# EMC® Avamar® Virtual Edition 7.2 for VMware

## Installation Guide

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EMC²

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For the most up-to-date regulatory document for your product line, go to EMC Online Support (https://support.emc.com).

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# CONTENTS

# TABLES

# PREFACE

As part of an effort to improve its product lines, EMC periodically releases 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.

Contact your EMC technical support professional if a product does not function properly or does not function as described in this document.

**Note**

This document was accurate at publication time. Go to EMC Online Support (https://support.emc.com) to ensure that you are using the latest version of this document.

### Purpose

This guide describes how to install the Avamar Virtual Edition solution, a single-node, non-RAIN Avamar server that runs as a virtual machine in a VMware ESX Server environment.

### Audience

This document is intended for EMC Professional Services employees and EMC authorized channel partners who install AVE.

### Revision history

The following table presents the revision history of this document.

| Revision | Date | Description |
|---|---|---|
| 01 | June, 2015 | Release of Avamar Virtual Edition for VMware7.2. |

### Related documentation

The following EMC publications provide additional information:

- *EMC Avamar Release Notes*
- *EMC Avamar Administration Guide*
- *EMC Avamar Operational Best Practices Guide*
- *EMC Avamar Product Security Guide*
- *EMC Avamar Backup Clients User Guide*

### Special notice conventions used in this document

EMC uses the following conventions for special notices:

**NOTICE**

Addresses practices not related to personal injury.

**Note**

Presents information that is important, but not hazard-related.

### Typographical conventions

EMC uses the following type style conventions in this document:

| | |
|---|---|
| **Bold** | Use for names of interface elements, such as names of windows, dialog boxes, buttons, fields, tab names, key names, and menu paths (what the user specifically selects or clicks) |
| *Italic* | Use for full titles of publications referenced in text |
| `Monospace` | Use for:<br>• System code<br>• System output, such as an error message or script<br>• Pathnames, file names, prompts, and syntax<br>• Commands and options |
| *Monospace italic* | Use for variables |
| **`Monospace bold`** | Use for user input |
| [ ] | Square brackets enclose optional values |
| \| | Vertical bar indicates alternate selections - the bar means “or” |
| { } | Braces enclose content that the user must specify, such as x or y or z |
| ... | Ellipses indicate nonessential information omitted from the example |

### Where to get help

The Avamar support page provides access to licensing information, product documentation, advisories, and downloads, as well as how-to and troubleshooting information. This information may enable you to resolve a product issue before you contact EMC Customer Support.

To access the Avamar support page:

1. Go to https://support.EMC.com/products.
2. Type a product name in the **Find a Product** box.
3. Select the product from the list that appears.
4. Click the arrow next to the **Find a Product** box.
5. (Optional) Add the product to the **My Products** list by clicking **Add to my products** in the top right corner of the **Support by Product** page.

### Documentation

The Avamar product documentation provides a comprehensive set of feature overview, operational task, and technical reference information. Review the following documents in addition to product administration and user guides:

- Release notes provide an overview of new features and known limitations for a release.
- Technical notes provide technical details about specific product features, including step-by-step tasks, where necessary.
- White papers provide an in-depth technical perspective of a product or products as applied to critical business issues or requirements.

### Knowledgebase

The EMC Knowledgebase contains applicable solutions that you can search for either by solution number (for example, esgxxxxxx) or by keyword.

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1. Click the **Search** link at the top of the page.
2. Type either the solution number or keywords in the search box.
3. (Optional) Limit the search to specific products by typing a product name in the **Scope by product** box and then selecting the product from the list that appears.
4. Select **Knowledgebase** from the **Scope by resource** list.
5. (Optional) Specify advanced options by clicking **Advanced options** and specifying values in the available fields.
6. Click the search button.

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### Live chat

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### Service Requests

For in-depth help from EMC Customer Support, submit a service request by clicking **Create Service Requests** on the **Service Center** panel of the Avamar support page.

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**Note**

To open a service request, you must have a valid support agreement. Contact your EMC sales representative for details about obtaining a valid support agreement or with questions about your account.

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To review an open service request, click the **Service Center** link on the **Service Center** panel, and then click **View and manage service requests**.

### Facilitating support

EMC recommends that you enable ConnectEMC and Email Home on all Avamar systems:

- ConnectEMC automatically generates service requests for high priority events.
- Email Home emails configuration, capacity, and general system information to EMC Customer Support.

