Project 12: Kernel Debugging with WinDbg (PC version) (20 pts.)

What You Need

- A Windows 7 machine with VMware Player installed.
- A Windows XPSP3 virtual machine to examine.

Purpose

Introduction to WinDbg and kernel debugging

The Two Machines

You need two Windows machines to do this project: One is the TARGET machine, which is a virtual machine running Win XP SP3.

The other is the WINDBG machine, which is the Windows 7 host.

Adding a Boot Menu Item to the TARGET machine

Start the Windows XPSP3 virtual machine.

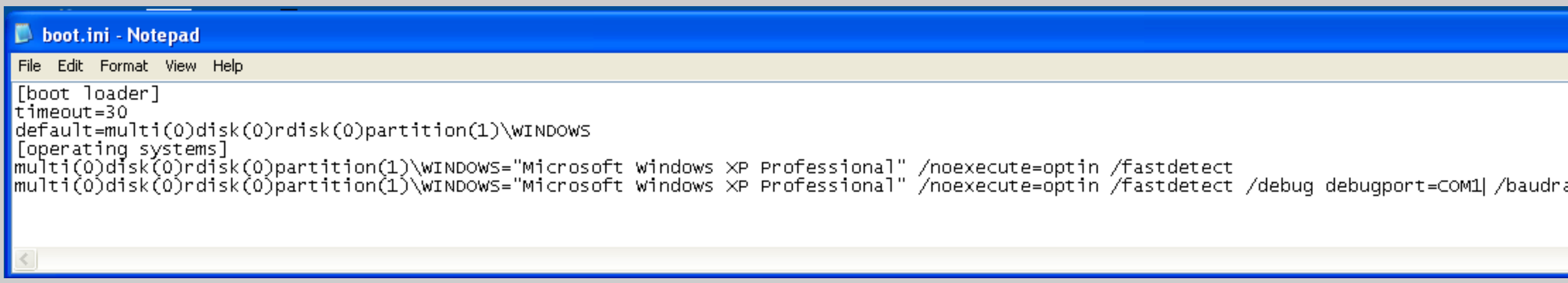
Click **Start**, **Run**.

In the Run box, execute this command:

```
notepad c:\boot.ini
```

In Notepad, copy the existing boot line, paste it at the end of the file, and add these switches to the end of the line, as shown below:

```
/debug /debugport=com1 /baudrate=115200
```



Save the file.

If you cannot save the file, open a Command Prompt and execute this command, to remove the Read-only, System, and Hidden flags from the file:

```
attrib -R -S -H c:\boot.ini
```

Adding a Virtual Serial Adapter

Power off the TARGET virtual machine. You cannot make this change while the virtual machine is running or suspended.

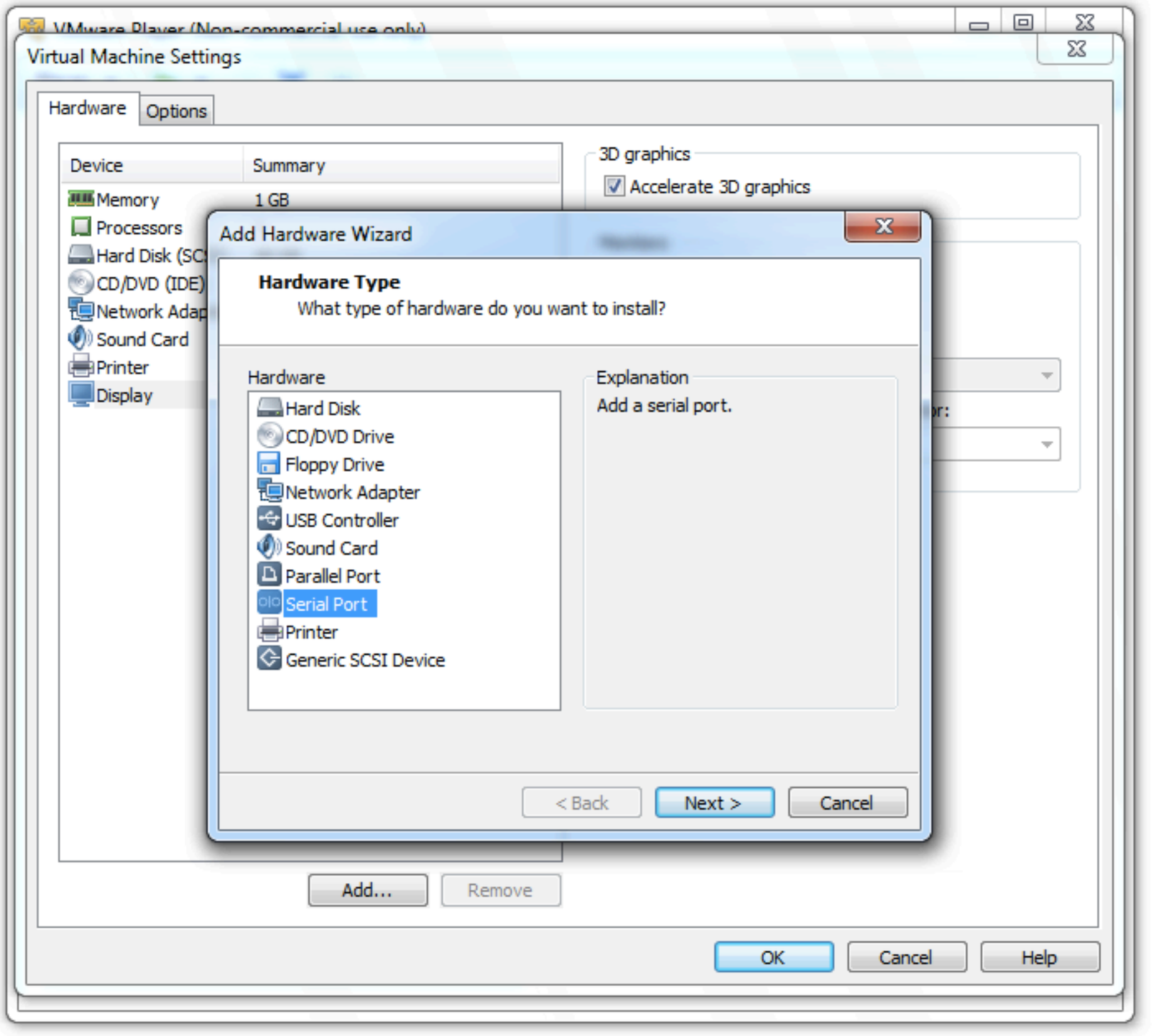
On the WINDBG machine, start VMware Player.

