Shanghai Jiaotong University

Multithreaded Program Debug Visualization Helper

User Manual

Documented By: Jessie Zhang

Table of Contents

User Manual

1. Project Overview

This project is an add-in for Microsoft Visual Studio 2005, which will help the programmer debug with multi-threaded programs. It displays the info of Win32 APIs called by running threads, such as the method's name, the invoking thread ID, and the calling time. It also provides a visual view of running threads by drawing the track of each running threads.

This project is based on a Microsoft-research technology called Detours. The implementation of the interception of Win32 API function calls is developed with C++, while the user interface of the project is with C#.net.

2. Installation

2.1 System Requirements

- Windows 2000/XP based on x86 machines
- Microsoft Visual Studio 2005 installed

2.2 Setup

The files needed for installation are under the directory /setup.

- First, copy the folder *Addins/* to the installation directory of add-ins for Visual Studio 2005(VS2005). The directory is something like *C:\Documents and Settings\Jessie\My Documents\Visual Studio 2005\Addins*
- Second, copy the folder *MultithreadDebugAddIn/* to the directory C:/

After you are finished with these two steps, the setup of the project is done.

2.3 Starting up and shutting down

2.3.1 Starting Up

- After starting up VS2005, go to the *tools* menu, and then the *add-in manager* menu. (Figure. 2-1)
  You will see a dialog box named *Add-in Manager* pop up. (Figure. 2-2)

