VMS Software

VSI OpenVMS x86-64 E9.2-3 Installation Guide

Operating System and Version: VSI OpenVMS x86-64 Version E9.2-3

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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 E9.2-3

This manual provides instructions for booting and installing (or upgrading to) VSI OpenVMS for x86-64 Version 9.2-3 Field Test (hereafter referred to as OpenVMS x86-64 E9.2-3) 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 E9.2-3 as a guest virtual machine.

Make sure you read the Release Notes, Installation Guide, and Boot Manager Guide prior to installing OpenVMS x86-64 E9.2-3.

3. Using the VSI Customer Portal

See the OpenVMS x86-64 E9.2-3 announcement email for information about how to log issues against the E9.2-3 release and how to use the VSI Services Portal at https://sp.vmssoftware.com.

4. Other Related Documentation

● *VSI OpenVMS x86-64 E9.2-3 Release Notes* [https://docs.vmssoftware.com/vsi-openvms-x86-64-v923-release-notes/]

● *VSI x86-64 Cross-tools Kit Installation and Startup Guide (for VSI OpenVMS V9.2-2)* [https://docs.vmssoftware.com/vsi-x86-64-cross-tools-kit-installation-and-startup-guide-v922/]

● *VSI OpenVMS Linker Manual* [https://docs.vmssoftware.com/vsi-openvms-linker-utility-manual/]

● *VSI Calling Standard Manual* [https://docs.vmssoftware.com/vsi-openvms-calling-standard/]

● *VSI OpenVMS x86-64 Boot Manager User Guide* [https://docs.vmssoftware.com/vsi-openvms-x86-64-boot-manager-user-guide-922/]

● VSI OpenVMS TCP/IP Services V6.0 documentation at the VSI Documentation portal [https://docs.vmssoftware.com/]

● Third-party documentation as cited throughout this document

Chapter 1. Preparing to Install VSI OpenVMS x86-64 E9.2-3

1.1. Tested Platforms

For information about supported virtual environments, see https://docs.vmssoftware.com/vsi-openvms-x86-64-v923-release-notes/.

If you need more information on the platforms tested by VSI, refer to the documentation websites for each.

1.2. 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 that 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:

- **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[1]

  - 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.

- **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.

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[1] When using VBox or VMware Workstation on Windows, be aware that Windows 11 has Hyper-V enabled by default, which can cause various issues.

- A **virtual disk** for the system files. The disk must be at least 15 GB in size (for the supported disk types, see the *VSI OpenVMS x86-64 E9.2-3 Release Notes* [https://docs.vmssoftware.com/vsi-openvms-x86-64-v923-release-notes/]). Optionally, if the disk space for the system files is limited, consider using a dump off system disk (DOSD) as described in the *VSI OpenVMS x86-64 E9.2-3 Release Notes* [https://docs.vmssoftware.com/vsi-openvms-x86-64-v923-release-notes/]. The minimum disk size for the DOSD must at least be equal to the amount of RAM that your VM has.

- **Boot Option:**

  o   Disable Secure Boot (if present).

  o   Enable UEFI or EFI (BIOS is not supported).

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

  ### Note

  Currently, only COM1 serial port is supported.

  ### Note

  Starting with version E9.2-3, OpenVMS x86-64 features the Guest Console as an alternative to serial ports. For more information, see Section 1.3.

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

- **Network:** Adapter Type or Device Model of e1000, e1000e (ESXi or KVM); 82540EM (VirtualBox). Also, two para-virtualized NICs, VirtIO for KVM, and vmxnet3 for ESXi. The new options in E9.2-3 are e1000e, VirtIO, and vmxnet3.

  ### Note

  VSI strongly advises against manual configuration of DECnet MAC address on any interface.

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

- **Minimum number of CPUs:** 2.

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

1.3. Guest Console

In previous versions of OpenVMS x86-64, all console interactions required a legacy serial port device. Starting with version E9.2-3, OpenVMS x86-64 features the Guest Console – a console interface that takes advantage of newer networking technologies. The Guest Console provides the necessary keyboard driver and terminal emulator features to allow users to interact with the system from the initial boot through the operator login.

Note that the current implementation of the Guest Console provides a minimal terminal that lacks certain important features, such as scrolling and copy-paste. This will be addressed in a future release of OpenVMS x86-64.

To enable the Guest Console, enter the following Boot Manager command:

```
BOOTMGR> OPA0
```

VSI does not recommend the Guest Console feature as superior to or a replacement for serial ports. The Guest Console is offered as an alternative specifically designed for customers who are unable to use serial ports.

Note

If you plan to use VMware VMotion with VMware ESXi virtual machine, ensure that *no* serial ports are configured. Instead, use the Guest Console.

