

PowerProtect DD Virtual Edition in VMware Cloud

Version DDVE 4.0

Installation and Administration Guide

REV 05

March 2020

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Revision history

Table 1 DDVE 4.0 in VMware Cloud Installation and Administration Guide revision history

Revision	Date	Description
05	March 2020	Editorial updates
04	January 2020	Editorial updates
03	September 2019	Editorial updates
02	March 2019	Editorial updates
01	December 2018	Initial Publication (with DD OS 6.2.0.5)

Preface

As part of an effort to improve its product lines, we periodically release revisions of its software and hardware. Therefore, some functions described in this document might not be supported by all versions of the software or hardware currently in use. The product release notes provide the most up-to-date information on product features.

Purpose

This manual describes how to install, configure, and administer DD Virtual Edition (DDVE) systems.

Audience

This manual is intended for use by both system administrators and general users of DD Virtual Edition.

Related documentation

The following publications and websites provide additional information:

- *DD Operating System Release Notes*
- *DD Operating System Initial Configuration Guide*
This manual explains configuration steps that are common to hardware and virtual DD systems.
- *DD Operating System OS Command Reference Guide*
This manual explains how to administer DD systems from the command line.
- *DD Operating System OS Administration Guide*
This manual explains how to administer DD systems with the System Manager graphical user interface.
- *DD Boost for OpenStorage Administration Guide*
This manual explains how to use the DD Boost protocol for data transfer between backup software and DD systems.
- *Avamar, DD and NetWorker Compatibility Guide*: <http://compatibilityguide.emc.com:8080/CompGuideApp/>
This website lists Avamar and NetWorker software support for DDVE.

Where to get help

We support, product, and licensing information can be obtained as follows:

Product information

For documentation, release notes, software updates, or information about products, go to Online Support at <https://support.emc.com>.

Technical support

For technical support of this release of DDVE, go to Online Support at <https://support.emc.com>.

Your comments

Your suggestions will help us continue to improve the accuracy, organization, and overall quality of the user publications. Send your opinions of this document to DPAD.Doc.Feedback@emc.com.

CHAPTER 1

Introducing DDVE

This chapter includes the following topics:

- [Introducing DDVE](#) 10
- [DDVE features](#) 10
- [DDVE cloud features](#) 10

Introducing DDVE

DD Virtual Edition (DDVE) is a software-only protection storage appliance: a virtual deduplication appliance that provides data protection for entry, enterprise and service provider environments. Like any DD system, DDVE is always paired with backup software.

DDVE runs the DD Operating System (DD OS), and includes the DD System Manager graphical user interface (GUI) and the DD OS command line interface (CLI) for performing system operations.

DDVE includes the following features:

- High-speed, variable length deduplication for a 10 to 30 times reduction in storage requirements
- Unparalleled data integrity to ensure reliable recovery, and seamless integration with leading backup and archiving applications
- DD Boost to speed backups by 50 percent
- DD Encryption for enhanced security of data
- DD Replicator for network efficient replication that enables faster time-to-DR readiness

DDVE runs on two types of platforms:

- On premises, DDVE supports VMware, Hyper-V, KVM, and VxRail.
- In the cloud, DDVE also runs in the Amazon Web Services (AWS) (cloud and gov cloud), Azure (cloud and gov cloud), VMware Cloud (VMC) on AWS cloud platforms, and Google Cloud Platform (GCP).

For more information about the features and capabilities of DD systems (both physical and virtual), see the *DD Operating System Administration Guide*.

DDVE features

Resource configurations depend on your DDVE configuration. For features for cloud configurations within the admin guide for your specific cloud provider, see [DDVE cloud features](#) on page 10.

The *DD OS Administration Guide*, *DD Boost OST Guide*, and *DD Boost for Partner Integration Administration Guide* provide additional information about the supported protocols and features.

DDVE cloud features

DDVE provides the capabilities of a cloud DD system using the following resource configuration sizes:

Table 2 DDVE on VMC resource configuration size

Type	Resource configuration size
DDVE on S3 storage	up to 96 TB

The following sections list supported DD protocols and features in DDVE.


Supported DD protocols

- DD Boost over IP

- DD Boost FS

Supported DD features

- DD Boost managed file replication (MFR)
- Encryption
- MTree replication
- DD System Manager GUI for DDVE management
- Secure multitenancy (SMT) with Network Isolation Support
- DD Boost/BoostFS for Big Data
- Key Management Interoperability Protocol (KMIP)
- More restricted IPtables settings

 **Note:** DDVE supports these replication capabilities:

- Managed file replication and MTree replication
- Replication across availability zones and regions
- Bidirectional replication between on-premises and VMC

The *DD OS Administration Guide*, *DD Boost OST Guide*, *DD Boost for Partner Integration Administration Guide* provide additional information about supported protocols and features.