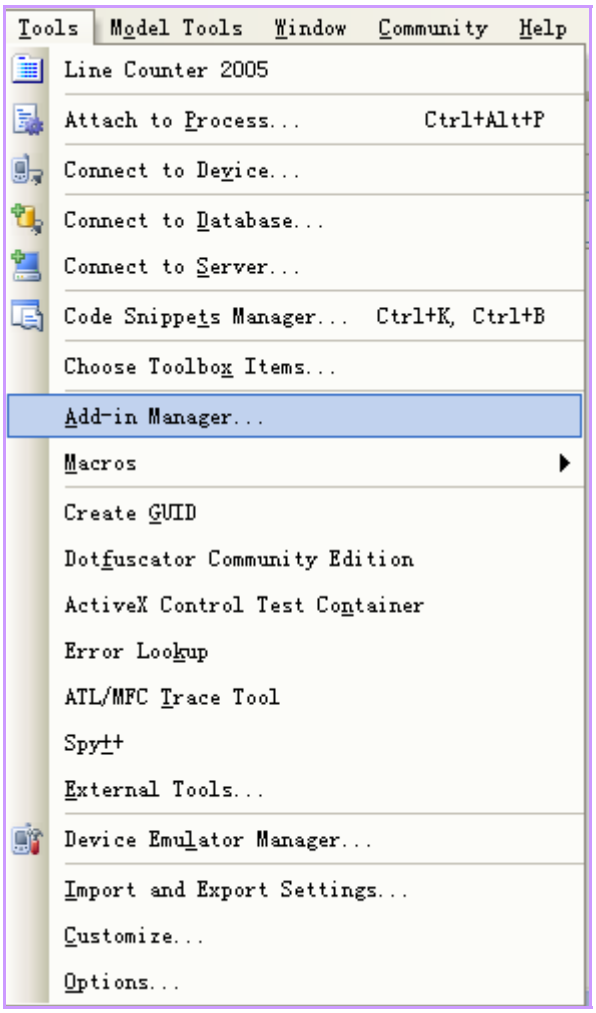

Figure.2-1 Tools Menu

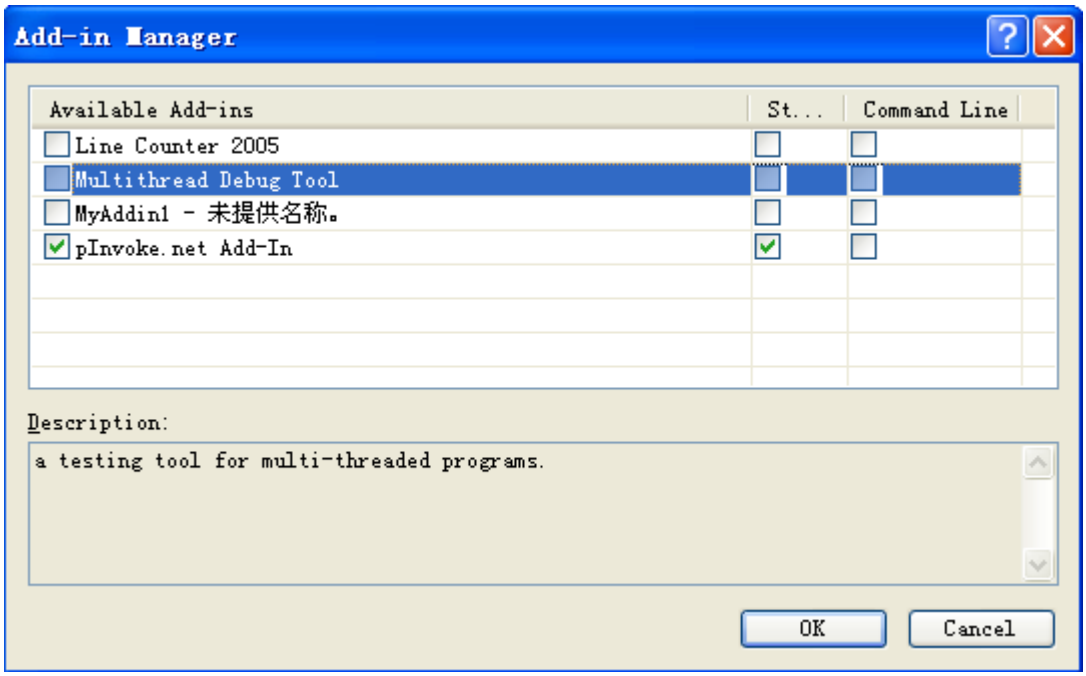

Figure. 2-2 Add-in Manager

- In Figure 2-2, *Multithread Debug Tool* is among the available Add-ins. Check the box before *Multithread Debug Tool*.

- *You do NOT need to restart the VS2005.*

  Go to the *Debug* menu, a menu named *Run Multithread Debug Helper* will appear. (Figure 2-3)

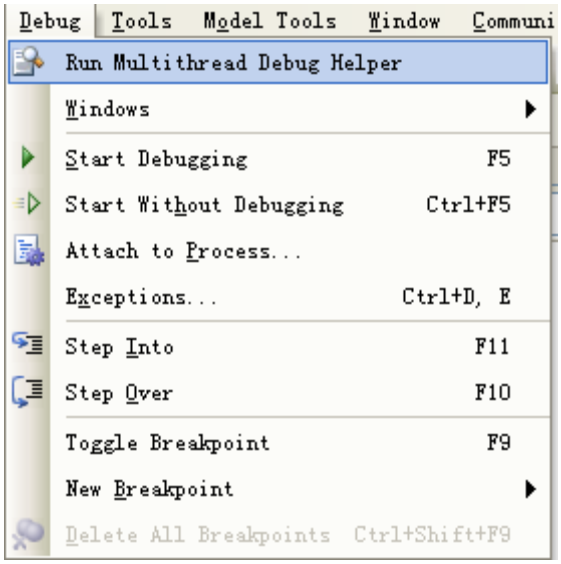

Figure. 2-3 Debug Menu

If the menu appears, the starting up of the project is successful.

2.3.2 Shutting Down

- Again, go to the tools menu, and then the *add-in manager* menu. (Figure. 2-1)

  You will see a dialog box named *Add-in Manager* pop up. (Figure. 2-4)