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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.

Please include the following information:

- Product name and version
- Document name, part number, and revision (for example, 01)
- Page numbers

- Other details that will help us address the documentation issue

# CHAPTER 1

# Introduction

This chapter includes the following topics:

# Overview of Avamar Virtual Edition for VMware

EMC® Avamar® Virtual Edition (AVE) is a single-node non-RAIN (Redundant Array of Independent Nodes) Avamar server that runs as a virtual machine in a VMware® ESXi 5.1/5.5/5.5u2/6.0 environment. AVE integrates the latest version of Avamar software with SUSE Linux as a VMware virtual machine.

AVE is similar to single-node Avamar servers in the following ways:

- Runs autonomously as a target for all Avamar client backups
- Performs replication to a physical Avamar system or another AVE

AVE is available in four configurations: 0.5 TB, 1 TB, 2 TB, and 4 TB licensed capacity. AVE is not scalable to a multi-node Avamar server and resizing the virtual machine is not supported. You can increase storage capacity by deploying additional AVE virtual machines, and then divide backups among them. Or you can replicate the data to another Avamar server, delete the smaller virtual machine, create a larger virtual machine, and replicate the data back to the larger virtual machine.

AVE supports backup of physical and virtual clients:

- For physical clients, install Avamar client software on each client.
- For virtual clients, there are two options for backups. Virtual clients can be backed up through guest OS backups (requires installing Avamar client software on each virtual machine) or through host-based backups (requires a proxy server).

# Appropriate environments for AVE

The following factors have the most direct impact on the long-term reliability, availability, and supportability of the AVE virtual machine:

- I/O performance capability of the AVE storage subsystem
- Amount of data added daily to the AVE virtual machine (change rate)
- Capacity utilized within the AVE virtual machine

Specifications in this section and AVE virtual disk requirements on page 17 describe minimum or maximum requirements for these factors. AVE generally performs better when I/O performance is higher, and change rate and utilized capacity are lower. To maximize the capacity the AVE virtual machine can use, the daily change rate of the data AVE protects must be balanced with adequate I/O performance.

The first step in determining the proper implementation of AVE is to establish which kind of customer environment AVE will be used to protect, file server or mixed environment. File server environments include file system data and mixed environments include file system data and structured data (for example, database data).

The following table describes the maximum change rates that AVE supports for file server and mixed environments.

**Table 1** Maximum change rates AVE supports for file server and mixed environments

| Configuration | File server data | Mixed data |
|---|---|---|
| 0.5 TB AVE | Less than 2 GB per day | Less than 5 GB per day |
| 1 TB AVE | Less than 4 GB per day | Less than 10 GB per day |

**Table 1** Maximum change rates AVE supports for file server and mixed environments (continued)

| Configuration | File server data | Mixed data |
|---|---|---|
| 2 TB AVE | Less than 8 GB per day | Less than 20 GB per day |
| 4 TB AVE | Less than 20 GB per day | Less than 20 GB per day |

Actual results depend on the retention policy and the actual data change rate. When the daily change rate exceeds the limits specified in the previous table, deploy a single or multi-node Avamar server.

# Pre-sales performance analysis

Pre-sales performance analysis for AVE is required. It is performed by EMC-trained personnel. Server hardware and the virtual environment must meet resource capability benchmarks according to results from the AVE Performance Assurance Tool (PAT). This tool also simulates the load imposed on the ESXi Server so that the customer can gauge the potential impact on the targeted ESXi Server. After the PAT is complete, the instructions contain information on how to analyze the data collected and determine if the ESXi Server is a good candidate for AVE.

The AVE PAT must be run for a minimum of 24 hours prior to sale. For pre-sales purposes, download the PAT tool and its associated checksum file with the following FTP commands:

**`ftp://avamar_ftp:anonymous@ftp.emc.com/software/PAT/PAT-4.zip`**

**`ftp://avamar_ftp:anonymous@ftp.emc.com/software/PAT/PAT-4.zip.md5`**

Use the checksum file to verify the PAT file was properly downloaded.

**Note**

Previous versions of AVE also required running the Benchmark Test prior to installation. If the PAT completes successfully with acceptable load levels, the Benchmark Test is not required. If you experience problems during installation and suspect it is bandwidth related, Benchmark Testing on page 25 is documented for troubleshooting purposes.

