



Firmware Updates for Clusters Using the OpenManage™ Integration for VMware vCenter

This Dell technical white paper describes how to use the OpenManage™ Integration for VMware vCenter to perform firmware updates for clusters onto Dell PowerEdge 11th generation or later host systems.

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Revisions

Date	Description
July 2013	Initial release
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Executive summary

The OpenManage Integration for VMware vCenter is a virtual appliance that streamlines tools and tasks associated with the management and deployment of Dell servers in your virtual environment. It reduces complexity by natively integrating the key management capabilities into the VMware vSphere Client console. It minimizes risk with hardware alarms, streamlined firmware updates and deep visibility into inventory, health, and warranty details.

The OpenManage Integration enables users to schedule firmware updates for clusters from within VMware vCenter. In addition, users can schedule the firmware update to run at a future time. This feature helps users to perform the firmware updates at the scheduled maintenance window without having to be present personally to attend the firmware updates.



1 Introduction

The OpenManage Integration provides a wizard that guides a user through the steps to perform firmware updates on cluster hosts using either a vSphere desktop client or a vSphere Web client. Both mechanisms are explained in this whitepaper. The firmware update functionality is only available on Dell PowerEdge™ 11th and 12th Generation Servers that fulfill server prerequisites.

1.1 Firmware Update Assurances

Sequential execution. To make sure all the hosts are not brought down to perform firmware updates, the firmware update is performed sequentially, one host at a time.

Single failure stoppage. If an update job fails on a server being updated, the existing jobs for that server continues; however the firmware update task stops and does not update any remaining servers.

One firmware update job for each vCenter. To avoid the possibility of multiple update jobs interacting with a server or cluster, only one firmware update job for each vCenter is allowed. If a firmware update is scheduled or running for a vCenter, a second firmware update job cannot be scheduled or invoked on that vCenter.

Entering Maintenance Mode. If an update requires a reboot, the host is placed into maintenance mode prior to the update being applied. Before a host can enter maintenance mode, VMware requires that you power off or migrate guest virtual machines to another host. You can configure the DRS features for a cluster to migrate the guest virtual machines to another host automatically. If a host is not able to enter maintenance mode the firmware update task timeouts and fails.

Exiting Maintenance Mode. Once the updates for a host have completed, the host will be taken out of maintenance mode, if a host was in maintenance mode prior to the updates.

NOTE: If a host was in maintenance mode prior to the firmware update task, it is removed from the maintenance mode after the firmware update jobs are completed on the host.

1.2 Server prerequisites for candidates of firmware updates for clusters

For the Dell PowerEdge 11th and 12th generation server to update the firmware of datacenters and clusters, the server must fulfill the following requirements:

- Servers must have a valid iDRAC Express or Enterprise License.
- Server must be part of a Connection Profile.



- Server must be compliant in terms of minimum required firmware, CSIOR status, Hypervisor, and OMSA status (in case for Dell PowerEdge 11th generation servers).
 - At least the base level of firmware updates for Lifecycle Controller, iDRAC, and BIOS. See the product documentation for more details.
 - Conduct System Inventory on Reboot (CSIOR) must be enabled.
 - For Dell PowerEdge 11th generation servers, a supported version of the OMSA agent must be installed. See the product documentation for more details.
- An inventory job run for the servers.

1.3 Firmware Repository prerequisites

A firmware repository accessible to the OpenManage Integration appliance is required. The repository can be the default repository location of <ftp.dell.com>, or a repository created using the Dell Repository Manager. Find information about creating a repository using the Dell Repository Manager in the whitepaper *"Using Dell Repository Manager with OpenManage Essentials & Dell™ OpenManage Integration for VMware vCenter"*



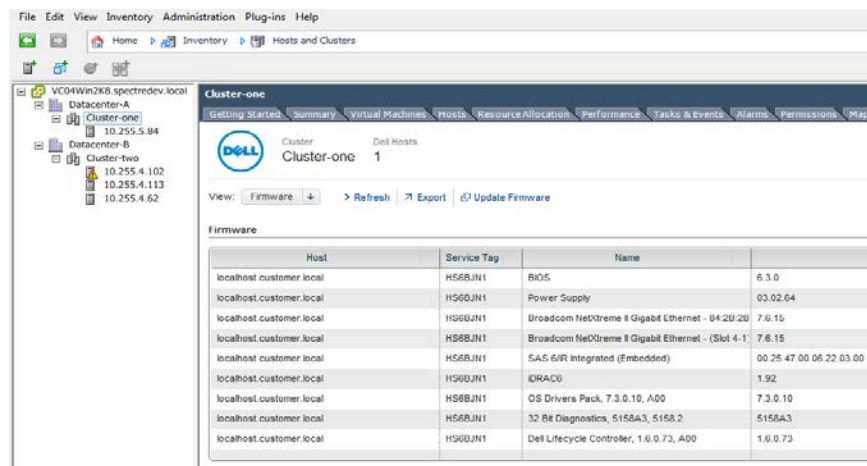
2 Firmware Update Wizard for clusters

Using a vSphere Desktop Client or vSphere Web Client, a user can step through the firmware update process and schedule firmware update jobs on clusters as follows:

1. In **Hosts and Clusters** tree view, select a cluster.
2. Launch the firmware wizard.

For vSphere Desktop Client, select OpenManage Integration tab and click **Update Firmware**.