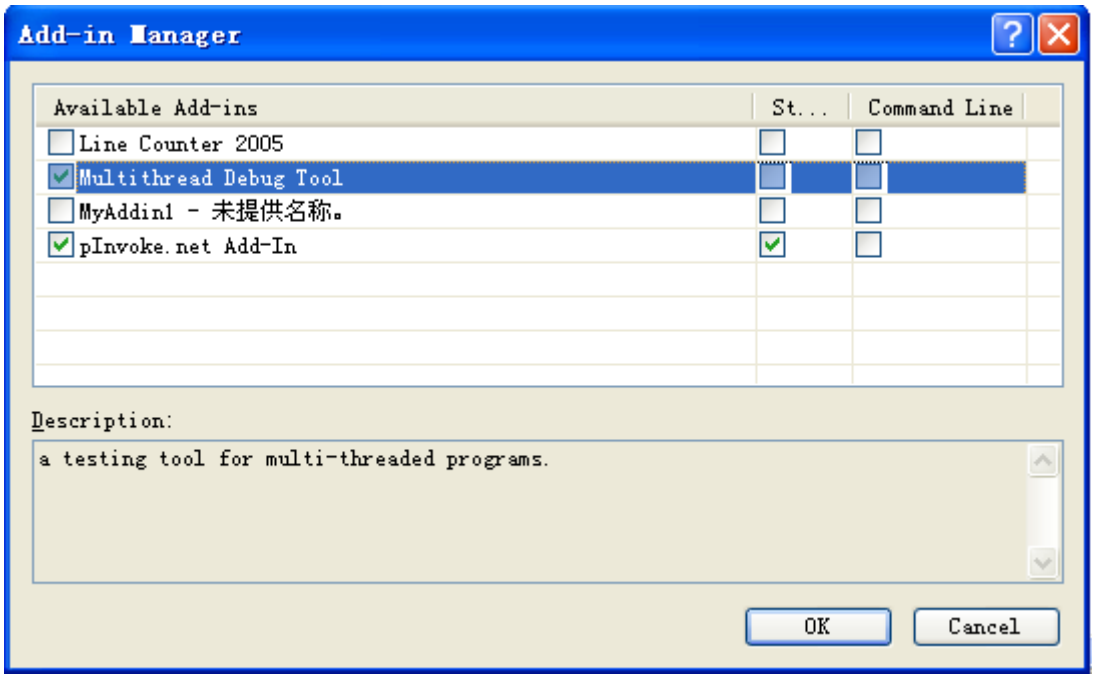

Figure. 2-4 Add-in Manager

- In Figure 2-2, *Multithread Debug Tool* is among the available Add-ins, and the box before *Multithread Debug Tool* is checked. Uncheck the box.
- Also, go to the Debug menu, You will see the menu called *Run Multithread Debug Helper* disappears. (Figure 2-5)

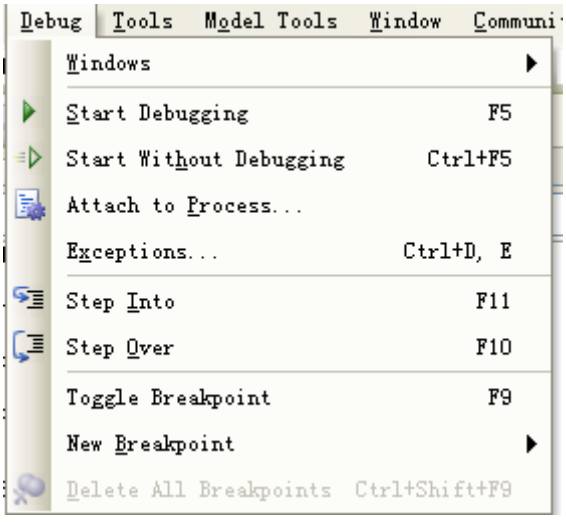

Figure. 2-5 Debug Menu

The add-in is successfully uninstalled.

3. Quick Start Guide

- First, open a VS2005 solution. (Figure 3-1)

