VMS Software

VSI OpenVMS x86-64 V9.2-1 Installation Guide

Operating System and Version: VSI OpenVMS x86-64 Version 9.2-1

VMS Software, Inc. (VSI)
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Installation Guide

VMS Software

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Preface

VMS Software, Inc. (VSI) is an independent software company licensed by Hewlett Packard Enterprise to develop and support the OpenVMS operating system.

1. Introducing OpenVMS x86-64 V9.2-1

This manual provides instructions for booting and installing VSI OpenVMS Version 9.2-1 for x86-64 (hereafter referred to as OpenVMS x86-64 V9.2-1) using an ISO file on guest virtual machines.

2. Intended Audience

Users of this manual are expected to obtain and reference any additional documentation specific to their hardware and environment. Users are expected to know how to identify the various devices involved in their installation and be familiar with the console commands that are available on their system and virtual machines.

Users should be familiar with the virtual machine environments they plan to use for running OpenVMS x86-64 V9.2-1 as a guest virtual machine.

Make sure you read the Release Notes, Installation Guide, and Boot Manager Guide prior to installing OpenVMS x86-64 V9.2-1.

3. Using the VSI Customer Portal

See the VSI OpenVMS x86-64 V9.2-1 announcement email for information about how to log issues against the V9.2-1 release and how to use the VSI Services Portal at https://sp.vmssoftware.com.

4. Other Related Documentation

- *VSI OpenVMS x86-64 V9.2-1 Release Notes*

- *VSI x86-64 Cross-tools Kit Installation and Startup Guide*

- *VSI OpenVMS Linker Manual*

- *VSI Calling Standard Manual*

- *VSI OpenVMS x86-64 Boot Manager User Guide*

- VSI OpenVMS TCP/IP Services V6.0 documentation at

  VSI Documentation portal [https://docs.vmssoftware.com/]

- Third party documentation as cited throughout this document

Chapter 1. Preparing to Install VSI OpenVMS x86-64 V9.2-1

1.1. Tested Platforms

For information about supported virtual environments, see .

Important

Note that not all VMware license types are currently supported for running VSI OpenVMS x86-64 V9.2-1. For more information, see *VSI OpenVMS x86-64 V9.2-1 Release Notes*.

1.2. Platforms Documentation

Due to the many third-party platform products that you can use with VSI OpenVMS x86-64 V9.2-1, VSI cannot provide the complete documentation for these products. The following table lists each product and a URL to its documentation web site:

Oracle VirtualBox	https://www.virtualbox.org/wiki/End-user_documentation
Redhat Enterprise Linux	https://access.redhat.com/documentation/en-us/red_hat_enterprise_linux/9
VMware ESXi Enterprise	https://docs.vmware.com/en/VMware-vSphere/index.html
VMware Fusion	https://docs.vmware.com/en/VMware-Fusion/index.html
VMware Workstation Pro	https://docs.vmware.com/en/VMware-Workstation-Pro/index.html
VMware Workstation Player	https://docs.vmware.com/en/VMware-Workstation-Player/index.html
Ubuntu	https://help.ubuntu.com/
openSUSE Leap	https://doc.opensuse.org/

1.2.1. Recommended Settings for Virtual Machines

While the actual configuration of the VM should reflect your expected system usage, the expected system usage might be a hard thing to predict. However, the benefit of using a virtual machine is, you can always reconfigure it as needed for the current situation. VSI recommends that your OpenVMS x86-64 virtual machine be configured with the following minimum settings:

● **Memory:** 8 GB

   Note that if your installation fails due to the lack of memory, you can increase the amount of it for the duration of the installation and then, if needed, reduce it back.

● **Operating system:** Other 64-bit

● At least **two virtual disks** (SATA/AHCI, LSI Logic Parallel for VMware; SCSI for KVM; AHCI/SATA, LsiLogic, and VirtIOSCSI for VirtualBox). The disk used as the system disk should be at

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least 15 GB in size. The second disk is recommended for Dump Off the System Disk (DOSD) and should be at least 8 GB in size. Larger configurations may require a larger dump device.

- **Boot Option:** if present, disable Secure Boot. OpenVMS requires UEFI or EFI (BIOS is not supported)

- **Console Communication:** serial port using a raw TCP connection for VMWare and Virtual Box, or virsh for KVM VMs.

Note

Currently, only COM1 serial port is supported.

- An additional **serial line** for non-console login.

- **Network:** Adapter Type or Device Model of e1000 (ESXi or KVM); 82540EM (VirtualBox)

- **CD/DVD device** (physical or virtual) with the OpenVMS installation kit (the .ISO file) assigned to it

- **CPU** that meets the following requirements:

  - Intel or AMD x86 CPU

  - 64-bit Instruction set

  - NX processor bit (NX)

  - Streaming SIMD Extensions 4.1 (SSE4.1)

  - Virtualization Technology (VT-x)

  - XSAVE instructions

  - Time Stamp Counter (TSC)

  - Advanced Programmable Interrupt Controller (APIC)

  - Memory Type Range Registers (MTRR)

  Most Intel CPUs from 2016/AMD (Zen) CPUs from 2017 and later support these processor features.

- **Minimum number of CPUs:** 2

- **Chipset**, where offered: ICH9 (VirtualBox); Q35 (KVM)

1.3. Licensing

During the installation, you will be prompted to register Product Authorization Keys (PAKs) for the base operating environment and any layered products that are not already included in the base OS.

A PAK is represented as a text structured file containing a series of named fields and unique values that were generated by VSI. You have the option to register your PAKs during the installation, or after the installation is complete. VSI recommends you register your PAKs after the installation by converting the PAK file(s) that VSI provided, renaming it with a .com extension, and then executing that file; this

will register all your licenses at once. However, you must either issue the `LICENSE LOAD` command or reboot to make them active. If you choose to register your PAKs *during* the installation, you can either type the values of each requested field, or copy-and-paste the values into the console line by line (assuming your console connection supports this action, such as using a terminal emulator).

Below is an example of what a PAK might look like:

```
$ LICENSE REGISTER OPENVMS-X86-BOE -
/ISSUER=VSI -
/AUTHORIZATION=1-VSI-SAMPLAUTH-0001 -
/PRODUCER=VSI -
/UNITS=32 -
/TERMINATION_DATE=31-OCT-2023
/OPTIONS=(PCL,X86_64) -
/CHECKSUM=X-XXXX-XXXX-XXXX-XXXX
```

1.3.1. Using VMware vSphere Hypervisor Licenses

Use the method described below to run VMware vSphere Hypervisor on an ESXi server with a basic license (not Enterprise or Enterprise Plus). You must use serial ports within the same ESXi server.
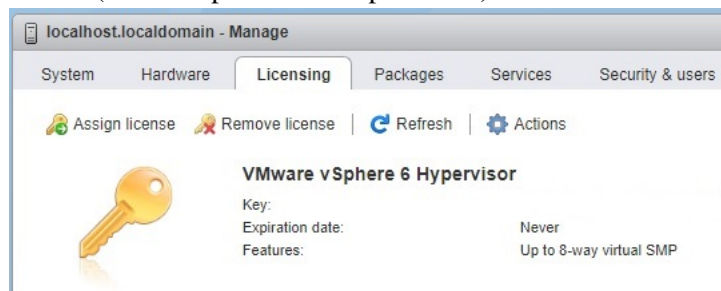
Use the named pipe functionality to map `COM1/OPA0:` on the VMS virtual machine to a pipe on a management server on which a terminal emulator is installed.

With the VM system in client mode, use the following syntax: `\\.\pipe_name`

With the management system in server mode, use the following syntax: `\\.\pipe_name`, where *pipe_name* is a unique name that you provide for each VM.

Note

For the named pipe connection to work correctly, both the server and client must reside on the host system.

The terminal emulator should be set for serial connection at 115200 baud.

The following two figures show how to set up pipes for a local terminal emulator-based console.
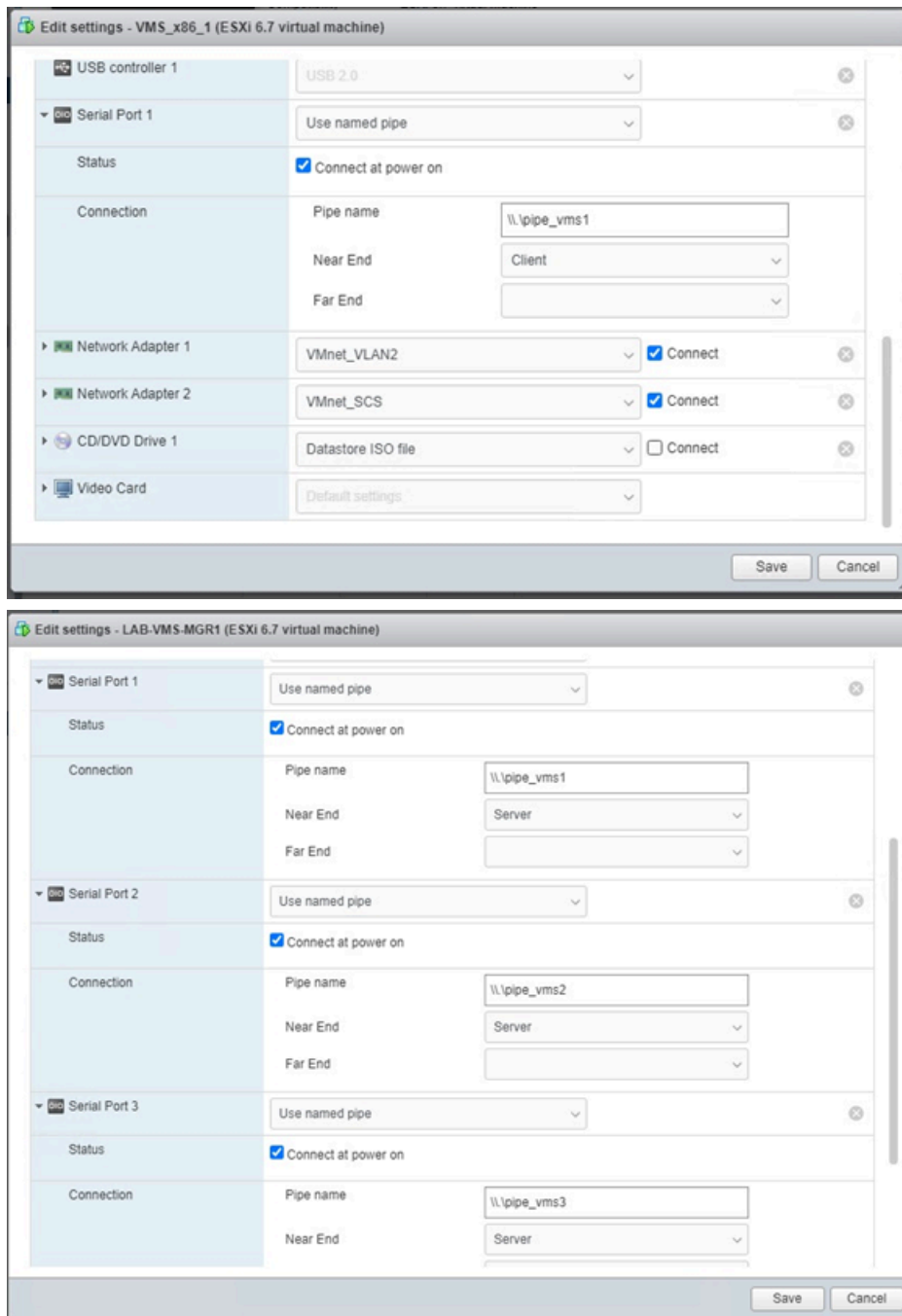
The following two figures show how to set up pipes between two local virtual machines where one plays the role of VMS console. This could be a virtual machine guest running any OS that supports a terminal emulator.

Chapter 2. Creating and Configuring a Virtual Machine

This chapter provides basic instructions for creating and configuring a guest virtual machine (VM) on VMware ESXi, KVM, and Oracle VirtualBox. In these instructions, VSI assumes that the application for managing the VM guests is already installed and configured.

2.1. Creating a VMware ESXi Virtual Machine

The instructions in this section were written for VMware ESXi 7.0. However, the general principles described here also apply to other VMware products, such as Workstation and Fusion.

To create a virtual machine on a VMware ESXi host, follow these steps:

1. Download, unzip, and copy the VSI OpenVMS x86-64 V9.2-1 ISO file to an area that is locally accessible to the browser used to connect to the VMware ESXi host client.

2. In your browser, enter the ESXi host IP address to bring up the VMware ESXi environment. At the login screen, provide your user credentials and log in.

3. On the left side of the VMware ESXi window, go to **Navigator > Storage**. On the right side of the window, click **Datastore browser**.

4. In the **Datastore browser** pop-up window, left-click the datastore where you would like to save the ISO kit, click **Upload**, and navigate to the ISO kit (which should be on your browser's local system). Then, click **Open**.

Note

Once the upload starts, you can close the **Datastore browser** window.

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5. To create a virtual machine using the ISO file, go to the **Host** menu, then click the **Create/Register VM** button.

6. In the **New virtual machine** window, perform the following steps:

    a. On the **Select creation type: Create a new virtual machine** page, click **Next**.

    b. On the **Select a name and guest OS** page, specify the following information:

        i. **Name** – set the name for your virtual machine. Keep in mind, the name must be unique in your environment.

        ii. **Compatibility** – VSI recommends accepting the default value.

        iii. **Guest OS family** – select **Other**.

        iv. **Guest OS version** – select **Other (64-bit)**.

        Click **Next**.

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c. On the **Select storage** page, select the datastore that will contain the disk image(s) and files for your VM. Click **Next.**

d. On the **Customize settings** page, click **Virtual Hardware** and specify values for the following fields:

   i. **CPU** – set the number of CPUs for your VM. VSI recommends a minimum of 2.

   ii. **Cores per Socket** – select a value appropriate for your VM and licensing needs.

   ───

   ## Note

   The **Sockets** field updates automatically depending on the number of cores per socket that you select.

   ───

   iii. **Memory/RAM** – set the appropriate amount of RAM for your VM. VSI recommends a minimum of 8 GB.

   iv. **SCSI Controller 0** – if this controller does not exist, and you would like to add it to your VM, click the **Add other device** button, above the **CPU** field. Then, select **SCSI controller** from the dropdown menu. Then, make sure **LSI Logic Parallel** is selected from the list. Other SCSI controllers are not supported in the current release.

   SATA Controller 0 – if this controller does not exist, and you would like to add it to your VM, click the **Add other device** button, above the **CPU** field. Then, select **SATA controller** from the dropdown menu.

   v. **Hard disk 1** – select disk type and set the size. VSI recommends setting up your VM with at least two disk images – one for the system files, and another for the sysdump.dmp (DOSD) and data files. VSI recommends a minimum of 15 GB for the system disk. Also, set the following parameters:

      A. **Controller location** on the left side – select the controller you wish to use: **SATA** or **SCSI**.

      B. **Controller location** on the right side – select the bus and LUN assignment for your disk (or accept the default value).

      ───

      ## Note

      Make sure *not* to use the same bus/LUN setting for any of your disks and/or CDROMs.

      ───

      ───

      ## Important

      At this stage, if you are using VMware Workstation 17 on an AMD-equipped computer, make sure to check the **Allocate all disk space now** checkbox.

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   vi. To add an additional disk, perform the following steps and specify the following settings:

      A. Click the **Add hard disk** button just above the CPU field.

      B. Select **New standard hard disk**.

C. **New Hard disk** – select disk type and set the size.

    I. **Controller location** on the left side – select the controller you wish to use: **SATA** or **SCSI**.

    II. **Controller location** on the right side – select the bus and LUN assignment for your disk (or accept the default value).

Note

Make sure *not* to use the same bus/LUN setting for any of your disks and/or CDROMs.

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vii. **Network Adapter 1** – ensure the correct adapter is selected from the drop-down list. The correct adapter depends on your environment.

- **Adapter Type** – select **E1000** from the list.

viii. **CD/DVD Drive 1** – select the Datastore ISO file value.

A. In the Datastore browser pop-up window, navigate to the VSI OpenVMS ISO file that you downloaded earlier and click **Select**.

B. **CD/DVD Media** – ensure the path to the ISO is correct.

C. **Controller location** on the left side – ensure the correct controller is selected for the new disk.

D. **Controller location** on the right side – select the bus and LUN assignment for the new hard disk.

ix. Set up a serial port for your VM, so that you can connect to it later using a terminal emulator. If you are using VMware ESXi, you will have to map this serial port to a valid TCP/IP port. If you are using any other VMware product as your hypervisor of choice, you may need to use a named pipe connection. Both methods are described below. Follow these steps:

A. Click **Add other device**.

B. Select **Serial port**.

C. From the **New Serial Port** dropdown list, select **Use network** if you plan to use you serial port with a TCP/IP port. If you plan to use your serial port with a named pipe, select **Use named pipe**.

Note

Note that using named pipes requires that your terminal utility reside on your VM host system. To use named pipes over a different network node, you will need to use a Named Pipe Proxy server.

D. If you selected **Use network** in the previous step, type `tcp://<your ESXi host IP>:<port ID>` in the **Connection Port URI** field. The port ID must be unique on

the ESXi host. Once you are satisfied with the URI, click anywhere in the window to validate the URI format and remove the warning.

If you selected **Use named pipe**, type `\\.\pipe\pipe_name` in the **Pipe name** field. The pipe name must be unique for each VM.

E. **Connection Direction** – ensure **Server** is selected.

e. On the **Customize settings** page, click **VM Options** and specify the following information:

i. Click **Boot Options** to expand the settings.

iii. **Enable UEFI secure boot** – make sure this checkbox *is not* checked.

iv. **Force BIOS setup** – make sure this checkbox *is* checked.

v. Click **Next**.

f. On the **Ready to complete** page, review the settings. If everything is correct, click **Finish**.

2.1.1. Completing Your VMware ESXi Virtual Machine Configuration

Once you have created your VM, follow these steps:

1. Go to the **Virtual Machines** area in the VMware ESXi environment and select the VM you created.

2. Edit the settings for your VM. Click the **VM Options** button.

   a. Navigate to **Boot Options > Firmware** and set the value to **EFI**.

   b. Navigate to **Advanced > Configuration Parameters** and from the **Edit Configuration** set the following parameters accordingly.

Key	Value
efi.quickBoot.enabled	FALSE
efi.serialconsole.enabled	TRUE
efi.shell.activeByDefault	TRUE

Note

Make sure your capitalization is done as specified in the table above.

   c. Click **Save**.

3. Your VM information, hardware configuration, and power controls will now be displayed. Click the **Power on** button at the top.

4. After the power on process is successfully completed, you will see the the blue BIOS screen of your VM in the console preview pane in the top left.

5. Click anywhere in the console preview pane to open up the ESXi browser console to the VM. The platform Boot Manager screen will be displayed. If needed, configure the screen size (in the menu,

navigate to **Boot Manager screen>Enter setup>Configure screen size>Set screen size>Commit changes and exit>Exit Boot Maintenance Manager**).

6. Navigate to **Enter setup > Configure boot options > Enable or disable boot options** screen and disable all lines *except* the **EFI Internal Shell (Unsupported option)**. An example is shown below.
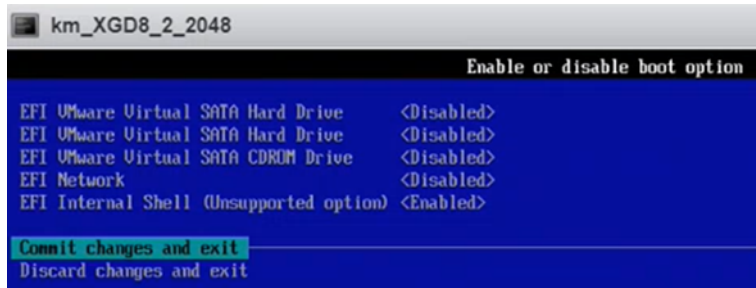
7. Select **Commit changes and exit > Exit the Boot Maintenance Manager**.

8. From the Boot Manager screen, select **EFI Internal Shell (Unsupported option)**, and press Enter.

Your virtual machine is now ready to have VSI OpenVMS x86-64 installed on it. See *Chapter 3, "Installing and Upgrading VSI OpenVMS x86-64 V9.2-1 on a Guest Virtual Machine"*.

2.2. Creating a KVM/QEMU Virtual Machine

Note

The following instructions have been written for KVM/QEMU 5.2.

To create a virtual machine on KVM/QEMU virtual machine, follow these steps:

1. Download, unzip, and copy the VSI OpenVMS x86-64 V9.2-1 ISO file to an area that is locally accessible to the KVM host server.

2. Run the Virtual Machine Manager and select **File > New Virtual Machine** from the main menu. The **Create a new Virtual Machine** wizard opens.

3. Select **Local install media (ISO image or CDROM)** and click **Forward**.

4. Click **Browse**.

5. In the *Locate ISO media volume* window, click the **Browse Local** button, then navigate to the VSI OpenVMS V9.2-1 ISO file, select it, and click **Open**.

6. Uncheck the **Automatically detect from the installation media/source** box and type in the search box **Generic** and select the value that has the words 'unknown' or 'generic' in parenthesis. Click **Forward**.

7. Select the amount of memory and number of CPUs to use for your VM. VSI recommends a minimum of 8 GB memory and 2 CPUs. Click **Forward**.

8. The **Create a disk image for the virtual machine** option is selected by default. Set the disk size for your VM; VSI recommends a minimum of 8 GB

Note

If you don't want your images to be saved in the default directory `/var/lib/libvirt/images` with default file names, you should either select **Select or create custom storage**, then click **Manage** and create your desired storage volumes for your VM disk images. Be sure to select the desired volume, then click the **Choose Volume** button.

Click **Forward**.

9. Give your virtual machine a name, review your VM's settings, and check the **Customize configuration before install** checkbox. Click the arrow next to **Network Selection** and verify your system is using a Bridge device with the appropriate Device name. Then, click **Finish**.

2.2.1. Completing Your KVM/QEMU Virtual Machine Configuration

1. Once you have created your VM, a **<VM_name> on QEMU/KVM** window opens. Then, set the following settings:

   a. Go to **Overview**, set the following settings:

      i. From the **Chipset** dropdown, select **Q35**.

      ii. From the **Firmware** dropdown, select the most basic **UEFI x86_64:/usr/share/*code.*** option.

      iii. Click **Apply**.

   b. If you wish to use **SCSI** disks, click the **Add Hardware** button located at the lower left.

      i. Go to **Controller**.

      ii. From the **Type** drop-down list, select **SCSI**.

      iii. Ensure the **Model** drop-down list is set for **VirtIO SCSI**.

      iv. Click **Apply**.

   c. Go to **IDE Disk 1 > Disk bus.**

      i. For the **Disk bus**, select either **SATA** or **SCSI**, whichever is appropriate for your environment. Other disk controller types are currently not supported.

      ii. Click **Apply**.

   d. VSI recommends setting up your VM with at least two disk images – one for the system files, and another for the sysdump.dmp (DOSD) and data files. To add an additional disk (aside from the system disk), click the **Add Hardware** button in the lower left corner of the screen, then perform the following steps:

      i. Go to **Storage**.

      ii. Select either one of the two options:

- **Create a disk image for the virtual machine** – will create a new qcow2 disk image which will be saved in the default location with a default name.

- **Select or create custom storage** – will allow you to create a disk volume and specify the desired storage location, name, and disk format.

   iii. Set your disk size as well as (if you clicked **Select or create custom storage**) the location, name, and/or format.

   iv. Make sure that **Device type:** is set to **Disk device**.

   v. Select either **SCSI** or **SATA** from the **Bus Type** drop-down list. Other disk controller types are currently not supported.

   vi. Click **Finish**.

   vii. Repeat these steps for each additional disk you wish to add to your configuration.

e. Go to **IDE CDROM 1**.

   i. To specify **Source path**, click **Browse**, navigate to the VSI OpenVMS V9.2-1 ISO file and select it. Then, click the **Choose Volume** button.

   ii. For the **Disk bus**, select either **SATA** or **SCSI**, whichever is appropriate for your environment. Other disk controller types are currently not supported.

   iii. Click **Apply**.

f. When you have created and configured your devices, go to **Boot Options**.

   i. Enable the **Enable boot menu** option.

   ii. Check the devices from which you want to boot (CDROM and the system disk, in most cases).

   iii. Click **Apply**.

2. VSI OpenVMS uses a serial port, so one has to be added on the VM that runs it. To set up the serial port, click **Add Hardware** again, then select **Serial**. Make sure that the **Pseudo TTY (pty)** type is selected. Accept the defaults for other parameters.