# CHAPTER 2

# Installation

This chapter includes the following topics:

# Preinstallation requirements and best practices

Before you install an AVE virtual machine, follow the preinstallation requirements and review the best practices in the following sections.

**Note**

Using third party tools to create clones or exact copies of deployed Avamar Virtual Edition systems is known to cause issues. Cloning of Avamar Virtual Edition systems is not supported.

## System requirements

Avamar Virtual Edition (AVE) is supported on VMware ESXi 5.1/5.5/5.5u2/6.0.

The following table defines the minimum system requirements for each size of AVE.

**Table 2** Minimum requirements for AVE

| | 0.5 TB AVE | 1 TB AVE | 2TB AVE | 4 TB AVE |
|---|---|---|---|---|
| Processors | Minimum two 2 GHz processors | Minimum two 2 GHz processors | Minimum two 2 GHz processors | Minimum four 2 GHz processors |
| Memory | 6 GB | 8 GB | 16 GB | 36 GB |
| Disk space | 900 GB | 1,650 GB | 3,150 GB | 6,150 GB |
| Network connection | 1 GbE connection | 1 GbE connection | 1 GbE connection | 1 GbE connection |

**Note**

If you are usingVMFS3 datastores, for 250 GB virtual disks, use at least 1 MB block size for your VMFS datastore filesystem. For 1000 GB disks, use at least a 4 MB block size for your VMFS3 datastore file system. For VMFS5 the block size is automatically defined.

## Verifying the DNS configuration

Prior to installing AVE, DNS must be properly configured. Failure to have DNS set up properly can cause runtime or configuration issues.

**Procedure**

1. Open a command prompt on the vCenter Server and type the following command:

   **nslookup *AVE_IP_address DNS_Server_IP_address***

   The `nslookup` command will return the FQDN for AVE.

2. Type the following command:

   **nslookup *AVE_FQDN DNS_Server_IP_address***

   The `nslookup` command will return the IP address for AVE.

3. Type the following command:

   **nslookup *FQDN_of_vCenter DNS_Server_IP_address***

The `nslookup` command returns the IP address of the vCenter Server.

4. If the `nslookup` commands returned the proper information, close the command prompt. If the `nslookup` commands do not return proper information, resolve the DNS configuration before you install AVE.

## AVE virtual disk requirements

The AVE disk layout comprises one operating system disk (126 GB) and several storage partitions (250 GB or 1000 GB depending on the AVE configuration).

The OS disk stores the operating system, Avamar application and log files.

The storage partitions store the backup data. Backup data is evenly distributed across the storage partitions. The primary amount of the disk read, write, and seek usage occurs on the storage partitions. To improve performance in the storage configuration, distribute storage partitions across high performance LUNs.

In addition to the OS partition, the following table defines the number and size of virtual disks required for each AVE configuration.

**Table 3** AVE virtual disk requirements

| AVE configuration | Number of virtual disks |
|---|---|
| 0.5 TB | 3 storage partitions (250 GB each) |
| 1 TB | 6 storage partitions (250 GB each) |
| 2 TB | 3 storage partitions (1000 GB each) |
| 4 TB | 6 storage partitions (1000 GB each) |

**Note**

For 250 GB virtual disks, use at least 1 MB block size for your VMFS datastore file system. For 1000 GB disks, use at least a 4 MB block size for your VMFS datastore file system.

## Software requirements

Before you install AVE, ensure you have the software listed in the following table.

**Table 4** Additional AVE software installation requirements

| Requirement | Description |
|---|---|
| Applications | PuTTY and WinSCP |
| Files | AVE Package, operating system security patches (if applicable) |

## Network requirements

Before you install AVE, gather the following information:

- Hostnames and IP addresses for the AVE virtual machine and the DNS Server
- Gateway, netmask, and domain of the AVE virtual machine
- Firewall openings, if applicable

**Note**

The *EMC Avamar Product Security Guide* provides client-server data port usage and firewall requirements.

## Virtual disk configuration best practices

ESXi supports multiple disk formats. For AVE virtual machines, the initial configuration is Thick Provision Lazy Zeroed.

**Note**

AVE does not support thin provisioning.

After the initial installation, if you configure the virtual disks for the Thick Provision Eager Zeroed, the customer will get better initial performance because the first write to the disk will require less operations.