CHAPTER 2

Deploying DDVE

This chapter includes the following topics:

- [Introducing VMware Cloud on AWS](#) 14
- [VMC system configuration requirements](#) 14
- [Deploying DDVE in VMware Cloud on AWS](#) 14
- [Configuring DDVE in VMC using DD System Manager](#) 15
- [VMware Cloud on AWS commands](#) 16
- [Running system headswap on DDVE in VMC](#) 17
- [Running system recovery on DDVE in VMC](#) 18

Introducing VMware Cloud on AWS

DDVE in VMware Cloud on AWS (VMC) provides a data protection solution that enables you to protect your operational data in the cloud and to backup and restore data into the cloud object store. This section describes first-time setup procedures, and includes how to manage and monitor DDVE in the VMC environment.

VMC system configuration requirements

Ensure that your system meets the requirements for VMC configuration.

VMC uses standard/vSAN metadata disks.

The instance type in the following table is for logical significance.

Table 3 VMC System Requirements

Instance Type	DDVE Capacity	#vCPU, Memory	System Disk
Standard_VMC_16	16 TB	4, 16 GB	250 GiB Root disk, 10 GiB vNVRAM disk
Standard_VMC_32	32 TB	4, 24 GB	250 GiB Root disk, 10 GiB vNVRAM disk
Standard_VMC_96	96 TB	8, 64 GB	250 GiB Root disk, 10 GiB vNVRAM disk

Deploying DDVE in VMware Cloud on AWS

Before you begin

For deploying DDVE in VMware Cloud on AWS (VMC) on S3 object store:

- Ensure that you have an AWS account linked to your VMware cloud account.
- The SDDC in VMC will be connected to an AWS account during creation. Ensure that the subnet selected in the AWS account is in the same region as the SDDC.
- Ensure that you create the AWS S3 bucket that is used by the DDVE in the same region as the SDDC and within the same AWS account.
- Ensure that the S3 traffic from VMC is routed internally toward the AWS infrastructure. (During the SDDC in VMC setup, you should have already linked your AWS/VPC subnet account to the VMC account.)
- Ensure that you create the S3 endpoint so that the object store traffic is routed within the AWS infrastructure.

The VMC documentation provides additional details.

Procedure

1. To upload the OVF file, from the vSphere Client navigation pane, under **Compute Resource Pool**, right-click the DD resource and select **Deploy OVF Template**.
2. Follow the steps in the **Deploy OVF Template** wizard:
 - a. Select the OVF template.

- b. Select the virtual machine name and folder where you want to deploy the DDVE instance.
 - c. Select the compute resource pool. It may be one of the nodes in the cluster or a pre-configured resource pool. Ensure the compatibility checks succeed.
 - d. Review and verify the template details.
 - e. Select the deployment configuration.
 - f. Select the storage for the metadata disks.
 - g. Select the parameters for the network.
 - h. Review the configuration details and exit the wizard.
3. Monitor the progress of the deployment under **Recent tasks**.
 4. While the DDVE instance is being deployed from the AWS console, create an AWS S3 bucket.

Note:

- To avoid additional costs and potential performance issues, ensure the S3 bucket and DDVE in VMC are available in the same region.
- Do not enable S3 versioning for the bucket that is associated with the DDVE, for the following reasons:
 - S3 versioning requires more storage and incurs increased storage costs. For example, even though DDVE's Garbage Collection process deletes the objects that are not needed, those objects still consume storage.
 - S3 versioning can result in performance issues.

5. From the VMC console, power on the DDVE instance.
6. On the **Settings** page, select **Add New Device** and add the metadata storage.

Configuring DDVE in VMC using DD System Manager

DD System Manager guides you through DDVE configuration in VMC.

About this task

Note:

- Recommended metadata storage is 10% of the total capacity.
- The default password is not set for DDVE in VMC. Log into the new instance for the first time from the vSphere Client by launching the web console.
- DHCP is enabled on the DDVE system by default. If the DHCP service is available, the DDVE system receives IP addresses from the DHCP server.

Procedure

1. Log in to the DD System Manager by entering the IP address of the DDVE into the web browser.
2. For the **Apply your license** step, select one of the three license types available on the drop down menu, and then click **Apply**:
 - Pre-install Evaluation: (500GB)
 - License File: Node locked license (unserved mode)
 - License Server: Served mode license

Note: If you begin the configuration with the evaluation license, but wish to purchase a license later, you will need the Node Locking ID for the DDVE instance. Click **Administration > Licenses** to view the Node Locking ID.