3. Go to **NIC:<your_mac_address>**

   a. From the **Device model:** dropdown, select **e1000e**.

   b. Click the field that shows **e1000e** and delete the **e** at the end, so that only **e1000** remains.

   c. Click **Apply**.

4. Click **Begin Installation**.

4. The Virtual Machine Manager Console will now show either the EFI Shell> prompt or the BootMgr> prompt. The screen that is displayed is dependent on which operating system that KVM is installed on and on which firmware .bin file was selected when the VM was created.

5. Regardless of which prompt is displayed, type `EXIT` and immediately press the **ESC** key repeatedly until the blue platform Boot Manager screen is displayed.

6. Navigate to **Boot Manager**, then select the **EFI Internal Shell** option and press **ENTER**.

7. You will see the EFI Shell prompt now. Enter `MAP FS* -B` to display just the file systems available on your VM one page at a time.

8. Inspect this list of file systems, and choose the one that maps to the VSI OpenVMS V9.2-1 ISO file. Since that ISO has been set up as a CDROM, the file system that maps to it will be labeled as CDROM. As an example, we will assume that the file system we want is `FS0:`.

9. At the Shell> prompt, enter `FS0:\efi\vms\vms_bootmgr`.

10. After this, you should see the VSI Boot Manager screen.

Your virtual machine is now ready to have VSI OpenVMS x86-64 installed on it. See *Chapter 3, "Installing and Upgrading VSI OpenVMS x86-64 V9.2-1 on a Guest Virtual Machine"*

2.3. Creating a VirtualBox Virtual Machine

Note

The following instructions have been written for VirtualBox 7.0.

To create a virtual machine in Oracle VM VirtualBox 7, follow these steps:

1. Run Oracle VM VirtualBox and select **Machine > New** from the main menu. The **Create Virtual Machine** wizard opens.

2. On the **Virtual machine Name and Operating System** page of the wizard, do the following:

   a. Set the **Name** and **Folder** for your VM.

   b. In the **ISO Image** field, specify the path to your OpenVMS ISO file.

   c. In the **Type** dropdown, select **Other**.

   d. In the **Version** dropdown, select **Other/Unknown (64-bit)**.

   e. Click **Next**.

3. On the **Hardware** page of the wizard, set the **Base Memory** for your virtual machine. VSI recommends a minimum of 8 GB. Click **Next**.

4. On the **Virtual Hard** disk, set the size of your virtual hard disk. VSI recommends a minimum of 15GB. Click **Next**.

5. Click **Finish**.

You have created your VirtualBox virtual machine. Now, you must properly configure it before you can install VSI OpenVMS x86-64 V9.2-1.

2.3.1. Completing Your VirtualBox Virtual Machine Configuration

To prepare your virtual machine for VSI OpenVMS x86-64 installation, follow these steps:

1. Once you have created your VM, right-click it and select **Settings** from the menu.

2. In the **Settings** window, do the following:

    a. Go to **System > Motherboard** and specify the following settings:

        i. From the **Chipset** dropdown, select **ICH9**. If you select any other chipset, OpenVMS will not install.

        ii. Make sure the **Enable I/O APIC** and **Enable EFI** options are checked.

        ### Note

        Your virtual machine *must* boot from UEFI, not BIOS.

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    b. Go to **Storage**.

    In the Storage Devices area of the Settings window, you will see the default IDE controller and two devices: the hard disk that you created in the [previous topic](#) and the optical drive containing the VSI OpenVMS V9.2-1 ISO file. IDE disk controllers are currently not supported, so you *must* change the controller type to either AHCI (SATA) or LsiLogic (the choice is up to you). To do so, perform the following steps:

        i. Click the IDE controller to select it.

        ii. In the Attributes area on the right side of the Settings window, select **AHCI** or **LsiLogic** from the **Type** dropdown list.

        iii. To avoid confusion in the future, enter an appropriate name in the **Name** field.

        iv. Click the hard disk to display its attributes and make sure that it is now marked appropriately as SATA or LsiLogic.

        v. Click the optical drive to display its attributes and make sure that it is now marked appropriately as SATA or LsiLogic.

    c. Go to **Network**.

        i. Click the **Attached to** dropdown and select **Host-only Adapter**.

        ii. Click **Advanced**.

        iii. From the **Adapter type** dropdown, select **Intel PRO/1000 MT Server**.

    d. Go to **Serial Ports**. Your VM must have an active serial port, so that you can connect to it later using a terminal emulator.

        i. Check **Enable Serial Port**.

      ii. Set **Port Mode** to **TCP**.

     iii. Uncheck **Connect to existing pipe/socket**.

     iv. In the **Path/Address** field, type the port number that you want to use. In this example, we will use port 2023.

  e. Click **OK** to apply the changes and close the **Settings** window.

Your virtual machine is now ready to have VSI OpenVMS x86-64 installed on it. See *Chapter 3, "Installing and Upgrading VSI OpenVMS x86-64 V9.2-1 on a Guest Virtual Machine"*.

Chapter 3. Installing and Upgrading VSI OpenVMS x86-64 V9.2-1 on a Guest Virtual Machine
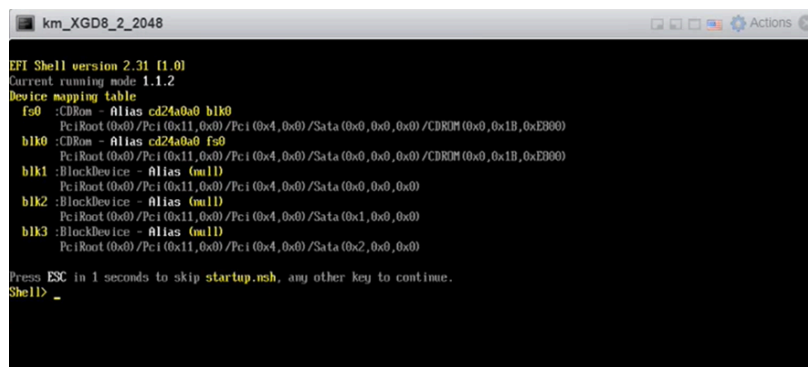
This chapter provides instructions on booting and installing VSI OpenVMS V9.2-1 on a guest VM, regardless of which hypervisor you are using.

For the first installation of VSI OpenVMS as a guest VM, continue with section *Section 3.1, "Installing VSI OpenVMS x86-64 V9.2-1"*. For upgrading an existing VMS installation on a VM, skip to *Section 3.2, "Upgrading to VSI OpenVMS x86-64 V9.2-1"*.

3.1. Installing VSI OpenVMS x86-64 V9.2-1

Before you install VSI OpenVMS x86-64 V9.2-1 on your virtual machine, ensure it has been created and configured as directed in *Chapter 2, "Creating and Configuring a Virtual Machine"* of this document. Once you have created and started your VM (or clicked **Begin Installation**, if you are using QEMU/KVM), follow these steps:

1. Power on your VM. Depending on your hypervisor of choice and the boot options settings of your VM, you will either see the UEFI Shell> prompt:

or the VSI Boot Manager screen:

_____

2. If you see the UEFI Shell> prompt, do the following:

   a. At the Shell> prompt, enter MAP FS* -B to display all the file systems available on your VM. The -B option will display the entries one page at a time if more than a page-worth exists.

   b. Choose the file system that maps to the VSI OpenVMS V9.2-1 ISO file. Since that ISO has been set up as a CDROM, the file system that maps to it will be labeled as CDROM as well. As an example, we will assume that the file system we want is FS0:

   c. At the Shell> prompt, enter FS0:\efi\vms\vms_bootmgr

   After this, you should see the VSI Boot Manager screen.

3. At the BOOTMGR> prompt, type DEVICES to display the list of available VMS-bootable devices.

4. From the list, identify the device that contains the ISO file with the new version of VSI OpenVMS (it will be labeled as a CDROM or DVD). Enter BOOT <device_name>, where <device_name> is the name of the disk that contains your ISO file (*not* the name of the ISO file itself). As an example, we enter BOOT DKA100. After the progress meter reaches 100%, you should see the following screen:
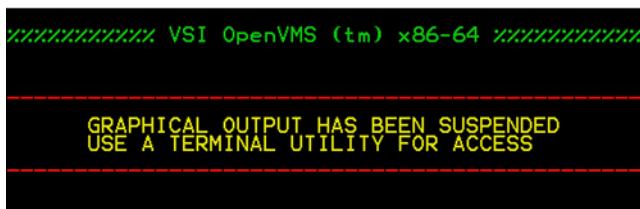
5. Establish a remote connection to your VM via a terminal emulator. Depending on your hypervisor of choice, VSI recommends using the following methods:

   ● On VMware hypervisors, you can choose to connect via telnet or a named pipe, depending on how you set up your VM earlier (see step 6.4.9 of the *Creating a VMware ESXi Virtual Machine* section).

   ● On KVM, perform the following procedure:

      a. Make sure that the serial console is enabled and started on the host server.

      b. Make sure that virsh is connected to the hypervisor that you are using.

      c. Start virsh and enter the command `console VMname`, where `VMname` is the name of the VM that you want to connect to.

- On VirtualBox, connect via telnet using the serial port of your VM (that you set up in <u>step 4</u> of the *Completing Your VirtualBox Virtual Machine Configuration* section) and the IP address of the host system.

Warning

If you are utilizing VMware Workstation or VMware Fusion as your hypervisor, be advised that virtual serial port support is not available via the GUI. For more information, refer to the Release Notes.

Note

If you are on ESXi, make sure that the port used by your VM can go through the ESXi firewall. If you are having trouble at this stage, contact the ESXi administator in your company.

When the BOOTMGR> prompt appears, your terminal emulator should automatically connect to your VM. However, if that does not happen, you can initiate command output to the serial port manually by entering the command:

```
BOOTMGR> COM n
```

where *n* is the serial port number that your VM uses.

6. Upon connecting, you should see the VSI OpenVMS installation menu and/or the `Enter CHOICE or ? for help: (1/2/3/4/5/6/7/8/9/?)` prompt:

Note

If this prompt does not appear, and the output appears blank or unchanging, press Enter. The prompt should now appear. To see the OpenVMS installation menu, type `?`, hit Enter, then hit Enter again.

Important

VSI OpenVMS x86-64 V9.2-1 does not support installation menu items number 3, 5, and 7. Also, do not use item number 6, unless directly instructed otherwise.

---

7. Enter `1` to start the installation process.

8. Since this a new installation, answer `INITIALIZE` to the `Do you want to INITIALIZE or to PRESERVE?` question.

9. At the `Enter device name for target disk:` prompt, enter the name of the disk where you want to install VSI OpenVMS.

To display a list of available devices, enter `?`. You can also enter `??`, which will display a list of devices with their volume label and size. As an example, we will enter `DKA0:`

10. At the `Enter volume label for target system disk` prompt, enter the label that you want to assign to your system disk. In this example, we will enter `systemDisk`.

11. You will see the `Do you want to enable hard links?` question. This choice is up to you and depends on how you are using or plan to use your OpenVMS setup. For more information about hard links, see VSI OpenVMS System Manager's Manual, Volume 1 [https://docs.vmssoftware.com/vsi-openvms-system-manager-s-manual-volume-1-essentials/].

12. A summary of your choices will be displayed, as well as a prompt asking you to confirm your choice. Enter `YES` if no changes are needed, or `NO` to re-enter the disk label and choice for hard-links. For brevity and readability, similar prompts will not be mentioned again in this document.

13. After the target disk has been initialized and mounted, you will be asked to create the SYSTEM password. Set and confirm the password for your SYSTEM account. The password must be a minimum of 15 characters.

Warning

If everything is working correctly, you should not see any characters in your output while you enter your password.

If you, however, see any output or get an error at this stage, this could be a terminal emulator issue or a Telnet issue. Make sure that Telnet operates in character mode and that your terminal emulator is forcing the local echo off.

---

14. At the `Enter SCSNODE:` prompt, enter a unique name for your OpenVMS system. As an example, we will enter `x86`.

15. Next, you will see the `Do you plan to use DECnet?` prompt. DECnet is a family of products that allows OpenVMS systems to communicate with each other (for more information, see VSI DECnet-Plus for OpenVMS Introduction and User's Guide [https://docs.vmssoftware.com/vsi-openvms-decnet-plus-introduction-and-user-s-guide/]). This choice is up to you and depends on how you are planning to use your OpenVMS setup.

Note

If you answer `NO`, you will be asked to specify a value for the SCSSYSTEMID parameter. This parameter is an ID number that each OpenVMS system has on a network. Make sure that each SCSSYSTEMID is unique amongst the systems on your network.

If you answer `YES`, the value for SCSSYSTEMID will be calculated based on the DECnet address that you enter when prompted for it.

---

16. Depending on your response to the previous question, you will be prompted for either the DECnet IV address, or the SCSSYSTEMID value. Enter a value that is unique in your environment.

17. The next several prompts will ask you to specify the time zone information for your system. Enter approptiate values.

18. After setting the time zone information, you will see the `Do you want to register any Product Authorization Keys?` prompt. VSI recommends that you answer `NO` and register your Product Authorization Keys (PAKs) after the installation is complete.

Important

VSI provides PAKs in the form of text files containing DCL code. You *cannot* run that code during the VSI installation. However, if you choose to NOT register your PAKs now, once the installation has completed and the system has rebooted (twice), you will be able to register your PAKs all at once by creating a COM file comprised of a copy-paste (provided your terminal emulator supports this) of the entirety of the PAK, then executing your COM file. You must then issue the `LICENSE LOAD` command to make the license(s) active on your system. If you choose to register your PAKs now, you must manually type the values for each of the fields exactly as they appear in the PAK for each license you wish to register. The licenses will be loaded automatically when the installation has completed and the system has finished rebooting.

---

19. Next, you will see the `Do you want to install DECwindows Motif for OpenVMS X86-64 V1.8?` prompt. DECWindows Motif is a graphical user interface for VSI OpenVMS. The answer is up to you, because it depends on how you plan to use your VSI OpenVMS setup.

20. Next, you will be prompted about installing DECnet products, which allow OpenVMS systems to communicate and share resources with each other.

    First, you will see the `Do you want to install DECnet-Plus for OpenVMS X86-64 V9.2-D?` promt. If you answer `NO`, you will see the `Do you want to install DECnet Phase IV for OpenVMS X86-64 V9.2-1?` prompt. Note, that you *cannot* install both products. Your choice to install one of them or neither of them depends on how you plan to use your VSI OpenVMS setup.

21. Give an answer to the `Do you always want detailed descriptions?` question. The answer is entirely up to you. As an example, we will say `NO`.

22. The product kit validation will proceed and then the configuration phase starts. Then, you will see the `Do you want the defaults for all options?` question. If you answer `YES` (which is recommended), the following components will be installed automatically:

    - DECdtm Distributed Transaction Manager

    - Support for DECnet-Plus or DECnet (Phase IV) for OpenVMS

    - Programming Support:

        o Debugger Utility

        o Image Dump Utility

        o Macro libraries

        o Macro-32 Migration Compiler

        o TLB intermediary form of STARLET

        o C Header Files

        o VMS text libraries of Ada declarations

- RMS Journaling Recovery Utility

- System Programming Support:

  - Delta Debugger

  - System Dump Analyzer Utility

  - Miscellaneous Symbol Table Files

- Utilities:

  - Phone Utility

  - XPG4 Internationalization Utilities

  - World-Wide PostScript Printing Subsystem

- Bliss Require Files

- Example Files

- Message Facility Files (HELP/MESSAGE)

- UETP Files

- DECwindows Server Support:

  - DECwindows Workstation files

  - Video fonts:

    - 100 dots-per-inch video fonts

  - Euro base support

    - Euro 100 dots-per-inch video fonts

- Delete any obsolete OpenVMS files

- Delete files archived by OpenVMS remedial kits

However, if you prefer *not* to install some of these components, answer NO and the system will prompt you about installing each component individually. Note, that in order to not install a subcomponent, you must first choose to install the main component

23. As the configuration phase progresses, some products may require the system to be rebooted. Answer YES to the `Can the system be REBOOTED after the installation completes?` question. A reboot is a necessary part of the installation process. If you answer NO, the installtion will abort.

24. At this stage, if you previously answered NO to the `Do you want the defaults for all options?` question (see above), you will see additional prompts asking you to confirm or reject the installation of subcomponents of some of the layered products.

25. Once the installation procedure has configured the layered products and their options, you will see the `Do you want to review the options?` prompt. The answer is up to you. As an example, we will answer `NO`.

26. After the `Portion done:` meter reaches 100%, a list of installed products will be displayed, followed by post-installation information for some of the products. Once the system updates the memory disk (which may take a minute), the installation procedure is complete. You will see the `Press Return to continue...` prompt. Press Enter.

27. Next, you will see the VSI OpenVMS installation menu and the `Enter CHOICE or ? for help: (1/2/3/4/5/6/7/8/9/?)` prompt. Enter 9 to shut down the system.

28. The system will shut down and display the `**** Hit any key to reboot system ****` prompt. Press any key to reboot the system.

29. Depending on your hypervisor of choice, you will either see the VSI Boot Manager screen, or the UEFI screen. If you see the VSI Boot Manager screen, proceed to the next step.

    If you see the UEFI Shell> prompt, do the following:

    a. At the `Shell>` prompt, enter `MAP FS* -B` to display all the file systems available on your VM. The `-B` option will display the entries one page at a time if more than a page-worth exists.

    b. Find the file system for the newly installed system disk. If the correct file system isn't readily apparent, use the file system for the CDROM device which had the installation ISO mapped to it.

    c. At the `Shell>` prompt, enter, for example `FS1:\efi\vms\vms_bootmgr`

    The VSI Boot Manager screen should now be displayed.

30. At the `BOOTMGR>` prompt, enter `DEVICES`. All VMS bootable devices will be listed.

31. At the `BOOTMGR>` prompt, enter `BOOT <system_disk_name>`, where <system_disk_name> is the disk that you specified as the target disk for the OpenVMS installation (in this step). The OpenVMS volume label for the device should be identified as the one you used for your target device, not for the CDROM/DVD device. In this example, we will enter `BOOT DKA0`. The system will boot up, run `AUTOGEN`, then automatically perform a shutdown and reboot. Please take note of, and investigate, any warnings that `AUTOGEN` may display.

32. When you see the `BOOTMGR>` prompt again, type `DEVICES` to show what bootable devices are available, then enter `BOOT <system_disk_name>` one more time and wait for the system to boot. Press Enter when you see an output similar to the one below:

```
 Accounting information:
 Buffered I/O count:              3087     Peak working set size:       13968
 Direct I/O count:                1521     Peak virtual size:          278848
 Page faults:                     4117     Mounted volumes:                 0
 Charged CPU time:       0 00:00:01.01     Elapsed time:       0 00:00:04.40
%EIA0, Link up: 1000 mbit, fdx, flow control (rcv only), 08-00-27-07-FC-DE
```

33. At the `Username:` prompt, type in `system`.

34. At the `Password:` prompt, enter in the password that you had previously set for the SYSTEM account (see this step).

35. You have successfully installed OpenVMS. If you did not register any of your licenses during installation (which is recommended), you must do so now, otherwise you will not be able to use any of the installed products.

To register your PAKs, you can either use the SYS$UPDATE:VMSLICENSE.COM procedure to enter the data for each PAK individually, or you can create a COM file, copy the contents of all your PAKs into it, and then execute the file by entering @ fileName.COM.

After you have registered your licenses, you must enter the LICENSE LOAD command (or reboot your VM) in order to be able to use the installed products.

You have successfully installed OpenVMS and registered your licenses. Now, you must perform several configuration steps, as outlined in *Chapter 4, "Networking Options"*.

3.2. Upgrading to VSI OpenVMS x86-64 V9.2-1

This section describes how to upgrade from the previous version of OpenVMS to V9.2-1.

It is *not* possible to upgrade VSI OpenVMS on a shadowed system disk, the procedure will always fail. You will need to disable shadowing on the system disk *before* you can upgrade the operating system.

If you are utilizing a non-shadowed system disk, you can proceed directly to the upgrade procedure *Section 3.2.2, "Upgrading a Non-Shadowed System Disk"*.

3.2.1. Creating a Non-Shadowed Target Disk From a Shadowed Disk

This section describes how to disable shadowing on an existing shadowed system disk, so that it can be used as a target disk for the upgrade.

Caution

VSI strongly recommends that you make a backup copy of the system disk before upgrading it.

To disable shadowing on a system disk, follow these steps:

1. Enter the command $ @SYS$SYSTEM:SHUTDOWN to shut down the system booted from the shadowed system disk that you want to upgrade.

2. The system will ask you several questions. Give appropriate answers, but make sure to answer NO when asked for permission to perform an automatic reboot.

3. Once you have shut down the system, you will need to perform a conversational (interactive) boot of the system disk that you want to upgrade. Begin the process by entering the following command at the UEFI Shell prompt:

   ```
   Shell> fsn:\efi\vms\vms_bootmgr
   ```

   where fsn is the file system associated with the shadowed system disk device that you want to upgrade. If you do not know which file system you need, enter the command **MAP FS* −B** to display all file systems available on your VM and look for the one associated with the shadowed system disk that you want to upgrade.

4. Once you have selected the file system that you want to work with (for example, fs1) and entered the command mentioned in the previous step, you will see the BOOTMGR> prompt.

5. On the boot manager startup screen, you will see the default boot command template, similar to the following:

`DEFAULT BOOT COMMAND: BOOT `*`your_device`*` 0x00 0x00000000`

where `0x00` stands for the root and `0x00000000` stands for the flags that you can specify.

To perform a conversational boot, you must boot from your system disk with the root set to 0 and the boot flag set to 1. To do so, enter the following command, which is based on the template that you saw on your boot manager screen (bear in mind that yours might be slightly different):

`BOOTMGR> BOOT `*`your_device`*` 0 1`

You will see the `SYSBOOT>` prompt.

6. At the `SYSBOOT>` prompt, enter the following command to disable volume shadowing on your system disk:

`SYSBOOT> SET SHADOW_SYS_DISK 0`

7. At the `SYSBOOT>` prompt, enter `CONTINUE` to resume the boot procedure.

8. After the boot completes, log in to the SYSTEM account.

9. Shutdown the system by entering the command `$ @SYS$SYSTEM:SHUTDOWN`

10. When asked whether an automatic system reboot should be performed, answer `NO`.

You now have a non-shadowed system disk that you can use for the upgrade. Go to *Section 3.2.2, "Upgrading a Non-Shadowed System Disk"* to begin the upgrade procedure.

3.2.2. Upgrading a Non-Shadowed System Disk

To upgrade to VSI OpenVMS x86-64 V9.2-1 from VSI OpenVMS x86-64 V9.2 or E9.2-1, follow these steps:

1. Download, unzip, and copy the VSI OpenVMS x86-64 V9.2-1 ISO file to an area that is locally accessible to your hypervisor.

Note

VSI recommends that you make a backup copy of the system disk before you start the upgrade procedure.

---

2. In your virtual machine management application, select the virtual machine that you want to upgrade to VSI OpenVMS x86-64 V9.2-1 and power it off. Then, bring up the screen to edit its settings.

3. Find the CDROM/DVD device that your virtual machine is using and change the ISO file associated with the optical drive to the V9.2-1 ISO file.

4. Save the changes and close the settings window.

5. Power on your VM. Depending on your hypervisor of choice and the boot options settings of the VM, you will either see the UEFI Shell> prompt:

or the VSI Boot Manager screen:

6. If you see the UEFI Shell> prompt, do the following:

    a. At the `Shell>` prompt, enter `MAP FS* -B` to display the file systems available on your VM.

    b. Choose the file system that maps to the VSI OpenVMS V9.2-1 ISO file. Since that ISO has been set up as a CDROM, the file system that maps to it will be labeled as CDROM as well. As an example, we will assume that the file system we want is FS0:.

    c. At the `Shell>` prompt, enter `FS0:\efi\vms\vms_bootmgr`

    After this, you should see the VSI Boot Manager screen.

