

VEP4600 Operating System

Installation Guide

Dell Solutions

Notes, cautions, and warnings

 **NOTE:** A NOTE indicates important information that helps you make better use of your product.

 **CAUTION:** A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

 **WARNING:** A WARNING indicates a potential for property damage, personal injury, or death.

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VEP4600 overview

The VEP4600 platform is a one rack unit, x86-based networking platform running virtualized universal customer premise equipment (uCPE) functions and basic switching/routing functions as a top-of-rack device with 4, 8, or 16 cores.



Figure 1. VEP4600 platform

- | | |
|---------------------------------|---|
| 1. Platform status icon LEDs | 2. RS-232 ports (top) and 10/100/1000 Base-T ports (bottom) |
| 3. SFP+ ports | 4. Luggage tag |
| 5. 1000 Base-T networking ports | 6. Processor power on/off button |
| 7. Micro USB-B port | 8. USB Type A ports |

For detailed information about the VEP4600 platform, see the following documents at <https://www.dell.com/support>:

- BMC User Guide
- BIOS User Guide
- VEP4600 Installation Guide
- VEP4600 Setup Guide
- uCPE Networking DIAG OS Guide

This document describes the steps for OS installation on a VEP4600 device. The OS installation steps are tested and verified on the VEP4600 device with the OS versions listed below:

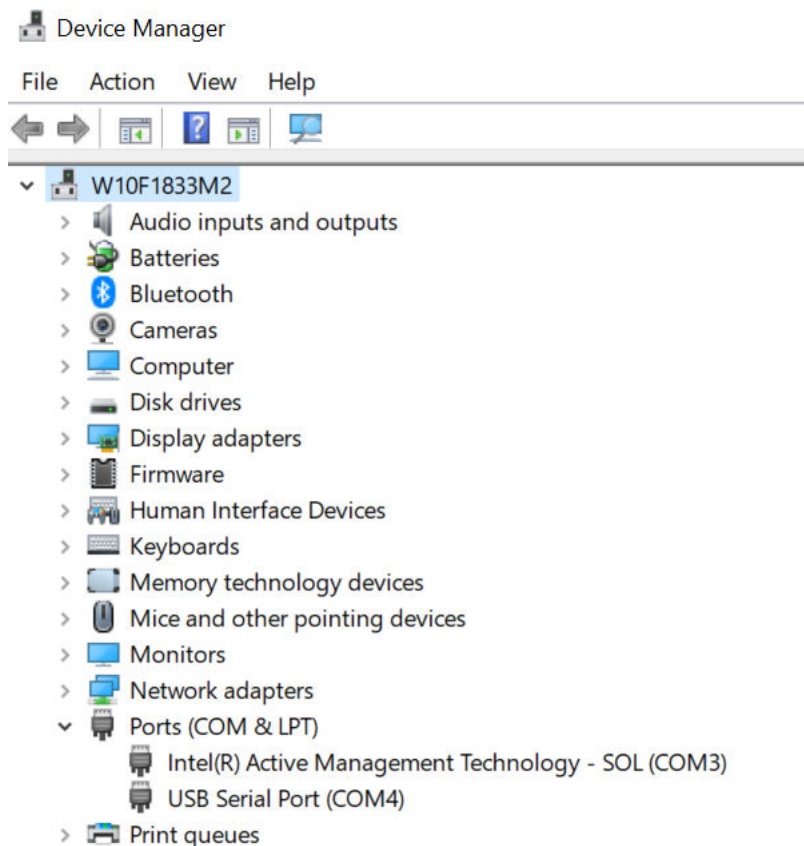
- DiagOS image: `diagos-recovery-x86_64-dellemc_vep4600_d21xyt-r0.3.41.3.81-9.iso`
- Ubuntu OS image: `ubuntu-18.04.3-live-server-amd64.iso`
- Adva OS image: `SVCS_connector-18.4.1.31-18.4-factory-dell-45.iso`
- ESXi 6.7 OS image: `VMware-VMvisor-Installer-6.7.0.update03-16316930.x86_64-DellEMC_Customized-A06.iso`
- ESXi 7.0 OS image: `VMware-VMvisor-Installer-7.0.0-16324942.x86_64-DellEMC_Customized-A02.iso`

NOTE: For systems running ESXi, BIOS shell, FreeBSD, Linux, or Windows, you can download the X722 firmware version 5.00 package from the **Drivers & Downloads** tab of the **Dell Networking VEP4600** support page at www.dell.com/support. Follow the instruction in the `readme.tx` to complete the update. Before you update, read and agree to the Intel License Agreement.

VEP4600 start up and serial console connection

1. On a laptop connected to the VEP4600, bring up Windows Device Manager to get the COM port.

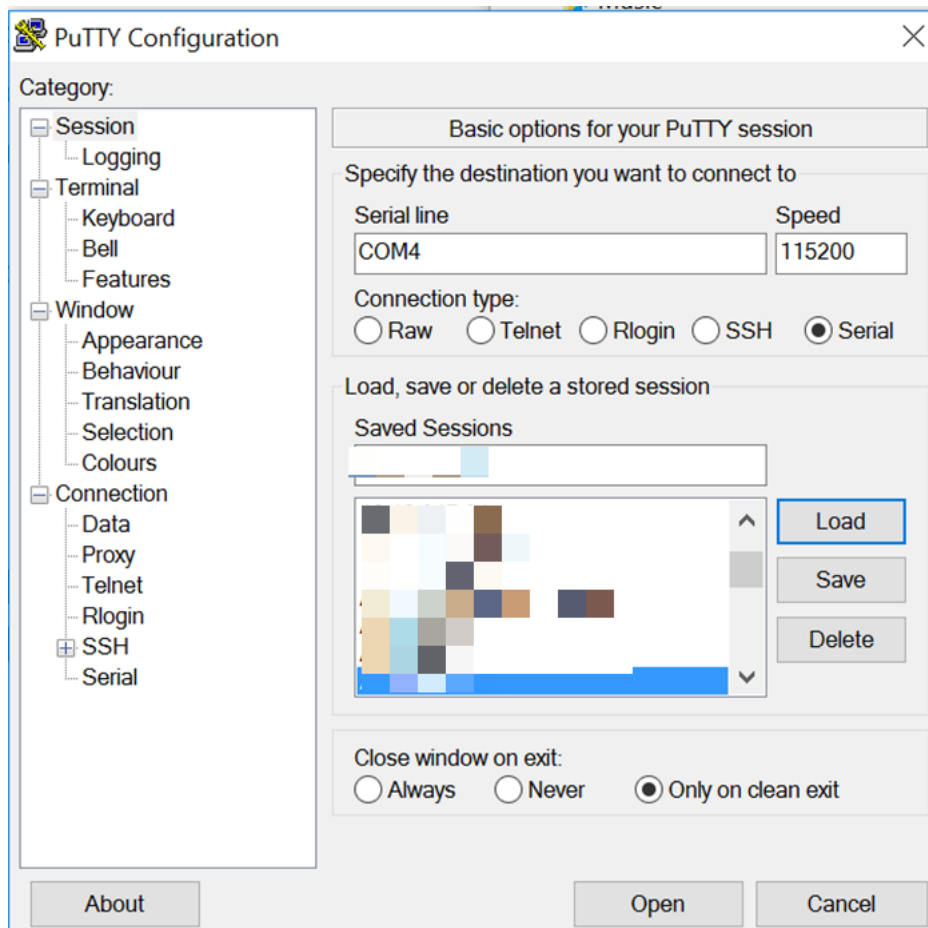
Windows Device Manager



It's the USB Serial Port drive in this case for our USB to serial console adapter. The COM port number is 4.

2. Using Putty, configure a console connection with the right COM port and speed.

PuTTY session options



3. Plug in a power cord to the back of VEP4600. It starts to power up immediately. Watch for VEP4600 console window.
VEP4600 console window

BIOS Boot Selector for VEP-4600
Primary BIOS Version 3.41.0.9-14

CPLD Version:1.0
CPLD Reset Source=0x44

POST Configuration
CPU Signature 50654
CPU FamilyID=6, Model=55, SteppingId=4, Processor=0
Microcode Revision 2000057
Platform ID: 0x1000000000000000
PKG_CST_CFG_CTL: 0x3
Misc EN: 0x4000840088
Gen PM Con1: 0x0
Therm Status: 0x8000000
POST Control=0xEA000301, Status=0xE600FF00

BIOS initializations...

POST:
RTC Battery OK at last cold boot
RTC date 8/22/2019 4:18:29

POST SPD test PASS

POST Lower DRAM Memory test
DRAM Interface test
Perf cnt (curr,fixed): 0x13E3512956,0x13EC46B39C
POST Lower DRAM Memory test PASS
POST Lower DRAM ECC check PASS

After the POST Lower DRAM Memory test text displays, the cursor moves to the upper left corner of the console window.

Curser



4. Press the **Delete** button until the **Press ...** string displays on the console window.

Console window

```
Version 2.20.1271. Copyright (C) 2018 American Megatrends, Inc.  
BIOS Date: 04/11/2018 02:44:05 Ver: 0ACJF020  
Press <DEL> or <F2> to enter setup.
```

NOTE: If you miss the setup screen, a boot up screen displays. If this happens, power cycle the VEP4600 and press the **Delete** button. Repeat the process until you see the setup screen.

Setup screen

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.		
Main Advanced Platform Configuration Socket Configuration >		
BIOS Information		^ Choose the system
BIOS Vendor	American Megatrends	* default language
Core Version	5.14	*
Compliance	UEFI 2.6; PI 1.4	*
Project Version	3.41.0.9-14	*
Build Date and Time	04/10/2019 00:01:36	*
Access Level	Administrator	*
Platform Information		*
Platform	TypeYubaCityRP	*
Processor	50654 - SKX M0	* ><: Select Screen
PCH	- B2-D	* ^v: Select Item
RC Revision	06D25	* Enter: Select
Memory Information		* +/-: Change Opt.
Total Memory	65536 MB	* F1: General Help
		+ F2: Previous Values
		+ F3: Optimized Defaults
		v F4: Save & Exit
		ESC: Exit
Version 2.20.1271. Copyright (C) 2019 American Megatrends, Inc.		

VEP4600 configuration guidelines

Topics

- Types of VEP4600 with pre-installed OS from manufacturing
- Guidelines for upgrading VEP4600 based on manufacturing configuration

This section describes the steps to take to complete the VEP4600 configuration. The VEP4600 will arrive from manufacturing with one of the following configurations.

- Config1: VEP4600 preinstalled with ESXi
- Config2: VEP4600 preinstalled with DiagOS
- Config3: VEP4600 preinstalled with Versa flex NFV

Config1 – ESXi v6.7 Ux is installed on the VEP4600:

- Update firmware from the BMC - See [Upgrade Firmware through BMC](#)

Config2 – DiagOS is installed on the VEP4600:

- Update to the latest version of DiagOS - See [Update to the latest version of DiagOS](#)
- Update the firmware - See [Upgrade Firmware through DiagOS](#)

Config3 – Versa flex NFV is installed on the VEP4600:

- Update firmware from the BMC - See [Upgrade Firmware through BMC](#)

Update to latest DiagOS

Verify you are running the latest DiagOS as noted in the [VEP4600 overview](#) with the following steps:

1. Log in to the Diag OS using `root` as the username and `calvin` as the password.
2. Enter the `sh_ver` command:

```
root@dellemc-diag-os:~#sh_ver
Diag OS version VEP4600_DIAG_OS_x.xx.x.xx-x
Build date/time Tue Apr 24 00:15:20 PDT 2018
Build server netLogin-eqx-03
Build by cxxxx
Kernel Info:
Linux 4.9.30 #1 SMP PREEMPT Tue Apr 24 00:12:19 PDT 2018 x86_64 GNU/Linux
Debian GNU/Linux 8 \n \l
root@dellemc-diag-os:
```

Upgrade firmware through DIAG OS

If Dell support requests, or if you want to use DIAG OS for the firmware updater, please refer to the DIAG OS install instruction in the Dell Technologies VEP4600 DIAG OS and Tools Release Notes at <https://www.dell.com/support> for installation instructions.

DIAG OS is not installed at factory but a user can create two partitions. Bootable DIAG OS USB on the first partition and another bootable operating systems on the second partition

Topics:

- [Check the existing firmware version](#)
- [Copy the Unified firmware updater to USB](#)
- [Mount USB on the VEP4600](#)
- [Run the Unified firmware updater through USB](#)

Check the existing firmware version

To check the current VEP4600 firmware versions from the DiagOS run the following command:

DiagOS installed: log in and type `updatetool -D ALL -V`

Copy the Unified firmware updater to USB

1. Download the Unified firmware updater from the [Dell support site](#).
2. Unzip `vep4600_ufw_3.7.zip` file to access `vep4600_ufw_3.7` (UFW) script.
3. From a Windows or Linux server copy the `vep4600_ufw_3.7.zip` file to a USB. (USB size 2GB is sufficient)

Mount USB on the VEP4600

1. Insert the USB into the USB port in the VEP4600 front panel.
2. From the serial console DiagOS:
 - a. Run the command `mkdir /mnt/usb` to create the mount point
 - b. Run the command `mount /dev/sdb /mnt/usb`

NOTE: The USB can take a different device name, but usually VEP4600 DIAG OS assigns `sdb` for the USB. If you run `fdisk -l` the USB is usually one of the last drives in the list.

Device	Boot	Start	End	Sectors	Size	Id	Type
/dev/sdb1		32	30031871	30031840	14.3G	c	W95 FAT32 (LBA)

Run the Unified firmware updater through USB

NOTE: x is a place marker for the current version.

1. From mounted USB, run the Unified ifrmware updater tool with the following commands:

- a. root@dellemc-diag-os:~# cd /mnt/usb
- b. root@dellemc-diag-os:/mnt/usb# chmod 777 vep4600_ufw_x.x
- c. root@dellemc-diag-os:/mnt/usb# ./vep4600_ufw_x.x interactive

2. The following menu is displayed below:

```

root@dellemc-diag-os:/mnt/usb# chmod 777 vep4600_ufw_x.x
root@dellemc-diag-os:/mnt/usb# ./vep4600_ufw_x.x interactive
Creating directory images
Verifying archive integrity... 100% MD5 checksums are OK. All good.
Uncompressing release 100%
Selecting previously unselected package zlib1g-dev:amd64.
(Reading database ... 20150 files and directories currently installed.)
Preparing to unpack .../zlib1g-dev_1%3a1.x.x.dfsg-2+b1_amd64.deb ...
Unpacking zlib1g-dev:amd64 (1:1.x.x.dfsg-2+b1) ...
Setting up zlib1g-dev:amd64 (1:1.x.x.dfsg-2+b1) ...
Processing triggers for man-db (2.7.0.2-5) ...
fopen: Permission denied
Selecting previously unselected package libssl-dev:amd64.
(Reading database ... 20181 files and directories currently installed.)
Preparing to unpack .../libssl-dev_1.0.1t-1+deb8u6_amd64.deb ...
Unpacking libssl-dev:amd64 (1.0.1t-1+deb8u6) ...
Setting up libssl-dev:amd64 (1.0.1t-1+deb8u6) ...
Selecting previously unselected package libssl-doc.
(Reading database ... 20267 files and directories currently installed.)
Preparing to unpack .../libssl-doc_1.0.1t-1+deb8u6_all.deb ...
Unpacking libssl-doc (1.0.1t-1+deb8u6) ...
Setting up libssl-doc (1.0.1t-1+deb8u6) ...
Processing triggers for man-db (2.7.0.2-5) ...
fopen: Permission denied
Selecting previously unselected package bc.
(Reading database ... 21629 files and directories currently installed.)
Preparing to unpack diag/bc_1.06.95-9_amd64.deb ...
Unpacking bc (1.06.95-9) ...
Setting up bc (1.06.95-9) ...
Processing triggers for man-db (2.7.0.2-5) ...
fopen: Permission denied

Package version: x.x
Packaged images:
BMC image: x.x
BIOS image: 3.41.0.x-xx
CPLD image: XxXX
Wifi CPLD image: XxX
X722 image: x.xx

Note: If BMC version is less than 1.23 CPLD versions will not be shown correctly

1. Automatically update all firmware components
2. BMC image[Primary version:2.30, backup version:2.0]
3. BIOS image[Booted version:3.41.0.9-23]
4. CPLD image[CPLD version:v12]
5. rNDC left CPLD image[CPLD version:0x2]
6. rNDC right CPLD image[CPLD version:0x2]
7. intel rNDC firmware update:
   [ left Type: NA, (0.0)]
   [ right Type: X710, (0.DUP package - 20.0.17)]

Note: also need to update i40e driver to 2.14.13 and DPDK to 20.08 or further version

8. intel X722 firmware[X722 firmware version:5.0]

Note: also need to update i40e driver to 2.14.13 and DPDK to 20.08 or further version

```

```
9. Reset BMC after CPLD update completion and system bootup

q. Exit
```

3. Enter **1** Automatically update all firmware components.

```
updating ALL images

updating BMC image

*****
* BMC version = x.x      *
* Back-up Version = x.x  *
*****
Already have x.x programmed

updating BIOS image

*****
* BIOS version = 3.41.0.x-xx *
*****
updating primary image only..
BIOS image is ./VEP4600-BIOS-3.41.0.x-xx.BIN
01
INFO: Yafu INI Configuration File not found... Default options will not be applied...

Creating IPMI session via USB...Done

-----
YAFUFlash - Firmware Upgrade Utility (Version 4.11x.x)
-----
(C)Copyright 2016, American Megatrends Inc.
Beginning BIOS Update...
Uploading Image : 100%... done
Flashing Firmware Image : 100%... done
Verifying Firmware Image : 100%... done
Done with updating image
Will continue to update rest of components
Power cycle cpu to boot new BIOS after update is complete
updating CPLD image
Already have Xxxx programmed
updating MC1_CARD CPLD image
Already have 0x2 programmed
WARNING: To avoid damage to your device, do not stop the update or reboot or power
off the system during t update.

Intel(R) Ethernet NVM Update Tool
NVMUpdate version 1.32.20.18
Copyright (C) 2013 - 2018 Intel Corporation.

done updating
Power cycle chassis for updates to take effect

Package version: x.x
Packaged images:
  BMC image: x.x
  BIOS image: 3.41.0.x-xx
  CPLD image: Xxxx

Note:If BMC version is less than 1.23 CPLD versions will not be shown correctly

1. Automatically update all firmware components
2. BMC image[Primary version:2.30, backup version:2.0]
3. BIOS image[Booted version:3.41.0.9-23]
4. CPLD image[CPLD version:v12]
5. rNDC left CPLD image[CPLD version:0x2]
```

```
6. rNDC right CPLD image[CPLD version:0x2]
7. intel rNDC firmware update:
   [ left Type: NA, (0.0)]
   [ right Type: X710, (0.DUP package - 20.0.17)]
Note: also need to update i40e driver to 2.14.13 and DPDK to 20.08 or further version
8. intel X722 firmware[X722 firmware version:5.0]
Note: also need to update i40e driver to 2.14.13 and DPDK to 20.08 or further version
9. Reset BMC after CPLD update completion and system bootup
q. Exit
   Enter your choice:q
```

4. After firmware upgrade completes, enter **q** to exit.
5. Once all firmware updates are complete, a system power cycle is required either with remote power cyclers or manually unplugging and plugging back the power cord.

 **NOTE:** Please note that the power down state should be **minimum of 15 seconds** for the complete power drain.

Upgrade firmware through BMC

This section describes the steps to take to upgrade the VEP4600's firmware remotely from a Linux or Windows server.

Topics:

- [Check the existing firmware version](#)
- [Configure BMC management address in BIOS](#)
- [Configure BMC management address on BMC console](#)
- [Run the Unified firmware updater tool from a Linux server](#)

Check the existing firmware version

To check the current VEP4600 firmware versions when an Operating system is installed:

- To find the CPLD and BIOS versions from the CPU mgmt console:
 - ESXi is installed: Scroll up to last boot output to see BIOS and CPLD versions.
 - DiagOS installed: Log in and type `updatetool -D ALL -V`.
- To find the BMC version from BMC mgmt console type `ipmitool -I lanplus -H 127.0.0.1 -U admin -P admin mc info`.

```
~ #ipmitool -I lanplus -H 127.0.0.1 -U admin -P admin mc info
Device ID           : 32
Device Revision     : 1
Firmware Revision   : 2.00
IPMI Version        : 2.0
Manufacturer ID     : 12290
Manufacturer Name   : Unknown (0x3002)
Product ID          : 1147 (0x047b)
Product Name        : Unknown (0x47B)
Device Available    : yes
Provides Device SDRs : no
```

Configure BMC management address in BIOS

To run the Unified firmware updater tool remotely, a BMC management address must be configured. This can be done through booting into the BIOS or from the BMC console.

- From the BMC console window, run the following commands to boot into the BIOS:

```
ipmitool -I lanplus -H 127.0.0.1 -U admin -P admin chassis bootparam set bootflag
force_bios

ipmitool -I lanplus -H 127.0.0.1 -U admin -P admin power reset
```

- In the BIOS, tab to `Server Mgmt` menu, then move cursor down to `BMC network configuration`.
Select BMC network configuration

```

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
< Dell Diagnostics  Server Mgmt  Security  Boot  Save & Exit

BMC Firmware Revision      1.23
IPMI Version                2.0
BMC Interface(s)           KCS, USB

BMC Support                 [Enabled]
Wait For BMC                [Disabled]
FRB-2 Timer                 [Enabled]
FRB-2 Timer timeout         [6 minutes]
FRB-2 Timer Policy          [Do Nothing]
OS Watchdog Timer           [Disabled]
OS Wtd Timer Timeout        [10 minutes]
OS Wtd Timer Policy         [Reset]
Serial Mux                  [Disabled]

> System Event Log
> BMC self test log
> View FRU information
> BMC network configuration
> View System Event Log

^|Configure BMC network
+|parameters
+|
*|
*|
*|
*|
*|><: Select Screen
*|^v: Select Item
*|Enter: Select
*|+/-: Change Opt.
*|F1: General Help
*|F2: Previous Values
+|F3: Optimized Defaults
v|F4: Save & Exit
|ESC: Exit

```

3. Move cursor down to highlight, Configuration address source and press **Enter**. Select **Static**.
4. Use Ctrl-h to clear the fields and enter your BMC ip address, Subnet mask and Router IP address (gateway address).
Select Static

```

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
Server Mgmt

--BMC network configuration--
*****
Configure IPV4 support
*****

Lan channel 1
Configuration Address source --- Configuration Address source ---
| Unspecified
| Static
| DynamicBmcDhcp
| DynamicBmcNonDhcp
BMC interface IP address
Subnet mask
Station MAC address      D8-9E-F3-BC-56-A9
Router IP address        100.67.144.254
Router MAC address       F8-B1-56-84-E1-26

*****

^|Select to configure LAN
*|channel parameters
*|statically or
*|dynamically(by BIOS or
*|BMC). Unspecified
*|option will not modify
*|MC network
*|ers during BIOS

+|+/-: Change Opt.
+|F1: General Help
+|F2: Previous Values
+|F3: Optimized Defaults
v|F4: Save & Exit
|ESC: Exit

```

5. Press the **F4** key to Save the changes and exit the utility.
6. Confirm saving the configuration by selecting **Yes** and press **Enter** to boot.
7. Log into the CPU mgmt (DiagOS) console and run the following command:

```
root@dellmc-diag-os:~# ipmitool lan set 1 ipsrc bios -> this will update the /etc/network/ interfaces file to what you have set in the bios
```

Configure BMC management address on BMC console

From the BMC console, run the following commands:

```
ipmitool -H 127.0.0.1 -U admin -P admin lan set 1 ipsrc <static or dhcp>
```

NOTE: If using static addressing, follow the next 3 commands:

```
ipmitool -H 127.0.0.1 -U admin -P admin lan set 1 ipaddr xxx.xx.xxx.xx
ipmitool -H 127.0.0.1 -U admin -P admin lan set 1 netmask 255.255.255.0
ipmitool -H 127.0.0.1 -U admin -P admin lan set 1 defgw ipaddr xxx.xx.xxx.254
```

Run the Unified firmware updater tool from a Linux server

1. Deploy a Linux OS (Adva Rocky Linux, RedHat, Ubuntu) that connects to the VEP4600 BMC network. Can be a VM based Linux server.
2. Verify you can reach the BMC ip address with ipmitool:

```
test_user@ubs18-04:~$ sudo bash
[sudo] password for test_user:
root@ubs18-04:~# ipmitool -I lanplus -H xxx.xx.xx.xxx -U admin -P admin power status
Chassis Power is on
```