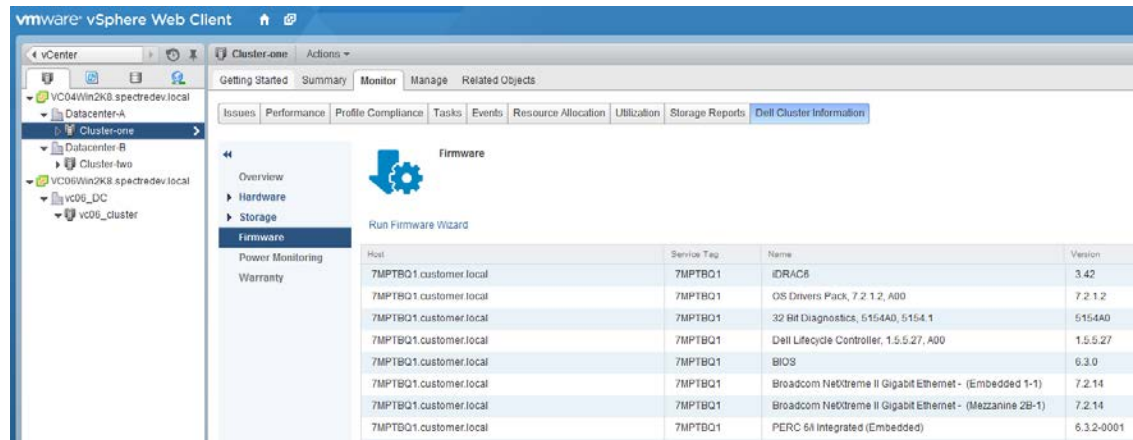
Figure 1 Host and Clusters – Desktop Client



For vSphere Web Client, do any of the following:

- a. Select **Dell Cluster Information** tab. Select **Firmware** page and click **Run Firmware Wizard**.
- b. Right click on a cluster, Select All OpenManage Integration Actions, and select **Firmware Update**.
- c. Click on **Actions** drop-down menu, Select All OpenManage Integration Actions, and select **Firmware Update**.

Figure 2 Host and Clusters – Web Client



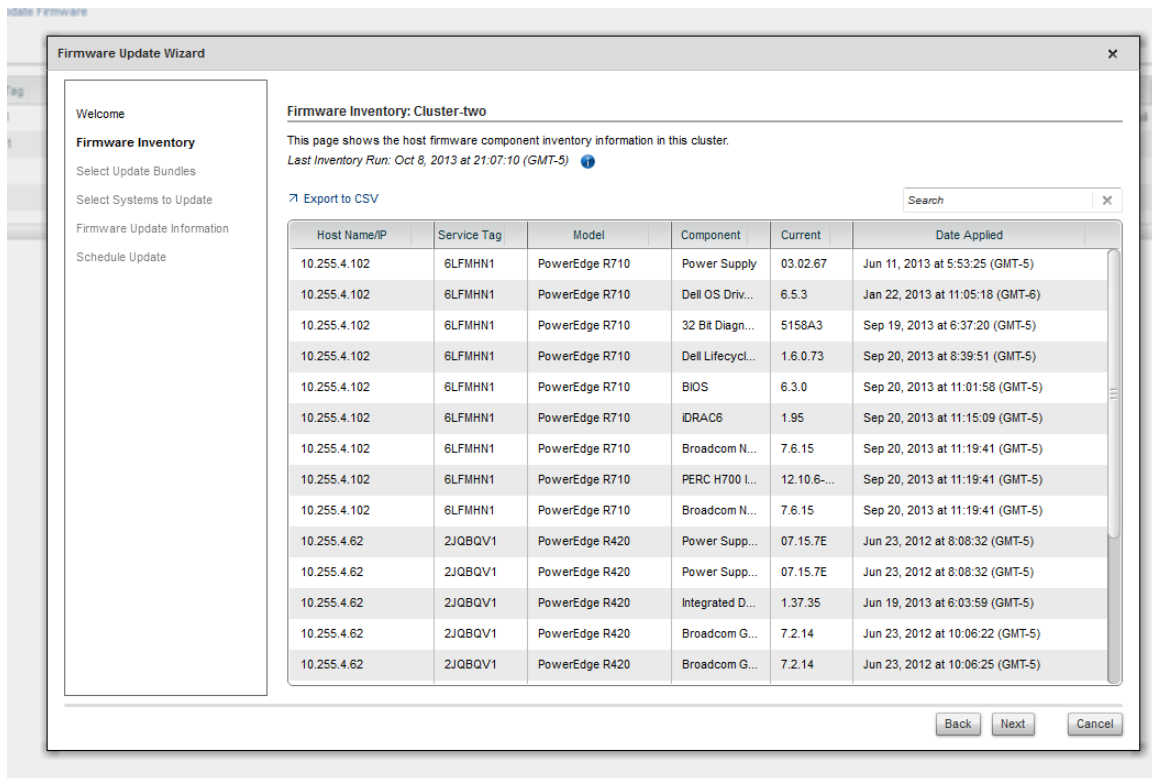
If there is a firmware update job in progress or scheduled, a popup is shown stating the name of the firmware job.

Firmware updates can be performed on different vCenters simultaneously, however only one *in progress* or *scheduled* firmware job for each vCenter is allowed. Dismiss the dialog. Wait, and try this again later. View the status of all jobs on the Firmware Update Jobs tab in Job Queue (See section **Job Status for Firmware Update Jobs** for more details).

3. The wizard opens with a **Welcome** screen with the information about the update. Read this screen before proceeding with the wizard.
4. On the vSphere Desktop Client, Click **Next** to see Firmware Inventory page to review the components that are currently installed on the servers. The list presented is using data from the last scheduled hardware inventory, not from a real-time data. This information is from the time the last inventory was run on the system. Use this time to determine the hardware inventory data is fresh, and that firmware wouldn't have changed since the last scheduled inventory. The inventory data will not reflect the new firmware changes until an inventory has completed for the server.