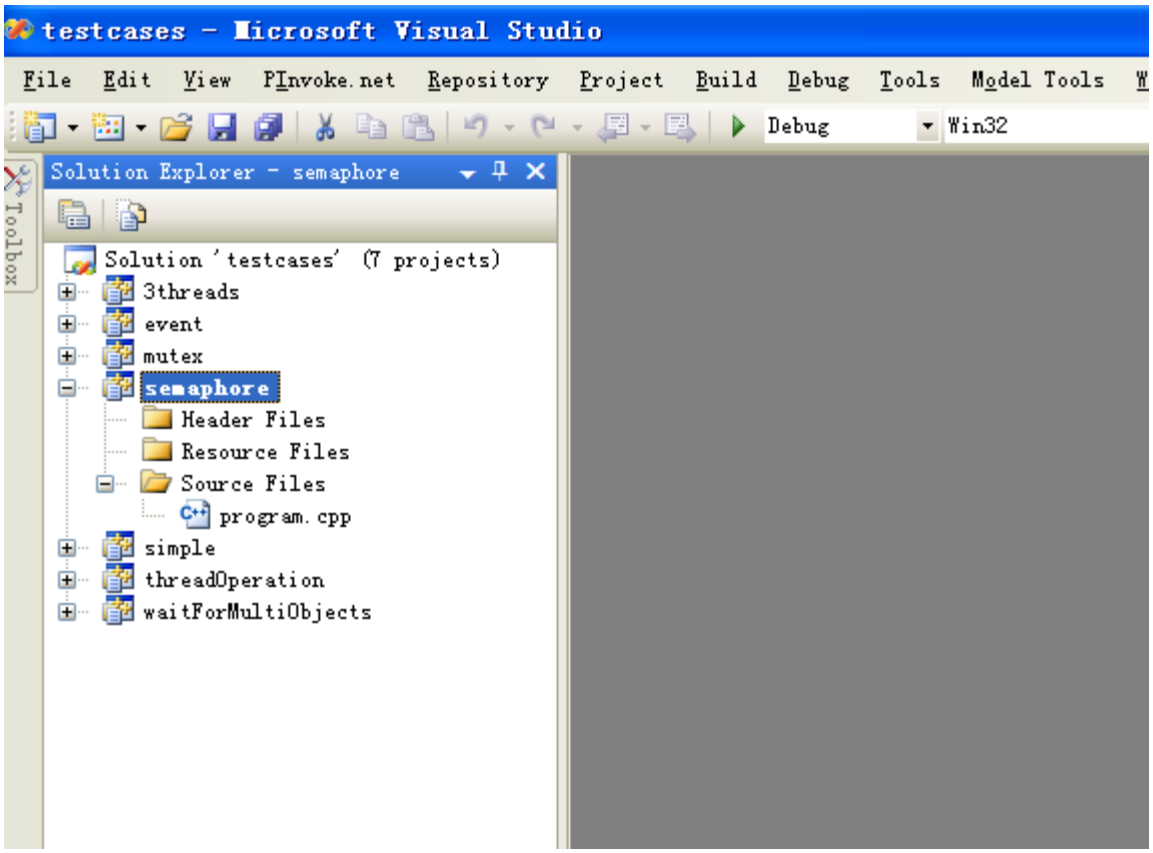

Figure. 3-1 solution

- Open the file that you want to debug with the add-in.(Figure 3-2)