3. Run the UFW from the Linux (Adva Rocky Linux, RedHat, Ubuntu) server with the following command:

```
./vep4600_ufw_x.x <BMC IP address> interactive
```

```
root@ubs18-04:~# cd Downloads/
root@ubs18-04:~/Downloads# ls -l
total 186916
-rw-rw-r-- 1 test_user test_user 98093308 Aug 17 15:43 vep4600_ufw_x.x
root@ubs18-04:~/Downloads# chmod u+x vep4600_ufw_x.x
root@ubs18-04:~/Downloads# ls -l
total 186916
-rwxrw-r-- 1 test_user test_user 98093308 Aug 17 15:43 vep4600_ufw_x.x

root@ubs18-04:~/Downloads# ./vep4600_ufw_x.x xxx.xx.xx.xxx interactive
Creating directory temp
Verifying archive integrity... 100% MD5 checksums are OK. All good.
Uncompressing release 100%
firmware_updater/
firmware_updater/x710/
firmware_updater/x710/spsetup.sh
firmware_updater/x710/DX69G.txt
firmware_updater/x710/BootIMG.FLB
firmware_updater/x710/6VDPG.txt
firmware_updater/x710/demere_map.txt
firmware_updater/x710/68M95.txt
firmware_updater/x710/nut_msg.txt
firmware_updater/x710/nvminv.cfg
firmware_updater/x710/98-secupdusb.rules
firmware_updater/x710/harbor_map.txt
firmware_updater/x710/shellfit.sh
firmware_updater/x710/XD56X.txt
firmware_updater/x710/getSystemId
firmware_updater/x710/OSFlavourUtils.sh
firmware_updater/x710/os_mapping.xml
firmware_updater/x710/svmExeMsg.xsl
firmware_updater/x710/PIEInfo.txt
firmware_updater/x710/UpdRollBack
```

```

firmware_updater/x710/Version.txt
firmware_updater/x710/UpdRollBack.lst
firmware_updater/x710/spconfig.xml
firmware_updater/x710/buildVer.sh
firmware_updater/x710/vpd.txt
firmware_updater/x710/Intel_Proprietary_License.pdf
firmware_updater/x710/nvmupdate.cfg
firmware_updater/x710/package.xml.sign
firmware_updater/x710/smbiosHelp.txt
firmware_updater/x710/nvmupdate64e
firmware_updater/x710/LinuxDepWrapperLinux.bin
firmware_updater/x710/PIEConfig.sh
firmware_updater/x710/payload/
firmware_updater/x710/payload/BootIMG.CFB
firmware_updater/x710/payload/FmpUpdateWrapper.efi
firmware_updater/x710/HashOfHashFileList.txt
firmware_updater/x710/BootIMG.FLB.filepart
firmware_updater/x710/08XJ7.txt
firmware_updater/x710/kerby_map.txt
firmware_updater/x710/DDJKY.txt
firmware_updater/x710/en.prop
firmware_updater/x710/Y348Y.txt
firmware_updater/x710/6VDPG_1G.txt
firmware_updater/x710/uni-eol.txt
firmware_updater/x710/mc.txt
firmware_updater/x710/00-secupd-dell.rules
firmware_updater/x710/sphelp.txt
firmware_updater/x710/Y5M7N.txt
firmware_updater/x710/sputility.bin
firmware_updater/x710/KF46X.txt
firmware_updater/x710/duppmdatacollector.bin
firmware_updater/x710/spUtilityHelp.txt
firmware_updater/x710/package.xml
firmware_updater/diag/
firmware_updater/diag/zlib1g-dev_1%3a1.2.8.dfsg-2+b1_amd64.deb
firmware_updater/diag/bc_1.06.95-9_amd64.deb
firmware_updater/diag/libssl-dev_1.0.1t-1+deb8u6_amd64.deb
firmware_updater/diag/libssl-doc_1.0.1t-1+deb8u6_all.deb
firmware_updater/Azul_CPLD_refresh.vme
firmware_updater/AZUL_CPLD_V12_20210520_refresh.vme
firmware_updater/libfreeipmi.so.16
firmware_updater/mstr_01_20181226.vme
firmware_updater/VEP4600-BIOS-3.41.0.9-21.BIN
firmware_updater/Adva Rocky Linux7/
firmware_updater/Adva Rocky Linux7/OpenIPMI-modalias-2.0.23-2.el7.x86_64.rpm
firmware_updater/Adva Rocky Linux7/ipmitool-1.8.18-7.el7.x86_64.rpm
firmware_updater/MCCARD_mstr_cpld_00_02_201809101600.vme
firmware_updater/install.sh
firmware_updater/AZUL_CPLD_V12_20210520_norefresh.vme
firmware_updater/X722/
firmware_updater/X722/
LBG_B2_Hybrid_CS4227_P01_Backplane_P23_LED_HIGH_No_WoL_NCSI_4p30_80001FDF.bin
firmware_updater/X722/BootIMG.FLB
firmware_updater/X722/iv.txt
firmware_updater/X722/nvmupdate_4.3.cfg
firmware_updater/X722/version.txt
firmware_updater/X722/Intel_firmware_license.txt
firmware_updater/X722/LBG_B2_Hybrid_CS4227_PXE_v3.51_80001007.bin
firmware_updater/X722/Immediate_offset_2.txt
firmware_updater/X722/iSCSI.txt
firmware_updater/X722/Intel_Proprietary_License.pdf
firmware_updater/X722/
LBG_B2_Hybrid_CS4227_P01_Backplane_P23_LED_HIGH_No_WoL_NCSI_5p00_80002313.bin
firmware_updater/X722/nvmupdate.cfg
firmware_updater/X722/update.xml
firmware_updater/X722/nvmupdate64e
firmware_updater/X722/license.pdf
firmware_updater/X722/OCF_Configuration.txt
firmware_updater/X722/CS4227_KR_SFI_8_13_2015.bin
firmware_updater/X722/readme.txt
firmware_updater/X722/file_license.txt
firmware_updater/X722/license.txt
firmware_updater/X722/Immediate_offset_1.txt

```

```

firmware_updater/libcrypto.so.1.1
firmware_updater/ipmitool
firmware_updater/libreadline.so.7
firmware_updater/libcrypto.so.1.0.0
firmware_updater/VEP4600-BMC-v2.30.ima
firmware_updater/Yafuflash
firmware_updater/x520/
firmware_updater/x520/spsetup.sh
firmware_updater/x520/BootIMG.FLB
firmware_updater/x520/nut_msg.txt
firmware_updater/x520/nvminv.cfg
firmware_updater/x520/98-secupdusb.rules
firmware_updater/x520/shellfit.sh
firmware_updater/x520/getSystemId
firmware_updater/x520/OSFlavourUtils.sh
firmware_updater/x520/os_mapping.xml
firmware_updater/x520/svmExeMsg.xsl
firmware_updater/x520/PIEInfo.txt
firmware_updater/x520/UpdRollBack
firmware_updater/x520/Version.txt
firmware_updater/x520/UpdRollBack.lst
firmware_updater/x520/spconfig.xml
firmware_updater/x520/buildVer.sh
firmware_updater/x520/vpd.txt
firmware_updater/x520/Intel_Proprietary_License.pdf
firmware_updater/x520/aqua_map.txt
firmware_updater/x520/nvmupdate.cfg
firmware_updater/x520/package.xml.sign
firmware_updater/x520/smbiosHelp.txt
firmware_updater/x520/nvmupdate64e
firmware_updater/x520/LinuxDepWrapperLinux.bin
firmware_updater/x520/PIEConfig.sh
firmware_updater/x520/payload/
firmware_updater/x520/payload/BootIMG.CFB
firmware_updater/x520/payload/FmpUpdateWrapper.efi
firmware_updater/x520/HashOfHashFileList.txt
firmware_updater/x520/en.prop
firmware_updater/x520/uni-eol.txt
firmware_updater/x520/sagepond_map.txt
firmware_updater/x520/mc.txt
firmware_updater/x520/00-secupd-dell.rules
firmware_updater/x520/sphelp.txt
firmware_updater/x520/sputility.bin
firmware_updater/x520/duppmdatacollector.bin
firmware_updater/x520/spUtilityHelp.txt
firmware_updater/x520/package.xml
firmware_updater/firmware.files
~/Downloads/temp ~/Downloads/temp
is ubuntu 18.04
installing libssl-dev
get X722 version from firmware.files is: 5.00

```

```

Package version: x.x
Packaged images:
BMC image: x.x
BIOS image: x.xx.x.x-xx
CPLD image: XxXX

```

Note: If BMC version is less than 1.23 CPLD versions will not be shown correctly

1. Automatically update all firmware components
2. BMC image[Primary version:2.30, backup version:2.0]
3. BIOS image[Booted version:3.41.0.9-23]
4. CPLD image[CPLD version:v12]
9. Reset BMC after CPLD update completion and system bootup
- q. Exit

4. Select the appropriate number of your choice to upgrade the firmware.

```
Enter your choice:3
updating BIOS image

*****
* BIOS version = 3.41.0.9-21 *
*****
updating primary image only..
BIOS image is ./VEP4600-BIOS-3.41.0.9-21.BIN
00
INFO: Yafu INI Configuration File not found... Default options will not be applied...

Creating IPMI session via network with address xxx.xx.xx.xx...Done

-----
YAFUFlash - Firmware Upgrade Utility (Version 4.117.7)
-----
(C)Copyright 2016, American Megatrends Inc.
Beginning BIOS Update...

Upgrading Firmware Image : 0%
Upgrading Firmware Image : 1%
.
Upgrading Firmware Image : 99%
Uploading Image : 100%... done

Flashing Firmware Image : 0%
Flashing Firmware Image : 1%
.
Flashing Firmware Image : 99%
Flashing Firmware Image : 100%
Flashing Firmware Image : 100%... done

Verifying Firmware Image : 0%
Verifying Firmware Image : 1%
.
Verifying Firmware Image : 99%
Verifying Firmware Image : 100%
Verifying Firmware Image : 100%... done
Done with updating primary image

Resetting BMC after updating BIOS
Sending reset to BMC to recover, should wait for 180 seconds

-
/
|
\
-
/
|
\ Will continue to update rest of components
Resetting CPU
Chassis Power Control: Cycle
-
/
|
\

Package version: 3.5
Packaged images:
    BMC image: 2.30
    BIOS image: 3.41.0.9-21
    CPLD image: 0x12
    Wifi CPLD image: 0x1
    X722 image: 5.00
Note:If BMC version is less than 1.23 CPLD versions will not be shown correctly

1. Automatically update all firmware components
```

```
2. BMC image[Primary version:2.30, backup version:1.22]
3. BIOS image[Booted version: 3.41.0.9-21]
4. CPLD image[CPLD version: 0x10]
9. Reset BMC after CPLD update completion and system bootup
q. Exit
```

```
Enter your choice:q
```

```
~/Downloads/temp
root@ubs18-04:~/Downloads#
```

5. After firmware upgrade completes, enter **q** to exit.
6. Once all firmware updates are complete, a system power cycle is required either with remote power cycler or manually unplugging and plugging back the power cord.
 -  **NOTE:** The power down state should be a **minimum of fifteen seconds** for the complete power drain.
 -  **NOTE:** UFW has been tested for use with Ubuntu 18.04, Adva Rocky Linux, and Versa VOS 21.2.2.
 -  **NOTE:** If an IPMI session error is seen while connecting to the BMC, run following command to reset the BMC prior to re-run of UFW. `root@ubs18-04:~/# ipmitool -l lanplus -H xxx.xx.xx.xxx -U admin -P admin mc reset cold`
 -  **NOTE:** UFW has a limitation that rNDC and x722 firmware upgrade cannot be done through the BMC network. Firmware upgrade options available for this hardware via DIAG OS and firmware workaround sections.

Upgrade rNDC and x722 firmware workaround

Topics:

- Upgrade rNDC firmware when ESXi is running on VEP4600
- Upgrade rNDC firmware when Versa is running on VEP4600
- Upgrade x722 running on VEP4600

Upgrade rNDC firmware when ESXi is running on VEP4600

1. Download the rNDC firmware from the Dell Support site: <https://www.dell.com/support/home/drivers/driversdetails?driverid=t0wh3>

 **NOTE:** The updated x710 20.5.13 driver package for ESXi is not available.

2. Scroll down to File Name: Intel_LAN_20.0.0_ESXi_FWUPDATEPACKAGE_A00.zip and click **Download File**.
3. Copy the File Name: Intel_LAN_20.0.0_ESXi_FWUPDATEPACKAGE_A00.zip file to ESXi through WinSCP.
4. Log in to the ESXi ssh shell.
5. Extract the File Name: Intel_LAN_20.0.0_ESXi_FWUPDATEPACKAGE_A00.zip file to the /tmp directory (default root directory has a small space.)
6. Run the following command in the extracted directory under /tmp.

```
chmod a+x ./intelfw.sh
./intelfw.sh
```

7. Wait until the command has been successfully run (takes about 10 minutes).
8. Reboot the unit.
9. Verify the FW upgrade by checking the lights on the ports:
 - a. Connect a cable to both ports. You should see a green light on both ports. If not, it means you have not successfully upgraded firmware.
10. Check both fixed 10G ports and rNDC 10G ports.
11. Check both fixed 1G ports and rNDC 1G ports (if applicable).

Upgrade rNDC firmware when Versa is running on VEP4600

Run Dell X710 firmware upgrade utility in Versa FlexVNF

1. Start to upgrade X710 FW from Versa FlexVNF, boot into FlexVNF and login as admin/versa123

```
Versa FlexVNF software
Release : xx.1Rx (Sxx.x) Versa FlexVNF version
Release date: 20xxxxxx
Package ID : be30dle
```

 **NOTE:** x is a place marker for the current version.

2. Run this command.

```
vsh stop
```

3. Check X710 FW version from Versa FlexVNF.

```
sudo ethtool -i eth7
driver: ixxx
version: x.x.xx
firmware-version: x.00 0x800039ed xx.x.x <<<<<
bus-info: 0000:xx:00.0
```

4. Upgrade X710 FW.

Download Dell X710 firmware upgrade utility from this link.

The file name is: x710fw.tar.gz

5. Copy the downloaded file to Versa FlexVNF.

Run gunzip to uncompress it to the tar file x710fw.tar.

6. Run `tar -xvf x710fw.tar` to expand it to the x710 folder.

Run `cd ~/x710`

7. Run `./nvmupdate64e -oem d -u -c nvmupdate.cfg -l nvmupdate.log`

```
Intel(R) Ethernet NVM Update Tool
NVMUpdate version 1.32.20.18
Copyright (C) 2013 - 2018 Intel Corporation.
Takes about 3 minutes to finish and return to the command prompt
[root@versa-flexvnf: x710] $
```

8. View the log file.

```
cat nvmupdate.log | more
Intel(R) Ethernet NVM Update Tool
NVMUpdate version 1.32.20.18
Copyright (C) 2013 - 2018 Intel Corporation.
./nvmupdate64e -oem d -u -c nvmupdate.cfg -l nvmupdate.log
Config file read.
Inventory
[00:023:00:00]: Intel(R) Ethernet 10G 4P X710 SFP+ rNDC
Flash inventory started.
Shadow RAM inventory started.
Alternate MAC address is not set.
Shadow RAM inventory finished.
Flash inventory finished.
OROM inventory started.
OROM inventory finished.
Update
[00:023:00:00]: Intel(R) Ethernet 10G 4P X710 SFP+ rNDC
Flash update started.
NVM image verification started.
Shadow RAM image verification started.
Shadow RAM image verification finished.
Flash image verification started.
Flash image verification finished.
NVM image verification finished.
Flash update successful.
OROM update started.
OROM image verification started.
OROM image verification finished.
OROM update successful.
Checking update availability for next tool run.
Reboot is required to complete the update process.
```

9. Boot into the BIOS settings to check X710 firmware version.

 **NOTE:** Optional, FW-Version can be checked using check X710 FW version from Versa FlexVNF.

```
Aptio Setup Utility - Copyright (C) 2019 American Megatronics
Advanced

/-----/
|> Firmware Image Properties
|> NIC Configuration
|> iSCSI Configuration
|> Device Level Configuration
|
| Blink LEDs                      0
|
| Adapter PBA                     H16305-012
| Device Name                     Intel(R) Ethernet 10G
|                               4P X710 SFP+ rNDC
| Chip Type                       Intel X710
| PCI Device ID                   1572
| PCI Address                     17:00:00
|
| Link Status                     [Disconnected]
|
| MAC Address                     E4:43:4B:52:23:60
| Virtual MAC Address             00:00:00:00:00:00
```

```
Aptio Setup Utility - Copyright (C) 2019 American Megatronics
Advanced

/-----/
| Family Firmware                 18.8.9
| Version
| EFI Version                     3.3.37
```

Upgrade x722 running on VEP4600

Upgrade x722 driver through a DIAG OS SSH shell.

i **NOTE:** To update the x722 firmware, follow the instructions in the readme.txt file found under each sub-tar ball.

1. Log into a DIAG OS SSH shell
2. Run:

```
./vep4600_ufw_3.3 interactive
```

3. Select **option 8** to upgrade X722 firmware

```
Package version: x.x
Packaged images:
BMC image: x.x
BIOS image: 3.41.0.x-xx
CPLD image: XxXX
Wifi CPLD image: XxX
X722 image: x.xx

Note: If BMC version is less than 1.23 CPLD versions will not be shown correctly

1. Automatically update all firmware components
```

```
2. BMC image[Primary version:2.30, backup version:2.0]
3. BIOS image[Booted version:3.41.0.9-23]
4. CPLD image[CPLD version:v12]
5. rNDC left CPLD image[CPLD version:0x2]
6. rNDC right CPLD image[CPLD version:0x2]
7. intel rNDC firmware update:
    [ left Type: NA, (0.0)]
    [ right Type: X710, (0.DUP package - 20.0.17)]
Note: also need to update i40e driver to 2.14.13 and DPDK to 20.08 or further version
8. intel X722 firmware[X722 firmware version:5.0]
Note: also need to update i40e driver to 2.14.13 and DPDK to 20.08 or further version
9. Reset BMC after CPLD update completion and system bootup
q. Exit
Enter your choice:8
```

4. When finished select **q** to exit UFW

```
Enter your choice:q
```

Prepare bootable USB with OS ISO image

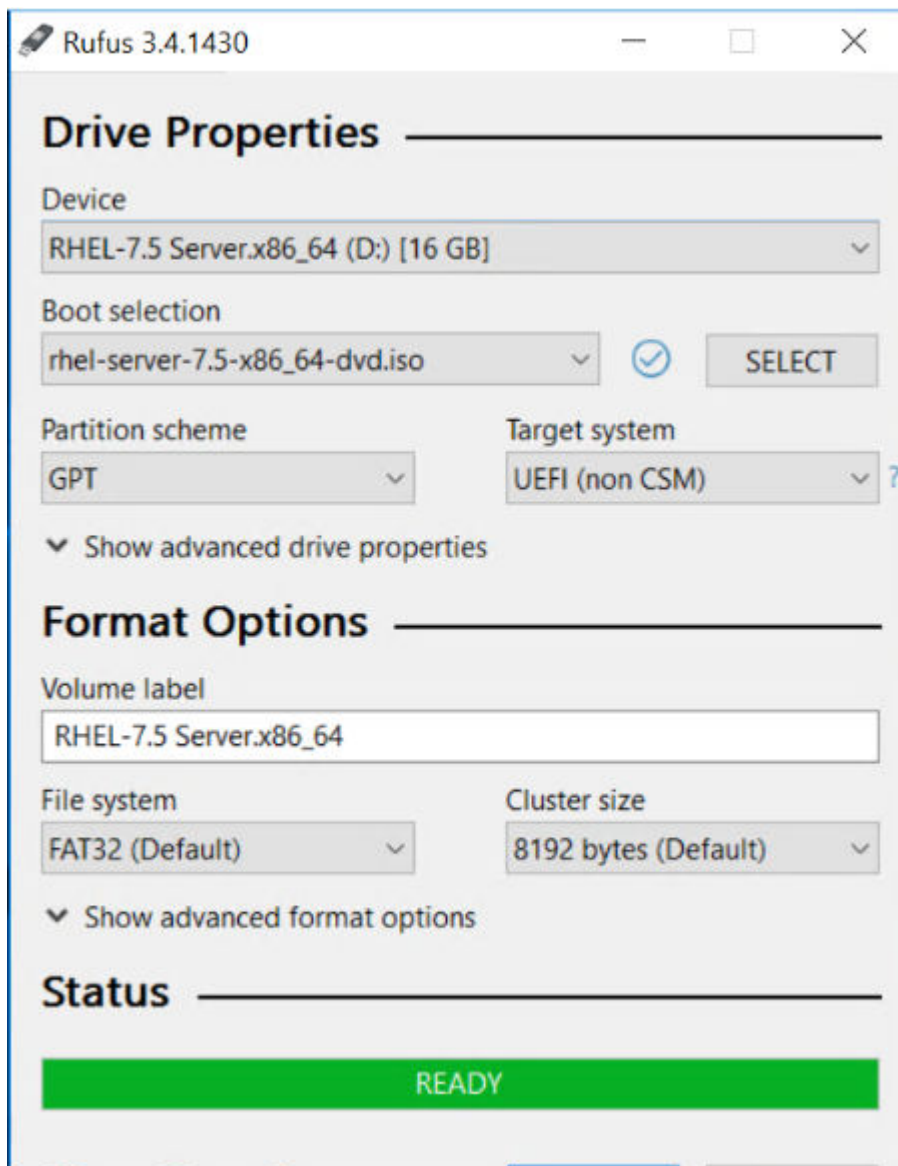
This section describes the how to prepare a USB key to install the operating system of your choice. For this procedure, you need a bootable USB. On a Windows PC, use Rufus to burn the bootable USB.

Topics:

- [Download Rufus](#)

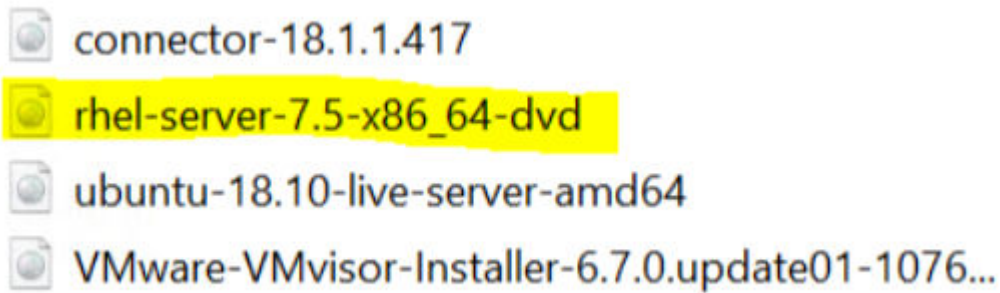
Download Rufus

1. To download Rufus, go to: <https://rufus.akeo.ie>
2. Open Rufus and click on SELECT button to load the ISO image from the Windows disks.
3. Plug the USB flash drive into the personal computer.

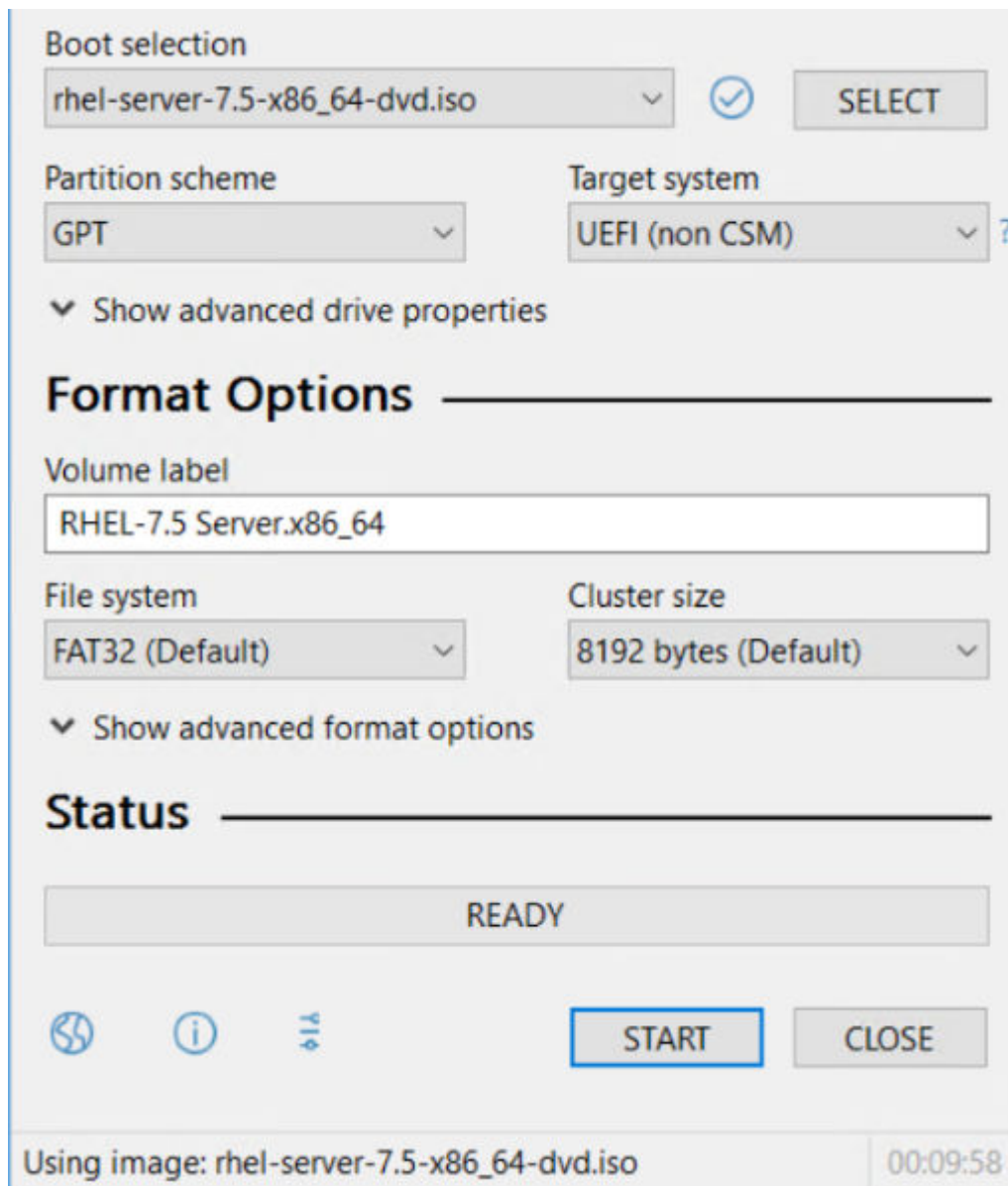


4. Navigate to the ISO file and click to select the file.

Select ISO file.



