

DA-820E Series Win10 LTSC 21H2 User Manual

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DA-820E Series Win10 LTSC 21H2 User Manual

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1. Introduction

This Windows 10 IoT Enterprise LTSC 2021(21H2) 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 sections in these chapters, confirm that the hardware specification of your computer model supports the functions/settings covered in this manual.

Moxa Computers and Windows

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

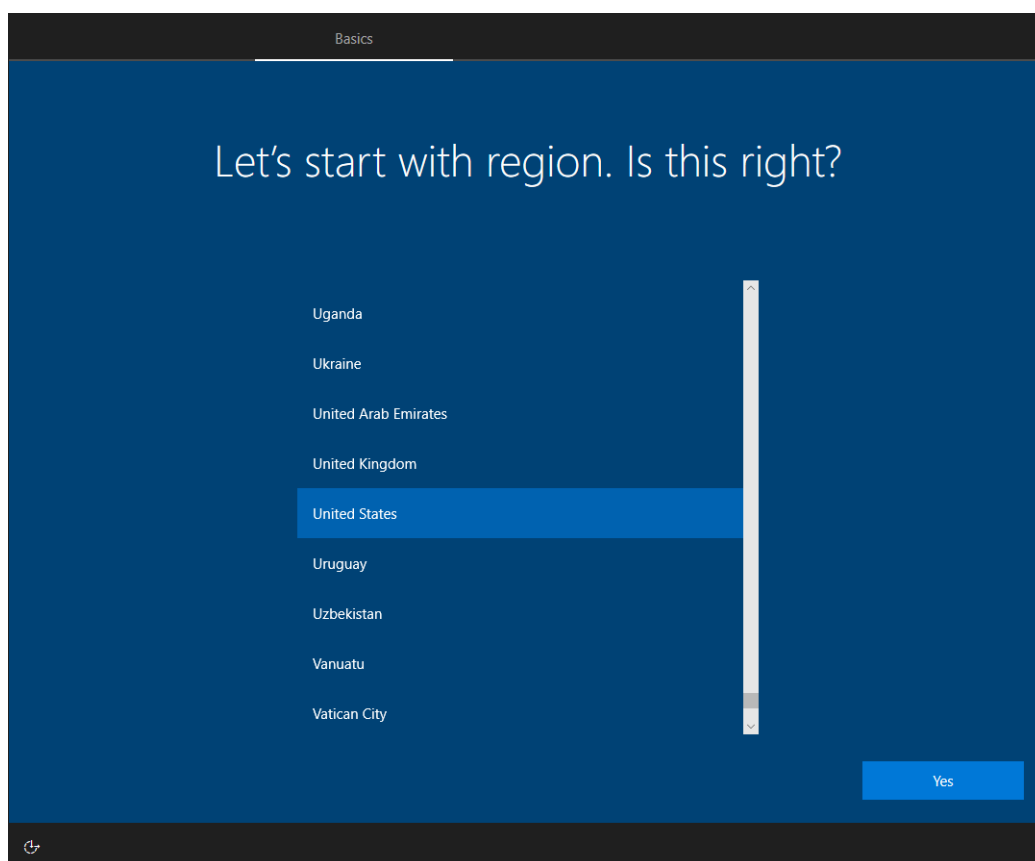
2. System Initialization

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.

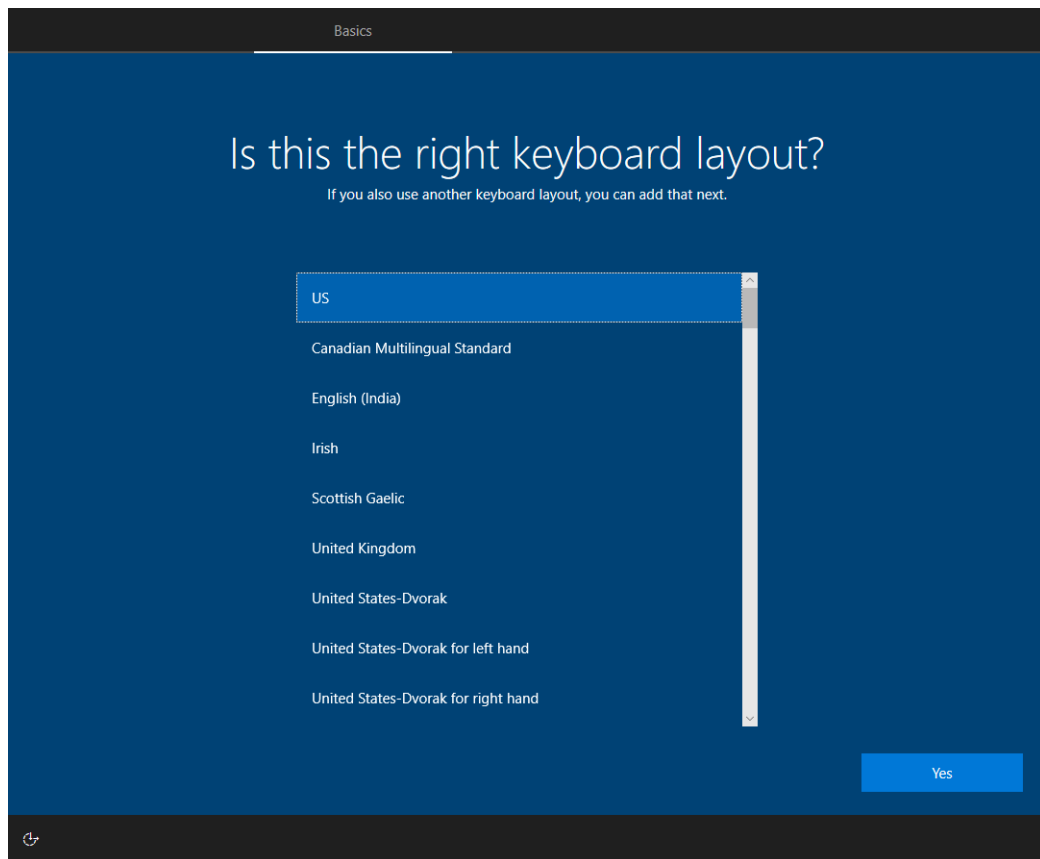
Initializing User Settings

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

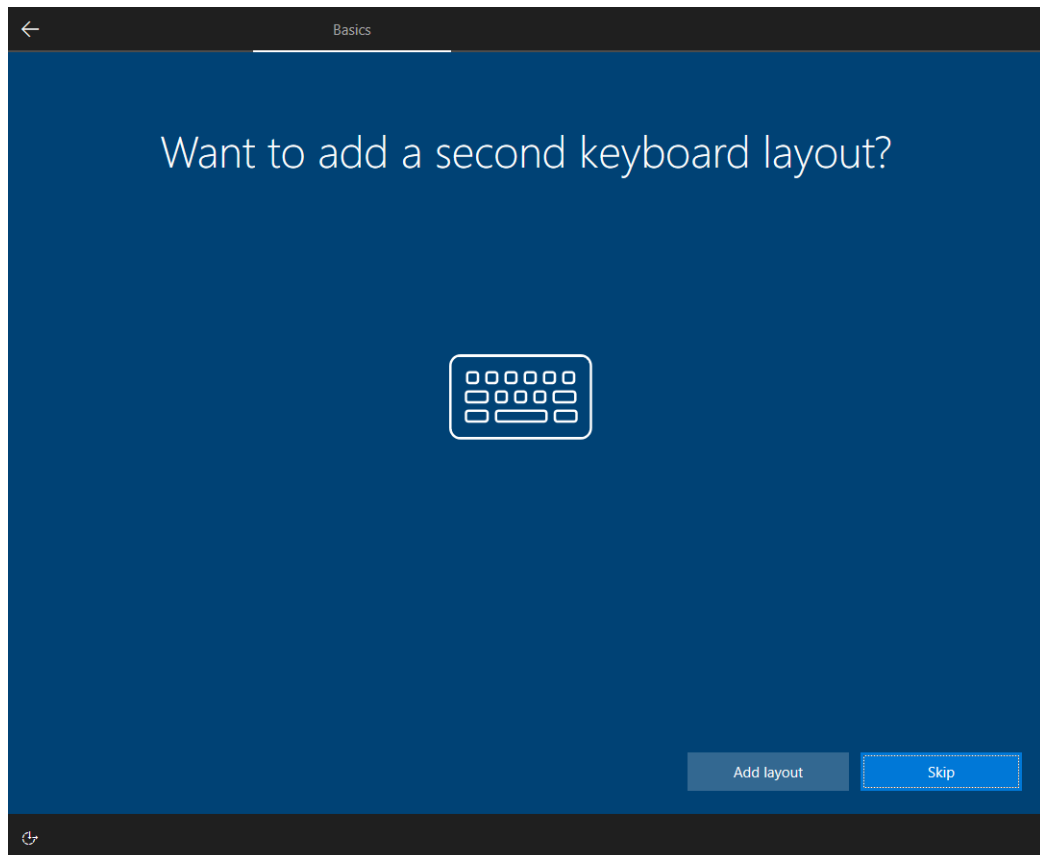
1. Select a region.



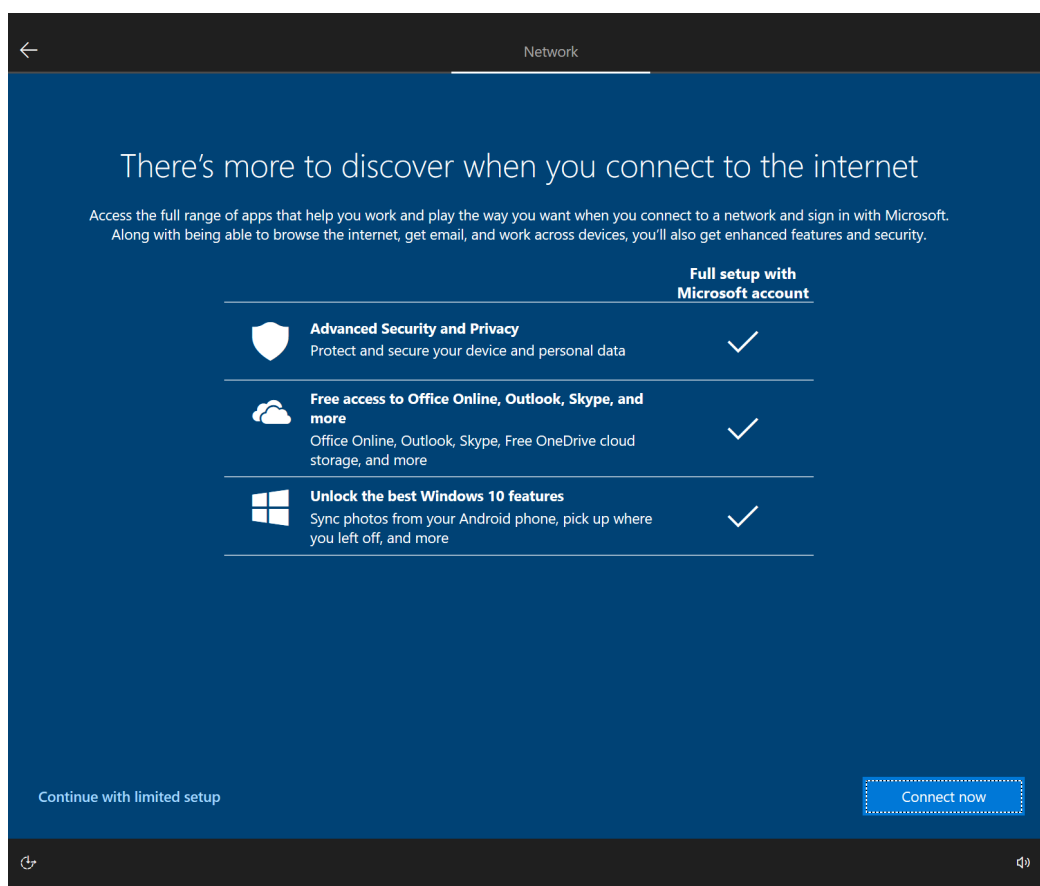
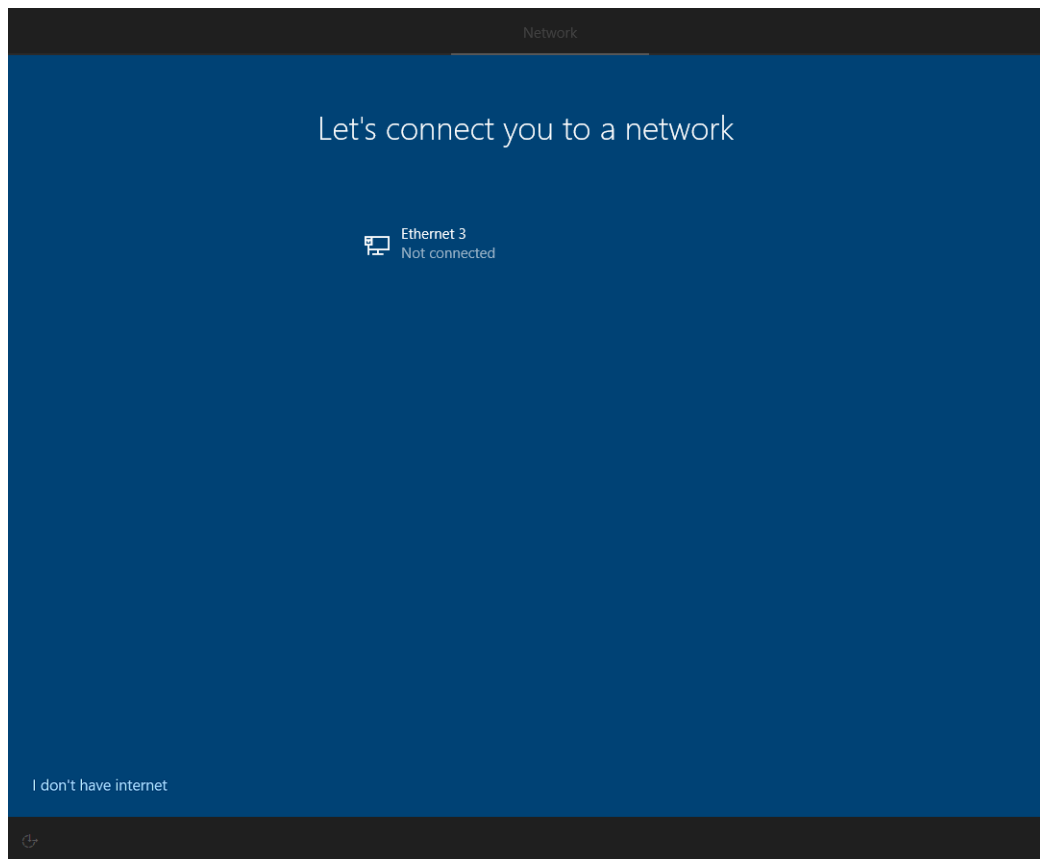
2. Select a keyboard.



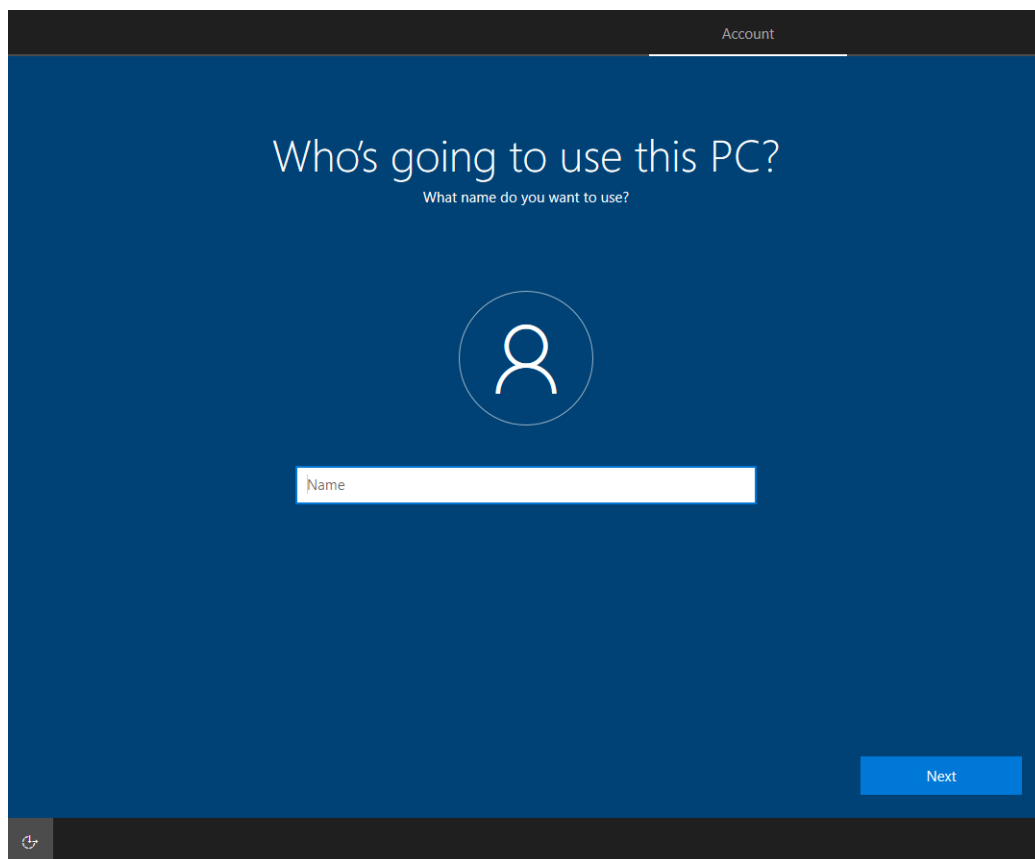
3. Select a second keyboard.



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

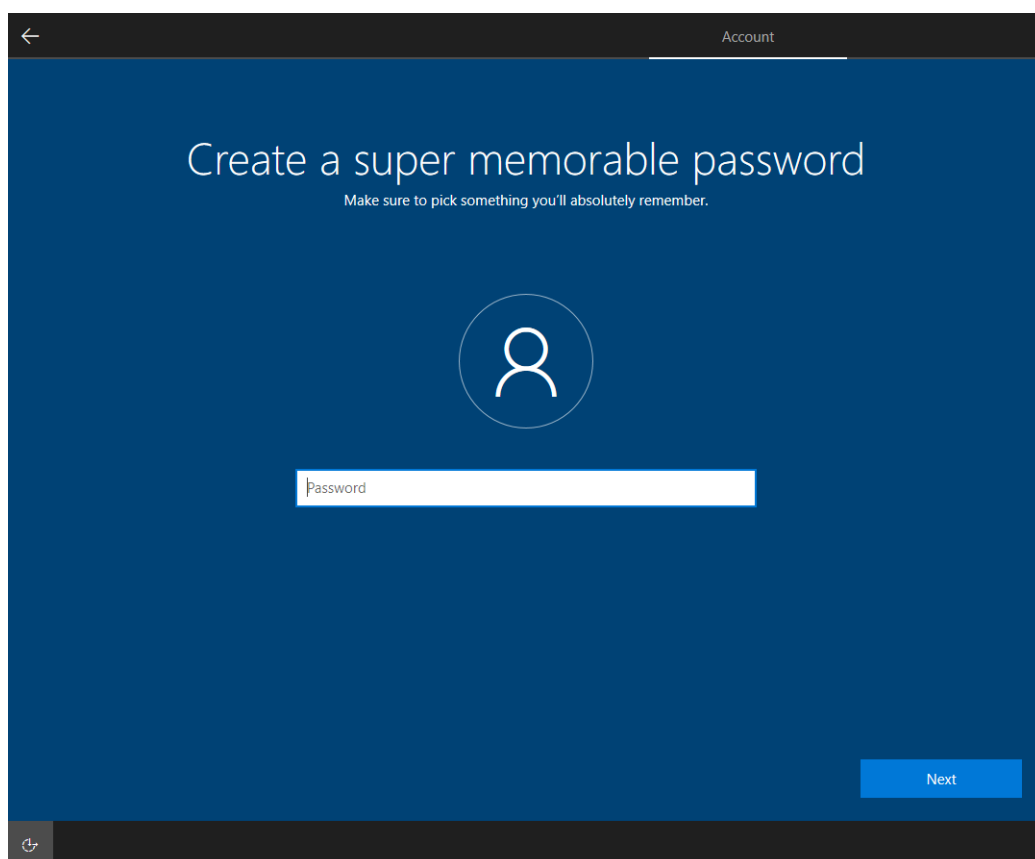


5. Sign in to or create a local account or a Microsoft account (MSA).



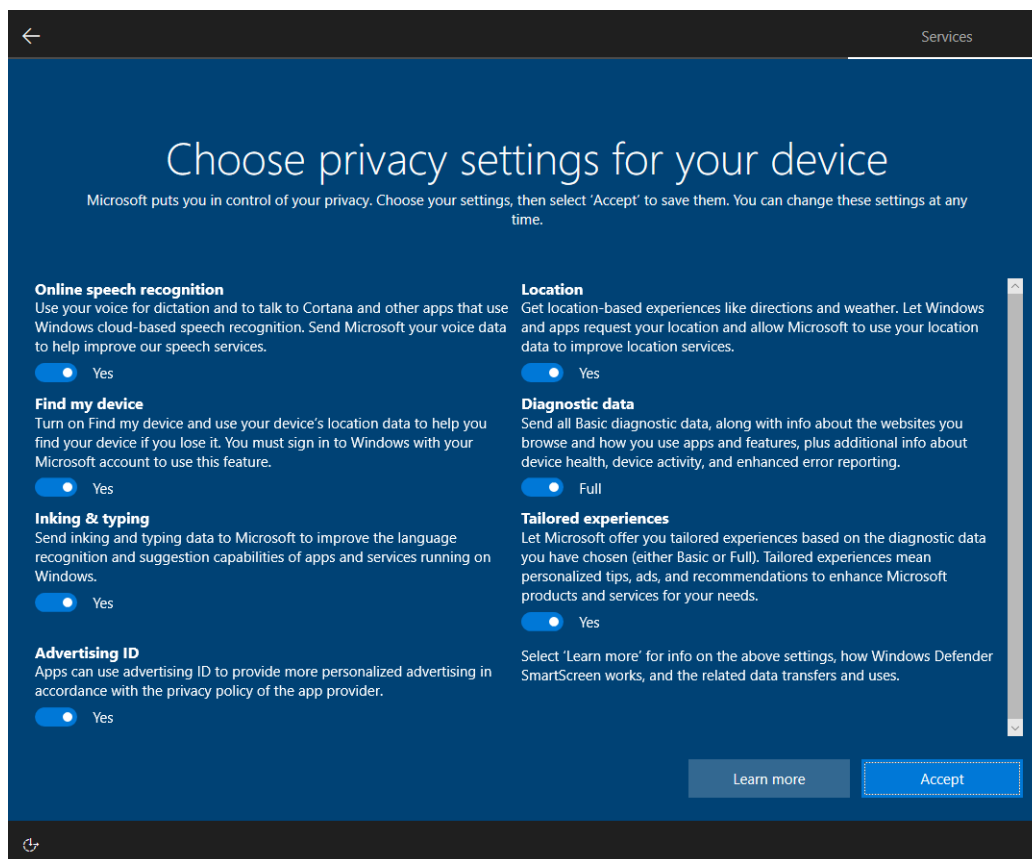
This screenshot shows the 'Who's going to use this PC?' screen during Windows 10 setup. The background is a solid blue color. At the top right, the word 'Account' is displayed in a small, light blue font. The main heading 'Who's going to use this PC?' is centered in a large, white, sans-serif font. Below it, the subtitle 'What name do you want to use?' is centered in a smaller, white, sans-serif font. In the center of the screen is a white circular icon containing a stylized white person silhouette. Below this icon is a white rectangular text input field with the placeholder text 'Name' in a small, grey, sans-serif font. At the bottom right of the screen is a blue rectangular button with the word 'Next' in white, sans-serif font. At the bottom left of the screen is a small, dark grey square button with a white circular arrow icon.

6. Set a password.



This screenshot shows the 'Create a super memorable password' screen during Windows 10 setup. The background is a solid blue color. At the top left, there is a white back arrow icon. At the top right, the word 'Account' is displayed in a small, light blue font. The main heading 'Create a super memorable password' is centered in a large, white, sans-serif font. Below it, the subtitle 'Make sure to pick something you'll absolutely remember.' is centered in a smaller, white, sans-serif font. In the center of the screen is a white circular icon containing a stylized white person silhouette. Below this icon is a white rectangular text input field with the placeholder text 'Password' in a small, grey, sans-serif font. At the bottom right of the screen is a blue rectangular button with the word 'Next' in white, sans-serif font. At the bottom left of the screen is a small, dark grey square button with a white circular arrow icon.

7. Choose your privacy settings.



Initializing System

After the OOB E settings, you will be redirected to the device desktop of the device. Wait until the process is complete. The device will reboot, and the new settings will take effect after the system restarts.

```
SetupComplete
C:\Windows\system32>start/wait c:\windows\system32\SetOEMModel.exe
C:\Windows\system32>start/wait c:\windows\system32\SortNetName.exe
C:\Windows\system32>reg delete "HKEY_LOCAL_MACHINE\Software\Microsoft\Windows\CurrentVersion\Run" /v "SetupComplete" /f
The operation completed successfully.
```

3. BitLocker

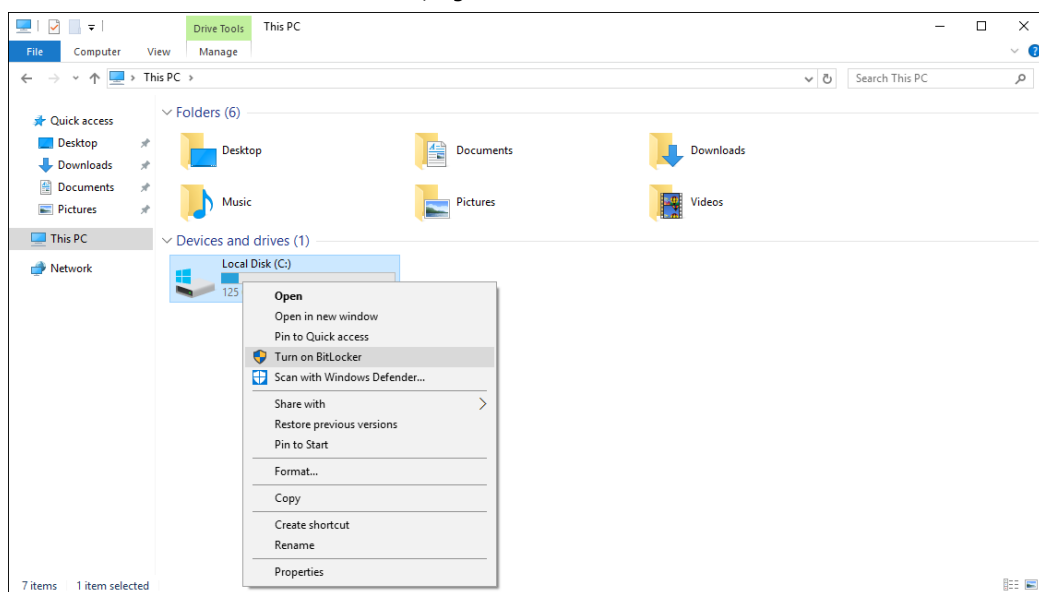
BitLocker is a Windows disk encryption feature, designed to protect data by providing encryption for entire volumes. BitLocker addresses the threats of data theft or exposure from lost, stolen, or inappropriately decommissioned devices. For more information about BitLocker, go to:

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

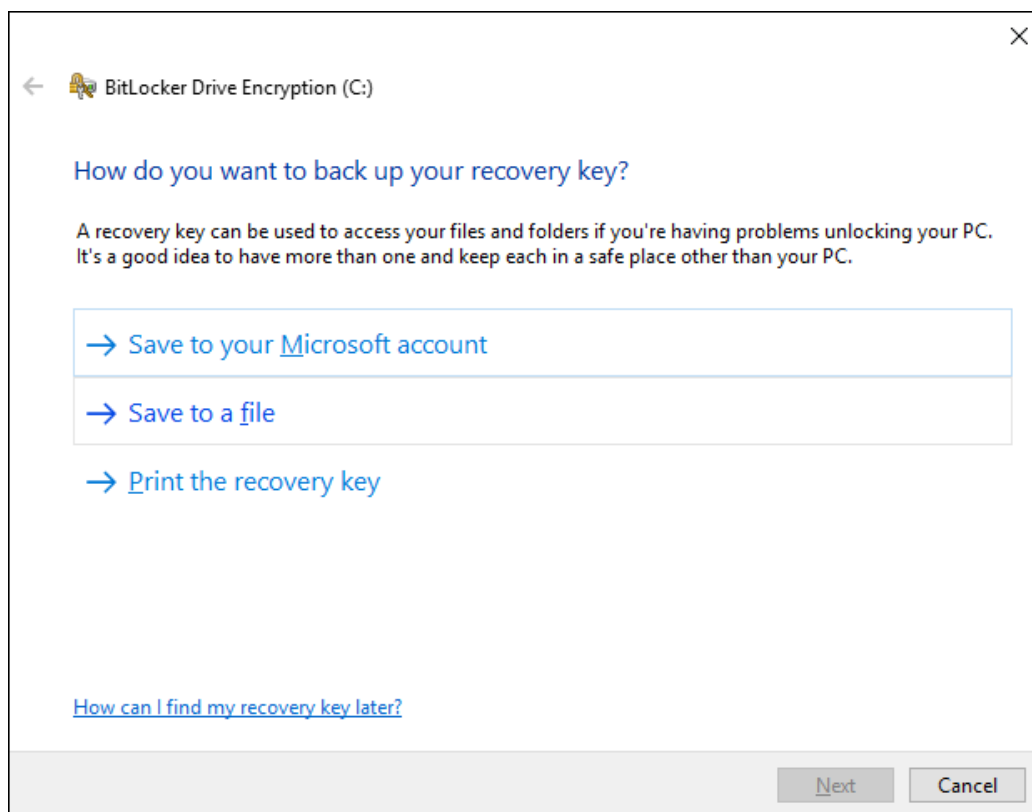
This chapter describes the BitLocker setup process.

Enabling the BitLocker

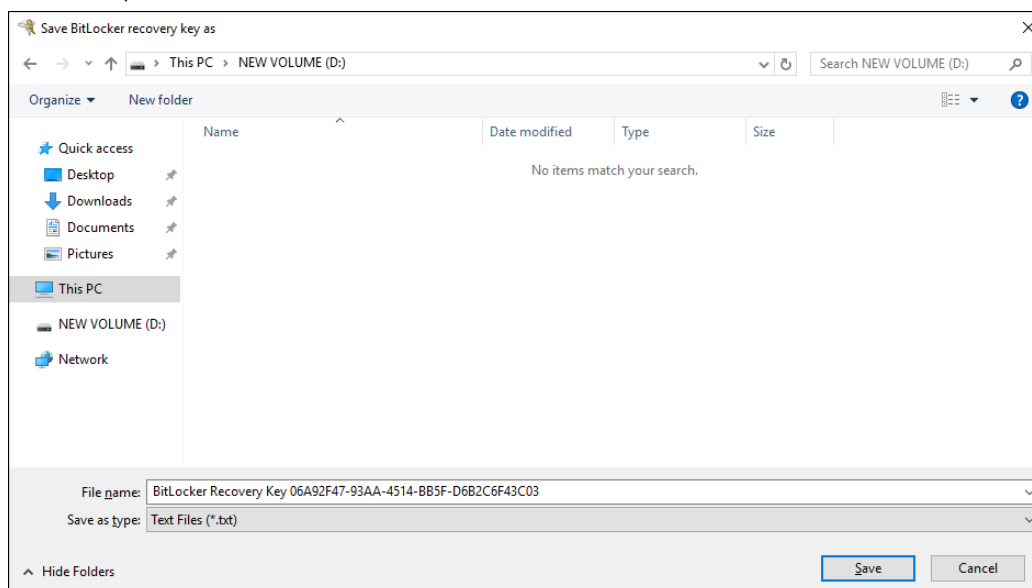
1. In the **Windows Devices and drives**, right-click on the drive and select **Turn on BitLocker**.



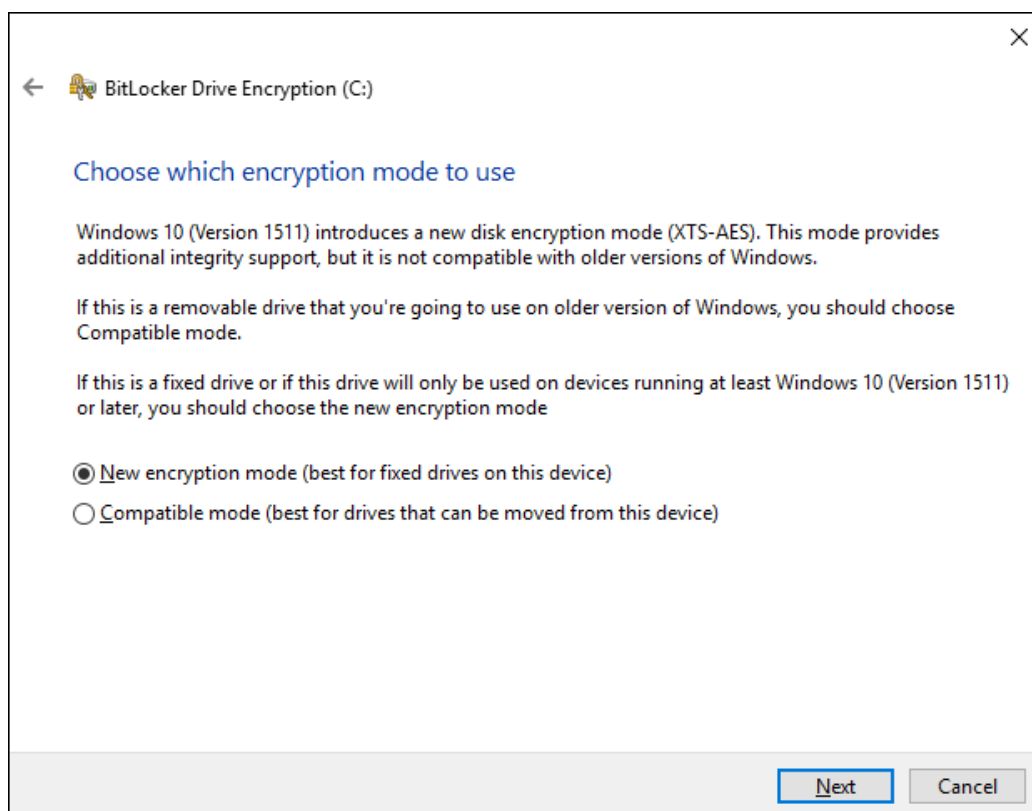
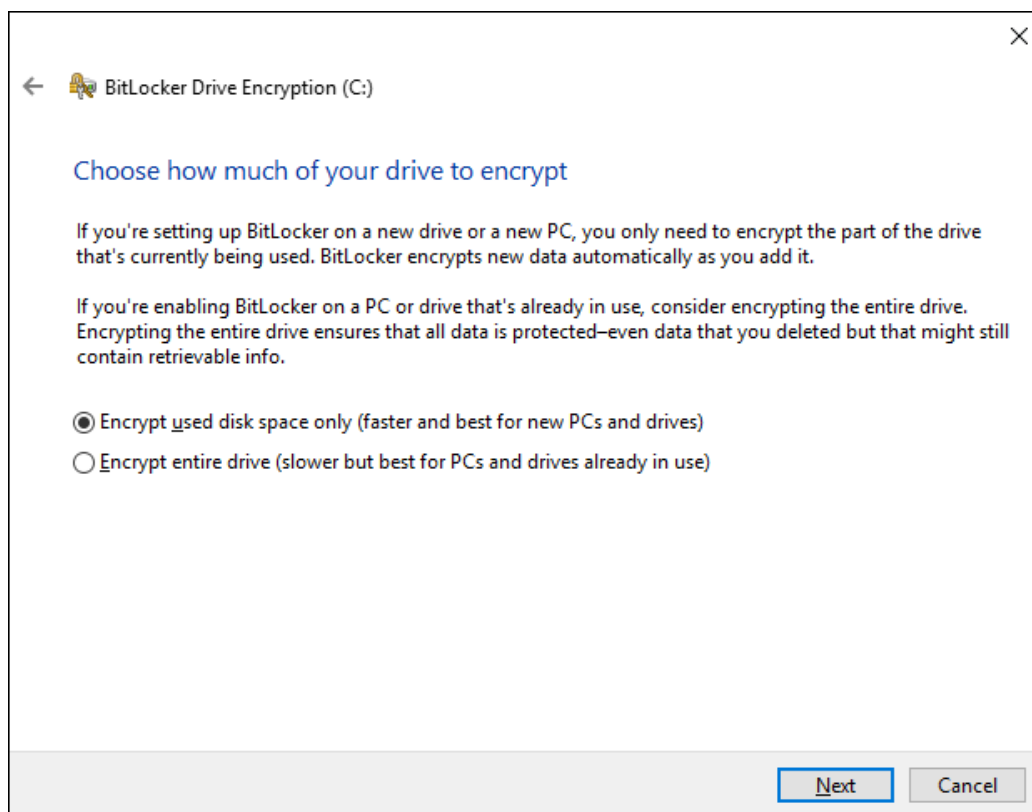
2. Select an option to back up the recovery key. For example, select **Save to a file**.