7. At the `BOOTMGR>` prompt, type `DEVICES` to display the list of available VMS-bootable devices.

8. From the list, identify the device that contains the ISO file with the new version of VSI OpenVMS (it will be labelled as a CDROM or DVD) and enter `BOOT <device-name>`. As an example, `BOOT DKA200`. After the progress meter reaches 100%, you should see the following screen:
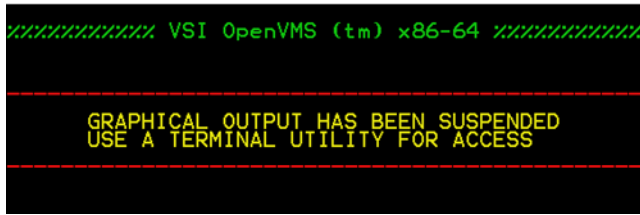
9. Establish a remote connection to your VM via a terminal emulator. There are various methods to establish a remote connection. One of them is to connect via telnet using the IP address of the host system and the serial port of your VM. However, if this method does not work for you, you can also use named pipes.

    In the serial port setup of your VM guest and in your terminal utility, define your named pipe as `\\.\pipe\pipe_name`, where `pipe_name` is simply a unique name you provide. Using named pipes requires that your terminal utility reside on your VM host system. To use named pipes over a different network node, you will need to use a Named Pipe Proxy server.

    When the BOOTMGR> prompt appears, your terminal emulator should automatically connect to your VM. However, if that does not happen, you can initiate command output to the serial port manually by entering the command:

    ```
    BOOTMGR> COM n
    ```

    where *n* is the serial port number that your VM uses.

    ### Warning

    If you are utilizing VMware Workstation or VMware Fusion as your hypervisor, be advised that virtual serial port support is not available via the GUI. For more information, refer to the Release Notes.

    ### Note

    If you are working on KVM, you can establish a secure connection to the host via SSH, then create serial ports and connect to them via the `VIRSH` command. For details, see the official documentation for your Linux distribution.

    If you are on ESXi, make sure that the port used by your VM can go through the ESXi firewall. If you are having trouble at this stage, contact the ESXi administator in your company.

10. Upon connecting, you should see the `Enter CHOICE or ? for help: (1/2/3/4/5/6/7/8/9/?)` prompt.

    ### Note

    If this prompt does not appear, and the output appears blank or unchanging, press Enter. The prompt should now appear. To see the OpenVMS installation menu, type `?`, hit Enter, then hit Enter again.

Important

VSI OpenVMS x86-64 V9.2-1 does not support installation menu items number 3, 5, and 7. Also, do not use item number 6, unless directly instructed otherwise.

---

11. If VSI x86VMS OpenSSH V8.9-1B or V8.9-1C is not currently installed on your system, skip this step.

Important

When upgrading to VSI OpenVMS V9.2-1, the procedure *will abort* if the VSI x86VMS OpenSSH V8.9-1B or V8.9-1C product is currently installed on your system. Additional issues may occur if VSI OpenSSH has not been properly configured.

Before you go on, make sure you know the name of the system disk you want to upgrade. If you do not know the system disk, follow the steps below.

a. In the VSI OpenVMS installation menu, select `8 - Execute DCL commands and procedures`.

b. At the `$$$` prompt, type the following command to display the list of available disks:

```
show devices dk
```

c. If you are unsure which system disk to upgrade, you may need to mount each of the local disks individually until you locate the desired one. That system disk will be referred to as <system_disk> later on in these instructions.

To uninstall VSI x86VMS OpenSSH V8.9-1B or V8.9-1C, perform the following procedure:

a. In the VSI OpenVMS installation menu, enter `6 - Removed Installed Products`.

b. At the prompt for the target disk, enter the disk name for the <system disk> that you will be upgrading.

c. Accept the default answer for the detailed description prompt.

d. You will see a list of installed products. Enter the item number that represents the VSI x86VMS OpenSSH V8.9-1B or V8.9-1C product.

e. Answer `YES` to the `Do you want to continue?` question.

f. **Important:** Answer `NO` to *each* of the `Do you want to terminate?` questions.

g. When the product is removed, you will see the `Press Return to continue...` prompt. Press Enter.

h. You will see the VSI OpenVMS installation menu.

12. Enter `1` to start the upgrade procedure.

13. Since this is an upgrade and not a fresh installation, answer `PRESERVE` to the `Do you want to INITIALIZE or to PRESERVE?` question.

14. At the `Enter device name for target disk:` prompt, enter the name of the disk where your current version of VSI OpenVMS is installed. If you are not sure which disk that is, enter `??` to display a list of the disks with volume names.

15. You will see a message stating the current label of the selected disk. Specify whether you want to keep the label or change it.

16. If your system does not have any patches installed that have recovery data available, skip to the next step.

    If your system does have at least one such patch installed, you will see an output informing you of which patches have recovery data available. Then, you will see the `Do you want to continue?` prompt. Answer `YES`.

17. At this stage, the system will output a list of installed products and state how each of the products is going to be handled by the upgrade procedure.

    If DECnet-Plus is not installed on your system, you will see a prompt to install it. The answer is up to you. Note that if you have DECnet IV installed and choose to install DECnet Plus, DECnet IV will be removed.

18. Give an answer to the `Do you always want detailed descriptions?` question. In this example, we will answer `NO`.

19. The product kit validation will proceed and then the configuration phase starts. You will then see the `Do you want the defaults for all options?` question. If you answer `YES` (which is recommended), the following components will be installed automatically:

    - DECdtm Distributed Transaction Manager

    - Support for DECnet-Plus or DECnet (Phase IV) for OpenVMS

    - Programming Support:

        ○ Debugger Utility

        ○ Image Dump Utility

        ○ Macro libraries

        ○ Macro-32 Migration Compiler

        ○ TLB intermediary form of STARLET

        ○ C Header Files

        ○ VMS text libraries of Ada declarations

    - RMS Journaling Recovery Utility

    - System Programming Support:

        ○ Delta Debugger

        ○ System Dump Analyzer Utility

        ○ Miscellaneous Symbol Table Files

- Utilities:

  - Phone Utility

  - XPG4 Internationalization Utilities

  - World-Wide PostScript Printing Subsystem

- Bliss Require Files

- Example Files

- Message Facility Files (HELP/MESSAGE)

- UETP Files

- DECwindows Server Support:

  - DECwindows Workstation files

  - Video fonts:

    - 100 dots-per-inch video fonts

    - Euro base support

      - Euro 100 dots-per-inch video fonts

- Delete any obsolete OpenVMS files

- Delete files archived by OpenVMS remedial kits

However, if you prefer *not* to install some of these components, answer `NO` and the system will prompt you about installing each component individually. Note, that in order to not install a subcomponent, you must first choose to install the main component

---

Note

Depending on what other components are currently installed or not installed on your system, you might get additional prompts asking for your consent to install them.

---

20. As the configuration phase starts and progresses, some of the products may require the system to be rebooted. If you see the `Can the system be REBOOTED after the installation completes?` question, always answer YES, because answering NO will abort the upgrade.

21. Once the upgrade procedure has configured the layered products and their options, you will see the `Do you want to review the options?` prompt. The answer is entirely up to you. As an example, we will answer `NO`.

22. As the execution phase starts and progresses, you will see several PCSI messages along with the `Do you want to continue?` prompt for one or more of the products that will be installed. Answer `YES` to all such prompts.

23. After the `Portion done` meter reaches 100%, you will see the list of installed and uninstalled products followed by post-installation information for some of them. Once the system updates

the memory disk (which may take a minute), the upgrade procedure is complete. You will see the `Press Return to continue...` prompt. Press Enter.

24. You will see the VSI OpenVMS installation menu and the `Enter CHOICE or ? for help:` `(1/2/3/4/5/6/7/8/9/?)` prompt. Enter 9 to shut down the system.

25. The system will shut down and display the `**** Hit any key to reboot system ****` prompt. Press any key to reboot the system.

26. Depending on your hypervisor of choice, you will either see the VSI Boot Manager screen, or the UEFI screen. If you see the VSI Boot Manager screen, proceed to the next step.

    If you see the UEFI Shell> prompt, do the following:

    a. At the `Shell>` prompt, enter `MAP FS* -B` to display all the file systems available on your VM. The `-B` option will display the entries one page at a time if more than a page-worth exists.

    b. Find the file system for the newly upgraded system disk. If the correct file system isn't readily apparent, use the file system for the CDROM device which had the installation ISO mapped to it.

    c. At the `Shell>` prompt, enter, for example `FS1:\efi\vms\vms_bootmgr`

    The VSI Boot Manager screen should now be displayed.

27. At the `BOOTMGR>` prompt, type `DEVICES` to display the list of available VMS-bootable devices.

28. At the `BOOTMGR>` prompt, enter `BOOT <system_disk_name>`, where <system_disk_name> is the disk that you specified as the target disk for the OpenVMS upgrade (in this step). The OpenVMS volume label for the device should be identified as the one you used for your target device, not for the CDROM/DVD device. In this example, we will enter `BOOT DKA0`. The system will boot up, run `AUTOGEN`, then automatically perform a shutdown and reboot. Please take note of, and investigate, any warnings that `AUTOGEN` may display.

29. When you see the `BOOTMGR>` prompt again, type `DEVICES` to show what bootable devices are available, then enter `BOOT <system_disk_name>` one more time and wait for the system to boot. Press Enter when you see an output similar to the one below:

```
 Accounting information:
 Buffered I/O count:                3087      Peak working set size:      13968
 Direct I/O count:                  1521      Peak virtual size:         278848
 Page faults:                       4117      Mounted volumes:                0
 Charged CPU time:         0 00:00:01.01      Elapsed time:      0 00:00:04.40
%EIA0, Link up: 1000 mbit, fdx, flow control (rcv only), 08-00-27-07-FC-DE
```

30. Log in to the system.

31. Now you should register your new licenses, if necessary. To do so, you can either use the SYS$UPDATE:VMSLICENSE.COM procedure to enter the data for each license individually, or you can create a COM file, copy all of your license scripts into it, and then execute the file by entering `@ fileName.COM`. After you have registered your licenses, you must enter the `LICENSE LOAD` command or reboot your VM.

You have successfully upgraded to VSI OpenVMS x86-64 V9.2-1.

Chapter 4. Networking Options

This chapter provides information about networking options and instructions for configuring DECnet Phase IV, VSI TCP/IP Services, and VSI OpenSSH on OpenVMS x86-64 V9.2-1.

4.1. Setting Up DECnet Phase IV

If you chose to install DECnet Phase IV, you must to configure this software using the NETCONFIG command procedure. For more information, see the DECnet for OpenVMS Guide to Networking [https://docs.vmssoftware.com/vsi-openvms-decnet-guide-to-networking/].

Once you have configured DECnet Phase IV, edit SYS$COMMON:[SYSMGR]SYSTARTUP_VMS.COM so that the software starts when the system reboots. You can have the software start interactively or in batch mode by making one of the following changes:

- Locate and uncomment the line:

  ```
  $!$ START/NETWORK DECNET
  ```

  So it now appears as:

  ```
  $ START/NETWORK DECNET
  ```

- To start the network in a batch job (speeds up startup) locate and uncomment the line:

  ```
  $!$ SUBMIT SYS$MANAGER:STARTNET.COM
  ```

  So it now appears as:

  ```
  $ SUBMIT SYS$MANAGER:STARTNET.COM
  ```

For more DECnet Phase IV documentation, visit VSI Documentation Portal [https://docs.vmssoftware.com].

4.2. Configuring VSI TCP/IP Services

This section provides information on configuring VSI TCP/IP Services 6.0 with a dynamic IP address provided by a DHCP server.

Important

The procedure below assumes you already have a network with a running DHCP server. It also assumes that your virtual machine is running and you have established a connection to the machine via a terminal emulator.

To configure VSI TCP/IP Services and DHCP, follow these steps:

1. At the $ prompt, enter @tcpip$config.

2. From the Configuration options menu

   Select 1 - Core environment.

---

3. From the `VSI TCP/IP Services for OpenVMS Core Environment Configuration Menu`

   Select `2 – Interfaces`.

4. From the `VSI TCP/IP Services for OpenVMS Interface & Address Configuration Menu`.

   Select `1 - IE0 Menu (EIA0: TwistedPair 1000mbps)`.

5. From the `VSI TCP/IP Services for OpenVMS Interface IE0 Configuration Menu (Node: MIKEY):`

   Select `3 - Enable DHCP client to manage address on IE0`.

6. Answer `YES` to the `Configure IE0 as the DHCP PRIMARY? (Y,N,HELP)` question.

7. From the `DHCP_CLIENT configuration options:`

   Select `1 - Enable service on this node`.

8. Exit the `VSI TCP/IP Services for OpenVMS Interface & Address Configuration Menu`.

9. Exit the `VSI TCP/IP Services for OpenVMS Core Environment Configuration Menu`.

10. Exit the `VSI TCP/IP Services for OpenVMS Configuration Menu`.

11. **Optional:** To make sure everything works correctly so far, ping a known IP address. Do not close your terminal emulator window.

4.3. Configuring VSI OpenSSH

To configure VSI OpenSSH on your VSI OpenVMS system, follow these steps:

Important

The procedure below assumes that your virtual machine is running and you have established a connection to the machine via a terminal emulator. Additionally, it is assumed that the TCP/IP configuration has been properly set up and is currently active.

Follow these steps:

1. To verify that TCP/IP is started, type the following command at the $ prompt:

   ```
   @sys$startup:tcpip$startup
   ```

   If TCP/IP services are already running, a message confirming their status will be displayed, and the system prompt will be returned. If TCP/IP services are not currently running, they will be initiated, and the system prompt will be displayed once they have started.

2. At the $ prompt, enter:

   ```
   $ @sys$common:[openssh.bin]ssh$create_account.com
   ```

3. Give the default answer to the `Enter default UIC group number for OpenSSH account` prompt.

4. Enter the following commands in this order:

```
$ @sys$common:[openssh.bin]ssh$create_startup_file.com
$ @sys$common:[openssh.bin]ssh$generate_keys.com
$ @sys$common:[openssh.bin]ssh$install_info.com
```

Note

After entering the second command, make sure that SSH keys were generated. They will be displayed on the screen.

---

5. Close the current terminal emulator window.

6. Establish a **Telnet** connection to the system via the IP address that was assigned to your system.

7. Login to the system.

8. **Optional:** Since later steps will involve editing existing VMS files, we recommend entering the following commands to set the page length and page width according to the size of your terminal window and turn off overstrike mode:

```
$ set terminal/inquire
$ set terminal/insert
```

9. Type in `EDIT SYSTARTUP_VMS.COM`

10. In the file, find and uncomment the following line:

```
@SYS$STARTUP:TCPIP$STARTUP.COM
```

11. Scroll to the end of the file and insert the following line before `$ EXIT`:

```
$ @sys$common:[openssh.bin]SSH$STARTUP.COM
```

12. If you are a privileged user or a system administrator/manager, enter EDIT SYLOGIN.COM to access the systemwide file. A non-privileged user can add the required lines to their LOGIN.COM file.

```
$ if f$trnlnm("SSH$ROOT", "LNM$SYSTEM_TABLE") .eqs. ""
$ then
$    write sys$output "VSI-OpenSSH is not configured. Configuring..."
$    if (f$search("SYS$STARTUP:SSH$DEFINE_ROOT") .nes. "")
$    then
$        @SYS$STARTUP:SSH$DEFINE_ROOT
$        write sys$output "...Done."
$        @SSH$ROOT:[BIN]SSH$DEFINE_COMMANDS.COM
$    else
$        write sys$output "VSI-OpenSSH seems to be missing..., make
 sure you have it installed."
$    endif
$ else
$    @SSH$ROOT:[BIN]SSH$DEFINE_COMMANDS.COM
$     write sys$output "VSI-OpenSSH is configured."
$ endif
```

13. Press **Ctrl+Z** to save the changes and close the file.

14. Enter `EDIT SYLOGICALS.COM`

15. In the file, find and uncomment this block of lines:

```
$! DEFINE/SYSTEM/EXECUTIVE SYSUAF                    SYS$SYSTEM:SYSUAF.DAT
$! DEFINE/SYSTEM/EXECUTIVE SYSUAFALT                 SYS$SYSTEM:SYSUAFALT.DAT
$! DEFINE/SYSTEM/EXECUTIVE SYSALF                    SYS$SYSTEM:SYSALF.DAT
$! DEFINE/SYSTEM/EXECUTIVE RIGHTSLIST                SYS$SYSTEM:RIGHTSLIST.DAT
$! DEFINE/SYSTEM/EXECUTIVE NETPROXY                  SYS$SYSTEM:NETPROXY.DAT
$! DEFINE/SYSTEM/EXECUTIVE NET$PROXY                 SYS$SYSTEM:NET$PROXY.DAT
$! DEFINE/SYSTEM/EXECUTIVE NETOBJECT                 SYS$SYSTEM:NETOBJECT.DAT
$! DEFINE/SYSTEM/EXECUTIVE NETNODE_REMOTE            SYS$SYSTEM:NETNODE_REMOT`
$! DEFINE/SYSTEM/EXECUTIVE LMF$LICENSE               SYS$SYSTEM:LMF$LICENSE.L`
$! DEFINE/SYSTEM/EXECUTIVE VMSMAIL_PROFILE           SYS$SYSTEM:VMSMAIL_PROFI`
$! DEFINE/SYSTEM/EXECUTIVE VMS$OBJECTS               SYS$SYSTEM:VMS$OBJECTS.D`
$! DEFINE/SYSTEM/EXECUTIVE VMS$AUDIT_SERVER          SYS$MANAGER:VMS$AUDIT_SE`
$! DEFINE/SYSTEM/EXECUTIVE VMS$PASSWORD_HISTORY      SYS$SYSTEM:VMS$PASSWORD_`
$! DEFINE/SYSTEM/EXECUTIVE VMS$PASSWORD_DICTIONARY   SYS$LIBRARY:VMS$PASSWORD`
$! DEFINE/SYSTEM/EXECUTIVE NETNODE_UPDATE            SYS$MANAGER:NETNODE_UPDA`
$! DEFINE/SYSTEM/EXECUTIVE VMS$PASSWORD_POLICY       SYS$LIBRARY:VMS$PASSWORD`
$! DEFINE/SYSTEM/EXECUTIVE LAN$NODE_DATABASE         SYS$SYSTEM:LAN$NODE_DATA`
$! DEFINE/SYSTEM/EXECUTIVE VMS$CLASS_SCHEDULE        SYS$SYSTEM:VMS$CLASS_SCH`
```

16. Save and close the file.

17. Reboot the system.

18. **Optional:** To verify that everything has been set up correctly, try and establish an SSH connection to your virtual machine.

Appendix A. Setting up a VMS Cluster

This appendix provides instructions to create a VMS cluster with two Oracle VirtualBox VMs both running on a Windows 10 system host with each using its own system disk.

Note

VSI development is providing the information in this appendix as one example of how to set up a cluster on a virtual machine. There may be other or better ways to do this. VSI encourages our customers to find other methods and to share them with us.

Use the following worksheet to list the names and addresses for your specific cluster environment. Variables in monospace font are used throughout the instructions.

Item	Your specific environment name
Location of the VSI OpenVMS V9.2-1 ISO file	_____
Your node names	
<VM1_nodename>	_____
<VM2_nodename>	_____
Names for your virtual machines	
<VM1_name>	_____
<VM2_name>	_____
Names for your system and paging disks	
<VM1_sysdisk_name>	_____
<VM1_paging_disk_name>	_____
<VM2_sysdisk_name>	_____
<VM2_paging_disk_name>	_____
DECnet addresses of your virtual machines	
<VM1_DECnet_address>	_____
<VM2_DECnet_address>	_____
SCSSYSTEMID	
<VM1_SCSSYSTEMID>	_____
<VM2_SCSSYSTEMID>	_____
MAC addresses[1]	
<VM1_DECnet_mac_address>	_____
<VM2_DECnet_mac_address>	_____
TCP/IP addresses for your virtual machines	
<your_domain_name>	_____
<VM1_TCPIP_address_1>	_____
<VM1_TCPIP_address_2>	_____

Item		Your specific environment name
	<VM2_TCPIP_address_1>	_____
	<VM2_TCPIP_address_2>	_____
Port numbers[2]		
	<VM1_port_number_1>	_____
	<VM1_port_number_2>	_____
	<VM2_port_number_1>	_____
	<VM2_port_number_2>	_____
Number and password for the cluster		
	<cluster_number>	_____
	<cluster_password>	_____

[1]The pseudo-MAC address used by DECnet comprises the fixed hex digits AA-00-04-00 followed by nn-nn that is the DECnet address in big-endian format. For example, 01-28 -> 0x2801 -> 10241 (also SCSSYSTEMID) -> (1024 * 10) + 1 -> DECnet address 10.1.

[2]In this article, we are using PuTTY as terminal emulator and have ports *<VM1_name>* COM1, *<VM1_name>* COM2, *<VM2_name>* COM1, *<VM2_name>* COM2, all using Host name 127.0.0.1, Connection Type: Raw, and ports *<VM1_port_number_1>*, *<VM1_port_number_2>*, *<VM2_port_number_1>*, and *<VM2_port_number_2>* respectively.

A.1. Initial Preparation

Follow these steps:

1. Locate the V9.2-1 ISO file. You may have a zipped copy, which you should unzip.

2. On an existing OpenVMS system, enter these commands to create a 2GB disk file that can be replicated as needed for each of the disks required:

```
$ LD CREATE EMPTY2GBDISK.DSK/SIZE=4194304/ERASE
$ LD CONNECT EMPTY2GBDISK.DSK LDA EMPTY$
$ INITIALIZE EMPTY$ EMPTY2GBDISK
$ LD DISCONNECT EMPTY$
$ ZIP EMPTY2GBDISK EMPTY2GBDISK.DSK
```

3. Copy the resulting EMPTY2GBDISK.ZIP file to your host system.

4. Unzip this archive four times to a folder where VirtualBox can access the DSK files. After each Unzip, rename the resulting EMPTY2GBDISK.DSK to:

- *<VM1_sysdisk_name>*.DSK

- *<VM1_paging_disk_name>*.DSK

- *<VM2_sysdisk_name>*.DSK

- *<VM2_paging_disk_name>*.DSK

5. Make a VMDK file for each one using the following command:

```
vboxmanage internalcommands createrawvmdk –filename <x>.vmdk –rawdisk <x>.dsk
```

A.2. Creating the First Virtual Machine

Follow these steps:

1. In the Oracle VM VirtualBox Manager window, click Machine, then New.

2. In the Name field, enter <VM1_name>. Accept the default for the Machine Folder field, set Type to Other, and Version to Other/Unknown (64-bit).

3. Click Next. VSI recommends that you set the memory size to 6144MB, then click Next again.

4. Select "Do not add a virtual hard disk", then click Create and Continue from the warning.

5. Select Settings for the new VM and click System.

6. In the Motherboard tab, uncheck Floppy and Optical, choose Chipset ICH9, and check Enable EFI.

7. In the Processor tab, VSI recommends that you set the CPU count to at least 2.

8. Select Storage from the settings menu.

9. Click Add controller, select the AHCI (SATA) type controller. Add four disks to this controller in the following order:

    - *<VM1_sysdisk_name>*.VMDK (as a hard disk)

    - *<VM1_paging_disk_name>*.VMDK (as a hard disk)

    - *<V9.2-1_ISO_file>*.ISO (as an optical drive)

    - *<VM2_sysdisk_name>*.VMDK (as a hard disk)

    You must add each disk to the available drives first, and then select it for the VM.

10. From the Settings menu, select Network.

11. Enable the first three adapters. The first adapter is used to connect to your extended network using TCP/IP, and might include a VPN. The second adapter is used to connect to your local network (which may be entirely within your host system) using TCP/IP. The third adapter is used to connect your virtual machines using DECnet IV. All three adapters are used for cluster communication.

12. For Adapter 1, select the NAT adapter type (default value).

Note

This setting is determined by how your computer accesses the rest of your network from the VM. In the example described here, the target machines are connected via VPN, which requires the NAT adapter type. If you are using a local network, change the adapter type to Bridged.

Under Advanced, make sure Adapter Type is set to Intel PRO/1000 MT Desktop (82540EM), use default MAC address, and make sure Cable Connected is checked.

13. Adapter 2 is a Bridged Adapter; accept the default name.

    Under Advanced, specify the same settings as Adapter 1 with the default MAC address, but make sure Promiscuous is set to Deny.

14. Set up Adapter 3 the same way as Adapter 2 but override the MAC address with <VM1_DECnet_mac_address>. This MAC address matches the DECnet address <VM1_DECnet_address>.

15. From the Settings menu, select Ports. With our method, two ports with distinct port numbers are used on each system. Ports 1 and 2 are COM1 and COM2 respectively. The Port Mode is TCP. "Connect to existing pipe/socket" option should be unchecked, and Path/Address are set to <VM1_port_number_1> and <VM1_port_number_2>.