1.4. 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 that you register your PAKs after the installation by renaming the PAK file(s) that VSI provided with a .COM extension and then executing that file; this will register all your licenses at once. Thereafter, you must either issue the `LICENSE LOAD` command or reboot OpenVMS 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
```

1.4.1. Installation Operating Environment

With the release of OpenVMS version E9.2-3, a new convenience feature named the Installation Operating Environment (OE) has been introduced to streamline the setup process for freshly installed systems.

An operating system installation takes place when the software is placed on the target disk without regard for any previous content on the target device. A system upgrade occurs when the target device contains a previous version of the OpenVMS operating system, and the new software is overlaid on the present content of the target disk. The Installation OE only applies to installations and not upgrades.

The Installation OE is a license that is limited in both scope and time and is generated during installation. It has a termination date of midnight of the 4th day after the date of installation. For example, if you install on Monday, the license terminates at midnight on Friday. The Installation OE will

be installed even if the customer chooses to register license PAKs during the installation dialogue. Note that only the following products are included in the Installation OE license:

● The base OpenVMS operating system

● TCP/IP Services for OpenVMS

● DECnet end node

The benefits of the Installation OE include:

● The ability to use a (virtual) serial terminal line to set up the system rather than requiring access to the system console terminal.

● The ability to configure and start TCP/IP or DECnet network services which may then be used to copy files to the new node directly.

● Removes the necessity to type in initial license PAKs by hand during installation.

● Permits DHCP configuration of TCP/IP. (Option during the installation dialogue.)

After the system is configured, you may delete or disable the OPENVMS-X86-INSTOE PAK to prevent messages about the expired PAK during boot.

1.4.2. Using VMware vSphere Hypervisor Licenses

Important

If you are using the Guest Console feature (see Section 1.3) to connect to your OpenVMS system, you can use any VMware license type.

Read the remainder of this section only if you are using a terminal emulator.

If you are using a terminal emulator to connect to your OpenVMS system, use the procedure described in this section 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 ESX server.
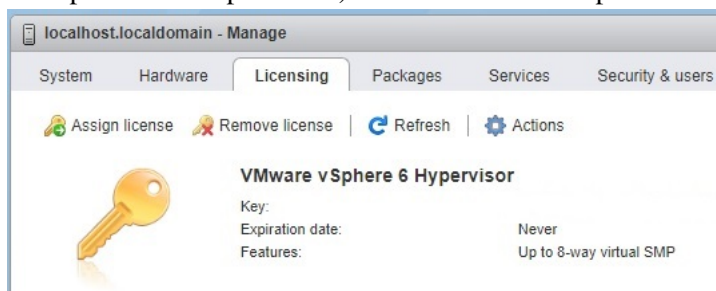
Using the named pipe functionality, map COM1/OPA0: on the VMS virtual machine to a pipe on a management server on which a terminal emulator is installed.

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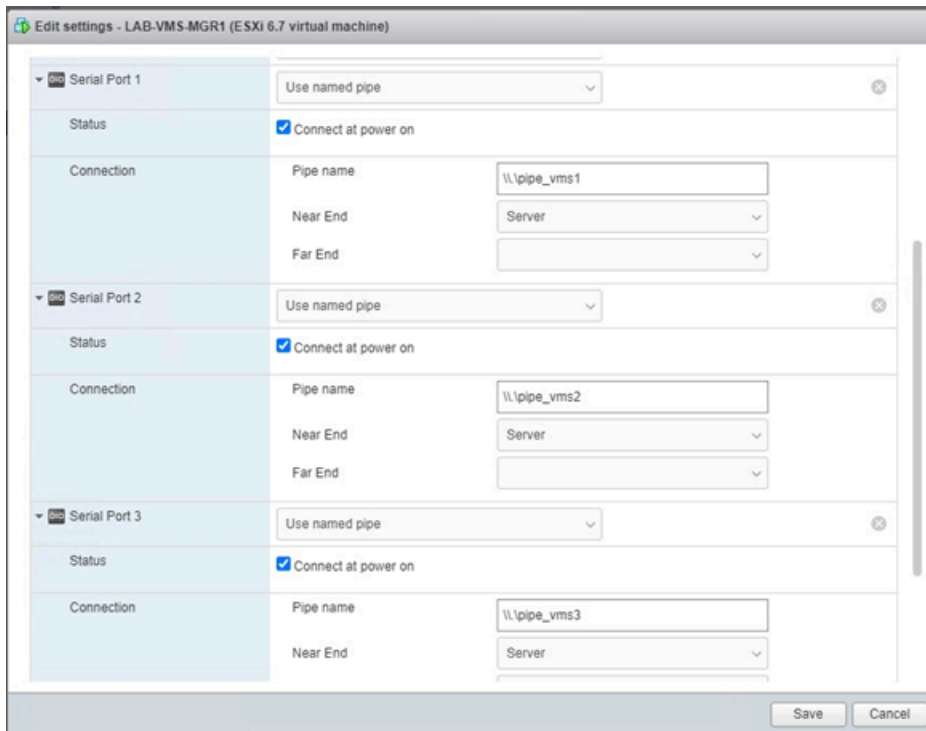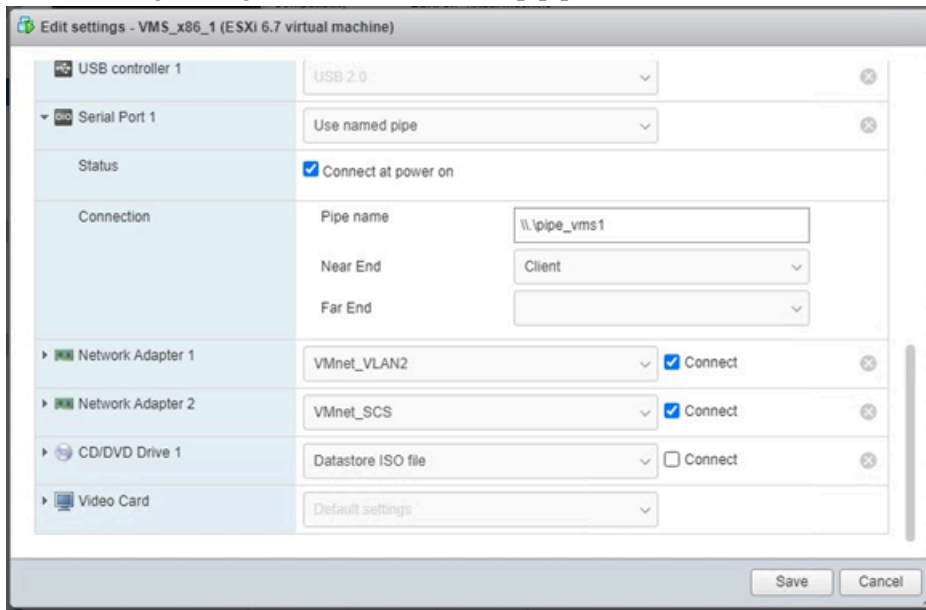
The following two figures show how to set up pipes between two local virtual machines where one plays the role of VMS console. This could be a virtual machine guest running any OS that supports a terminal emulator.

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 E9.2-3 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, perform the following procedure:

    a. Left-click the datastore where you would like to save the ISO kit, then click **Upload**, and navigate to the ISO kit (which should be on your browser's local system).

    b. Click **Open**.

    ### Note

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

    ---

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**.

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 (for the values recommended by VSI, refer to Section 1.2).

    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 (for the values recommended by VSI, refer to Section 1.2).

    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 (for the VSI recommendation, refer to Section 1.2). 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
>
> If you are using a version of VMware ESXi earlier than 8, make sure *not* to use the same bus/LUN setting for any of your disks and/or CD-ROMs. ESXi 8 automatically sets different LUNs if they accidentally coincide.

        C. **Disk Provisioning** – select the **Thick provisioned, lazily zeroed** option.

    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 CD-ROMs.

    D. **Disk Provisioning** – select the **Thick provisioned, lazily zeroed** option.

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 the network adapter **e1000** or **e1000e** 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. Select a method to manage your VM's console communication. You can configure a serial port (A) or use the Guest Console (B). Follow the steps below for each method:

    A. If you prefer using a virtual serial port connection, your VM must have an active serial port, 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:

        I. Click **Add other device**.

        II. Select **Serial port**.

        III. From the **New Serial Port** dropdown list, select **Use network** if you plan to use your 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.

    IV. 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.

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

  B. If you prefer to use the new Guest Console feature, finish configuring your VM. Instructions on how to switch to Guest Console will be provided in the next chapter.

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

1. Once you have created your VM, go to the **Virtual Machines** area in the VMware ESXi environment and select the VM you created.

> **Warning**
>
> Attempting to perform the next steps *before* your VM is fully created will result in an unusable VM.

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[1]	TRUE

Key	Value
efi.shell.activeByDefault	TRUE

[1]Set this parameter if you intend to use a virtual serial port. Skip, if you plan to use a Guest Console.

Note

If you are using a version of VMware ESXi earlier than 8, 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 blue BIOS screen of your VM in the console preview pane in the top left.

Note

On VMware ESXi 8, when an OpenVMS VM is launched, it immediately enters the boot manager instead of the BIOS. To get into BIOS, you need to force log in by enabling the following setting:

Navigate to **VM Options > Boot Options > Force BIOS Setup** . The next time the virtual machine boots, force entry into the BIOS setup screen.

With VMware ESXi 8, proceed to Section 2.2.

---

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.
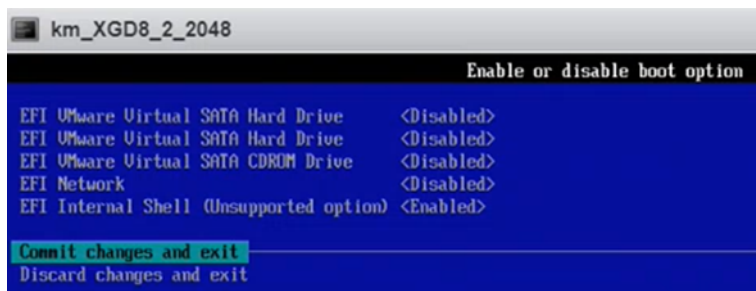
7. Select **Commit changes and exit > Exit the Boot Maintenance Manager**.

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

Note

On ESXi, some users may experience problems when trying to establish a connection to a VMware console. To remedy this, you must enable a firewall rule by following the steps below:

---

1. Display the ESXi firewall rule for `remoteSerialPort` using the command:

   ```
   esxcli network firewall ruleset rule list -r remoteSerialPort
   ```

2. Enable the rule by using the command:

   ```
   esxcli network firewall ruleset set -r remoteSerialPort -e true
   ```

For information about working with ESXi firewall, refer to the official VMware documentation.

Your virtual machine is now ready to have VSI OpenVMS x86-64 installed on it. See Chapter 3.

2.1.2. Using Physical Fibre Channel Devices As Data Disks

Starting with the E9.2-3 release, OpenVMS x86-64 supports the VMware VMDirectPath I/O feature, which allows virtual machines to directly access the physical PCI devices of the host system, bypassing the virtualization layer. The use of this feature can significantly improve the performance of systems that utilize high-speed I/O devices (such as Fibre Channel) as data disks.

Restrictions

Booting OpenVMS from a Fibre Channel disk is currently not possible.

The VMware VMDirectPath I/O feature is not compatible with the VMware vMotion feature.

To configure your VM to use physical Fibre Channel disks of the host system, complete the following steps:

1. Make sure that a Fibre Channel HBA (Host Bus Adapter) card is installed into your server and configured on your host system. For information on how to install and configure a Fibre Channel HBA, refer to the documentation for your system hardware.

2. In the top-left part of the ESXi window, expand **Host**, then click **Manage**.

3. In the **Manage** area, switch to the **Hardware** tab, then click **PCI Devices**.

4. Select the devices that represent the ports of your Fibre Channel HBA and click **Toggle passthrough**.

5. Power off the VM that you are going to work with and bring up the **Edit Settings** window for it.

6. In the **Edit Settings** window, click **Add other device**, then **New PCI Device**.

7. Click the drop-down list next to your new PCI device and select one of the ports of your Fibre Channel HBA.

8. Create as many PCI devices as there are ports on your Fibre Channel HBA and map each device to a different port.

9. On the left side of the **Edit Settings** window, click **Memory**, then enable the **Reserve all guest memory (All locked)** option.

10. Save the changes and close the **Edit Settings** window.

11. Power on your VM and boot OpenVMS.

12. Ensure that OpenVMS has access to the physical device(s) on your host system by entering the following command:

    ```
    $ SHOW DEVICE /FULL FG
    ```

    You should see an output similar to the following:

    ```
    Device FGA0:, device type YOUR_DEVICE, is online, shareable, error
                  logging is enabled.

    .
    .
    .

    Device FGB0:, device type YOUR_DEVICE, is online, shareable, error
                  logging is enabled.

    .
    .
    .
    ```

13. Log into the management interface of your MSA and map the volumes created there to the HBA that your VM is using. For information on how to create and map Fibre Channel volumes, refer to the documentation provided with your storage device.

14. Identify and configure the volumes you have mapped by entering the following command:

    ```
    $ MCR SYSMAN IO AUTOCONFIGURE/LOG
    ```

    You should see an output similar to the following:

    ```
    %SYSMAN-I-OUTPUT, command execution on node MM2442
    %IOGEN-I-PREFIX, searching for ICBM with prefix SYS$
    %IOGEN-I-SCSIPOLL, scanning for devices through SCSI port PKA0
    %IOGEN-I-SCSIPOLL, scanning for devices through SCSI port PKB0
    %IOGEN-I-FIBREPOLL, scanning for devices through FIBRE port FGA0
    %IOGEN-I-FIBREPOLL, scanning for devices through FIBRE port FGB0
    ```

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, follow these steps:

1. Download, unzip, and copy the VSI OpenVMS x86-64 E9.2-3 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 E9.2-3 ISO file, select it, and click **Open**.

6. Uncheck the **Automatically detect from the installation media/source** box, 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 (for the values recommended by VSI, refer to Section 1.2). Click **Forward**.

8. The **Create a disk image for the virtual machine** option is selected by default. Set the disk size for your VM (for the values recommended by VSI, refer to Section 1.2). Click **Forward**.

Note

If you don't want your images to be saved in the default directory `/var/lib/libvirt/images` with default file names, click **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 **Choose Volume**.

---

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 to **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. To add an additional disk (as recommended by VSI, see Section 1.2), 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:

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

    A. Click **Manage**.

    B. On the left side of the **Locate or create storage** window, select the storage pool that you want to use or create a new one by clicking the button below the list.

    C. After selecting the storage pool, go to the central area of the **Locate or create storage** window and click the button to add a volume.

    D. In the **Add a Storage Volume** window, specify the name, format, and capacity for the storage volume.

    E. Enable the **Allocate entire volume now** checkbox.

    F. Click **Finish**.

    G. Select your volume and click **Choose Volume**.

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

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

    v. Click **Finish**.

    vi. 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 E9.2-3 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. Select a method to manage your VM's console communication. You can configure a serial port (a) or use the Guest Console (b). Follow the steps below for each method:

    a. 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.

    b. If you prefer to use the new Guest Console feature, finish configuring your VM. Instructions on how to switch to Guest Console will be provided in the next chapter.

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

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

    ### Note

    If you want to use **e1000**, you should click the field that shows **e1000e** and delete the **e** at the end, so that only **e1000** remains.

    ---

    b. Click **Apply**.

4. Click **Begin Installation**.

5. The Virtual Machine Manager Console will now show either the EFI `Shell>` prompt or the `BOOTMGR>` prompt. This depends on the operating system on which KVM is installed and on the firmware .BIN file that was selected when the VM was created.

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

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

8. You will see the EFI Shell prompt now. Enter **`map fs*`** to display just the file systems available on your VM one page at a time.

9. Inspect this list of file systems and choose the one that maps to the VSI OpenVMS E9.2-3 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:`.

10. At the `Shell>` prompt, enter the following command:

    `FS0:\efi\vms\vms_bootmgr`

11. 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.

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, 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 (for the values recommended by VSI, refer to Section 1.2). Click **Next**.

4. On the **Virtual Hard** disk (for the values recommended by VSI, refer to Section 1.2) set the size of your virtual hard. Make sure the preallocate full size option is enabled. 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 E9.2-3.

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.

         ---

   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 E9.2-3 ISO file. IDE disk controllers are currently not supported, so you *must* change the controller type to either AHCI (SATA) or LsiLogic. 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. Select a method to manage your VM's console communication. You can configure a serial port (i) or use the Guest Console (ii). Follow the steps below for each method:

     i. If you prefer using a virtual serial port connection, your VM must have an active serial port, so that you can connect to it later using a terminal emulator. To configure a serial port on your VM, follow these steps:

          A. Go to **Serial Ports**.

          B. Check **Enable Serial Port**.

          C. Set **Port Mode** to **TCP**.

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

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

     ii. If you prefer to use the new Guest Console feature, finish configuring your VM. Instructions on how to switch to Guest Console will be provided in the next chapter.

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.

Chapter 3. Installing and Upgrading VSI OpenVMS x86-64 E9.2-3 on a Guest Virtual Machine

This chapter provides instructions on booting and installing VSI OpenVMS E9.2-3 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. For upgrading an existing VMS installation on a VM, skip to Section 3.2.

3.1. Installing VSI OpenVMS x86-64 E9.2-3
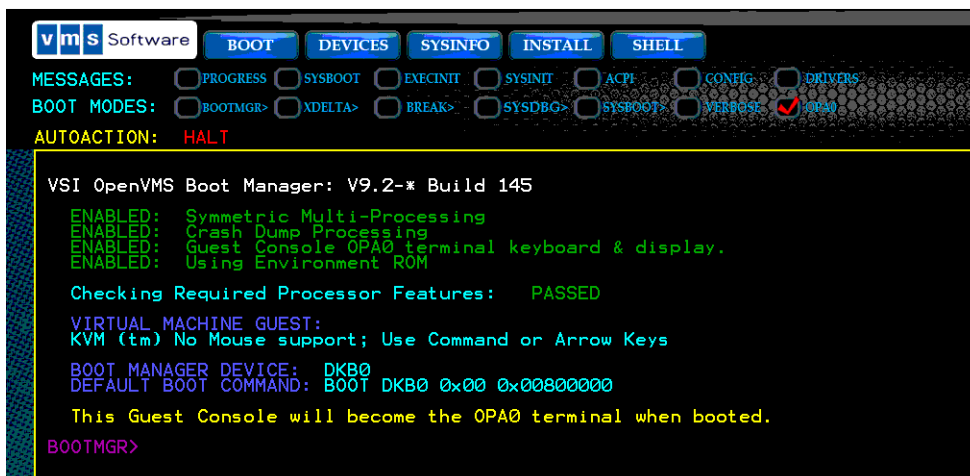
Before you install VSI OpenVMS x86-64 E9.2-3 on your virtual machine, ensure it has been created and configured as directed in Chapter 2 of this document. Once you have created and powered on your VM (or clicked **Begin Installation** if you are using QEMU/KVM), follow these steps:

1. 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*`** to display all the file systems available on your VM.

b. Choose the file system that maps to the VSI OpenVMS E9.2-3 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. If you plan to use the Guest Console feature instead of a serial port, enable the Guest Console by entering the command **`BOOTMGR> OPA0`** or selecting the **OPA0** checkbox with the arrow keys and pressing Enter.

You will see the following message indicating that the Guest Console is enabled:

```
ENABLED: Guest Console OPA0 terminal (use local keyboard &
display instead of serial port). The Guest Console provides
a minimal OPA0 terminal (no scrolling or cut-and-paste).
```

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

5. 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%, what you see depends on whether you are using the Guest Console or not. If you are using a serial port, you should see the following screen:
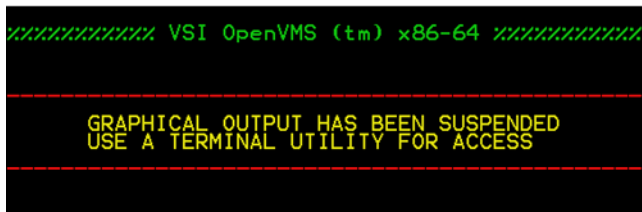
In this case, continue with the next step.

If you are using the Guest Console, you should see the installation menu now. In this case, go to step 7.

6. 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 <ins>step 4</ins> 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.

7. 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 E9.2-3 does not support installation menu items number 3, 5, and 7. Also, do not use item number 6 unless directly instructed otherwise.

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

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

10. 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:`.

11. 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`.

12. 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/#HARD_LINKS].

13. 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 choose for hard-links. For brevity and readability, similar prompts will not be mentioned again in this document.

14. 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.

Ensure that both the **Implicit CR** and **Implicit LF** options are unchecked in your terminal emulator software.

---

15. At the `Enter SCSNODE:` prompt, enter a unique name for your OpenVMS system with a maximum length of 6 characters. As an example, we will enter `x86`.

16. 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.

---

17. 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.

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

19. 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.

Starting from this release, you can now copy your PAKs over the network after installation using the Installation OE license, which activates networking and other essential OpenVMS features needed for initial setup for 5 days. For more details check Section 1.4.1.

20. 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.

21. 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 E9.2-3?` prompt. If you answer `NO`, you will see the `Do you want to install DECnet Phase IV for OpenVMS X86-64 E9.2-3?` 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.

22. 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`.

23. 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 or performed 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

- o   VMS text libraries of Ada declarations

- RMS Journaling Recovery Utility

- System Programming Support:

  - o   Delta Debugger

  - o   System Dump Analyzer Utility

  - o   Miscellaneous Symbol Table Files

- Utilities:

  - o   Phone Utility

  - o   XPG4 Internationalization Utilities

  - o   World-Wide PostScript Printing Subsystem

- Bliss Require Files

- Example Files

- Message Facility Files (HELP/MESSAGE)

- UETP Files

- DECwindows Server Support:

  - o   DECwindows Workstation files

  - o   Video fonts:

    - ▪   100 dots-per-inch video fonts

  - o   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. If any subcomponent is not desired, you must first choose to install the main component, and then you will be asked about each subcomponent.

24. 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.

25. 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.

26. 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*** to display all the file systems available on your VM.

   b. Find the file system for the newly installed system disk. If the correct file system is not readily apparent, use the file system for the CD-ROM 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 CD-ROM/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, indicating the completion of the OpenVMS boot process:

```
 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. **Optional:** At this point, OpenVMS has successfully been installed, but certain infrequently used system libraries are compressed to reduce the occupied disk space. All compressed libraries are completely usable, but a small number of them perform slower in the compressed state. To increase the performance of those libraries, VSI recommends manually expanding them via the LIBDECOMP command procedure. To do so, enter the following command:

    `@SYS$UPDATE:LIBDECOMP EXPAND HELPLIB.HLB STARLET.OLB STARLET.MLB`

    For more information on LIBDECOMP, enter `@SYS$UPDATE:LIBDECOMP HELP` or refer to the VSI OpenVMS System Manager's Manual [https://docs.vmssoftware.com/vsi-openvms-system-manager-s-manual-volume-2-tuning-monitoring-and-complex-systems/#DECOMPLIBS].

36. 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.

3.2. Upgrading to VSI OpenVMS x86-64 E9.2-3

This section describes how to upgrade to OpenVMS E9.2-3 from OpenVMS V9.2-1 or V9.2-2. Note that if you want to upgrade from an earlier version of OpenVMS, you must perform a fresh install of OpenVMS E9.2-3.

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.

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*** 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 <u>previous step</u>, 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 0xnn 0Xnnnnnnnn
   ```

   where **0xnn** stands for the root and **0Xnnnnnnnn** 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 to begin the upgrade procedure.

3.2.2. Upgrading a Non-Shadowed System Disk
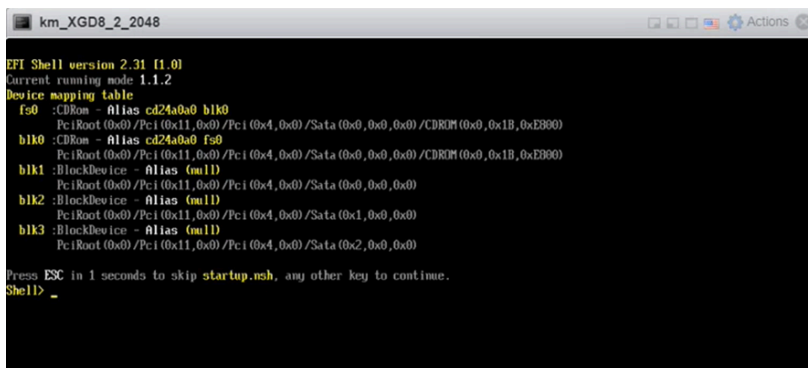
To upgrade to VSI OpenVMS x86-64 E9.2-3 from VSI OpenVMS x86-64 V9.2, V9.2-1, or V9.2-2, follow these steps:

1. Download, unzip, and copy the VSI OpenVMS x86-64 E9.2-3 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 E9.2-3 and power it off. Then, bring up the screen to edit its settings.

3. Find the CD-ROM/DVD device that your virtual machine is using and change the ISO file associated with the optical drive to the E9.2-3 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*`** to display the file systems available on your VM.

    b. Choose the file system that maps to the VSI OpenVMS E9.2-3 ISO file. Since that ISO has been set up as a CD-ROM, 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 the following command:

```
FS0:\efi\vms\vms_bootmgr
```

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

7. If you plan to use the Guest Console instead of a serial port, enable the Guest Console now by entering the command: **BOOTMGR> OPA0**.

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

Note

In certain scenarios, the list of devices displayed at this moment might be inaccurate. If the list does not include the device that contains the ISO file with the new version of VSI OpenVMS, type `EXIT` and, immediately after that, repeatedly press the Esc key on your keyboard until you see the KVM boot manager screen. Once you see that screen, select the Continue option and press Enter. Then, type `DEVICES` at the `BOOTMGR>` prompt again. Now, the list should be correct.

---

9. From the list, identify the device that contains the ISO file with the new version of VSI OpenVMS (it will be labelled as a CD-ROM or DVD) and enter `BOOT <device-name>`. As an example, `BOOT DKA200`. After the progress meter reaches 100%, what you see depends on whether you are using the Guest Console or not. If you are using a serial port, you should see the following screen:
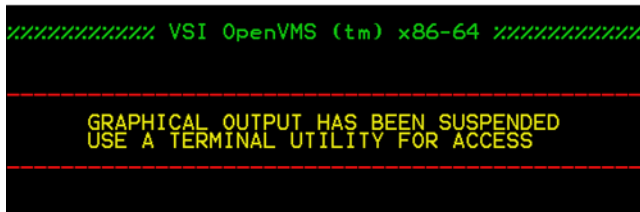
In this case, continue with the next step.

If you are using the Guest Console, you should see the installation menu now. In this case, go to step 11.

10. 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.

11. 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 E9.2-3 does not support installation menu items number 3, 5, and 7. Also, do not use item number 6, unless directly instructed otherwise.

12. If VSI X86VMS OPENSSH V8.9-1F or earlier version is not currently installed on your system, skip this step.

Important

When upgrading to VSI OpenVMS E9.2-3, the procedure *will abort* if the VSIX86VMS OPENSSH V8.9-1F or earlier 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.

d. Type `LOGOUT` to return to the VSI OpenVMS installation menu.

To uninstall VSI x86VMS OpenSSH V8.9-1F or earlier product, perform the following procedure:

a. In the VSI OpenVMS installation menu, enter `6 - Remove 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 V8.9-1F or earlier 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.

13. If you remove the VSI X86VMS OPENSSH V8.9-1H01 kit from the Installation menu, you may encounter the following error message:

    ```
    CREATE-E-DIRNOTCRE, !AS directory file not created %PCSI-E-OPFAILED.
    ```

    This error can be safely ignored, as the VSI X86VMS OPENSSH V8.9-1H01 kit has been successfully removed.

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

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

16. 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.

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

18. 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`.

19. 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.

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

21. 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 or performed 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:

    o Delta Debugger

    o System Dump Analyzer Utility

    o Miscellaneous Symbol Table Files

- Utilities:

    o Phone Utility

    o XPG4 Internationalization Utilities

    o World-Wide PostScript Printing Subsystem

- Bliss Require Files

- Example Files

- Message Facility Files (HELP/MESSAGE)

- UETP Files

- DECwindows Server Support:

o 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. If any subcomponent is not desired, you must first choose to install the main component, and then will be asked about each subcomponent.

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.

---

22. 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.

23. 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.

24. 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.

25. 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.

26. 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.

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

28. 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*** to display all the file systems available on your VM.

    b. Find the file system for the newly upgraded system disk. If the correct file system is not readily apparent, use the file system for the CD-ROM 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.

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

30. 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.

31. 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
```

32. Log in to the system.

33. At this point, OpenVMS has been upgraded successfully, but certain system libraries still must be expanded by manually running the LIBDECOMP command procedure. To expand all unexpanded libraries, enter the following command:

`@SYS$UPDATE:LIBDECOMP EXPAND ALL`

For more information on LIBDECOMP, `@SYS$UPDATE:LIBDECOMP HELP` or refer to the VSI OpenVMS System Manager's Manual [https://docs.vmssoftware.com/vsi-openvms-system-manager-s-manual-volume-2-tuning-monitoring-and-complex-systems/#DECOMPLIBS].

34. 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 E9.2-3.

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 E9.2-3.

4.1. Setting Up DECnet Phase IV

If you chose to install DECnet Phase IV, you must 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 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 system-wide 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. Sample Installation and Upgrade Logs

This appendix provides a sample installation log for VSI OpenVMS x86-64 E9.2-3 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.

A.1. Sample Installation Log

Below is the sample installation log.

```
 Terminal Session Connected

BOOTMGR> DEV

BOOTABLE DEVICES:
 B = BootMgr Device, V = Default VMS Boot Device. Set BOOTMGR flag for path info
             .

 BV DKB0       (DVD) = FS0    UEFI: E9_2_3      VMS: None          1475  MB  SAT
              A DVD

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

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


_____

      THE GUEST CONSOLE HAS BEEN SUSPENDED
     USE A TERMINAL UTILITY FOR OPA0 ACCESS
_____

VSI Primary Kernel SYSBOOT

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


        VMS Software, Inc. OpenVMS (TM) x86_64 Operating System, E9.2-3
                  Copyright 2024 VMS Software, Inc.

  MDS Mitigation active, variant verw(MD_CLEAR)

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


    Installing required known files...

    Configuring devices...

%EIA0, Link up: 1000 mbit, 00-0C-29-90-46-78
```

```
    ******************************************************************

    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 E9.2-3
        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)
  ------------      ------------------------ --------------   --------------------
  DKB100:       ATA VMware Virtual S
  DKB200:       ATA VMware Virtual S

  For volume label and device size enter ??

Enter device name for target disk: (? for choices) DKB100

Enter volume label for target system disk: [X86SYS] X86SYS3

    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, DKB100:, will be initialized
      with structure level 5 (ODS-5).
      Hard links WILL be enabled.
      The disk will be labeled X86SYS3.
      Any data currently on the target system disk will be lost.

Is this OK? (Yes/No) y

      Initializing and mounting target....

      Creating page file....

      Boot options in the EFI Boot Manager boot option menu can provide a
      convenient way to boot your system.  The installation  procedure can
      automatically create a new boot option (if none exists) or validate
      existing boot options.

Do you want to create or validate boot options? (Yes/No) [Yes]

      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: ES2525

      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]

      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] 1.613

        SCSSYSTEMID will be set to 1637.
```

_____

```
      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]:


    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]:


    The target disk of this installation may be set up
    to automatically configure the TCP/IP network stack
    as a DHCP client, and to start up TCP/IP and SSH when
    the system is booted.

    If this option is chosen: The TCP/IP and SSH start up
    procedures will be run by the operating system provided
    start up command procedure that runs SYSTARTUP_VMS.COM.
    The TCP/IP and SSH start up procedures will be executed
    before SYSTARTUP_VMS.COM is executed.

    A DHCP server is required.

Do you want to automatically configure and start up TCP/IP & SSH? (Yes/No) [No]



    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 V3.0-13 for OpenVMS X86-64 (based on OpenSSL V3.0.13)
        o SSL111 V1.1-1W for OpenVMS X86-64 (based on OpenSSL V1.1.1w)
        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 V1.8-1?
(Yes/No) [Yes]


    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-G?
(Yes/No) [Yes]

    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$COMMON]VSI-X86VMS-VMS-E0902-3-2.PC
SI$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.DWMOTIF_SUPPORT_X860923_KIT]VSI-X
86VMS-DWMOTIF_SUPPORT-E0902-3-1.PCSI$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.AVAIL_MAN_BASE_KIT]VSI-X86VMS-AVA
IL_MAN_BASE-E0902-3-1.PCSI$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.TCPIP]VSI-X86VMS-TCPIP-V0600-25-1
.PCSI$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.SSL3]VSI-X86VMS-SSL3-V0300-13-1.P
CSI$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.KERBEROS]VSI-X86VMS-KERBEROS-V030
3-3-1.PCSI$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.SSL111]VSI-X86VMS-SSL111-V0101-1W
-1.PCSI$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.OPENSSH]VSI-X86VMS-OPENSSH-V0809-
1H01-1.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-
1-1.PCSI$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.DECNET_PLUS]VSI-X86VMS-DECNET_PLU
S-V0902-G-1.PCSI$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.DECNET_PHASE_IV_X860923_KIT]VSI-X
86VMS-DECNET_PHASE_IV-E0902-3-1.PCSI$COMPRESSED;1 succeeded

The following product has been selected:
    VSI X86VMS OPENVMS E9.2-3   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 E9.2-3: OPENVMS and related products Platform

    Copyright 2015-2024 VMS Software, Inc.

    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 V6.0-25 requires a system reboot.
* Product VSI X86VMS AVAIL_MAN_BASE E9.2-3 recommends a system reboot.
Can the system be REBOOTED after the installation completes? [YES]

    KERBEROS for OpenVMS X86-64

    SSL3 V3.0-13 for OpenVMS X86-64 (based on OpenSSL V3.0.13)

    SSL111 V1.1-1W for OpenVMS X86-64 (based on OpenSSL V1.1.1w)

    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$X86SYS3:[VMS$COMMON.]
    VSI X86VMS AVAIL_MAN_BASE E9.2-3       DISK$X86SYS3:[VMS$COMMON.]
    VSI X86VMS DECNET_PLUS V9.2-G          DISK$X86SYS3:[VMS$COMMON.]
    VSI X86VMS DWMOTIF V1.8-1              DISK$X86SYS3:[VMS$COMMON.]
    VSI X86VMS DWMOTIF_SUPPORT E9.2-3      DISK$X86SYS3:[VMS$COMMON.]
    VSI X86VMS KERBEROS V3.3-3             DISK$X86SYS3:[VMS$COMMON.]
    VSI X86VMS OPENSSH V8.9-1H01           DISK$X86SYS3:[VMS$COMMON.]
    VSI X86VMS OPENVMS E9.2-3              DISK$X86SYS3:[VMS$COMMON.]
    VSI X86VMS SSL111 V1.1-1W              DISK$X86SYS3:[VMS$COMMON.]
    VSI X86VMS SSL3 V3.0-13                DISK$X86SYS3:[VMS$COMMON.]
    VSI X86VMS TCPIP V6.0-25               DISK$X86SYS3:[VMS$COMMON.]
    VSI X86VMS VMS E9.2-3                  DISK$X86SYS3:[VMS$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 E9.2-3       Layered Product
    VSI X86VMS DECNET_PLUS V9.2-G          Layered Product
    VSI X86VMS DWMOTIF V1.8-1              Layered Product
    VSI X86VMS DWMOTIF_SUPPORT E9.2-3      Layered Product
    VSI X86VMS KERBEROS V3.3-3             Layered Product
    VSI X86VMS OPENSSH V8.9-1H01           Layered Product
    VSI X86VMS OPENVMS E9.2-3              Platform (product suite)
    VSI X86VMS SSL111 V1.1-1W              Layered Product
    VSI X86VMS SSL3 V3.0-13                Layered Product
    VSI X86VMS TCPIP V6.0-25               Layered Product
    VSI X86VMS VMS E9.2-3                  Operating System

VSI X86VMS OPENVMS E9.2-3: OPENVMS and related products Platform

    VSI X86VMS TCPIP V6.0-25: VSI TCP/IP Services for OpenVMS.

      VSI X86VMS SSL3 V3.0-13: SSL3 for OpenVMS X86-64 V3.0-13 (Based on OpenSSL
 3.0.13)

        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:SSL30-13-X86.RELEASE_NOTES for more information.

    Check the release notes for current status of the product.

    VSI X86VMS KERBEROS V3.3-3

      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 V3.0-13: SSL3 for OpenVMS X86-64 V3.0-13 (Based on OpenSSL 3
.0.13)

     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:SSL30-13-X86.RELEASE_NOTES for more information.

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

     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-W-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-G: DECnet-Plus V9.2-G 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


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

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


Created memory disk DKB100:[VMS$COMMON.SYS$LDR]SYS$MD.DSK;1
        - using 187024 blocks in 1 extent with 25634 spare blocks
        - mounted on LDM9134: with volume label MD24206D585A
        - contains OpenVMS E9.2-3


%LD-I-UNIT, Allocated device is LDM9135:
%LMFINSTALL-I-SUCCESS, License installed with 6 units, Termination: 29-JUL-2024

    The EFI Boot Manager menu includes multiple Boot Options
    for DKB100:
Boot Options cannot be created or validated automatically.


    Please use the OpenVMS X86-64 Boot Manager to ensure that you
    have a valid Boot Option for this system.

    You can run the OpenVMS X86-64 Boot Manager by choosing the DCL
    option from the main menu and then execute this command:

        $$$ @SYS$MANAGER:BOOT_OPTIONS

  You can also execute this command from a properly privileged
  account after booting your OpenVMS X86-64 system.

  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 24-JUL-2024 15:11:19.73

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 E9.2-3
        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 - Handles Shutdown/Reboot/Crash Dumps

** 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 VMware Virtual SATA CDROM Drive (0.0)...


Scanning devices and preparing the OpenVMS Boot Manager Build 145...

%VMS_BOOTMGR-I-GRAPHICS, Using Rendered Text Console (1600 x 1200)

VSI OpenVMS Boot Manager: V9.2-* Build 145

  ENABLED:   Symmetric Multi-Processing
  ENABLED:   Crash Dump Processing
  ENABLED:   Legacy Serial Port Console for remote COM 1
  ENABLED:   Using Environment ROM

  Checking Required Processor Features:   PASSED

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

  BOOT MANAGER DEVICE:  DKB0
  DEFAULT BOOT COMMAND: BOOT DKB100 0x00 0x00000000

  AUTOACTION: HALT

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

BOOTMGR> DEV

BOOTABLE DEVICES:
 B = BootMgr Device, V = Default VMS Boot Device. Set BOOTMGR flag for path info
                .

  V DKB100      (HD) = FS0    UEFI: E9_2_3      VMS: X86SYS3      14336 MB   SAT
                A Disk
  B  DKB0       (DVD) = FS1    UEFI: E9_2_3      VMS: None         1475  MB   SAT
                A DVD

BOOTMGR> B DKB100
Booting...

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

_____