Note: This page is not shown on the vSphere Web Client.

Figure 3 Firmware Inventory – Desktop Client



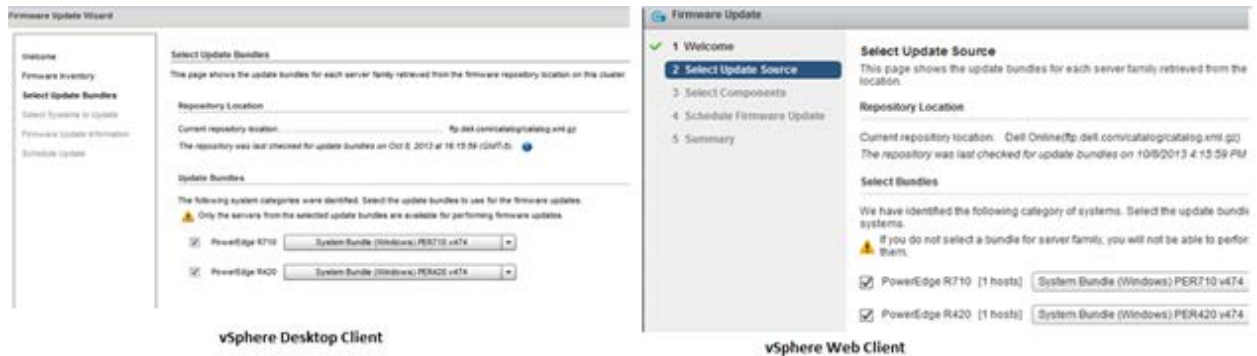
Note: The Cluster column is populated with the cluster name the host is under. If the host is not associated with any cluster, then the column is populated with "Not Applicable".

- Click **Next** to see the repository information and update bundles.

Use the check boxes to select the update bundles on this page.

If a catalog does not contain a bundle for a given model, it is not listed. If multiple bundles are available for a model in the catalog, use the drop-down to select a bundle containing the update packages.

Figure 4 Update Bundles



Note: The bundle information is from the time specified on this screen. If the repository information was changed after that time, the change is not reflected. To reflect the change, exit the wizard. Next, update the repository location using any of the following:

a. vSphere Desktop Client:

- i. Click Dell Management Center under Home > Management
- ii. Navigate to Settings > Firmware Repository. Click Edit.

b. vSphere Web Client:

- i. Click OpenManage Integration under Home > Administration
- ii. Navigate to Manage > Settings. Click Edit icon next to Firmware Update Repository.

Note: The bundles are loaded from a cached catalog file downloaded from the repository location listed. See **Troubleshooting** for details on errors.

When changing the Firmware Repository, allow several minutes for the appliance repository catalog file to synchronize so that the new catalog file is used. When the catalog file is being downloaded, on navigating the Update Bundles step of the wizard, an error popup "The repository is being updated by another process" is shown.

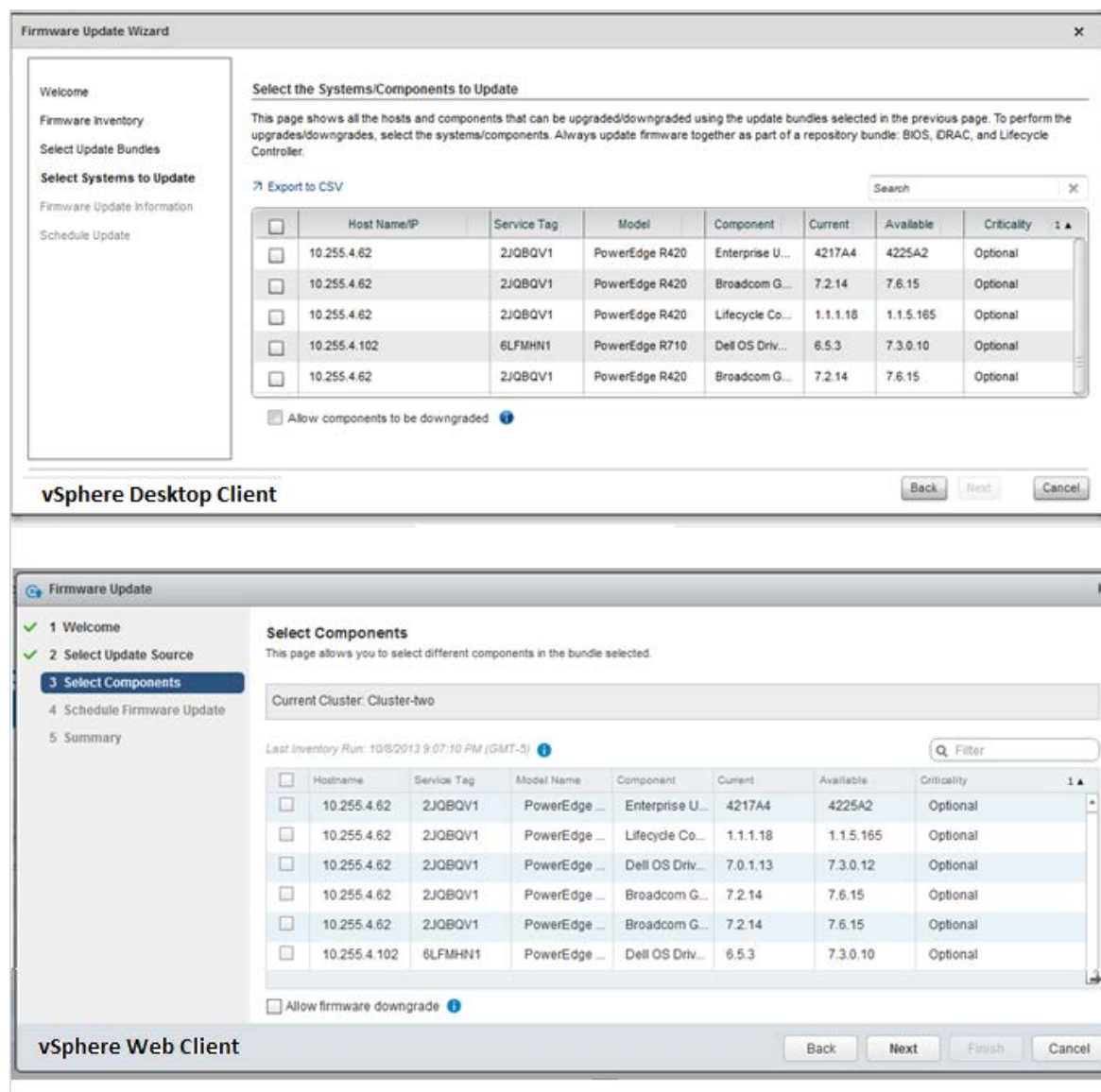
6. Click **Next** to see page showing components that can be updated. Use check boxes to select the components to upgrade or downgrade. To downgrade certain components, select the checkbox to allow downgrade (checkbox below the datagrid).

