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Marvell® Solutions Lab

Generating a Custom VMware ESXi Installation ISO Image with Marvell rivers

2400, 2500, 2600, 3200, 4000, 8100, 8200, 8300, and 10000 Series

Solution Lab

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1 Introduction

This document provides information on generating a custom ISO image for VMware® ESXi 4.*x* and 5.*x* installation with the latest Marvell drivers to streamline the installation of new servers, for the following Marvell adapters:

- 2400, 2500, and 2600 Series Fibre Channel Adapters
- 3200 Series Intelligent Ethernet Adapters
- 4000 Series iSCSI Adapters
- 8100, 8200, and 8300 Series Converged Network Adapters (iSCSI and Ethernet)
- FabricCache® 10000 Series Adapters

Overview

Installing VMware ESXi on new server hardware can be challenging. Installing and upgrading the drivers on every new vSphere host is a time-consuming process. In addition, you may be lacking the drivers for the latest hardware.

This document presents two solutions that provide significant time savings along with any missing drivers. The first is the manual method using the VMware vSphere® PowerCLI commands to generate an ISO image with the latest Marvell drivers. The second method uses a Windows PowerShell® script with added functionality that and makes the process much easier.

The intended use is for partners and customer to create custom ISO installation images with the latest drivers and management utilities. This process is also necessary for use in the VMware AutoDeploy feature which allows customers to PXE boot their ESXi hosts so that there is no need to have internal storage for the boot drives. AutoDeploy also allows for rapid, standardized deployment of a large number of ESXi hosts.

For additional information, refer to the following:
http://pubs.vmware.com/vsphere-50/index.jsp#com.vmware.vsphere.install.doc_50/GUID-C84C5113-3111-4A27-9096-D61EED29EF45.html

Requirements

This section lists the hardware and software required to generate an ESXi installation ISO image for the supported adapters.

Hardware Required

Required hardware includes the following:

- At least one of the supported Marvell adapters (see the beginning of this chapter for a list of supported adapters)
- A desktop or laptop computer that is running the Microsoft® Windows 7®, Windows 2008®, or Windows Server 2012® operating system and has an Internet connection

Software Required

Required software includes the following:

- Microsoft Windows PowerShell installed on the computer

NOTE

Microsoft PowerShell is included in all Windows 7, Windows 2008, Windows 2008 R2, and Windows 2012 installations by default.

- Add-ins installed for the VMware vSphere PowerCLI

NOTE

VMware PowerCLI can be downloaded from the following location: https://www.vmware.com/support/developer/PowerCLI/index.html

2 Setup

This chapter describes the setup that is required before you can generate the ISO image as described in Chapter 3, “Generating the ISO Image”.

Setup Procedure

Follow these instructions to get set up to create the custom ISO image:

1. Create a directory that will be used for staging the drivers and the creation of the ISO images. For example:
   `C:\> mkdir c:\ESXi_Temp`
2. For greater flexibility later, create a subdirectory for the offline driver bundles to be downloaded from the VMware website. For example:
   `C:\> mkdir c:\ESXi_Temp\Drivers`
3. Go to https://my.vmware.com/web/vmware/downloads and download the following Marvell driver files (a VMware account is required)[1]:

   VMware ESXi 5.1 or earlier:

   - Marvell Fibre Channel/FCoE Adapter Drivers:
     `qla2xxx-934.5.22.0-1211558.zip`
   - Marvell 3200/8200/8300 Ethernet Adapter Drivers:
     `qlcnic-esx50-5.1.157-1089431.zip`
   - Marvell iSCSI Converged Network Adapter Drivers:
     `qla4xxx-634.5.18.0-1072898.zip`

   VMware ESXi 5.5 only:

   - Marvell Fibre Channel/FCoE Adapter
     `VMW-ESX-5.5.0-qlnativefc-1.1.14.0-offline_bundle-1377848.zip`
   - Marvell 3200/8200/8300 Ethernet Adapter Drivers:
     `qlcnic-esx50-5.5.164-offline_bundle-1245384.zip`
   - Marvell iSCSI Converged Network Adapter Drivers:
     `qla4xxx-634.55.26.0-offline_bundle-1383581.zip`

[1] This section only lists drivers not included as inbox drivers at the time this document was written.

