



RAID And Storage Configuration using RACADM Commands in iDRAC7

This Dell white paper describes the tasks to be performed in configuring RAID and storage devices using RACADM commands

Dell Engineering
December 2013

Authors

Manjunath AM

Revisions

Date	Description
August 2013	Initial release

THIS WHITE PAPER IS FOR INFORMATIONAL PURPOSES ONLY, AND MAY CONTAIN TYPOGRAPHICAL ERRORS AND TECHNICAL INACCURACIES. THE CONTENT IS PROVIDED AS IS, WITHOUT EXPRESS OR IMPLIED WARRANTIES OF ANY KIND.

© 2013 Dell Inc. All rights reserved. Reproduction of this material in any manner whatsoever without the express written permission of Dell Inc. is strictly forbidden. For more information, contact Dell.

Dell, the DELL logo, and the DELL badge are trademarks of Dell Inc. Symantec, NetBackup, and Backup Exec are trademarks of Symantec Corporation in the U.S. and other countries. Microsoft, Windows, and Windows Server are registered trademarks of Microsoft Corporation in the United States and/or other countries. Other trademarks and trade names may be used in this document to refer to either the entities claiming the marks and names or their products. Dell disclaims any proprietary interest in the marks and names of others.

Dell™, the Dell logo, Dell Boomi™, Dell Precision™, OptiPlex™, Latitude™, PowerEdge™, PowerVault™, PowerConnect™, OpenManage™, EqualLogic™, Compellent™, KACE™, FlexAddress™, Force10™ and Vostro™ are trademarks of Dell Inc. Other Dell trademarks may be used in this document. Cisco Nexus®, Cisco MDS®, Cisco NX-OS®, and other Cisco Catalyst® are registered trademarks of Cisco System Inc. EMC VNX®, and EMC Unisphere® are registered trademarks of EMC Corporation. Intel®, Pentium®, Xeon®, Core® and Celeron® are registered trademarks of Intel Corporation in the U.S. and other countries. AMD® is a registered trademark and AMD Opteron™, AMD Phenom™ and AMD Sempron™ are trademarks of Advanced Micro Devices, Inc. Microsoft®, Windows®, Windows Server®, Internet Explorer®, MS-DOS®, Windows Vista® and Active Directory® are either trademarks or registered trademarks of Microsoft Corporation in the United States and/or other countries. Red Hat® and Red Hat® Enterprise Linux® are registered trademarks of Red Hat, Inc. in the United States and/or other countries. Novell® and SUSE® are registered trademarks of Novell Inc. in the United States and other countries. Oracle® is a registered trademark of Oracle Corporation and/or its affiliates. Citrix®, Xen®, XenServer® and XenMotion® are either registered trademarks or trademarks of Citrix Systems, Inc. in the United States and/or other countries. VMware®, Virtual SMP®, vMotion®, vCenter® and vSphere® are registered trademarks or trademarks of VMware, Inc. in the United States or other



countries. IBM® is a registered trademark of International Business Machines Corporation. Broadcom® and NetXtreme® are registered trademarks of Broadcom Corporation. Qlogic is a registered trademark of QLogic Corporation. Other trademarks and trade names may be used in this document to refer to either the entities claiming the marks and/or names or their products and are the property of their respective owners. Dell disclaims proprietary interest in the marks and names of others.



Contents

Revisions	2
Executive Summary	5
1 Introduction.....	6
1.1 RAID Monitory Commands	6
1.2 Help Commands	9
1.3 Commands for Configuring Virtual Disk (Vdisk)	10
1.4 RACADM Commands for Configuring RAID	11
1.5 RACADM Commands for Configuring Physical Disk Drives (Pdisk)	12
1.6 Storage Configuration Commands	12
References	14
Summary.....	14



Executive Summary

This white paper describes the tasks and commands used to configure RAID and other storage devices by running RACADM commands at the command line interface (CLI).



