Advantech Power Suite
User Manual

V2.0.8

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Advantech Power Suite User Manual

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1. Foreword

In Windows 10/11 IoT Enterprise LTSC, Microsoft provides many useful and helpful features for users, however, it's not intuitive to use these features. Therefore, Advantech developed Power Suite application, enabling users to access these features more quickly and easily.

Following Windows versions are supported by Advantech Power Suite application:

➢ Windows 10/11 IoT Enterprise
➢ Windows 10 IoT Enterprise 2016/2019/2021 LTSC
➢ Windows 11 IoT Enterprise 2024 LTSC
➢ Windows 11 IoT Enterprise 2024 LTSC ARM

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2. Requirements

I.   Windows 10/11 IoT Enterprise LTSC

II.   The user account must have administrator privileges

III. If the device is not provided by Advantech, please fill-in information to get an activation code.

IV.   The user must clicks "**Agree**" button to the END-USER License Agreement (EULA) when launching Advantech power suite application for the first time.

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3. Limitation

After Sysprep, the setup of below items would be removed:

OS Enhancement Utility

- Notification Settings
- Hide Action Center
- Windows Settings: Hibernate
- Device Control
- Kiosk Mode

Lockdown Utility

- Automatic Logon
- Advanced Boot Option: Login Screen
- Ctrl + Alt + Del Screen Option: Lock/Sign Out/Change a Password/Task Manager
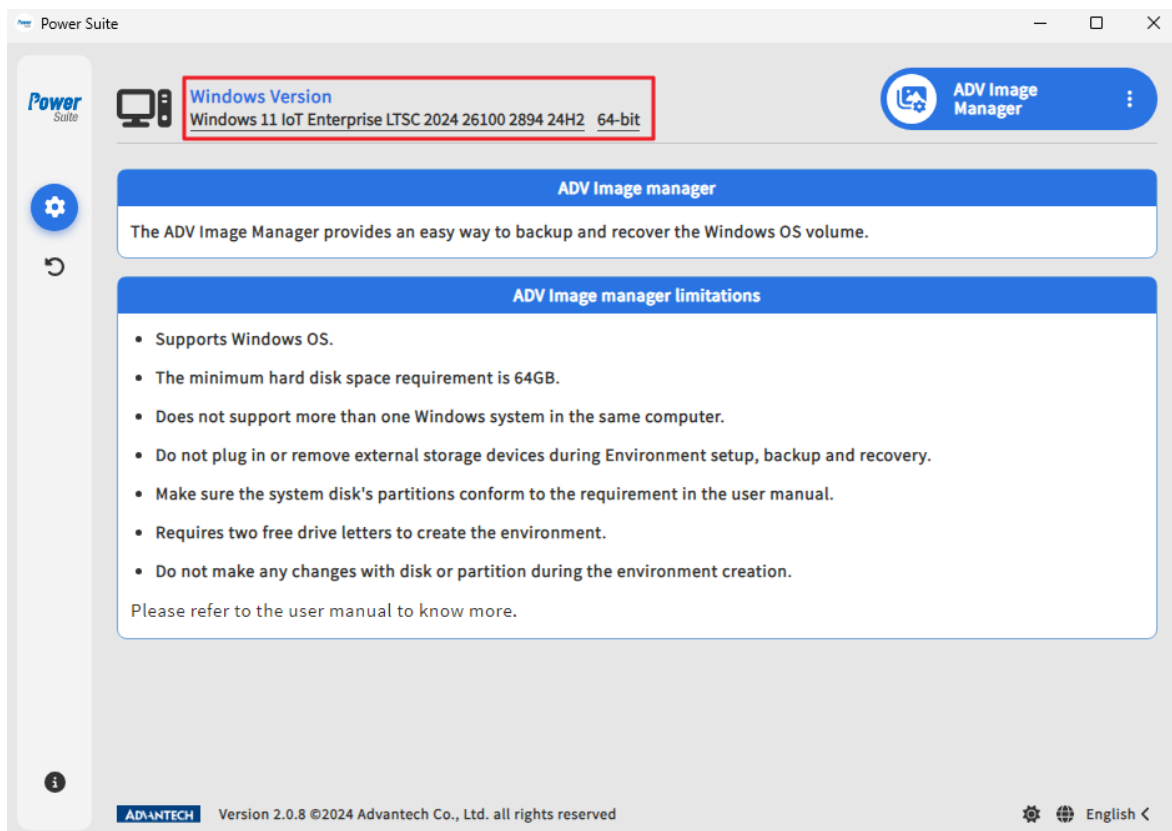
For ADV Image Manager:

I.   Only the C: partition will be backed up.
II.   Items in the Recycle Bin will not be included in the backup.
III.   Multiple Windows systems on the same computer are not supported.
IV.   Do not plug in or remove external storage devices during environment setup, backup, or recovery.
V.   Do not make any changes to disks or partitions during environment creation.
VI.   Please do not format C:, as it contains necessary driver files required for ADV Image Manager to start recovery.
VII.   The number of partitions on the computer should not exceed 23.
VIII.   The drive label "ADV Backup" must be reserved exclusively for ADV Image Manager.
IX.   Two free drive letters are required to create the environment.
X.   The filter of the Unified Write Filter (UWF) feature must be disabled.
XI.   The defragmentation service (also known as "Optimize Drives" service) will be initiated during environment creation.
XII.   Ensure that the partitions on the system disk meet the requirements specified in Section 6.1 and that there is no unallocated space on the system disk.
XIII.   The Intel® Graphics Command Center may display an error after recovery.

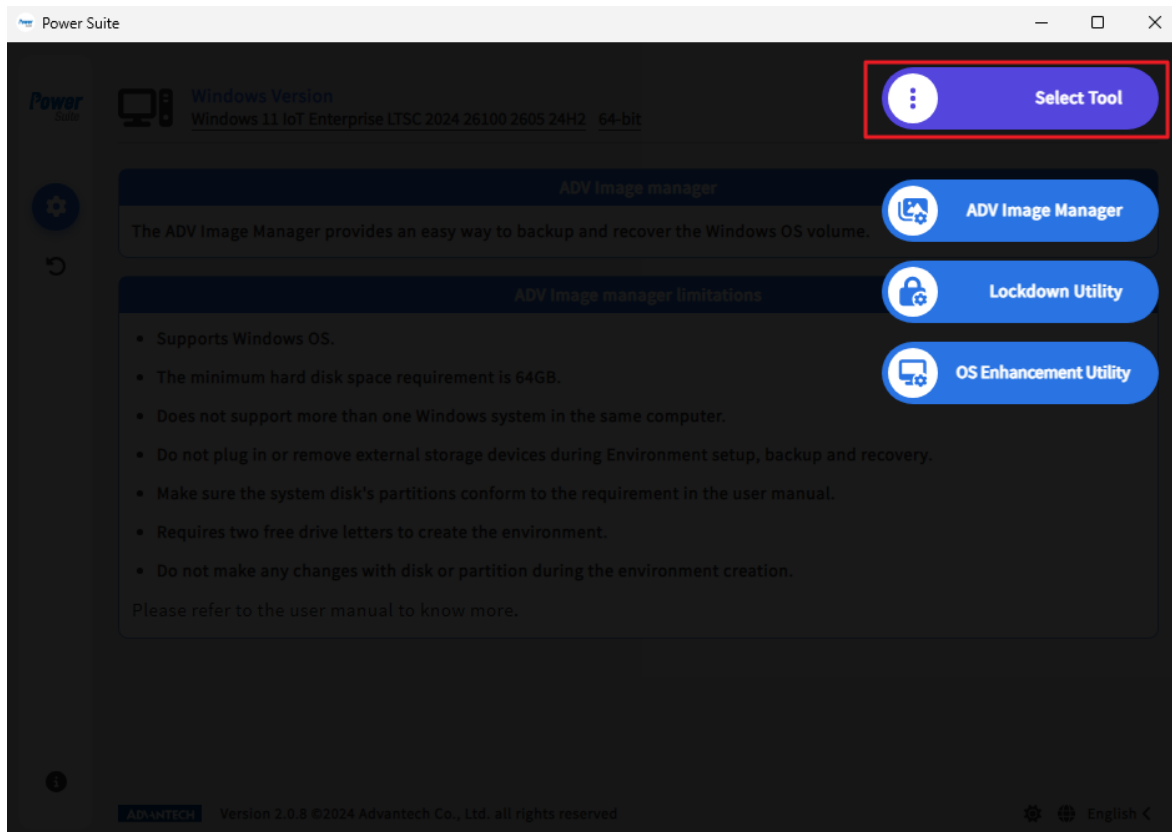Embedded IoT SW

4. General Functions

4.1 Windows Version

It shows Windows version, build numbers and architecture. Advantech Power Suite only supports OS build version newer than 17763.
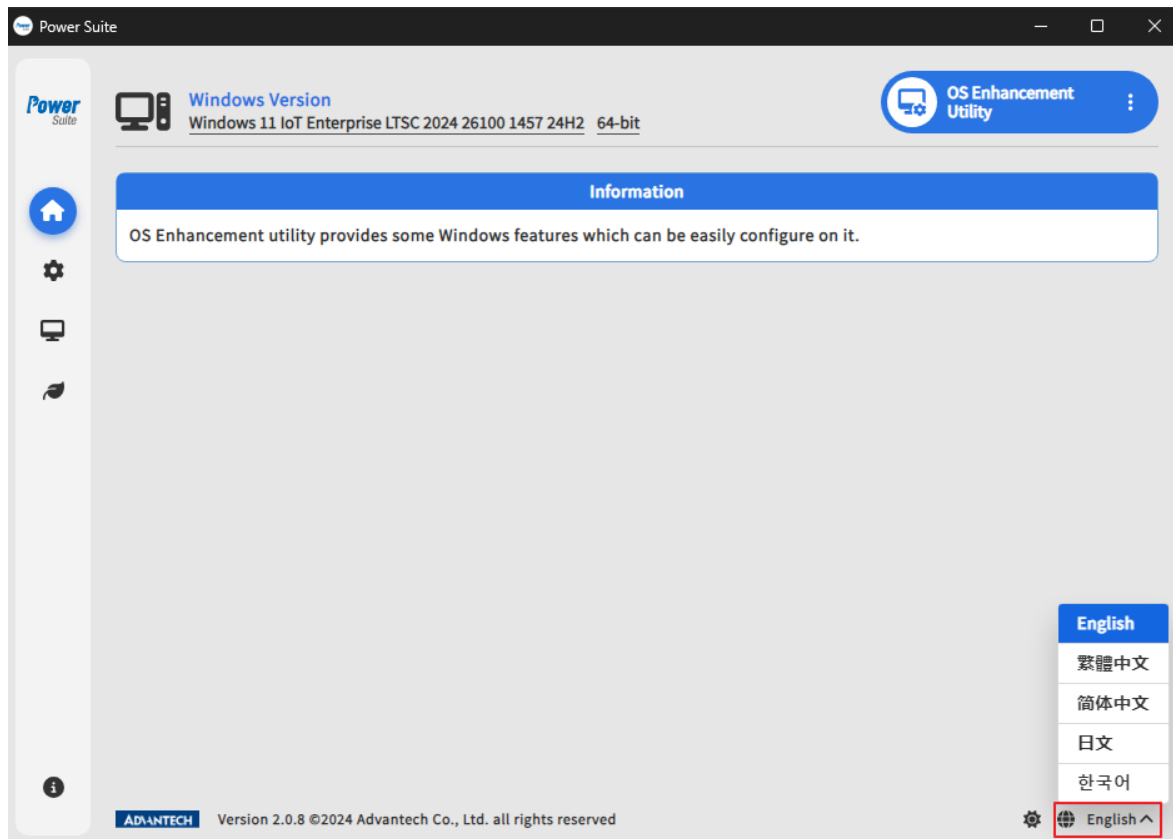
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4.2 Select Tool/Utility

3 tools are available: ADV Image Manager, Lockdown Utility, and OS Enhancement Utility.
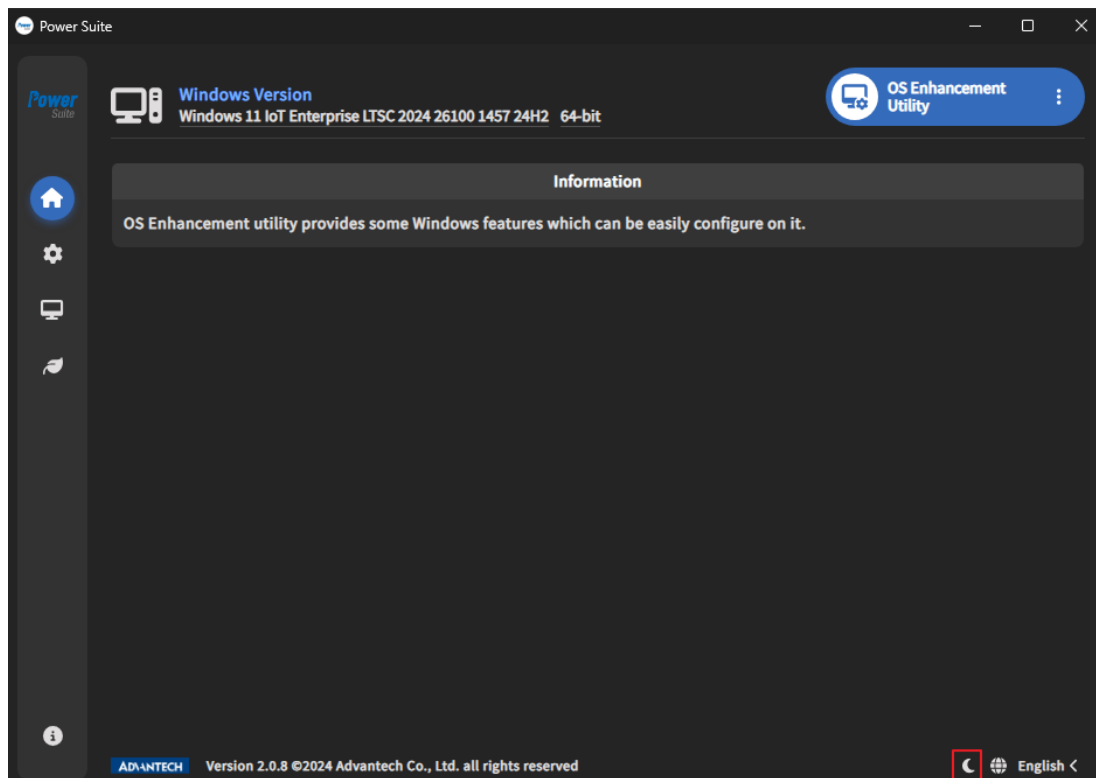
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4.3 Change Language

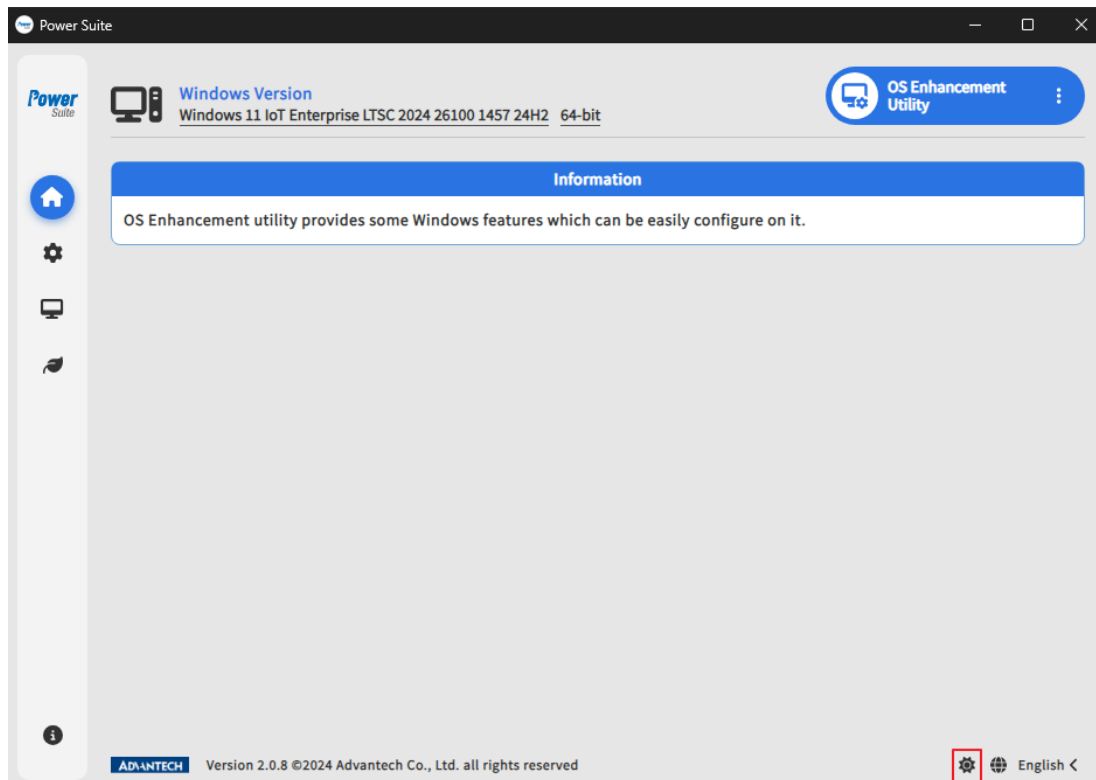Change user interfaces of Advantech Power Suite based on the language selected by the user.

