DRP/BXP/RKP Series
Windows 11 Professional 2022/2024
Manual

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www.moxa.com/products

DRP/BXP/RKP Series Windows 11 Professional 2022/2024 Manual

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1. Introduction

This Windows 11 Professional user manual is applicable to Moxa's x86-based computers listed below and covers the complete set of instructions for these series. Detailed instructions on configuring advanced settings are covered in the following chapters of the manual. Before referring to instructions in the following sections, confirm that the hardware specification of your computer supports the functions/settings covered therein.

- **BXP** Series
  - BXP-A100, BXP-C100, BXP-A101
- **DRP** Series
  - DRP-A100, DRP-C100
- **RKP** Series
  - RKP-A110, RKP-C110, RKP-C220

Moxa Computers and Windows

Moxa computers are integrated with Windows drivers and I/O controller utilities based on the Microsoft Windows up-to-date version so that you can use the most compatible hardware-software combinations in your application field.

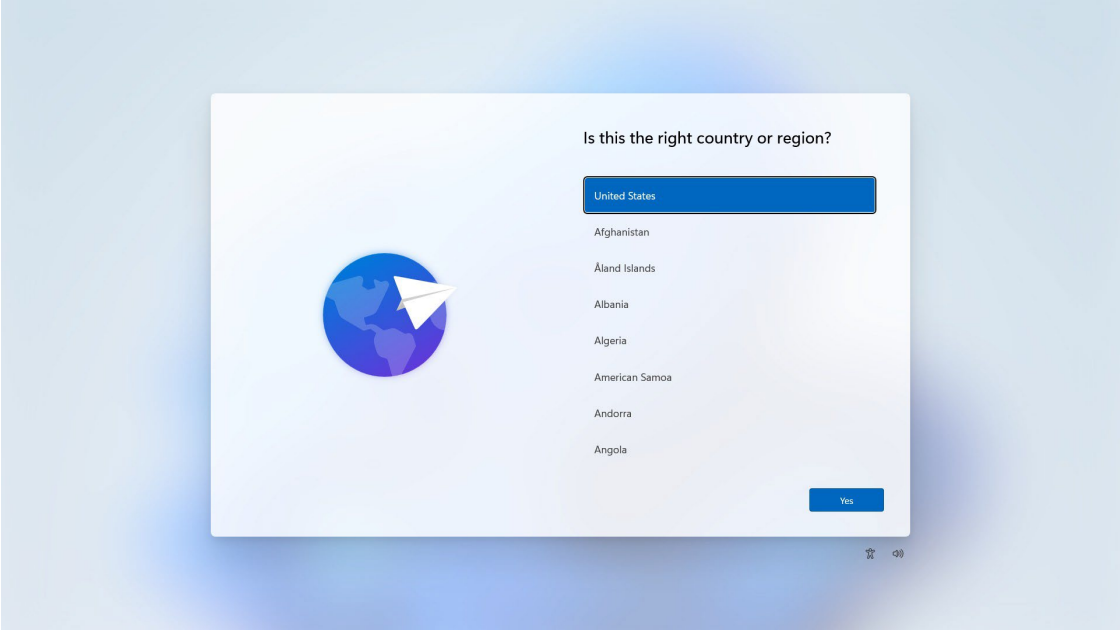
2. System Initialization

In this chapter, we describe how to initialize the system settings when you boot up the computer for the first time. When you turn on the computer, you will see the Windows Out of Box Experience (OOBE) wizard. OOBE consists of a series of screens that require customers to accept the license agreement, connect to the internet, log in with or sign up for a Microsoft Account, and share information with the OEM.

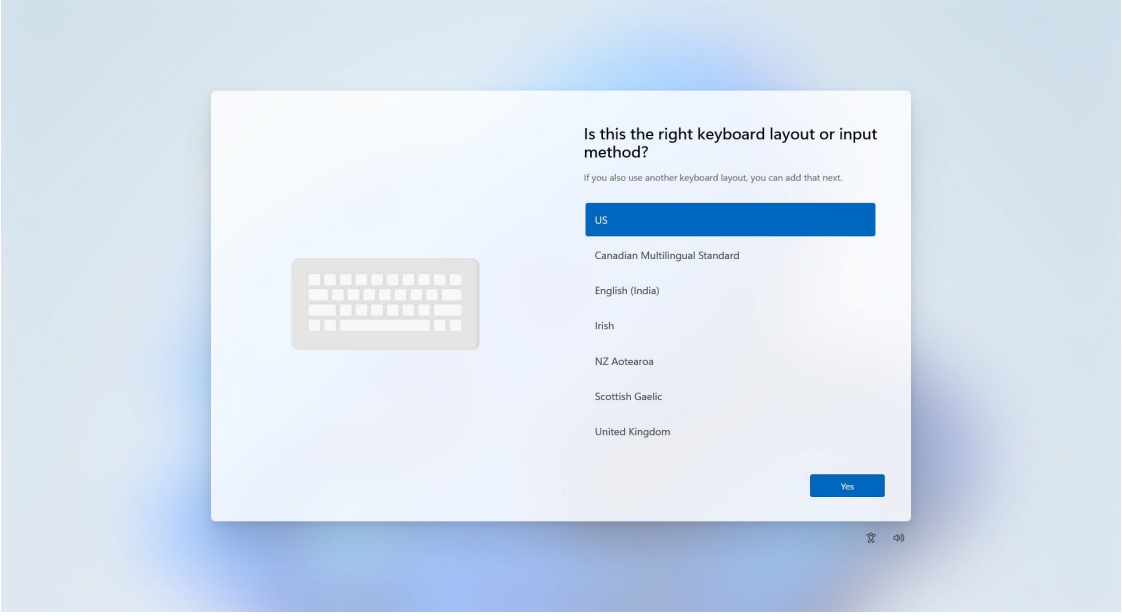
Initializing User Settings

The following is a non-exhaustive list of OOBE screens that you will see in the order that they are listed here:

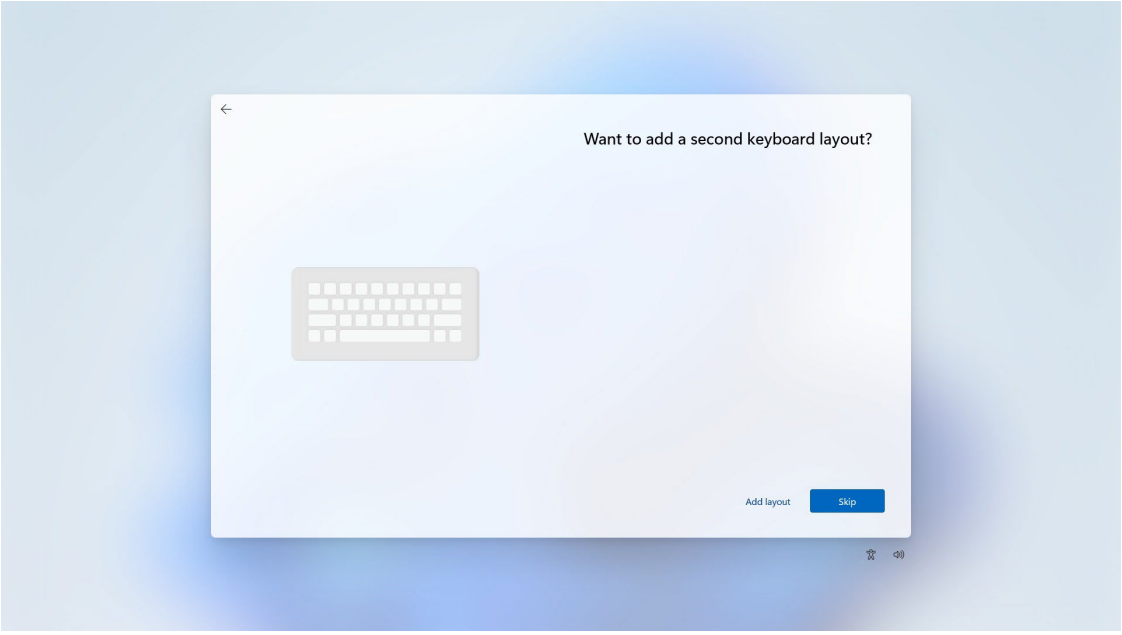
1. Select a region.



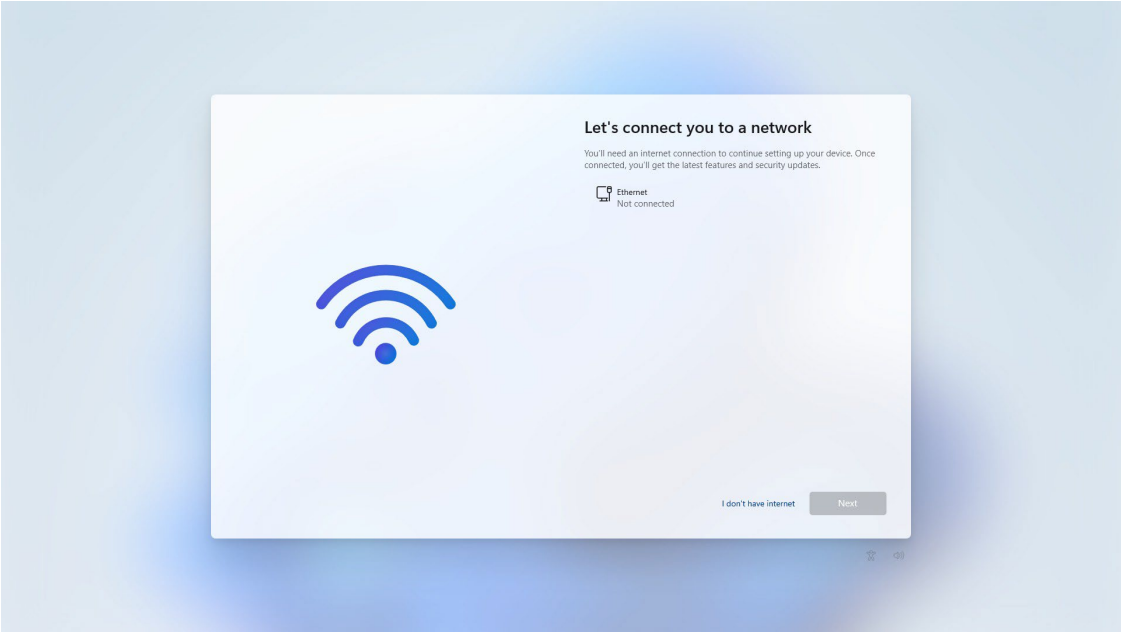
2. Select a keyboard.

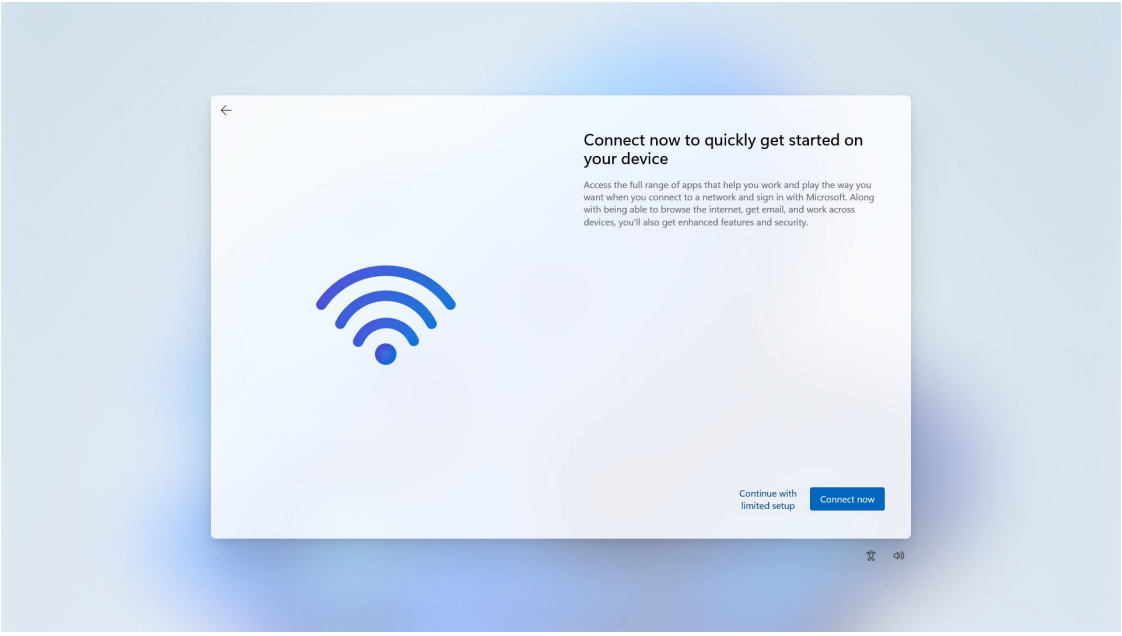


3. Select a second keyboard.

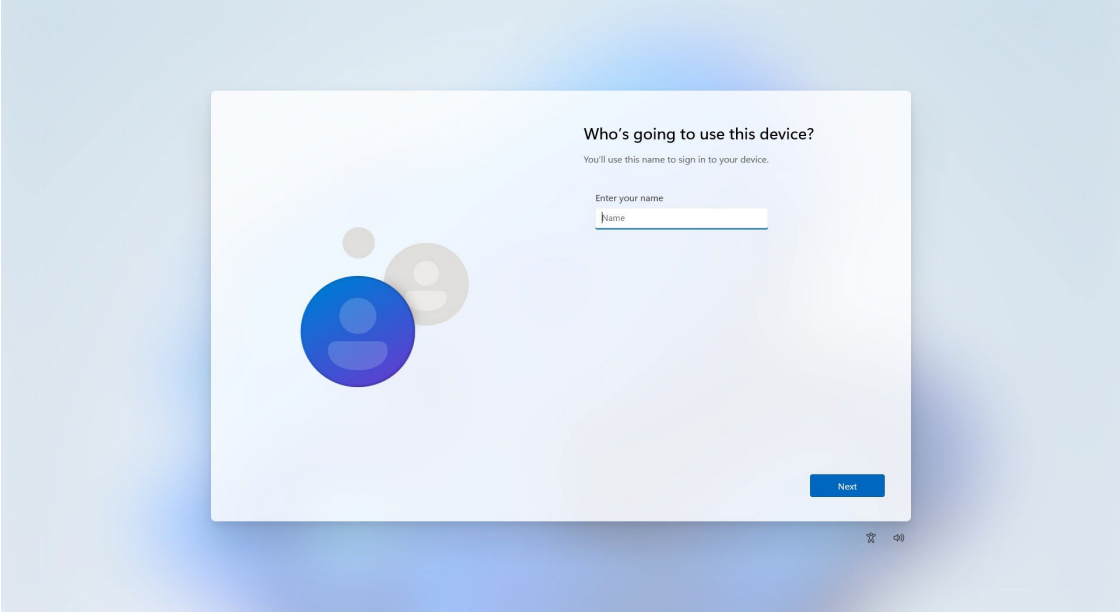


4. Connect to a network or continue with limited setup.

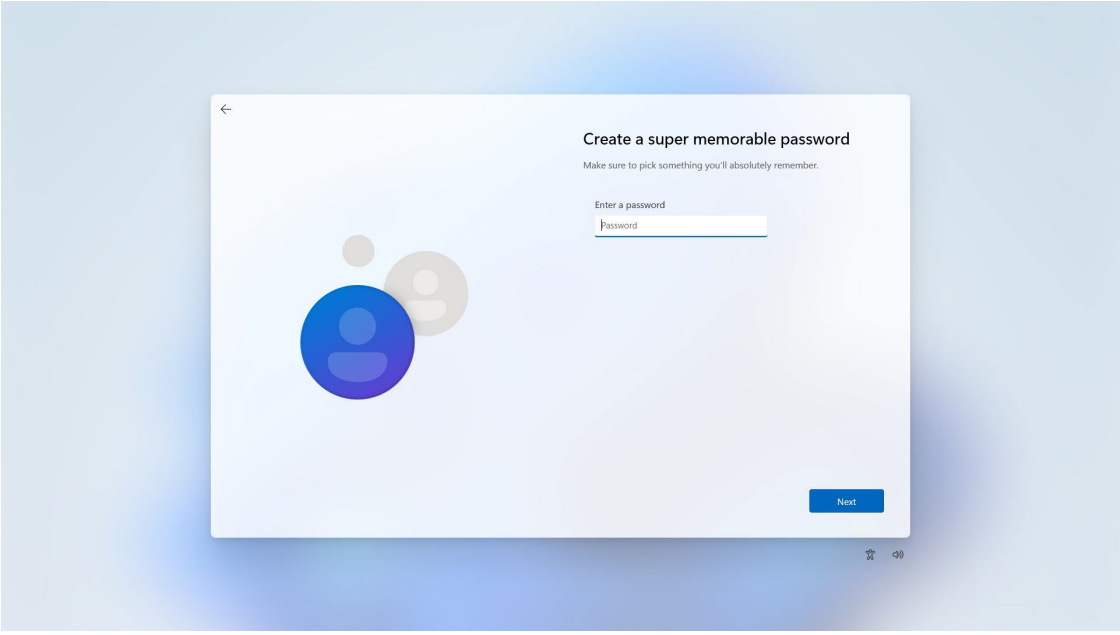




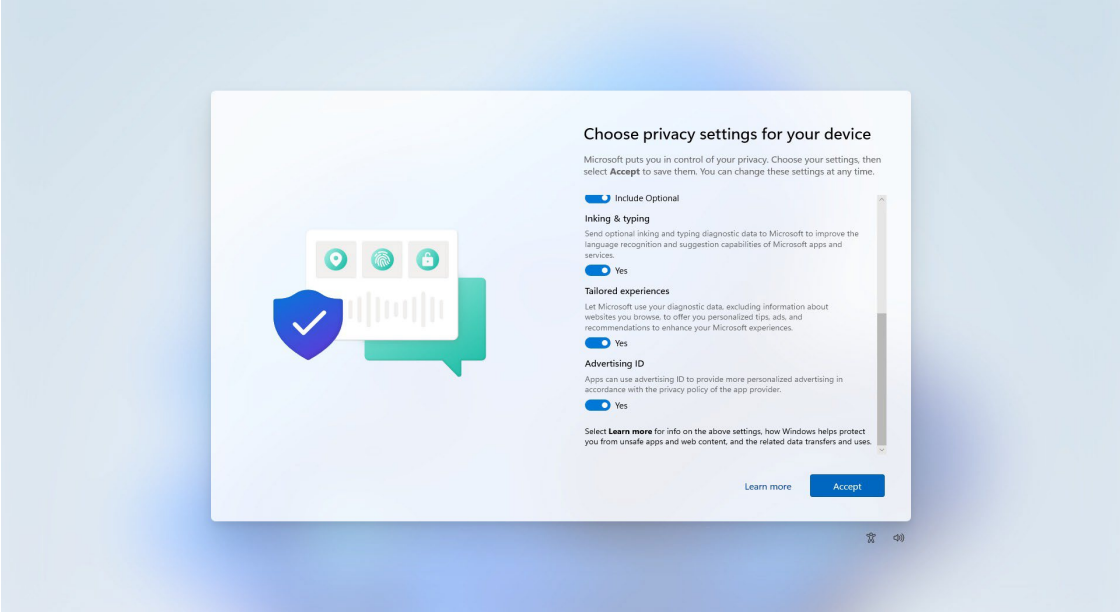
5. Sign in to or create a local account or a Microsoft account (MSA).



6. Set a password.

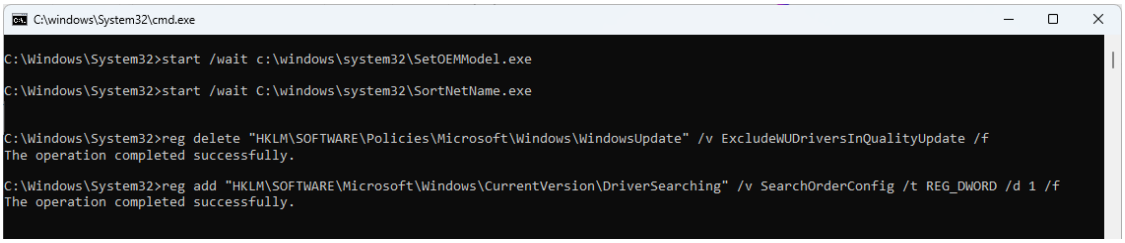


7. Choose your privacy settings.



Initializing System

- After the OOBE settings, you will be redirected to the device desktop. Wait until the process is complete.



- The device will now reboot, and the new settings will take effect after the system restarts.

3. BitLocker

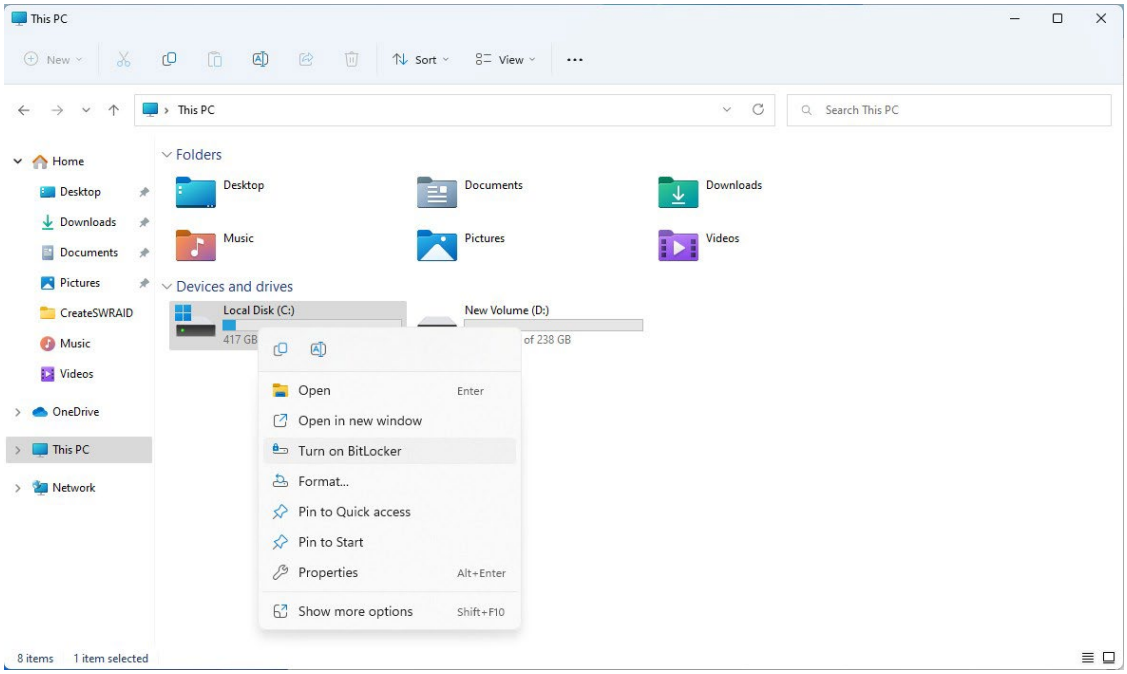
Bitlocker is a Windows disk encryption feature, designed to protect data by providing encryption for entire volumes. BitLocker addresses the threats of data theft or exposure from lost, stolen, or inappropriately decommissioned devices.

For more information about BitLocker:

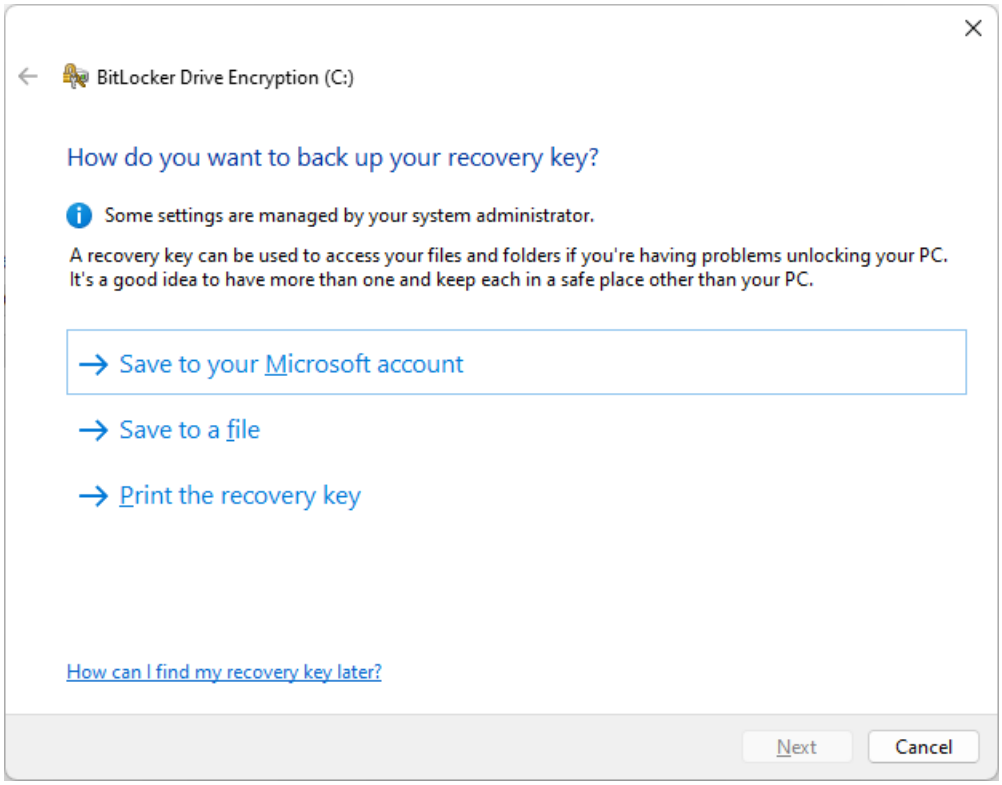
https://learn.microsoft.com/en-us/windows/security/operating- system-security/data-protection/bitlocker/

Enabling the BitLocker

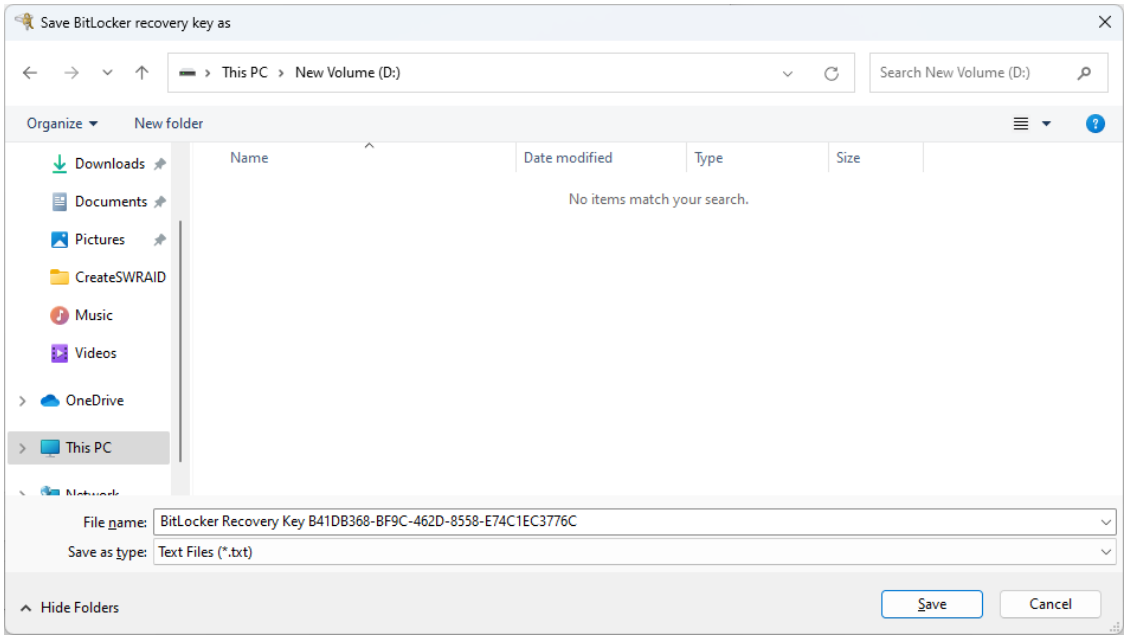
In the **Windows Devices and drives**, right-click on the drive and select **Turn on BitLocker**.



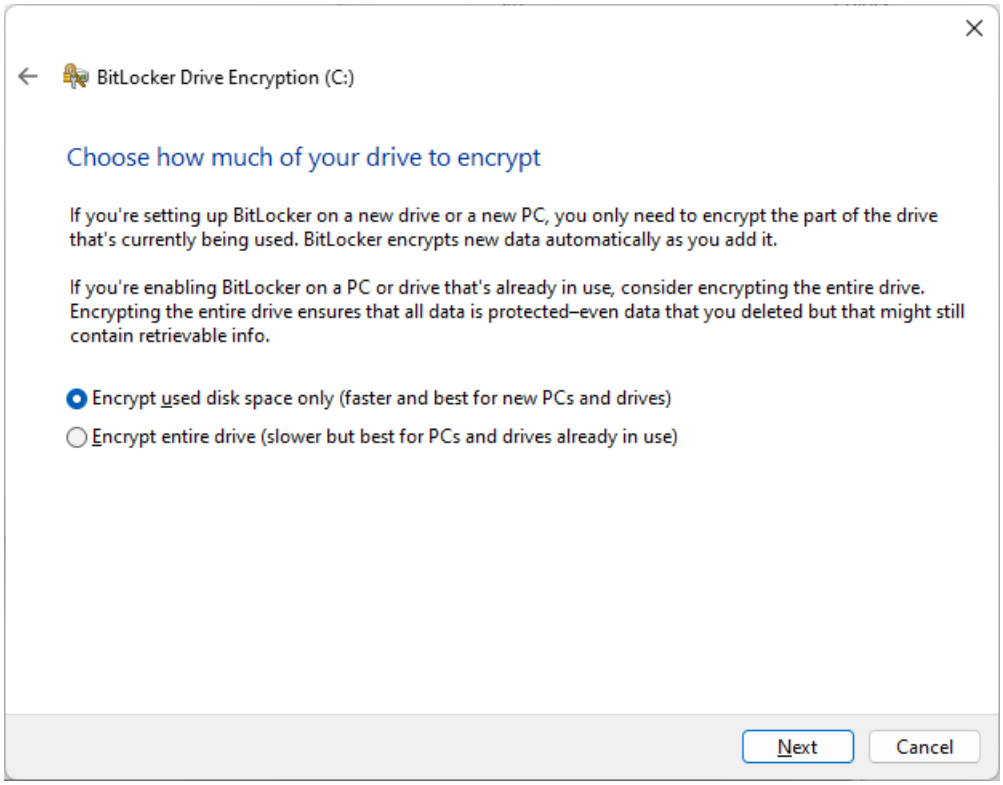
1. Select an option to back up the recovery key. For example, select **Save to a file**.

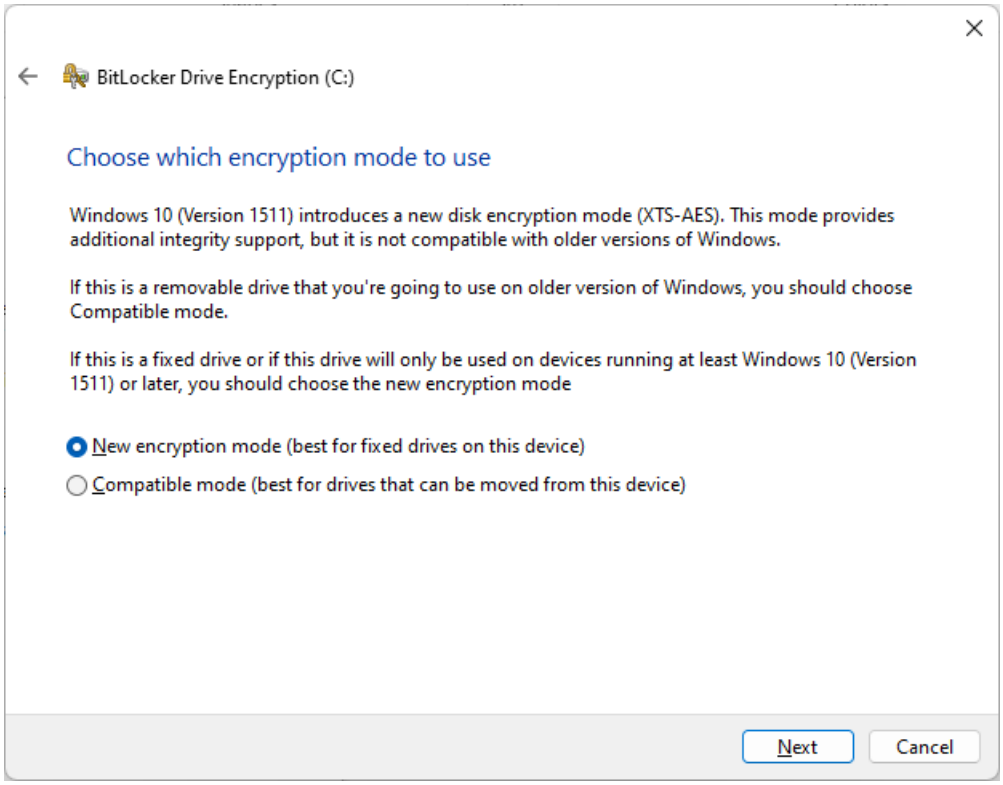


2. Select the path to store the file in.

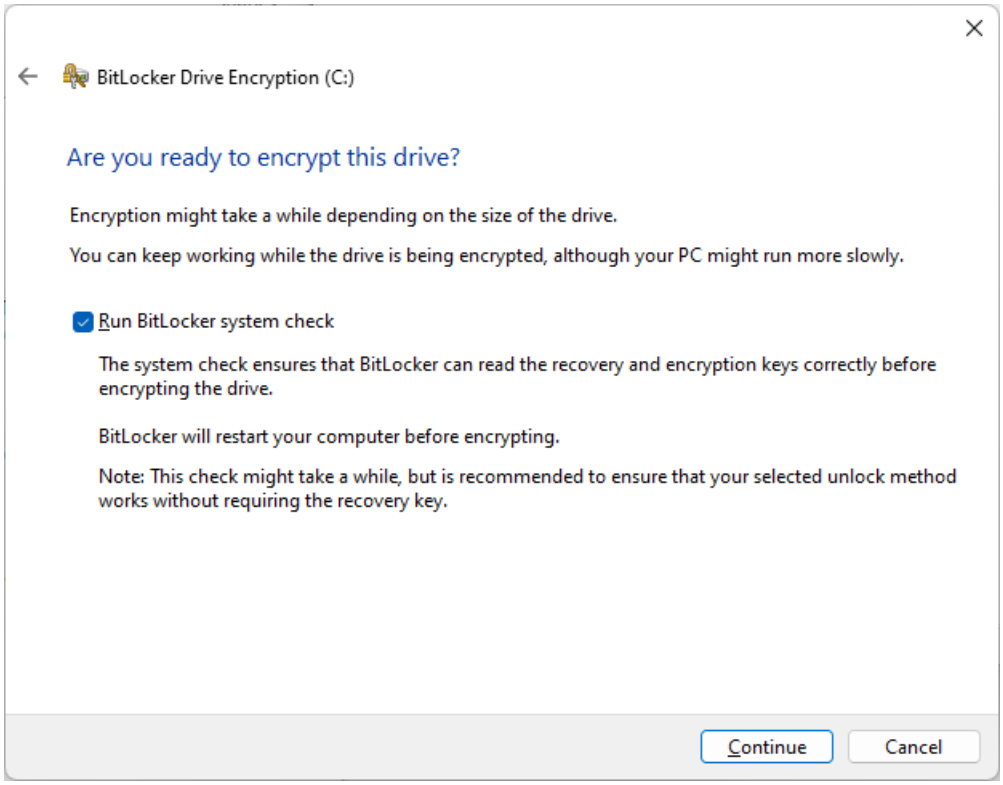


3. Follow the onscreen instructions to specify the drive encryption options.

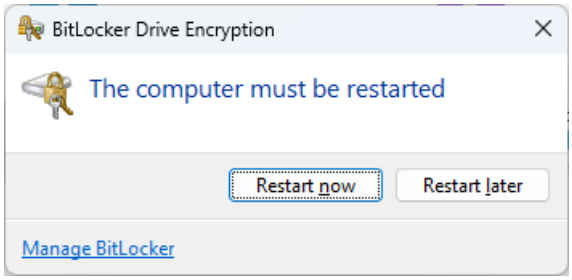




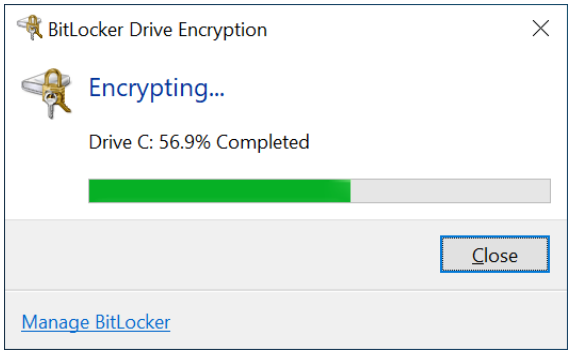
4. Click **Continue**.



5. Restart the computer.

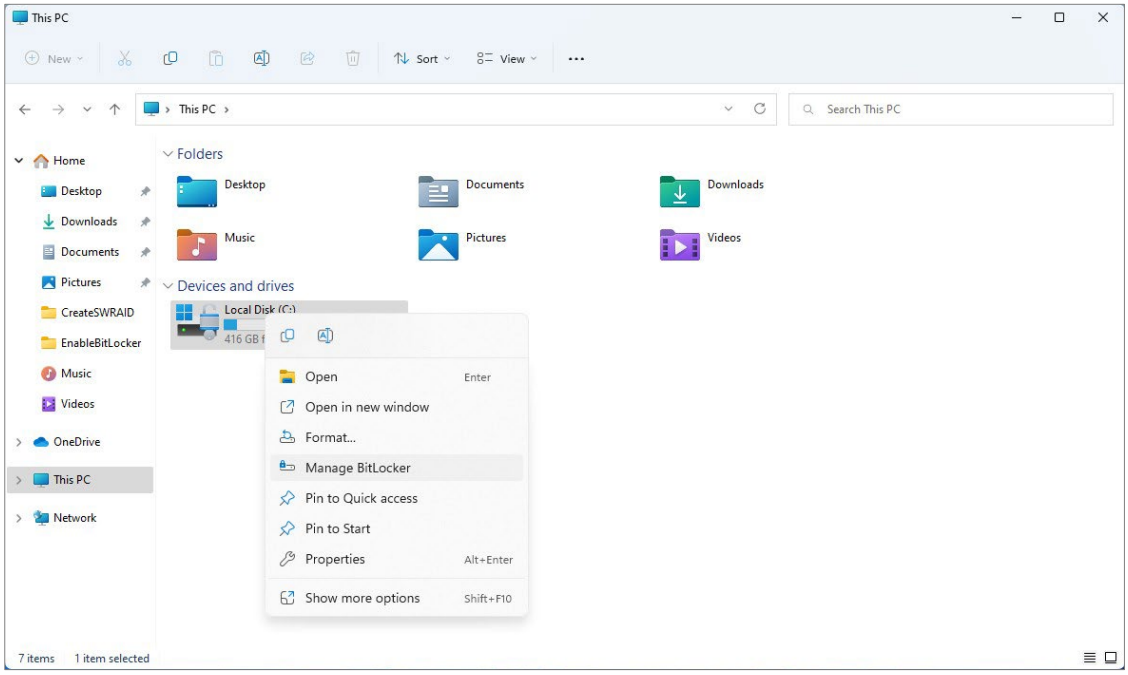


6. Wait for the encryption process to complete and then click **Close**.

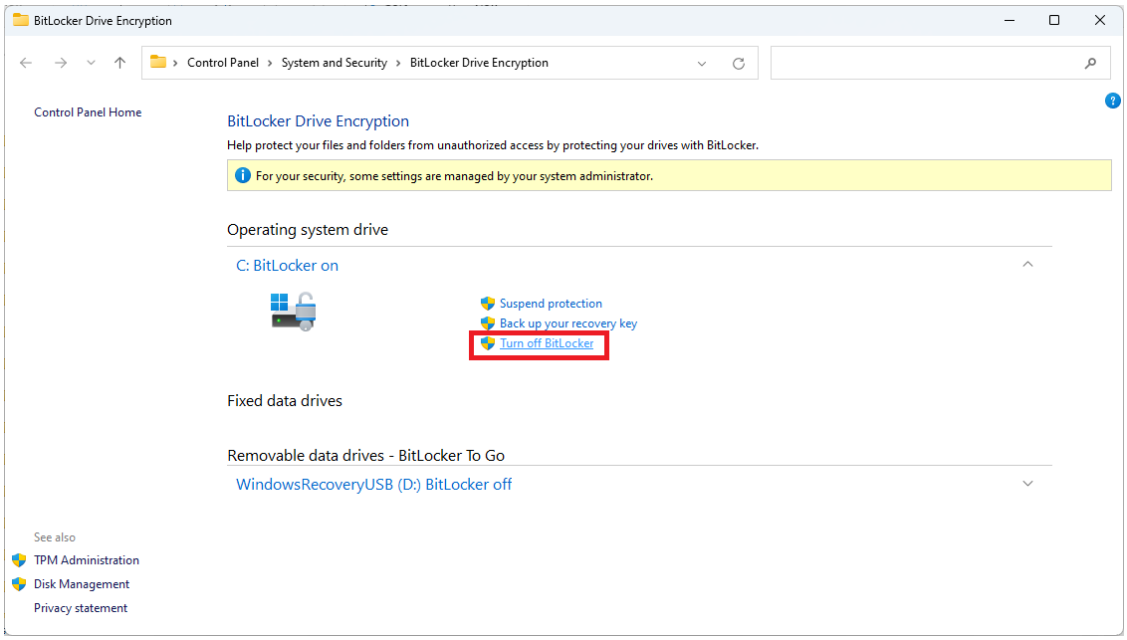


Disabling the BitLocker

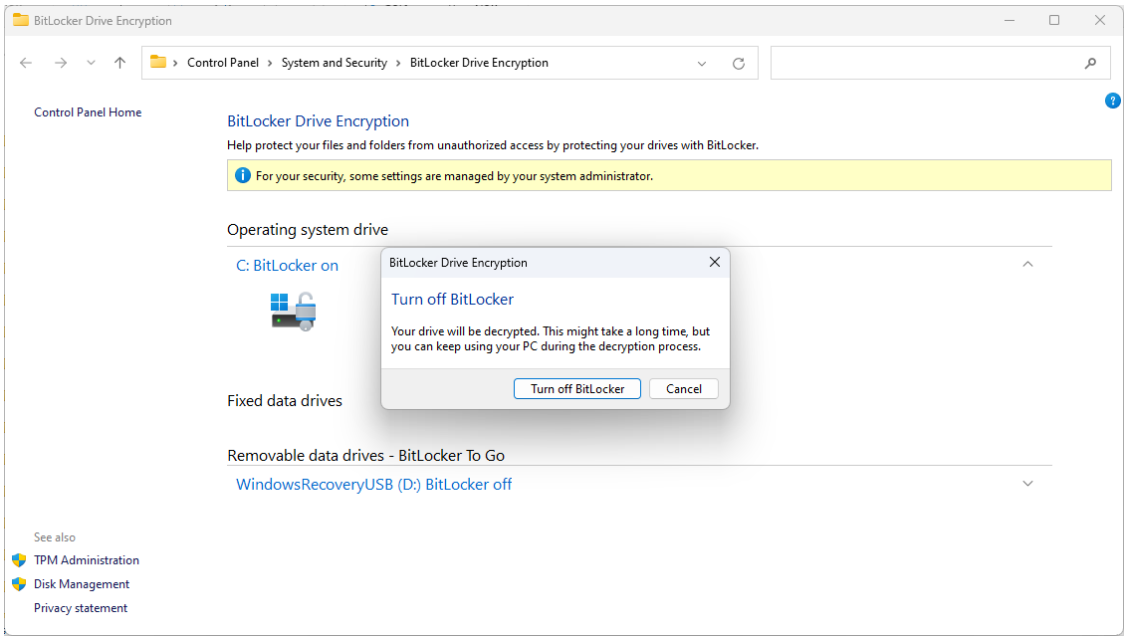
1. In the **Windows Devices and drives**, right-click on the drive and select **Manage BitLocker**.