In the left pane of VMware Player, click your TARGET machine.

At the lower right of VMware Player, click "**Edit virtual machine settings**".

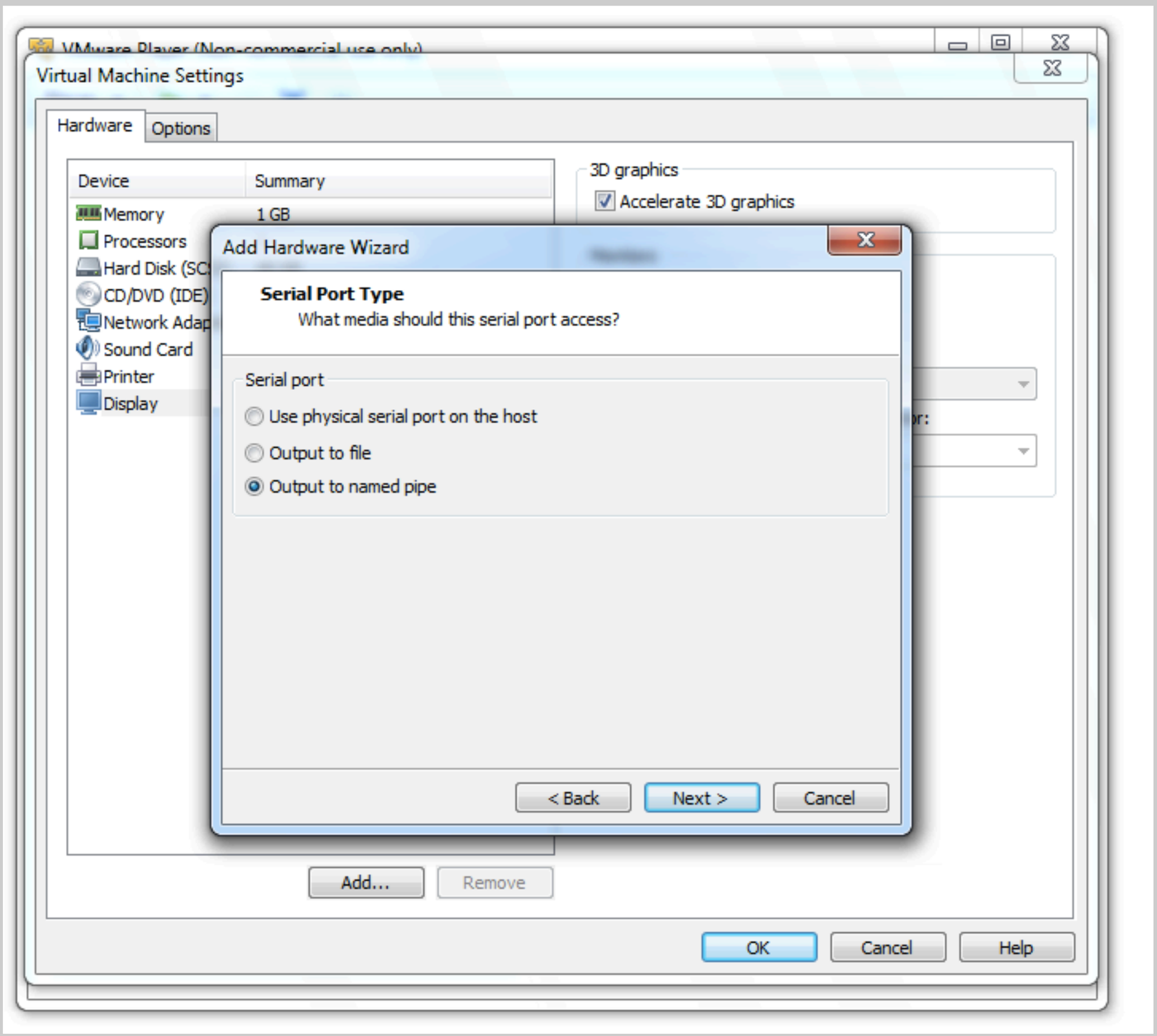
In the left side of the "Virtual Machine Settings" box, click the **Add...** button.

In the "Hardware Type" box, select "**Serial Port**", as shown below.



Click **Next**.

In the "Serial Port Type" box, click "**Output to named pipe**", as shown below.



Click **Next**.