NOTE

- All file names in this document were correct when this document was written but may become obsolete. Be sure to verify that you download the latest files, by referring to build and version numbers embedded into the file names.
- The Fibre Channel/FCoE drivers cover Marvell 2400/2500/2600 Series Fibre Channel Adapters, FabricCache 10000 Series Adapters, and 8100/8200/8300 Series Converged Network Adapters.

4. Download the packages for the Marvell QConvergeConsole Plug-in for VMware vCenter (a management tool for Marvell products):

   a. Go to the Marvell Downloads and Documentation page: https://www.marvell.com/support/downloads.html

   b. Type the Marvell model name in the search box.

   c. In the search results list, select the vCenter Plugin and CIM Provider.

   d. View the product details Web page to ensure that you have the correct package. For additional information, click the **Read Me** and **Release Notes** icons under Support Files.

   e. Click **Download Now**.

   f. Save the file to your computer.

   The packages you need to download are:

   - Marvell FabricCache 10000 Series Adapters: `QLGC-ESX-5.0.0-Marvell-fca-provider-1.0.9-offline_bu ndle-1140150.zip`
   - Marvell Fibre Channel Adapters and Converged Network Adapters: `QLGC-ESX-5.0.0-Marvell-adapter-provider-1.6.31-offli ne_bundle-1152815.zip`

5. Unzip the zip files downloaded from both the VMware and Marvell websites to extract the offline bundles.

6. Copy the offline bundles to the subdirectory that you created in Step 2. Figure 2-1 shows an example of the offline bundles after being copied to the subdirectory. The first 3 files are in the zip files downloaded from the VMware website in Step 3. while the other two files are in the vCenter Plugin bundle from Step 4.

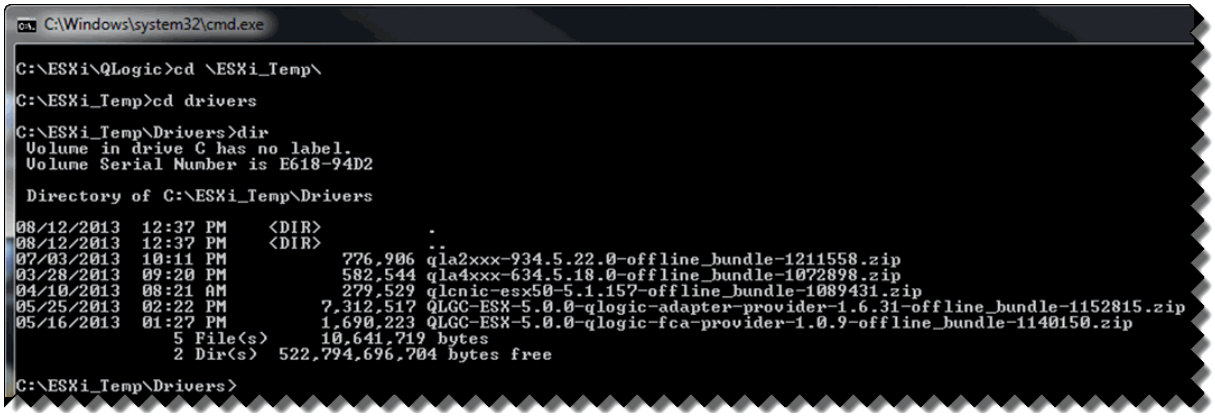

Figure 2-1. Offline Bundles in Subdirectory

You are now ready to generate the ISO images, as explained in Chapter 3, “Generating the ISO Image”.

3 Generating the ISO Image

This chapter explains how to generate a custom ESXi ISO image using either of two methods: a manual method using VMware PowerCLI, or an automated method for advanced users that employs a PowerShell script for the ESXi-Customizer.

