

UEFI & EDK II Training

PLATFORM BUILD LAB – NT32

tianocore.org



PLATFORM BUILD LABS

Lab Setup and Build for Nt32

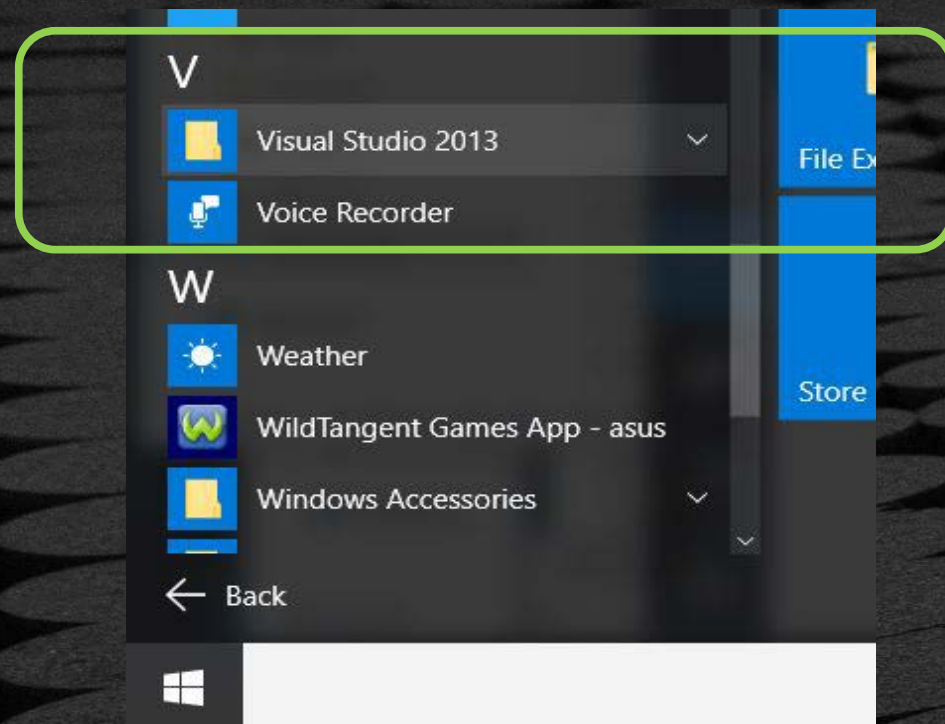
- ✳ Pin Visual Studio Command Prompt to Windows Task Bar
- ✳ Build a EDK II Platform using Nt32 package