In the "Specify Socket" box, enter a Named Pipe of

```
\\.\pipe\com_1
```

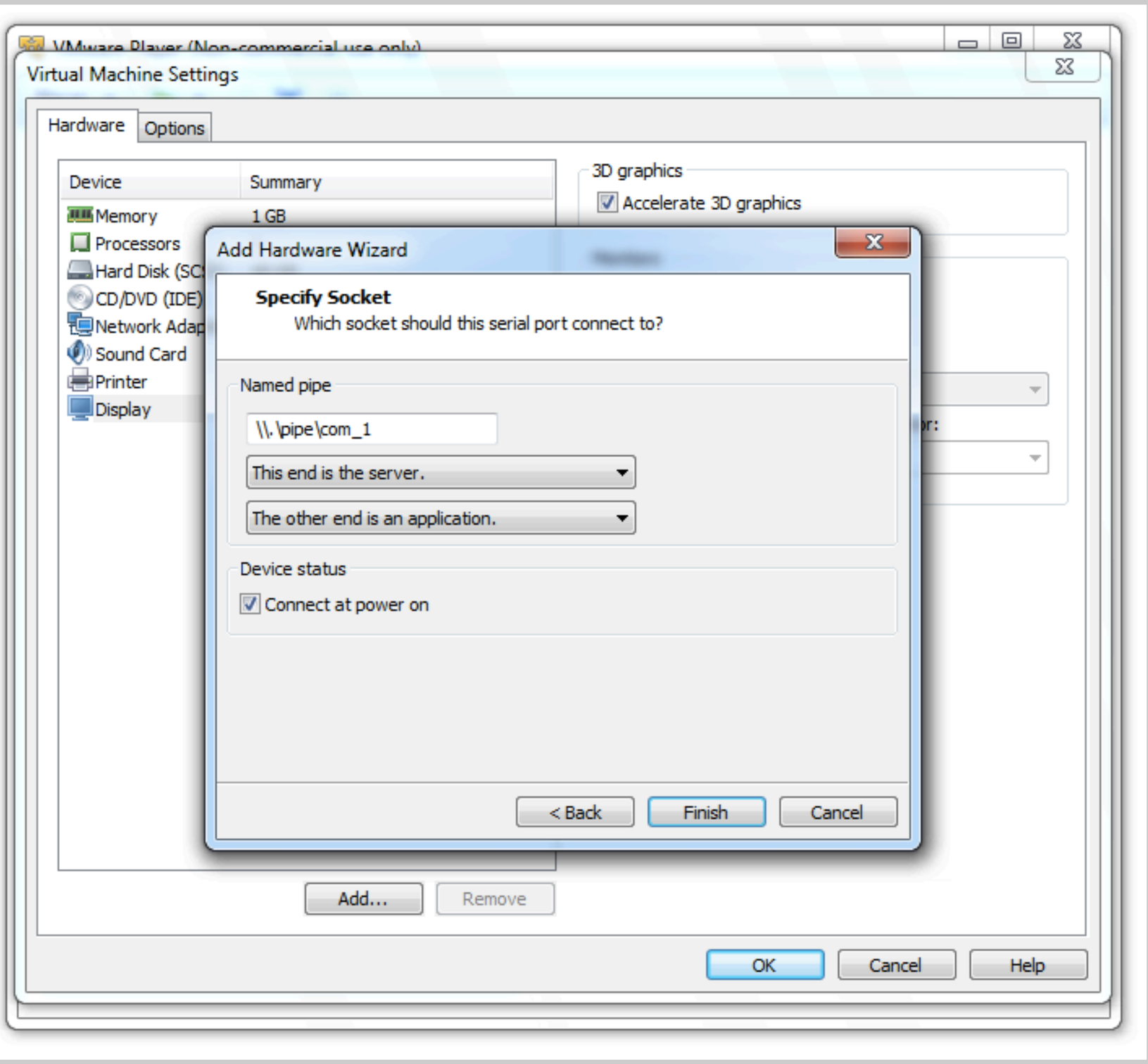
In the two drop-down list boxes, select

This end is the server.

and

The other end is an application.

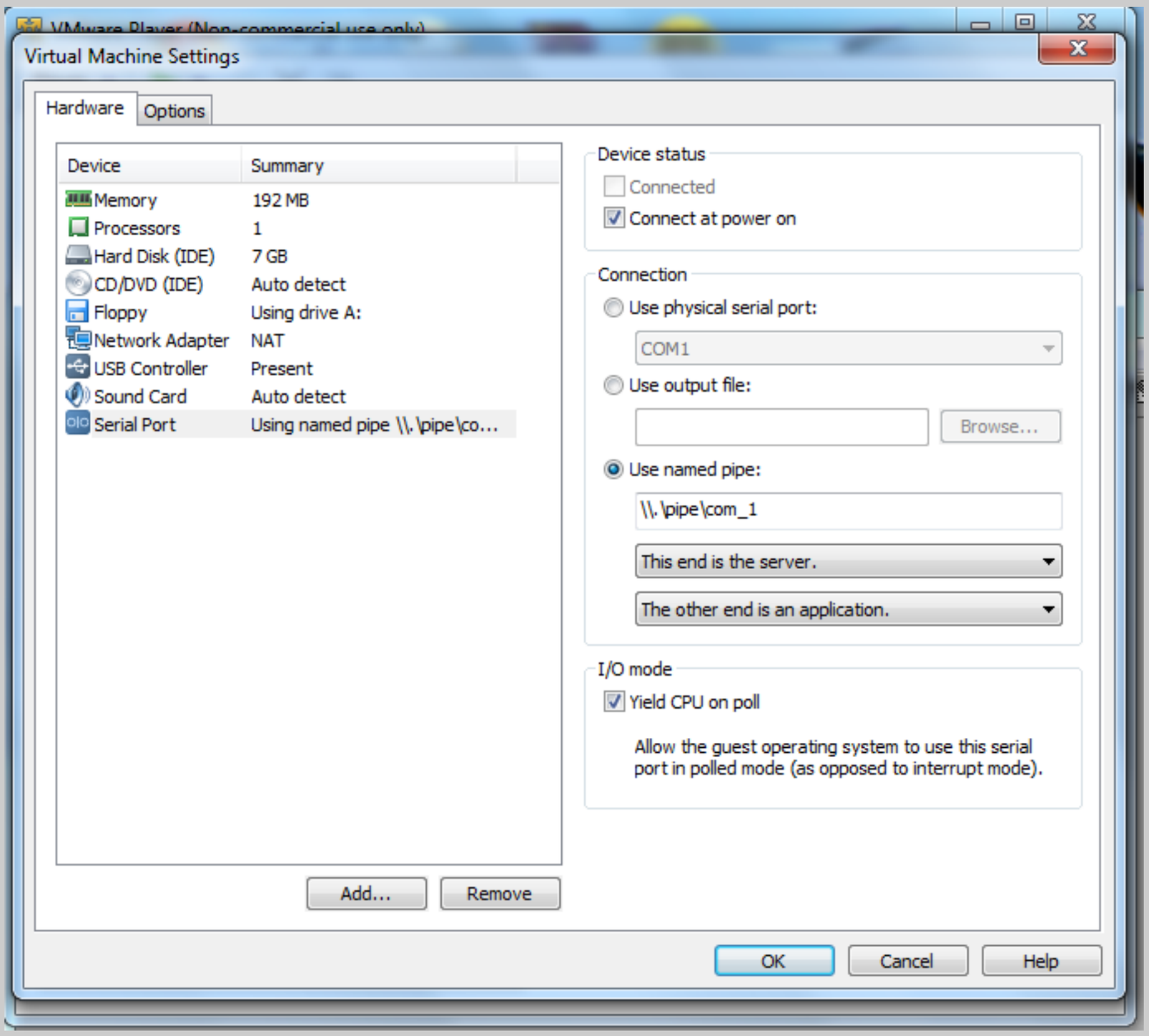
as shown below.



