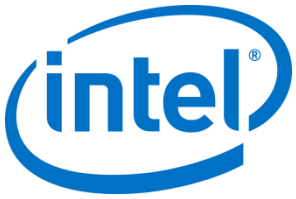

Setup Intel® Virtual RAID on CPU (Intel® VROC) with Ubuntu 18.04.3 LTS and 18.04.4 LTS Server

User Guide

August 2020

Document Number: 342787-002US

Revision History

Document Version	Description	Date
001	• Initial Release	March 2020
002	• Added mdadm compilation and known issues	August 2020

Contents

1 Introduction

1.1 Overview

This document provides the steps for users to setup Intel® Virtual RAID on CPU (Intel® VROC) with the Ubuntu 18.04.3 or 18.04.4 LTS server. Ubuntu 18.04.3 and 18.04.4 LTS servers have inbox drivers include mdadm and ledmon user-space utilities and kernel md, VMD drivers to enable Intel® VROC functionalities.

1.2 Defect Submission Support

For Ubuntu related issue, please contact Ubuntu support https://ubuntu.com/support

For any silicon/platform related issues, Intel will accept and process issues reported by customers via the Intel premier Support (IPS) portal.

To submit an issue, please use the Intel Premier Support (IPS) tool. Your local FAE can provide you the necessary requirements to enable submission of an IPS issue.

http://www.intel.com/content/www/us/en/design/support/ips/training/welcome.html

1.3 Supported Operating Systems

- Ubuntu 18.0.4.3 LTS Server
- Ubuntu 18.0.4.4 LTS Server

1.4 Supported Platforms

Intel® Xeon® E5/E7 SP

- Intel® Xeon® Scalable Platform family with Intel® C620 series chipset

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2 Installation

2.1 Download the Ubuntu 18.04.3 or 18.04.4 LTS Server

- Ubuntu 18.04.3 LTS non-live server can be downloaded

  http://old-releases.ubuntu.com/releases/18.04.3/ubuntu-18.04.3-server-amd64.iso

- Ubuntu 18.04.4 LTS non-live server can be downloaded

  http://cdimage.ubuntu.com/releases/18.04.4/release/ubuntu-18.04.4-server-amd64.iso

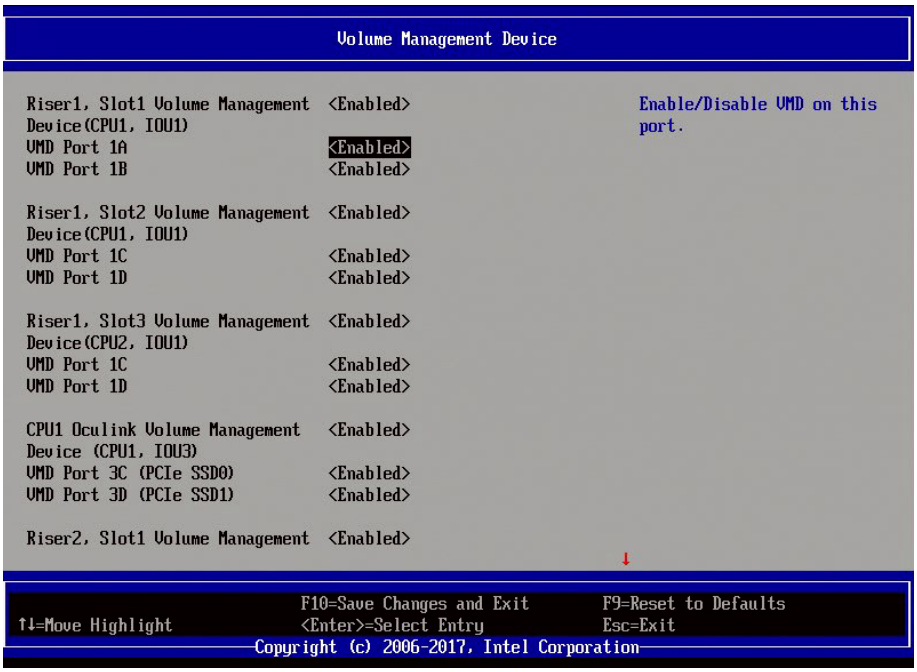
- Follow the installation guide process to install with either DVD or USB drive