PIN VS COMMAND PROMPT

Pin the Visual Studio Command prompt to
Windows Task Bar



Windows 10

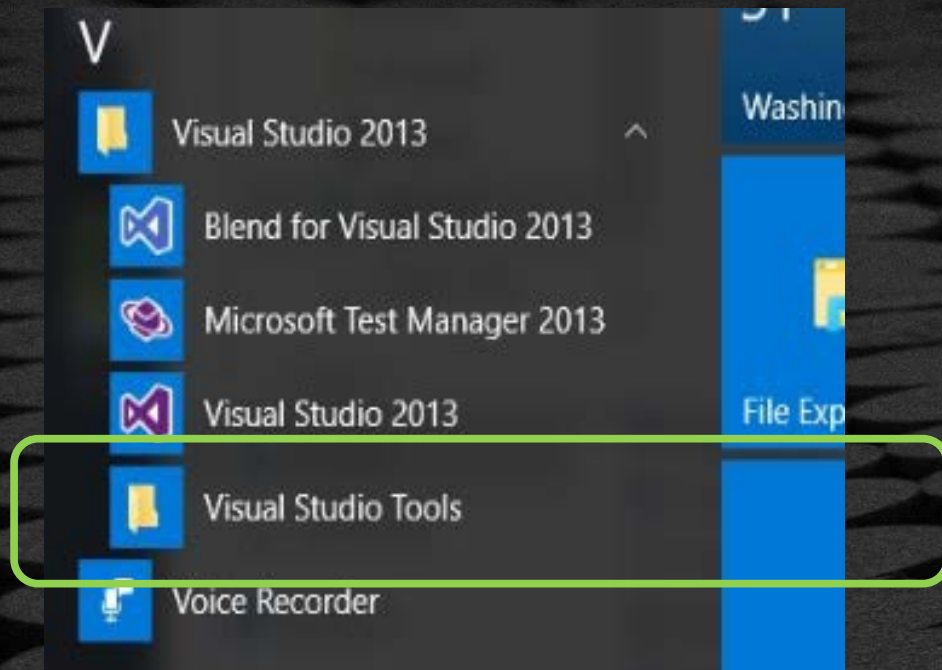


Steps to Pin Visual Studio Command Prompt to task bar for Windows 10

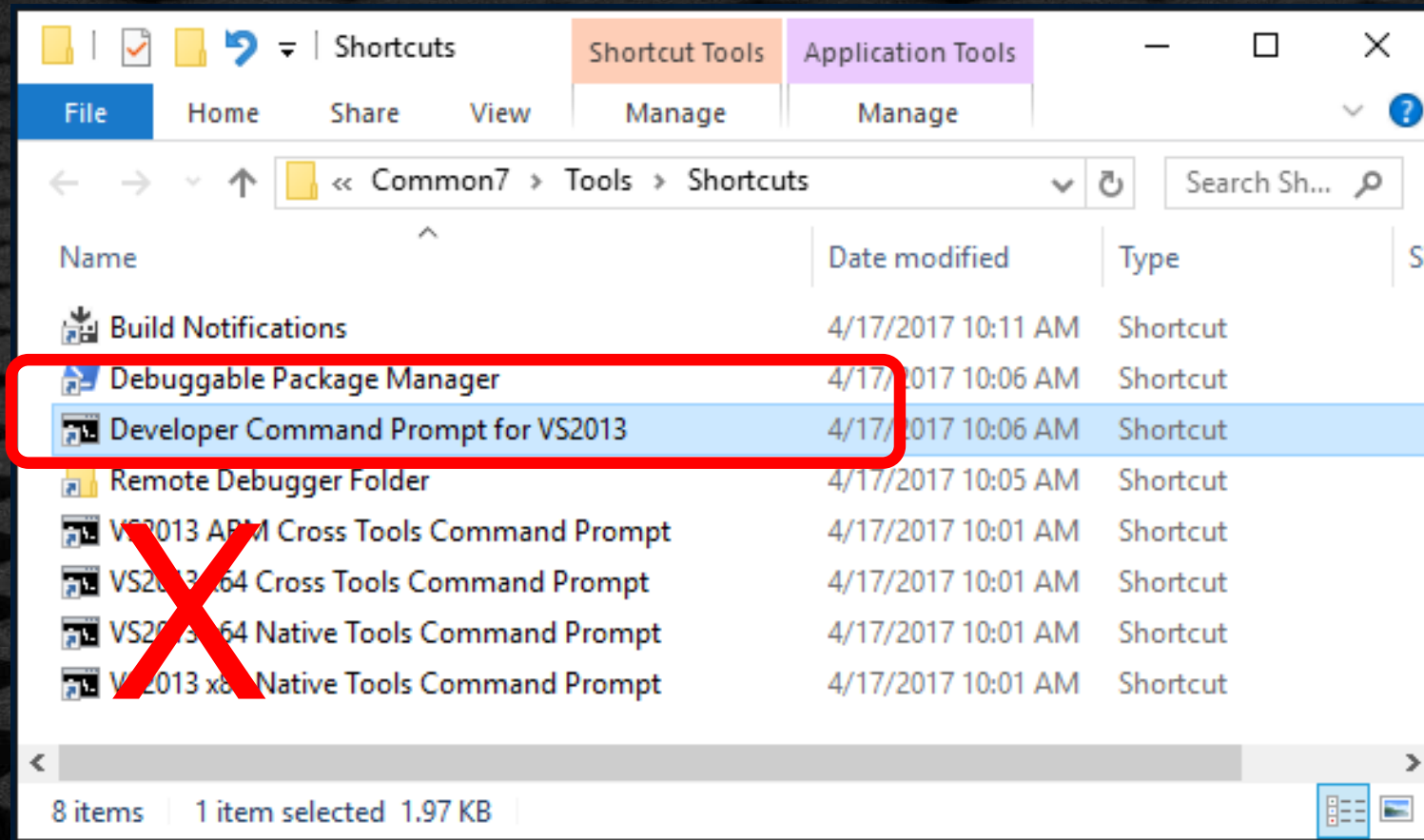
1. Using the Start menu in Windows 10, Left Click on “Windows Key” Lower Left 
2. Scroll down from the scroll bar on the right until “**Visual Studio 201ⁿ**”
3. Left Click “**Visual Studio 201ⁿ**”