3. Accept the End User License Agreement (EULA).
4. In the Configuration wizard, select **File System** and click **Yes**.
5. To configure the DDVE on S3 storage, select **Configure Active Tier > Enable Object Store**.
6. Enter the passphrase.
Make note of this passphrase, as you will need it later.
7. Enter the S3 bucket name created in the same region as the DDVE instance.
8. Import the Baltimore CyberTrust Root certificate to communicate with AWS S3 Object Store.
9. Add the metadata storage.
10. Review the summary and click **Submit** to create the file system and enable it.
11. Review **File System Creation Complete** page and click **OK**.
12. To view the space usage and availability details for the S3 Object storage and local metadata storage, select **Data Management > File System**.
13. (Optional) Configure the following settings:
 - a. Under **System settings**, update the sysadmin password or configure Alert and Autosupport email settings.
 - b. Under **DD Boost Protocol**, create a DD Boost storage unit and assign an owner.
14. To configure or update the license on the DDVE instance, select **Administration > Licenses > Replace licenses**.
15. To relaunch the configuration wizard, select **Maintenance > System > Configure System**.

VMware Cloud on AWS commands

VMware Cloud on AWS (VMC) enables AWS to run applications in sphere-based cloud environments while making use of AWS services. These CLI commands have been modified for the interaction with VMC. These commands are not supported on physical Data Domain systems.

Table 4 DDVE-only commands

Command	Description
<code>storage object-store enable</code>	Enables the object-store feature for DDVE.
<code>storage object-store profile set</code>	Set the access credentials/profile information. Role required: admin. When this command runs for the first time: <pre>#storage object-store profile set Enter access key: Enter secret key: Enter region: Enter bucket name: Profile is set.</pre>

Table 4 DDVE-only commands (continued)

Command	Description
<code>storage object-store profile show</code>	<p>Show details of the object-storage profile. Role required: admin</p> <pre>#storage object-store profile show Region: <region> End Point: <end-point> Bucket Name: <bucket-name> Provider: AWS (VMware Cloud)</pre>

Running system headswap on DDVE in VMC

The system headswap command recovers DDVE with head unit failure in VMC.

Before you begin


Ensure that the vNVRAM disk and Metadata disks from system A (original system) are available. If either vNVRAM disk or any metadata disk is not available, use the command `system recovery from object-store` instead.

About this task

This procedure copies the vNVRAM disk and Metadata disks from system A (original instance) to system B (new instance).

Procedure

1. Create instance B with Head Unit (root disk only) with the same instance type as system A.
2. Detach the vNVRAM and Meta-data storage from the broken head unit.
3. Attach the vNVRAM and Meta-data storage to instance B Head Unit.

 **Note:** Ensure that the vNVRAM disk is attached before attaching the metadata disks.

4. Set the system B passphrase to match the system A passphrase.

If the passphrases do not match, the headswap fails.

```
# system passphrase set
Enter new passphrase:
Re-enter new passphrase:
Passphrases matched.
The passphrase is set.
```

5. Ensure that system A is powered off.

This step is required to detach the bucket from system A and make it available to be attached with system B.

6. Execute system headswap.

 **Note:** The system will restart during the headswap process.

```
# system headswap
This command returns the system back to its prior operational
```

```

conditions. The system will be rebooted before
resuming normal operations.

**   If system passphrase was set on the old head, you will
      need to do one of the following after headswap completes:
      - unlock the filesystem           if you have encrypted data, or
      - set the system passphrase      if you don't have encrypted data
Are you sure? (yes|no) [no]: yes

ok, proceeding.

Please enter sysadmin password to confirm 'system headswap':
Restoring the system configuration, do not power off / interrupt
process ...
Broadcast message from root (Mon Apr 30 13:44:10 2018):

The system is going down for reboot NOW!

```

7. Ensure that the system is running after the headswap process is complete.

```

# fileys status
The filesystem is enabled and running.

```

Running system recovery on DDVE in VMC

The system recovery command recovers DDVE with a head unit, vNVRAM disk, or Metadata disk failure.

Before you begin

About this task

If both the vNVRAM disk and the Metadata disks are available, use the `system headswap` command instead.

Procedure

1. Create instance B with the same configuration as instance A, including instance type and metadata disk capacity.
2. Enable object-store

```

# storage object-store enable
Object-store is enabled.