5. Verify that the file name-selected displays at the bottom of the Rufus device dialog box.



Rufus device dialog box

 **NOTE:** Use the same process to burn a USB with Ubuntu, Adva, and ESXi ISO images.

6. Click START and wait for successful completion, then unplug the USB drive.

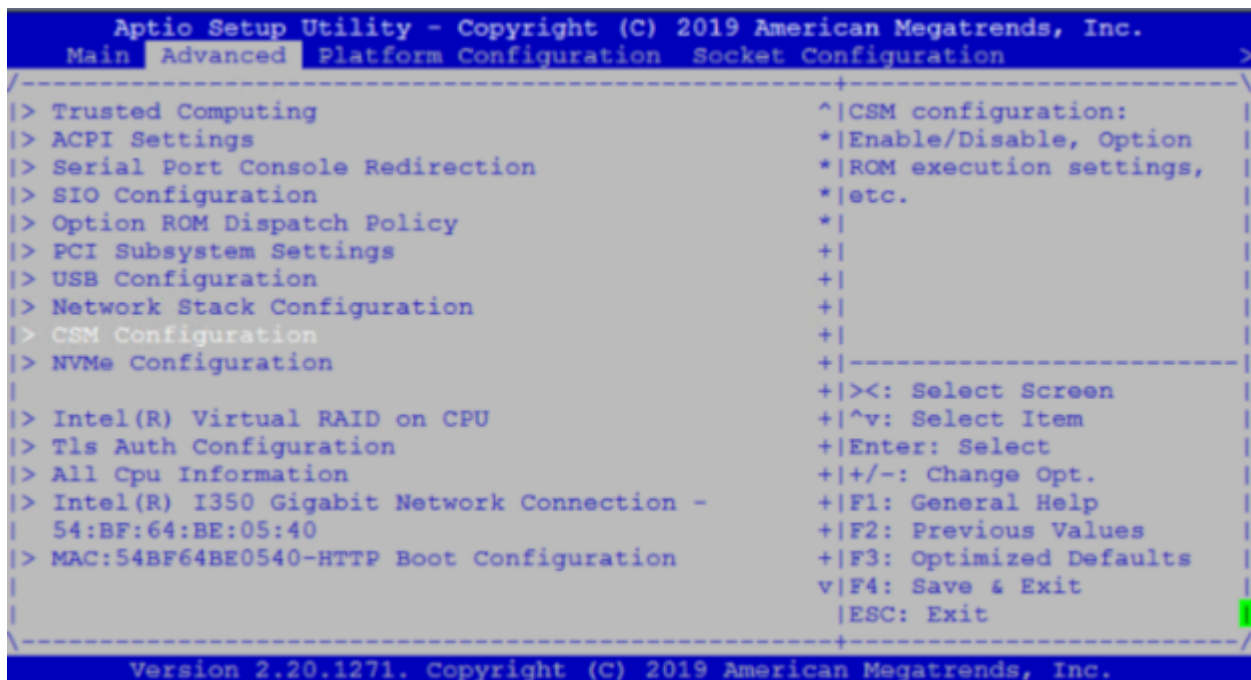
Configure BIOS and install Ubuntu OS

Topics:

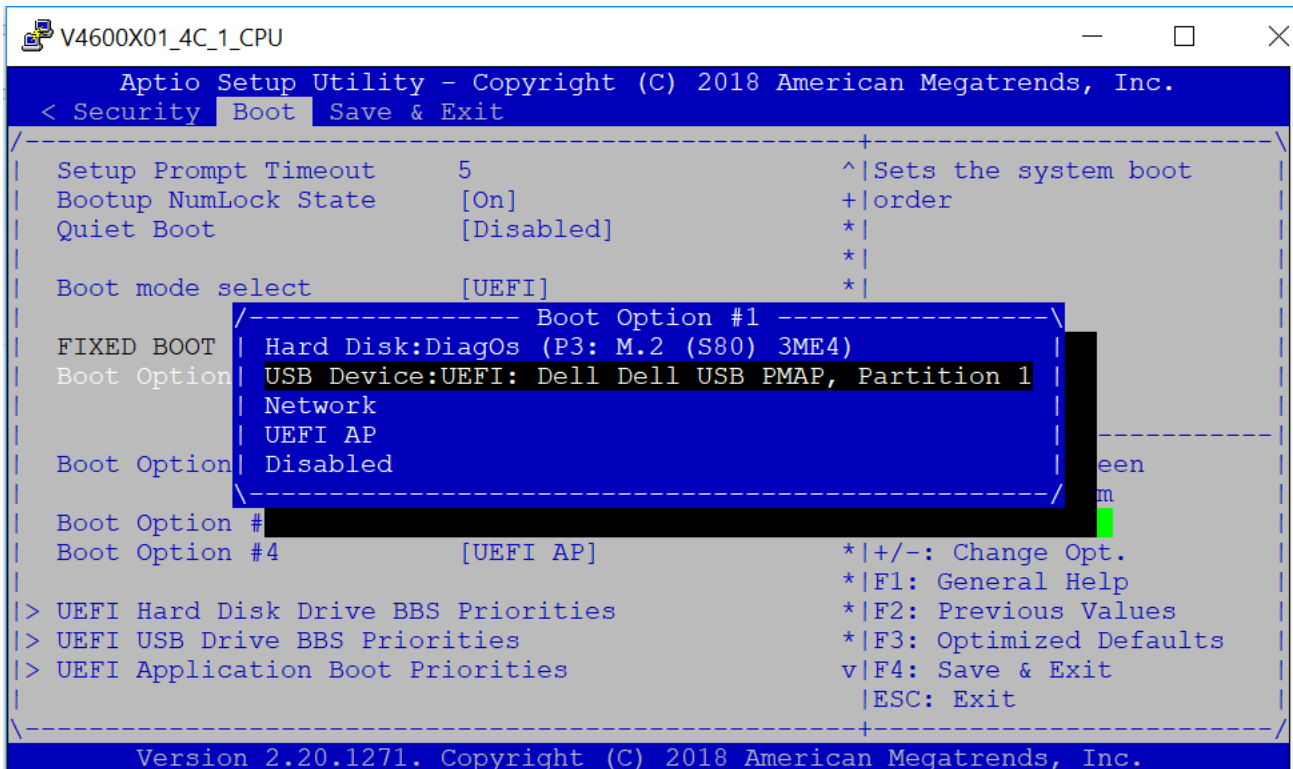
- Configure BIOS to boot from USB
- Ubuntu OS installation
- Configure BIOS to boot from SSD
- fstrim functionality

Configure BIOS to boot from USB

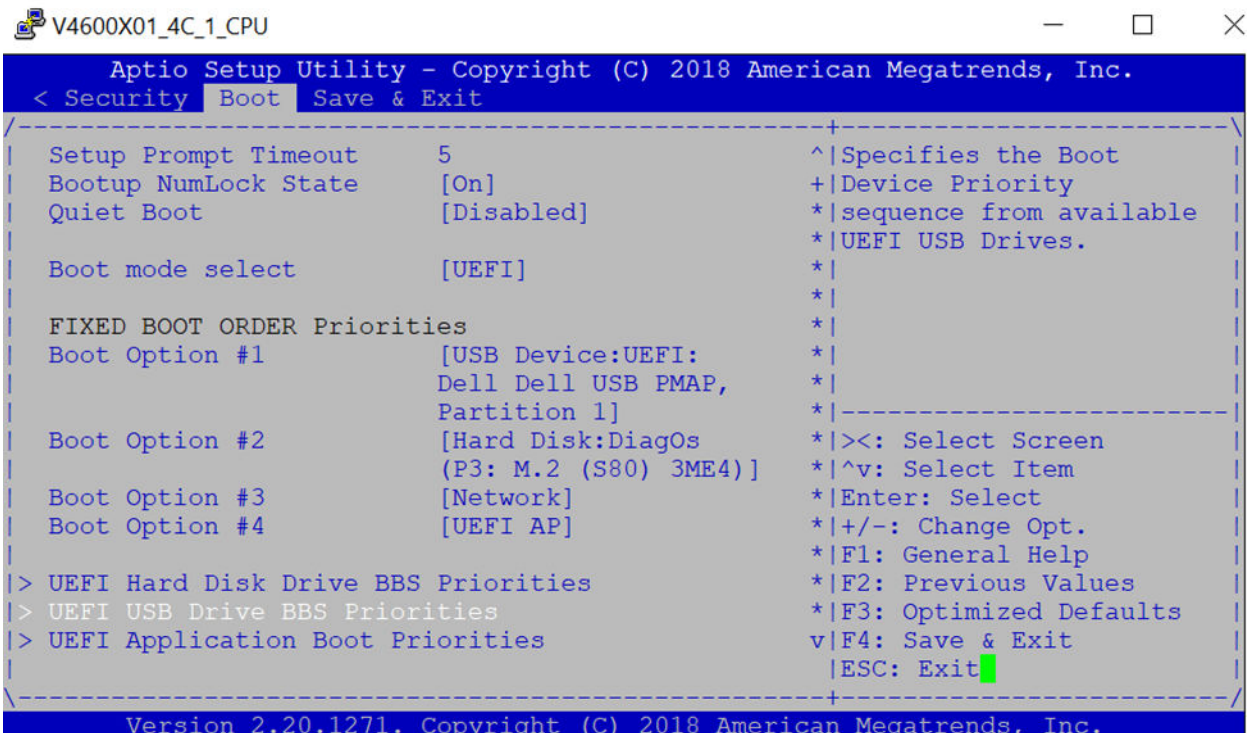
1. Plug in bootable USB flash drive containing Ubuntu.
2. Boot into BIOS settings, select CSM configuration under Advanced Tab.



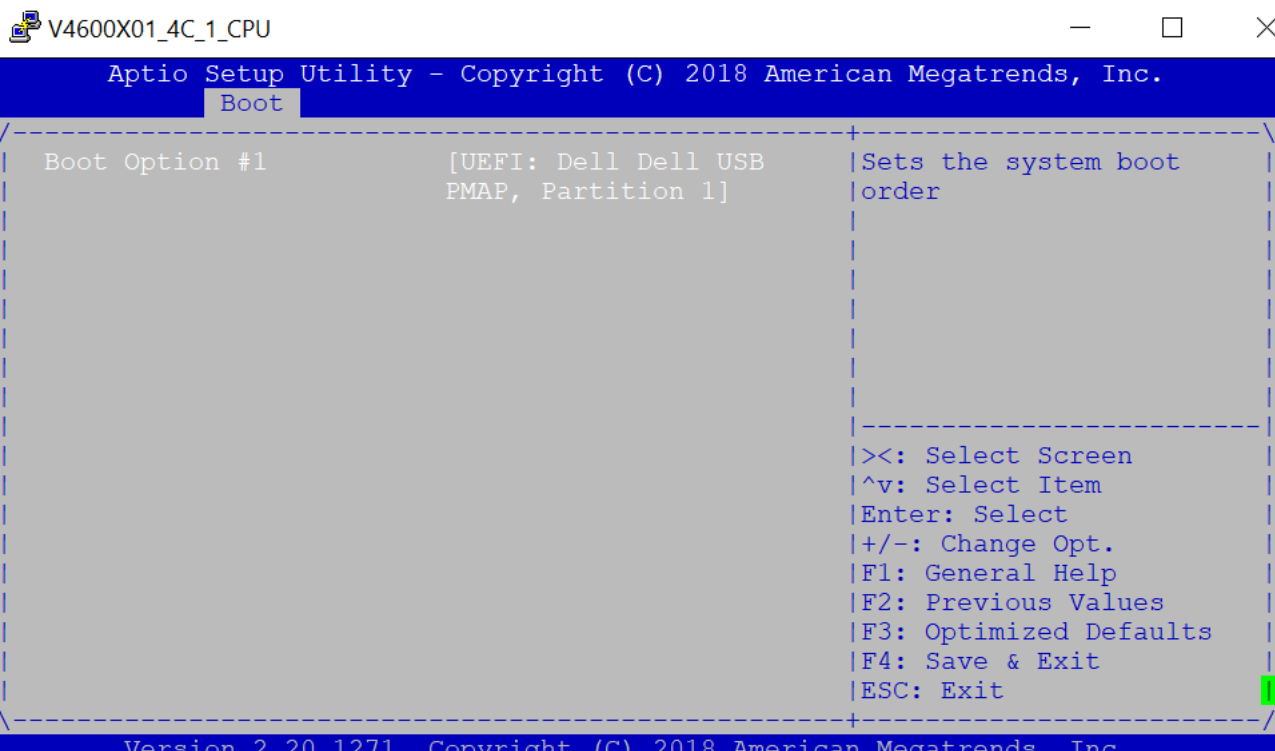
3. Change the Boot option filter to UEFI only mode



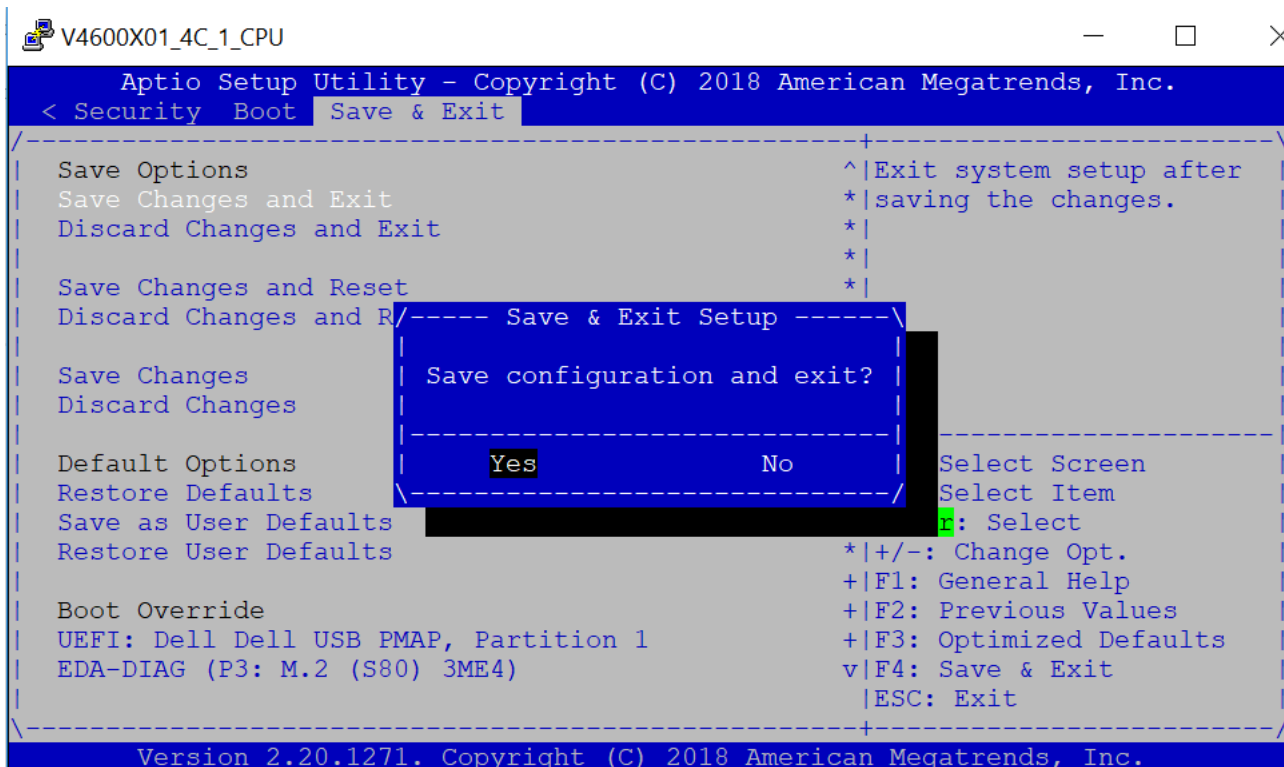
6. If you don't see required USB boot, go down to UEFI USB Drive BBS Priorities and press **Enter**.



7. Make sure the required USB is selected.



8. Press the **F4** key to save the changes and exit the utility.
9. Confirm saving the configuration by selecting **Yes** and press **Enter**.



10. The system will boot from the USB and start the installation.

Ubuntu OS installation

1. Boot into Ubuntu GRUB menu. Highlight Install Ubuntu Server option

```

GNU GRUB version 2.02

/-----
| Install Ubuntu Server
| OEM install (for manufacturers)
| Check disc for defects
|-----

```

2. Type **e** and Add console=ttyS0,115200 string as shown in the following figure.

Edit Boot Entry

```

GNU GRUB version 2.02

/-----
| setparams 'Install Ubuntu Server'
|
|       set gfxpayload=keep
|       linux      /casper/vmlinuz console=ttyS0,115200 boot=casper quiet
| t ---
|       initrd     /casper/initrd.gz
|-----

```

Minimum Emacs-like screen editing is supported. TAB lists completions. Press Ctrl-x or F10 to boot, Ctrl-c or F2 for a command-line or ESC to discard edits and return to the GRUB menu.

3. Press **ctrl-x** to start the installation.
4. Choose Preferred Language (In this case, preferred language selection is English)

```

Willkommen! Bienvenue! Welcome! Добро пожаловать! Welkom!

Please choose your preferred language.

[ English ]
[ Asturianu ]
[ Català ]
[ Hrvatski ]
[ Nederlands ]
[ Suomi ]
[ Français ]
[ Deutsch ]
[ Ελληνικά ]
[ Magyar ]
[ Latviešu ]
[ Norsk bokmål ]
[ Polski ]
[ Русский ]

1 / 11

Use UP, DOWN and ENTER keys to select your language.

```

5. Select **Done**.
6. Select Install Ubuntu.

```

GNU GRUB version 2.02

/-----
| Install Ubuntu Server
| OEM install (for manufacturers)
| Check disc for defects
|

```

7. Scroll up/down to select management network interface accordingly (In this case, enp4s0 is selected as management interface of the VEP4600 device)

```

Network connections

Configure at least one interface this server can use to talk to
other machines, and which preferably provides sufficient access
for updates.

[ enp4s0      eth    100.67.147.216/24 (from dhcp)      ▶ ]▲
3c:2c:30:3d:eb:04 / Intel Corporation / I210 Gigabit Network
Connection

[ ens4f0      eth    DHCPv4 has supplied no addresses ▶ ]■
24:6e:96:02:63:80 / Intel Corporation / 82599ES 10-Gigabit SFI/SFP+
Network Connection (Ethernet 10G 4P X520/I350 rNDC)

[ ens4f1      eth    DHCPv4 has supplied no addresses ▶ ]▼

      [ Done      ]
      [ Back      ]

```

8. Follow the installation wizard to complete interface configuration (In this case, choose Edit IPv4 from the list to modify Interface configuration for static IP assignment).

Choose Edit IPv4

```

Network connections

Configure at least one interface this server can use to talk to
other machines, and which preferably provides sufficient access
for updates.

[ enp4s0      eth    100.67.147.216/24 (from dhcp)      ▶ ]◀ (close)
3c:2c:30:3d:eb:04 / Intel Corporation / I210 Gigabit Network
Connection                                         Info ▶
                                                    Edit IPv4 ▶
                                                    Edit IPv6 ▶
                                                    Add a VLAN tag ▶

[ ens4f0      eth    DHCPv4 has supplied no addresses ▶ ]
24:6e:96:02:63:80 / Intel Corporation / 82599ES 10-G
Network Connection (Ethernet 10G 4P X520/I350 rNDC)

[ ens4f1      eth    DHCPv4 has supplied no addresses ▶ ]▼

      [ Done      ]
      [ Back      ]

```

9. Fill the entries manually according to your network (Subnet, Address, Gateway and Name Server)

Edit enp4s0 IPv4 configuration

IPv4 Method: [Manual ▼]

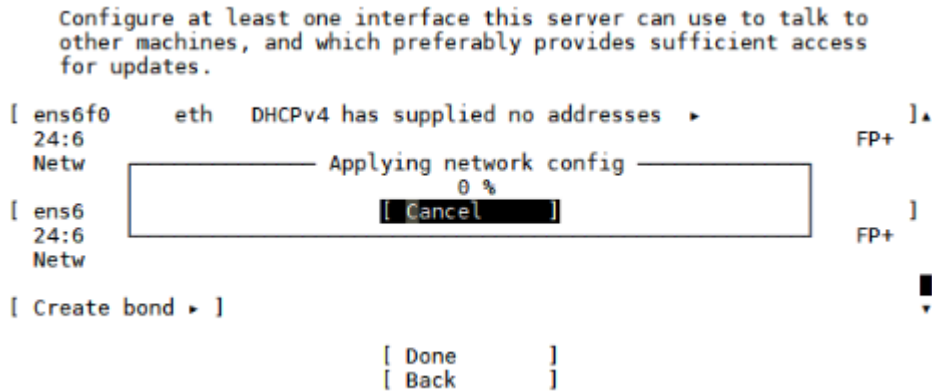
Subnet: [REDACTED]

Address: [REDACTED]
Address cannot be empty

[Save]
[Cancel]

10. Click **Done** to apply network configuration.

Applying network configuration



11. Click **Done**.

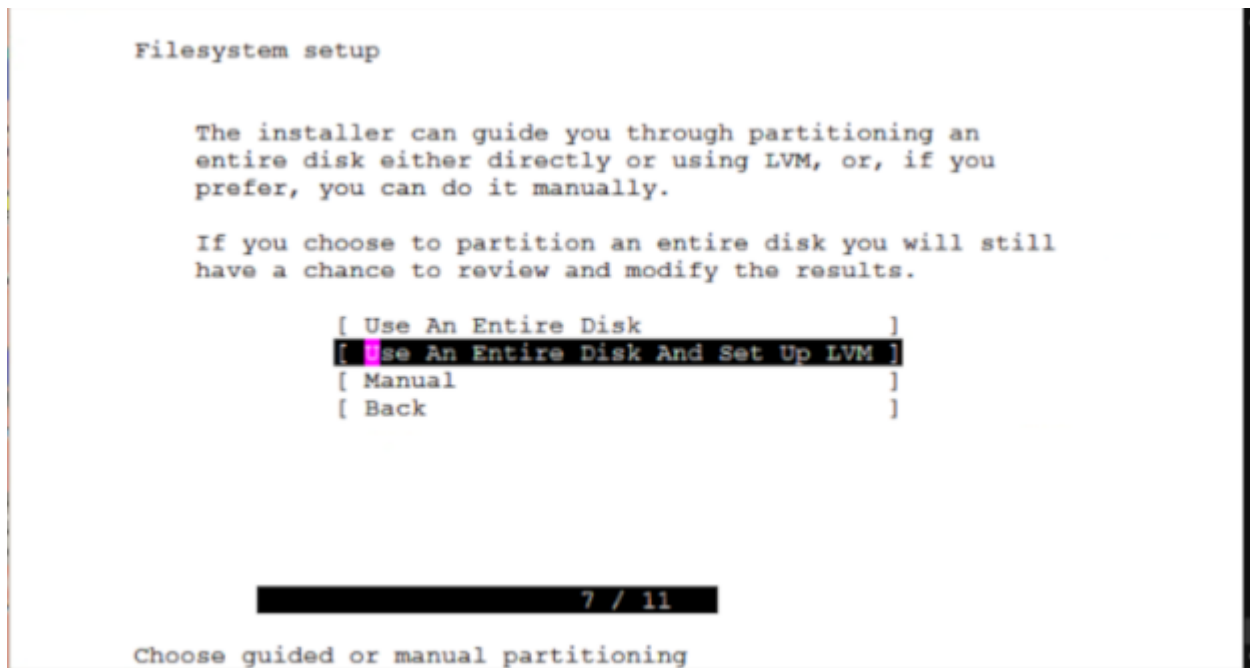
Proxy address



12. Click **Done**.



13. Select **Use Entire Disk** and **Set Up LVM** or follow the installation wizard for different configuration options.



14. Select Hard Drive.

Filesystem setup

The LVM guided partitioning scheme creates three partitions on the selected disk: one as required by the bootloader, one for '/boot', and one covering the rest of the disk.