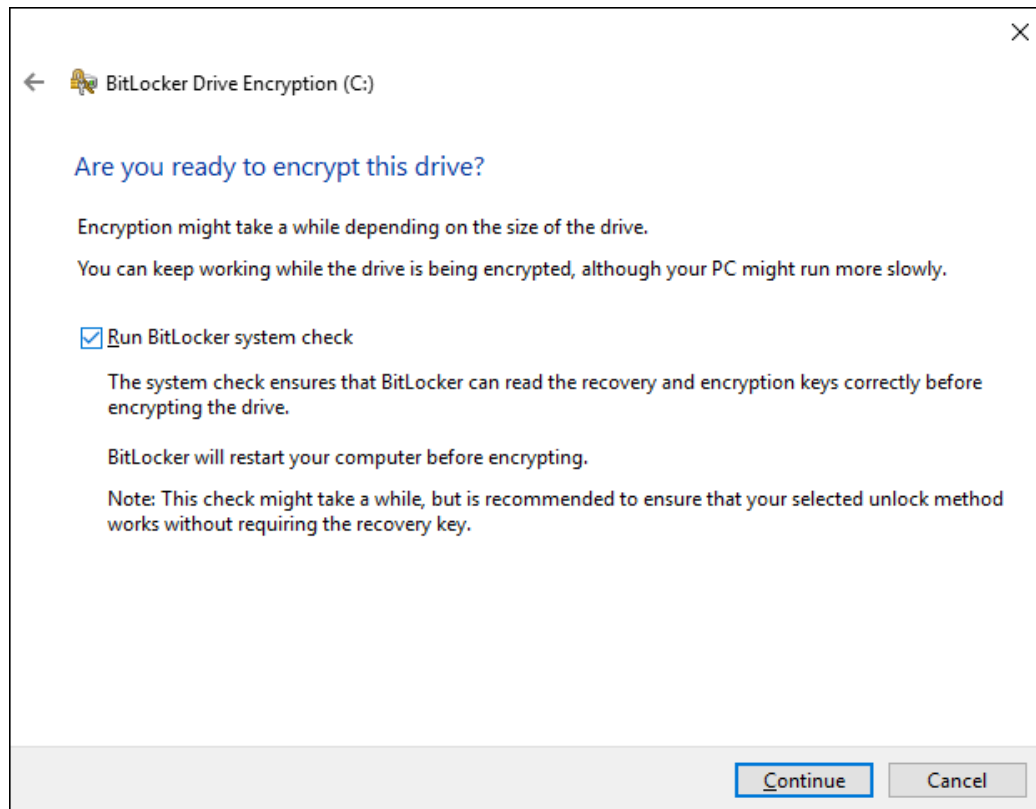
3. Select the path to store the file in.



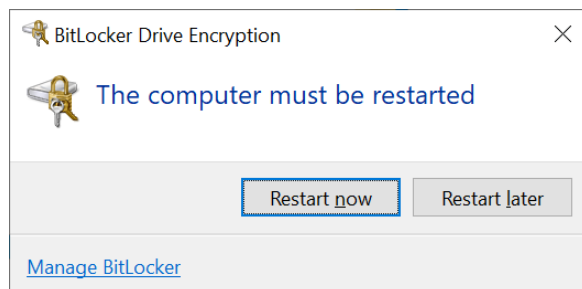
4. Follow the onscreen instructions to specify the drive encryption options.



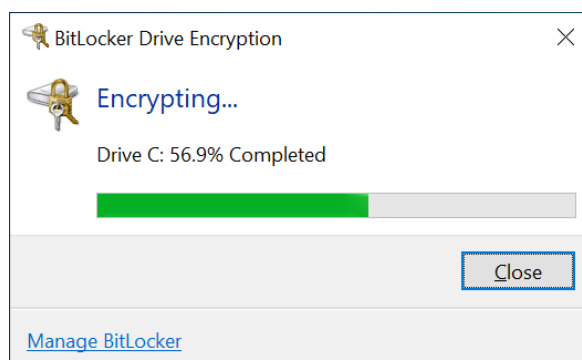
5. Click **Continue**.



6. Restart the computer.

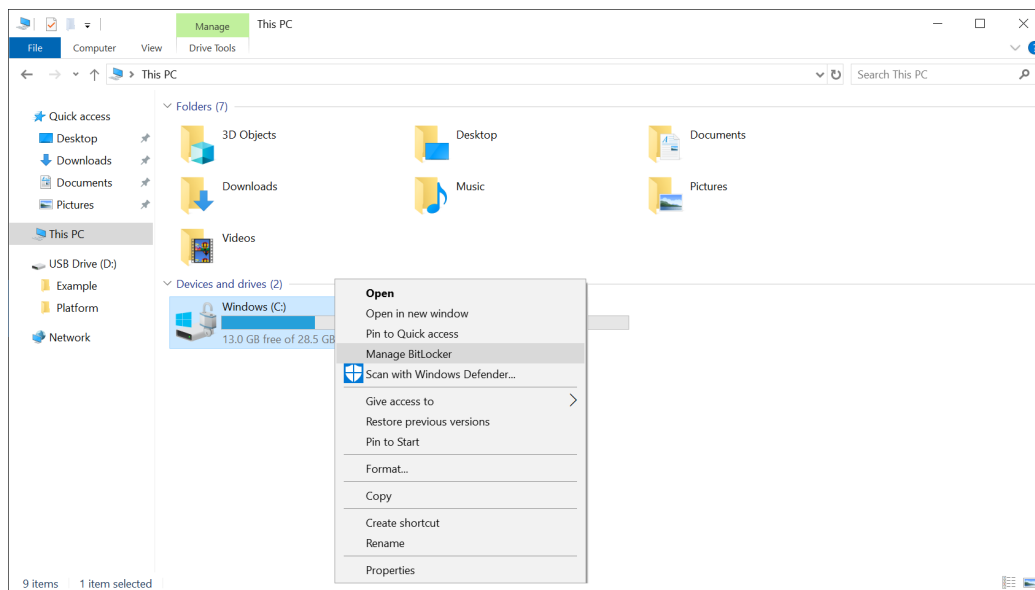


7. Wait for the encryption process to complete and then click **Close**.

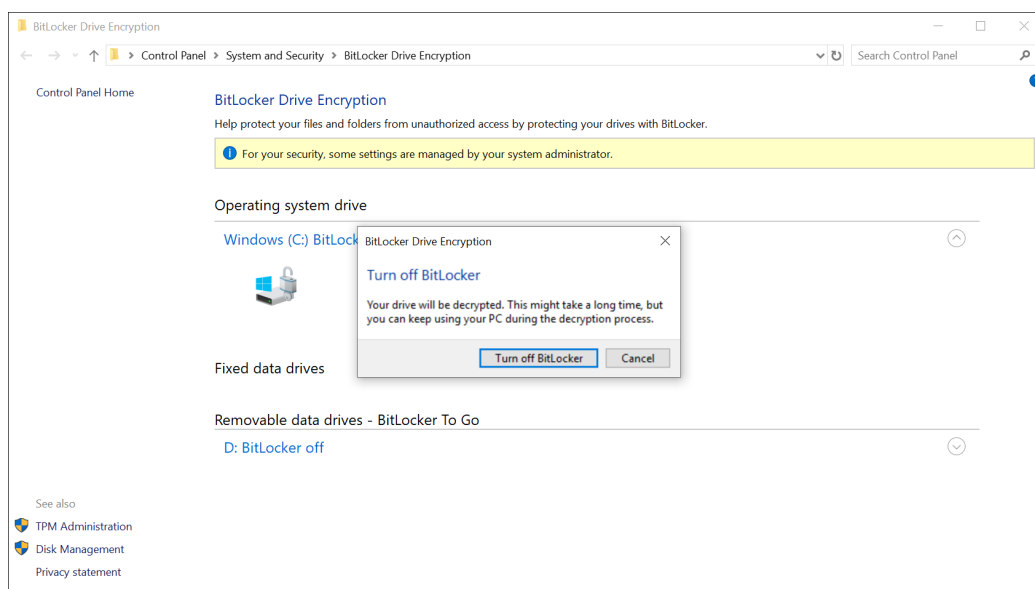


Disabling the BitLocker

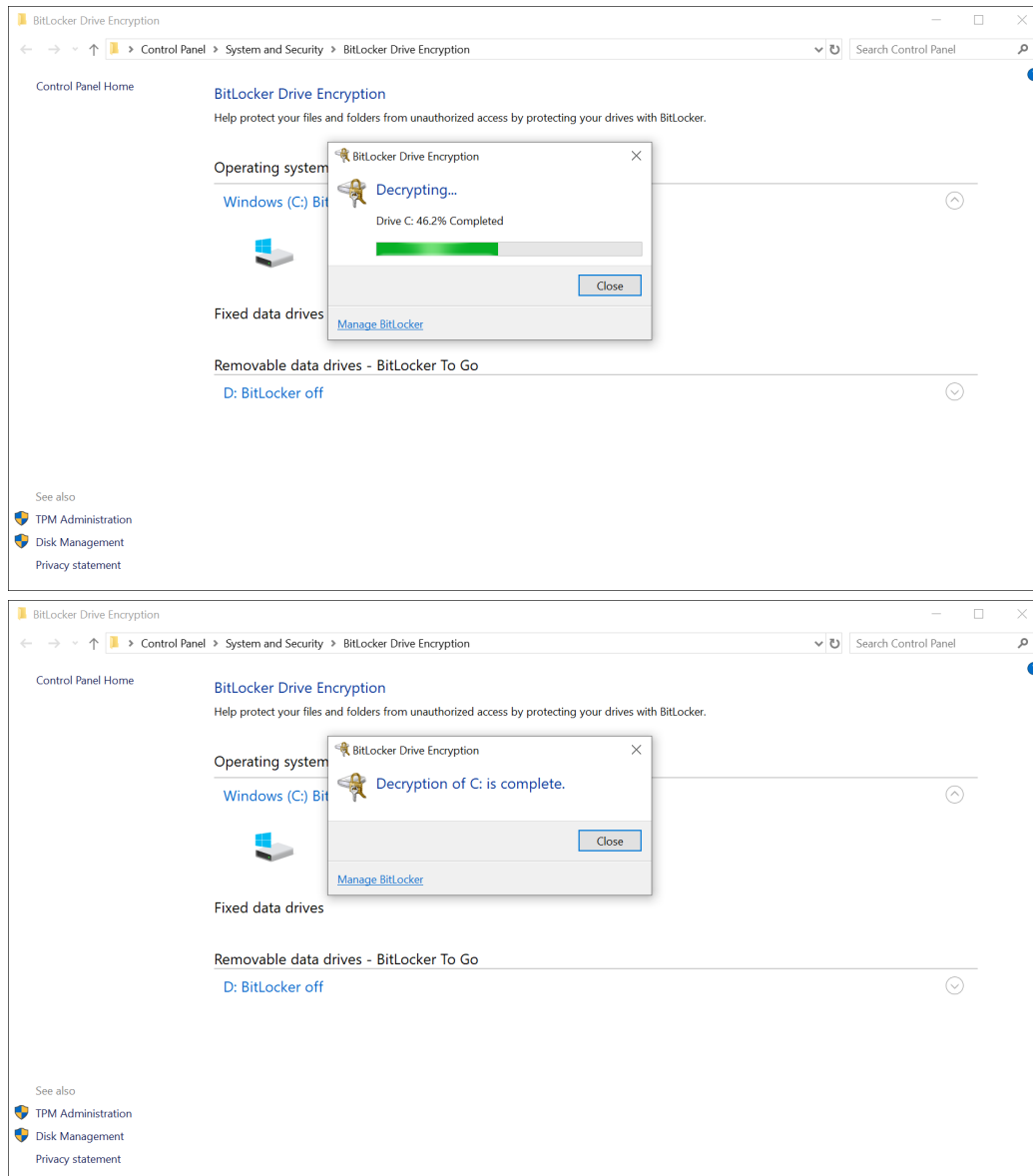
1. In the **Windows Devices and drives**, right-click on the drive and select **Manage BitLocker**.



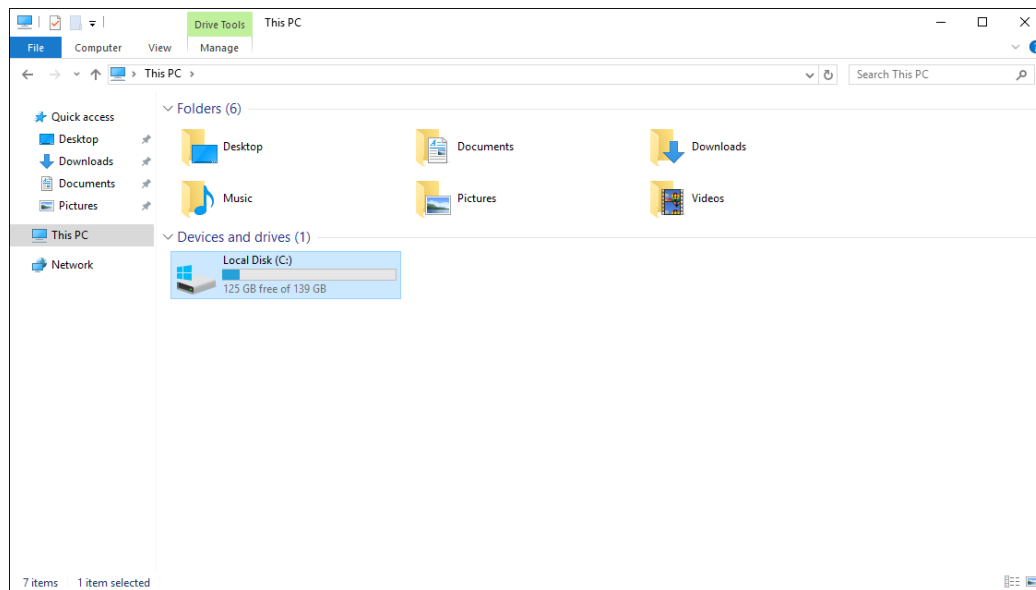
2. Click on **Turn off BitLocker**.



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 is the acronym for **Redundant Array of Independent Disk** which indicates the use of 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.

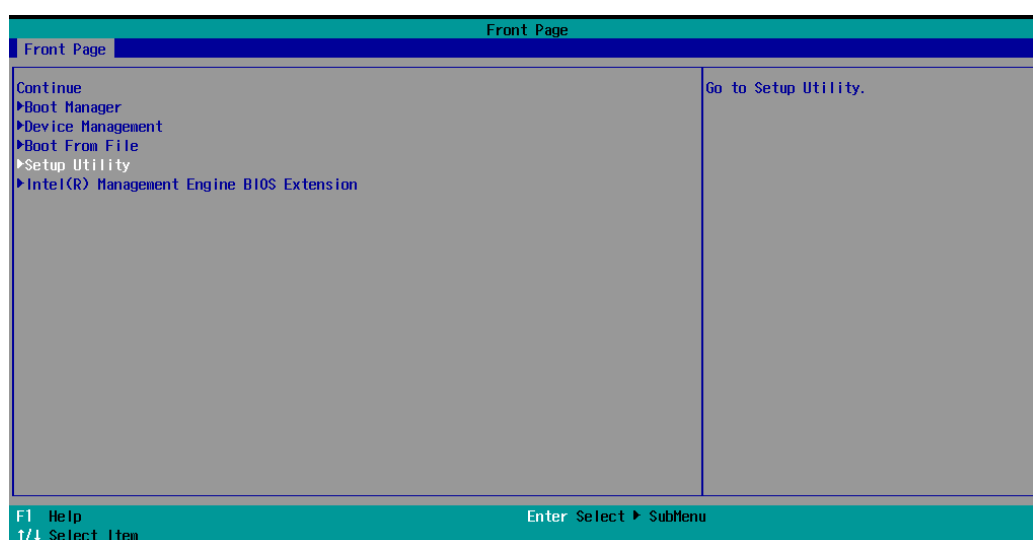


NOTE

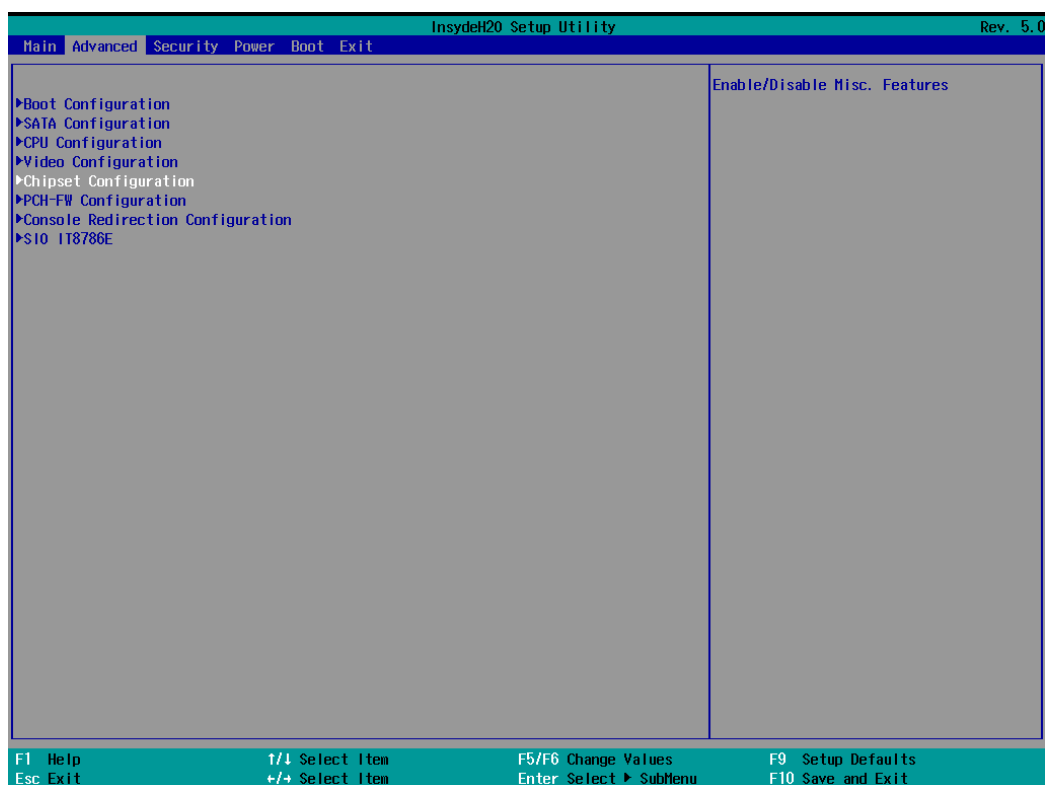
Use hard disks of the same brand, same model, and same capacity to create a RAID for best performance.

Intel® RAID: Changing the RAID Mode

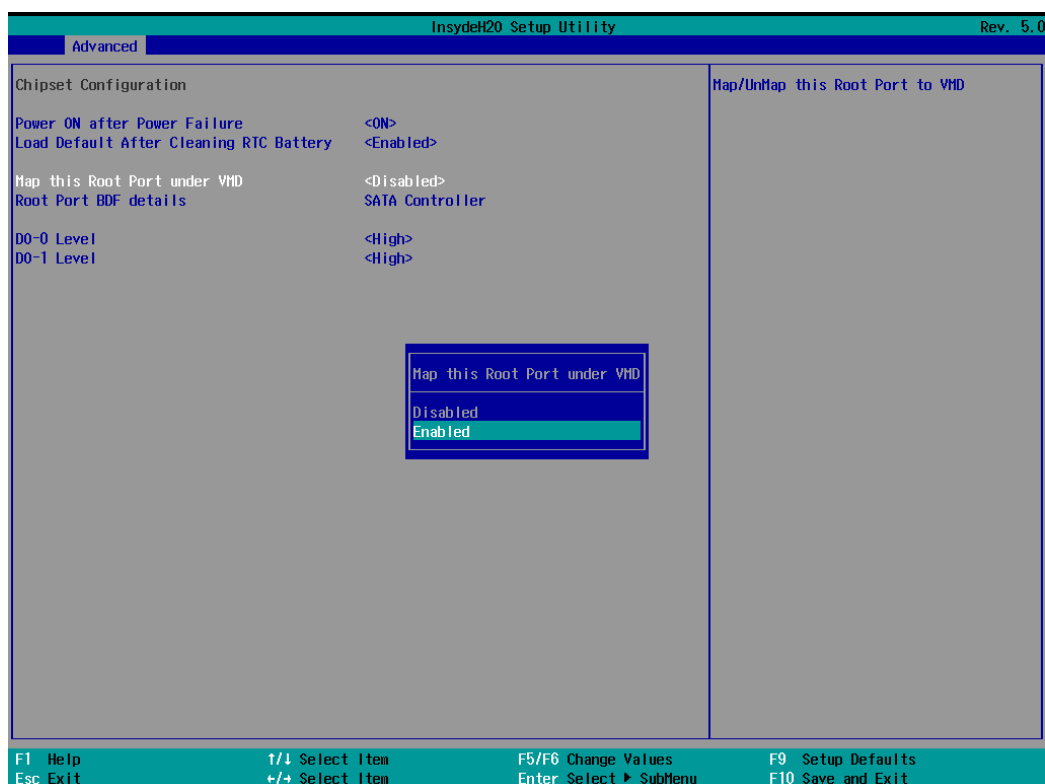
1. Power on the computer and press **F2** to enter the BIOS menu.
2. Select the **Setup Utility** option.



3. Select the **Chipset Configuration** option.



4. Select the **Map SATA Root Port under VMD** and **Enable** this option.

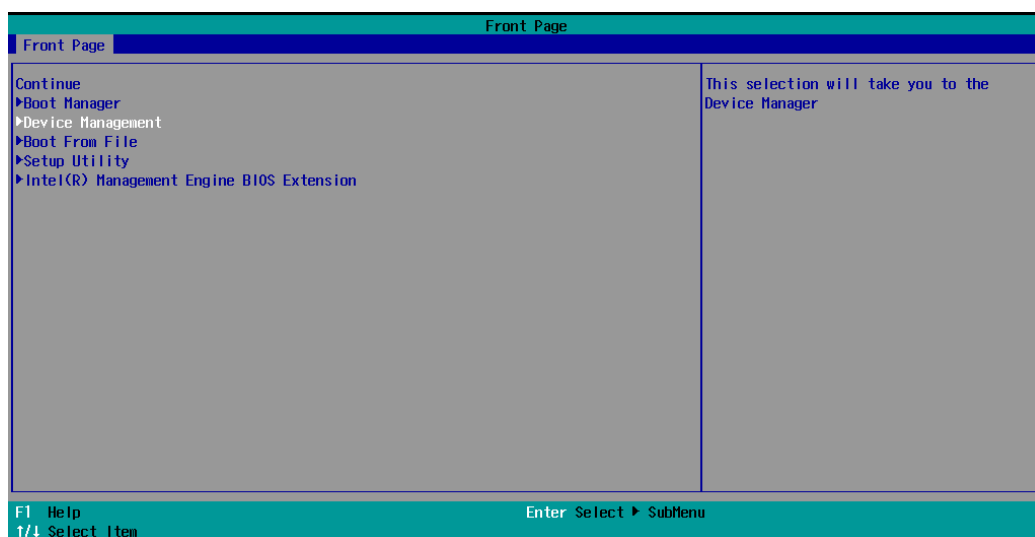


5. Press **F10** to save the settings and Exit, and then select **Yes** to save the settings.

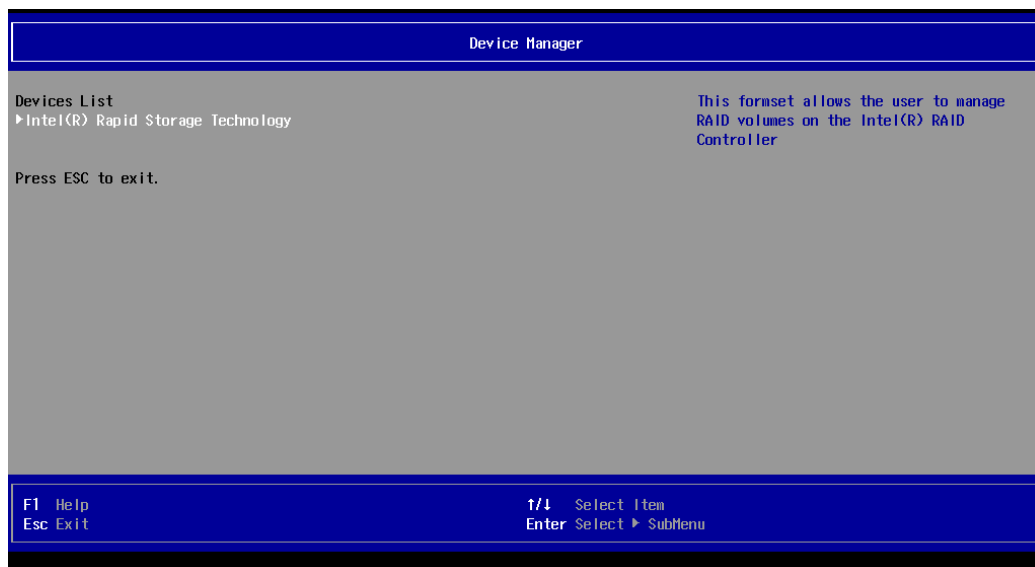


Intel® RAID: Creating a RAID Disk in BIOS

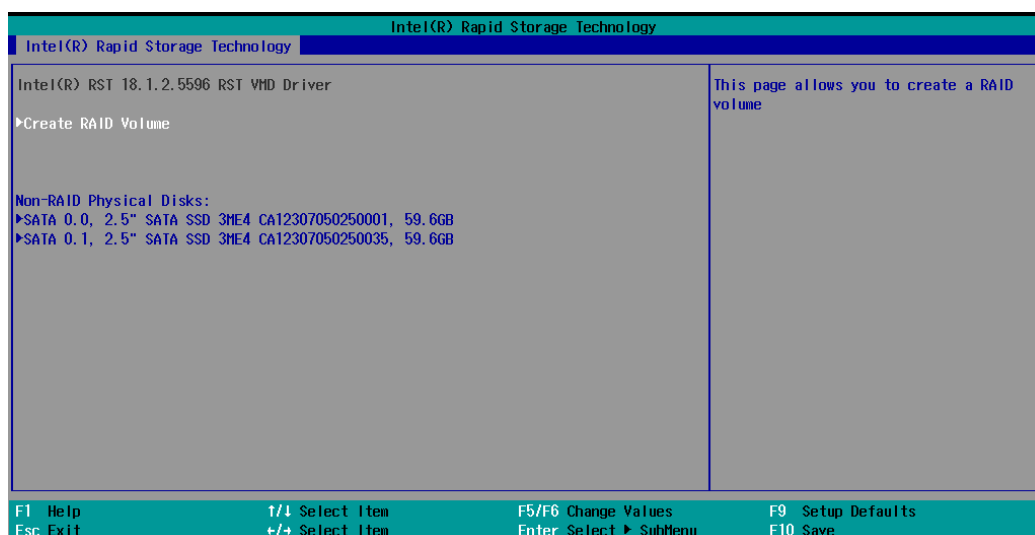
1. Power on the computer and press **F2** to enter the BIOS menu.
2. Select the **Device Management** option.



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



4. Select **Create RAID Volume**.



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

Intel(R) Rapid Storage Technology	
Create RAID Volume Name: Volume1 RAID Level: <RAID0 (Stripe)> Select Disks: SATA 0.0, 2.5" SATA SSD 3ME4 < > CA12307050250001, 59.6GB SATA 0.1, 2.5" SATA SSD 3ME4 < > CA12307050250035, 59.6GB Strip Size: <16KB> Capacity (MB): [0] ►Create Volume Select at least two disks	Select RAID Level RAID Level: RAID0 (Stripe) RAID1 (Mirror)
F1 Help ↑/↓ Select Item F5/F6 Change Values F9 Setup Defaults Esc Exit +/+ Select Item Enter Select ► SubMenu F10 Save	

Intel(R) Rapid Storage Technology	
Create RAID Volume Name: Volume1 RAID Level: <RAID1 (Mirror)> Select Disks: SATA 0.0, 2.5" SATA SSD 3ME4 < > CA12307050250001, 59.6GB SATA 0.1, 2.5" SATA SSD 3ME4 < > CA12307050250035, 59.6GB Capacity (MB): [0] ►Create Volume Select two disks	Select RAID Level
F1 Help ↑/↓ Select Item F5/F6 Change Values F9 Setup Defaults Esc Exit +/+ Select Item Enter Select ► SubMenu F10 Save	

6. Select the target disk.

Intel(R) Rapid Storage Technology	
Create RAID Volume Name: Volume1 RAID Level: <RAID1 (Mirror)> Select Disks: SATA 0.0, 2.5" SATA SSD 3ME4 < > CA12307050250001, 59.6GB SATA 0.1, 2.5" SATA SSD 3ME4 < > CA12307050250035, 59.6GB Capacity (MB): [0] ►Create Volume Select two disks	X - to Select Disk
F1 Help ↑/↓ Select Item F5/F6 Change Values F9 Setup Defaults Esc Exit +/+ Select Item Enter Select ► SubMenu F10 Save	

- Enter **X** and then press **Enter**.

Intel(R) Rapid Storage Technology	
Create RAID Volume Name: Volume1 RAID Level: <RAID1 (Mirror)> Select Disks: SATA 0.0, 2.5" SATA SSD 3ME4 CA12307050250001, 59.6GB SATA 0.1, 2.5" SATA SSD 3ME4 CA12307050250035, 59.6GB Capacity (MB): [61055] ▶Create Volume X - to Select Disk SATA 0.0, 2.5" SATA SSD 3ME4 CA12307050250001, 59.6GB X	
F1 Help Esc Exit	t/↓ Select Item +/- Select Item
F5/F6 Change Values Enter Select ▶ SubMenu	F9 Setup Defaults F10 Save

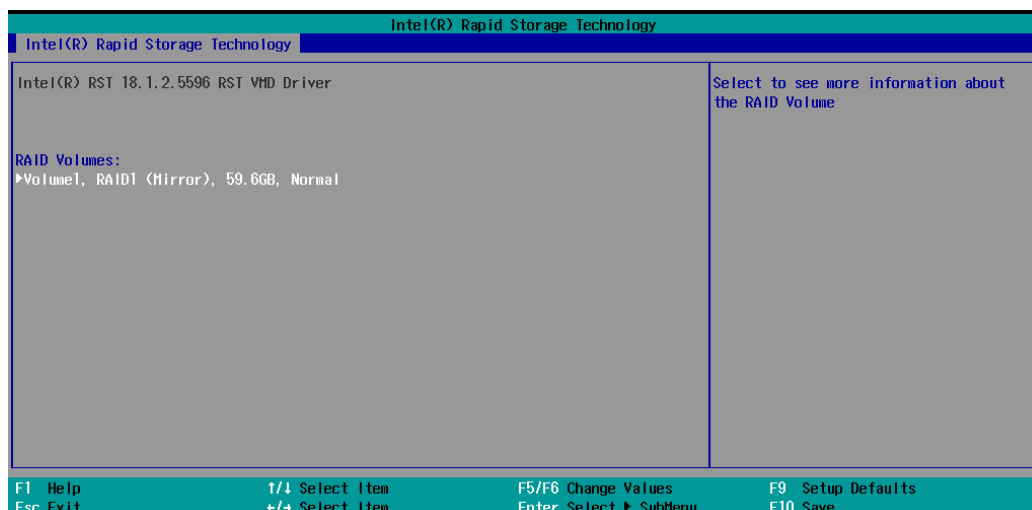
- The disk is now marked with an **X** next to it to indicate the selection.

Intel(R) Rapid Storage Technology	
Create RAID Volume Name: Volume1 RAID Level: <RAID1 (Mirror)> Select Disks: SATA 0.0, 2.5" SATA SSD 3ME4 CA12307050250001, 59.6GB SATA 0.1, 2.5" SATA SSD 3ME4 CA12307050250035, 59.6GB Capacity (MB): [61055] ▶Create Volume X - to Select Disk <X> <X>	
F1 Help Esc Exit	t/↓ Select Item +/- Select Item
F5/F6 Change Values Enter Select ▶ SubMenu	F9 Setup Defaults F10 Save

- Select the **Create Volume** option.

Intel(R) Rapid Storage Technology	
Create RAID Volume Name: Volume1 RAID Level: <RAID1 (Mirror)> Select Disks: SATA 0.0, 2.5" SATA SSD 3ME4 CA12307050250001, 59.6GB SATA 0.1, 2.5" SATA SSD 3ME4 CA12307050250035, 59.6GB Capacity (MB): [61055] ▶Create Volume Create a volume with the settings specified above	
F1 Help Esc Exit	t/↓ Select Item +/- Select Item
F5/F6 Change Values Enter Select ▶ SubMenu	F9 Setup Defaults F10 Save

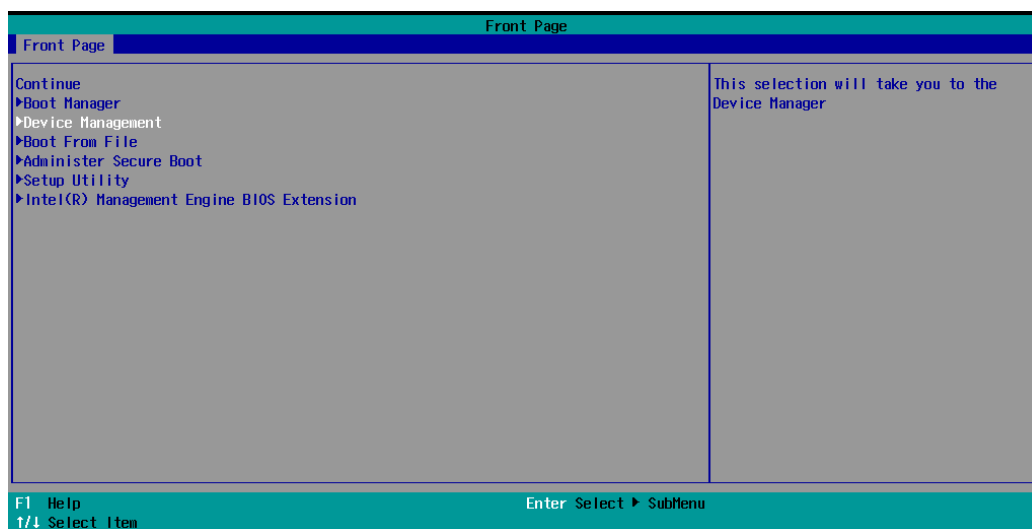
10. A RAID volume is created based on the settings specified.



