Chassis Cloning, Backup and Restore with Configuration Profiles.

Dell technical white paper
Dell Engineering
August 2015

Authors:
Sumesh Surendran
Elangovan G
Kapil Agrawal
## Table of contents

Executive summary .................................................................................................................................................. 4  

1 Introduction......................................................................................................................................................... 5  

2 Export Modes....................................................................................................................................................... 6  
   2.1 Clone.............................................................................................................................................................. 6  
      2.1.1 RACADM Command for export as clone.............................................................................................. 6  
      2.1.2 WSMAN Command for export as clone ................................................................................................. 7  
      2.1.3 GUI for export as clone........................................................................................................................... 7  
   2.2 Replace .......................................................................................................................................................... 10  
      2.2.1 RACADM Command for export as replace .......................................................................................... 10  
      2.2.2 WSMAN Command for export as replace ............................................................................................ 11  
      2.2.3 GUI for export as Replace ...................................................................................................................... 13  

3 Import Mode.......................................................................................................................................................... 15  
   3.1 RACADM Commands for import.................................................................................................................. 15  
   3.2 WSMAN Commands for import ................................................................................................................... 16  
   3.3 Restore Configuration from GUI .................................................................................................................. 17  

Use this section to restore the configuration settings of a chassis by importing the backup file (.XML or .bak) on the local management station or the network share to which the chassis settings have been saved previously. The settings include all the properties available through the web-based interface and RACADM commands and security certificates, and settings ........................................................................................................................................ 17  

4 Sample Chassis Configuration XML........................................................................................................................................ 19
Executive summary

In today’s environment distributed data centers are common solutions and deploying and managing a large number of chassis is a challenge. Administrators appreciate features that help minimize manual errors and streamline the deployment process. The new version of the M1000e, VRTX and FX2 CMCs introduces a feature - Chassis Configuration from a XML profile, which can save the chassis configuration in an XML file. This file can be used to clone the configuration to another chassis or can be used to restore a configuration. The advantages of using an XML is, it can significantly reduce the time, effort and manual errors to replicate the configuration of a chassis for the purposes of cloning and backup and can replace the many racadm commands that are used today to achieve this functionality.
1 Introduction

The CMC versions 5.1, 2.1 and 1.3 has introduced a new feature to capture the chassis configuration in an XML file. There are several advantages of this feature.

1. The saved XML file can be applied to a different chassis for cloning the properties.
2. The file can be used on the same chassis to restore to a certain configuration

This file can be saved in NFS, CIFS or a local management station. Caution needs to be exercised for certain properties like IP addresses, I/O Identity and others that could result in serious issues if misconfigured.

This feature is supported only with Enterprise license in VRTX, FX and FX2 platforms and for the M1000e chassis there is no need for a license.
2 Export Modes

The term export here means the process of saving the configuration of CMC as profile in XML format to Network Share (NFS or CIFS) or Local Management Station. This feature allows two methods of exporting the chassis configuration.

1. Clone
2. Replace

2.1 Clone

This option is to clone a configuration of one chassis to another chassis within the same platform. Ex: The M1000e chassis configuration file cannot be applied to a VRTX or an FX2 chassis. All the properties related to user, time, MCM, IP address are commented out in the XML file. The cloning operation can be done via the RACADM or WSMAN or CMC GUI.

2.1.1 RACADM Command for export as clone

**RACADM Command for export as clone to NFS:**

```
racadm get -f FILENAME.xml -t xml -l xx.xx.xx.xx:/PATH --clone
```

**From remote racadm,**

```
racadm -r xx.xx.xx.xx -u USERNAMECMC -p PASSWORDCMC get -f FILENAME.xml -t xml -l xx.xx.xx.xx:/PATH --clone
```

**RACADM Command for export as clone to CIFS:**

```
racadm get -f FILENAME.xml -t xml -u USERNAMENFCIFS -p PASSWORDCIFS -l //xx.xx.xx.xx/PATH --clone
```

**From remote racadm,**

```
```

**We can do even an export to Local Management Station using Remote Racadm as below**

```
racadm -r xx.xx.xx.xx -u USERNAMECMC -p PASSWORDCMC get -f FILENAME.xml -t xml
```

**The status of the above get commands are viewable using the below command.**

```
racadm jobqueue view -i <JOBID>
```
where JOBID is the output of the successful execution of above get command.