A LVM volume group is created containing the large partition. A 4 gigabyte logical volume is created for the root filesystem. It can easily be enlarged with standard LVM command line tools.

Choose the disk to install to:

```
[ M.2 S80 3MG2-P BCA11804210360142 924.060G ▶ ]
```

15. Click **Done** to continue the selected disk partition format.

Filesystem setup

MOUNT POINT	SIZE	TYPE	DEVICE TYPE
[/	4.000G	ext4	LVM logical volume ▶]
[/boot	1.000G	ext4	partition of local disk ▶]
[/boot/efi	512.000M	fat32	partition of local disk ▶]

AVAILABLE DEVICES

DEVICE	SIZE	TYPE
[ubuntu-vg	922.554G	LVM volume group ▶]
[ubuntu-lv	4.000G (0%)	▶]

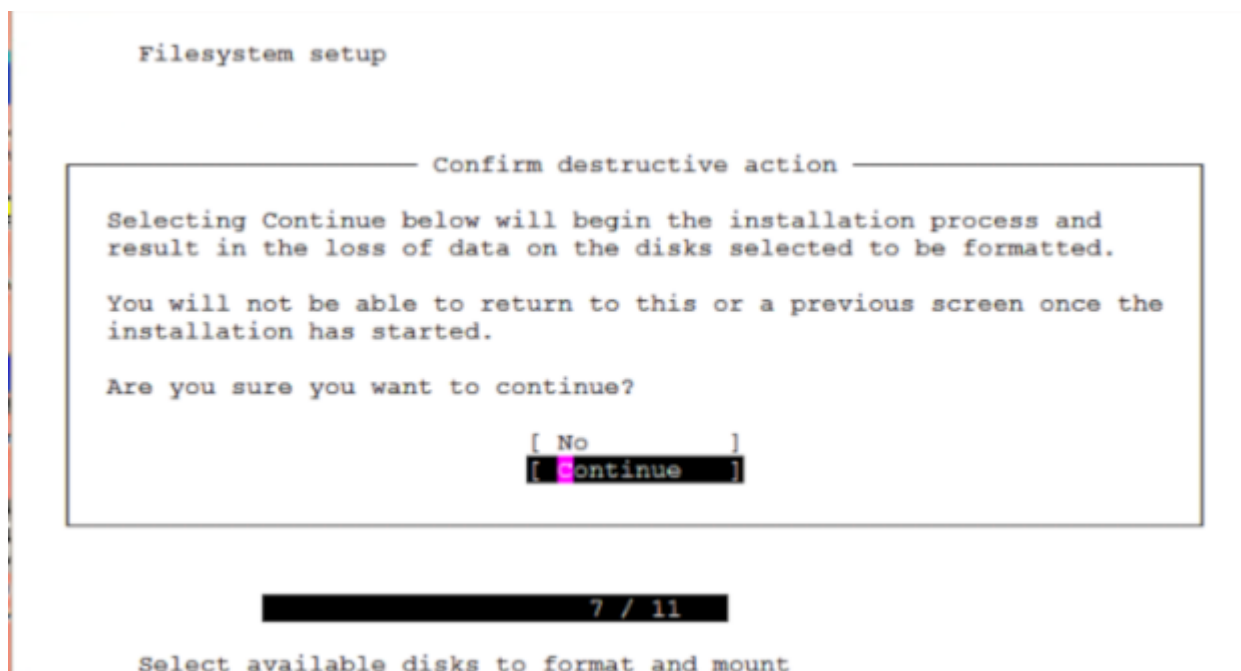
formatted as ext4, mounted at /

```

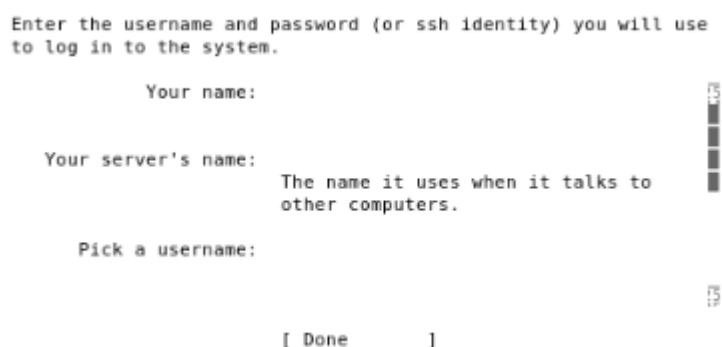
[ Done ]
[ Reset ]
[ Back ]

```

16. Select **Continue** to start the installation.



17. Enter your profile information and choose **Done**.

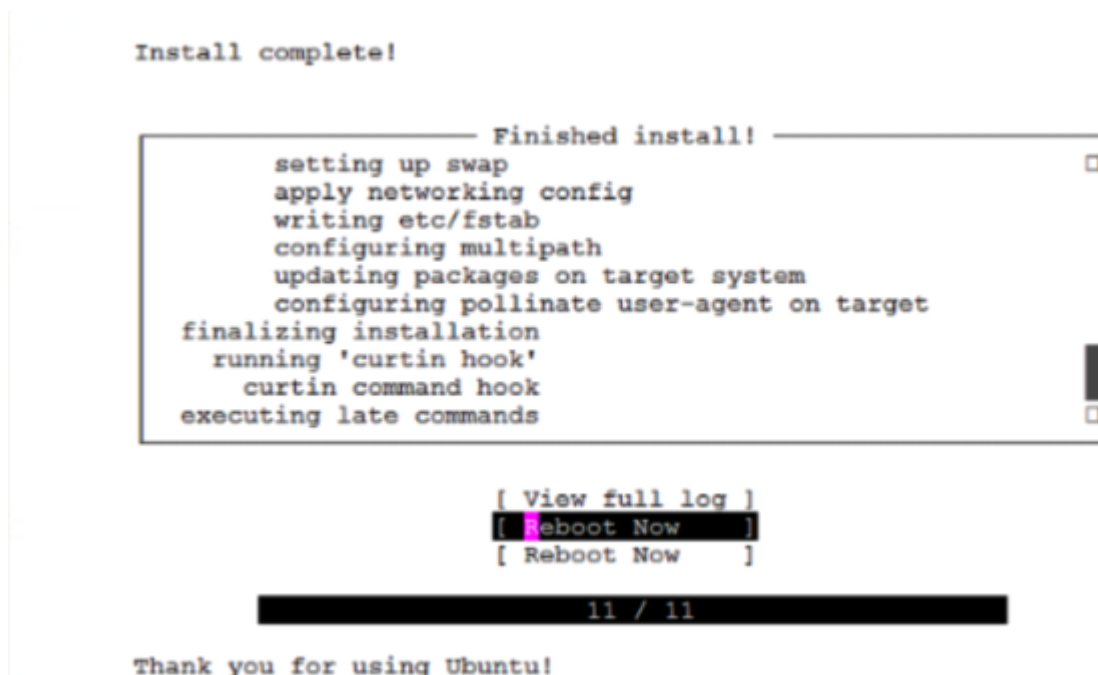


18. Click **Done** to start the installation.

19. After Installation completes, remove the USB from the device.

20. Choose Reboot Now.

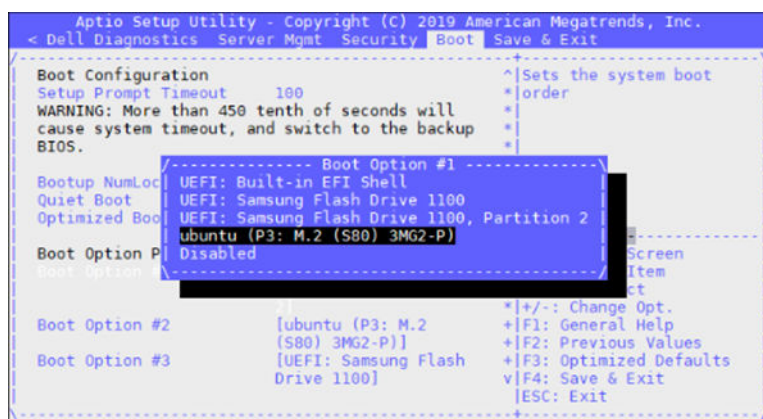
Installation complete



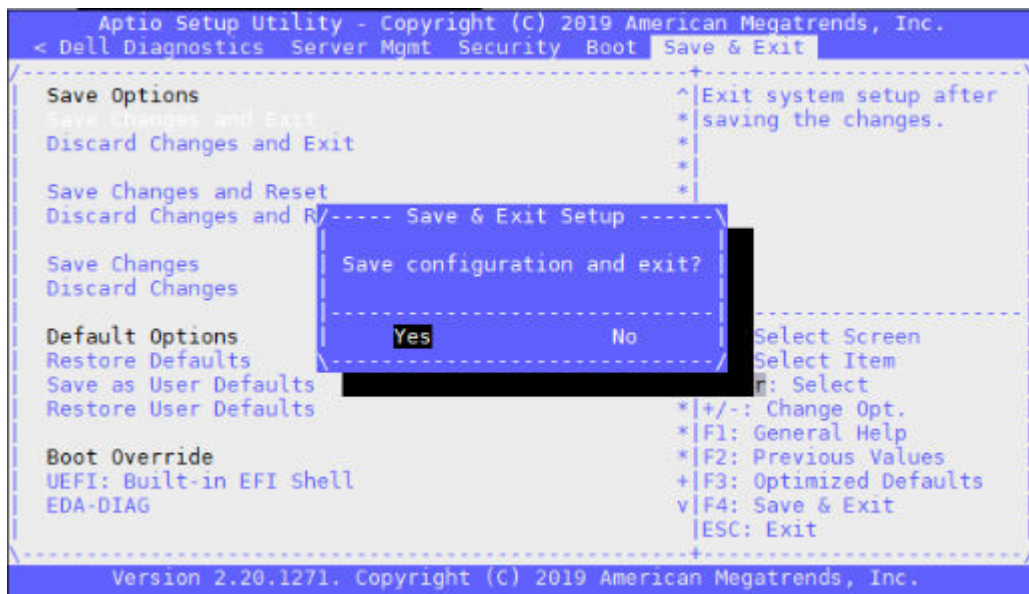
Configure BIOS to boot from SSD

1. Change the Boot Option Priority to Ubuntu Hard Drive in the Boot Tab.

Select Ubuntu Hard Drive



2. Save and Exit



Boot up screen

```

[ OK ] Found device 256GB SATA Flash Drive 2.
[ OK ] Mounting /boot...
[ OK ] Created slice system-lvm2\x2dtpvscan.slice.
[ OK ] Starting LVM2 PV scan on device 8:3...
[ OK ] Mounted /boot.
[ OK ] Mounting /boot/efi...
[ OK ] Started LVM2 PV scan on device 8:3.
[ OK ] Mounted /boot/efi.
[ OK ] Reached target Local File Systems.
[ OK ] Starting Tell Plymouth To Write Out Runtime Data...
[ OK ] Starting Commit a transient machine-id on disk...
[ OK ] Starting Create final runtime dir for shutdown pivot root...
[ OK ] Starting Create Volatile Files and Directories...
[ OK ] Starting Set console font and keymap...
[ OK ] Starting AppArmor initialization...
[ OK ] Starting GRUB failed boot detection...
[ OK ] Started Tell Plymouth To Write Out Runtime Data.
[ OK ] Started Commit a transient machine-id on disk.
[ OK ] Started Create final runtime dir for shutdown pivot root.
[ OK ] Started Create Volatile Files and Directories.
[ OK ] Starting Update UTMP about System Boot/Shutdown...
[ OK ] Starting Network Time Synchronization...
[ OK ] Started GRUB failed boot detection.
[ OK ] Started Update UTMP about System Boot/Shutdown.
[ OK ] Started Network Time Synchronization.
[ OK ] Reached target System Time Synchronized.
[ OK ] Started AppArmor initialization.
[ OK ] Starting Load/Save RF Kill Switch Status...
[ OK ] Started Load/Save RF Kill Switch Status.
[ OK ] 12.917581] cloud-init[584]: Cloud-init v. 18.4-7-g4652b196-0ubuntu1 running 'init-local' at Wed, 10 Jul 2019 06:34:54 +0000. Up 12.01 seconds.
[ OK ] Started Initial cloud-init job (pre-networking).
[ OK ] Reached target Network (Pre).
[ OK ] Starting Network Service...
[ OK ] Started Set console font and keymap.
[ OK ] Started Network Service.
[ OK ] Starting Wait for Network to be Configured...
[ OK ] Starting Network Name Resolution...
[ OK ] Started Network Name Resolution.
[ OK ] Reached target Network.
[ OK ] Reached target Host and Network Name Lookups.
[ OK ] A start job is running for Wait for... to be Configured (35s / no limit)

```

fstrim functionality

Execute the following command to ensure that the fstrim functionality is enabled and active:

```

systemctl status fstrim.timer
fstrim.timer - Discard unused blocks once a week
Loaded: loaded (/usr/lib/systemd/system/fstrim.timer; enabled; vendor preset: disabled)
Active: active (waiting) since Fri 2020-05-08 08:25:30 EST; 3 weeks 4 days ago
Docs: man:fstrim

```

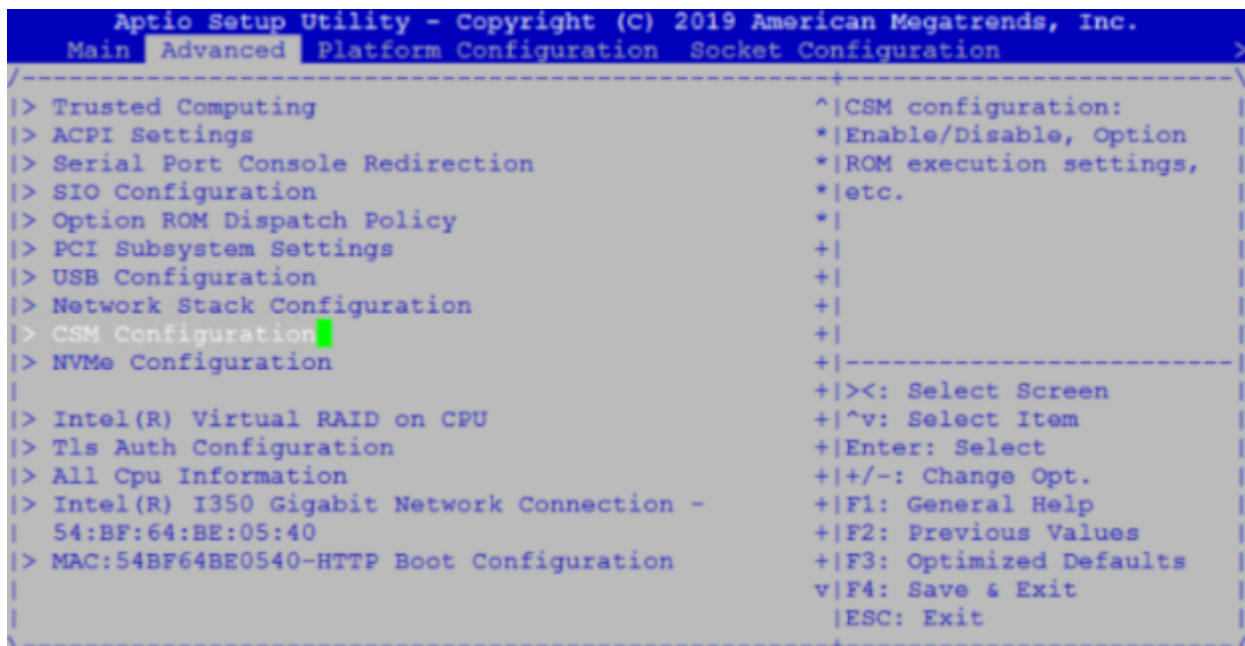
Configure BIOS and install Adva OS

Topics:

- Configure BIOS to boot from USB
- ADVA OS installation
- Configure BIOS to boot from SSD
- fstrim functionality

Configure BIOS to boot from USB

1. Plug in bootable USB flash drive containing Adva OS.
2. Boot into the BIOS and go to the Advanced menu tab.
3. Select CSM Configuration and press **Enter**.

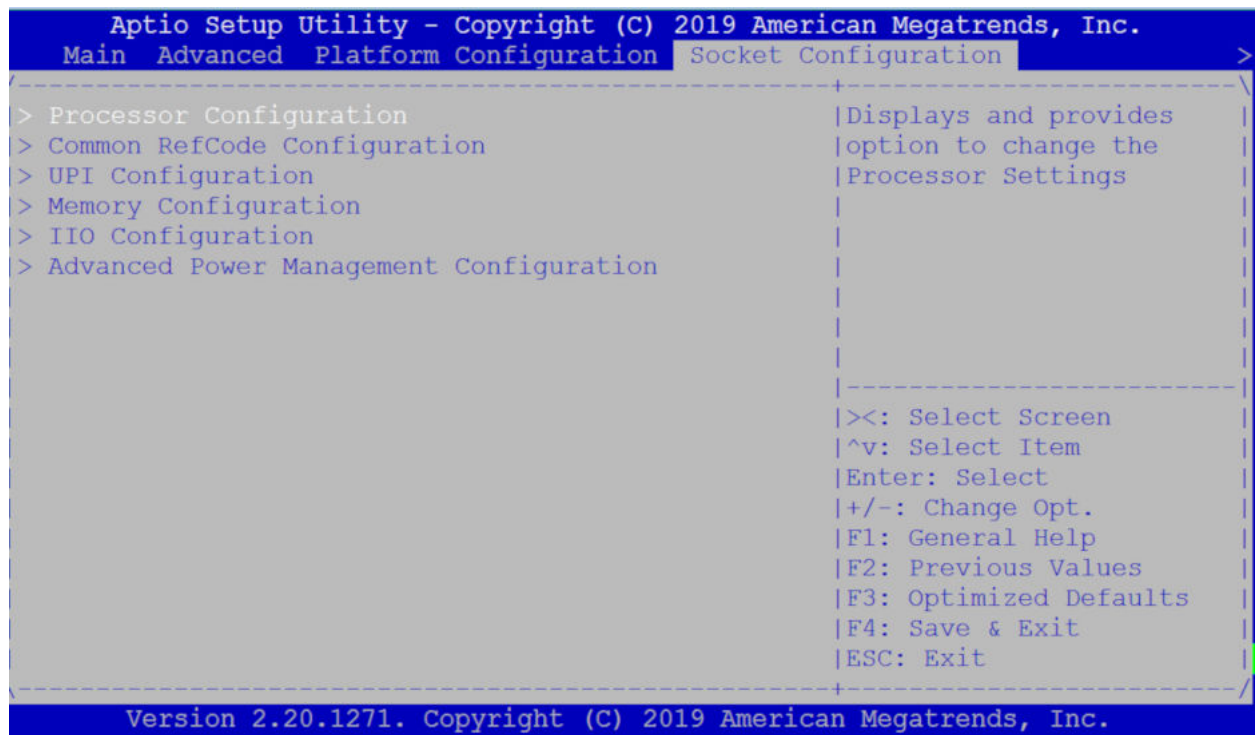


4. Change the Boot option filter to UEFI and Legacy mode.



5. Disable Hyper-Threading

- a. Tab to Socket Configuration, press **Enter** on Processor Configuration



- b. Scroll down to Hyper-Threading, press **Enter** and select **Disable**.

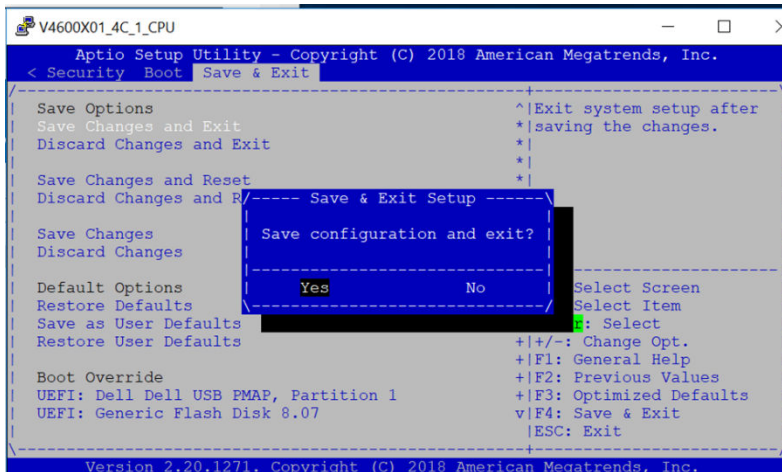
6. Go to the Boot menu, select USB using the up and down arrows for Boot Option #1 and press **Enter**.

Select USB



7. Press the **F4** key to Save the changes and exit the utility.

8. Confirm saving the configuration by selecting Yes and press **Enter**.



9. The system will boot from the USB and start the installation.

ADVA OS installation

1. The OS installation starts.

```
[ 7.125864] i8042: No controller found
[ 10.644350] dracut-pre-udev[417]: modprobe: ERROR: could not insert 'floppy': No such device
[ 10.660267] dracut-pre-udev[417]: modprobe: ERROR: could not insert 'edd': No such device
[ OK ] Started Device-Mapper Multipath Device Controller.
Starting Open-iSCSI...
[ OK ] Started Show Plymouth Boot Screen.
[ OK ] Started Forward Password Requests to Plymouth Directory Watch.
[ OK ] Reached target Paths.
[ OK ] Reached target Basic System.
[ OK ] Started Open-iSCSI.
Starting dracut initqueue hook...
[ 11.940931] c6xx 0000:b5:00.0: Failed to load MMP firmware qat_c62x_mmp.bin
[ 11.947901] c6xx 0000:b5:00.0: Failed to load acceleration FW
[ 12.065306] c6xx 0000:b6:00.0: Failed to load MMP firmware qat_c62x_mmp.bin
[ 12.072272] c6xx 0000:b6:00.0: Failed to load acceleration FW
[ 12.189301] c6xx 0000:b7:00.0: Failed to load MMP firmware qat_c62x_mmp.bin
[ 12.196258] c6xx 0000:b7:00.0: Failed to load acceleration FW
[ 14.139242] dracut-initqueue[1776]: mount: /dev/sdb is write-protected, mounting read-only
[ OK ] Started dracut initqueue hook.
Starting dracut pre-mount hook...
[ OK ] Reached target Remote File Systems (Pre).
[ OK ] Reached target Remote File Systems.
[ OK ] Started dracut pre-mount hook.
[ OK ] Reached target Initrd Root File System.
Starting Reload Configuration from the Real Root...
[ OK ] Started Reload Configuration from the Real Root.
[ OK ] Reached target Initrd File Systems.
```

Disk formatting and installation complete successfully

```

np2s0f3', u'em4', u'em1', u'em3', u'em2'])
[ 52.164932] sysprep.py[13896]: Comparing physical_core_count, expected 8
[ 52.165143] sysprep.py[13896]: Comparing physical_core_count, expected 8
[ 52.165346] sysprep.py[13896]: Comparing physical_core_count, expected 8
[ 52.165549] sysprep.py[13896]: Comparing physical_core_count, expected 8
[ 52.165753] sysprep.py[13896]: Comparing physical_core_count, expected 8
[ 52.165956] sysprep.py[13896]: Comparing interface_names, expected {u'set_requires': [u'wpp0s2lu4i12', u'enp2s0f0', u'enp2s0f1',
u'enp2s0f2', u'enp2s0f3', u'enp8s0f0', u'enp8s0f1', u'enp7s0f1', u'enp7s0f0']}
[ 52.166170] sysprep.py[13896]: Comparing interface_names, expected {u'set_requires': [u'wpp0s2lu4i12', u'enp2s0f0', u'enp2s0f1',
u'enp2s0f2', u'enp2s0f3', u'enp8s0f0', u'enp8s0f1', u'enp7s0f1', u'enp7s0f0']}
[ 52.166377] sysprep.py[13896]: Comparing physical_core_count, expected 4
[ 52.166581] sysprep.py[13896]: Comparing physical_core_count, expected 4
[ 52.166785] sysprep.py[13896]: Comparing physical_core_count, expected 12
[ 52.166989] sysprep.py[13896]: Comparing physical_core_count, expected 8
[ 52.167199] sysprep.py[13896]: Comparing physical_core_count, expected 8
[ 52.167402] sysprep.py[13896]: Comparing physical_core_count, expected 16
[ 52.167605] sysprep.py[13896]: Comparing dmi_system_manufacturer, expected DELL
[ 52.167847] sysprep.py[13896]: Comparing interface_pci_addrs, expected {u'set_requires': [u'0000:b8:00:0', u'0000:b8:00:1', u'00
00:02:00:0', u'0000:02:00:1', u'0000:02:00:2', u'0000:02:00:3', u'0000:04:00:0']}
[ 52.168061] sysprep.py[13896]: Comparing dmi_system_product_name, expected VEP-4600
[ 52.168267] sysprep.py[13896]: szm= True tym= True
[ 52.168471] sysprep.py[13896]: hd_type= any drv_type= ssd
[ 52.168674] sysprep.py[13896]: min_size_in= 100.0 size= 924.1 max_size_in= 1048576.0
[ 52.168877] sysprep.py[13896]: initializing DiskAttributes, disk device is sda
[ 52.169087] sysprep.py[13896]: Checking max_size 64 against disk size 924
[ 52.169291] sysprep.py[13896]: Checking max_size 72 against disk size 924
[ 52.169493] sysprep.py[13896]: Checking max_size 100 against disk size 924
[ 52.169697] sysprep.py[13896]: Checking max_size 128 against disk size 924
[ 52.169903] sysprep.py[13896]: Checking max_size 99999999 against disk size 924
[ 52.170115] sysprep.py[13896]: found matching disk policy
Disk formatting and installation completed successfully. Shutting down.