Note: Currently available in English, Traditional Chinese, Simplified Chinese, Japanese, and Korean.
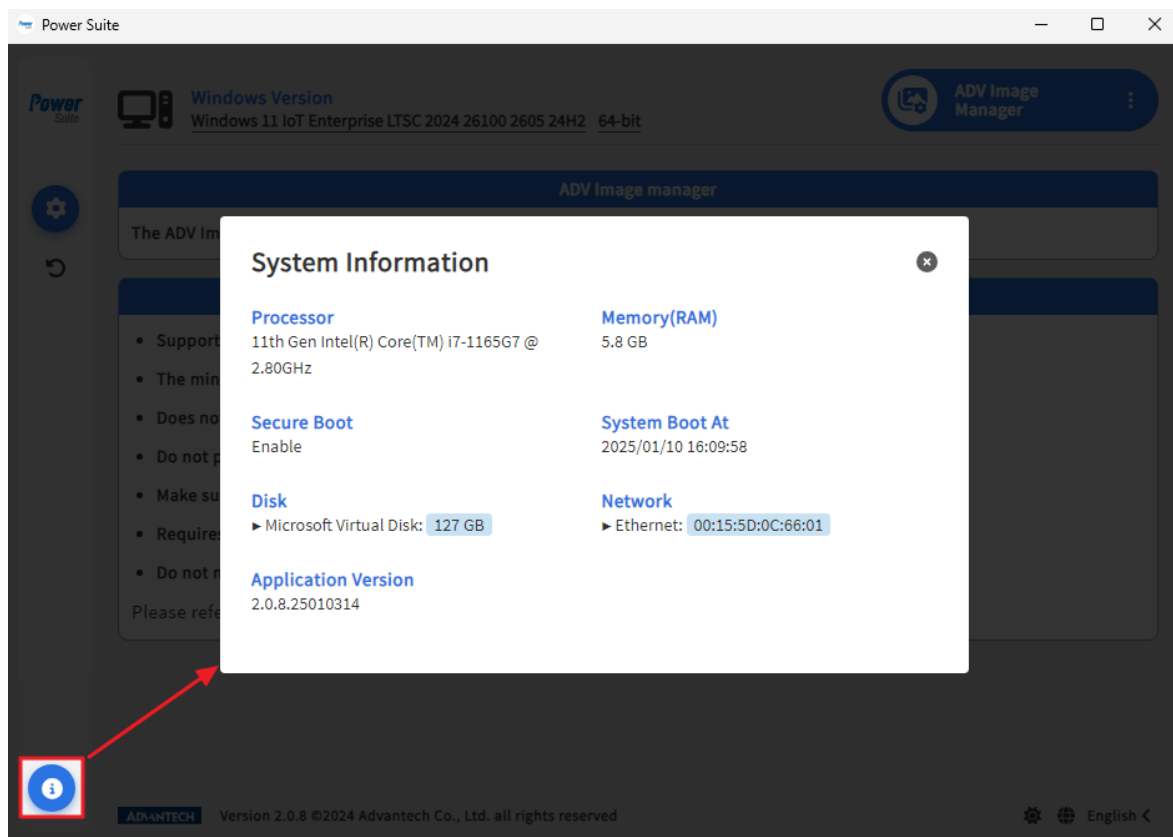
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4.4 Switch Dark/Light Modes

Users can switch between light (⚙) and dark (🌙) mode based on their preferences.
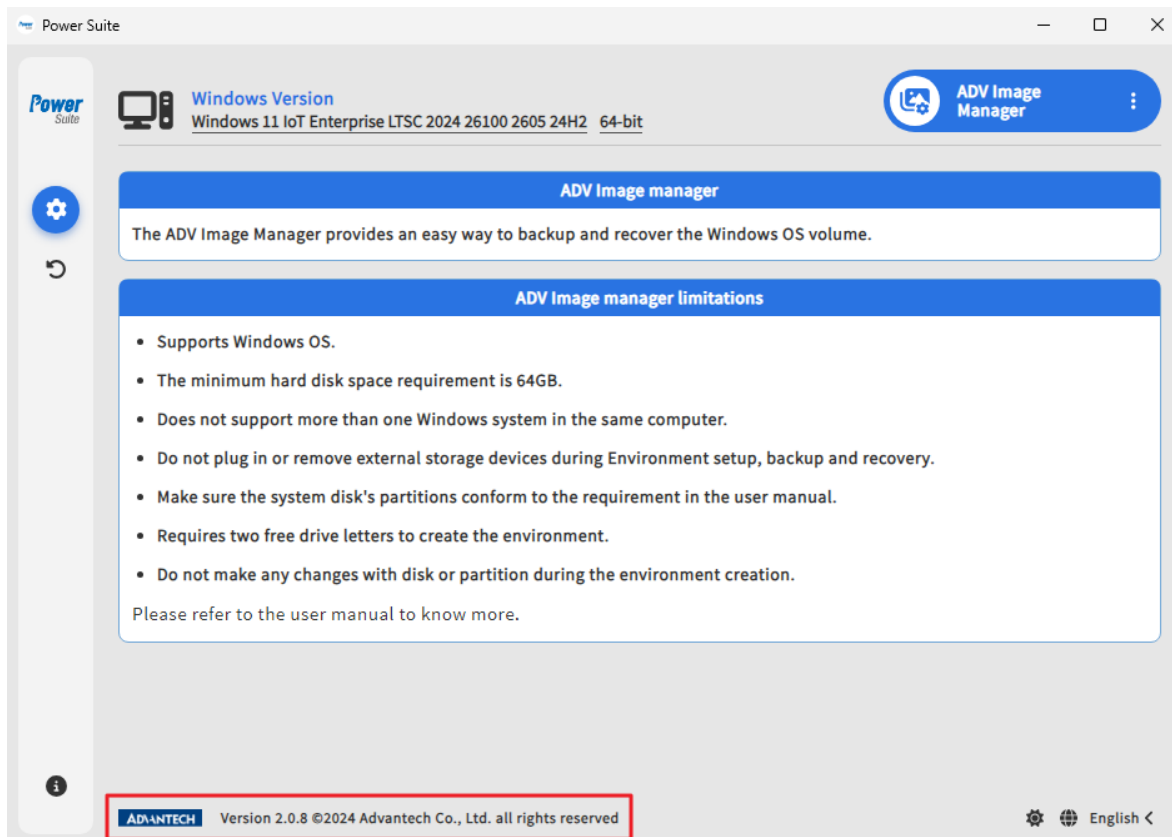
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4.5 System Information

Display current system information.

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4.6 Copyright Notice

Copyright notice and software version of Advantech Power Suite.

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4.7 Uninstall Advantech Power Suite

During the uninstallation of Advantech Power Suite, the "ADV Backup" partition will be deleted and the image backup will also be deleted.

Make sure you want to delete the image backup, then press "**OK**". If not, please press "**Cancel**". Uninstall will be canceled and nothing will be changed if "**Cancel**" is pressed.

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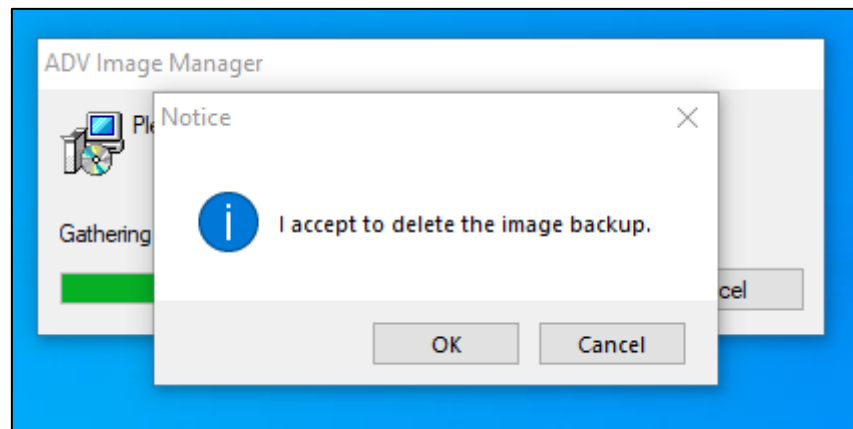
5. Tools / Utilities

5.1 ADV Image Manager

5.1.1 Information

　　Microsoft offers a Backup and Restore function, but it requires multiple steps to complete the process. ADV Image Manager simplifies this by providing an easy way to back up and recover the computer system.

　　ADV Image Manager can perform backup and recovery from the desktop application. Additionally, when the computer fails to enter the Windows system, ADV Image Manager can be started from the EFI Shell to recover the system.

➢ **What does the Environment setup section do?**
  When the environment setup starts, ADV Image Manager will replace the built-in WinRE with a new WinRE. Meanwhile, ADV Image Manager will create the "ADV Backup" partition on the system disk to store the backup image.

➢ **What does the Backup section do?**
  When the backup starts, the system will restart and boot into WinRE. In WinRE, ADV Image Manager will back up the C:\ partition. Please don't close the command prompt and keep the system focused on the command prompt to run the backup. When the backup is finished, the system will automatically restart and boot into Windows. In Windows, open the ADV Image Manager application to check the backup result.

➢ **What does the Recovery section do?**
  When the recovery starts, the system will restart and boot into WinRE. In the WinRE, ADV Image Manager will recover the C:\ partition and the system partition. Please don't close the command prompt and keep the system focused on the command prompt to run the recovery. When the recovery is finished, the system will automatically restart and boot into Windows. In Windows, open the ADV Image Manager application to check the recovery result.

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5.1.2Start to set up the environment

Select the "**ADV Image Manager**" tab, then select the "**Backup & Recovery**" page, and then press "**Settings**" button.

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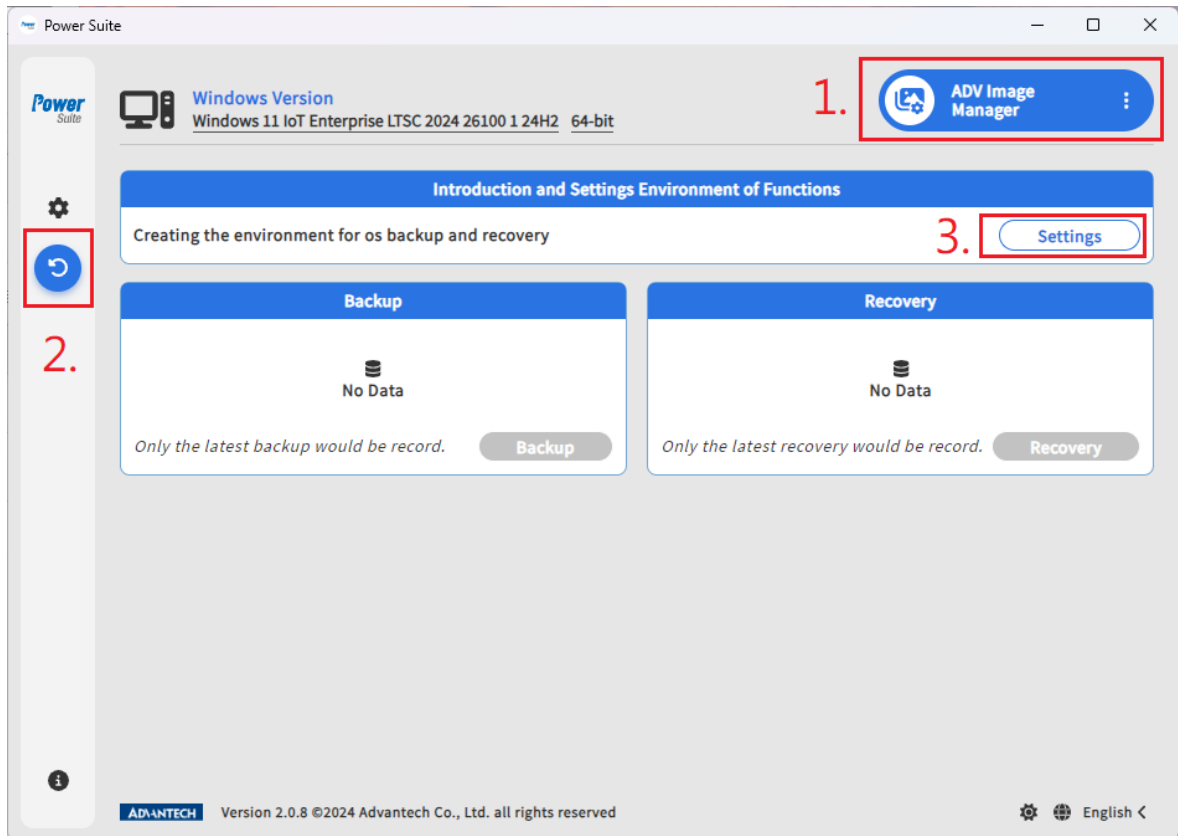
The computer's built-in WinRE will be replaced after the ADV Image Manager environment is created. This is an irreversible change even if the ADV Image Manager is uninstalled. Press "**Confirm**" to continue creating the environment.
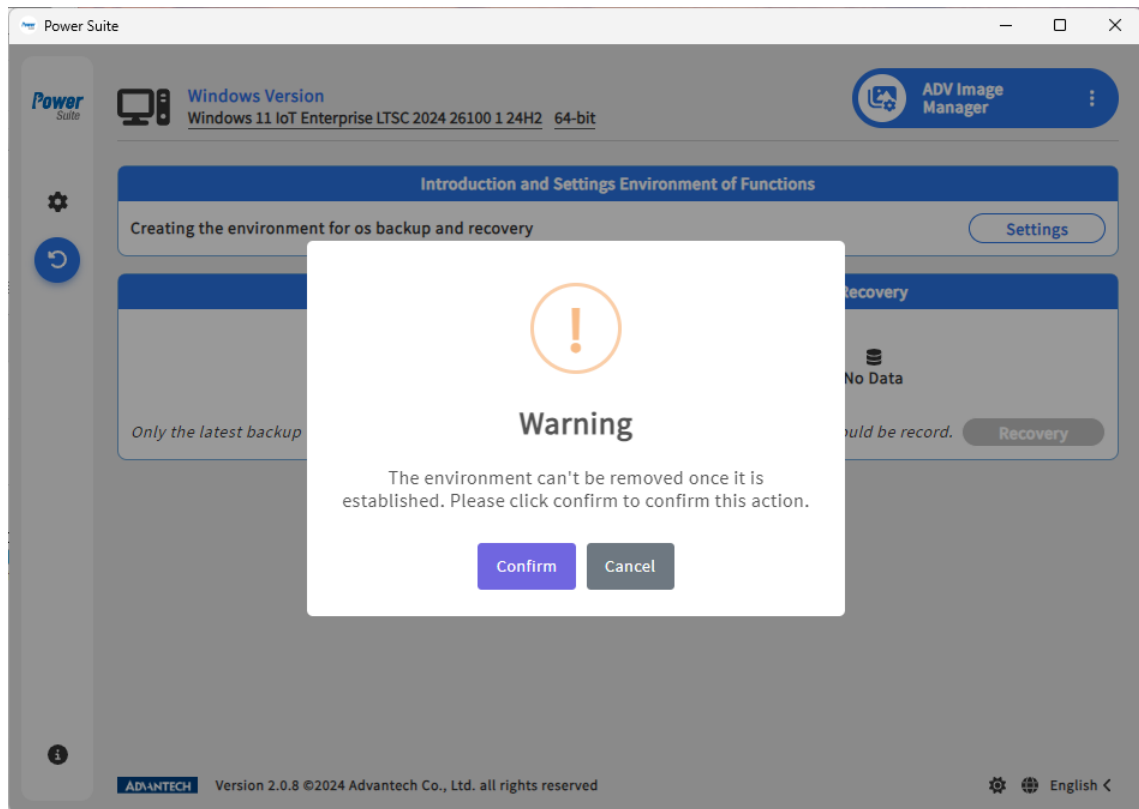
It takes a while to create the environment, please wait.

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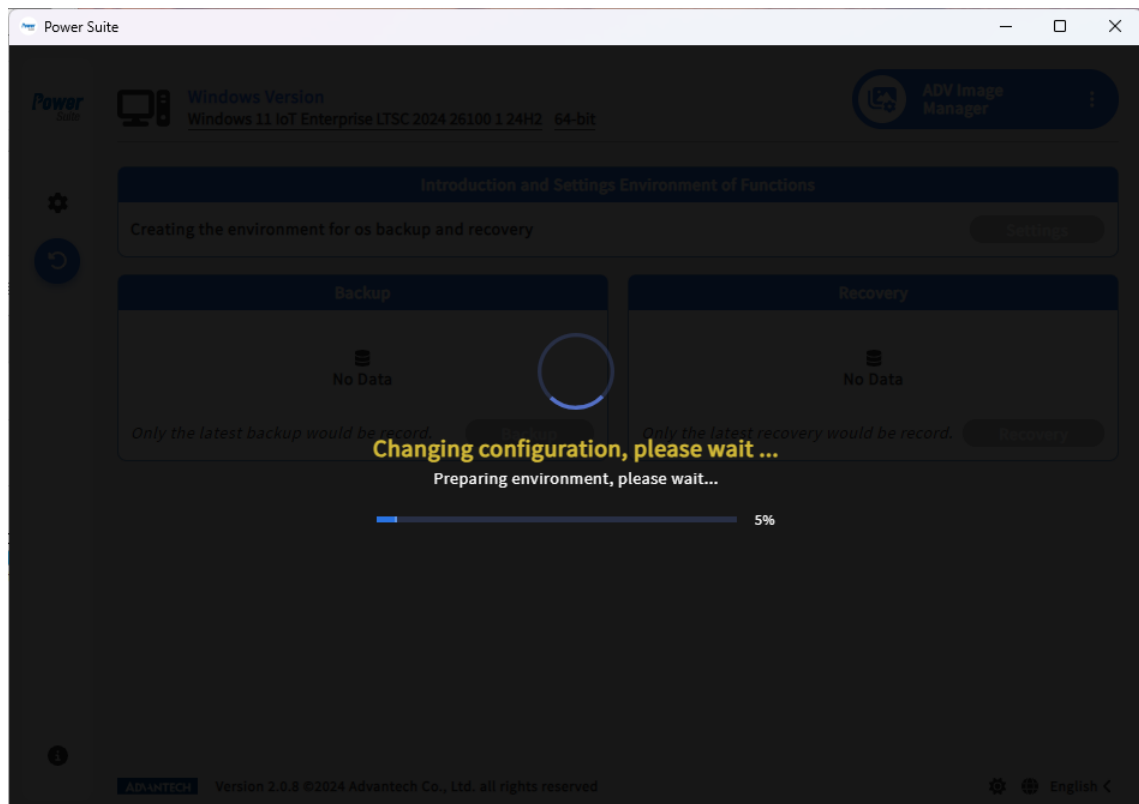
When the environment is created successfully, ADV Image Manager will display as shown below.

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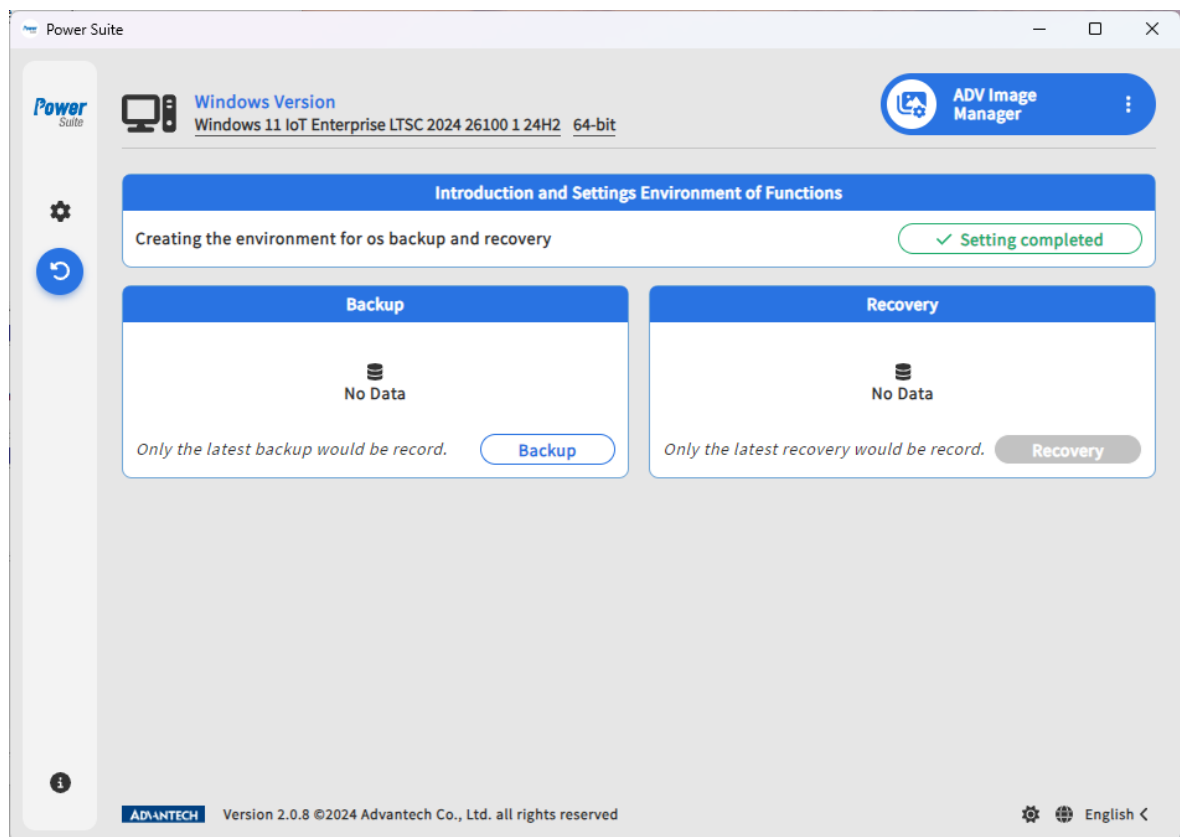
5.1.3Create Image Backup

Click the "**Backup**" button, then press "**Confirm**". The system will restart to WinRE and start the backup. Please don't close ADV Image Manager after the backup starts.