### 2.1.2 WSMAN Command for export as clone

**WSMAN Command for export as clone to NFS:**

```
winrm invoke ExportSystemConfiguration http://schemas.dell.com/wbem/wscim/1/cim-schema/2/DCIM_MgmtControllerService?__cimnamespace=root\dell\cmc+SystemCreationClassName=Dell_ChassisMgr+SystemName=systemmc+CreationClassName=DCIM_MgmtControllerService+Name=mgmtcontrollerservice1 -r:https://xxx.xxx.xxx.xxx:443 -u:CMCUSER -p:CMCPSWD -a:basic -skipCNcheck -skipcachecheck -skiprevocationcheck -encoding:utf-8 @{IPAddress="NFSIP";ShareName="NFSSHARE";ExportUse="1";IncludeInExport="0";ShareType="0";FileName="FILENAME.xml"}
```

**WSMAN Command for export as clone to CIFS:**

```
winrm invoke ExportSystemConfiguration http://schemas.dell.com/wbem/wscim/1/cim-schema/2/DCIM_MgmtControllerService?__cimnamespace=root\dell\cmc+SystemCreationClassName=Dell_ChassisMgr+SystemName=systemmc+CreationClassName=DCIM_MgmtControllerService+Name=mgmtcontrollerservice1 -r:https://xxx.xxx.xxx.xxx:443 -u:CMCUSER -p:CMCPSWD -a:basic -skipCNcheck -skipcachecheck -skiprevocationcheck -encoding:utf-8 @{IPAddress="CIFSIP";ShareName="CIFSSHARE";ExportUse="1";IncludeInExport="0";ShareType="2";Username="CIFSUSER";Password="CIFSPSWD";FileName="FILENAME.xml"}
```

### 2.1.3 GUI for export as clone

**GUI for export as clone to NFS:**

Configure the NFS Network share details from “Chassis Overview → Server Overview → Setup → Network Share” and provide the NFS share details (ie. Protocol as NFS, IP address, Share Name and Chassis Profile Folder) for saving the Chassis profile in Network share(NFS). Refer the below screen shot for configure the NFS share.

For more information, see the Dell PowerEdge M1000e Chassis Management Controller Firmware Version 5.1 User’s Guide under “Configuring Network Share Using CMC Web Interface” section.
Create Chassis profile from “Chassis Overview → Setup → Profiles” and Provide the Profile Name, Profile Type as “NFS” Profile location “Network Share” and click Save and Backup.
GUI for export as clone to CIFS:

Configure the CIFS Network share details from "Chassis Overview → Server Overview → Setup → Network Share" and provide the CIFS share details (i.e. Protocol as CIFS, IP address, Share Name, Chassis Profile Folder, User name and password).

Create Chassis profile from "Chassis Overview → Setup → Profiles" and Provide the Profile Name, Profile Type as "CIFS” Profile location “Network Share” and click Save and Backup.
2.2 Replace

This option can be used if the user intends to restore CMC’s settings to a baseline. The chassis slot
servernames, users, iDRAC root password, starting IDRAC IPv4 address, IPv4 gateway, IPv4 netmask, IPv6
gateway, IPv6 prefixlength, CMC DNS configuration, CMC static IPv4 configuration, CMC static IPv6
configuration, iDRACs VLAN configuration, IOM VLAN configuration, security configuration, thermal, blade
cloning deploy information, MCM configuration will be uncommented in xml for this mode of export.