```
      THE GUEST CONSOLE HAS BEEN SUSPENDED
      USE A TERMINAL UTILITY FOR OPA0 ACCESS
_____

VSI Primary Kernel SYSBOOT

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

        VMS Software, Inc. OpenVMS (TM) x86_64 Operating System, E9.2-3
                    Copyright 2024 VMS Software, Inc.

  MDS Mitigation active, variant verw(MD_CLEAR)
%DECnet-I-LOADED, network base image loaded, version = 05.92.07

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

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

    Installing required known files...

    Configuring devices...

%RUN-S-PROC_ID, identification of created process is 00000024
%STARTUP-E-NOPAGFIL, No page files have been successfully installed.
%%%%%%%%%%  OPCOM  24-JUL-2024 15:12:49.06  %%%%%%%%%%
Operator _ES2525$OPA0: has been enabled, username SYSTEM

%SYSTEM-I-BOOTUPGRADE, security auditing disabled
%%%%%%%%%%  OPCOM  24-JUL-2024 15:12:49.06  %%%%%%%%%%
Operator status for operator _ES2525$OPA0:
CENTRAL, PRINTER, TAPES, DISKS, DEVICES, CARDS, NETWORK, CLUSTER, SECURITY,
LICENSE, OPER1, OPER2, OPER3, OPER4, OPER5, OPER6, OPER7, OPER8, OPER9, OPER10,
OPER11, OPER12

%%%%%%%%%%  OPCOM  24-JUL-2024 15:12:49.07  %%%%%%%%%%
Logfile has been initialized by operator _ES2525$OPA0:
Logfile is ES2525::SYS$SYSROOT:[SYSMGR]OPERATOR.LOG;1

%%%%%%%%%%  OPCOM  24-JUL-2024 15:12:49.07  %%%%%%%%%%
Operator status for operator ES2525::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  24-JUL-2024 15:12:49.11  %%%%%%%%%%
Message from user SYSTEM on ES2525
%JBC-E-OPENERR, error opening SYS$COMMON:[SYSEXE]QMAN$MASTER.DAT;

%%%%%%%%%%  OPCOM  24-JUL-2024 15:12:49.11  %%%%%%%%%%
Message from user SYSTEM on ES2525
-RMS-E-FNF, file not found

%SYSTEM-I-BOOTUPGRADE, security server not started
%%%%%%%%%%  OPCOM  24-JUL-2024 15:12:49.25  %%%%%%%%%%
Message from user SYSTEM on ES2525
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, 00-0C-29-90-46-78

    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, DKB100:[SYS0.SYSEXE]SYSDUMP.DMP;1 created
%SYSGEN-I-EXTENDED, DKB100:[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  24-JUL-2024 15:13:49.91  %%%%%%%%%%
Message from user SYSTEM on ES2525
%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 ES2525

%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  24-JUL-2024 15:13:50.87  %%%%%%%%%%
Message from user SYSTEM on ES2525
%JBC-E-OPENERR, error opening SYS$COMMON:[SYSEXE]QMAN$MASTER.DAT;
```

```
%%%%%%%%%%  OPCOM  24-JUL-2024 15:13:50.87  %%%%%%%%%%
Message from user SYSTEM on ES2525
-RMS-E-FNF, file not found

SHUTDOWN message on ES2525 from user SYSTEM at ES2525 Batch   15:13:50
ES2525 will shut down in 0 minutes; back up soon.  Please log off node ES2525.
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  24-JUL-2024 15:13:51.63  %%%%%%%%%%
Message from user SYSTEM on ES2525
STARTUP, ES2525 shutdown was requested by the operator.

VSI Dump Kernel - Handles Shutdown/Reboot/Crash Dumps

** Dumping error logs to the system disk (ES2525$DKB100:)
** Error logs dumped to ES2525$DKB100:[SYS0.SYSEXE]SYS$ERRLOG.DMP
** (used 36 out of 128 available blocks)

Restarting the system...

Attempting to start up from:
 > EFI VMware Virtual SATA CDROM Drive (0.0)...

Scanning devices and preparing the OpenVMS Boot Manager Build 145...

VSI OpenVMS Boot Manager: V9.2-* Build 145

  ENABLED:  Symmetric Multi-Processing
  ENABLED:  Crash Dump Processing
  ENABLED:  Legacy Serial Port Console for remote COM 1
  ENABLED:  Using Environment ROM

  Checking Required Processor Features:   PASSED

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

  BOOT MANAGER DEVICE:  DKB0
  DEFAULT BOOT COMMAND: BOOT DKB100 0x00 0x00000000

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

BOOTMGR> DEV

BOOTABLE DEVICES:
 B = BootMgr Device, V = Default VMS Boot Device. Set BOOTMGR flag for path info
              .

  V DKB100      (HD) = FS0    UEFI: E9_2_3      VMS: X86SYS3      14336 MB  SAT
              A Disk
  B DKB0        (DVD) = FS1    UEFI: E9_2_3      VMS: None         1475  MB  SAT
              A DVD

BOOTMGR> B DKB100
Booting...