4. Left Click “Visual Studio Tools”

This will open another Windows file explorer window



PIN VS COMMAND PROMPT

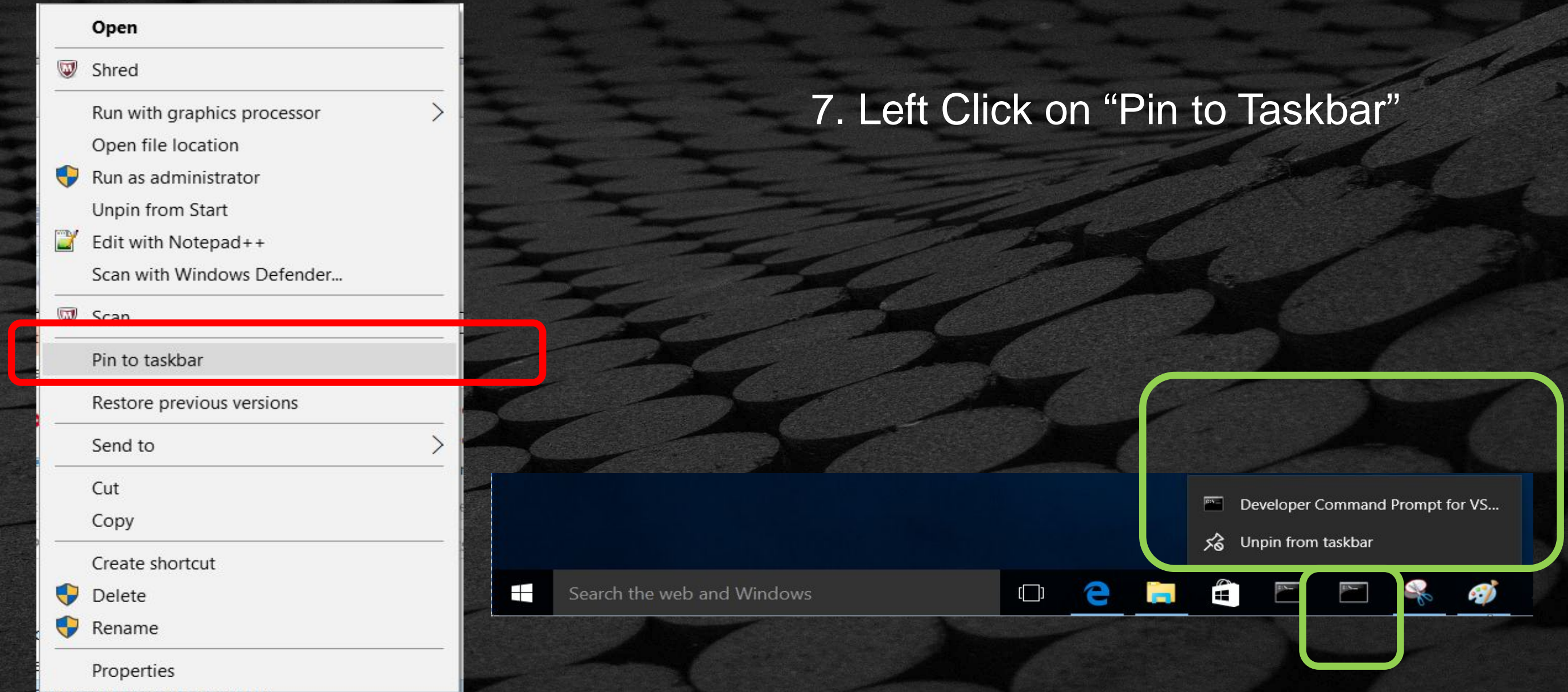


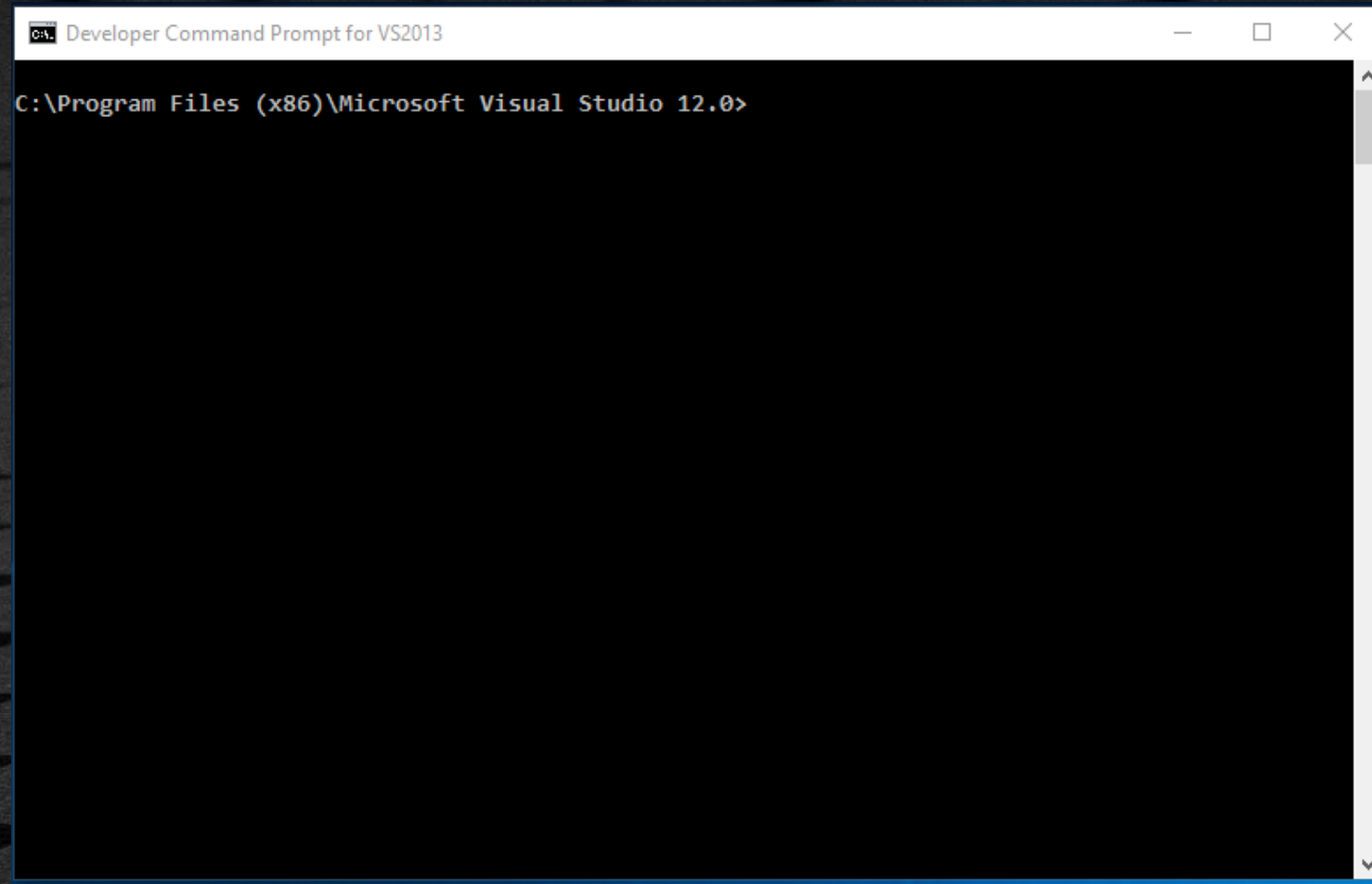
5. Select “Developer Command Prompt for VS201n”

6. Right Click to open Windows dialog box

**Do not use any of the other
“.. Command Prompts”**

7. Left Click on “Pin to Taskbar”





8. Open VS Command Prompt”

All Windows Labs use this short-cut to Build Edk II platforms and projects using Windows Visual Studio :
2010 / 2012 / 2013 / 2015 or 2017

END OF PIN VS PROMPT

LAB 1: BUILD NT32PKG

Setup Nt32Pkg to build and run NT32
emulation with Windows

DOWN LOAD THE EDK II SOURCE - OPTIONAL

OPTIONAL - Open a “git” command prompt and create a source working directory

```
C:\>mkdir WS  
C:\> cd WS
```

OPTIONAL - Internet Proxies – (company Firewall used for example)

```
C:\WS> git config --global https.proxy <proxyname>.domain.com:<port>  
C:\WS> git config --global http.proxy <proxyname>.domain.com:<port>
```

OPTIONAL - Download edk2 source tree using Git command prompt

```
C:\WS> git clone https://github.com/tianocore/edk2.git  
C:\WS> git clone https://github.com/tianocore/edk2-BaseTools-win32.git
```