Embedded IoT SW
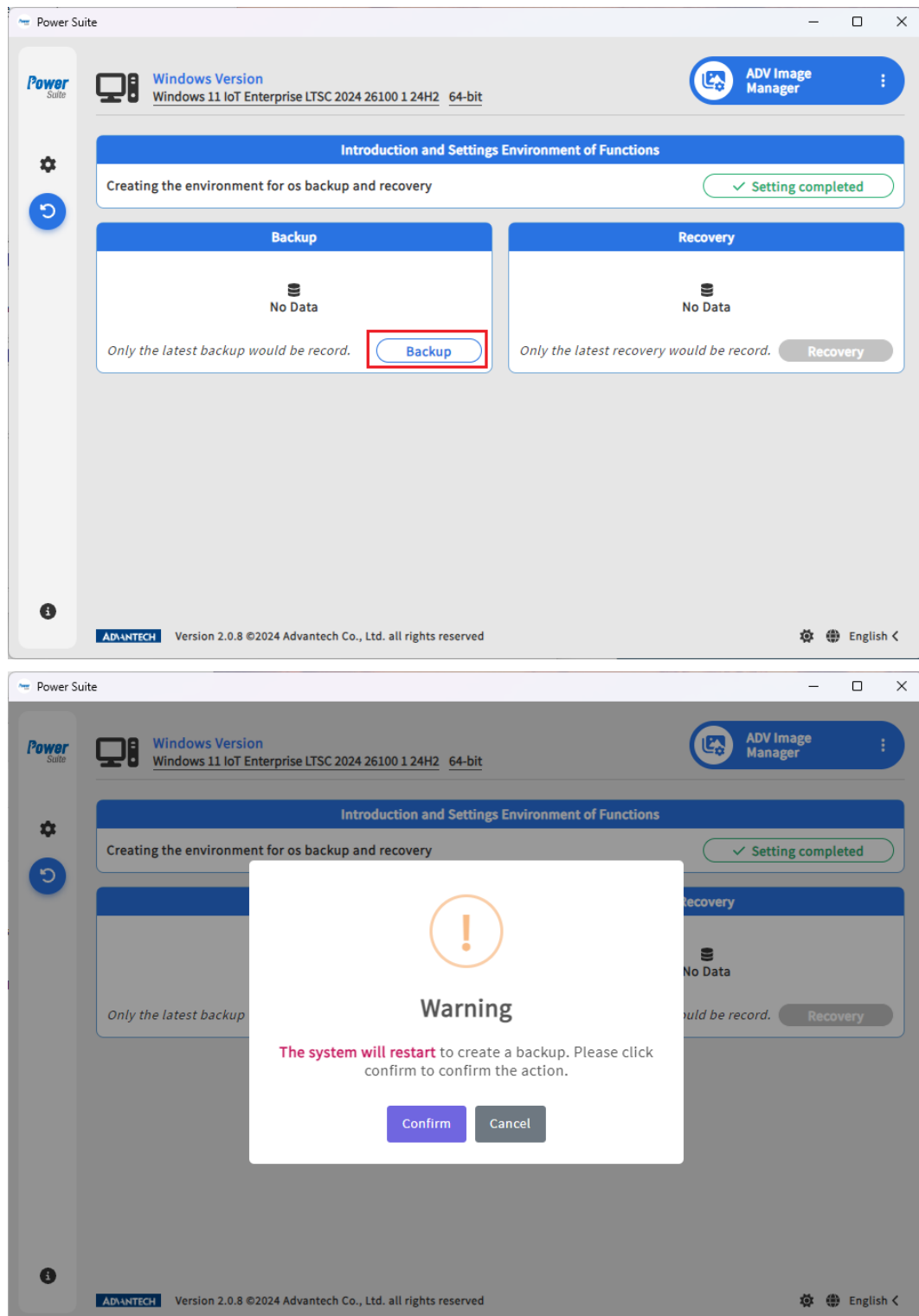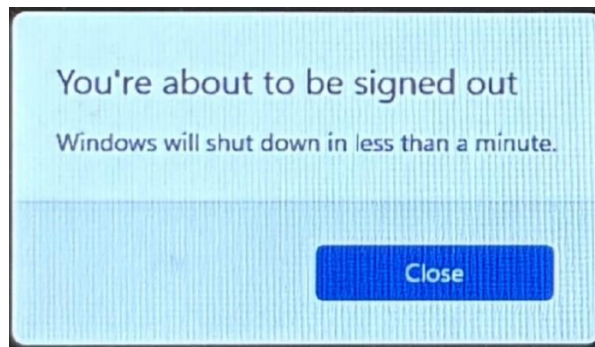
In WinRE, please don't close the command prompt and keep the system focused on the command prompt to run the backup. If the system is not focused on the command prompt, please press "Enter" in the command prompt to regain focus.

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When the backup is finished, the system will automatically restart and boot into Windows. In Windows, open the ADV Image Manager application to check the backup result.

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5.1.4Recovery

➢ **Recover Image From Desktop Application**

Click the "**Recovery**" button, then press "**Confirm**". The system will restart to WinRE and start the recovery. The backup file will be recovered to C:, thus all changes made after the backup file was created will be lost. Please don't close ADV Image Manager after the recovery starts.
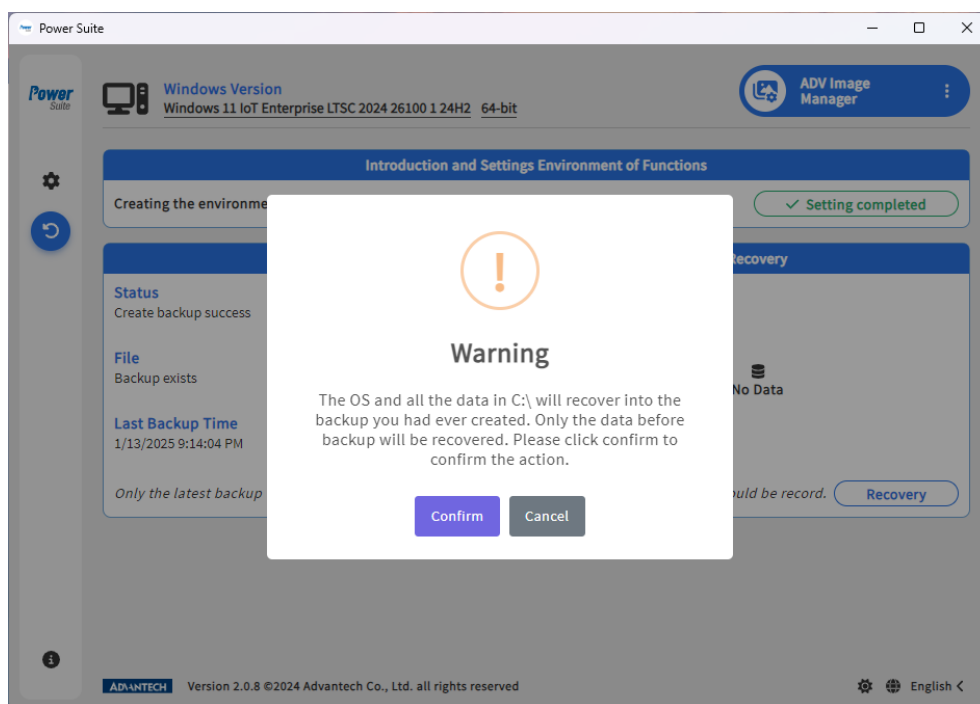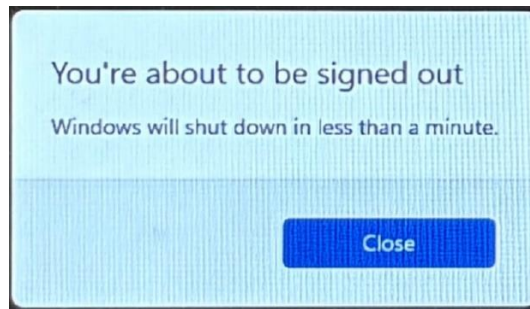
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Please don't close the command prompt and keep the system focused on the command prompt to run the recovery. If the system is not focused on the command prompt, please press "Enter" in the command prompt to regain focus.
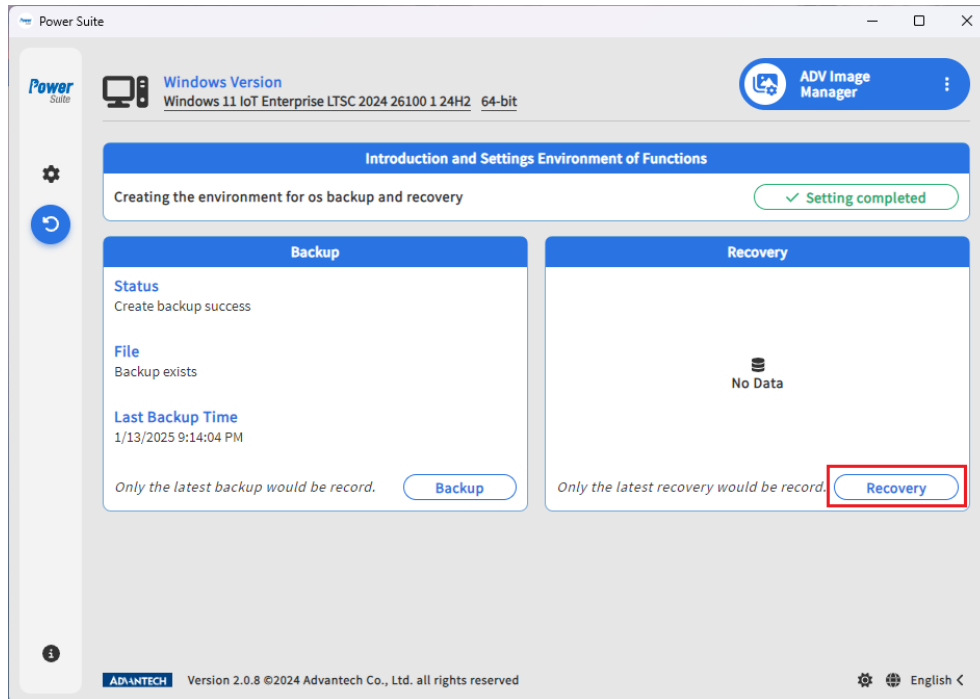
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When the recovery is finished, the system will auto restart and boot into Windows. In Windows, open the ADV Image Manager application to check the recovery result.
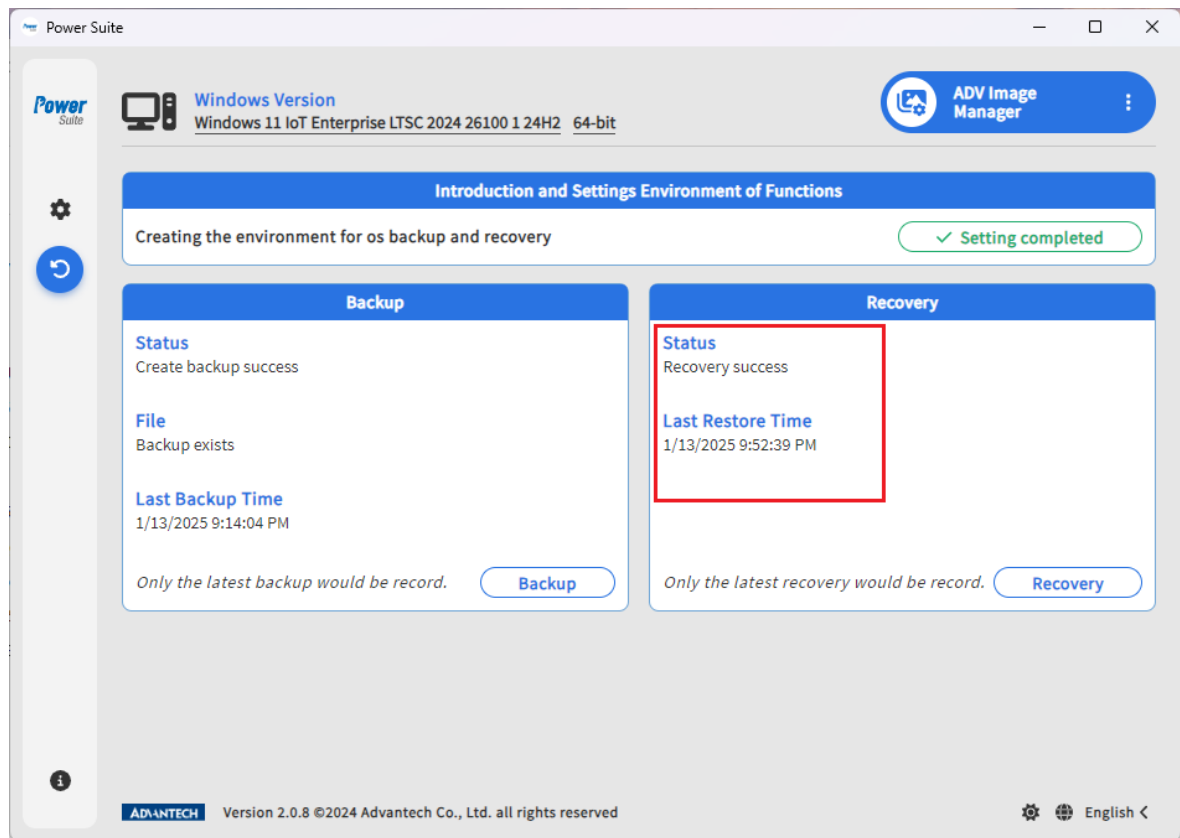
> ➢ **Recover Image from Desktop Application**
> Besides starting recovery from the desktop application, ADV Image Manager can also start recover from WinRE. The WinRE entry points can reference on the Microsoft website. When the computer fails to enter the Windows system, you can use this method to recover your system.

I.   Using the BIOS built-in EFI Shell or a USB drive that includes EFI Shell can start WinRE.

II.   Using command "fsX:" and "EFI\Microsoft\Boot\bootmgfw.efi /RecoveryBCD" to enter WinRE.

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III.   X is the selected file system's number.

IV.   Type "2" then press "Enter" to select the Recover OS function.

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V. Type "Y" or "y" then press "Enter" to start the recovery. After recovery, the system will reboot into Windows.
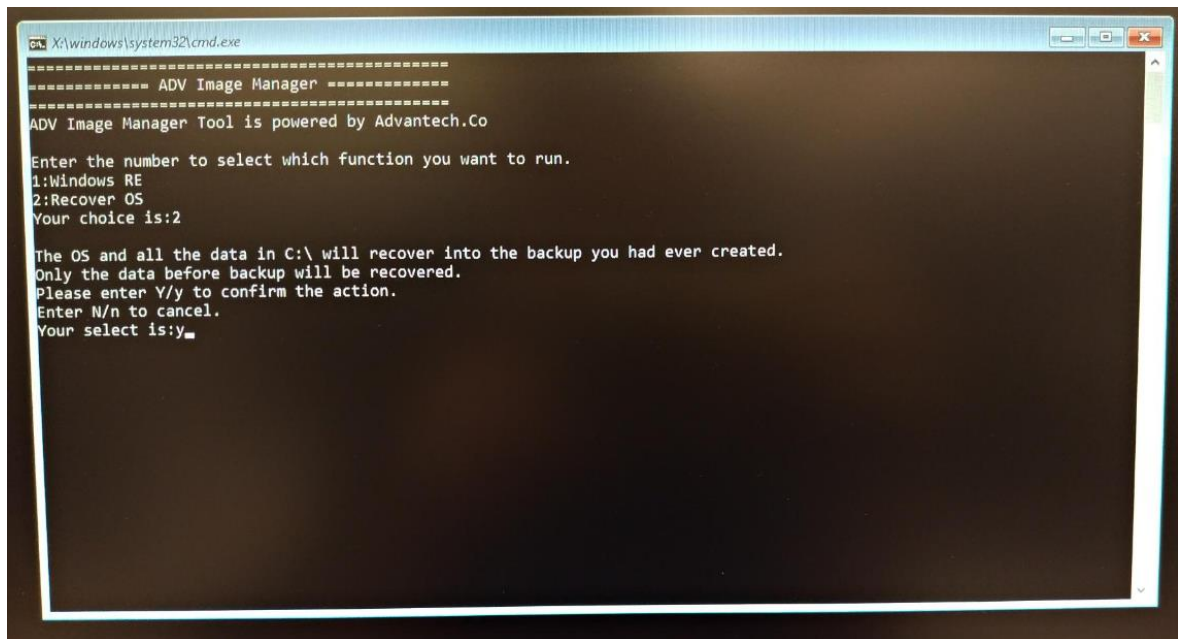
If you want to cancel the recovery, please type "N" or "n" then press "Enter" to cancel.
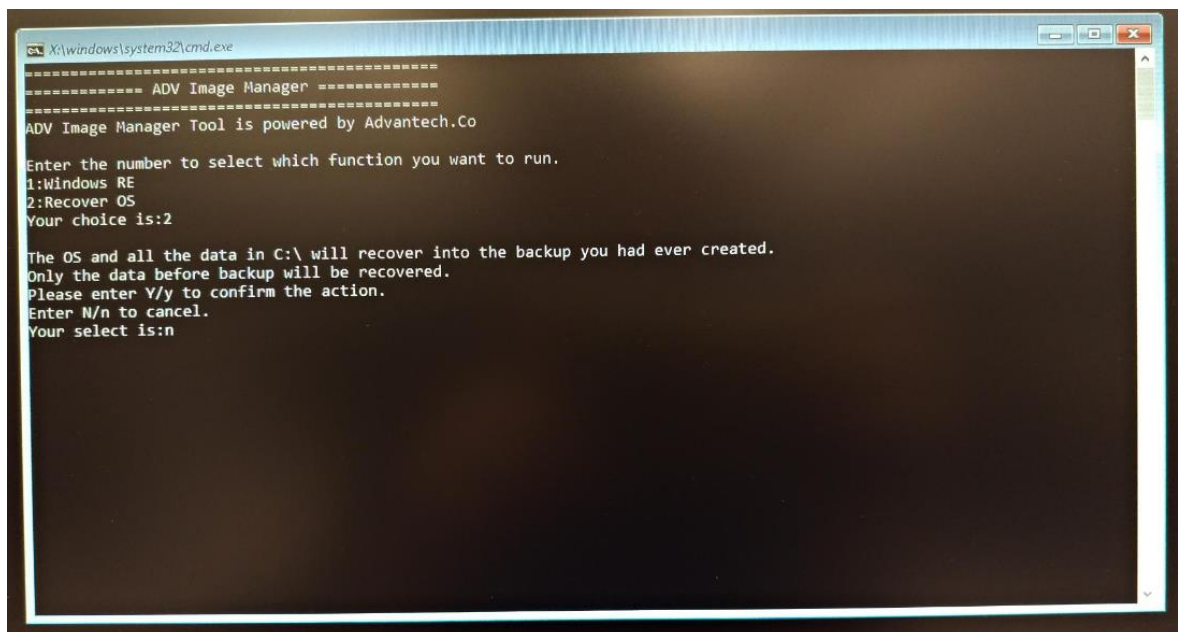
For other WinRE functions, please check 6.2.