**Note**

See the VMware documentation for information on converting Lazy zeroed virtual disks to Eager zeroed virtual disks. Converting a disk from Thick Provisioned Lazy Zeroed to Thick Provisioned Eager Zeroed is time consuming and can consume a significant number of storage I/O processes.

A virtual machine running AVE aggressively uses disk I/O and is almost never idle. VMware's recommendations for appropriate resources for high-performance database virtual machines are generally applicable to an AVE virtual machine. In particular, a storage pool allocated from a group of dedicated physical disks in a RAID 1 (mirror) or RAID 10 (combines RAID 0 with RAID 1) configuration provides the best performance.

# Installation

The following sections are describe how to install an AVE virtual machine.

## Preparing the virtual machine

The following instructions use vCenter Server 5.5. Other versions of vCenter Server might have different options.

**Procedure**

1. Download the AVE virtual appliance file for the appropriate version of AVE you are installing.
2. Extract the compressed .7z file.
3. Start a VMware vSphere Client and connect to the vCenter Server or to the ESXi host that will host the AVE virtual machine.
4. Log in with administrative rights.
5. If you logged into vCenter, select the ESXi server that will host the AVE virtual machine.
6. Select **File** › **Deploy OVF Template**.

   The **Source** page appears.
7. Select **Deploy from a file or URL** and browse to the AVE virtual machine file (OVF extension) and click **Next**.

The **OVF Template Details** page appears.

8. Verify the template details are correct and click **Next**.

   The **Name and Location** page appears.

9. Type in the AVE name, select the inventory location, and then click **Next**.

   The **Storage** page appears.

10. Select the storage for AVE and click **Next**.

    The **Disk Format** page appears.

11. Select **Thick Provision Lazy Zeroed** format and click **Next**.

    Thin provisioning is not supported with AVE.

    The **Network Mapping** page appears.

12. Select the destination network and click **Next**.

    The **Ready to Complete** page appears.

13. Confirm the deployment settings are correct and click **Finish**.

    The installation may take several minutes. A Deployment Completed Successfully message appears when the installation is complete.

14. Click **Close**.

15. Right-click the AVE virtual machine and select **Edit Settings**.

    The **Virtual Machine Properties** window appears.

16. On the **Hardware** tab, select **Memory** and set **Memory Size** based on the size of the AVE license:

    - For 0.5 TB AVE, specify **6 GB**
    - For 1 TB AVE, specify **8 GB**
    - For 2 TB AVE, specify **16 GB**
    - For 4 TB AVE, specify **36 GB**

17. On the **Hardware** tab, select **CPUs** and change the number of virtual CPUs based on the size of the AVE license:

    - For 0.5 TB AVE, specify **2 CPUs**.
    - For 1 TB AVE, specify **2 CPUs**.
    - For 2 TB AVE, specify **2 CPUs**.
    - For 4 TB AVE, specify **4 CPUs**.

18. On the **Hardware** tab, select **Network adapter 1**, choose the **Network Connection** (Network label), and then select the correct network.

19. Create additional virtual hard disks (VMDKs) for the AVE virtual machine based on the specifications from AVE virtual disk requirements on page 17.

    Thin provisioning is not supported with AVE.

    a. Click the **Add** button.

       The **Add Hardware Wizard** appears.

    b. Select **Hard Disk**.

    c. Click **Next**.

d. Select **Create a new virtual disk**.

e. Click **Next**.

f. For **Disk Size**, type **250 GB** (or **1000 GB** if you are implementing a 2 or 4 TB AVE).

g. For **Disk Provisioning** select **Thick Provision Lazy Zeroed** format.

If you select **Thick Provision Eager Zeroed** during the installation, the installation could take several hours. Time-out errors could also occur. See AVE virtual disk requirements on page 17 for information about disk formatting after the installation process is complete.

h. For **Location**, select either **Store with virtual machine** or **Specify a datastore**.

i. Click **Next**.

j. For **Mode** select **Independent**. Use the default setting for **Persistent**.

k. Click **Next**.

l. Verify the configuration and select **Finish**.

m. Repeat these steps based on your AVE configuration:

- For 0.5 TB AVE, repeat two more times (for a total of three 250 GB hard drives).
- For 1 TB AVE, repeat five more times (for a total of six 250 GB hard drives).
- For 2 TB AVE, repeat two more times (for a total of three 1000 GB hard drives).
- For 4 TB AVE repeat five more times (for a total of six 1000 GB hard drives).