A.3. Starting the Virtual Machine

Follow these steps:

1. Start the VM that you have just set up.

2. In the Virtual Machine console window that is created, the VM boot process should stop at the Shell> prompt. If it does not, press ESC.

3. Click View, then click Scaled Mode. Close the Virtual Machine window.

4. In the Close Virtual Machine pop-up window, select Power Off the machine, and then click OK. This sets "Power off" as the default action on close.

5. Restart the VM.

6. Connect your COM1 port.

7. To find the CD-ROM and invoke the Boot Manager from it, enter the map -r command at the Shell> prompt. Because the only bootable disk is the ISO kit file, just VMS_BOOTMGR should be sufficient.

    Enable auto-boot and set Flags to 800 before entering the BOOT DKA200 command to begin the installation. You should install to the DKA0: disk with the following settings:

    1. Set the volume label to *<VM1_nodename>*_V92

    2. Enable hard links if you need them

    3. Set SCSNODE to *<VM1_nodename>*

    4. Set SCSSYSTEMID to *<VM1_SCSSYSTEMID>*

8. **Important:** When the system reboots to perform AUTOGEN, abort AUTO BOOT and manually boot the new system disk with the command BOOT DKA0. Once the AUTOGEN step is done and the system boots, log in and invoke CLUSTER_CONFIG_LAN.COM, option 1.

9. Answer Yes to the SCSI bus prompt and enter <cluster_number> and <cluster_password> when requested.

10. Answer Yes to the disk server prompt.

11. Answer No to the quorum disk prompt. Skip the port allocation class and set EXPECTED_VOTES to 1. You can safely ignore the warnings.

12. Run AUTOGEN again and let the system reboot as a single-node cluster.

13. At this point, you should modify several of the SYSGEN parameters. Refer to the *VSI OpenVMS System Management Utilities Reference Manual* for the description of MODPARAMS.DAT and update its contents and the CURRENT parameter settings. The values used should be from the following list:

```
WINDOW_SYSTEM=1
DISK_QUORUM=""
NISCS_LOAD_PEA0=1
VAXCLUSTER=2
EXPECTED_VOTES=1
MSCP_LOAD=1
MSCP_SERVE_ALL=5
INTERCONNECT="NI"
BOOTNODE="NO"
TTY_TYPAHDSZ=512
TTY_BUF=132
SCSNODE="<VM1_nodename>"
SCSSYSTEMID=<VM1_SCSSYSTEMID>
VOTES=1
```

A.4. Adding a Node Using a Copy of an Existing System Disk

On VSI OpenVMS x86-64 systems, if you use a copy of an existing system disk as the initial system disk of a new node that is being added to a cluster, you must perform an additional step, which is changing the label for the memory disk. Follow these steps (which assume that the new system disk is DKA300:, and it is not already mounted):

1. Identify a system disk for VM2, *<VM2_sysdisk_name>*.

2. To copy DKA0: (system disk of VM1) to DKA300: (this will become system disk of VM2), type in the following commands:

   ```
   $ MOUNT/FOREIGN DKA300:
   $ BACKUP/IMAGE/IGNORE=INTERLOCK DKA0: DKA300:
   ```

3. To be able to change the label of DKA300:, first type in the following commands:

   ```
   $ DISMOUNT DKA300:
   $ MOUNT DKA300/OVERRIDE=ID
   ```

4. Change the label to *<VM2_nodename>*_V92.

5. Dismount the disk again and enter:

   ```
   $ MOUNT/SYSTEM DKA300: <VM2_nodename>_V92
   ```

6. Connect and mount the memory disk container file using the following commands:

   ```
   $ LD CONNECT DKA300:[VMS$COMMON.SYS$LDR]SYS$MD.DSK LDM LDDEV
   $ MOUNT/OVER=ID LDDEV
   ```

7. Note the label of the memory disk. It will be of the form "MD20345927FD". Change the last letter to create a unique name. For example:

   ```
   $ SET VOLUME LDDEV /LABEL=MD20345927FE
   ```

8. This gets a unique volume label into *<VM2_sysdisk_name>*'s memory disk. Before dismounting the memory disk or the system disk, update several parameters, including SCSNODE and SCSSYSTEMID:

   ```
   $ MCR SYSGEN
   SYSGEN> USE LDDEV:[SYS0.SYSEXE]X86_64VMSSYS.PAR
   SYSGEN> SET SCSNODE "<VM2_nodename>"
   SYSGEN> SET SCSSYSTEMID <VM2_SCSSYSTEMID>
   SYSGEN> SET VOTES 0
   SYSGEN> WRITE LDDEV:[SYS0.SYSEXE]X86_64VMSSYS.PAR
   SYSGEN> EXIT
   ```

9. Dismount the memory disk before completing the other setup tasks for the new system disk.

    ```
    $ DISMOUNT LDDEV
    $ LD DISCONNECT LDDEV
    ```

A.5. Creating the Second Virtual Machine

1. Before you start, shut down and power off the VM you are currently running (VM1).

2. Go into VM1 Settings, click Storage and remove disk *<VM2_sysdisk_name>* (you will need to use that disk in the new VM).

3. The process of creating VM2 is mostly the same as VM1 (as described in *Section A.2, "Creating the First Virtual Machine"*), with a few differences:

    ● VM's name is *<VM2_name>*.

    ● Add three disks to its SATA controller: *<VM2_sysdisk_name>*.VMDK and *<VM2_paging_disk_name>*.VMDK (as hard disks), and an empty optical drive.

    ● Under Network, set the MAC address for Adapter 3 to *<VM2_DECnet_MAC_address>*, which translates to DECnet address *<VM2_DECnet_address>* or SCSSYSTEMID *<VM2_SCSSYSTEMID>*. (See earlier footnote).

    ● Under Ports, use port numbers *<VM2_port_number_1>* and *<VM2_port_number_2>*.

4. Start VM1 again. Allow it to boot completely.

5. Start VM2 and perform steps 2 through 4 from *Section A.3, "Starting the Virtual Machine"* of this document, so that the default action on Close is Power Off instead of Save.

6. Restart VM2 and connect VM2's COM1 port.

7. Locate and start the boot manager as for VM1. Enable auto-boot and set Flags to 800.

8. Then boot DKA0:.

At this point, you should have a two-node cluster, running off separate system disks.

A.6. Finalizing Cluster Setup

Perform the following system management tasks as follows:

1. Initialize and mount the paging disk on each system, then create PAGEFILE.SYS and SYSDUMP.DMP in [SYS0.SYSEXE] for each one.

2. Use 1,000,000 blocks for each file. Also, create a [SYSMGR] directory on this disk as a place to save dumps from SDA.

    On VM1, enter the following:

    ```
    $ INITIALIZE DKA100: <VM1_nodename>_PAGE
    $ MOUNT/SYSTEM DKA100: <VM1_nodename>_PAGE
    $ CREATE/DIRECTORY DKA100:[SYS0.SYSEXE]
    $ MCR SYSGEN
    SYSGEN> CREATE DKA100:[SYS0.SYSEXE]PAGEFILE.SYS/SIZE=1000000
    SYSGEN> CREATE DKA100:[SYS0.SYSEXE]SYSDUMP.DMP/SIZE=1000000
    SYSGEN> EXIT
    ```

```
$ CREATE/DIRECTORY DKA100:[SYSMGR]
```

Repeat these commands on VM2 using *<VM2_nodename>*_PAGE.

3. Edit SYPAGSWPFILES.COM to install the page file.

    On VM1, type in:

    ```
    $ mount/system dka100: <VM1_nodename>_page
    $ mcr sysgen install dka100:[sys0.sysexe]pagefile.sys/page
    ```

    On VM2, type in:

    ```
    $ mount/system dka100: <VM2_nodename>_page
    $ mcr sysgen install dka100:[sys0.sysexe]pagefile.sys/page
    ```

4. During the installation of OpenVMS, a minimal pagefile was created on the system disk. Use the SHOW MEMORY command to confirm the exact location. You may want to delete this (which is now on both system disks), and you should do this by renaming the file (to PAGEFILE.TMP, for example), then rebooting each system before deleting the renamed file.

5. To set up the dump device, enter the following command on both systems:

    ```
    $ SET DUMP_OPTIONS/DEVICE=DKA100:
    ```

6. Update MODPARAMS.DAT on each node for the changes that have been made. The following lists are taken from the MODPARAMS contents generated by the installation and running CLUSTER_CONFIG_LAN.COM:

Common to both nodes	VM1 only	VM2 only
WINDOW_SYSTEM=1	SCSNODE="*<VM1_nodename>*"	SCSNODE="*<VM2_nodename>*"
DISK_QUORUM=""	SCSSYSTEMID=	SCSSYSTEMID=
NISCS_LOAD_PEA0=1	*<VM1_SCSSYSTEMID>*	*<VM2_SCSSYSTEMID>*
VAXCLUSTER=2	VOTES=1	VOTES=0
EXPECTED_VOTES=1		
MSCP_LOAD=1		
MSCP_SERVE_ALL=5		
INTERCONNECT="NI"		
BOOTNODE="NO"		
TTY_TYPAHDSZ=512		
TTY_BUF=132		

Note

Some of these values may not have been set to the desired values (probably MSCP_SERVE_ALL, TTY_TYPAHDSIZ, and TTY_BUF). You need to edit both copies of MODPARAMS.DAT and use SYSGEN to update the values in use. Do not forget to enter WRITE CURRENT.

7. To set the terminal (and any other) features you want, create a SYLOGIN.COM and/or LOGIN.COM. Among other things, we use:

```
$ SET TERMINAL/WIDTH=132/PAGE=48/INSERT/INQUIRE
```

The values above match the PuTTY setup of the terminal window used in these instructions.

8. Set up TCP/IP Services and enter the command @TCPIP$CONFIG.COM:

   ● Set Domain to *<your_domain_name>*

   ● Set IE0 to *<VM1_TCPIP_address_1>*/24 = *<VM1_nodename>* and *<VM2_TCPIP_address_1>*/24 = *<VM2_nodename>* (mask = 255.255.255.0). VirtualBox works with 10.0.2.15 and similar addresses.

   ● Set IE1 to static addresses that work with your local host's network, so you can issue a TELNET command to each node from your local host (but leave the node name associated with IE0). These are *<VM1_TCPIP_address_2>* and *<VM2_TCPIP_address_2>*.

   ● Set IE2 to "No TCP/IP", this adapter is for DECnet.

   ● Set Default route to an appropriate gateway value. VirtualBox works with 10.0.2.2.

   ● Set DNS to your extended network's name servers' addresses.

   ● Make sure FTP and TELNET are both set as CLIENT and SERVER.

9. Set up DECnet IV using NETCONFIG.COM and start it with STARTNET.COM:

   ● Set *<VM1_nodename>* = *<VM1_DECnet_address>* and *<VM2_nodename>* = *<VM2_DECnet_address>*

   ● Define LINE and CIRCUIT EIA-2 only (STATE ON)

   ● Define the other node in the NODE database.

     On VM1, enter:

     ```
     $ MCR NCP DEFINE NODE <VM2_DECnet_address> NAME <VM2_nodename>
     ```

     On VM2, enter:

     ```
     $ MCR NCP DEFINE NODE <VM1_DECnet_address> NAME <VM1_nodename>
     ```

At this point, we have a two-node cluster, with each node running from its own system disk. Each node has a private page/dump disk. The first node (VM1) also has the kit ISO as a third disk (optical drive). For symmetry, the second node (VM2) also has an empty optical drive. For safety, only VM1 has a cluster vote.

A.7. Saving Your Cluster Setup

At this point, it's worth saving all the work that's been done so far. The following method is the easiest way to save the current VMS cluster setup (however, note that it does not save any of the VirtualBox VM configuration data).

Shut down and power off both nodes. Then create a ZIP file of the four DSK files:

● *<VM1_sysdisk_name>*.DSK

- *<VM1_paging_disk_name>*.DSK

- *<VM2_sysdisk_name>*.DSK

- *<VM2_paging_disk_name>*.DSK

Perform the following steps:

1. Use the CLUSTER_SHUTDOWN and POWER_OFF options in SHUTDOWN.COM. Once the virtual machines have exited, use the host to create the ZIP file.

2. On Windows 10, open your "VirtualBox VMs" folder, select all four files, and right-click the selection.

3. In "Send to", choose "Compressed (Zipped) folder".

4. The ZIP file is named after one of the files, so when the ZIP file is populated, rename it.

Note

If you need to restore just one disk from here, that does not mean you have to restore all of them. Simply navigate to the ZIP folder and drag the disk file you need back to the original folder to overwrite it.

Appendix B. Sample Installation and Upgrade Logs

This appendix provides a sample installation log for VSI OpenVMS x86-64 V9.2-1 installation.

Note

Depending on the choices that you make during the installation as well as your hypervisor of choice, certain parts of your log might look different.

B.1. Sample Installation Log

Below is the sample installation log.

```
VSI OpenVMS Boot Manager: V9.2-1, Build 128
  ENABLED:  Symmetric Multi-Processing
  ENABLED:  Crash Dump Processing
  ENABLED:  Console output to Legacy COM 1 Port

  Checking Required Processor Features:
  PASSED

  BOOT MANAGER DEVICE:  DKB0
  DEFAULT BOOT COMMAND: BOOT DKB0 0 00000001

  VIRTUAL MACHINE GUEST:
  VMware (tm) No Mouse support; Use Commands or Arrow Keys


  CONNECT A REMOTE TERMINAL SESSION NOW.
  Enter the TERMINAL command for remote connection assistance.

BOOTMGR> DEVICES

BOOTABLE DEVICES (System Disks, Installation Kits, other):

  DKB0       (DVD) = FS2    UEFI: E9_2_1       VMS: None        1574  MB  SATA DVD

BOOTMGR> BOOT DKB0:
Booting...
%VMS_BOOTMGR-I-INSTALL, Booting an OpenVMS Installation Kit...
100%

%%%%%%%%%% VSI OpenVMS (tm) x86-64 %%%%%%%%%%


_____

      GRAPHICAL OUTPUT HAS BEEN SUSPENDED
      USE A TERMINAL UTILITY FOR ACCESS
_____

VSI Primary Kernel SYSBOOT   1-JUN-2023 13:14:13.16
%SYSBOOT-I-VMTYPE, Booting as a VMware (tm) Guest

SYSBOOT> C


        VMS Software, Inc. OpenVMS (TM) x86_64 Operating System, V9.2-1
                  Copyright 2023 VMS Software, Inc.

  MDS Mitigation active, variant verw(MD_CLEAR)
```

```
%SMP-I-CPUTRN, CPU #3 has joined the active set.
%SMP-I-CPUTRN, CPU #2 has joined the active set.
%SMP-I-CPUTRN, CPU #1 has joined the active set.


    Installing required known files...

    Configuring devices...

%EIA0, Link up: 1000 mbit, fdx, flow control (rcv only), 00-0C-29-AB-A3-04


    *******************************************************************

    You can install or upgrade the OpenVMS X86-64 operating system
    or you can install or upgrade layered products that are included
    on the OpenVMS X86-64 distribution media.

    You can also execute DCL commands and procedures to perform
    "standalone" tasks, such as backing up the system disk.

    Please choose one of the following:

        1)  Upgrade, install or reconfigure OpenVMS X86-64 Version V9.2-1
        2)  Display layered products that this procedure can install
        3)  Install or upgrade layered products
        4)  Show installed products
        5)  Reconfigure installed products
        6)  Remove installed products
        7)  Find, Install or Undo patches; Show or Delete Recovery Data
        8)  Execute DCL commands and procedures
        9)  Shut down this system

Enter CHOICE or ? for help: (1/2/3/4/5/6/7/8/9/?) 1
    **************************************************************

    This procedure will ask a series of questions.

          () - encloses acceptable answers
          [] - encloses default answers

    Type your response and press the <Return> key.  Type:

          ? - to repeat an explanation
          ^ - to change prior input (not always possible)
          Ctrl/Y - to exit the installation procedure

    There are two choices for installation/upgrade:

    Initialize - Removes all software and data files that were
        previously on the target disk and installs OpenVMS X86-64.

    Preserve -- Installs or Upgrades OpenVMS X86-64 on the target disk
        and retains all other contents of the target disk.

   * Note: You cannot use preserve to install OpenVMS X86-64 on a disk on
        which any other operating system is installed.  This includes
        implementations of OpenVMS for other architectures.

Do you want to INITIALIZE or to PRESERVE? [PRESERVE] INITIALIZE


    You must enter the device name for the target disk on which
    OpenVMS X86-64 will be installed.

Enter device name for target disk: (? for choices) ?

  Device Name        Device Type Name        Volume Label      Size (blocks/xB)
```

```
    ------------  ------------------------  --------------  --------------------
  DKA0:           VMware Virtual disk
  DKA100:         VMware Virtual disk

  For volume label and device size enter ??


Enter device name for target disk: (? for choices) DKA0

Enter volume label for target system disk: [X86SYS] X86SYS2

    OpenVMS V9.0 and later requires that the target system disk be
    initialized with On-Disk Structure Level 5 (ODS-5).


    Hard links can be enabled on ODS-5 disks.  WBEM Services for OpenVMS
    does not require hard links.  (? for more information)

Do you want to enable hard links? (Yes/No/?) y


    You have chosen to install OpenVMS X86-64 on a new disk.

    The target system disk, DKA0:, will be initialized
    with structure level 5 (ODS-5).
    Hard links WILL be enabled.
    The disk will be labeled X86SYS2.
    Any data currently on the target system disk will be lost.

Is this OK? (Yes/No) y

    Initializing and mounting target....

    Creating page file....


    You must enter a password for the SYSTEM account.

    The password must be a minimum of 15 characters in length, and
    may not exceed 31 characters.  It will be checked and verified.
    The system will not accept passwords that can be guessed easily.

    The password will not be displayed as you enter it.

Password for SYSTEM account:

Re-enter SYSTEM password for verification:



    For your system to operate properly, you must set two parameters:
    SCSNODE and SCSSYSTEMID.

    SCSNODE can be from 1 to 6 letters or numbers.  It must contain at
    least one letter.

    If you plan to use DECnet, SCSNODE must be the DECnet Phase IV
    node name, or the DECnet-Plus (Phase V) node synonym.

    If you have multiple OpenVMS systems, the SCSNODE on each system
    must be unique.

Enter SCSNODE: ES2061

    If you plan to use DECnet, SCSSYSTEMID must be set based on the
    DECnet Phase IV address.

Do you plan to use DECnet? (Yes/No) [Yes] y
```

```
    DECnet Phase IV addresses are in the format

        DECnet_area_number.DECnet_node_number

    DECnet_area_number is a number between 1 and 63.
    DECnet_node_number is a number between 1 and 1023.

    If you plan to use DECnet WITHOUT Phase IV compatible addresses,
    enter 0.0.


Enter DECnet (Phase IV) Address: [1.1] 1.614

      SCSSYSTEMID will be set to 1638.

      This was calculated as follows:

          (DECnet_area_number * 1024) + DECnet_node_number

  Configuring the Local Time Zone


TIME ZONE SPECIFICATION -- MAIN Time Zone Menu          "*" indicates a menu

  0* GMT
  1* AFRICA          17) EST            33) IRAN           49) PORTUGAL
  2* AMERICA         18) EST5EDT        34) ISRAEL         50) PRC
  3* ANTARCTICA      19* ETC            35) JAMAICA        51) PST8PDT
  4* ARCTIC          20* EUROPE         36) JAPAN          52) ROC
  5* ASIA            21) FACTORY        37) KWAJALEIN      53) ROK
  6* ATLANTIC        22) GB-EIRE        38) LIBYA          54) SINGAPORE
  7* AUSTRALIA       23) GB             39) MET            55) TURKEY
  8* BRAZIL          24) GMT-0          40* MEXICO         56) UCT
  9* CANADA          25) GMT            41* MIDEAST        57) UNIVERSAL
 10) CET             26) GMT0           42) MST            58* US
 11* CHILE           27) GMTPLUS0       43) MST7MDT        59) UTC
 12) CST6CDT         28) GREENWICH      44) NAVAJO         60) W-SU
 13) CUBA            29) HONGKONG       45) NZ-CHAT        61) WET
 14) EET             30) HST            46) NZ             62) ZULU
 15) EGYPT           31) ICELAND        47* PACIFIC
 16) EIRE            32* INDIAN         48) POLAND

Press "Return" to redisplay, enter "=" to search or "?" for help, or
Select the number above that best represents the desired time zone: 20

EUROPE Time Zone Menu                                   "*" indicates a menu

  0* RETURN TO MAIN TIME ZONE MENU
  1) AMSTERDAM       18) HELSINKI       35) NICOSIA        52) TALLINN
  2) ANDORRA         19) ISLE_OF_MAN    36) OSLO           53) TIRANE
  3) ASTRAKHAN       20) ISTANBUL       37) PARIS          54) TIRASPOL
  4) ATHENS          21) JERSEY         38) PODGORICA      55) ULYANOVSK
  5) BELFAST         22) KALININGRAD    39) POLAND         56) UZHGOROD
  6) BELGRADE        23) KIEV           40) PORTUGAL       57) VADUZ
  7) BERLIN          24) KIROV          41) PRAGUE         58) VATICAN
  8) BRATISLAVA      25) LISBON         42) RIGA           59) VIENNA
  9) BRUSSELS        26) LJUBLJANA      43) ROME           60) VILNIUS
 10) BUCHAREST       27) LONDON         44) SAMARA         61) VOLGOGRAD
 11) BUDAPEST        28) LUXEMBOURG     45) SAN_MARINO     62) WARSAW
 12) BUSINGEN        29) MADRID         46) SARAJEVO       63) ZAGREB
 13) CHISINAU        30) MALTA          47) SARATOV        64) ZAPOROZHYE
 14) COPENHAGEN      31) MARIEHAMN      48) SIMFEROPOL     65) ZURICH
 15) DUBLIN          32) MINSK          49) SKOPJE
 16) GIBRALTAR       33) MONACO         50) SOFIA
 17) GUERNSEY        34) MOSCOW         51) STOCKHOLM

Press "Return" to redisplay, enter "=" to search or "?" for help, or
Select the number above that best represents the desired time zone: 14

You selected EUROPE / COPENHAGEN as your time zone.
```

```
Is this correct? (Yes/No) [YES]: .

You selected EUROPE / COPENHAGEN as your time zone.
Is this correct? (Yes/No) [YES]: y


    Configuring the Time Differential Factor (TDF)


    Default Time Differential Factor for standard time is 1:00.
    Default Time Differential Factor for daylight saving time is 2:00.

    The Time Differential Factor (TDF) is the difference between your
    system time and Coordinated Universal Time (UTC).  UTC is similar
    in most respects to Greenwich Mean Time (GMT).

    The TDF is expressed as hours and minutes, and should be entered
    in the hh:mm format.  TDFs for the Americas will be negative
    (-3:00, -4:00, etc.); TDFs for Europe, Africa, Asia and Australia
    will be positive (1:00, 2:00, etc.).

This time zone supports daylight saving time.
Is this time zone currently on daylight saving time? (Yes/No): y

Enter the Time Differential Factor [2:00]:

    NEW SYSTEM TIME DIFFERENTIAL FACTOR = 2:00

Is this correct? [Y]: y


    If you have Product Authorization Keys (PAKs) to register,
    you can register them now.

Do you want to register any Product Authorization Keys? (Yes/No) [Yes] n


    The following products are part of the OpenVMS installation;
    they will be installed along with the OpenVMS operating system:

        o Availability Manager (base) for OpenVMS X86-64
        o TCP/IP Services for OpenVMS X86-64
        o KERBEROS for OpenVMS X86-64
        o SSL3 V3.0-8 for OpenVMS X86-64 (based on OpenSSL V3.0.8)
        o SSL111 V1.1-1T for OpenVMS X86-64 (based on OpenSSL V1.1.1t)
        o OpenSSH for OpenVMS X86-64
        o 64-bit PERL for OpenVMS X86-64

    You can also install the following optional products along with the
    OpenVMS operating system:

        o DECwindows Motif for OpenVMS X86-64
        o DECnet-Plus for OpenVMS X86-64
        o DECnet Phase IV for OpenVMS X86-64

    If you want to change your selections, you can do so later in the
    installation by answering "NO" to the following question:

        "Do you want the defaults for all options?"



    Do you want to install DECwindows Motif for OpenVMS X86-64 V1.8?
(Yes/No) [Yes] y



    The DECnet-Plus kit is provided with the OpenVMS operating system kit.
    DECnet Phase IV applications are supported by DECnet-Plus.
```

```
    DECnet Phase IV is also provided as an option.

    If you install DECnet-Plus and TCP/IP you can run DECnet
    applications over a TCP/IP network.  Please refer to the
    VSI DECnet-Plus for OpenVMS Planning Guide for information
    on running DECnet over TCP/IP.

    Do you want to install DECnet-Plus for OpenVMS X86-64 V9.2-E?
(Yes/No) [Yes] y


    The installation operation can provide brief or detailed descriptions.
    In either case, you can request the detailed descriptions by typing ?.

Do you always want detailed descriptions? (Yes/No) [No]

Performing product kit validation of signed kits ...
%PCSI-I-VSIVALPASSED, validation of DMM1:[VMS$COMMON]VSI-X86VMS-VMS-V0902-1-2.PC
SI$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.DWMOTIF_SUPPORT_X860921_KIT]VSI-X
86VMS-DWMOTIF_SUPPORT-V0902-1-1.PCSI$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.AVAIL_MAN_BASE_KIT]VSI-X86VMS-AVA
IL_MAN_BASE-V0902-1-1.PCSI$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.TCPIP]VSI-X86VMS-TCPIP-X0600-22-1
.PCSI$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.SSL3]VSI-X86VMS-SSL3-V0300-8-1.PC
SI$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.KERBEROS]VSI-X86VMS-KERBEROS-V030
3-2A-1.PCSI$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.SSL111]VSI-X86VMS-SSL111-V0101-1T
-1.PCSI$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.OPENSSH]VSI-X86VMS-OPENSSH-V0809-
1D-1.PCSI$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.PERL534]VMSPORTS-X86VMS-PERL534-T
0534-0-1.PCSI$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.DWMOTIF]VSI-X86VMS-DWMOTIF-V0108-
-1.PCSI$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.DECNET_PLUS]VSI-X86VMS-DECNET_PLU
S-V0902-E-1.PCSI$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.DECNET_PHASE_IV_X860921_KIT]VSI-X
86VMS-DECNET_PHASE_IV-V0902-1-1.PCSI$COMPRESSED;1 succeeded


The following product has been selected:
    VSI X86VMS OPENVMS V9.2-1              Platform (product suite)

Configuration phase starting ...

You will be asked to choose options, if any, for each selected product and for
any products that may be installed to satisfy software dependency requirements.

Configuring VSI X86VMS OPENVMS V9.2-1: OPENVMS and related products Platform

    Copyright 2015-2023 VMS Software, Inc.

    VMS Software, Inc.

Do you want the defaults for all options? [YES] y

    Availability Manager (base) for OpenVMS X86-64

    TCP/IP Services for OpenVMS X86-64

* Product VSI X86VMS TCPIP X6.0-22 requires a system reboot.
Can the system be REBOOTED after the installation completes? [YES]

    KERBEROS for OpenVMS X86-64

    SSL3 V3.0-8 for OpenVMS X86-64 (based on OpenSSL V3.0.8)
```

```
    SSL111 V1.1-1T for OpenVMS X86-64 (based on OpenSSL V1.1.1t)

    OpenSSH for OpenVMS X86-64

    64-bit PERL for OpenVMS X86-64

Do you want to review the options? [NO]

Execution phase starting ...

The following products will be installed to destinations:
    VMSPORTS X86VMS PERL534 T5.34-0        DISK$X86SYS2:[VMS$COMMON.]
    VSI X86VMS AVAIL_MAN_BASE V9.2-1       DISK$X86SYS2:[VMS$COMMON.]
    VSI X86VMS DECNET_PLUS V9.2-E          DISK$X86SYS2:[VMS$COMMON.]
    VSI X86VMS DWMOTIF V1.8                DISK$X86SYS2:[VMS$COMMON.]
    VSI X86VMS DWMOTIF_SUPPORT V9.2-1      DISK$X86SYS2:[VMS$COMMON.]
    VSI X86VMS KERBEROS V3.3-2A            DISK$X86SYS2:[VMS$COMMON.]
    VSI X86VMS OPENSSH V8.9-1D             DISK$X86SYS2:[VMS$COMMON.]
    VSI X86VMS OPENVMS V9.2-1              DISK$X86SYS2:[VMS$COMMON.]
    VSI X86VMS SSL111 V1.1-1T              DISK$X86SYS2:[VMS$COMMON.]
    VSI X86VMS SSL3 V3.0-8                 DISK$X86SYS2:[VMS$COMMON.]
    VSI X86VMS TCPIP X6.0-22               DISK$X86SYS2:[VMS$COMMON.]
    VSI X86VMS VMS V9.2-1                  DISK$X86SYS2:[VMS$COMMON.]

Portion done: 0%...10%...20%...30%...40%...50%...60%...70%

        Restoring STARTUP.NSH file(s)...

        No files restored

...80%...90%
%PCSI-I-PRCOUTPUT, output from subprocess follows ...
% - Execute SYS$MANAGER:TCPIP$CONFIG.COM to proceed with configuration of
%   VSI TCP/IP Services for OpenVMS.
%
Portion done: 100%

The following products have been installed:
    VMSPORTS X86VMS PERL534 T5.34-0        Layered Product
    VSI X86VMS AVAIL_MAN_BASE V9.2-1       Layered Product
    VSI X86VMS DECNET_PLUS V9.2-E          Layered Product
    VSI X86VMS DWMOTIF V1.8                Layered Product
    VSI X86VMS DWMOTIF_SUPPORT V9.2-1      Layered Product
    VSI X86VMS KERBEROS V3.3-2A            Layered Product
    VSI X86VMS OPENSSH V8.9-1D             Layered Product
    VSI X86VMS OPENVMS V9.2-1              Platform (product suite)
    VSI X86VMS SSL111 V1.1-1T              Layered Product
    VSI X86VMS SSL3 V3.0-8                 Layered Product
    VSI X86VMS TCPIP X6.0-22               Layered Product
    VSI X86VMS VMS V9.2-1                  Operating System

VSI X86VMS OPENVMS V9.2-1: OPENVMS and related products Platform

    VSI X86VMS TCPIP X6.0-22: VSI TCP/IP Services for OpenVMS.

       VSI X86VMS SSL3 V3.0-8: SSL3 for OpenVMS X86-64 V3.0-8 (Based on OpenSSL 3
.0.8)

        Insert the following lines in SYS$MANAGER:SYSTARTUP_VMS.COM:
            @SYS$STARTUP:SSL3$STARTUP.COM
        Insert the following lines in SYS$MANAGER:SYSHUTDWN.COM:
            @SYS$STARTUP:SSL3$SHUTDOWN.COM

        Review the Installation Guide and Release Notes for post install directi
ons.

        Review the Installation Guide and Release Notes for post upgrade verific
ation suggestions.

        Refer to SYS$HELP:SSL30-8-X86.RELEASE_NOTES for more information.
```