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5.2 Lockdown Utility

5.2.1 Lockdown Settings
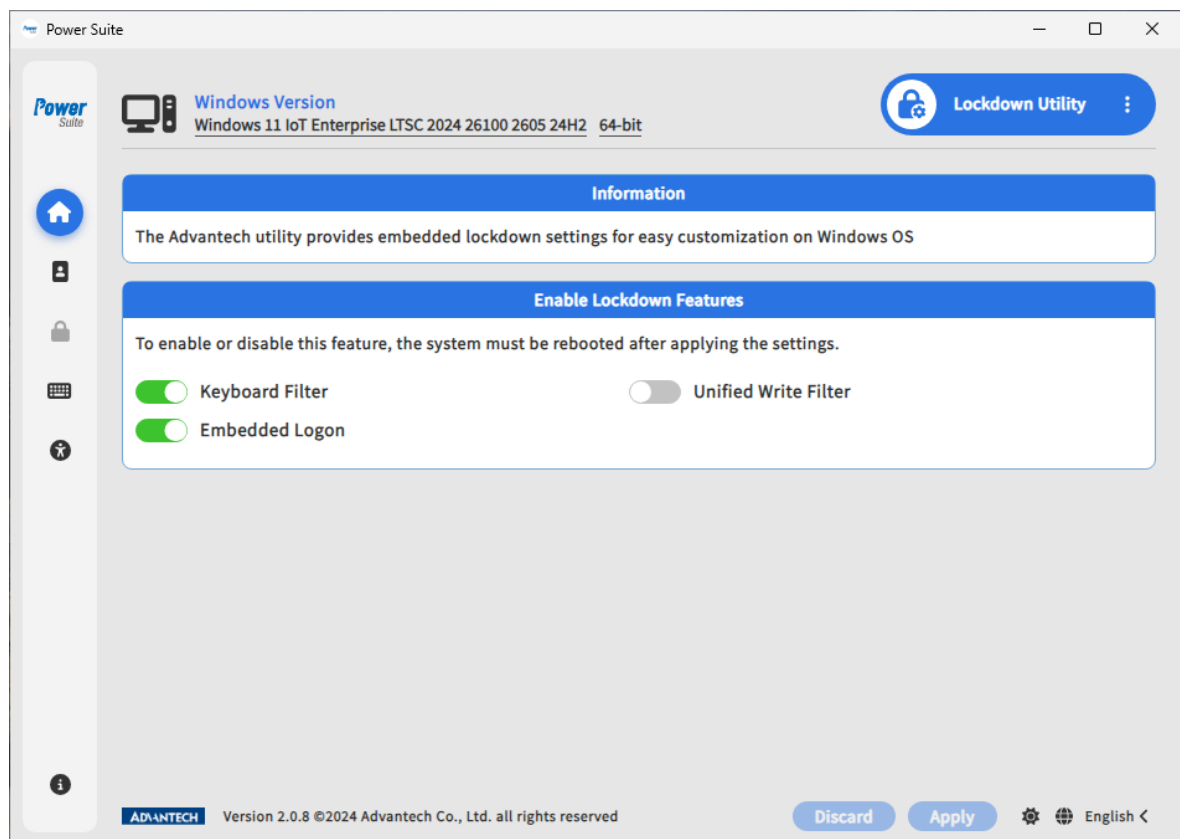
➢ Enable Lockdown Features

■ There are some dependency settings to be designed onto the Enable Lockdown Features. You can directly enable or disable Windows Features without using DISM.

■ Each toggle switch is correspondence with the menu items on the left side. If you do not enable toggle switch, you will not be able to use the menu item functions.

■ Make sure toggle switches to be enabled before setting the functions from the menu on the left.

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5.2.2 Automatic Logon and Boot Options
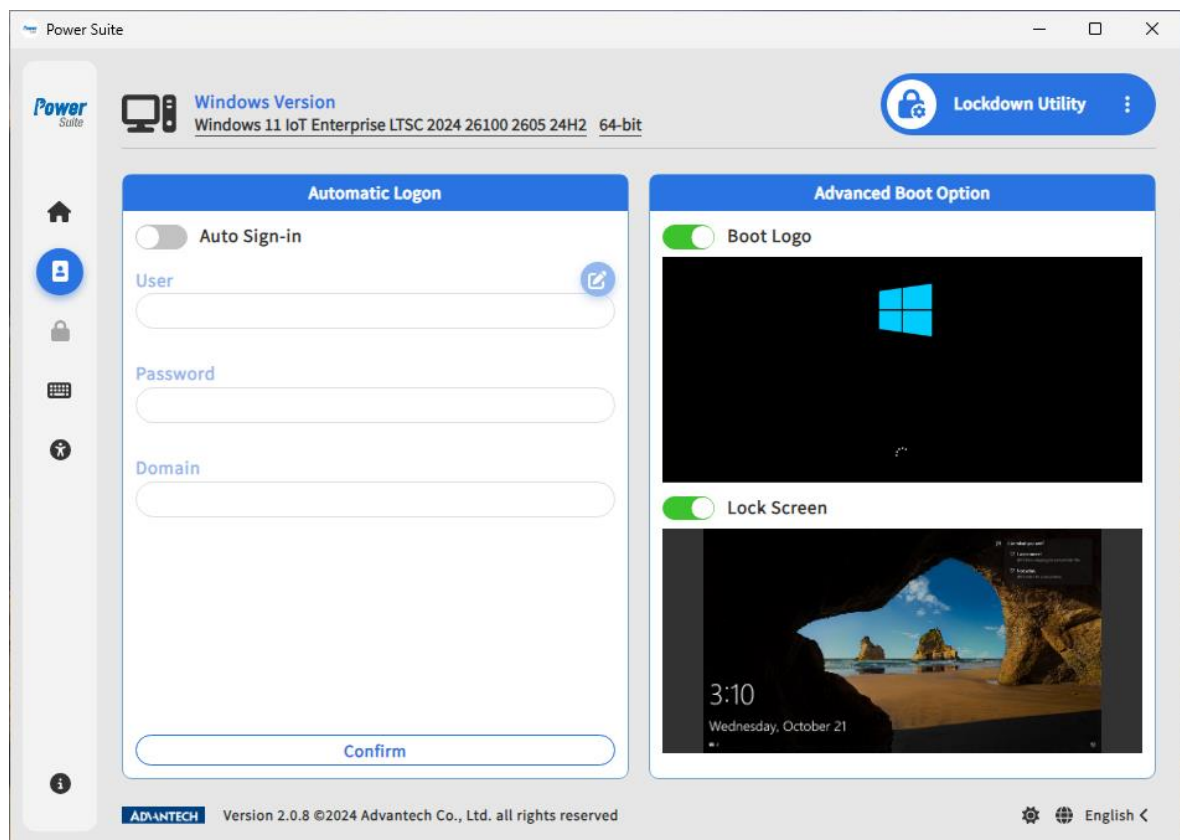
➢ Automatic Logon
  ◼ Auto Sign-in: enabling this function to automatically logon with your **User Name**, **Password**, and **Domain Name** when boot up**.**

➢ Advanced Boot Option
  ◼ Advanced Boot Option is designed for image customization to disable Microsoft boot logo and Microsoft lock screen.

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5.2.3 Unified Write Filter

The Unified Write Filter (UWF) feature on your device is to help protect your physical storage media. With UWF enabled, your device will become read-only, which protect system from write operations.

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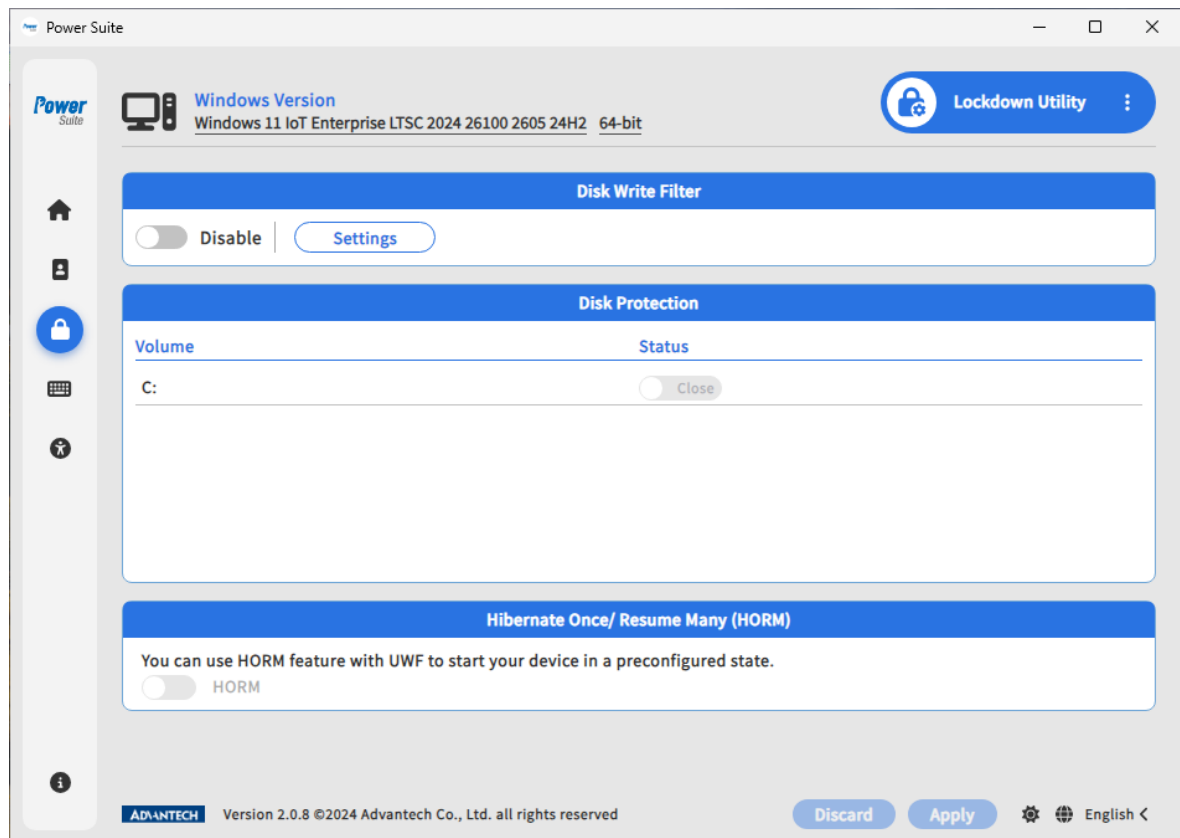
➢ Disk Write Filter

After enabling Disk Write Filter, you **cannot modify advanced settings** because of dependency. The Advanced Settings include overlay setting and exclusions. More information is available at

● [Unified Write Filter (UWF) overlay location and size](#)
● [Write filter exclusion](#)

Since the system will become read-only, all the changes would be saved in a virtual overlay. You could decide where the virtual overlay to be saved, in RAM or in Disk. You could also decide which files/directories are exclusive from protection via below Windows.

Note: Please enable "Disk Write Filter" before go to next action, "Disk Protection".

Embedded IoT SW
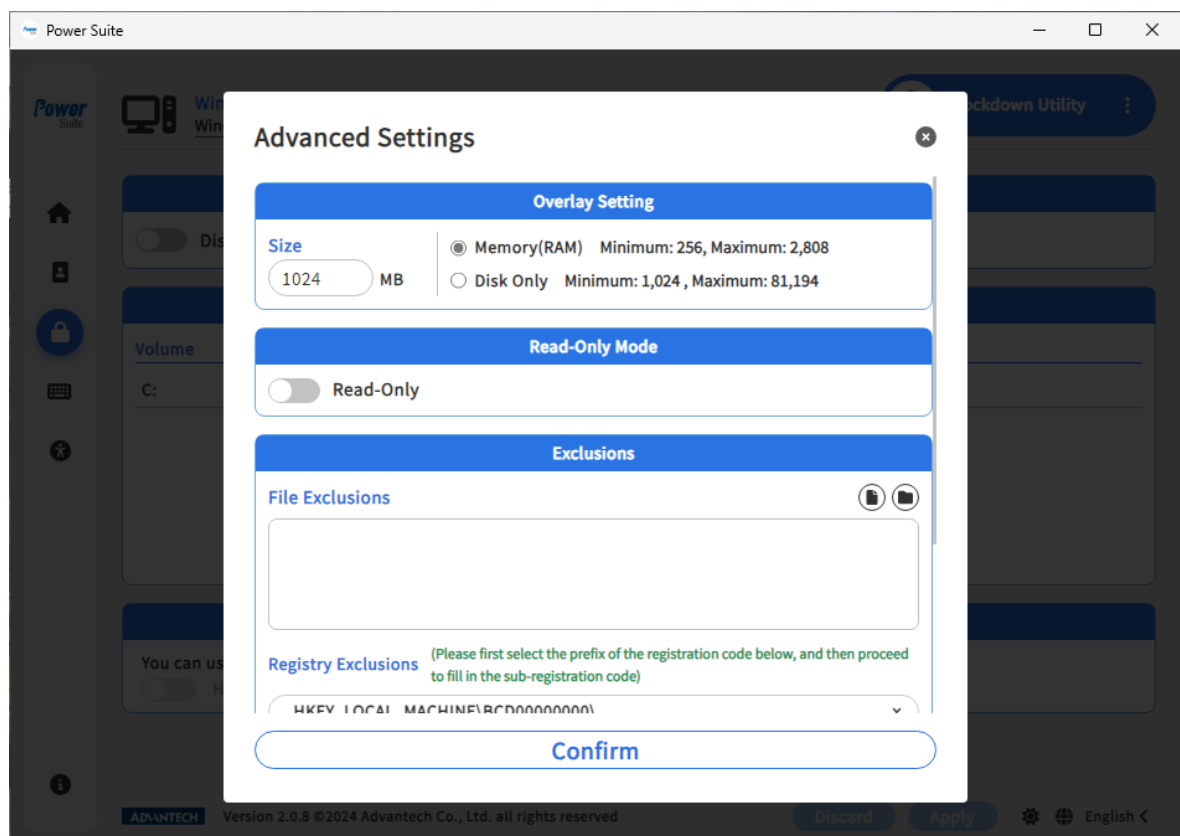
- ➢ Disk Protection

  This area lists all volumes on the device. If you want to use Disk Write Filter, It's necessary to indicate how many volume you would to protect.

  <u>You CANNOT use UWF to protect external removable Medias.</u>

  Note: If you already protect disk and then would like to disable "Disk Write Filter", please unprotect disk first.

- ➢ HORM

  Hibernate Once/Resume Many helps to quickly turn off or shut down your system, and then restart into the preconfigured state, even in the event of a sudden power loss. When HORM is enabled, your system always resumes and restarts from the last saved hibernation file (hiberfil.sys).

  If you would like to activate HORM, Hibernate function must be enabled in advance. You can enable it through OS Enhancement Utility or Windows Control Panel.

  UWF must be enabled before you can enable or disable HORM. UWF must be configured in the following ways to protect the hibernation file from becoming invalid:

  - I.   All fixed volumes mounted on the system must be protected by UWF.
  - II.   No file, folder, or registry exclusions configured for UWF.
  - III. The UWF overlay must be configured to use RAM mode. HORM does not support disk-backed overlays.

  https://docs.microsoft.com/en-us/windows-hardware/customize/enterprise/hibernate-once-resume-many-horm-

  Note 1: HORM can be worked on a UEFI device when your Win 10 IoT Enterprise version is 1709 or newer, otherwise only Legacy. If you cannot use HORM, please try to make your windows update to the latest.

  Note 2: Once the system enters into Hibernate with HORM enable, the next HORM enable action will resume from the previous Hibernate status.

  If you would like to enable HORM while the condition of UWF is enabled and read only media is disabled. Please disable UWF first, then enable Read-Only Mode, and enable HORM afterward. Otherwise the settings under UWF is enabled would be invalid.

  https://learn.microsoft.com/en-us/windows/iot/iot-enterprise/customize/uwf-wes7-ewf-to-win10-uwf#read-only-media-mode

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5.2.4 Keyboard Filter
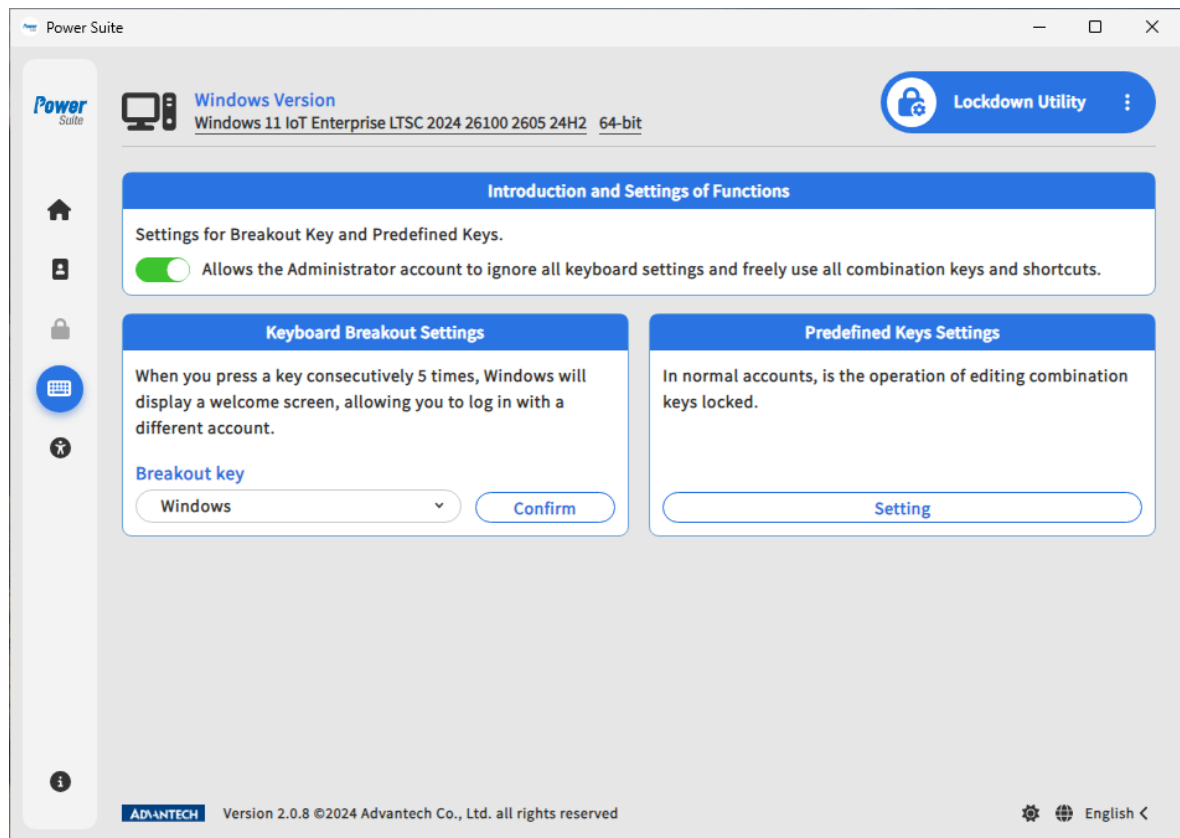
➢ Introduction and Settings of Functions
Enable the setting to avoid being restricted keyboard use under administrator account.