2.2.1 RACADM Command for export as replace

RACADM Command for export as replace to NFS:

```
racadm get -f FILENAME.xml -l xx.xx.xx.xx://PATH -t xml --replace
```

From remote racadm,

```
```

RACADM Command for export as replace to NFS with Include password hash attributes in the
configuration XML file.

```
racadm get -f FILENAME.xml -l xx.xx.xx.xx://PATH -t xml --replace --includeph
```
From remote racadm,

```
```

**RACADM Command for export as replace to CIFS:**

```
racadm get -f FILENAME.xml -u USERNAMENCIFS -p PASSWORDCIFS -l //xx.xx.xx.xx/PATH -t xml --replace
```

From remote racadm,

```
racadm -r xx.xx.xx.xx -u USERNAMECMC -p PASSWORDCMC get -f FILENAME.xml -l //xx.xx.xx.xx/PATH -t xml --replace --includeph
```

**RACADM Command for export as replace to CIFS with Include password hash attributes in the configuration XML file.**

```
racadm get -f FILENAME.xml -u USERNAMENCIFS -p PASSWORDCIFS -l //xx.xx.xx.xx/PATH -t xml --replace --includeph
```

We can do even an export to Local Management Station using Remote Racadm as below

```
racadm -r xx.xx.xx.xx -u USERNAMECMC -p PASSWORDCMC get -f FILENAME.xml -- replace -t xml
```

The status of the above get commands are viewable using the below command.

```
racadm jobqueue view -i <JOBID>
```

where JOBID is the output of the successful execution of above get command.

### 2.2.2 WSMAN Command for export as replace

**WSMAN Command for export as replace to NFS:**

```
winrm invoke ExportSystemConfiguration http://schemas.dell.com/wbem/wscim/1/cim-schema/2/DCIM_MgmtControllerService?__cimnamespace=root/dell/cmc+SystemCreationClassName=Dell_ChassisMgmt+SystemName=systemmc+CreationClassName=DCIM_MgmtControllerService+Name=mgmtcontrollerservice1 -r:https://xxx.xxx.xxx.xxx:443 -u:CMCUSER -p:CMCPWD -a:basic -skipCNcheck -skipcacheck -skiprevocationcheck -encoding:uft-8 @{IPAddress="NFSIP";ShareName="NFSSHARE";ExportUse="2";IncludeInExport="0";ShareType="0";FileName="FILENAME.xml"}
```
Sample successfull OutPut

ExportSystemConfiguration_OUTPUT
Job
EndpointReference
    Address = http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
    ReferenceParameters
    SelectorSet
    Selector: InstanceID = JID_xxxxxxxxxxxxx, __cimnamespace = root/dellcmc
    ReturnValue = 4096

WSMAN Command for export as replace to CIFS:

@{IPAddress="CIFSIP";ShareName="CIFSSHARE";ExportUse="2";IncludeInExport="0";ShareType="2";Username="CIFSUSER";Password="CIFSPWD";FileName="FILENAME.xml"}

Sample successfull OutPut

ExportSystemConfiguration_OUTPUT
Job
EndpointReference
    Address = http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
    ReferenceParameters
    SelectorSet
    Selector: InstanceID = JID_xxxxxxxxxxxxx, __cimnamespace = root/dellcmc
    ReturnValue = 4096

Wsmaw command for viewing the job status


Sample successfull OutPut

DCIM_LifeCycleJob
    ElapsedTimeSinceCompletion = null
    InstanceID = JID_xxxxxxxxxxxxx
    JobStartime = NA
    JobStatus = Completed
    JobUntilTime = NA
    Message = Successfully exported system configuration XML file.
    MessageArguments = NA
    MessageID = SYS053
    Name = Import Configuration
    PercentComplete = 100
2.2.3 GUI for export as Replace

GUI for Export as replace to Local:

To export and backup the Chassis profile with Type as “Replace” follow the below explained steps

1. Go to Chassis Overview → Setup → Profile.
2. Provide the Profile Name, Profile Type as “Replace”, Profile Location as “Local”.
3. Click the “Save and Backup” button.
4. Browse through the local system path for e.g “C:\Chassis\Profile” to save the xml file.