```

Power down prompt

```

[ OK ] Stopped Rebuild Journal Catalog...
[ OK ] Stopped target Local File Systems.
[ OK ] Stopped Configure read-only root support.
      Stopping Configure read-only root support...
      Unmounting /run/install/repo...
      Unmounting /mnt/images...
      Unmounting /mnt/var...
      Unmounting Configuration File System...
      Unmounting /boot/efi...
[ OK ] Stopped Rebuild Hardware Database.
      Stopping Rebuild Hardware Database...
[ OK ] Stopped Read and set NIS domainname from /etc/sysconfig/network.
      Stopping Read and set NIS domainname from /etc/sysconfig/network...
[ OK ] Stopped Apply Kernel Variables.
      Stopping Apply Kernel Variables...
[ OK ] Stopped target Slices.
[ OK ] Removed slice User and Session Slice.
[ OK ] Stopped Load/Save Random Seed.
[ OK ] Failed unmounting /run/install/repo.
[ OK ] Failed unmounting Configuration File System.
[ OK ] Unmounted /mnt/var.
[ OK ] Unmounted /boot/efi.
      Unmounting /boot...
[ OK ] Unmounted /mnt/images.
[ OK ] Unmounted /boot.
[ OK ] Reached target Unmount All Filesystems.
[ OK ] Stopped target Local File Systems (Pre).
[ OK ] Stopped Create Static Device Nodes in /dev...
      Stopping Create Static Device Nodes in /dev...
[ OK ] Stopped Collect Read-Ahead Data.
      Stopping Collect Read-Ahead Data...
      Stopping Monitoring of LVM2 mirrors... dmeventd or progress polling...
[ OK ] Stopped Monitoring of LVM2 mirrors...ng dmeventd or progress polling.
      Stopping Device-mapper event daemon...
      Stopping LVM2 metadata daemon...
[ OK ] Stopped LVM2 metadata daemon.
[ OK ] Stopped Device-mapper event daemon.
[ OK ] Reached target Shutdown.
[ OK ] Reached target Final Step.
      Starting Power-Off...
[ 206.034665] systemd-shutdown[1]: Failed to finalize file systems, DM devices, ignoring
[ 206.192576] i40e 0000:b6:00:3: Failed to update MAC address registers; cannot enable Multicast Magic packet wake up
[ 206.310374] i40e 0000:b6:00:2: Failed to update MAC address registers; cannot enable Multicast Magic packet wake up
[ 206.430395] i40e 0000:b6:00:1: Failed to update MAC address registers; cannot enable Multicast Magic packet wake up
[ 206.550378] i40e 0000:b6:00:0: Failed to update MAC address registers; cannot enable Multicast Magic packet wake up
[ 207.328928] Power down.

```

2. Remove the USB and start up the system.

 **NOTE:** User required to power on/off device either physically or by using PDU.

Configure BIOS to boot from SSD

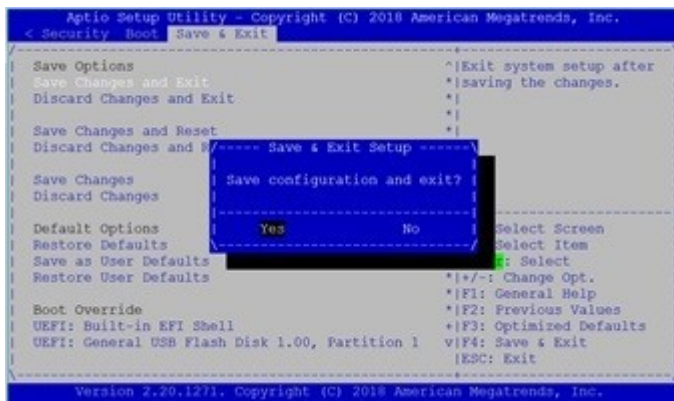
1. After the install completes, unplug the USB flash drive from VEP4600. Reboot the system and go into the BIOS settings.
2. In the Boot menu, select Hard Drive BBS Priorities then press **Enter**.



3. Select sSATA P3: INTEL as Boot Option #1.



4. Press the **F4** key to Save the changes and exit the utility.
5. Save the configuration by selecting Yes and press **Enter**.



6. The system will boot from the hard drive.

```

[ OK ] Starting LSB: modprobe the QAT modul...pass configuration parameters...
[ OK ] Started Connector System Config File Create.
[ OK ] Started Xinetd A Powerful Replacement For Inetd.
[ OK ] Started Notify NFS peers of a restart.
Starting vSE Prepare...
Starting Overture Datapath Service...
[ OK ] Started OpenSSH server daemon.
[ OK ] Started containerd container runtime.
Starting Docker Application Container Engine...
[ OK ] Started 65vse Time Verifier.
[ OK ] Started 65vse Time Store.
[ OK ] Started Virtualization daemon.
[ OK ] Started LSB: modprobe the QAT modul...o pass configuration parameters.
Starting Virtualization daemon...
[ OK ] Started Dynamic System Tuning Daemon.
Mounting FUSE Control File System...
[ OK ] Mounted FUSE Control File System.
[ OK ] Started Virtualization daemon.
[ OK ] Started vSE Prepare.
[ OK ] Started Permit User Sessions.
[ OK ] Started Getty on tty1.
[ OK ] Started Serial Getty on ttyS0.
[ OK ] Reached target Login Prompts.
[ OK ] Started Command Scheduler.
Stopping irqbalance daemon...
[ OK ] Started Docker Application Container Engine.
[ OK ] Started Crash recovery kernel arming.

CentOS Linux 7 (Core)
Kernel 4.19.65-23.el7.adva.x86_64 on an x86_64

DellEMC-VEP-AdvaOS login: █

```

fstrim functionality

Execute the following command to ensure that the fstrim functionality is enabled and active:

```

systemctl status fstrim.timer
fstrim.timer - Discard unused blocks once a week
Loaded: loaded (/usr/lib/systemd/system/fstrim.timer; enabled; vendor preset:
disabled)
Active: active (waiting) since Fri 2020-05-08 08:25:30 EST; 3 weeks 4 days ago
Docs: man:fstrim

```

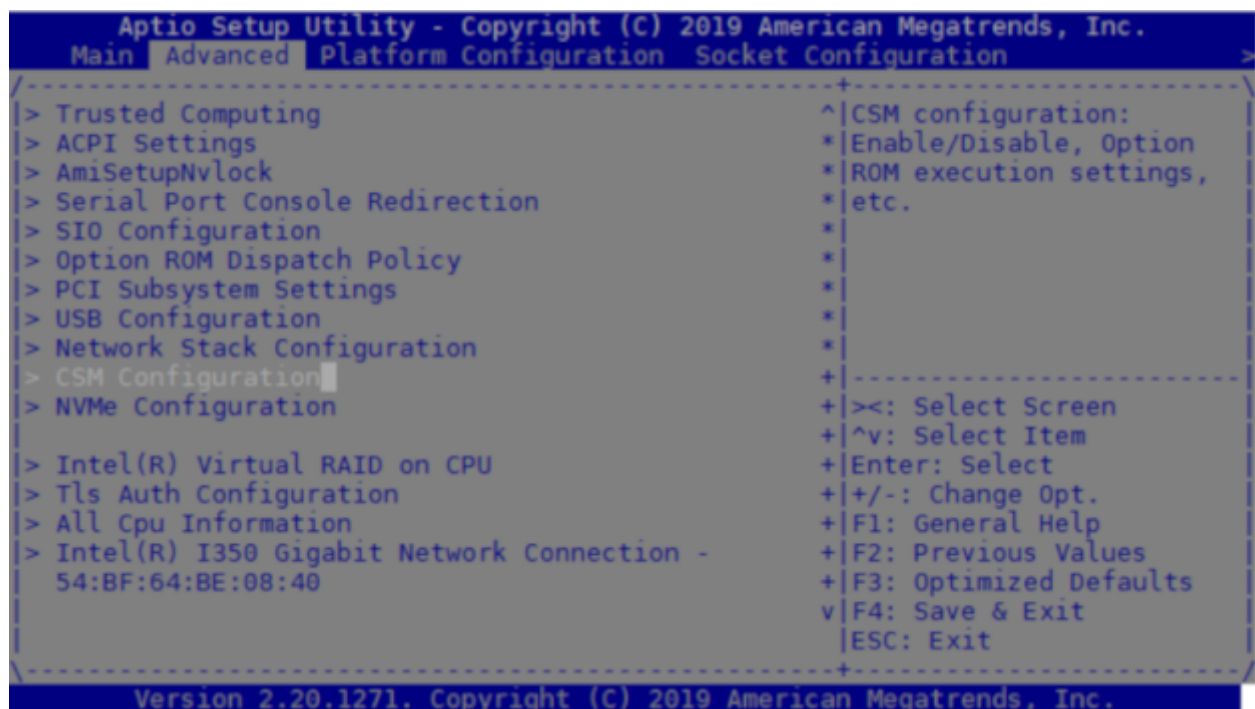
Configure BIOS and Install ESXi OS

Topics:

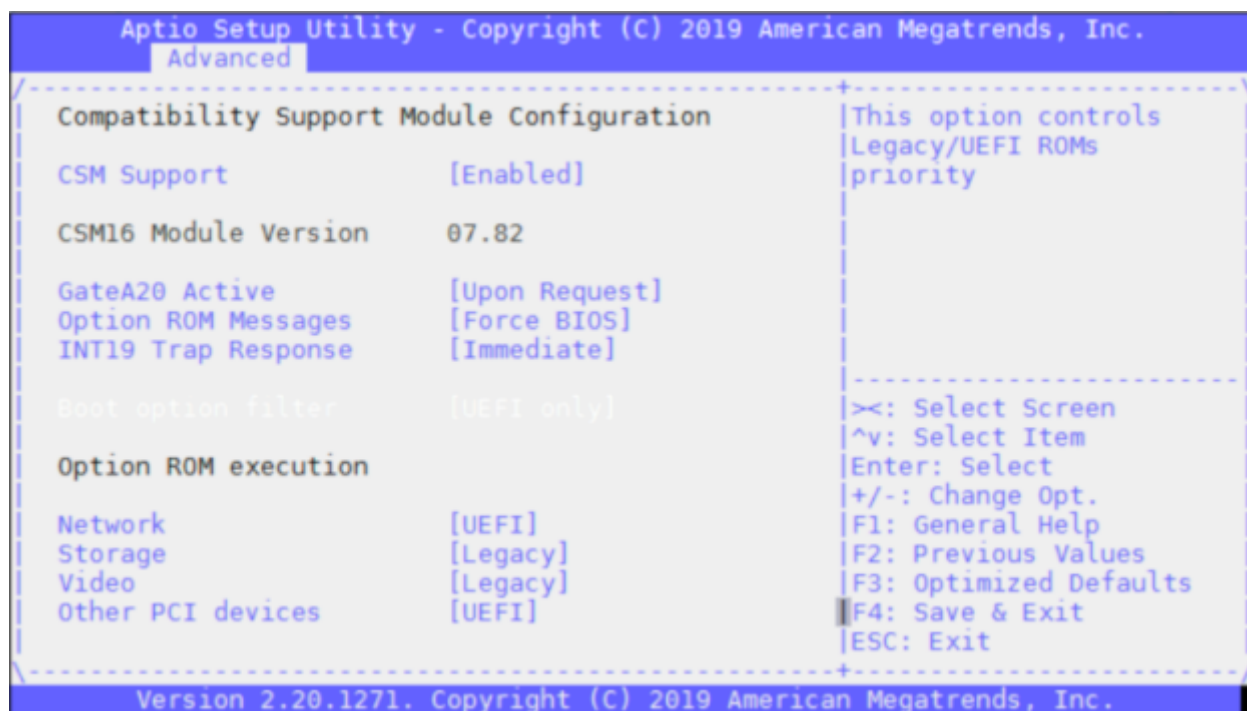
- Configure BIOS to boot from USB
- Install ESXi OS
- Configure BIOS to boot from SSD
- Configure BIOS to enable Secure Boot
- Logging into ESXi
- Configuring the network on ESXi
- How to add ESXi license
- How to check for TRIM settings

Configure BIOS to boot from USB

1. Plug in bootable USB flash drive containing ESXi.
2. In BIOS, set `Boot Option Filter` to UEFI only.
 - a. Navigate to `Advanced` menu tab using left-right arrow keys. Select `CSM Configuration`.

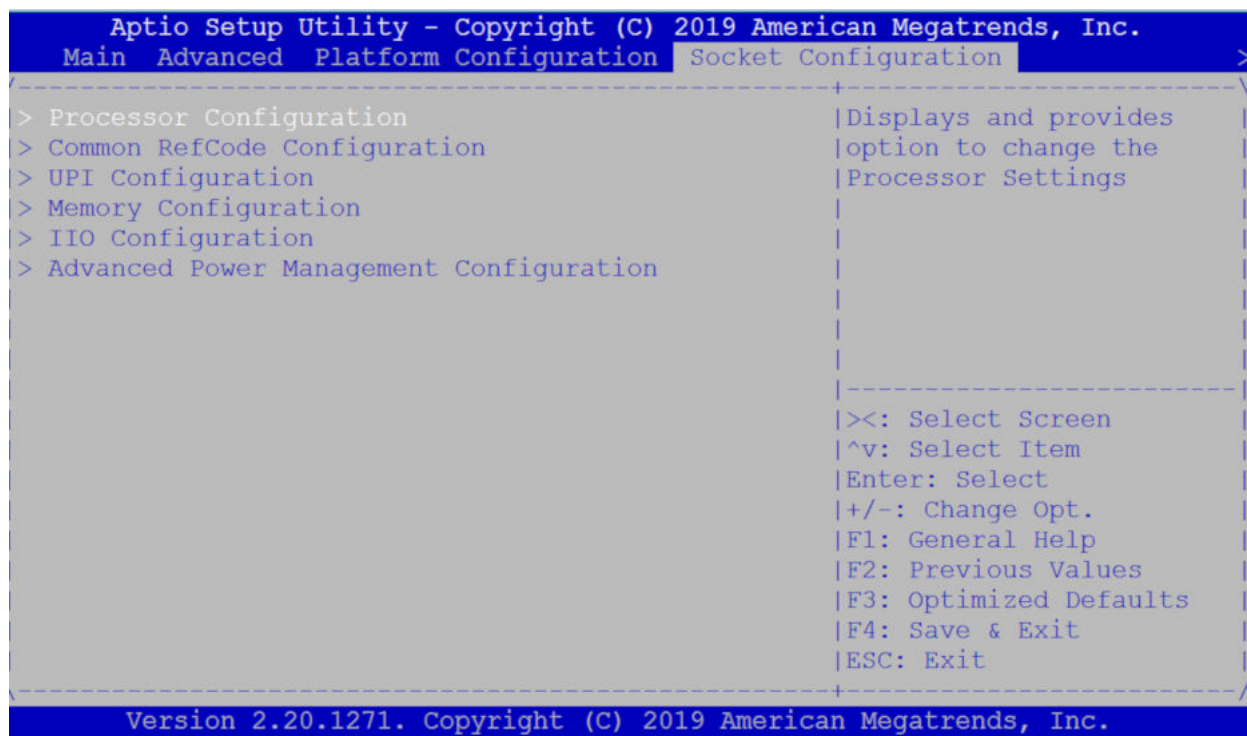


- b. Verify that `UEFI only` is selected for the `Boot option filter` from the `Compatibility Support Module Configuration` screen.

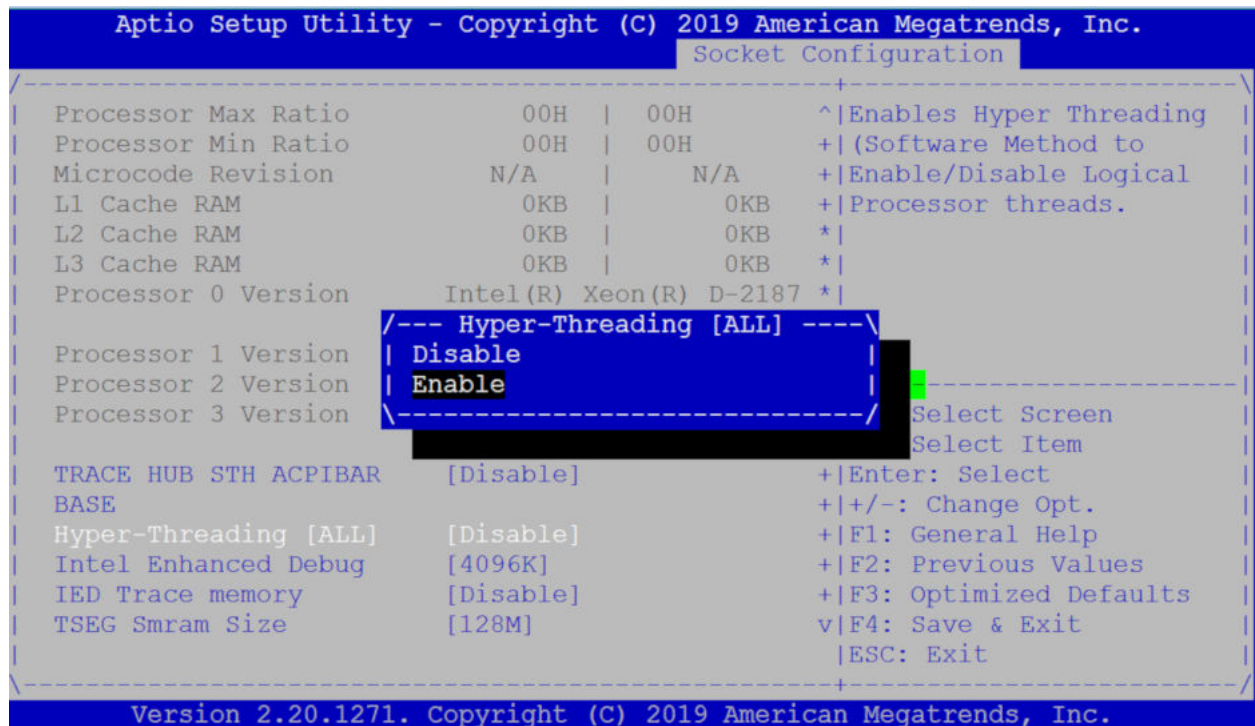


3. Enable Hyper-Threading

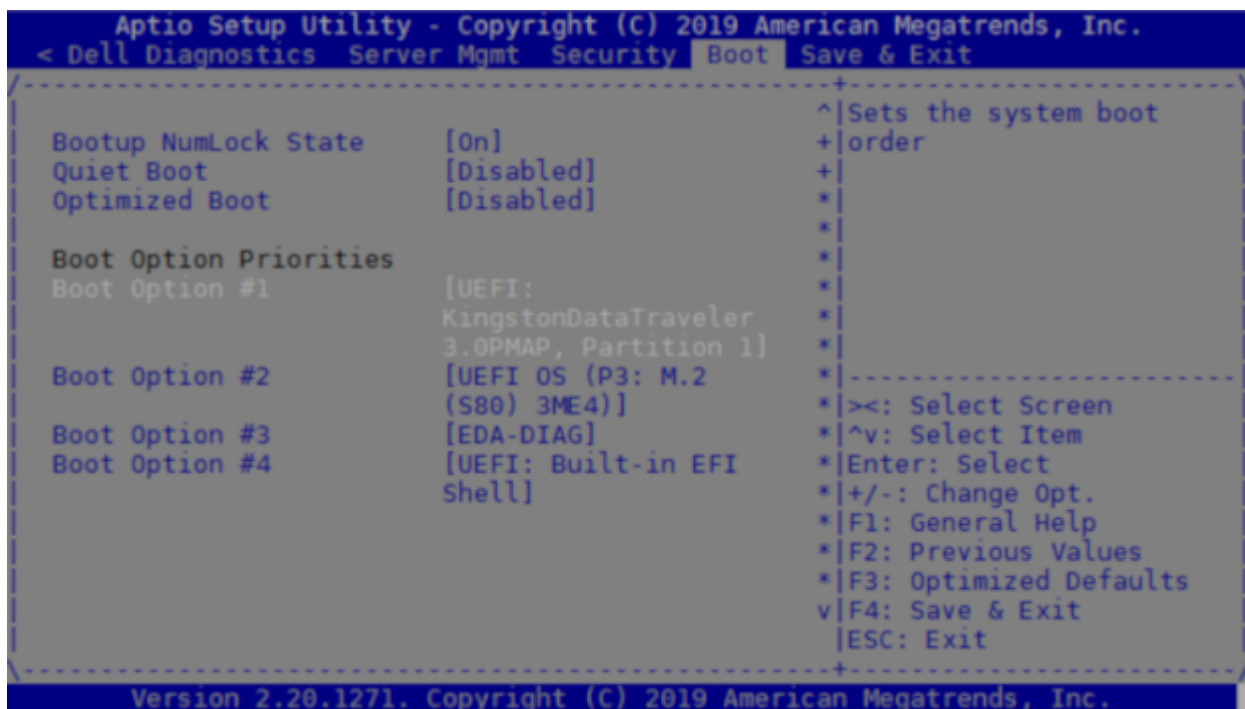
- a. Tab to Socket Configuration, press **Enter** on Processor Configuration.



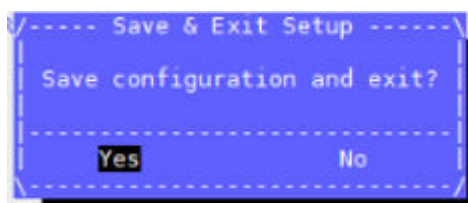
- b. Scroll down to Hyper-Threading, press **Enter** and select **Enable**.



- Tab to Boot menu, select the ESXi bootable USB (UEFI: Partition 1) as Boot Option #1, then press **Enter**.



- Press the **F4** key to save the changes and exit the utility.
- Confirm saving the configuration by selecting Yes and press **Enter**.



- The system will boot from the USB and start the ESXi installation.

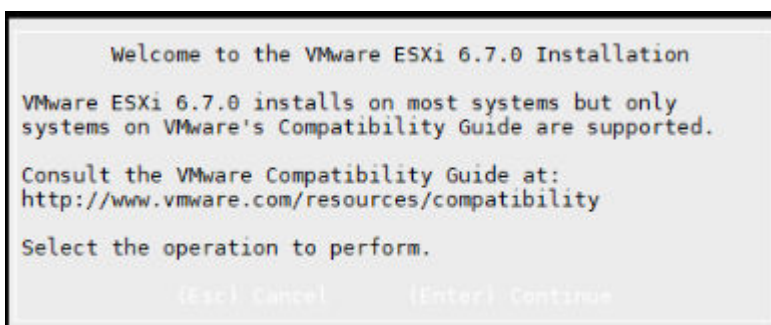
ESXi installation output

```
<6>Loading /b.b00
<6>Loading /jumpstrt.gz
<6>Loading /useropts.gz
<6>Loading /features.gz
<6>Loading /k.b00
<6>Loading /uc_intel.b00
<6>Loading /uc_amd.b00
<6>Loading /uc_hygon.b00
<6>Loading /procfs.b00
<6>Loading /vmx.v00
<6>Loading /vim.v00
<6>Loading /tpm.v00
<6>Loading /sb.v00
<6>Loading /s.v00
<6>Loading /dell_osn.v00
<6>Loading /bnxtnet.v00
<6>Loading /bnxtroce.v00
<6>Loading /brcmfcoe.v00
<6>Loading /brcmnvme.v00
<6>Loading /elxiscsi.v00
<6>Loading /elxnet.v00
<6>Loading /i40en.v00
<6>Loading /i40iwn.v00
<6>Loading /iavmd.v00
<6>Loading /igbn.v00
<6>Loading /iser.v00
<6>Loading /ixgben.v00
<6>Loading /lpfc.v00
<6>Loading /lpnic.v00
<6>Loading /lsi_mr3.v00
<6>Loading /lsi_msgp.v00
<6>Loading /lsi_msgp.v01
```

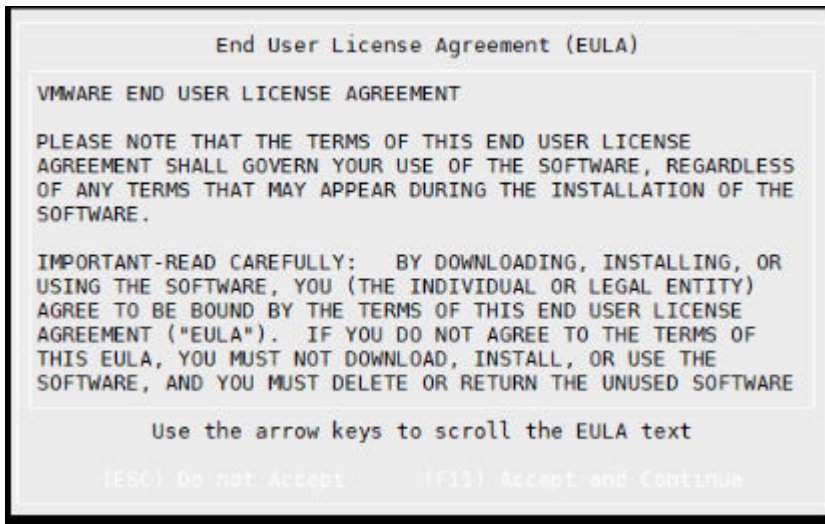
Install ESXi OS

NOTE: The output listed here is for ESXi 6.7 U3 installation and the installation steps are similar for ESXi 7.0.