20. Finalize virtual machine configuration by completing the following steps:

a. Click **OK**.

b. In the **Recent Tasks** status area (bottom of screen), observe the progress of the hard drive creation.

When the status of the reconfigured Virtual Machine is complete, a Completed message appears.

21. Right-click the virtual machine and select **Power** › **Power On**. This command boots the virtual machine.

22. Open the **Virtual Console** to monitor installation progress.

An insufficient licensing message at this point might indicate either a shortage of ESXi Server licenses or an inability to connect to a license server. Resolve this problem with the network administrator.

23. On the **Summary** tab, verify the status for **VMware Tools** changes to `Running` or `Unmanaged`.

## Configuring network settings

The following procedure is used to configure AVE network configuration for a single IP address.

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**Note**

If you need to run the Benchmark Test, skip this section and proceed to GUID-0DDEB048-16D4-40D1-B581-8862ADDA54CC.

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**Note**

If you require dual-mode stack configuration (to support IPv4 and IPv6) refer to the SLES Unix `YAST2` documentation.

### Procedure

1. At the command prompt, type the following command:

   **`yast2`**

2. Press **Enter**.

   In YaST2, pressing **Ctrl-H** backspaces over data to delete existing data.

   The **YaST2 Control Center** dialog box appears.

3. Select **Network Devices** and press **Enter**.

   The **Network Devices** dialog box appears.

4. From **Network Devices**, select **Network Settings** and press **Enter**.
5. From **Network Settings** use the **Tab** key to access the **Edit** option and press **Enter**.
6. From the **Network Card Setup** use the **Tab** key to access and select **Statically assigned IP Address** (select using the spacebar). **Tab** to **IP Address** and type in the **`IP Address`**, the **`Subnet Mask`**, and the **`Hostname`** of the AVE virtual machine.
7. Use the **Tab** key to select **Next** and press **Enter**.
8. From**Network Settings**, use the **Tab** key to select **Overview**. Use the right-arrow key to select **Hostname/DNS**. Use the **Tab** key to specify the following fields:

   a. **`Hostname`**

   b. **`Domain Name`**

   c. **`Name Server 1`**

   d. **`Name Server 2`**

   e. **`Domain Search`**

9. Use the **Tab** key to select **Hostname/DNS**. Use the **right-arrow** key to select **Routing**. Type in the **`Default Gateway IP address`** for the AVE virtual machine. Use the **Tab** key to select **OK**, and then press **Enter**.
10. From the **YaST Control Center**, use the **Tab** key to select **Quit** and press **Enter**.

    Before proceeding, it is critical to confirm the network settings configured through `YAST2` are correct. Verify that all of the configuration files edited through `YAST2` are properly configured. Refer to the SLES Unix YAST2 documentation for additional information.

11. Wait a couple of minutes and verify the preceding data by typing the following command:

    **`ifconfig`**

12. Verify basic network configuration of **eth0** typing the following command:

    **`ping`** *Static-IP-Address*

13. Verify basic network configuration by typing the following commands:

    **`ping`***gateway_IP_Address*

    **`ping`***DNS_IP Address*

**nslookup** *FQDN*

## Installing and configuring Avamar software

To install Avamar software on a new AVE virtual machine, complete the following procedure:

### Procedure

1. Log in to the **Avamar Installation Manager** user interface as root.
2. Open a web browser and type the following URL:

   **https://*Avamar-Server*:7543/avi/avigui.html**

   where *Avamar-Server* is the hostname or the IP address of the Avamar virtual machine.

   The **EMC Avamar Installation Manager** login page appears.
3. If any security messages appear, click **Continue**.

   The **EMC Avamar Installation Manager** dialog box appears.
4. In the **User** field type **root**.
5. In the Password field type **changeme**.
6. Click **Login**.
7. Click the **SW Updates** tab and click the **Unlock** icon in the upper right corner of the dialog page.

   The **Passcode** dialog box appears.
8. Type in the support password **Supp0rtHarV1** and click **OK**.

   The **EMC Avamar Installation Manager** dialog box appears. This screen can take a few minutes to populate.
9. After a few minutes, click the **Refresh** icon on your web browser to see the installation package.
10. Click the **Install** button.