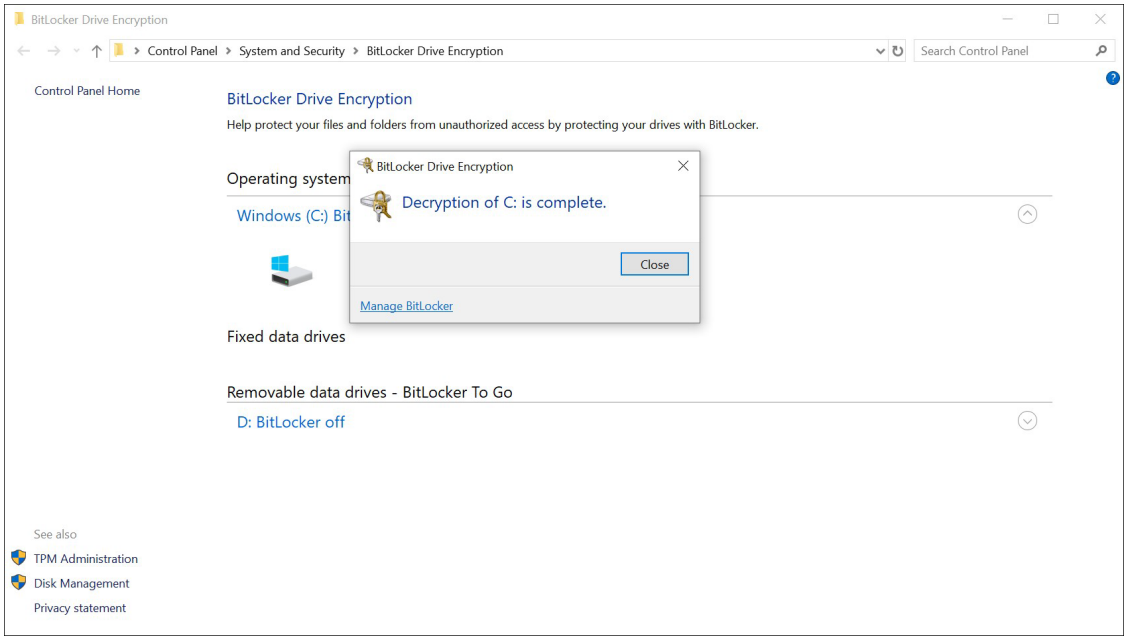


2. Click on **Turn off BitLocker**.

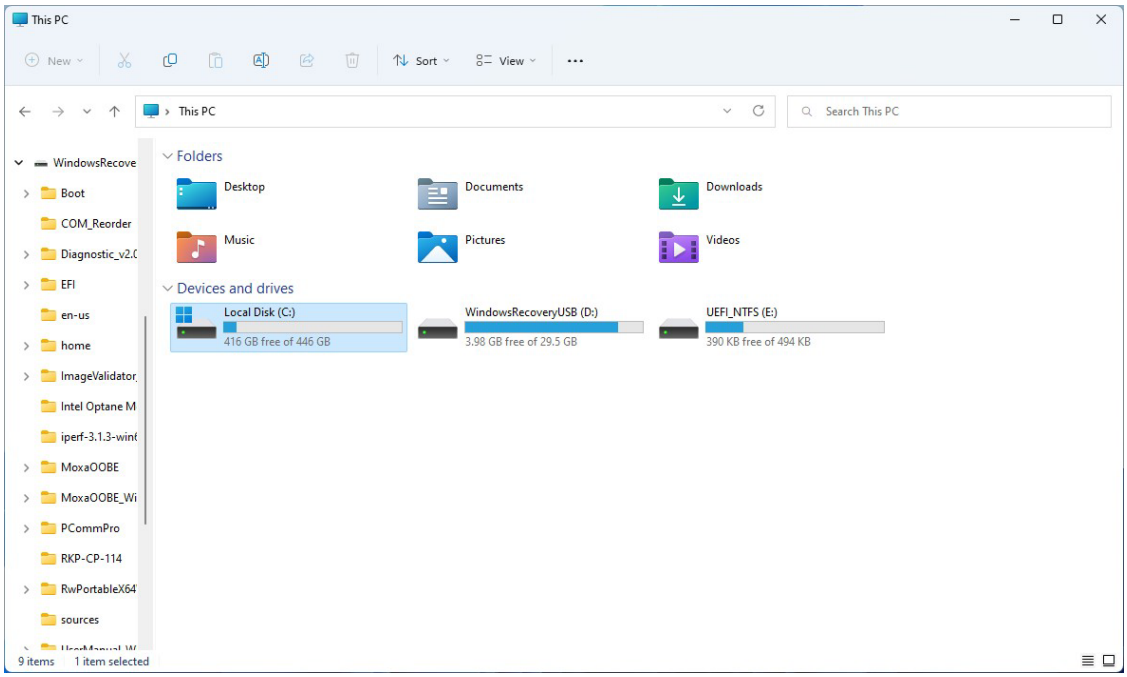


3. Wait for the decryption process to complete and click **Close** to exit the program.





4. Check the disk status after the decryption process is completed.



4. RAID

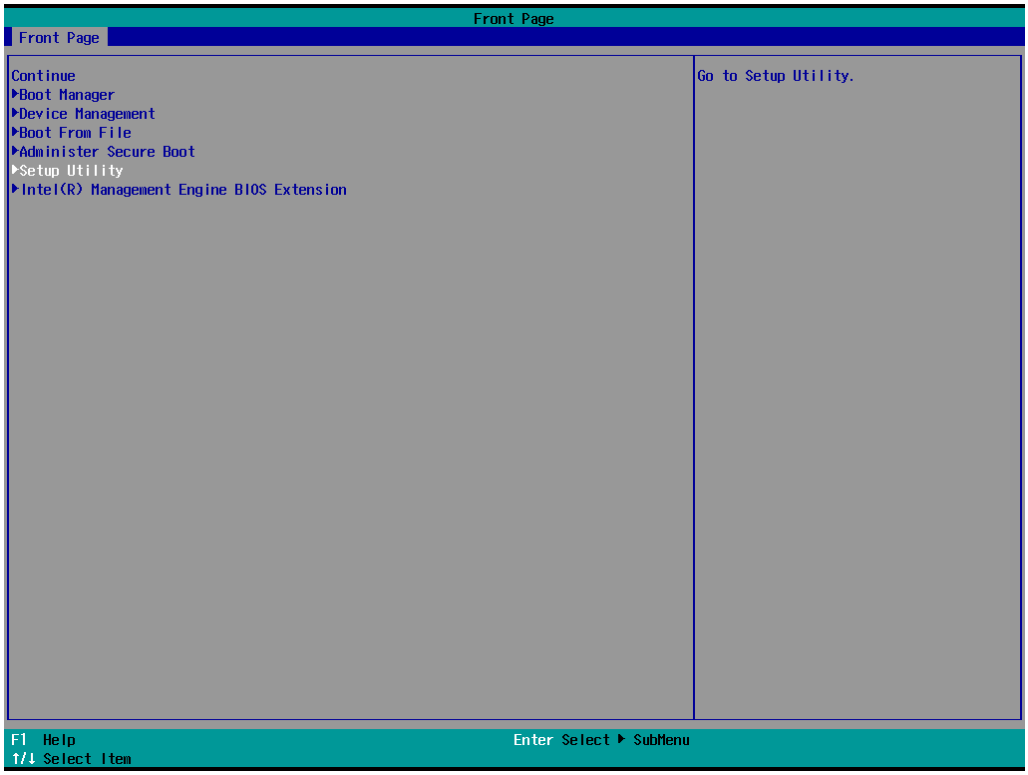
RAID stands for Redundant Array of Independent Disk which enables combining multiple disks into one or more logical units for data redundancy, performance improvement, or both. This chapter describes the setup process for Intel® RAID (Intel® RST) and SW RAID.

NOTE

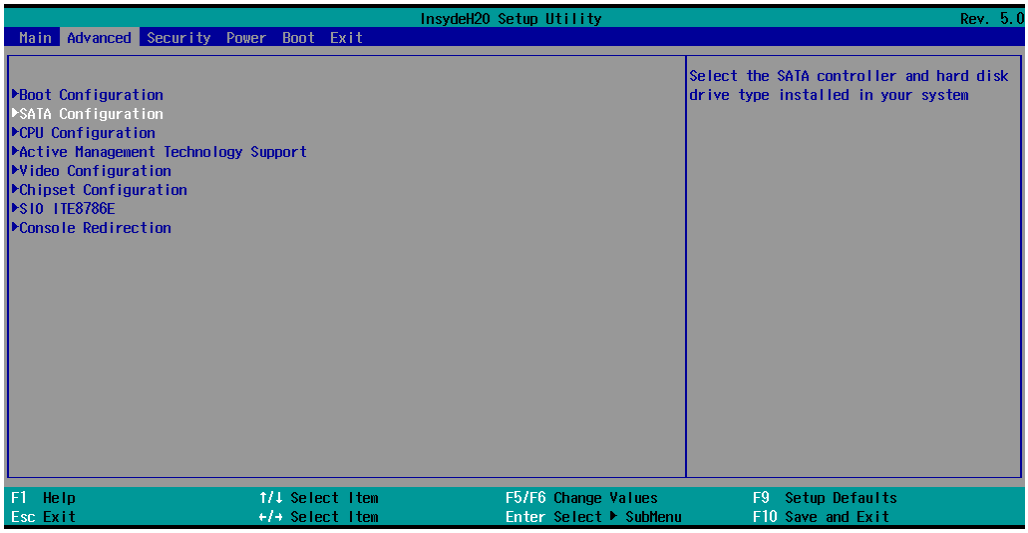
- The RAID function is only supported for the RKP-C110 Series (including 2HV models) and RKP-C220 Series.
- When configuring Intel® RAID, drives must be of the same type to form a RAID array.
  SSDs (SATA-based) can only be grouped with other SSDs, while NVMe drives must be grouped exclusively with other NVMe drives. Mixing different types of storage devices (e.g., SATA SSDs with NVMe SSDs) in the same RAID volume is not supported.

Intel® RAID—Changing the RAID Mode

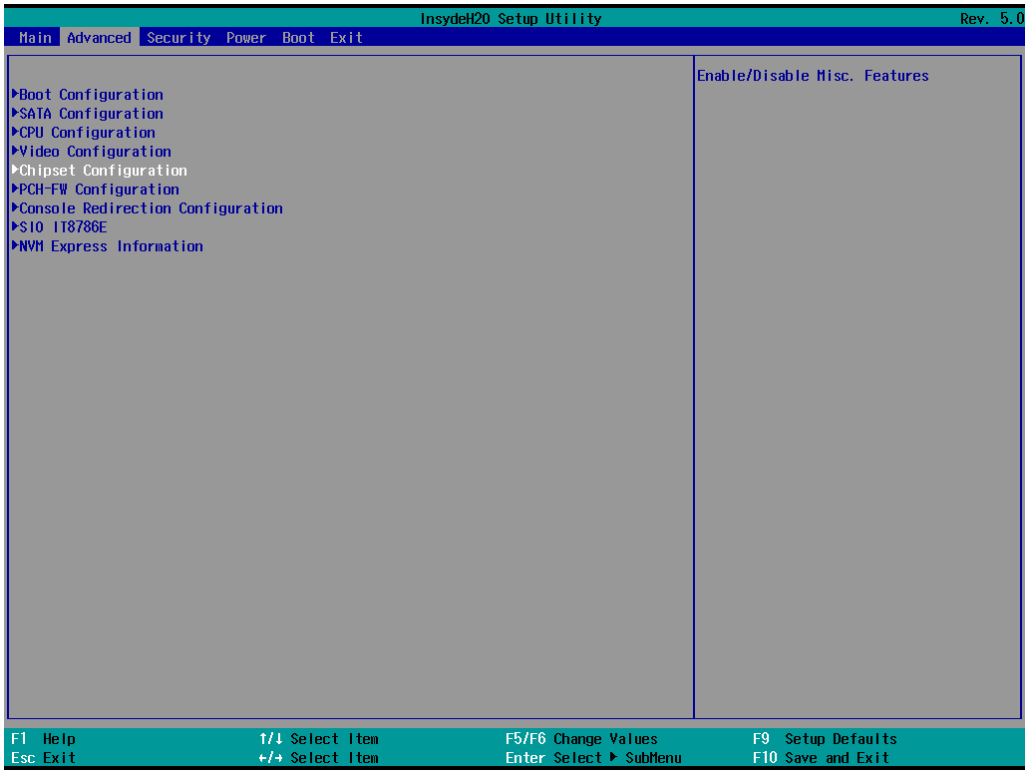
1. Power on the computer and press **F2** to enter the BIOS menu.
2. Select **Setup Utility**.



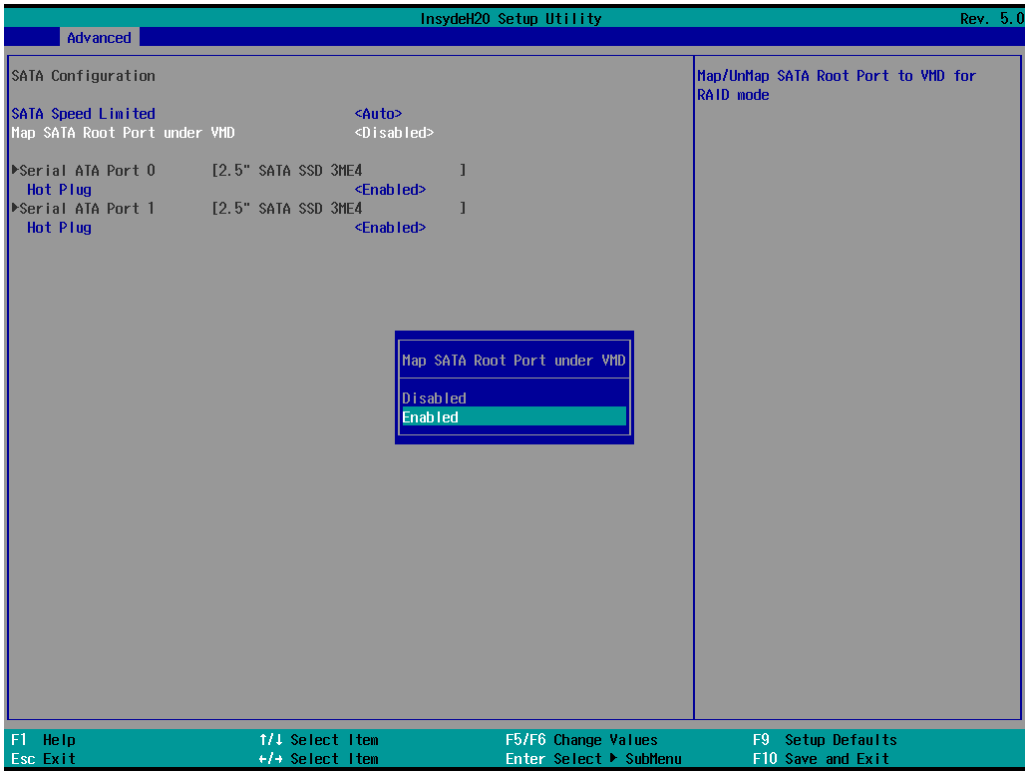
3. **RKP-C110 Series:**
   Select **SATA Configuration**.

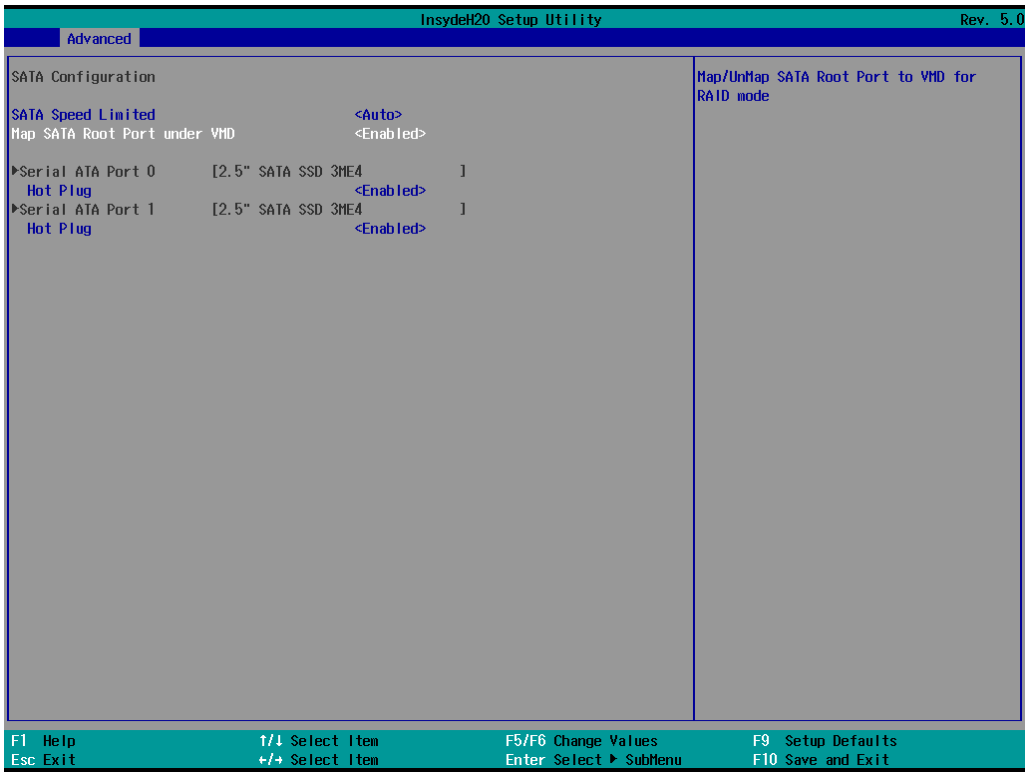


RKP-C220 Series:
Select **Chipset Configuration**.

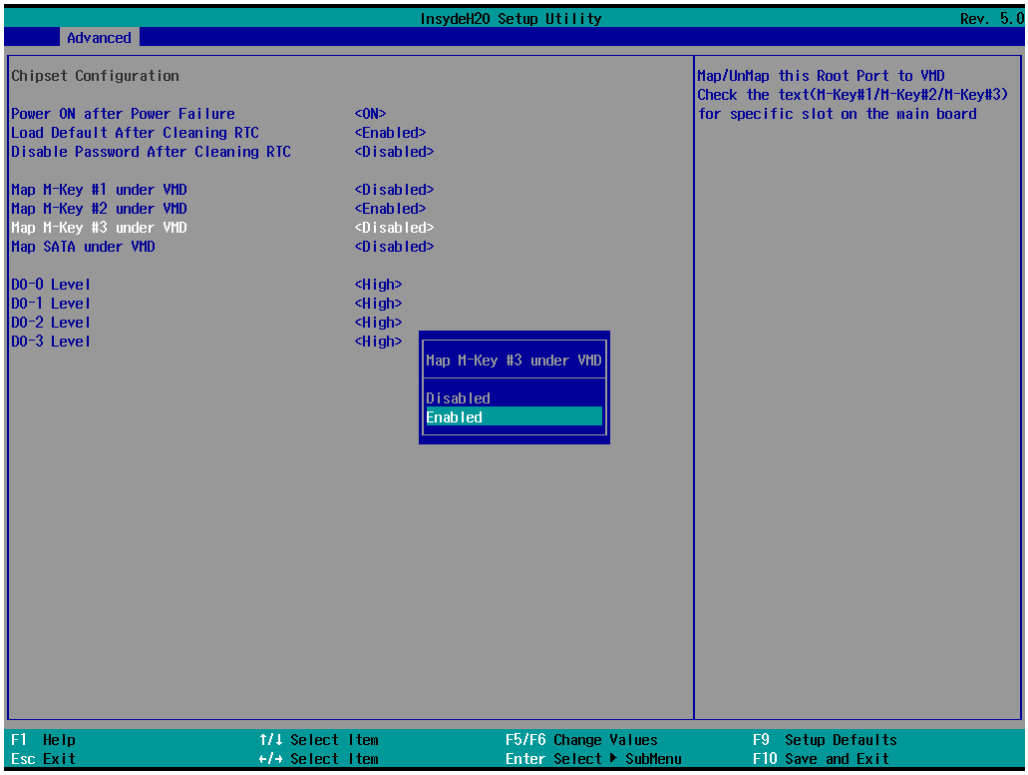


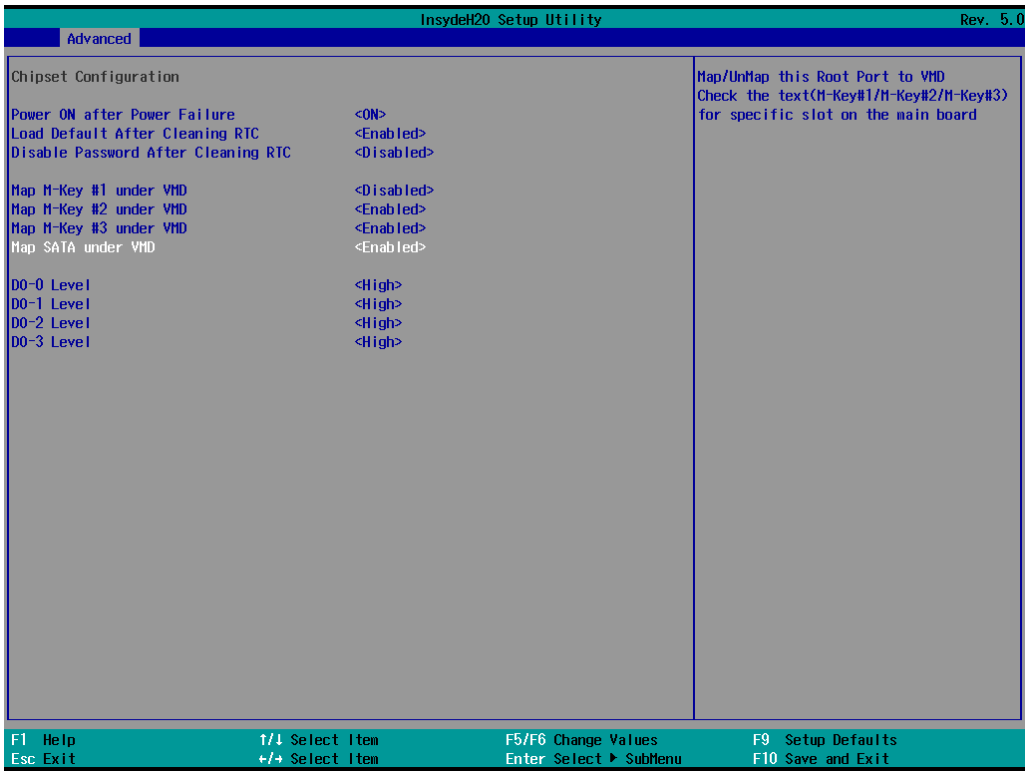
4. **RKP-C110 Series:**
   a. Select **Map SATA Root Port under VMD** and then select **Enabled**.
   b. Enable the **Hot Plug** function on all ports.



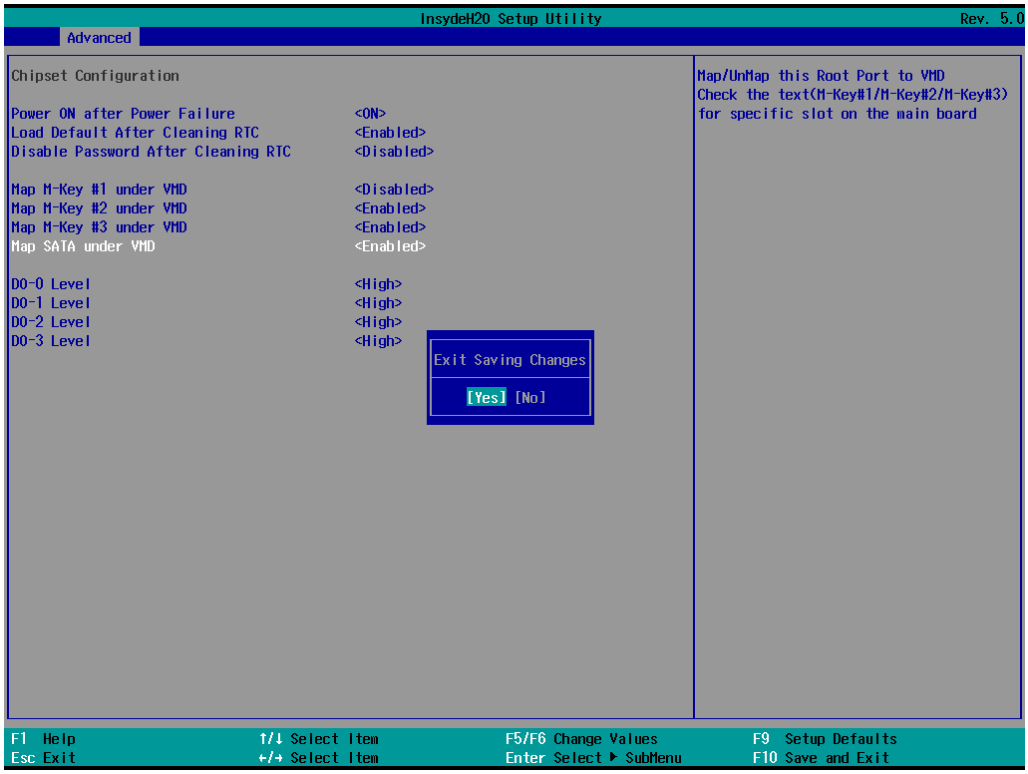


RKP-C220 Series:
After enabling **Map XXXX** under **VMD**.





5. Press **F10** and select **Yes** to exit after saving the settings.

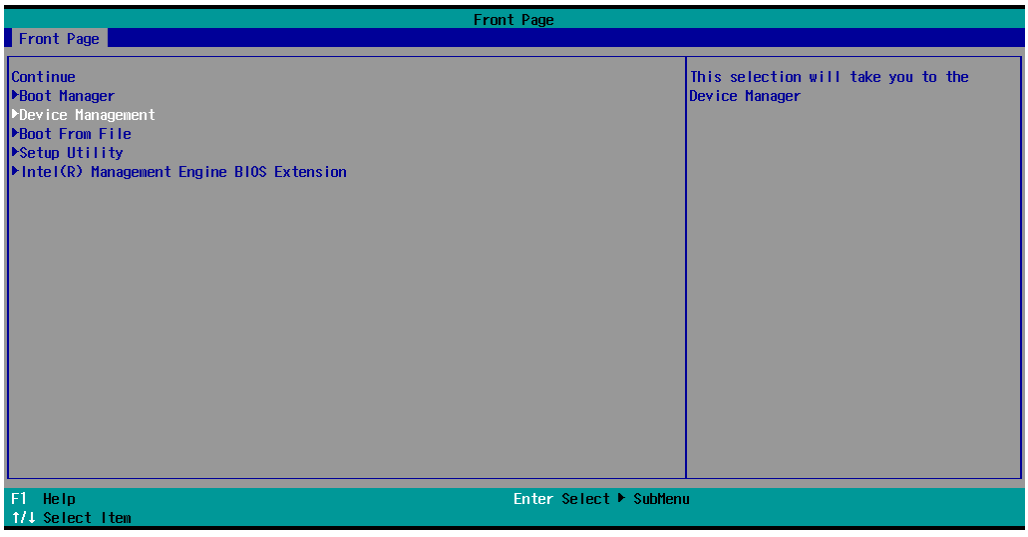


Intel® RAID—Creating a RAID Disk in the BIOS

NOTE

When configuring Intel RAID, drives must be of the same type to form a RAID array. SSDs (SATA-based) can only be grouped with other SSDs, while NVMe drives must be grouped exclusively with other NVMe drives. Mixing different types of storage devices (e.g., SATA SSDs with NVMe SSDs) in the same RAID volume is not supported.

1. Power on the computer and press **F2** to enter the BIOS menu.
2. Select **Device Management**.

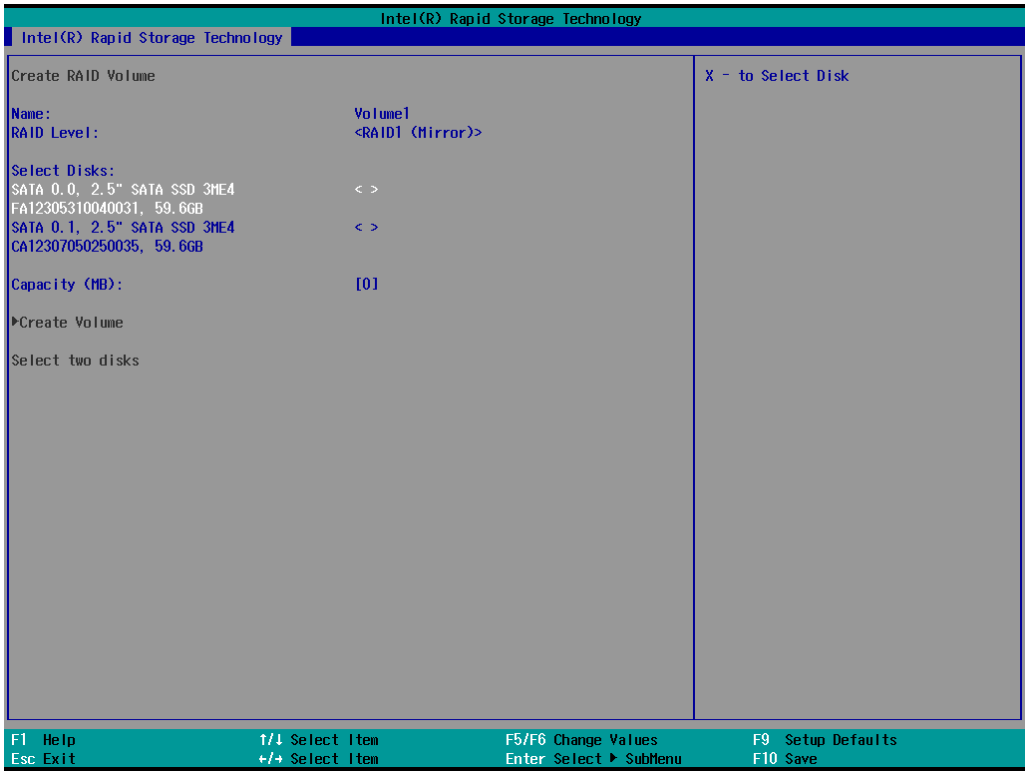


3. Select **Intel® Rapid Storage Technology**.

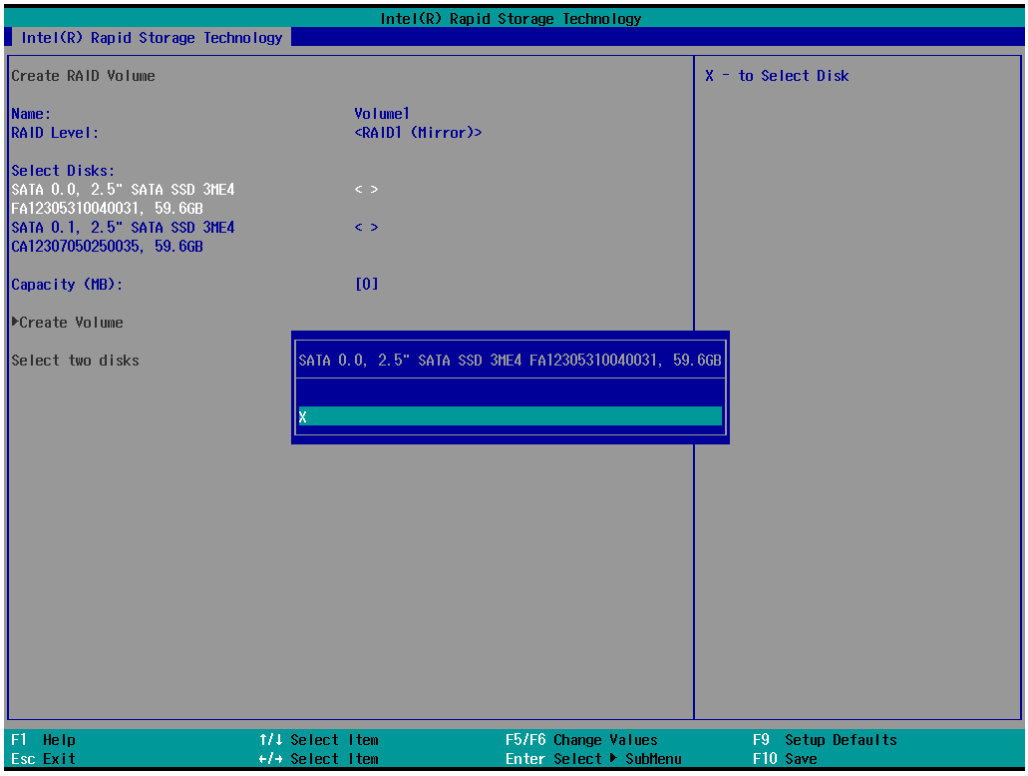
4. Select **Create RAID Volume**.

5. Select the **RAID Level** and then press **Enter** to select the raid level; for example, **RAID1(Mirror)**.

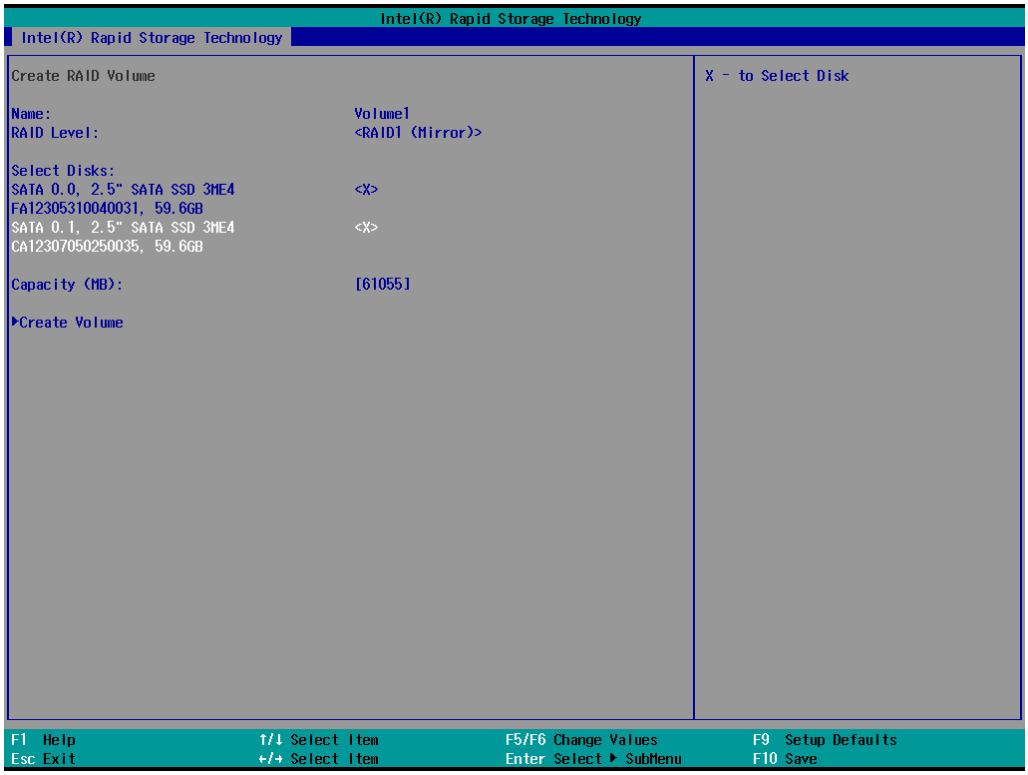
6. Select the target disk.



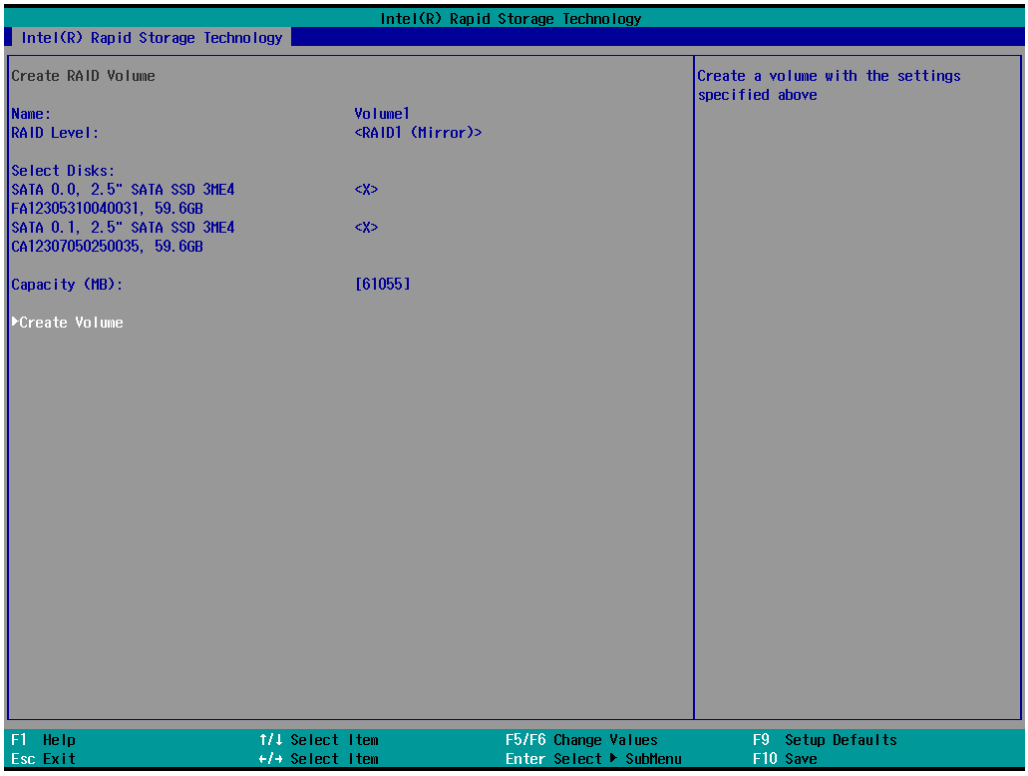
7. Enter **X** and press **Enter**.