Be sure to perform the steps described in “Setup Procedure” on page 3 before attempting to generate the ISO image using either of the following methods.

- “Method 1: VMware vSphere PowerCLI (ESXi 5.0, 5.1, 5.5)” on page 6
- “Method 2: ESXi-Customizer-PowerShell Script (ESXi 4.1, 5.0, 5.1, 5.5)” on page 11

Method 1: VMware vSphere PowerCLI (ESXi 5.0, 5.1, 5.5)

Follow these steps to generate the ISO image using VMware vSphere PowerCLI :

1. Double-click the VMware vSphere PowerCLI desktop icon  to start a PowerShell session with the PowerCLI add-ins installed.

   The VMware vSphere PowerCLI welcome screen opens, as shown in Figure 3-1 on page 6.

Figure 3-1. VMware vSphere PowerCLI Welcome Screen

2. Issue the following cmdlets to connect to the VMware software depot and list out the available images, as shown in Figure 3-1 on page 6.

```
Add-EsxSoftwareDepot https://hostupdate.vmware.com/software/VUM/PRODUCTION/main/vmw-depot-index.xml
Get-ESXImageProfile | Sort-Object "Name","ModifiedTime" -Descending | format-table -property Name,CreationTime
```

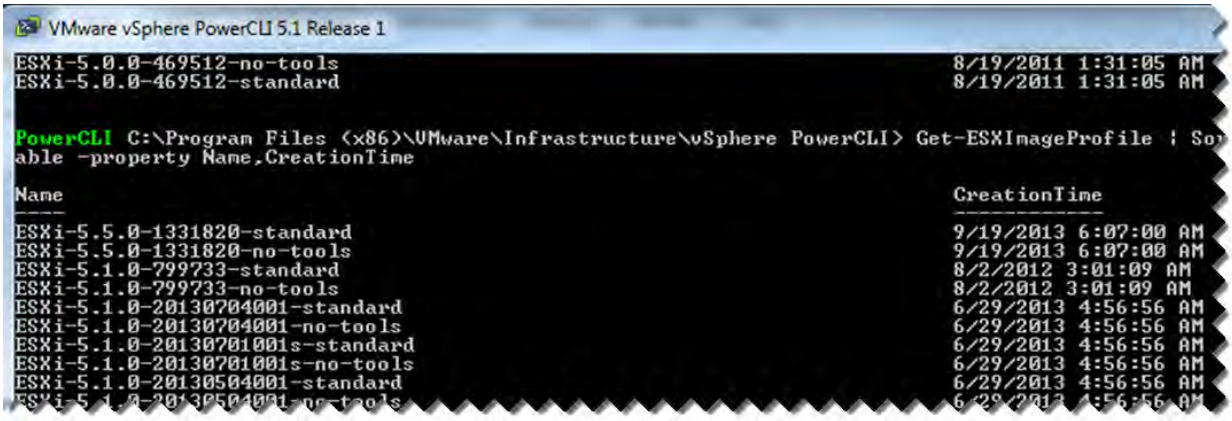

Figure 3-2. VMware vSphere PowerCLI Cmdlet Output

Note the name of the build that will be the basis for the image being created. For example, in Figure 3-2, the build name for an ESXi 5.5 ISO image is `ESXi-5.5.0-1331820-standard`.

3. Add the Marvell drivers to the local version of the software depot before merging the local and remote depots, by issuing the following cmdlet for each Marvell driver to be added to the custom ISO image:

   `Add-ESXSoftwareDepot <path to offline bundle>`

   The drivers correspond to these Marvell adapters and management tools:

   - ❑ Marvell Fibre Channel adapters, Converged Network Adapters (FCoE), and Marvell FabricCache adapters
   - ❑ Marvell Converged Network Adapters (Ethernet and iSCSI)
   - ❑ Marvell Intelligent Ethernet adapters
   - ❑ Marvell vCenter Plugin and CIM provider (for Fibre Channel, Ethernet and iSCSI adapters and Converged Network Adapters)
   - ❑ Marvell vCenter Plugin and CIM provider (for FabricCache Adapters)

NOTE

For the names of the driver zip files, refer to Chapter 2, “Setup”.