➢ Keyboard Breakout Settings
You can configure a breakout key sequence to switch out a locked down account by specifying a key scan code. When you press the Breakout Key 5 times consecutively, Windows presents the Welcome screen so that you can sign in to a different account.

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➢ Predefined Keys Settings

We provide predefined keys which are defined by Microsoft.

The default setting is to allow all of the predefine keys. If you want to block keys for your users, check the items that you want to block, and click "**Save**". The selected key combinations will be blocked.

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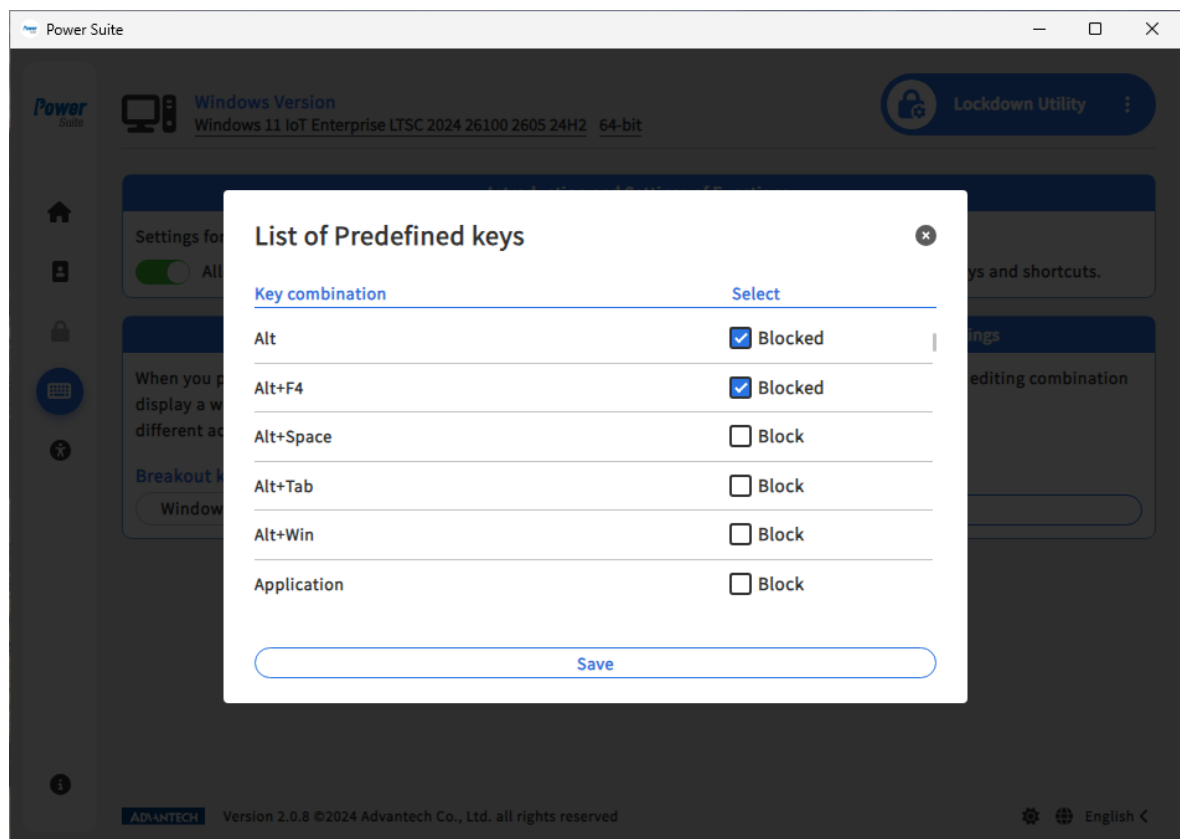
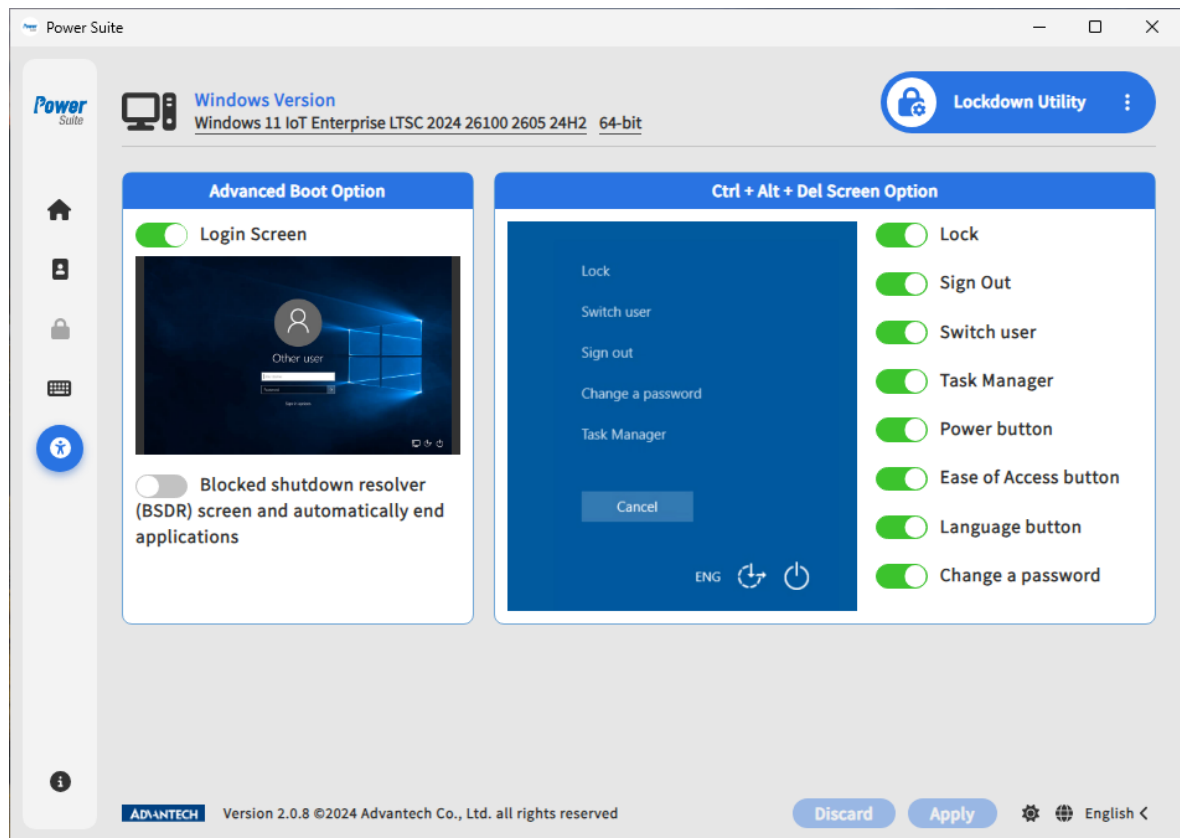## 5.2.5 Embedded Logon

➢ Advanced Boot Option
You can hide logon screen by disabling "Login Screen". Before configuring this setting, you must enable auto login in advance, which can be set on the "Automatic Logon and Boot Options" menu.

When the BSDR screen is enabled, any open applications that blocking system from restarting or shutting down would be close immediately. No UI will be displayed to check again whether you are sure to restart system, and users are not given any chances to cancel the shutdown process. This action will result in losing data if there are any unsaved data.
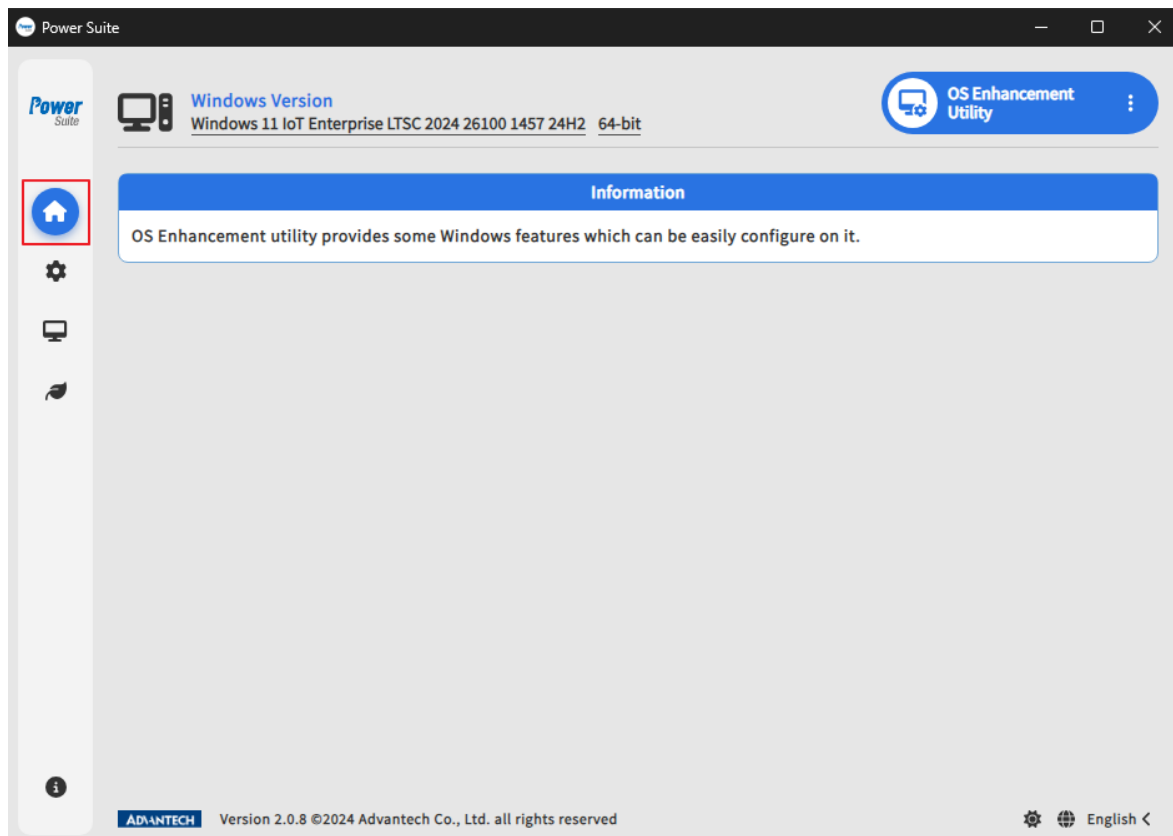
➢ Ctrl + Alt + Del Screen Option
You can configure Ctrl + Alt + Del options to customize what kind of function to be run under the combination keys of Ctrl, Alt, and Del.

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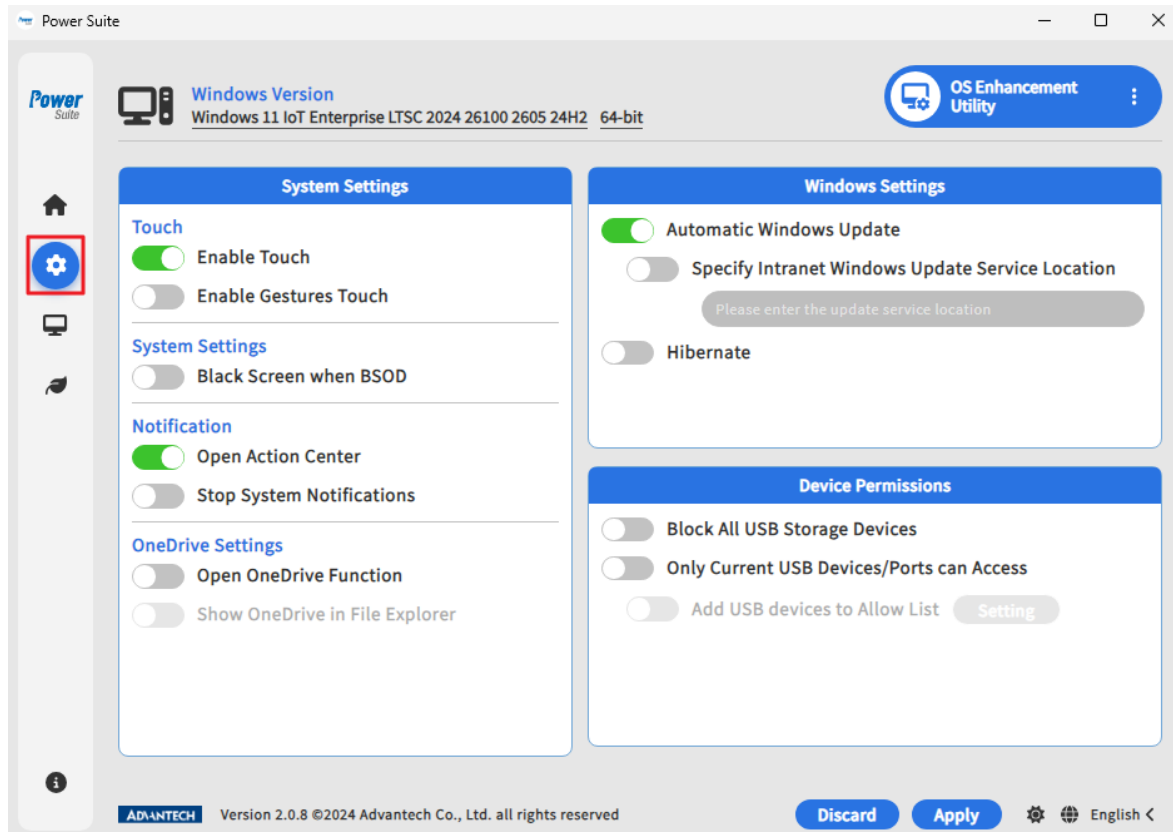# 5.3 OS Enhancement Utility

5.3.1 Information

Basic function description of the OS Enhancement Utility.

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5.3.2General Settings

Provide interfaces that allow users to quickly configure frequently used Windows settings.

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➢ System Settings

■ Touch
  ● **Enable Touch**: enable or disable touch function (only support capacitance touch device)
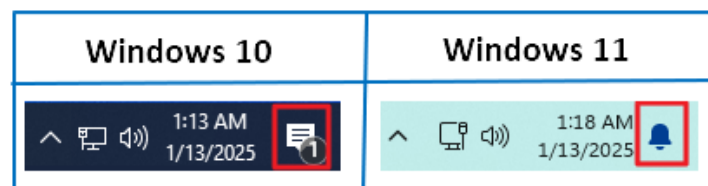 ● **Enable Touch** Gestures: enable or disable touch gestures

■ System Settings
  ● **Black screen when BSOD**: after enable this feature, screen will display black screen when system occurs BSOD instead of blue screen

■ Notification
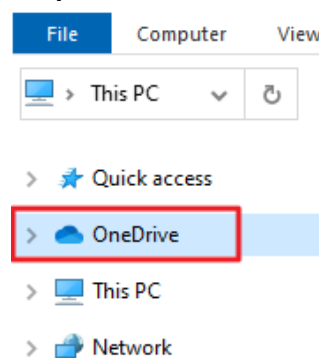 ● **Open Action Center**: enable to show action center on task bar

 ● **Stop System Notifications**: enable/disable to suppress/show system notifications

■ OneDrive Settings
  ● **Open OneDrive Function**: enable or disable OneDrive function
  ● **Show OneDrive in File Explorer**: enable to show OneDrive node in file explorer

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➢ Windows Settings

■ **Automatic Windows Update**: enable or disable automatic Windows updates

● **Enable to use intranet Windows update service location**: enable to assign an intranet URL as new Windows update location if **automatic Windows update** is enabled

● **Hibernate**: enable to show hibernate option in showdown settings menu

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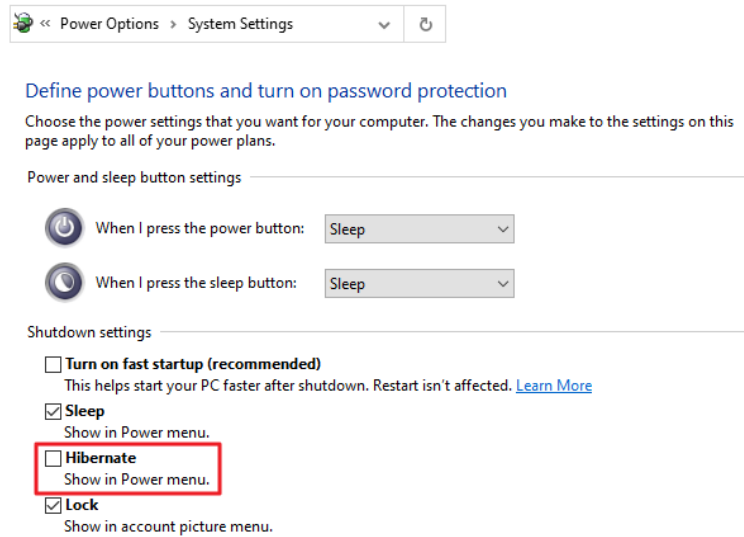
➢ Device Permissions

- **Block All USB Storage Devices**: Enable to block all USB storage devices, including read, write, and execute permissions
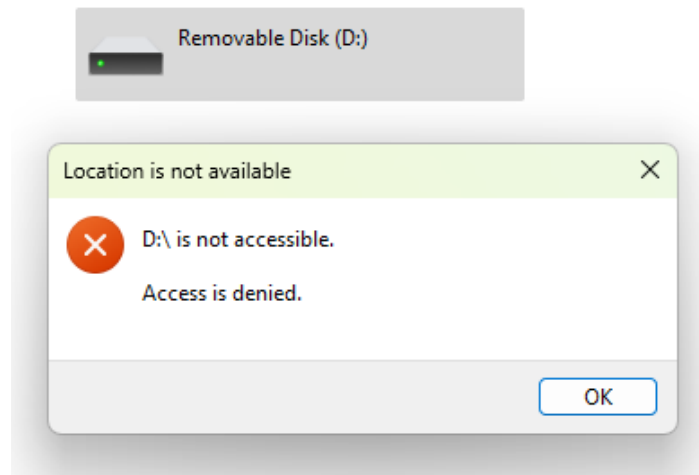