```

3. Set object-store profile:
 - a. Set the passphrase to match the system A passphrase, otherwise, the recovery will fail.
 - b. Set the s3 bucket name the same as system A.

```

# storage object-store profile set
A passphrase needs to be set on the system.
Enter new passphrase: <enter-passphrase-string-meeting-requirements>
Re-enter new passphrase: <re-enter-passphrase-string>
Passphrases matched.
The passphrase is set
DDVE is running in AWS. Role-based access will be used to access s3.
Enter the bucket name: <name-of-the-bucket>

```

```

Object-store endpoint needs the Baltimore CyberTrust Root
certificate to be imported.
Do you want to import that certificate with below fingerprint?
D4:DE:20:D0:5E:66:FC:53:FE:1A:50:88:2C:78:DB:28:52:CA:E4:74
(yes|no) [yes]:

Profile is set.

```

```
# storage object-store profile set
```

c. Follow the remaining CLI prompts.

4. Add metadata disks to the active tier to match or exceed the capacity of system A.

```

# storage add dev3
Object-store is not enabled. Filesystem will use block storage for user
data.
Do you want to continue? (yes|no) [no]: yes
Checking storage requirements...done
Adding dev3 to the active tier...done
Updating system information...done
dev3 successfully added to the active tier.

```

5. Run system recovery precheck.

```

# system recovery precheck from object-store
Recovery precheck passed. Use start command to start the recovery.

```

6. Execute the recovery.

```

# system recovery start from object-store
System recovery has started. Use status command to check the status.


```

7. Check the recovery status.

```

# system recovery status
System recovery is running: stage 2 of 6 (attaching object-store)

```

 **Note:** The system reboots during the recovery process.

8. Check the status after the recovery process completes.

```

# fileys status
The filesystem is enabled and running.

```


CHAPTER 3

Administering DDVE

This chapter includes the following topics:

- [Adding virtual storage](#)22
- [Extensions to DDOS for DDVE](#)..... 22
- [DDVE-only commands](#).....23
- [Modified DD OS commands](#).....25
- [Unsupported DD OS commands](#) 27
- [Troubleshooting performance issues](#)..... 32
- [Migrating DDVE](#).....33

Adding virtual storage

Additional virtual storage can be added to the DDVE using the GUI or the CLI.

Note: It is not possible to extend a virtual disk if it has already been used by the file system. Instead, expand the storage by adding a new virtual disk.

Using the GUI

In DD SM, click **Hardware > Storage > Configure Storage** to add the additional devices to the DDVE active tier.

Using the CLI

When you add a new virtual data disk to an existing DDOS file system, use the `filesys expand` command instead of the `filesys create` command.

Configuring spindle groups

DDVE 3.1 and above, support 16 spindle-groups. We recommend that virtual disks from the same storage be configured with same spindle-group number. Virtual disks with different storage should be configured with a different spindle-group number. By default, disks are assigned with different spindle-groups. The best practice is NOT to assign spindle-group manually.

Note: The `storage add` command does not support multiple devices in one command line. As a workaround you can use one of the following:

- `# storage add dev3,dev4,dev5`
- `# storage add dev3-5`

Extensions to DDOS for DDVE

Several DDOS commands are supported on the DDVE platform only. This section describes these commands.

perf

Collect and show DDVE performance statistics.

```
perf disable trace event-regexp [module {default | ddfs}]
```

Disable tracing of specified events.

```
perf enable trace event-regexp [module {default | ddfs}]
```

Enable tracing of the specified events.

```
perf start histogram [module {default | ddfs}]
```

Start collecting performance histograms. This command may reduce performance marginally.

```
perf start stats
```

Start printing statistics. This command may reduce performance marginally.

```
perf start trace [allow-wrap] [module {default | ddfs}]
```

Start tracing events. This command may reduce performance marginally.

```
perf status trace event-regexp [module {default | ddfs}]
```

Shows whether tracing is enabled or disabled for the specified events.

```
perf stop histogram histogram-filename [module {default | ddfs}]
```

Stop collecting histograms and write the collected histograms to the specified file.

```
perf stop stats
```

Stop printing statistics.

```
perf stop trace trace-filename [module {default | ddfs}]
```

Stop tracing events and write the collected traces to the specified file.

system vresource

Display details about the virtual CPU and memory resources on the DDVE.

```
system vresource show [current | requirements]
```

```
sysadmin@zx-benchmark-1# system vresource show requirements
  Active Tier      Cloud Tier
Instance
Capacity (TB)    Capacity
(TB)
-----
                        8          n/a   Standard_F4 (Only block storage is
supported)
                        16          n/a
Standard_F8
                        32          n/a
Standard_D4_v2
                        96          n/a
Standard_D16_v3
                        256         n/a
Standard_D32s_v3
-----
** The maximum allowed system capacity for active tier on block
storage is 16 TB
```

DDVE-only commands

The following commands only work on DDVE, and are not supported on physical DD systems.