Note: When selecting all components, if some components remain unselected, there are no upgrades available for those components. Such components may be selected for a downgrade.

CAUTION: There are some known issues with specific pre-existing firmware versions that may cause a firmware update job to fail. Please read the release notes prior to selecting updates to identify and avoid any of these known issues. Also see the **Known Firmware Compatibility Issues** section.

CAUTION: Bundles may contain multiple updates of different versions for a component. It is recommended to select a single update version for a component. Applying multiple updates to a given component as part of the same update job may result in unexpected behavior on the target system.

Figure 5 Update Components



7. **For vSphere Desktop client**, click **Next** to see “Firmware Update Information” to review the components selected for upgrade/downgrade.

Note: **For vSphere Web Client**, the selected components are shown in the **Summary** page.

Figure 6 Firmware Update Information – Desktop Client

Firmware Update Wizard

Welcome
Firmware Inventory
Select Update Bundles
Select Systems to Update
Firmware Update Information
Schedule Update

Firmware Update Information

This page shows the components selected for upgrades/downgrades.

Firmware Update Assurance:

- * The wizard updates one host at a time.
- * The wizard always puts the host in maintenance mode before applying the firmware updates. The host may reboot as part of the update process.
- * The wizard updates a second host after confirming the previous host is out of maintenance mode, up and running.
- * If the firmware update fails for one of the components on a particular host, the update task continues for the remaining components on that host until those updates are completed. However, this host will remain in maintenance mode, and the remaining host updates are cancelled.
- * It typically takes 30-60 minutes to update firmware components for each host.

Components selected for upgrades/downgrades

Host Name/IP	Service Tag	Model	Component	Current	Available	Criticality
10.255.4.62	2JQBQV1	PowerEdge R420	Enterprise U...	4217A4	4225A2	Optional
10.255.4.62	2JQBQV1	PowerEdge R420	Broadcom G...	7.2.14	7.6.15	Optional
10.255.4.62	2JQBQV1	PowerEdge R420	Lifecycle Co...	1.1.1.18	1.1.5.165	Optional
10.255.4.102	6LFMHN1	PowerEdge R710	Dell OS Driv...	6.5.3	7.3.0.10	Optional

Back Next Cancel

8. Click **Next** to see a page that provides the options for creating a firmware update job. In the Firmware Update Job Name text box, type the firmware update job name. This is a mandatory field. Do not enter a name that is already in use. If the name has been purged, it can be used again.

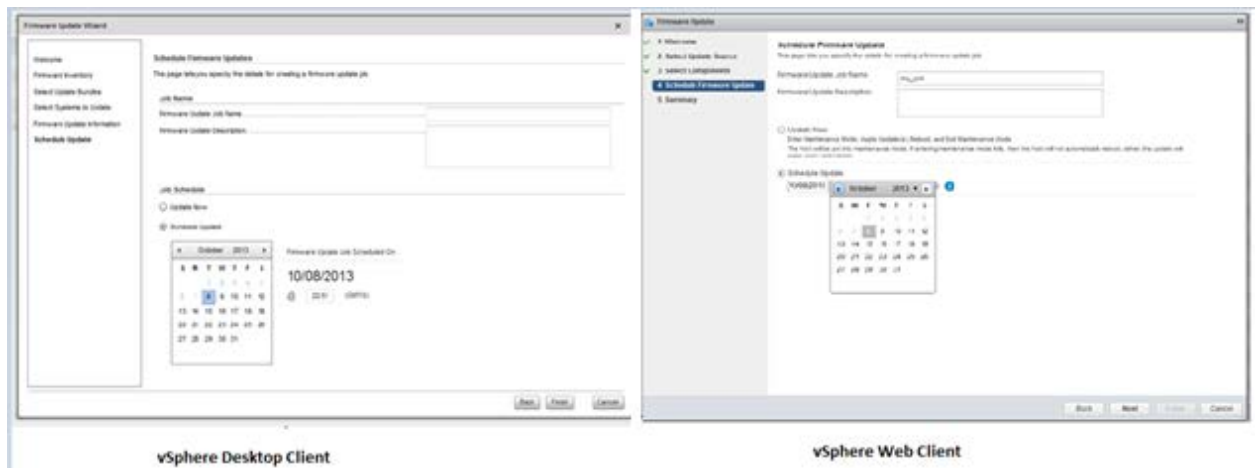
In the Firmware Update Description, type the description.