- **Only Current USB Device/Port can Access**: this is a device-based feature. If enabled, only the USB devices that had working in this computer could work, and no other USB devices could work further.
  For example, if only USB keyboard-A is already recognized by this computer, after enabling this feature, no other USB keyboards could work in this computer unless the device ID is added to the allow list.
 - ◆ **Add USB devices to Allow List**: users add device IDs into the allow list to make sure the selected device types still work on this computer while **Only Current USB Device/Port can Access** is enabled.
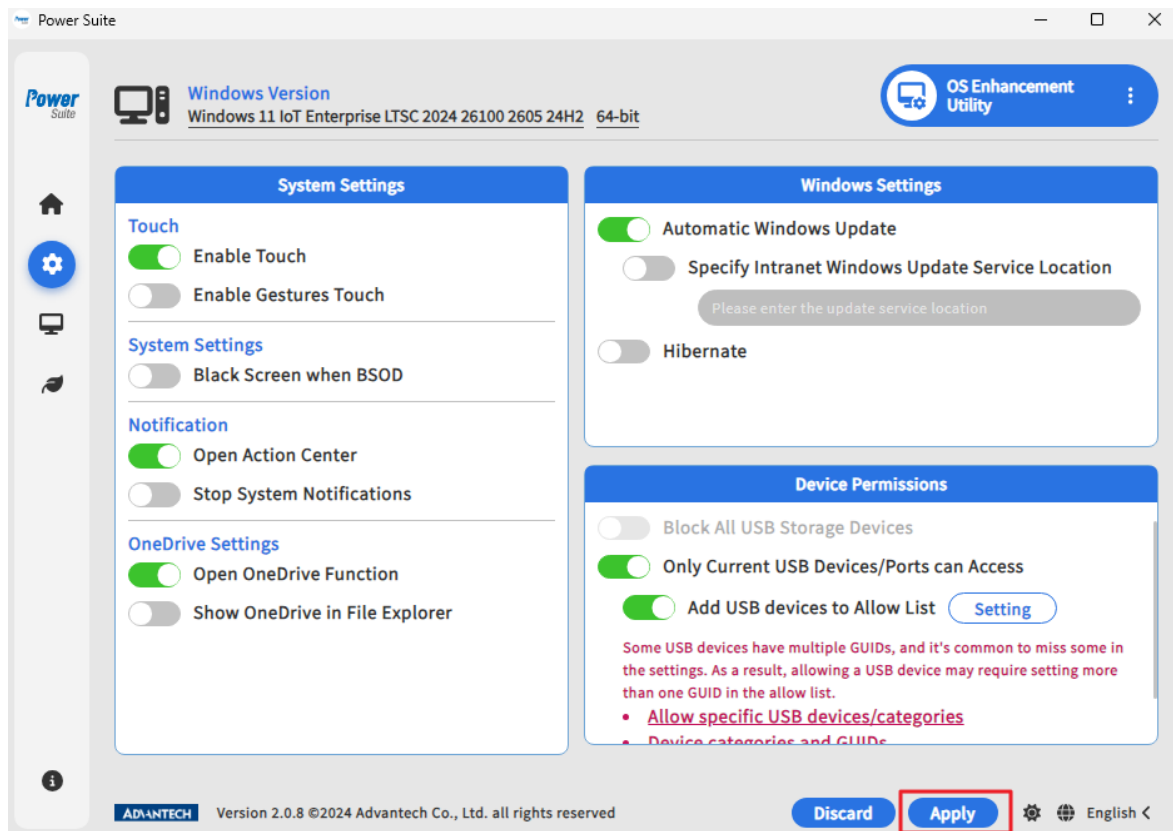   For example, if a user can apply following steps to use another keyboard:
    1. Enable **Add USB devices to Allow List**
    2. Click "**Setting**" button to open dialog

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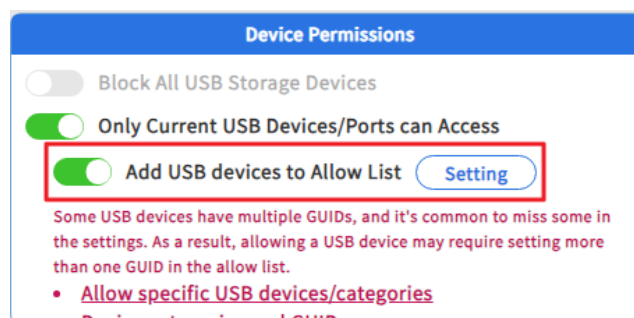
3. Select all required device IDs (state from "Allow" to "Allowed")

4. Click "**Save**" button to close dialog
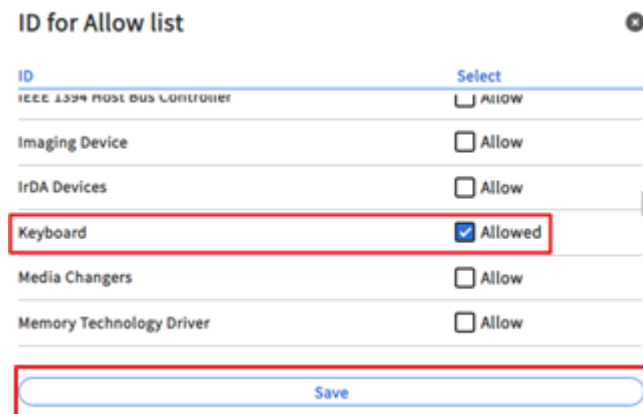
5. Click "**Apply**" button to finish setup and reboot device

Note: add a device type may need selecting multiple class IDs from allow list.

For example, if a user wants to add new keyboard devices, in addition to the Keyboard ID, the Human Interface Device (HID) ID is also required to make the Keyboard ID effective.
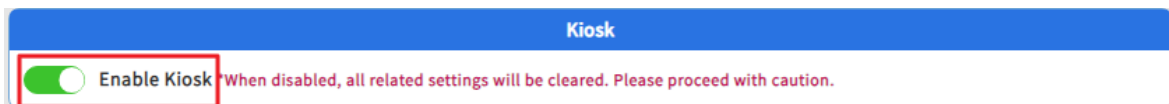
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5.3.3 Kiosk

Kiosk mode is a common way to lock down a Windows device while the device is used for a specific task or used in a public setting.
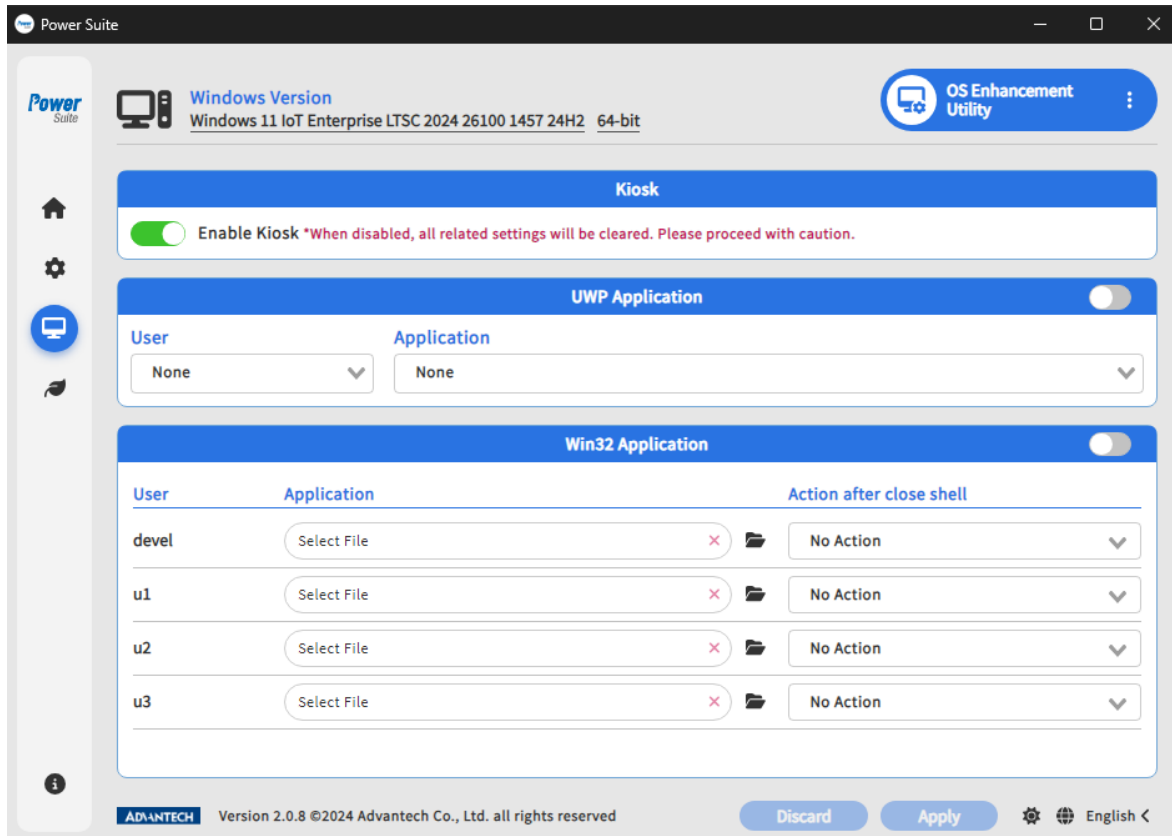
➢ Kiosk

■ **Enable Kiosk**: enable or disable kiosk feature

Note: all current kiosk settings will be purged if the toggle is set to disable and applied

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➢ **UWP Application**

▪ **UWP Application**: set enable to launch the selected UWP application when the selected user logs on

  ● **User**: select a local account other than current user
 ● **Application**: select an UWP application

➢ **Win32 Application**

▪ **Win32 Application**: set enable to launch the selected Win32 application when the corresponding user logs on

  ● **Application**: select a Win32 application to be launched when the user logs on
  ● **Action after close shell**: choose the action to take if the selected Win32 application is terminated. Available actions are: No Action, Shutdown Computer, Reboot Computer, and Restart Shell.

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5.3.4 Energy

Collect settings that have an impact on power consumption. By apply recommendation values, user can reduce power use, improve battery life and lower the carbon footprint.
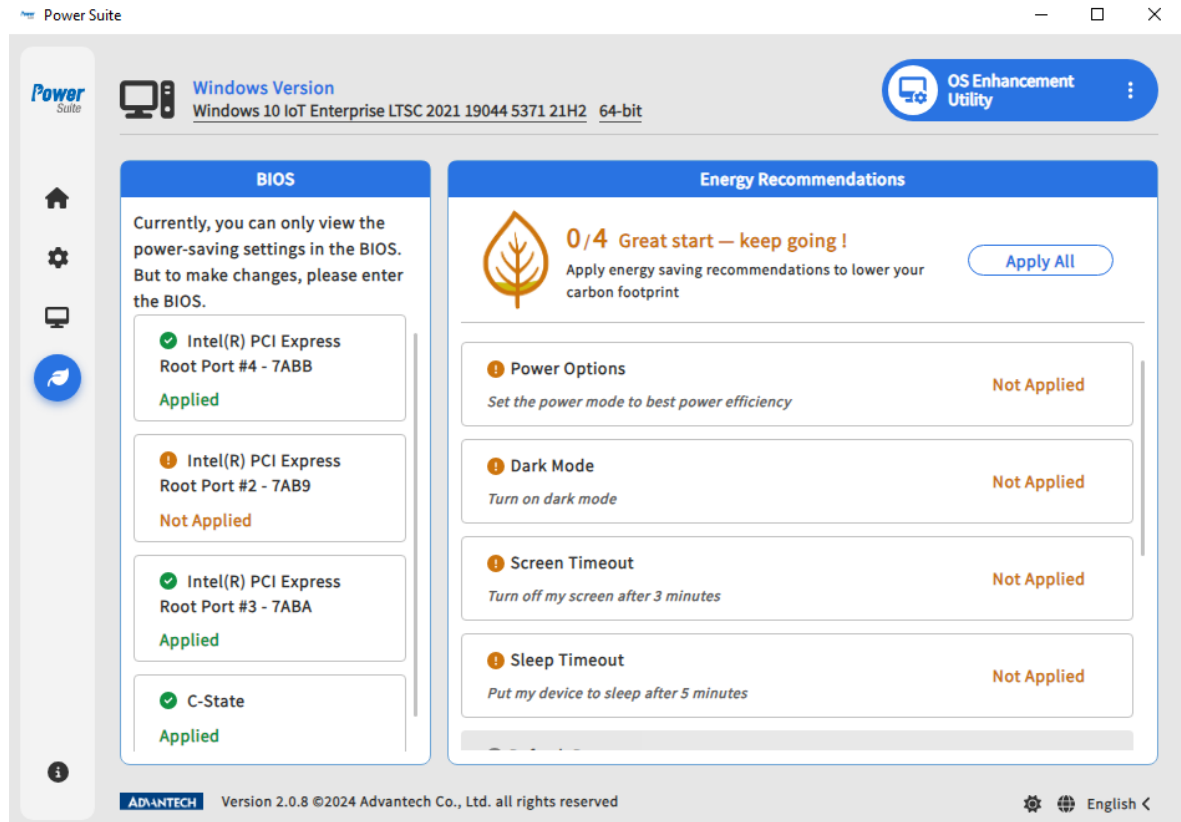
Note: utility try to read some information using Advantech SUSI APIs. This means that the status will be "No Data", "Not Available", or "Not Support" if Advantech SUSI package is not installed on the device.

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➢ BIOS

■ Display current status of BIOS energy recommendation settings. These values are read from BIOS and can't be modified by utility.
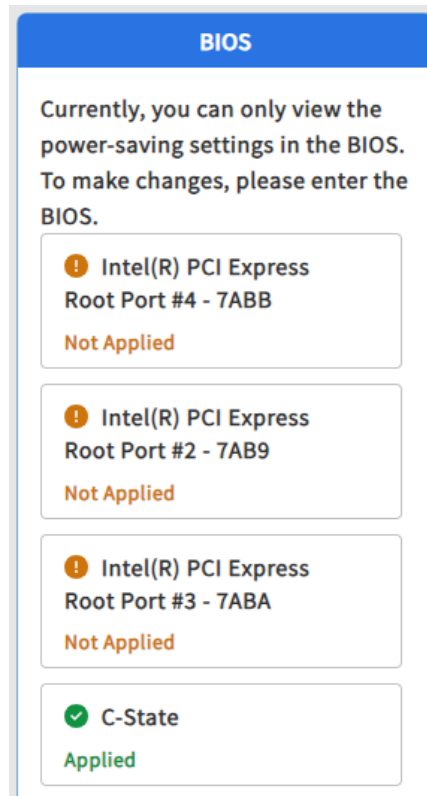
Note: only specific Intel CPUs are supported at this time. Not available for all platforms/products.

➢ Energy Recommendations

■ Click "**Apply All**" button to automatically apply recommended values to all items.

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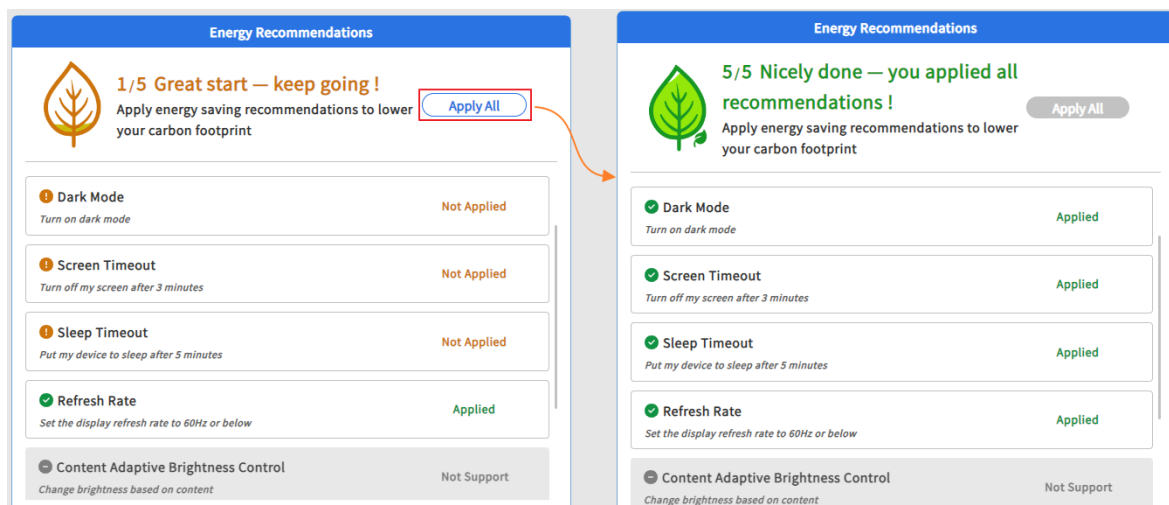
6. APPENDIX

6.1 APPENDIX 1

6.1.1Windows 10 IoT Enterprise LTSC 2019

- ➢ First partition needs to be the "Recovery" partition.
- ➢ Second partition needs to be the "System" partition (EFI System Partition).
- ➢ Third partition needs to be the "Reserved" partition. This partition is not shown in Disk Management.
- ➢ The "Primary" partitions start at the fourth partition. "Primary" partitions are Windows partition and other data partitions.
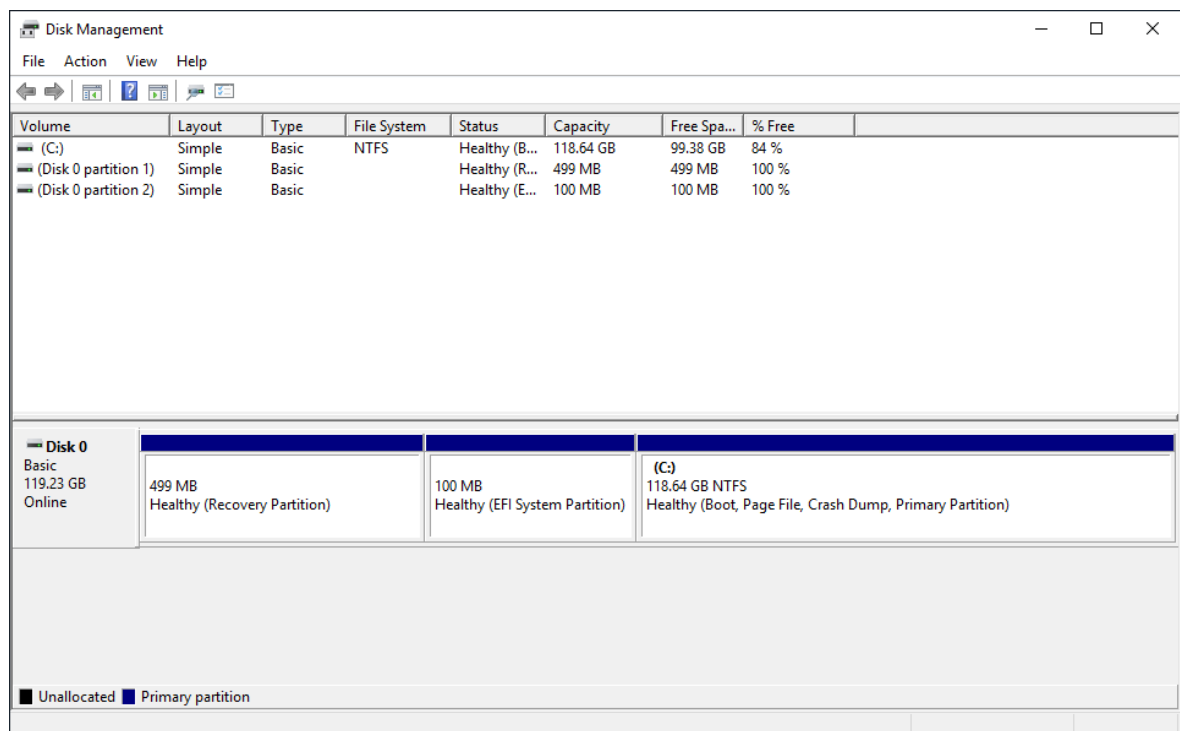
The suggested partition layout schematic is as below.