Click **Finish**.

In the "Virtual Machine Settings" box, on the lower right, click the "**Yield CPU on poll**" box, as shown below.

Then click the **OK** button.



Downloading Microsoft Symbols

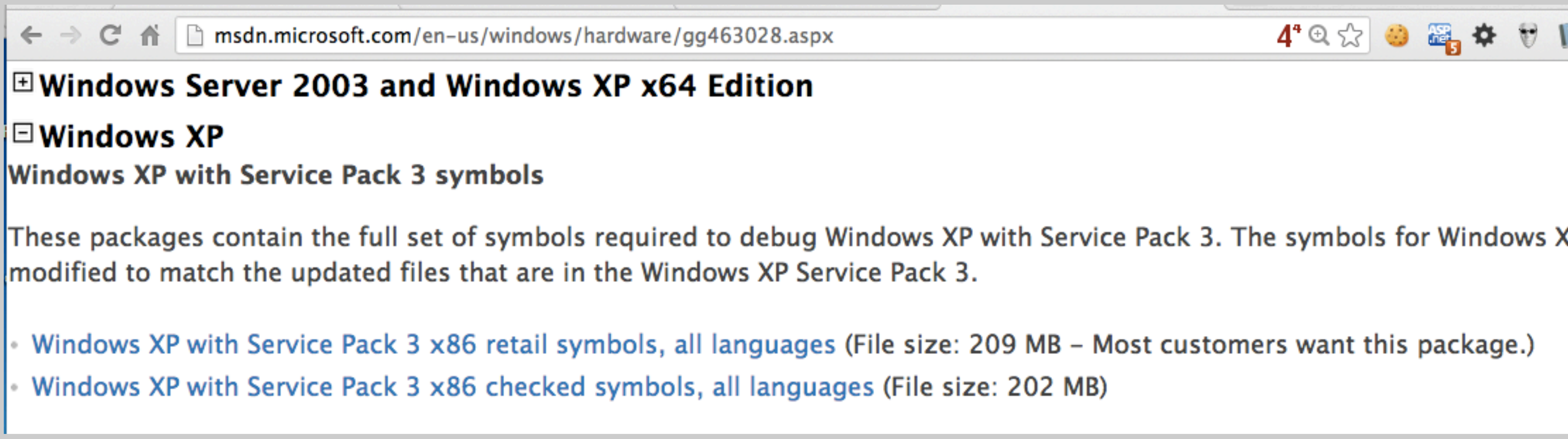
Kernel debugging is much easier with symbols.

WinDbg can download them automatically as needed, but downloading them separately is the best procedure if you plan to work without always being connected to a reliable, high-speed Internet connection.

Start the WINDBG machine. in a Web browser, go to

http://msdn.microsoft.com/en-us/windows/hardware/gg463028.aspx

Download the symbol file for "Windows XP with Service Pack 3 x86 retail symbols, all languages", as shown below.



You end up with an EXE file. Run it in the WINDBG machine. Accept all the default options.

First it will extract into a temporary directory with a long name, then it will automatically extract into C:\Windows\Symbols. Accept that selection.

Installing WinDbg on the WINDBG Machine

On the WINDBG machine, open a browser and go to

http://msdn.microsoft.com/en-US/windows/desktop/bg162891

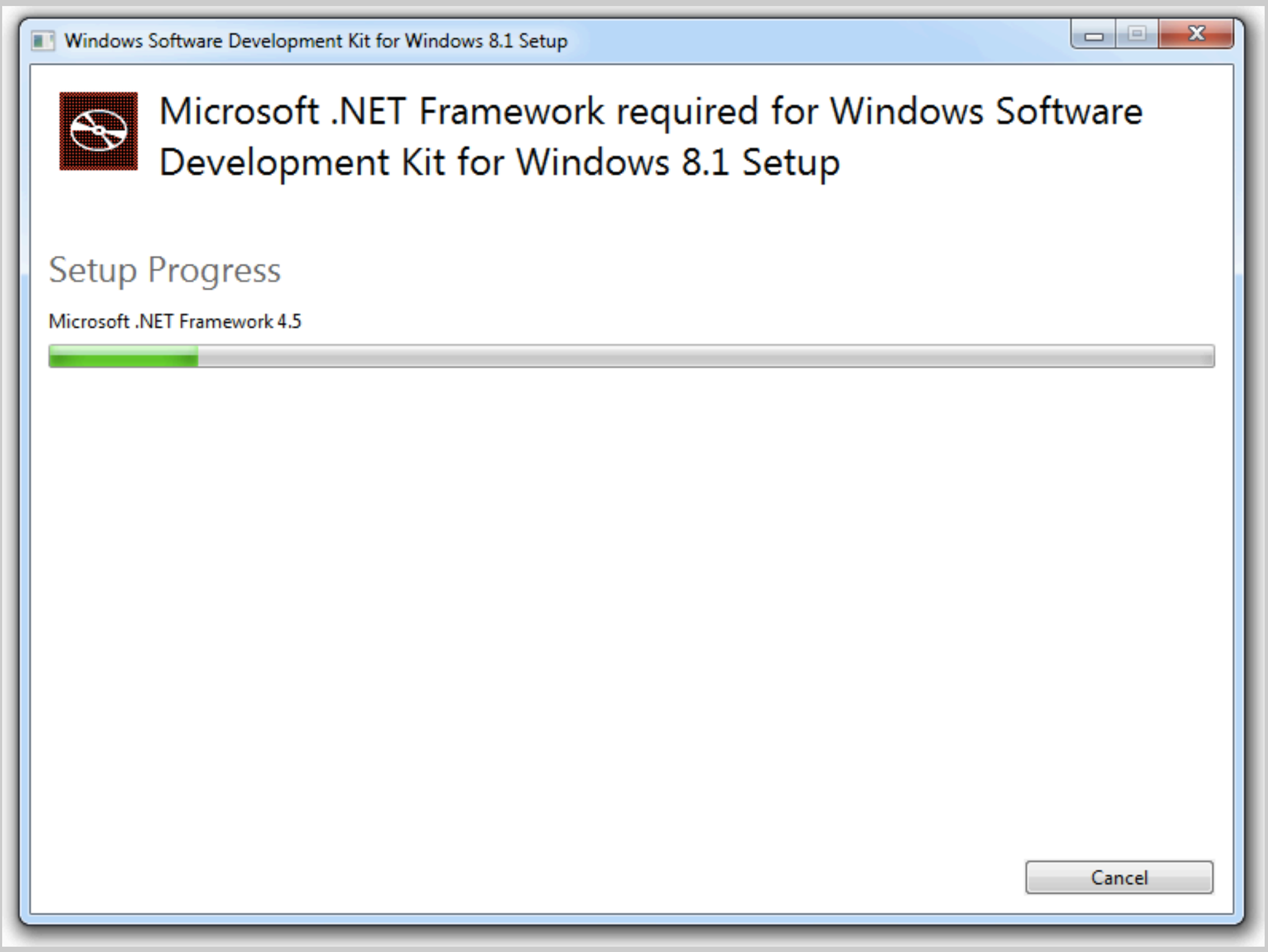
Click the blue **Download** button.