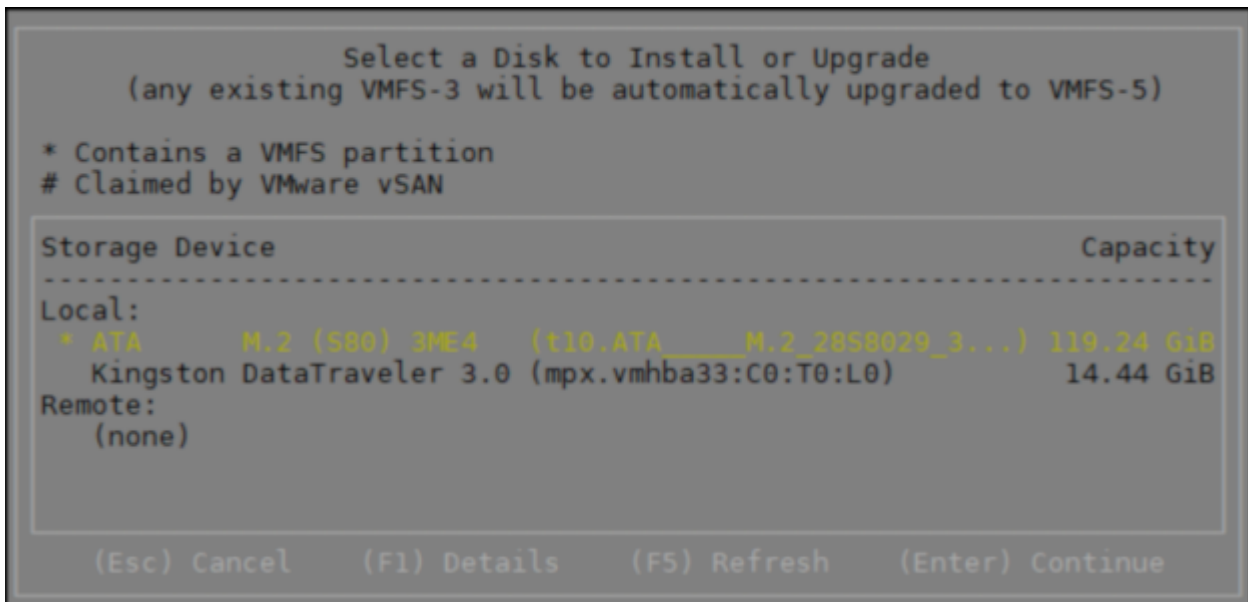
1. Press **Enter** to continue installation process.



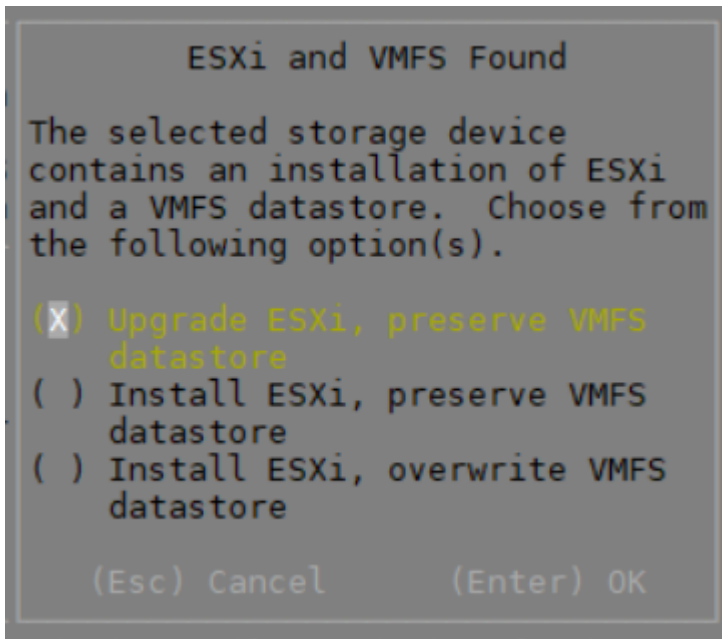
2. Press **F11** to Accept and Continue License Agreement.



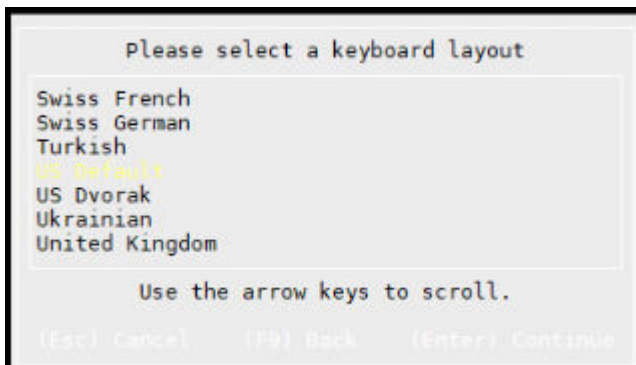
3. Select SSD as the destination disk.



4. If ESXi is already present on the disk, select option needed.
Use arrow keys and space-bar to select the option and **Enter**.



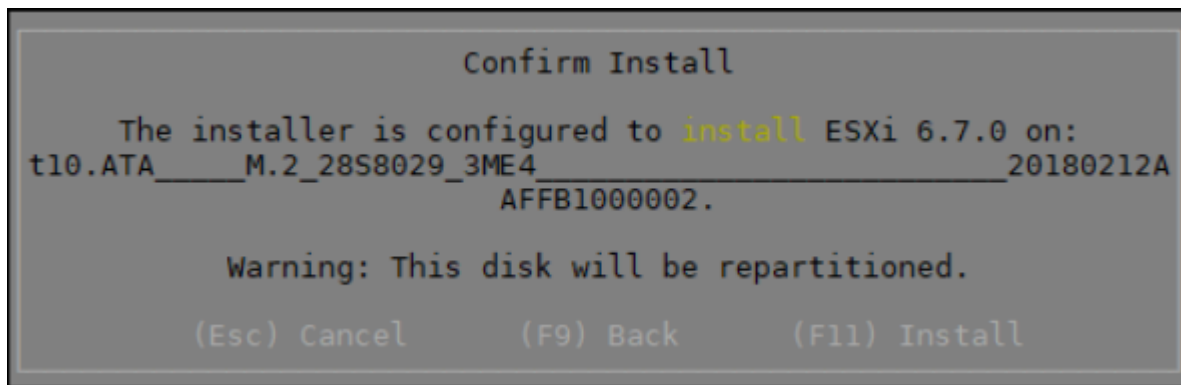
5. Confirm the disk selection by pressing **Enter**.
6. Select the keyboard layout option using up down keys and press **Enter**.



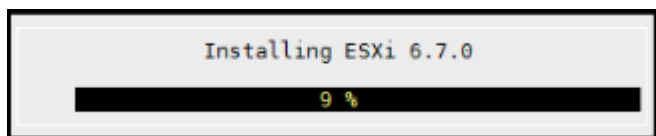
7. Enter Root Password and press **Enter**



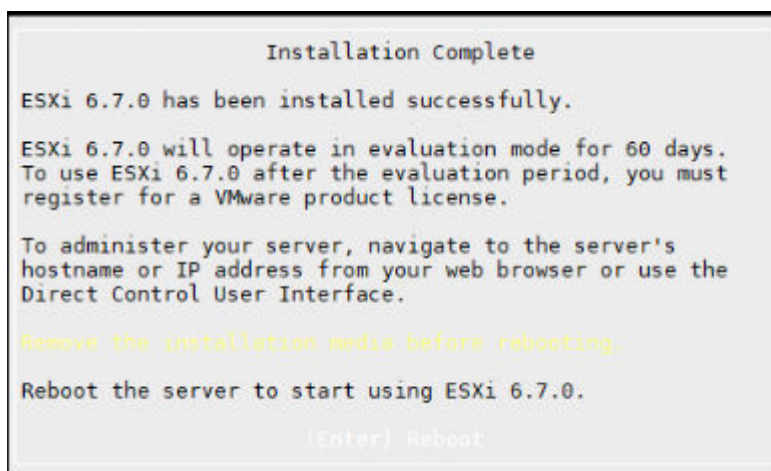
8. Press **F11** to confirm the repartition and installation.



9. The ESXi installation status screen displays.

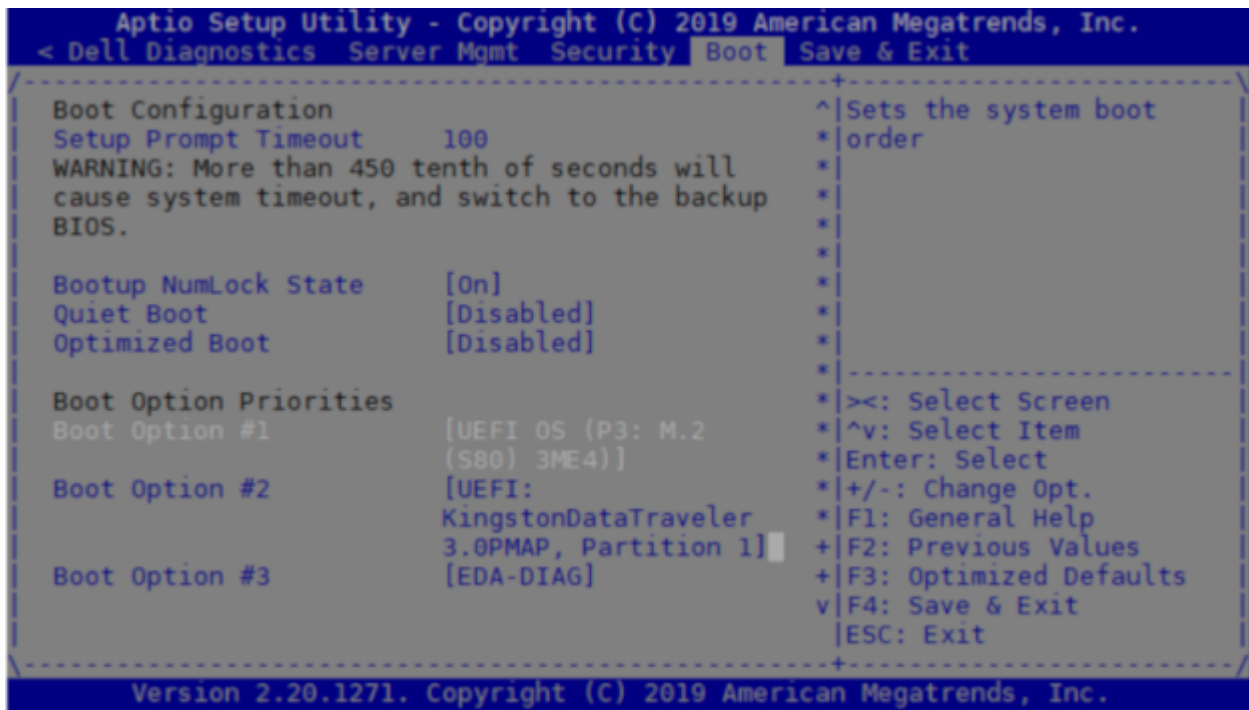


10. Press **Enter** to reboot after the installation completion screen displays.

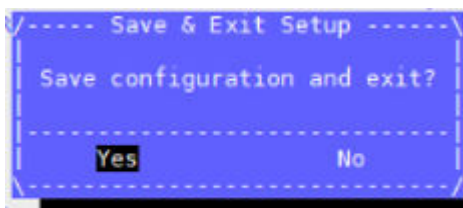


Configure BIOS to boot from SSD

1. Unplug the USB flash drive from VEP4600.
2. Boot into the BIOS settings and select the Boot menu tab.
3. Select the hard disk as Boot Option 1.



4. Press **F4** to save changes and exit. Select **Yes** and press **Enter**.



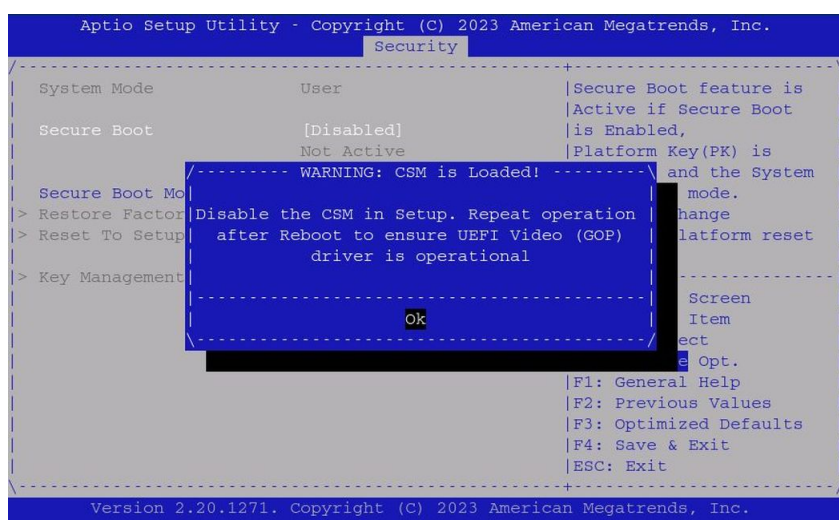
Configure BIOS to enable Secure Boot

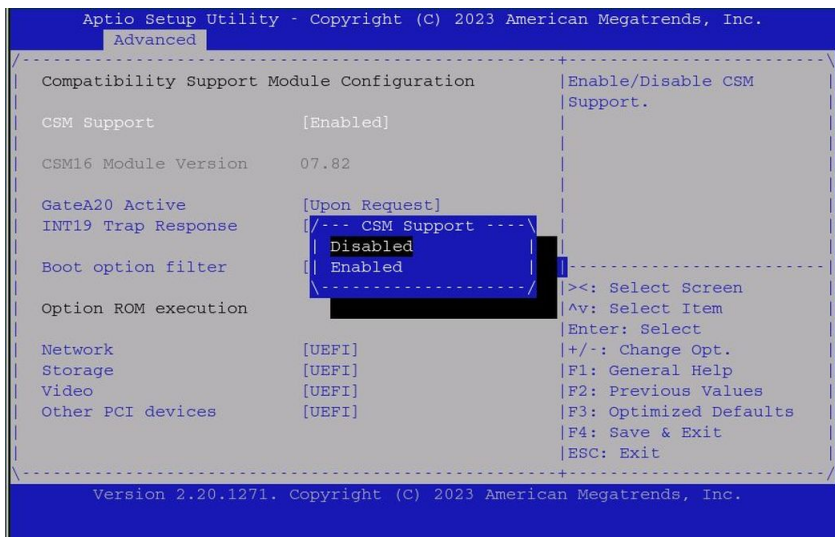
Enable Secure Boot for additional hardware security. You must use a signed ESXi image.

1. Reboot the system and go into the BIOS settings. For steps to access the BIOS settings page, see [Configure BIOS to boot from USB](#).
2. Select Secure Boot from the Security BIOS window.

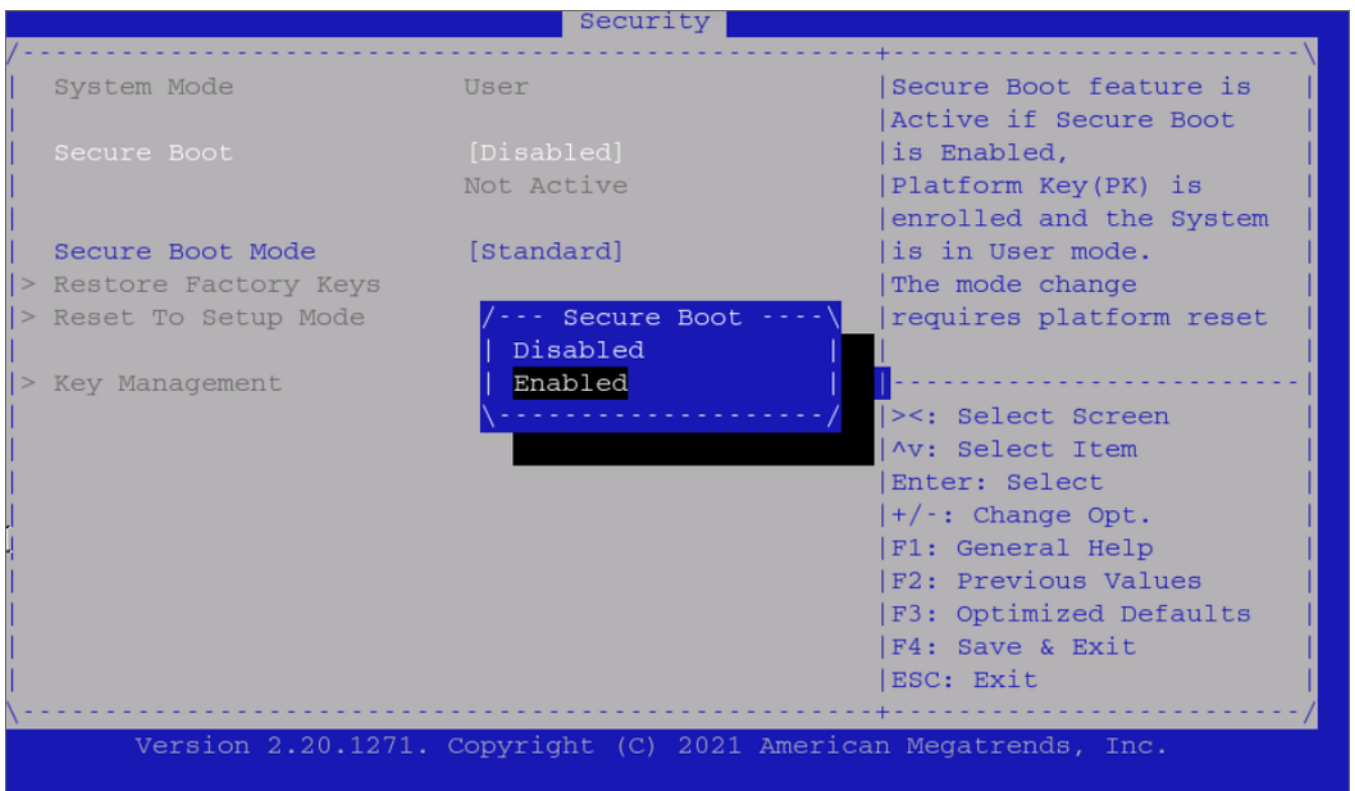


3. For **BIOS version 3.41.0.9-23 and later**, disable CSM Support before you enable Secure Boot. A warning appears if CSM Support is not disabled. Disable CSM Support from the Advanced BIOS window.





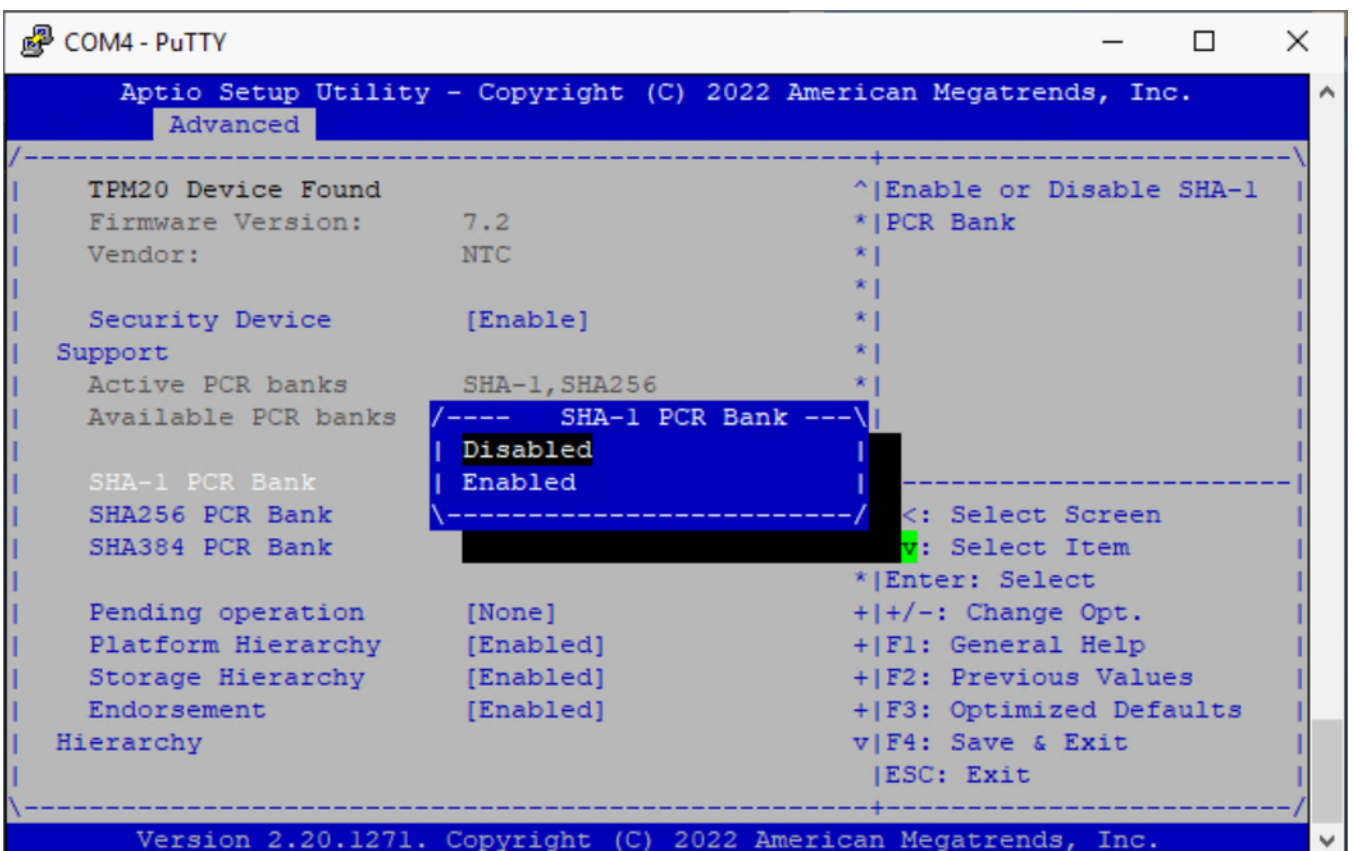
- From the Secure Boot window, select Enabled.