Refer the below screen shot for Save and Backup profile.xml
GUI for Export as replace to Network Share:

To export and backup the Chassis profile with Type as “Replace” follow the below explained steps

1. Go to Chassis Overview \(\rightarrow\) Setup \(\rightarrow\) Profile.
2. Provide the Profile Name, Profile Type as “Replace”, Profile Location as “Network Share”.
3. Click the “Save and Backup” button.
4. Profile will be saved in Network Share, which is highlighted below

Refer the below screen shot for Save and Backup profile.xml
3 Import Mode

Import is defined as the process by which the exported profile is applied back to the CMC. While Importing the following integrity of the XML is checked before applying.

1. Whether the profile is of proper schema.
2. The profile is of the proper platform.
3. If it is replace, the profile is unique for this chassis.

3.1 RACADM Commands for import

**RACADM Command for import from NFS**

```
racadm set -f FILENAME.xml -t xml -l xx.xx.xx.xx:/PATH
```

**From remote racadm,**

```
racadm -r xx.xx.xx.xx -u USERNAMECMC -p PASSWORDCMC set -f FILENAME.xml -t xml -l xx.xx.xx.xx:/PATH
```

**RACADM Command for import from CIFS:**

```
racadm set -f FILENAME.xml -t xml -u USERNAMECIFS -p PASSWORDCIFS -l //xx.xx.xx.xx/PATH
```

**From remote racadm,**

```
```

**We can do even an import from Local Management Station using Remote Racadm as below**

```
racadm -r xx.xx.xx.xx -u USERNAMECMC -p PASSWORDCMC set -f FILENAME.xml -t xml --replace
```

**The status of the above set commands are viewable using the below command.**

```
racadm jobqueue view -i <JOBID>
```

where JOBID is the output of the successful execution of above get command.
3.2 WSMAN Commands for import

**WSMAN Command for import from NFS:**

```
winrm invoke ExportSystemConfiguration http://schemas.dell.com/wbem/wscim/1/cim-schema/2/DCIM_MgmtControllerService?__cimnamespace=root/dell/cmc+SystemCreationClassName=Dell_ChassisMgr+SystemName=systemmc+CreationClassName=DCIM_MgmtControllerService+Name=mgmtcontrollerservice1 -r:https://xxx.xxx.xxx.xxx:443 -u:CMCUSER -p:CMCPSWD -a:basic -skipCNcheck -skipcachec -skiprevocationcheck -encoding:utf-8 @{IPAddress="NFSIP";ShareName="NFSSHARE";ShareType="0";FileName="FILENAME.xml"}
```

**WSMAN Command for import from CIFS:**

```
winrm invoke ImportSystemConfiguration http://schemas.dell.com/wbem/wscim/1/cim-schema/2/DCIM_MgmtControllerService?__cimnamespace=root/dell/cmc+SystemCreationClassName=Dell_ChassisMgr+SystemName=systemmc+CreationClassName=DCIM_MgmtControllerService+Name=mgmtcontrollerservice1 -r:https://xxx.xxx.xxx.xxx:443 -u:CMCUSER -p:CMCPSWD -a:basic -skipCNcheck -skipcachec -skiprevocationcheck -encoding:utf-8 @{IPAddress="CIFSIP";ShareName="CIFSSHARE";ShareType="2";Username="CIFSPSWD";Password="CIFSUSER";FileName="FILENAME.xml"}
```

**Wsman command for viewing the job status**

```
```

**Sample successfull OutPut**

```
DCIM_LifeCycleJob
   ElapsedTimeSinceCompletion = null
   InstanceID = JID_xxxxxxxxxxxx
   JobStartTime = NA
   JobStatus = Completed
   JobUntilTime = NA
   Message = Successfully imported and applied system configuration XML file.
   MessageArguments = NA
   MessageID = SYS053
   Name = Import Configuration
   PercentComplete = 100
```