_____

```
     Check the release notes for current status of the product.

  VSI X86VMS KERBEROS V3.3-2A

     Configure and set up Kerberos

     If Kerberos will be run on this system, but has not been
     used previously, you need to perform the following steps.

      o Run the Kerberos configuration procedure:

         @SYS$STARTUP:KRB$CONFIGURE.COM

      o Add the following line to SYS$MANAGER:SYSTARTUP_VMS.COM:

         $ @SYS$STARTUP:KRB$STARTUP

      o Add the following line to SYS$MANAGER:SYLOGIN.COM:

         $ @SYS$MANAGER:KRB$SYMBOLS


  VSI X86VMS SSL3 V3.0-8: SSL3 for OpenVMS X86-64 V3.0-8 (Based on OpenSSL 3.0
.8)

     Insert the following lines in SYS$MANAGER:SYSTARTUP_VMS.COM:
         @SYS$STARTUP:SSL3$STARTUP.COM
     Insert the following lines in SYS$MANAGER:SYSHUTDWN.COM:
         @SYS$STARTUP:SSL3$SHUTDOWN.COM

     Review the Installation Guide and Release Notes for post install direction
s.

     Review the Installation Guide and Release Notes for post upgrade verificat
ion suggestions.

     Refer to SYS$HELP:SSL30-8-X86.RELEASE_NOTES for more information.

  VSI X86VMS SSL111 V1.1-1T: SSL111 for OpenVMS X86-64 V1.1-1T (Based on OpenS
SL 1.1.1T)

     Review the Installation Guide and Release Notes for post install direction
s.

     Review the Installation Guide and Release Notes for post upgrade verificat
ion suggestions.

     Refer to SYS$HELP:SSL111-T-X86.RELEASE_NOTES for more information.

  VMSPORTS X86VMS PERL534 T5.34-0

     Post-installation tasks are required for Perl for OpenVMS.


         To use the Perl provided with this kit, run the following set-up
         command procedure, assuming you installed in SYS$COMMON.

           $ @sys$common:[perl-5_34]perl_setup.com

         You may wish to put that command in SYS$MANAGER:SYLOGIN.COM to
         make Perl available to all users on the system.

         Perl includes its own help system called perldoc.  Type

           $ perldoc perldoc

         for the documentation to perldoc itself.  Type

           $ perldoc perldelta
```

```
         for the changes that are new in version T5.34-0 of Perl.

         There are many Perl-related resources on the web; point your
         browser at:

           http://www.perl.org

         to get started, and thank you for using Perl for OpenVMS.


    VSI X86VMS DECNET_PLUS V9.2-E: DECnet-Plus V9.2-E for OpenVMS X86

      Release notes are available in SYS$HELP:HPE_DECNET-Plus-V84.RELEASE_NOTES
and SYS$HELP:VSI_DECNET_OSI.RELEASE_NOTES

%PCSI-I-SYSTEM_REBOOT, executing reboot procedure ...

         Shutdown/reboot deferred when this product is
         installed as part of the O/S installation/upgrade


    Running SYS$UPDATE:SYS$MD.COM to update the memory disk...


Created memory disk DKA0:[VMS$COMMON.SYS$LDR]SYS$MD.DSK;1
         - using 221536 blocks in 1 extent with 25671 spare blocks
         - mounted on LDM2202: with volume label MD23152B958A
         - contains OpenVMS V9.2-1


%LD-I-UNIT, Allocated device is LDM2203:



    The installation is now complete.

    When the newly installed system is first booted, a special
    startup procedure will be run.  This procedure will:

        o  Configure the system for standalone or OpenVMS Cluster operation.
        o  Run AUTOGEN to set system parameters.
        o  Reboot the system with the newly set parameters.


    You may shut down now or continue with other operations.


  Process X86VMS_INSTALL logged out at  1-JUN-2023 13:11:06.15

Press Return to continue...

    *****************************************************************

    You can install or upgrade the OpenVMS X86-64 operating system
    or you can install or upgrade layered products that are included
    on the OpenVMS X86-64 distribution media.

    You can also execute DCL commands and procedures to perform
    "standalone" tasks, such as backing up the system disk.

    Please choose one of the following:

        1)  Upgrade, install or reconfigure OpenVMS X86-64 Version V9.2-1
        2)  Display layered products that this procedure can install
        3)  Install or upgrade layered products
        4)  Show installed products
        5)  Reconfigure installed products
        6)  Remove installed products
        7)  Find, Install or Undo patches; Show or Delete Recovery Data
```

```
        8)   Execute DCL commands and procedures
        9)   Shut down this system

Enter CHOICE or ? for help: (1/2/3/4/5/6/7/8/9/?) 9

     Shutting down the system



VSI Dump Kernel SYSBOOT May 16 2023 13:21:17

** Error logs not dumped, system disk is write locked.

         SYSTEM SHUTDOWN COMPLETE

**** Hit any key to reboot system ****


Restarting the system...


  ENABLED:   Symmetric Multi-Processing
  ENABLED:   Crash Dump Processing
  ENABLED:   Console output to Legacy COM 1 Port
  ENABLED:   Using Environment ROM

  Checking Required Processor Features:
  PASSED

  BOOT MANAGER DEVICE:  DKB0
  DEFAULT BOOT COMMAND: BOOT DKB0 0x00 0x00000000

  VIRTUAL MACHINE GUEST:
  VMware (tm) No Mouse support; Use Commands or Arrow Keys


  CONNECT A REMOTE TERMINAL SESSION NOW.
  Enter the TERMINAL command for remote connection assistance.

BOOTMGR> DEV

BOOTABLE DEVICES (System Disks, Installation Kits, other):

  DKA0       (HD) = FS0    UEFI: V9_2_1      VMS: X86SYS2      14336 MB  SCSI Disk
  DKB0       (DVD) = FS1   UEFI: V9_2_1      VMS: None         1483  MB  SATA DVD

BOOTMGR> B DKA0
Booting...

%%%%%%%%%% VSI OpenVMS (tm) x86-64 %%%%%%%%%%


_____

       GRAPHICAL OUTPUT HAS BEEN SUSPENDED
       USE A TERMINAL UTILITY FOR ACCESS
_____

VSI Primary Kernel SYSBOOT May 16 2023 13:21:17

%SYSBOOT-I-VMTYPE, Booting as a VMware (tm) Guest


        VMS Software, Inc. OpenVMS (TM) x86_64 Operating System, V9.2-1
                  Copyright 2023 VMS Software, Inc.

  MDS Mitigation active, variant verw(MD_CLEAR)
%DECnet-I-LOADED, network base image loaded, version = 05.92.05

%DECnet-W-ZEROLEN, length of file is zero -- SYS$SYSROOT:[SYSEXE]NET$CONFIG.DAT
```

```
%SMP-I-CPUTRN, CPU #3 has joined the active set.
%SMP-I-CPUTRN, CPU #1 has joined the active set.
%SMP-I-CPUTRN, CPU #2 has joined the active set.
%SMP-I-CPUTRN, CPU #5 has joined the active set.
%SMP-I-CPUTRN, CPU #4 has joined the active set.

    Installing required known files...

    Configuring devices...

%STARTUP-E-NOPAGFIL, No page files have been successfully installed.
%%%%%%%%%%  OPCOM   1-JUN-2023 13:12:45.93  %%%%%%%%%%
Operator _ES2061$OPA0: has been enabled, username SYSTEM

%SYSTEM-I-BOOTUPGRADE, security auditing disabled
%%%%%%%%%%  OPCOM   1-JUN-2023 13:12:45.93  %%%%%%%%%%
Operator status for operator _ES2061$OPA0:
CENTRAL, PRINTER, TAPES, DISKS, DEVICES, CARDS, NETWORK, CLUSTER, SECURITY,
LICENSE, OPER1, OPER2, OPER3, OPER4, OPER5, OPER6, OPER7, OPER8, OPER9, OPER10,
OPER11, OPER12

%%%%%%%%%%  OPCOM   1-JUN-2023 13:12:45.94  %%%%%%%%%%
Logfile has been initialized by operator _ES2061$OPA0:
Logfile is ES2061::SYS$SYSROOT:[SYSMGR]OPERATOR.LOG;1

%%%%%%%%%%  OPCOM   1-JUN-2023 13:12:45.95  %%%%%%%%%%
Operator status for operator ES2061::SYS$SYSROOT:[SYSMGR]OPERATOR.LOG;1
CENTRAL, PRINTER, TAPES, DISKS, DEVICES, CARDS, NETWORK, CLUSTER, SECURITY,
LICENSE, OPER1, OPER2, OPER3, OPER4, OPER5, OPER6, OPER7, OPER8, OPER9, OPER10,
OPER11, OPER12

%%%%%%%%%%  OPCOM   1-JUN-2023 13:12:46.02  %%%%%%%%%%
Message from user SYSTEM on ES2061
%JBC-E-OPENERR, error opening SYS$COMMON:[SYSEXE]QMAN$MASTER.DAT;

%%%%%%%%%%  OPCOM   1-JUN-2023 13:12:46.02  %%%%%%%%%%
Message from user SYSTEM on ES2061
-RMS-E-FNF, file not found

%LICENSE-F-EMTLDB, license database contains no license records
%SYSTEM-I-BOOTUPGRADE, security server not started
%%%%%%%%%%  OPCOM   1-JUN-2023 13:12:46.13  %%%%%%%%%%
Message from user SYSTEM on ES2061
TDF-I-SETTDF TDF set new timezone differential

NET$STARTUP, Network not started due to UPGRADE boot
%%%%%%%%%%  OPCOM   1-JUN-2023 13:12:46.25  %%%%%%%%%%
Message from user SYSTEM on ES2061
%LICENSE-E-NOAUTH, VSI OPENVMS-X86 use is not authorized on this node
-LICENSE-F-NOLICENSE, no license is active for this software product
-LICENSE-I-SYSMGR, please see your system manager


%LICENSE-E-NOAUTH, VSI OPENVMS-X86 use is not authorized on this node
-LICENSE-F-NOLICENSE, no license is active for this software product
-LICENSE-I-SYSMGR, please see your system manager
Startup processing continuing...

%SYSTEM-I-BOOTUPGRADE, Coordinated Startup not performed
%EIA0, Link up: 1000 mbit, fdx, flow control (rcv only), 00-0C-29-54-58-EF


    AUTOGEN will now be run to compute the new system parameters.  The system
    will then shut down and reboot, and the installation or upgrade will be
    complete.

    After rebooting you can continue with such system management tasks as:
```

```
            Configuring networking software (TCP/IP Services, DECnet, other)
            Using SYS$MANAGER:CLUSTER_CONFIG.COM to create an OpenVMS Cluster
            Creating FIELD, SYSTEST and SYSTEST_CLIG accounts if needed

%AUTOGEN-I-BEGIN, GETDATA phase is beginning.
%AUTOGEN-I-NEWFILE,  Previous contents of SYS$SYSTEM:CLU$PARAMS.DAT have
  been copied to SYS$SYSTEM:CLU$PARAMS.OLD.  You may wish to purge
  SYS$SYSTEM:CLU$PARAMS.OLD.
%AUTOGEN-I-NEWFILE,  Previous contents of SYS$SYSTEM:CLU$PARAMS.DAT have
  been copied to SYS$SYSTEM:CLU$PARAMS.OLD.  You may wish to purge
  SYS$SYSTEM:CLU$PARAMS.OLD.
%AUTOGEN-I-NEWFILE,  Previous contents of SYS$SYSTEM:CLU$PARAMS.DAT have
  been copied to SYS$SYSTEM:CLU$PARAMS.OLD.  You may wish to purge
  SYS$SYSTEM:CLU$PARAMS.OLD.
%AUTOGEN-I-NEWFILE, A new version of SYS$SYSTEM:PARAMS.DAT has been created.
        You may wish to purge this file.
%AUTOGEN-I-END, GETDATA phase has successfully completed.
%AUTOGEN-I-BEGIN, GENPARAMS phase is beginning.
%AUTOGEN-I-NEWFILE, A new version of SYS$MANAGER:VMSIMAGES.DAT has been created.
        You may wish to purge this file.
%AUTOGEN-I-NEWFILE, A new version of SYS$SYSTEM:SETPARAMS.DAT has been created.
        You may wish to purge this file.
%AUTOGEN-I-END, GENPARAMS phase has successfully completed.
%AUTOGEN-I-BEGIN, GENFILES phase is beginning.
%SYSGEN-I-CREATED, SYS$SYSROOT:[SYSEXE]SYS$ERRLOG.DMP;2 created
%SYSGEN-I-CREATED, DKA0:[SYS0.SYSEXE]SYSDUMP.DMP;1 created
%SYSGEN-I-EXTENDED, DKA0:[SYS0.SYSEXE]SYSDUMP.DMP;1 extended

******************
%AUTOGEN-W-REPORT, Warnings were detected by AUTOGEN.  Please review the
        information given in the file SYS$SYSTEM:AGEN$PARAMS.REPORT
******************

%AUTOGEN-I-REPORT, AUTOGEN has produced some informational messages which
        have been stored in the file SYS$SYSTEM:AGEN$PARAMS.REPORT.  You may
        wish to review the information in that file.

%AUTOGEN-I-END, GENFILES phase has successfully completed.
%AUTOGEN-I-BEGIN, SETPARAMS phase is beginning.
%SYSGEN-W-SETMAX, value set to maximum for parameter GH_EXEC_CODE
%%%%%%%%%%  OPCOM   1-JUN-2023 13:13:32.48  %%%%%%%%%%
Message from user SYSTEM on ES2061
%SYSGEN-I-WRITECUR, CURRENT system parameters modified by process ID 00000023 in
to file SYS$SYSROOT_MD:[SYSEXE]X86_64VMSSYS.PAR;2

%AUTOGEN-I-SYSGEN, parameters modified
%AUTOGEN-I-END, SETPARAMS phase has successfully completed.
%AUTOGEN-I-BEGIN, REBOOT phase is beginning.

The system is shutting down to allow the system to boot with the
generated site-specific parameters and installed images.

The system will automatically reboot after the shutdown and the
upgrade will be complete.



        SHUTDOWN -- Perform an Orderly System Shutdown
                  on node ES2061


%SHUTDOWN-I-BOOTCHECK, performing reboot consistency check...
%SHUTDOWN-I-CHECKOK, basic reboot consistency check completed

%SHUTDOWN-I-OPERATOR, this terminal is now an operator's console
%SHUTDOWN-I-DISLOGINS, interactive logins will now be disabled
%SET-I-INTSET, login interactive limit = 0, current interactive value = 0
%SHUTDOWN-I-STOPQUEUES, the queues on this node will now be stopped
%%%%%%%%%%  OPCOM   1-JUN-2023 13:13:33.18  %%%%%%%%%%
Message from user SYSTEM on ES2061
```

```
%JBC-E-OPENERR, error opening SYS$COMMON:[SYSEXE]QMAN$MASTER.DAT;

%%%%%%%%%%  OPCOM   1-JUN-2023 13:13:33.18  %%%%%%%%%%
Message from user SYSTEM on ES2061
-RMS-E-FNF, file not found


SHUTDOWN message on ES2061 from user SYSTEM at ES2061 Batch   13:13:33
ES2061 will shut down in 0 minutes; back up soon.  Please log off node ES2061.
Reboot system with AUTOGENerated parameters


%SHUTDOWN-I-STOPUSER, all user processes will now be stopped
%SHUTDOWN-I-STOPCPU, the secondary processors will now be stopped
%SMP-I-CPUTRN, CPU #1 was removed from the active set.
%SMP-I-CPUTRN, CPU #2 was removed from the active set.
%SMP-I-CPUTRN, CPU #3 was removed from the active set.
%SMP-I-CPUTRN, CPU #4 was removed from the active set.
%SMP-I-CPUTRN, CPU #5 was removed from the active set.
%SHUTDOWN-I-REMOVE, all installed images will now be removed
%SET-I-PSXROOSET, system POSIX root set to SYS$SYSDEVICE:[000000]
%SHUTDOWN-I-DISMOUNT, all volumes will now be dismounted
%%%%%%%%%%  OPCOM   1-JUN-2023 13:13:33.90  %%%%%%%%%%
Message from user SYSTEM on ES2061
STARTUP, ES2061 shutdown was requested by the operator.



VSI Dump Kernel SYSBOOT May 16 2023 13:21:17

** Dumping error logs to the system disk (ES2061$DKA0:)
** Error logs dumped to ES2061$DKA0:[SYS0.SYSEXE]SYS$ERRLOG.DMP
** (used 36 out of 128 available blocks)

Restarting the system...


VSI OpenVMS Boot Manager: V9.2-1 Build 128

  ENABLED:  Symmetric Multi-Processing
  ENABLED:  Crash Dump Processing
  ENABLED:  Console output to Legacy COM 1 Port
  ENABLED:  Using Environment ROM

  Checking Required Processor Features:
  PASSED

  BOOT MANAGER DEVICE:  DKB0
  DEFAULT BOOT COMMAND: BOOT DKA0 0x00 0x00000000

  VIRTUAL MACHINE GUEST:
  VMware (tm) No Mouse support; Use Commands or Arrow Keys


  CONNECT A REMOTE TERMINAL SESSION NOW.
  Enter the TERMINAL command for remote connection assistance.

BOOTMGR> DEV

BOOTABLE DEVICES (System Disks, Installation Kits, other):

  DKA0        (HD) = FS0    UEFI: V9_2_1      VMS: X86SYS2      14336 MB  SCSI Disk
  DKB0        (DVD) = FS1   UEFI: V9_2_1      VMS: None         1483  MB  SATA DVD

BOOTMGR> B DKA0
Booting...

%%%%%%%%%% VSI OpenVMS (tm) x86-64 %%%%%%%%%%
```

```
_____

      GRAPHICAL OUTPUT HAS BEEN SUSPENDED
      USE A TERMINAL UTILITY FOR ACCESS
_____


VSI Primary Kernel SYSBOOT May 16 2023 13:21:17

%SYSBOOT-I-VMTYPE, Booting as a VMware (tm) Guest


        VMS Software, Inc. OpenVMS (TM) x86_64 Operating System, V9.2-1
                  Copyright 2023 VMS Software, Inc.

  MDS Mitigation active, variant verw(MD_CLEAR)
%DECnet-I-LOADED, network base image loaded, version = 05.92.05

%DECnet-W-ZEROLEN, length of file is zero -- SYS$SYSROOT:[SYSEXE]NET$CONFIG.DAT

%SMP-I-CPUTRN, CPU #1 has joined the active set.
%SMP-I-CPUTRN, CPU #2 has joined the active set.
%SMP-I-CPUTRN, CPU #3 has joined the active set.
%SMP-I-CPUTRN, CPU #4 has joined the active set.
%SMP-I-CPUTRN, CPU #5 has joined the active set.
%STDRV-I-STARTUP, OpenVMS startup begun at  1-JUN-2023 13:15:00.48
%EIA0, Link up: 1000 mbit, fdx, flow control (rcv only), 00-0C-29-54-58-EF
%RUN-S-PROC_ID, identification of created process is 00000404
%RUN-S-PROC_ID, identification of created process is 00000405
%%%%%%%%%% OPCOM   1-JUN-2023 13:15:02.09  %%%%%%%%%%
Operator _ES2061$OPA0: has been enabled, username SYSTEM

%%%%%%%%%% OPCOM   1-JUN-2023 13:15:02.09  %%%%%%%%%%
Operator status for operator _ES2061$OPA0:
CENTRAL, PRINTER, TAPES, DISKS, DEVICES, CARDS, NETWORK, CLUSTER, SECURITY,
LICENSE, OPER1, OPER2, OPER3, OPER4, OPER5, OPER6, OPER7, OPER8, OPER9, OPER10,
OPER11, OPER12

%%%%%%%%%% OPCOM   1-JUN-2023 13:15:02.09  %%%%%%%%%%
Logfile has been initialized by operator _ES2061$OPA0:
Logfile is ES2061::SYS$SYSROOT:[SYSMGR]OPERATOR.LOG;2

%%%%%%%%%% OPCOM   1-JUN-2023 13:15:02.09  %%%%%%%%%%
Operator status for operator ES2061::SYS$SYSROOT:[SYSMGR]OPERATOR.LOG;2
CENTRAL, PRINTER, TAPES, DISKS, DEVICES, CARDS, NETWORK, CLUSTER, SECURITY,
LICENSE, OPER1, OPER2, OPER3, OPER4, OPER5, OPER6, OPER7, OPER8, OPER9, OPER10,
OPER11, OPER12

%SET-I-NEWAUDSRV, identification of new audit server process is 0000040B
%%%%%%%%%% OPCOM   1-JUN-2023 13:15:02.14  %%%%%%%%%%
Message from user AUDIT$SERVER on ES2061
%AUDSRV-I-NEWSERVERDB, new audit server database created ( PC 00000000.8001A365)

%%%%%%%%%% OPCOM   1-JUN-2023 13:15:02.15  %%%%%%%%%%
Message from user SYSTEM on ES2061
%JBC-E-OPENERR, error opening SYS$COMMON:[SYSEXE]QMAN$MASTER.DAT;

%%%%%%%%%% OPCOM   1-JUN-2023 13:15:02.15  %%%%%%%%%%
Message from user SYSTEM on ES2061
-RMS-E-FNF, file not found

%%%%%%%%%% OPCOM   1-JUN-2023 13:15:02.15  %%%%%%%%%%
Message from user AUDIT$SERVER on ES2061
%AUDSRV-I-REMENABLED, resource monitoring enabled for journal SECURITY

%%%%%%%%%% OPCOM   1-JUN-2023 13:15:02.16  %%%%%%%%%%
Message from user AUDIT$SERVER on ES2061
%AUDSRV-I-NEWOBJECTDB, new object database created ( PC 00000000.8001FA80)

%LICENSE-F-EMTLDB, license database contains no license records
%%%%%%%%%% OPCOM   1-JUN-2023 13:15:02.24  %%%%%%%%%%
```

```
Message from user SYSTEM on ES2061
%SECSRV-I-SERVERSTARTINGU, security server starting up


%%%%%%%%%%  OPCOM   1-JUN-2023 13:15:02.25  %%%%%%%%%%
Message from user SYSTEM on ES2061
%SECSRV-I-CIACRECLUDB, security server created cluster intrusion database


%%%%%%%%%%  OPCOM   1-JUN-2023 13:15:02.25  %%%%%%%%%%
Message from user SYSTEM on ES2061
%SECSRV-I-CIASTARTINGUP, breakin detection and evasion processing now starting u
p


%%%%%%%%%%  OPCOM   1-JUN-2023 13:15:02.27  %%%%%%%%%%
Message from user SYSTEM on ES2061
TDF-I-SETTDF TDF set new timezone differential

Copyright 2023 VMS Software, Inc.
%NET$STARTUP-W-NONETCONFIG, this node has not been configured to run DECnet-Plus
 for OpenVMS
        use SYS$MANAGER:NET$CONFIGURE.COM if you wish to configure DECnet
%NET$STARTUP-I-OPERSTATUS, DECnet-Plus for OpenVMS operational status is OFF
%DECdtm-F-NODECnet, the TP_SERVER process was not started because either:

o  DECnet-Plus is not started or is not configured, or

o  The SYS$NODE_FULLNAME logical name is not defined

   This could be because when you installed DECnet-Plus and were prompted
   for the system's full name, you specified a local name instead of a
   DECdns or Domain name.

If you want to use DECdtm services, make sure that DECnet-Plus is started and
configured and that SYS$NODE_FULLNAME is defined, then use the following
command to start the TP_SERVER process:

   $ @SYS$STARTUP:DECDTM$STARTUP.COM

%%%%%%%%%%  OPCOM   1-JUN-2023 13:15:02.53  %%%%%%%%%%
Message from user SYSTEM on ES2061
%LICENSE-E-NOAUTH, VSI OPENVMS-X86 use is not authorized on this node
-LICENSE-F-NOLICENSE, no license is active for this software product
-LICENSE-I-SYSMGR, please see your system manager


%LICENSE-E-NOAUTH, VSI OPENVMS-X86 use is not authorized on this node
-LICENSE-F-NOLICENSE, no license is active for this software product
-LICENSE-I-SYSMGR, please see your system manager
Startup processing continuing...

%STARTUP-I-AUDITCONTINUE, audit server initialization complete
%%%%%%%%%%  OPCOM   1-JUN-2023 13:15:02.82  %%%%%%%%%%
Message from user AUDIT$SERVER on ES2061
Security alarm (SECURITY) and security audit (SECURITY) on ES2061, system id: 16
38
Auditable event:          Audit server starting up
Event time:                1-JUN-2023 13:15:02.76
PID:                      00000403
Username:                 SYSTEM


The OpenVMS system is now executing the site-specific startup commands.

%%%%%%%%%%  OPCOM   1-JUN-2023 13:15:03.28  %%%%%%%%%%
Message from user AUDIT$SERVER on ES2061
Security alarm (SECURITY) and security audit (SECURITY) on ES2061, system id: 16
38
Auditable event:          Identifier added
```

```
Event time:              1-JUN-2023 13:15:03.27
PID:                    00000403
Process name:           STARTUP
Username:               SYSTEM
Process owner:          [SYSTEM]
Image name:             ES2061$DKA0:[SYS0.SYSCOMMON.][SYSEXE]AUTHORIZE.EXE
Identifier name:        SYS$NODE_ES2061
Identifier value:       %X80010000
Attributes:             none
Posix UID:              -2
Posix GID:              -2 (%XFFFFFFFE)


%UAF-I-RDBADDMSG, identifier SYS$NODE_ES2061 value %X80010000 added to rights da
tabase
%%%%%%%%%%  OPCOM   1-JUN-2023 13:15:03.32  %%%%%%%%%%
Message from user AUDIT$SERVER on ES2061
Security alarm (SECURITY) and security audit (SECURITY) on ES2061, system id: 16
38
Auditable event:        Identifier added
Event time:              1-JUN-2023 13:15:03.32
PID:                    00000403
Process name:           STARTUP
Username:               SYSTEM
Process owner:          [SYSTEM]
Image name:             ES2061$DKA0:[SYS0.SYSCOMMON.][SYSEXE]AUTHORIZE.EXE
Identifier name:        DECW$WS_QUOTA
Identifier value:       %X80010001
Attributes:             none
Posix UID:              -2
Posix GID:              -2 (%XFFFFFFFE)


%UAF-I-RDBADDMSG, identifier DECW$WS_QUOTA value %X80010001 added to rights data
base
%%%%%%%%%%  OPCOM   1-JUN-2023 13:15:03.36  %%%%%%%%%%
Message from user AUDIT$SERVER on ES2061
Security alarm (SECURITY) and security audit (SECURITY) on ES2061, system id: 16
38
Auditable event:        Identifier added
Event time:              1-JUN-2023 13:15:03.35
PID:                    00000403
Process name:           STARTUP
Username:               SYSTEM
Process owner:          [SYSTEM]
Image name:             ES2061$DKA0:[SYS0.SYSCOMMON.][SYSEXE]IMGDMP_RIGHTS.EXE
;1
Identifier name:        IMGDMP$READALL
Identifier value:       %X90390001
Attributes:             none
Posix UID:              -2
Posix GID:              -2 (%XFFFFFFFE)


%PROCDUMP-I-CREATED, rights identifier IMGDMP$READALL successfully created
%PROCDUMP-I-CREATED, rights identifier IMGDMP$PROTECT successfully created
%%%%%%%%%%  OPCOM   1-JUN-2023 13:15:03.37  %%%%%%%%%%
Message from user AUDIT$SERVER on ES2061
Security alarm (SECURITY) and security audit (SECURITY) on ES2061, system id: 16
38
Auditable event:        Identifier added
Event time:              1-JUN-2023 13:15:03.37
PID:                    00000403
Process name:           STARTUP
Username:               SYSTEM
Process owner:          [SYSTEM]
Image name:             ES2061$DKA0:[SYS0.SYSCOMMON.][SYSEXE]IMGDMP_RIGHTS.EXE
;1
Identifier name:        IMGDMP$PROTECT
Identifier value:       %X90390002
Attributes:             RESOURCE
Posix UID:              -2
Posix GID:              -2 (%XFFFFFFFE)
```

```
%SET-I-INTSET, login interactive limit = 64, current interactive value = 0
%RUN-S-PROC_ID, identification of created process is 00000411
%%%%%%%%%%  OPCOM   1-JUN-2023 13:15:03.46  %%%%%%%%%%
Message from user SYSTEM on ES2061
%SMHANDLER-S-STARTUP, server management event handler startup

%%%%%%%%%%  OPCOM   1-JUN-2023 13:15:05.25  %%%%%%%%%%
Message from user SYSTEM on ES2061
%SECSRV-I-PROXYSTARTINGUP, proxy processing now starting up


%%%%%%%%%%  OPCOM   1-JUN-2023 13:15:05.25  %%%%%%%%%%
Message from user SYSTEM on ES2061
%SECSRV-E-NOPROXYDB, cannot find proxy database file NET$PROXY.DAT
%RMS-E-FNF, file not found


  SYSTEM       job terminated at  1-JUN-2023 13:15:05.47

  Accounting information:
  Buffered I/O count:               3108      Peak working set size:      13712
  Direct I/O count:                 1692      Peak virtual size:         279216
  Page faults:                      4095      Mounted volumes:                0
  Charged CPU time:         0 00:00:01.61     Elapsed time:       0 00:00:05.02

 Welcome to OpenVMS (TM) x86_64 Operating System, Version V9.2-1

Username: system
Password:
%LICENSE-I-NOLICENSE, no license is active for this software product
%LOGIN-S-LOGOPRCON, login allowed from OPA0:
VMS Software, Inc. OpenVMS (TM) x86_64 Operating System, V9.2-1

$
$
$ sho dev dk

Device              Device           Error   Volume          Free  Trans Mnt
 Name               Status           Count    Label         Blocks Count Cnt
ES2061$DKA0:        Mounted             0 X86SYS2          9483888   182   1
ES2061$DKA100:      Online              0
ES2061$DKB0:        Online wrtlck       0
$
```