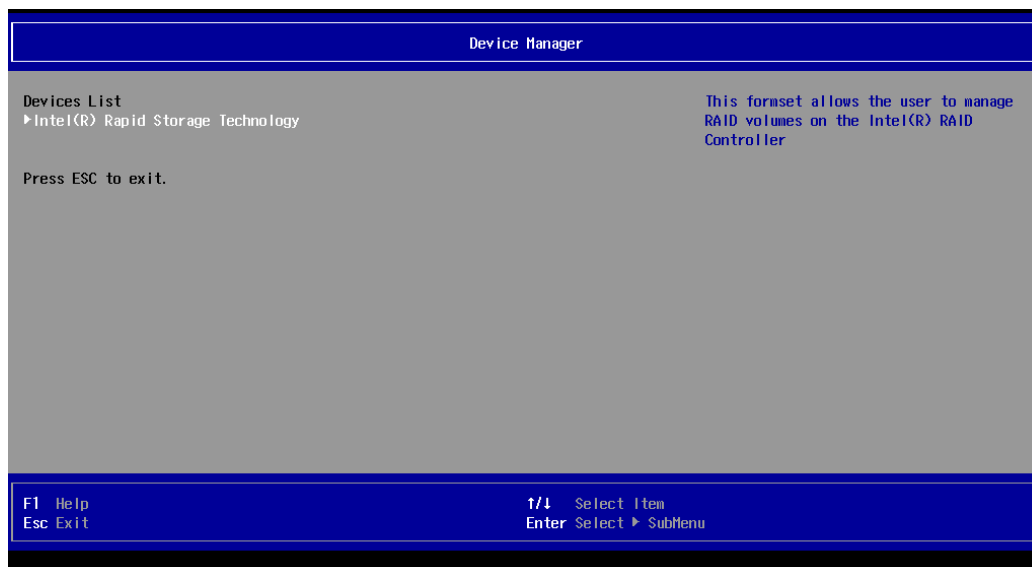
11. Press **F10** to save the settings.

Intel® RAID: Removing a RAID Volume From the BIOS

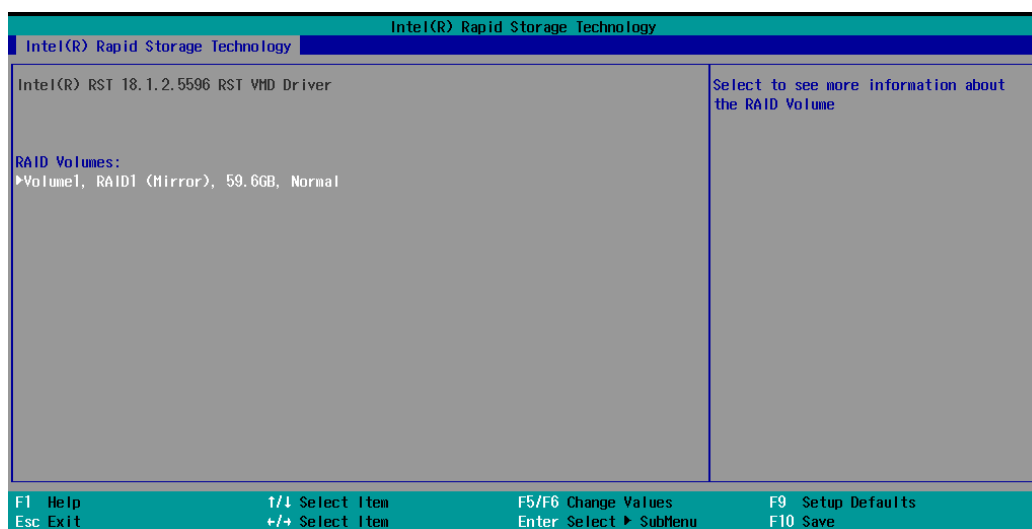
1. Power on the computer and press **F2** to enter the BIOS menu.
2. Select **Device Management**.



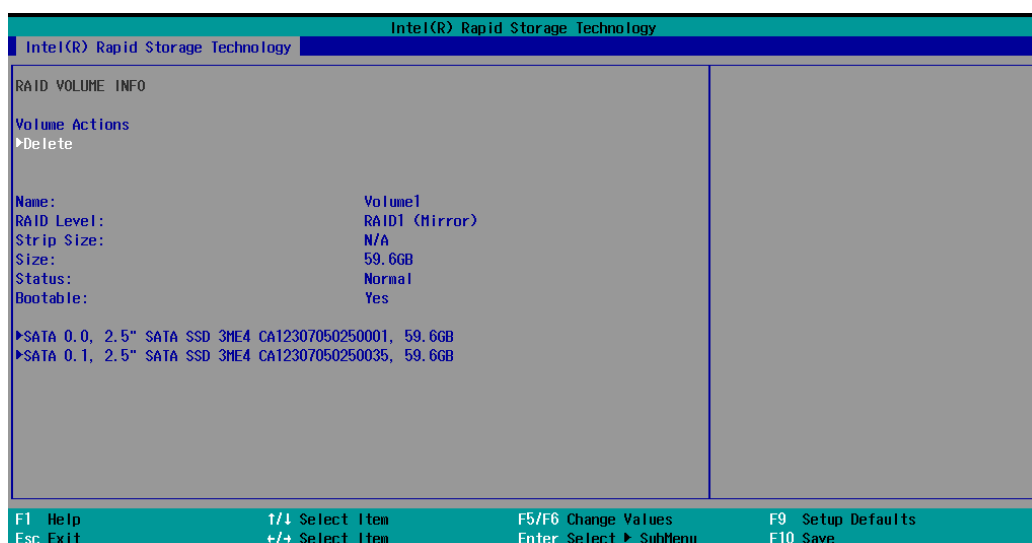
3. Select the **Intel® Rapid Storage Technology** option.



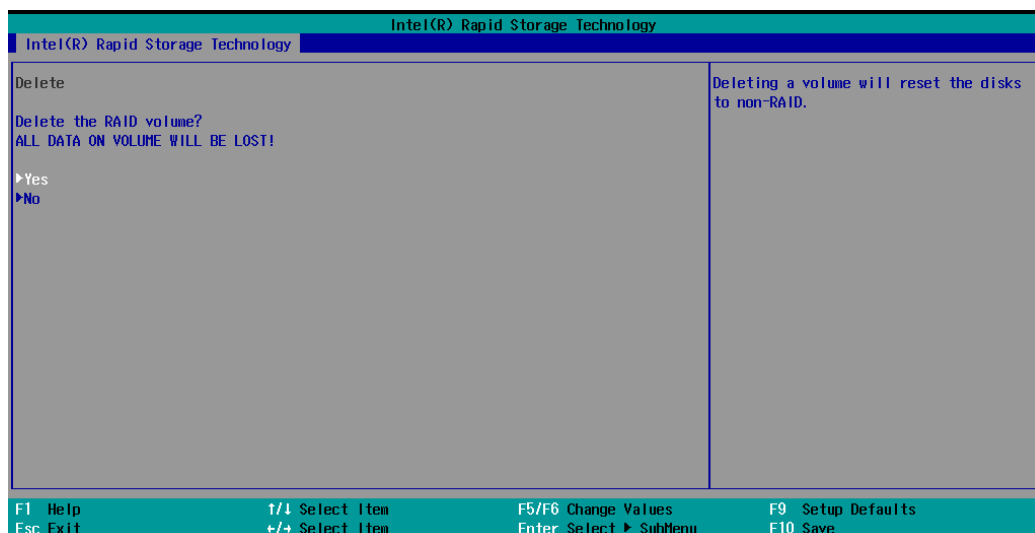
4. Select the RAID volume that you want to remove.



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



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



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



NOTE

Using hard disks of the same brand, same model and same capacity to create RAID for best performance.

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

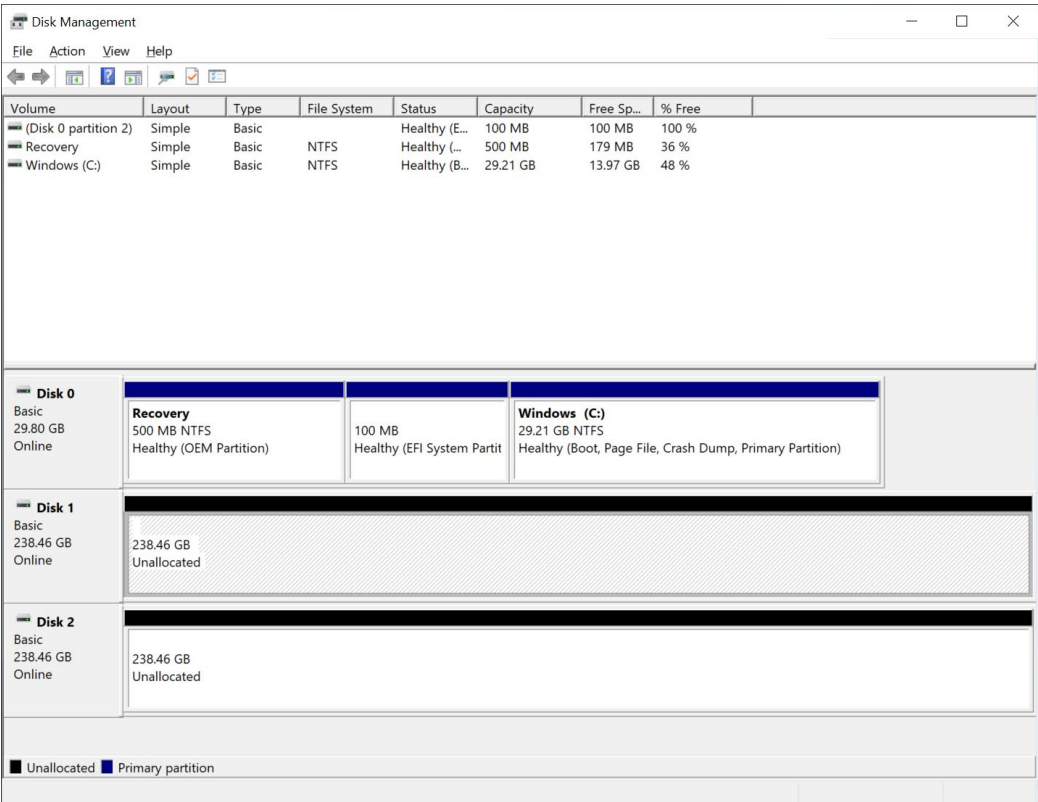


NOTE

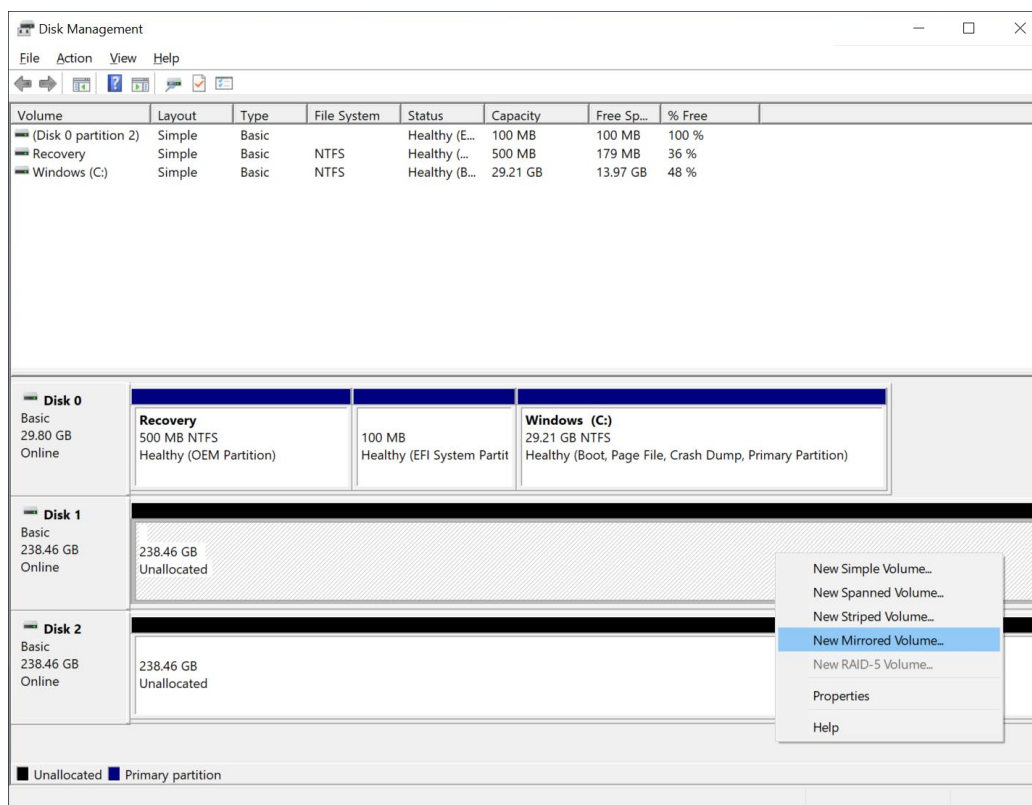
Use hard disks of the same brand, same model, and same capacity to create a RAID for best performance.

1. Run the **Disk Management**.

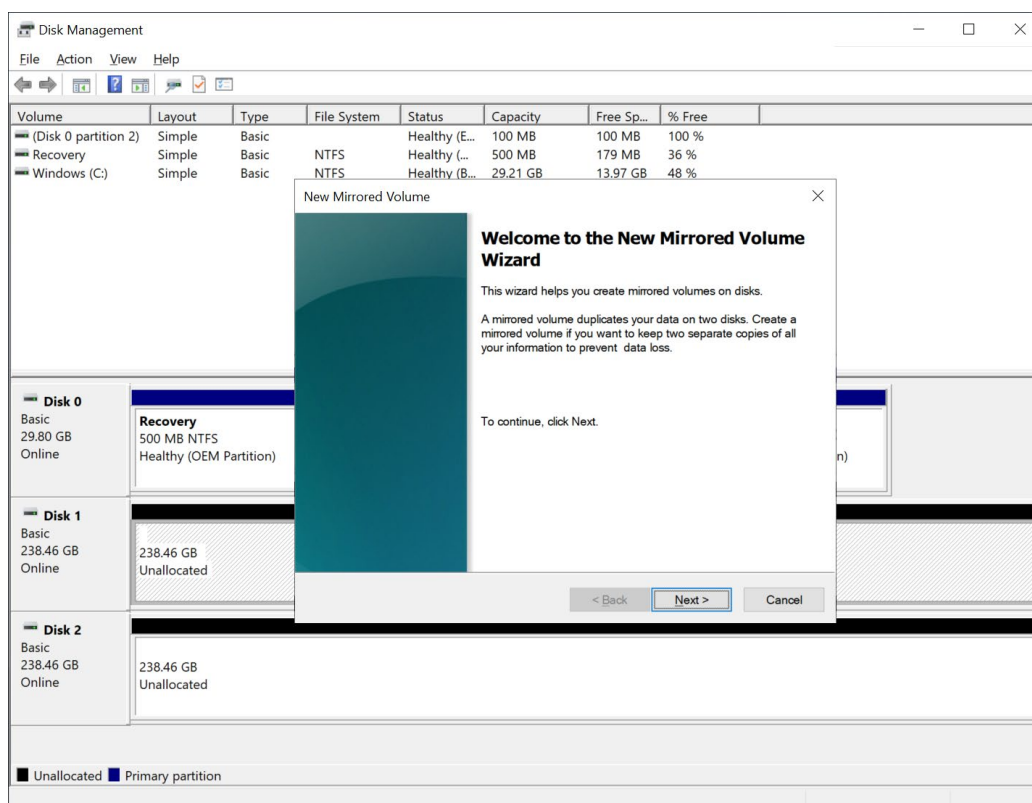
All connected disks should have the disk status **Unallocated**. If the disk status is not **Unallocated**, you can right-click on the disk and select **Delete Volume**.



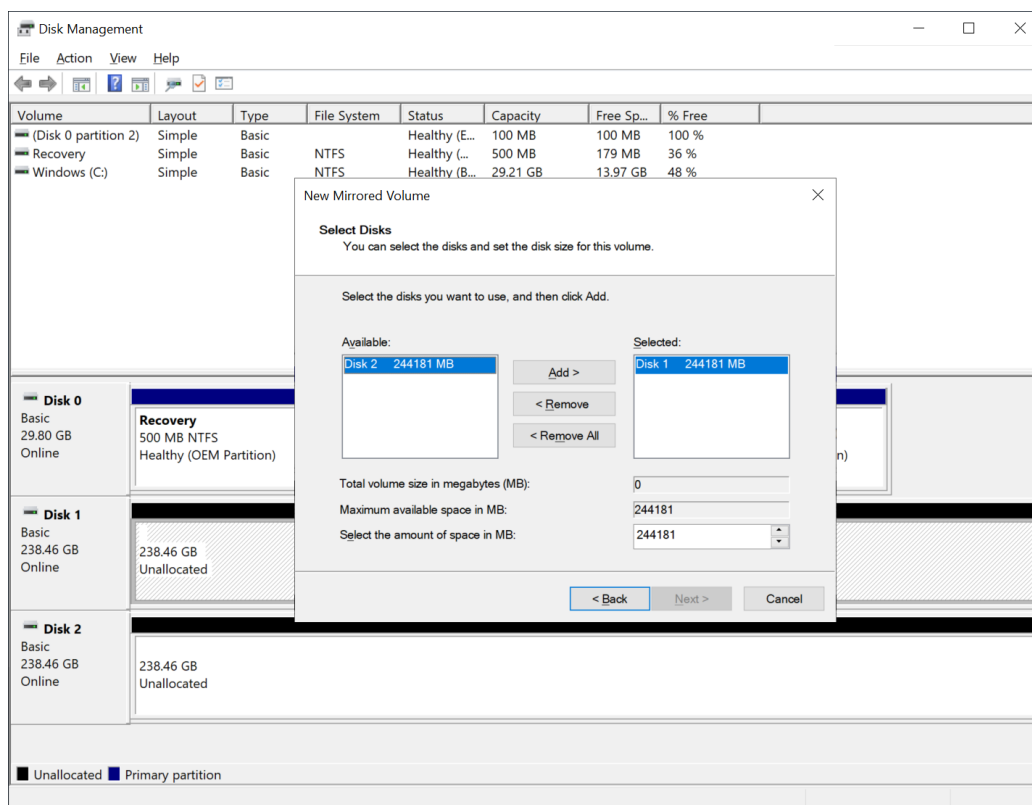
2. Right-click the target disk. Select the target volume type. For example: **RAID1(Mirror)**.



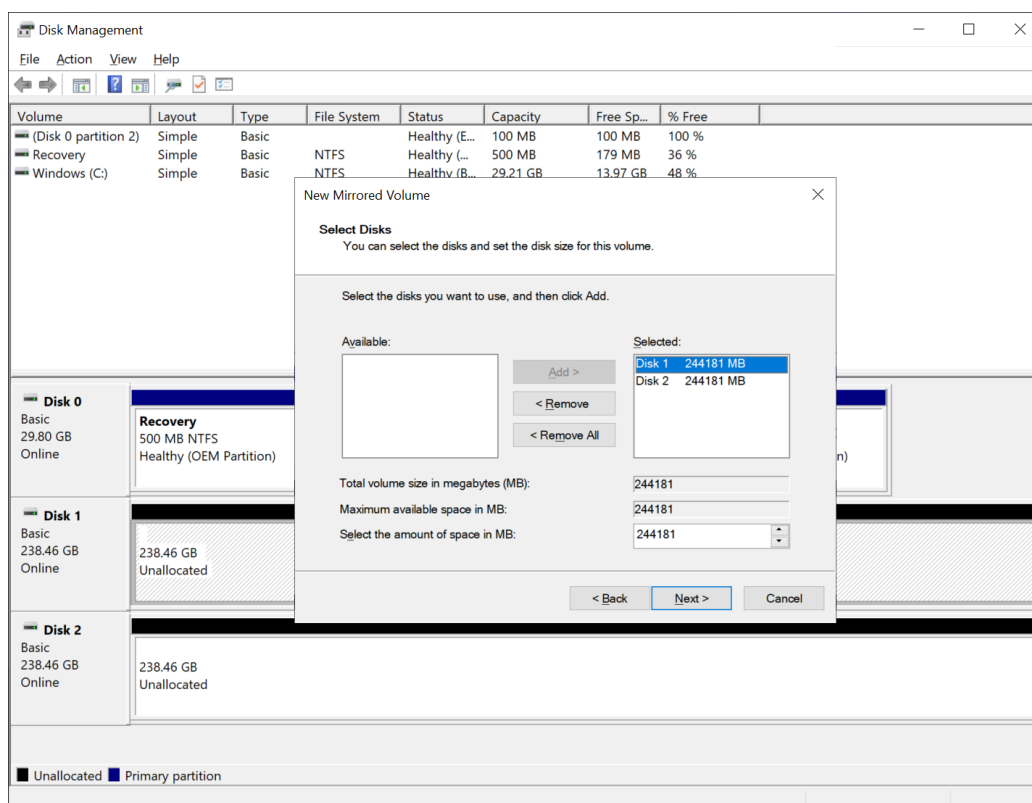
3. To continue, click **Next**



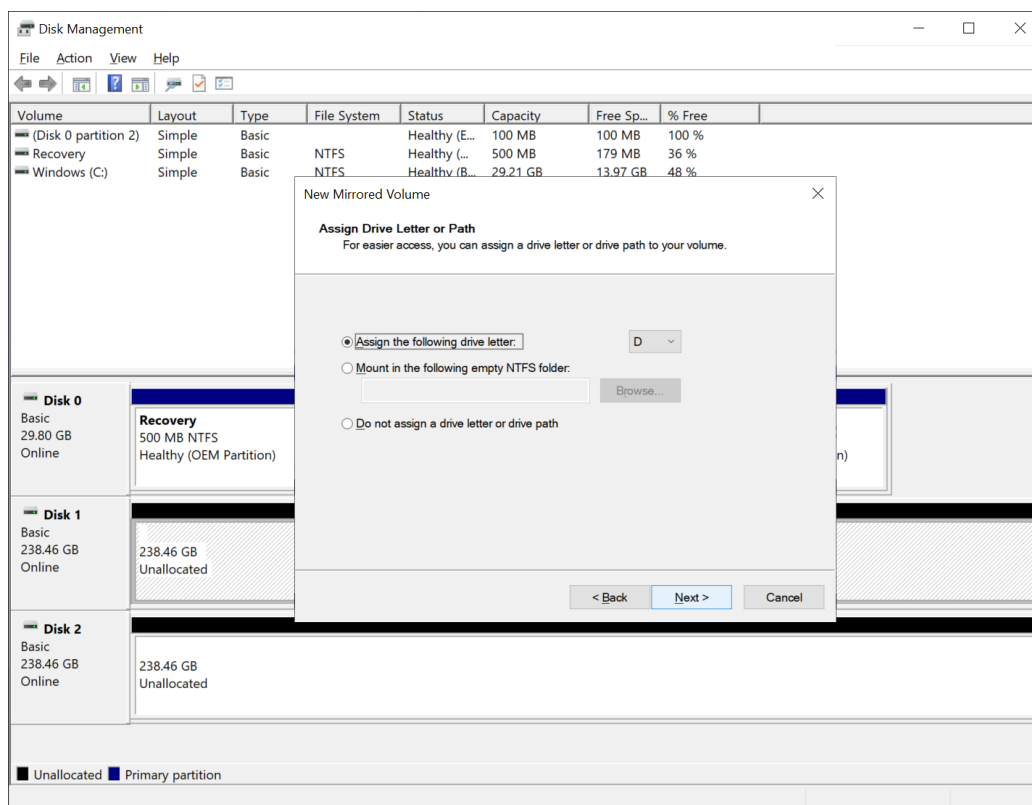
4. Select the disks you want to use, and then click **Add**.



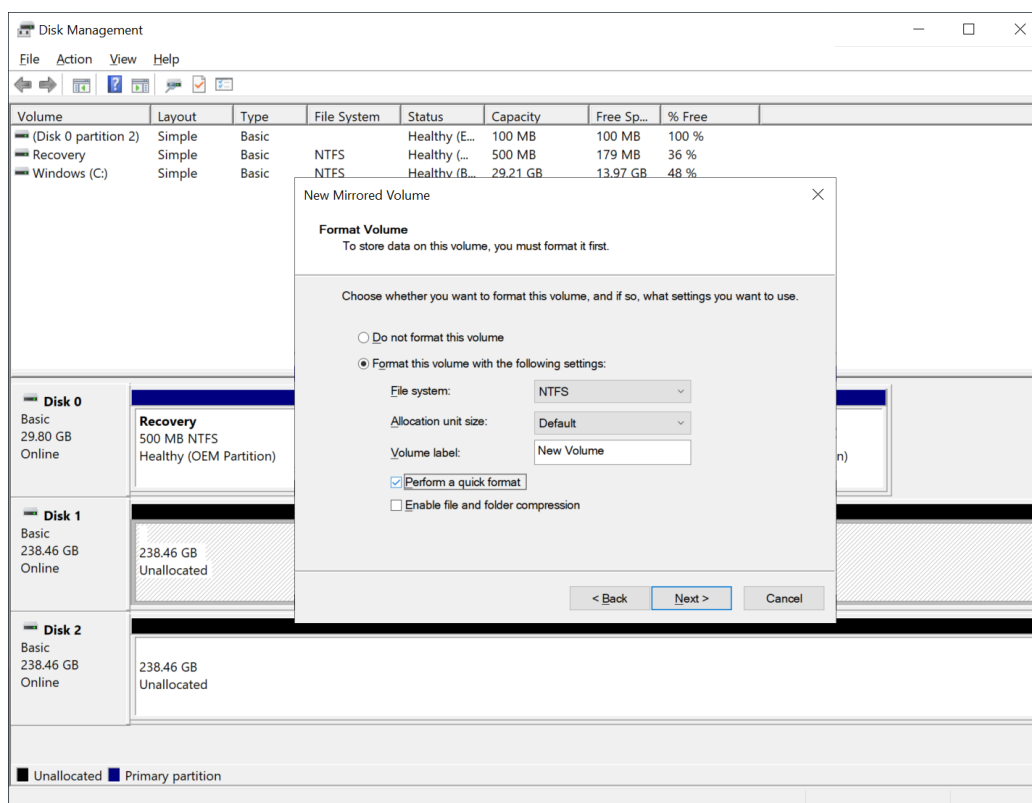
5. Click **Next**.



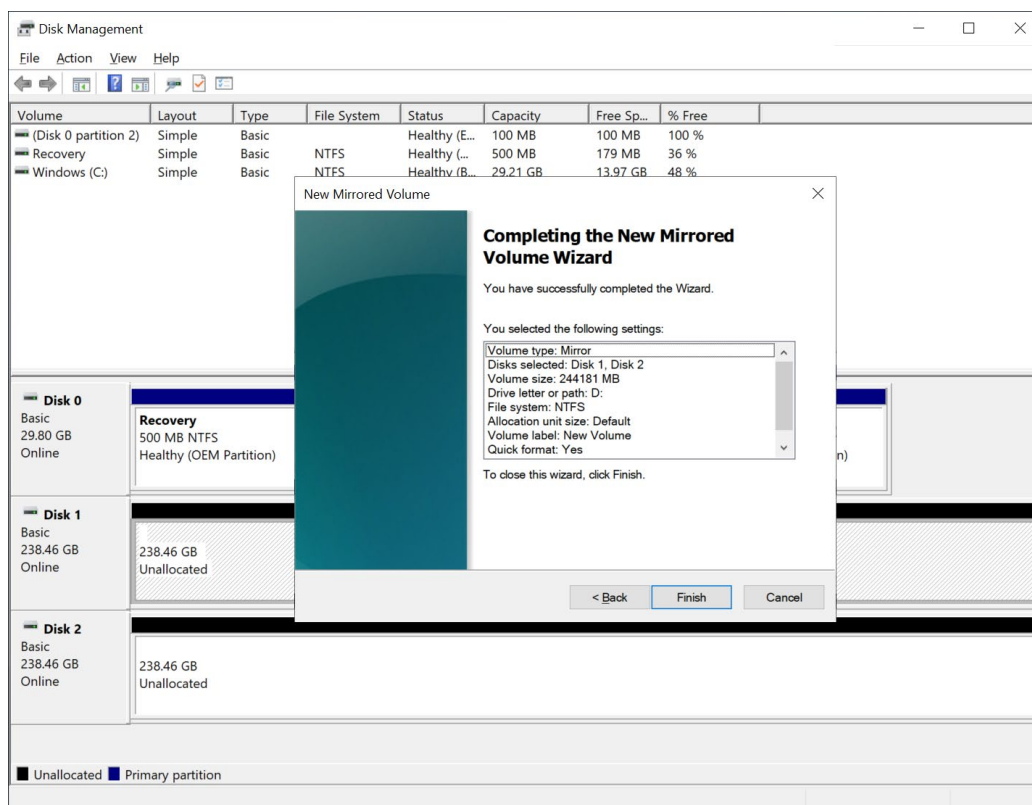
6. Assign the drive letter, click **Next**.



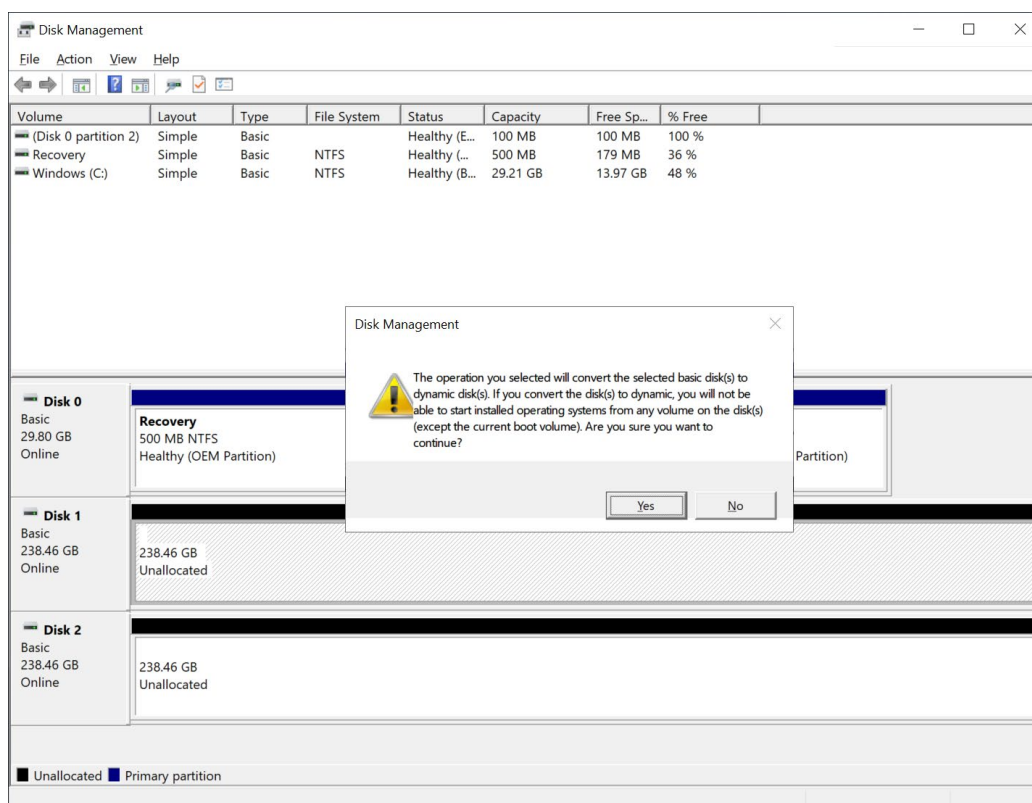
7. Format the volume using **Quick Format**, click **Next**.



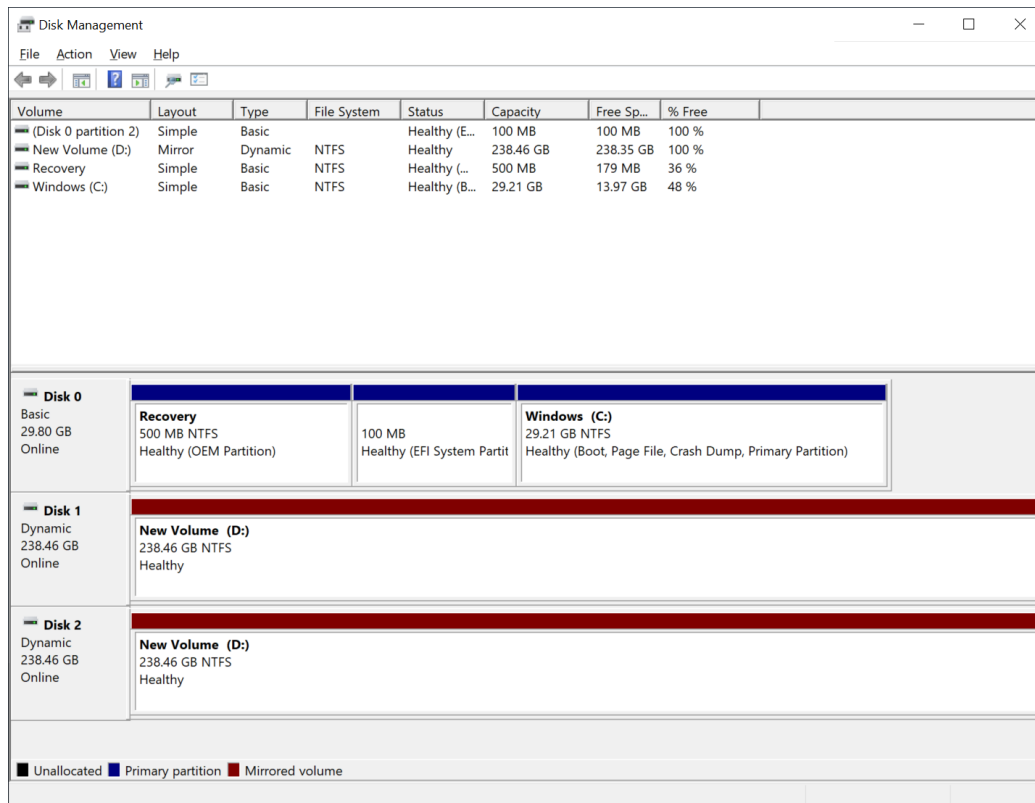
8. Checking the RAID1(Mirror) information. Click **Finish** to create the RAID1 volume.