Save the sdksetup.exe file on your desktop.

Double-click the **sdksetup.exe** file.

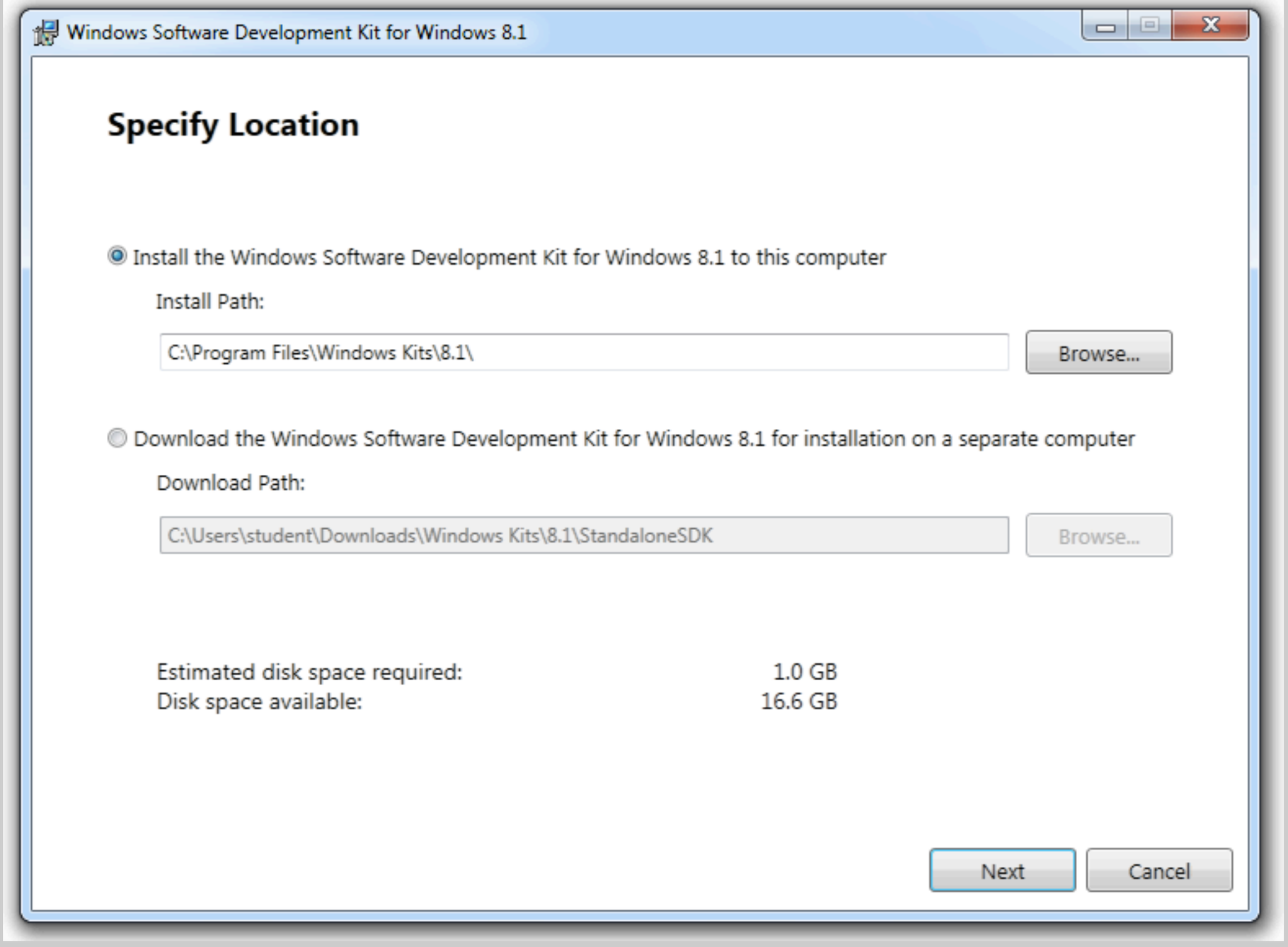
Accept the agreement and click the "**Accept & Install**" button.

Wait while .NET installs, as shown below.



In the "Specify Location" box, accept the default options, as shown below.

Click **Next**.

