Installing Windows 10X (from cabs) on real hardware

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Supported Windows 10X Version:	20279

Disclaimer: Some drivers may fail to load, the guide will be updated with extra tips on extending driver compatibility later

Overview

Here's some quick notes on installing Windows 10X on real hardware from cabs. For this example, we're assuming a system with *no* other critical disks installed, and a helpful host system being around to set up the initial image.

This guide has been created for the 20279 version of Windows 10X.

Prerequisites

Host

- Windows 10 Iron or Cobalt (20279 or 21xxx+) - though 20H2 can also work just fine
- Utility USB flash drive of ~8GB+

Target

- Graphics card with DCHU drivers available
- UEFI system firmware with the ability to **disable Secure Boot**

- Boot drive larger than 100 GiB
- Learn how to disable Secure Boot in your device, and change its boot order to allow booting from the USB Flash Drive

Peripherals

Note: If your device doesn't have a built-in Ethernet adapter, prepare an external Ethernet adapter (USB/USB-C/USB-C Hub with Ethernet). You **won't be able to pass through the OOBE without internet connection**.

Common: Files & Tools

Workspace

1. Create a folder called 10X in the root of your drive, e.g, `C:\10X`
2. Create a subfolder called `Sources`
3. Create a subfolder called `DCHUDrivers`
4. Use v0.3.0.0. release of the Gus's UUPMediaCreator(https://github.com/gus33000/UUPMediaCreator)) to download bits by typing this command in the Command Prompt (where `dlfolder` is the place to put downloaded bits, e.g., `C:\10X\dlfolder`, and `amd64` specifies the architecture; you can specify `arm64` for ARM64 build of Windows 10X):

```
uupdownload -o dlfolder -s Lite -t amd64 -r External -b Dev -a CB -c fe_release_10x -v 10.0.20279.1002
```

Note: you can use `-z Test` param to download **Test** build of Windows 10X which includes non-production components.

5. Put them into `Sources` folder (e.g., `C:\10X\Sources`)
6. Make sure that bits are in `Sources` folder directly (`\10X\Sources\*compdb*.cab` should be at this level)
7. Download `overlay.zip` from Rafael
8. Unpack it to your `Sources` folder (e.g., `C:\10X\Sources`)
9. Open command line in the `Sources` folder and run `fixup.cmd` in it
10. Copy the appx folder from it to the root of your packages folder (`C:\10X\Sources`)
11. Move `FM` folder from `\10X\Sources` to `\10X`
12. Move `OEMInput.xml` from `\10X\Sources` to `\10X`
13. Your resulting folder structure should look like this:

```
(disk root)
|
-----10X
    |
    ------DCHUDrivers
    ------FM
    ------Sources
        |
        -----appx (includes folders for each AppX)
        -----Retail
            |
            -----%Architecture_Name% (e.g., AMD64)
                |
                -----fre (includes the rest of the cabs)
        -----(several top-most cabs with compdb in the name, and .uupmcreplay file)
    ------OEMInput.xml
```

Install Tools

Note: Both ADK and WinPE should have the same or higher version as your Windows 10X Image.

1. [Optional] If you have previous kits (e.g., WP8 Tools), remove them
2. Download the ADK Insider Preview ISO for your host OS version (only tested with `Windows_InsiderPreview_ADK_en-us_20279.iso`)
3. Install **Deployment Tools**, **ICD**, **Configuration Designer**, and uncheck the rest if possible/as needed
4. Download the Windows Preinstallation Environment ISO for your host OS version (only tested with 20279 version)
5. Install **Windows Preinstallation Environment**

Configure Your BSP

Board Support Packages (BSP) is a collection of drivers/settings required to run Windows 10X on a hardware platform. The BSP also includes a set of device drivers that are specific to the components/silicon used in the device, mostly in the form of .inf files and their associated .sys/.dll files.

You will need a BSP for your device if you want it to use all of its devices (WiFi, Cameras, etc.).

To configure your BSP, you need to obtain DCH (Universal) Drivers for your device, and then prepare the `OEMDriversFM.xml` feature manifest XML file with the links to your drivers.

Prepare DCHU Drivers for Your Hardware

1. Obtain DCHU Drivers for your hardware (especially GPU)
2. Find all infs that contain "firmware update" in them and remove them
3. Copy all remaining drivers to your `DCHUDrivers` subfolder (`\10X\DCHUDrivers`)

Form A BSP for Your Hardware

1. Use `OEMDriversFM.xml` example from Albacore

```
<?xml version="1.0" encoding="utf-8"?>
<FeatureManifest Revision="1" SchemaVersion="1.2" xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns="http://schemas.microsoft.com/embedded/2004/10/ImageUpdate">
  <Drivers>
    <BaseDriverPackages>
      <DriverPackageFile Path="C:\10X\DCHUDrivers\WcosGraphicsDriver.Intel\bin\Drivers\iigd_oc"
Name="iigd_dc_base.inf"/>
    </BaseDriverPackages>
  </Drivers>
</FeatureManifest>
```