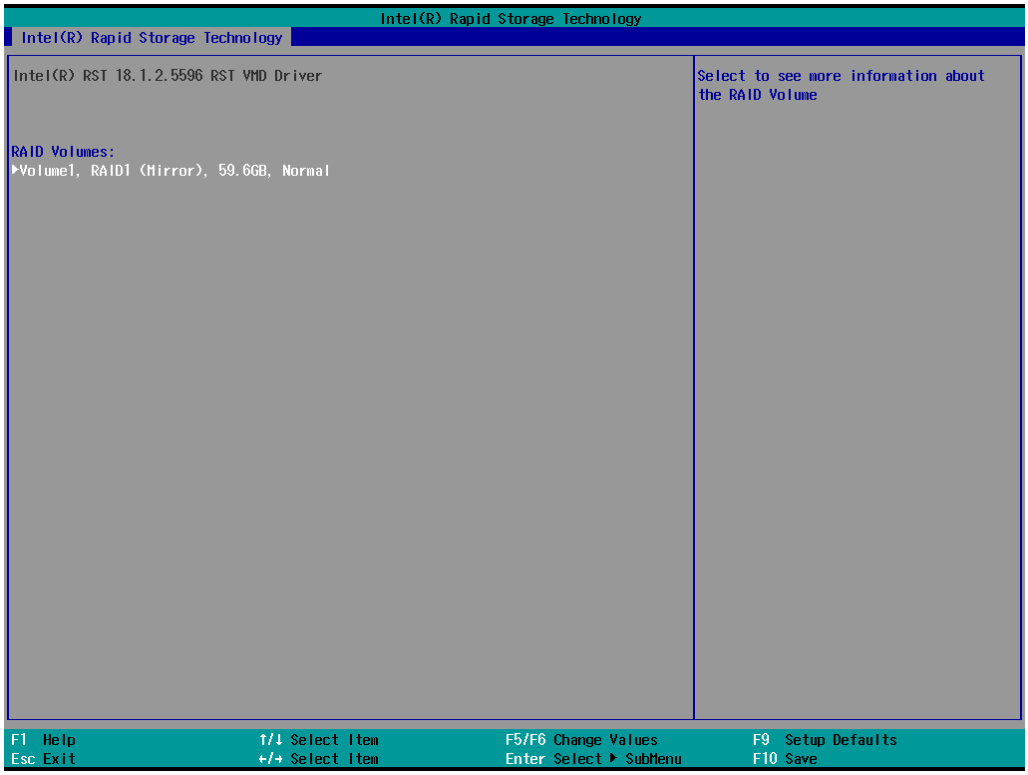
The disk shows an **X** next to it to indicate its selection.



8. Select **Create Volume**.



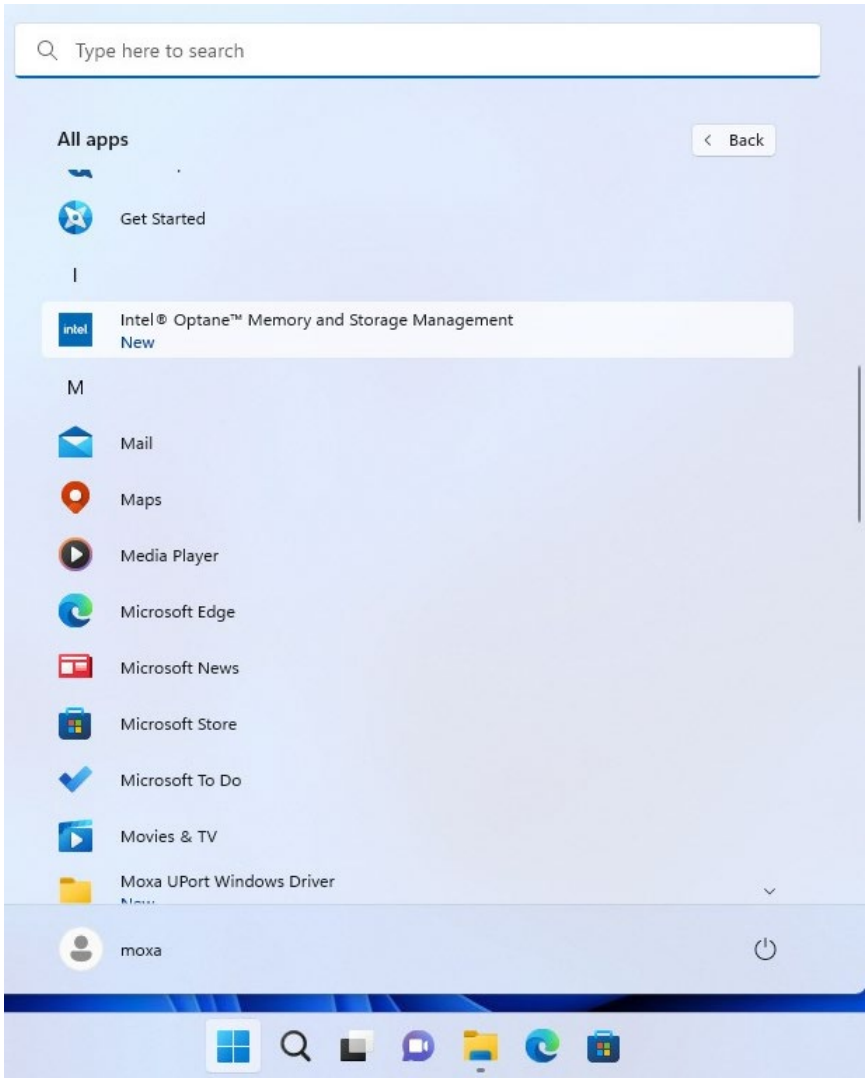
9. A RAID volume is created based on the settings specified.



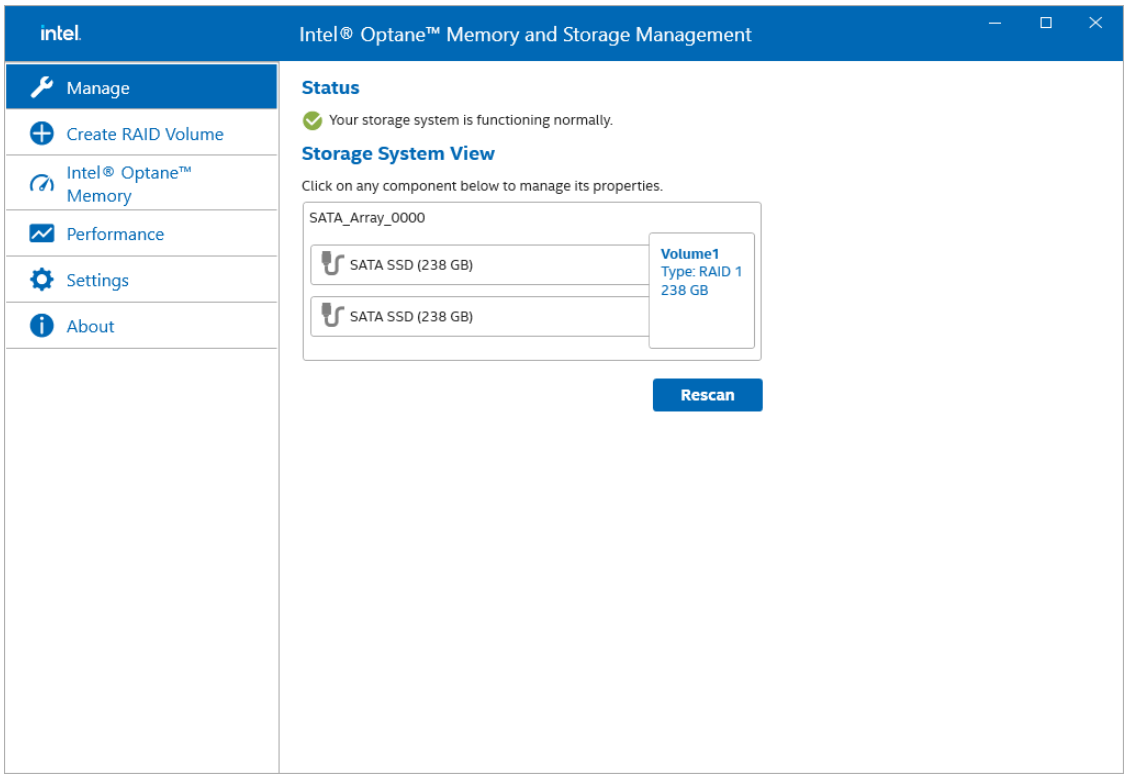
10. Press **F10** to save the settings.

Intel® RAID—Replacing a Disk

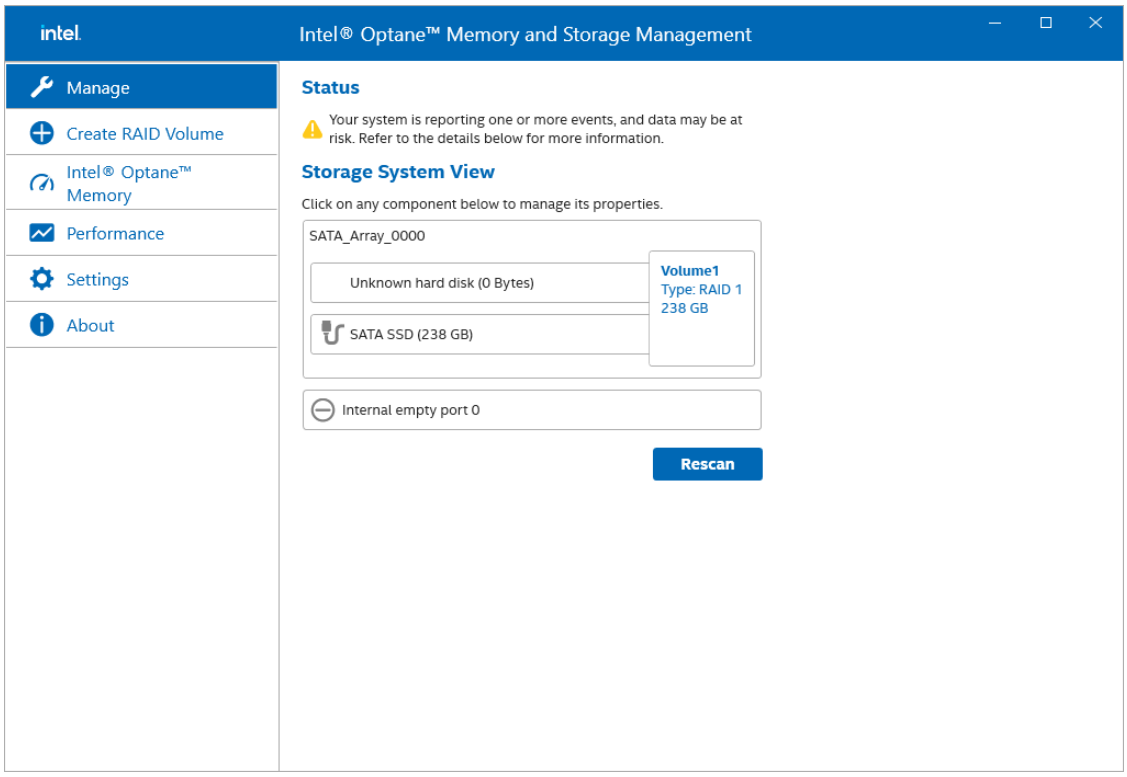
1. Run **Intel® Optane™ Memory and Storage Management** from the Windows start menu.



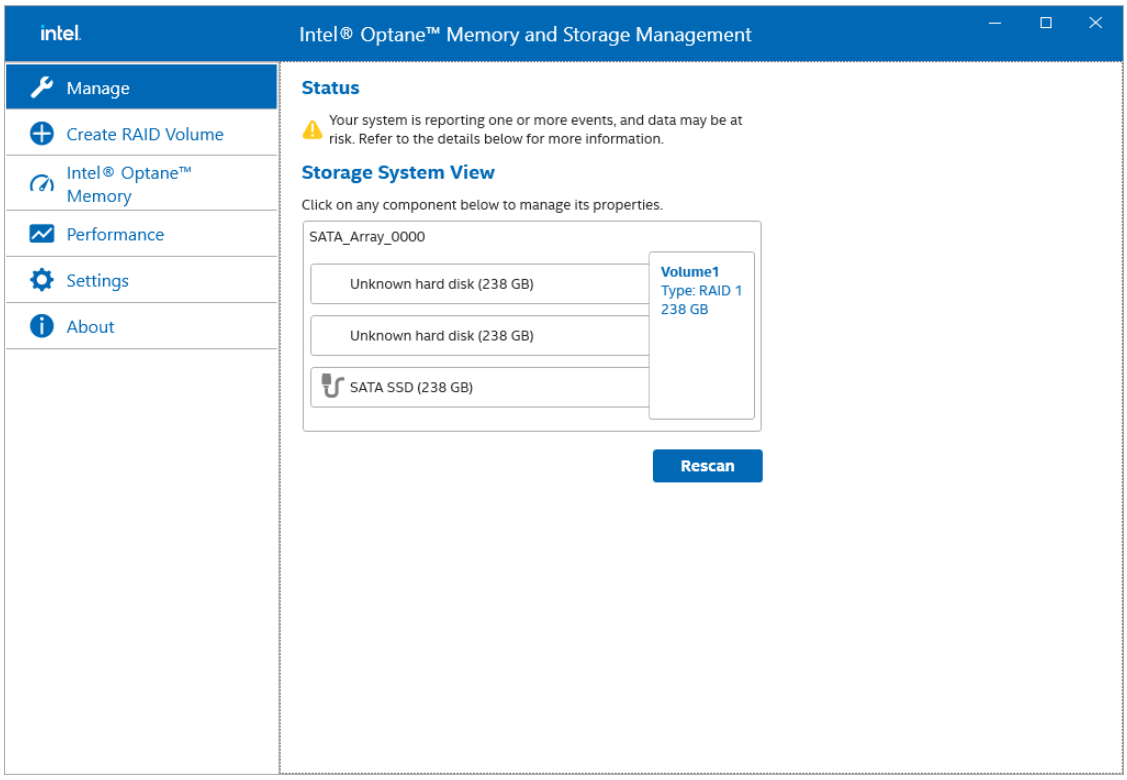
2. Physically unplug the target SSD from the computer.



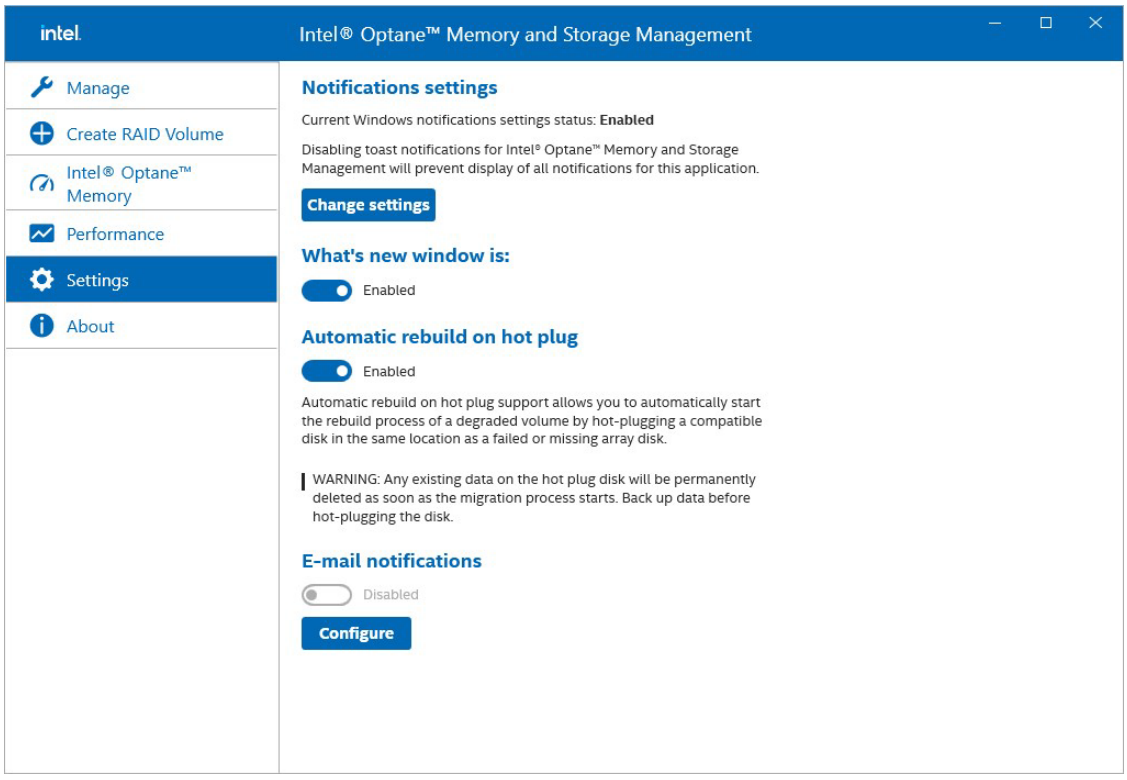
The status of the SSD that is unplugged will change to **Unknown hard disk (0 Bytes)** as shown here:



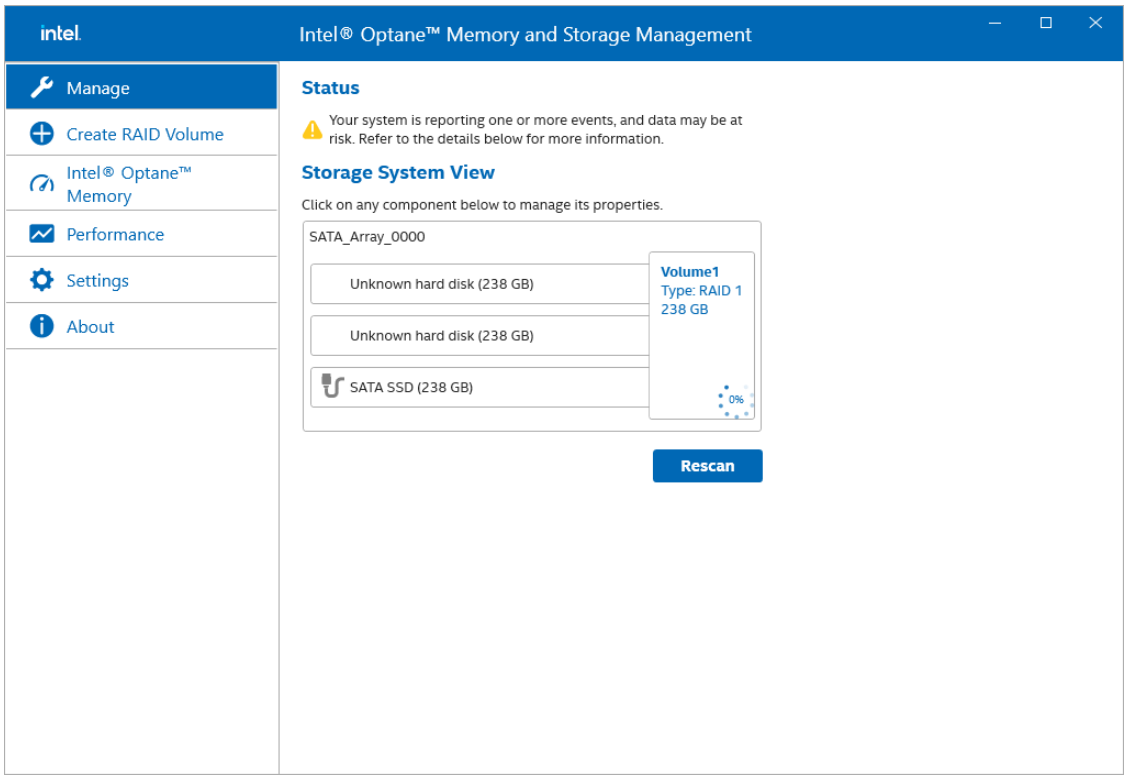
3. Install the new SSD in the same location.

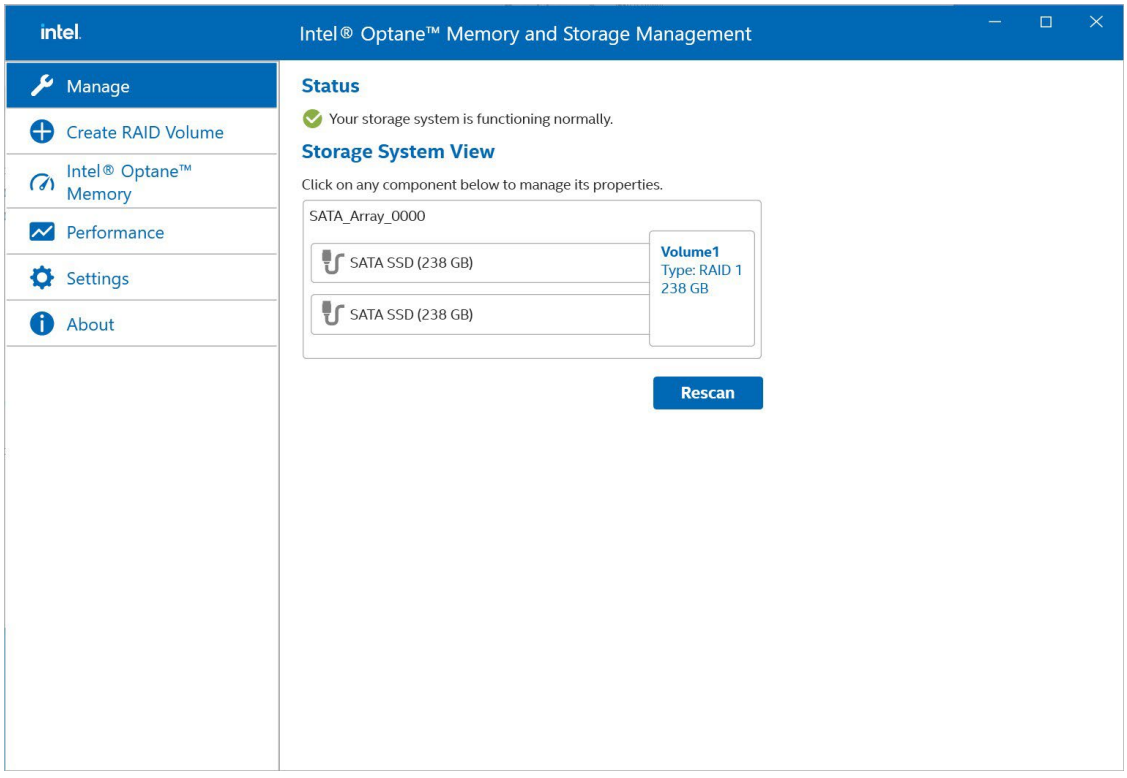


4. Click **Settings** and enable **Automatic rebuild on hot plug**.



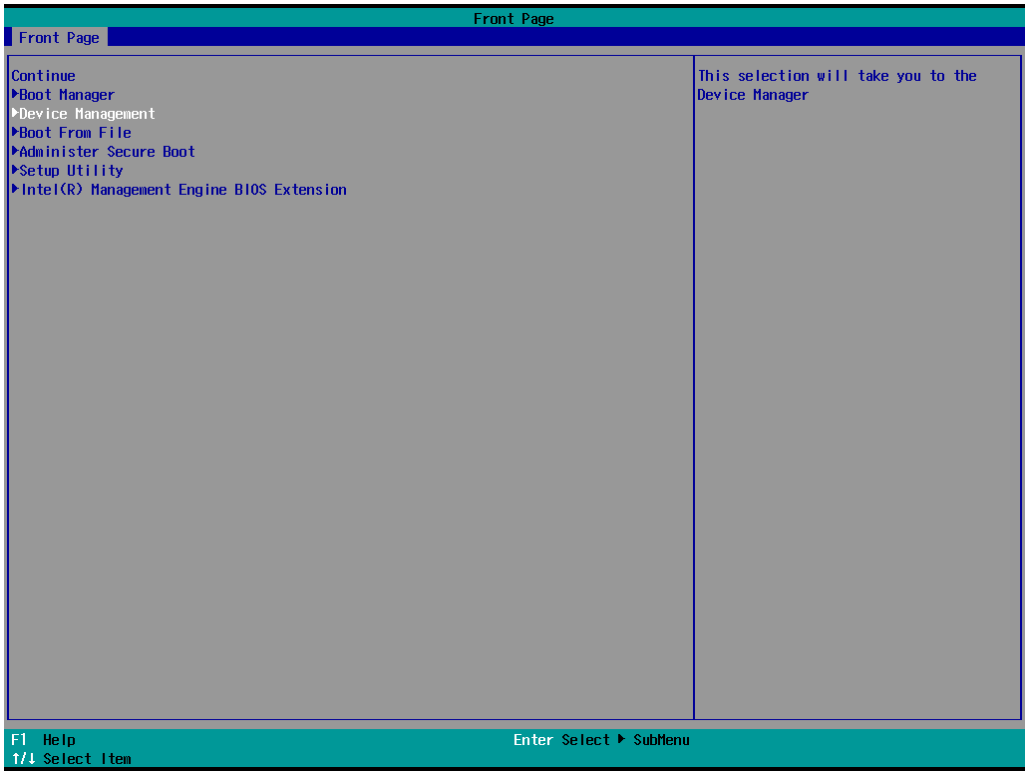
5. The system will start rebuilding the storage volume.
   Wait for the rebuild process to complete.





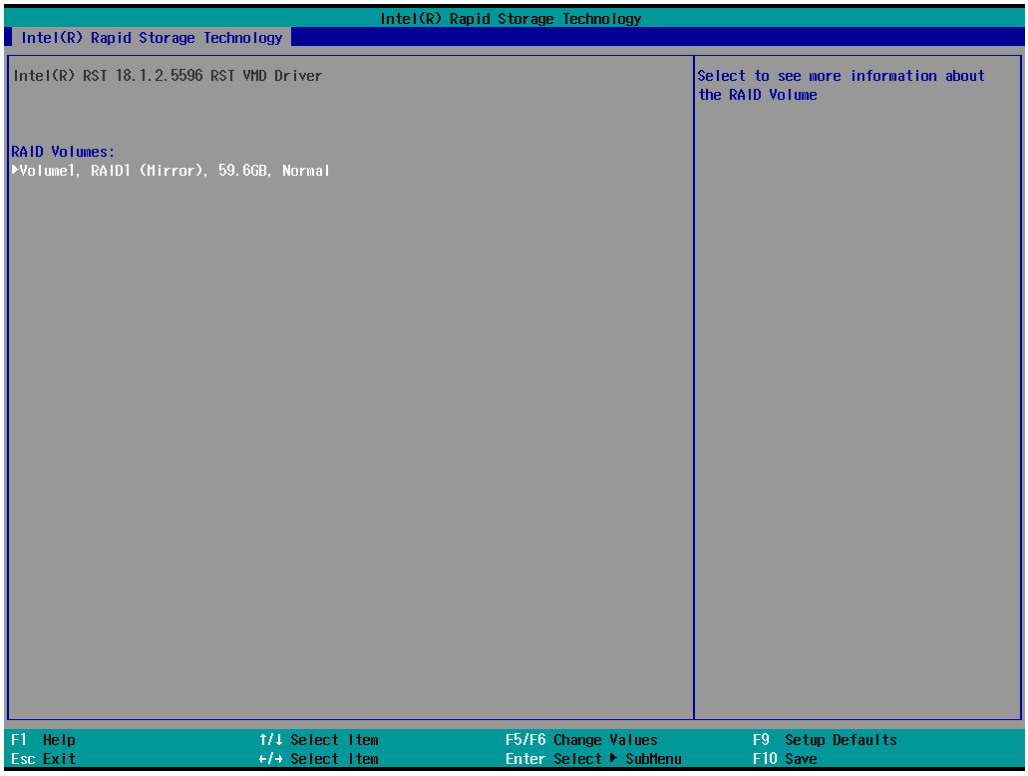
Intel® RAID—Removing a RAID Volume From the BIOS

1. Power on the computer and press **F2** to enter the BIOS menu.
2. Select **Device Management**.

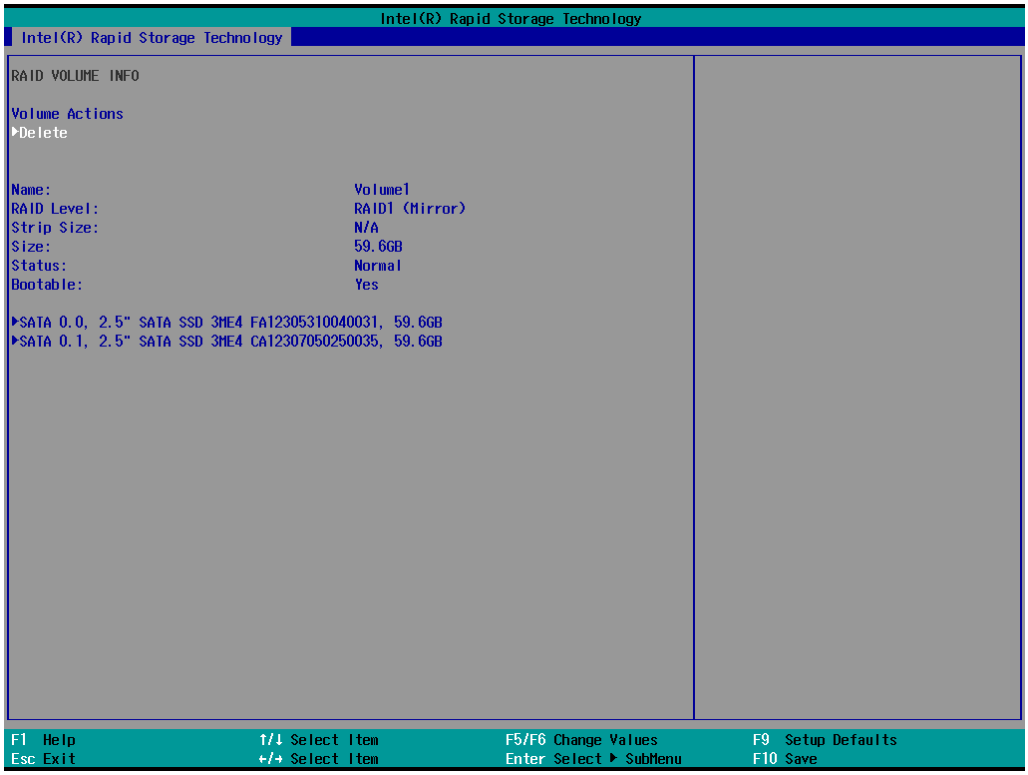


3. Select **Intel® Rapid Storage Technology**.

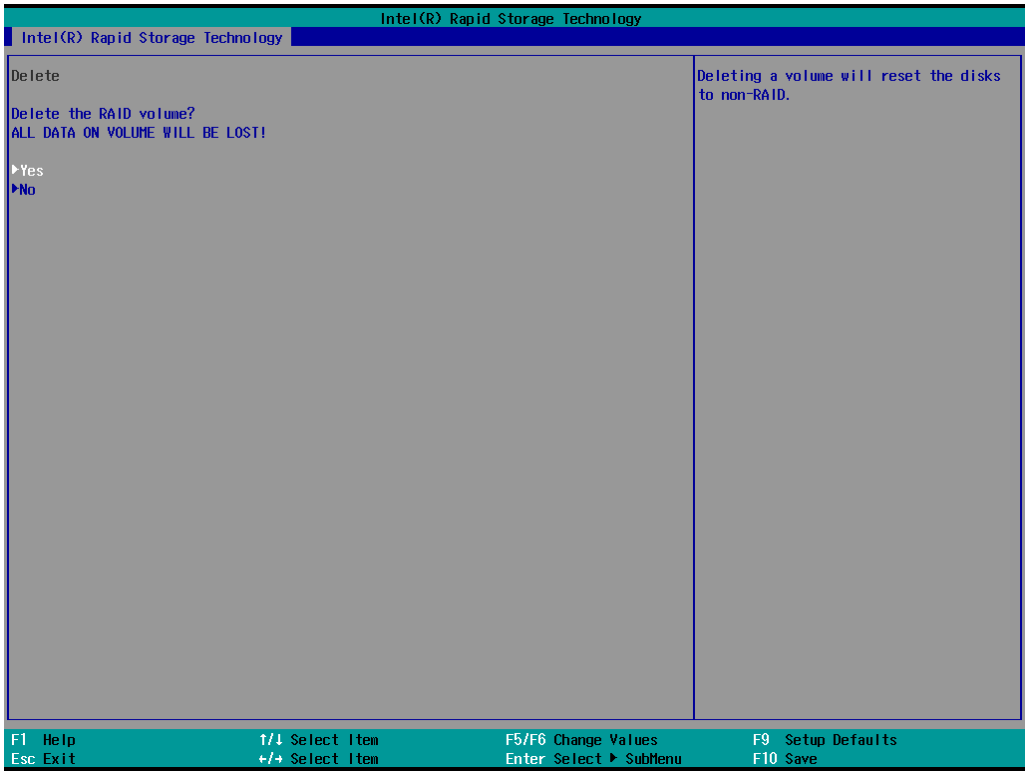
4. Select the RAID volume that you want to remove.



5. Select **Delete** and then press **Enter**.



6. Select **Yes** to confirm and then press **Enter**.



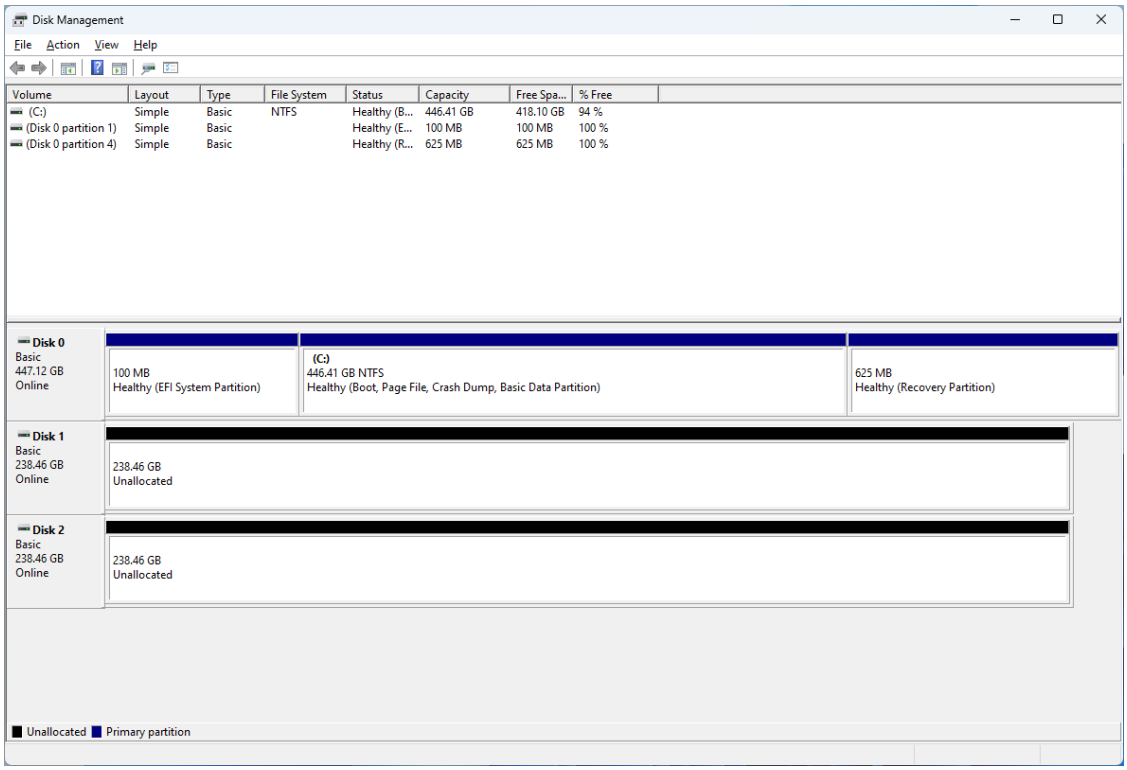
7. Press **F10** to save the settings.

SW RAID—Creating the RAID 0 or RAID 1 From Disk Management

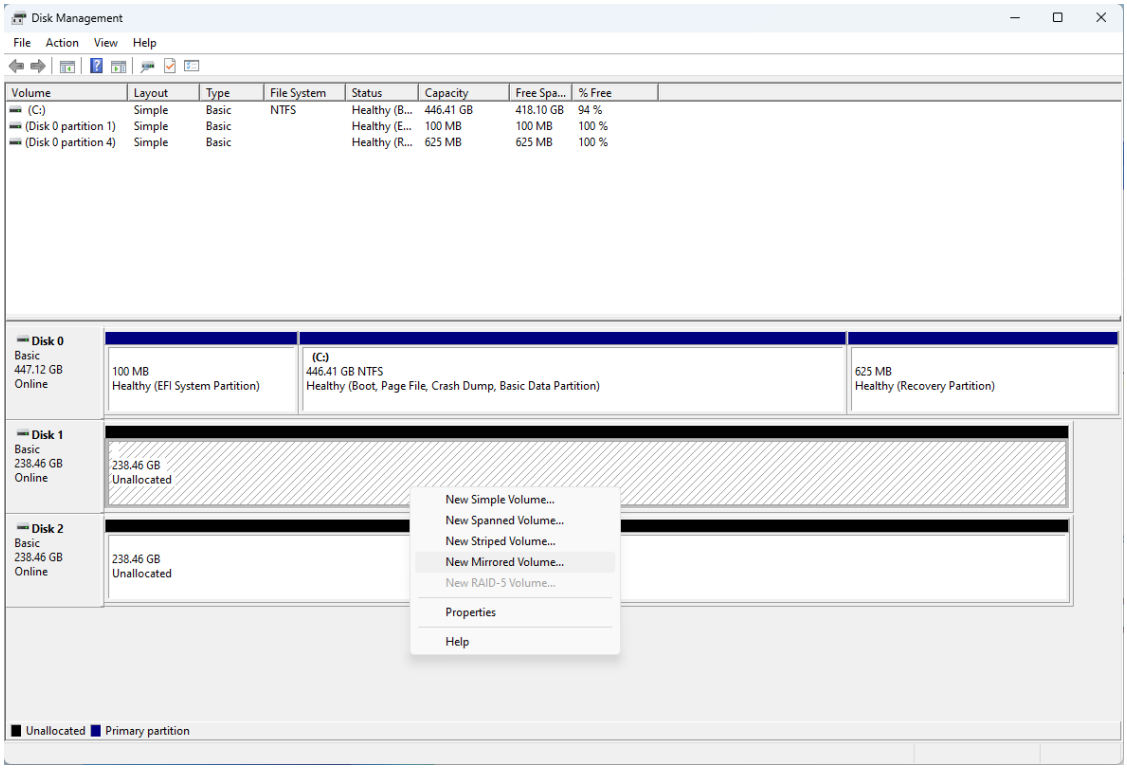
NOTE

For best performance, use hard disks of the same brand, same model, and same capacity to create a RAID volume.

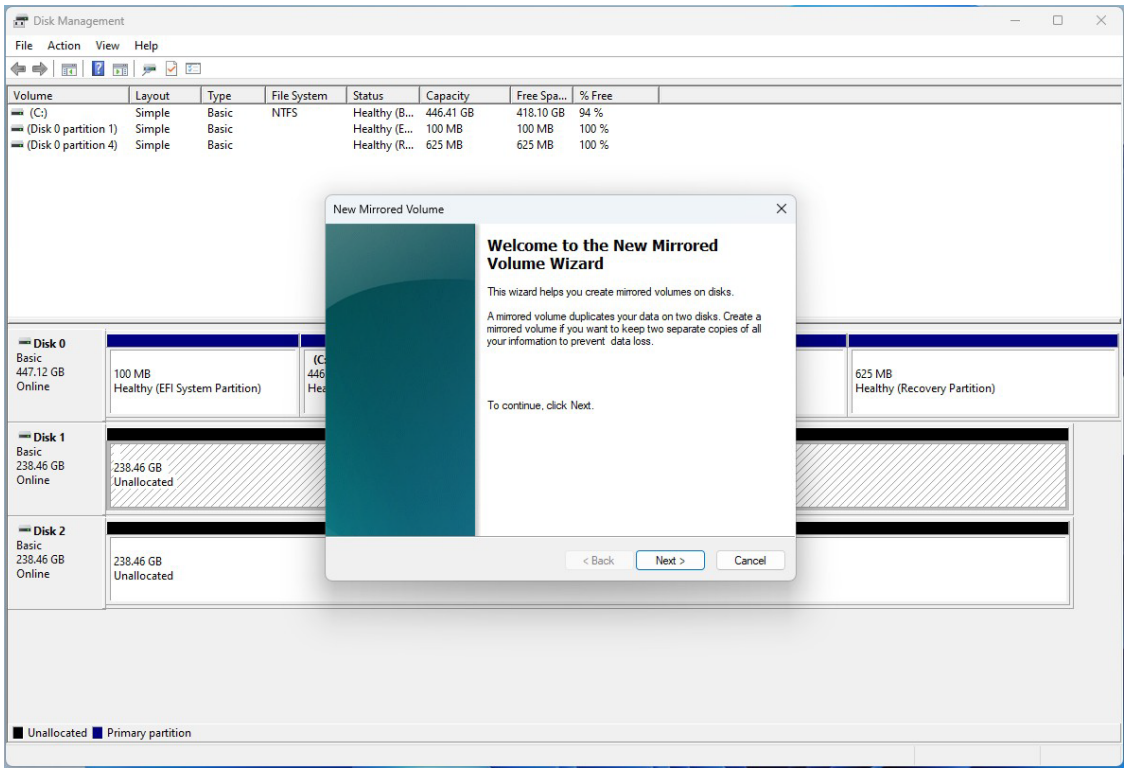
1. Run **Disk Management**.
   Connect the new disks and confirm that all the disk statuses are **Unallocated**. If a disk status is not **Unallocated**, you can right-click the disk and select **Delete Volume**.