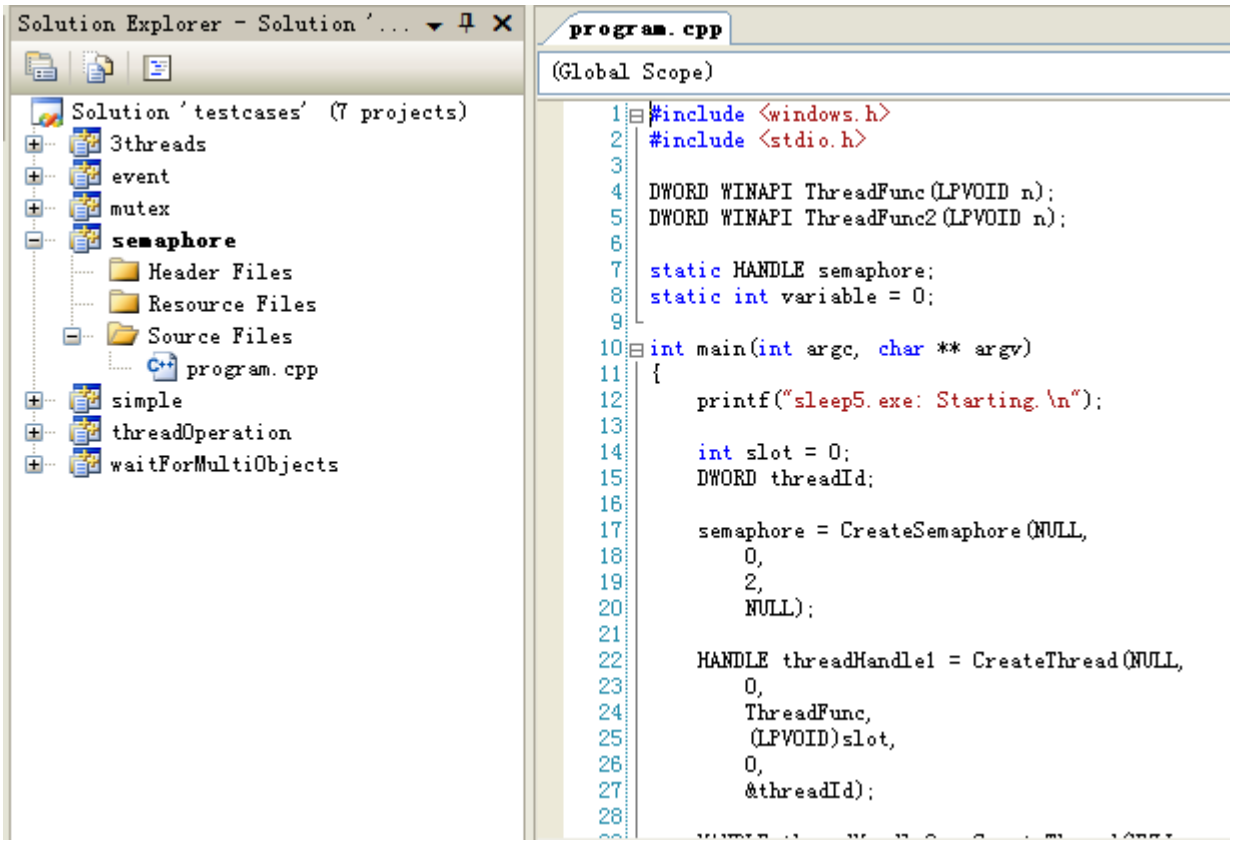

Figure. 3-2 opening one file

- Third, run the add-in.(Figure 3-2)

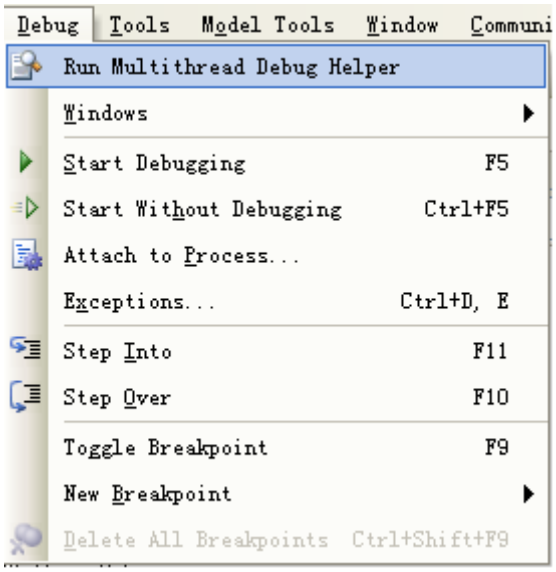

Figure. 3-2 Debug Menu

Click the *Run Multithread Debug Helper* to run the add-in, and you will see a panel pop up.(Figure 3-3)

