



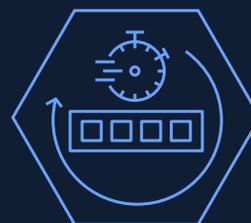
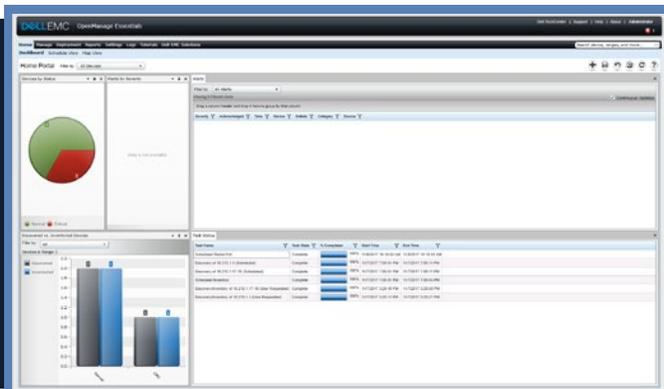
Save hands-on IT administrator time using the Dell EMC OpenManage Essentials profile mobility feature

Migrate stateless 14th generation Dell EMC PowerEdge servers more quickly

Datacenter administrators must prepare for the worst to ensure business continues to run smoothly. Because even the most reliable servers can experience outages due to failure or extended maintenance, Dell EMC™ OpenManage™ Essentials (OME) gives IT admins the ability to rapidly migrate 14th generation Dell EMC PowerEdge™ servers powered by Intel® Xeon® Scalable processors, minimizing downtime and requiring less hands-on IT administrator time.

In our datacenter, we compared the process of migrating a server booting from SAN manually versus using the profile mobility feature of OpenManage Essentials (OME). Because the OME console can capture and store a configuration profile for each 14th generation PowerEdge server, IT admins can quickly replicate an established profile onto a standby server in a matter of a few clicks—and have the replicated server and precise configuration up and running in just 50 seconds. Using a manual process, IT admins would spend nine additional minutes to achieve the same result.

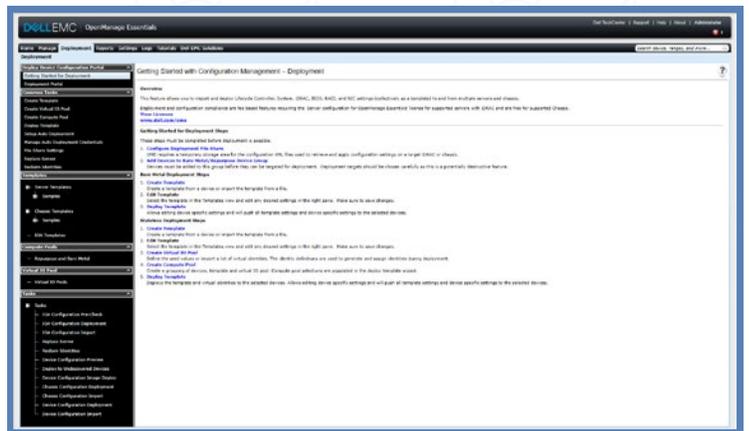
By making it faster to migrate a server, using OME to manage 14th generation PowerEdge servers can help your organization minimize downtime and free up IT administrators to spend more time on strategic initiatives.



Up to
91.6%
less time
to migrate to a
stateless server

Exploring the benefits of OpenManage Essentials for 14th generation PowerEdge servers

Server profiles are specific, set configurations that allow your workloads to run exactly as you require them to. If a server goes down, whether due to failure or because it requires service that will exceed the maintenance window for a given application, server profile mobility can be a valuable tool to reduce the impact of an outage to production workloads.



OpenManage Essentials saves all of your BIOS and hardware settings, including your SAN WWNs, and enables you to easily migrate stateless servers that are booting from SAN. Using the OME console, you can quickly redeploy a replacement server bearing the precise settings required to get the application back up—potentially without stepping foot in the datacenter. Our testing found that administrators would spend more hands-on time getting the right server profile on a replacement server without the benefit of the OME automated process. According to Dell EMC, future releases of OpenManage Enterprise (OMEnt) will provide this same time-saving functionality for Dell EMC 12th-14th generation servers.

About Intel Xeon Scalable processors

Intel Xeon Scalable processors are the latest generation of server processors, which comprise four feature configurations designed for various workloads: Platinum, Gold, Silver, and Bronze.