9. System will show the warning message about SW RAID volume, click **Yes** to continue.

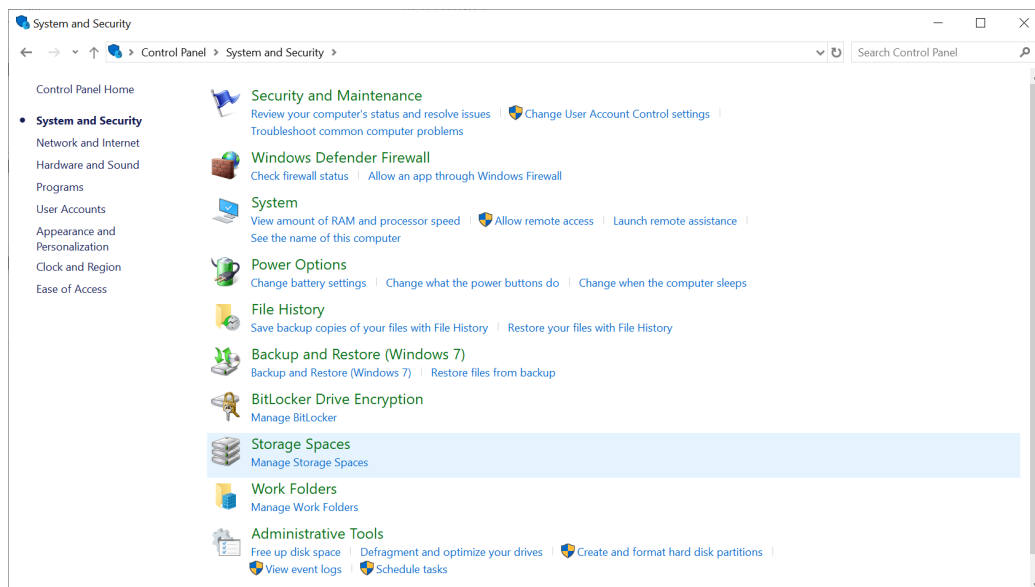


10. Checking the RAID1(Mirror) information from disk management.

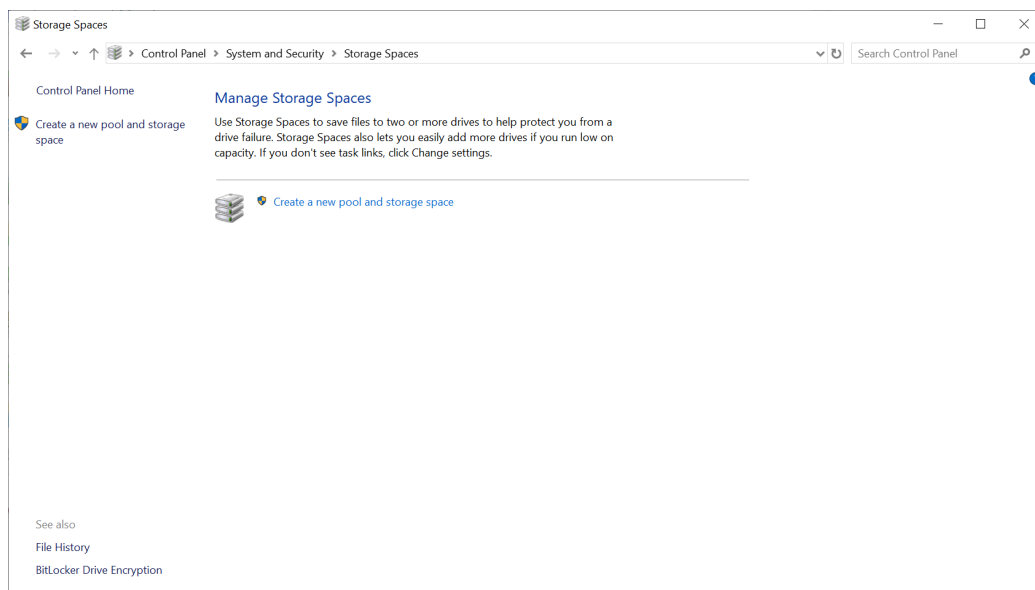


SW RAID: Creating the RAID 5 From Storage Spaces

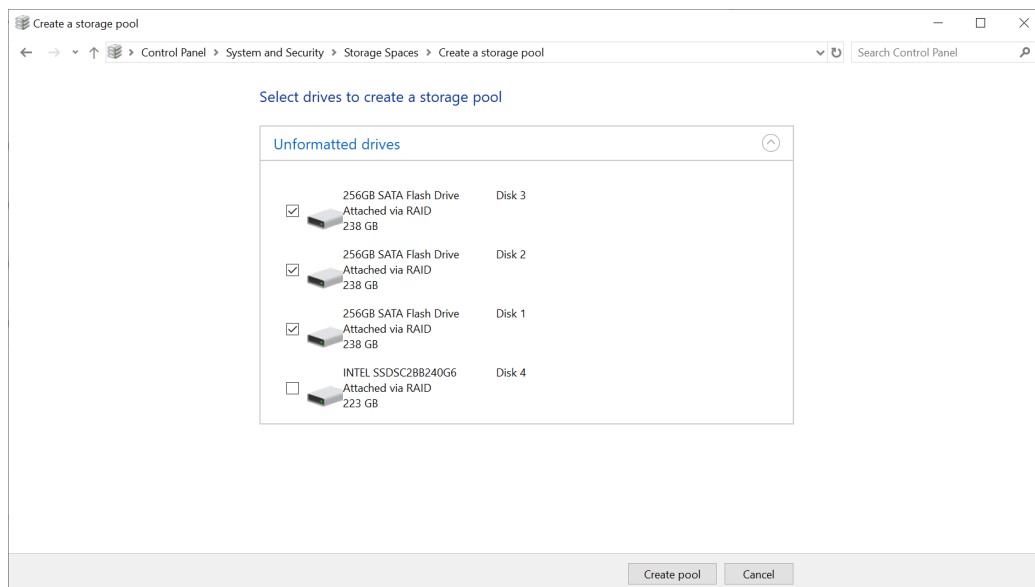
1. Open **Control Panel > System and Security**, run **Storage Spaces**.



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



3. Select target drives to create a storage pool. RAID 5 requires at least three disks. Click **Create pool**.



4. Changing the **Resiliency type** to **Parity**. Click **Create storage space**.

Create a storage space

Control Panel > System and Security > Storage Spaces > Create a storage space

Enter a name, resiliency type, and size for the storage space

Name and drive letter

Name: Storage space

Drive letter: D: ▾

File system: NTFS ▾

Resiliency

Resiliency type: Parity ▾

i A parity storage space writes your data with parity information, helping to protect you from a single drive failure. A parity storage space requires at least three drives.

Size

Total pool capacity: 713 GB

Available pool capacity: 713 GB

Size (maximum): 470 GB ▾

Including resiliency: 705 GB

Create storage space Cancel

5. Checking the RAID 5 volume status.

Storage Spaces

Control Panel > System and Security > Storage Spaces

Control Panel Home

Create a new pool and storage space

Storage spaces

Storage space (D:) OK [View files](#)
Parity
470 GB [Change](#)
Using 2.25 GB pool capacity [Delete](#)

Physical drives

256GB SATA Flash Drive OK [Rename](#)
SN: D0119232100000000012
Attached via RAID
1.37% used
Providing 238 GB pool capacity

256GB SATA Flash Drive OK [Rename](#)
SN: D0119235600000000018
Attached via RAID
0.53% used
Providing 238 GB pool capacity

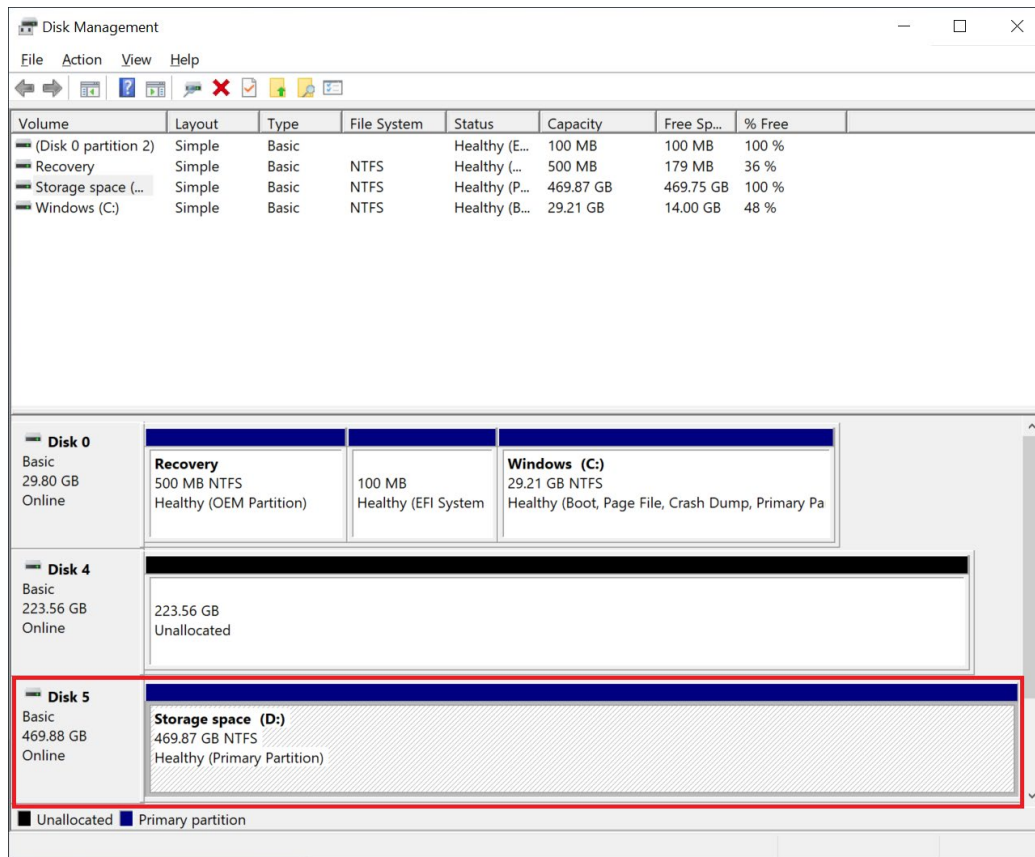
256GB SATA Flash Drive OK [Rename](#)
SN: D011926340000000006C
Attached via RAID
1.37% used
Providing 238 GB pool capacity

See also

[File History](#)

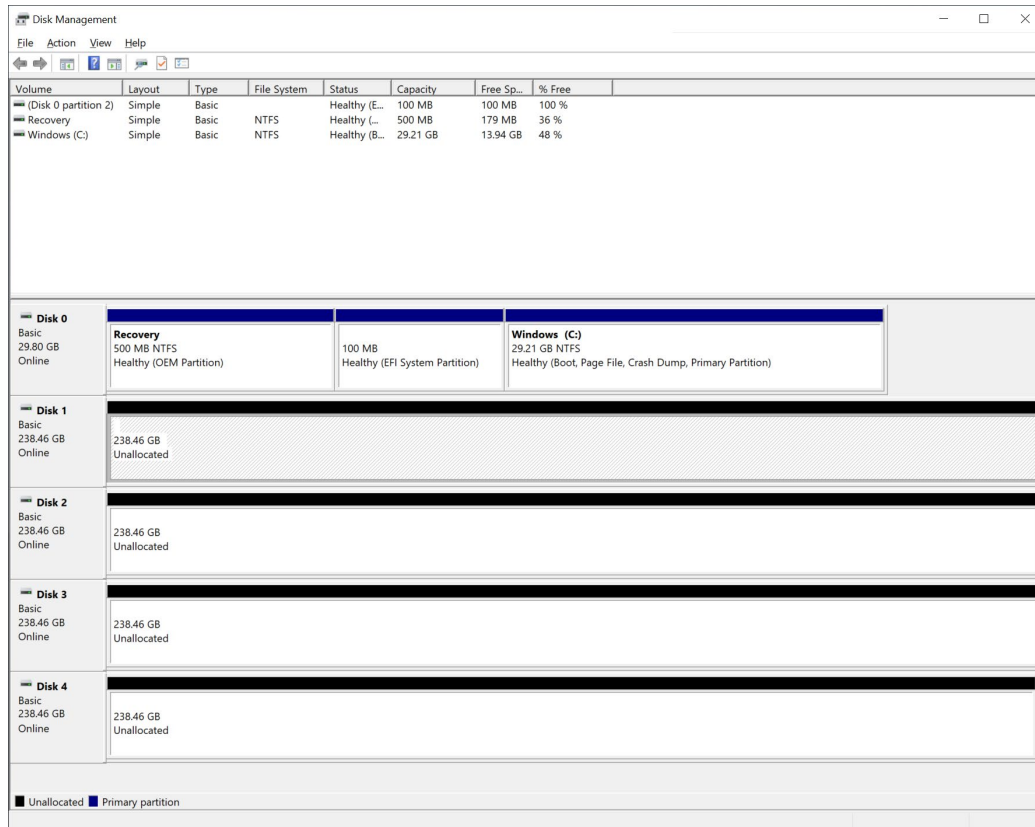
[BitLocker Drive Encryption](#)

6. Checking the storage space from disk management.

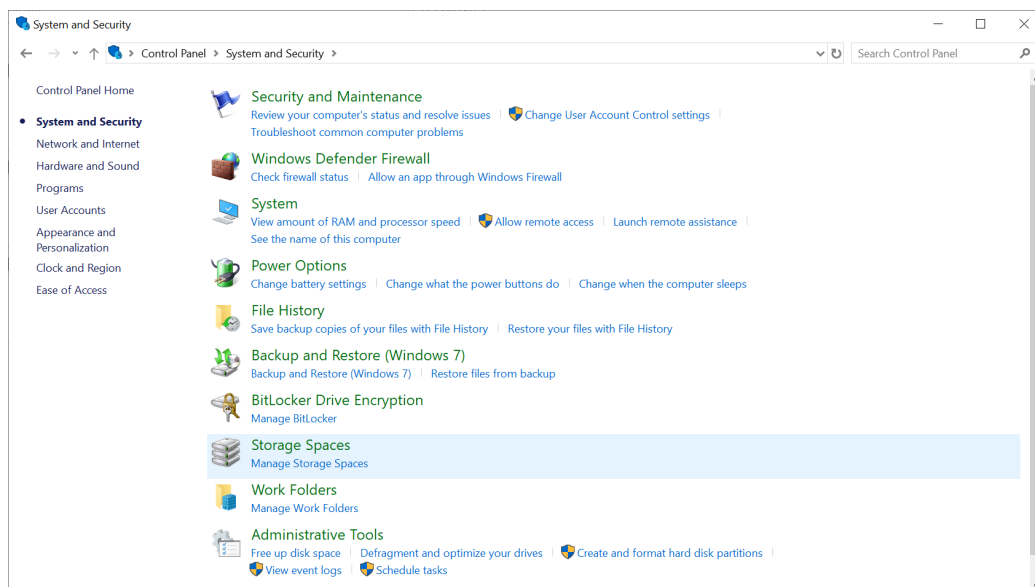


SW RAID: Creating the RAID 10 From Storage Spaces

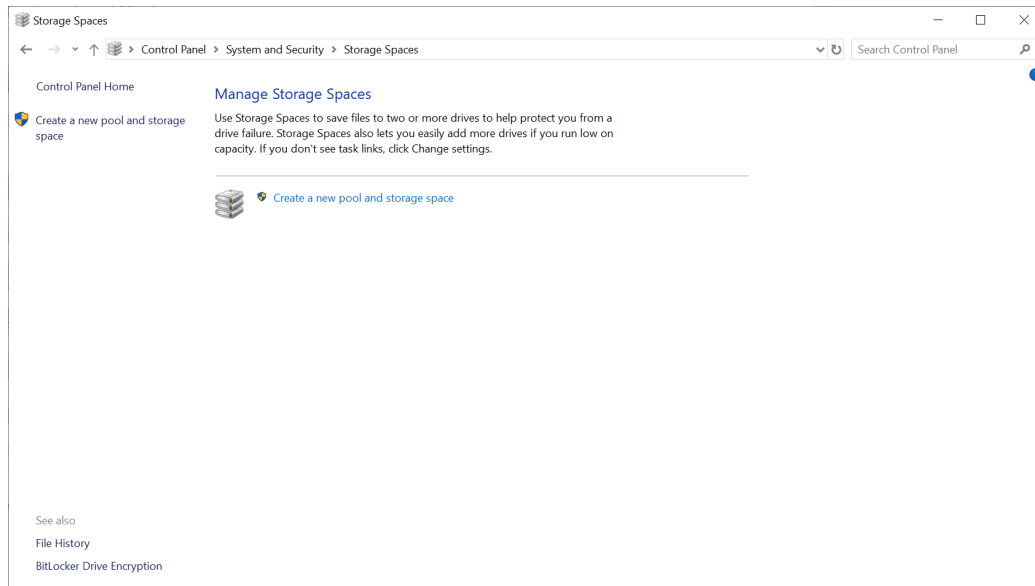
1. Run the **Disk Management**. Connecting the new disks and checking all the disk status are **Unallocated**. If the disk status is not **Unallocated**, you can right-click the target disk and select **Delete Volume**.



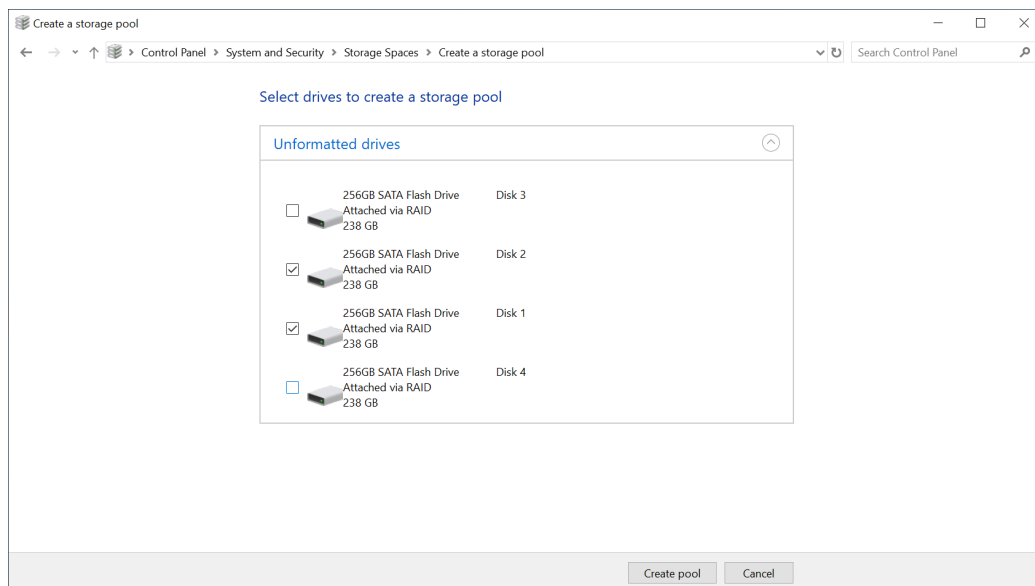
2. Open **Control Panel > System and Security**, run **Storage Spaces**.



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



4. RAID 10 requires at least four disks. Select **Disk 1** and **Disk 2** to create a storage pool. Click **Create a pool**.



5. Changing the **Resiliency type** to **Two-way mirror**. Click **Create storage space**. Follow the step 4 to run the same steps on **Disk 3** and **Disk 4**.

Control Panel > System and Security > Storage Spaces > Create a storage space

Enter a name, resiliency type, and size for the storage space

Name and drive letter

Name:

Drive letter:

File system:

Resiliency

Resiliency type:

A two-way mirror storage space writes two copies of your data, helping to protect you from a single drive failure. A two-way mirror storage space requires at least two drives.

Size

Total pool capacity: 475 GB

Available pool capacity: 475 GB

Size (maximum): GB

Including resiliency: 470 GB

Create storage space Cancel

6. Checking the storage space status.

Control Panel > System and Security > Storage Spaces

Storage pool

Using 6.00 GB of 475 GB pool capacity

Create a storage space
Add drives
Rename pool
Optimize drive usage

Storage spaces

Storage space (D:) ☒ OK View files
Two-way mirror
235 GB
Using 1.50 GB pool capacity
Change
Delete

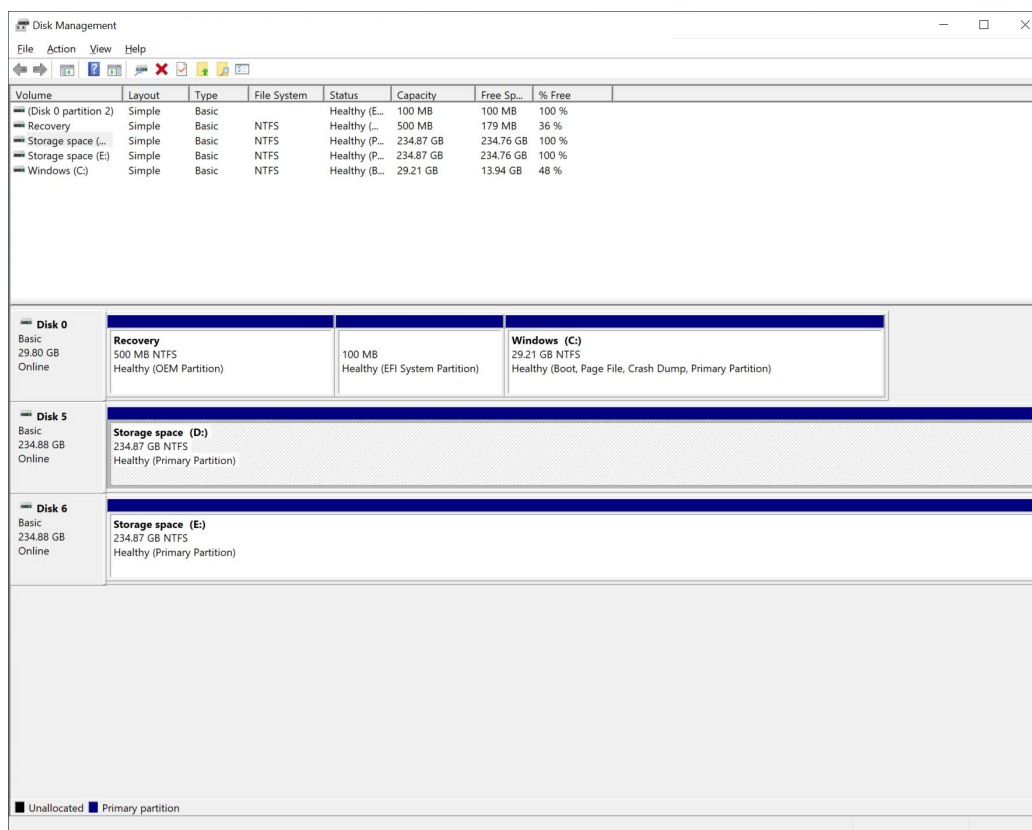
Physical drives

256GB SATA Flash Drive ☒ OK Rename
SN: D0119235600000000018
Attached via RAID
1.37% used
Providing 238 GB pool capacity

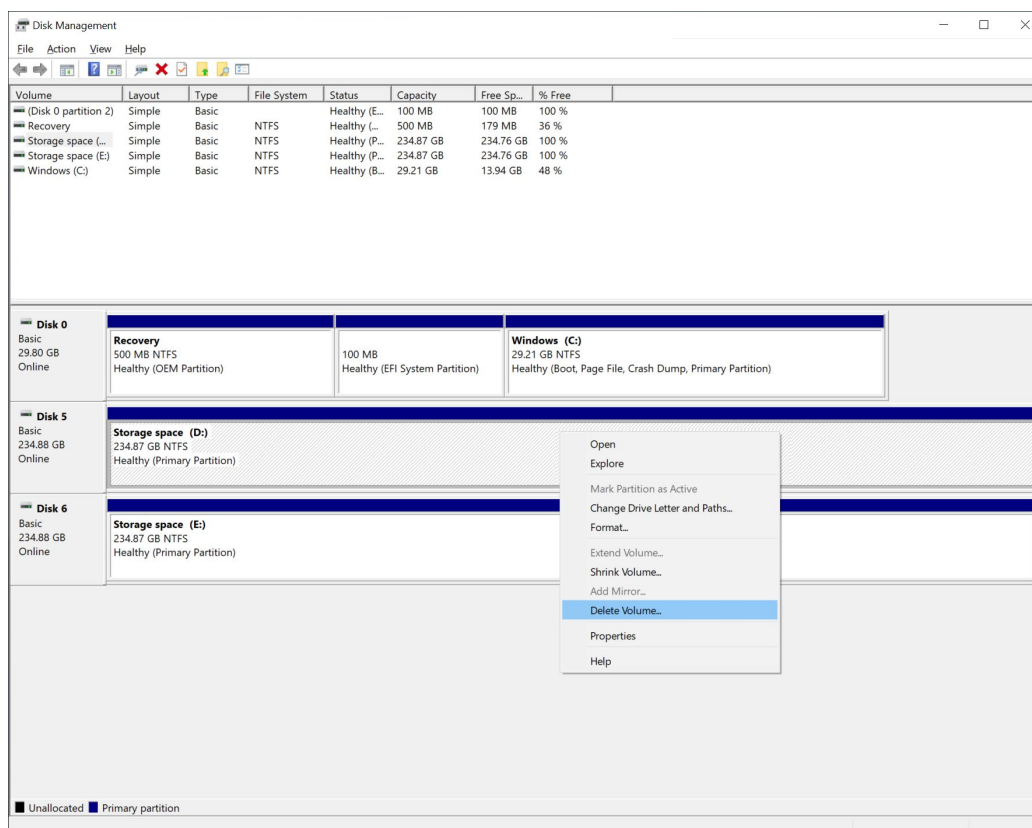
256GB SATA Flash Drive ☒ OK Rename
SN: D0119263400000000006C
Attached via RAID
1.37% used
Providing 238 GB pool capacity

See also
File History
BitLocker Drive Encryption

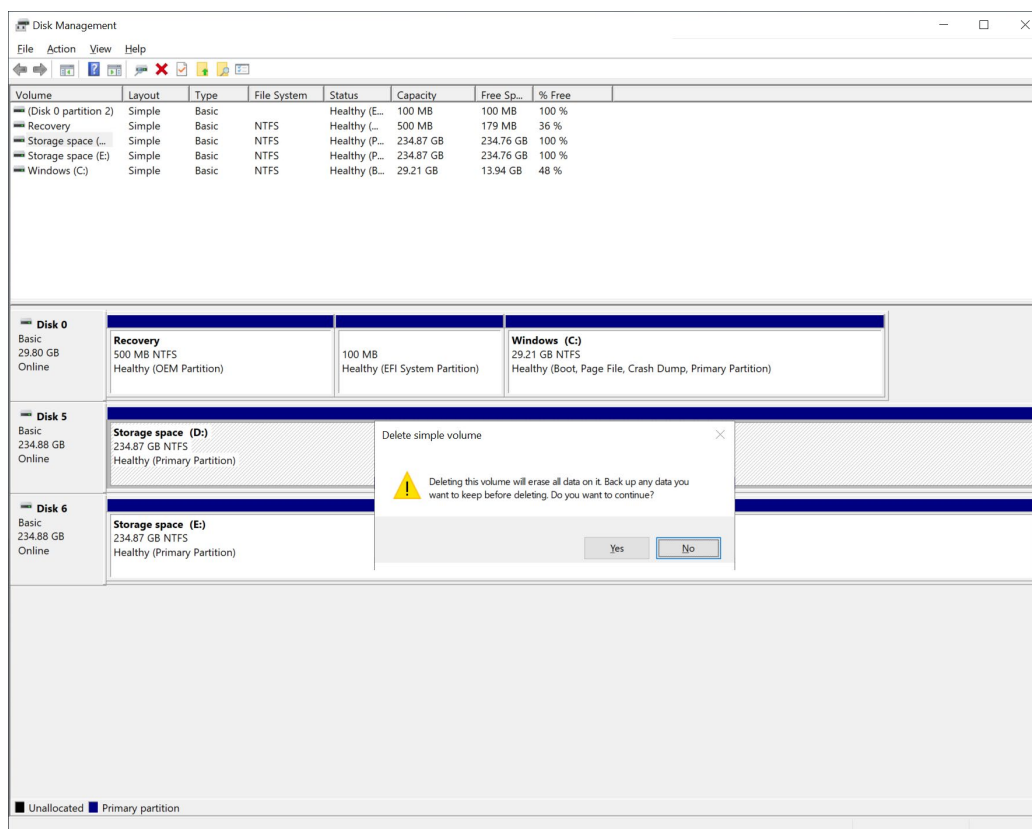
- After the creating steps, the **Storage space (D:)** and **Storage space (E:)** will be shown on **Disk Management**.



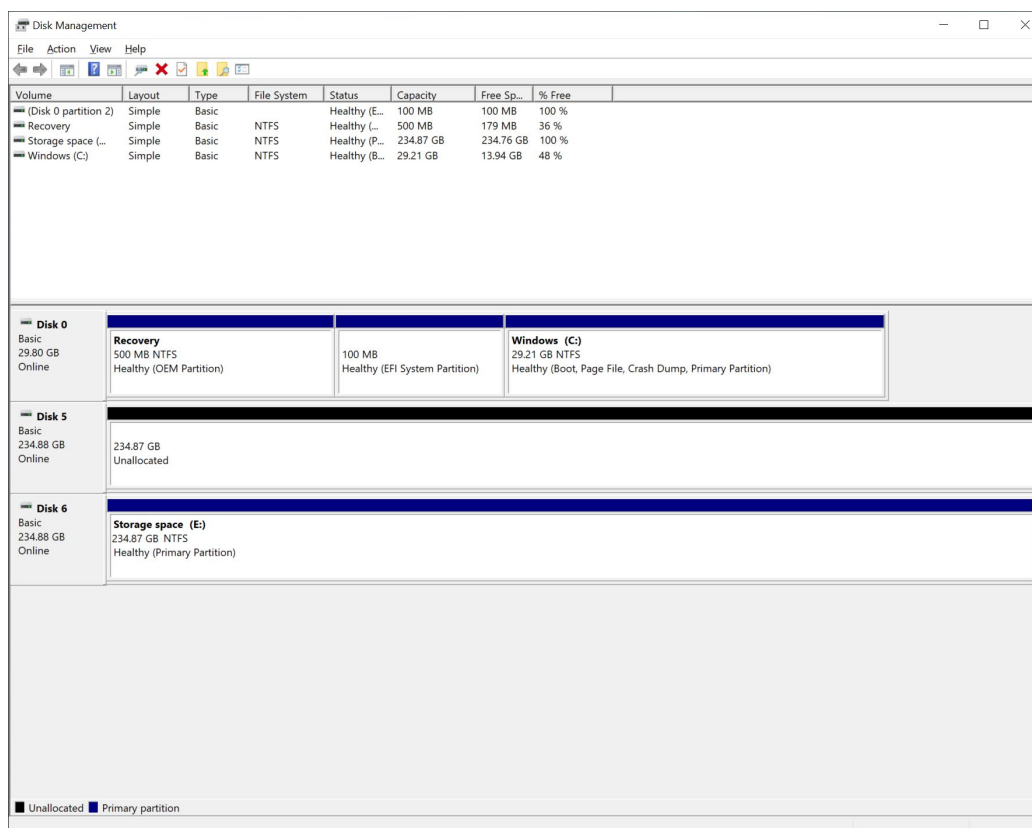
- Right-click the **Storage space (D:)**, select **Delete Volume**.



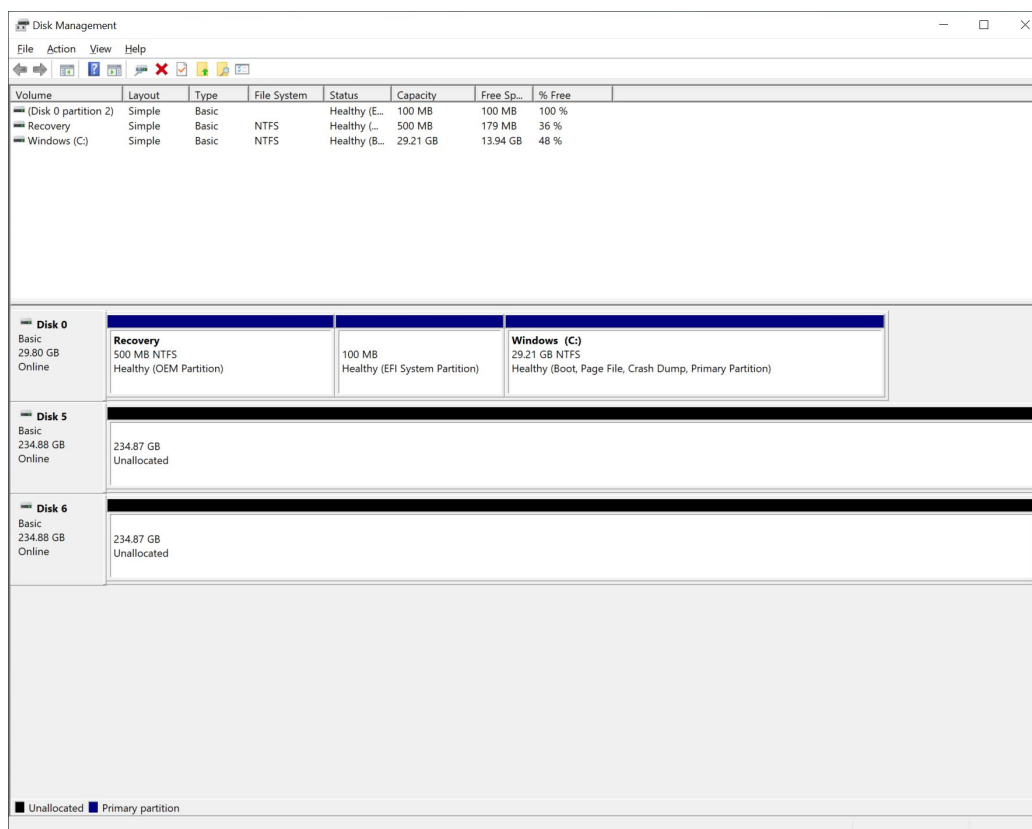
- The warning messages will show on screen, click **Yes** to delete the volume.



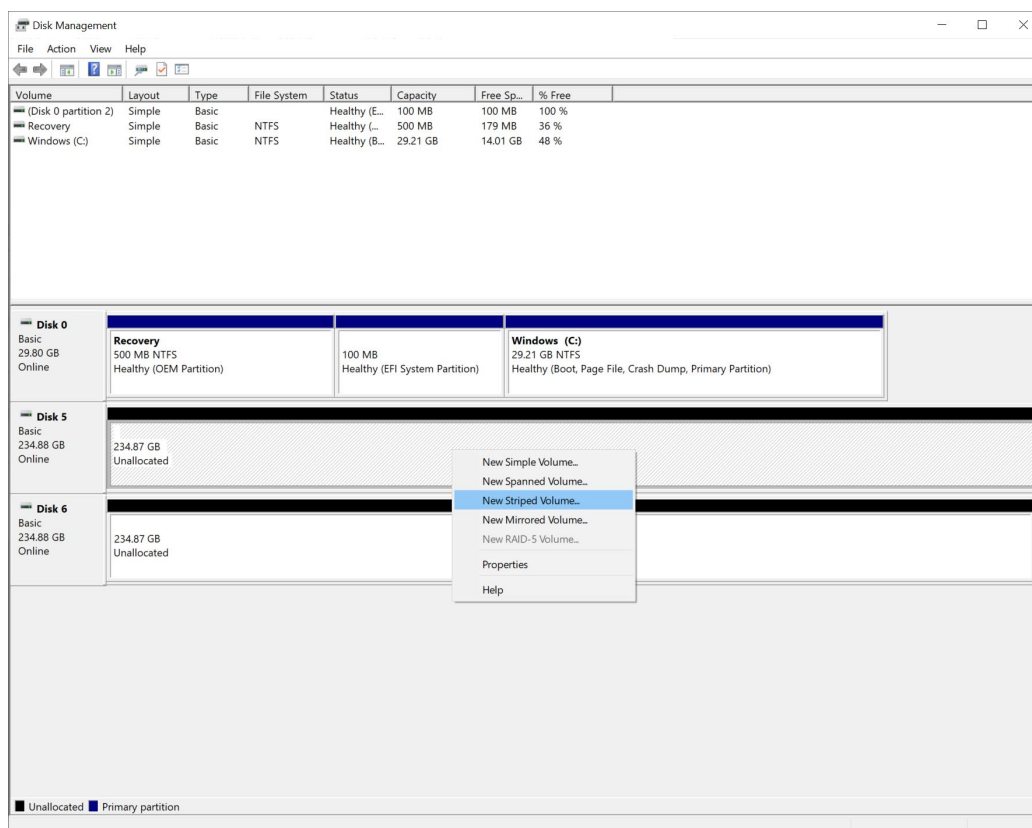
- The storage space status will change to **Unallocated**, run the same steps on **Storage space (E:)**.