Under Job Schedule, do one of the following mandatory option:

- To run the update job now, click Update Now.
 - To run the update job later, click Schedule Update, and then do the following:
 - o In the Calendar box, select the month and day.
 - o In the Time text box, type the time in HH:MM, and then click Finish.
- Note:** The time is the local timezone where your client is physically located.

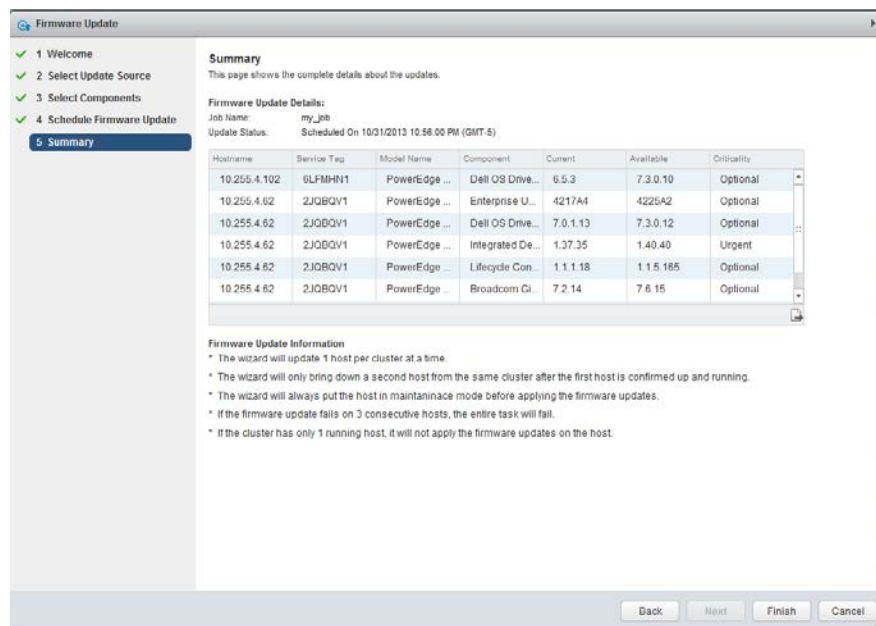
Note: For **vSphere Desktop Client**, this is the last screen in the wizard. Review the options before clicking Finish.

Figure 7 Schedule Update



9. For **vSphere Web Client**, click **Next** to see summary of user selected components as well as information about the job details such as job name, description and schedule option. Review this information before clicking "Finish".

Figure 8 Summary Page – Web Client Only



10. Clicking **Finish** creates and schedules the firmware update job. A popup appears to confirm creation of the job. The Firmware Update task normally takes 30 to 60 minutes for each host to update the firmware.

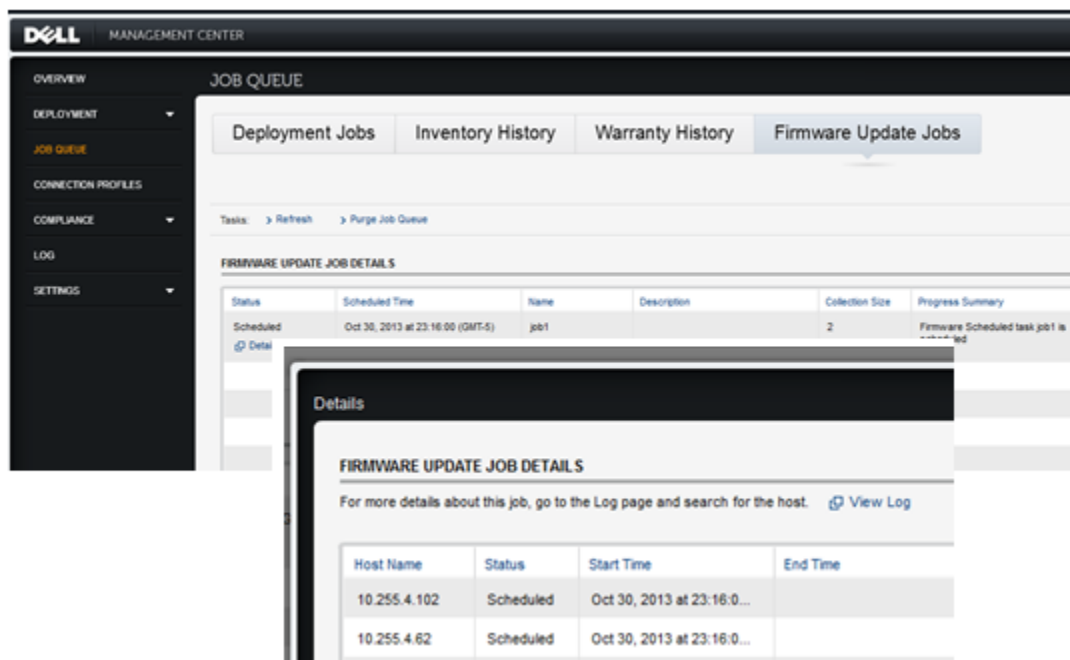
3 Job Status for Firmware Update Jobs

3.1 Viewing Job Status and Details for Firmware Update Jobs

The Firmware Update Job section of Job Queue shows a list of firmware Update jobs and their status.