1 Introduction

Storage or RAID configuration is made easy on iDRAC7 1.50.50 and later versions by supporting through RACADM commands. With this support, you can easily and quickly configure RAID configurations and also monitor the status of each controller, physical disk drive, and virtual disk properties. The main advantage is that the user can easily write scripts, automate the configurations, and also run the scripts to perform a reliability test.

1.1 RAID Monitory Commands

The monitory commands are used to view the details about controllers, physical disk drives, virtual disks, and their attributes values.

The command syntaxes with examples are explained here:

```
$ racadm raid get pdisks
```

Will only retrieve the controllers keys. That is, FQDDs.

```
$ racadm raid get pdisks
```

```
Disk.Bay.0:Enclosure.Internal.0-1:RAID.Integrated.1-1
```

```
Disk.Bay.2:Enclosure.Internal.0-1:RAID.Integrated.1-1
```

```
Disk.Bay.3:Enclosure.Internal.0-1:RAID.Integrated.1-1
```

```
Disk.Bay.4:Enclosure.Internal.0-1:RAID.Integrated.1-1
```

The option “-o” can be used in the command to obtain optimized version of full physical disks objects along with their keys. For example,

```
$ racadm raid get pdisks -o
```

```
Disk.Bay.0:Enclosure.Internal.0-1:RAID.Integrated.1-1
```

```
    Status                = Ok
```

```
DeviceDescription        = Disk 0 in Backplane 1 of Integrated RAID  
                          Controller 1
```

```
    RollupStatus          = Ok
```

```
    Name                  = Physical Disk 0:1:0
```

```
    State                  = Online
```



OperationState	= Not Applicable
PowerStatus	= Spun-Up
Size	= 136.13 GB
FailurePredicted	= NO
RemainingRatedWriteEndurance	= Not Applicable
SecurityStatus	= Not Capable
BusProtocol	= SAS
MediaType	= HDD
UsedRaidDiskSpace	= 136.13 GB
AvailableRaidDiskSpace	= 0.00 GB
Hotspare	= NO
Manufacturer	= FUJITSU
ProductId	= MBE2147RC
Revision	= D903
SerialNumber	= D304PAC07NPW
PartNumber	= PH0W328K755710CE8C16A00
NegotiatedSpeed	= 6.0 Gb/s
ManufacturedDay	= 3
ManufacturedWeek	= 51
ManufacturedYear	= 2010
SasAddress	= 0x5000000E116BFB472
FormFactor	= 2.5 Inch
RaidNominalMediumRotationRate	= 15000
T10PICapability	= Not Capable
BlockSizeInBytes	= 512
MaxCapableSpeed	= 6 Gb/s



```
$ racadm raid get pdisks -o -p <property names separated by comma>
```

The option “-o” along with “-p” and property names separated by comma lists the values of selected properties. For example,

```
$ racadm raid get pdisks -o -p state,size
```

```
Disk.Bay.0:Enclosure.Internal.0-1:RAID.Integrated.1-1
```

```
State = Online
```

```
Size = 136.13 GB
```

```
Disk.Bay.2:Enclosure.Internal.0-1:RAID.Integrated.1-1
```

```
State = Online
```

```
Size = 136.13 GB
```

```
Disk.Bay.3:Enclosure.Internal.0-1:RAID.Integrated.1-1
```

```
State = Ready
```

```
Size = 67.75 GB
```

```
Disk.Bay.4:Enclosure.Internal.0-1:RAID.Integrated.1-1
```

```
State = Ready
```

```
Size = 67.75 GB
```

```
Disk.Direct.5:RAID.Integrated.1-1
```

```
State = Ready
```

```
Size = 185.75 GB
```

The “-pending” switch can be used to check the pending status of all the configurations. The command is:

```
$ racadm raid get pdisks -pending
```

Similarly, the virtual disks and controllers properties can be viewed by running the -pending command (replace pdisks with vdisks or controllers).