In our tests with OpenManage Essentials, the Dell EMC PowerEdge M640 server used Intel Xeon Gold 5120 processors. The Intel Xeon Gold 5120 processor contains 14 cores running at 2.20 GHz frequency, with a Max Turbo frequency of 3.20 GHz. To learn more about Intel Xeon Scalable processors, visit www.intel.com/content/www/us/en/processors/xeon/scalable/xeon-scalable-platform.html.



How OpenManage Essentials profile mobility can save time for IT admins

Dell EMC OpenManage Essentials is available for the extended line of 14th generation PowerEdge servers powered by Intel Xeon Scalable processors, which includes both blade and rack servers. To show how OME profile mobility works for 14th generation servers, we set up two PowerEdge M640 servers with Intel Xeon Gold 5120 processors connected to FC storage.

The differences between the two approaches (migrating a server booting from SAN manually versus using the profile mobility features of OpenManage Essentials) were significant. Using OME on our 14th generation PowerEdge server solution saved a significant amount of IT admin hands-on time compared to the manual approach when setting up a replacement server with a specific, existing configuration. Using OME required very little hands-on time from start to finish; our technician completed the migration process in just 50 seconds.

Conversely, the manual approach required nearly 10 minutes to reach the same result. And that time assumes the best-case scenario for recovery using a manual approach, where all configuration information from the failed server is readily available and up to date. It's more likely that without a solution like OpenManage Essentials, an IT administrator would run into problems figuring out exactly what the correct configuration is for the replacement server. In many cases, the IT admin would have to find and search through records, especially if the server was completely unavailable.

Having cold or warm spares plugged in and ready to go could further simplify the process of bringing a new server online. In the event of a server outage, IT admins can also leverage the combined intelligent automation features of OpenManage Essentials and iDRAC to complete server configurations remotely, without ever having to set foot inside the datacenter. The ability to maintain and recover server access from anywhere—at home, in a meeting, out at dinner, etc.—can make a big difference in the life of an IT administrator. A server outage doesn't necessarily require a drive into the office should something go wrong.

Migrating to a stateless server

Dell EMC OpenManage Essentials



50 sec

Manual



9 min 57 sec





Advantages of centralizing IT infrastructure management

OpenManage Essentials provides a single, unified platform from which to manage your servers, no matter the size of the deployment. By centralizing server management and eschewing a piecemeal approach, you have the potential to reap several benefits that ease the management burden.

Centralizing server management can improve connectivity, speed up deployment of new servers, allow for automated maintenance processes that free up IT admin time, ease the update process, and more. Plus, giving IT admins a unified console through which to monitor all systems can improve the ongoing health, maintenance, and productivity of all servers in the stack.

OpenManage Essentials lets you automate a disaster recovery process that any operator can carry out—no standby experienced system administrator required. Automating avoids manual recovery costs, including the need for 24x7 availability and physical access by an experienced administrator. Plus, when operators can leverage standby hardware and start the recovery process from anywhere, overall recovery times can go down even further, because workloads don't have to wait for an experienced administrator to receive a page, drive into the office, and begin work.

Conclusion

Minimizing downtime is crucial to running a successful datacenter. Even when hardware becomes unavailable, it's important that workloads keep going or the organization can incur a significant cost. We found that with its profile mobility feature, Dell EMC OpenManage Essentials (OME) could help minimize downtime and its related costs.

By storing server profiles for easy redeployment, OME profile mobility enables IT admins to get a new 14th generation Dell EMC PowerEdge server powered by Intel Xeon Gold processors back up and running in far less time than with a traditional manual approach, which can help organizations meet workload SLAs. Using OME to leverage server profile mobility could save IT administrator time—something that becomes more significant as the size of a deployment grows.



On December 1, 2017, we finalized the hardware and software configurations we tested. Updates for current and recently released hardware and software appear often, so unavoidably these configurations may not represent the latest versions available when this report appears. For older systems, we chose configurations representative of typical purchases of those systems. We concluded hands-on testing on December 6, 2017.

Appendix A: System configuration information

Server configuration information	Dell EMC PowerEdge M640
BIOS name and version	Dell 1.0.1
Non-default BIOS settings	Intel Turbo Boost enabled, Virtualization enabled
Operating system name and version/build number	Windows Server® 2012 R2 SP1
Date of last OS updates/patches applied	10/01/2017
Power management policy	Balanced
Processor	
Number of processors	2
Vendor and model	Intel Xeon Gold 5120
Core count (per processor)	14
Core frequency (GHz)	2.20
Stepping	1
Memory module(s)	
Total memory in system (GB)	96
Number of memory modules	12
Vendor and model	Hynix® HMA82GR7AFR8N-VK
Size (GB)	16
Type	PC4-24000
Speed (MHz)	2,666
Speed running in the server (MHz)	2,666
Storage controller	
Vendor and model	Dell EMC PERC H330 Mini
Firmware version	25.5.0.0019
Local storage	
Number of drives	2
Drive vendor and model	Seagate® ST600MM0238
Drive size (GB)	600
Drive information (speed, interface, type)	15K, 12Gb SAS, HDDv