Table 5 DDVE-only commands

Command	Description
<code>elicense checkout feature-license <feature-name-list></code>	Allows user to check out the features of licenses for License Server installation
<code>elicense checkout capacity-license <feature-name> value <n> {TB GB}</code>	Allows user to check out the capacity of licenses for License Server installation. Here is sample output: <pre>sysadmin@localhost# elic checkout capacity-license capacity value 10 TB Checking out CAPACITY license willl also checkout available feature licenses. An addition 10 TB CAPACITY license will be checked out. 10 TB additional CAPACITY license has been</pre>

Table 5 DDVE-only commands (continued)

Command	Description
	checked out. License(s) have been checked out for REPLICATION, DDBOOST, ENCRYPTION. Total 10 TB CAPACITY license is now available on this system.
<code>elicense checkin {<feature-name-list> all}</code>	Allows user to check in features for licences for License Server installation
<code>elicense license-server set server {<ipaddr> <hostname>} port <port-number></code>	
<code>elicense license-server reset</code>	Returns DDVE to factory license settings.
<code>elicense license-server show</code>	
<code>filesystem show space tier active local-metadata</code>	Displays the usage for the metadata storage. Note: Some portion of the disk space is reserved for internal metadata, such as index. The amount of space is based on the maximum capacity of the platform and not on licensed capacity.
<code>net hosts add</code>	Two DDVEs in different regions cannot resolve each other's hostname. Run this command to add a host list entry. Note: For VNET to VNET connection between different regions in Azure, see Microsoft.com .
<code>storage object-store enable</code>	Enables the object-store feature for DDVE.
<code>storage object-store disable</code>	Disables the object-store feature for DDVE.
<code>storage object-store profile set</code>	Configures the object-store access profile.
<code>storage object-store profile show</code>	Displays the object-store access profile.
<code>storage object-store profile status</code>	This CLI lists the object-store profile information set on the DDVE.
<code>system vresource show [requirements]</code>	Displays the file system capacity, the number of virtual CPUs, and the amount of memory assigned to the virtual machine running the DDVE instance. The <code>requirements</code> option displays the physical storage requirements for DDVE.
<code>vserver config set</code>	DDVE supports the hypervisor's functionality to collect performance statistics from the hypervisor. These performance statistics can be used to troubleshoot the DDVE performance problems. To do that, users need to specify the vServer information (hostname

Table 5 DDVE-only commands (continued)

Command	Description
	or IP address) and the credential information(username and password). The vServer can be a vCenter server, an ESXi host for vSphere, a Hyper-V server, or an SVCMM server for Hyper-V. Once this information is configured, DDVE will collect performance statistics from the vServer every 5 minutes.
<code>vserver config reset</code>	Reset the vServer credentials for DDVE to their default values.
<code>vserver config show</code>	Display the vServer credentials for DDVE.

Modified DD OS commands

The behavior of the following commands has been modified on the DDVE platform:

Table 6 Modified DD OS commands

Command	Changes
<code>alert</code>	The <code>tenant-unit</code> parameter is not supported.
<code>compression</code>	The <code>tenant-unit</code> parameter is not supported.
<code>config setup show</code>	Arguments for configuring features not available in DDVE have been removed.
<code>ddboost clients show active</code>	The <code>tenant-unit</code> parameter is not supported.
<code>ddboost file-replication show active</code>	The <code>tenant-unit</code> parameter is not supported.
<code>ddboost file-replication show detailed-file-history</code>	The <code>tenant-unit</code> parameter is not supported.
<code>ddboost file-replication show file-history</code>	The <code>tenant-unit</code> parameter is not supported.
<code>ddboost option reset</code>	The <code>fc</code> parameter is not supported.
<code>ddboost option show</code>	The <code>fc</code> parameter is not supported.
<code>ddboost storage-unit create</code>	The <code>tenant-unit</code> parameter is not supported.
<code>ddboost storage-unit modify</code>	The <code>tenant-unit</code> parameter is not supported.
<code>ddboost storage-unit show</code>	The <code>tenant-unit</code> parameter is not supported.

Table 6 Modified DD OS commands (continued)