  https://tutorials.ubuntu.com/tutorial/tutorial-install-ubuntu-server#0

2.2 Enable VMD and Configure RAID in the HII

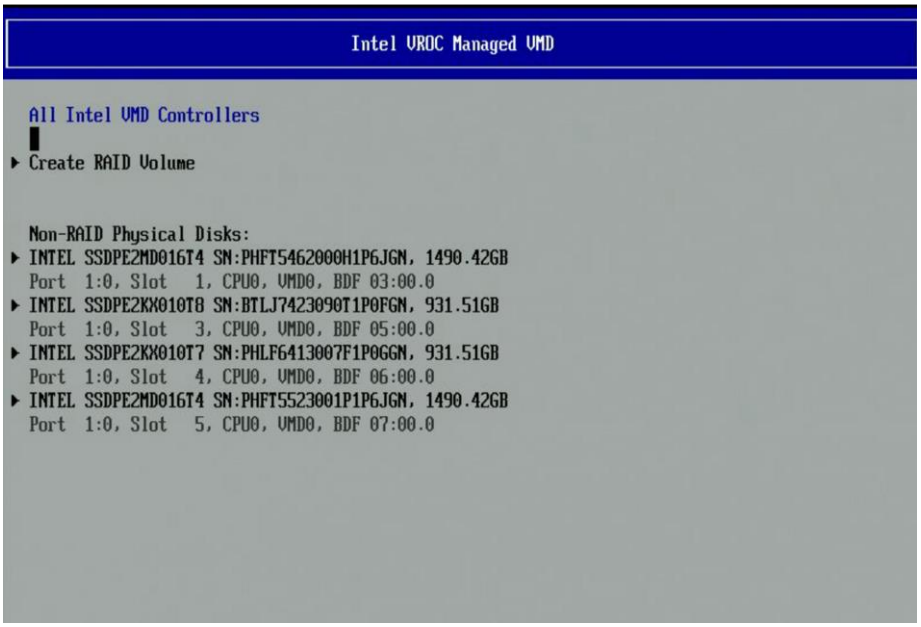
- Enable the VMD in the BIOS HII menu for the NVMe drives connected to the system behind VMD.

  (The following screenshot is from Intel server S2600WF platform BIOS. Different system BIOS may have different HII setup menu. Please contact your OEM vendor if configuration support is needed.)

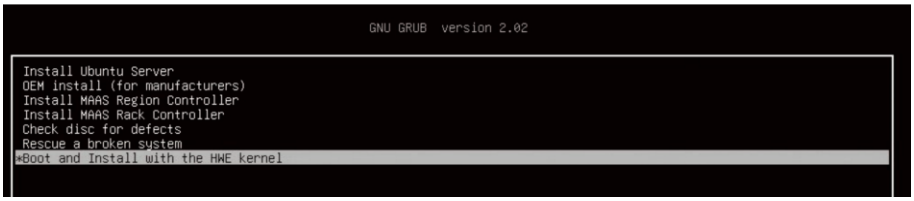


- VROC RAID volume can be created in the HII. The Ubuntu installer can recognize the RAID volume as the installation target during the installation. VROC activation KEY will be needed to create the VROC RAID volume.

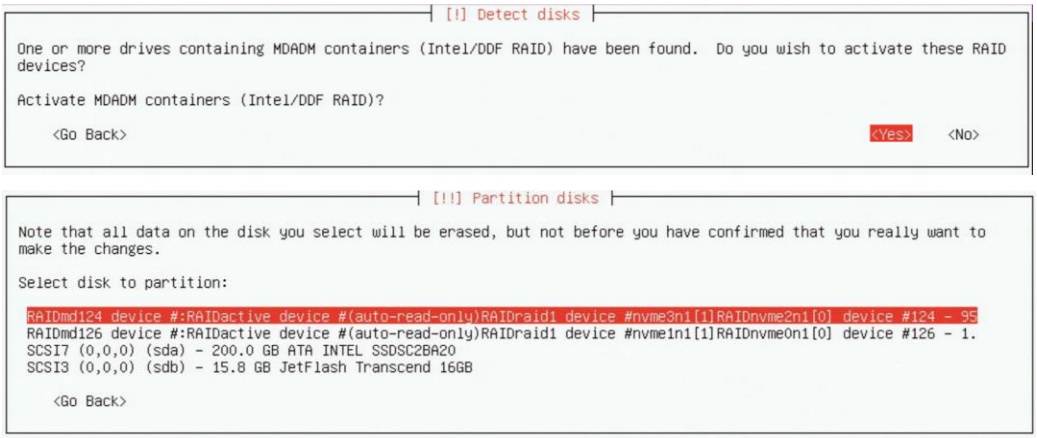
  (This step is optional if Ubuntu is installed to the passthrough drive behind VMD.)