Server configuration information		Dell EMC PowerEdge M640
Network adapter		
Vendor and model	Intel 10G 2P X710-k bNDC	
Number and type of ports	2 x 10GbE	
Driver version	18.0.16	

Server configuration information		Dell EMC PowerEdge M1000e
Number of management modules	2	
Management module firmware revision	6.00.200.201708033700	
KVM module firmware	01.00.01.01	
Midplane version	1.0	
First type of I/O module		
Vendor and model number	Dell EMC Networking 8000	
I/O module firmware revision	1.0	
Number of modules	4	
Occupied bay(s)	A1, B1, A2, B2	
Power supplies		
Vendor and model number	Dell EMC 0W1R7VA00	
Number of power supplies	6	
Wattage of each (W)	2,700	
Cooling fans		
Vendor and model number	Dell EMC YK776 Rev. A00	
Number of fans	9	



Appendix B: How we tested

Using the Dell EMC OME Replace Server wizard

Installing Dell EMC OME

For our test, we used a Microsoft Windows Server 2016 VM located on the infrastructure vCenter.

1. Download Dell EMC OpenManage Essentials. Open the installation media.
2. Leave Dell EMC OpenManage Essentials checked, and click Install.
3. At the Critical Prerequisites screen, click Install All Critical Prerequisites. When the warning dialog appears, click Yes to continue installation of the critical prerequisites.
4. At the next prerequisites screen, click Install Essentials. Click Yes to install Essentials on a local database.
5. Again, click Install Essentials.
6. Accept the license agreement for Dell EMC OpenManage Essentials, and click Next.
7. Leave the Typical setup type selected, and click Next.
8. Review the installation settings, and click Install.
9. When installation completes, leave Launch Dell EMC OpenManage Essentials checked, and click Finish.
10. When Dell EMC OpenManage Essentials launches, click the Deployment tab to configure the deployment file share.
11. Click File Share Settings.
12. Enter the Domain \ Username (for our test, we used localhost\Administrator). Enter the Password, and click Apply. Click OK when the settings are applied successfully.

Discovering and inventorying servers

1. From Dell EMC OpenManage Essentials, click the Manage tab.
2. Click the Discovery and Inventory subtab.
3. Click Add Discovery Range.
4. At the Discovery Range Configuration wizard, enter the IP address range for the Dell servers.
5. Click Add, and click Next.
6. Check iDRAC (server out of band), and click Next.
7. Leave the default ICMP timeout and retry parameters, and click Next.
8. Enter the iDRAC user ID and password, and click Next.
9. Review the summary, and click Finish.
10. Click OK. The Discovery and Inventory job will execute.
11. When discovery completes, click the Deployment tab.
12. From the Repurpose and Bare Metal Devices pane, click Modify Devices.
13. Expand the All Applicable Devices tree, and check the inventoried systems. Click OK to add the systems to the Repurpose and Bare Metal device group.

Creating a stateless server profile

Creating a template from reference server

1. From Dell EMC OpenManage Essentials Deployment page, under Common Tasks, click Create Template.
2. Give the Template a name, and expand the All Applicable Devices tree. Select the reference server, enter the execution credentials, and click Finish. Click OK. The template creation process will automatically execute.

Creating a virtual I/O pool

1. From the Deployment page, click Create Virtual IO Pool.
2. When the Create Virtual IO Pool wizard opens, enter a name for the pool, and click Next.
3. Uncheck Include MAC addresses in the pool, and click Next.
4. Specify the starting address for the Fibre Channel WWNN identities in the pool, and enter a Number of Identities that satisfies your environment. Click Next.
5. Specify the starting address for the Fibre Channel WWPN identities in the pool, and enter a Number of Identities that satisfies your environment. Click Next.
6. Uncheck Include IQN Identities in the Pool, and click Next.
7. Review the Summary page, and click Finish. The creation of the virtual I/O pool will execute automatically.