1.2 Help Commands

The following command displays RAID help and command syntax details:

```
$racadm help raid
```

The following command displays help information related to virtual disks.

```
$ racadm raid help vdisks
```

The following command displays help information related to physical disk drives.

```
$ racadm raid help pdisks
```

The following commands can be used to view 'help' information about any listed objects:

- \$racadm raid help <objects>
- batteries
- converttoraid
- converttononraid
- controllers
- clearconfig
- createsecuritykey
- createvd
- deletesecuritykey
- deletevd
- encryptvd
- enclosures
- emms
- fans
- hotspare
- importconfig
- init
- modifysecuritykey
- psus
- pdisks
- resetconfig
- tempprobes
- vdisks



1.3 Commands for Configuring Virtual Disk (Vdisk)

There are set of RACADM commands to create or delete virtual disks, manage virtual disk properties, and performs operations such as background initialization, consistency check, locate, and reconfiguration. The `createvd` command will create virtual disk and the mandatory parameters are controller FQDD, RAID level, and FQDDs of physical disk drives. Span count, span size, VdName, write protection, read policy, vd size, and disc cache policy are optional parameters

The command syntax is:

```
racadm raid createvd:RAID.Integrated.1-1 -rl {r0|r1|r5|r6|r10|r50|r60} [-wp {wt|wb}] [-rp {nra|ra|ara}][-ss {1k|2k|4k|8k|16k|32k|64k|128k|256k|512k|1M|2M|4M|8M|16M}] -pdkey:<comma separated PD FQDD>[-dcp {enabled|disabled|default}] [-name <VD name>] [-size <VD size>{b|k|m|g|t}]
```

Key notes while creating a virtual disk are:

- For hybrid RAID levels such as RAID10 and RAID 50 'span count' is a mandatory parameter.
- Span count (-sc) must not be 0 for any of the RAID levels except RAID10.
- After creating a virtual disk, you must create a job and restart the server operating system (OS) to apply a configurations of a virtual disk.
- To create a virtual disk from a set of physical disk drives, all the physical disk drives must have the same size, speed, and should be in a ready state.
- Before using a virtual disk, initialize the virtual disks by running the command:

```
$ racadm raid init:<VD FQDD>.
```

- A virtual disk can be deleted by running the command:

```
$ racadm raid deletevd:<VD FQDD>
```

- A virtual disk can be encrypted for better security by running the command:

```
$ racadm raid racadm raid encryptvd:<VD FQDD>
```

For example:

```
$ racadm raid createvd:RAID.Integrated.1-1 -rl r0 -pdkey:Disk.Bay.3:Enclosure.Internal.0-1:RAID.Integrated.1-1
```

RAC1040 : Successfully configured the RAID, and the change is in pending state. To apply the updated values, create a configuration job, and then restart the system. To create the commit- and reboot jobs, run the jobqueue command. For more information about the jobqueue command, see the RACADM Help file.



1.4 RACADM Commands for Configuring RAID

You can create, modify, and delete a security key by running the commands. The security key is used by the controller to lock and unlock access to encryption-capable physical disk drives. There is one security key per controller; user can manage the security key under Local Key Management (LKM).

The RACADM command syntaxes are:

```
$ racadm raid createsecuritykey:RAID.Integrated.1-1 -key <Key id> -passwd <passphrase>
```

```
$ racadm raid modifysecuritykey:RAID.Integrated.1-1 -key <Key id> -oldpasswd <old passphrase> -newpasswd <new passphrase>
```

```
$ racadm raid deletesecuritykey:RAID.Integrated.1-1
```

Note: After a security key is created, you can't create another key for that controller without deleting the current key, but `modify security key` can be used to modify it with a new value.