The following cmdlets add all the drivers to the local software depot.

```
Add-ESXSoftwareDepot c:\esxi_temp\drivers\qla2xxx-934.5.22.0-offline_bundle-1211558.zip
Add-ESXSoftwareDepot c:\esxi_temp\drivers\qla4xxx-634.5.18.0-offline_bundle-1072898.zip
Add-ESXSoftwareDepot c:\esxi_temp\drivers\qlcnic-esx50-5.1.157-offline_bundle-1089431.zip
Add-ESXSoftwareDepot c:\esxi_temp\drivers\QLGC-ESX-5.0.0-Marvell-adapter-prov ider-1.6.31-offline_bundle-1152815.zip
Add-ESXSoftwareDepot c:\esxi_temp\drivers\QLGC-ESX-5.0.0-Marvell-fca-provider -1.0.9-offline_bundle-1140150.zip
```

Figure 3-3 shows an example of the output for each cmdlet:

```
PowerCLI C:\ESXi_Temp> Add-ESXSoftwareDepot c:\esxi_temp\drivers\qla2xxx-934.5.22.0-offline_bundle-1211558.zip
Depot Url
---------
zip:C:\esxi_temp\drivers\qla2xxx-934.5.22.0-offline_bundle-1211558.zip?index.xml
```

Figure 3-3. Sample Cmdlet Output: Adding Driver to Local Software Depot

4. Clone the VMware software depot image to the local software depot, so that all the combining can be done locally, follows:

   a. Clone a VMware image profile using the `New-EsximageProfile` cmdlet, as shown in the following example.

```
New-EsximageProfile -cloneprofile ESXi-5.1.0-20130704001-standard -
name "ESXi-5.1.0-20130704001-standard-Marvell" -Vendor "Marvell"
```

The cmdlet arguments include the following:

- Source profile name (`ESXi-5.1.0-20130704001-standard` in the example) from the output of the `Get-ESXImageProfile` cmdlet shown in Figure 3-2 on page 7
- Custom name (`ESXi-5.1.0-20130704001-standard-Marvell` in the example) to which to add the newer drivers

NOTE

Always use the standard version (denoted by `-standard`), as it contains the latest version of the VMTools installers.

- `-Vendor` option (set to `Marvell` in the example).

b. Add the drivers that you previously added to the local software depot, using the `Add-ESX-SoftwarePackage` cmdlet. This cmdlet contains the ImageProfile name of the cloned image and the actual package name to be installed. The package name can be found by opening the offline bundle zip file and displaying the contents of the directory under the vib20 directory, as shown in Figure 3-4.