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

```
─────────────────────────────────────────────

     THE GUEST CONSOLE HAS BEEN SUSPENDED
     USE A TERMINAL UTILITY FOR OPA0 ACCESS
─────────────────────────────────────────────


VSI Primary Kernel SYSBOOT

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

        VMS Software, Inc. OpenVMS (TM) x86_64 Operating System, E9.2-3
                    Copyright 2024 VMS Software, Inc.


  MDS Mitigation active, variant verw(MD_CLEAR)
%DECnet-I-LOADED, network base image loaded, version = 05.92.07

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


%SMP-I-CPUTRN, CPU #2 has joined the active set.
%SMP-I-CPUTRN, CPU #5 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 #1 has joined the active set.
%STDRV-I-STARTUP, OpenVMS startup begun at 24-JUL-2024 15:14:27.18
%EIA0, Link up: 1000 mbit, 00-0C-29-90-46-78
%RUN-S-PROC_ID, identification of created process is 00000404
%RUN-S-PROC_ID, identification of created process is 00000405
%%%%%%%%%%  OPCOM  24-JUL-2024 15:14:33.48  %%%%%%%%%%
Operator _ES2525$OPA0: has been enabled, username SYSTEM

%%%%%%%%%%  OPCOM  24-JUL-2024 15:14:33.48  %%%%%%%%%%
Operator status for operator _ES2525$OPA0:
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  24-JUL-2024 15:14:33.49  %%%%%%%%%%
Logfile has been initialized by operator _ES2525$OPA0:
Logfile is ES2525::SYS$SYSROOT:[SYSMGR]OPERATOR.LOG;2

%%%%%%%%%%  OPCOM  24-JUL-2024 15:14:33.49  %%%%%%%%%%
Operator status for operator ES2525::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

%%%%%%%%%%  OPCOM  24-JUL-2024 15:14:33.53  %%%%%%%%%%
Message from user AUDIT$SERVER on ES2525
%AUDSRV-I-NEWSERVERDB, new audit server database created ( PC 00000000.8001A365)

%%%%%%%%%%  OPCOM  24-JUL-2024 15:14:33.54  %%%%%%%%%%
Message from user AUDIT$SERVER on ES2525
%AUDSRV-I-REMENABLED, resource monitoring enabled for journal SECURITY

%%%%%%%%%%  OPCOM  24-JUL-2024 15:14:33.54  %%%%%%%%%%
Message from user SYSTEM on ES2525
%JBC-E-OPENERR, error opening SYS$COMMON:[SYSEXE]QMAN$MASTER.DAT;

%%%%%%%%%%  OPCOM  24-JUL-2024 15:14:33.54  %%%%%%%%%%
Message from user SYSTEM on ES2525
-RMS-E-FNF, file not found

%%%%%%%%%%  OPCOM  24-JUL-2024 15:14:33.57  %%%%%%%%%%
Message from user AUDIT$SERVER on ES2525
%AUDSRV-I-NEWOBJECTDB, new object database created ( PC 00000000.8001FA80)

%%%%%%%%%%  OPCOM  24-JUL-2024 15:14:33.63  %%%%%%%%%%
Message from user SYSTEM on ES2525
%SECSRV-I-SERVERSTARTINGU, security server starting up
```

```
%%%%%%%%%%  OPCOM  24-JUL-2024 15:14:33.63  %%%%%%%%%%
Message from user SYSTEM on ES2525
%SECSRV-I-CIACRECLUDB, security server created cluster intrusion database


%%%%%%%%%%  OPCOM  24-JUL-2024 15:14:33.64  %%%%%%%%%%
Message from user SYSTEM on ES2525
%SECSRV-I-CIASTARTINGUP, breakin detection and evasion processing now starting up


%%%%%%%%%%  OPCOM  24-JUL-2024 15:14:33.66  %%%%%%%%%%
Message from user SYSTEM on ES2525
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  24-JUL-2024 15:14:34.32  %%%%%%%%%%
Message from user AUDIT$SERVER on ES2525
Security alarm (SECURITY) and security audit (SECURITY) on ES2525, system id: 16
37
Auditable event:          Audit server starting up
Event time:               24-JUL-2024 15:14:34.14
PID:                      00000403
Username:                 SYSTEM


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

%%%%%%%%%%  OPCOM  24-JUL-2024 15:14:34.87  %%%%%%%%%%
Message from user AUDIT$SERVER on ES2525
Security alarm (SECURITY) and security audit (SECURITY) on ES2525, system id: 16
37
Auditable event:          Identifier added
Event time:               24-JUL-2024 15:14:34.86
PID:                      00000403
Process name:             STARTUP
Username:                 SYSTEM
Process owner:            [SYSTEM]
Image name:               ES2525$DKB100:[SYS0.SYSCOMMON.][SYSEXE]AUTHORIZE.EXE
Identifier name:          SYS$NODE_ES2525
Identifier value:         %X80010000
Attributes:               none
Posix UID:                -2
Posix GID:                -2 (%XFFFFFFFE)

%UAF-I-RDBADDMSG, identifier SYS$NODE_ES2525 value %X80010000 added to rights da
tabase
%%%%%%%%%%  OPCOM  24-JUL-2024 15:14:34.91  %%%%%%%%%%
```

```
Message from user AUDIT$SERVER on ES2525
Security alarm (SECURITY) and security audit (SECURITY) on ES2525, system id: 16
37
Auditable event:          Identifier added
Event time:               24-JUL-2024 15:14:34.91
PID:                      00000403
Process name:             STARTUP
Username:                 SYSTEM
Process owner:            [SYSTEM]
Image name:               ES2525$DKB100:[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$WS_QUOTA value %X80010001 added to rights data
base
%DECW$DEVICE-I-NODEVICE, no graphics devices found.
%%%%%%%%%%  OPCOM  24-JUL-2024 15:14:34.95  %%%%%%%%%%
Message from user AUDIT$SERVER on ES2525
Security alarm (SECURITY) and security audit (SECURITY) on ES2525, system id: 16
37
Auditable event:          Identifier added
Event time:               24-JUL-2024 15:14:34.95
PID:                      00000403
Process name:             STARTUP
Username:                 SYSTEM
Process owner:            [SYSTEM]
Image name:               ES2525$DKB100:[SYS0.SYSCOMMON.][SYSEXE]IMGDMP_RIGHTS.E
XE;1
Identifier name:          IMGDMP$READALL
Identifier value:         %X90390001
Attributes:               none
Posix UID:                -2
Posix GID:                -2 (%XFFFFFFFE)

%PROCDUMP-I-CREATED, rights identifier IMGDMP$READALL successfully created
%%%%%%%%%%  OPCOM  24-JUL-2024 15:14:34.96  %%%%%%%%%%
Message from user AUDIT$SERVER on ES2525
Security alarm (SECURITY) and security audit (SECURITY) on ES2525, system id: 16
37
Auditable event:          Identifier added
Event time:               24-JUL-2024 15:14:34.96
PID:                      00000403
Process name:             STARTUP
Username:                 SYSTEM
Process owner:            [SYSTEM]
Image name:               ES2525$DKB100:[SYS0.SYSCOMMON.][SYSEXE]IMGDMP_RIGHTS.E
XE;1
Identifier name:          IMGDMP$PROTECT
Identifier value:         %X90390002
Attributes:               RESOURCE
Posix UID:                -2
Posix GID:                -2 (%XFFFFFFFE)

%PROCDUMP-I-CREATED, rights identifier IMGDMP$PROTECT successfully created
%SET-I-INTSET, login interactive limit = 64, current interactive value = 0
%RUN-S-PROC_ID, identification of created process is 00000411
%%%%%%%%%%  OPCOM  24-JUL-2024 15:14:35.06  %%%%%%%%%%
Message from user SYSTEM on ES2525
%SMHANDLER-S-STARTUP, server management event handler startup

%%%%%%%%%%  OPCOM  24-JUL-2024 15:14:36.64  %%%%%%%%%%
Message from user SYSTEM on ES2525
%SECSRV-I-PROXYSTARTINGUP, proxy processing now starting up


%%%%%%%%%%  OPCOM  24-JUL-2024 15:14:36.64  %%%%%%%%%%
Message from user SYSTEM on ES2525
```

```
%SECSRV-E-NOPROXYDB, cannot find proxy database file NET$PROXY.DAT
%RMS-E-FNF, file not found


  SYSTEM       job terminated at 24-JUL-2024 15:14:37.06

  Accounting information:
  Buffered I/O count:              3056    Peak working set size:    13856
  Direct I/O count:                1777    Peak virtual size:       279168
  Page faults:                     4156    Mounted volumes:              0
  Charged CPU time:      0 00:00:01.68     Elapsed time:     0 00:00:09.94

 Welcome to OpenVMS (TM) x86_64 Operating System, Version E9.2-3


Username: system
Password:
VMS Software, Inc. OpenVMS (TM) x86_64 Operating System, E9.2-3

$ sho sys/noproc/full
OpenVMS E9.2-3  on node ES2525   24-JUL-2024 15:14:56.41   Uptime  0 00:00:30
        VMware, Inc. VMware7,1
$
```

A.2. Sample Upgrade Log

Below is the sample upgrade log.

```
 Terminal Session Connected

BOOTMGR> DEV

BOOTABLE DEVICES:
 B = BootMgr Device, V = Default VMS Boot Device. Set BOOTMGR flag for path info
                         .

  V DKB100      (HD) = FS0    UEFI: V9_2_2        VMS: X86SYS3      14336 MB  SAT
                        A Disk
  B  DKB0       (DVD) = FS1    UEFI: E9_2_3        VMS: None         1475  MB  SAT
                        A DVD

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

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


_____

      THE GUEST CONSOLE HAS BEEN SUSPENDED
     USE A TERMINAL UTILITY FOR OPA0 ACCESS
_____

VSI Primary Kernel SYSBOOT

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

        VMS Software, Inc. OpenVMS (TM) x86_64 Operating System, E9.2-3
                  Copyright 2024 VMS Software, Inc.

  MDS Mitigation active, variant verw(MD_CLEAR)

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

```
    Installing required known files...

    Configuring devices...

%EIA0, Link up: 1000 mbit, 00-0C-29-90-46-78

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

    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 E9.2-3
        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] 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)
  ------------   ------------------------   --------------   --------------------
  DKB100:        ATA VMware Virtual S
  DKB200:        ATA VMware Virtual S

  For volume label and device size enter ??

Enter device name for target disk: (? for choices) DKB100

    DKB100: is now labeled X86SYS3.
```

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

    OpenVMS X86-64 will be upgraded on DKB100:.

    Boot options in the EFI Boot Manager boot option menu can provide a
    convenient way to boot your system. The installation procedure can
    automatically create a new boot option (if none exists) or validate
    existing boot options.

Do you want to create or validate boot options? (Yes/No) [Yes]

    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 V3.0-13 for OpenVMS X86-64 (based on OpenSSL V3.0.13)
        o SSL111 V1.1-1W for OpenVMS X86-64 (based on OpenSSL V1.1.1w)
        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
    is installed on your system. It will be upgraded.

    SSL3 V3.0-13 for OpenVMS X86-64 (based on OpenSSL V3.0.13)
    is installed on your system. It will be upgraded.

    SSL111 V1.1-1W for OpenVMS X86-64 (based on OpenSSL V1.1.1w) V1.1-1W
    is already installed on your system. An upgrade is not required.

    OpenSSH for OpenVMS X86-64
    is installed on your system. It will be upgraded.

    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
    is installed on your system. It will be upgraded.

    DECnet-Plus for OpenVMS X86-64
    is installed on your system. It will be upgraded.

    DECnet Phase IV for OpenVMS X86-64 is not installed on your system.
    It will not be installed.

    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]

```
    Preserving existing copies of STARTUP.NSH if found...