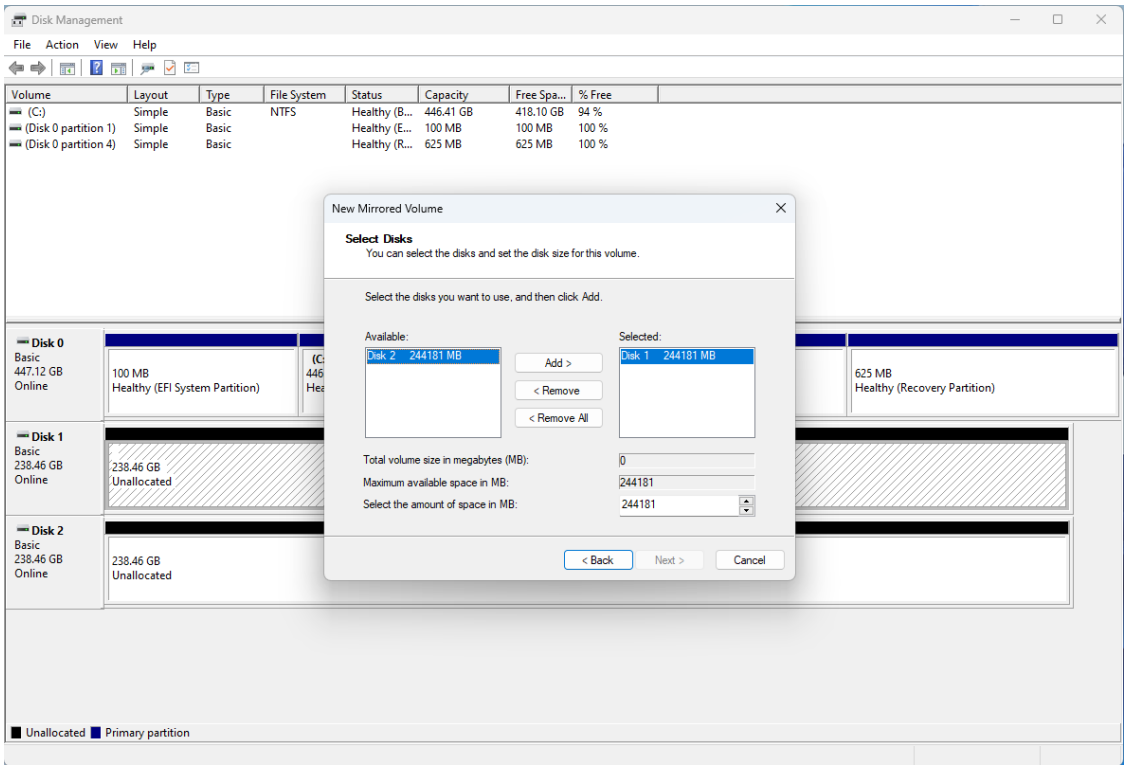
2. Right-click the target disk and select the target volume type.
   For example: **RAID1(Mirror)**.



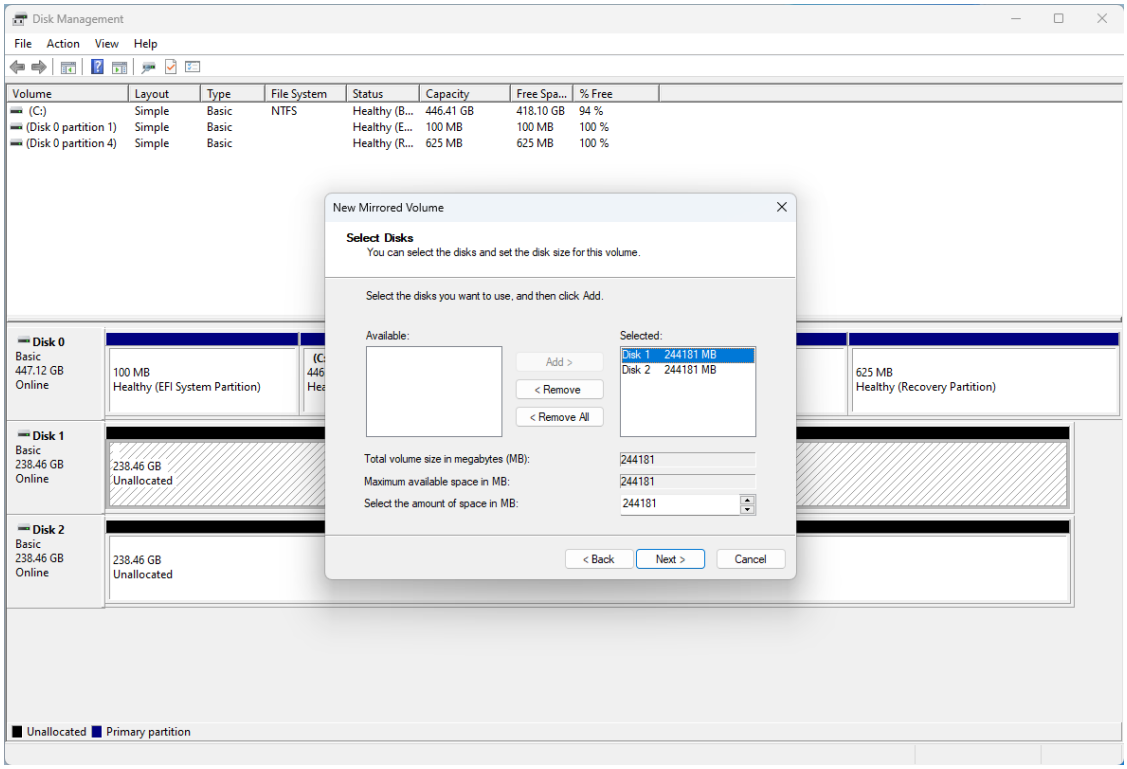
3. Click **Next** to continue with the creation of a new RAID volume.



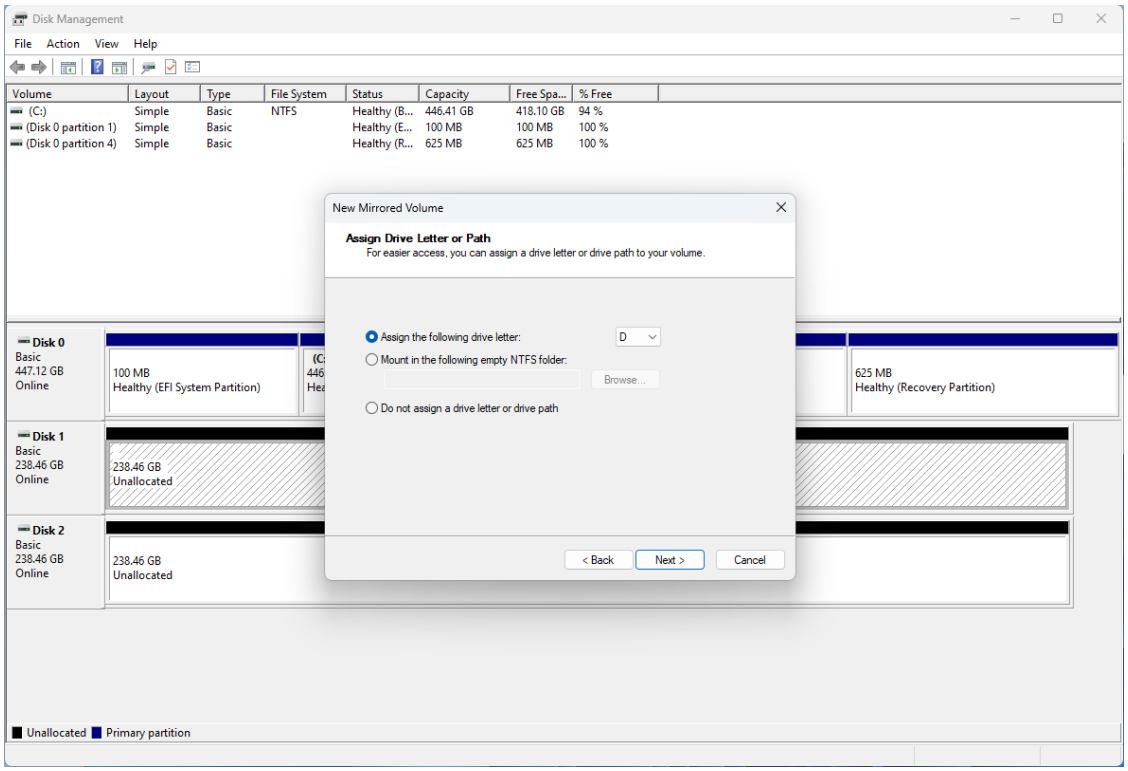
4. Select and **Add** the disks you want to use.



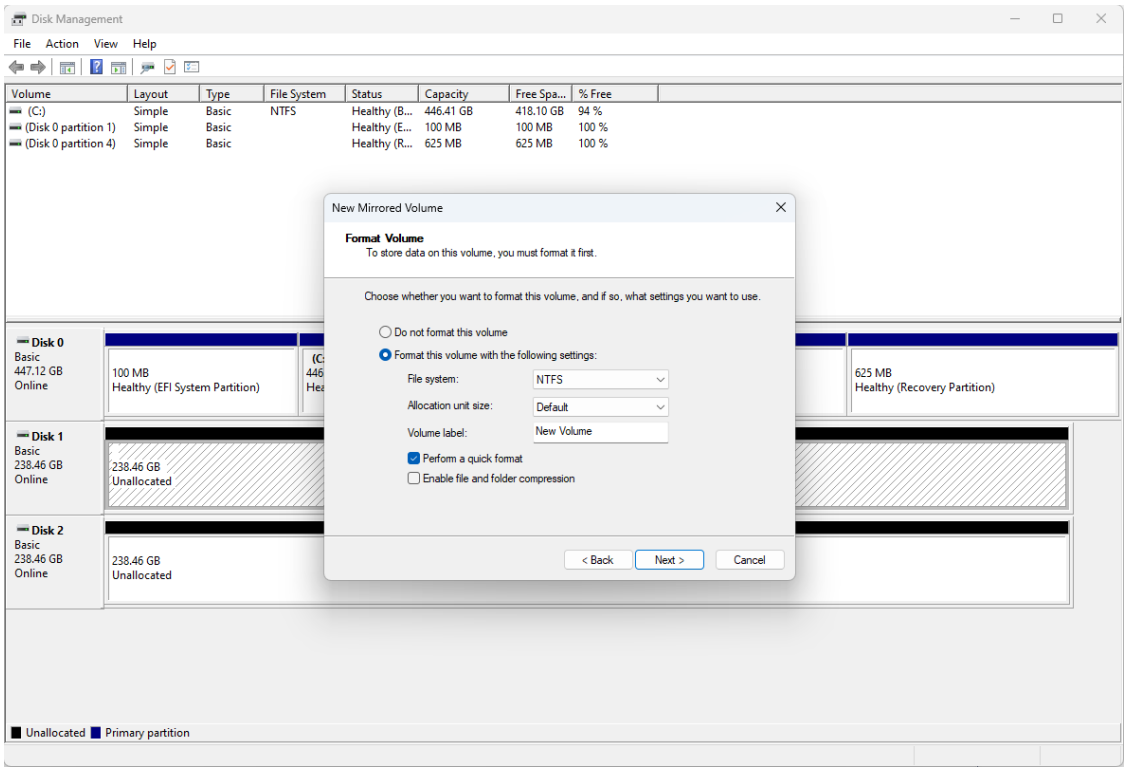
5. Click **Next**.



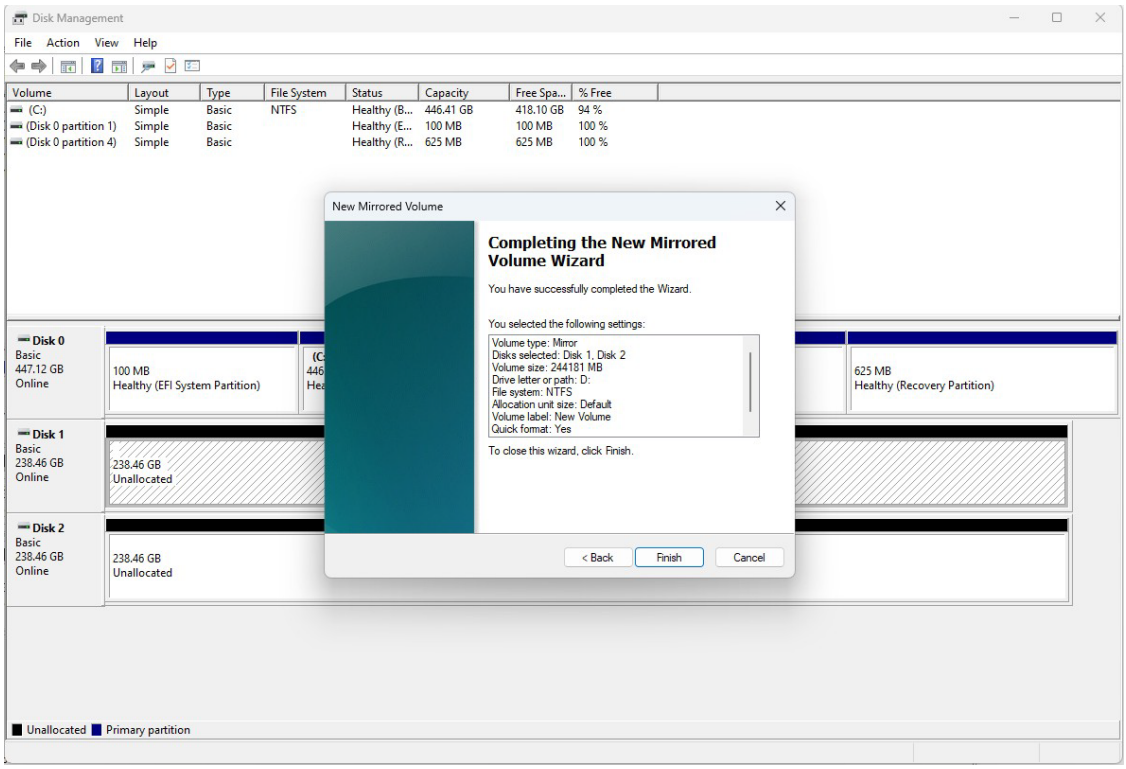
6. Assign the drive letter and click **Next**.



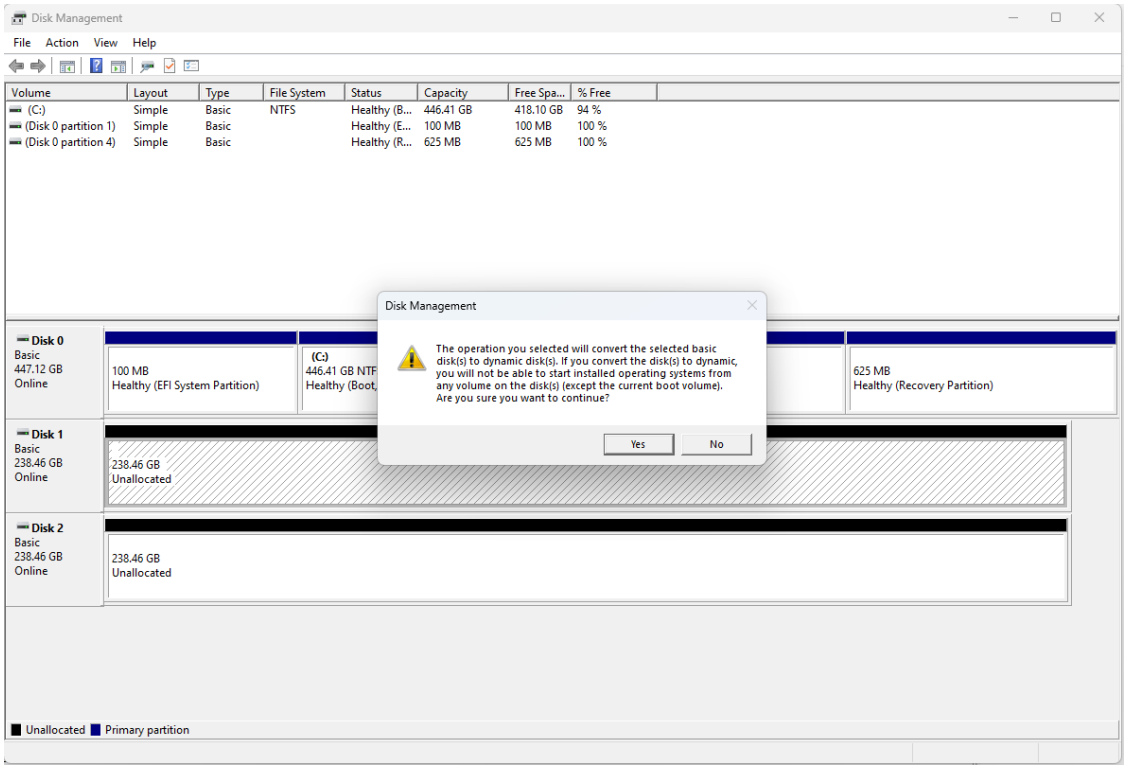
7. Select **Format the volume with...** and then **Perform a Quick Format.**
   Click **Next** to continue.



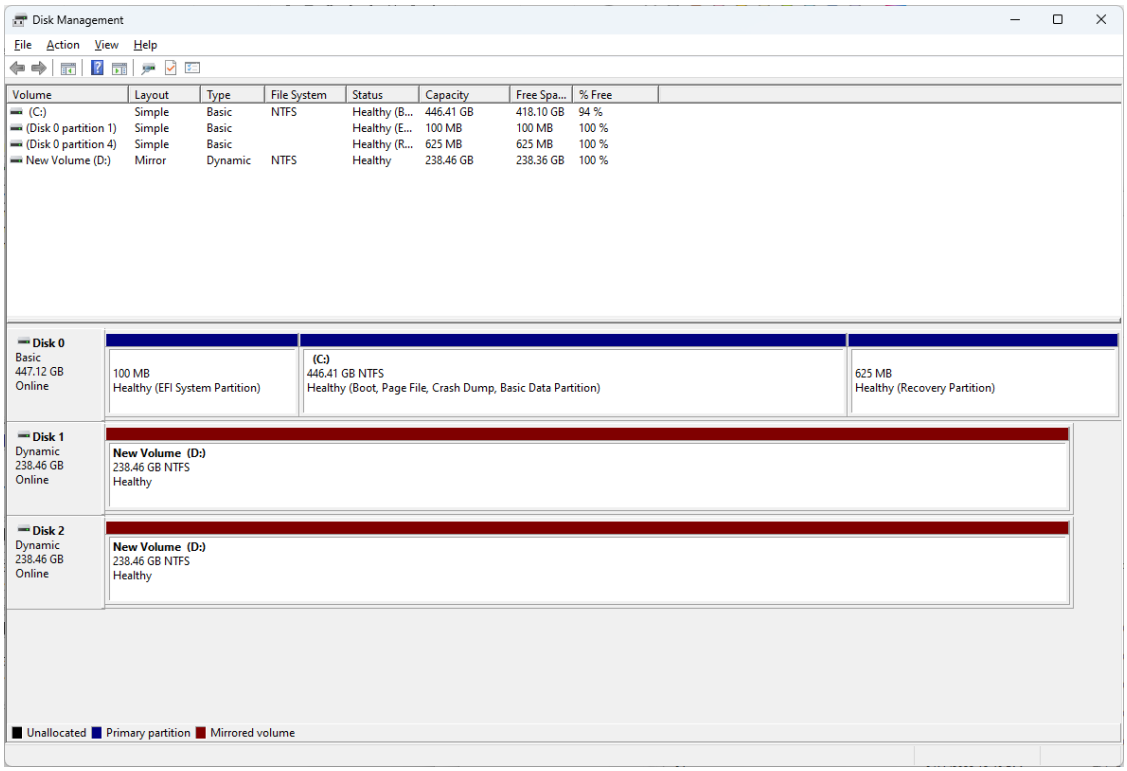
8. Check the RAID1(Mirror) information and click **Finish** to create the volume.



9. Click **Yes** for the system warning message displayed regarding the SW RAID volume.

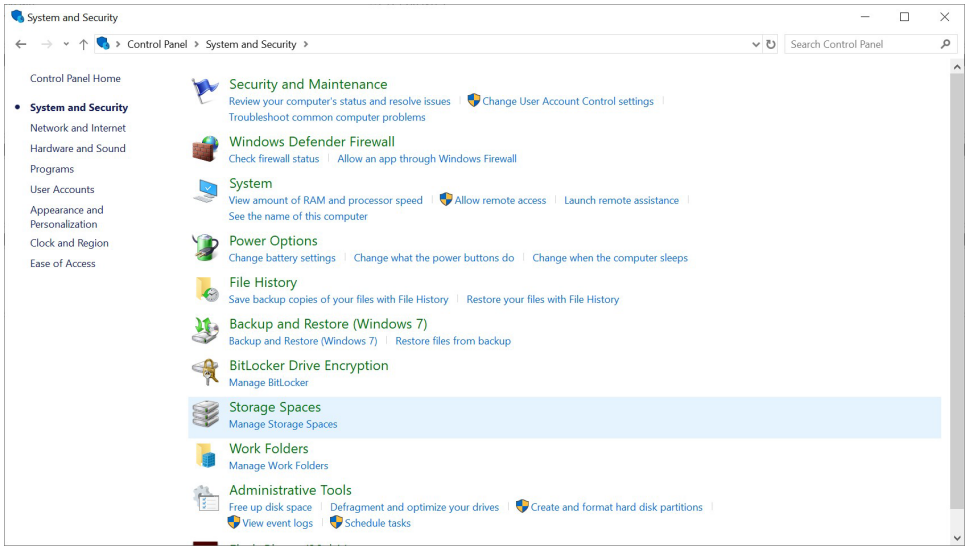


10. Check the RAID1(Mirror) information via Disk Management to confirm that the volume is created.

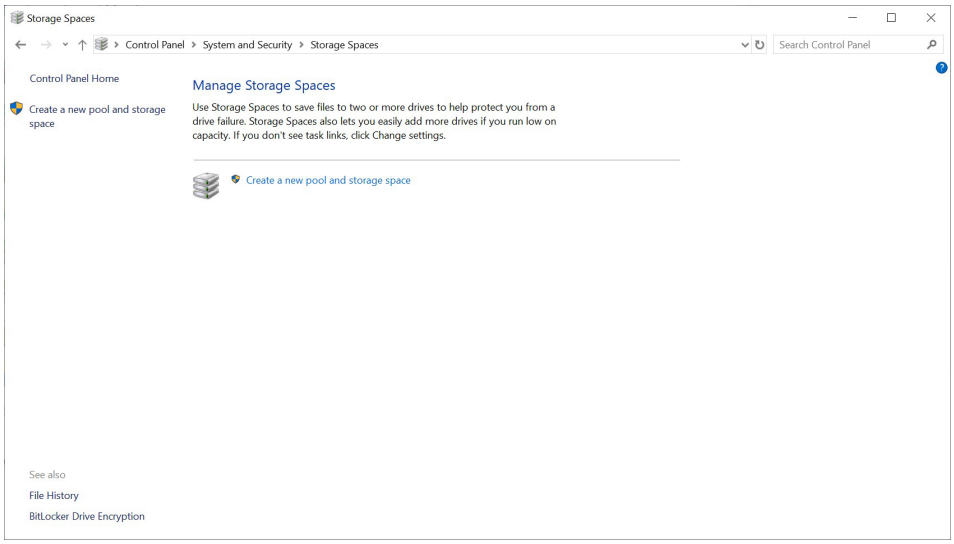


SW RAID—Creating a RAID 5 From Storage Spaces

1. Open **Control Panel > System and Security** and run **Storage Spaces**.



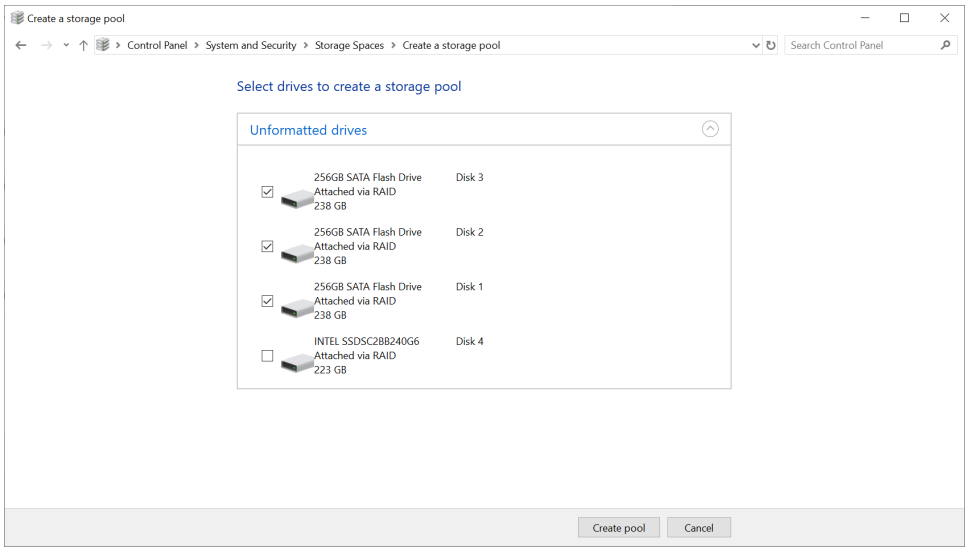
2. Click **Create a new pool and storage space**.



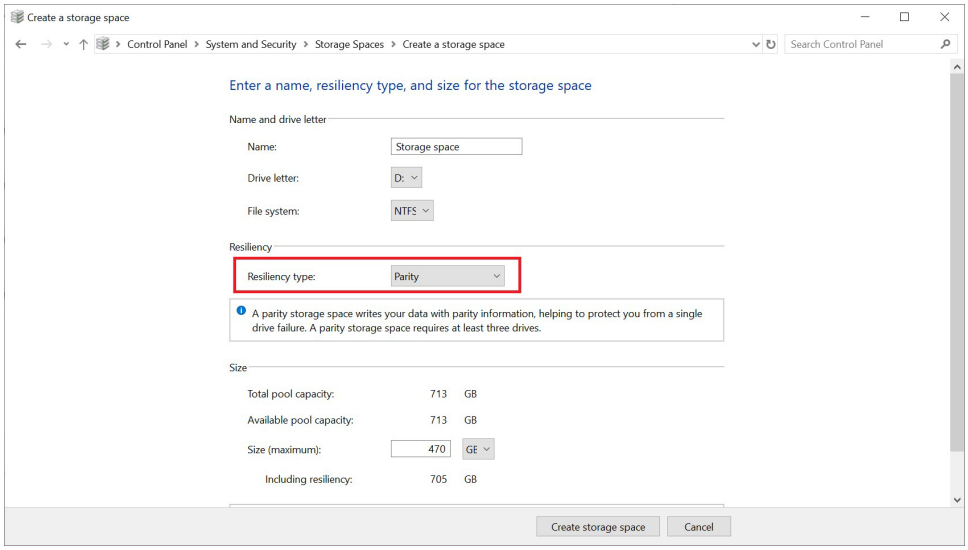
3. Select target drives to create a storage pool and click **Create pool**.

NOTE

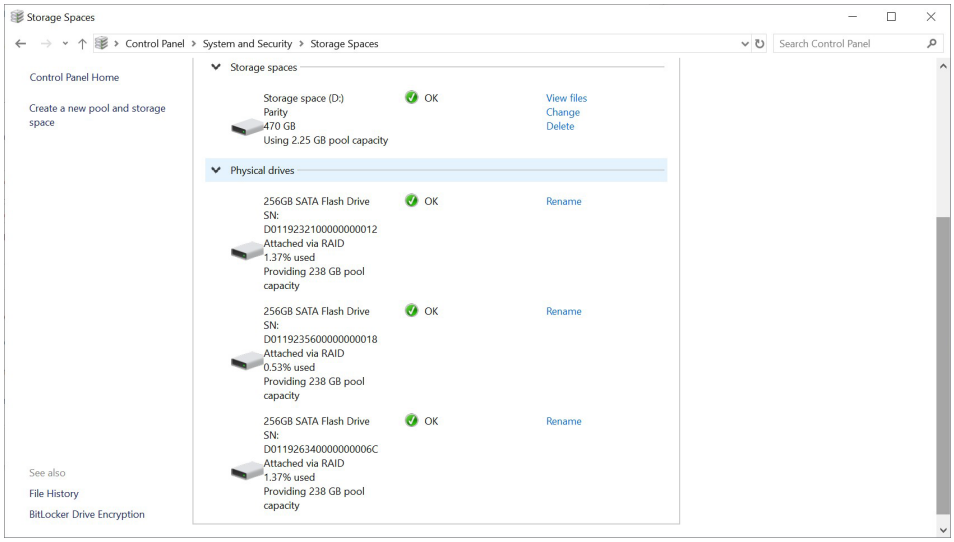
RAID 5 requires at least three disks.



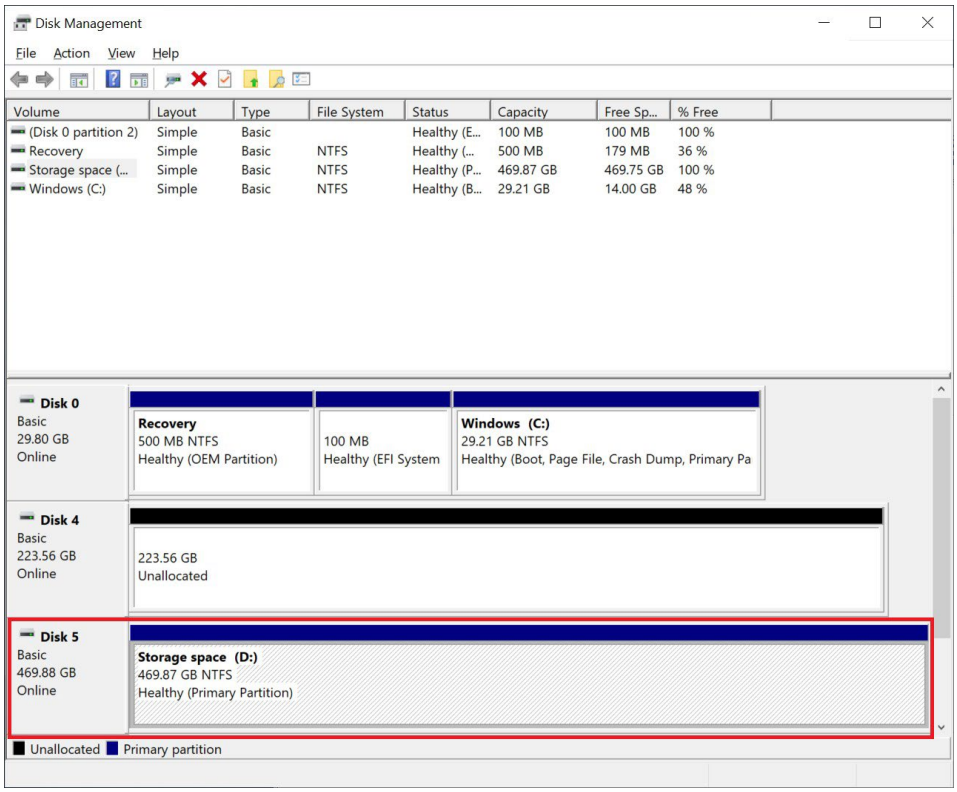
4. Change the **Resiliency type** to **Parity** and click **Create storage space**.



5. Check the status of the RAID 5 volume.

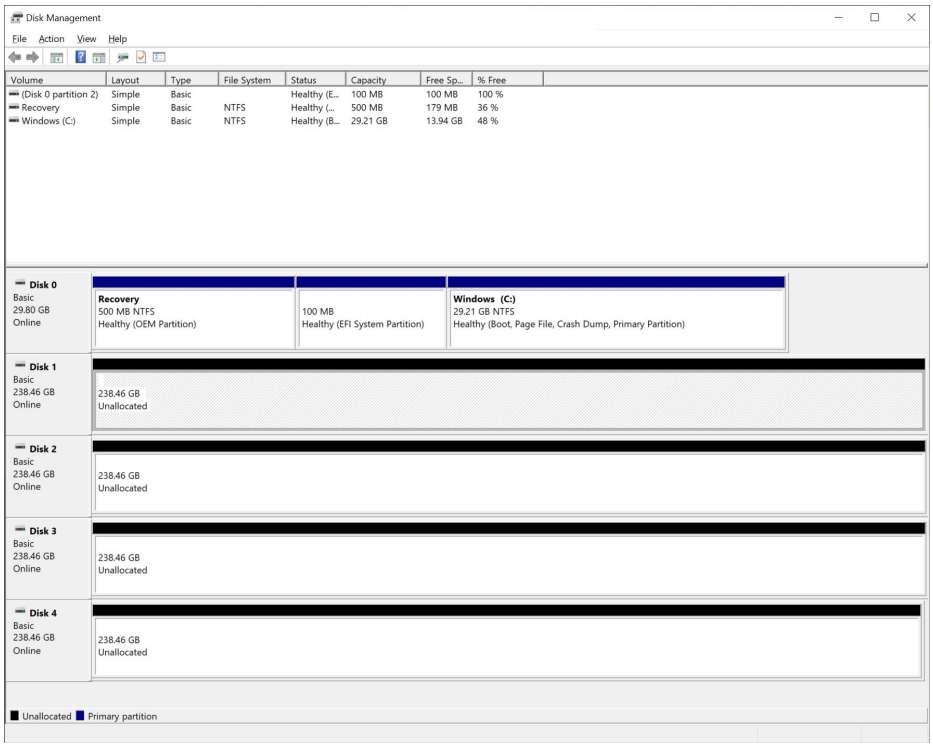


6. Check the storage space via Disk Management to confirm that it is created correctly.

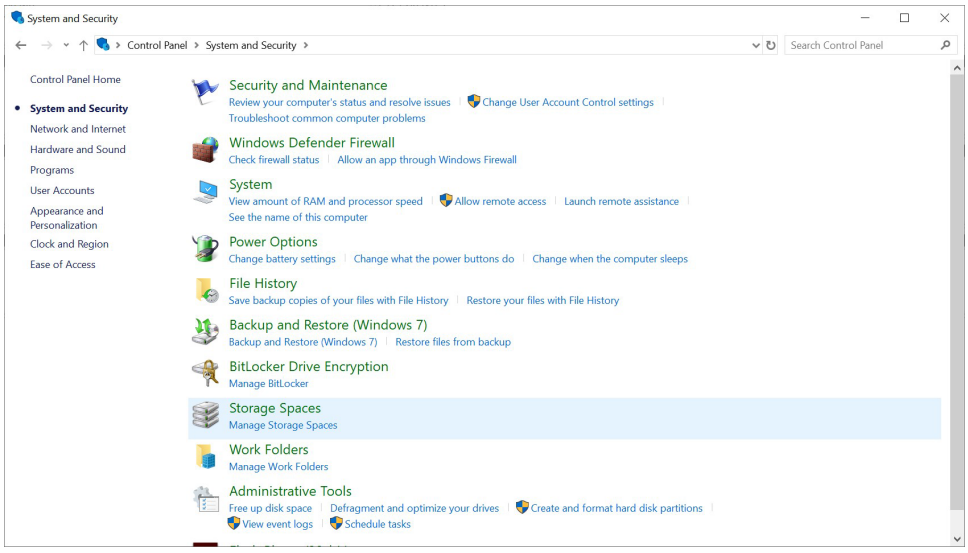


SW RAID—Creating RAID 10 From Storage Spaces

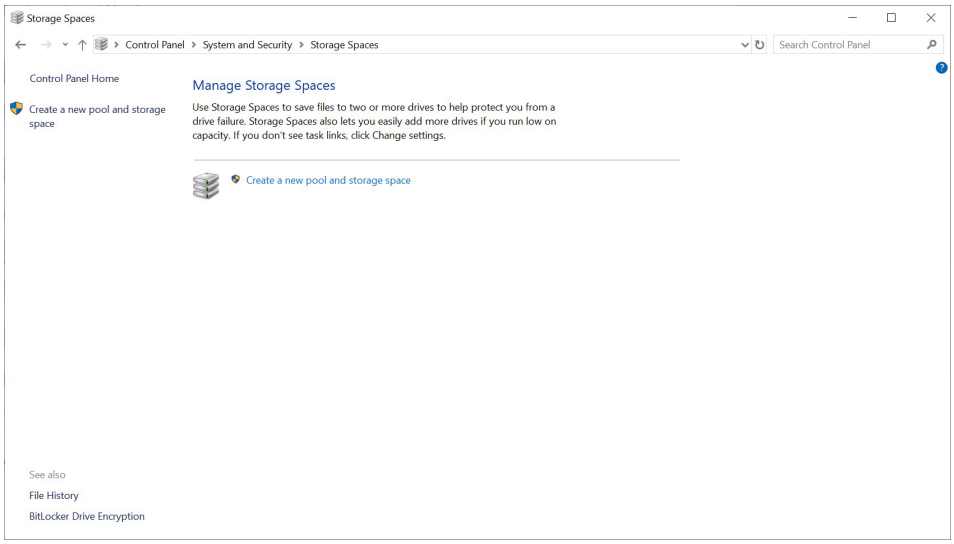
1. Run **Disk Management**.
   Connect the new disks and confirm that disk statuses are **Unallocated**. If the disk status is not **Unallocated**, you can right-click the disk and select **Delete Volume**.



2. Open **Control Panel > System and Security and** run **Storage Spaces**.

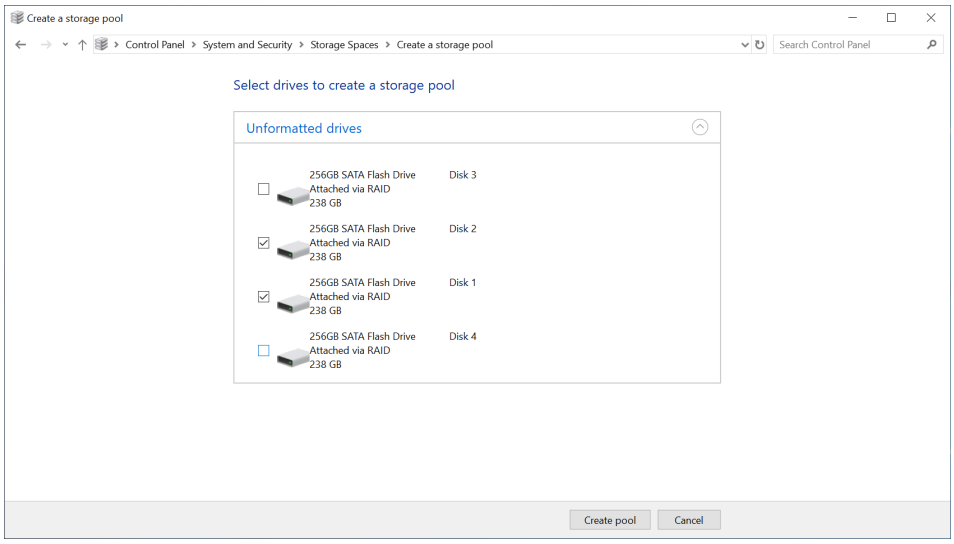


3. Click **Create a new pool and storage space**.

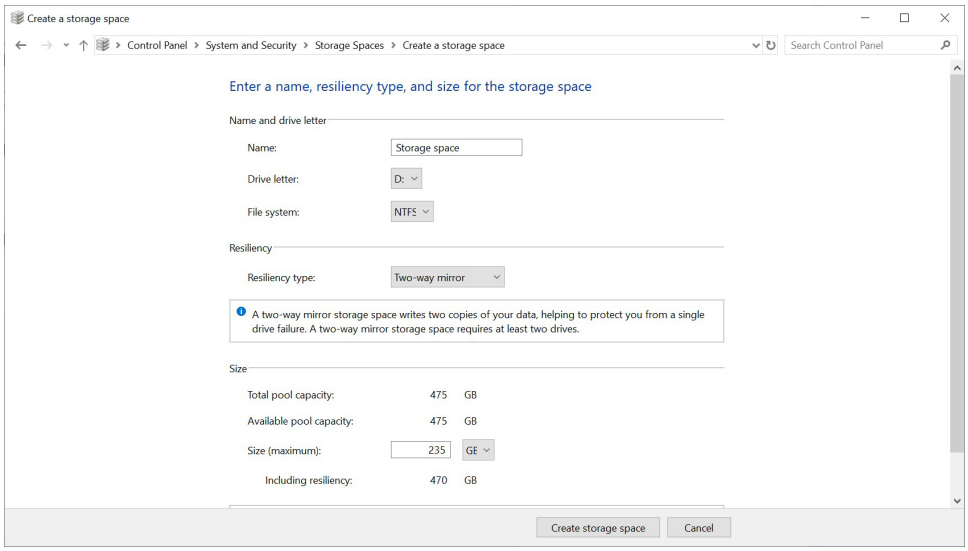


4. Select **Disk 1** and **Disk 2** to create a storage pool and click **Create a pool**.

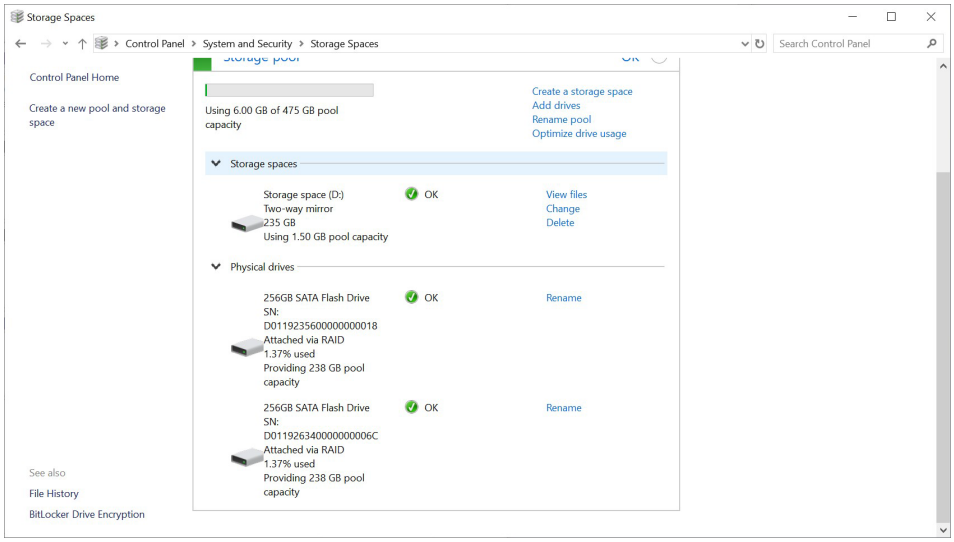
> **NOTE**
>
> RAID 10 requires at least four disks.