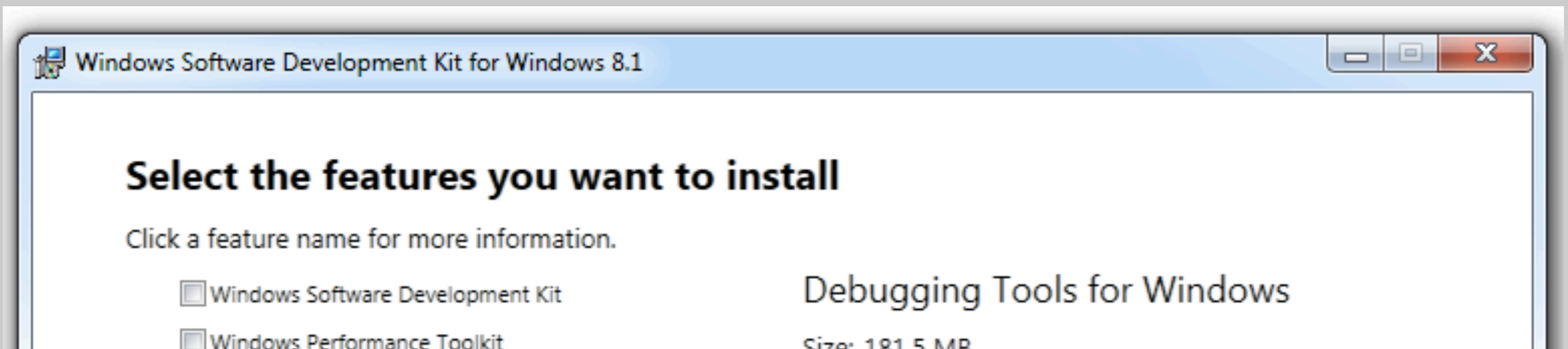


In the "Join the Customer Experience Improvement Program (CEIP)" box, accept the default selection of No and click **Next**.

In the "License Agreement" box, click **Accept**.

In the "Select the features you want to install" box, clear all the check boxes except "**Debugging Tools for Windows**", as shown below.

Click **Install**.



When the process is complete, you see a message saying "Welcome to the Windows Software Deveopment Kit for Windows 8.1!".

Click **Close**.

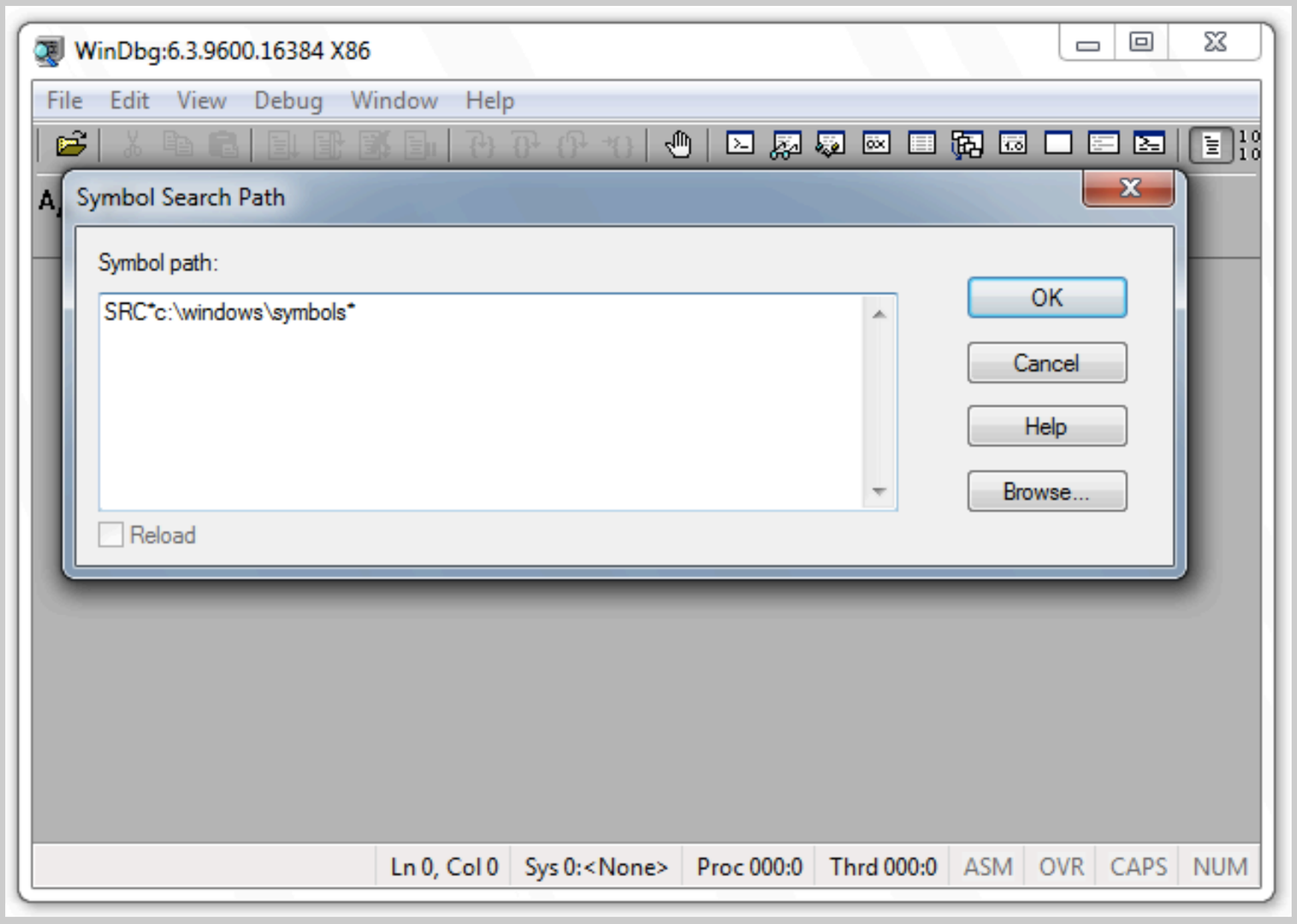
Configuring Symbols in WinDbg

Click **Start**. Type in **WINDBG**.

Launch WinDbg. If you are using Windows 7, run it as Administrator.

