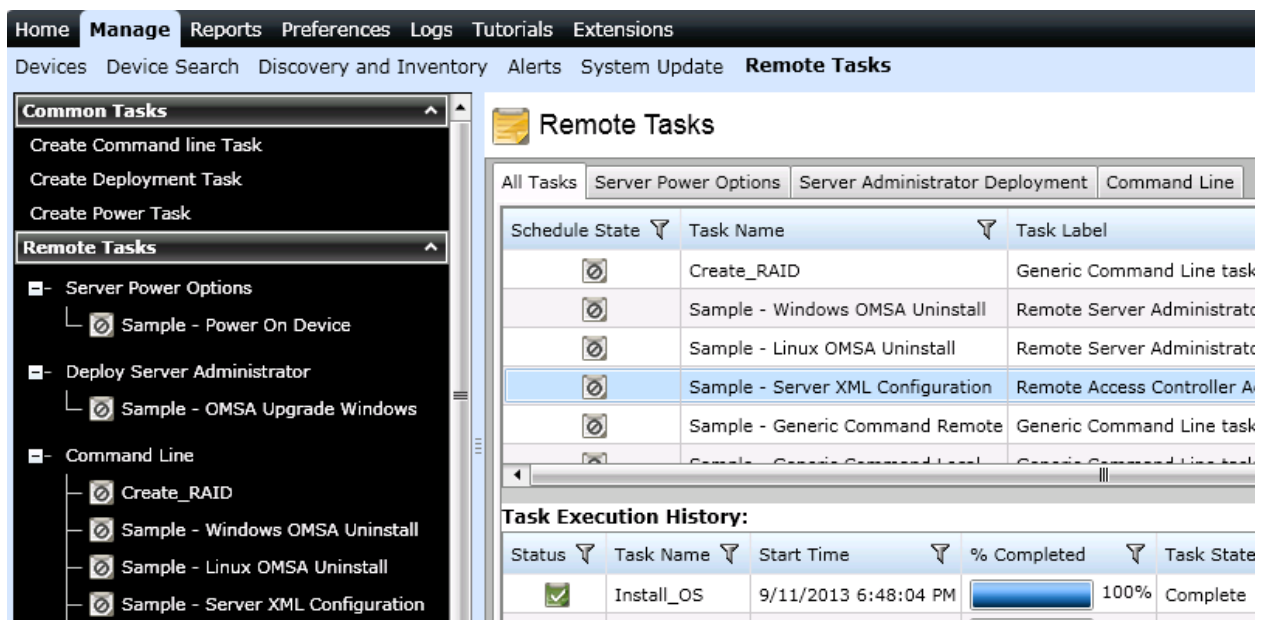
c. Click on "Create Command Line Task".
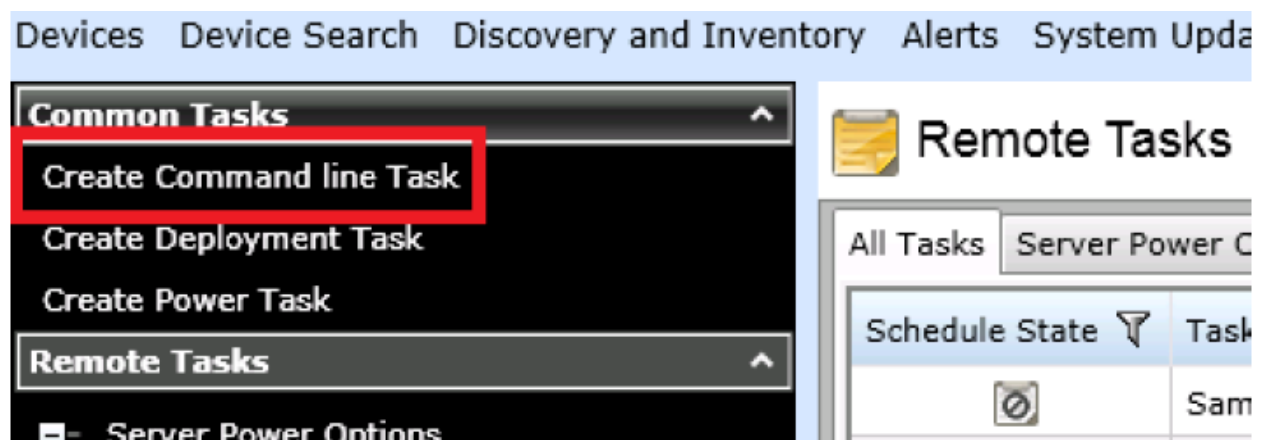
d. "Create a Command Line Task" window is displayed.

