



Headless Operating System Installation Whitepaper

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Grizzly (VL-ESU-5070)

A rugged embedded server unit featuring the Intel® C3958 16-core micro-server processor and 10 GbE networking ports.





WWW.VERSALOGIC.COM 

12100 SW Tualatin Road
Tualatin, OR 97062-7341
(503) 747-2261
Fax (971) 224-4708

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Product Release Notes

Rev 1.0 – Initial draft

Rev 1.1 – Updated board images

Support Page

The [Product Support Page](#) contains additional information and resources for this product including:

- Operating system information and links to software drivers
- Data sheets and manufacturers' links for chips used in this product
- BIOS and PLD information and upgrades
- Links to Knowledge Base articles and product advisories

VersaTech Knowledgebase

The [VersaTech KnowledgeBase](#) is a useful resource for resolving technical issues with your VersaLogic product.

Customer Support

If you are unable to solve a problem after reading this manual, visiting the product support page, or searching the Knowledge Base, contact VersaLogic Technical Support at (503) 747-2261. VersaLogic support engineers are also available via e-mail at Support@VersaLogic.com.

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Introduction

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Introduction

The term “headless” refers to a computer with no video monitor or local keyboard/mouse. In servers, video is not always required because they usually are located in remote data centers or other locations. Most management of a headless server is done through Ethernet or using a serial port terminal. The installation and usage of an operating system on headless systems varies with the support provided by the operating system vendor for that particular configuration. For example, server versions of Linux operating systems tend to not install a graphical desktop by default for this reason. Most server applications are designed to be remotely managed by desktop clients over Ethernet.

The VL-ESU-5070 (Grizzly) board from VersaLogic does not have an integrated graphics adapter, so by default, it is headless. There are graphics adapter options such as the VersaLogic MPEe-V5 mini-PCIe adapter that can be inserted into the Grizzly expansion slot. But there are methods to both install and use some operating systems without the need for a video card. The Grizzly currently supports Windows Server 2019, Ubuntu Server 18.04 Server, and VMWare vSphere 6.7 Hypervisor (ESXi). The headless support provided by these operating systems varies. This document provides observations and configuration steps for headless installation, where supported.



Ubuntu Server 18.04

The Ubuntu Server installation can be done using a local Serial Port or using Serial Over LAN so a video card is not needed. By default, the Ubuntu installer doesn't enable a serial console so bootloader options need to be modified to point the installer console to a serial port.

To know which serial port to specify, use the following as reference regarding how Linux specifies the device. Note that the Grizzly configures the two local serial ports as PCI HSUART ports by default:

- ttyS4 – Serial Over LAN port
- ttyS5 – PCI HSUART Serial Port 1
- ttyS6 – PCI HSUART Serial Port 2

It has been observed that the Ubuntu 18.04.3 Installer Kernel does not contain the HSUART driver (`8250_mid`) although the installed kernel does have support for it. There may be updates from Ubuntu for this in the future. To install using HSUART serial console, some steps would need to be taken to add the HSUART driver to the install kernel or the install needs to be done with a video card, and then it can be removed after install.

The Serial Over LAN port is supported in all Linux kernels so if possible, VersaLogic recommends using that port to do the headless install. To use Serial Over LAN, connect to the 10G management port on the Grizzly from a remote Linux system and use [ipmitool](#) to start a session:

```
ipmitool -I lanplus -H 10.99.99.60 -U root -P root sol
activate
```

For information on how to use Serial Over LAN using the Ethernet Management Port (10G port) on Grizzly, refer to the Versallogic [Grizzly Remote Management Manual](#).

To get the installer to use the serial console for installation, remove the video card if inserted, and boot the install DVD/USB drive while a serial console is connected (i.e., using Serial Over LAN). When the bootloader screen appears, highlight the "Install Ubuntu Server" selection and press "e". Edit the "linux" line and add "console=ttyS4,115200n8" to it (to use Serial Over LAN for example) so it looks something like:

```
linux /install/vmlinuz file=/cdrom/preseed/ubuntu-
server.seed quiet console=ttyS4,115200n8 ---
```

Press Ctrl-X or F10 to boot using those parameters and the install program should start. This should be sufficient to install Ubuntu. After the installation is complete, the command line parameters can be permanently set to use a serial console by adding to `/etc/default/grub`. Refer to <https://help.ubuntu.com/community/SerialConsoleHowto>.

VMWare vSphere 6.7 Hypervisor (ESXi)

In order to do a headless install of ESXi Hypervisor, bootloader command line parameters need to be modified, much like Linux. However, the instructions only work when booting from Legacy mode and also the installer only supports Legacy serial ports, not PCI Serial ports like the HSUARTs or Serial Over LAN port. So the HSUART0 port needs to be changed to Legacy in BIOS Setup.

Enter BIOS at boot to set the serial ports to Legacy

- South Cluster Config -> UART Config -> COM1 = Legacy
- Under Console Redirection also ensure that it is set for the standard 115200 baud, 8n1 (same for the host side of course)
- Save and Exit

Boot the install image (i.e., USB DVD) in Legacy mode at the BIOS boot menu.

After booting the Install image, at the bootloader screen, select the ESXi installer and press tab to edit options. Make the line look like (com1 is the local serial port 1/COM1):

```
mboot.c32 -c boot.cfg kernelopt=text nofb com1_baud=115200  
com1_Port=0x3f8 com1_Irq=10 tty2port=com1 gdbPort=none  
logPort=none
```

Press [Enter] and the install will start. It will take several seconds before anything shows up on the host terminal screen. Depending on the serial terminal used on the host, pressing <F11> may not work correctly with default settings.

Once the install is complete and the system reboots the OS will be available on the network once DHCP assigns an IP address. An administrator should be able to provide the address. Enter the IP address into a web browser and VMWare ESXi should come up on the screen. Login with 'root' and the password you set during install.

Refer to the [VMWare Sphere Hypervisor documentation](#) for more information on configuring headless systems for ESXi.

Microsoft Windows Server 2019

Windows Server, while able to run using a command line interface, still requires a video card for most operations, included the installation of the OS. While there are methods to install an image onto the hard drive using an unattend.xml file to answer the install questions automatically, there will still be difficulties using it without a video card. Versallogic recommends a video card be installed for installation and usage of Windows Server on Grizzly.