    No STARTUP.NSH files were found in the EFI system partition file

Performing product kit validation of signed kits ...
%PCSI-I-VSIVALPASSED, validation of DMM1:[VMS$COMMON]VSI-X86VMS-VMS-E0902-3-2.PCSI
$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.DWMOTIF_SUPPORT_X860923_KIT]VSI-X86VMS-
DWMOTIF_SUPPORT-E0902-3-1.PCS
I$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.AVAIL_MAN_BASE_KIT]VSI-X86VMS-
AVAIL_MAN_BASE-E0902-3-1.PCSI$COMPRESS
ED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.TCPIP]VSI-X86VMS-TCPIP-V0600-25-1.PCSI
$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.SSL3]VSI-X86VMS-SSL3-V0300-13-1.PCSI
$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.KERBEROS]VSI-X86VMS-KERBEROS-V0303-3-1.PCSI
$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.SSL111]VSI-X86VMS-SSL111-V0101-1W-1.PCSI
$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.OPENSSH]VSI-X86VMS-OPENSSH-V0809-1H01-1.PCSI
$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.PERL534]VMSPORTS-X86VMS-PERL534-
T0534-0-1.PCSI$COMPRESSED;1 succeede
d
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.DWMOTIF]VSI-X86VMS-DWMOTIF-V0108-1-1.PCSI
$COMPRESSED;1 succeeded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.DECNET_PLUS]VSI-X86VMS-DECNET_PLUS-V0902-
G-1.PCSI$COMPRESSED;1 succe
eded
%PCSI-I-VSIVALPASSED, validation of DMM1:[KITS.DECNET_PHASE_IV_X860923_KIT]VSI-X86VMS-
DECNET_PHASE_IV-E0902-3-1.PCS
I$COMPRESSED;1 succeeded


The following product has been selected:
    VSI X86VMS OPENVMS E9.2-3            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 E9.2-3: OPENVMS and related products Platform

    Copyright 2015-2024 VMS Software, Inc.

    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 V6.0-25 requires a system reboot.
* Product VSI X86VMS AVAIL_MAN_BASE E9.2-3 recommends a system reboot.
Can the system be REBOOTED after the installation completes? [YES]

    KERBEROS for OpenVMS X86-64

    SSL3 V3.0-13 for OpenVMS X86-64 (based on OpenSSL V3.0.13)

    SSL111 V1.1-1W for OpenVMS X86-64 (based on OpenSSL V1.1.1w)

    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:
    VSI X86VMS AVAIL_MAN_BASE E9.2-3      DISK$X86SYS3:[VMS$COMMON.]
    VSI X86VMS DECNET_PLUS V9.2-G         DISK$X86SYS3:[VMS$COMMON.]
    VSI X86VMS DWMOTIF V1.8-1             DISK$X86SYS3:[VMS$COMMON.]
    VSI X86VMS DWMOTIF_SUPPORT E9.2-3     DISK$X86SYS3:[VMS$COMMON.]
    VSI X86VMS KERBEROS V3.3-3            DISK$X86SYS3:[VMS$COMMON.]
    VSI X86VMS OPENSSH V8.9-1H01          DISK$X86SYS3:[VMS$COMMON.]
    VSI X86VMS OPENVMS E9.2-3             DISK$X86SYS3:[VMS$COMMON.]
    VSI X86VMS SSL3 V3.0-13               DISK$X86SYS3:[VMS$COMMON.]
    VSI X86VMS TCPIP V6.0-25              DISK$X86SYS3:[VMS$COMMON.]
    VSI X86VMS VMS E9.2-3                 DISK$X86SYS3:[VMS$COMMON.]
The following products will be removed from destinations:
    VSI X86VMS AVAIL_MAN_BASE V9.2-2      DISK$X86SYS3:[VMS$COMMON.]
    VSI X86VMS DECNET_PLUS V9.2-E         DISK$X86SYS3:[VMS$COMMON.]
    VSI X86VMS DWMOTIF V1.8               DISK$X86SYS3:[VMS$COMMON.]
    VSI X86VMS DWMOTIF_SUPPORT V9.2-2     DISK$X86SYS3:[VMS$COMMON.]
    VSI X86VMS KERBEROS V3.3-2A           DISK$X86SYS3:[VMS$COMMON.]
    VSI X86VMS OPENSSH V8.9-1G            DISK$X86SYS3:[VMS$COMMON.]
    VSI X86VMS OPENVMS V9.2-2             DISK$X86SYS3:[VMS$COMMON.]
    VSI X86VMS SSL3 V3.0-11               DISK$X86SYS3:[VMS$COMMON.]
    VSI X86VMS TCPIP V6.0-23              DISK$X86SYS3:[VMS$COMMON.]
    VSI X86VMS VMS V9.2-2                 DISK$X86SYS3:[VMS$COMMON.]


Portion done: 0%
Device is DISK$X86SYS3:[SYS0.SYSCOMMON.SYS$STARTUP], now upgrade remove running...

  Unless you elect to retain them when prompted,
  this utility will delete the following:
    - OpenSSH configuration files.
    - OpenSSH default OpenVMS accounts (SSH$SSH, SSH$SSHD).

Delete OpenSSH configuration files? [y/n]: [n]
Disabling TCPIP services...
  No services found

Deleting SSH$ROOT: directory tree...

SSH$ROOT: directory tree successfully removed
from SYS$SYSDEVICE:[SYS0.SYSCOMMON.OPENSSH]

...10%...20%...30%...40%...50%...60%

        Restoring STARTUP.NSH file(s)...

        No files restored

...70%...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:
    VSI X86VMS AVAIL_MAN_BASE E9.2-3      Layered Product
    VSI X86VMS DECNET_PLUS V9.2-G         Layered Product
    VSI X86VMS DWMOTIF V1.8-1             Layered Product
    VSI X86VMS DWMOTIF_SUPPORT E9.2-3     Layered Product
    VSI X86VMS KERBEROS V3.3-3            Layered Product
    VSI X86VMS OPENSSH V8.9-1H01          Layered Product
    VSI X86VMS OPENVMS E9.2-3             Platform (product suite)
    VSI X86VMS SSL3 V3.0-13               Layered Product
    VSI X86VMS TCPIP V6.0-25              Layered Product
    VSI X86VMS VMS E9.2-3                 Operating System
The following products have been removed:
    VSI X86VMS AVAIL_MAN_BASE V9.2-2      Layered Product
```

```
    VSI X86VMS DECNET_PLUS V9.2-E          Layered Product
    VSI X86VMS DWMOTIF V1.8                Layered Product
    VSI X86VMS DWMOTIF_SUPPORT V9.2-2      Layered Product
    VSI X86VMS KERBEROS V3.3-2A            Layered Product
    VSI X86VMS OPENSSH V8.9-1G             Layered Product
    VSI X86VMS OPENVMS V9.2-2              Platform (product suite)
    VSI X86VMS SSL3 V3.0-11               Layered Product
    VSI X86VMS TCPIP V6.0-23              Layered Product
    VSI X86VMS VMS V9.2-2                  Operating System

VSI X86VMS OPENVMS E9.2-3: OPENVMS and related products Platform

    VSI X86VMS TCPIP V6.0-25: VSI TCP/IP Services for OpenVMS.

      VSI X86VMS SSL3 V3.0-13: SSL3 for OpenVMS X86-64 V3.0-13 (Based on OpenSSL 3.0.13)

        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:SSL30-13-X86.RELEASE_NOTES for more information.

    Check the release notes for current status of the product.

    VSI X86VMS KERBEROS V3.3-3

    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 V3.0-13: SSL3 for OpenVMS X86-64 V3.0-13 (Based on OpenSSL 3.0.13)

        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:SSL30-13-X86.RELEASE_NOTES for more information.

    VSI X86VMS DECNET_PLUS V9.2-G: DECnet-Plus V9.2-G 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

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

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

Created memory disk DKB100:[VMS$COMMON.SYS$LDR]SYS$MD.DSK;2
        - using 187040 blocks in 1 extent with 25627 spare blocks
        - mounted on LDM6499: with volume label MD24206D1E8B
        - contains OpenVMS E9.2-3

    The EFI Boot Manager menu includes multiple Boot Options
    for DKB100:
Boot Options cannot be created or validated automatically.

    Please use the OpenVMS X86-64 Boot Manager to ensure that you
    have a valid Boot Option for this system.

    You can run the OpenVMS X86-64 Boot Manager by choosing the DCL
    option from the main menu and then execute this command:

        $$$ @SYS$MANAGER:BOOT_OPTIONS

  You can also execute this command from a properly privileged
  account after booting your OpenVMS X86-64 system.

   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 24-JUL-2024 14:55:55.01

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 E9.2-3
        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 - Handles Shutdown/Reboot/Crash Dumps
```

```
** 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 VMware Virtual SATA CDROM Drive (0.0)...

Scanning devices and preparing the OpenVMS Boot Manager Build 145...

%VMS_BOOTMGR-I-GRAPHICS, Using Rendered Text Console (1600 x 1200)

VSI OpenVMS Boot Manager: V9.2-* Build 145

  ENABLED:  Symmetric Multi-Processing
  ENABLED:  Crash Dump Processing
  ENABLED:  Legacy Serial Port Console for remote COM 1
  ENABLED:  Using Environment ROM

  Checking Required Processor Features:   PASSED

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

  BOOT MANAGER DEVICE:  DKB0
  DEFAULT BOOT COMMAND: BOOT DKB100 0x00 0x00000000

  AUTOACTION: HALT

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

BOOTMGR> DEV

BOOTABLE DEVICES:
 B = BootMgr Device, V = Default VMS Boot Device. Set BOOTMGR flag for path info.

  V DKB100      (HD) = FS0    UEFI: E9_2_3      VMS: X86SYS3      14336 MB  SATA Disk
  B  DKB0       (DVD) = FS1    UEFI: E9_2_3      VMS: None         1475  MB  SATA DVD

BOOTMGR> B DKB100
Booting...

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


_____

      THE GUEST CONSOLE HAS BEEN SUSPENDED
      USE A TERMINAL UTILITY FOR OPA0 ACCESS
_____

VSI Primary Kernel SYSBOOT

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

        VMS Software, Inc. OpenVMS (TM) x86_64 Operating System, E9.2-3
                  Copyright 2024 VMS Software, Inc.

