ETERNUS

ETERNUS VAAI Plug-in

for VMware vSphere5

1.0.0

User's Guide

FUJITSU

Preface

This document provides an overview of ETERNUS VAAI Plug-in for VMware vSphere5 and discribes how to use it.

The Structure of this Document

This document consists of the following chapters.

1. Introduction
2. Requirements
3. Installation
4. Uninstallation
5. Restrictions and Notes
6. Messages

Abbreviations

In this document, the disk storage system supported by this product is referred to as "ETERNUS Disk storage system". For details of the supported disk storage system, refer to the following web-site:

http://www.fujitsu.com/global/services/computing/storage/eternus/tools/vaai.html

In this document, Web GUI and ETERNUSmgr are collectively referred to as "ETERNUS Web GUI".

Reference

- Fujitsu ETERNUS Disk storage systems
  http://www.fujitsu.com/global/services/computing/storage/eternus/products/diskstorage/

- ETERNUS VAAI Plug-in
  http://www.fujitsu.com/global/services/computing/storage/eternus/tools/vaai.html

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Contents

1   Introduction

1.1 ETERNUS VAAI Plug-in

ETERNUS VAAI Plug-in is a program designed to support the "Full Copy" operation of VMware's vStorage APIs for Array Integration (VAAI) with Fujitsu ETERNUS Disk Storage Systems. Using this software enables functions, previously operated using server resources, to be offloaded to the storage system. This achieves a server workload reduction and improves performance in virtual environments.

Full Copy
  This feature enables the ETERNUS Disk storage systems to make full copies of data within the disk array. ESX host does not need to read and write the copy data. You can expect to reduce the amount of network traffic and CPU resources, and offer more agile virtualization solution. This feature provides hardware offload for the following functions: Storage VMotion, VM Cloning and provisioning VMs from template.

1.2 Audience

This document is intended for VMware vSphere5 administrators who are using Fujitsu ETERNUS Disk storage system as an infrastructure of virtualization deployments. It is assumed that the reader has a general knowledge of VMware vSphere5 and ETERNUS Disk storage systems.

1.3 Release Information

Version	Modification details
1.0.0 (December 2011)	First version

2   Requirements

This section describes support environment and necessary resources. Please be sure to check this section before installing ETERNUS VAAI Plug-in.

2.1 Supported Environment

For ETERNUS VAAI Plug-in supported disk storage systems, Firmware version and OSes, refer to the following web page:
http://www.fujitsu.com/global/services//computing/storage/eternus/tools/vaai.html

2.2 Necessary Resources

License

The Advanced Copy Function is required to use the "Full Copy" feature.

For the ETERNUS DX400 series or ETERNUS DX8000 series, the advanced Copy license is an extra-option. For the other ETERNUS Disk Storage systems (such as ETERNUS DX80 S2/DX90 S2, ETERNUS DX400 S2 series), register "Use free License/ VAAI" or "Use VAAI". When the paid license is registered, no free license registration is needed.

Setting for advanced copy table size is also required. Please refer to "ETERNUSmgr User's Guide -Setting/maintenance-" for registration and setting. "Block Zeroing" feature and "Hardware Assisted Locking" feature are available without the Advanced Copy License.

3 Installation

This section describes how to install ETERNUS VAAI Plug-in using the esxcli command. Refer to the VMware's Administration Guide if you install ETERNUS VAAI Plug-in using other tools, such as VMware vSphere Command Line Interface.

3.1 Installation using esxcli command

Perform the following steps on the ESXi shell. ESXi shell is not usually enabled so it is necessary to enable it from "Troubleshooting Options" of the Direct Console User Interface.

1. Copy the FJT_vaaip_module_esx5_100.zip file to a local directory on your ESX host.

2. Run the esxcli command to install ETERNUS VAAI Plug-in into the ESXi host. In this case, FJT_vaaip_module_esx5_100.zip file is located under the /tmp directory.

```
# esxcli software vib install -d /tmp/FJT_vaaip_module_esx5_100.zip --maintenance-mode
```

3. Reboot the ESXi host.

3.2 Verifying ETERNUS VAAI Plug-in Installation

This section describes how to verify the correct ETERNUS VAAI Plug-in installation. Perform the following steps on the ESXi shell.

1. Run the following command.

```
# esxcli storage core claimrule list --claimrule-class=VAAI
```

The above command should appear as follows:

```
VAAI    <rule number>    runtime   vendor   FJT_VAAIP_MODULE   vendor=FUJITSU model=ETERNUS_DX8000
VAAI    <rule number>    file      vendor   FJT_VAAIP_MODULE   vendor=FUJITSU model=ETERNUS_DX8000
VAAI    <rule number>    runtime   vendor   FJT_VAAIP_MODULE   vendor=FUJITSU model=ETERNUS_DX400
VAAI    <rule number>    file      vendor   FJT_VAAIP_MODULE   vendor=FUJITSU model=ETERNUS_DX400
VAAI    <rule number>    runtime   vendor   FJT_VAAIP_MODULE   vendor=FUJITSU model=ETERNUS_DXL
VAAI    <rule number>    file      vendor   FJT_VAAIP_MODULE   vendor=FUJITSU model=ETERNUS_DXL
```

2. Confirm that ETERNUS Disk storage systems devices are claimed by ETERNUS VAAI Plug-in if devices are attached to ESX host. "FJT_VAAIP_MODULE" is displayed at "VAAI Plugin Name" field if the devices are controlled by the ETERNUS VAAI Plug-in successfully.

```
# esxcli storage core device vaai status get
naa.600000e00d100000000010011000220000
    VAAI Plugin Name: FJT_VAAIP_MODULE
    ATS Status: supported
    Clone Status: supported
    Zero Status: supported
    Delete Status: unsupported
```

4   Uninstallation

This section describes how to uninstall ETERNUS VAAI Plug-In using the esxcli command. Deactivation of ETERNUS VAAI Plug-in Setting is required after uninstalling ETERNUS VAAI Plug-in. Refer to the chapter 4.2 for details

4.1 Uninstallation using esxcli command

Perform the following steps on the ESXi shell.