B.2. Sample Upgrade Log

Below is the sample upgrade log.

```
Script started on Thu Jun  1 21:01:25 2023

The default interactive shell is now zsh.
To update your account to use zsh, please run `chsh -s /bin/zsh`.
For more details, please visit https://support.apple.com/kb/HT208050.
[?1034hbash-3.2$ telnet [3Pexittelnet 10.10.117.75 4044
Trying 10.10.117.75...
Connected to 10.10.117.75.
Escape character is '^]'.
^]
telnet> mode char

 MYNODE_>}
telnet> unset crlf
Will send carriage returns as telnet <CR><NUL>.


MYNODE_>sho sys/noproc/full
```

```
OpenVMS E9.2-1  on node MYNODE     1-JUN-2023 21:02:35.72   Uptime  0 01:32:47
        VMware, Inc. VMware7,1


MYNODE_>reboot



 SHUTDOWN -- Perform an Orderly System Shutdown
             on node MYNODE

%SHUTDOWN-I-OPERATOR, this terminal is now an operator's console
%%%%%%%%%%  OPCOM   1-JUN-2023 21:02:56.54  %%%%%%%%%%
Operator status for operator _MYNODE$OPA0:
CENTRAL, PRINTER, TAPES, DISKS, DEVICES, CARDS, NETWORK, CLUSTER, SECURITY,
LICENSE, OPER1, OPER2, OPER3, OPER4, OPER5, OPER6, OPER7, OPER8, OPER9, OPER10,
OPER11, OPER12

%SHUTDOWN-I-DISLOGINS, interactive logins will now be disabled
%SET-I-INTSET, login interactive limit = 0, current interactive value = 1
%SHUTDOWN-I-SHUTNET, the DECnet network will now be shut down
%SHUTDOWN-I-STOPQUEUES, the queues on this node will now be stopped
%%%%%%%%%%  OPCOM   1-JUN-2023 21:02:56.64  %%%%%%%%%%
Message from user SYSTEM on MYNODE
%JBC-E-OPENERR, error opening SYS$COMMON:[SYSEXE]QMAN$MASTER.DAT;

%%%%%%%%%%  OPCOM   1-JUN-2023 21:02:56.64  %%%%%%%%%%
Message from user SYSTEM on MYNODE
-RMS-E-FNF, file not found


SHUTDOWN message on MYNODE from user SYSTEM at _MYNODE$OPA0:   21:02:56
MYNODE will shut down in 0 minutes; back up LATER.  Please log off node MYNODE.
SHUTDOWN


1 terminal has been notified on MYNODE.
%SHUTDOWN-I-SITESHUT, the site-specific shutdown procedure will now be invoked
%SHUTDOWN-I-STOPUSER, all user processes will now be stopped
%%%%%%%%%%  OPCOM   1-JUN-2023 21:02:56.70  %%%%%%%%%%
Message from user INTERnet on MYNODE
INTERnet ACP NOLISTEN Process creation success: Service - FTP

%%%%%%%%%%  OPCOM   1-JUN-2023 21:02:57.18  %%%%%%%%%%
Message from user DECNET on MYNODE
DECnet shutting down

%SHUTDOWN-I-STOPAUDIT, the security auditing subsystem will now be shut down
%SHUTDOWN-I-STOPSECSRV, the security server will now be shut down
%%%%%%%%%%  OPCOM   1-JUN-2023 21:03:04.81  %%%%%%%%%%
Message from user AUDIT$SERVER on MYNODE
Security alarm (SECURITY) and security audit (SECURITY) on MYNODE, system id: 1438
Auditable event:        Audit server shutting down
Event time:              1-JUN-2023 21:03:04.81
PID:                    00000413
Username:               SYSTEM

%SHUTDOWN-I-STOPCPU, the secondary processors will now be stopped
%SMP-I-CPUTRN, CPU #1 was removed from the active set.
%SMP-I-CPUTRN, CPU #2 was removed from the active set.
%SMP-I-CPUTRN, CPU #3 was removed from the active set.
%SMP-I-CPUTRN, CPU #4 was removed from the active set.
%SMP-I-CPUTRN, CPU #5 was removed from the active set.
%SMP-I-CPUTRN, CPU #6 was removed from the active set.
%SMP-I-CPUTRN, CPU #7 was removed from the active set.
%SMP-I-CPUTRN, CPU #8 was removed from the active set.
%SMP-I-CPUTRN, CPU #9 was removed from the active set.
%SMP-I-CPUTRN, CPU #10 was appovved from the active set.
%SMP-I-CPUTRN, CPU #11 was removed from the active set.
%SMP-I-CPUTRN, CPU #12 was removed from the active set.
%SMP-I-CPUTRN, CPU #13 was removed from the active set.
```

```
%SMP-I-CPUTRN, CPU #14 was removed from the active set.
%SMP-I-CPUTRN, CPU #15 was removed from the active set.
%SHUTDOWN-I-REMOVE, all installed images will now be removed
%SET-I-PSXROOSET, system POSIX root set to SYS$SYSDEVICE:[000000]
%SHUTDOWN-I-DISMOUNT, all volumes will now be dismounted
%%%%%%%%%% OPCOM   1-JUN-2023 21:03:05.06  %%%%%%%%%%
Message from user SYSTEM on MYNODE
_MYNODE$OPA0:, MYNODE shutdown was requested by the operator.

%%%%%%%%%% OPCOM   1-JUN-2023 21:03:05.07  %%%%%%%%%%
Logfile was closed by operator _MYNODE$OPA0:
Logfile was MYNODE::SYS$SYSROOT:[SYSMGR]OPERATOR.LOG;2

%%%%%%%%%% OPCOM   1-JUN-2023 21:03:05.09  %%%%%%%%%%
Operator _MYNODE$OPA0: has been disabled, username SYSTEM


Open user files prevent dismounting host device _MYNODE$DKA0:
Cannot deinstall page/swap file DISK$X86SYS:[SYS0.SYSEXE]PAGEFILE.SYS;1
  (index # 254)

VSI Dump Kernel SYSBOOT Jan 23 2023 14:03:45

** Dumping error logs to the system disk (MYNODE$DKA0:)

** Error logs dumped to MYNODE$DKA0:[SYS0.SYSEXE]SYS$ERRLOG.DMP

** (used 276 out of 288 available blocks)

Restarting the system...

Attempting to start up from:
 > EFI Internal Shell (Unsupported option)...
EFI Shell version 2.40 [1.0]
Current running mode 1.1.2
Device mapping table
  fs0    :CDRom - Alias cd23b0a0 blk0
     PciRoot(0x0)/Pci(0x11,0x0)/Pci(0x1,0x0)/Sata(0x1,0x0,0x0)/CDROM(0x0,0x1B,0xE800)
  fs1    :CDRom - Alias cd25c0a0 blk1
          PciRoot(0x0)/Pci(0x11,0x0)/Pci(0x3,0x0)/Sata(0x2,0x0,0x0)/CDROM(0x0,0x1B,0xE800)
  fs2    :Removable HardDisk - Alias hd17a0b blk2
          PciRoot(0x0)/Pci(0x10,0x0)/Scsi(0x0,0x0)/HD(1,GPT,0540B8AB-00D1-11EE-9002-
AA000400FEFF,0x2C8C20,0x3E800)
  blk0    :CDRom - Alias cd23b0a0 fs0
          PciRoot(0x0)/Pci(0x11,0x0)/Pci(0x1,0x0)/Sata(0x1,0x0,0x0)/CDROM(0x0,0x1B,0xE800)
  blk1    :CDRom - Alias cd25c0a0 fs1
          PciRoot(0x0)/Pci(0x11,0x0)/Pci(0x3,0x0)/Sata(0x2,0x0,0x0)/CDROM(0x0,0x1B,0xE800)
  blk2    :Removable HardDisk - Alias hd17a0b fs2
          PciRoot(0x0)/Pci(0x10,0x0)/Scsi(0x0,0x0)/HD(1,GPT,0540B8AB-00D1-11EE-9002-
AA000400FEFF,0x2C8C20,0x3E800)
  blk3    :BlockDevice - Alias (null)
          PciRoot(0x0)/Pci(0x11,0x0)/Pci(0x1,0x0)/Sata(0x1,0x0,0x0)
  blk4    :BlockDevice - Alias (null)
          PciRoot(0x0)/Pci(0x11,0x0)/Pci(0x3,0x0)/Sata(0x2,0x0,0x0)
  blk5    :Removable HardDisk - Alias (null)
          PciRoot(0x0)/Pci(0x10,0x0)/Scsi(0x0,0x0)/HD(2,GPT,0540B8AA-00D1-11EE-9001-
AA000400FEFF,0x30,0x2C8BF0)
  blk6    :Removable HardDisk - Alias (null)
          PciRoot(0x0)/Pci(0x10,0x0)/Scsi(0x0,0x0)/HD(3,GPT,0540B8AB-00D1-11EE-9001-
AA000400FEFF,0x307420,0x1CF8BBF)
  blk7    :Removable BlockDevice - Alias (null)
          PciRoot(0x0)/Pci(0x10,0x0)/Scsi(0x0,0x0)
  blk8    :Removable BlockDevice - Alias (null)
          PciRoot(0x0)/Pci(0x11,0x0)/Pci(0x2,0x0)/Scsi(0x2,0x0)


Press ESC in 5 seconds to skip startup.nsh, any other key to continue.
Press ESC in 4 seconds to skip startup.nsh, any other key to continue.
Press ESC in 3 seconds to skip startup.nsh, any other key to continue.
Press ESC in 2 seconds to skip startup.nsh, any other key to continue.
```

```
Press ESC in 1 seconds to skip startup.nsh, any other key to continue.
Shell>
Shell>
Shell>
Shell>
Shell>
Shell>
Shell>
Shell>
Shell>
Shell>
Shell>
Shell>
Shell>
Shell>
Shell>
Shell>
Shell>
Shell> map fs*
Device mapping table
  fs0      :CDRom - Alias cd23b0a0 blk0
            PciRoot(0x0)/Pci(0x11,0x0)/Pci(0x1,0x0)/Sata(0x1,0x0,0x0)/CDROM(0x0,0x1B,0xE800)
  fs1      :CDRom - Alias cd25c0a0 blk1
            PciRoot(0x0)/Pci(0x11,0x0)/Pci(0x3,0x0)/Sata(0x2,0x0,0x0)/CDROM(0x0,0x1B,0xE800)
  fs2      :Removable HardDisk - Alias hd17a0b blk2
            PciRoot(0x0)/Pci(0x10,0x0)/Scsi(0x0,0x0)/HD(1,GPT,0540B8AB-00D1-11EE-9002-
AA000400FEFF,0x2C8C20,0x3E800)

Shell> fs1:\efi\vms\vms_bootmgr

Scanning devices and preparing the OpenVMS Boot Manager...

VSI OpenVMS Boot Manager: V9.2-1 Build 128

  ENABLED:  Symmetric Multi-Processing
  ENABLED:  Crash Dump Processing
  ENABLED:  Console output to Legacy COM 1 Port
  ENABLED:  Using Environment ROM

  Checking Required Processor Features:
  PASSED

  BOOT MANAGER DEVICE:  DKD200
  DEFAULT BOOT COMMAND: BOOT DKA0 0x00 0x00000000

  VIRTUAL MACHINE GUEST:
  VMware (tm) No Mouse support; Use Commands or Arrow Keys


  CONNECT A REMOTE TERMINAL SESSION NOW.
  Enter the TERMINAL command for remote connection assistance.

BOOTMGR> DEV

BOOTABLE DEVICES (System Disks, Installation Kits, other):

  DKA0        (HD) = FS0    UEFI: E9_2_1      VMS: X86SYS      16384 MB   SCSI Disk
  DKB100      (DVD) = FS1   UEFI: E9_2_1      VMS: None        1574  MB   SATA DVD
  DKD200      (DVD) = FS2   UEFI: V9_2_1      VMS: None        1483  MB   SATA DVD

BOOTMGR> BOOT DKD200
Booting...
%VMS_BOOTMGR-I-INSTALL, Booting an OpenVMS Installation Kit...
  0%  1%  2%  3%  4%  5%  6%  7%  8%  9% 10% 11% 12% 13% 14% 15% 16% 17% 18% 19% 20% 21%
 22% 23% 24% 25% 26% 27% 28% 29% 30% 31% 32% 33% 34% 35% 36% 37% 38% 39% 40% 41% 42% 43%
 44% 45% 46% 47% 48% 49% 50% 51% 52% 53% 54% 55% 56% 57% 58% 59% 60% 61% 62% 63% 64% 65%
 66% 67% 68% 69% 70% 71% 72% 73% 74% 75% 76% 77% 78% 79% 80% 81% 82% 83% 84% 85% 86% 87%
 88% 89% 90% 91% 92% 93% 94% 95% 96% 97% 98% 99%100%
```

```
%%%%%%%%%% VSI OpenVMS (tm) x86-64 %%%%%%%%%%

_____


      GRAPHICAL OUTPUT HAS BEEN SUSPENDED

    USE A TERMINAL UTILITY FOR ACCESS

_____


VSI Primary Kernel SYSBOOT May 16 2023 13:21:17


%SYSBOOT-I-VMTYPE, Booting as a VMware (tm) Guest


       VMS Software, Inc. OpenVMS (TM) x86_64 Operating System, V9.2-1


                 Copyright 2023 VMS Software, Inc.


%SMP-I-CPUTRN, CPU #3 has joined the active set.
%SMP-I-CPUTRN, CPU #9 has joined the active set.
%SMP-I-CPUTRN, CPU #15 has joined the active set.
%SMP-I-CPUTRN, CPU #14 has joined the active set.
%SMP-I-CPUTRN, CPU #10 has joined the active set.
%SMP-I-CPUTRN, CPU #1 has joined the active set.
%SMP-I-CPUTRN, CPU #13 has joined the active set.
%SMP-I-CPUTRN, CPU #4 has joined the active set.
%SMP-I-CPUTRN, CPU #12 has joined the active set.
%SMP-I-CPUTRN, CPU #5 has joined the active set.
%SMP-I-CPUTRN, CPU #2 has joined the active set.
%SMP-I-CPUTRN, CPU #11 has joined the active set.
%SMP-I-CPUTRN, CPU #8 has joined the active set.
%SMP-I-CPUTRN, CPU #6 has joined the active set.
%SMP-I-CPUTRN, CPU #7 has joined the active set.

    Installing required known files...

    Configuring devices...


%EIA0, Link up: 1000 mbit, fdx, flow control (rcv only), 00-50-56-AC-49-CB

[c7[255;255H[6n8>

    ******************************************************************

    You can install or upgrade the OpenVMS X86-64 operating system
    or you can install or upgrade layered products that are included
    on the OpenVMS X86-64 distribution media.

    You can also execute DCL commands and procedures to perform
    "standalone" tasks, such as backing up the system disk.

    Please choose one of the following:

        1)  Upgrade, install or reconfigure OpenVMS X86-64 Version V9.2-1
        2)  Display layered products that this procedure can install
        3)  Install or upgrade layered products
        4)  Show installed products
        5)  Reconfigure installed products
        6)  Remove installed products
        7)  Find, Install or Undo patches; Show or Delete Recovery Data
        8)  Execute DCL commands and procedures
        9)  Shut down this system
```

```
Enter CHOICE or ? for help: (1/2/3/4/5/6/7/8/9/?) 1

    ***************************************************************

    This procedure will ask a series of questions.

          () - encloses acceptable answers
          [] - encloses default answers

    Type your response and press the <Return> key.  Type:

          ? - to repeat an explanation
          ^ - to change prior input (not always possible)
          Ctrl/Y - to exit the installation procedure

    There are two choices for installation/upgrade:

    Initialize - Removes all software and data files that were
        previously on the target disk and installs OpenVMS X86-64.

    Preserve -- Installs or Upgrades OpenVMS X86-64 on the target disk
        and retains all other contents of the target disk.

    * Note: You cannot use preserve to install OpenVMS X86-64 on a disk on
        which any other operating system is installed.  This includes
        implementations of OpenVMS for other architectures.

Do you want to INITIALIZE or to PRESERVE? [PRESERVE]


    You must enter the device name for the target disk on which
    OpenVMS X86-64 will be installed.

Enter device name for target disk: (? for choices) ??

  Device Name        Device Type Name          Volume Label     Size (blocks/xB)
  ------------     ------------------------   --------------   --------------------
  DKA0:            VMware Virtual disk        X86SYS            33554432   16.00GB
  DKC200:          VMware Virtual disk                         16777216    8.00GB


Enter device name for target disk: (? for choices) dla  ka0:

    DKA0: is now labeled X86SYS.

Do you want to keep this label? (Yes/No) [Yes]

    OpenVMS X86-64 will be upgraded on DKA0:.

    The following products are part of the OpenVMS installation;
    if necessary they will be installed or upgraded along with the
    OpenVMS operating system.

        o Availability Manager (base) for OpenVMS X86-64
        o TCP/IP Services for OpenVMS X86-64
        o KERBEROS for OpenVMS X86-64
        o SSL3 V3.0-8 for OpenVMS X86-64 (based on OpenSSL V3.0.8)
        o SSL111 V1.1-1T for OpenVMS X86-64 (based on OpenSSL V1.1.1t)
        o OpenSSH for OpenVMS X86-64
        o 64-bit PERL for OpenVMS X86-64

    If necessary, the following optional products will also be upgraded
    along with the OpenVMS operating system.

        o DECwindows Motif for OpenVMS X86-64
        o DECnet-Plus for OpenVMS X86-64