Less Offset   More Offset

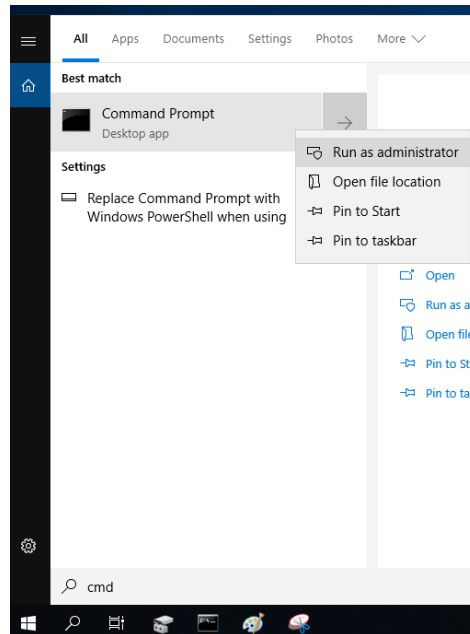| Recovery | System | Reserved | Primary | Primary | Primary | ... | Primary |

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The partition status can be checked using Disk Management. Right-click on the start button, then click Disk Management.

The suggested partition layout might appear as below.

Embedded IoT SW
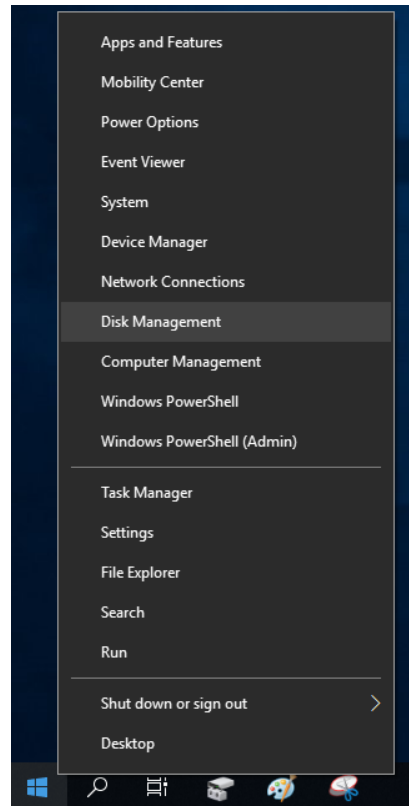
The partition layout can also be checked using diskpart. Search for "cmd" in the Start menu, then right-click "Command Prompt". Left-click "**Run as administrator**".

Type "diskpart" then press "Enter". After starting diskpart, use the commands "list disk", "select disk", and "list part" to check the partition layout. The suggested partition layout might appear as below.

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➢   The last partition needs enough free space to shrink.

ADV Image Manager will use the last partition to create the "ADV Backup" partition. Make sure the last partition can shrink to provide space as large as the used space on drive C.
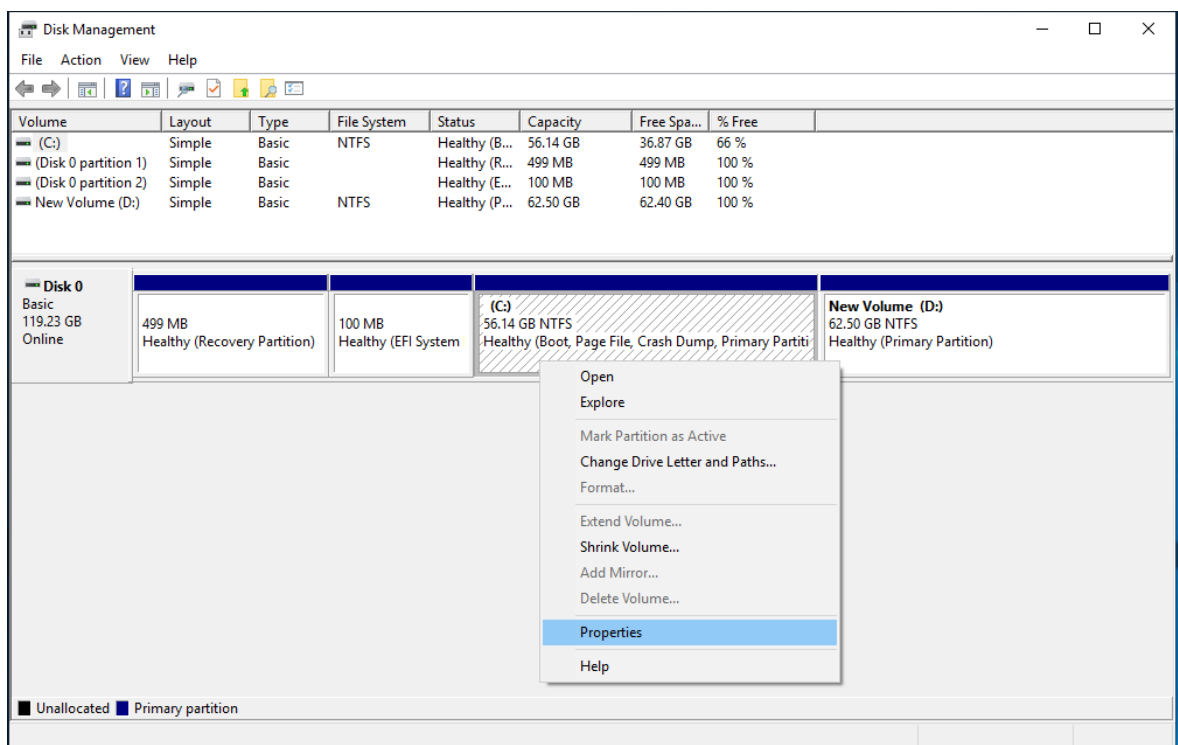
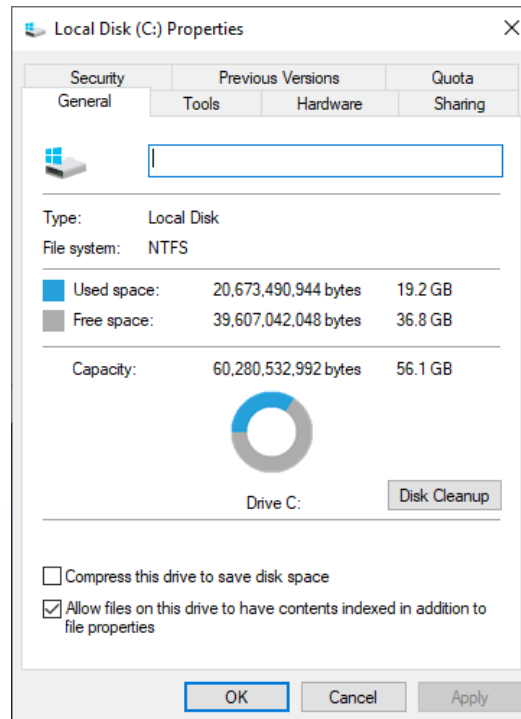The last "Primary" partition is shown below in the red frame.

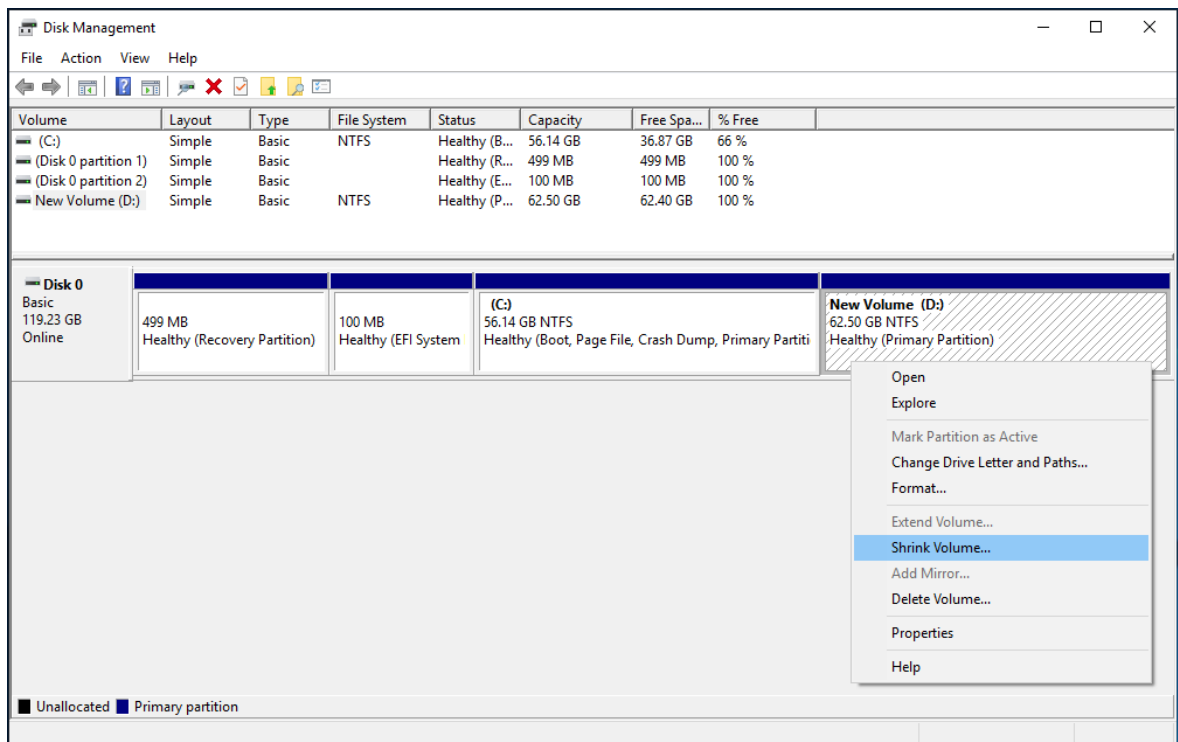Less Offset   More Offset

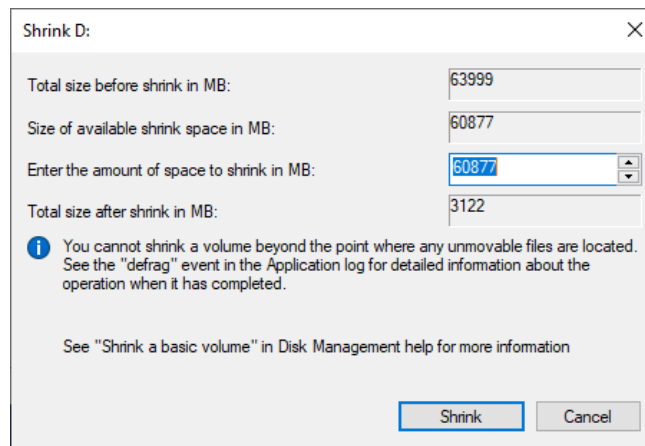| Recovery | System | Reserved | Primary | Primary | Primary | ... | Primary |

The used space on C: can be checked by "**Properties**". Right-click on the C:\ partition and select "**Properties**".

Embedded IoT SW
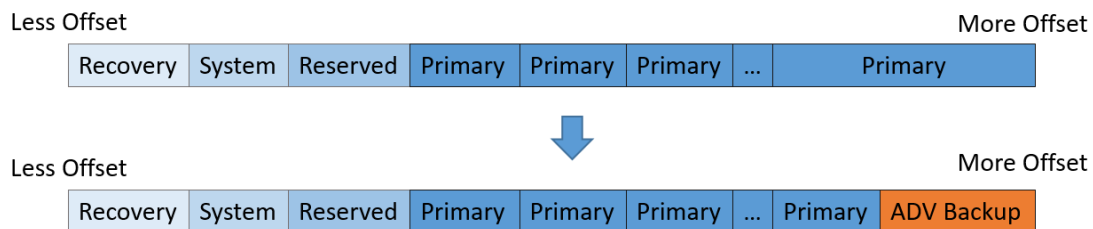
The maximum shrink space can be checked by "**Shrink Volume**". Right-click on the last partition and select "**Shrink Volume**".
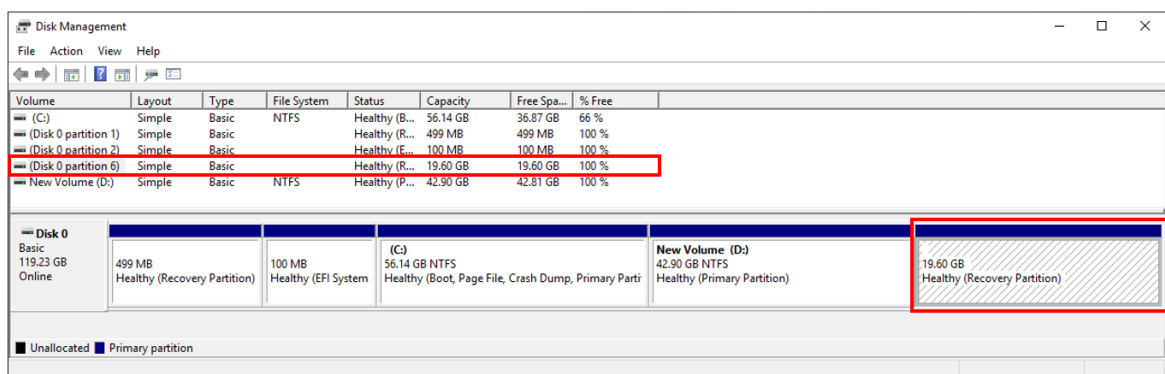
Embedded IoT SW

"ADV Backup" partition will be created as shown in the schematic below.


For example, "ADV Backup" partition is shown below in the red frame. Please do not modify this partition.

Embedded IoT SW

6.1.2Windows 10 IoT Enterprise LTSC 2021

➢ Windows 10 IoT Enterprise LTSC 2021 and Windows 11 IoT Enterprise LTSC 24H2 follow this section.

➢ First partition needs to be the "System" partition (EFI System Partition).

➢ Second partition needs to be the "Reserved" partition. This partition is not shown in Disk Management.

➢ The "Primary" partitions are between the second partition and the last partition. "Primary" partitions are Windows partition and other data partitions.

➢ The last partition needs to be the "Recovery" partition.

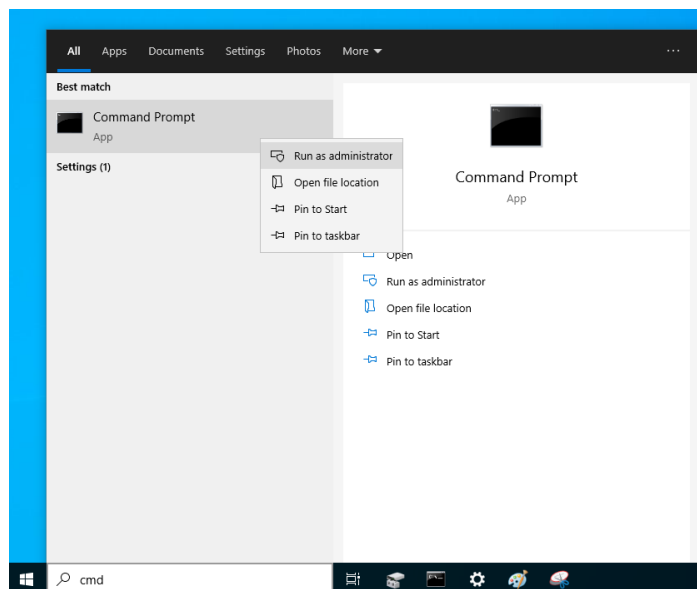The suggestion partition layout schematic is as below.
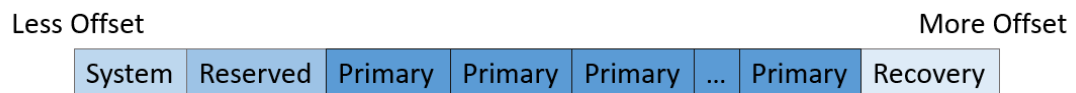
Less Offset   More Offset

| System | Reserved | Primary | Primary | Primary | … | Primary | Recovery |

The partition status can be checked using Disk Management. Right-click on the Start button, then click Disk Management.

Embedded IoT SW
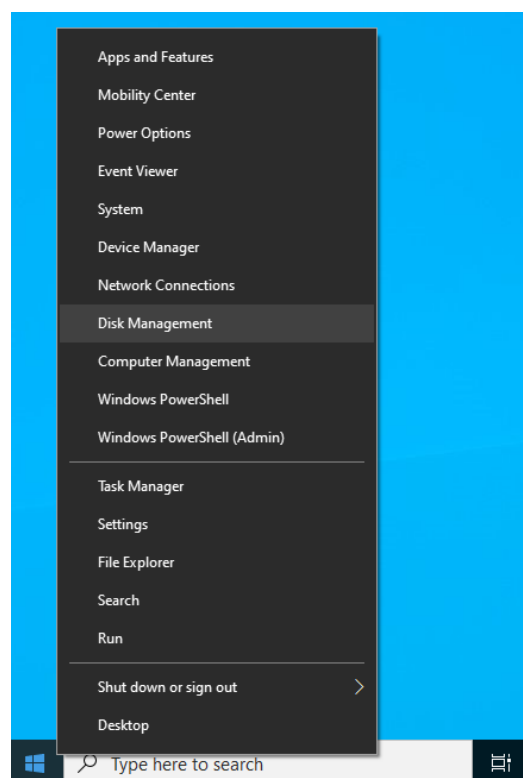
The suggested partition layout might appear as below.
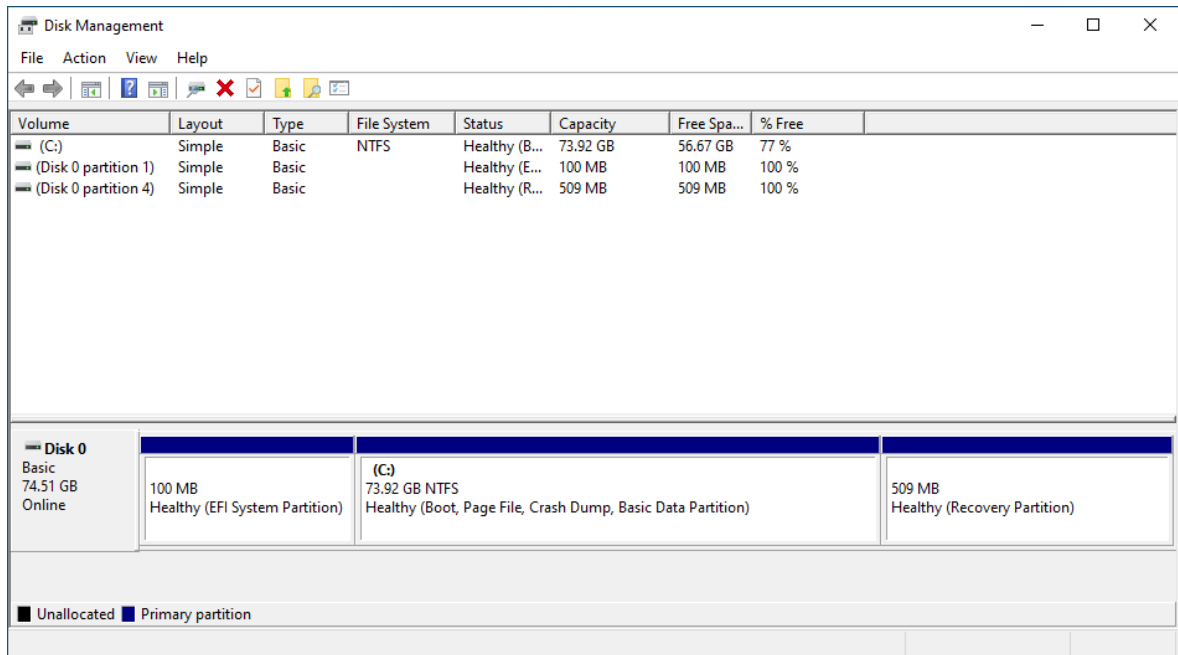
The partition layout can also be checked using diskpart. Search the "cmd" in the Start menu, then right-click "Command Prompt". Left-click "**Run as administrator**".