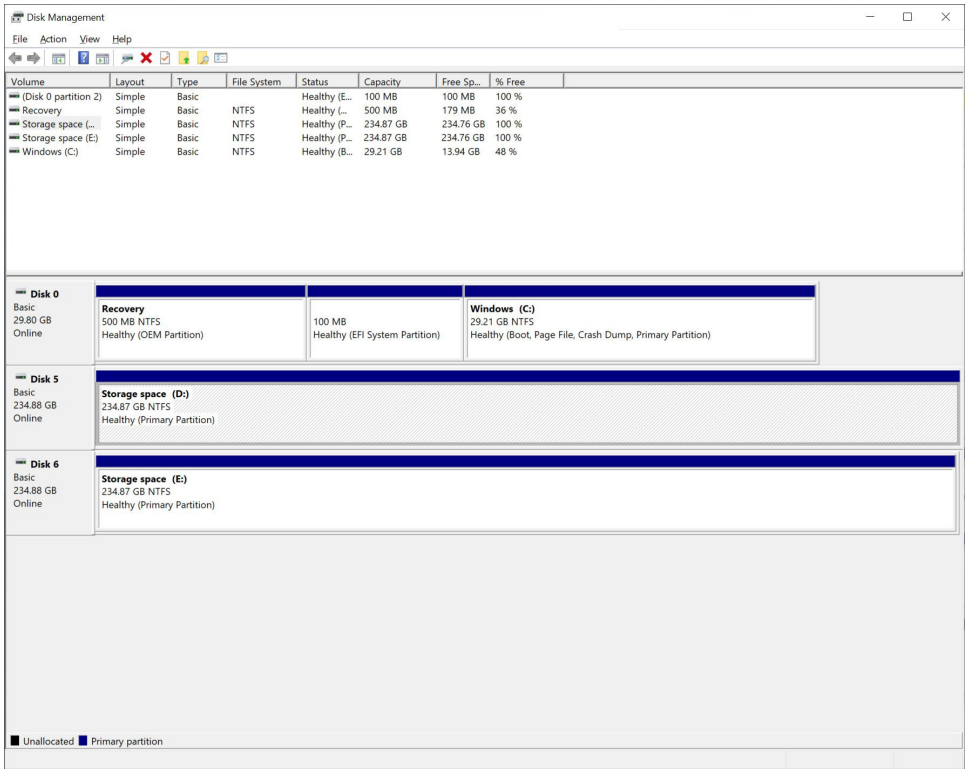
5. Set the **Resiliency type** to **Two-way mirror** and click **Create storage space.**



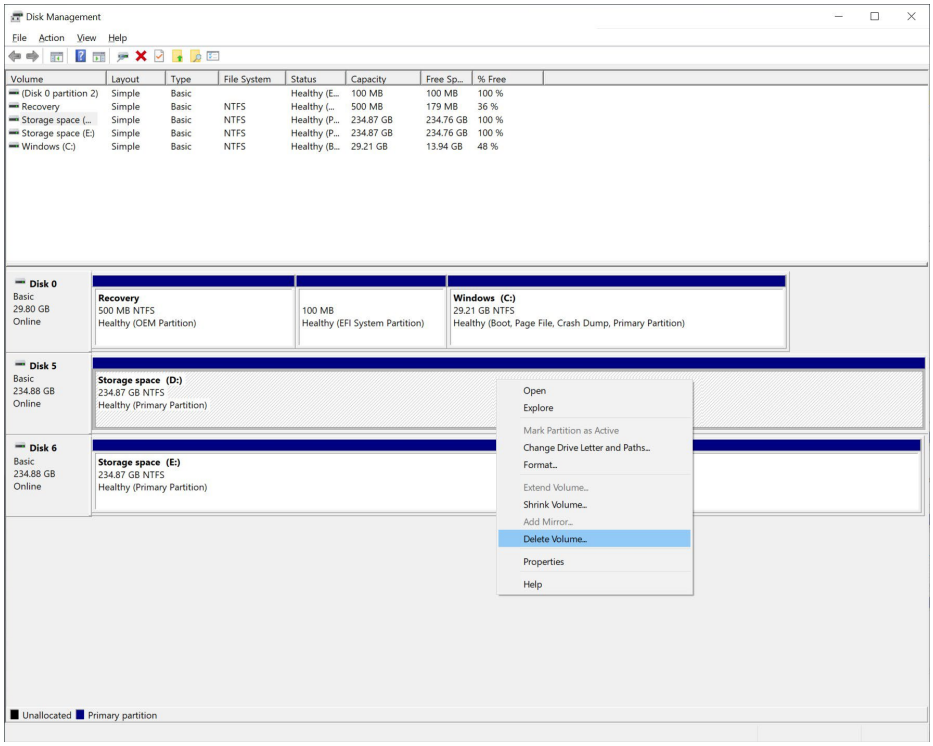
6. Create **Disk 3** and **Disk 4** in the same way by following steps 4 and 5.
7. Check the statuses of the storage spaces created.



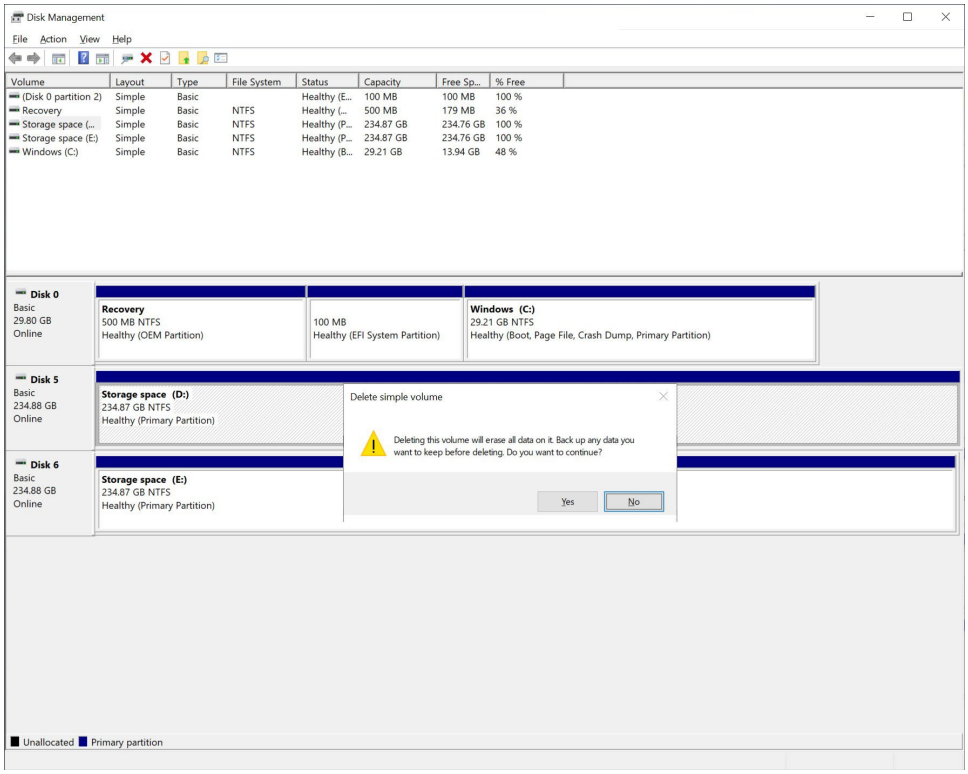
The **Storage space (D:)** and **Storage space (E:)** will be shown in **Disk Management**.


Disk Management
File Action View Help
Volume Layout Type File System Status Capacity Free Sp... % Free
(Disk 0 partition 2) Simple Basic Healthy (E... 100 MB 100 MB 100 %
Recovery Simple Basic NTFS Healthy (... 500 MB 179 MB 36 %
Storage space (... Simple Basic NTFS Healthy (P... 234.87 GB 234.76 GB 100 %
Storage space (E:) Simple Basic NTFS Healthy (P... 234.87 GB 234.76 GB 100 %
Windows (C:) Simple Basic NTFS Healthy (B... 29.21 GB 13.94 GB 48 %
Disk 0
Basic
29.80 GB
Online
Recovery
500 MB NTFS
Healthy (OEM Partition)
100 MB
Healthy (EFI System Partition)
Windows (C:)
29.21 GB NTFS
Healthy (Boot, Page File, Crash Dump, Primary Partition)
Disk 5
Basic
234.88 GB
Online
Storage space (D:)
234.87 GB NTFS
Healthy (Primary Partition)
Disk 6
Basic
234.88 GB
Online
Storage space (E:)
234.87 GB NTFS
Healthy (Primary Partition)
Unallocated
Primary partition

8. Right-click **Storage space (D:)** and select **Delete Volume**.

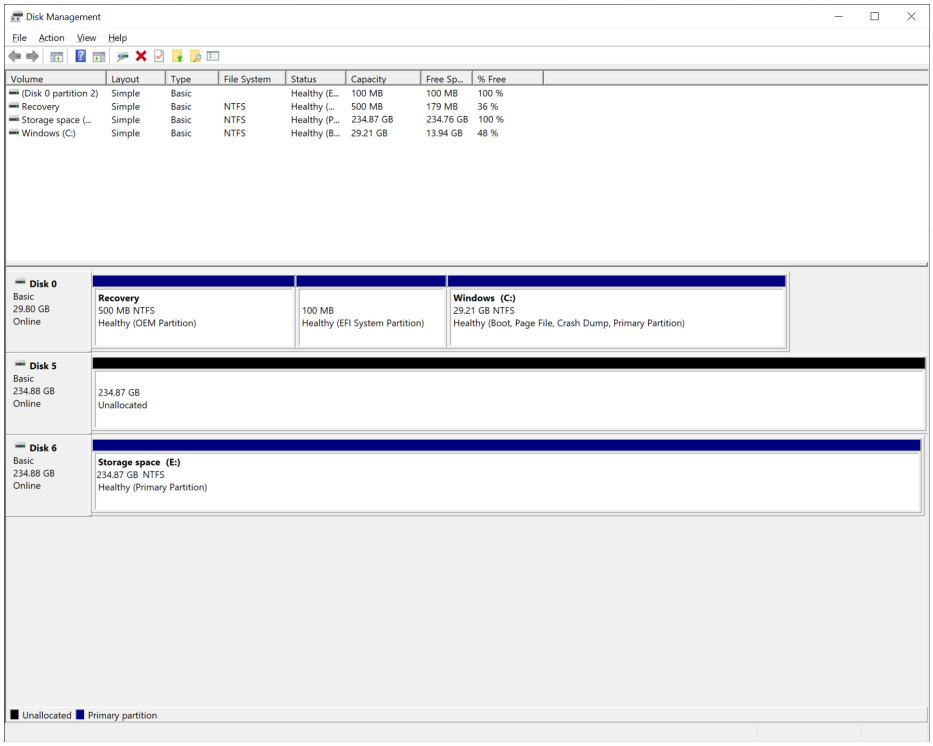


9. Click **Yes** for the warning message shown.

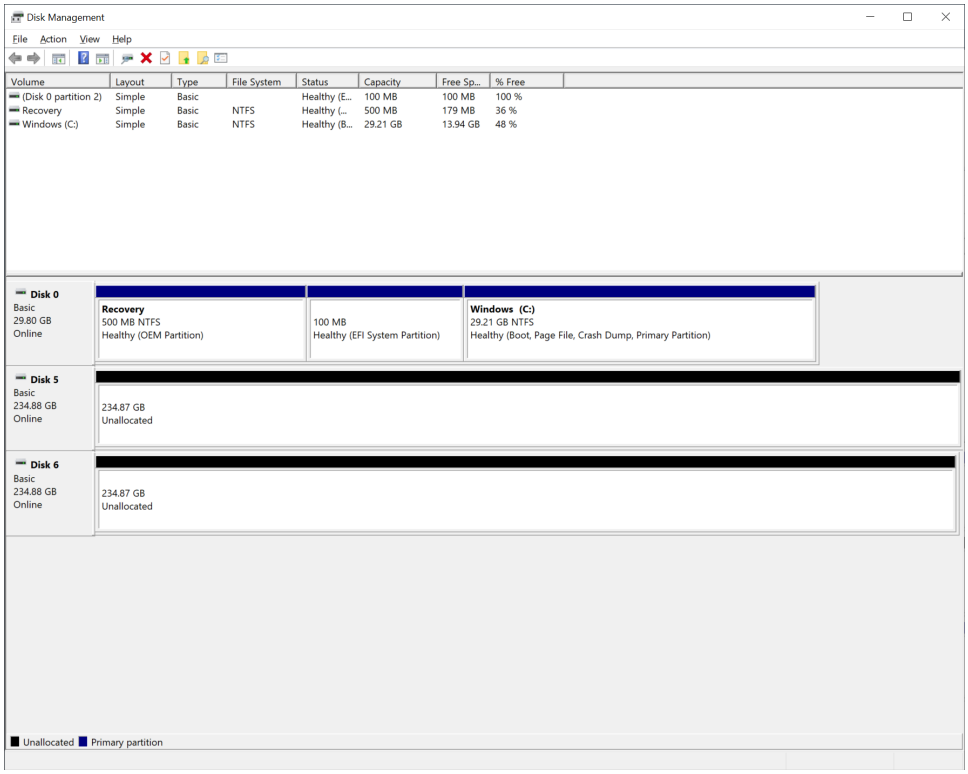


The storage space status will change to **Unallocated**.

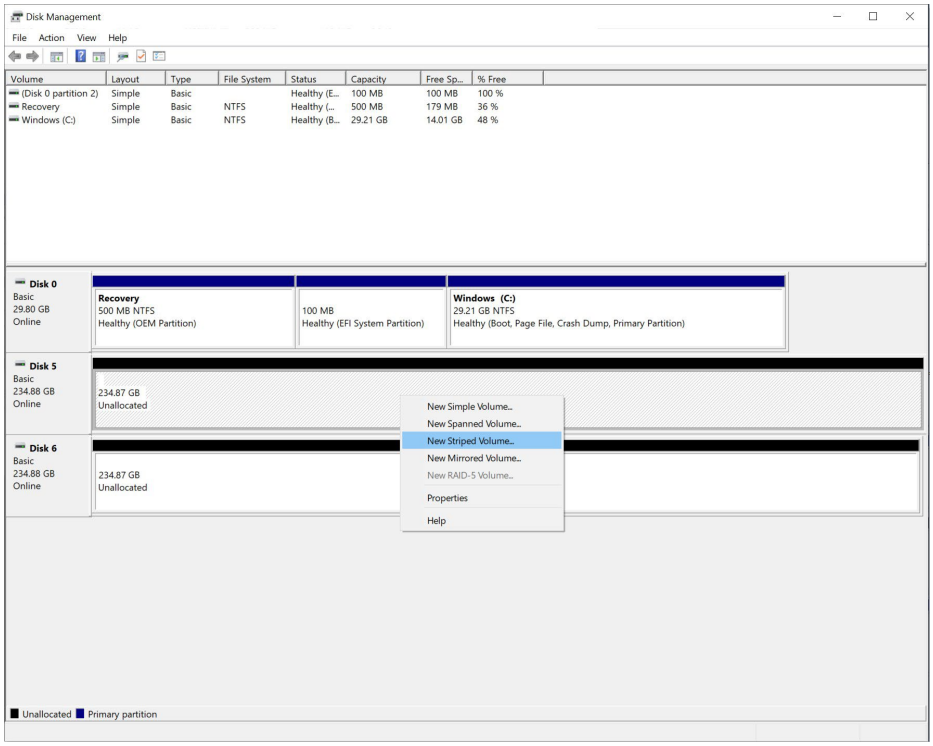
10. Do the same for **Storage space (E:)** to change the status to **Unallocated**.



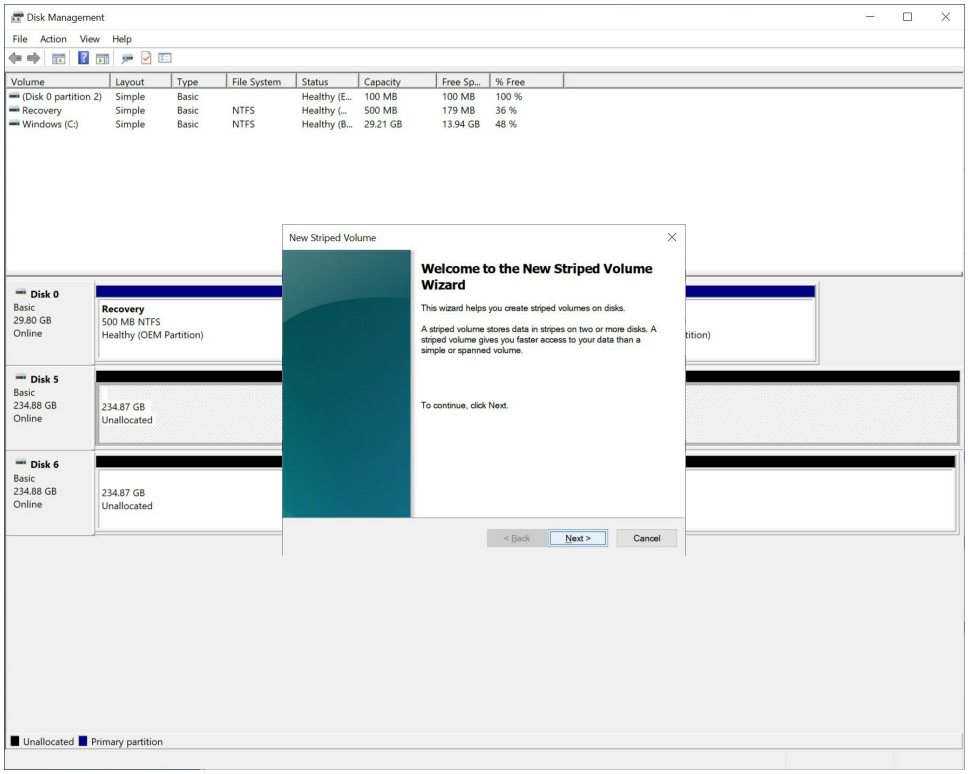
Confirm that the status of all storage spaces is **Unallocated**.



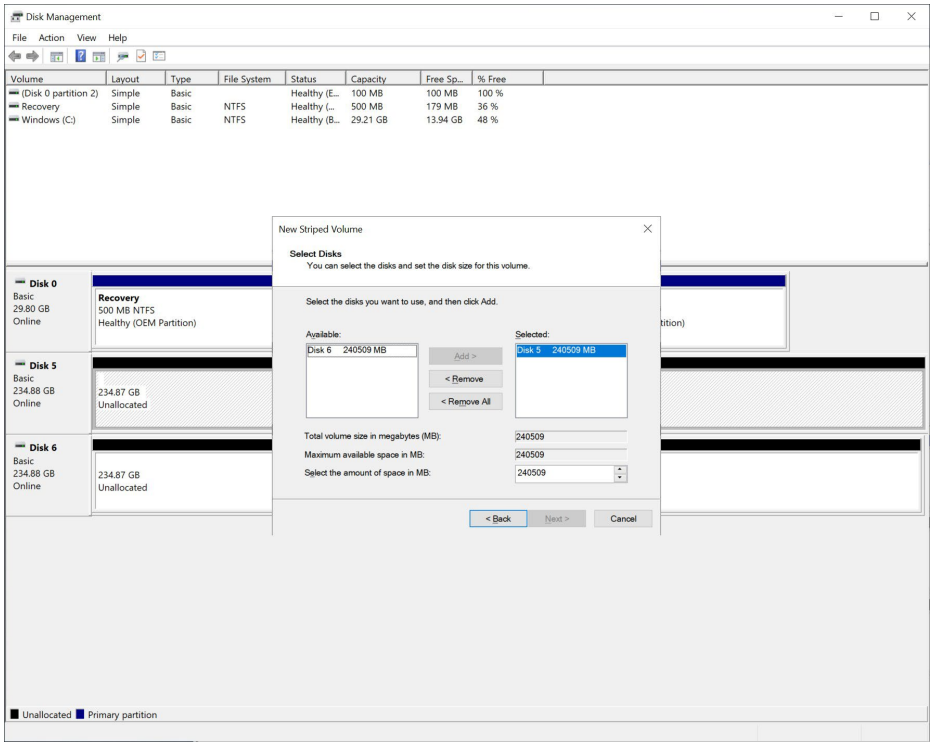
11. Right-click on the **Disk 5** and select **New Striped Volume**.



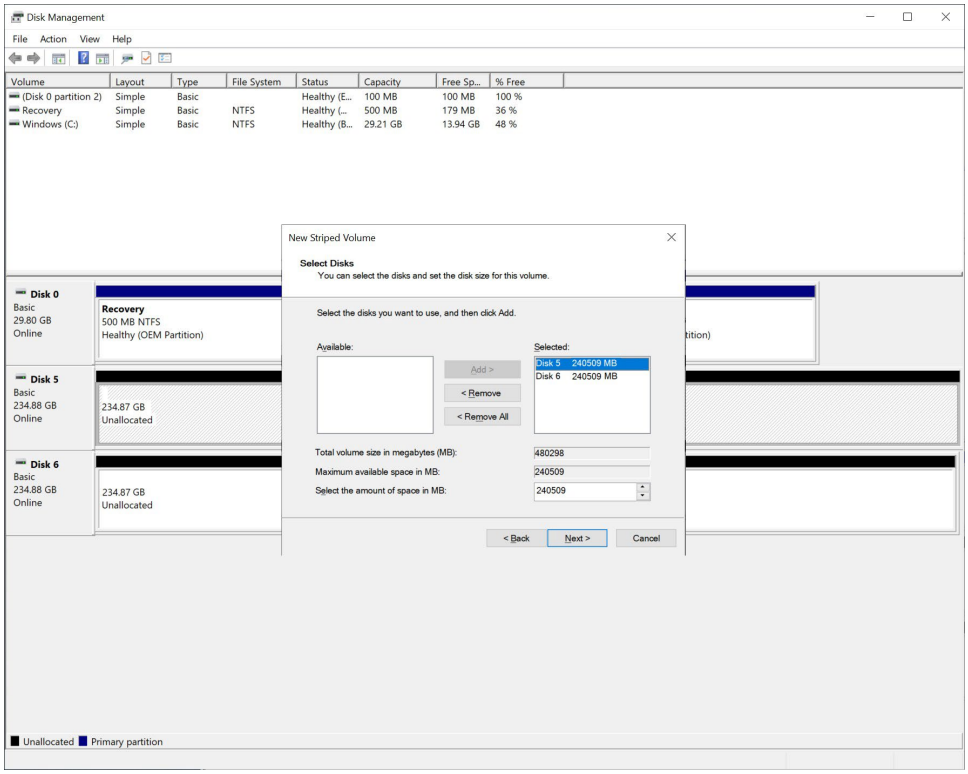
12. To continue, click **Next**.



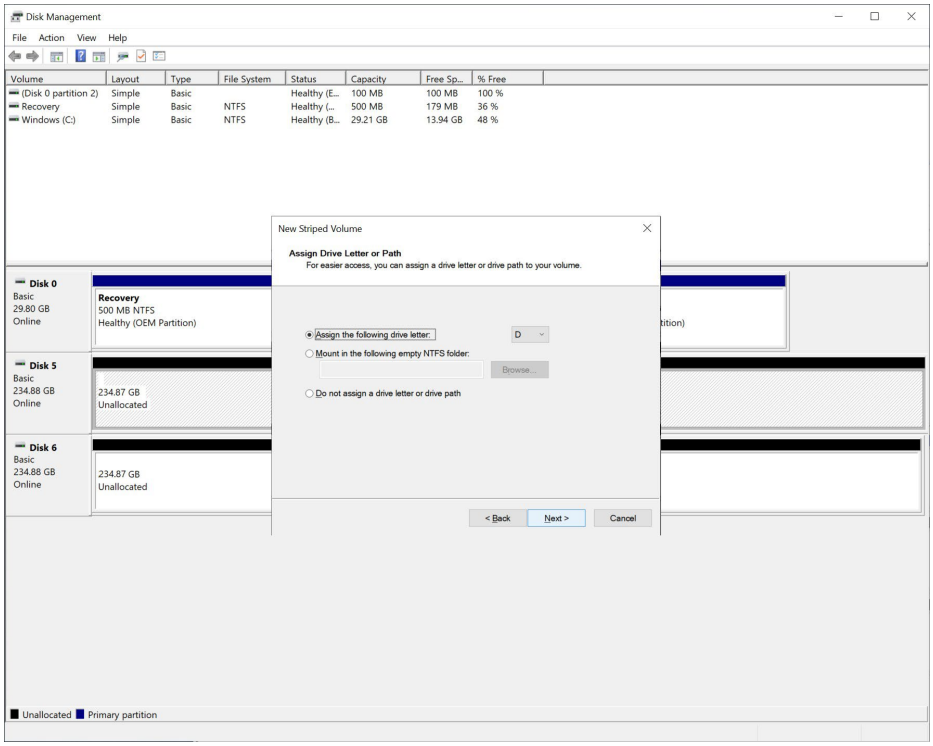
13. Select the disks you want to use and click **Add**.



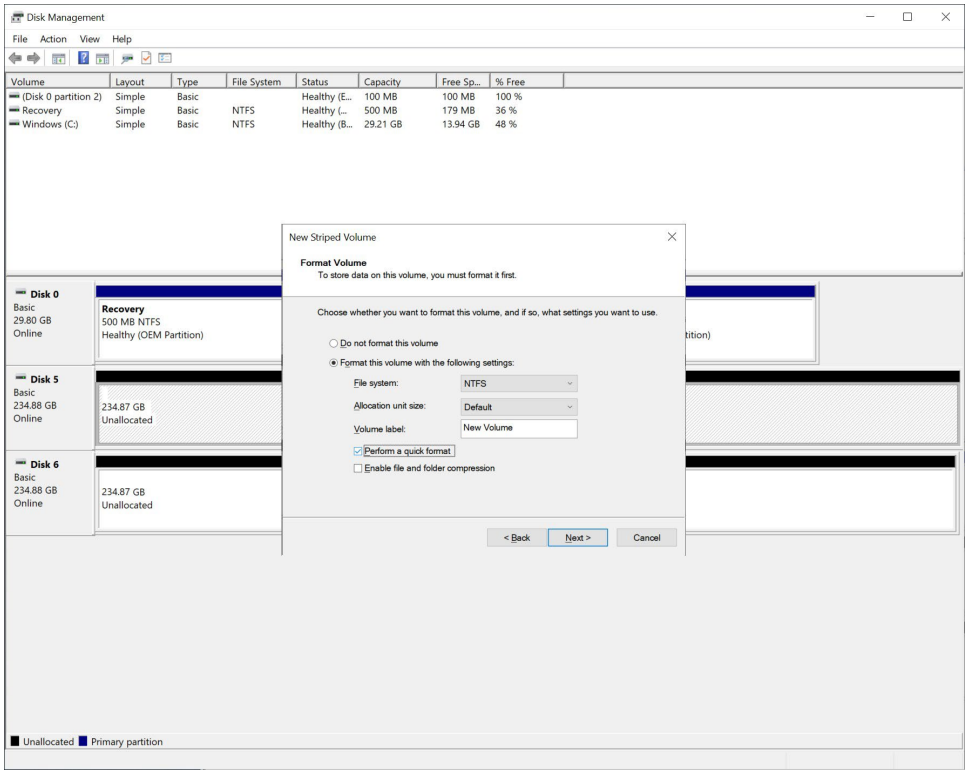
14. Click **Next**.



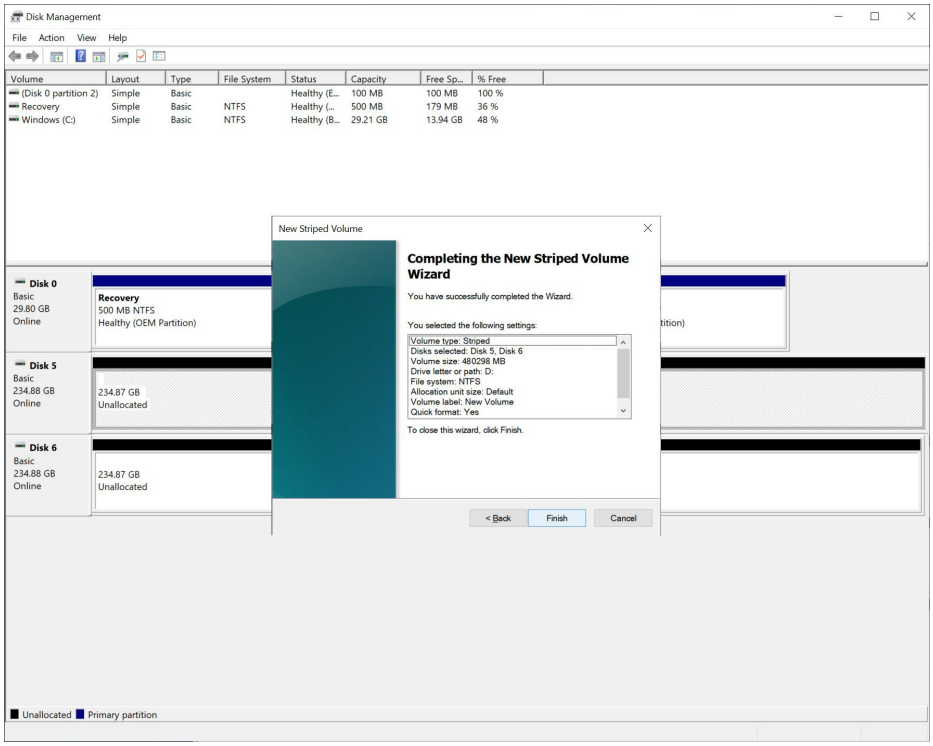
15. Assign drive letters to the drives and click **Next**.



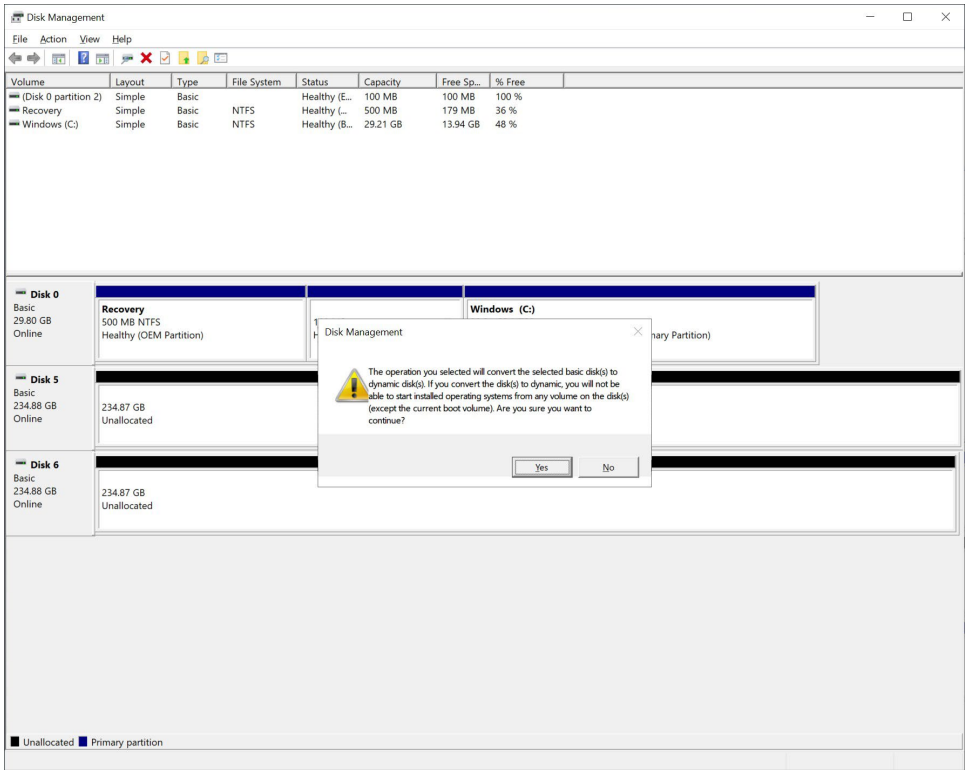
16. Select **Quick Format** for the drive volumes and click **Next** to format them.



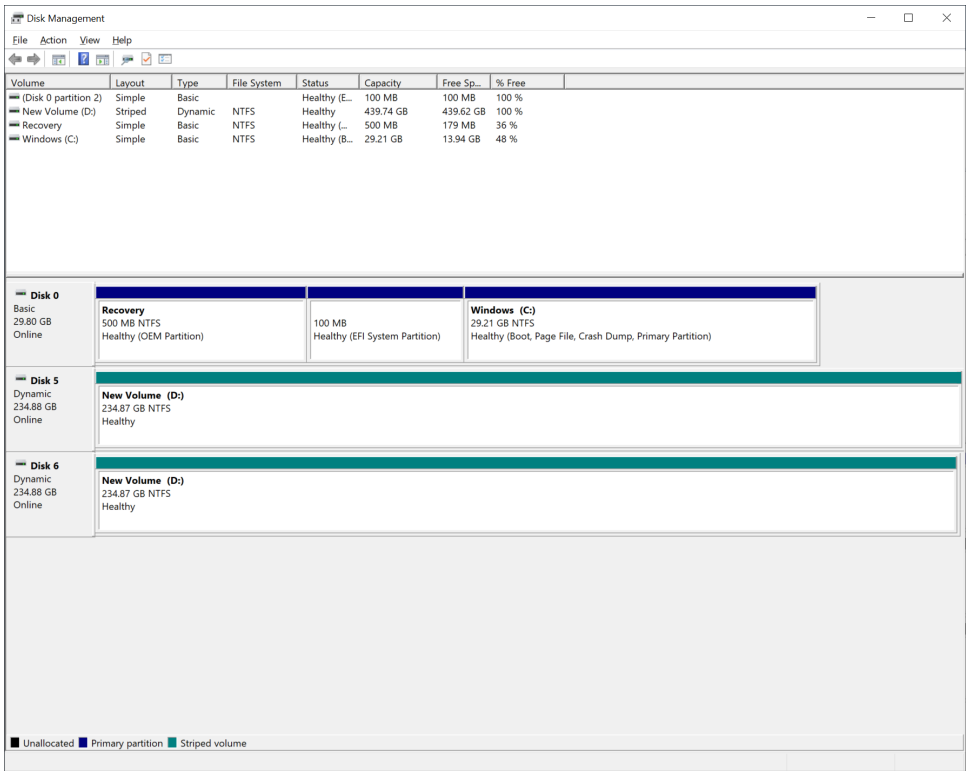
17. Checking the drive volume information and click **Finish** to create the striped volume.



18. Click **Yes** to the system messages shown about SW RAID volume.



19. Check the striped volume information in Disk Management to confirm the creation of the drives.



5. Intel® Active Management Technology

Intel® AMT is part of the Intel vPro technology offering. Platforms equipped with Intel® AMT can be managed remotely, regardless of its power state or whether it has a functioning OS or not. The Intel® Converged Security and Management Engine (Intel® CSME) powers the Intel® AMT system. As a component of the Intel vPro platform, Intel® AMT uses a number of elements in the Intel vPro platform architecture.

This chapter describes the setup process for the Intel® Active Management Technology. For more information about Intel® Active Management Technology:

https://www.intel.com/content/www/us/en/developer/articles/guide/getting-started-with-active-management-technology.html?wapkw=AMT

NOTE

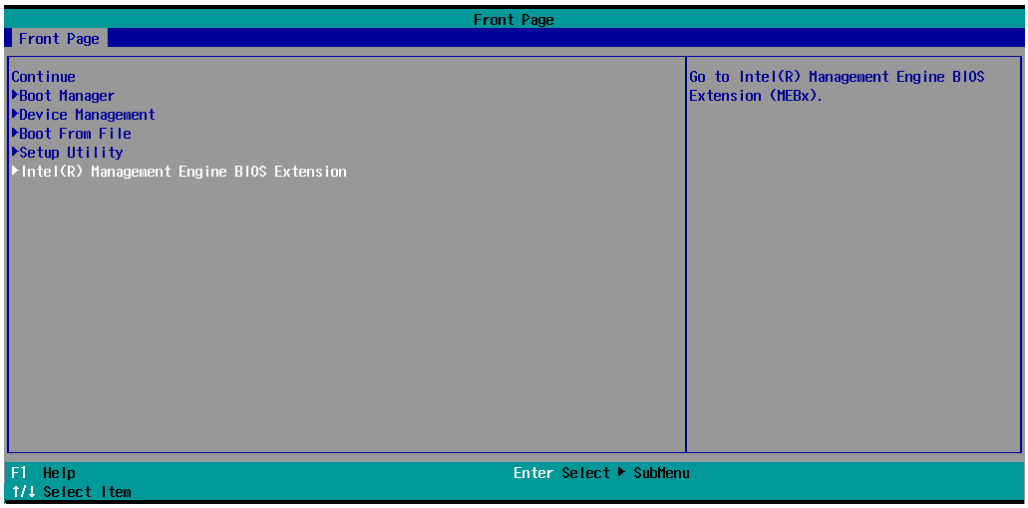
Intel® AMT is not supported in models with Intel® Celeron®, Intel® Core™ i3, and Intel Atom® processors.

Applicable Series

- BXP-C100 Series
- DRP-C100 Series
- RKP-C110 Series
- RKP-C220 Series

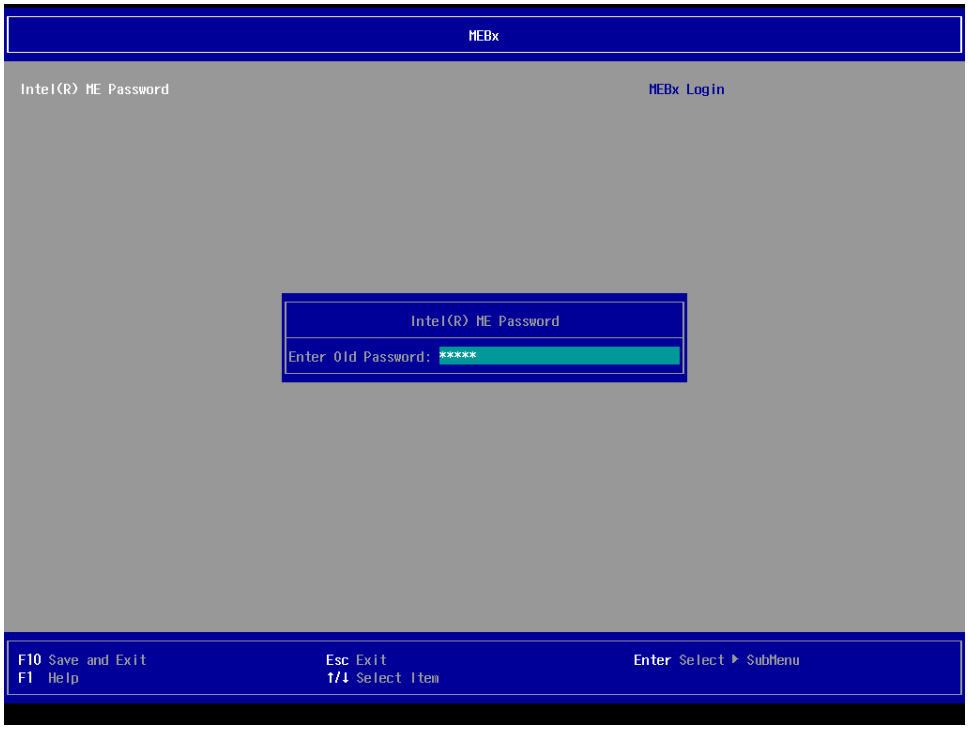
Turning on Intel® AMT on PC

1. Power on the computer and press **F2** to enter the BIOS menu.
2. Select **Intel(R) Management Engine BIOS Extension**.