**Wsman command for GetConfigResults**

```
winrm i GetConfigResults http://schemas.dell.com/wbem/wscim/1/cim-schema/2/DCIM_MgmtControllerService?__cimnamespace=root/dell/cmc+SystemCreationClassName=Dell_ChassisMgr+SystemName=systemmc+CreationClassName=DCIM_MgmtControllerService+Name=mgmtcontrollerservice1 -r:https://10.94.226.47:443 -u:root -p:calvin -SkipCNCheck -SkipCAcheck -encoding:utf-8 -a:basic @{JobID="JID_xxxxxxxxxxxx"}
```
3.3 Restore Configuration from GUI

GUI for Restoring configuration from Local:

Use this section to restore the configuration settings of a chassis by importing the backup file (.XML or .bak) on the local management station or the network share to which the chassis settings have been saved previously. The settings include all the properties available through the web-based interface and RACADM commands and security certificates, and settings.

The .bak file is encrypted and keyed to the chassis from which it is generated. Hence, you can use the .bak file only for restoring configuration to that chassis.

**Import From**

Click **Browse** to select the backup file (XML or .bak) to import the saved chassis configuration settings.

**Restore Configuration**

Click to upload an encrypted backup file (.bak) or an XML stored profile file to the CMC after you specify the file location using the **Import From** option. After uploading the file, the .bak file is decrypted for the chassis and applied. The restore operation takes a few minutes. The CMC web interface returns to the login page after a successful restore operation. Refer the below screen shot for restore configuration.
GUI for Apply profile from Network Share:

Select the Chassis profile from “Stored Profile” location and click “Apply profile” to apply the configuration to Chassis. Refer the below screen shot.
4 Sample Chassis Configuration XML

The chassis configuration xml file does have a system configuration node, which is the parent node, with the Model, Service Tag, Time stamp and ExportMode attributes. The model name varies as per the various platforms among Noble, Plasma or Stomp. The service tag is unique for cmc. The timestamp is the time of export. The Export Mode tells the user whether the profile type is clone (1) or replace (2). The first child node is component with FQDD as the attribute. The FQDD value is CMC.Integrated.1. The chassis properties are included as Attribute nodes, which contains name and value.

While exporting the Chassis Profile as Clone type, certain attributes will be commented due to below reasons.

   
   For Instance:-

   <!--This attribute is commented because of security reasons-->
   <!-- <Attribute Name="Users.2#Password">******</Attribute>-->

2. Commented because it is clone operation

   For Instance:-

   <!--This attribute is commented because it is clone operation-->
   <!-- <Attribute Name="Users.1#Name">root</Attribute>-->  

A snippet of XML file is provided below.

```xml
<?xml version="1.0"?>
<SystemConfiguration Model="PowerEdge M1000e" ServiceTag="4HGFF22" TimeStamp="Mon Aug 17 14:34:23 2015" ExportMode="1">
<!--Export type is Clone-->
   <!--Exported configuration may contain commented attributes. Attributes may be commented due to dependency, destructive nature, preserving chassis identity or for security reasons.-->
   <Component FQDD="CMC.Integrated.1">
   <!--This attribute is commented because it is read only-->
   <!-- <Attribute Name="ChassisInfo.1#ProductName">PowerEdge M1000e</Attribute>-->
   <!--This attribute is commented because it is read only-->
   <!-- <Attribute Name="ChassisInfo.1#Manufacturer">DELL</Attribute>-->
   <!--This attribute is commented because it is read only-->
   <!-- <Attribute Name="ChassisInfo.1#ServiceTag">4HGFF22</Attribute>-->
   <!--This attribute is commented because it is read only-->
```
To summarize, the feature Chassis Configuration from an XML profile can be used to clone the configuration to another similar chassis or restore/replace a baseline configuration.