Command	Changes
<code>ddboost streams show active</code>	The <code>tenant-unit</code> parameter is not supported.
<code>ddboost streams show history</code>	The <code>tenant-unit</code> parameter is not supported.
<code>disk rescan</code>	The <code><enlcosure-ID>.<disk-ID></code> parameter is not supported.
<code>disk show state</code>	DDVE system disks show the <code>System Dev</code> state.
<code>disk show stats</code>	The DDVE format for this command is <code>disk show stats [dev <n>]</code>
<code>disk status</code>	The <code>Spare</code> row has been removed from the output. The <code>System</code> row has been added.
<code>enclosure show all</code>	The <code>[<enclosure>]</code> parameter is not supported.
<code>enclosure show controllers</code>	The <code>[<enclosure>]</code> parameter is not supported.
<code>enclosure show cpus</code>	The <code>[<enclosure>]</code> parameter is not supported.
<code>enclosure show io-cards</code>	The <code>[<enclosure>]</code> parameter is not supported.
<code>enclosure show memory</code>	The <code>[<enclosure>]</code> parameter is not supported.
<code>filesystem encryption keyes delete</code>	The <code>[tier {active archive} archive-unit <unit-name>]</code> parameter is not supported.
<code>filesystem encryption keys show</code>	The <code>[tier {active archive} archive-unit <unit-name>]</code> parameter is not supported.
<code>filesystem fastcopy</code>	The <code>[retention-lock]</code> parameter is supported with DDVE 4.0. Retention lock governance mode is supported for DDVE on premises. Retention lock compliance mode is not supported for any DDVE.
<code>filesystem show compression</code>	The <code>[tier {active archive} archive-unit <unit-name>]</code> parameter is not supported.
<code>filesystem show space</code>	The <code>[tier {active archive} archive-unit <unit-name> arcjove-unit {all <unit-name>}]</code> parameter is not supported.

Table 6 Modified DD OS commands (continued)

Command	Changes
<code>mtree create</code>	The <code>tenant-unit</code> parameter is not supported.
<code>mtree list</code>	The <code>tenant-unit</code> parameter is not supported.
<code>mtree show compression</code>	The <code>tenant-unit</code> and <code>tenant-unit</code> parameters are not supported.
<code>mtree show performance</code>	The <code>tenant-unit</code> parameter is not supported.
<code>net create interface</code>	The <code><virtual-ifname></code> parameter is not supported.
<code>net destroy</code>	The <code><virtual-ifname></code> parameter is not supported.
<code>perf</code>	The <code>vtl</code> option is not supported on any <code>perf</code> command.
<code>storage add</code>	The <code>enclosure</code> and <code>disk</code> parameters are not supported.
<code>storage remove</code>	The <code>enclosure</code> and <code>disk</code> parameters are not supported.
<code>storage show</code>	The <code>archive</code> option is not supported.
<code>system show stats</code>	NVRAM statistics are not reported, because DDVE systems do not have physical NVRAM.
<code>quota</code>	The <code>tenant-unit</code> parameter is not supported.
<code>replication</code>	MTree replication is the only type of replication supported.
<code>snapshot</code>	The <code>tenant-unit</code> parameter is not supported.

Unsupported DD OS commands

The following DD OS commands and command options are not supported on the DDVE platform.

Table 7 Unsupported commands and command options

Unsupported command or command option	Notes
<code>adminaccess https generate certificate</code>	Deprecated. Use <code>adminaccess certificate generate</code> instead.
<code>alerts add</code>	Deprecated. Use <code>alerts notify-list add</code> instead.
<code>alerts del</code>	Deprecated. Use <code>alerts notify-list del</code> instead.

Table 7 Unsupported commands and command options (continued)

Unsupported command or command option	Notes
alerts notify-list option set <i>group-name</i> tenant-alert-summary {enabled disabled}	
alerts notify-list option reset <i>group-name</i> tenant-alert-summary	
alerts reset	Deprecated. Use <code>alerts notify-list reset</code> instead.
alerts show alerts-list	Deprecated. Use <code>alerts notify-list show</code> instead.
alerts test	Deprecated. Use <code>alerts notify-list test</code> instead.
archive	
authorization	
autosupport display	Deprecated. Use <code>autosupport show report</code> instead.
autosupport reset support-list	Deprecated. Use <code>autosupport reset { all alert-summary asup-detailed support-notify }</code> instead.
autosupport show support-list	Deprecated. Use <code>autosupport show { all asup-detailed alert-summary support-notify }</code> instead.
cifs set authentication nt4	Deprecated. Use <code>cifs set authentication active-directory</code> instead.
cluster	
ddboost fc	
ddboost option reset fc	
ddboost option set distributed-segment-processing disabled	Turning off distributed segment processing (DSP) with this DDBoost command is not supported for DDVE on DD OS 6.1.2.x.
ddboost option show	Turning off DSP with this DDBoost command is not supported for DDVE on DD OS 6.1.2.x.
ddboost option show fc	
ddboost show image-duplication	Deprecated. Use <code>ddboost file-replication show</code> instead.
ddboost user option set <i>user</i> default-tenant-unit <i>tenant-unit</i>	
ddboost user option reset <i>user</i> [default-tenant-unit]	
disk add devdisk-id [spindle-group 1-16]	Deprecated. Use <code>storage add</code> instead.
disk add enclosure <i>enclosure-id</i>	Deprecated. Use <code>storage add</code> instead.
disk benchmark start	Not supported by DDVE in cloud
disk benchmark show	Not supported by DDVE in cloud