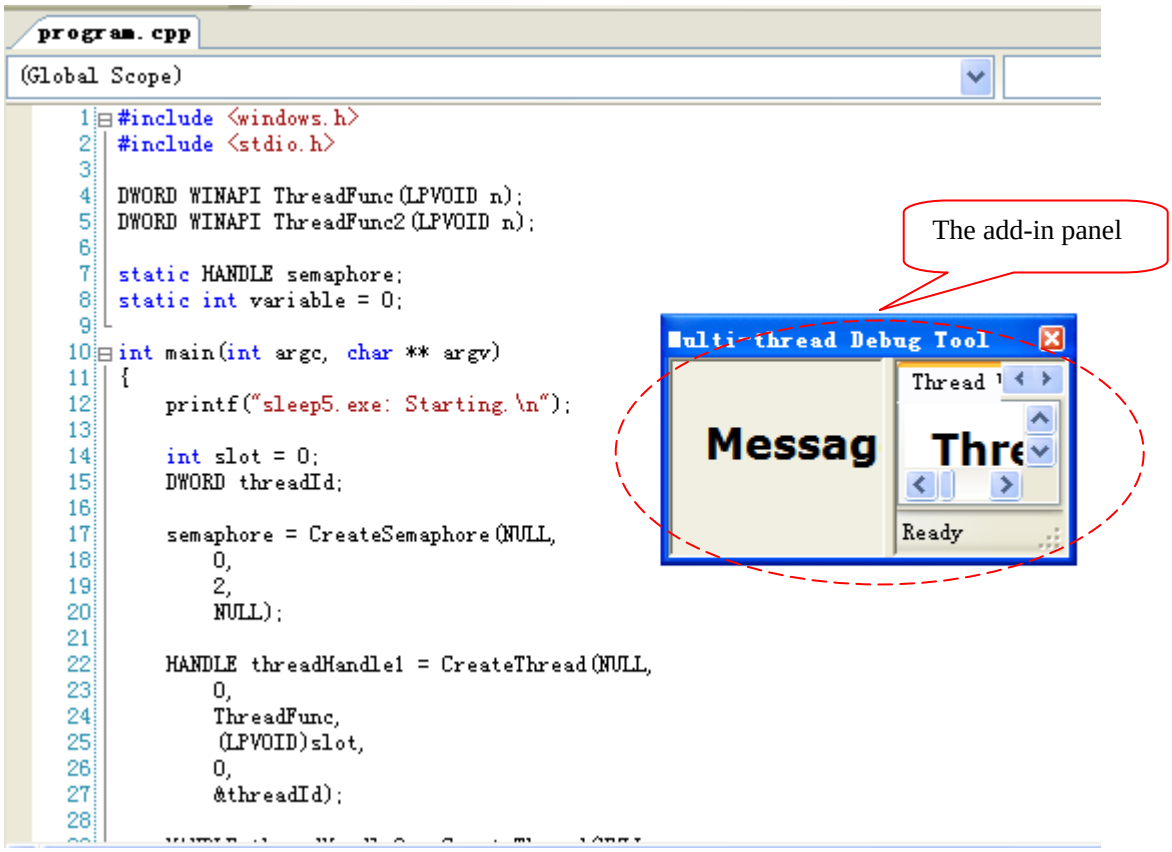

Figure. 3-3 panel

- Drag the panel to be docked at any side of the VS2005.(Figure 3-4, Figure 3-5)