    The installation initialization begins. The initialization extracts files from the package and prepares the environment for the installation. The process can take a few minutes.
11. Once the initialization completes, the **Installation Setup** page appears. Note that the tabs with a red exclamation mark (!) are required for the installation.

    By default, the **Network Config** tab is open.
12. Type a value of 0 and click **Save**.
13. Click the **ConnectEMC** tab and specify the following:

    a. For **Email sender address** type *sender email address for email notification*

    b. For **Email server** type *Hostname of email server for notification emails to EMC*

    c. For **Site name** type *Description of Avamar server location*

    d. For **Email Server IP Protocol** select *IP Protocol used by the email server*

    e. Click **Save**
14. Click the **Install Patches** tab. Install available patches, and then click **Save**.
15. Click the **Passwords** tab, and then specify and confirm passwords. Make sure you note these for the customer. Click **Save**.

16. Click the **Customer Contact Info** tab, and then specify the customer contact information and click **Save**.
17. (Optional) To set Security Settings, click the **Security Settings** tab and then configure applicable security settings. Click **Save**.
18. Click the **Server Settings** tab. Leave the Avamar Server Address field blank. Select the applicable System time zone name and click **Save**. Click **Continue**.

    The Avamar configuration begins. Wait until the process completes.

**Note**

Please check for the latest available security rollup released and install if applicable

**Note**

Once AVE is installed, see the *EMC Avamar Administration Guide* for additional information on setting up and configuring Avamar.

# APPENDIX A

# Benchmark Testing

This appendix includes the following topics:

# Running ave-part.pl

The `ave-part.pl` command is used to create AVE partitions before the Benchmark Test is run.

**Procedure**

1. In the vSphere Client, select the AVE virtual machine and click the **Console** tab.
2. Click in the middle of the **Console** to put it into command mode and press **Enter**.

   Press **Ctrl-Alt** to regain mouse control.
3. Log in to the guest as root.
4. When prompted for a password, type **`changeme`** and press **Enter**.
5. Configure the virtual hard drives by typing the following command and pressing **Enter**:

   **`/usr/local/avamar/bin/ave-part.pl`**

   When all actions are completed and a `Script Complete!` message appears in the command shell. This script can take several minutes to complete.

# Running benchmark testing

The benchmark test is essentially the same as the Performance Analysis Tool (PAT). If the PAT passes, you should not need to use the benchmark test. However, if the configuration changes or additional load is added to the ESXi host between the PAT and the AVE deployment, I/O performance might change to unacceptable levels.

There are two purposes for this test:

- To ensure the AVE virtual machine runs in an environment with acceptable I/O performance.
- To stress virtual machine resources to determine whether the impact of running an AVE virtual machine is acceptable to other applications on the ESXi host.

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**Note**

Before running the benchmark test, warn the customer that the test will induce a high load on the ESXi host. Monitor the ESXi host performance while the tool is running to determine whether the stress on resources is acceptable. If not, end the test by following the instructions in Manually ending benchmark testing on page 27.

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# Starting benchmark testing

The following steps are used to start the benchmark test:

**Procedure**

1. On the **vSphere Client Console** tab, log in to the guest as root.
2. When prompted for a password, type **`changeme`** and press **Enter**.

   All remaining instructions in this procedure assume that you are logged in to the guest, and not into the ESXi Server.
3. Run the benchmark test by typing the following command:

   **`/usr/local/avamar/bin/24hr-benchmark.sh &`**

While the test is running, monitor the host ESXi Server's performance. If the stress on resources is unacceptable, end the test with the instructions. See Manually ending benchmark testing on page 27 for more detail.

The test runs for 24 hours unless it is manually ended (see next section). This command also copies operational status data to a log file.

4. After 24 hours, confirm the test has successfully ended by typing the following command:

   **ps -ax | grep benchmark**

   Blank output indicates the test is complete.

5. Save test results by typing the following commands:

   **cd /root**

   **tar -cvf CUSTOMERNAME_benchmark-results.tar *YYYYMMDD_benchmark***

   where YYYYMMDD_benchmark is the directory automatically created by the start of the test.

# Manually ending benchmark testing

By default, the benchmark test runs for 24 hours and does not need to be manually ended. If the stress on resources is unacceptable, the following steps can be used to manually end benchmark testing.