In WinDbg, click **File**, "**Symbol File Path**". Enter this line, as shown below:

SRC*c:\windows\symbols*

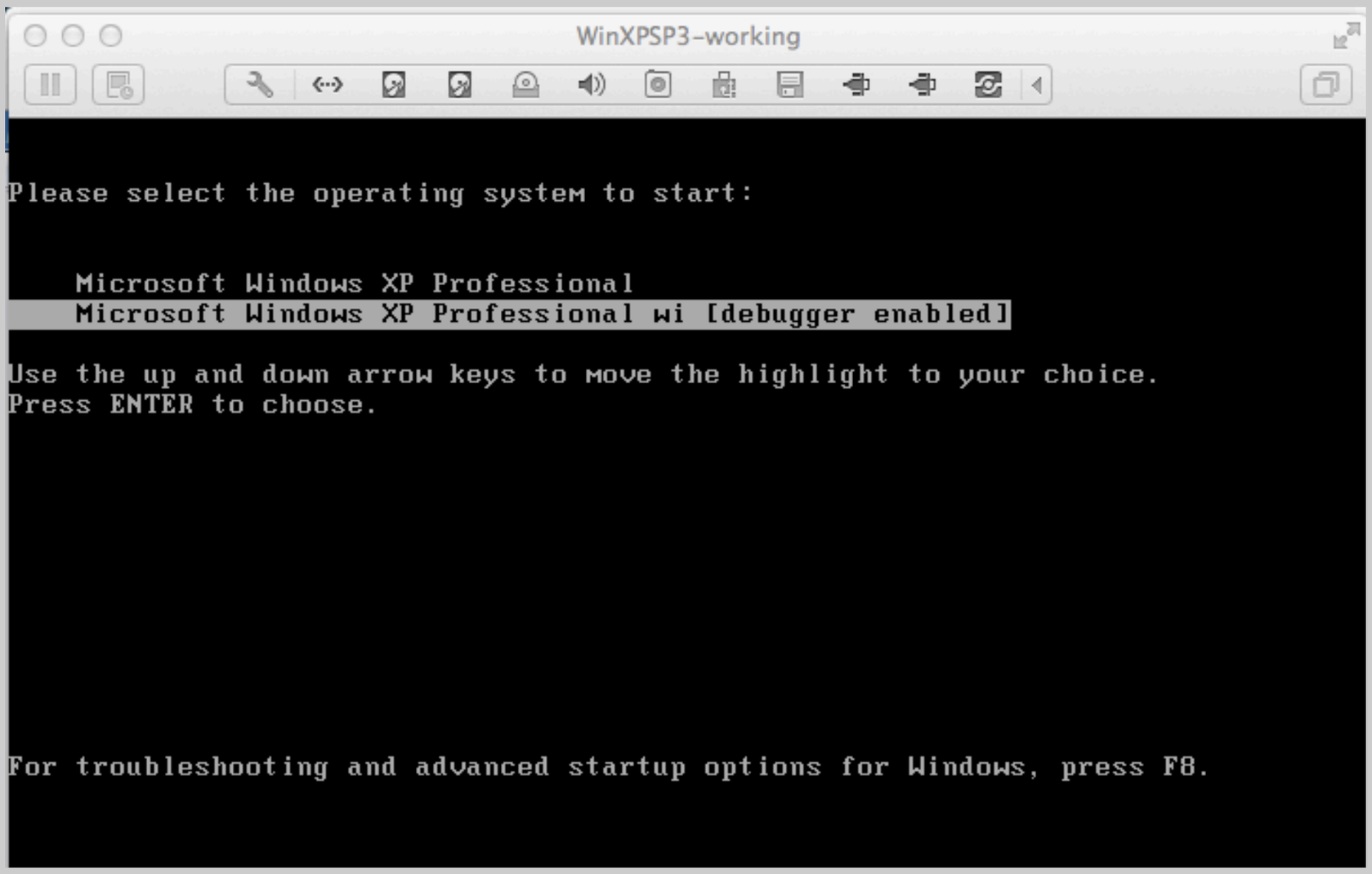


Click the **OK** button.

Starting the TARGET machine

Start the TARGET virtual machine.

When you should see two boot-menu options, choose the second one, "Microsoft Windows XP Professional with debugger enabled", as shown below.



Starting Kernel Debugging

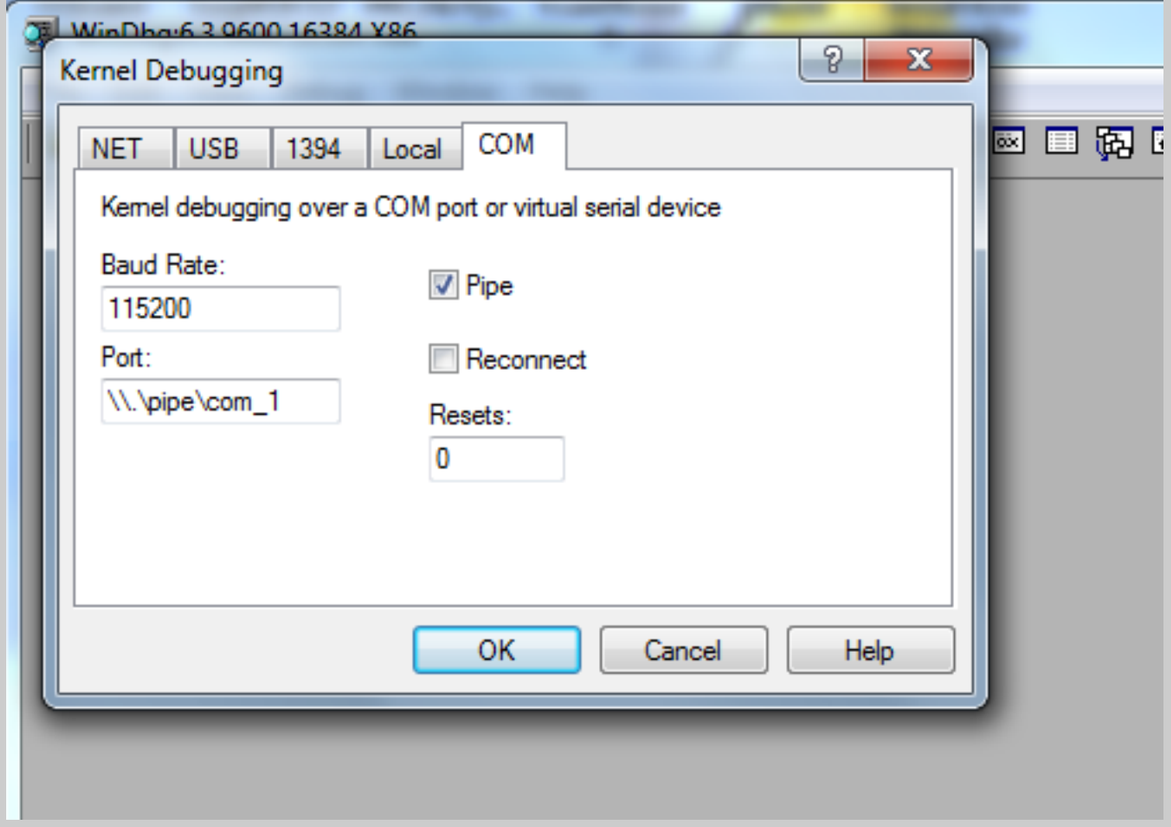
In WinDbg, click **File**, "**Kernel Debug**".