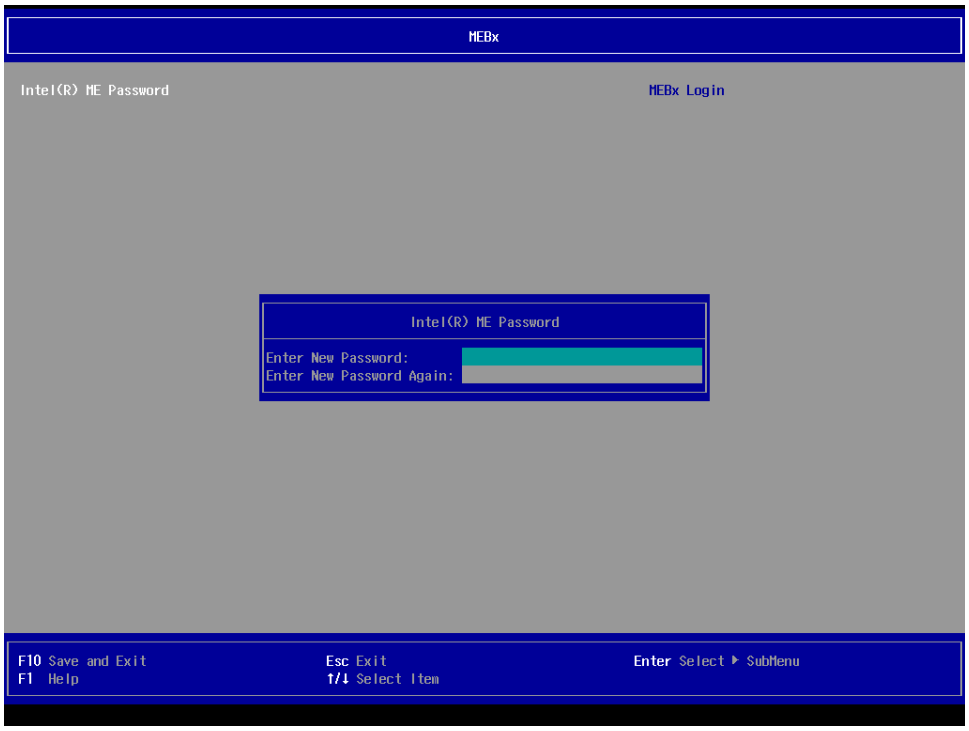


3. Select **MEBx Login**.

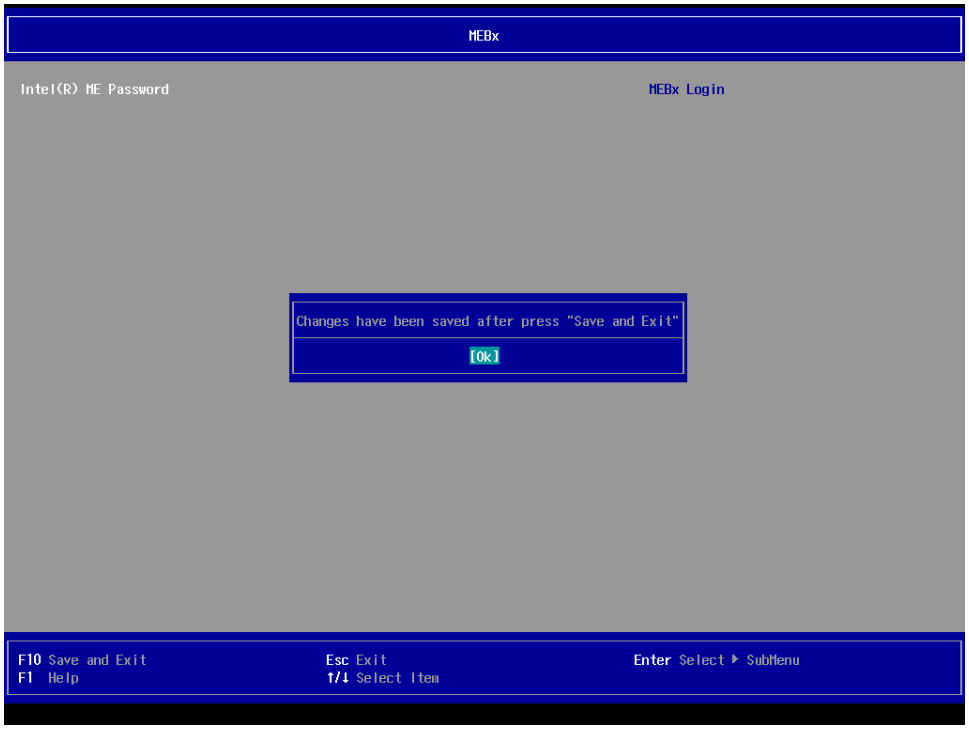
4. Type the Intel® ME default password: "**admin**".



5. Type the new password. The new Intel® MEBX password must meet the following requirements for strong passwords:
   - **Password Length:** At least 8 characters, and no more than 32.
   - **Password Complexity:** Password must include the following:
     - At least one digit character ('0', '1', … '9')
     - At least one 7-bit ASCII non-alpha-numeric character (e.g., '!', '$', ';'), but excluding ':', ',' and '"' characters.
     - At least one lower-case letter ('a', 'b'…'z') and at least one upper case letter ('A','B'…'Z').



6. Select **OK** to save and exit.



7. Select **Intel(R) AMT Configuration**.

8. Select **Network Setup**.

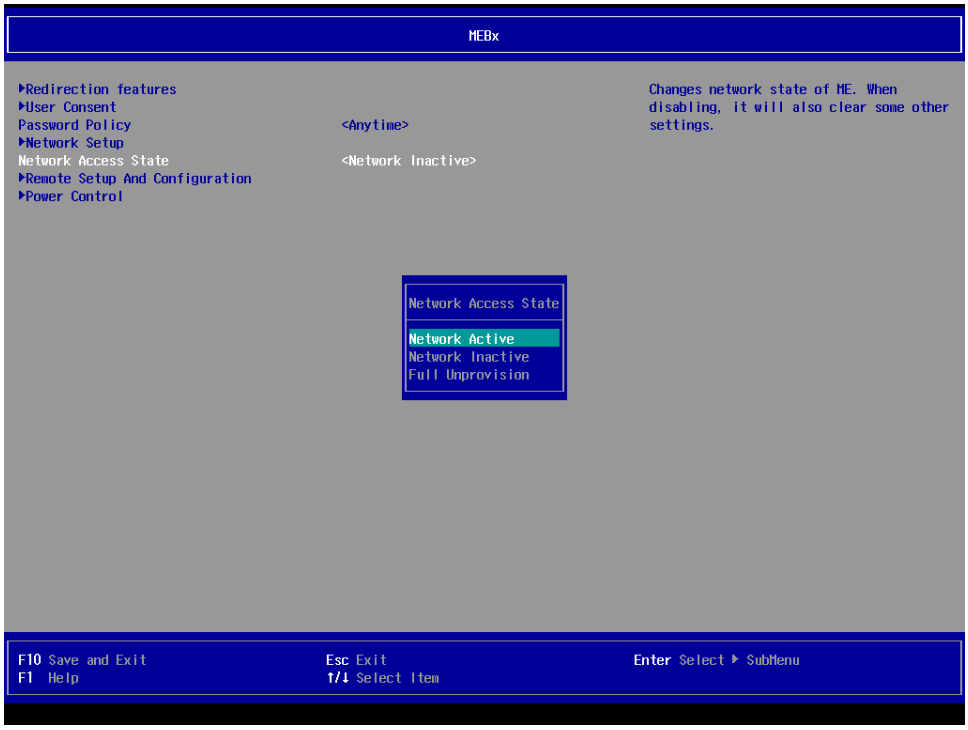
9. Select **TCP/IP Settings**.

10. Select **Wired LAN IPV4 Configuration**.

11. Select **DHCP Mode** and **Disable** DHCP mode.

12. Type the network settings for Intel® Active Management Technology.

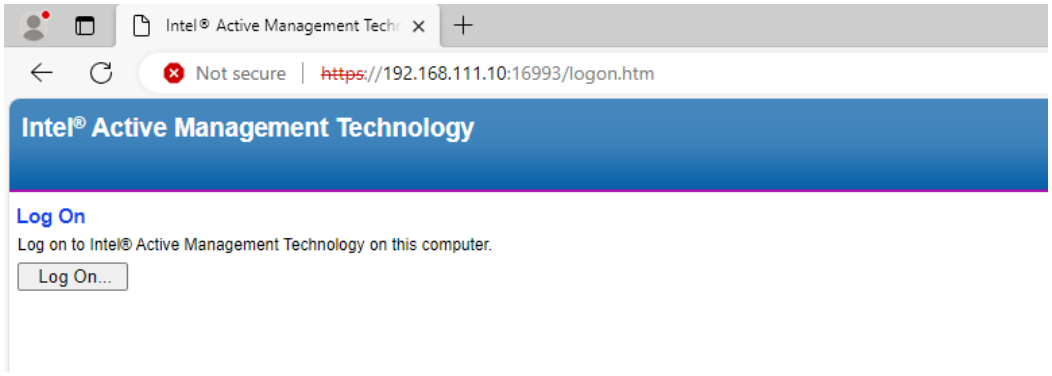
13. Go back to the **Intel(R) AMT Configuration** page and select **Network Activate Access > Network Active**. Enter **Y** to continue.



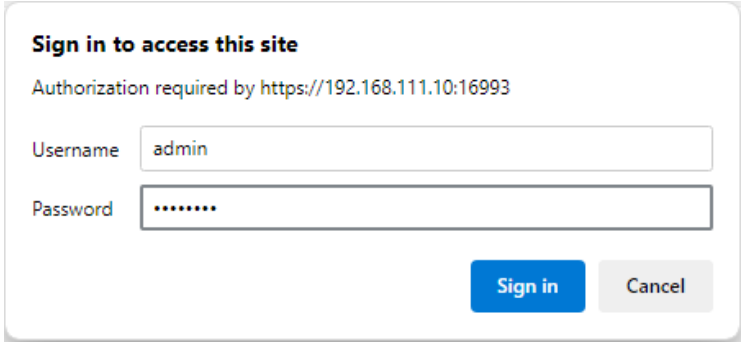
14. Press **F10** to Save and Exit.

Access the Intel® AMT From Website

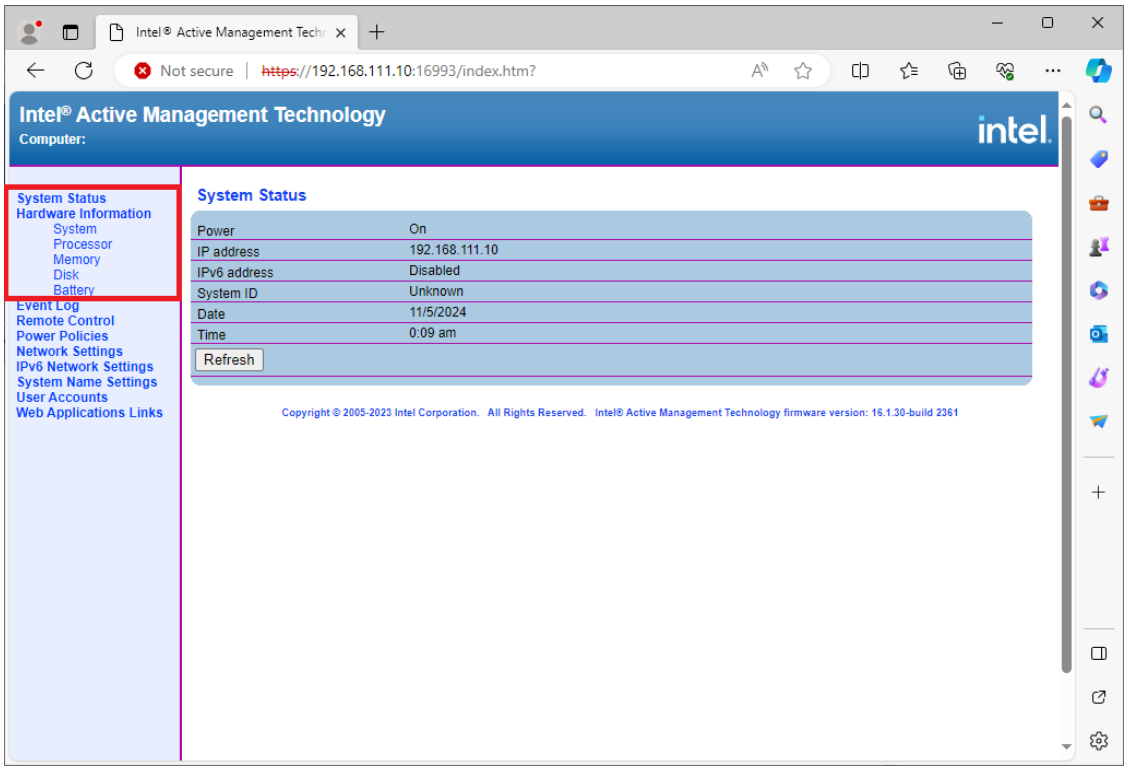
1. Open the web browser and type the URL: **Intel® AMT IP Address:16993** (ex: 192.168.111.10:16993)



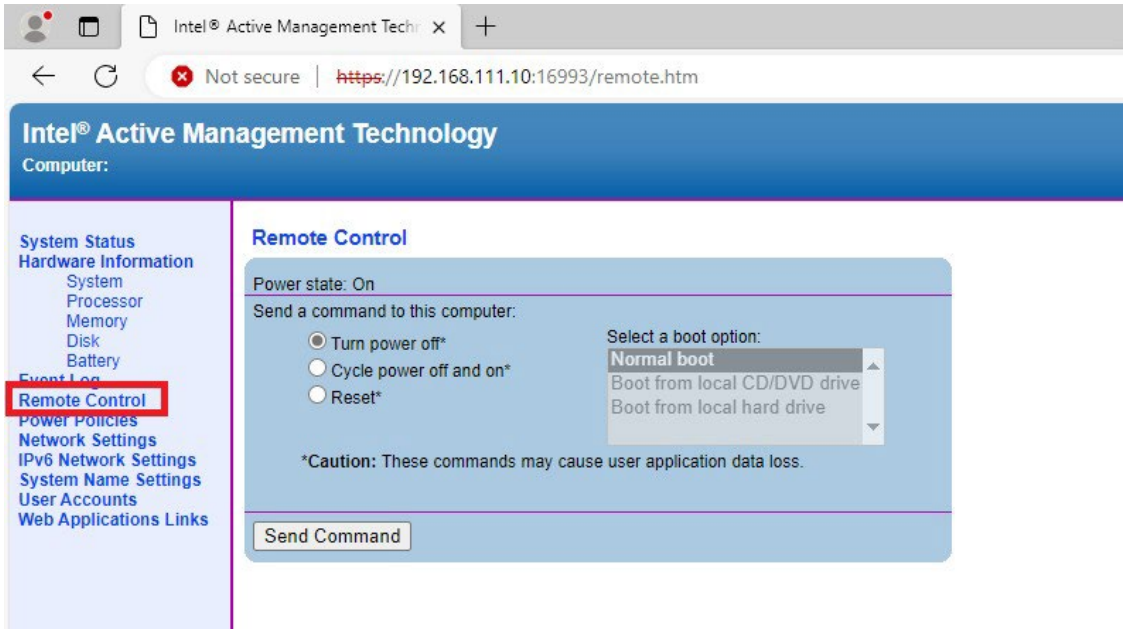
2. The browser would show the sign in message box. Type the **Username** and **Password** of Intel® AMT. The default username is **admin**.



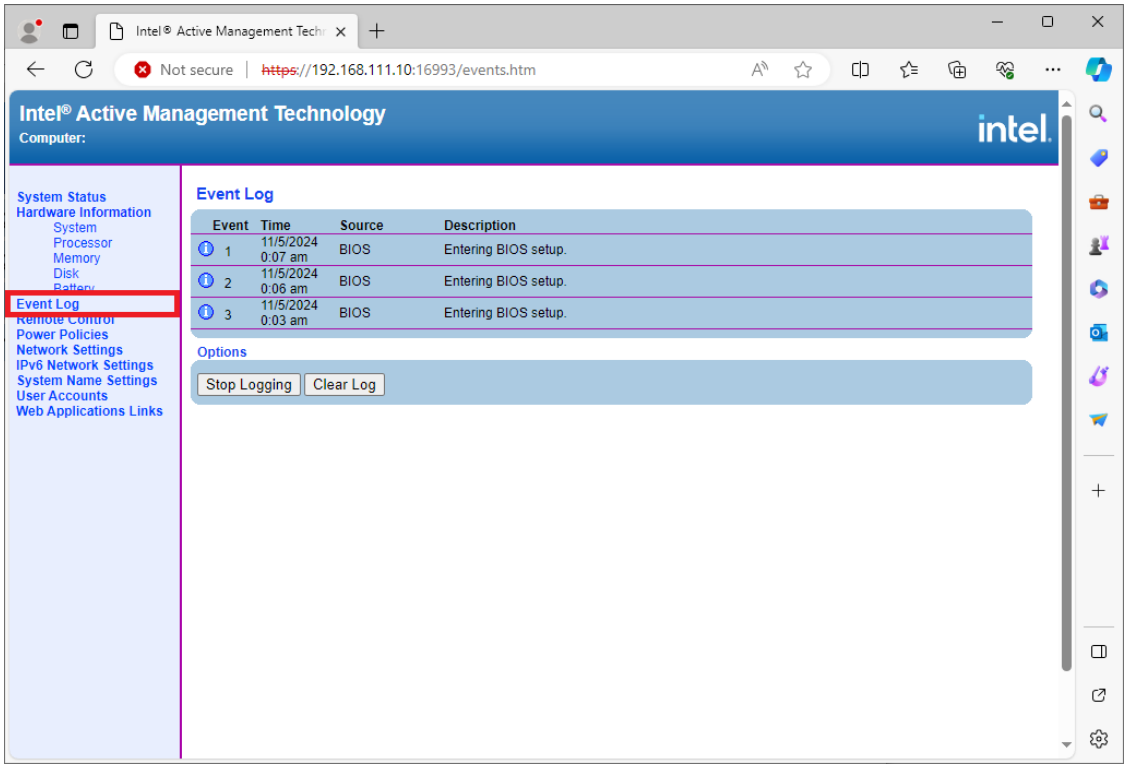
3. After signing in, you can check the system status and hardware information of the managed device.



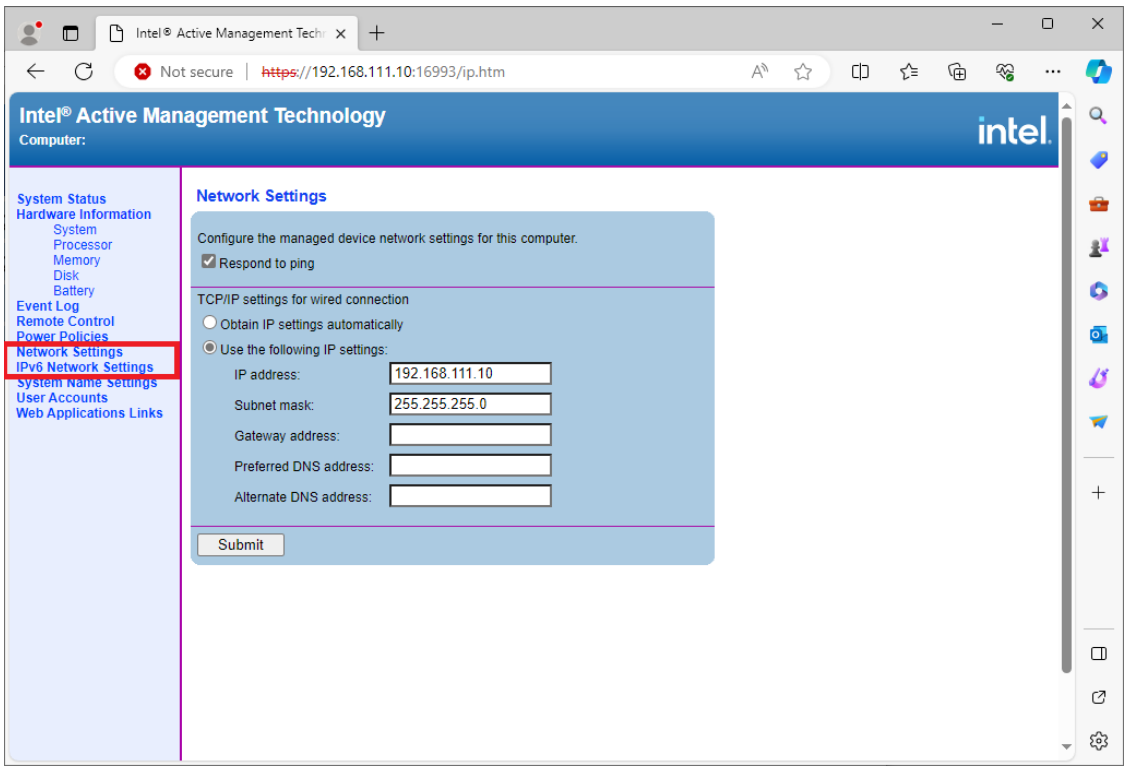
The Intel® AMT website provides a basic remote power control feature under **Remote Control** for managed devices. Advanced remote power control and remote KVM features require a management tool that supports Intel® AMT, such as Intel® Endpoint Management Assistant (Intel® EMA) or the third-party tool MeshCommander. For installation and usage instructions, refer to the official documentation of the selected tool.



4. The Event Manager deals with internal alerts that occur in both the host platform and the Intel® AMT device, regardless of the power state.



5. You can configure the managed device network settings from the website.



NOTE

You can also use AMT management tool to remotely manage devices.

6. Unified Write Filter

Unified Write Filter (UWF) is an optional feature that helps to protect your drives by intercepting and redirecting any writes to the drive (app installations, settings changes, saved data) to a virtual overlay. The virtual overlay is a temporary location that is usually cleared during a reboot or when a guest user logs off.

UWF provides a clean experience for thin clients and workspaces that have frequent guests, like schools, library, or hotel computers. Guests can work, change settings, and install software. After the device reboots, the next guest receives a clean experience. It increases security and reliability for kiosks, IoT-embedded devices, and other devices where new apps are not expected to be frequently added.

This chapter describes the usage of the Unified the Write Filter (UWF).

To use the UWF, you must first install the feature and enable it; the default is disable.

The first time you enable UWF on your device, UWF makes the following changes to your system to improve its performance:

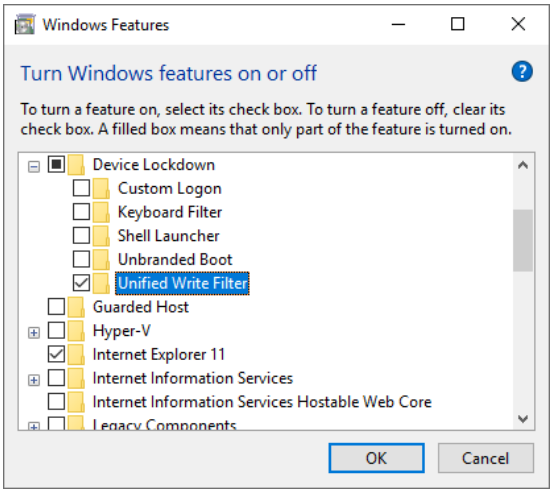
- **Paging files are disabled**
- **System restore is disabled**
- **SuperFetch is disabled**
- **File indexing service is turned off**
- **Fast boot is disabled**
- **Defragmentation service is turned off**
- **BCD setting bootstatuspolicy is set to ignoreallfailures**

After UWF is enabled, you can select a drive that you want to protect and start using UWF. UWF can help you manage PCs and devices remotely using WMI.

Turning on UWF on a Running PC

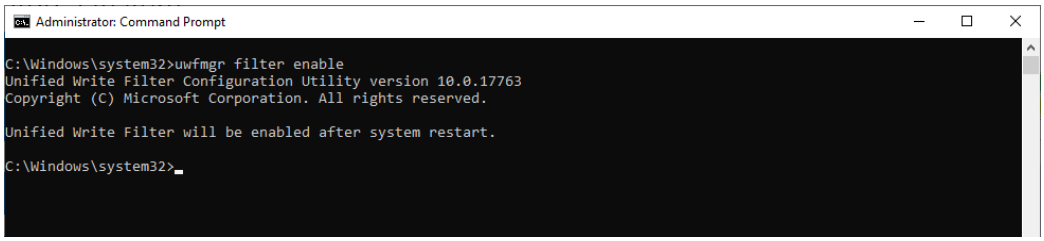
- Install UWF.
  a. In the Windows **Start** window, type **Turn Windows features on or off**.
  b. Open the **Windows Features** window and expand the **Device Lockdown** node.
  c. Select **Unified Write Filter** and click **OK**.
  d. Windows searches for the required files and displays a progress bar.

     Once the files are found, Windows applies the changes. When the changes are complete, a message to this effect is displayed.
  e. Click **Close**.



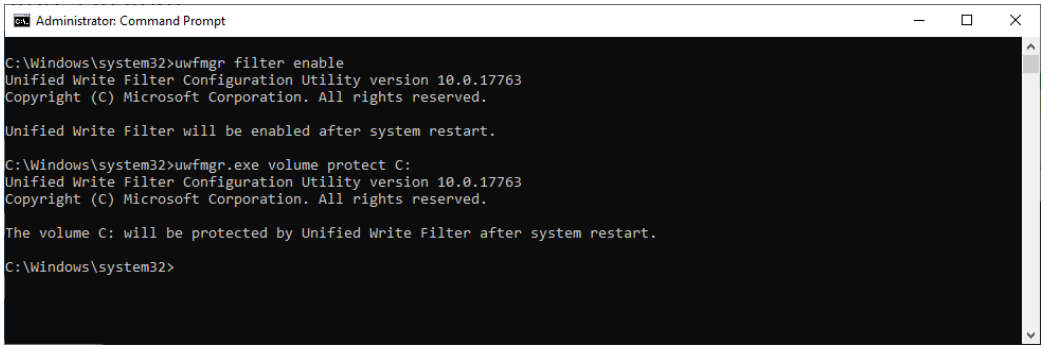
- Enable the following filter as an Administrator:

  cmd uwfmgr filter enable



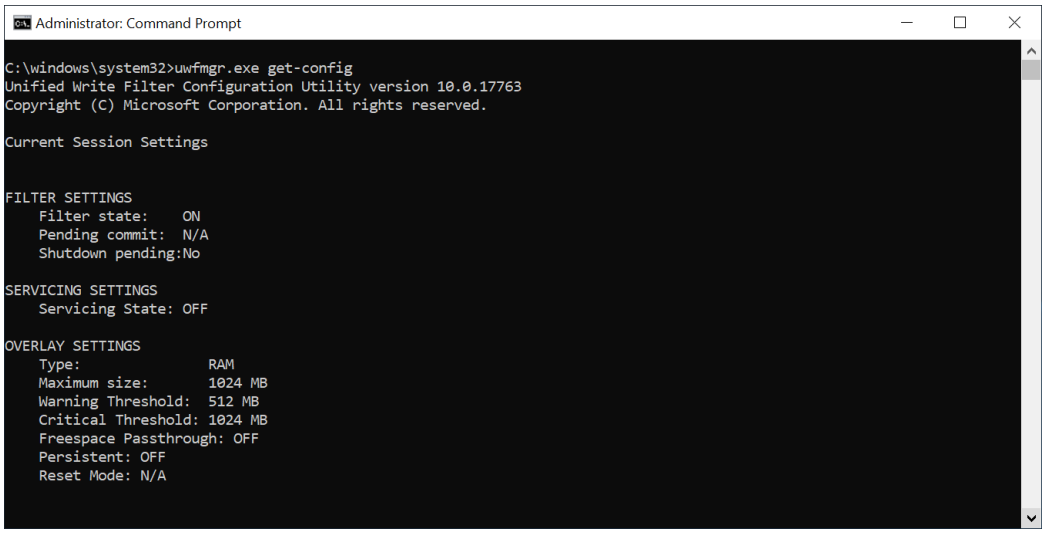
- Enable write protection for a drive:

  cmd uwfmgr.exe volume protect C:



- Restart your computer.
- Confirm that UWF is running:

  cmd uwfmgr.exe get-config



Installing UWF Using WMI

If you have already installed Windows on your computer and you do not want to use a provisioning package, you can configure UWF by using Windows Management Instrumentation (WMI) providers.

To turn on UWF using WMI, use the **UWF_Filter** function, specifically the **UWF_Filter.Enable** method in one of the following ways:

- Use the WMI providers directly in a PowerShell script
- Use the WMI providers directly in an application
- Use the command line tool, uwfmgr.exe

NOTE

You must restart your computer after you turn on or turn off UWF for the changes to take effect.

You can also change the settings after you turn on UWF. For example, you can move the page file location to an unprotected volume and re-enable paging files.

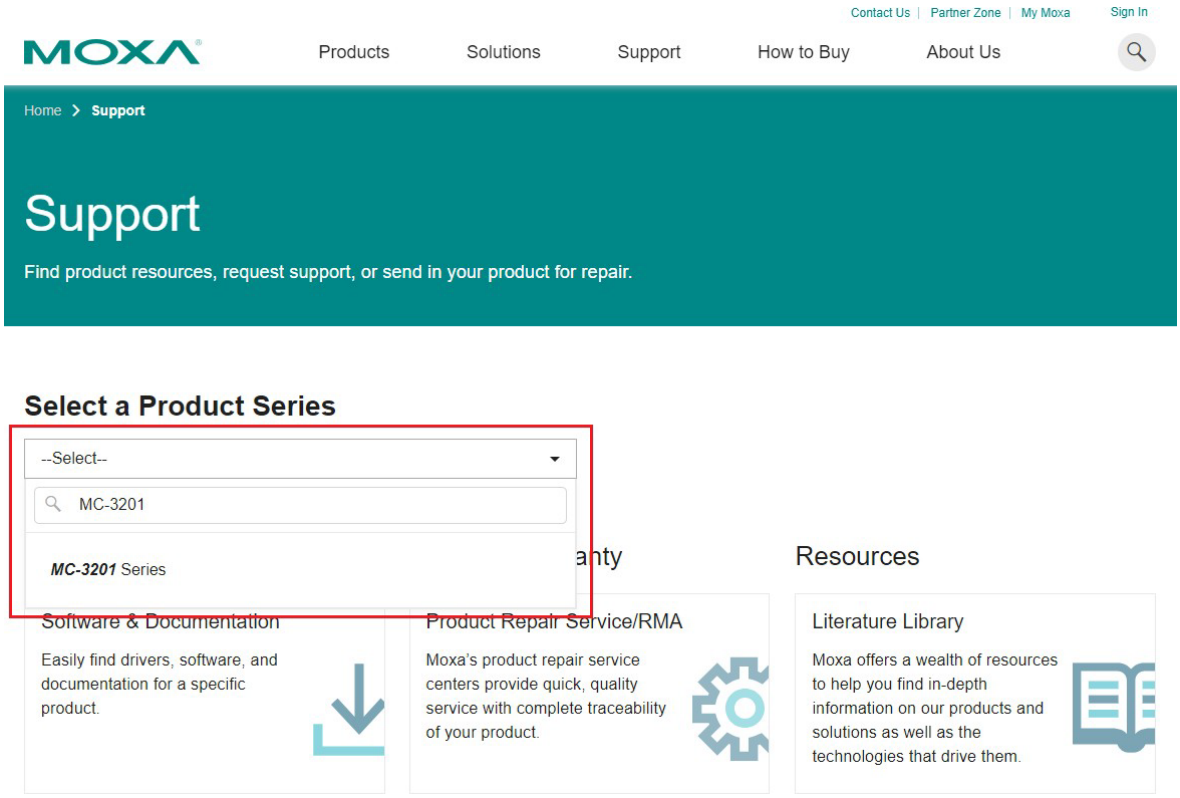
IMPORTANT!

If you add UWF to your image by using SMI settings in the unattend.xml file, turning on UWF only sets the bootstatuspolicy BCD setting and turns off the defragmentation service. You must manually turn off the other features and services if you want to increase the performance of UWF.

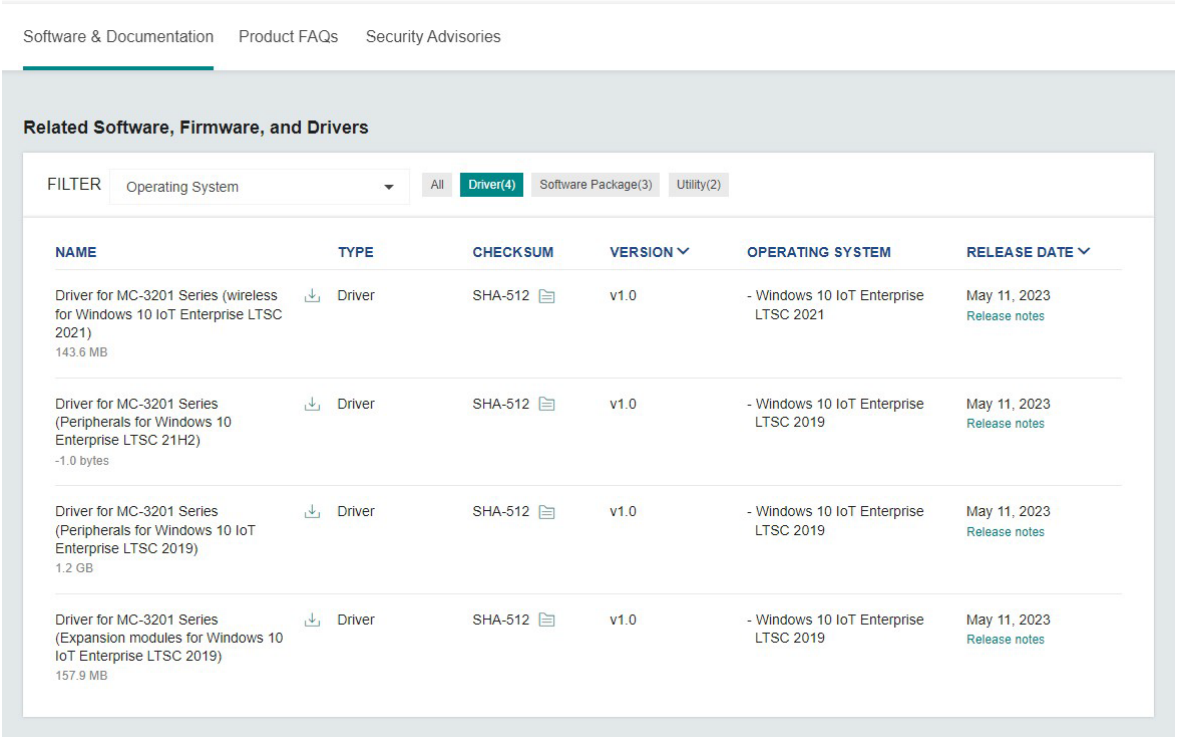
After the device is restarted, UWF maintains configuration settings for the current session in a registry. UWF automatically excludes these registry entries from its filter. Static configuration changes do not take effect until after a device restarts; the changes are saved in registry entries for use in the next session. Dynamic configuration changes occur immediately and persist after a device restarts.

7. Driver

Moxa provide verified drivers for each device on official website. Please access the Moxa support page (https://www.moxa.com/en/support) and search for the device from the searching window (For Example: MC-3201).



From the **Software & Documentation** page filtered by **Driver** and download the driver package. The driver packages are categorized by OS version.



8. Utility

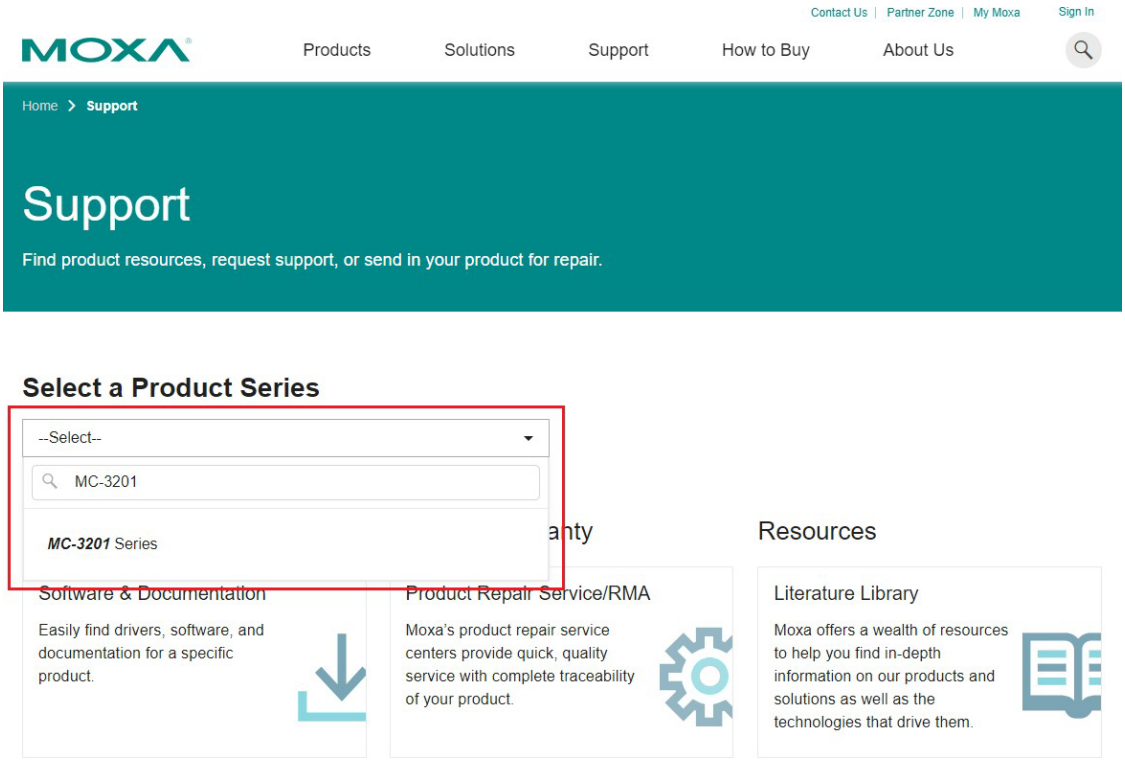
This chapter describes the usage of the following:

- **Moxa IO Controller Utility**
- **Serial Interface Utility**
- **Moxa Sort Net Name Utility**
- **Moxa CAN Port Sort Utility**

Where to Find the Windows Utilities

The utilities are preinstalled on your device if the Windows 11 OS is provided by Moxa. If you have installed Windows 11 on your own, go to the Moxa support page (https://www.moxa.com/en/support) to download the utility.

1. Search for the device from the searching window (example: MC-3201).



2. Go to the **Software & Documentation** page, filter by **Utility** and download the required file. The installation file for the device is in a *.zip file.