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Type "diskpart" then press "Enter". After starting diskpart, use the commands "list disk", "select disk", and "list part" to check the partition layout. The suggested partition layout might appear as below.
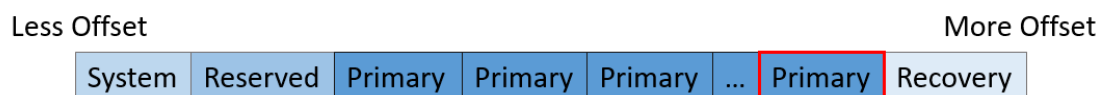

➢   The last "Primary" partition needs enough free space to shrink.

ADV Image Manager will use the last "Primary" partition to create the "ADV Backup" partition. Make sure the last "Primary" partition can shrink to provide space as large as the used space on drive C.

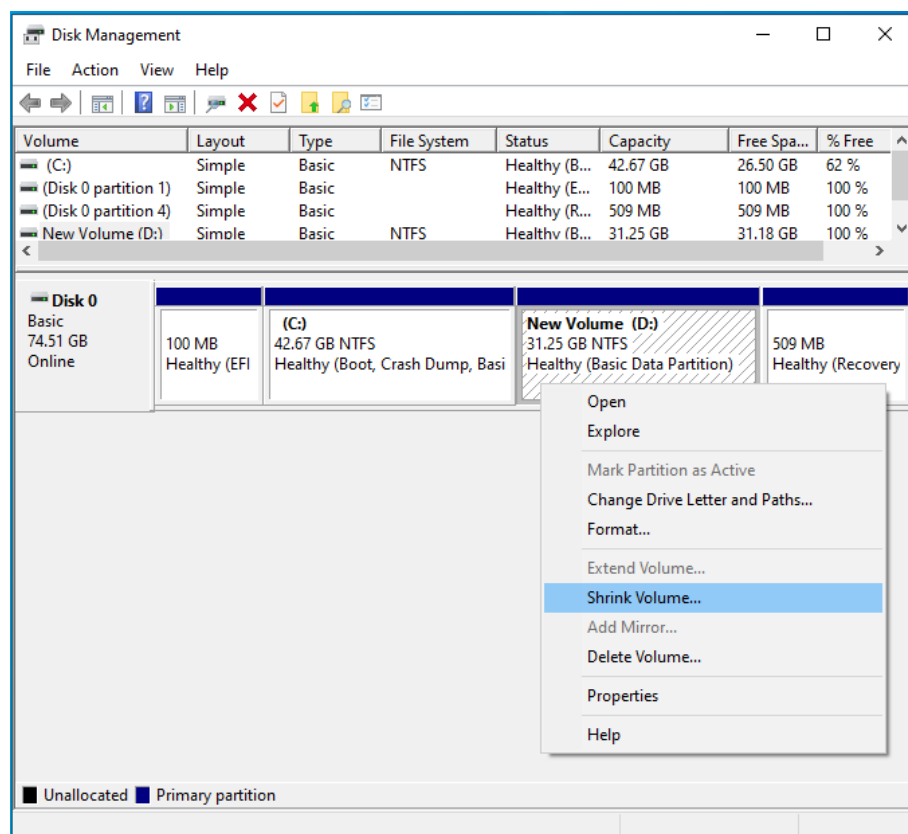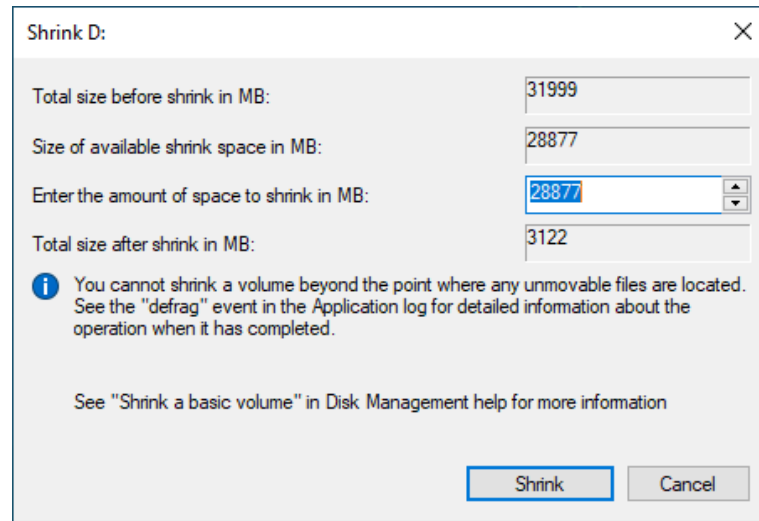The last "Primary" partition is shown below in the red frame.

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The used space on C: can be checked by "**Properties**". Right-click on the C:\ partition and select "**Properties**".
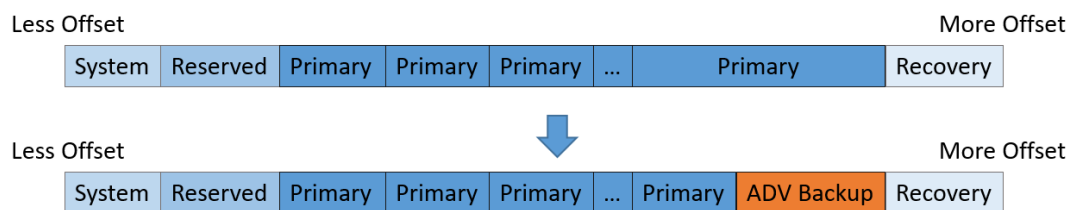
Embedded IoT SW
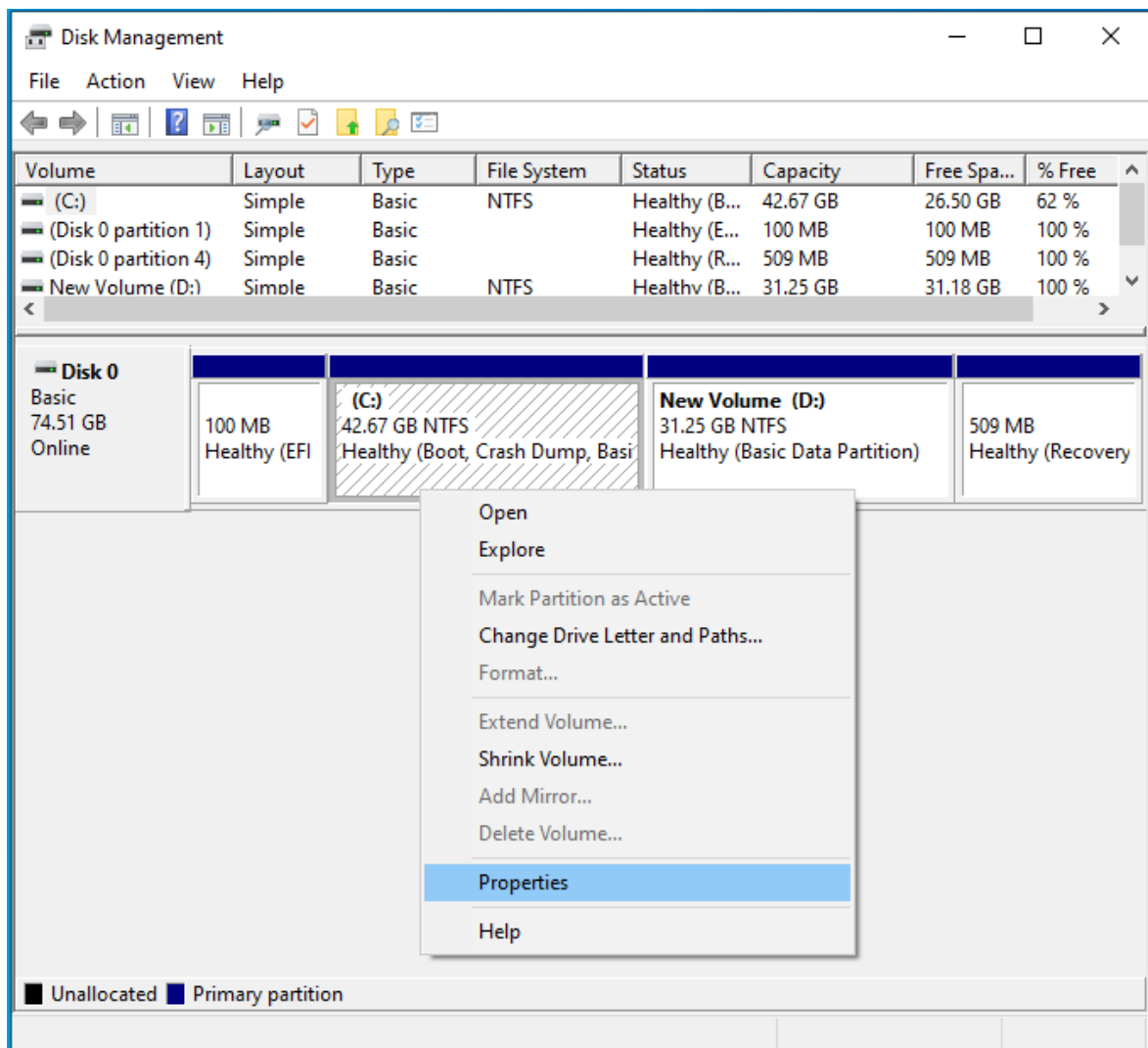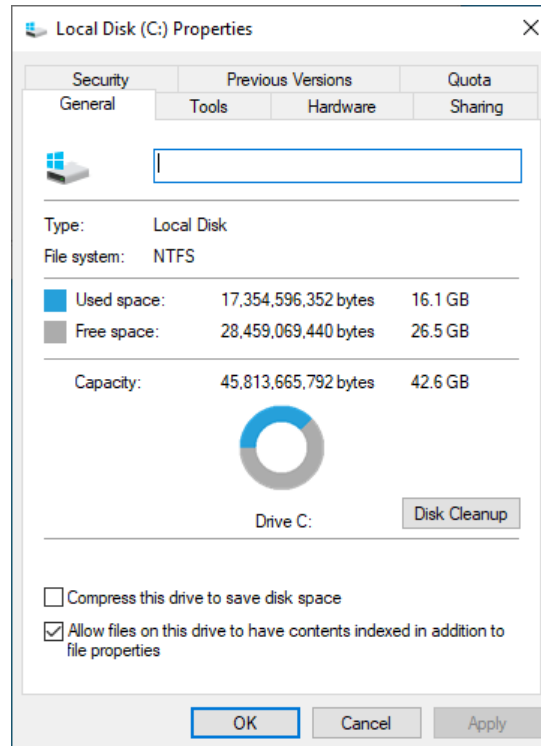
The maximum shrink space can be checked by "**Shrink Volume**". Right-click on the last "Primary" partition and select "**Shrink Volume**".
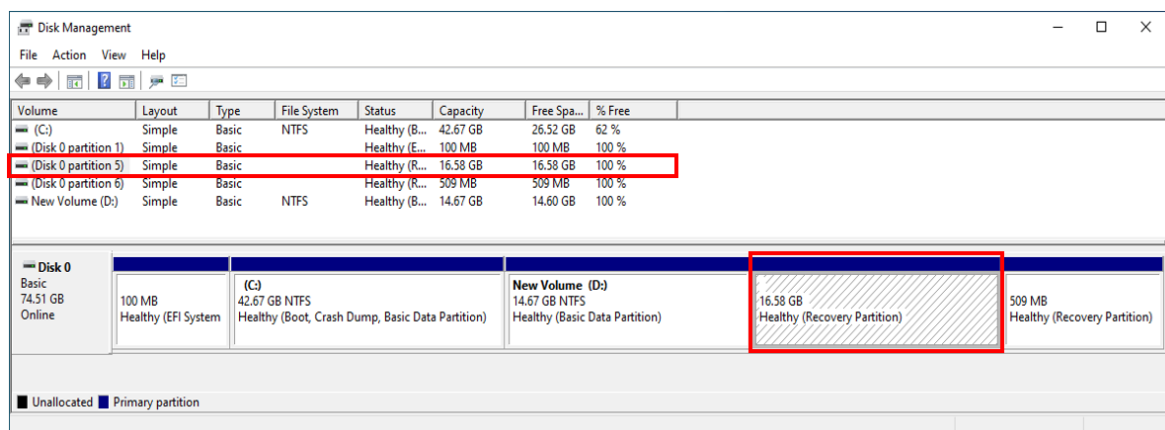
Embedded IoT SW

"ADV Backup" partition will be created as shown in the schematic below.

For example, "ADV Backup" partition is shown below in the red frame. Please do not modify this partition.
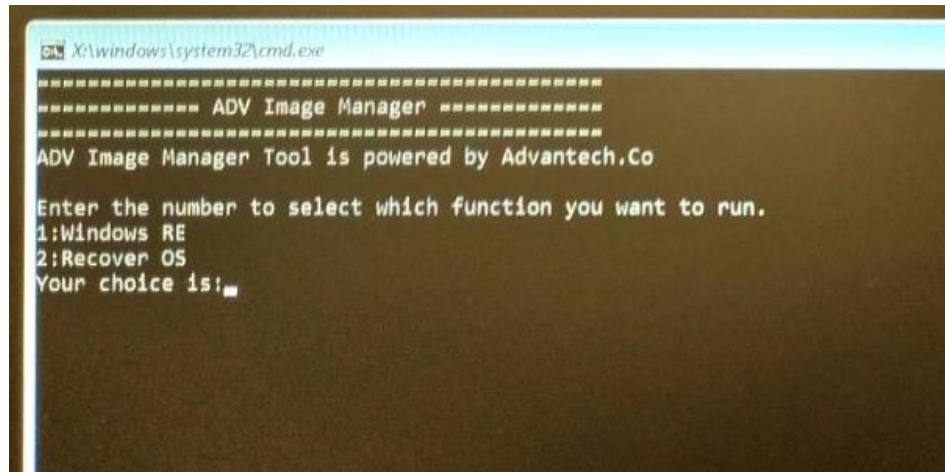
Embedded IoT SW
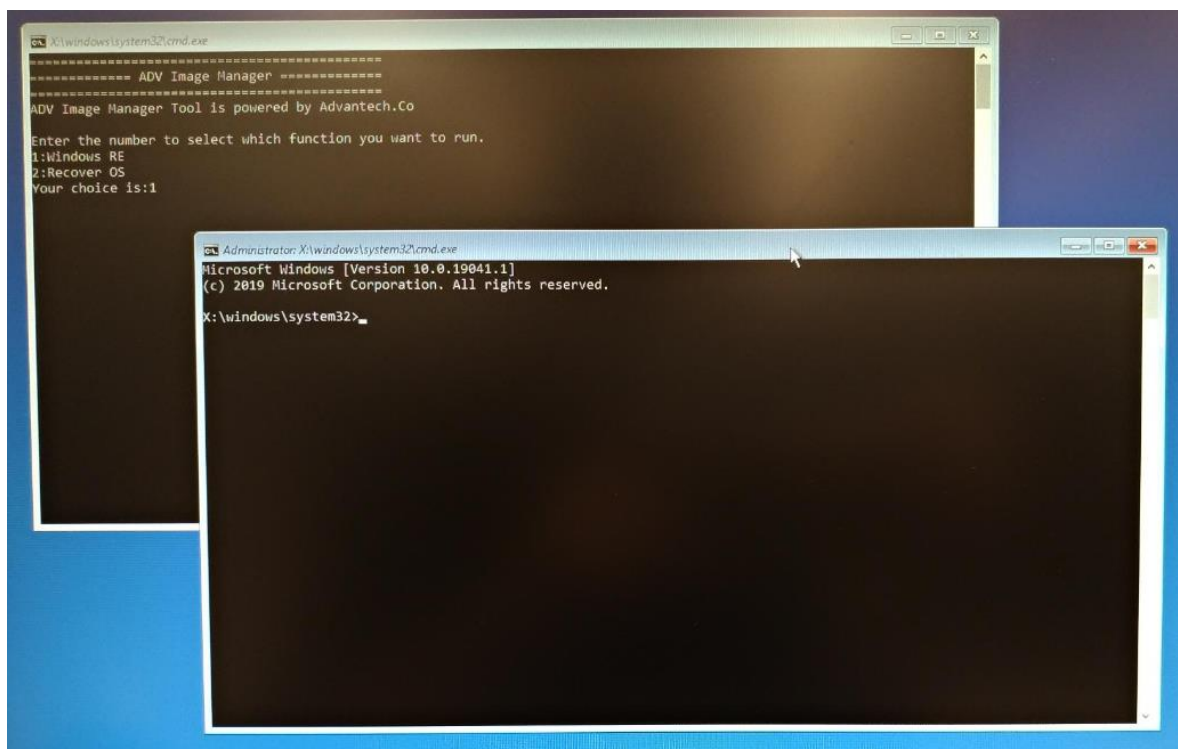
6.2 APPENDIX 2

Other WinRE Functions

After entering WinRE, the command prompt shows function menu.

Type "1" then press "Enter" to select the Windows RE function.

After that, the WinRE function will start up as shown below.

Please keep the ADV Image Manager command prompt window running in the background and don't close it.

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6.3 APPENDIX 3

Change History

Version	Change content	Status
V2.0.8	Initial version	Released

Embedded IoT SW