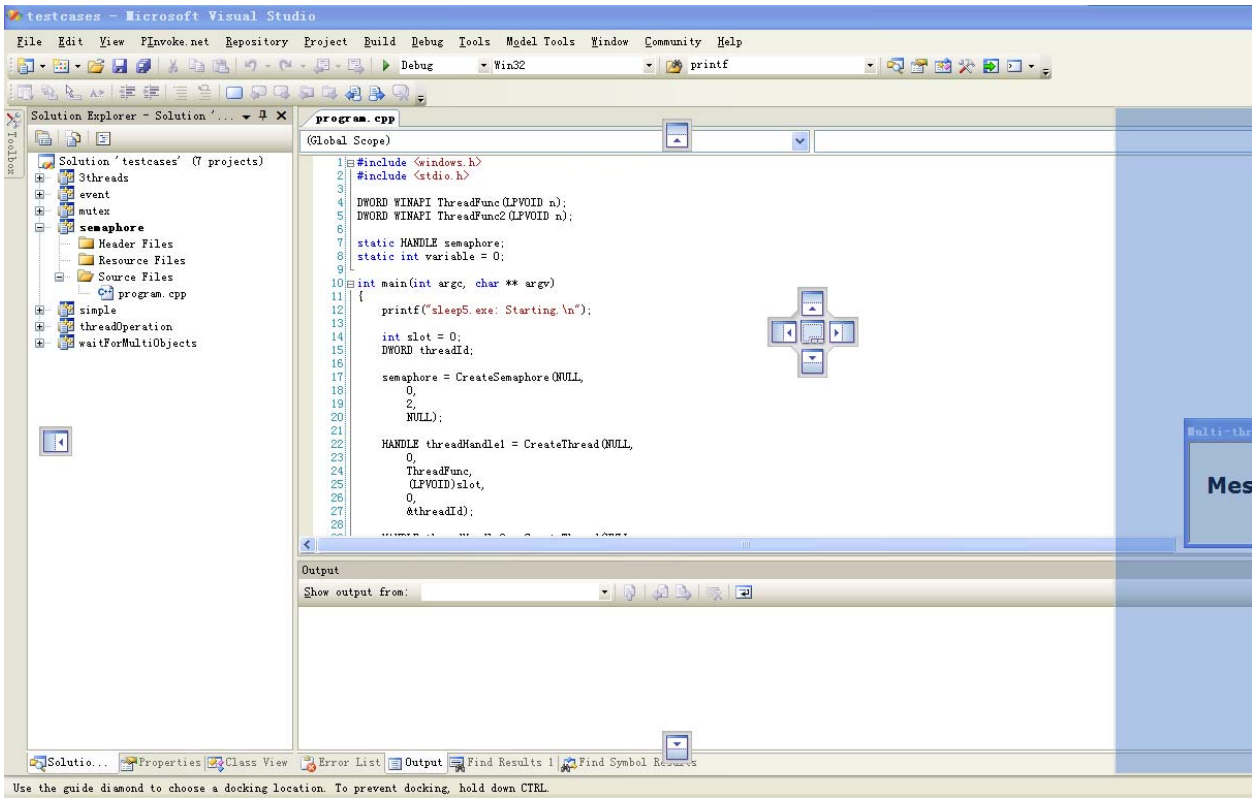

Figure. 3-4 dock the panel

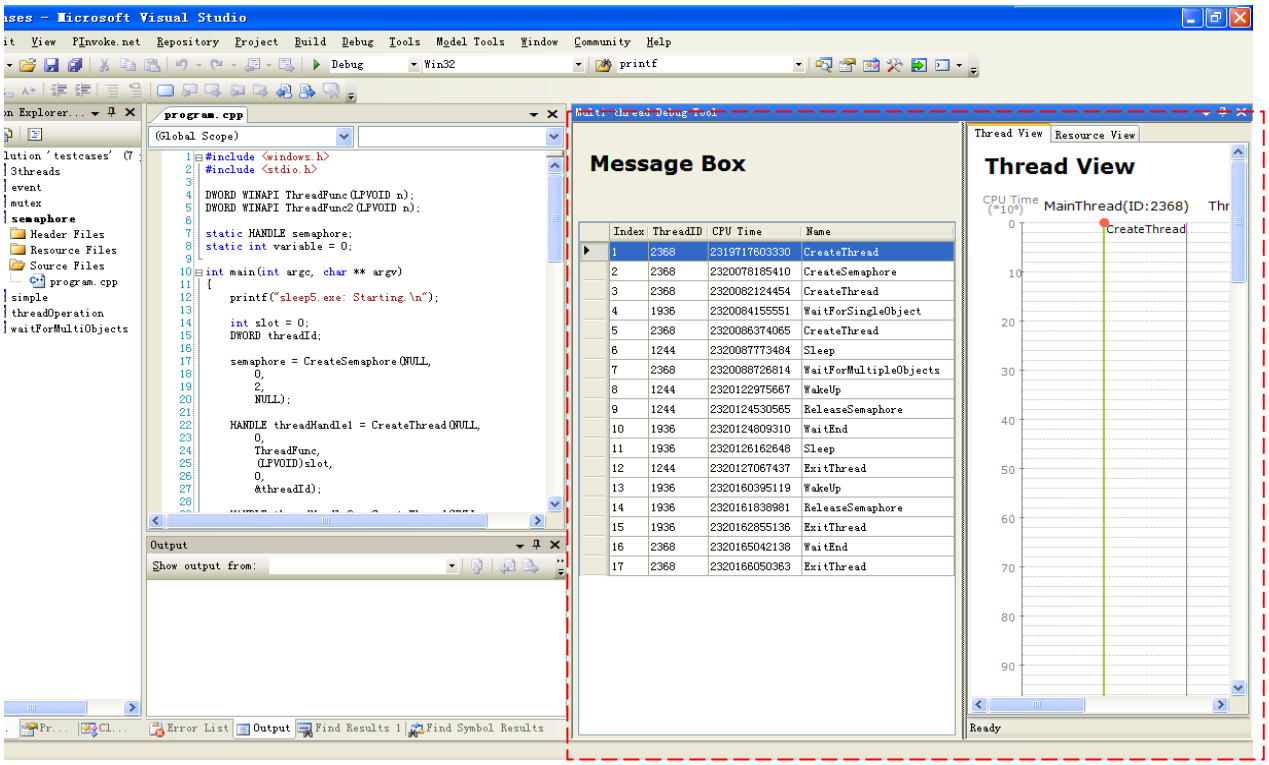

Figure. 3-5 panel

In the Figure 3-5, on the left of the panel is the *message box*, which displays the Win32 APIs called by the running threads in the program; one the right of the panel is the *thread view*, which displays the track of each running threads.(Figure 3-6) Also, you can switch from the thread view to the resource view, which displays the resources(including semaphores, mutexes and events created in the program).(Figure 3-7)