The configurations of a controller can be reset to factory configurations using the `resetconfig` command, the command syntax is:

```
$ racadm raid resetconfig:<CTRL FQDD>
```

The configuration set can be cleared from pending database before it is applied using below command:

```
$ racadm raid clearconfig:<CTRL FQDD>
```

The RAID configuration already configured for a physical disk drive in any of the similar server can be imported to the controller of another server of same type by running the RACADM command:

```
$ racadm raid importconfig:<CTRL FQDD>
```

or

```
$ racadm raid importconfig:<Controller FQDD>
```



1.5 RACADM Commands for Configuring Physical Disk Drives (Pdisk)

There are a set of physical disk drive configuration commands to perform operations such as assign or unassign hot-spares, force online/offline, and rebuild after a physical disk drive failure. The physical disk drives must be set to RAID-capable mode before creating a virtual disk. Converting to RAID-capable and non-RAID-capable can be done using RACADM commands as discussed here.

```
$ racadm raid converttoraid:<PD FQDD>  
$ racadm raid converttononraid:<PD FQDD>
```

A hot-spare, that is, a spare hot-swappable physical disk drive for a particular virtual disk can be configured running the RACADM command:

```
$ racadm raid hotspare:<PD FQDD> -assign yes -type ghs
```

The `-type` switch to indicate the type of hot-spare. That is, `ghs` (global hot-spare) or `dhs` (dedicated hot-spare).

```
$ racadm raid hotspare:<PD FQDD> -assign yes
```

`-type dhs -vdkey:<VD FQDD>` to indicate `dhs()`—dedicated hotspare and the existing command indicates `ghs`(global hot spare)

The hot-spare configuration of a physical disk drive can be deleted by running the RACADM command:

```
$ racadm raid hotspare:<PD FQDD> -assign no
```

1.6 Storage Configuration Commands

Storage config commands are used to monitor or configure storage attributes. It supports the configuration of controller, physical disk drives, and virtual disks configurations using the RACADM `get` and `set` mechanism.

Controller commands

The command examples are:

1. To list all the available controllers:

```
$ racadm get storage.controller.
```

```
RAID.controller.1 [Key=RAID.Integrated.1-1#Controller]
```

2. To list all the supported attributes of controller 1

```
$ racadm get storage.controller.1.
```



```
[Key=RAID.Integrated.1-1#Controller]
BackgroundInitializationRate=40
BatteryLearnMode=Not supported
CheckConsistencyMode=Normal
CheckConsistencyRate=30
CopybackMode=ON
EnhancedAutoImportForeignConfig=Disabled
PatrolReadMode=Disabled
PatrolReadRate=30
PossibleloadBalancedMode=Auto
RebuildRate=10
ReconstructRate=10
SupportControllerBootMode=Not Supported
SupportEnhancedAutoForeignImport=Supported
SupportRAID10UnevenSpans=Not Supported
T10PICapability=Not Capable
```

3. To get individual attribute value of controller 1

```
$ racadm get storage.controller.1.BackgroundInitializationRate.
[Key=RAID.Integrated.1-1#Controller]
BackgroundInitializationRate=40
```

4. To set or modify an individual attribute value of controller 1

```
$ racadm set Storage.Controller.1.CopybackMode On
Successfully modified the value
```



5. To see the help for particular controller object

```
$ racadm help Storage.Controller.CheckConsistencyMode.
```

```
CheckConsistencyMode    -- Check Consistency feature is used to verify the
                        accuracy of the redundant (parity) information.

Usage                    -- Normal;Stop On Error

Required License         -- RACADM

Dependency               -- None
```

6. The command syntaxes will be same for physical disk drive and virtual disk. However, just need to replace controller with physical disk drive or virtual disk in the above commands.

References

- RACADM Installation procedures

<http://en.community.dell.com/techcenter/systems-management/w/wiki/3205.racadm-command-line-interface-for-drac.aspx>

- RACADM Command Line Reference Guide

<http://www.dell.com/support/Manuals/us/en/04/Product/integrated-dell-remote-access-cntrlr-7-v1.50.50>

Summary

RACADM being a CLI—based tool, is very easy for system management team to monitor and configure the servers easily and quickly using quick commands or scripts. Addition of RAID or Storage monitor and configuration in RACADM CLI will be an added advantage for the system administration team to monitor and configure the storage modules.