Table 7 Unsupported commands and command options (continued)

Unsupported command or command option	Notes
disk benchmark stop	Not supported by DDVE in cloud
disk benchmark watch	Not supported by DDVE in cloud
disk expand	Deprecated. Use <code>storage add</code> instead.
disk failenclosure-id.disk-id	
disk multipath	
disk port	
disk rescan [enclosure-id.disk-id]	
disk show detailed-raid-info	Deprecated. Use <code>disk show state</code> and <code>storage show</code> instead.
disk show failure-history	
disk show performance	Not supported by DDVE in cloud
disk show raid-info	Deprecated. Use <code>disk show state</code> and <code>storage show</code> instead.
disk show reliability-data	
disk disk show stats	Not supported by DDVE in cloud
disk unfail	
enclosure beacon	
enclosure show all [enclosure]	This command is supported, but not with the <i>enclosure</i> argument.
enclosure show chassis	
enclosure show controllers enclosure	This command is supported, but not with the <i>enclosure</i> argument.
enclosure show cpus [enclosure]	This command is supported, but not with the <i>enclosure</i> argument.
enclosure show fans	
enclosure show io-cards [enclosure]	This command is supported, but not with the <i>enclosure</i> argument.
enclosure show memory [enclosure]	This command is supported, but not with the <i>enclosure</i> argument.
enclosure show nvram	
enclosure show powersupply	
enclosure show summary	
enclosure show temperature-sensors	
enclosure show topology	
enclosure test topology	

Table 7 Unsupported commands and command options (continued)

Unsupported command or command option	Notes
<code>filesys archive</code>	
<code>filesys clean update-stats</code>	Deprecated. Use <code>filesys show space</code> instead.
<code>filesys encryption</code>	
<code>filesys encryption passphrase change</code>	Deprecated. Use <code>system passphrase change</code> instead.
<code>filesys retention-lock</code>	Deprecated. Use <code>mtree retention-lock</code> instead.
<code>filesys show compression tier</code>	The <code>tier</code> option is not supported.
<code>filesys show history</code>	Deprecated. Use <code>filesys show compression daily</code> instead.
<code>ha create</code>	Not supported by DDVE in cloud
<code>ha destroy</code>	Not supported by DDVE in cloud
<code>ha status</code>	Not supported by DDVE in cloud
<code>ha failover</code>	Not supported by DDVE in cloud
<code>ha online</code>	Not supported by DDVE in cloud
<code>ha offline</code>	Not supported by DDVE in cloud
<code>license</code>	The <code>license</code> commands are not supported because DDVE uses new <code>elicense</code> commands.
<code>mtree show compression <i>mtree_path</i> tier</code>	
<code>net aggregate</code>	
<code>net config <i>ifname</i> type cluster</code>	
<code>net create interface <i>virtual-ifname</i></code>	
<code>net create interface <i>physical-ifname</i> vlan <i>vlan-id</i></code>	
<code>net create virtual <i>vethid</i></code>	
<code>net destroy <i>virtual-ifname</i></code>	
<code>net destroy <i>vlan-ifname</i></code>	
<code>net failover</code>	
<code>net modify <i>virtual-ifname</i> bonding {aggregate failover}</code>	
<code>net set portnaming</code>	
<code>ndmp</code>	
<code>ndmpd</code>	
<code>nfs option disable report-replica-as-writable</code>	Deprecated. Use <code>filesys option disable report-replica-as-writable</code> instead.

Table 7 Unsupported commands and command options (continued)