- Boot to Ubuntu installer in the “GRUB” and start to install Ubuntu



- Select “YES” to activate RAID device in the pop-out window during installation. Afterward, RAID volume device can be selected as installation target.



- Follow the installer process to complete the installation and press “Continue” to reboot the system.

2.2.1 Update ledmon

- Install ledmon tool for LED management from the Ubuntu repository

  #sudo apt install ledmon

  #sudo ledmon - -version (check the ledmon installation)

Note: Ubuntu offers ledmon from two repositories: bionic universe (ledmon 0.79) and bionic-updates universe (ledmon 0.90), we recommend higher version. Bionic-updates universe should be enabled (by default it is).

- Ledmon is not lauched by default when system reboot. The steps following help user to manual create and Setup systemd service for ledmon.
  - Create the file “/etc/systemd/system/ledmon.service”

    #sudo vi /etc/systemd/system/ledmon.service (input the content following)

    [Unit]

    Description=Enclosure LED Utilities

    [Service]

    ExecStart=/usr/sbin/ledmon

    Type=forking

    [Install]

    WantedBy=multi-user.target

- Start ledmon as systemd service

  #sudo systemctl start ledmon.service

- Check ledmon service status

  #sudo systemctl status ledmon.service

- Enable ledmon service for automatically loading service in next system boot

  #sudo systemctl enable ledmon.service

- The inbox ledmon version in Ubuntu 18.04.3 and 18.04.4 LTS server repositories is not up-to-date. Known issues could be found in the Ubuntu launchpad listed in the Chapter 3. It is optional but recommended to upgrade ledmon version from the github.

  #git clone https://github.com/intel/ledmon.git

  The build tool and dependency packages may need to install from the Ubuntu repository (git, gcc, make, sg3-utils-udev, libsgutils2-dev, libudev-dev. Follow the README https://github.com/intel/ledmon/blob/master/README.md in the github for the detail configuration compilation steps and required packages needed.)

Note: In ledmon 0.94 new dependency was added (libpci). Also please note that with option –enable-systemd, a service file will be generated (and overwritten) during installation. The major difference is that the foreground option in generated unit file, old ledmon (0.90 from repository), is not able to handle this and will fail. To avoid this possible failure, it is suggested to remove the old one before performing manual installation (apt remove ledmon) from github.

2.2.2 Update mdadm

Updating mdadm to align with the latest version in the upstream is not a mandatory but is recommended. The inbox mdadm version 4.0 should address most of the key open issues. If user would like to upgrade mdadm to get new features and bugfixes, it can be manually installed. Mdadm is opensource and it is still in active development, Intel cannot guarantee that the freshest version (upstream HEAD) is fully validated. Compilation steps described above have been tested on mdadm 4.1:

Install the tool and dependencies:
#apt install make dpkg-dev git

The latest mdadm source code can be downloaded from kernel.org:
https://git.kernel.org/pub/scm/utils/mdadm/mdadm.git/
#git clone https://git.kernel.org/pub/scm/utils/mdadm/mdadm.git/

cd mdadm
Modify Makefile, around line 247, remove call to install-udev target:
<original> install : mdadm mdmon install-man install-udev
<modified> install : mdadm mdmon install-man

run make with additional parameters:
#LDFLAGS=$(dpkg-buildflags --get LDFLAGS)
#CFLAGS=$(dpkg-buildflags --get CFLAGS)

#make CXFLAGS="$CFLAGS" LDFLAGS="$LDFLAGS" DEBIAN=yes CONFFILE=/etc/mdadm/mdadm.conf CONFFILE2=/etc/mdadm.conf

Install:
#make install

Optional:
#make install-systemd

As a last step (mandatory) initrd update is needed:

#update-initramfs -u

For more detail mdadm configuration, please refer to linux user guide
https://www.intel.com/content/www/us/en/support/articles/000030445/memory-and-storage/ssd-software.html?productId=122484&localeCode=us_en

Note: In the scenario users who upgrade the mdadm package may find the old mdmon still present in memory. Intel recommends rebooting the system after mdadm upgrade.

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3 Known Issues

There are two known ledmon issues in Ubuntu launchpad. Please refer to the following links for further details:

https://bugs.launchpad.net/ubuntu/+source/ledmon/+bug/1831591
https://bugs.launchpad.net/ubuntu/+source/ledmon/+bug/1831733

One of the mdadm auto rebuild issue #1808469035

(Auto Rebuild) Recovery does not start automatically after adding prepared spare disk

Description:	Recovery does not start automatically after adding prepared spare disk,to container of degraded RAID volume.
Workaround:	Use mdadm monitor with delay

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