1. Run the following command to uninstall ETERNUS VAAI Plug-in.

    ```
    # esxcli software vib remove -n fjt_vaaip_module --maintenance-mode
    ```

4.2 Deactivation of ETERNUS VAAI Plug-in setting

Perform the following steps on the ESXi shell after uninstalling ETERNUS VAAI Plug-in.

1. Confirm the claim-rule number of ETERNUS VAAI Plug-in.

    ```
    # esxcli storage core claimrule list --claimrule-class=Filter
    Rule Class   Rule     Class    Type      Plugin          Matches
    Filter        5001    runtime  vendor    VAAI_FILTER   vendor=FUJITSU model=ETERNUS_DX8000
    Filter        5002    runtime  vendor    VAAI_FILTER   vendor=FUJITSU model=ETERNUS_DX400
    Filter        5003    runtime  vendor    VAAI_FILTER   vendor=FUJITSU model=ETERNUS_DXL
    ```

    "5001", "5002" and "5003" are claim-rule number of ETERNUS VAAI Plug-in, as shown above example.

2. Deactivate the claim-rule of ETERNUS VAAI Plug-in. The following example shows how to delete "5001" claim-rule.

    ```
    # esxcli storage core claimrule remove -r 5001 --claimrule-class=Filter
    # esxcli storage core claimrule remove -r 5001 --claimrule-class=VAAI
    ```

3. Load the new rules.

    ```
    # esxcli storage core claimrule load --claimrule-class=all
    ```

4. Confirm that the claim-rule of ETERNUS VAAI Plug-in is deleted.

    ```
    # esxcli storage core claimrule list --claimrule-class=all
    ```

5. Reboot the ESXi host.

5　Restrictions and Notes

➢ "Full Copy" feature only works when source and destination datastore exist on the same ETERNUS Disk storage system. If source and destination datastore exist on the different ETERNUS Disk storage system, copying operation does not offload to the storage hardware. In this case, traditional software data movement is done using server's CPU resources. We have no current plan to support "Full Copy" feature between different ETERNUS Disk storage systems.

➢ Following message may appear many times to /var/log/vmkernel* log files while "Full Copy". This message can be safely ignored because it simply indicates that the submission queue for the ETERNUS copy engine is full and therefore it cannot accept any more copy jobs. The copy jobs are resubmitted automatically though retry mechanism so no action is required by the user.

NMP: nmp_ThrottleLogForDevice:2318: Cmd 0xe9 (0x412440c414c0) to dev "naa.600000e00d1000000010011000210000" on path "vmhba4:C0:T0:L0" Failed: H:0x0 D:0x2 P:0x0 Valid sense data: 0x5 0x26 0x92.Act:NONE

6 Messages

This section describes the message of ETERNUS VAAI Plug-in. Check the /var/log/vmkernel* log files when an error or trouble occurs.

Message
　WARNING: Failed to init_module (%s)
Meaning
　Registration of ETERNUS VAAI Plug-in on the system failed. %s indicates failed operations and error information.
Action
　Uninstall ETERNUS VAAI Plug-in, and re-install after rebooting the ESX host.

Message
　WARNING: FJT_VAAIP_MODULE: cleanup_module: Failed to unregister the plugin. The module will be unloaded anyway.
Meaning
　The ETETNUS VAAI Plug-in was not properly unregistered during cleanup process. In this case, ETETNUS VAAI Plug-in is unloaded from the vmkernel.
Action
　None.

Message
　WARNING: FJT_VAAIP_MODULE: fjt_claim_device: Out of memory claiming device %s.
　WARNING: FJT_VAAIP_MODULE: checkVAAIsupport: Out of memory claiming device %s.
Meaning
　Claiming process failed due to lack of memory. %s indicates the target device.
Action
　Check the memory resource.

Message
　WARNING: FJT_VAAIP_MODULE: checkVAAIsupport: device %s1 is not VAAI capable. %s2 %s3.
Meaning
　COMPARE and WRITE command failed. %s1 indicates a target device. %s2 indicates a device status, driver/hba status and plug-in status. %s3 indicates received sense information.
Action
　Check the connectivity between ESX host and ETERNUS Disk storage systems.

Message
　WARNING: FJT_VAAIP_MODULE: fjt_claim_device: Inquiry to device %s1 failed. %s2 %s3
Meaning
　Inquiry command failed. %s1 indicates a target device. %s2 indicates a device status, driver/hba status and plug-in status. %s3 indicates received sense information.
Action
　Check the connectivity between ESX host and ETERNUS Disk storage systems.

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