e. "General "tab is displayed.

f. Select "Generic command task" option – Enter task name "Create RAID" or use the default one.

g. In the command field enter the location of the createRAIDConfig.exe that was extracted in Step 1 of this section, and in the "Arguments" field enter "$RAC_IP $USERNAME $PASSWORD". Refer following screenshot for details.

Create a Command Line Task

General | Task Target | Schedule and Credentials

Task Name   Create_RAID

○ Remote Server Administrator Command
◉ Generic Command
○ IPMI Command
○ RACADM Command Line

Command: C:\OME-OS-Deploy\Executables\createRAIDConfig.e

Arguments: $RAC_IP $USERNAME $PASSWORD

☐ Ping Device
☐ Output to file
  ☐ Append   ☐ Include errors

Script Credentials

$USERNAME:

$PASSWORD:

h. Script Credentials section is displayed. Enter Credentials of the target iDRACs as shown in the figure below.

Create a Command Line Task

General | Task Target | Schedule and Credentials

Task Name Create_RAID

○ Remote Server Administrator Command
◉ Generic Command
○ IPMI Command
○ RACADM Command Line

Command: C:\OME-OS-Deploy\Executables\createRAIDConfig.e

Arguments: $RAC_IP $USERNAME $PASSWORD
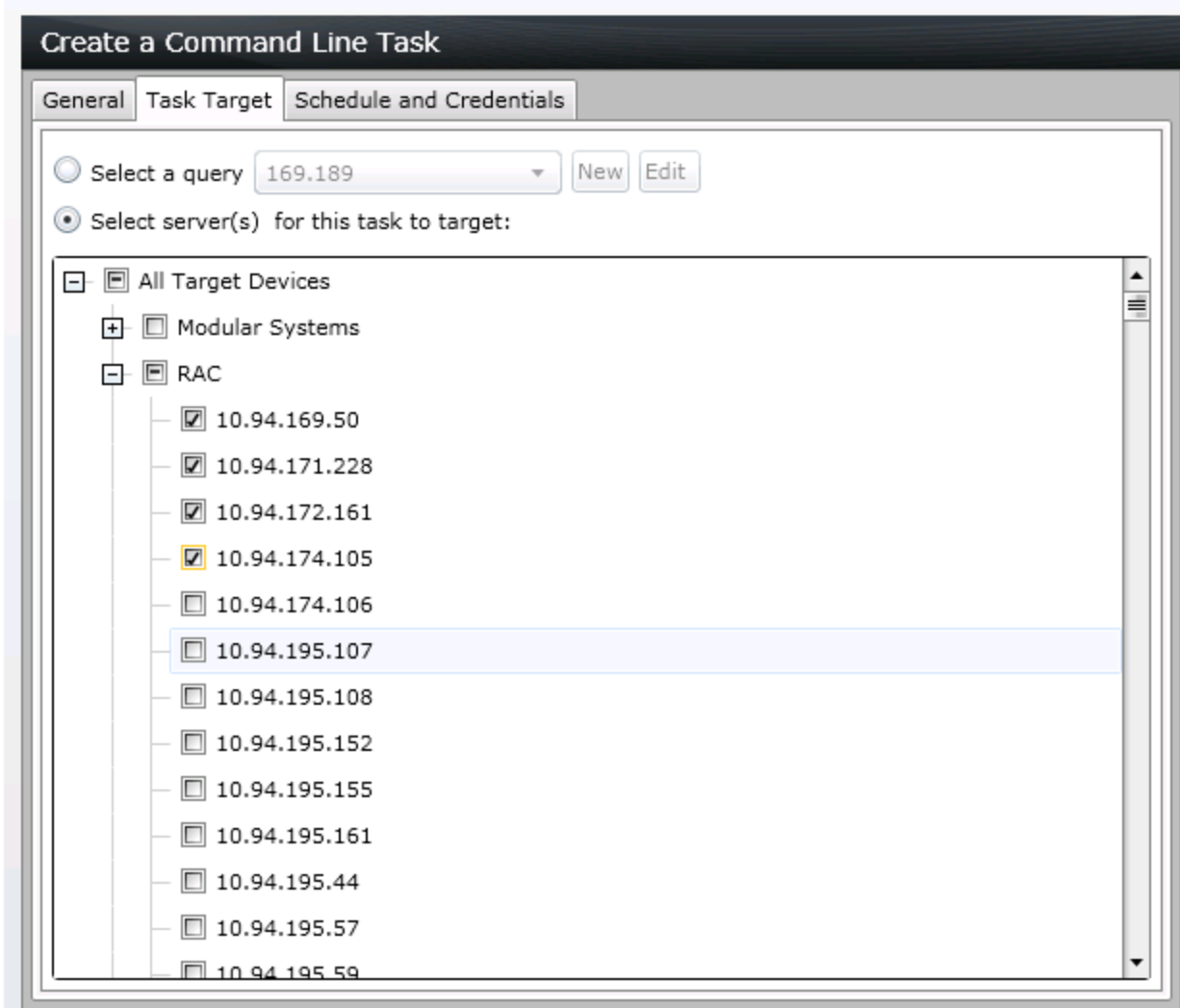
☐ Ping Device
☐ Output to file