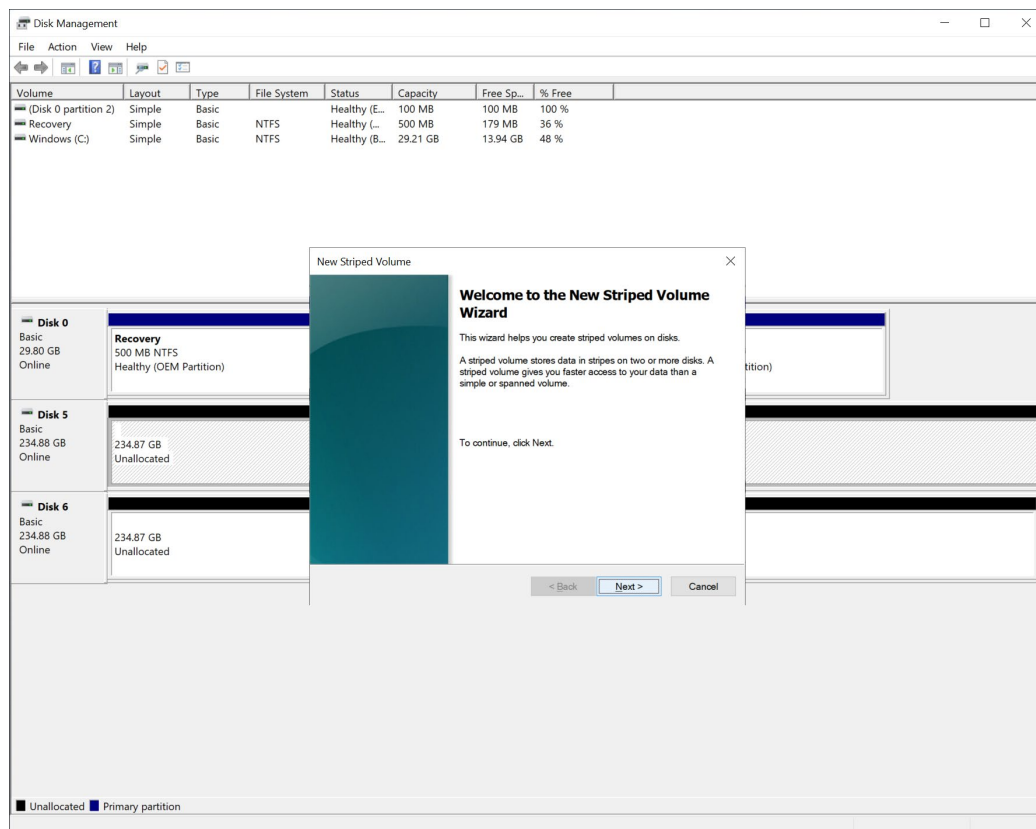
11. All the storage space status are **Unallocated**.



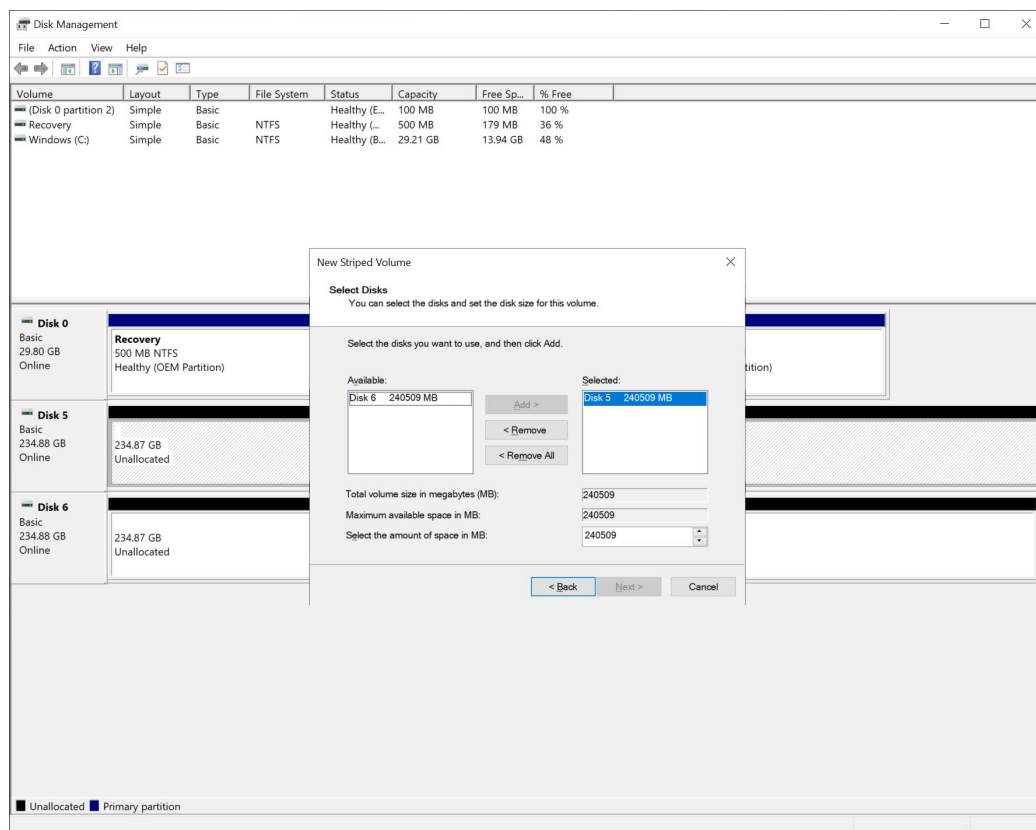
12. Right-click on the **Disk 5**, select **New Striped Volume**.



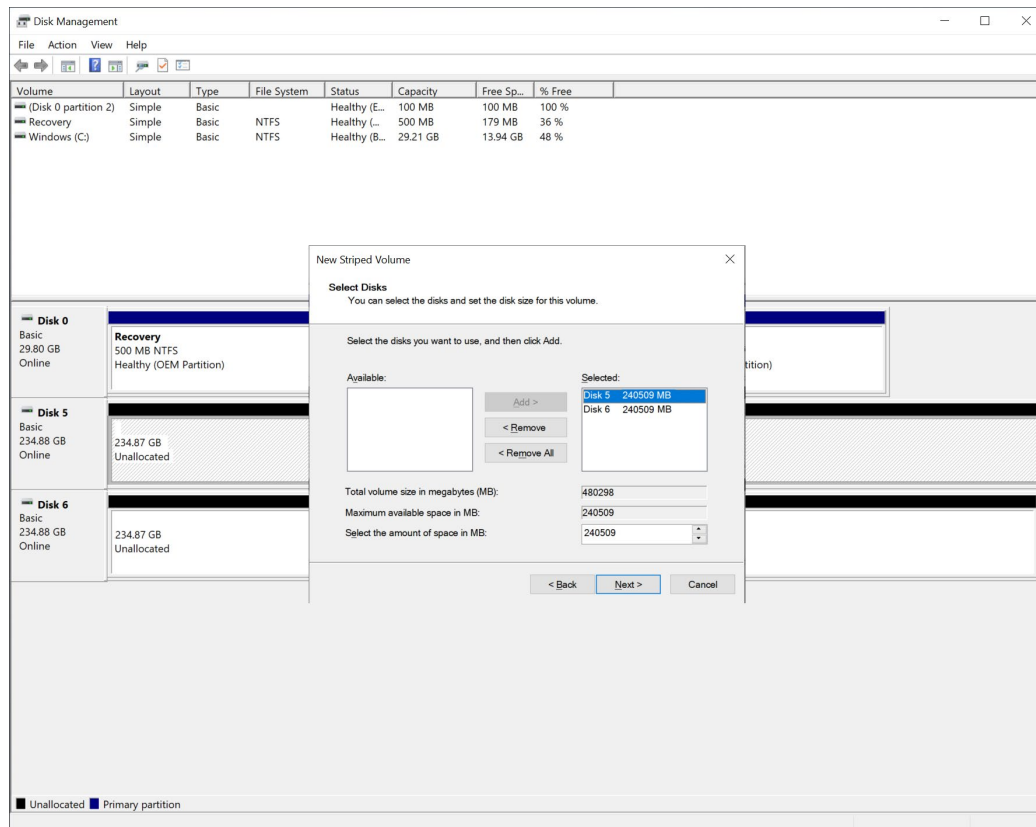
13. To continue, click **Next**.



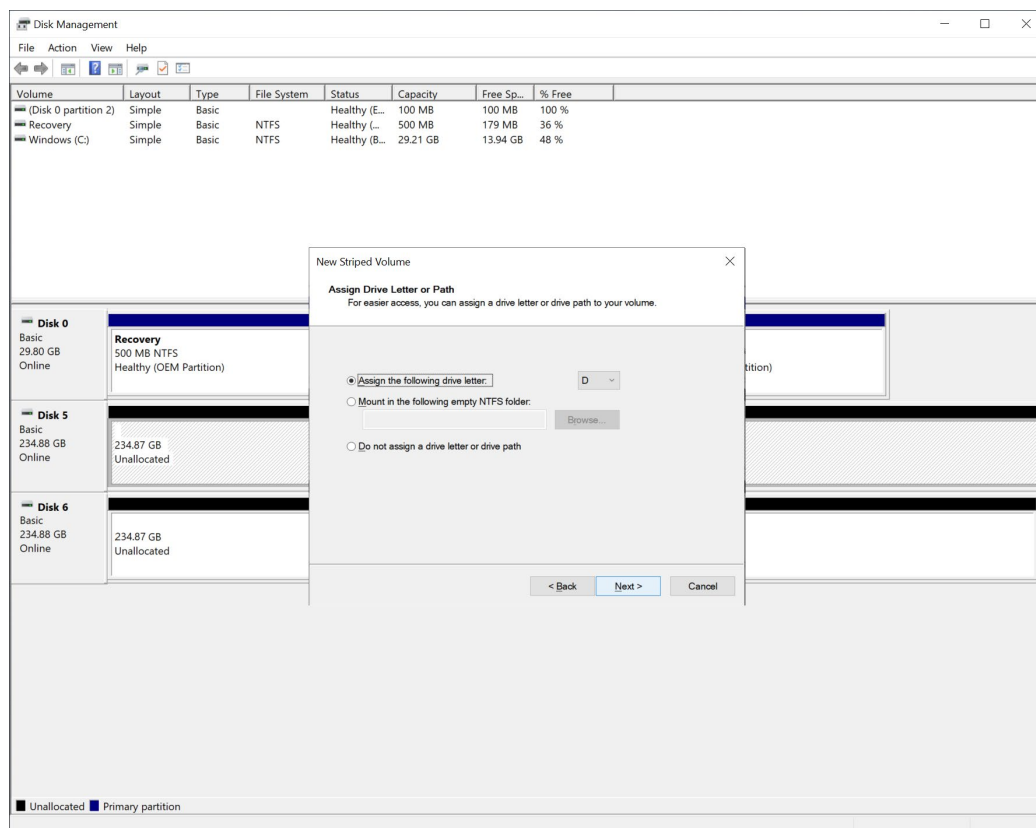
14. Select the disks you want to use, and then click **Add**.



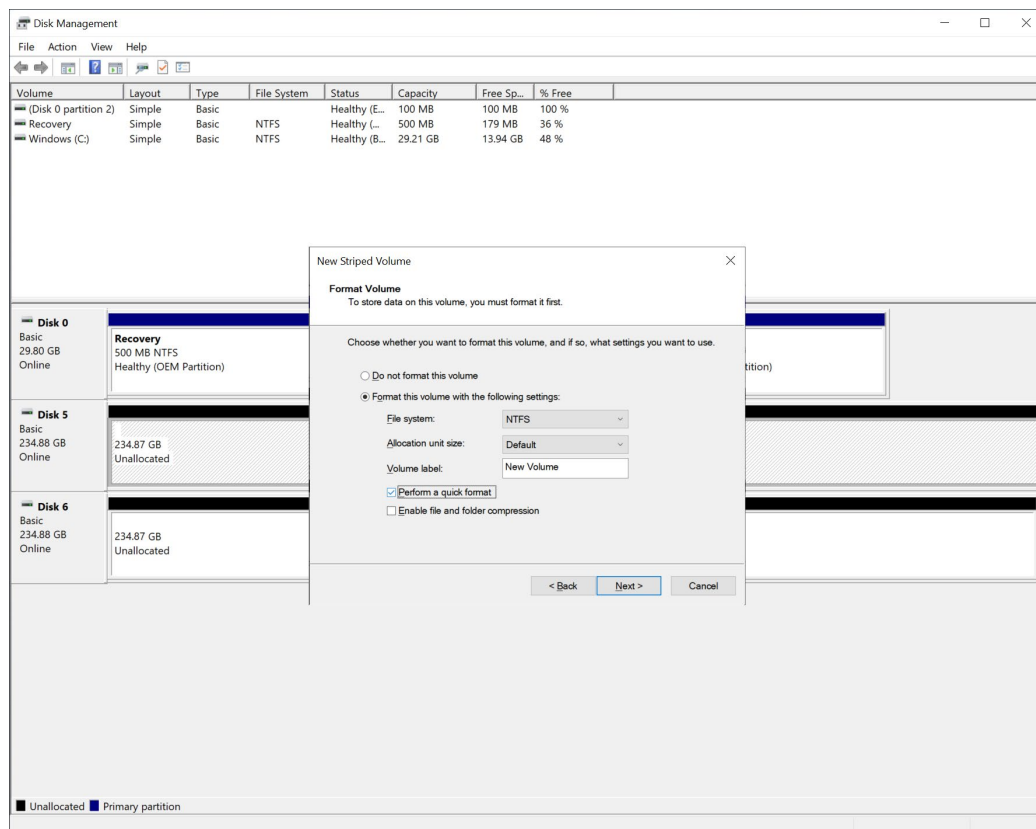
15. Click **Next**.



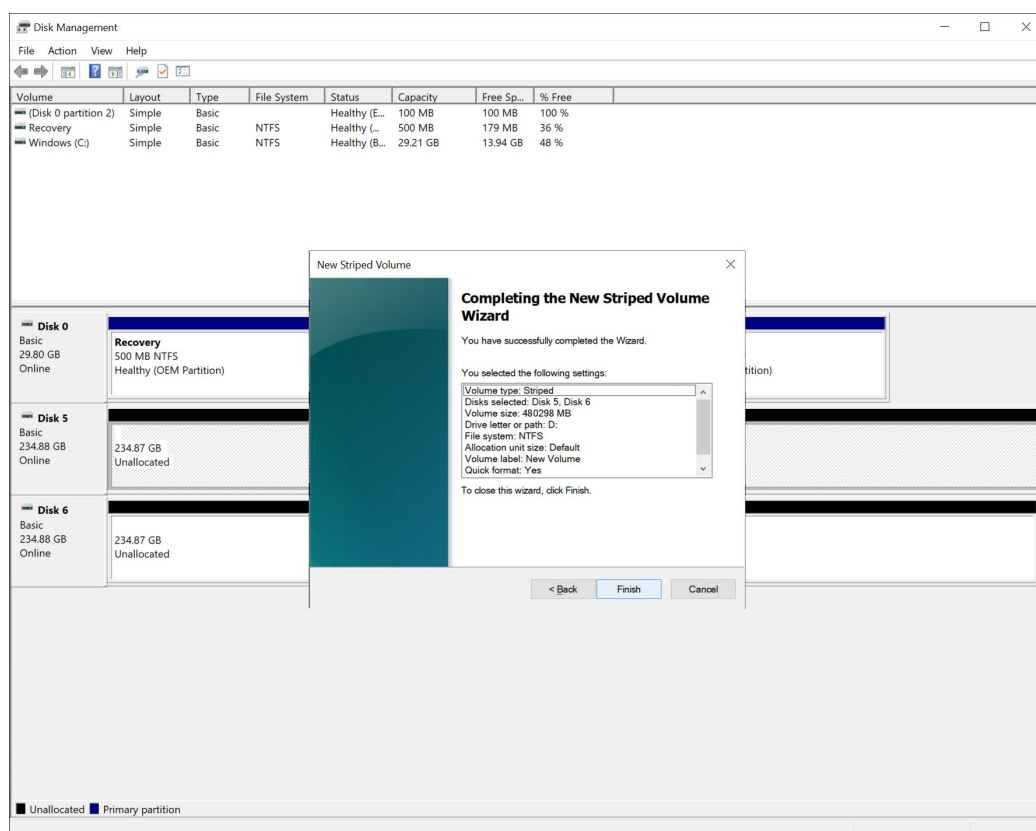
16. Assign the drive letter, click **Next**.



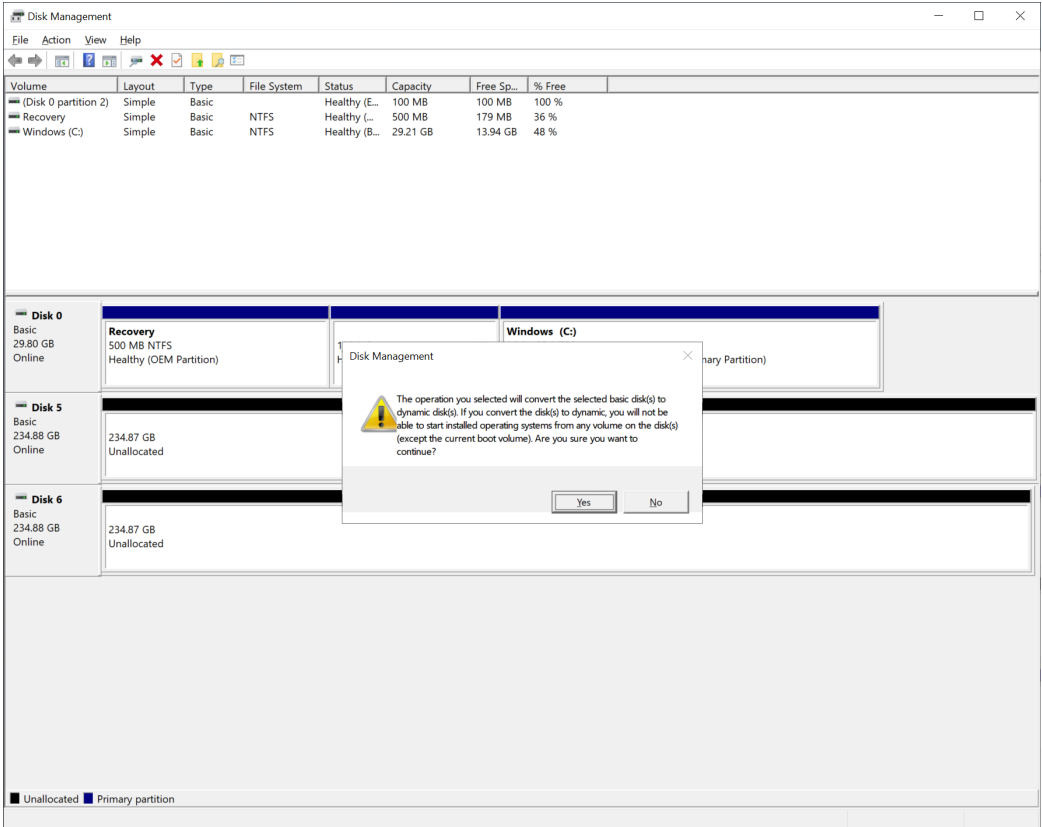
17. Format the volume using the **Quick Format**, click **Next**.



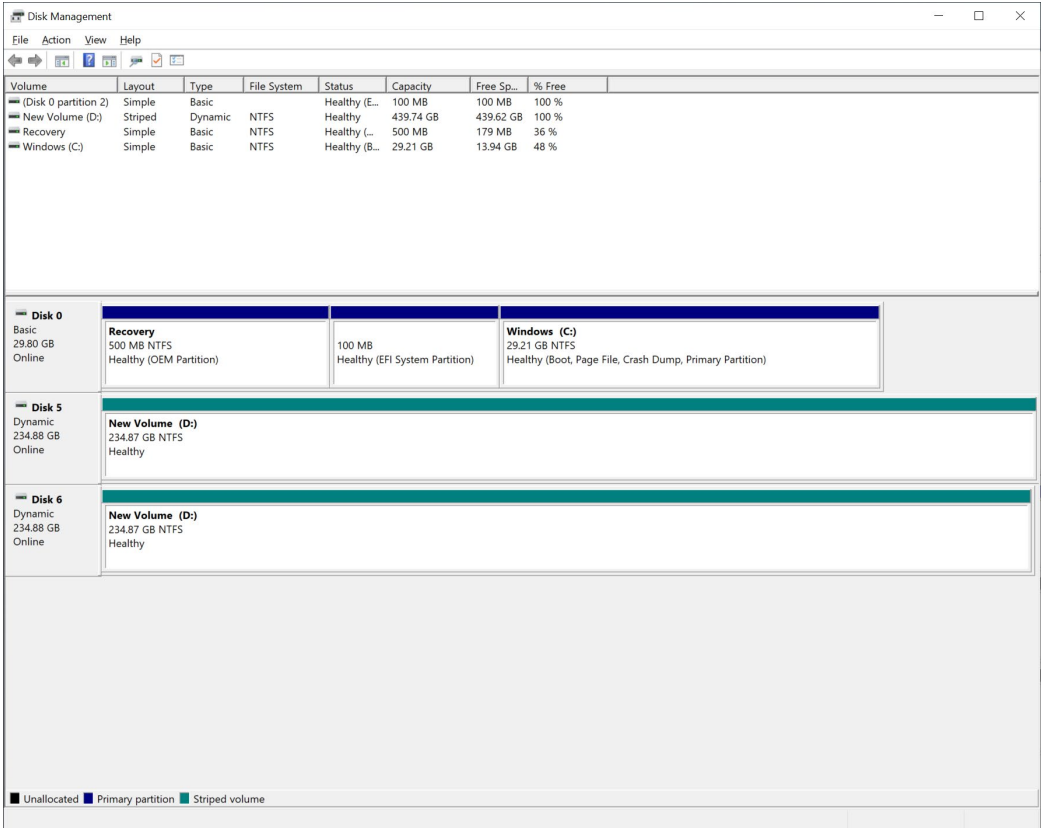
18. Checking the volume information. Click **Finish** to create the striped volume.



19. System will show the warning messages about SW RAID volume, click **Yes** to continue.



20. Checking the striped volume information from disk management.



5. Teaming

NIC Teaming, also known as load balancing and failover (LBFO), allows multiple network adapters on a computer to be placed into a team for bandwidth aggregation or traffic failover to prevent connectivity loss in the event of a network component failure.

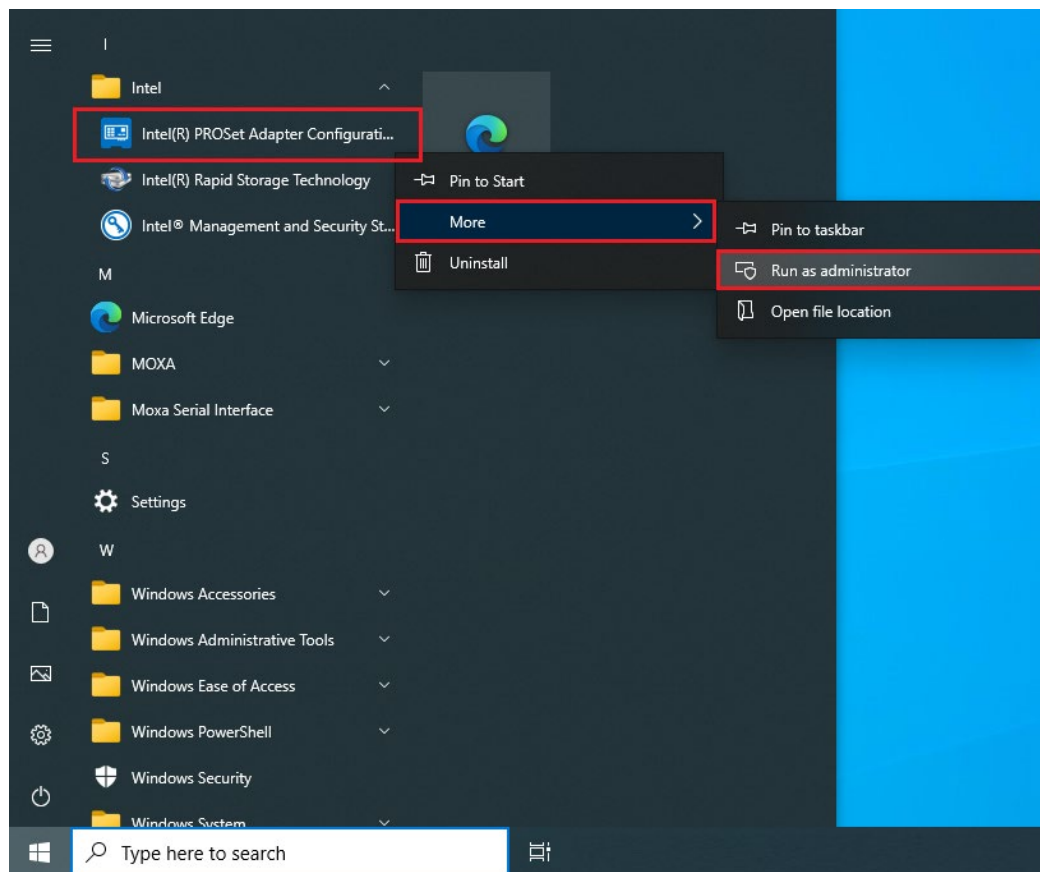
For more information about Teaming : [https://learn.microsoft.com/en-us/previous-versions/windows/itpro/windows-server-2012-r2-and-2012/hh997031\(v=ws.11\)](https://learn.microsoft.com/en-us/previous-versions/windows/itpro/windows-server-2012-r2-and-2012/hh997031(v=ws.11))

Intel® Net Team

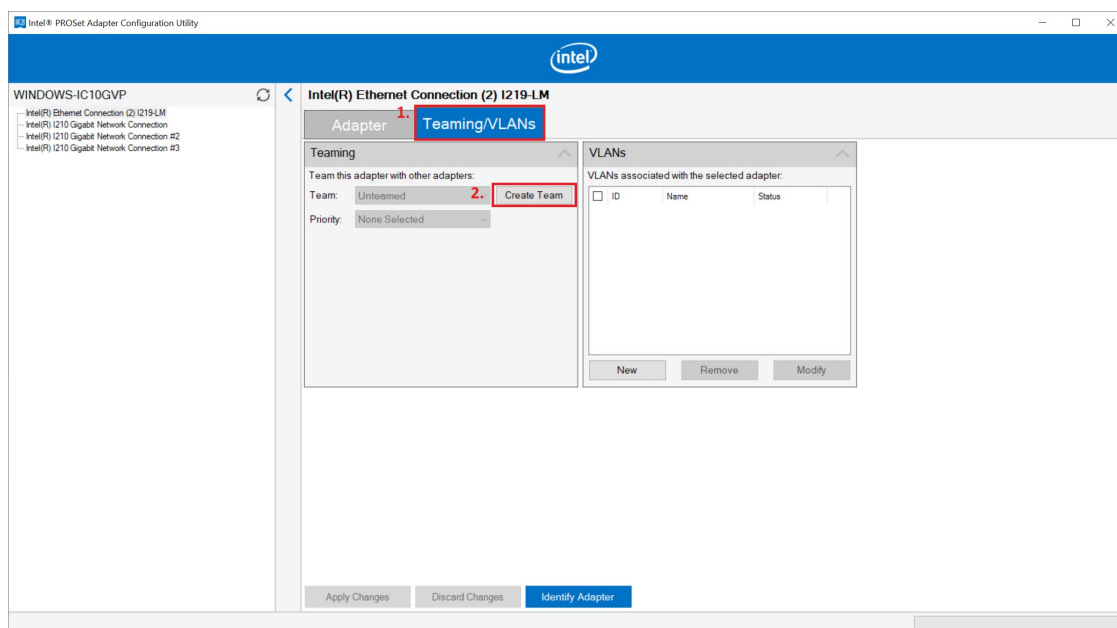
This chapter describes the setup process for the Intel® Teaming function.

Creating an Intel® Net Team

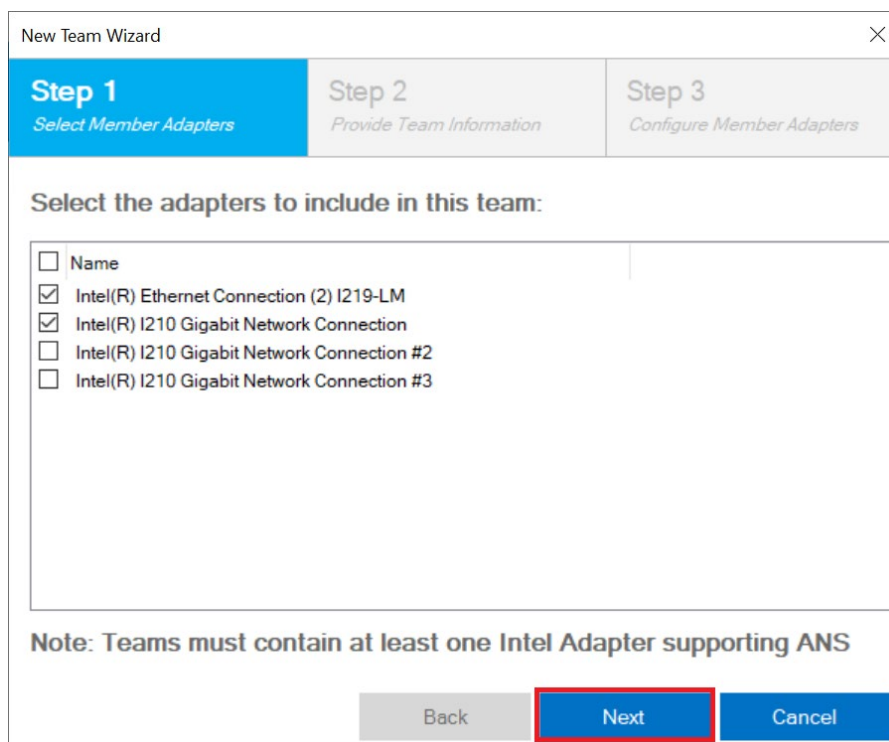
1. Run **Intel® PROSet Adapter Configuration Utility** as administrator.



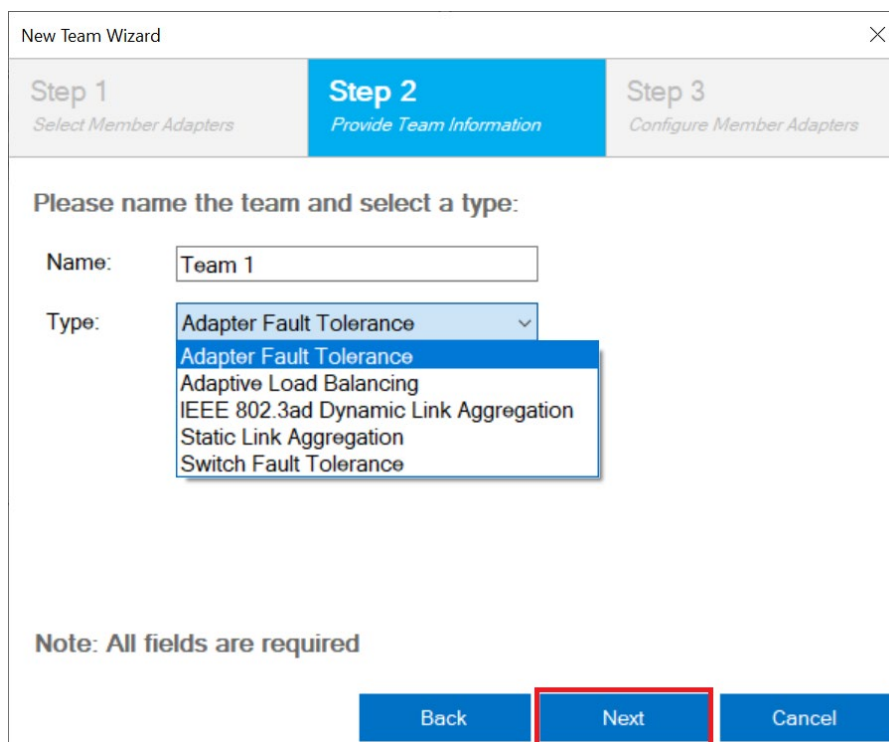
2. In the **Teaming/VLANs** tab, click **Create Team**.



3. Select the adapter to include in this team and click **Next**. An Intel ANS team can contain a maximum of eight members.



4. Name the team and select a team type. Click **Next** to continue.



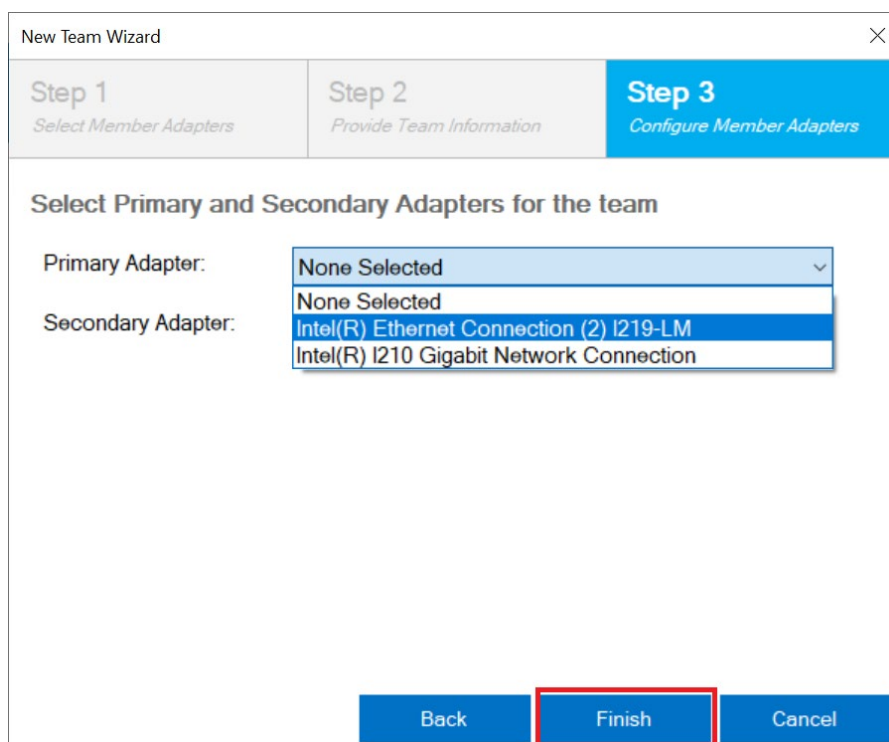
The screenshot shows the 'New Team Wizard' window at Step 2, 'Provide Team Information'. The window has three tabs: Step 1 (Select Member Adapters), Step 2 (Provide Team Information), and Step 3 (Configure Member Adapters). Step 2 is active. The main text says 'Please name the team and select a type:'. There is a 'Name:' label followed by a text box containing 'Team 1'. Below that is a 'Type:' label followed by a dropdown menu. The dropdown menu is open, showing a list of team types: 'Adapter Fault Tolerance' (highlighted), 'Adaptive Load Balancing', 'IEEE 802.3ad Dynamic Link Aggregation', 'Static Link Aggregation', and 'Switch Fault Tolerance'. At the bottom, there is a 'Note: All fields are required' and three buttons: 'Back', 'Next' (highlighted with a red border), and 'Cancel'.