1. **For vSphere Desktop Client**, click the Job Queue tab in the Dell Management Center. Click on the “Firmware Update Jobs” tab. More details for the firmware update job are seen by clicking the *Details* link for the job in the Status column. This link opens a details window.

Figure 9 Firmware Update Jobs – Desktop Client



The details page shows a link to the log page where the status of the updates can be tracked.

2. **For vSphere Web Client**, click “OpenManage Integration” under Home > Administration. Select Monitor tab and Job Queue sub-tab to see different job types. Select “Firmware Updates” to see the firmware update job status information for all vCenters.
3. Select a given job in the upper list. Details about the hosts for this job is shown in the lower list.

Figure 10 Firmware Update Jobs – Web Client

Status	Scheduled Time	Name	Description	vCenter	Collection Size	Progress Summary
Scheduled	10/30/2013 11:16:00 PM (...)	job1		VC04Win2K8.spectredev.loc...	2	Firmware Scheduled task jo...

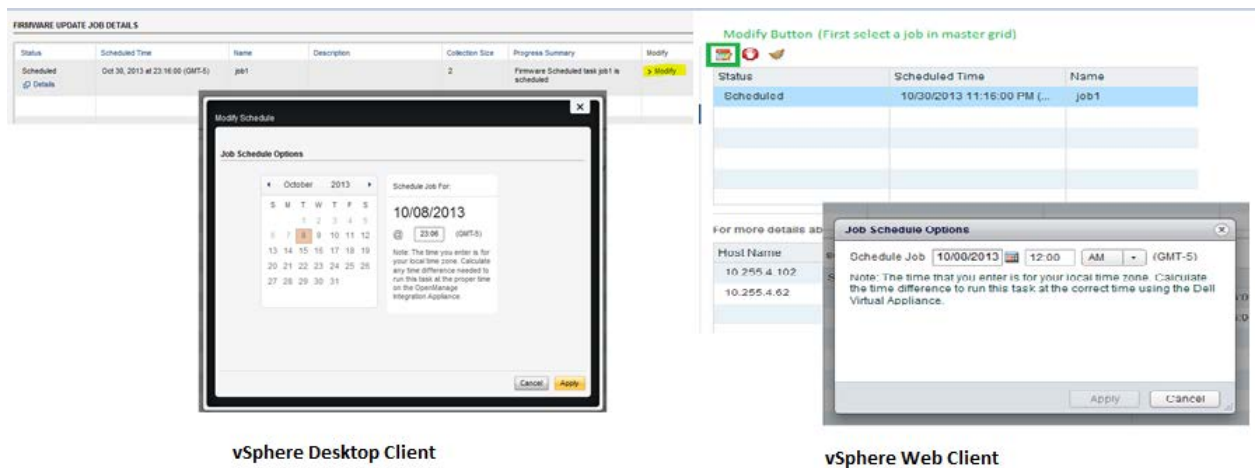
Host Name	Status	Start Time	End Time
10.255.4.102	Scheduled	10/30/2013 11:16:00 PM (GMT-5)	
10.255.4.62	Scheduled	10/30/2013 11:16:00 PM (GMT-5)	

3.2 Actions on Firmware Update Jobs

3.2.1 Modify Jobs

A scheduled job can be modified to run on a different date by clicking **Modify** button.

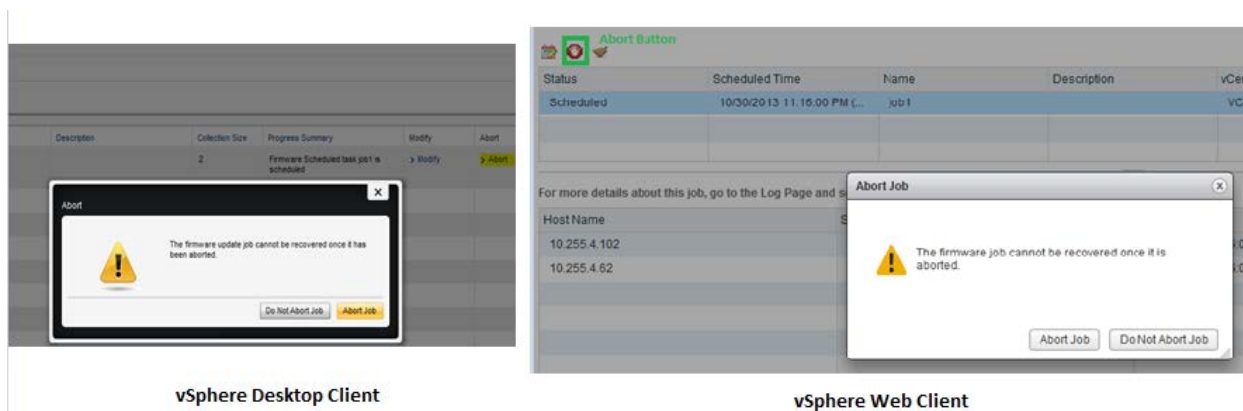
Figure 11 Modify Job



3.2.2 Abort Jobs

A scheduled or a running job can be aborted by clicking **Abort** button. If a firmware update is in-progress on a given host, the update on only that host is allowed to finish.