        o DECnet Phase IV for OpenVMS X86-64

    If you want to add or delete optional products, you can do so later
    in the upgrade by answering "NO" to the following question:
```

```
        "Do you want the defaults for all options?"

    Availability Manager (base) for OpenVMS X86-64
    is installed on your system. It will be upgraded.

    TCP/IP Services for OpenVMS X86-64
    is installed on your system. It will be upgraded.

    KERBEROS for OpenVMS X86-64 V3.3-2A
    is already installed on your system.  An upgrade is not required.

    SSL3 V3.0-8 for OpenVMS X86-64 (based on OpenSSL V3.0.8)
    is installed on your system. It will be upgraded.

    SSL111 V1.1-1T for OpenVMS X86-64 (based on OpenSSL V1.1.1t)
    is installed on your system. It will be upgraded.

    OpenSSH for OpenVMS X86-64 V8.9-1D
    is already installed on your system.  An upgrade is not required.

    64-bit PERL for OpenVMS X86-64 T5.34-0
    is already installed on your system.  An upgrade is not required.

    DECwindows Motif for OpenVMS X86-64 V1.8
    is already installed on your system.  An upgrade is not required.

    The DECnet-Plus kit is provided with the OpenVMS operating system kit.
    DECnet Phase IV applications are supported by DECnet-Plus.

    DECnet Phase IV is also provided as an option.

    If you install DECnet-Plus and TCP/IP you can run DECnet
    applications over a TCP/IP network.  Please refer to the
    VSI DECnet-Plus for OpenVMS Planning Guide for information
    on running DECnet over TCP/IP.

    Do you want to install DECnet-Plus for OpenVMS X86-64 V9.2-E?
(Yes/No) [Yes]


    DECnet Phase IV for OpenVMS X86-64 is installed on your system.
    It will be removed.

    The installation operation can provide brief or detailed descriptions.
    In either case, you can request the detailed descriptions by typing ?.

Do you always want detailed descriptions? (Yes/No) [No]
)0==)0==)0==)0==
    Preserving existing copies of STARTUP.NSH if found...


    No STARTUP.NSH files were found in the EFI system partition file

)0=

Performing product kit validation of signed kits ...
%PCSI-I-VSIVALPASSED, validation of DMM1:[VMS$COMMON]VSI-X86VMS-VMS-V0902-1-2.PCSI
$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.DWMOTIF_SUPPORT_X860921_KIT]VSI-X86VMS-
DWMOTIF_SUPPORT-V0902-1-1.PCSI$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.AVAIL_MAN_BASE_KIT]VSI-X86VMS-
AVAIL_MAN_BASE-V0902-1-1.PCSI$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.TCPIP]VSI-X86VMS-TCPIP-X0600-22-1.PCSI
$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.SSL3]VSI-X86VMS-SSL3-V0300-8-1.PCSI
$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.KERBEROS]VSI-X86VMS-KERBEROS-V0303-2A-1.PCSI
$COMPRESSED;1 succeeded
```

```
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.SSL111]VSI-X86VMS-SSL111-V0101-1T-1.PCSI
$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.OPENSSH]VSI-X86VMS-OPENSSH-V0809-1D-1.PCSI
$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.PERL534]VMSPORTS-X86VMS-PERL534-
T0534-0-1.PCSI$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.DWMOTIF]VSI-X86VMS-DWMOTIF-V0108--1.PCSI
$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.DECNET_PLUS]VSI-X86VMS-DECNET_PLUS-V0902-
E-1.PCSI$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.DECNET_PHASE_IV_X860921_KIT]VSI-X86VMS-
DECNET_PHASE_IV-V0902-1-1.PCSI$COMPRESSED;1 succeeded


The following product has been selected:
    VSI X86VMS OPENVMS V9.2-1          Platform (product suite)

Configuration phase starting ...

You will be asked to choose options, if any, for each selected product and for
any products that may be installed to satisfy software dependency requirements.

Configuring VSI X86VMS OPENVMS V9.2-1: OPENVMS and related products Platform

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    VMS Software, Inc.


Do you want the defaults for all options? [YES]


    Availability Manager (base) for OpenVMS X86-64

    TCP/IP Services for OpenVMS X86-64

* Product VSI X86VMS TCPIP X6.0-22 requires a system reboot.

Can the system be REBOOTED after the installation completes? [YES]


    KERBEROS for OpenVMS X86-64

    SSL3 V3.0-8 for OpenVMS X86-64 (based on OpenSSL V3.0.8)

    SSL111 V1.1-1T for OpenVMS X86-64 (based on OpenSSL V1.1.1t)

    OpenSSH for OpenVMS X86-64

    64-bit PERL for OpenVMS X86-64


Do you want to review the options? [NO]


Execution phase starting ...

%PCSI-W-VERRES, version types W through Z are reserved for VMS internal use
-PCSI-W-VERINS, the installation of product VSI X86VMS TCPIP X6.0-22
-PCSI-W-VERREM, will remove current product VSI X86VMS TCPIP X6.0-20

Do you want to continue? [YES]

The following products will be installed to destinations:
    VSI X86VMS AVAIL_MAN_BASE V9.2-1     DISK$X86SYS:[VMS$COMMON.]
    VSI X86VMS DECNET_PLUS V9.2-E        DISK$X86SYS:[VMS$COMMON.]
    VSI X86VMS DWMOTIF_SUPPORT V9.2-1    DISK$X86SYS:[VMS$COMMON.]
    VSI X86VMS OPENVMS V9.2-1            DISK$X86SYS:[VMS$COMMON.]
    VSI X86VMS SSL111 V1.1-1T            DISK$X86SYS:[VMS$COMMON.]
    VSI X86VMS SSL3 V3.0-8              DISK$X86SYS:[VMS$COMMON.]
    VSI X86VMS TCPIP X6.0-22            DISK$X86SYS:[VMS$COMMON.]
```

```
    VSI X86VMS VMS V9.2-1                  DISK$X86SYS:[VMS$COMMON.]
The following products will be removed from destinations:
    VSI X86VMS AVAIL_MAN_BASE E9.2-1       DISK$X86SYS:[VMS$COMMON.]
    VSI X86VMS DECNET_PHASE_IV E9.2-1      DISK$X86SYS:[VMS$COMMON.]
    VSI X86VMS DWMOTIF_SUPPORT E9.2-1      DISK$X86SYS:[VMS$COMMON.]
    VSI X86VMS OPENVMS E9.2-1              DISK$X86SYS:[VMS$COMMON.]
    VSI X86VMS SSL111 V1.1-1S              DISK$X86SYS:[VMS$COMMON.]
    VSI X86VMS SSL3 V3.0-7                 DISK$X86SYS:[VMS$COMMON.]
    VSI X86VMS TCPIP X6.0-20               DISK$X86SYS:[VMS$COMMON.]
    VSI X86VMS VMS E9.2-1                  DISK$X86SYS:[VMS$COMMON.]


Portion done: 0%...10%...20%...30%...40%...50%...60%...70%...80%

 Restoring STARTUP.NSH file(s)...

 No files restored

...90%...100%

The following products have been installed:
    VSI X86VMS AVAIL_MAN_BASE V9.2-1       Layered Product
    VSI X86VMS DECNET_PLUS V9.2-E          Layered Product
    VSI X86VMS DWMOTIF_SUPPORT V9.2-1      Layered Product
    VSI X86VMS OPENVMS V9.2-1              Platform (product suite)
    VSI X86VMS SSL111 V1.1-1T              Layered Product
    VSI X86VMS SSL3 V3.0-8                 Layered Product
    VSI X86VMS TCPIP X6.0-22               Layered Product
    VSI X86VMS VMS V9.2-1                  Operating System
The following products have been removed:
    VSI X86VMS AVAIL_MAN_BASE E9.2-1       Layered Product
    VSI X86VMS DECNET_PHASE_IV E9.2-1      Layered Product
    VSI X86VMS DWMOTIF_SUPPORT E9.2-1      Layered Product
    VSI X86VMS OPENVMS E9.2-1              Platform (product suite)
    VSI X86VMS SSL111 V1.1-1S              Layered Product
    VSI X86VMS SSL3 V3.0-7                 Layered Product
    VSI X86VMS TCPIP X6.0-20               Layered Product
    VSI X86VMS VMS E9.2-1                  Operating System

VSI X86VMS OPENVMS V9.2-1: OPENVMS and related products Platform

    VSI X86VMS TCPIP X6.0-22: VSI TCP/IP Services for OpenVMS.

      VSI X86VMS SSL3 V3.0-8: SSL3 for OpenVMS X86-64 V3.0-8 (Based on OpenSSL 3.0.8)

        Insert the following lines in SYS$MANAGER:SYSTARTUP_VMS.COM:
            @SYS$STARTUP:SSL3$STARTUP.COM
        Insert the following lines in SYS$MANAGER:SYSHUTDWN.COM:
            @SYS$STARTUP:SSL3$SHUTDOWN.COM

        Review the Installation Guide and Release Notes for post install directions.

        Review the Installation Guide and Release Notes for post upgrade verification
 suggestions.

        Refer to SYS$HELP:SSL30-8-X86.RELEASE_NOTES for more information.

     Check the release notes for current status of the product.

    VSI X86VMS SSL3 V3.0-8: SSL3 for OpenVMS X86-64 V3.0-8 (Based on OpenSSL 3.0.8)

      Insert the following lines in SYS$MANAGER:SYSTARTUP_VMS.COM:
          @SYS$STARTUP:SSL3$STARTUP.COM
      Insert the following lines in SYS$MANAGER:SYSHUTDWN.COM:
          @SYS$STARTUP:SSL3$SHUTDOWN.COM

      Review the Installation Guide and Release Notes for post install directions.

      Review the Installation Guide and Release Notes for post upgrade verification
 suggestions.
```

```
        Refer to SYS$HELP:SSL30-8-X86.RELEASE_NOTES for more information.

    VSI X86VMS SSL111 V1.1-1T: SSL111 for OpenVMS X86-64 V1.1-1T (Based on OpenSSL 1.1.1T)

        Review the Installation Guide and Release Notes for post install directions.

        Review the Installation Guide and Release Notes for post upgrade verification
 suggestions.

        Refer to SYS$HELP:SSL111-T-X86.RELEASE_NOTES for more information.

    VSI X86VMS DECNET_PLUS V9.2-E: DECnet-Plus V9.2-E for OpenVMS X86

        Release notes are available in SYS$HELP:HPE_DECNET-Plus-V84.RELEASE_NOTES and SYS
$HELP:VSI_DECNET_OSI.RELEASE_NOTES

%PCSI-I-SYSTEM_REBOOT, executing reboot procedure ...

 Shutdown/reboot deferred when this product is
 installed as part of the O/S installation/upgrade

    Running SYS$UPDATE:SYS$MD.COM to update the memory disk...

Created memory disk DKA0:[VMS$COMMON.SYS$LDR]SYS$MD.DSK;2
        - using 221552 blocks in 1 extent with 25664 spare blocks
        - mounted on LDM3165: with volume label MD2315229BFB
        - contains OpenVMS V9.2-1

    The upgrade is now complete.

    When the newly upgraded system is first booted, a special
    startup procedure will be run.  This procedure will:

        o  Run AUTOGEN to set system parameters.
        o  Reboot the system with the newly set parameters.

    You may shut down now or continue with other operations.


  Process X86VMS_INSTALL logged out at  1-JUN-2023 21:10:45.08

Press Return to continue...

    ******************************************************************

    You can install or upgrade the OpenVMS X86-64 operating system
    or you can install or upgrade layered products that are included
    on the OpenVMS X86-64 distribution media.

    You can also execute DCL commands and procedures to perform
    "standalone" tasks, such as backing up the system disk.

    Please choose one of the following:

        1)  Upgrade, install or reconfigure OpenVMS X86-64 Version V9.2-1
        2)  Display layered products that this procedure can install
        3)  Install or upgrade layered products
        4)  Show installed products
        5)  Reconfigure installed products
        6)  Remove installed products
        7)  Find, Install or Undo patches; Show or Delete Recovery Data
        8)  Execute DCL commands and procedures
        9)  Shut down this system

Enter CHOICE or ? for help: (1/2/3/4/5/6/7/8/9/?) 9

    Shutting down the system

VSI Dump Kernel SYSBOOT May 16 2023 13:21:17
```

```
[c7[255;255H[6n8>

** Error logs not dumped, system disk is write locked.

        SYSTEM SHUTDOWN COMPLETE

**** Hit any key to reboot system ****

Restarting the system...

Attempting to start up from:
 > EFI Internal Shell (Unsupported option)...
EFI Shell version 2.40 [1.0]
Current running mode 1.1.2
Device mapping table
  fs0     :CDRom - Alias cd23b0a0 blk0
           PciRoot(0x0)/Pci(0x11,0x0)/Pci(0x1,0x0)/Sata(0x1,0x0,0x0)/CDROM(0x0,0x1B,0xE800)
  fs1     :CDRom - Alias cd25c0a0 blk1
           PciRoot(0x0)/Pci(0x11,0x0)/Pci(0x3,0x0)/Sata(0x2,0x0,0x0)/CDROM(0x0,0x1B,0xE800)
  fs2     :Removable HardDisk - Alias hd17a0b blk2
           PciRoot(0x0)/Pci(0x10,0x0)/Scsi(0x0,0x0)/HD(1,GPT,0540B8AB-00D1-11EE-9002-
AA000400FEFF,0x2C8C20,0x3E800)
  blk0    :CDRom - Alias cd23b0a0 fs0
           PciRoot(0x0)/Pci(0x11,0x0)/Pci(0x1,0x0)/Sata(0x1,0x0,0x0)/CDROM(0x0,0x1B,0xE800)
  blk1    :CDRom - Alias cd25c0a0 fs1
           PciRoot(0x0)/Pci(0x11,0x0)/Pci(0x3,0x0)/Sata(0x2,0x0,0x0)/CDROM(0x0,0x1B,0xE800)
  blk2    :Removable HardDisk - Alias hd17a0b fs2
           PciRoot(0x0)/Pci(0x10,0x0)/Scsi(0x0,0x0)/HD(1,GPT,0540B8AB-00D1-11EE-9002-
AA000400FEFF,0x2C8C20,0x3E800)
  blk3    :BlockDevice - Alias (null)
           PciRoot(0x0)/Pci(0x11,0x0)/Pci(0x1,0x0)/Sata(0x1,0x0,0x0)
  blk4    :BlockDevice - Alias (null)
           PciRoot(0x0)/Pci(0x11,0x0)/Pci(0x3,0x0)/Sata(0x2,0x0,0x0)
  blk5    :Removable HardDisk - Alias (null)
           PciRoot(0x0)/Pci(0x10,0x0)/Scsi(0x0,0x0)/HD(2,GPT,0540B8AA-00D1-11EE-9001-
AA000400FEFF,0x30,0x2C8BF0)
  blk6    :Removable HardDisk - Alias (null)
           PciRoot(0x0)/Pci(0x10,0x0)/Scsi(0x0,0x0)/HD(3,GPT,0540B8AB-00D1-11EE-9001-
AA000400FEFF,0x307420,0x1CF8BBF)
  blk7    :Removable BlockDevice - Alias (null)
           PciRoot(0x0)/Pci(0x10,0x0)/Scsi(0x0,0x0)
  blk8    :Removable BlockDevice - Alias (null)
           PciRoot(0x0)/Pci(0x11,0x0)/Pci(0x2,0x0)/Scsi(0x2,0x0)


Press ESC in 5 seconds to skip startup.nsh, any other key to continue.
Press ESC in 4 seconds to skip startup.nsh, any other key to continue.
Press ESC in 3 seconds to skip startup.nsh, any other key to continue.
Press ESC in 2 seconds to skip startup.nsh, any other key to continue.
Press ESC in 1 seconds to skip startup.nsh, any other key to continue.
Shell>
Shell>
Shell>
Shell>
Shell>
Shell>
Shell>
Shell>
Shell>
Shell>
Shell>
Shell>
Shell>
Shell>
Shell> nao[25;10H [25;10Hp fs*
'nap' is not recognized as an internal or external command, operable program, or batch file
Exit status code: Invalid Parameter

Shell> map fs*
Device mapping table
```