MC-3201 Series

Compact computers with 11th Gen Intel® Core™ processor, designed for IIoT, AI, and marine applications, -20 to 55°C operating temperature

GO TO PRODUCT PAGE Save

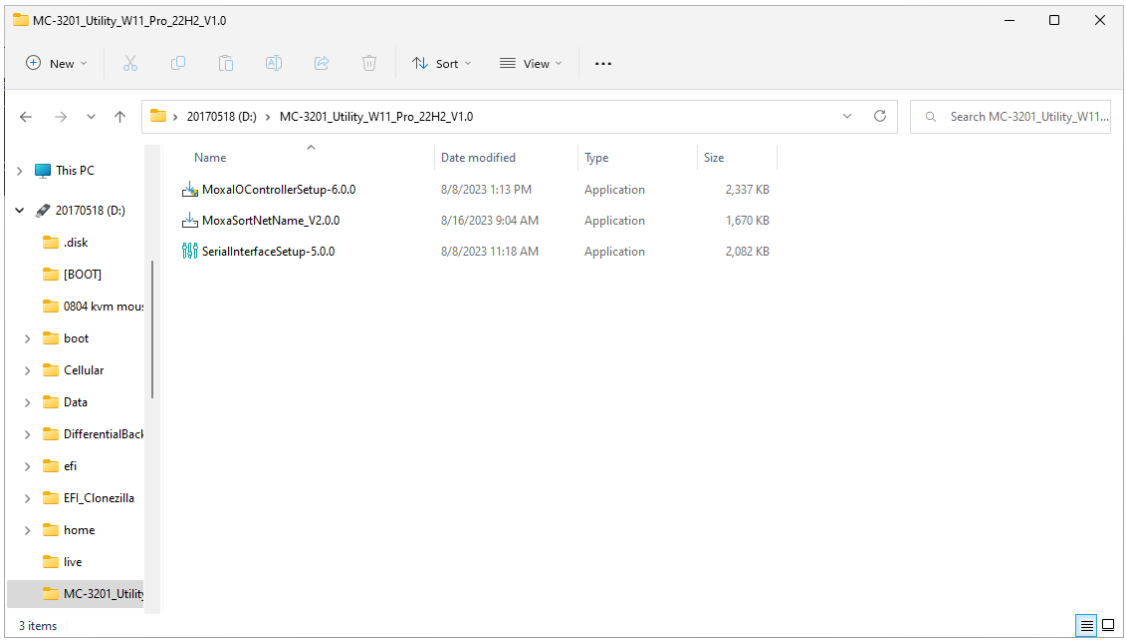
Software & Documentation Product FAQs Security Advisories

Related Software, Firmware, and Drivers

FILTER Operating System All Driver(4) Software Package(3) Utility(2)

NAME	TYPE	CHECKSUM	VERSION	OPERATING SYSTEM	RELEASE DATE
Utility for MC-3201 Series (Windows 10 IoT Enterprise LTSC 2021) 5.9 MB	Utility	SHA-512	v1.0	- Windows 10 IoT Enterprise LTSC 2021	May 11, 2023 Release notes
Utility for MC-3201 Series (Windows 10 IoT Enterprise LTSC 2019) 5.1 MB	Utility	SHA-512	v1.0	- Windows 10 IoT Enterprise LTSC 2019	May 11, 2023 Release notes

3. After extracting the files, you will obtain the following setup files.



Dependent Packages

- After the installation of Windows 11 Professional and drivers are completed, you will need to install **dependent packages** to ensure the smooth operation of the utility. Use the following links to download and install the packages.
- Microsoft Visual C++ Redistributable: https://learn.microsoft.com/en-us/cpp/windows/latest- supported-vc-redist?view=msvc-170
- Microsoft .NET Framework 4.8: https://support.microsoft.com/en-us/topic/microsoft-net-framework-4- 8-offline-installer-for-windows-9d23f658-3b97-68ab-d013-aa3c3e7495e0

Moxa IO Controller Utility

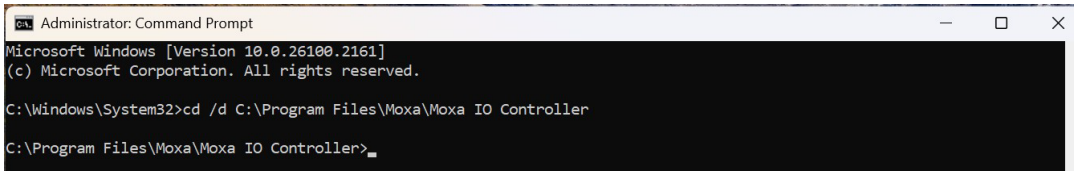
Moxa IO Controller Utility is developed to control the peripherals' IO as well as expansion modules interface of the device.

This section describes how to use the Moxa IO Controller utility and covers the following:

- Setting the DIO status
- Setting the UART mode
- Setting the PCIe slot power status (only for BXP-A101 Series)
- Setting the PCIe reset pin status (only for BXP-A101 Series)

Use the pre-installed utility or install the **MoxaIOControllerSetup utility** from the Moxa support page.

To use the Moxa IO Controller utility, first install the utility and enable the utility to configure the DIO, UART, PCIe slot power, and PCIe reset pin status. After the installation process is complete, run the Windows command prompt as an Administrator and change the path to C:\Program Files\Moxa\Moxa IO Controller.

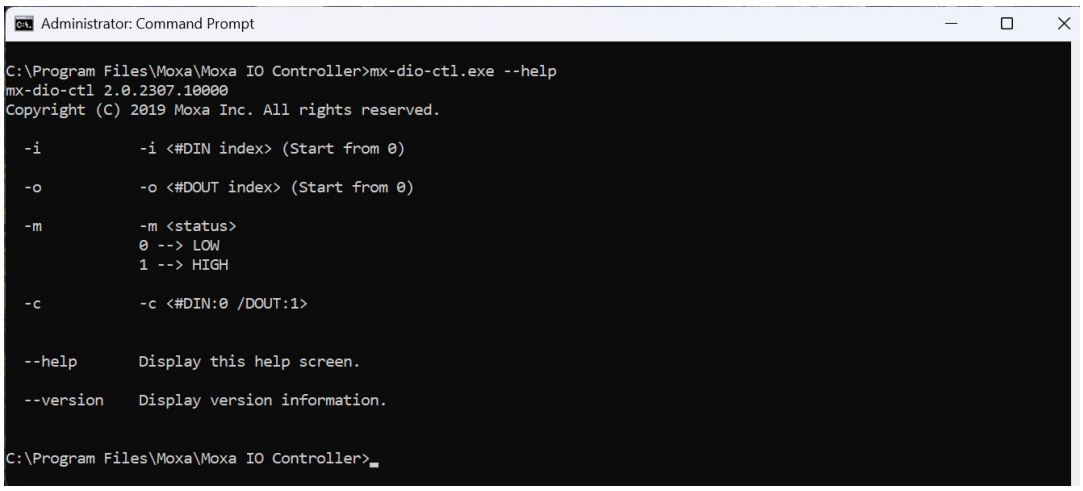


Setting the DIO Status

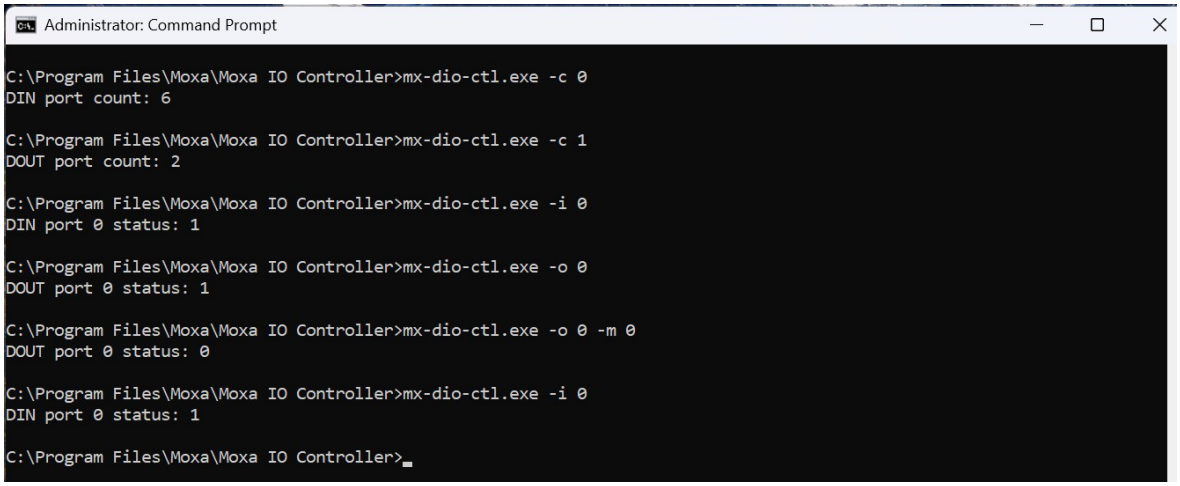
Type the **mx-dio-ctl --help** command to see the instructions on using this utility and follow them to get or set the DIO status.

IMPORTANT!

The DIN and DOUT indices start at 0. Even though the console output starts at 1, the indices still start at 0.



Example:

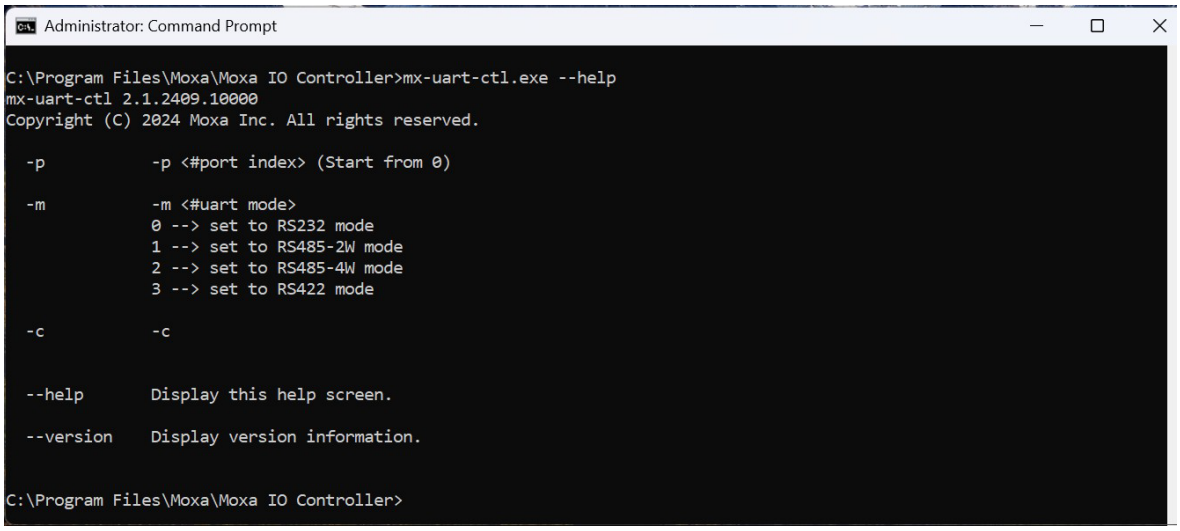


Setting the UART Mode

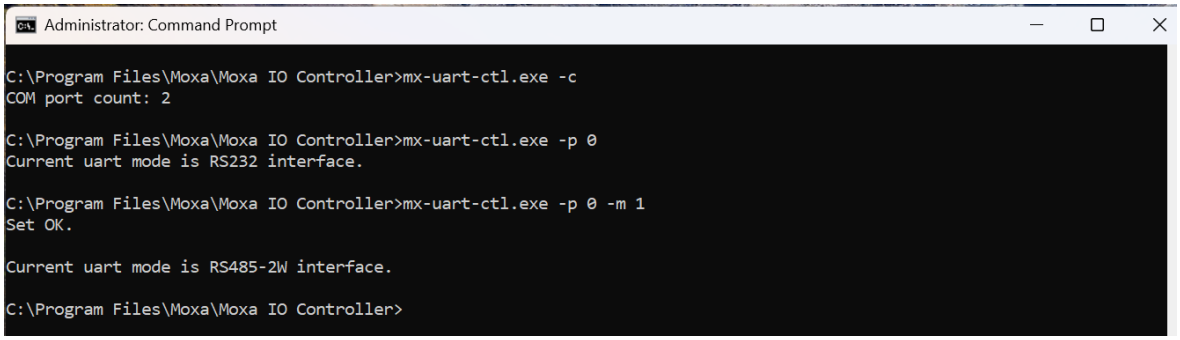
Type the **mx-uart-ctl --help** command to see instructions on using this utility and follow the onscreen instructions to get or set the UART mode.

IMPORTANT!

The UART index starts from 0. Even though the console output starts at 1, the index still starts at 0.



Example:

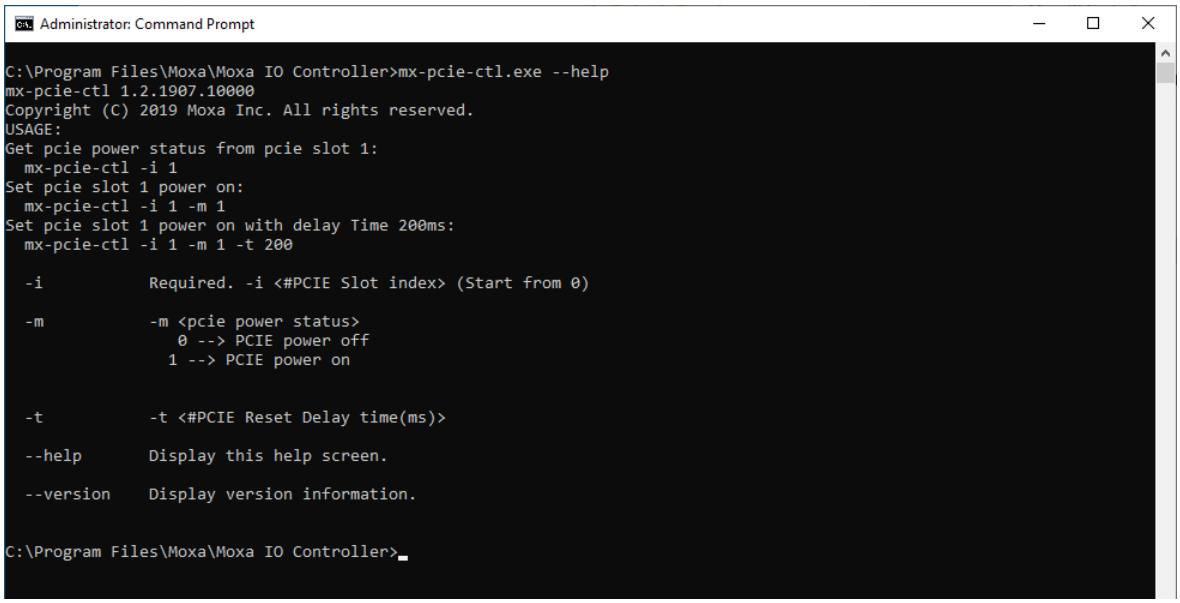


Setting the PCIe Slot Power Status (only for BXP-A101 Series)

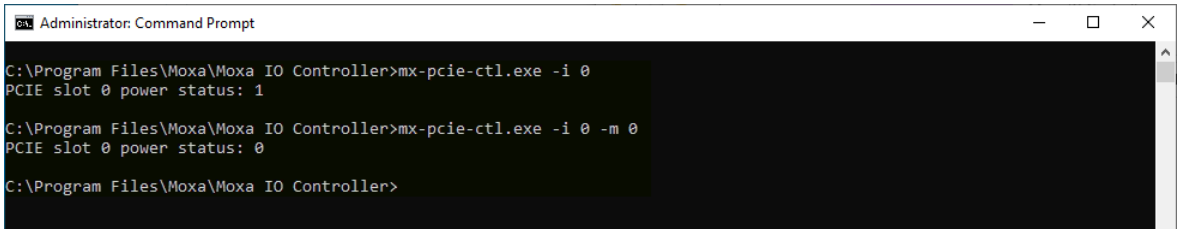
Run the **mx-pcie-ctl --help** command to see instructions on using this utility and follow the onscreen instructions to get or set the status of the PCIE slot power.

IMPORTANT

The PCIe slot index starts from 0. Even though the console output starts at 1, the index still starts at 0.


Administrator: Command Prompt
C:\Program Files\Moxa\Moxa IO Controller>mx-pcie-ctl.exe --help
mx-pcie-ctl 1.2.1907.10000
Copyright (C) 2019 Moxa Inc. All rights reserved.
USAGE:
Get pcie power status from pcie slot 1:
mx-pcie-ctl -i 1
Set pcie slot 1 power on:
mx-pcie-ctl -i 1 -m 1
Set pcie slot 1 power on with delay Time 200ms:
mx-pcie-ctl -i 1 -m 1 -t 200
-i Required. -i <#PCIE Slot index> (Start from 0)
-m -m <pcie power status>
0 --> PCIE power off
1 --> PCIE power on
-t -t <#PCIE Reset Delay time(ms)>
--help Display this help screen.
--version Display version information.
C:\Program Files\Moxa\Moxa IO Controller>

Example:

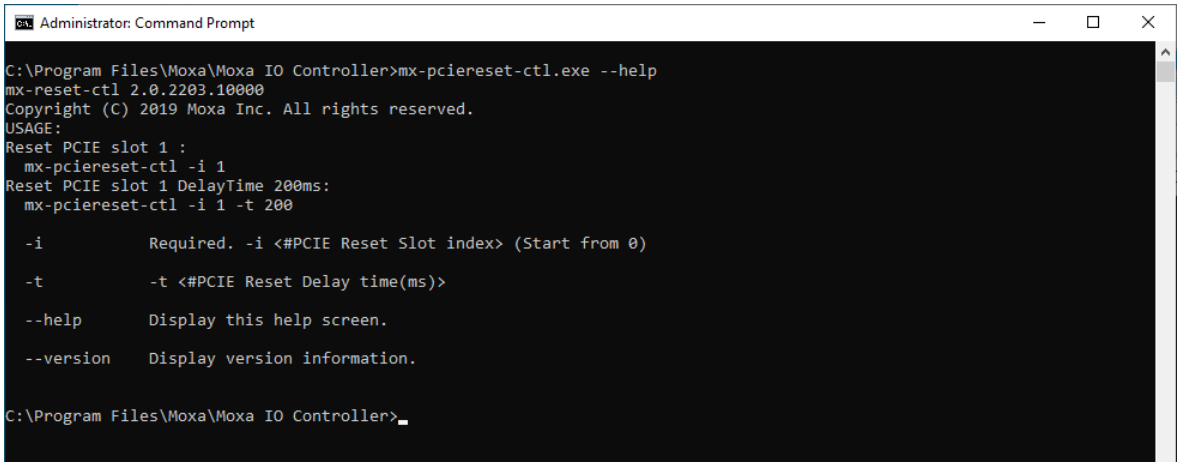

Administrator: Command Prompt
C:\Program Files\Moxa\Moxa IO Controller>mx-pcie-ctl.exe -i 0
PCIE slot 0 power status: 1
C:\Program Files\Moxa\Moxa IO Controller>mx-pcie-ctl.exe -i 0 -m 0
PCIE slot 0 power status: 0
C:\Program Files\Moxa\Moxa IO Controller>

Setting the PCIe Reset Pin Status (only for BXP-A101 Series)

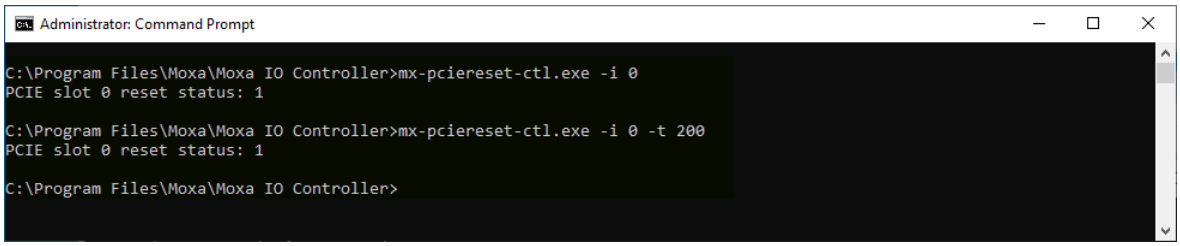
Run the **mx-pciereset-ctl --help** command to see instructions on using this utility and follow the onscreen instructions to get or set the PCIE reset pin status and delay time.

IMPORTANT

The PCIe reset pin index starts from 0. Even though the console output starts at 1, the index still starts at 0.



Example:

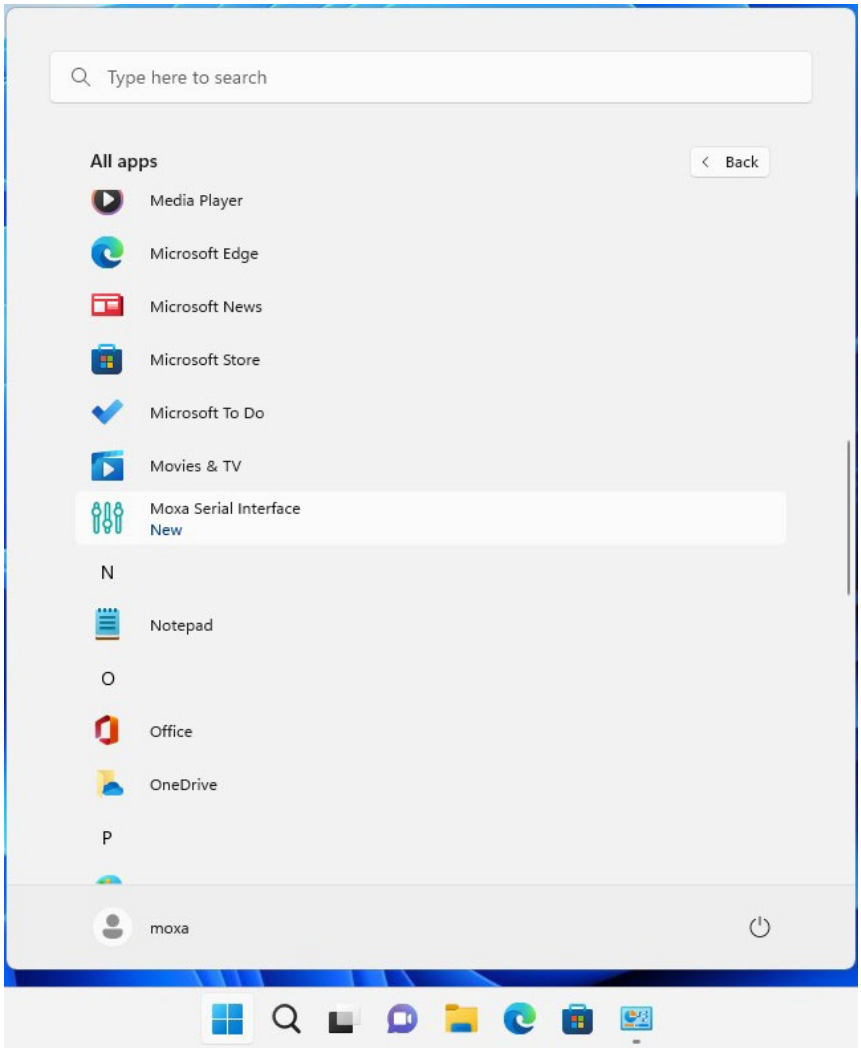


Moxa Serial Interface Utility

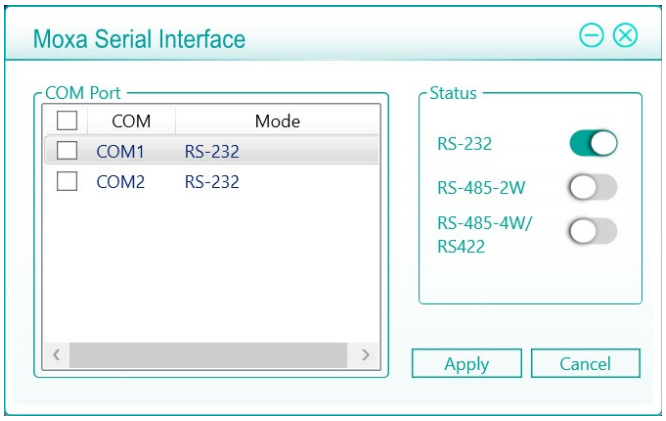
The Moxa Serial Interface utility to set the UART mode in your computer's serial interface.

Setting the Serial Port Mode

1. Use the preinstalled **SerialInterfaceSetup** utility or install it from the Moxa support page.
2. From the Windows Start menu, run the **Moxa Serial Interface utility**.



3. Select the target COM port and UART mode and click **Apply** to save the settings.

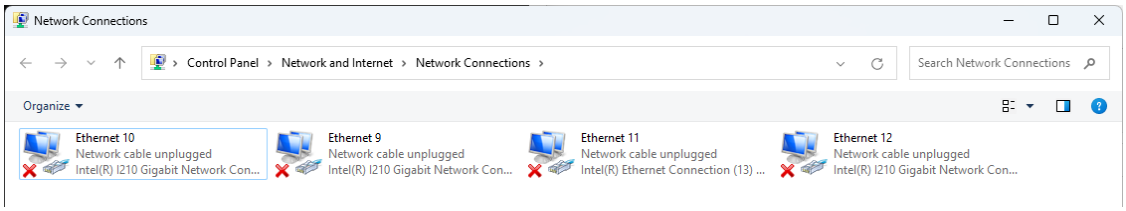


Moxa Sort Net Name Utility

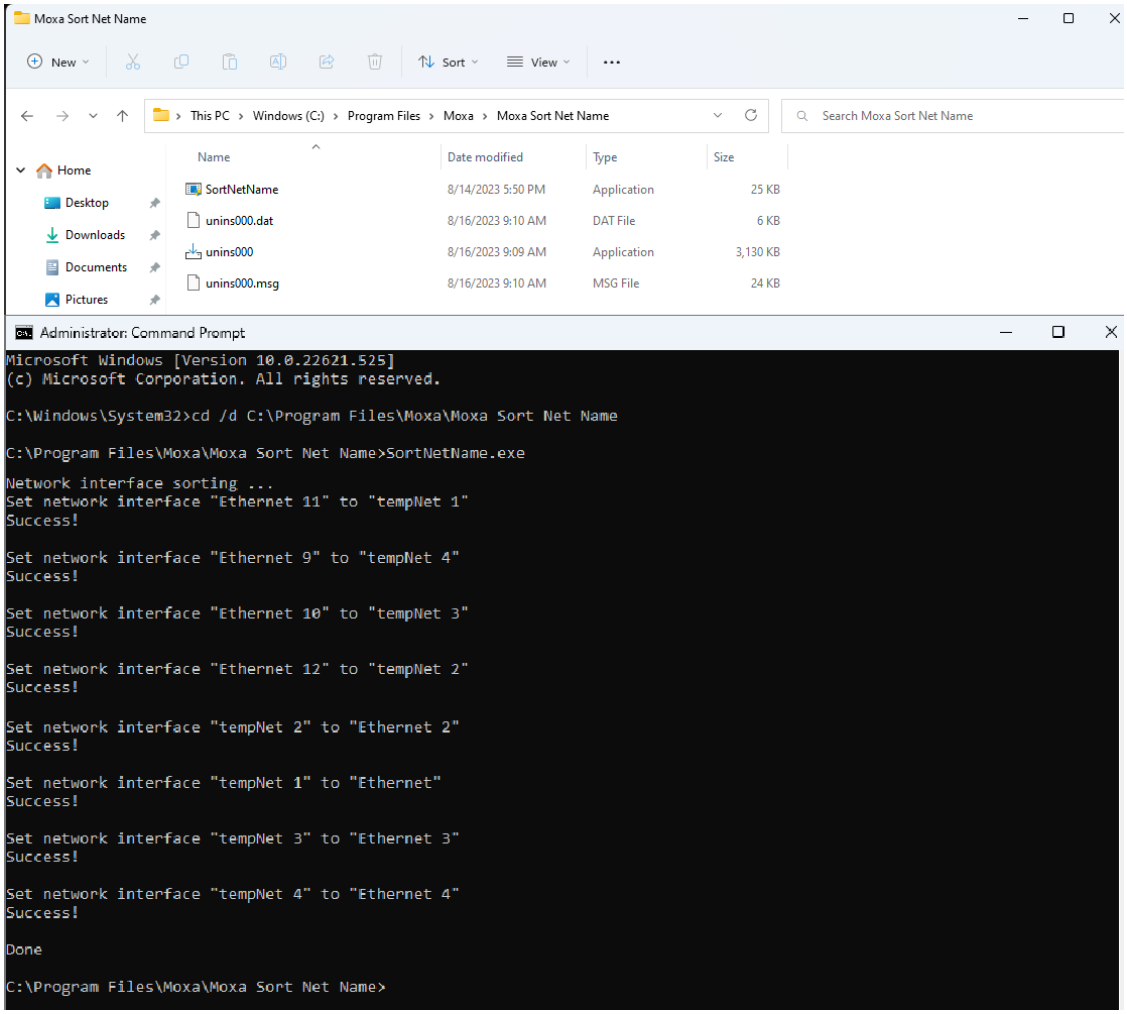
The Moxa Sort Net Name utility can be used to rename Ethernet adapter for mapping physical LAN port order on chassis as follows:

1. Use the pre-installed utility or install the **MoxaSortNetName** utility from the Moxa support page.

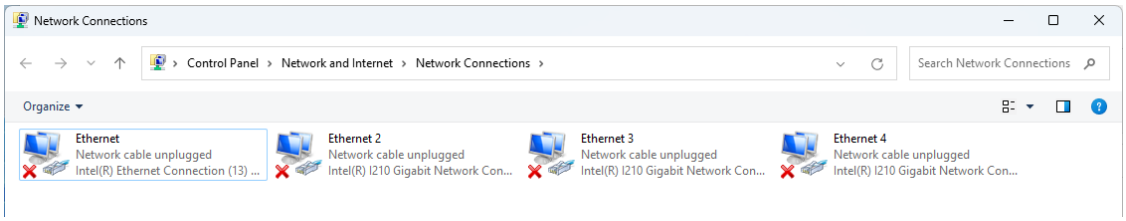
   The initial order of network names may be random.

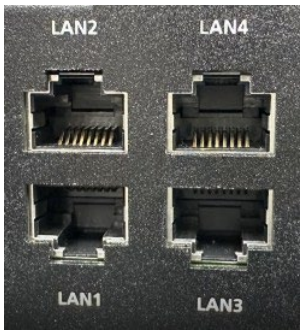


2. Run the **SortNetName.exe** from **C:\Program Files\Moxa\Moxa Sort Net Name** as an Administrator.



3. Wait for the process to complete to rename Ethernet adapter. The order of the Ethernet adapter will correspond to the order of label (e.g., LAN 2 on chassis is mapping to Ethernet 2 in Windows).



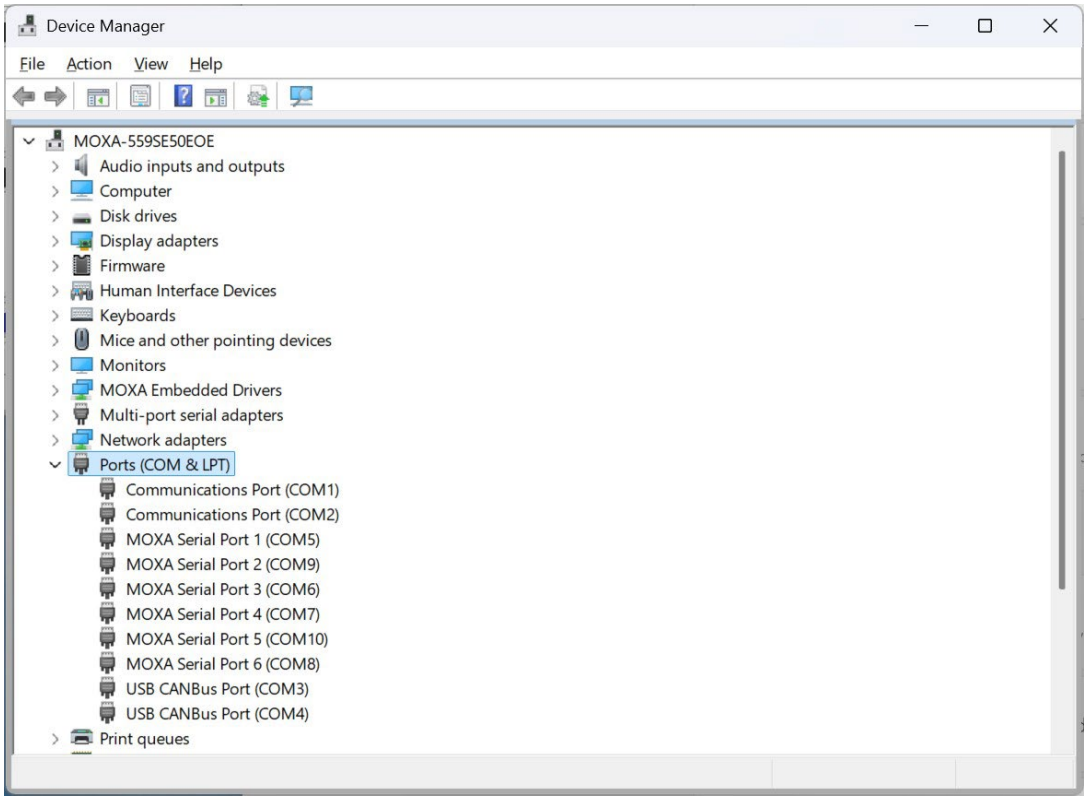


Moxa CAN Port Sort Utility (only for RKP-C220 Series)

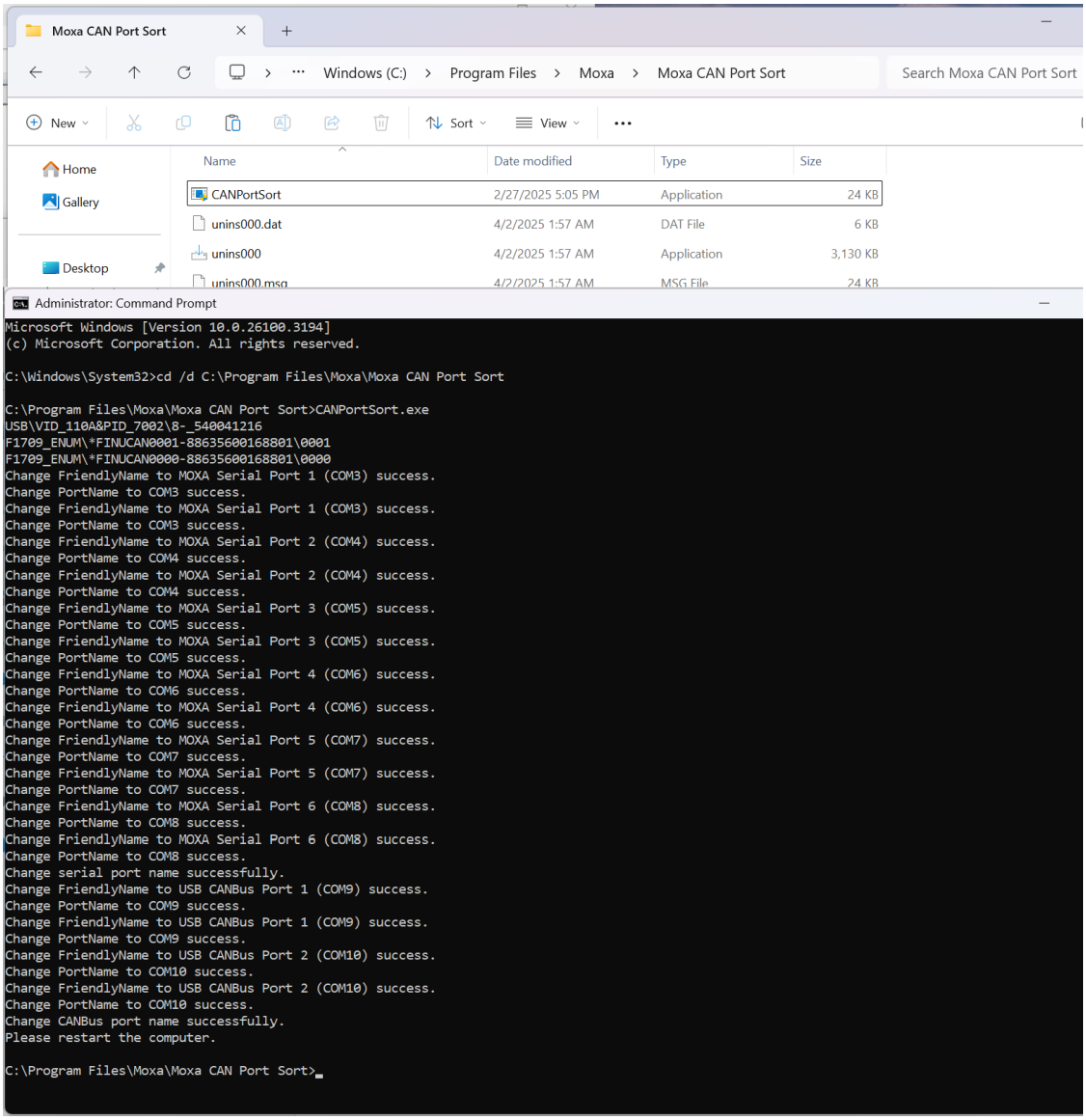
The Moxa CAN Port Sort utility can be used to assign COM port numbers for mapping the physical CAN ports to the UART port order on the chassis (compatible with the 6 COM 2 CAN model) as follows:

1. Use the pre-installed utility or install the **MoxaCANPortSort** utility from the Moxa support page.

   The initial COM port number assigned may differ from the chassis.



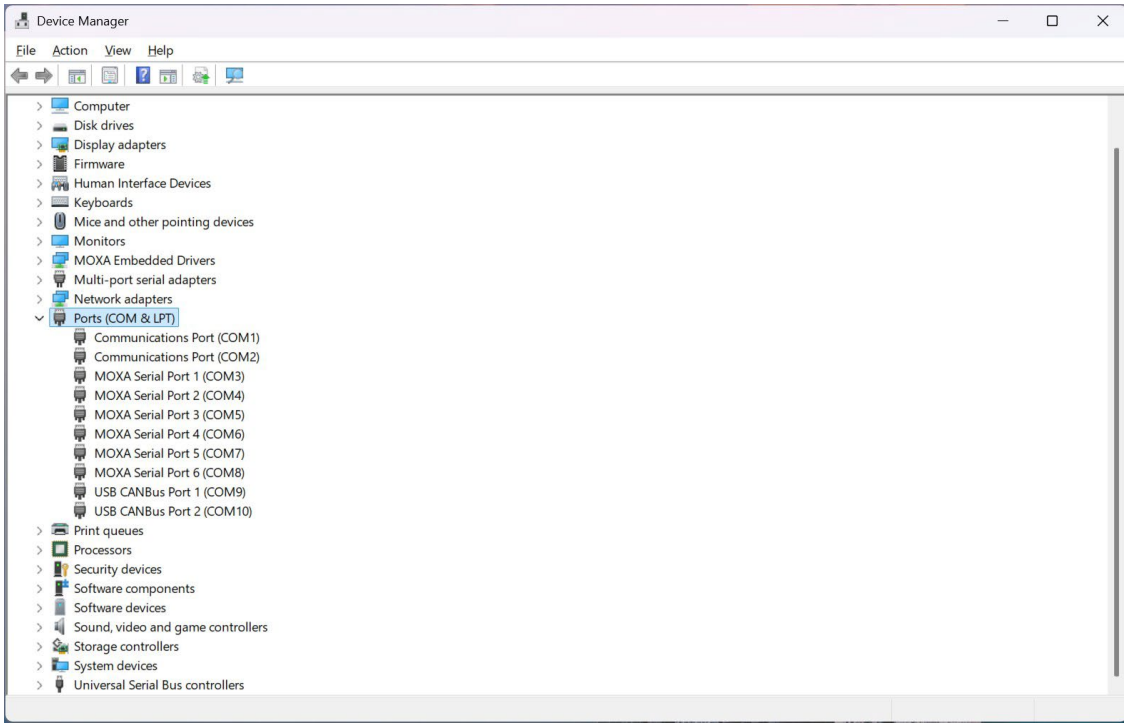
2. Run the **CANPortSort.exe** as an Administrator from **C:\Program Files\Moxa\Moxa CAN Port Sort**.



3. Wait for the process to complete to then assign the COM port numbers.

4. Restart the computer.

   The order of the CANBus ports and UART ports will correspond to the order of labels on the chassis.

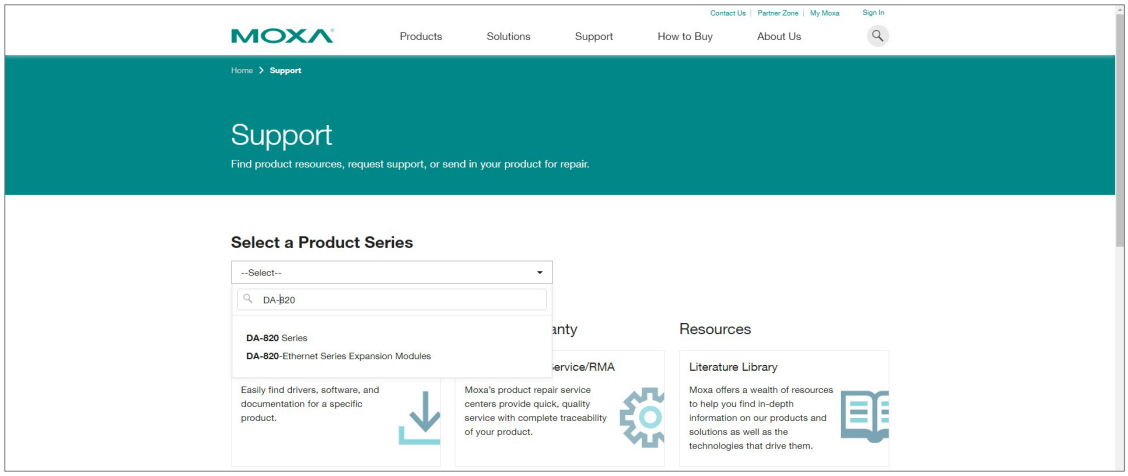


9. IO Control API

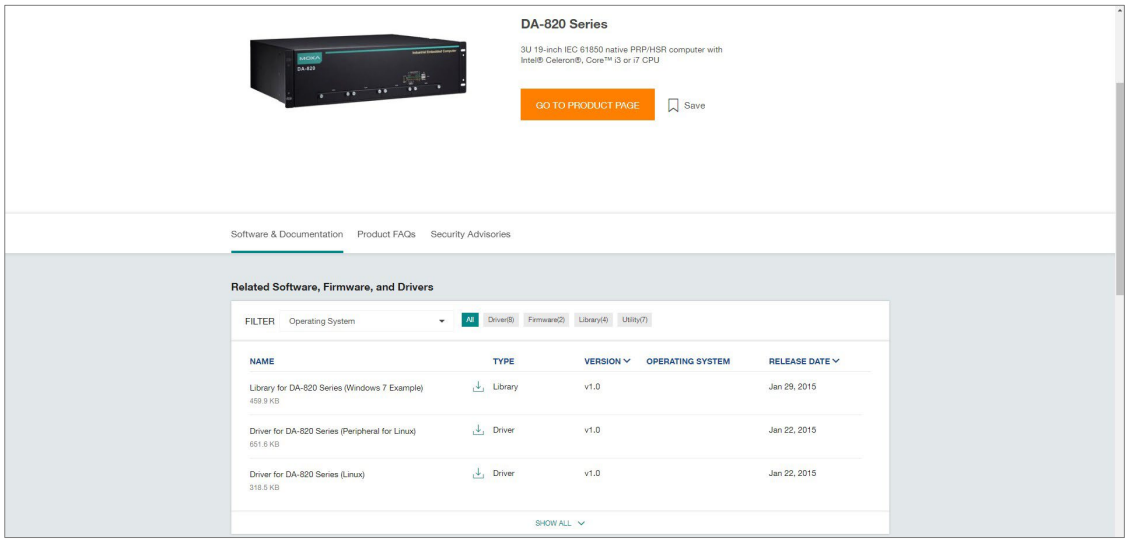
This chapter describes the usage of the IO Control API.