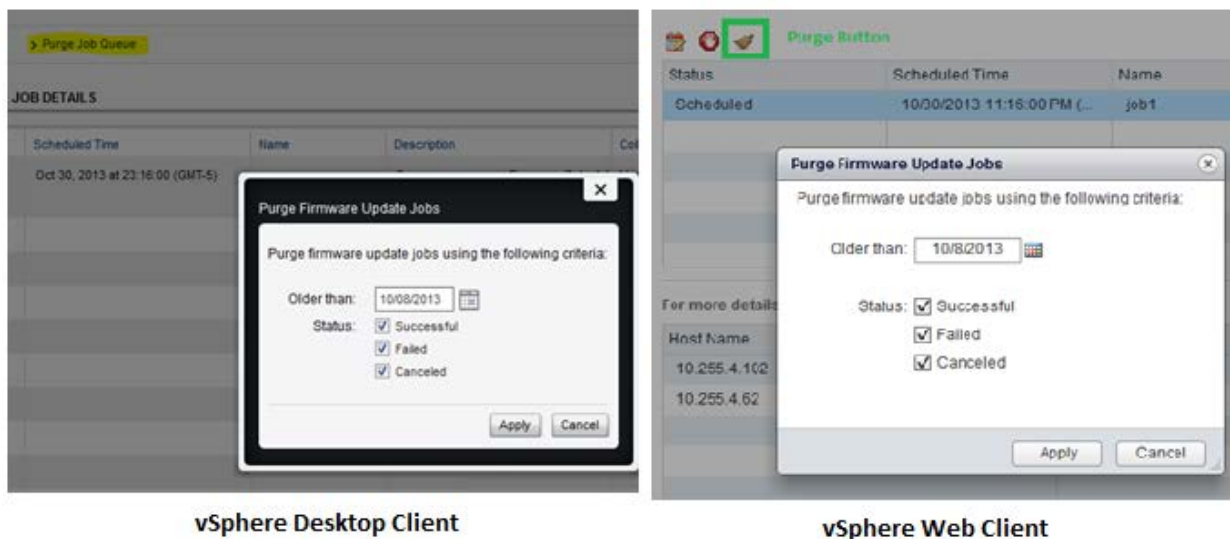
Figure 12 Abort Job



3.2.3 Purge Jobs

A completed job (success, failed) can be purged from the history by clicking the **Purge** button.

Figure 13 Purge Job

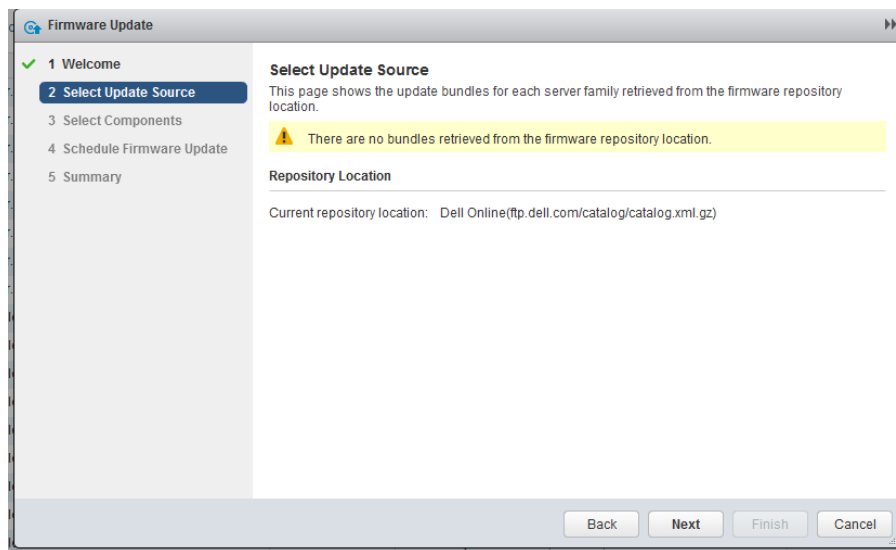


4 Troubleshooting

4.1 Firmware Repository Problems

Problem Scenario 1: In the vSphere Web Client, even though the repository catalog has bundles for the models for the servers in a cluster, the firmware wizard shows no bundles with message “There are no bundles retrieved from the firmware repository location”.

Figure 14 No bundles problem



Resolution:

If the servers in the cluster are 11G servers and are not compliant (e.g. OMSA not configured), then the bundles are not shown unless the servers are fixed using the compliance wizard. To fix such servers, open the vSphere Desktop Client, click Dell Management Center, and click vSphere Hosts under Compliance, and run the compliance wizard on this page.

Problem Scenario 2: While running the Firmware Update wizard for clusters, an error message “The firmware repository file does not exist or is invalid.” is displayed. This may be due to a daily background process that was unable to download and cache the catalog file from the repository, where the catalog file was not reachable at the time the background process runs. Another reason may be the proxy settings cannot reach out to Dell Online and the repository is set to Dell Online.

Resolution: After resolving any catalog connectivity issues that may exist, a user can re-initiate the background process by changing the firmware repository location and then setting it back to the original location. Allow about 10 minutes for the background process to complete.

4.2 Known Firmware Compatibility Issues

Issue 1: Using the OpenManage Integration to upgrade a Broadcom NetXtreme II 10Gigabit Ethernet adapter (BCM57712) from firmware version of 6.2.x or less, or downgrade to a firmware version of 6.2.x or less is not supported.

Resolution/Workaround: There is a known issue with the Broadcom NetXtreme II 10Gigabit Ethernet adapter (BCM57712) where updating the adapter from firmware version of 6.2.x or less, or downgrade to a firmware version of 6.2.x or less fails when the update is applied using the Lifecycle Controller. When attempting to perform this update using the OpenManage Integration, the update may incorrectly show that it completed successfully; however, the firmware update will have failed and remain at the previous level. One way to successfully update the adapter software for the Broadcom NetXtreme II 10Gigabit Ethernet adapter (BCM57712) is for customers to update the adapter firmware from an operating system.