OPTIONAL - Build the tools


```
C:\WS> set EDK_TOOLS_BIN=c:\WS\edk2-BaseTools-win32
```

NOTE: Lab Material will have a different “edk2”

SETUP LAB MATERIAL

Lab_Material_FW.zip

DOWN LOAD LAB MATERIAL

Download the Lab_Material_FW.zip from :  [github.com](https://github.com/Laurie0131/Lab_Material_FW.git)
Lab_Material_FW.zip

OR

Use git clone to download the Lab_Material_FW

```
C:\> git clone https://github.com/Laurie0131/Lab_Material_FW.git
```

Directory Lab_Material_FW will be created

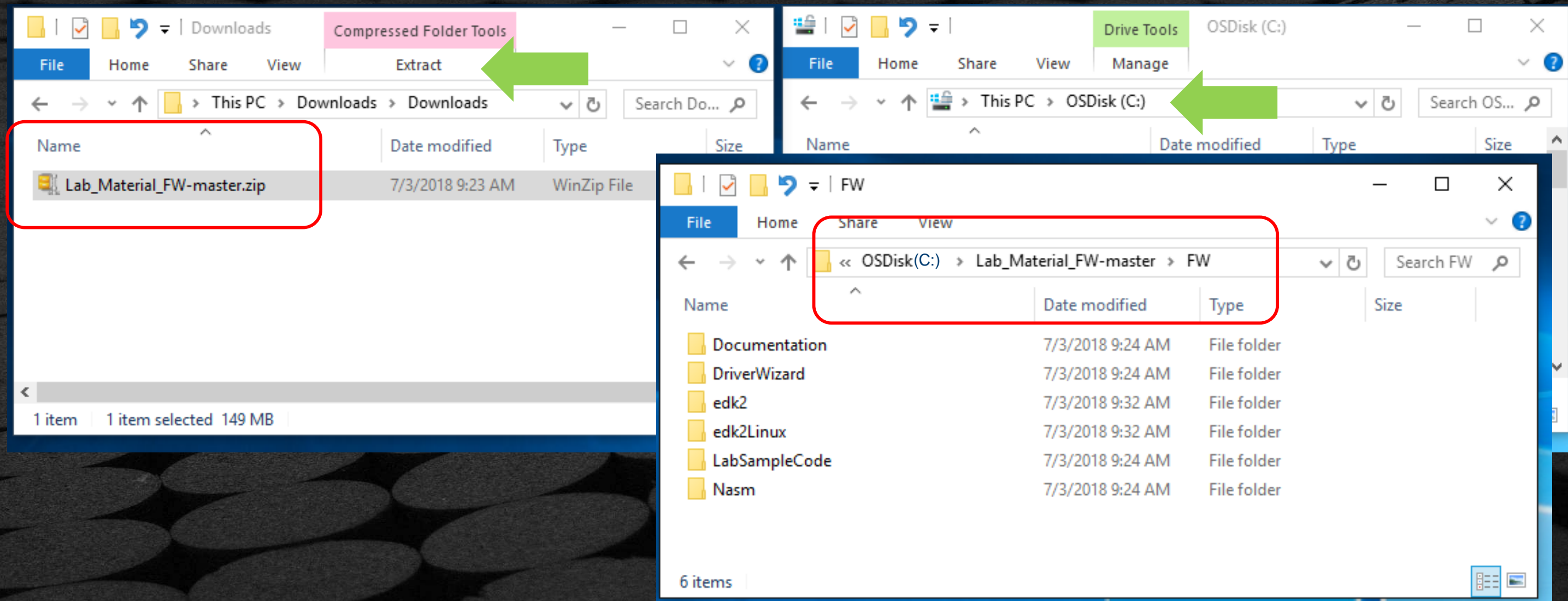
FW

- Documentation
- DriverWizard
- edk2
- edk2Linux
- LabSampleCode
- Nasm

BUILD EDK II NT32

-Extract the Source

1. Extract the Downloaded `Lab_Material_FW-master.zip` to `C:\`



The screenshot illustrates the process of extracting the `Lab_Material_FW-master.zip` file. It consists of two overlapping File Explorer windows.

Left Window (Downloads):

- Path: `This PC > Downloads > Downloads`
- Tab: `Compressed Folder Tools`
- File: `Lab_Material_FW-master.zip` (149 MB, WinZip File)


Right Window (OSDisk (C:)):

- Path: `This PC > OSDisk (C:) > Lab_Material_FW-master > FW`
- Tab: `Drive Tools`
- Contents:

Name	Date modified	Type	Size
Documentation	7/3/2018 9:24 AM	File folder	
DriverWizard	7/3/2018 9:24 AM	File folder	
edk2	7/3/2018 9:32 AM	File folder	
edk2Linux	7/3/2018 9:32 AM	File folder	
LabSampleCode	7/3/2018 9:24 AM	File folder	
Nasm	7/3/2018 9:24 AM	File folder	