NOTE

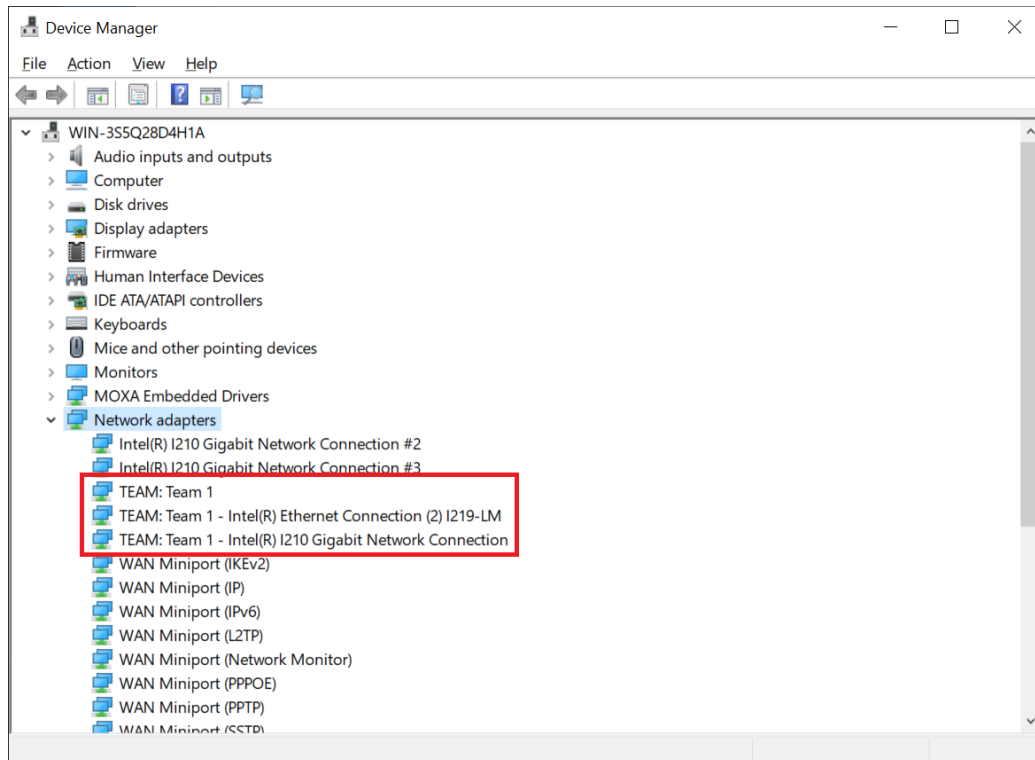
You cannot use an Intel® AMT enabled adapter in a Dynamic Link Aggregation (DLA) team or in a Static Link Aggregation (SLA) team.

1. Select the primary and secondary adapters for the team and click **Finish** to create an Intel net team.



The screenshot shows the 'New Team Wizard' window at Step 3, 'Configure Member Adapters'. The window has three tabs: Step 1 (Select Member Adapters), Step 2 (Provide Team Information), and Step 3 (Configure Member Adapters). Step 3 is active. The main text says 'Select Primary and Secondary Adapters for the team'. There are two labels: 'Primary Adapter:' and 'Secondary Adapter:'. The 'Primary Adapter:' label is followed by a dropdown menu showing 'None Selected'. The 'Secondary Adapter:' label is followed by a list box showing three options: 'None Selected', 'Intel(R) Ethernet Connection (2) I219-LM' (highlighted), and 'Intel(R) I210 Gigabit Network Connection'. At the bottom, there are three buttons: 'Back', 'Finish' (highlighted with a red border), and 'Cancel'.

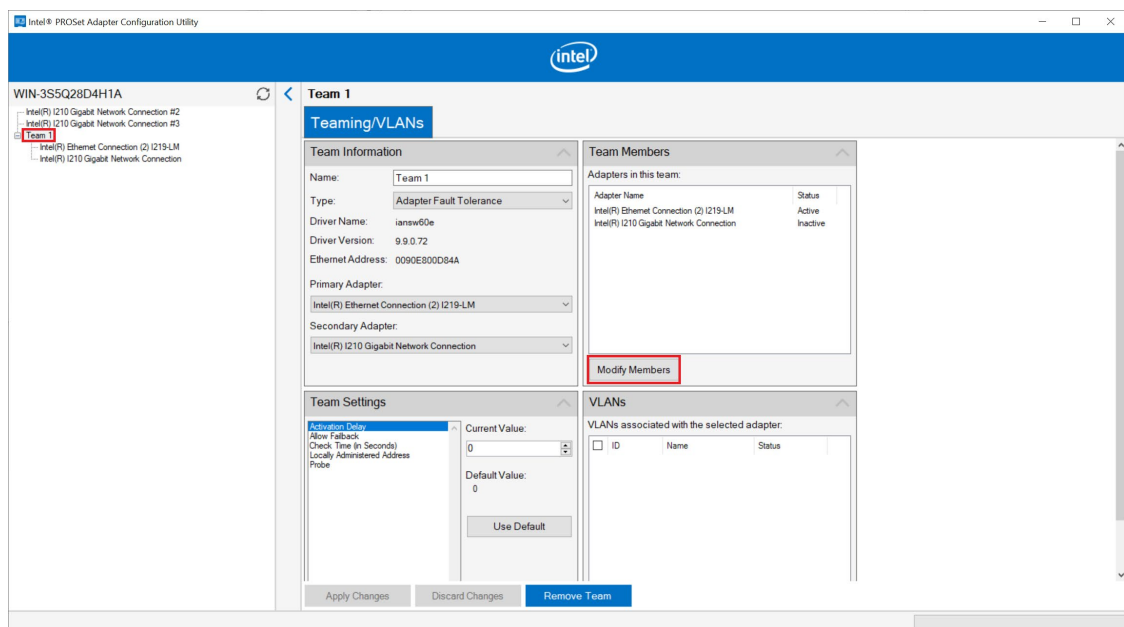
2. Check the **Network adapters** in the **Windows Device Manager**.



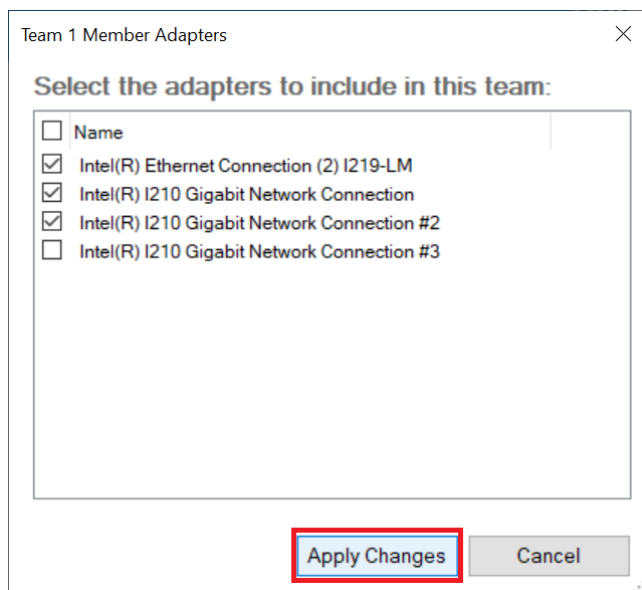
Modifying an Intel® Net Team Member

Adding an Intel® Net Team Member

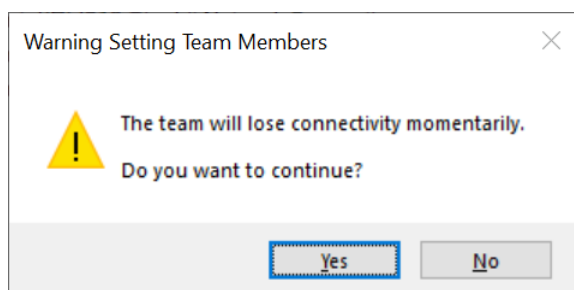
1. Select an Intel® Net team and click **Modify Members**.



2. Select the adapters to include in this team and click **Apply Changes**.



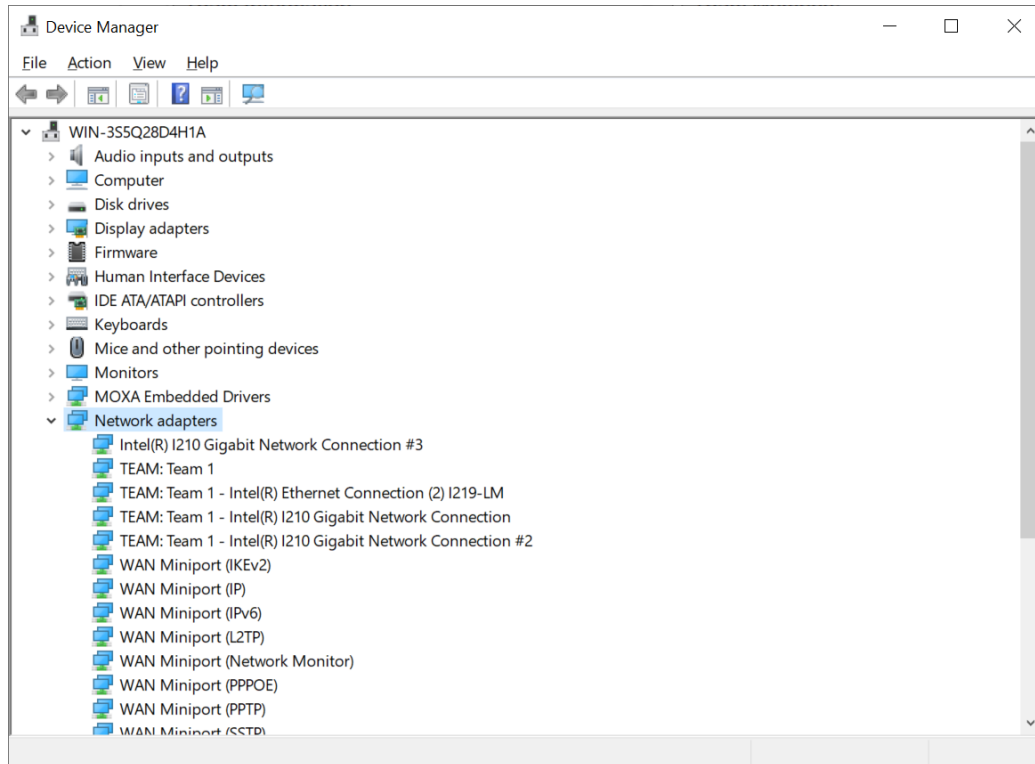
3. Click **Yes** to continue.



NOTE

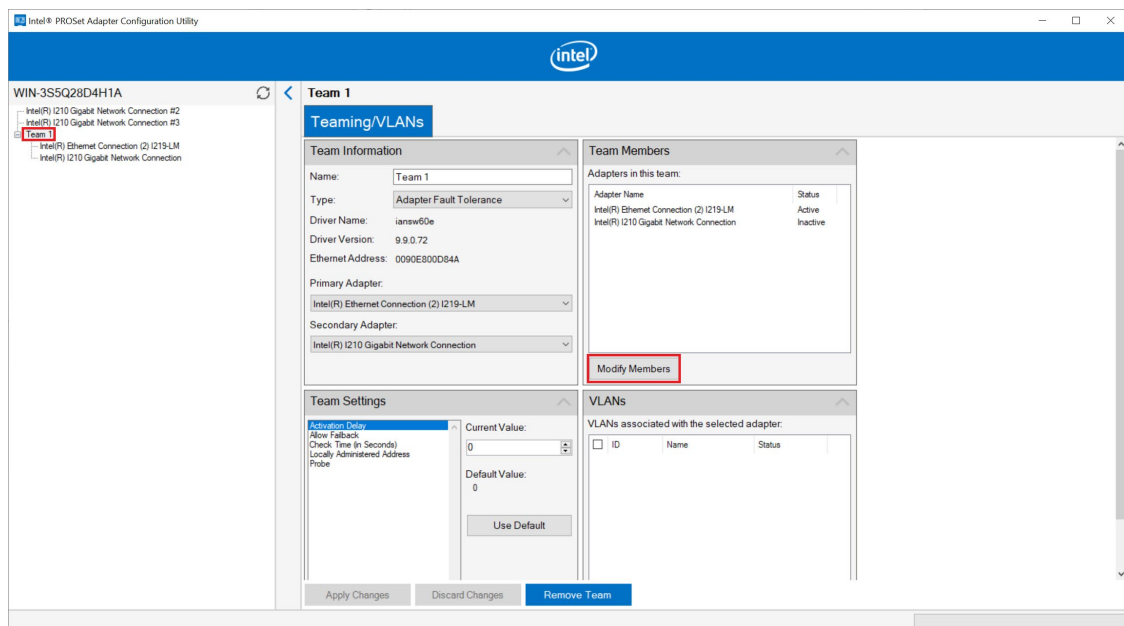
Modifying team members will cause the members to momentarily lose connectivity.

4. Check the **Network adapters** in the **Windows Device Manager**.

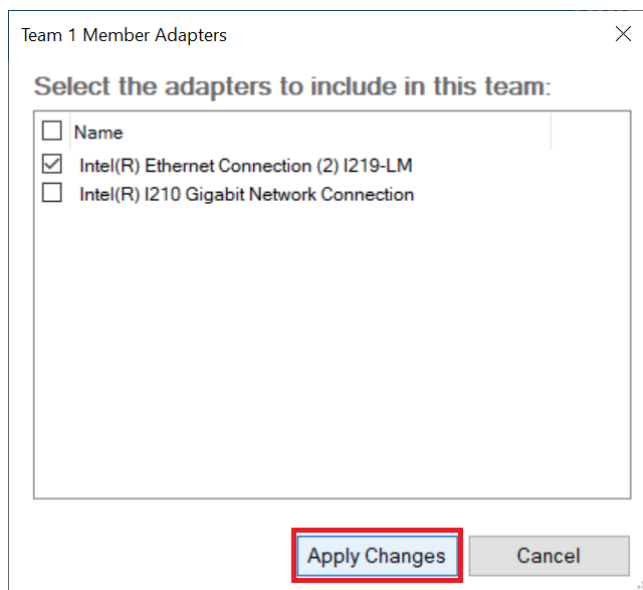


Removing an Intel® Net Team Member

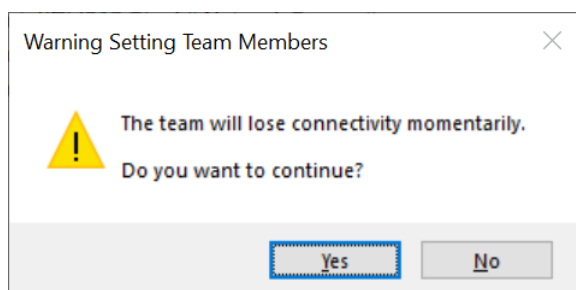
1. Select an Intel® Net team and click **Modify Members**.



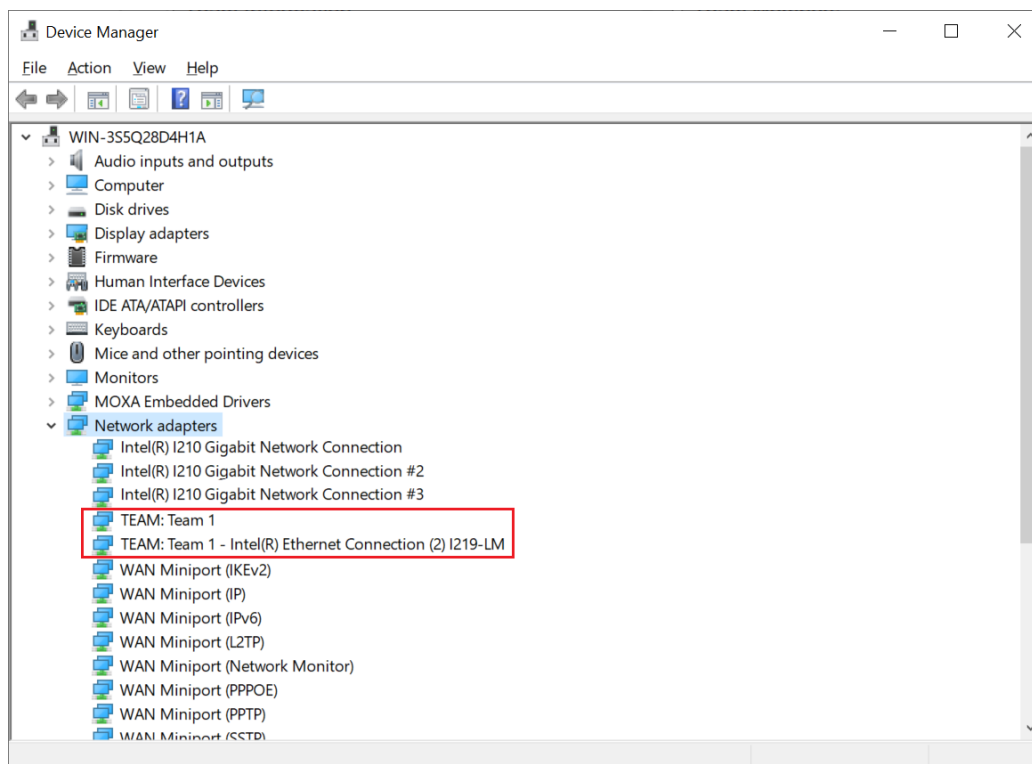
2. Uncheck the adapters you want to remove in this team and click **Apply Changes**.



3. Click **Yes** to continue.



4. Check the **Network adapters** in the **Windows Device Manager**.



6. 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 if 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 several 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-activemanagement-technology.html?wapkw=AMT>

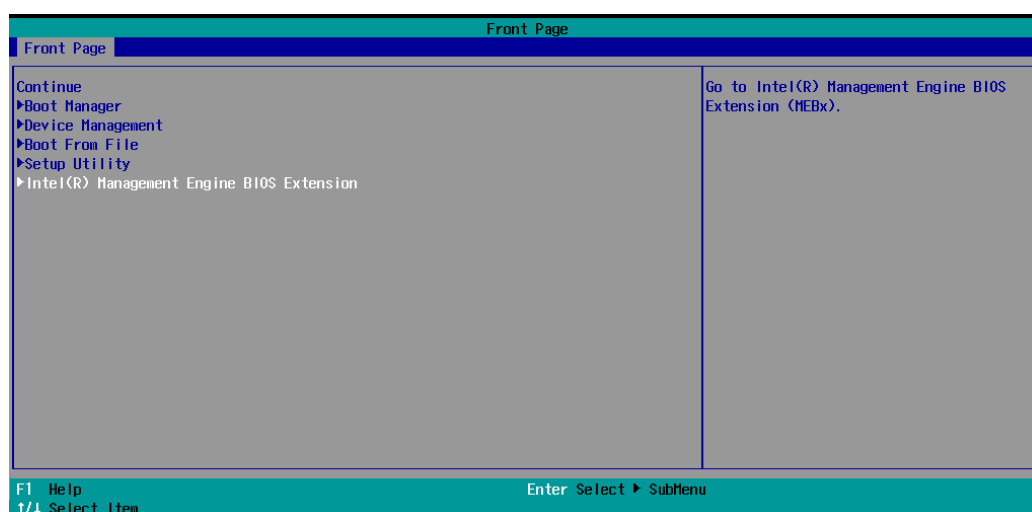


NOTE

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

Turning on Intel® AMT on PC

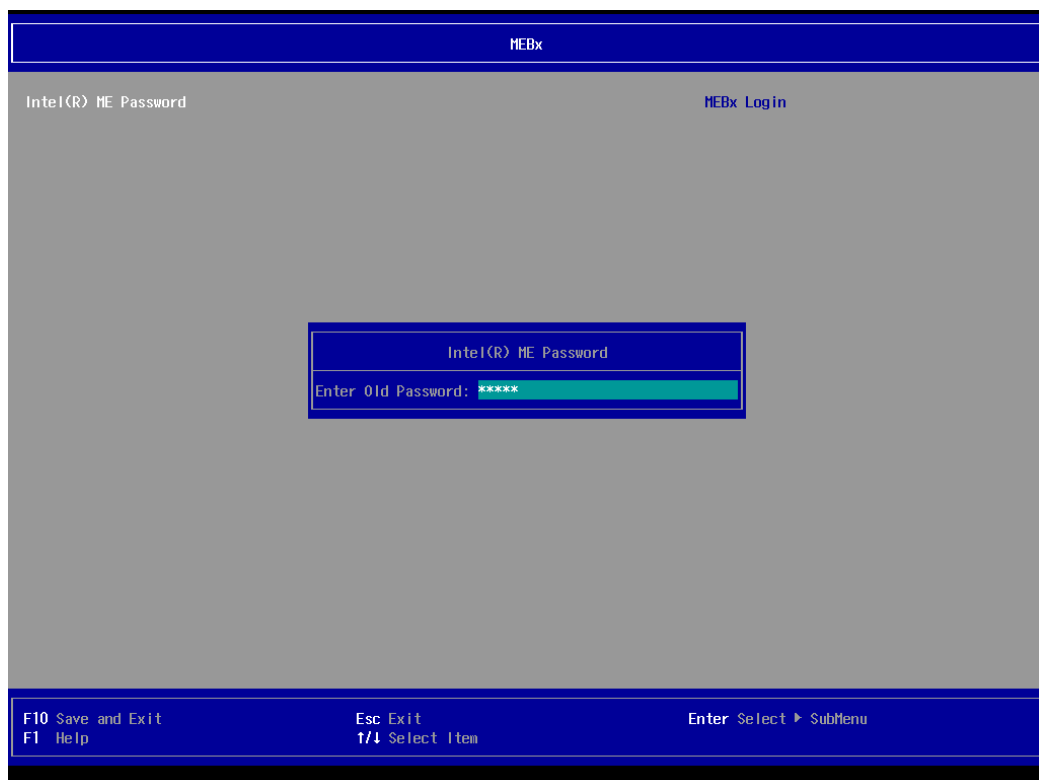
1. Power on the computer and press **F2** to enter the BIOS menu.
2. Select **Intel(R) Management Engine BIOS Extension**.



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:
- a. **Password Length:** At least 8 characters, and no more than 32.
 - b. **Password Complexity:** Password must include the following:
 - i. At least one digit character ('0', '1', ... '9')
 - ii. At least one 7-bit ASCII non alphanumeric character (e.g., '!', '\$', ';'), but excluding ':', ', ' and ''' characters.
 - iii. At least one lower-case letter ('a', 'b'...'z') and at least one upper case letter ('A', 'B'...'Z').

MEBx

Intel(R) ME Password MEBx Login

Intel(R) ME Password

Enter New Password:

Enter New Password Again:

F10 Save and Exit
F1 Help

Esc Exit
t/1 Select Item

Enter Select > SubMenu

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

MEBx

Intel(R) ME Password MEBx Login

Changes have been saved after press "Save and Exit"

OK

F10 Save and Exit
F1 Help

Esc Exit
t/1 Select Item

Enter Select > SubMenu

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.



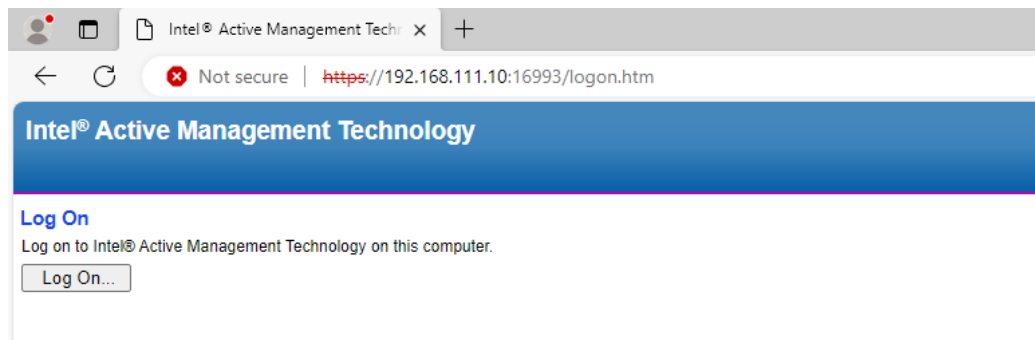
- Go back to the **Intel(R) AMT Configuration** page and select **Network Activate Access > Network Active**. Enter **Y** to continue.



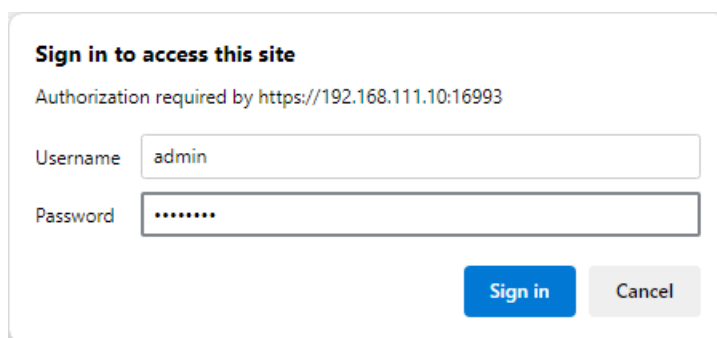
- Press **F10** to Save and Exit.

Access the Intel® AMT From Website

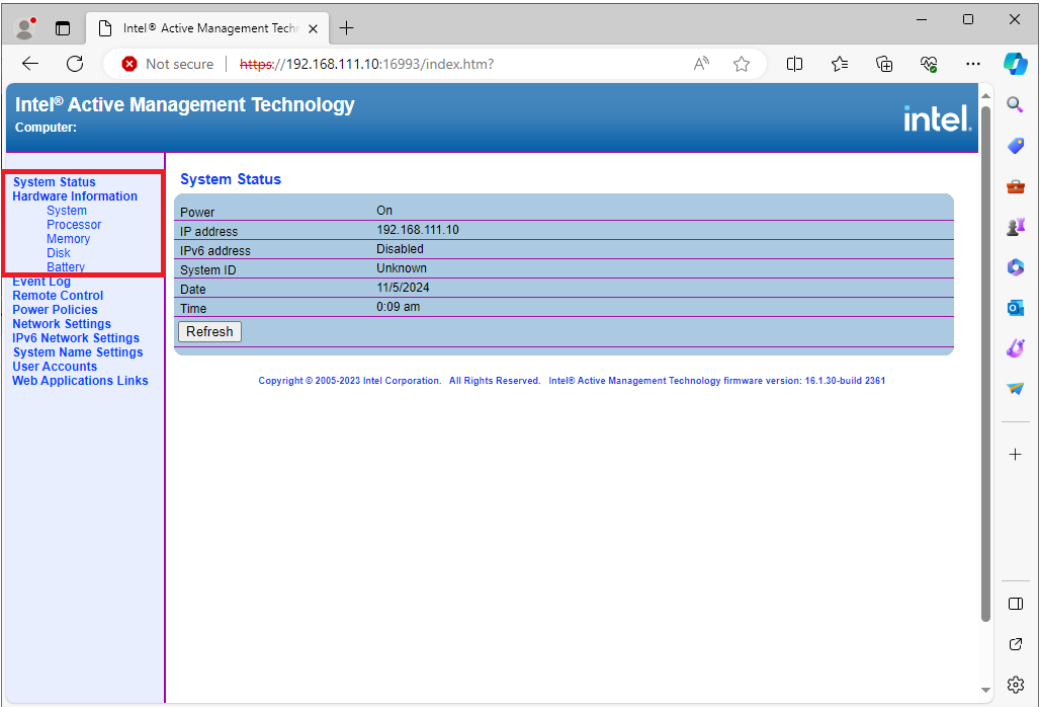
- Open the web browser and type the URL: **Intel® AMT IP Address:16993** (ex: 192.168.111.10:16993)



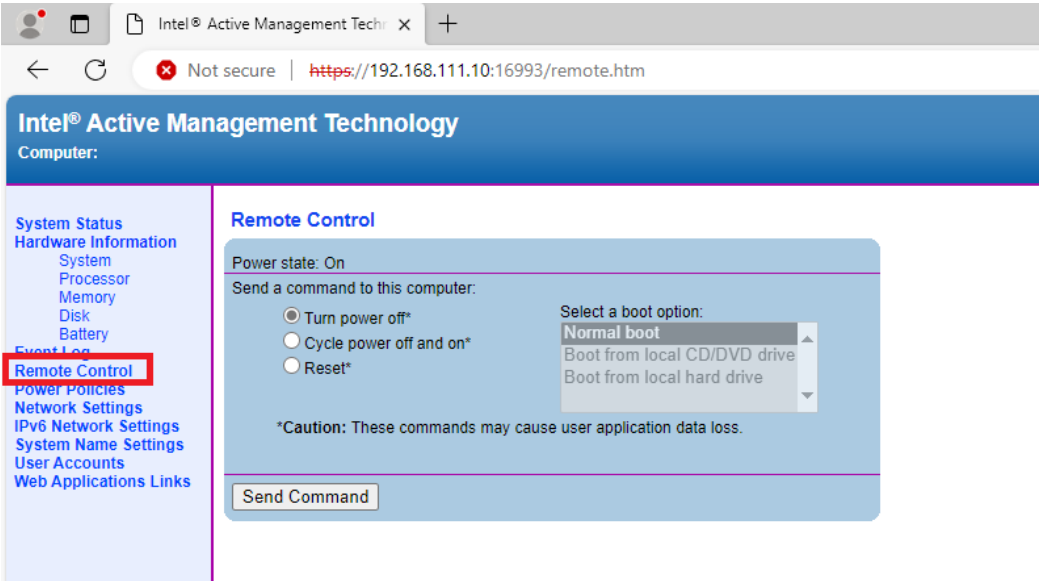
- The browser would show the sign in message box. Type the **Username** and **Password** of Intel® AMT. The default username is **admin**.



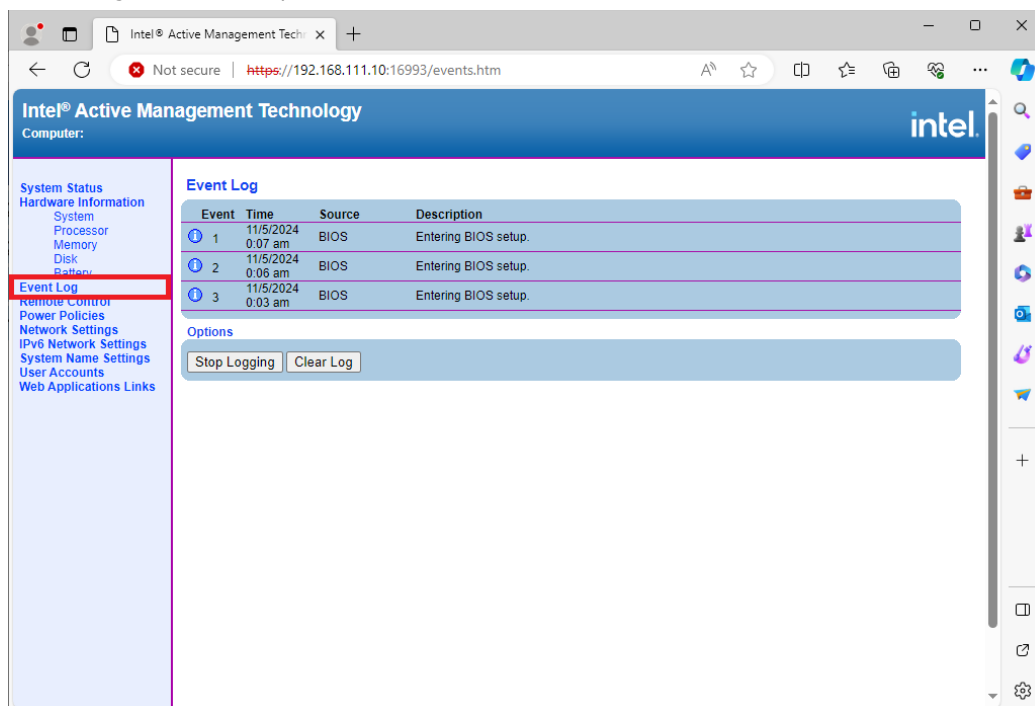
3. After signing in, you can check the system status and hardware information of your managed device.



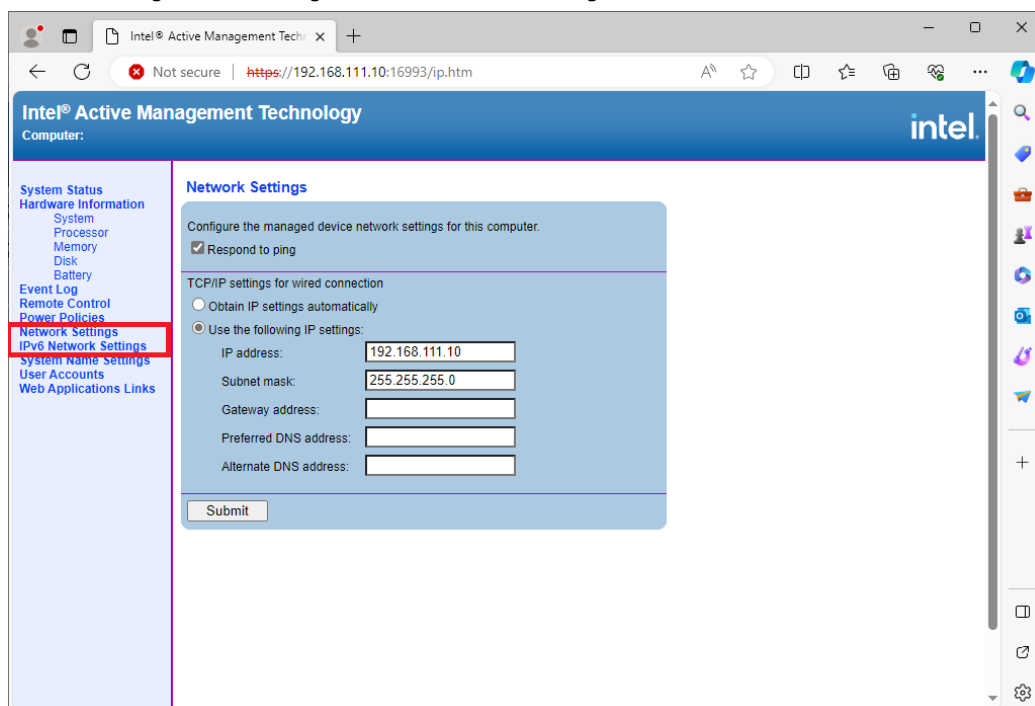
4. The Intel® AMT website provides the basic remote power control feature for the managed device. The advanced remote power control and the remote KVM feature please reference to next chapter.



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



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



NOTE

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

7. 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 school, 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, or other devices where new apps are not expected to be frequently added.

This chapter describes how to use the Unified Write Filter (UWF).