Downloading the API

1. Access the Moxa support page: https://www.moxa.com/en/support
2. Select the product series (example: DA-820).



3. Download the related files.



mxdgio

The **mxdgio** library operates on the digital I/Os and consists of the following:

- **GetDinCount**
- **GetOutCount**
- **GetDinStatus**
- **GetDoutStatus**
- **SetDoutStatus**

GetDinCount

Syntax

```
int GetDinCount();
```

Description

Get the numbers of a digital input port.

Parameters

N/A.

Return Value

The numbers of the digital input port.

Error codes

The following error codes can be retrieved using the **DIO_STATUS** function.

Name	Value	Meaning
LIB_INITIALIZE_FAIL	-1	The mxdgio library initialization failed. Cannot open json profile.

Requirements

Name	Items
Header	mxdgio.h
Library	mxdgio.lib
DLL	mxdgio.dll
Profile	MxdgioProfile[*ModelName*].json

GetDoutCount

Syntax

```
int GetDoutCount();
```

Description

Get the numbers of a digital output port.

Parameters

N/A.

Return Value

The numbers of the digital output port.

Error codes

The following error codes can be retrieved using the **DIO_STATUS** function.

Name	Value	Meaning
LIB_INITIALIZE_FAIL	-1	The mxdgio library initialization failed. Cannot open json profile.

Requirements

Name	Items
Header	mxdgio.h
Library	mxdgio.lib
DLL	mxdgio.dll
Profile	MxdgioProfile[*ModelName*].json

GetDinStatus

Syntax

```
int GetDinStatus(int port);
```

Description

Gets the status of a digital input port.

Parameters

port: The index of the digital input port; starts at 0.

Return Value

The status of the digital input port; 0 for low and 1 for high.

Error codes

The following error codes can be retrieved using the **DIO_STATUS** function.

Name	Value	Meaning
LIB_INITIALIZE_FAIL	-1	The mxdgio library initialization failed. Cannot open json profile.
PORT_OUTOF_INDEX	-2	Target port index is out of range.

Requirements

Name	Items
Header	mxdgio.h
Library	mxdgio.lib
DLL	mxdgio.dll
Profile	MxdgioProfile[*ModelName*].json

GetDoutStatus

Syntax

```
int GetDoutStatus(int port);
```

Description

Gets the status of a digital output port.

Parameters

port: The index of the digital output port; starts at 0.

Return Value

The status of the digital output port; 0 for low and 1 for high.

Error codes

The following error codes can be retrieved using the **DIO_STATUS** function.

Name	Value	Meaning
LIB_INITIALIZE_FAIL	-1	The mxdgio library initialization failed. Cannot open json profile.
PORT_OUTOF_INDEX	-2	Target port index is out of range.

Requirements

Name	Items
Header	mxdgio.h
Library	mxdgio.lib
DLL	mxdgio.dll
Profile	MxdgioProfile[*ModelName*].json

SetDoutStatus

Syntax

```
int SetDoutStatus(int port, int status);
```

Description

Sets the status of a digital output port.

Parameters

port: The index of the digital output port; starts at 0.

status: The status of the digital output port; 0 for low and 1 for high.

Return Value

Returns the value 0 if the digital output status is successfully set.

Error codes

The following error codes can be retrieved using the **DIO_STATUS** function.

Name	Value	Meaning
LIB_INITIALIZE_FAIL	-1	The mxdgio library initialization failed. Cannot open json profile.
PORT_OUTOF_INDEX	-2	Target port index is out of range.
SET_STATUS_ERR	-3	Status setting failed or is defined with a bad format.

Requirements

Name	Items
Header	mxdgio.h
Library	mxdgio.lib
DLL	mxdgio.dll
Profile	MxdgioProfile[*ModelName*].json

mxsp

The **mxsp** library operates on the serial port and consists of the following:

- **GetUartCount**
- **GetUartMode**
- **SetUartMode**

GetUartCount

Syntax

```
int GetUartCount();
```

Description

Gets the numbers of the UART port.

Parameters

N/A

Return Value

The numbers of the UART port.

Error codes

The following error codes can be retrieved using the **UART_STATUS** function.

Name	Value	Meaning
LIB_INITIALIZE_FAIL	-1	The mxsp library initialization failed. Cannot open json profile.

Requirements

Name	Items
Header	mxsp.h
Library	mxsp.lib
DLL	mxsp.dll
Profile	MxspProfile[*ModelName*].json

GetUartMode

Syntax

```
int GetUartMode(int port);
```

Description

Gets the status of the UART port.

Parameters

port: The index of the UART port; starts at 0.

Return Value

The mode of a UART interface; 0 for RS-232, 1 for RS-485-2W, 2 for RS-485-4W and 3 for RS-422.

Error codes

The following error codes can be retrieved using the **UART_STATUS** function.

Name	Value	Meaning
LIB_INITIALIZE_FAIL	-1	The mxsp library initialization failed. Cannot open json profile.
PORT_OUTOF_INDEX	-2	Target port index is out of range.

Requirements

Name	Items
Library	mxsp.lib
DLL	mxsp.dll
Profile	MxspProfile[*ModelName*].json

SetUartMode

Syntax

```
int SetUartMode(int port, int mode);
```

Description

Sets the status of the UART port.

Parameters

port: The index of the UART port; starts at 0.

mode: The mode of a UART interface; 0 for RS-232, 1 for RS-485-2W, 2 for RS-485-4W and 3 for RS-422.

Return Value

Returns 0 if the UART mode is successfully set.

Error codes

The following error codes can be retrieved using the **UART_STATUS** function.

Name	Value	Meaning
LIB_INITIALIZE_FAIL	-1	The mxsp library initialization failed. Cannot open json profile.
PORT_OUTOF_INDEX	-2	Target port index is out of range.
SET_STATUS_ERR	-3	Status setting failed or is defined with a bad format.
NOT_SUPPORT_MODE	-4	Target mode is not supported for this port.

Requirements

Name	Items
Header	mxsp.h
Library	mxsp.lib
DLL	mxsp.dll
Profile	MxspProfile[*ModelName*].json

mxpcie (only for BXP-A101 Series)

The mxpcie library operates on the power of PCIE slot and consists of the following:

- **GetPCIESlotStatus**
- **SetPCIESlotStatus**
- **SetPCIESlotStatusWithReset**

GetPCIESlotStatus

Syntax

```
int GetPCIESlotStatus(int port);
```

Description

Gets the PCIE slot power status.

Parameters

port: The index of the PCIE slot; starts at 0.

Return Value

The status of a PCIE slot power; 0 for OFF, 1 for ON.

Error codes

The following error codes can be retrieved using the **PCIE_STATUS** function.

Name	Value	Meaning
LIB_INITIALIZE_FAIL	-1	The mxpcie library initialization failed. Cannot open json profile.
PORT_OUTOF_INDEX	-2	Target port index is out of range.

Requirements

Name	Items
Header	mxpcie.h
Library	mxpcie.lib
DLL	mxpcie.dll
Profile	MxpcieProfile[*ModelName*].json

SetPCIESlotStatus

Syntax

```
int SetPCIESlotStatus(int port, int status);
```

Description

Sets the PCIE slot power status.

Parameters

port: The index of the PCIE slot; starts at 0.

status: The status of the PCIE slot power; 0 for OFF, 1 for ON.

Return Value

Returns 0 if the PCIE slot power is successfully set.

Error codes

The following error codes can be retrieved using the **PCIE_STATUS** function.

Name	Value	Meaning
LIB_INITIALIZE_FAIL	-1	The mxpcie library initialization failed. Cannot open json profile.
PORT_OUTOF_INDEX	-2	Target port index is out of range.
SET_STATUS_ERR	-3	Status setting failed or is defined with a bad format.

Requirements

Name	Items
Header	mxpcie.h
Library	mxpcie.lib
DLL	mxpcie.dll
Profile	MxpcieProfile[*ModelName*].json

SetPCIESlotStatusWithReset

Syntax

```
int SetPCIESlotStatusWithReset(int port, int status, int time);
```

Description

Sets the PCIE slot power status and PCIE slot reset pin turn ON and OFF.

Parameters

port: The index of the PCIE slot; starts at 0.
status: The status of the PCIE slot power and PICE reset pin; 0 for OFF, 1 for ON.
time: The delay time between PCIE slot reset pin turn ON and OFF.

Return Value

Returns 0 if the PCIE slot power and PCIE reset pin are successfully set.

Error codes

The following error codes can be retrieved using the **PCIE_STATUS** function.

Name	Value	Meaning
LIB_INITIALIZE_FAIL	-1	The mxpcie library initialization failed. Cannot open json profile.
PORT_OUTOF_INDEX	-2	Target port index is out of range.
SET_STATUS_ERR	-3	Status setting failed or is defined with a bad format.

Requirements

Name	Items
Header	mxpcie.h
Library	mxpcie.lib
DLL	mxpcie.dll
Profile	MxpcieProfile[*ModelName*].json

mxpciereset (only for BXP-A101 Series)

The mxpciereset library operates on the PCIE reset pin status and consists of the following:

- **GetRESETSlotStatus**
- **SetRESETSlotStatus**

GetRESETSlotStatus

Syntax

```
int GetRESETSlotStatus(int port);
```

Description

Gets the PCIE slot reset pin status.

Parameters

port: The index of the PCIE slot; starts at 0.

Return Value

The status of a PCIE slot reset pin; 0 for OFF, 1 for ON.

Error codes

The following error codes can be retrieved using the **RESET_STATUS** function.

Name	Value	Meaning
LIB_INITIALIZE_FAIL	-1	The mxpciereset library initialization failed. Cannot open json profile.
PORT_OUTOF_INDEX	-2	Target port index is out of range.

Requirements

Name	Items
Header	mxpciereset.h
Library	mxpciereset.lib
DLL	mxpciereset.dll
Profile	MxpcieresetProfile[*ModelName*].json

SetRESETSlotStatus

Syntax

```
int SetRESETSlotStatus(int port, int time);
```

Description

Sets the PCIE slot reset pin ON/OFF cycle and delay time.

Parameters

port: The index of the PCIE slot; starts at 0.

time: The delay time between PCIE slot reset pin turn ON and OFF.

Return Value

Returns 0 if the PCIE slot reset pin is successfully set.

Error codes

The following error codes can be retrieved using the **RESET_STATUS** function.

Name	Value	Meaning
LIB_INITIALIZE_FAIL	-1	The mxpciereset library initialization failed. Cannot open json profile.
PORT_OUTOF_INDEX	-2	Target port index is out of range.
SET_STATUS_ERR	-3	Status setting failed or is defined with a bad format.

Requirements

Name	Items
Header	mxpciereset.h
Library	mxpciereset.lib
DLL	mxpciereset.dll
Profile	MxpcieresetProfile[*ModelName*].json

mxwdg

The **mxwdg** library operates on the watchdog and consists of the following:

- **mxwdg_open**
- **mxwdg_refresh**
- **mxwdg_close**

mxwdg_open

Syntax

```
PVOID mxwdg_open(unsigned long time);
```

Description

Initializes the watchdog timer.

Parameters

time: The interval at which the watchdog timer is refreshed; the unit is seconds.

Return Value

Returns the pointer to the watchdog handle; returns -1 on failure to initialize the watchdog timer.

Requirements

Name	Items
Header	mxwdg.h
Library	mxwdg.lib
DLL	mxwdg.dll

mxwdg_refresh

Syntax

```
int mxwdg_refresh(PVOID fd);
```

Description

Refreshes the watchdog timer.

Parameters

fd: The handle of the watchdog timer.

Return Value

Returns 0 on success; otherwise, the function has failed.

Requirements

Name	Items
Header	mxwdg.h
Library	mxwdg.lib
DLL	mxwdg.dll

mxwdg_close

Syntax

```
void mxwdg_close(PVOID fd);
```

Description

Disables the watchdog timer.

Parameters

fd: The handle of the watchdog timer.

Return Value

This function does not return a value.

Requirements

Name	Items
Header	mxwdg.h
Library	mxwdg.lib
DLL	mxwdg.dll

10. System Backup and Restore

This chapter describes the usage of the system backup and restoration tool.

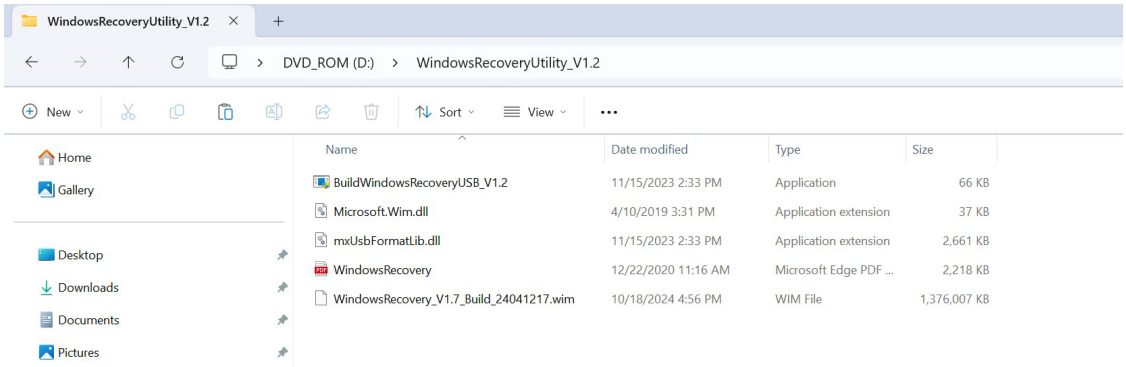
- **WindowsRecovery**

WindowsRecovery

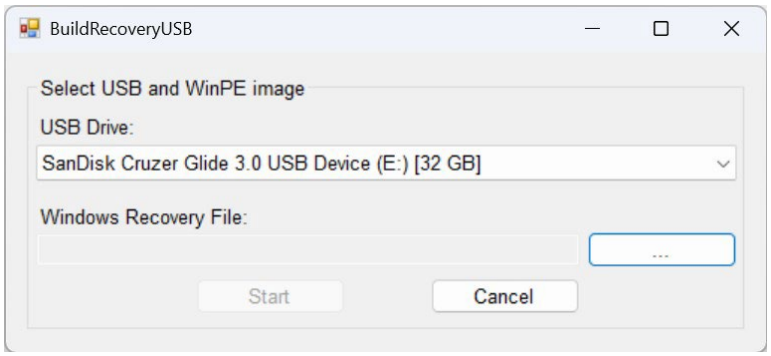
WindowsRecovery is an OS image backup and restore program for system deployment, backup, and recovery. You will first need to create a WindowsRecovery USB disk. This WindowsRecovery disk can only be used to boot a **UEFI BIOS** machine.

Preparing the USB device

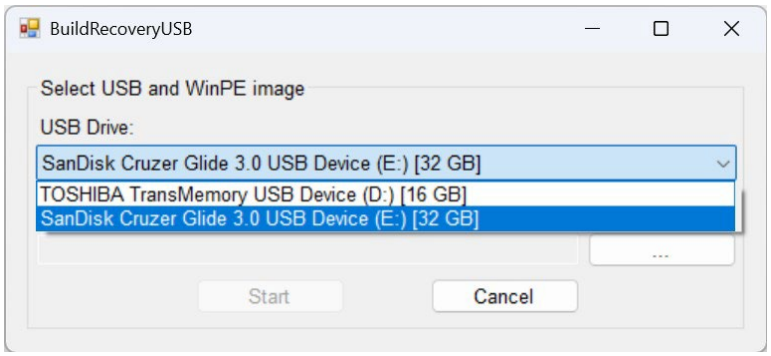
1. Contact a Moxa technical staff and get the required file.



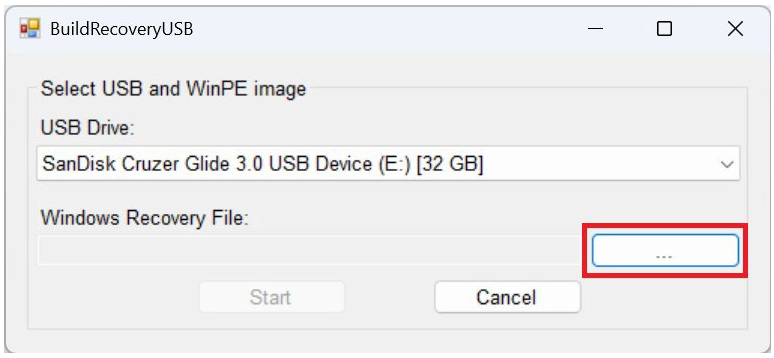
2. Run the **BuildWindowsRecoveryUSB_V1.2.0.exe**.

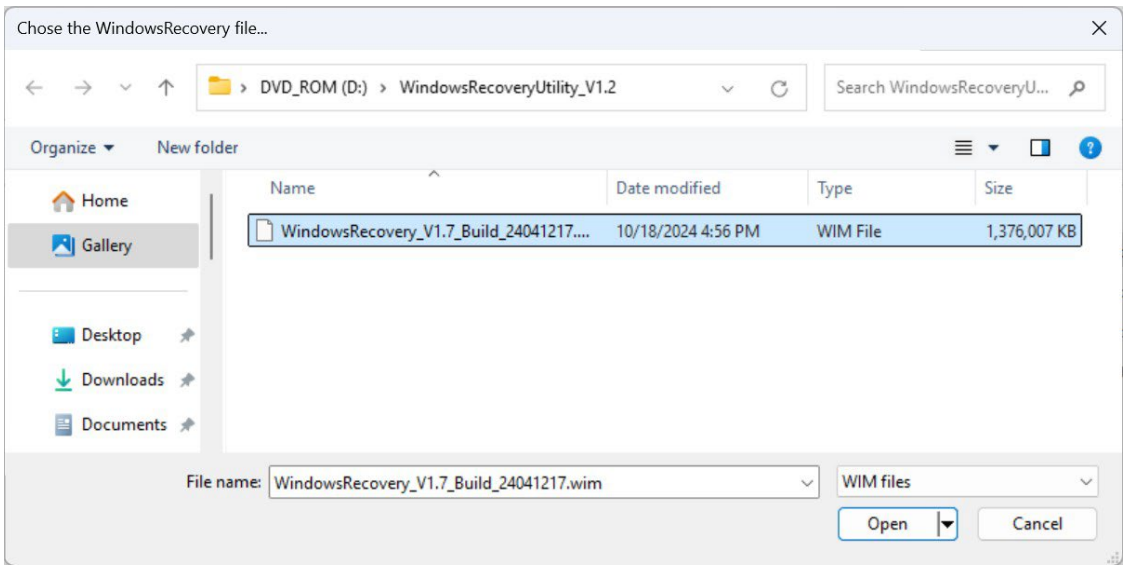


3. Select the USB drive to format.

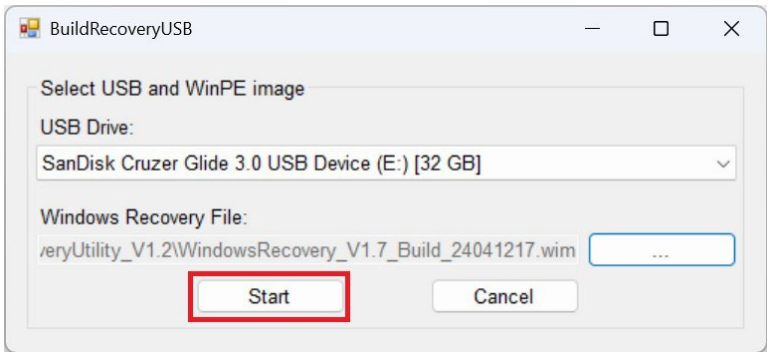


4. Click **...** to select **.wim** file from the folder.

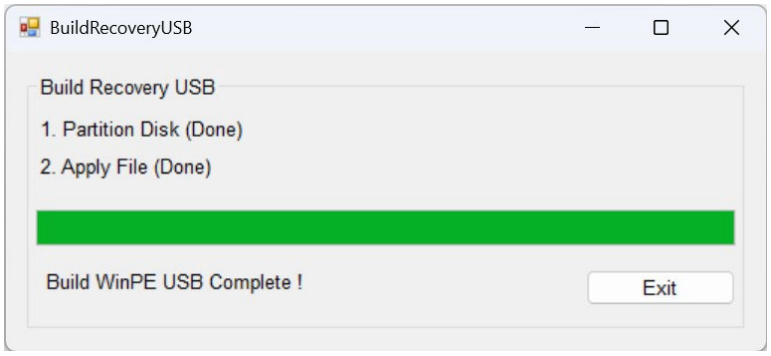




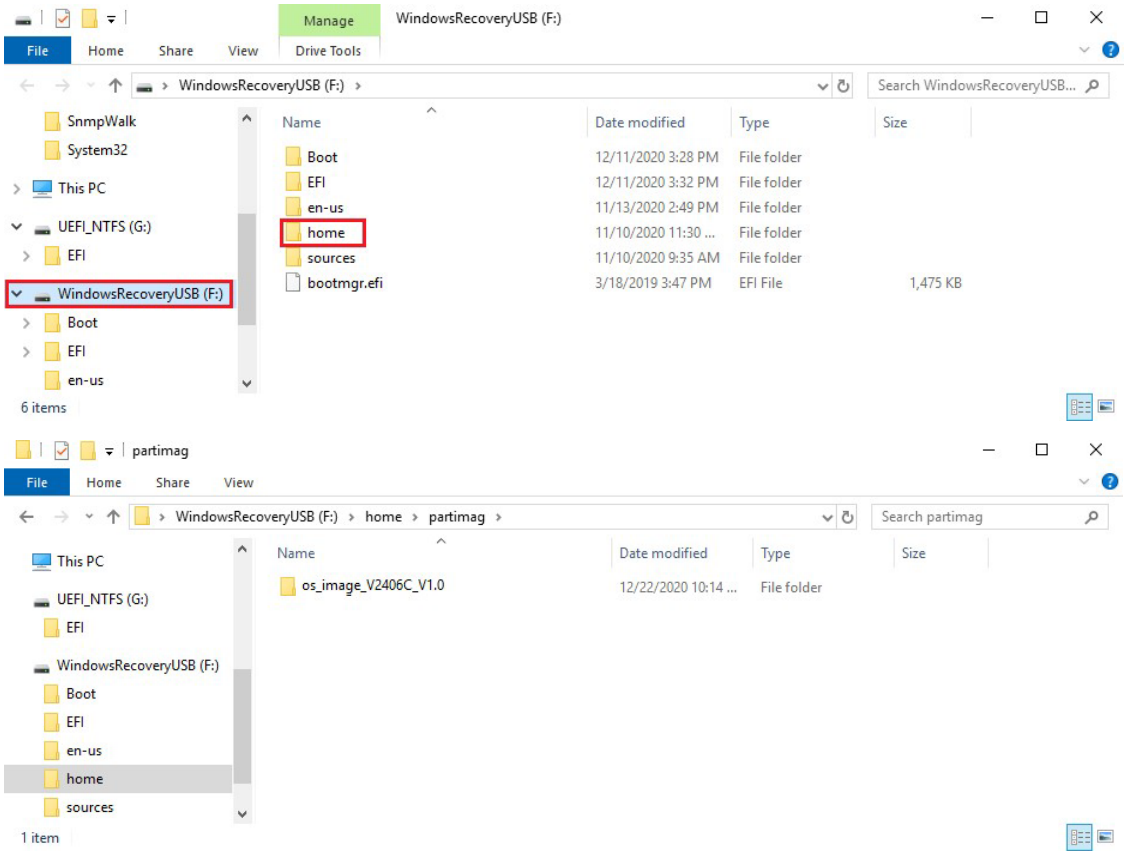
5. Click **Start** and make sure the selected USB can be formatted. Click **Yes** to start creating the recovery USB.



6. Wait for the process to finish. The program will format the USB device and create a UEFI bootable volume and a WinPE volume. You may see additional windows about folder information; do not close these. You can close the windows after the process finishes.

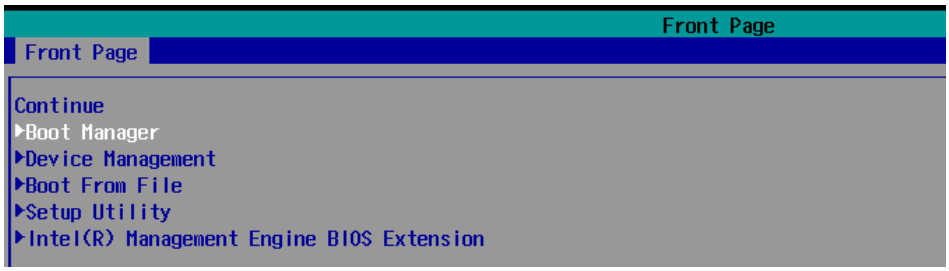


7. To create a recovery USB disk with the Windows 11 image, copy the **os_image_ModelName** directory to the **\home\partimag** folder in the USB drive.

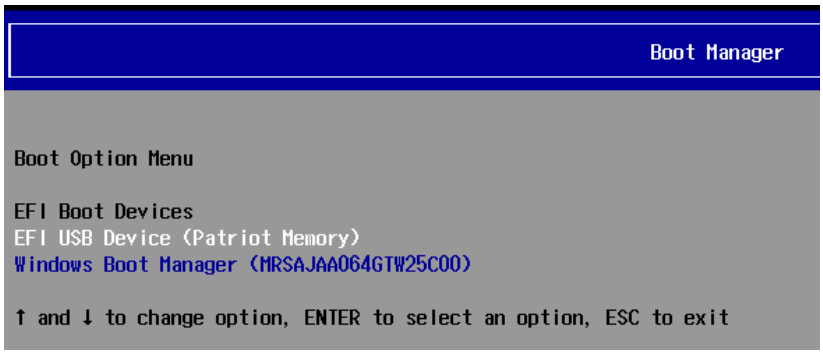


Booting From the USB Disk

1. Turn on the computer and press **F2** when you hear the beep sound to enter the BIOS setup menu, select **Boot Manager** and press **Enter** to continue.



2. Select the **EFI USB Device** on the computer and press **Enter** to continue to boot from the USB device.

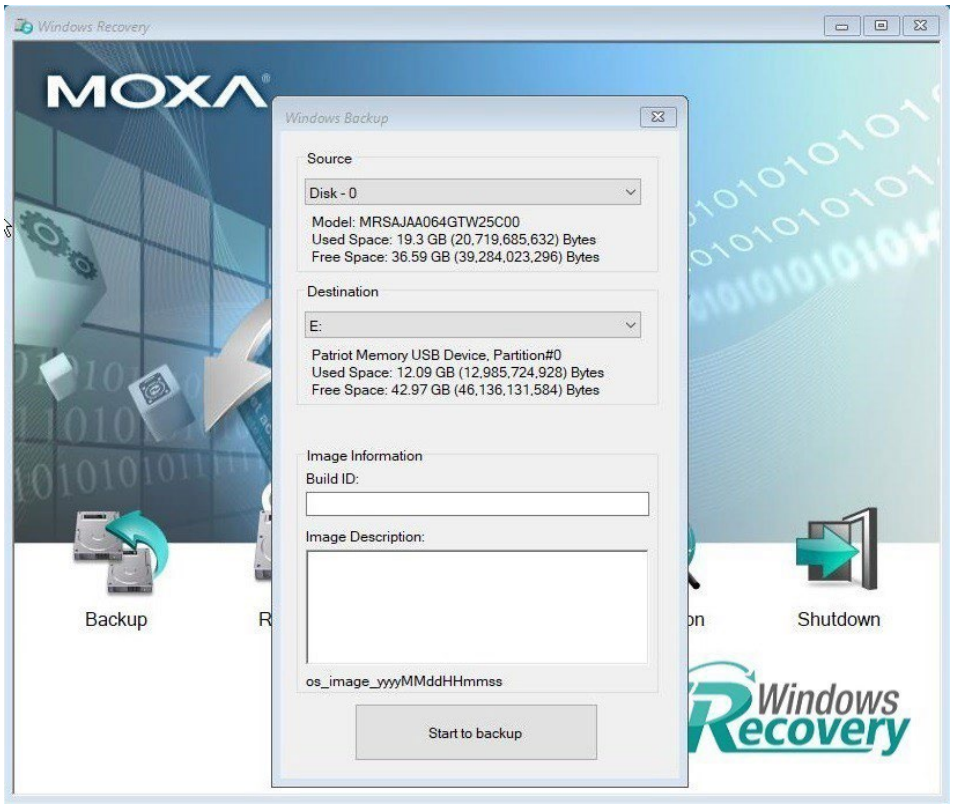


System Image Backup

To back up the image from the USB disk, run **Windows Preinstallation Environment(WinPE)** and the **Windows Recovery utility** will display. Follow these steps.

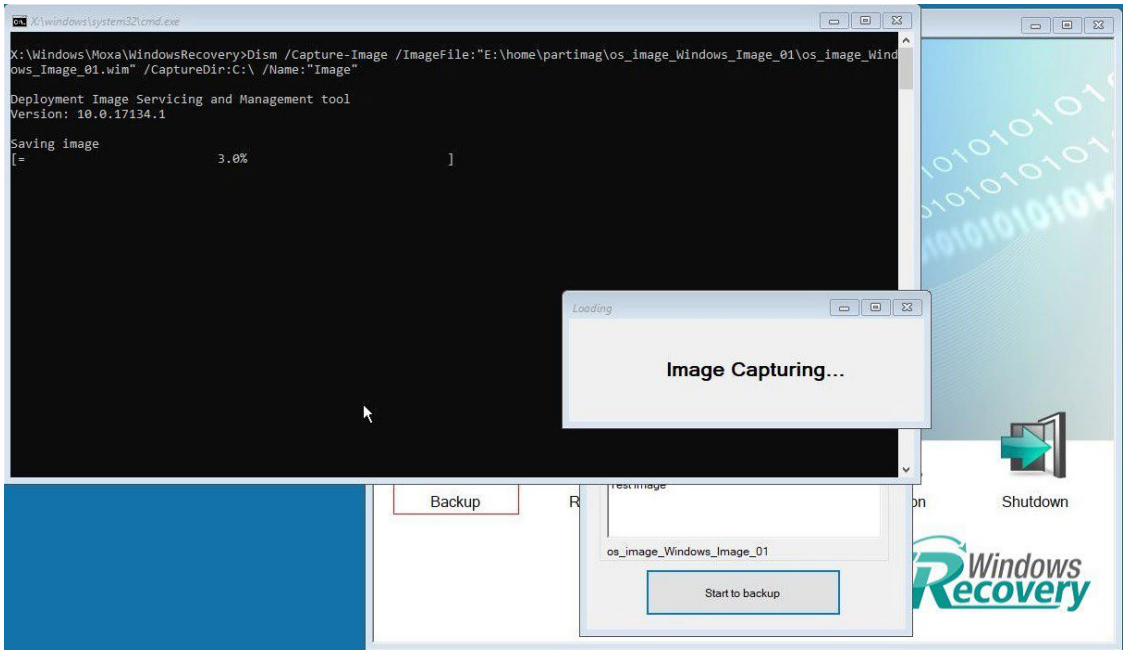
1. Click **Backup**.

2. Select the **Source disk** to backup and **Destination USB** to store the OS image, also give an image name and description. Click **Start to backup**.

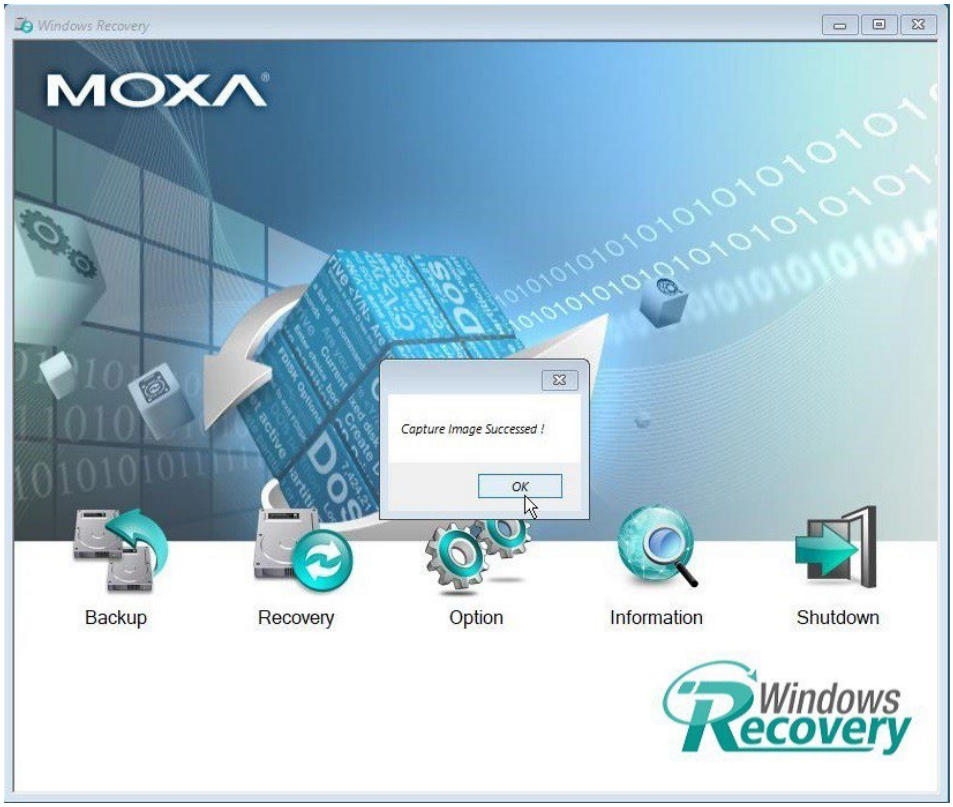


3. Click **Yes** to continue.

4. Wait for the backup process to complete.

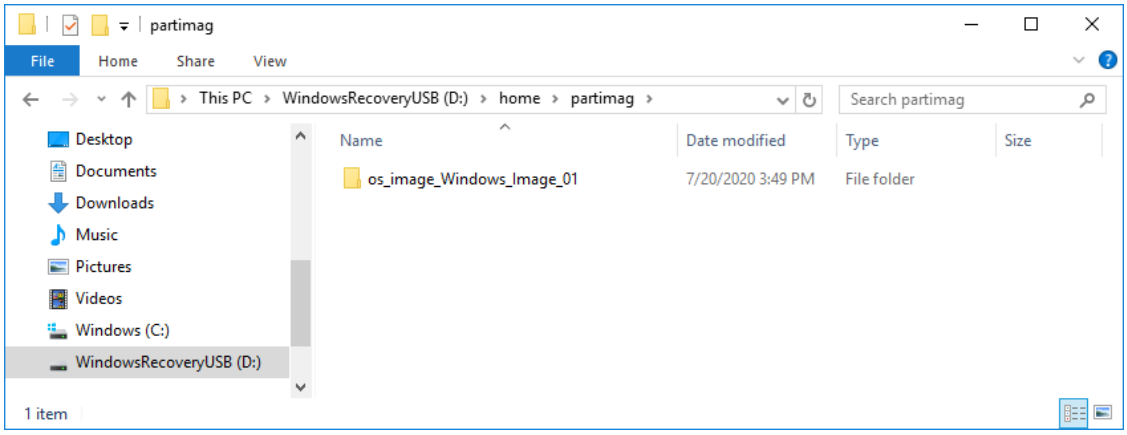


5. When the process is done, click **OK**.

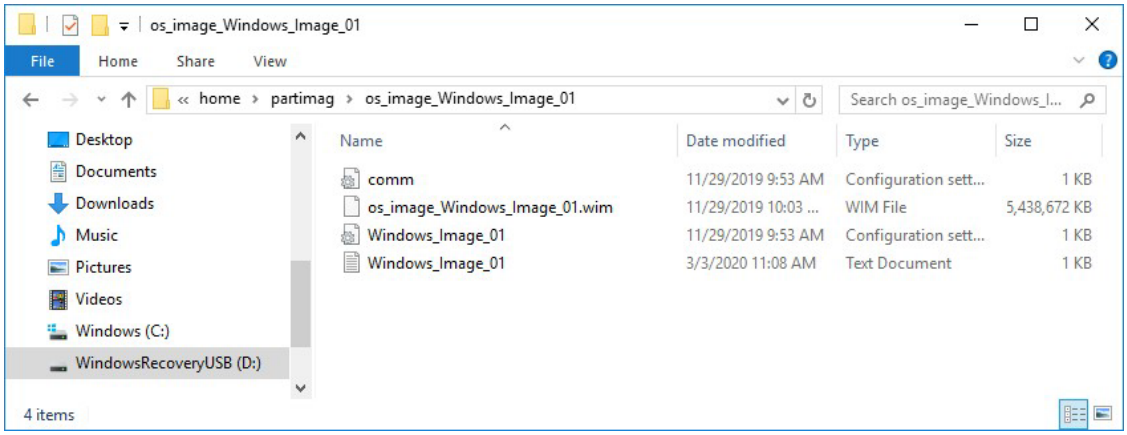


6. Click **OK**, the computer will shut down.

7. The OS image will be saved in USB disk **home\partimag**.



8. In the **os_image** folder you can view the backup information and the image files.



Restoring the System From a Backup

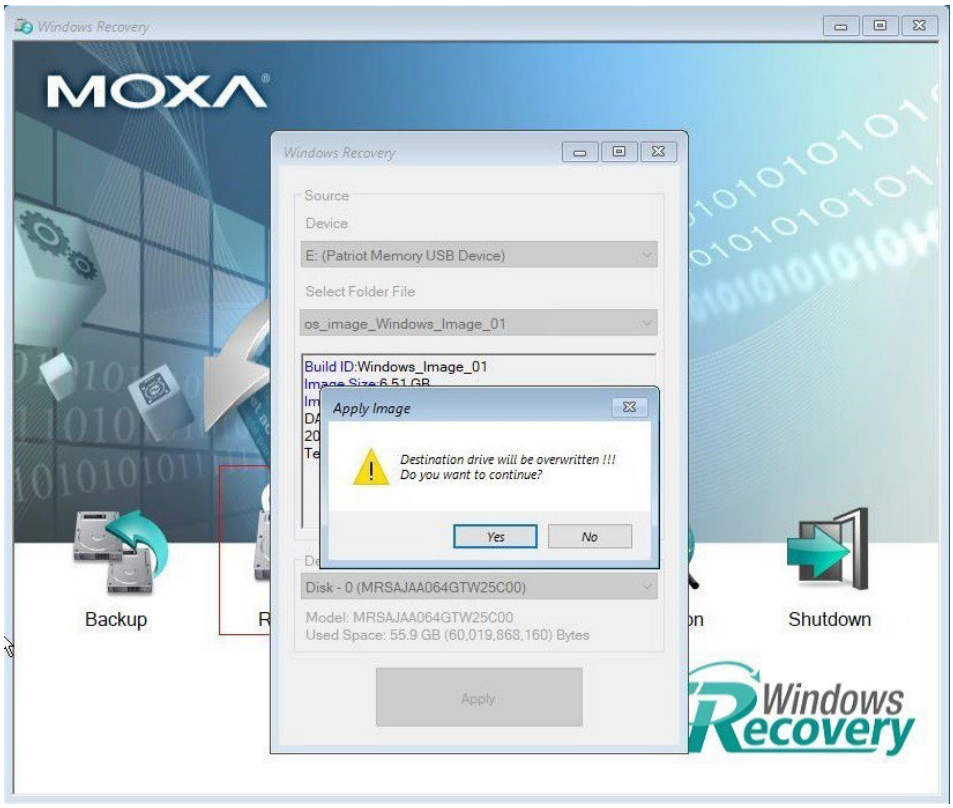
To restore the image, run the **Windows Preinstallation Environment(WinPE)** and the **Windows Recovery utility** will display. Follow these steps.

1. Click **Recovery**.

2. Select the **Source USB Device**, **Image Folder File** and check the image information, select the **Destination Drive** to restore. Click **Apply**.

3. Click **Yes** to continue the process.

4. Click **Yes** to overwrite the destination drive.



5. Wait for the process to complete.

6. Click **OK**.

NOTE

When you restart the computer, you will need to wait about 5 minutes for the computer to go through two cycles of the reboot process. The system configuration files will be initialized during the first bootup process. Do not turn off or shut down the computer while the system is restarting.