  MDS Mitigation active, variant verw(MD_CLEAR)
%DECnet-I-LOADED, network base image loaded, version = 05.92.07

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

%RUN-S-PROC_ID, identification of created process is 00000404
%STARTUP-E-NOPAGFIL, No page files have been successfully installed.
%SYSTEM-I-BOOTUPGRADE, security auditing disabled
%%%%%%%%%%  OPCOM  24-JUL-2024 14:56:53.11  %%%%%%%%%%
Operator _ES2525$OPA0: has been enabled, username SYSTEM

%%%%%%%%%%  OPCOM  24-JUL-2024 14:56:53.11  %%%%%%%%%%
Operator status for operator _ES2525$OPA0:
CENTRAL, PRINTER, TAPES, DISKS, DEVICES, CARDS, NETWORK, CLUSTER, SECURITY,
LICENSE, OPER1, OPER2, OPER3, OPER4, OPER5, OPER6, OPER7, OPER8, OPER9, OPER10,
OPER11, OPER12

%%%%%%%%%%  OPCOM  24-JUL-2024 14:56:53.12  %%%%%%%%%%
Logfile has been initialized by operator _ES2525$OPA0:
Logfile is ES2525::SYS$SYSROOT:[SYSMGR]OPERATOR.LOG;3

%%%%%%%%%%  OPCOM  24-JUL-2024 14:56:53.13  %%%%%%%%%%
Operator status for operator ES2525::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  24-JUL-2024 14:56:53.15  %%%%%%%%%%
Message from user SYSTEM on ES2525
%JBC-E-OPENERR, error opening SYS$COMMON:[SYSEXE]QMAN$MASTER.DAT;

%%%%%%%%%%  OPCOM  24-JUL-2024 14:56:53.15  %%%%%%%%%%
Message from user SYSTEM on ES2525
-RMS-E-FNF, file not found

%LICENSE-F-EMTLDB, license database contains no license records
%SYSTEM-I-BOOTUPGRADE, security server not started
%%%%%%%%%%  OPCOM  24-JUL-2024 14:56:53.26  %%%%%%%%%%
Message from user SYSTEM on ES2525
TDF-I-SETTDF TDF set new timezone differential

NET$STARTUP, Network not started due to UPGRADE boot
%%%%%%%%%%  OPCOM  24-JUL-2024 14:56:53.38  %%%%%%%%%%
Message from user SYSTEM on ES2525
%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, 00-0C-29-90-46-78

    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, 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
        No dump file modifications were made on device DKB100:.
        Dumpfile on device DKB100: will remain at 16246506 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  24-JUL-2024 14:57:06.38  %%%%%%%%%%
Message from user SYSTEM on ES2525
%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 ES2525

%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  24-JUL-2024 14:57:06.63  %%%%%%%%%%
Message from user SYSTEM on ES2525
%JBC-E-OPENERR, error opening SYS$COMMON:[SYSEXE]QMAN$MASTER.DAT;

%%%%%%%%%  OPCOM  24-JUL-2024 14:57:06.63  %%%%%%%%%%
Message from user SYSTEM on ES2525
-RMS-E-FNF, file not found

SHUTDOWN message on ES2525 from user SYSTEM at ES2525 Batch   14:57:06
ES2525 will shut down in 0 minutes; back up soon.  Please log off node ES2525.
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  24-JUL-2024 14:57:06.86  %%%%%%%%%%
Message from user SYSTEM on ES2525
STARTUP, ES2525 shutdown was requested by the operator.


VSI Dump Kernel - Handles Shutdown/Reboot/Crash Dumps

** Dumping error logs to the system disk (ES2525$DKB100:)
** Error logs dumped to ES2525$DKB100:[SYS0.SYSEXE]SYS$ERRLOG.DMP
** (used 116 out of 128 available blocks)


Restarting the system...


Attempting to start up from:
 > EFI VMware Virtual SATA CDROM Drive (0.0)...


Scanning devices and preparing the OpenVMS Boot Manager Build 145...

VSI OpenVMS Boot Manager: V9.2-* Build 145

  ENABLED:  Symmetric Multi-Processing
  ENABLED:  Crash Dump Processing
  ENABLED:  Legacy Serial Port Console for remote COM 1
  ENABLED:  Using Environment ROM

  Checking Required Processor Features:   PASSED

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

  BOOT MANAGER DEVICE:  DKB0
  DEFAULT BOOT COMMAND: BOOT DKB100 0x00 0x00000000

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

BOOTMGR> DEV

BOOTABLE DEVICES:
 B = BootMgr Device, V = Default VMS Boot Device. Set BOOTMGR flag for path info

 V DKB100      (HD) = FS0    UEFI: E9_2_3      VMS: X86SYS3      14336 MB  SAT
 B DKB0       (DVD) = FS1    UEFI: E9_2_3      VMS: None          1475 MB  SAT

BOOTMGR> B DKB100
Booting...

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


_____


      THE GUEST CONSOLE HAS BEEN SUSPENDED
     USE A TERMINAL UTILITY FOR OPA0 ACCESS
_____


VSI Primary Kernel SYSBOOT

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


        VMS Software, Inc. OpenVMS (TM) x86_64 Operating System, E9.2-3
                 Copyright 2024 VMS Software, Inc.
```

```
  MDS Mitigation active, variant verw(MD_CLEAR)
%DECnet-I-LOADED, network base image loaded, version = 05.92.07

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

%SMP-I-CPUTRN, CPU #2 has joined the active set.
%SMP-I-CPUTRN, CPU #3 has joined the active set.
%SMP-I-CPUTRN, CPU #1 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 24-JUL-2024 14:57:38.15
%EIA0, Link up: 1000 mbit, 00-0C-29-90-46-78
%RUN-S-PROC_ID, identification of created process is 00000404
%RUN-S-PROC_ID, identification of created process is 00000405
%%%%%%%%%% OPCOM  24-JUL-2024 14:57:43.55  %%%%%%%%%%
Operator _ES2525$OPA0: has been enabled, username SYSTEM

%%%%%%%%%% OPCOM  24-JUL-2024 14:57:43.55  %%%%%%%%%%
Operator status for operator _ES2525$OPA0:
CENTRAL, PRINTER, TAPES, DISKS, DEVICES, CARDS, NETWORK, CLUSTER, SECURITY,
LICENSE, OPER1, OPER2, OPER3, OPER4, OPER5, OPER6, OPER7, OPER8, OPER9, OPER10,
OPER11, OPER12

%%%%%%%%%% OPCOM  24-JUL-2024 14:57:43.56  %%%%%%%%%%
Logfile has been initialized by operator _ES2525$OPA0:
Logfile is ES2525::SYS$SYSROOT:[SYSMGR]OPERATOR.LOG;4

%%%%%%%%%% OPCOM  24-JUL-2024 14:57:43.56  %%%%%%%%%%
Operator status for operator ES2525::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  24-JUL-2024 14:57:43.59  %%%%%%%%%%
Message from user SYSTEM on ES2525
%JBC-E-OPENERR, error opening SYS$COMMON:[SYSEXE]QMAN$MASTER.DAT;

%%%%%%%%%% OPCOM  24-JUL-2024 14:57:43.60  %%%%%%%%%%
Message from user SYSTEM on ES2525
-RMS-E-FNF, file not found

%LICENSE-F-EMTLDB, license database contains no license records
%%%%%%%%%% OPCOM  24-JUL-2024 14:57:43.66  %%%%%%%%%%
Message from user SYSTEM on ES2525
%SECSRV-I-SERVERSTARTINGU, security server starting up


%%%%%%%%%% OPCOM  24-JUL-2024 14:57:43.67  %%%%%%%%%%
Message from user SYSTEM on ES2525
%SECSRV-I-CIACRECLUDB, security server created cluster intrusion database


%%%%%%%%%% OPCOM  24-JUL-2024 14:57:43.67  %%%%%%%%%%
Message from user SYSTEM on ES2525
%SECSRV-I-CIASTARTINGUP, breakin detection and evasion processing now starting u
p


%%%%%%%%%% OPCOM  24-JUL-2024 14:57:43.70  %%%%%%%%%%
Message from user SYSTEM on ES2525
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 24-JUL-2024 14:57:43.93 %%%%%%%%%%
Message from user SYSTEM on ES2525
%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 24-JUL-2024 14:57:44.00 %%%%%%%%%%
Message from user AUDIT$SERVER on ES2525
Security alarm (SECURITY) and security audit (SECURITY) on ES2525, system id: 16
37
Auditable event: Audit server starting up
Event time: 24-JUL-2024 14:57:43.98
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
%RUN-S-PROC_ID, identification of created process is 00000411
%%%%%%%%%% OPCOM 24-JUL-2024 14:57:44.39 %%%%%%%%%%
Message from user SYSTEM on ES2525
%SMHANDLER-S-STARTUP, server management event handler startup

  SYSTEM   job terminated at 24-JUL-2024 14:57:46.41

  Accounting information:
  Buffered I/O count: 3033   Peak working set size: 13856
  Direct I/O count: 1714   Peak virtual size: 279168
  Page faults: 4129   Mounted volumes: 0
  Charged CPU time: 0 00:00:01.61   Elapsed time: 0 00:00:08.28
%%%%%%%%%% OPCOM 24-JUL-2024 14:57:46.67 %%%%%%%%%%
Message from user SYSTEM on ES2525
%SECSRV-I-PROXYSTARTINGUP, proxy processing now starting up

%%%%%%%%%% OPCOM 24-JUL-2024 14:57:46.68 %%%%%%%%%%
Message from user SYSTEM on ES2525
%SECSRV-E-NOPROXYDB, cannot find proxy database file NET$PROXY.DAT
%RMS-E-FNF, file not found

 Welcome to OpenVMS (TM) x86_64 Operating System, Version E9.2-3

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, E9.2-3
    Last interactive login on Wednesday, 24-JUL-2024 14:48:52.70

_____

```
$ sho sys/noproc/full
OpenVMS E9.2-3  on node ES2525   24-JUL-2024 14:58:03.60   Uptime  0 00:00:26
       VMware, Inc. VMware7,1
$
```