Unsupported command or command option	Notes
<code>nfs option enable report-replica-as-writable</code>	Deprecated. Use <code>filesystems option enable report-replica-as-writable</code> instead.
<code>nfs option reset report-replica-as-writable</code>	Deprecated. Use <code>filesystems option reset report-replica-as-writable</code> instead.
<code>nfs option show report-replica-as-writable</code>	Deprecated. Use <code>filesystems option show report-replica-as-writable</code> instead.
<code>perf * module vtl</code>	
<code>san</code>	
<code>shelf migration start</code>	Not supported by DDVE in cloud
<code>shelf migration status</code>	Not supported by DDVE in cloud
<code>shelf migration suspend</code>	Not supported by DDVE in cloud
<code>shelf migration resume</code>	Not supported by DDVE in cloud
<code>shelf migration precheck</code>	Not supported by DDVE in cloud
<code>shelf migration option</code>	Not supported by DDVE in cloud
<code>shelf migration finalize</code>	Not supported by DDVE in cloud
<code>shelf migration show history</code>	Not supported by DDVE in cloud
<code>snapshot add schedule name [days days] time time [,time...] [retention period]</code>	Deprecated. Use <code>snapshot schedule create</code> instead.
<code>snapshot add schedule name [days days] time time every mins [retention period]</code>	Deprecated. Use <code>snapshot schedule create</code> instead.
<code>snapshot add schedule name [days days] time time-time [every hrs mins] [retention period]</code>	Deprecated. Use <code>snapshot schedule create</code> instead.
<code>snapshot del schedule {name all}</code>	Deprecated. Use <code>snapshot schedule destroy</code> instead.
<code>snapshot modify schedule name {[days days] time time [,time...] [retention period]}</code>	Deprecated. Use <code>snapshot schedule modify</code> instead.
<code>snapshot modify schedule name {[days days] time time every {mins none} [retention period]}</code>	Deprecated. Use <code>snapshot schedule modify</code> instead.
<code>snapshot modify schedule name {[days days] time time-time [every {hrs mins none}] [retention period]}</code>	Deprecated. Use <code>snapshot schedule modify</code> instead.
<code>snapshot reset schedule</code>	Deprecated. Use <code>snapshot schedule reset</code> instead.
<code>snapshot show schedule</code>	Deprecated. Use <code>snapshot schedule show</code> instead.
<code>storage add enclosure enclosure-id</code>	
<code>storage add disk enclosure-id.disk-id</code>	

Table 7 Unsupported commands and command options (continued)

Unsupported command or command option	Notes
<code>storage remove enclosure enclosure-id</code>	
<code>storage remove disk enclosure_id.disk-id</code>	
<code>system firmware</code>	
<code>system option set console</code>	
<code>system retention-lock</code>	
<code>system sanitize</code>	
<code>system show anaconda</code>	
<code>system show controller-inventory</code>	
<code>system show nvram</code>	
<code>system show nvram-detailed</code>	
<code>system show oemid</code>	
<code>system upgrade continue</code>	
<code>user</code>	
<code>user change priv</code>	Deprecated, with no replacement.
<code>vserver config set host</code>	Not supported by DDVE in cloud
<code>vserver config reset</code>	Not supported by DDVE in cloud
<code>vserver config show</code>	Not supported by DDVE in cloud
<code>vserver config perf-stats start</code>	Not supported by DDVE in cloud
<code>vserver config perf-stats stop</code>	Not supported by DDVE in cloud
<code>vserver config perf-stats status</code>	Not supported by DDVE in cloud
<code>vtl lunmask</code>	Deprecated. Use <code>vtl group</code> instead.
<code>vtl lunmask add</code>	Deprecated. Use <code>vtl group add</code> instead.
<code>vtl lunmask del</code>	Deprecated.
<code>vtl lunmask show</code>	Deprecated. Use <code>vtl group show</code> instead.

Troubleshooting performance issues

You can check DDVE performance statistics as follows:

- With native tools in VMC

You can also use the following to monitor benchmark performance:

- `perf`

[Extensions to DDOS for DDVE](#) on page 22 provides more information about commands.

CPU Performance

The two key statistics for CPU performance are:

- CPU usage—CPU usage as a percentage during the interval
- CPU ready—The percentage of time that the virtual machine was ready, but could not get scheduled to run on the physical CPU. This counter might not be displayed by default.

If these counters are high, there may be a performance problem on the hypervisor host.

Memory Performance

- Memory swapping—The key statistic for memory performance, which is the current amount of guest physical memory swapped out to the virtual machine's swap file.

Virtual Disk Performance

The key statistics for virtual disk performance are:

- I/O throughput—A decrease in these values indicates a performance issue.
- I/O latency—An increase in read and write latency values indicates a performance problem.

Failed commands—An increase in the average number of outstanding read and write requests indicates a performance problem.

Migrating DDVE

The virtual machine running DDVE supports live migration and cold migration in VMware vCenter environments. The virtual machine running DDVE supports live migration in Hyper-V environments. DDVE supports live migration and cold migration.

- ① **Note:** After changing the virtual host, verify the network adapters are connected with the correct network label, otherwise the virtual machine will not be able to acquire an IP address. The system generates a warning when a virtual machine host does not have the network label available.
- ① **Note:** DDVE uses dynamic mac address on Hyper-V platform. When you perform DDVE migration on Hyper-V, the mac address may change. Use DHCP so that IP address will change. However, if you want to keep the MAC address, you can configure DDVE with static mode before migration. For additional information, see *Hyper-V and Dynamic MAC Address Regeneration* at <https://blogs.msdn.microsoft.com> and *Understanding MAC Address Behavior During Hyper-V Live Migration* at <http://www.virtualizationadmin.com>