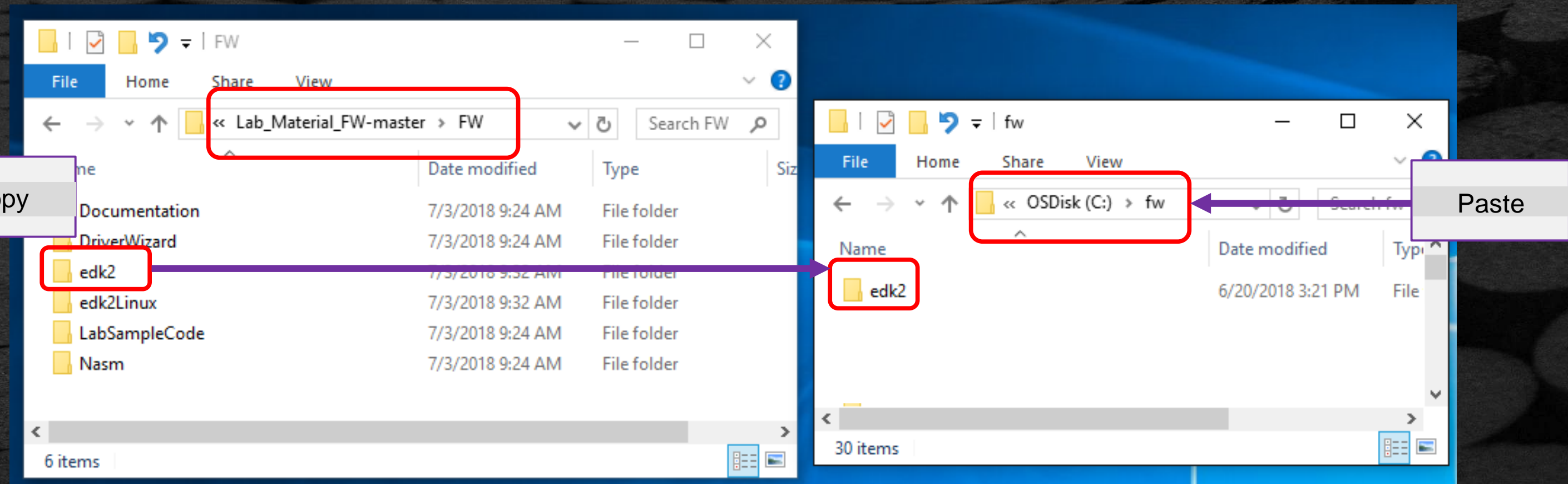
BUILD EDK II NT32

-Copy edk2

2. Open a VS Command prompt 
3. Create a working space directory "FW"

```
C:\> mkdir FW
```