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

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

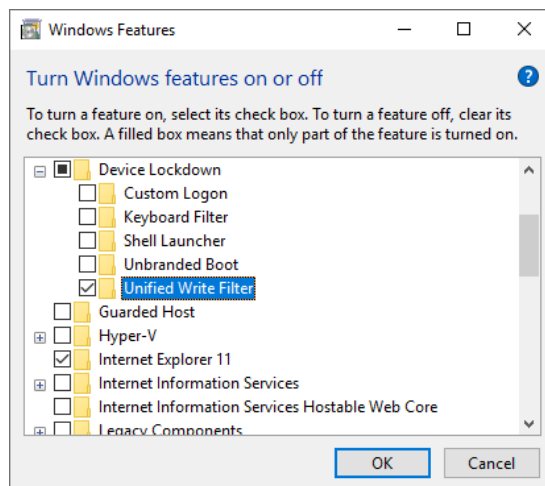
- **Paging files are disabled.**
- **System restore is disabled.**
- **SuperFetch is disabled.**
- **File indexing service is turned off.**
- **Fast boot is disabled.**
- **Defragmentation service is turned off.**
- **BCD setting bootstatuspolicy is set to ignoreallfailures.**

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

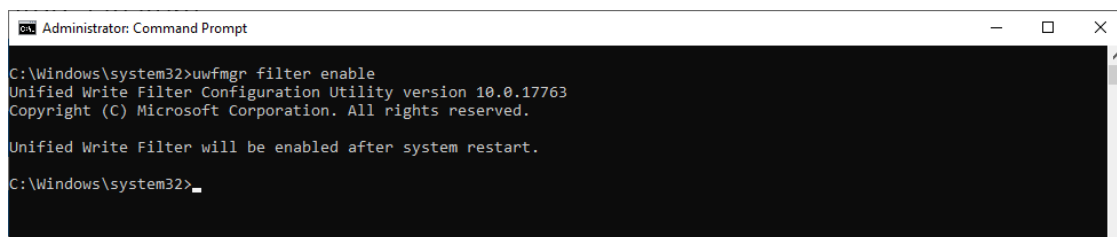
- Install UWF.
 - a. In the Windows **Start** window, type **Turn Windows features on or off**.
 - b. Open the **Windows Features** window and expand the **Device Lockdown** node.
 - c. Select **Unified Write Filter** and click **OK**.
 - d. Windows searches for the required files and displays a progress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



```
Administrator: Command Prompt

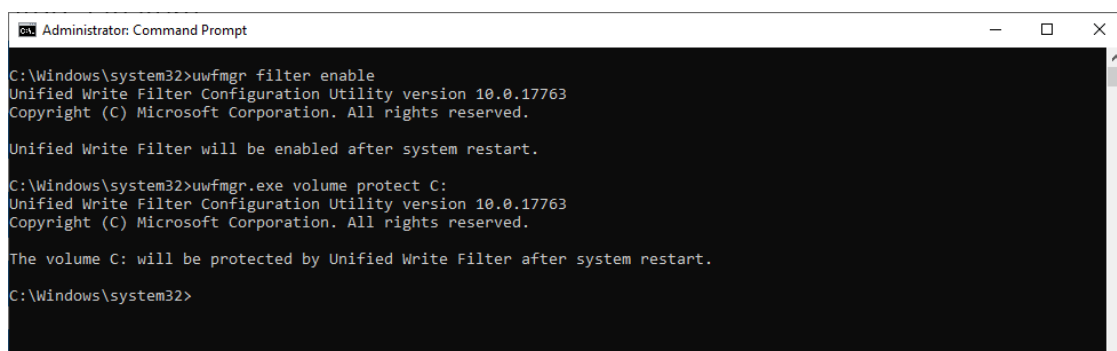
C:\Windows\system32>uwfmgr filter enable
Unified Write Filter Configuration Utility version 10.0.17763
Copyright (C) Microsoft Corporation. All rights reserved.

Unified Write Filter will be enabled after system restart.

C:\Windows\system32>
```

- Enable write protection for a drive:

cmd uwfmgr.exe volume protect C:



```
Administrator: Command Prompt

C:\Windows\system32>uwfmgr filter enable
Unified Write Filter Configuration Utility version 10.0.17763
Copyright (C) Microsoft Corporation. All rights reserved.

Unified Write Filter will be enabled after system restart.

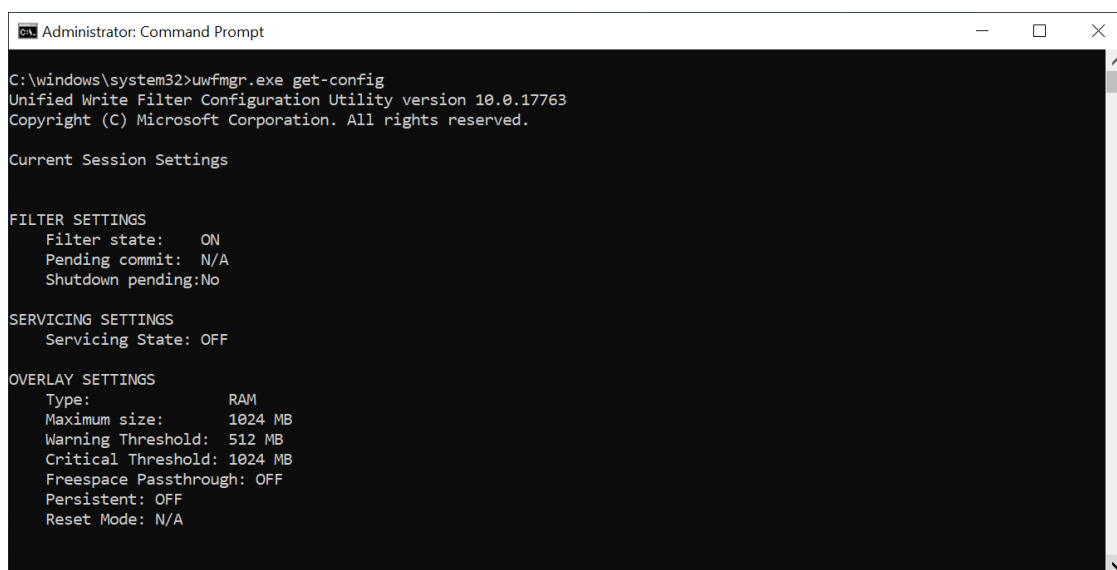
C:\Windows\system32>uwfmgr.exe volume protect C:
Unified Write Filter Configuration Utility version 10.0.17763
Copyright (C) Microsoft Corporation. All rights reserved.

The volume C: will be protected by Unified Write Filter after system restart.

C:\Windows\system32>
```

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

cmd uwfmgr.exe get-config



```
Administrator: Command Prompt

C:\windows\system32>uwfmgr.exe get-config
Unified Write Filter Configuration Utility version 10.0.17763
Copyright (C) Microsoft Corporation. All rights reserved.

Current Session Settings

FILTER SETTINGS
  Filter state:    ON
  Pending commit: N/A
  Shutdown pending:No

SERVICING SETTINGS
  Servicing State: OFF

OVERLAY SETTINGS
  Type:           RAM
  Maximum size:   1024 MB
  Warning Threshold: 512 MB
  Critical Threshold: 1024 MB
  Freespace Passthrough: OFF
  Persistent:     OFF
  Reset Mode:     N/A
```

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.



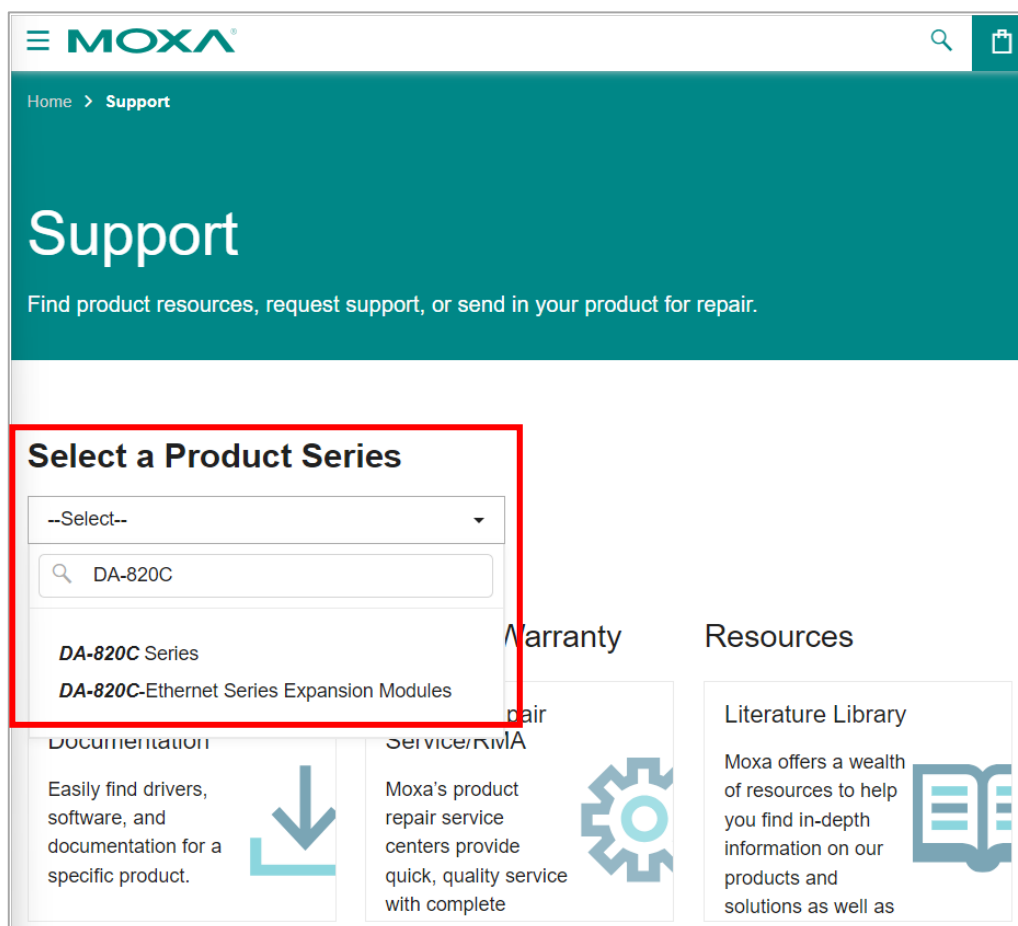
IMPORTANT!

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.

8. Driver

Moxa provides verified drivers for each device on the official website. Please access the Moxa support page(<https://www.moxa.com/en/support>) and search for the device from the search window (For Example: DA-820C).



The screenshot shows the Moxa Support website interface. At the top, there is a navigation bar with the Moxa logo and a search icon. Below the navigation bar, a teal banner displays the word "Support" and a sub-header: "Find product resources, request support, or send in your product for repair." The main content area features a section titled "Select a Product Series" which is highlighted with a red rectangle. This section contains a dropdown menu currently set to "--Select--", a search input field with "DA-820C" entered, and a list of search results: "DA-820C Series" and "DA-820C-Ethernet Series Expansion Modules". To the right of this section, there are three columns of links: "Warranty", "Resources", and "Literature Library". The "Literature Library" section includes a description: "Moxa offers a wealth of resources to help you find in-depth information on our products and solutions as well as" followed by a book icon.

From the **Software & Documentation** page filtered by **Driver** and download the driver package. The driver packages are categorized by OS version, with separate sections for **Peripheral** and **Expansion modules**.

Software & Documentation
Product FAQs
Security Advisories

Related Software, Firmware, and Drivers

FILTER

Operating System

All

Driver(6)

Firmware(2)

Software Package(7)

Utility(6)

NAME	TYPE	CHECKSUM	VERSION	OPERATING SYSTEM	RELEASE DATE
Driver for DA-820C Series (Windows 10 IoT Enterprise LTSC 2019 and Windows Server 2019 peripherals) 1.2 GB	Driver	SHA-512	v1.2	- Windows 10 IoT Enterprise LTSC 2019 - Windows Server 2019	Jul 18, 2024 Release notes
Driver for DA-820C Series (Windows 10 IoT Enterprise LTSC 2021 peripherals) 1.9 GB	Driver	SHA-512	v1.1	- Windows 10 IoT Enterprise LTSC 2021	Jul 18, 2024 Release notes
Driver for DA-820C Series (Windows 10 IoT Enterprise LTSC 2021 for DA-IRIG-B module) 3.2 MB	Driver	SHA-512	v1.0	- Windows 10 IoT Enterprise LTSC 2021	Apr 13, 2022 Release notes
Driver for DA-820C Series (Linux for DA-IRIG-B module) 10.8 KB	Driver	SHA-512	v1.3	- Debian 9.x	Jul 27, 2021 Release notes
Driver for DA-820C Series (Windows 10 IoT Enterprise LTSC 2019/2021 and Windows Server 2019 for DN-SP08 module) 2.5 MB	Driver	SHA-512	v1.0	- Windows 10 IoT Enterprise LTSC 2019 - Windows 10 IoT Enterprise LTSC 2021 - Windows Server 2019	Sep 02, 2019 Release notes
Driver for DA-820C Series (Windows 10 IoT Enterprise LTSC 2019 and Windows Server 2019 for DN-LN04 module) 276.4 KB	Driver	SHA-512	v1.0	- Windows 10 IoT Enterprise LTSC 2019 - Windows Server 2019	Sep 02, 2019 Release notes

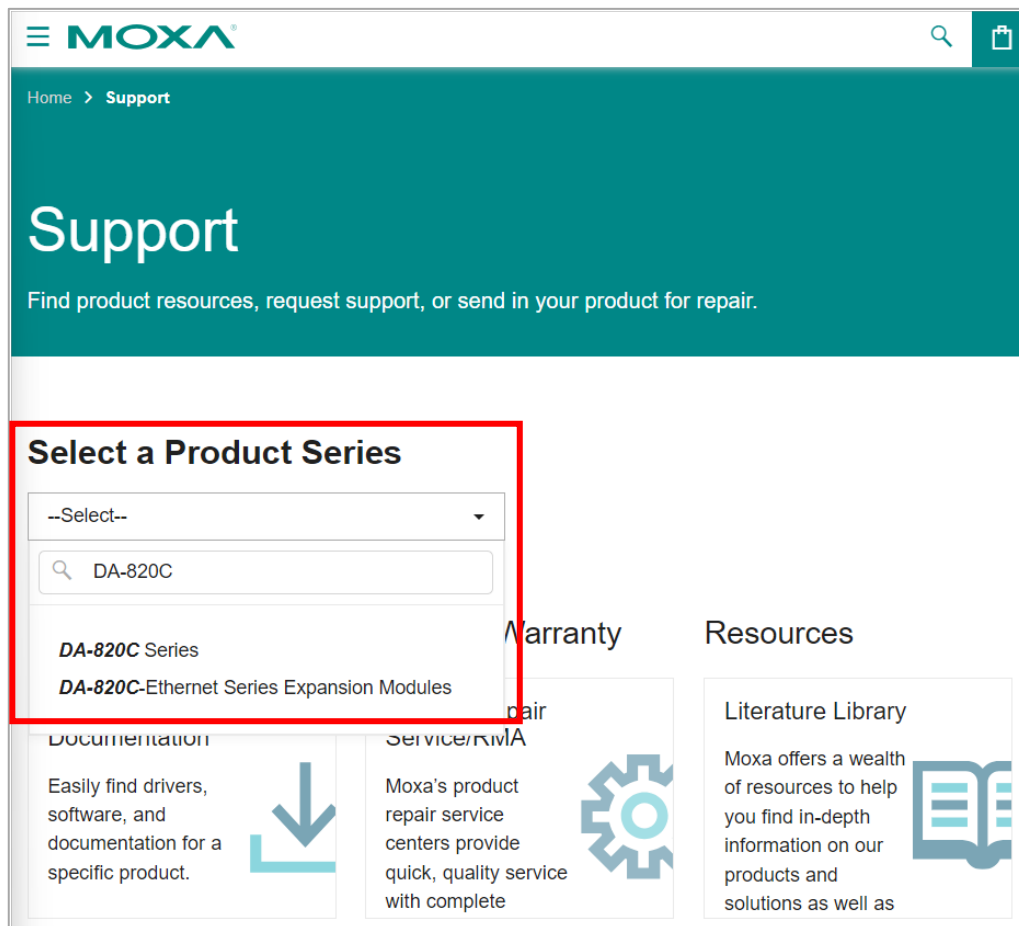
9. Utility

This chapter describes the usage of the following:

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

Where to Find Windows Utility

The utilities will be preinstalled on the device if Moxa provides the Windows 10 OS. However, if you install Windows 10 independently, visit Moxa's support page (<https://www.moxa.com/en/support>) to download the required utilities. Simply search for your device model (e.g., DA-820C) on the support page to find the appropriate files.



From the **Software & Documentation** page, filter by **Utility** and download the installation *.zip file.

Software & Documentation Product FAQs Security Advisories						
Related Software, Firmware, and Drivers						
FILTER Operating System All Driver(6) Firmware(2) Software Package(7) Utility(6)						
NAME	TYPE	CHECKSUM	VERSION	OPERATING SYSTEM	RELEASE DATE	
Utility for DA-820C Series (Windows 10 IoT Enterprise LTSC 2019 and Windows Server 2019) 3.3 MB	Utility	SHA-512	v1.1	- Windows 10 IoT Enterprise LTSC 2019 - Windows Server 2019	Jul 18, 2024	Release notes
Utility for DA-820C Series (Windows 10 IoT Enterprise LTSC 2021) 3.3 MB	Utility	SHA-512	v1.1	- Windows 10 IoT Enterprise LTSC 2021	Jul 18, 2024	Release notes
Utility for DA-820C Series (Windows 10 IoT Enterprise LTSC 2021 for DA-PRP-HSR-I210 module) 2.3 MB	Utility	SHA-512	v1.5	- Windows 10 IoT Enterprise LTSC 2021	Feb 16, 2023	Release notes
Utility for DA-820C Series (DN-PRP-HSR-I210 module) 2.3 MB	Utility	SHA-512	v1.5	- Windows 10 IoT Enterprise LTSC 2021	Feb 16, 2023	Release notes
Utility for DA-820C Series (Linux for DA-PRP-HSR-I210 module) 15.6 KB	Utility	SHA-512	v1.0	- Debian 9.x	Mar 22, 2021	Release notes
Utility for DA-820C Series (Linux for DA-IRIG-B module) 38.9 KB	Utility	SHA-512	v1.0	- Debian 9.x	Sep 02, 2019	Release notes

Dependent Packages

After completing the installation of Windows 10 LTSC 2021 and the necessary drivers, you must install the required (dependency) packages to ensure the utility functions correctly. Use the following link to download and install the packages:

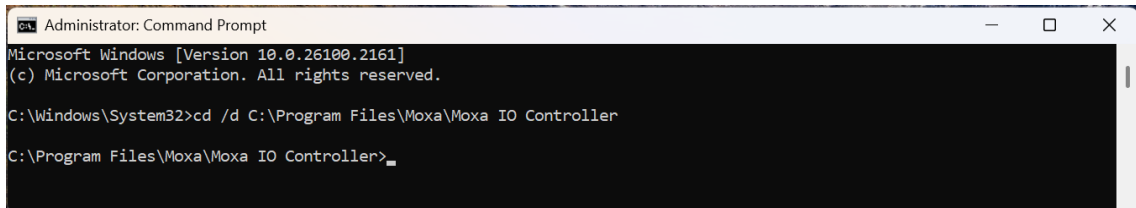
- Microsoft Visual C++ Redistributable:
<https://learn.microsoft.com/en-us/cpp/windows/latest-supported-vc-redist?view=msvc-170>
- Microsoft .NET Framework 4.8:
<https://support.microsoft.com/en-us/topic/microsoft-net-framework-4-8-offline-installer-for-windows-9d23f658-3b97-68ab-d013-aa3c3e7495e0>

Moxa IO Controller Utility

The Moxa IO Controller Utility is designed to manage the device's peripheral I/O and expansion module interfaces. This section provides an overview of how to use the utility, covering the following topics:

- **Setting the DIO Status**
- **Setting the UART Mode**
- **Setting the Relay Status**
- **Setting the LED Status**

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, Relay, and LED mode. 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.



```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.26100.2161]
(c) Microsoft Corporation. All rights reserved.

C:\Windows\System32>cd /d C:\Program Files\Moxa\Moxa IO Controller

C:\Program Files\Moxa\Moxa IO Controller>
```

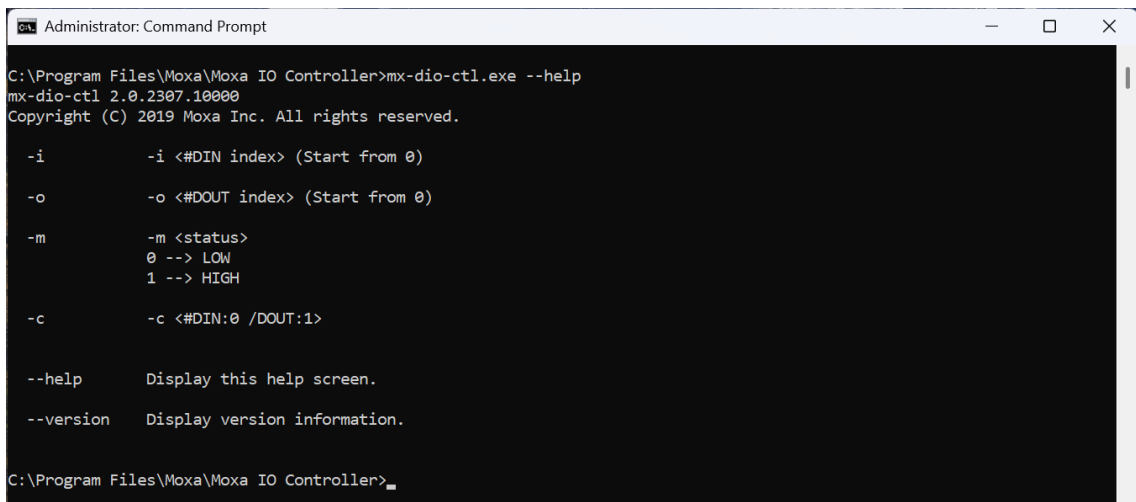
Setting the DIO Status

Run the **mx-dio-ctl --help** command to view instructions for using this utility. Follow the displayed guidelines 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.



```
Administrator: Command Prompt

C:\Program Files\Moxa\Moxa IO Controller>mx-dio-ctl.exe --help
mx-dio-ctl 2.0.2307.10000
Copyright (C) 2019 Moxa Inc. All rights reserved.

-i      -i <#DIN index> (Start from 0)

-o      -o <#DOUT index> (Start from 0)

-m      -m <status>
        0 --> LOW
        1 --> HIGH

-c      -c <#DIN:0 /DOUT:1>

--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-dio-ctl.exe -c 0
DIN port count: 6

C:\Program Files\Moxa\Moxa IO Controller>mx-dio-ctl.exe -c 1
DOUT port count: 2

C:\Program Files\Moxa\Moxa IO Controller>mx-dio-ctl.exe -i 0
DIN port 0 status: 1

C:\Program Files\Moxa\Moxa IO Controller>mx-dio-ctl.exe -o 0
DOUT port 0 status: 1

C:\Program Files\Moxa\Moxa IO Controller>mx-dio-ctl.exe -o 0 -m 0
DOUT port 0 status: 0

C:\Program Files\Moxa\Moxa IO Controller>mx-dio-ctl.exe -i 0
DIN port 0 status: 1

C:\Program Files\Moxa\Moxa IO Controller>
```

Setting the UART Mode

Run the **mx-uart-ctl --help** command to view instructions for using this utility. Follow the displayed guidelines to get or set the UART status.



IMPORTANT!

The UART 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-uart-ctl.exe --help
mx-uart-ctl 2.1.2409.10000
Copyright (C) 2024 Moxa Inc. All rights reserved.

-p          -p <#port index> (Start from 0)

-m          -m <#uart mode>
            0 --> set to RS232 mode
            1 --> set to RS485-2W mode
            2 --> set to RS485-4W mode
            3 --> set to RS422 mode

-c          -c

--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-uart-ctl.exe -c
COM port count: 2

C:\Program Files\Moxa\Moxa IO Controller>mx-uart-ctl.exe -p 0
Current uart mode is RS232 interface.

C:\Program Files\Moxa\Moxa IO Controller>mx-uart-ctl.exe -p 0 -m 1
Set OK.

Current uart mode is RS485-2W interface.

C:\Program Files\Moxa\Moxa IO Controller>
```

Setting the Relay Status

Run the **mx-relay-ctl --help** command to view instructions for using this utility. Follow the displayed guidelines to get or set the Relay status.



IMPORTANT!

The relay 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-relay-ctl.exe --help
mx-relay-ctl 1.0.1905.0
Copyright (C) 2019 Moxa Inc. All rights reserved.
USAGE:
Get value from relay index 1:
  mx-relay-ctl -i 1
Turn on relay index 2:
  mx-relay-ctl -i 2 -m 1

-i          Required. -i <#Relay index> (Start from 0)

-m          -m <status>
            0 --> turn off
            1 --> turn on

--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-relay-ctl.exe -i 0
Relay index 0 data: 1

C:\Program Files\Moxa\Moxa IO Controller>mx-relay-ctl.exe -i 0 -m 0
Relay index 0 data: 0

C:\Program Files\Moxa\Moxa IO Controller>mx-relay-ctl.exe -i 0
Relay index 0 data: 0

C:\Program Files\Moxa\Moxa IO Controller>mx-relay-ctl.exe -i 0 -m 1
Relay index 0 data: 1

C:\Program Files\Moxa\Moxa IO Controller>
```

Setting the LED Status

Run the **mx-led-ctl --help** command to view instructions for using this utility. Follow the displayed guidelines to get or set the LED status.



IMPORTANT!

The LED 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-led-ctl.exe --help
mx-led-ctl 1.0.1905.0
Copyright (C) 2019 Moxa Inc. All rights reserved.
USAGE:
Get value from LED index 1:
  mx-led-ctl -i 1
Turn on LED index 2:
  mx-led-ctl -i 2 -m 1
Set LED index 3 to blink mode:
  mx-led-ctl -i 3 -m 2

-i      Required. -i <#LED index> (Start from 0)

-m      -m <status>
        0 --> led off
        1 --> led on
        2 --> led blink

--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-led-ctl.exe -i 1
LED index 1 data: 0

C:\Program Files\Moxa\Moxa IO Controller>mx-led-ctl.exe -i 1 -m 1
LED index 1 data: 1

C:\Program Files\Moxa\Moxa IO Controller>mx-led-ctl.exe -i 1
LED index 1 data: 1

C:\Program Files\Moxa\Moxa IO Controller>mx-led-ctl.exe -i 1 -m 0
LED index 1 data: 0

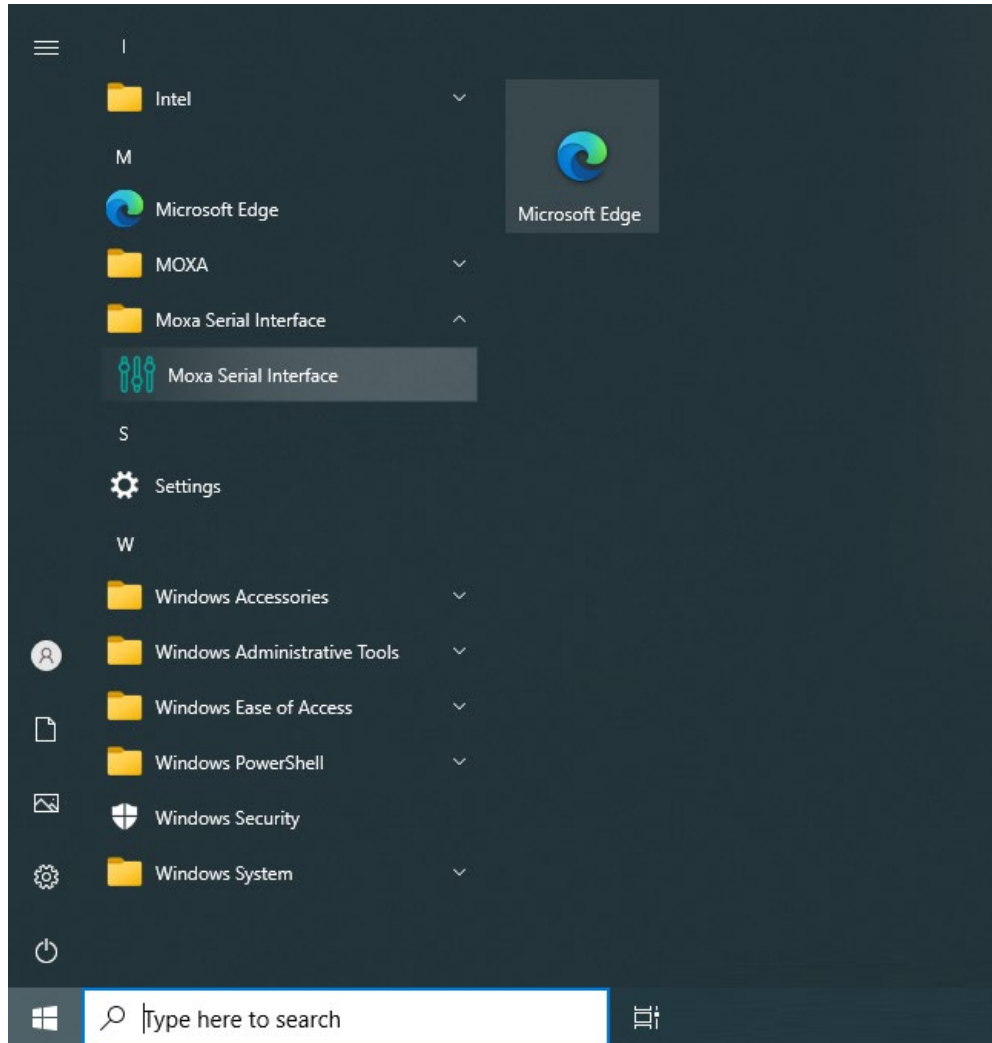
C:\Program Files\Moxa\Moxa IO Controller>
```

Moxa Serial Interface Utility

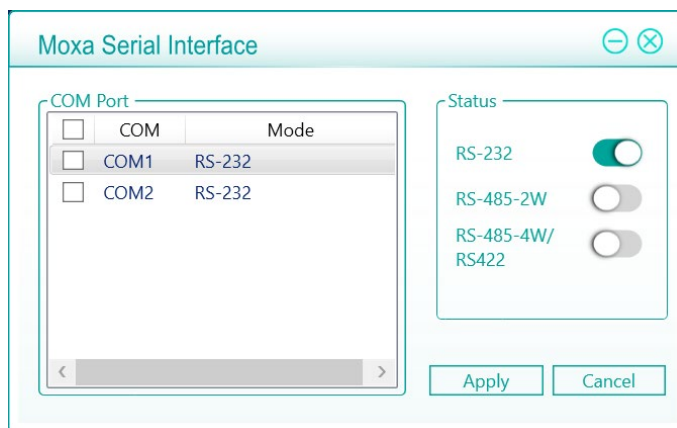
This section explains how to use the Moxa Serial Interface Utility to configure the UART mode on your computer's serial interface.

Setting the Serial Port Mode

1. Install the Moxa Serial Interface utility
2. From the Windows Start menu, run the **Moxa Serial Interface utility**.



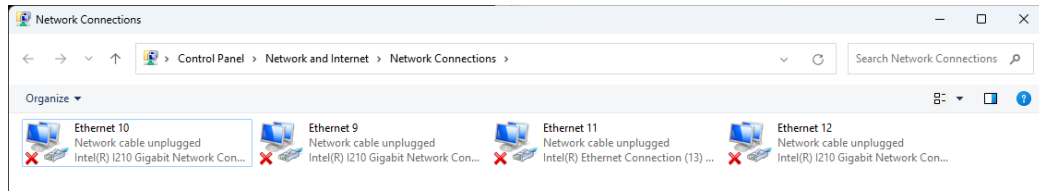
3. Select the target COM port and UART mode and click **Apply** to save the settings.



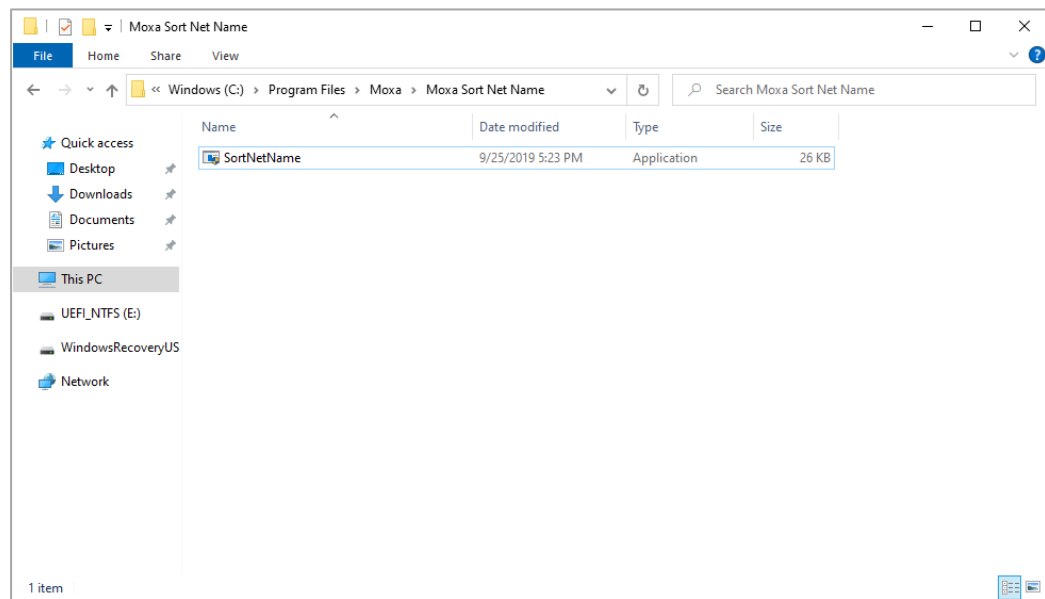
Moxa Sort Net Name Utility

This section explains how to use the **Moxa Sort Net Name** utility to rename Ethernet adapters. This utility helps map the physical LAN port order on the chassis to the corresponding adapter names in the system.

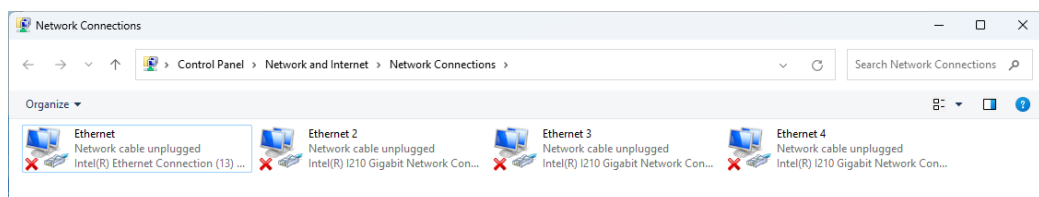
1. Use the pre-installed utility or install the **MoxaSortNetName** utility from the Moxa support page.
2. The initial order of network names may be random.



3. After the installation process is complete, run the **SortNetName.exe** from **C:\Program Files\Moxa\Moxa Sort Net Name** as an Administrator.



4. If you want to rename the Ethernet adapter, wait for the installation process to complete. The order of the Ethernet adapter will correspond to the order of the label (e.g., **LAN 2** of the computer is mapped to **Ethernet 2** in Windows).

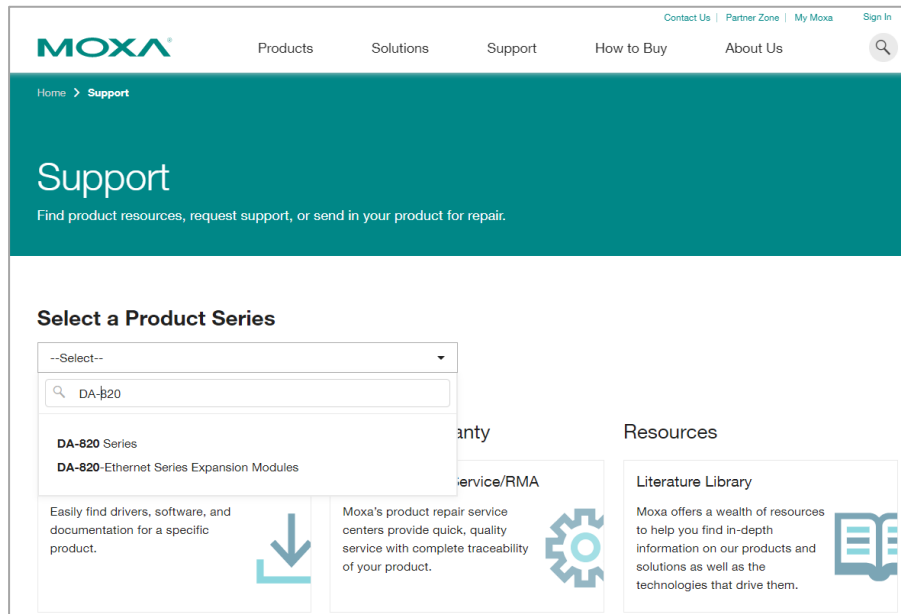


10. IO Control API

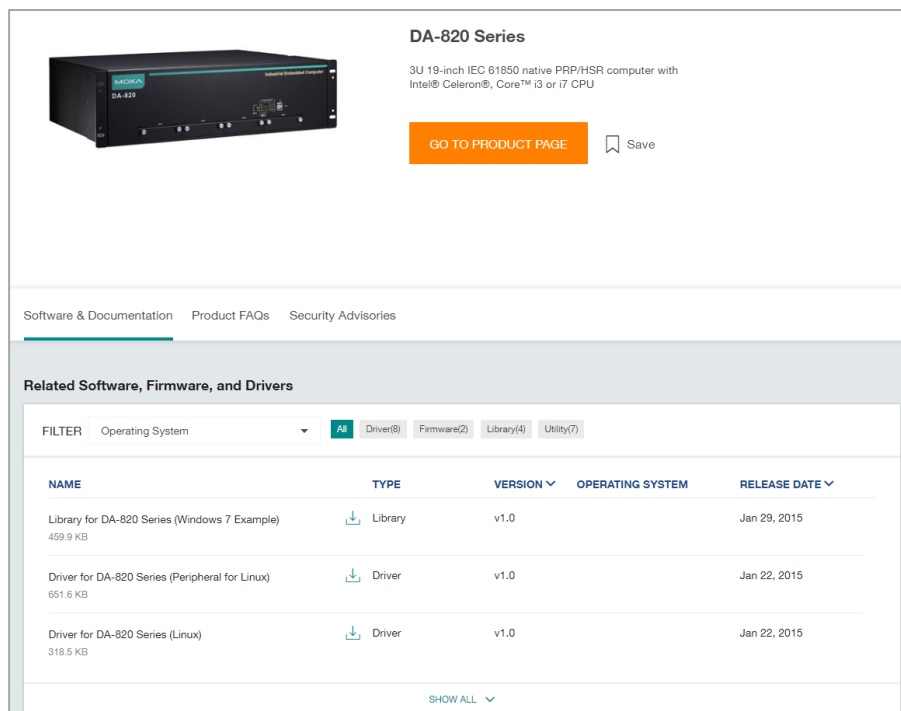
This chapter describes how to use the IO Control API.

Downloading the API

1. Go to <https://www.moxa.com/en/support>
2. Select your product series (e.g., DA-820).



3. Download the related files.



mxdbgio

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

- **GetDinCount**
- **GetDOutCount**
- **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 mxdbgio library initialization failed. Cannot open json profile.

Requirements

Name	Items
Header	mxdbgio.h
Library	mxdbgio.lib
DLL	mxdbgio.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[<i>ModelName</i>].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[<i>ModelName</i>].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[<i>ModelName</i>].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
Header	mxsp.h
Library	mxsp.lib
DLL	mxsp.dll
Profile	MxspProfile[<i>ModelName</i>].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[<i>ModelName</i>].json

mxrelay

The mxrelay library operates on the relay output and consists of the following:

- **GetRelayData**
- **SetRelayData**

GetRelayData

Syntax