In the "Kernel Debugging" box, click the **COM** tab.

Change the Port to

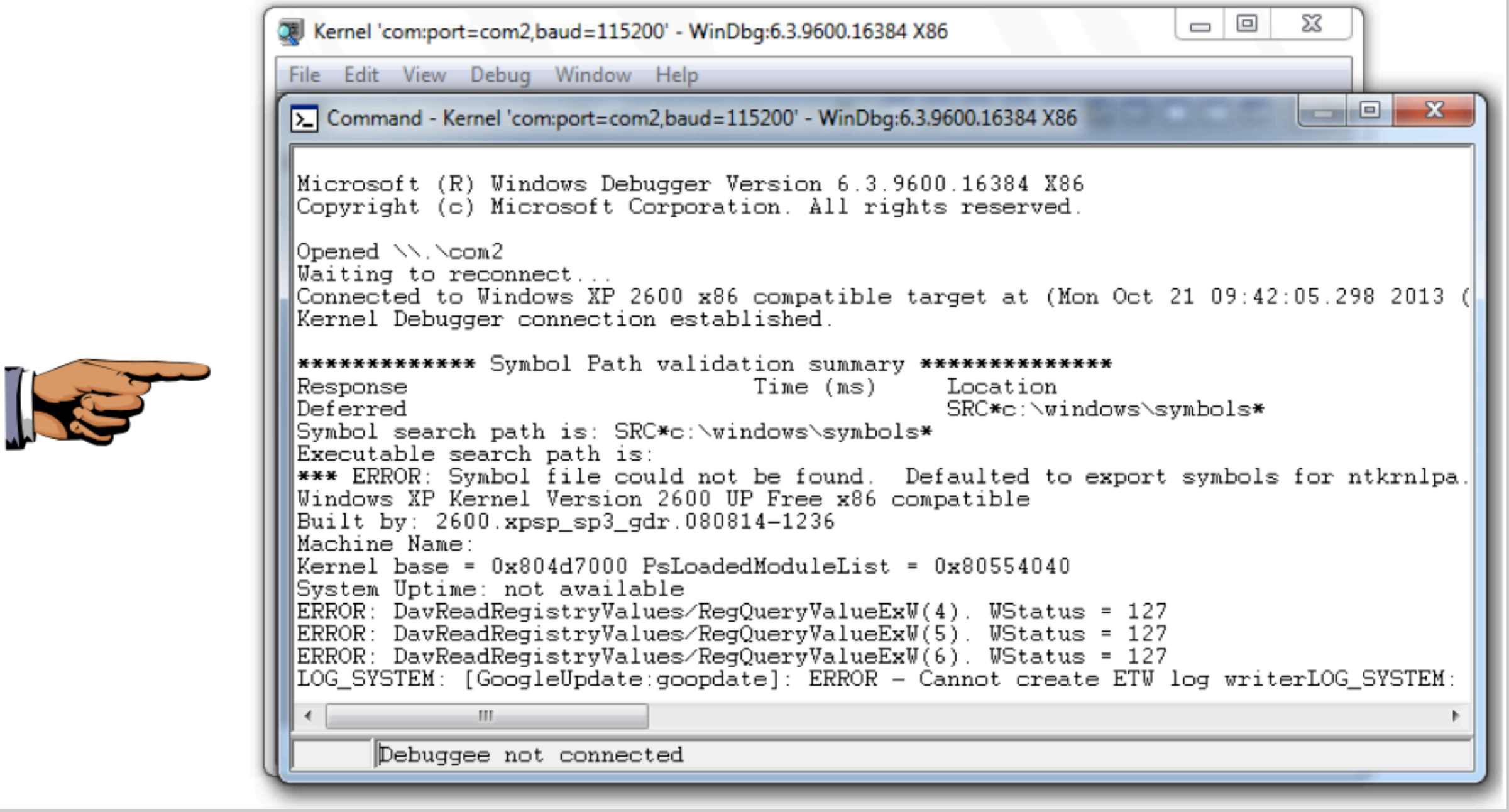
\\.\pipe\com_1

and check the **Pipe** box, as shown below. Then click **OK**.



Your WINDBG machine should now show the message "**Connected to Windows XP**", as shown below. (The figure below shows "com_2" instead of "com_1", just ignore that.)

If it doesn't connect, try restarting the virtual machine.



Saving a Screen Image

Make sure you can see the message "**Connected to Windows XP**", as shown above.

On your keyboard, press the PrntScrn key.

Click **Start**, type in **PAINT**, and open Paint.

Press **Ctrl+V** to paste in the image of your desktop.

YOU MUST SUBMIT WHOLE-DESKTOP IMAGES TO GET FULL CREDIT.

Save the image with a filename of "**Proj 12 from YOUR NAME**".

Turning in Your Project

Email the images to: **cnit.126sam@gmail.com** with a subject line of **Proj 12 From Your Name**, replacing Your Name with your own first and last name. Send a Cc to yourself.

Last Modified: 10-21-13 10:23 pm