### Procedure

1. Type the following command on the vCenter Client Console tab:

   **/usr/local/avamar/bin/kill-benchmark.sh**

2. Wait at least 30 seconds, and then type the following command:

   **ps ax | grep benchmark**

   Blank output indicates the test has been stopped.

3. Delete data from the following directory:

   /usr/local/avamar/bin/

   Blank output indicates the test is complete.

# Analyzing benchmark results

Test results are written to:

/*DIRECTORY*/dt_std_*HOSTNAME*_summary

/DIRECTORY/*seektest_only_summary_1 files*

The following table lists minimal acceptable benchmark test results for 0.5 TB AVE:

**Table 5** 0.5 TB AVE minimum benchmark test results

| Conditions | File server data | Mixed data |
|---|---|---|
| Total Minimal Read Throughput | 60 MB/sec | 75 MB/sec |

**Table 5** 0.5 TB AVE minimum benchmark test results (continued)

| Conditions | File server data | Mixed data |
|---|---|---|
| Total Read Throughput | 60 MB/sec | 75 MB/sec |
| Total Minimal Write Throughput | 30 MB/sec | 60 MB/sec |
| Total Write Throughput | 30 MB/sec | 60 MB/sec |
| Total Seek Minimal Throughput for 4 Threads | 320 seeks/sec | 320 seeks/sec |
| Total Seek Throughput for 4 Threads | 400 seeks/sec | 400 seeks/sec |

The following table lists minimal acceptable benchmark test results for 1 TB AVE:

**Table 6** 1 TB AVE minimum benchmark test results

| Conditions | File server data | Mixed data |
|---|---|---|
| Total Minimal Read Throughput | 80 MB/sec | 100 MB/sec |
| Total Read Throughput | 80 MB/sec | 100 MB/sec |
| Total Minimal Write Throughput | 40 MB/sec | 80 MB/sec |
| Total Write Throughput | 40 MB/sec | 80 MB/sec |
| Total Seek Minimal Throughput for 4 Threads | 400 seeks/sec | 400 seeks/sec |
| Total Seek Throughput for 4 Threads | 500 seeks/sec | 500 seeks/sec |

The following table lists minimal acceptable benchmark test results for 2 TB AVE:

**Table 7** 2 TB AVE minimum benchmark test results

| Conditions | File server data | Mixed data |
|---|---|---|
| Total Minimal Read Throughput | 150 MB/sec | 150 MB/sec |
| Total Read Throughput | 150 MB/sec | 150 MB/sec |
| Total Minimal Write Throughput | 120 MB/sec | 120 MB/sec |
| Total Write Throughput | 120 MB/sec | 120 MB/sec |
| Total Seek Minimal Throughput for 4 Threads | 400 seeks/sec | 400 seeks/sec |
| Total Seek Throughput for 4 Threads | 500 seeks/sec | 500 seeks/sec |

The following table lists minimal acceptable benchmark test results for 4 TB AVE:

**Table 8** 4 TB AVE minimum benchmark test results

| Conditions | File server data | Mixed data |
|---|---|---|
| Total Minimal Read Throughput | 260 MB/sec | 260 MB/sec |
| Total Read Throughput | 270 MB/sec | 270 MB/sec |
| Total Minimal Write Throughput | 270 MB/sec | 270 MB/sec |
| Total Write Throughput | 280 MB/sec | 280 MB/sec |

**Table 8** 4 TB AVE minimum benchmark test results (continued)

| Conditions | File server data | Mixed data |
|---|---|---|
| Total Seek Minimal Throughput for 4 Threads | 500 seeks/sec | 500 seeks/sec |
| Total Seek Throughput for 4 Threads | 500 seeks/sec | 500 seeks/sec |

# Benchmark removal

Once the benchmark test is complete, it can be removed by typing the following command in the vSphere Client **Console** tab as root user:

### Procedure

- `/usr/local/avamar/bin/dtsh --cleanup`

# Benchmark failure

If minimum acceptable benchmark results cannot be achieved, delete the virtual machine by performing the following:

**Note**

Do not perform the following procedure if benchmark results are satisfactory. In that case, continue installing AVE.

### Procedure

1. Log in as root.

   When prompted for a password, type `changeme` and press **Enter**.

2. On the **vSphere Client Console** tab, type the following command:

   `poweroff`

3. In left pane, right-click the virtual machine you want to remove.
4. Select **Delete from Disk**.