☐ Append   ☐ Include errors

Script Credentials

$USERNAME: root

$PASSWORD: ••••••

i. Click "Next".

j. "Task Target" tab is displayed.

k. Select the iDRAC 7 Targets where you want to install the operating system. Refer the following screenshot.

Create a Command Line Task

General | Task Target | Schedule and Credentials

- Select a query [169.189 ▼] [New] [Edit]
- Select server(s) for this task to target:

- All Target Devices
  - Modular Systems
  - RAC
    - ☑ 10.94.169.50
    - ☑ 10.94.171.228
    - ☑ 10.94.172.161
    - ☑ 10.94.174.105
    - ☐ 10.94.174.106
    - ☐ 10.94.195.107
    - ☐ 10.94.195.108
    - ☐ 10.94.195.152
    - ☐ 10.94.195.155
    - ☐ 10.94.195.161
    - ☐ 10.94.195.44
    - ☐ 10.94.195.57
    - ☐ 10.94.195.59

l. Click Next.

m. "Schedule and Credentials" tab is displayed.

n. Set schedule – user can either choose run now or set schedule.

o. Enter credentials of the OME Administrator who has the privileges to run the task on this server.

p. Click Finish and wait for the task to finish successfully. The task may take significant time if number of target systems are more. Typically it takes 10-20 minutes per target system.

13. Create another generic command line task in OME for installation of operating system. Use all the sub steps mentioned in Step 13 above to create the task and replace the command section with the path to "bootToNetworkISO.exe" (instead of "createRAIDConfig.exe") and wait for the task to be successful.

14. Once the task created in Step 14 becomes successful, an unattended installation of RHEL 6.x automatically starts on all the target Dell PowerEdge 12th generation systems. The installation takes typically 30-60 minutes based on the packages selected for installation.

15. After the operating system installation is complete for all the target systems, a clean up task has to be created. The same sub steps as mentioned in the Step 13 of this section can be used to create the task and replace the command section with the path to "detachNetworkISO.exe" (instead of "createRAIDConfig.exe") and wait for the task to be successful.