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# Building with the EWDK

Please read these notes carefully, they contain important information about the lab exercises.

- In the lab exercises for this course, you will develop Windows kernel drivers using the Enterprise WDK (EWDK) or Visual Studio 2019 and the WDK.
- You will run and test these drivers in the guest VM system with kernel debugging enabled.

## EWDK Build Command Prompt

Each lab involves the following steps. Some of these steps are unnecessary if you are using Visual Studio and WDK instead of EWDK:

- Start a non-admin command prompt
- Setup the EWDK build environment by running the following command in the command prompt `c:\ewdk\LaunchBuildEnv.cmd`
- Change to the directory that contains the .SLN and .VCXPROJ files.

## Automation Scripts

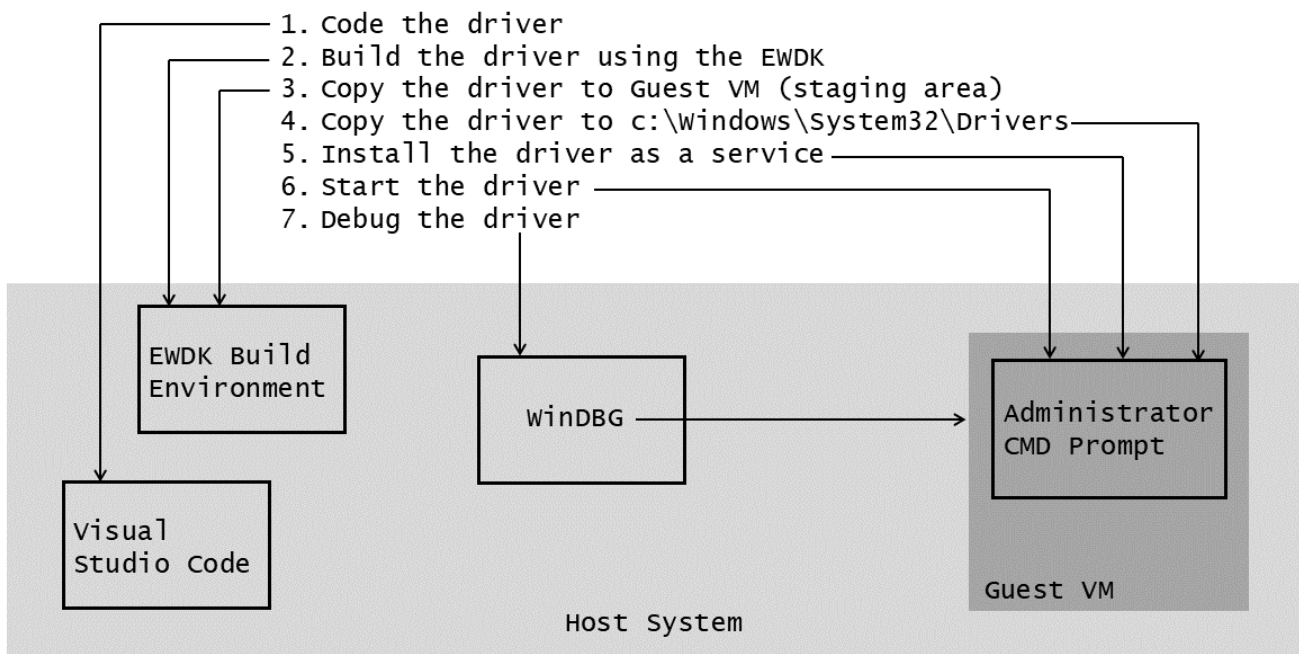
Most of the steps mentioned in the next section are available in batch files in the `c:\cm\script` directory on the host and the `c:\pub\script` directory on the guest VM.

## Troubleshooting tips

- If the driver debug output does not show up in the debugger, check if the “Debug Print Filter” is setup properly.
- If the driver fails to load due to driver signature enforcement failure, check if WinDBG is connected to the Guest VM.

## Steps

The illustration below shows the steps that must be performed for every lab and where they must be performed. Details of each step follow:



1. On the host, code the driver in Visual Studio Code or your favorite editor.
2. On the host, build the driver by typing in the following command in the directory containing the .SLN and the .VCXPROJ files in the command prompt with the EWDK environment setup:  
`msbuild /p:configuration=debug /p:platform=x64 /p:targetversion=windows10`  
This command is also available on the host in `c:\cm\script\module_build.cmd`.
3. On the host, copy the driver binary from the build output to the target VM's staging directory i.e., `\\winlabvm\pub` by running the command  
`c:\cm\script\module_stage.cmd \\winlabvm\pub`.
4. In the VM, in an Admin command prompt, copy the driver binary from the staging directory to the `c:\windows\system32\drivers` directory by running the command  
`driver_copy.cmd <DriverNameWithout.SYSExtension>`.
5. In the VM, in an Admin command prompt, install the driver as a service by running the command  
`driver_install.cmd <DriverNameWithout.SYSExtension>`.
6. In the VM, in an Admin command prompt, start the driver as a service by running the command  
`driver_start.cmd <DriverNameWithout.SYSExtension>`.
7. Break into the Guest VM (in WinDBG select Home -> Break) and run any required command and then resume the VM by typing in the "g" command in WinDBG.

To stop the driver, in the VM, in an Admin command prompt, run the command  
`driver_stop.cmd <DriverNameWithout.SYSExtension>`.