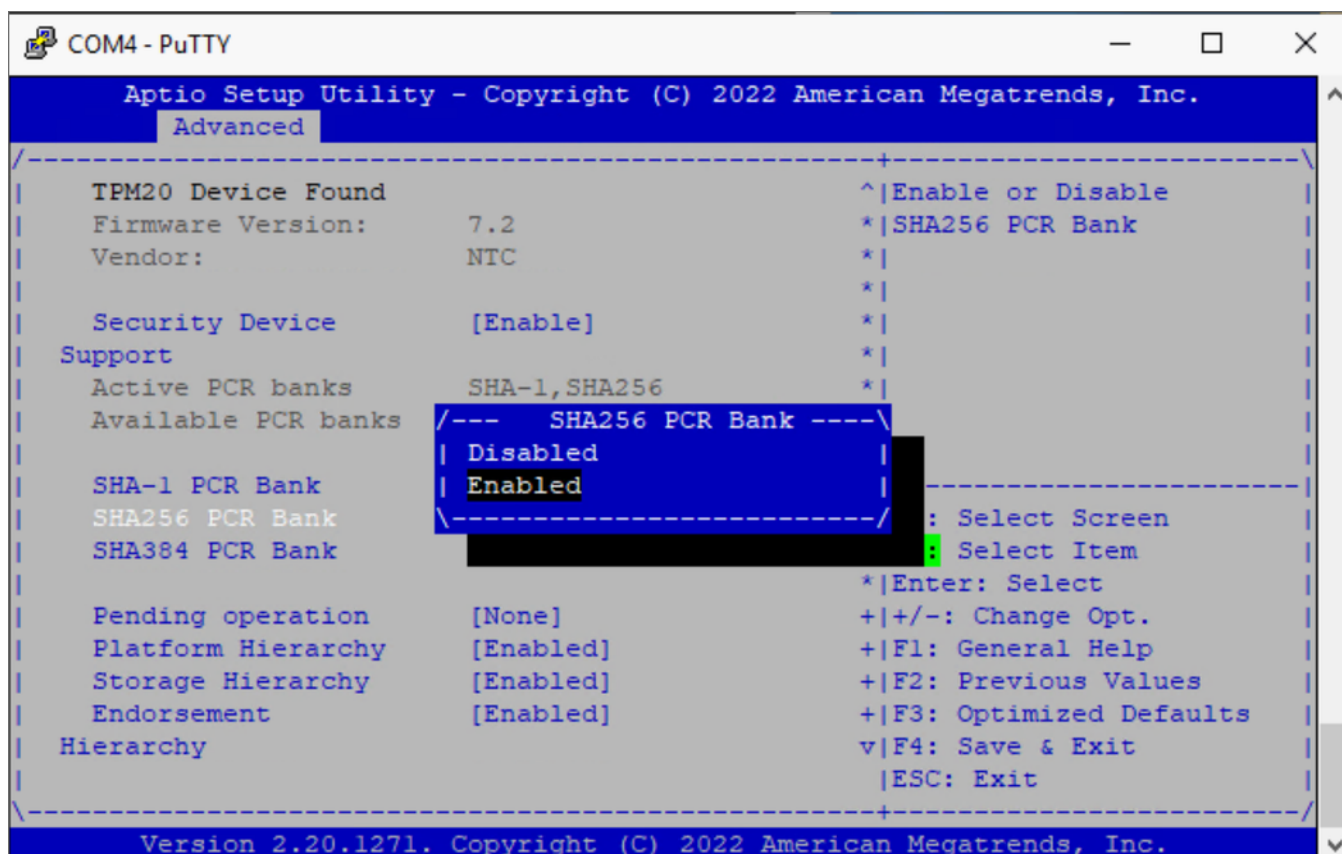
- Press the **F4** key to Save the changes and exit the utility.
- Access the BIOS settings page as an Administrator. Default password for the Administrator login is <service tag>!.



7. From the Advanced tab, select SHA1 PCR Bank and press Enter.
8. From the SHA1 PCR Bank window, select Disabled.



9. From the Advanced tab, select SHA256 PCR Bank and press Enter.
10. From the SHA256 PCR Bank window, select Enabled.



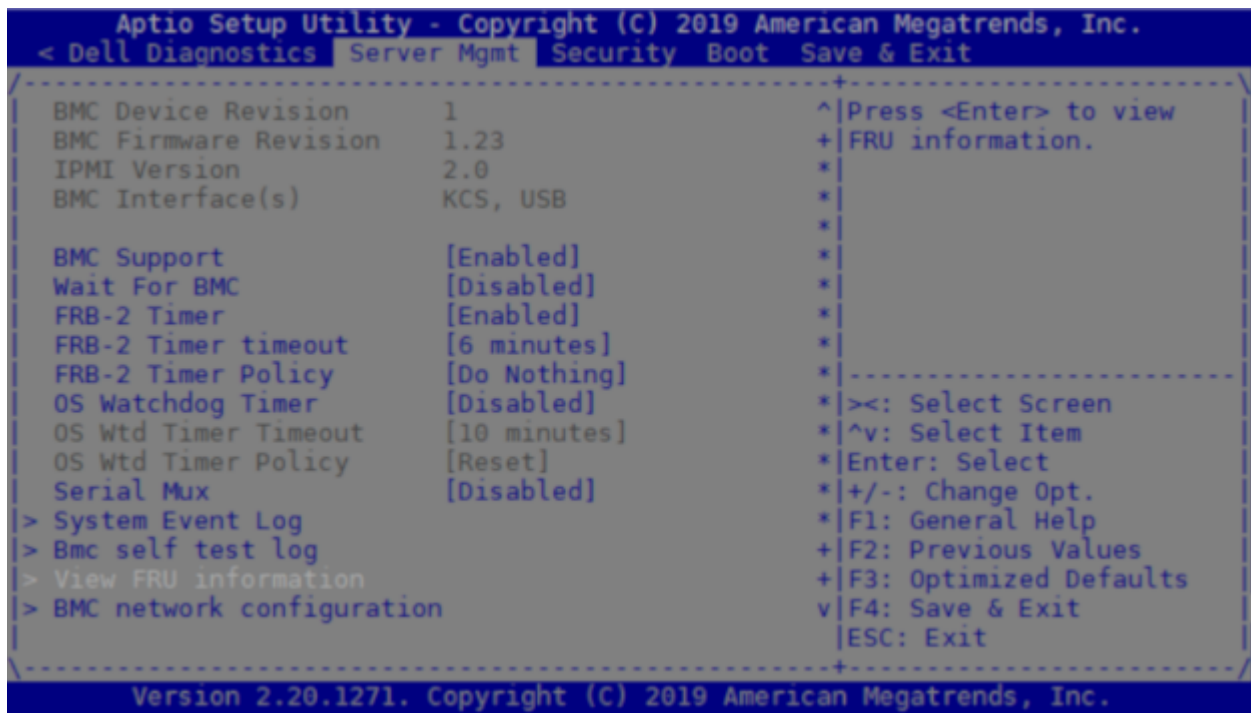
11. Connect the installable CD or DVD into the system.
12. Install the required ESXi version. For example, **7.0 U1/U2/U3**.
13. After installation is complete, enable shell and key using the following commands:
 - a. `vsish -e get /hardware/firmwareType`
The command must return the following: UEFI
 - b. `vsish -e get /uefi/variable/SecureBoot-8be4df61-93ca-11d2-aa0d-00e098032b8c`
This command must return the following output: 00000000 06 00 00 00 01 |.....| 00000005

Logging into ESXi

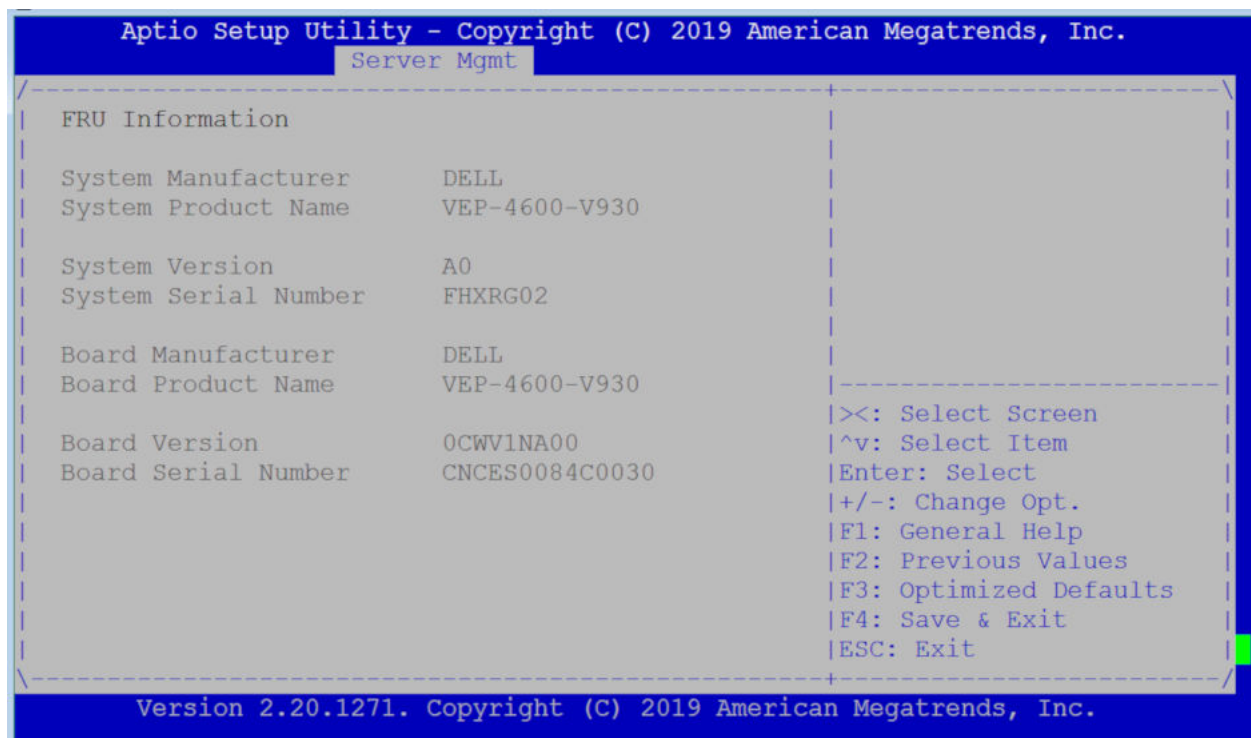
NOTE: Logging into the ESXi console will invoke the 60-day trial license.

1. Login credentials for ESXi on the VEP4600 are Login Name `root` and Password is the unit's <service tag> plus `!`.

NOTE: To get the service tag, copy the luggage tag on the top right corner of the VEP4600 server. The service tag can also be found in the BIOS.
2. To view service tag in the BIOS, go to the `Server Mgmt` tab.

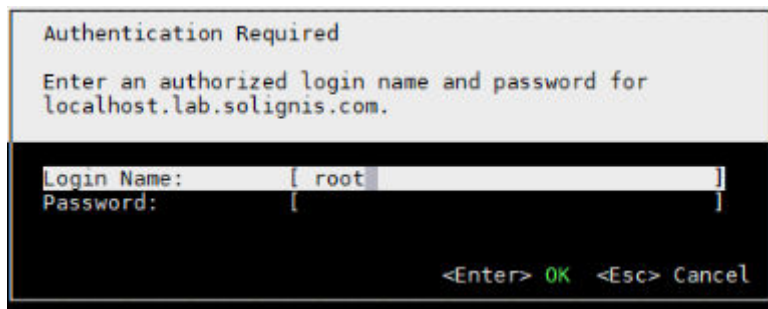


3. Scroll down to View FRU information and press **Enter**.



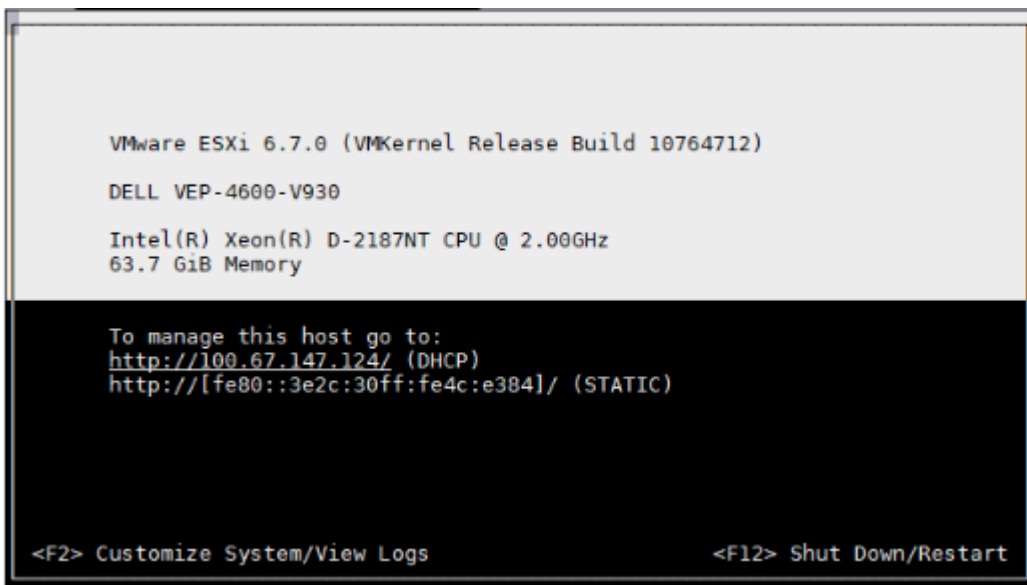
NOTE: System serial number is the service tag.

4. To log into the serial console:
 - a. After ESXi boots, press **F2**.
 - b. Enter the required login and password credentials at the login screen then press **Enter**.



Configuring the network on ESXi

1. After booting with ESXi, press **F2** to configure the network.



2. Select Configure Management Network from the System Customization screen then press **Enter**.

System Customization	Configure Management Network
Configure Password	Hostname: localhost
Configure Lockdown Mode	IPv4 Address: 100.67.144.137
Configure Management Network	Network identity acquired from DHCP server 100.67.144.100
Restart Management Network	IPv6 Addresses: fe80::56bf:64ff:febe:844/64
Test Management Network	To view or modify this host's management network settings in detail, press <Enter>.
Network Restore Options	<Enter> More <Esc> Log Out
Troubleshooting Options	
View System Logs	
View Support Information	
Reset System Configuration	

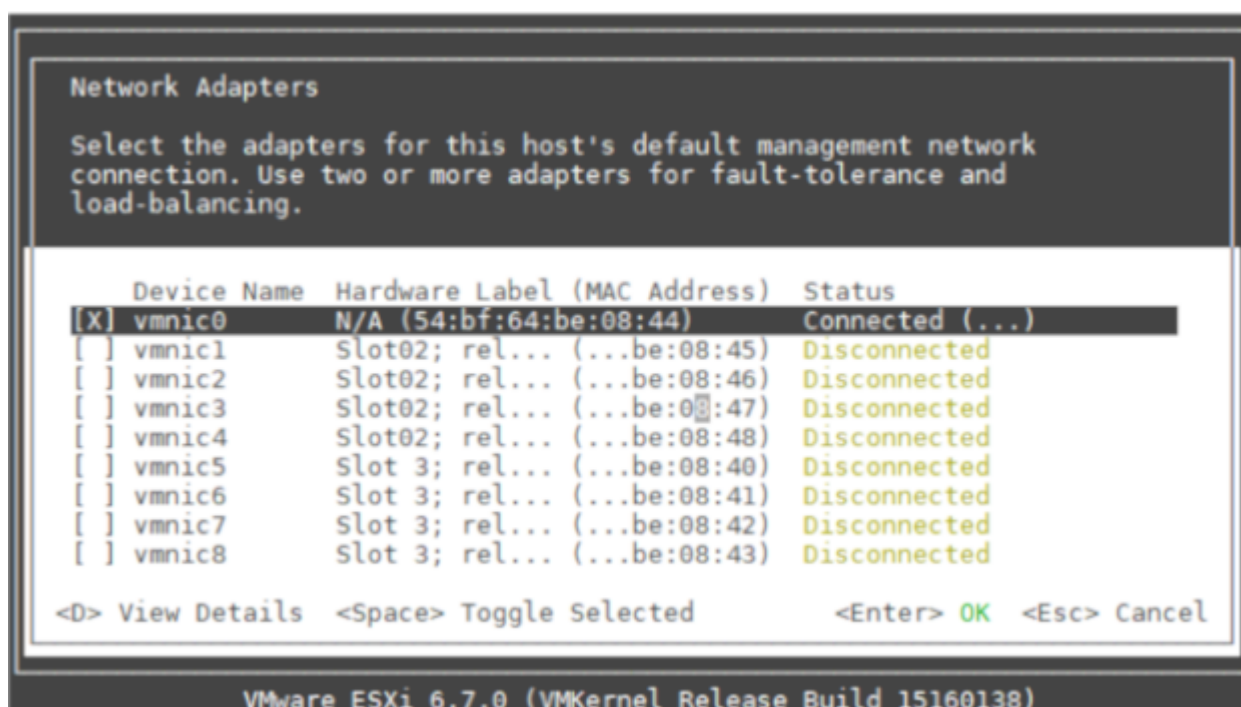
VMware ESXi 6.7.0 (VMKernel Release Build 10764712)

3. Select Network Adapters using the up and down arrow keys from the Configure Management Network screen and press **Enter**.

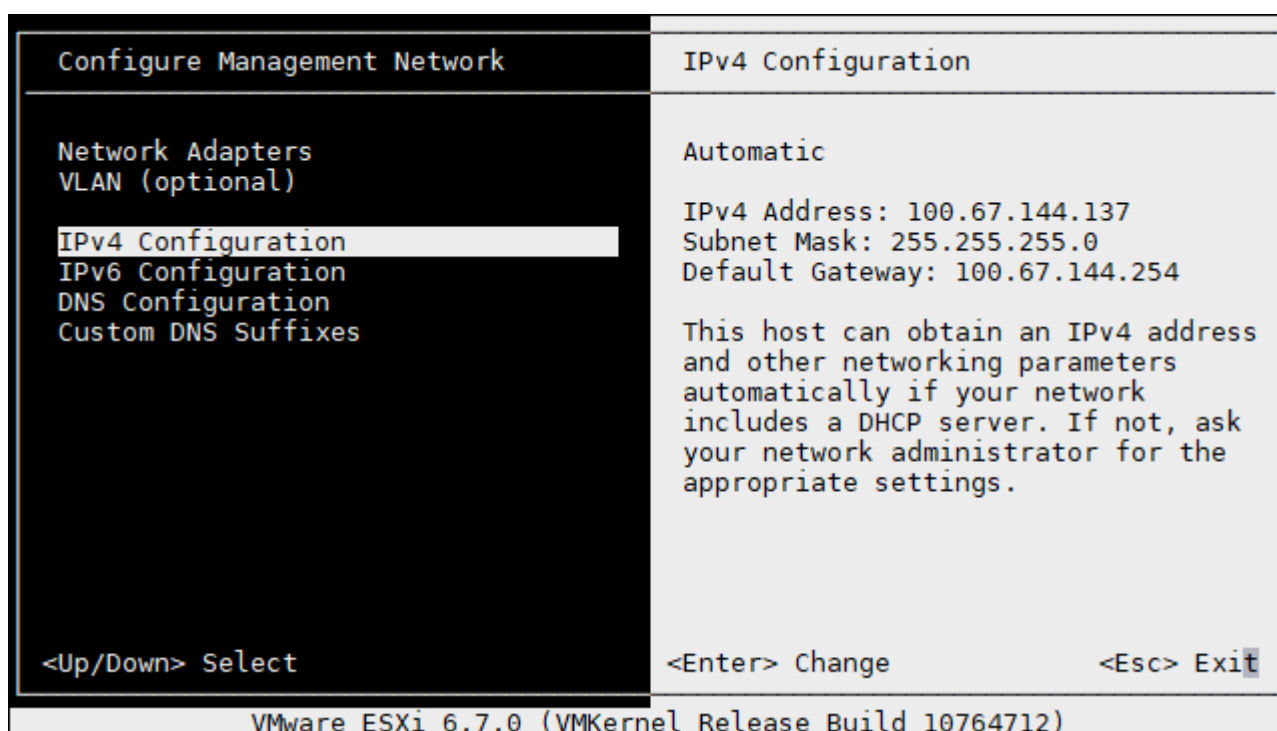
Configure Management Network	Network Adapters
Network Adapters	vmnic0 (3c:2c:30:4c:e3:84)
VLAN (optional)	The adapters listed here provide the default network connection to and from this host. When two or more adapters are used, connections will be fault-tolerant and outgoing traffic will be load-balanced.
IPv4 Configuration	
IPv6 Configuration	
DNS Configuration	
Custom DNS Suffixes	
<Up/Down> Select	<Enter> Change <Esc> Exit

VMware ESXi 6.7.0 (VMKernel Release Build 10764712)

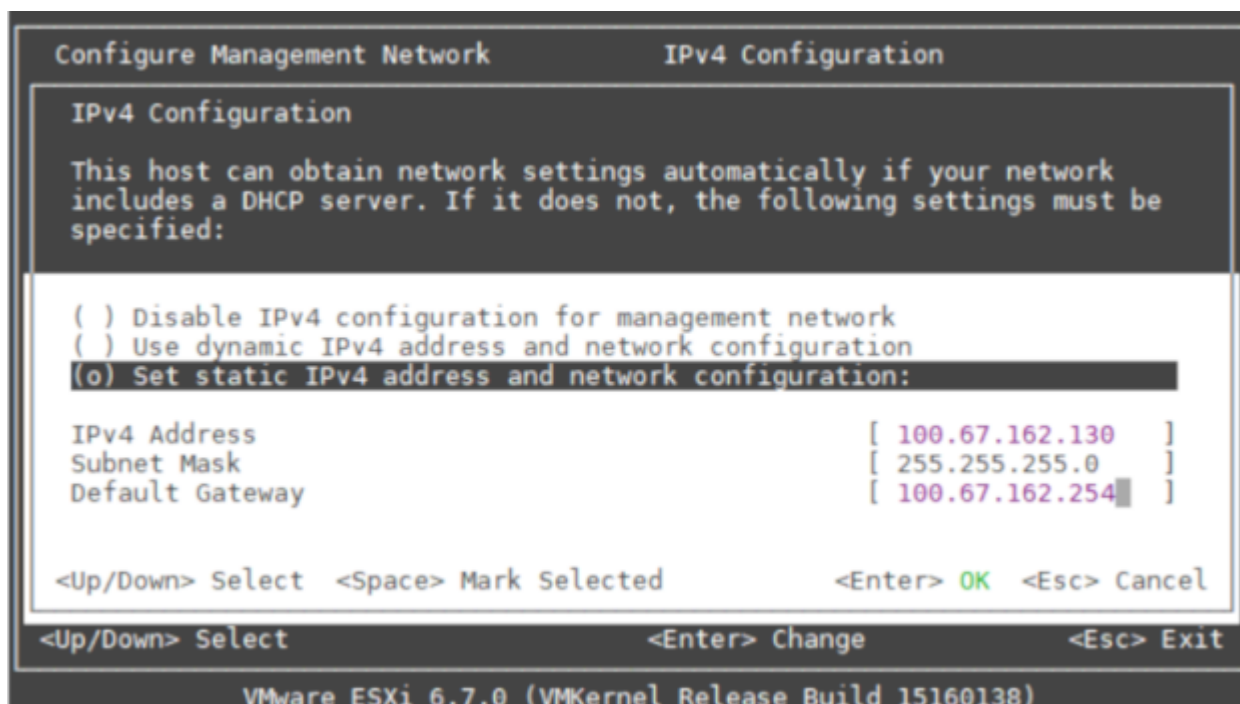
4. Using space-bar select the network adapter that is Connected, and press **Enter**.



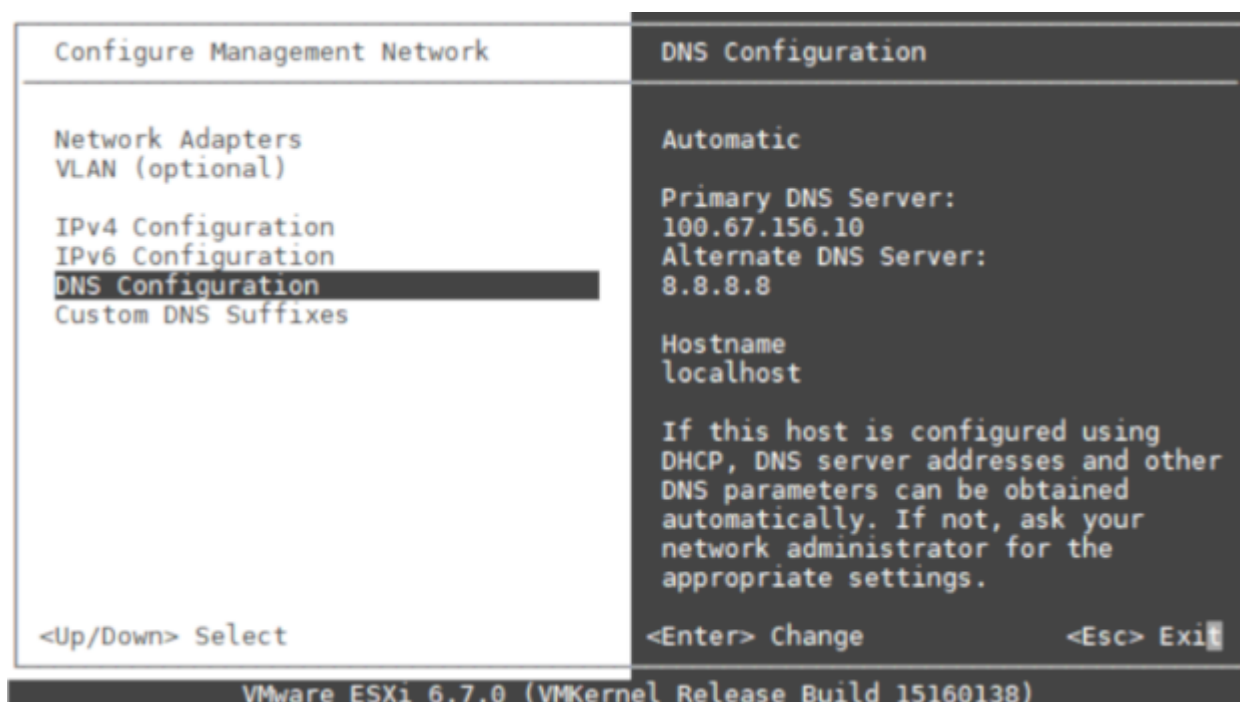
5. Select IPv4 Configuration.