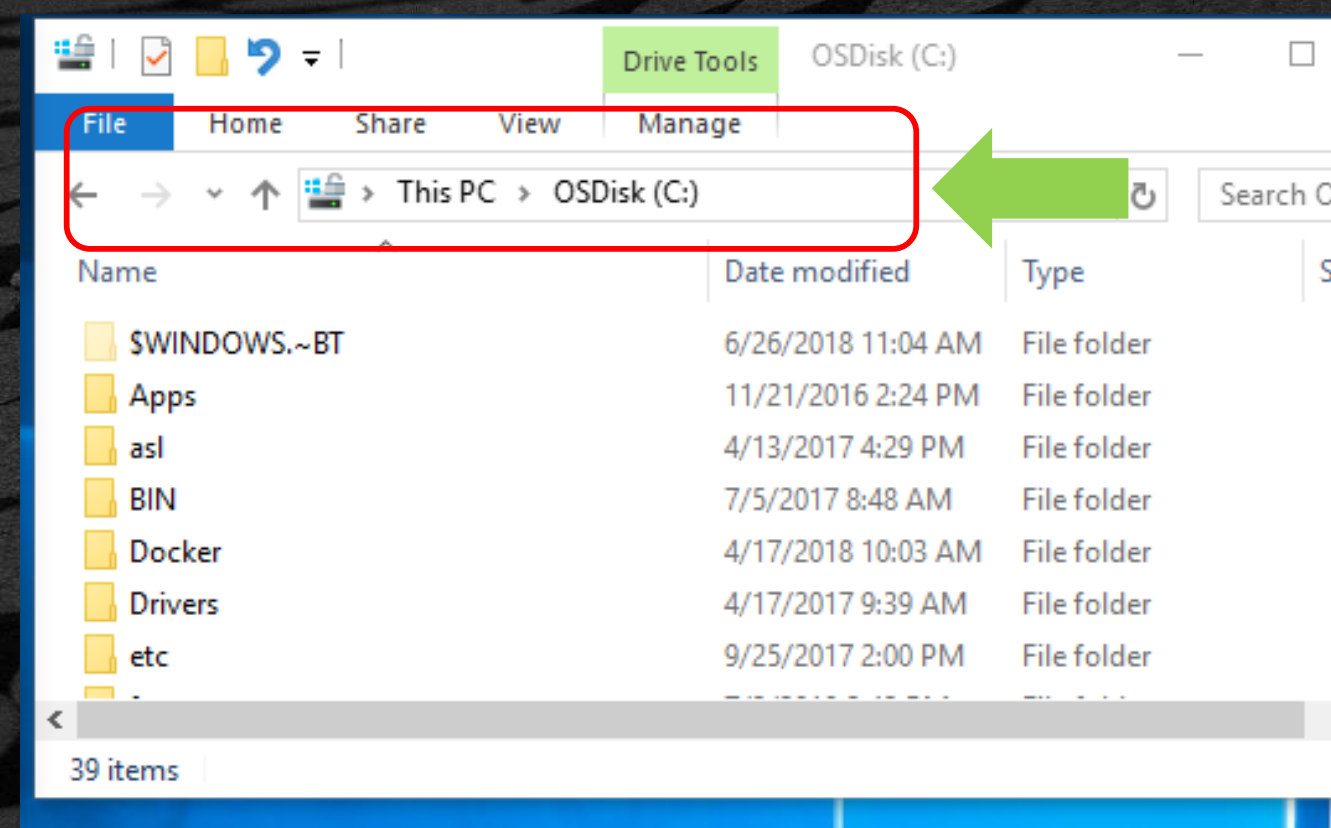
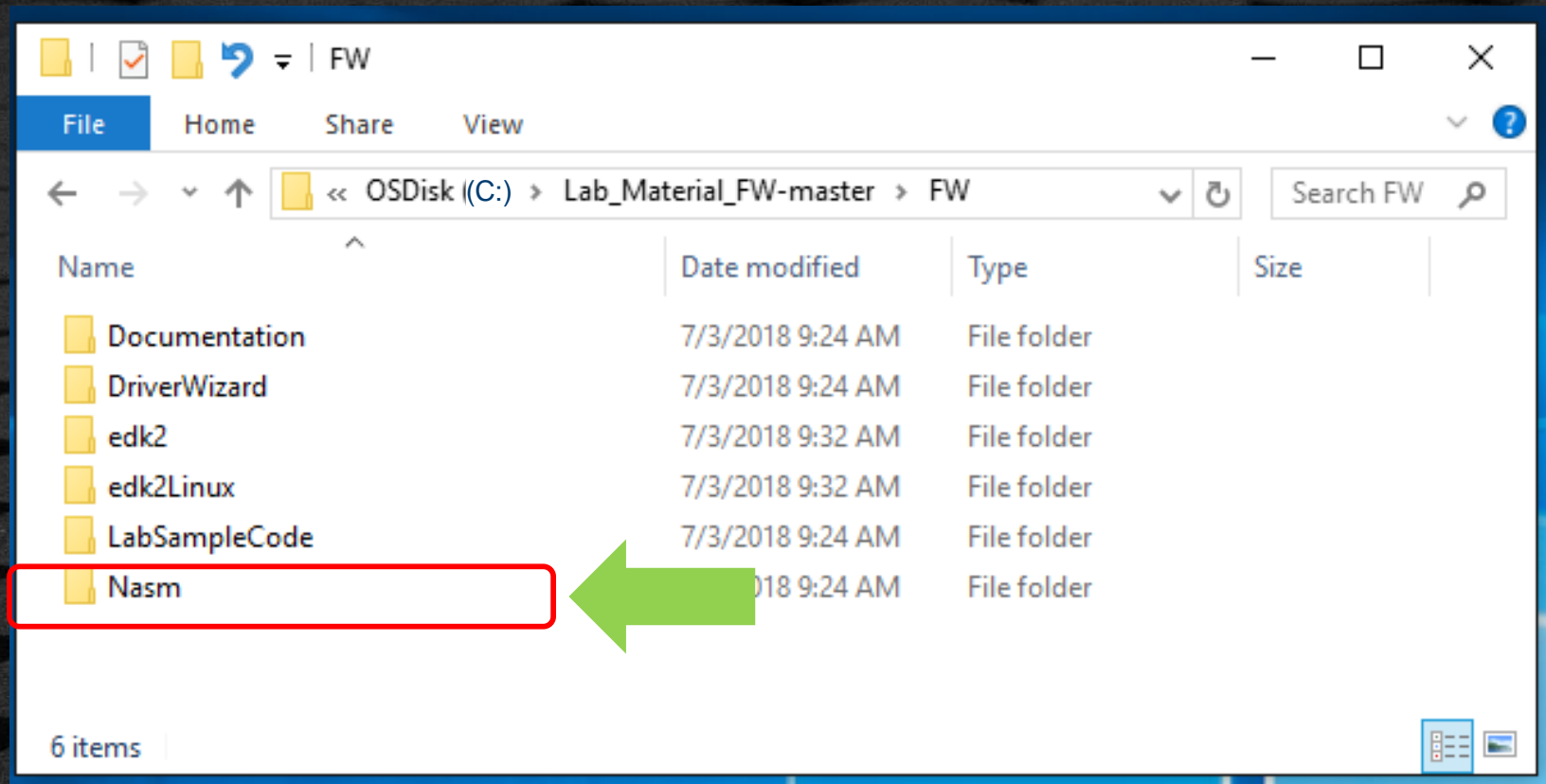
4. From the downloaded Lab_Material_FW folder, copy and paste folder "..\edk2" to C:/FW