_____

```
   fs0      :CDRom - Alias cd23b0a0 blk0
            PciRoot(0x0)/Pci(0x11,0x0)/Pci(0x1,0x0)/Sata(0x1,0x0,0x0)/CDROM(0x0,0x1B,0xE800)
   fs1      :CDRom - Alias cd25c0a0 blk1
            PciRoot(0x0)/Pci(0x11,0x0)/Pci(0x3,0x0)/Sata(0x2,0x0,0x0)/CDROM(0x0,0x1B,0xE800)
   fs2      :Removable HardDisk - Alias hd17a0b blk2
            PciRoot(0x0)/Pci(0x10,0x0)/Scsi(0x0,0x0)/HD(1,GPT,0540B8AB-00D1-11EE-9002-
AA000400FEFF,0x2C8C20,0x3E800)

Shell> fs2:\efi\vms\vms_bootmgr

Scanning devices and preparing the OpenVMS Boot Manager...

VSI OpenVMS Boot Manager: V9.2-1 Build 128

  ENABLED:  Symmetric Multi-Processing
  ENABLED:  Crash Dump Processing
  ENABLED:  Console output to Legacy COM 1 Port
  ENABLED:  Using Environment ROM

  Checking Required Processor Features:
  PASSED

  BOOT MANAGER DEVICE:  DKA0
  DEFAULT BOOT COMMAND: BOOT DKD200 0x00 0x00000000

  VIRTUAL MACHINE GUEST:
  VMware (tm) No Mouse support; Use Commands or Arrow Keys


  CONNECT A REMOTE TERMINAL SESSION NOW.
  Enter the TERMINAL command for remote connection assistance.

BOOTMGR> DEV

BOOTABLE DEVICES (System Disks, Installation Kits, other):

  DKA0      (HD) = FS0    UEFI: V9_2_1     VMS: X86SYS      16384 MB   SCSI Disk
  DKB100    (DVD) = FS1   UEFI: E9_2_1     VMS: None        1574  MB   SATA DVD
  DKD200    (DVD) = FS2   UEFI: V9_2_1     VMS: None        1483  MB   SATA DVD

BOOTMGR> BOOT DKA0
Booting...

%%%%%%%%%% VSI OpenVMS (tm) x86-64 %%%%%%%%%%
_____


      GRAPHICAL OUTPUT HAS BEEN SUSPENDED

      USE A TERMINAL UTILITY FOR ACCESS

_____


VSI Primary Kernel SYSBOOT May 16 2023 13:21:17

%SYSBOOT-I-VMTYPE, Booting as a VMware (tm) Guest


        VMS Software, Inc. OpenVMS (TM) x86_64 Operating System, V9.2-1

                    Copyright 2023 VMS Software, Inc.


%DECnet-I-LOADED, network base image loaded, version = 05.92.05


%DECnet-W-ZEROLEN, length of file is zero -- SYS$SYSROOT:[SYSEXE]NET$CONFIG.DAT
```

```
%SMP-I-CPUTRN, CPU #1 has joined the active set.
%SMP-I-CPUTRN, CPU #2 has joined the active set.
%SMP-I-CPUTRN, CPU #13 has joined the active set.
%SMP-I-CPUTRN, CPU #3 has joined the active set.
%SMP-I-CPUTRN, CPU #5 has joined the active set.
%SMP-I-CPUTRN, CPU #10 has joined the active set.
%SMP-I-CPUTRN, CPU #7 has joined the active set.
%SMP-I-CPUTRN, CPU #15 has joined the active set.
%SMP-I-CPUTRN, CPU #8 has joined the active set.
%SMP-I-CPUTRN, CPU #6 has joined the active set.
%SMP-I-CPUTRN, CPU #9 has joined the active set.
%SMP-I-CPUTRN, CPU #14 has joined the active set.
%SMP-I-CPUTRN, CPU #4 has joined the active set.
%SMP-I-CPUTRN, CPU #11 has joined the active set.
%SMP-I-CPUTRN, CPU #12 has joined the active set.

    Installing required known files...

    Configuring devices...

%STARTUP-E-NOPAGFIL, No page files have been successfully installed.
%SYSTEM-I-BOOTUPGRADE, security auditing disabled
%%%%%%%%%%  OPCOM   1-JUN-2023 21:12:20.20  %%%%%%%%%%
Operator _MYNODE$OPA0: has been enabled, username SYSTEM

%%%%%%%%%%  OPCOM   1-JUN-2023 21:12:20.20  %%%%%%%%%%
Operator status for operator _MYNODE$OPA0:
CENTRAL, PRINTER, TAPES, DISKS, DEVICES, CARDS, NETWORK, CLUSTER, SECURITY,
LICENSE, OPER1, OPER2, OPER3, OPER4, OPER5, OPER6, OPER7, OPER8, OPER9, OPER10,
OPER11, OPER12

%%%%%%%%%%  OPCOM   1-JUN-2023 21:12:20.21  %%%%%%%%%%
Logfile has been initialized by operator _MYNODE$OPA0:
Logfile is MYNODE::SYS$SYSROOT:[SYSMGR]OPERATOR.LOG;3

%%%%%%%%%%  OPCOM   1-JUN-2023 21:12:20.22  %%%%%%%%%%
Operator status for operator MYNODE::SYS$SYSROOT:[SYSMGR]OPERATOR.LOG;3
CENTRAL, PRINTER, TAPES, DISKS, DEVICES, CARDS, NETWORK, CLUSTER, SECURITY,
LICENSE, OPER1, OPER2, OPER3, OPER4, OPER5, OPER6, OPER7, OPER8, OPER9, OPER10,
OPER11, OPER12

%%%%%%%%%%  OPCOM   1-JUN-2023 21:12:20.24  %%%%%%%%%%
Message from user SYSTEM on MYNODE
%JBC-E-OPENERR, error opening SYS$COMMON:[SYSEXE]QMAN$MASTER.DAT;

%%%%%%%%%%  OPCOM   1-JUN-2023 21:12:20.25  %%%%%%%%%%
Message from user SYSTEM on MYNODE
-RMS-E-FNF, file not found

%SYSTEM-I-BOOTUPGRADE, security server not started
%%%%%%%%%%  OPCOM   1-JUN-2023 21:12:20.37  %%%%%%%%%%
Message from user SYSTEM on MYNODE
TDF-I-SETTDF TDF set new timezone differential

NET$STARTUP, Network not started due to UPGRADE boot
%SYSTEM-I-BOOTUPGRADE, Coordinated Startup not performed

%EIA0, Link up: 1000 mbit, fdx, flow control (rcv only), 00-50-56-AC-49-CB

    AUTOGEN will now be run to compute the new system parameters.  The system
    will then shut down and reboot, and the installation or upgrade will be
    complete.

    After rebooting you can continue with such system management tasks as:

            Configuring networking software (TCP/IP Services, DECnet, other)
            Using SYS$MANAGER:CLUSTER_CONFIG.COM to create an OpenVMS Cluster
            Creating FIELD, SYSTEST and SYSTEST_CLIG accounts if needed

%AUTOGEN-I-BEGIN, GETDATA phase is beginning.
```

```
%AUTOGEN-I-NEWFILE,  Previous contents of SYS$SYSTEM:CLU$PARAMS.DAT have
  been copied to SYS$SYSTEM:CLU$PARAMS.OLD.  You may wish to purge
  SYS$SYSTEM:CLU$PARAMS.OLD.
%AUTOGEN-I-NEWFILE, A new version of SYS$SYSTEM:PARAMS.DAT has been created.
        You may wish to purge this file.
%AUTOGEN-I-END, GETDATA phase has successfully completed.
%AUTOGEN-I-BEGIN, GENPARAMS phase is beginning.
%AUTOGEN-I-NEWFILE, A new version of SYS$MANAGER:VMSIMAGES.DAT has been created.

        You may wish to purge this file.
%AUTOGEN-I-NEWFILE, A new version of SYS$SYSTEM:SETPARAMS.DAT has been created.
        You may wish to purge this file.
%AUTOGEN-I-END, GENPARAMS phase has successfully completed.
%AUTOGEN-I-BEGIN, GENFILES phase is beginning.
%SYSGEN-I-CREATED, SYS$SYSROOT:[SYSEXE]SYS$ERRLOG.DMP;3 created

        ** WARNING ** - The system disk would be over 90% full
            if the dump file were created with 66578314 blocks.
        No dump file modifications were made on device DKA0:.
        Dumpfile on device DKA0: will remain at 0 blocks.

*****************
%AUTOGEN-W-REPORT, Warnings were detected by AUTOGEN.  Please review the
        information given in the file SYS$SYSTEM:AGEN$PARAMS.REPORT
*****************

%AUTOGEN-I-REPORT, AUTOGEN has produced some informational messages which
        have been stored in the file SYS$SYSTEM:AGEN$PARAMS.REPORT.  You may
        wish to review the information in that file.

%AUTOGEN-I-END, GENFILES phase has successfully completed.
%AUTOGEN-I-BEGIN, SETPARAMS phase is beginning.
%SYSGEN-W-SETMAX, value set to maximum for parameter GH_EXEC_CODE
%%%%%%%%%%  OPCOM   1-JUN-2023 21:12:34.22  %%%%%%%%%%
Message from user SYSTEM on MYNODE
%SYSGEN-I-WRITECUR, CURRENT system parameters modified by process ID 00000403 in
to file SYS$SYSROOT_MD:[SYSEXE]X86_64VMSSYS.PAR;1

%AUTOGEN-I-SYSGEN, parameters modified
%AUTOGEN-I-END, SETPARAMS phase has successfully completed.
%AUTOGEN-I-BEGIN, REBOOT phase is beginning.

The system is shutting down to allow the system to boot with the
generated site-specific parameters and installed images.

The system will automatically reboot after the shutdown and the
upgrade will be complete.

        SHUTDOWN -- Perform an Orderly System Shutdown
                  on node MYNODE

%SHUTDOWN-I-BOOTCHECK, performing reboot consistency check...
%SHUTDOWN-I-CHECKOK, basic reboot consistency check completed

%SHUTDOWN-I-OPERATOR, this terminal is now an operator's console
%SHUTDOWN-I-DISLOGINS, interactive logins will now be disabled
%SET-I-INTSET, login interactive limit = 0, current interactive value = 0
%SHUTDOWN-I-STOPQUEUES, the queues on this node will now be stopped
%%%%%%%%%%  OPCOM   1-JUN-2023 21:12:34.52  %%%%%%%%%%
Message from user SYSTEM on MYNODE
%JBC-E-OPENERR, error opening SYS$COMMON:[SYSEXE]QMAN$MASTER.DAT;

%%%%%%%%%%  OPCOM   1-JUN-2023 21:12:34.52  %%%%%%%%%%
Message from user SYSTEM on MYNODE
-RMS-E-FNF, file not found

SHUTDOWN message on MYNODE from user SYSTEM at MYNODE Batch   21:12:34
MYNODE will shut down in 0 minutes; back up soon.  Please log off node MYNODE.
Reboot system with AUTOGENerated parameters
```

```
%SHUTDOWN-I-STOPUSER, all user processes will now be stopped
%SHUTDOWN-I-STOPCPU, the secondary processors will now be stopped
%SMP-I-CPUTRN, CPU #1 was removed from the active set.
%SMP-I-CPUTRN, CPU #2 was removed from the active set.
%SMP-I-CPUTRN, CPU #3 was removed from the active set.
%SMP-I-CPUTRN, CPU #4 was removed from the active set.
%SMP-I-CPUTRN, CPU #5 was removed from the active set.
%SMP-I-CPUTRN, CPU #6 was removed from the active set.
%SMP-I-CPUTRN, CPU #7 was removed from the active set.
%SMP-I-CPUTRN, CPU #8 was removed from the active set.
%SMP-I-CPUTRN, CPU #9 was removed from the active set.
%SMP-I-CPUTRN, CPU #10 was removed from the active set.
%SMP-I-CPUTRN, CPU #11 was removed from the active set.
%SMP-I-CPUTRN, CPU #12 was removed from the active set.
%SMP-I-CPUTRN, CPU #13 was removed from the active set.
%SMP-I-CPUTRN, CPU #14 was removed from the active set.
%SMP-I-CPUTRN, CPU #15 was removed from the active set.
%SHUTDOWN-I-REMOVE, all installed images will now be removed
%SET-I-PSXROOSET, system POSIX root set to SYS$SYSDEVICE:[000000]
%SHUTDOWN-I-DISMOUNT, all volumes will now be dismounted
%%%%%%%%%%  OPCOM   1-JUN-2023 21:12:34.80  %%%%%%%%%%
Message from user SYSTEM on MYNODE
STARTUP, MYNODE shutdown was requested by the operator.

VSI Dump Kernel SYSBOOT May 16 2023 13:21:17

** Dumping error logs to the system disk (MYNODE$DKA0:)

** Error logs dumped to MYNODE$DKA0:[SYS0.SYSEXE]SYS$ERRLOG.DMP

** (used 276 out of 288 available blocks)

Restarting the system...


Attempting to start up from:
 > EFI Internal Shell (Unsupported option)...
EFI Shell version 2.40 [1.0]
Current running mode 1.1.2
Device mapping table
  fs0     :CDRom - Alias cd23b0a0 blk0
           PciRoot(0x0)/Pci(0x11,0x0)/Pci(0x1,0x0)/Sata(0x1,0x0,0x0)/CDROM(0x0,0x1B,0xE800)
  fs1     :CDRom - Alias cd25c0a0 blk1
           PciRoot(0x0)/Pci(0x11,0x0)/Pci(0x3,0x0)/Sata(0x2,0x0,0x0)/CDROM(0x0,0x1B,0xE800)
  fs2     :Removable HardDisk - Alias hd17a0b blk2
           PciRoot(0x0)/Pci(0x10,0x0)/Scsi(0x0,0x0)/HD(1,GPT,0540B8AB-00D1-11EE-9002-
AA000400FEFF,0x2C8C20,0x3E800)
  blk0    :CDRom - Alias cd23b0a0 fs0
           PciRoot(0x0)/Pci(0x11,0x0)/Pci(0x1,0x0)/Sata(0x1,0x0,0x0)/CDROM(0x0,0x1B,0xE800)
  blk1    :CDRom - Alias cd25c0a0 fs1
           PciRoot(0x0)/Pci(0x11,0x0)/Pci(0x3,0x0)/Sata(0x2,0x0,0x0)/CDROM(0x0,0x1B,0xE800)
  blk2    :Removable HardDisk - Alias hd17a0b fs2
           PciRoot(0x0)/Pci(0x10,0x0)/Scsi(0x0,0x0)/HD(1,GPT,0540B8AB-00D1-11EE-9002-
AA000400FEFF,0x2C8C20,0x3E800)
  blk3    :BlockDevice - Alias (null)
           PciRoot(0x0)/Pci(0x11,0x0)/Pci(0x1,0x0)/Sata(0x1,0x0,0x0)
  blk4    :BlockDevice - Alias (null)
           PciRoot(0x0)/Pci(0x11,0x0)/Pci(0x3,0x0)/Sata(0x2,0x0,0x0)
  blk5    :Removable HardDisk - Alias (null)
           PciRoot(0x0)/Pci(0x10,0x0)/Scsi(0x0,0x0)/HD(2,GPT,0540B8AA-00D1-11EE-9001-
AA000400FEFF,0x30,0x2C8BF0)
  blk6    :Removable HardDisk - Alias (null)
           PciRoot(0x0)/Pci(0x10,0x0)/Scsi(0x0,0x0)/HD(3,GPT,0540B8AB-00D1-11EE-9001-
AA000400FEFF,0x307420,0x1CF8BBF)
  blk7    :Removable BlockDevice - Alias (null)
           PciRoot(0x0)/Pci(0x10,0x0)/Scsi(0x0,0x0)
  blk8    :Removable BlockDevice - Alias (null)
           PciRoot(0x0)/Pci(0x11,0x0)/Pci(0x2,0x0)/Scsi(0x2,0x0)
```

```
Press ESC in 5 seconds to skip startup.nsh, any other key to continue.
Press ESC in 4 seconds to skip startup.nsh, any other key to continue.
Press ESC in 3 seconds to skip startup.nsh, any other key to continue.
Press ESC in 2 seconds to skip startup.nsh, any other key to continue.
Press ESC in 1 seconds to skip startup.nsh, any other key to continue.
Shell>
Shell>
Shell>
Shell>
Shell>
Shell>
Shell>
Shell>
Shell> map fs*
Device mapping table
  fs0     :CDRom - Alias cd23b0a0 blk0
           PciRoot(0x0)/Pci(0x11,0x0)/Pci(0x1,0x0)/Sata(0x1,0x0,0x0)/CDROM(0x0,0x1B,0xE800)
  fs1     :CDRom - Alias cd25c0a0 blk1
           PciRoot(0x0)/Pci(0x11,0x0)/Pci(0x3,0x0)/Sata(0x2,0x0,0x0)/CDROM(0x0,0x1B,0xE800)
  fs2     :Removable HardDisk - Alias hd17a0b blk2
           PciRoot(0x0)/Pci(0x10,0x0)/Scsi(0x0,0x0)/HD(1,GPT,0540B8AB-00D1-11EE-9002-
AA000400FEFF,0x2C8C20,0x3E800)

Shell> fs2:\efi\vms\vms_bootmgr

Scanning devices and preparing the OpenVMS Boot Manager...

VSI OpenVMS Boot Manager: V9.2-1 Build 128

  ENABLED:  Symmetric Multi-Processing
  ENABLED:  Crash Dump Processing
  ENABLED:  Console output to Legacy COM 1 Port
  ENABLED:  Using Environment ROM

  Checking Required Processor Features:
  PASSED

  BOOT MANAGER DEVICE:  DKA0
  DEFAULT BOOT COMMAND: BOOT DKA0 0x00 0x00000000

  VIRTUAL MACHINE GUEST:
  VMware (tm) No Mouse support; Use Commands or Arrow Keys

  CONNECT A REMOTE TERMINAL SESSION NOW.
  Enter the TERMINAL command for remote connection assistance.

BOOTMGR> DEVICES

BOOTABLE DEVICES (System Disks, Installation Kits, other):

  DKA0        (HD) = FS0    UEFI: V9_2_1      VMS: X86SYS      16384 MB  SCSI Disk
  DKB100      (DVD) = FS1   UEFI: E9_2_1      VMS: None        1574  MB  SATA DVD
  DKD200      (DVD) = FS2   UEFI: V9_2_1      VMS: None        1483  MB  SATA DVD

BOOTMGR> BOOT DKA0
Booting...

%%%%%%%%%% VSI OpenVMS (tm) x86-64 %%%%%%%%%%


_____


       GRAPHICAL OUTPUT HAS BEEN SUSPENDED


       USE A TERMINAL UTILITY FOR ACCESS


_____


VSI Primary Kernel SYSBOOT May 16 2023 13:21:17
```

```
%SYSBOOT-I-VMTYPE, Booting as a VMware (tm) Guest

        VMS Software, Inc. OpenVMS (TM) x86_64 Operating System, V9.2-1

                    Copyright 2023 VMS Software, Inc.

%DECnet-I-LOADED, network base image loaded, version = 05.92.05

%DECnet-W-ZEROLEN, length of file is zero -- SYS$SYSROOT:[SYSEXE]NET$CONFIG.DAT


%SMP-I-CPUTRN, CPU #1 has joined the active set.
%SMP-I-CPUTRN, CPU #9 has joined the active set.
%SMP-I-CPUTRN, CPU #7 has joined the active set.
%SMP-I-CPUTRN, CPU #15 has joined the active set.
%SMP-I-CPUTRN, CPU #14 has joined the active set.
%SMP-I-CPUTRN, CPU #12 has joined the active set.
%SMP-I-CPUTRN, CPU #6 has joined the active set.
%SMP-I-CPUTRN, CPU #5 has joined the active set.
%SMP-I-CPUTRN, CPU #13 has joined the active set.
%SMP-I-CPUTRN, CPU #2 has joined the active set.
%SMP-I-CPUTRN, CPU #8 has joined the active set.
%SMP-I-CPUTRN, CPU #3 has joined the active set.
%SMP-I-CPUTRN, CPU #4 has joined the active set.
%SMP-I-CPUTRN, CPU #10 has joined the active set.
%SMP-I-CPUTRN, CPU #11 has joined the active set.
%STDRV-I-STARTUP, OpenVMS startup begun at  1-JUN-2023 21:14:00.30

%EIA0, Link up: 1000 mbit, fdx, flow control (rcv only), 00-50-56-AC-49-CB
%RUN-S-PROC_ID, identification of created process is 00000404
%RUN-S-PROC_ID, identification of created process is 00000405
%%%%%%%%%% OPCOM   1-JUN-2023 21:14:06.03  %%%%%%%%%%
Operator _MYNODE$OPA0: has been enabled, username SYSTEM

%%%%%%%%%% OPCOM   1-JUN-2023 21:14:06.03  %%%%%%%%%%
Operator status for operator _MYNODE$OPA0:
CENTRAL, PRINTER, TAPES, DISKS, DEVICES, CARDS, NETWORK, CLUSTER, SECURITY,
LICENSE, OPER1, OPER2, OPER3, OPER4, OPER5, OPER6, OPER7, OPER8, OPER9, OPER10,
OPER11, OPER12

%%%%%%%%%% OPCOM   1-JUN-2023 21:14:06.05  %%%%%%%%%%
Logfile has been initialized by operator _MYNODE$OPA0:
Logfile is MYNODE::SYS$SYSROOT:[SYSMGR]OPERATOR.LOG;4

%%%%%%%%%% OPCOM   1-JUN-2023 21:14:06.05  %%%%%%%%%%
Operator status for operator MYNODE::SYS$SYSROOT:[SYSMGR]OPERATOR.LOG;4
CENTRAL, PRINTER, TAPES, DISKS, DEVICES, CARDS, NETWORK, CLUSTER, SECURITY,
LICENSE, OPER1, OPER2, OPER3, OPER4, OPER5, OPER6, OPER7, OPER8, OPER9, OPER10,
OPER11, OPER12

%SET-I-NEWAUDSRV, identification of new audit server process is 0000040B
%%%%%%%%%% OPCOM   1-JUN-2023 21:14:06.10  %%%%%%%%%%
Message from user SYSTEM on MYNODE
%JBC-E-OPENERR, error opening SYS$COMMON:[SYSEXE]QMAN$MASTER.DAT;

%%%%%%%%%% OPCOM   1-JUN-2023 21:14:06.10  %%%%%%%%%%
Message from user SYSTEM on MYNODE
-RMS-E-FNF, file not found

%%%%%%%%%% OPCOM   1-JUN-2023 21:14:06.18  %%%%%%%%%%
Message from user SYSTEM on MYNODE
%SECSRV-I-SERVERSTARTINGU, security server starting up


%%%%%%%%%% OPCOM   1-JUN-2023 21:14:06.18  %%%%%%%%%%
Message from user SYSTEM on MYNODE
%SECSRV-I-CIACRECLUDB, security server created cluster intrusion database


%%%%%%%%%% OPCOM   1-JUN-2023 21:14:06.19  %%%%%%%%%%
Message from user SYSTEM on MYNODE
```

%SECSRV-I-CIASTARTINGUP, breakin detection and evasion processing now starting u
p

%%%%%%%%% OPCOM   1-JUN-2023 21:14:06.22 %%%%%%%%%%
Message from user SYSTEM on MYNODE
TDF-I-SETTDF TDF set new timezone differential

Copyright 2023 VMS Software, Inc.
%NET$STARTUP-W-NONETCONFIG, this node has not been configured to run DECnet-Plus
 for OpenVMS
        use SYS$MANAGER:NET$CONFIGURE.COM if you wish to configure DECnet
%NET$STARTUP-I-OPERSTATUS, DECnet-Plus for OpenVMS operational status is OFF
%DECdtm-F-NODECnet, the TP_SERVER process was not started because either:

o DECnet-Plus is not started or is not configured, or

o The SYS$NODE_FULLNAME logical name is not defined

   This could be because when you installed DECnet-Plus and were prompted
   for the system's full name, you specified a local name instead of a
   DECdns or Domain name.

If you want to use DECdtm services, make sure that DECnet-Plus is started and
configured and that SYS$NODE_FULLNAME is defined, then use the following
command to start the TP_SERVER process:

    $ @SYS$STARTUP:DECDTM$STARTUP.COM

%STARTUP-I-AUDITCONTINUE, audit server initialization complete
%%%%%%%%% OPCOM   1-JUN-2023 21:14:06.84 %%%%%%%%%%
Message from user AUDIT$SERVER on MYNODE
Security alarm (SECURITY) and security audit (SECURITY) on MYNODE, system id: 14
38
Auditable event: Audit server starting up
Event time: 1-JUN-2023 21:14:06.82
PID: 00000403
Username: SYSTEM

The OpenVMS system is now executing the site-specific startup commands.

%SET-I-INTSET, login interactive limit = 64, current interactive value = 0
%DECW$DEVICE-I-NODEVICE, no graphics devices found.
%RUN-S-PROC_ID, identification of created process is 00000411
%%%%%%%%% OPCOM   1-JUN-2023 21:14:07.27 %%%%%%%%%%
Message from user SYSTEM on MYNODE
%SMHANDLER-S-STARTUP, server management event handler startup

%%%%%%%%% OPCOM   1-JUN-2023 21:14:09.19 %%%%%%%%%%
Message from user SYSTEM on MYNODE
%SECSRV-I-PROXYSTARTINGUP, proxy processing now starting up

%%%%%%%%% OPCOM   1-JUN-2023 21:14:09.20 %%%%%%%%%%
Message from user SYSTEM on MYNODE
%SECSRV-E-NOPROXYDB, cannot find proxy database file NET$PROXY.DAT
%RMS-E-FNF, file not found

  SYSTEM   job terminated at 1-JUN-2023 21:14:09.27

  Accounting information:
  Buffered I/O count: 3051   Peak working set size: 13792
  Direct I/O count: 1679   Peak virtual size: 279216
  Page faults: 3795   Mounted volumes: 0
  Charged CPU time: 0 00:00:01.78   Elapsed time: 0 00:00:09.01

 Welcome to OpenVMS (TM) x86_64 Operating System, Version V9.2-1

```
Username: system
Password:
VMS Software, Inc. OpenVMS (TM) x86_64 Operating System, V9.2-1
    Last interactive login on Thursday,  1-JUN-2023 20:59:34.00
 MYNODE_>prod show prod
------------------------------------ ----------- ---------
PRODUCT                              KIT TYPE    STATE
------------------------------------ ----------- ---------
VMSPORTS X86VMS PERL534 T5.34-0      Full LP     Installed
VSI X86VMS AVAIL_MAN_BASE V9.2-1     Full LP     Installed
VSI X86VMS DECNET_PLUS V9.2-E        Full LP     Installed
VSI X86VMS DWMOTIF V1.8              Full LP     Installed
VSI X86VMS DWMOTIF_SUPPORT V9.2-1    Full LP     Installed
VSI X86VMS KERBEROS V3.3-2A          Full LP     Installed
VSI X86VMS OPENSSH V8.9-1D           Full LP     Installed
VSI X86VMS OPENVMS V9.2-1            Platform    Installed
VSI X86VMS SSL111 V1.1-1T            Full LP     Installed
VSI X86VMS SSL3 V3.0-8               Full LP     Installed
VSI X86VMS TCPIP X6.0-22             Full LP     Installed
VSI X86VMS VMS V9.2-1                Oper System Installed
------------------------------------ ----------- ---------
12 items found
MYNODE_>sho sys/noproc/full
OpenVMS V9.2-1  on node MYNODE    1-JUN-2023 21:15:06.37   Uptime  0 00:01:12
        VMware, Inc. VMware7,1

MYNODE_>
telnet> disconnect
?Invalid command
telnet> quit
Connection closed.
bash-3.2$ exit
exit
```