```
int GetRelayData(int port);
```

Description

Gets the status of the relay output port.

Parameters

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

Return Value

The status of a relay output port; 0 for OFF, 1 for ON.

Error codes

The following error codes can be retrieved by the **RELAY_STATUS** function.

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

Requirements

Name	Items
Header	mxrelay.h
Library	mxrelay.lib
DLL	mxrelay.dll
Profile	MxrelayProfile[<i>ModelName</i>].json

SetRelayData

Syntax

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

Description

Sets the status of the relay output port.

Parameters

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

status: The status of a relay output; 0 for OFF, 1 for ON.

Return Value

Returns 0 if the status of the relay output is successfully set.

Error codes

The following error codes can be retrieved by the **RELAY_STATUS** function.

Name	Value	Meaning
LIB_INITIALIZE_FAIL	-1	The mxrelay 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	mxrelay.h
Library	mxrelay.lib
DLL	mxrelay.dll
Profile	MxrelayProfile[ModelName].json

mxled

The mxled library operates on the relay output and consists of the following:

- **GetLedData**
- **SetLedData**

GetLedData

Syntax

```
int GetLedData(int port);
```

Description

Gets the status of the LED port.

Parameters

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

Return Value

The status of a LED port; 0 for OFF, 1 for ON.

Error codes

The following error codes can be retrieved by the **LED_STATUS** function.

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

Requirements

Name	Items
Header	mxled.h
Library	mxled.lib
DLL	mxled.dll
Profile	MxledProfile[<i>ModelName</i>].json

SetLedData

Syntax

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

Description

Sets the status of the LED port.

Parameters

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

status: The status of the LED; 0 for OFF, 1 for ON, and 2 for blinking.

Return Value

Returns 0 if the LED status is set successfully.

Error codes

The following error codes can be retrieved by the **LED_STATUS** function.

Name	Value	Meaning
LIB_INITIALIZE_FAIL	-1	The mxled 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	mxled.h
Library	mxled.lib
DLL	mxled.dll
Profile	MxledProfile[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. If not, 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

11. System Backup and Restore

This chapter describes the usage of the following for system backup and restoration.

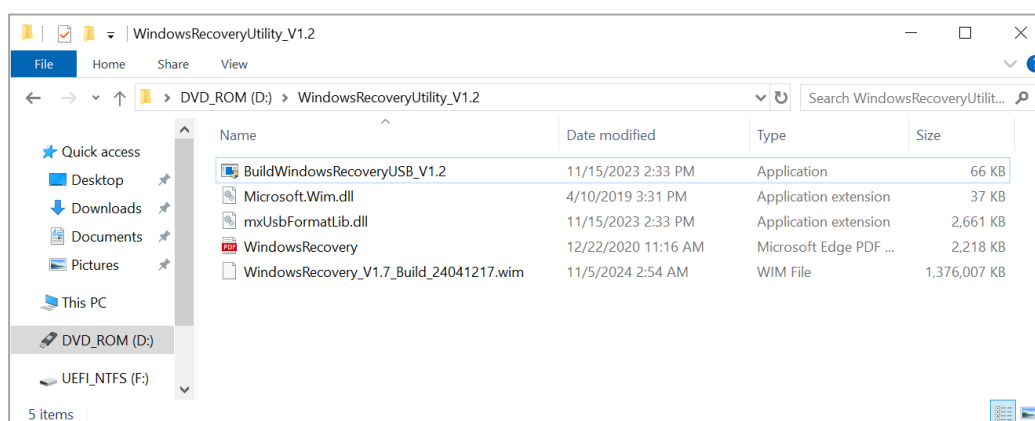
- **WindowsRecovery**

WindowsRecovery

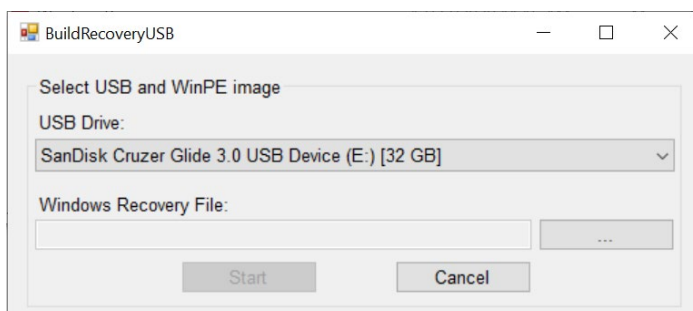
WindowsRecovery is an OS image backup and restore program for system deployment, backup, and recovery. You will first need to create a WindowsRecovery USB disk. This WindowsRecovery disk can only be used to boot a **UEFI BIOS** machine. This chapter describes the setup process of the Windows Recovery function.

Preparing the USB device

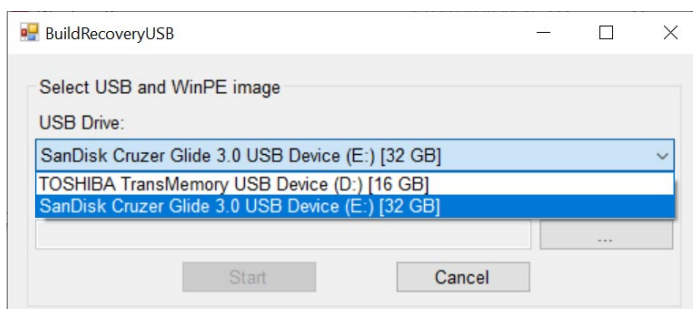
1. Contact a Moxa technical staff and get the required file.



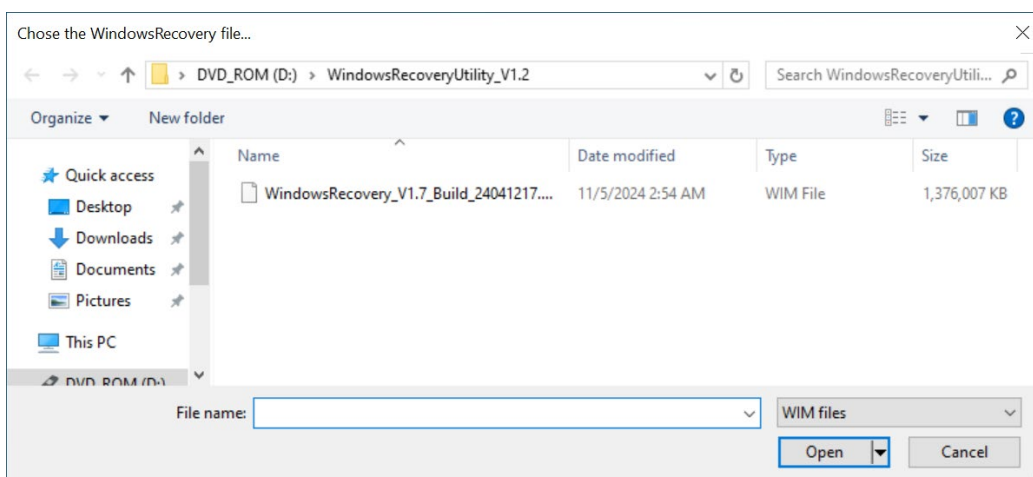
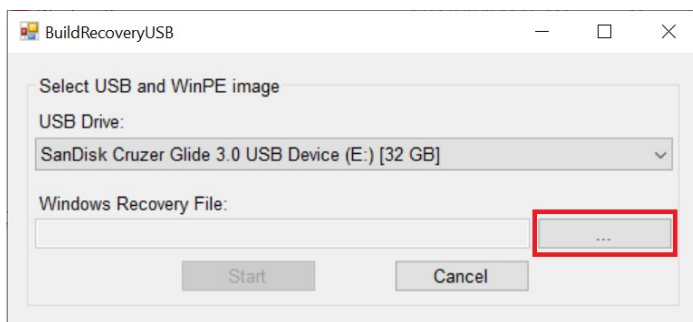
2. Run the **BuildWindowsRecoveryUSB_V1.2.0.exe**.



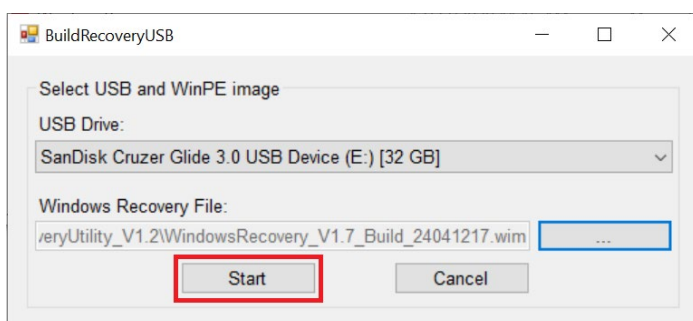
3. Select the USB drive to format.



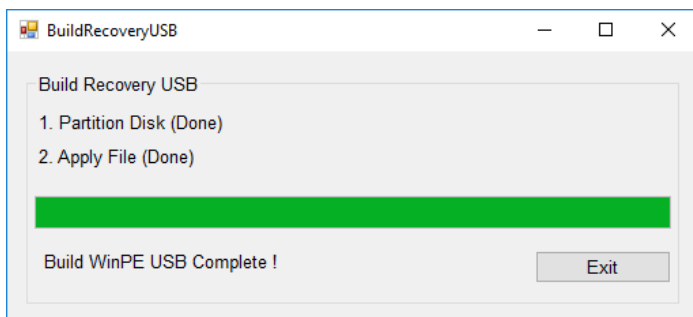
4. Click ... to select **.wim** file from the folder.



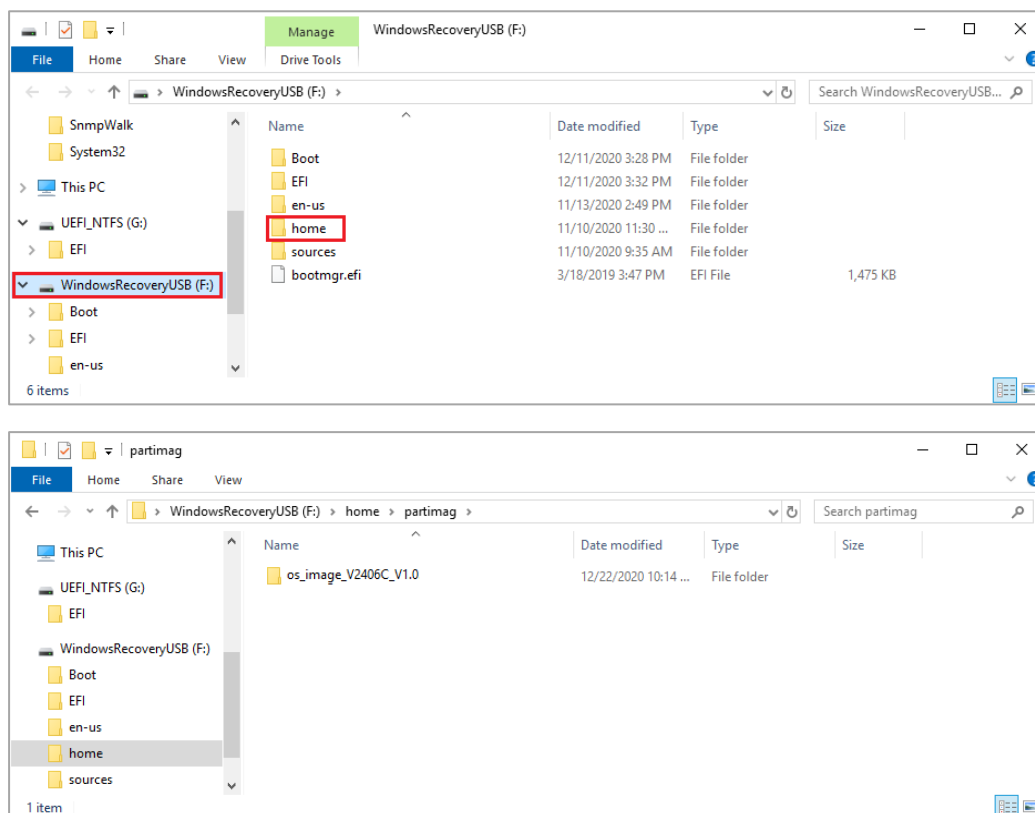
5. Click **Start** and make sure the selected USB can be formatted. Click **Yes** to start creating the recovery USB.



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.

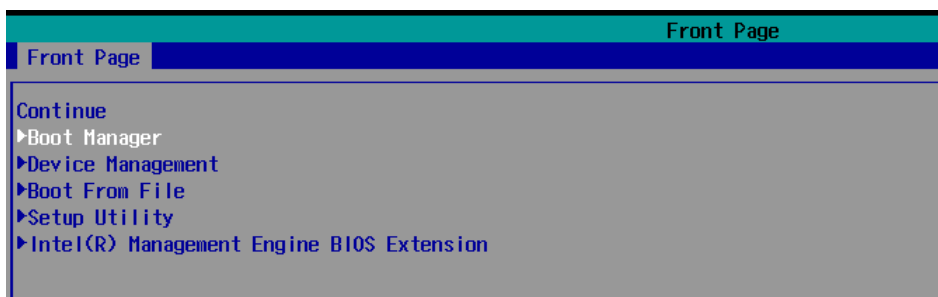


- To create a recovery USB disk with the Windows 10 image, copy the **os_image_ModelName** directory to the **\home\partimag** folder in the USB drive.

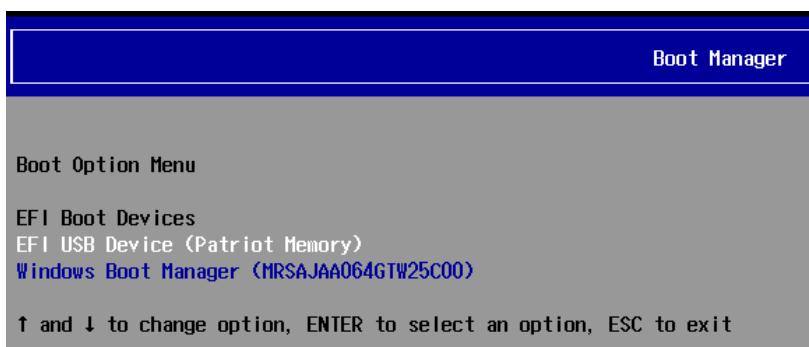


Booting From the USB Disk

- 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.



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



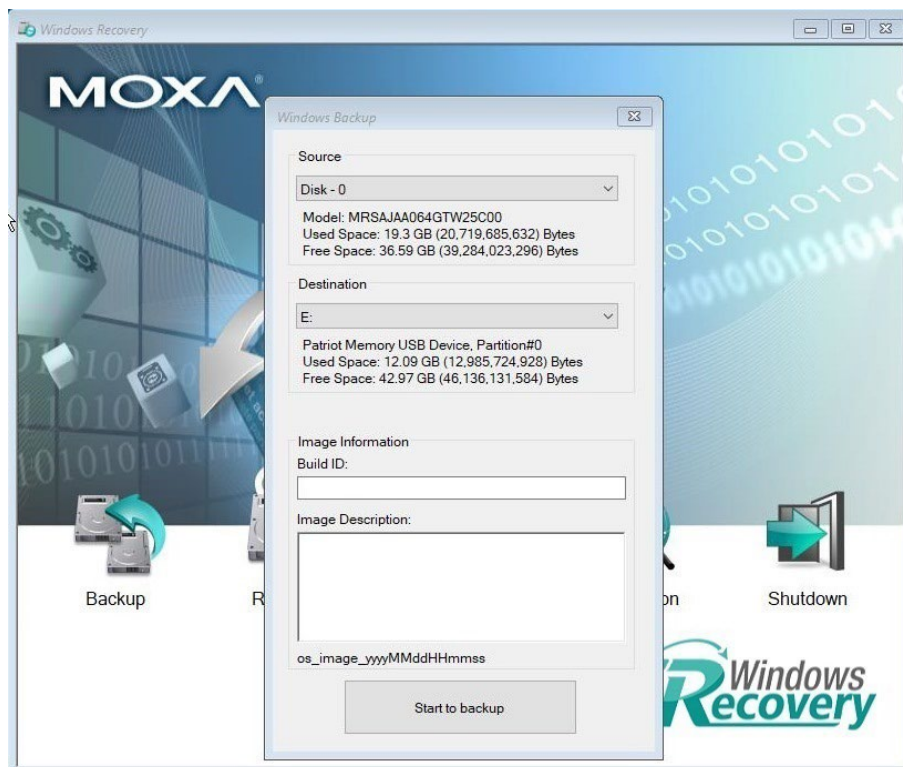
System Image Backup

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

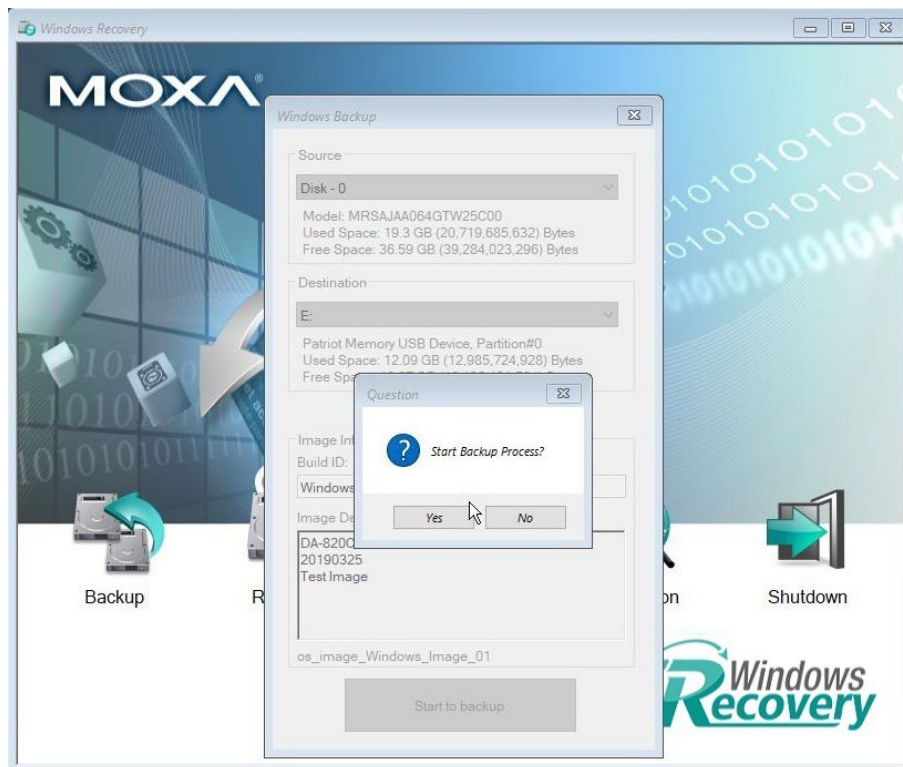
1. Click **Backup**.



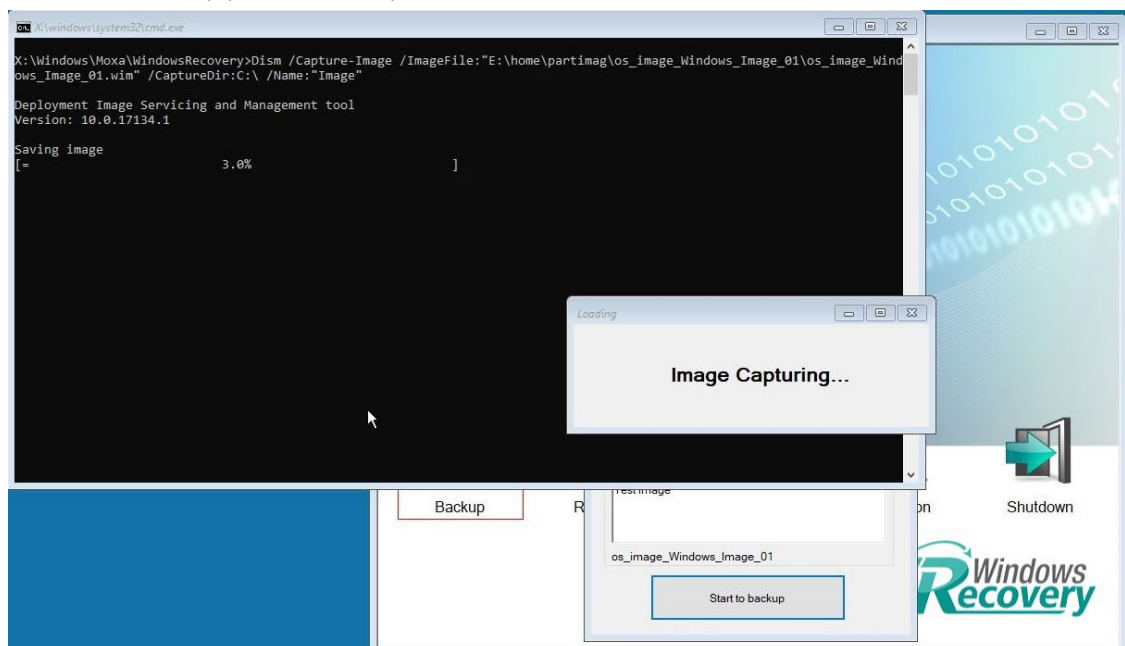
2. Select the **Source disk** to backup and **Destination USB** to store the OS image, also give an image name and description. Click **Start to backup**.



3. Click **Yes** to continue.



4. Wait for the backup process to complete.



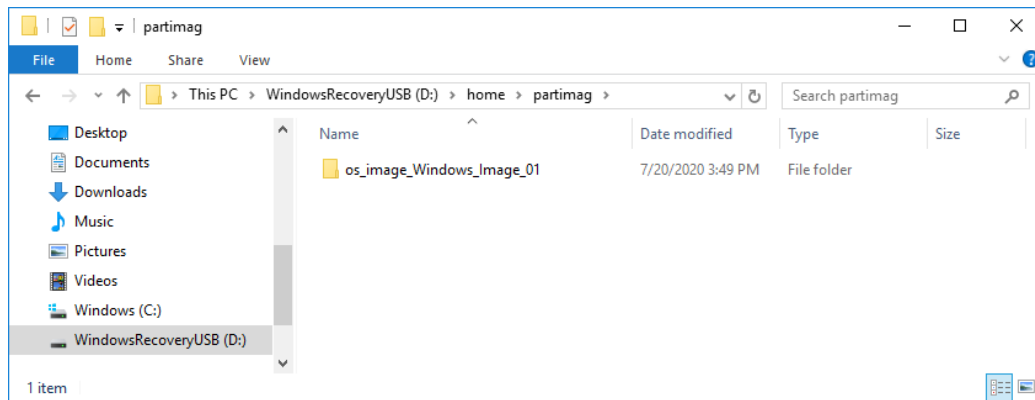
5. When the process is done, click **OK**.



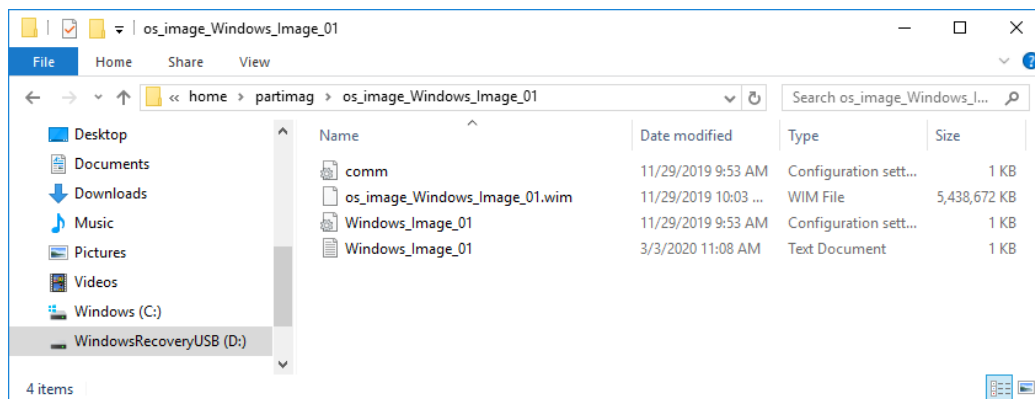
6. Click **OK**, the computer will shut down.



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



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



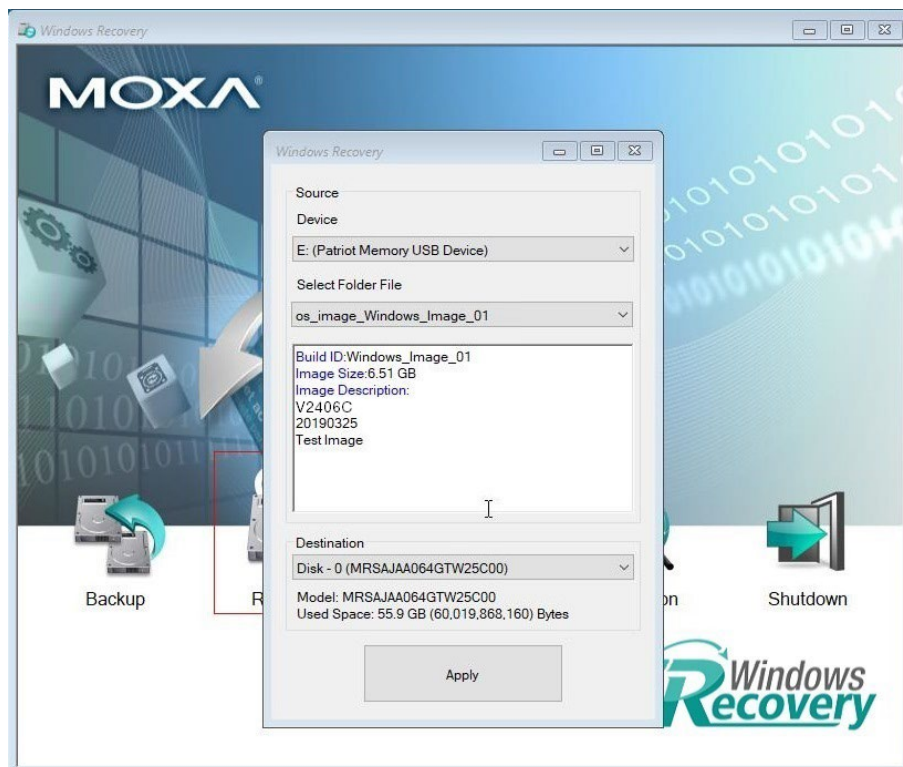
Restoring the System From a Backup

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**.

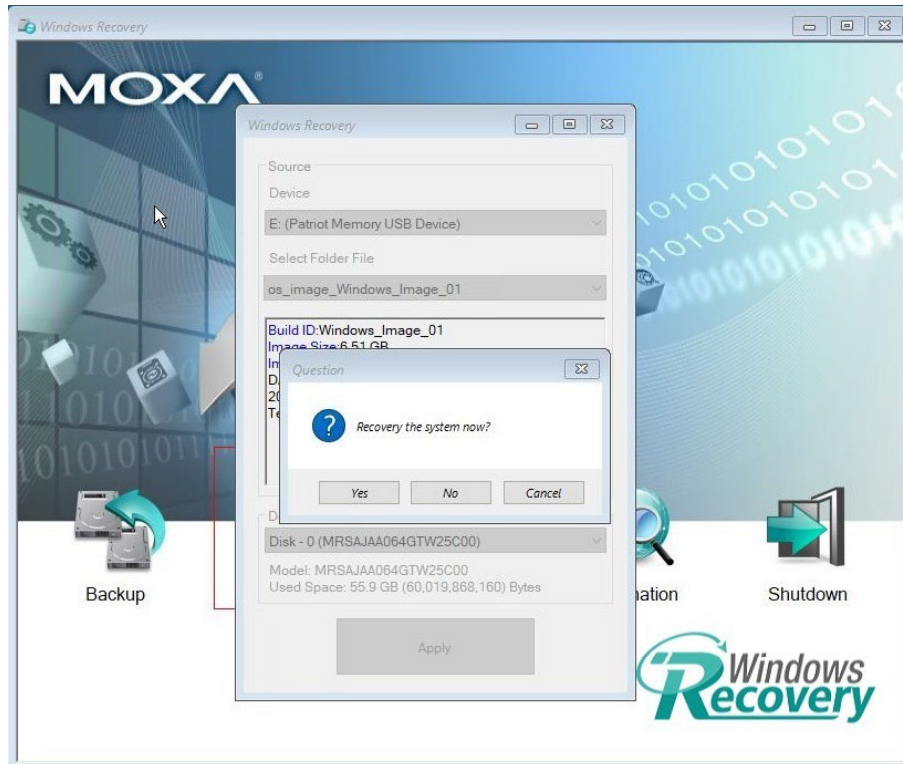




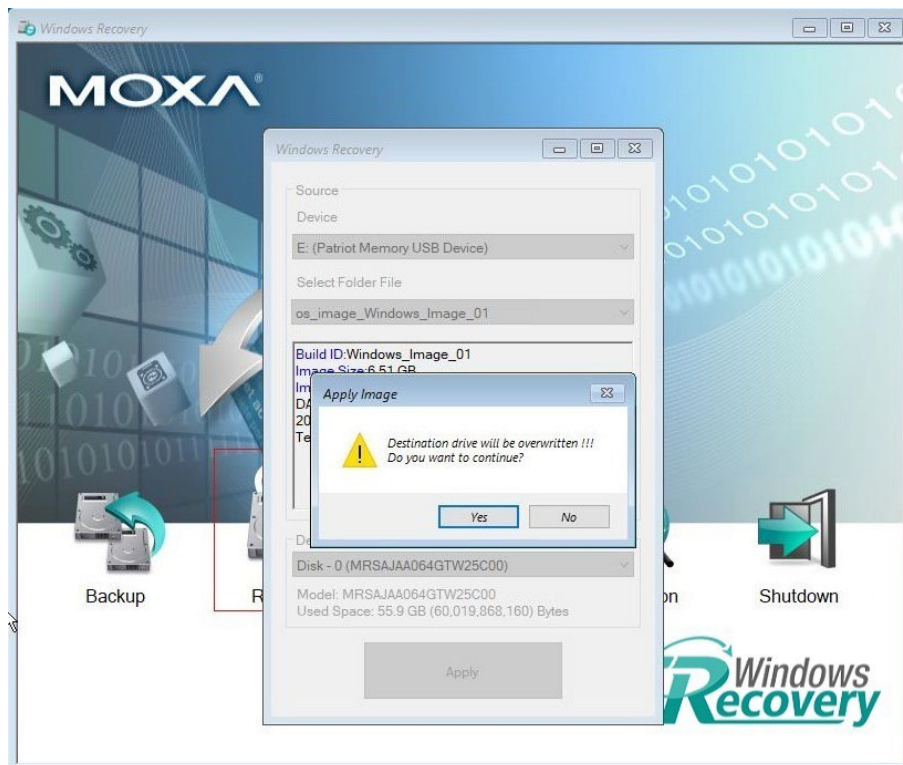
NOTE

If dual operating systems are required, it is recommended that you restore the image to the destination drive with the PCIe interface (if available) first.

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 initiated during the first boot-up process. Do not turn off or shut down the computer while the system is restarting.