BUILD EDK II NT32

-Get Nasm

Copy Nasm to c:\



BUILD NT32 PLATFORM

BUILD EDK II NT32

-Update Target.txt

Nt32Pkg - Build with edk2

Invoke Edksetup.bat

```
C:\> cd FW/edk2
```

```
C:\FW\edk2> edksetup.bat
```

Edit the file Conf/target.txt (*change Tool_Chain_Tag*)

```
notepad Conf/target.txt
```



target.txt - Notepad
File Edit Format View Help
TOOL_CHAIN_TAG = VS2013x86

VS version	TOOL_CHAIN_TAG
2010	VS2010x86
2012	VS2012x86
2013	VS2013x86
2015	VS2015x86
2017	VS2017x86

Save and Exit

Build Nt32Pkg

```
C:\> cd FW/edk2
```

```
C:\FW\edk2> build -D BUILD_NEW_SHELL
```

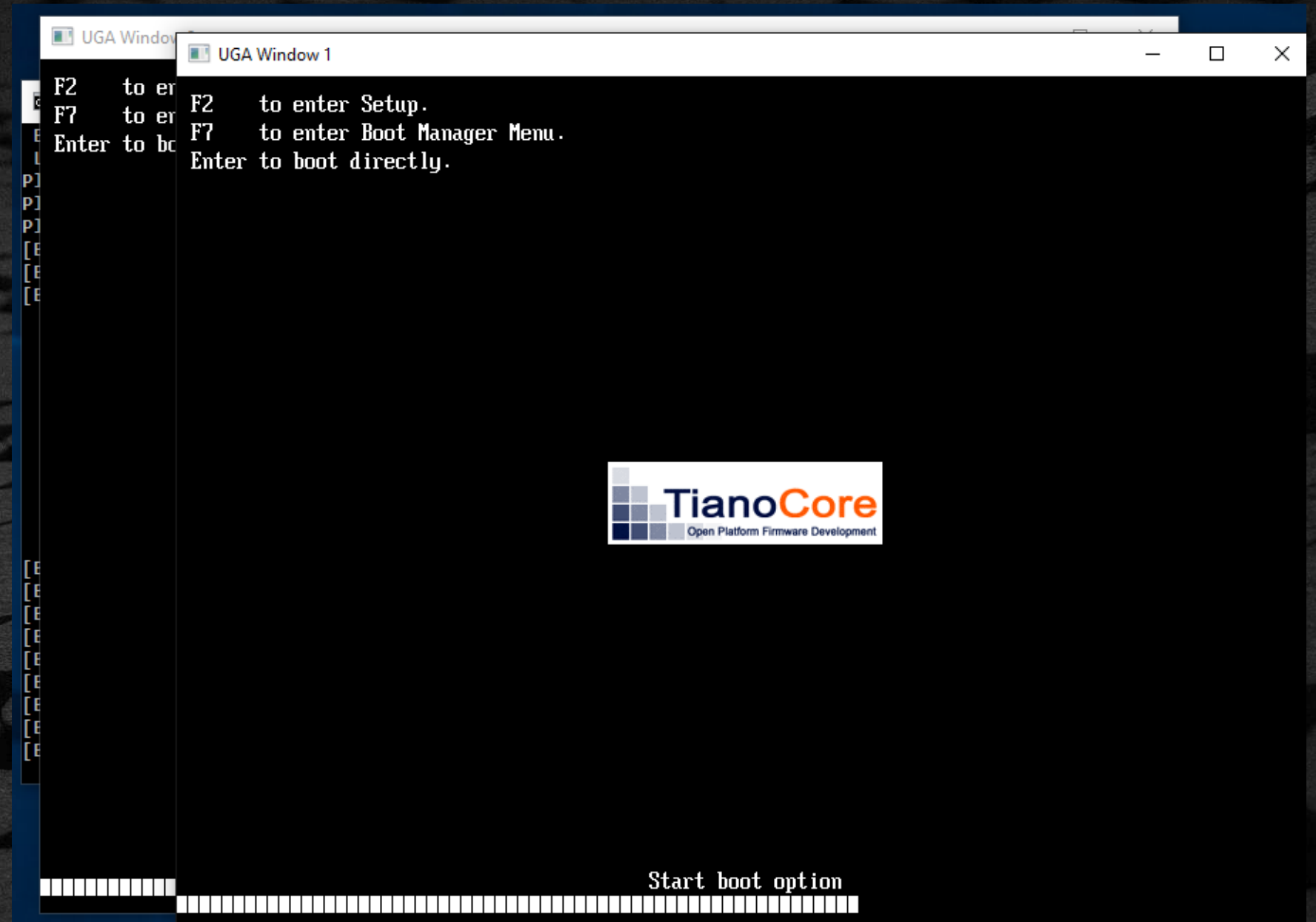

POSSIBLE BUILD ERRORS

1. If you get a BUILD Error: Error “C:/Program “ not found
 - First check that you have opened Visual Studio and installed the “C++”
 - Open Visual Studio and create a “C++” project
 - (This will take some time to install)
2. If you get a BUILD Error: Check if RC.Exe compiler not found is the error -[here](#)
3. If you get a BUILD Error: fatal error C1041: cannot open program database ... Check [here](#)

Finished build

INVOKE NT32 EMULATION

From the command prompt
C:\FW\edk2> Build Run



END OF LAB SETUP (NT32)

Return to the Beginning

SUMMARY

Lab Setup and Build for Nt32

- ★ Pin Visual Command Prompt to Windows Task Bar
- ★ Lab 1: Build a EDK II Platform using Nt32 package

Questions?





BACKUP

BUILD ERRORS

Build Error- RC.exe

Error message:

```
"c:\Program Files (x86)\Windows Kits\8.0\bin\x64\rc.exe"  
/Foc:\edkii.svn\Build\NT32IA32\DEBUG_VS2013x86\IA32\MdeModulePkg\Application\HelloWorld\HelloWorld\OUTPUT  
\HelloWorldhii.lib  
c:\edkii.svn\Build\NT32IA32\DEBUG_VS2013x86\IA32\MdeModulePkg\Application\HelloWorld\HelloWorld\OUTPUT\He  
lloWorldhii.rc  
'c:\Program' is not recognized as an internal or external command,  
operable program or batch file.  
  
NMAKE : fatal error U1077: '"c:\Program Files (x86)\Windows Kits\8.0\bin\x64\rc.exe' : return code '0x1'  
Stop.
```

Find where the RC.EXE is located on your VS Installation:

Example (VS 2013): The RC.exe is located on this machine:

C:\Program Files (x86)\Windows Kits\8.1\bin\x64

Edit Conf\tools_def.txt

Build Error- RC.exe Cont.

Edit Conf\tools_def.txt

Search for your installation of Visual Studio (2013 or 2015)

Update according to the path for where the RC.EXE is found

Paths on your
machine

```
# Microsoft Visual Studio 2013 Professional Edition
DEFINE WINSDK8_BIN      = c:\Program Files\Windows Kits\8.1\bin\x86\
DEFINE WINSDK8x86_BIN   = c:\Program Files (x86)\Windows Kits\8.1\bin\x64

# Microsoft Visual Studio 2015 Professional Edition
DEFINE WINSDK81_BIN     = c:\Program Files\Windows Kits\8.1\bin\x86\
DEFINE WINSDK81x86_BIN  = c:\Program Files (x86)\Windows Kits\8.1\bin\x64
```


Build Error: fatal error C1041:

Build Error from fatal error C1041: cannot open program database

This Error is usually because the location you are building is being shared by another application in Windows. Example: Syncplicity may cause this

Error Message:

```
k:\fw\edk2\MdePkg\Library\BaseLib\LinkedList.c : fatal error C1041: cannot open program
database
'k:\fw\edk2\build\nt32ia32\debug_vs2013x86\ia32\mdepkg\library\baselib\baselib\vc120.pdb'; if
multiple CL.EXE write to the same .PDB file, please use /FS
NMAKE : fatal error U1077: '"C:\Program Files (x86)\Microsoft Visual Studio
12.0\Vc\bin\cl.exe"' : return code '0x2'
Stop.
```

Solution: Try using a Workspace that is not shared

SUPPORT FOR VS 2015 FOR MINNOWBOARD MAX

The Open Source Max release does not support VS 2015

To work around do the following:

Copy the file

```
"..Max/edk2/conf/tools_def_VS2015x86.txt" to  
"..Max/edk2/conf/tools_def.txt"
```

Check out the differences:

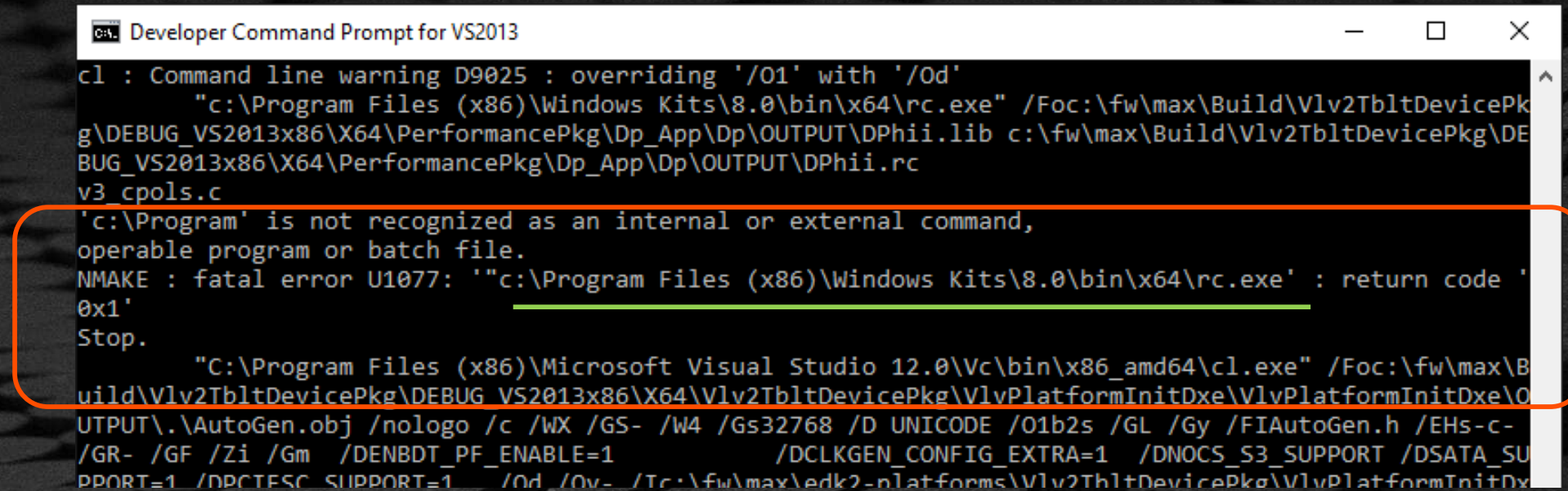
There is a check for `VS140COMNTOOLS` and if defined setup for VS 2015

See that `tools_def.txt` replaces `/Wx` and `/W4` with `/w` to turn off warnings as errors

VISUAL STUDIO RESOURCE COMPILER ERROR – RC.EXE

The Rc.exe was not found
and the build fails

Find where rc.exe is located
and update the
`tools_def.txt`



```
Developer Command Prompt for VS2013

cl : Command line warning D9025 : overriding '/O1' with '/Od'
      "c:\Program Files (x86)\Windows Kits\8.0\bin\x64\rc.exe" /Foc:\fw\max\Build\Vlv2TbлтDevicePkg\DEBUG_VS2013x86\X64\PerformancePkg\Dp_App\Dp\OUTPUT\DPHii.lib c:\fw\max\Build\Vlv2TbлтDevicePkg\DEBUG_VS2013x86\X64\PerformancePkg\Dp_App\Dp\OUTPUT\DPHii.rc
v3 cpols.c
'c:\Program' is not recognized as an internal or external command,
operable program or batch file.
NMAKE : fatal error U1077: '"c:\Program Files (x86)\Windows Kits\8.0\bin\x64\rc.exe' : return code '
0x1'
Stop.

      "C:\Program Files (x86)\Microsoft Visual Studio 12.0\VC\bin\x86_amd64\cl.exe" /Foc:\fw\max\Build\Vlv2TbлтDevicePkg\DEBUG_VS2013x86\X64\Vlv2TbлтDevicePkg\VlvPlatformInitDxe\VlvPlatformInitDxe\O
UTPUT\.\AutoGen.obj /nologo /c /WX /GS- /W4 /Gs32768 /D UNICODE /O1b2s /GL /Gy /FIAutoGen.h /EHs-c-
/GR- /GF /Zi /Gm /DENBDT_PF_ENABLE=1 /DCLKGEN_CONFIG_EXTRA=1 /DNOCS_S3_SUPPORT /DSATA_SU
PPORT=1 /DPCTESC_SUPPORT=1 /Od /Ov- /Tc:\fw\max\edk2-platforms\Vlv2TbлтDevicePkg\VlvPlatformInitDxe
```

Update `Max/edk2/conf/tools_def.txt`

Microsoft Visual Studio 2013 Professional Edition

DEFINE WINSDK8x86_BIN = **C:\Program Files (x86)\Windows Kits\8.1\bin\x64**

Microsoft Visual Studio 2015 Professional Edition

DEFINE WINSDK81x86_BIN = **C:\Program Files (x86)\Windows Kits\8.1\bin\x64**

Microsoft Visual Studio 2017 Professional Edition

DEFINE WINSDK10_BIN = **Location of Rc.exe**

SUPPORT FOR VS 2017 FOR MINNOWBOARD MAX

The Open Source Max release does not support VS 2017

To work around do the following:

Copy the file

"C:/FW/edk2/conf/tools_def_VS2015x86_w.txt" to
"C:/FW/Max/edk2/conf/tools_def.txt"

See that tools_def.txt replaces /Wx and /W4 with /w to turn off warnings as errors

At MS Command Prompt

```
>Set TOOL_CHAIN_TAG=VS2010x86
```