Creating a compute pool

1. From the Deployment page, click Create Compute Pool.
2. When the Create Compute Pool wizard opens, enter a name for the pool, and click Next.
3. Check Select template for the compute pool, and select the template created from the reference server. Click Next.
4. Leave the defaults for Select ISO Location, and click Next.
5. Change User defined IO assignment to Automatic IO assignment. Select the Virtual IO Pool from the dropdown dialog, and click next.
6. From the Select Devices page, expand the All Applicable Devices tree, and check the reference and replacement servers. Click Next.
7. From the Edit Attributes page, click the Identity Attributes subtab. Ensure that virtual IO identities will be generated for the Fibre Channel adapters, and click Next.
8. Review the Summary, and click Finish. The Create Compute Pool job will execute automatically.

Deploying the template

1. From the Deployment page, click Deploy Template.
2. When the Deploy Template Wizard opens, enter a name for the task, and click the drop-down arrow to change Compute Pool to the compute pool created above. Click Next.
3. From the Select Template page, select the template created from the reference server, and click Next.
4. From the Select Virtual IO Pool page, select Automatic IO assignment, and select the virtual IO pool created above. Click Next.
5. From the Select Devices page, check the reference server from the compute pool. Click Next.
6. From the Edit Attributes page, click the Identity Attributes subtab, and ensure that device identities will be generated for the Fibre Channel adapters.
7. Click Assign Identities. Click OK to confirm successful identity assignment, and click Next.
8. From the Set Schedule page, change the run time to Run Now, and enter the Execution Credentials. Click Next.
9. Click Next to skip the Preview page.
10. Review the Summary, and click Finish. Click Yes to confirm the template deployment. The Template Deployment job will automatically execute.

Test: Replacing a stateless server with OME (Time: 50 seconds)

1. From Dell EMC OpenManage Essentials, click the Deployment tab.
2. Under Compute Pools, right-click the created compute pool, and click Replace Server.
3. Enter a Name for the task, and click Next.
4. From the Source and Target page, select the reference server from the source column, and select the replacement server from the target column. Click Next.
5. Review the source attributes, and click Next.
6. From the Options page, check Remove source from compute pool, and Deploy to target even if virtual identities cannot be reclaimed from the source. Click Next.
7. From the Credentials page, enter the execution credentials for the source and target servers, and click Next.
8. Review the Summary, and click Finish. Click OK to confirm replacement. The replace server task will execute automatically.

Using a traditional method: CMC Server Profiles

Enabling CMC Network Share

1. Use a web browser to navigate to the IP address of the Chassis Management Controller, and log in with administrator credentials.
2. Click Server Overview.
3. Click the Setup tab, and click the Network Share subtab.
4. Enter the IP address and credentials of the file share, as well as a directory for Server Profile and Boot Identity folders. Click Apply. Click OK to confirm successful operation.

Creating a Server Profile

1. From the Chassis Management Controller Server Overview Setup page, click the Profiles subtab.
2. From the Server Profiles pane, check the target server, and click Save.
3. From the Stored Profiles dialog, enter a Profile Name, and click Save. Click OK to confirm successful operation.

Creating a Virtual MAC Address Pool

1. From the Profiles page, click the Boot Identities tab.
2. Scroll to the Manage Virtual MAC Address Pool section, and click Add MAC Addresses.
3. Enter a number of MAC Addresses that satisfies your environment, and click Apply. Click OK to confirm successful operation, and the page will reload.



Creating and applying a Boot Identity Profile

1. From the Boot Identity Profiles page, select the target server, and click Save Identity.
2. From the Stored Profiles dialog, enter a Base Profile Name, and select a Virtual MAC Address from the drop-down menu.
3. Click Save. Click OK to confirm the Lifecycle Controller operation, and click OK again to confirm successful operation.
4. When the Boot Identity Profiles page reloads, select the target server again, and select the created Boot Identity Profile from the drop-down menu.
5. Click Apply Identity. Click OK to confirm the Lifecycle Controller operation, and click OK again to confirm successful operation.

Test: Replacing a stateless server using CMC (Time: 9 minutes 57 seconds)

1. From the Chassis Management Controller, click Server Overview.
2. Click the Setup tab, and click the Profiles subtab.
3. The Server Profiles page will initialize. After the page finishes loading, select the replacement server, and select the Server Profile from the drop-down menu.
4. Click Apply Profile. Click OK, and click OK again to confirm successful operation.
5. After the Server Profile page finishes loading, click the Boot Identity Profiles tab.
6. Select the target server, and click Clear Identity. Click OK, and click OK again to confirm successful operation.
7. The server will remain in a Clearing Identity state for some time. Refresh the page until the operation is complete. After Clearing Identity finishes, select the replacement server, and choose the Server Profile from the drop-down menu.
8. Click Apply Identity. Click OK to confirm the Lifecycle Controller operation, and click OK again to confirm successful operation.

This project was commissioned by Dell EMC.



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