Note: When using the firmware update, avoid selecting to update the Broadcom NetXtreme II 10Gigabit Ethernet adapter (BCM57712) with a version of 6.2.x or less.

Issue 2: Using OpenManage Integration to update an Intel Network card with the firmware version of 13.5.2 is not supported.

Resolution/Workaround: There is a known issue with Dell PowerEdge 12th generation servers and some Intel Network cards with a firmware version of 13.5.2. Updating some models of Intel network cards at this version of firmware will fail when the firmware update is applied using the Lifecycle Controller. Customers with this version of firmware must update the network driver software using an operating system. If the Intel Network card has a version of firmware other than 13.5.2, you can update using OpenManage Integration. For more information, see

<http://en.community.dell.com/techcenter/b/techcenter/archive/2013/03/20/intel-network-controller-card-with-v13-5-2-firmware-cannot-be-upgraded-using-lifecycle-controller-to-v13-5-6.aspx>

Note: When using the firmware update, avoid selecting Intel network adapters that are at version 13.5.2, as this will fail and stop the update task from updating remaining servers.

4.3 Tracing/Troubleshooting Firmware Update Jobs

Each completed sub-step in a firmware update job (for example, staging of files for update) is recorded in the logs. To view the firmware update job details in the log for tracing status of a job or troubleshooting a failed firmware update job, do the following:

1. Navigate to the log page.
 - o For **vSphere Desktop Client**, click "LOG" on the Management Center.
 - o For **vSphere Web Client**, click "Log" under Monitor tab of OpenManage Integration.
2. Select "Info" Filter.
3. In the text input box, type in **[Firmware Update]**.



- The log entries with date and time, and description will be filtered to show firmware update job related log information.

Figure 15 Example of Log page with Firmware Update Job Details

Category	Date and Time	Description
Info	Oct 14, 2013 at 20:01:12 (GMT-5)	[Firmware Update] File: Network_Firmware_59M26_VN32_7.6.16.EXE - Status: Completed - Message: DRAC - Job finished successfully
Info	Oct 14, 2013 at 19:51:11 (GMT-5)	[Firmware Update] Successfully staged 2 file(s) for update.
Info	Oct 14, 2013 at 19:40:57 (GMT-5)	[Firmware Update] File: ESM_Firmware_C10G0_VN32_3.50_A00.EXE - Status: Completed - Message: DRAC - Job finished successfully
Info	Oct 14, 2013 at 19:11:41 (GMT-5)	[Firmware Update] File: Lifecycle-Controller_Application_GFFFC_VN32_1.6.0.73_A00.EXE - Status: Completed - Message: iDRAC - Job completed successfully
Info	Oct 14, 2013 at 19:09:43 (GMT-5)	[Firmware Update] Successfully staged 2 file(s) for update.
Info	Oct 14, 2013 at 19:06:49 (GMT-5)	[Firmware Update] File: Network_Firmware_59M26_VN32_7.6.16.EXE - Status: Completed - Message: DRAC - The specified job has completed successfully.
Info	Oct 14, 2013 at 18:59:01 (GMT-5)	[Firmware Update] File: ESM_Firmware_V7Y7W_VN32_1.50.50_A00.EXE - Status: Completed - Message: iDRAC - Job completed successfully.
Info	Oct 14, 2013 at 18:52:17 (GMT-5)	[Firmware Update] Successfully staged 3 file(s) for update.
Info	Oct 14, 2013 at 18:34:09 (GMT-5)	[Firmware Update] File: ESM_Firmware_KD43R_VN32_1.82_A00.EXE - Status: Completed - Message: DRAC - Job finished successfully
Info	Oct 14, 2013 at 17:46:47 (GMT-5)	[Firmware Update] Successfully staged 1 file(s) for update.
Info	Oct 14, 2013 at 16:18:18 (GMT-5)	[Firmware Update] File: SAS-RAID_Firmware_C1VYX_VN32_21.2.0.0007_A04.EXE - Status: Completed - Message: iDRAC - The specified job has completed successfully.
Info	Oct 14, 2013 at 16:18:17 (GMT-5)	[Firmware Update] File: BIOS_1V3M9_VN32_1.6.7.EXE - Status: Completed - Message: iDRAC - The specified job has completed successfully.
Info	Oct 14, 2013 at 16:06:48 (GMT-5)	[Firmware Update] File: ESM_Firmware_67G7D_VN32_1.48.45_A00.EXE - Status: Completed - Message: iDRAC - Job completed successfully
Info	Oct 14, 2013 at 15:59:12 (GMT-5)	[Firmware Update] File: Lifecycle-Controller_Application_R0KQD_VN32_1.1.5.185_A00.EXE - Status: Completed - Message: DRAC - Job completed successfully.
Info	Oct 14, 2013 at 15:57:15 (GMT-5)	[Firmware Update] Successfully staged 4 file(s) for update.
Info	Oct 14, 2013 at 15:49:31 (GMT-5)	[Firmware Update] Successfully staged 2 file(s) for update.

5 Conclusion

The OpenManage Integration contains many features to reduce complexity and help you manage and deploy Dell servers for use with VMware. Using the Firmware Update Wizard, one can easily update firmware on clusters. Experience how the OpenManage Integration can speed deployment in a data center by downloading an evaluation version. Browse to:

<http://dell.com/vcenterplugin>