2. For each of your drivers put a link to it in the form like one above.

Configure Your Image

1. Edit `OEMInput.xml` (remove VM_*, uncomment UEFI_Hardware line, add/remove features etc.)
2. Add a link to your BSP (`OEMDriversFM.xml`) to your `OEMInput.xml` like this:

```
<?xml version="1.0" encoding="utf-8"?>
<OEMInput xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns="http://schemas.microsoft.com/embedded/2019/06/ImageUpdate">
  <Description></Description>
  <DeviceLayoutType>GPT_SPACES_512</DeviceLayoutType>
  <SV>Microsoft</SV>
  <Device>GenericUEFIDevice</Device>
```

```
  <ReleaseType>Test</ReleaseType>
  <BuildType>fre</BuildType>
  <Languages>
    <Language Default="true">en-us</Language>
  </Languages>
  <AdditionalFMs>
   <!--Windows 10X Feature Manifests-->
   <AdditionalFM>c:\10X\FM\WindowsCoreProductionFM.xml</AdditionalFM>
   <!-- Your BSMBSP -->
   <AdditionalFM>c:\10X\OEMDriversFM.xml</AdditionalFM>
  </AdditionalFMs>
</OEMInput>
```

Build Your Image

1. Prepare your environment:

Start > open **elevated** ***Deployment and Imaging Tools Environment**

2. In that window, type this (where `C:\` is the drive where your Windows 10 Insider Preview ADK is installed):

```
C:\> cd c:\Program Files (x86)\Windows Kits\10\Tools\bin\i386
```

3. Run this command to unregister the imaging toolchain overrides *(unless you use a non-production machine)*:

```
C:\> "%ProgramFiles(x86)%\Windows Kits\10\Assessment and Deployment Kit\Deployment Tools\%PROCESSOR_ARCHITECTURE%\DISM\wimmountadksetup%PROCESSOR_ARCHITECTURE%.exe" /q /uninstall
```

4. Run `IMGGEN` in your Command Prompt window (give a name to your ffu, e.g., `SurfaceGo.ffu` if your device is Surface Go). ***Important***: Use **absolute paths** both in files (`OEMInput.xml` & `OEMDriversFM.xml`) **AND** in the command line:

```
C:\> imggen c:\10X\SurfaceGo.ffu C:\10X\OEMInput.xml C:\10X\Sources AMD64
```

Prepare USB Drive for Flashing

Note: You can follow Microsoft docs (Part I: Create Multipartition USB Drive, Part II: Install WinPE), or you can follow these instructions (taken from the docs):

1. Get an empty Flash drive (with size at least 8GB)
2. In the same **Deployment and Imaging Tools Environment**'s elevated **Command Prompt window** open **diskpart** and press `Enter`
3. Follow these instructions to create two disks:

```
List disk
select disk X (where X is your USB drive)
clean
create partition primary size=2048
active
format fs=FAT32 quick label="WinPE"
assign letter=P
create partition primary
format fs=NTFS quick label="Images"
assign letter=I
exit
```

4. Create Working WinPE files by using this command (where `C:\WinPE_amd64` is the location of your choice):

```
copype amd64 C:\WinPE_amd64
```

5. Create bootable media with it (where `P:` is the letter of the FAT32 partition of your USB Flash drive):

```
MakeWinPEMedia /UFD C:\WinPE_amd64 P:
```

6. Copy your Image (`.ffu` file) to the `I:` drive (the second partition of your Flash drive formatted with NTFS)
7. Download and add `gdisk64.exe` file to the root of your WinPE partition (`P:` in this example)

Apply Your Image

Apply Your Image on Machine Without Windows 10X Installed On It

1. Boot from WinPE drive
2. Open **diskpart**

3. Type this:

```
list disk
```

Take a note of the name of your device's main disk drive, e.g., `disk 0` 4. Type **exit** to leave **diskpart** 5. Use this command (and specify the correct path to the ffu that you created above, as well the id of your physical drive):

```
dism /apply-ffu /imagefile:C:\YourDevice.ffu /applydrive:\\.\physicaldrive0
```

6. Once complete, remove your USB flash drive
7. Type **exit** in the **Command Prompt window**

Apply Your Image on Machine With Windows 10X Installed On It

1. Boot from WinPE drive
2. Type **notepad** to open notepad
3. Use `File-->Open` to find the name of your WinPE disk
4. Type this to identify the id of your physical drive:

```
spaceutil get-drive -poolname ospool
```

5. Type this (where `D:\` is the name of your WinPE disk and `0` in the end of `physicaldrive0` is the id of your physical drive):

```
cd D:\
gdisk64 -l \\.\physicaldrive0
```

6. Make sure that it contains OSPool and other partitions of Windows 10X
7. Type this to clean up the drive (where `0` in the end of `physicaldrive0` is the id of your physical drive):

```
gdisk64 \\.\physicaldrive0
o
w
```

and press `Enter`

8. Use this command (and specify the correct path to the ffu that you created above, as well the id of your physical drive):

```
dism /apply-ffu /imagefile:C:\YourDevice.ffu /applydrive:\\.\physicaldrive0
```

9. Once complete, remove your USB flash drive
10. Type **exit** in the **Command Prompt window**

Load Windows 10X

At this time, your Windows 10X will boot. If everything is correct you should see the OOBE.

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