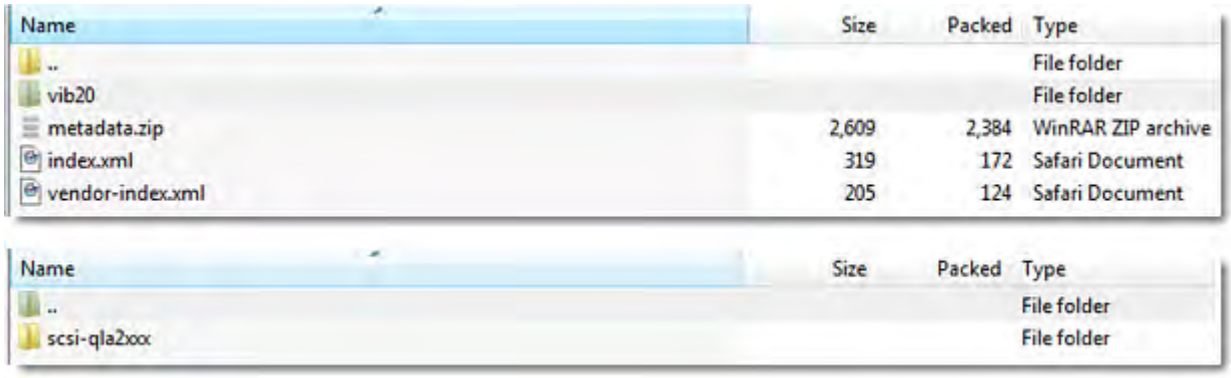

Figure 3-4. Contents of Offline Bundle Zip File

The cmdlets used to add the drivers to the cloned image are:

```
Add-ESXSoftwarePackage -ImageProfile ESXi-5.1.0-20130704001-standard-QLogicscsi-qla2xxx
Add-ESXSoftwarePackage -ImageProfile ESXi-5.1.0-20130704001-standard-QLogicscsi-qla4xxx
Add-ESXSoftwarePackage -ImageProfile ESXi-5.1.0-20130704001-standard-QLogicima-qla4xxx
Add-ESXSoftwarePackage -ImageProfile ESXi-5.1.0-20130704001-standard-QLogicnet-qlcnic
Add-ESXSoftwarePackage -ImageProfile ESXi-5.1.0-20130704001-standard-QLogicqlogic-adapter-provider
Add-ESXSoftwarePackage -ImageProfile ESXi-5.1.0-20130704001-standard-QLogicprovider-fca
```

5. Compile the image profile into the ISO image, as follows:

   a. Compare the cloned image profile to the original by issuing the following cmdlet:

```
Compare-Esximageprofile -comparisonprofile ESXi-5.1.0-20130704001-standard-QLogic -ReferenceProfile ESXi-5.1.0-20130704001-standard
```

The cmdlet outputs a summary of the changes being made, as shown in Figure 3-5.

Figure 3-5. Sample Cmdlet Output: Compare Cloned Image Profile to Original

b. Export the image profile to a usable ISO image on the local drive by issuing the following cmdlet:

```
Export-EsxImageProfile -ImageProfile ESXi-5.1.0-20130704001-standard-Marvell
-ExportToIso -FilePath c:\esxi_temp\ESXi-5.1.0-20130704001-standard
-Marvell.iso
```

Depending on Internet connection speed and system speed, this process takes approximately 5-10 minutes with a 10Mbps connection.

You can now burn the ISO image to CD or use it with the virtual media function of a server's iLO, iDRAC, IMM2, or other remote management feature.

Method 2: ESXi-Customizer-PowerShell Script (ESXi 4.1, 5.0, 5.1, 5.5)

This section describes ESXi-Customizer-PS, a Windows PowerShell script that reduces the manual method of generating the ISO image to a single command. The script, and information about it, are available at: VMware Front Experience.

The ESXi-Customizer-PS script makes creating a custom ISO image simpler by removing the need to collect information about the offline bundles. Instead, the script simply accesses the directory containing the latest downloaded drivers.

Using ESXi-Customizer-PS

Follow these steps to use the ESXi-Customizer-PS script:

1. Download the ESXi-Customizer-PS script from VMware Front Experience.
2. Open the VMware PowerCLI command prompt and go to the directory where the downloaded script resides.
3. Make sure that all the offline bundles to be added are in one directory. For instructions on downloading the offline bundles, refer to “Setup Procedure” on page 3.
4. Issue the following command:

   ```
   .\ESXi-Customizer-PS-v1.4.3.ps1 -obDir .\Drivers
   ```

   This command uses the latest image profile from the VMware software depot and adds all the offline bundles in the directory specified by the `-obDir` switch—in this example, the `Drivers` subdirectory of the current directory (provide the full path if the folder is not a subdirectory of the current directory). Figure 3-6 on page 12 shows an example of the script’s screen output.

```
PowerCLI C:\ESXi_Temp> .\ESXi-Customizer-PS-v1.4.3.ps1 -obDir .\Drivers -sip

Script to build a customized ESXi installation ISO or Offline bundle
using the VMware PowerCLI ImageBuilder snapin
(Call with -help for instructions)

Running with VMware vSphere PowerCLI 5.1 Release 1 build 793510

Connecting the VMware ESXi base depot ... [OK]
Using ImageProfile ESXi-5.1.0-20130704001-standard ...
(dated 06/29/2013 04:56:56, AcceptanceLevel: PartnerSupported,
For more information, see http://kb.vmware.com/kb/2052148.)

Adding Offline bundles from .\Drivers ...
   Adding C:\ESXi_Temp\Drivers\qla2xxx-934.5.22.0-offline_bundle-1211558.zip ... [OK]
      Add VIB scsi-qla2xxx 934.5.22.0-10EM.500.0.0.472560 [OK]
   Adding C:\ESXi_Temp\Drivers\qla4xxx-634.5.18.0-offline_bundle-1072898.zip ... [OK]
      Add VIB ima-qla4xxx 500.2.01.31-1vmw.0.0.060523 [OK]
      Add VIB scsi-qla4xxx 634.5.18.0-10EM.500.0.0.472560 [OK]
   Adding C:\ESXi_Temp\Drivers\qlcnic-esx50-5.1.157-offline_bundle-1089431.zip ... [OK]
      Add VIB net-qlcnic 5.1.157-10EM.500.0.0.472560 [OK]
   Adding C:\ESXi_Temp\Drivers\QLGC-ESX-5.0.0-qlogic-adapter-provider-1.6.31-offline_bundle-1152815.zip ... [OK]
      Add VIB qlogic-adapter-provider 1.6.31-469512 [OK]
   Adding C:\ESXi_Temp\Drivers\QLGC-ESX-5.0.0-qlogic-fca-provider-1.0.9-offline_bundle-1140150.zip ... [OK]
      Add VIB provider-fca 1.0.9-469512 [OK]

Exporting the ImageProfile to 'C:\ESXi_Temp\ESXi-5.1.0-20130704001-standard-customized.iso'. Please be patient ...
```

Figure 3-6. Sample Output of ESXi-Customizer-PS Script

NOTE

To display help information for the ESXi-Customizer-PS script, use the `-help` switch, as shown in Figure 3-7.

```
PowerCLI C:\ESXi_Temp> .\ESXi-Customizer-PS-v1.4.3.ps1 -help

Script to build a customized ESXi installation ISO or Offline bundle
using the VMware PowerCLI ImageBuilder snapin

Optional parameters:
   -help           : display this help
   -izip <bundle>: use the VMware Offline bundle <bundle> as input instead of
                     the Online depot
   -obDir <dir>  : directory of Offline bundles to add (if any, no default)
   -ozip           : output an Offline bundle instead of an installation ISO
   -outDir <dir> : directory to store the customized ISO or Offline bundle
                     (the default is the script directory)
   -ipname <name>: provide a name for the customized ImageProfile
                     (the default is derived from the cloned input ImageProfile)
   -hp             : add packages from the HP VIBs Depot (default = no)
   -hprel <mon>  : select HP packages from release dated <mon> (e.g. 'sep2012')
                     (default = select latest available HP packages)
   -sip            : select an ImageProfile from the current list
                     (default = auto-select latest available standard profile)
   -v50            : Use only ESXi 5.0 profiles as input, ignore newer versions
   -nsc            : use -NoSignatureCheck with export
   -test           : skip package download and image build (for testing)

PowerCLI C:\ESXi_Temp>
```

Figure 3-7. Help Information for ESXi-Customizer-PS Script

You can now burn the ISO image to CD or use it with the virtual media function of a server's iLO, iDRAC, IMM2, or other remote management feature.

Marvell first revolutionized the digital storage industry by moving information at speeds never thought possible. Today, that same breakthrough innovation remains at the heart of the company's storage, networking and connectivity solutions. With leading intellectual property and deep system-level knowledge, Marvell semiconductor solutions continue to transform the enterprise, cloud, automotive, industrial, and consumer markets. For more information, visit www.marvell.com.

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