6. Select IPv4 address and network configuration using space-bar.
7. Enter IPv4 Address, Subnet Mask and Default Gateway in the fields and press **Enter**.



8. Select DNS Configuration and press **Enter**.



9. Select Use the following DNS server addresses and hostname using the space-bar.
10. Enter Primary DNS Server, Alternate DNS Server (if applicable), Hostname and press **Enter**.

Configure Management Network

DNS Configuration

DNS Configuration

This host can only obtain DNS settings automatically if it also obtains its IP configuration automatically.

() Obtain DNS server addresses and a hostname automatically
(o) Use the following DNS server addresses and hostname:

Primary DNS Server	[100.67.156.10]
Alternate DNS Server	[8.8.8.8]
Hostname	[localhost]

<Up/Down> Select <Space> Mark Selected <Enter> OK <Esc> Cancel

<Up/Down> Select <Enter> Change <Esc> Exit

VMware ESXi 6.7.0 (VMKernel Release Build 15160138)

11. Press **Esc** and then **Y** key to confirm the changes and restart management network.

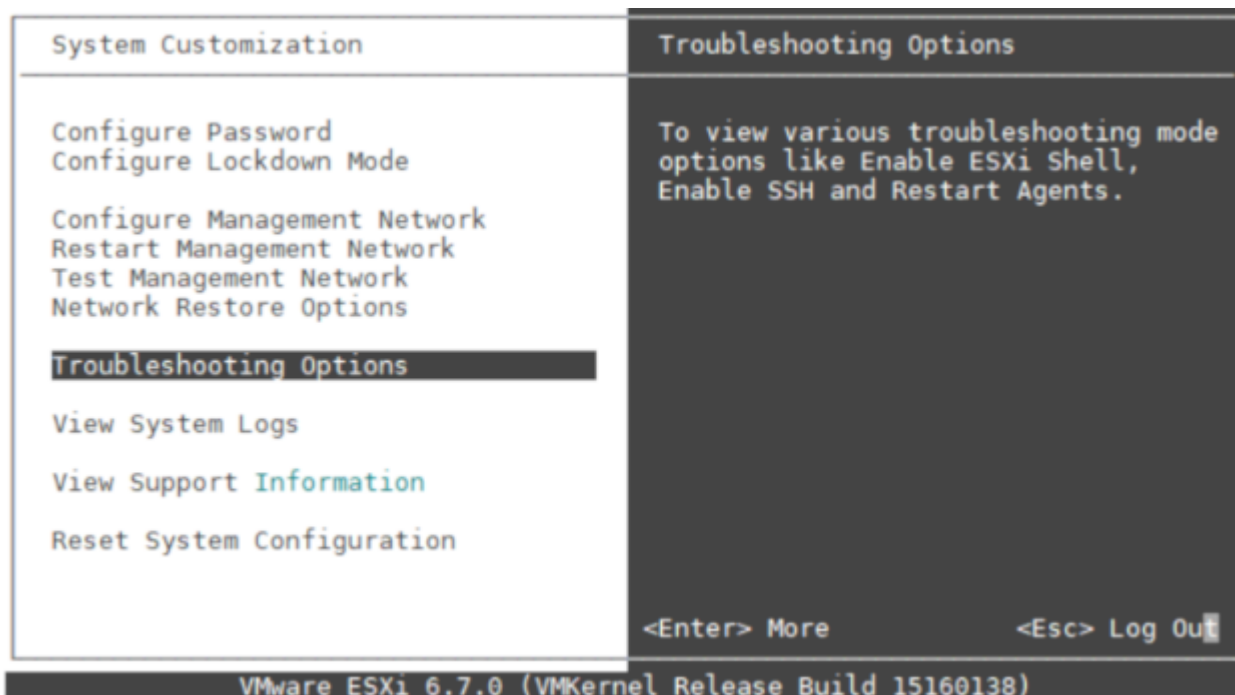
Configure Management Network: Confirm

You have made changes to the host's management network. Applying these changes may result in a brief network outage, disconnect remote management software and affect running virtual machines. In case IPv6 has been enabled or disabled this will restart your host.

Apply changes and restart management network?

<Y> Yes <N> No <Esc> Cancel

12. Select Troubleshooting Options in the System Customization Menu and press **Enter**.



13. Select Enable ESXi Shell from the Troubleshooting Mode Options and press **Enter** to enable the service.

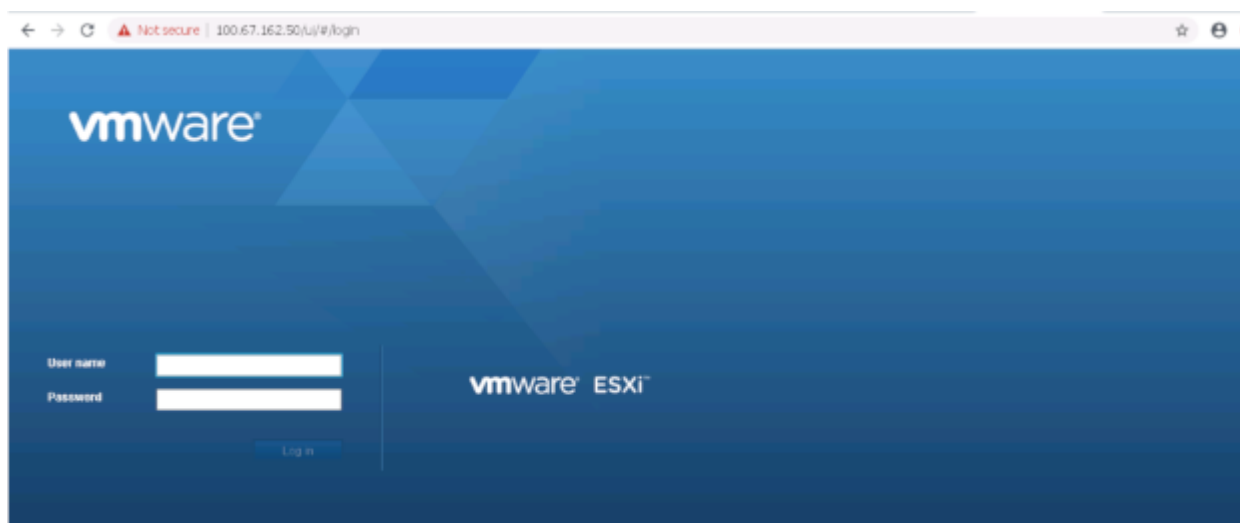


14. Select Enable SSH and press **Enter** to enable the service.

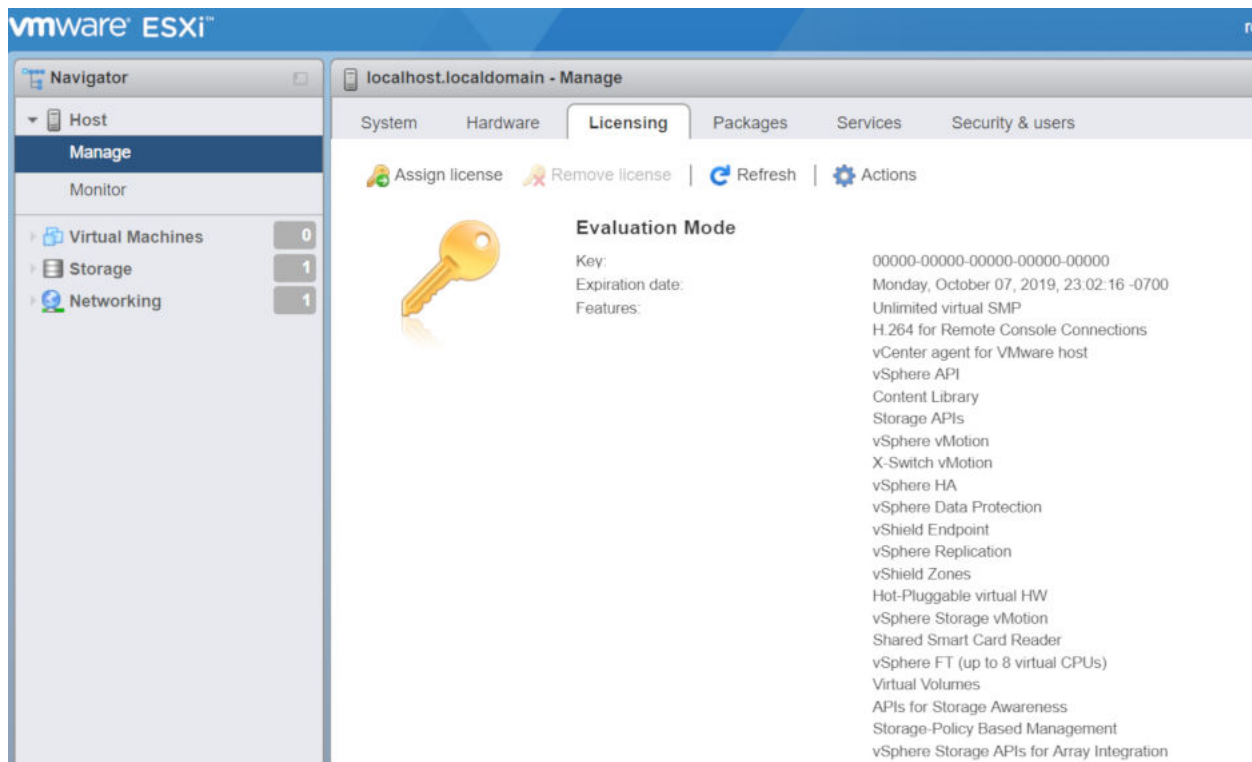


How to add ESXi license

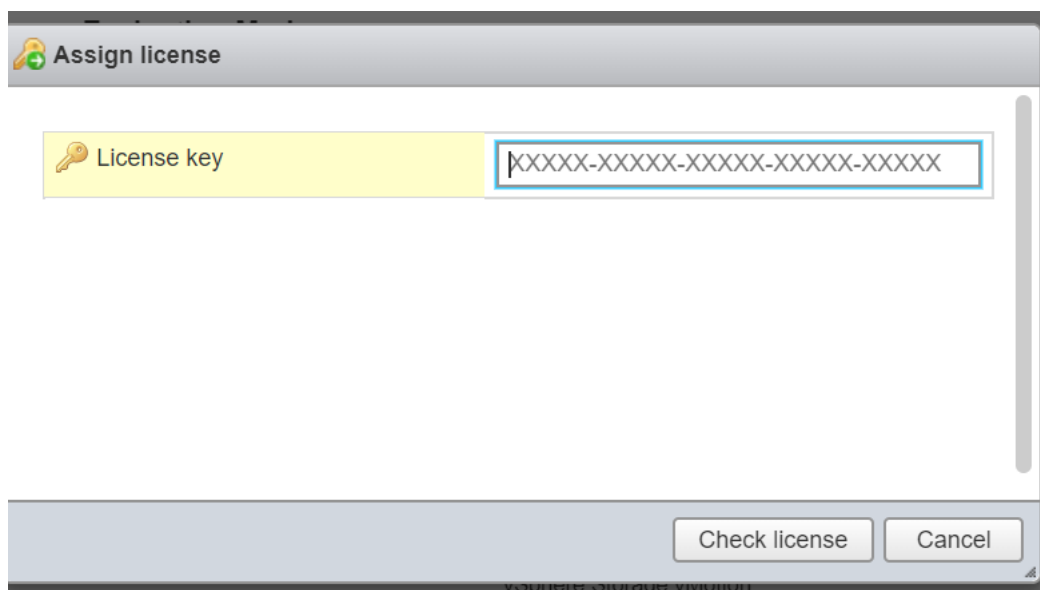
1. Log into ESXi vSphere UI.



2. Click Manage from the menu on the left panel.
Click on the Licensing tab



3. Enter a valid license and click **Check license**.



How to check for TRIM settings

1. Retrieve SSD/datastore UUID using the following command:

```
ls -l /vmfs/volumes
lrwxr-xr-x 1 root root 35 Jul 10 21:55 datastore1 -> 5dfa78d5-
b6e77d92-0a71-3c2c304d0e80
```

2. Please execute the following command to ensure that the TRIM is enabled on the ESXi OS.

```
esxcli storage vmfs reclaim config get --volume-uuid 5dfa78d5-
b6e77d92-0a71-3c2c304d0e80
```

```
Reclaim Granularity: 1048576 Bytes  
Reclaim Priority: low  
Reclaim Method: priority  
Reclaim Bandwidth: 0 MB/s
```

In the output of the command, the reclaim priority and method should **not** be set to `off`

LTE modem detection

The information provided in the following sections assists with the connection of an Inseego external USB LTE modem, purchased separately, to the Virtual Edge Platform (VEP) 1405 or 4600 series of systems using Versa, Adva, or ESXi.

Topics:

- [LTE modem detection on Versa](#)
- [LTE modem detection on Adva](#)
- [LTE modem detection on ESXi](#)

LTE modem detection on Versa

To initiate the detection of an LTE modem on the Virtual Edge Platform (VEP) 1405 or 4600 series of systems running the Versa operating system, perform the following steps:

1. Connect the LTE modem to the VEP series system.
The Versa operating system automatically detects the LTE modem.
2. To verify that the LTE modem is attached, enter the following command:

```
lsusb:

[admin@versa-flexvnf: ~] $ lsusb
Bus 002 Device 001: ID 1d6b:0003 Linux Foundation 3.0 root hub
Bus 001 Device 004: ID 046b:ff20 American Megatrends, Inc.
Bus 001 Device 003: ID 046b:ff01 American Megatrends, Inc.
Bus 001 Device 005: ID 1199:9071 Sierra Wireless, Inc.
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
```

3. Enter the following command to list the modem port that is assigned to the Sierra Wireless modem:

```
[admin@versa-flexvnf: ~] $ mmcli -L
Found 1 modems:
    /org/freedesktop/ModemManager1/Modem/0 [Sierra Wireless, Incorporated] MC7455
```

4. Verify the WAN interface status of the modem by running the following Versa CLI command:

```
[admin@versa-flexvnf: ~]cli
admin@versa-flexvnf-cli> show interfaces wwan status brief
interfaces wwan status brief vni-0/100
interface-status    Configured
hw-status            "Modem Detected"
connection-status    Connected
vendor-id            1199
product-id           9071
hw-vendor-name       "Sierra Wireless, Inc."
hw-model-name        "Sierra Wireless_MC7455_Qualco"
imei                 359072061219297
```

LTE modem detection on Adva

To initiate the detection of an LTE modem on the Virtual Edge Platform (VEP) 1405 or 4600 series of systems running the Adva operating system, perform the following steps:

-  **NOTE:** The LTE modem will be automatically detected if Adva v18.4 or later is installed. If the LTE modem is not detected automatically, the APN value based on the carrier may need to be set.

1. Install the Adva image on the VEP system.
2. Connect the LTE modem to the VEP system.
3. From the **Network Manager**, run the `lsusb` command on the terminal to verify that the LTE device is connected.
4. If necessary, download and install the latest LTE modem drivers.

NOTE: To access the latest LTE modem drivers for your VEP system running Adva, go to <https://source.sierrawireless.com/resources/airprime/software/usb-drivers-linux-qmi-software-s2,-d-,41n2,-d-,61/#sthash.KM7k2ze1.PrDDHhcE.dpbs>.
5. From the **Network Manager**, verify that the LTE connection is listed.

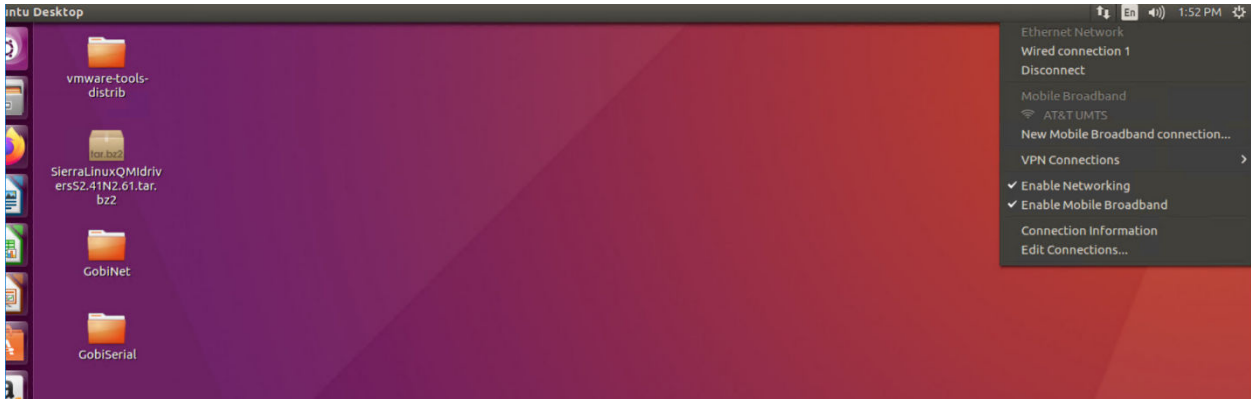


Figure 2. LTE connection listing within Adva Network Manager

6. From the **Network** icon in the toolbar, select the **Mobile Broadband** listing.

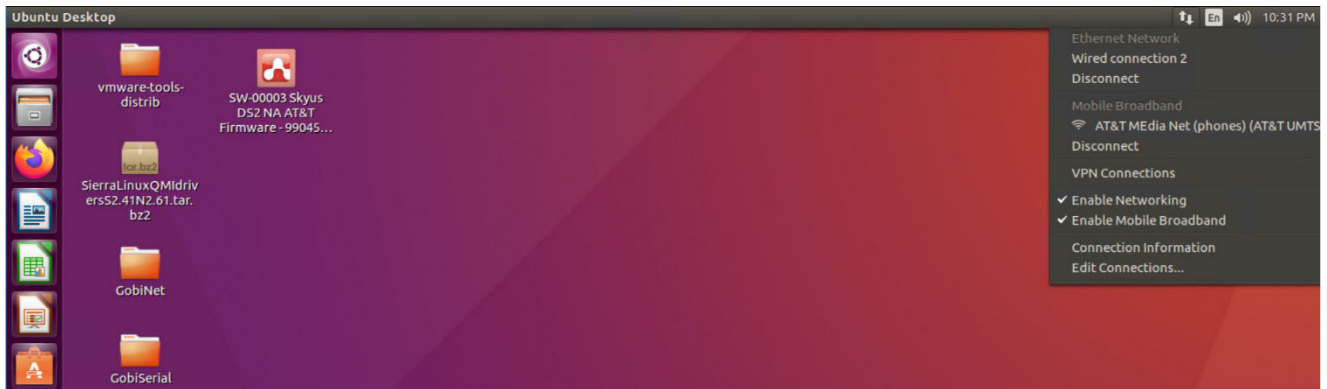


Figure 3. Adva Network Manager

7. Select the **Configure Network Settings** option to configure the broadband network settings for the LTE modem.

LTE modem detection on ESXi

To initiate the detection of an LTE modem on the Virtual Edge Platform (VEP) 1405 or 4600 series of systems running ESXi, perform the following steps:

1. To enable the LTE card, select **Enable ESXi Shell** from the **Troubleshooting Mode Options** menu.
2. Select **Enable SSH** and then press **Enter** to enable the service.
3. Log in to the ESXi shell and add the following entries in the `passthru.map` file at `/etc/vmware/passthru.map`:
`168c 003c d3d0 false`
4. Connect the LTE modem to the VEP system.
 ESXi automatically detects the LTE modem.
5. To verify that the LTE modem is attached, enter the following command:

```
lsusb:
[root@localhost:~] lsusb
Bus 001 Device 004: ID 1199:9071 Sierra Wireless, Inc.
Bus 001 Device 003: ID 046b:ff20 American Megatrends, Inc.
```

```
Bus 001 Device 002: ID 046b:ff01 American Megatrends, Inc.
Bus 001 Device 001: ID 0e0f:8003 VMware, Inc. Root Hub
```

6. From the ESXi server, create a Microsoft Windows VM so that the LTE modem can be used.
- i **NOTE:** If using the LTE modem with a Microsoft Windows operating system, note that the drivers only work with the Microsoft Windows XP, Windows 7, Windows 8, and Windows 10 operating systems. Microsoft Windows 2000 is not supported.
7. Within the newly created VM, edit the VM configuration to add a USB device and selecting the LTE modem.

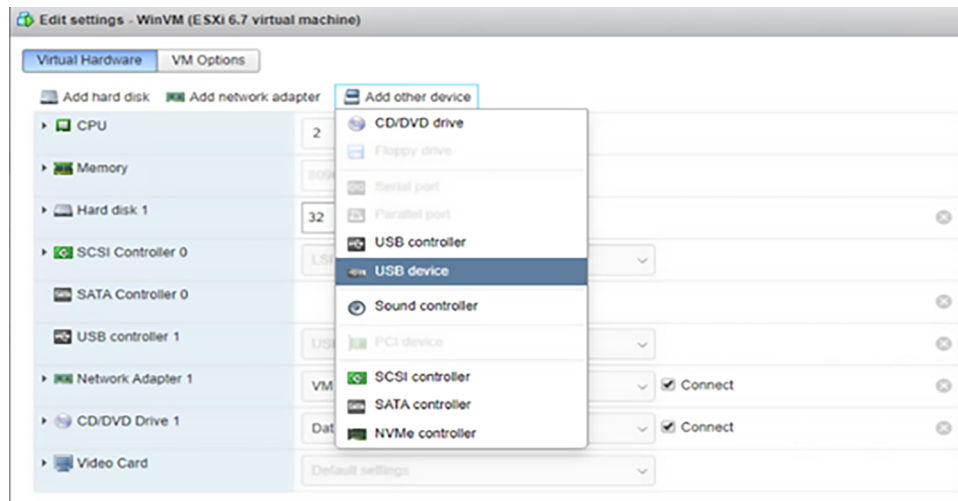


Figure 4. Microsoft Windows WinVM settings screen

8. After the LTE modem has been added to the VM configuration, power on the VM.
9. Download and install the LTE USB modem drivers and carrier firmware on the WinVM.
- i **NOTE:** To obtain the latest modem drivers and carrier firmware, go to <https://www.inseego.com/software-downloads/>.
10. Connect the modem to the network by performing the following steps:
 - a. From the taskbar, click the **Windows** icon.
 - b. Within the application screen, click the **Settings** icon. The **Windows Settings** screen displays.
 - c. From the **Windows Settings** screen, click the **Network & Internet** icon. The **Network & Internet** screen displays.
 - d. Click the **Cellular** listing, verify that the **Connect automatically** option is selected, and then click **Connect**.

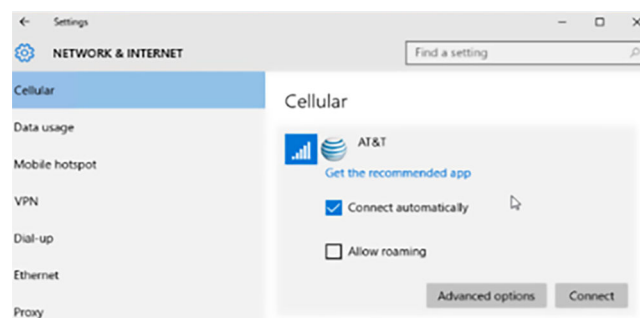


Figure 5. Cellular options within Network and Internet screen

11. From the **Network Connections** screen, verify that the **Cellular** connection is shown.

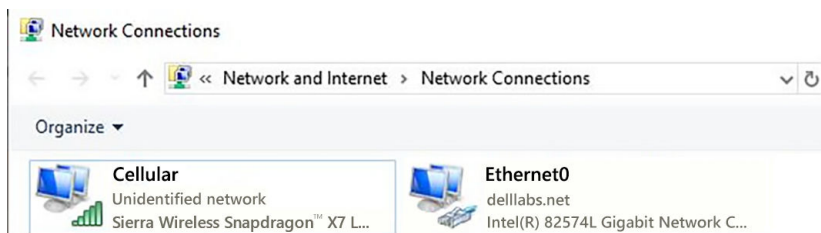


Figure 6. Network Connections screen with Cellular listing

12. After the Cellular listing shows a connection, run the `ipconfig/all` command to confirm the modem connection.

 Command Prompt
NetBIOS over Tcpip : Disabled
Mobile Broadband adapter Cellular:
Connection-specific DNS Suffix . :
Description. : Sierra Wireless Snapdragon™ X7 LTE-A WWAN Network Adapter
Physical Address : 00-A0-C6-00-00-04
DHCP Enabled : No
Autoconfiguration Enabled. . . : Yes
IPv4 Address : 10.154.46.17(Preferred)
Subnet Mask. : 255.255.255.252
Default Gateway. : 10.154.46.18
DHCPv6 IAID. : 151036102
DHCPv6 Client DUID : 00-01-00-01-26-46-B4-05-00-50-56-BB-B7-2D
DNS Servers. : 172.26.38.1
NetBIOS over Tcpip : Enabled

Figure 7. Command Prompt screen