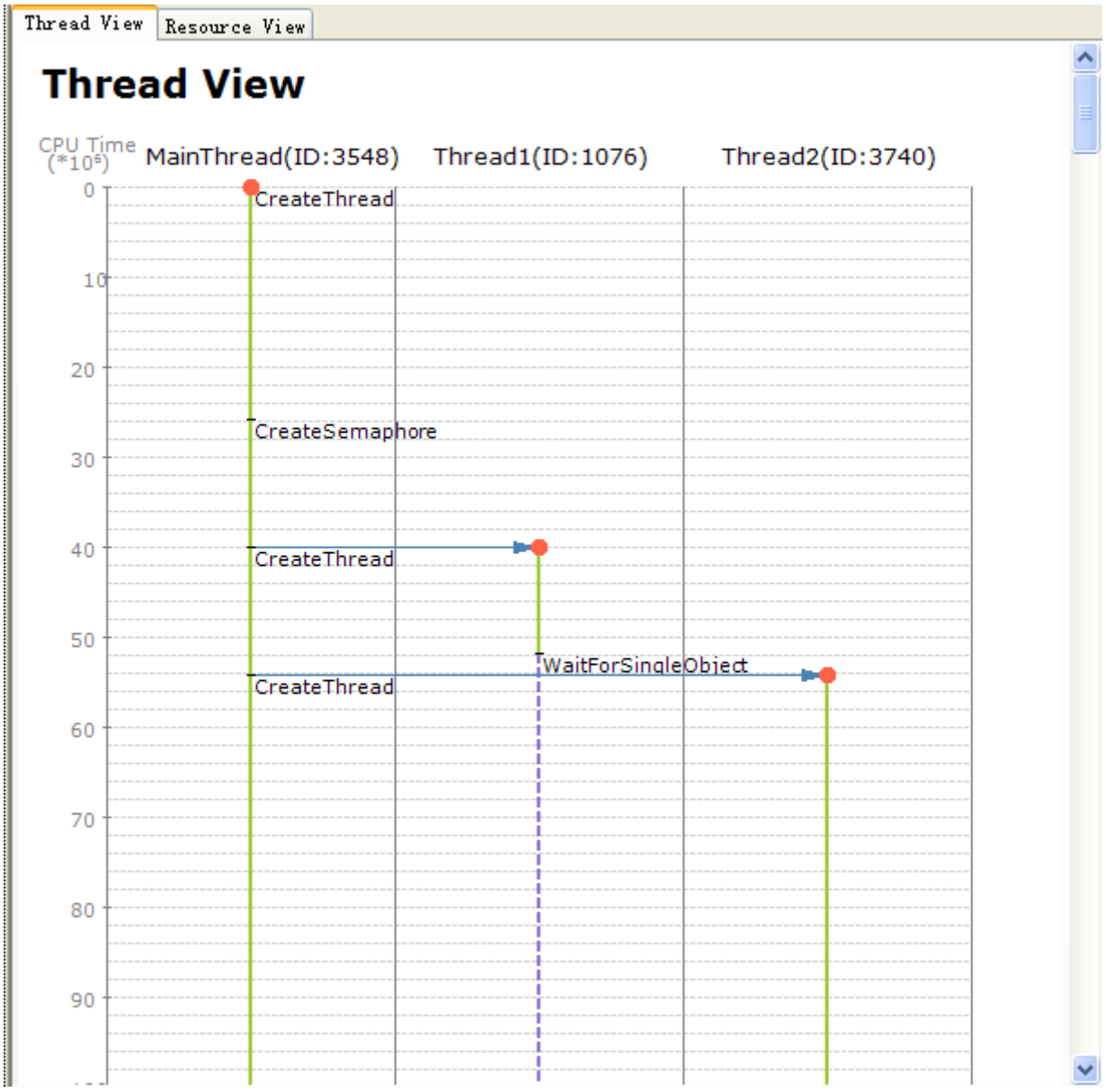

Figure. 3-6 thread view

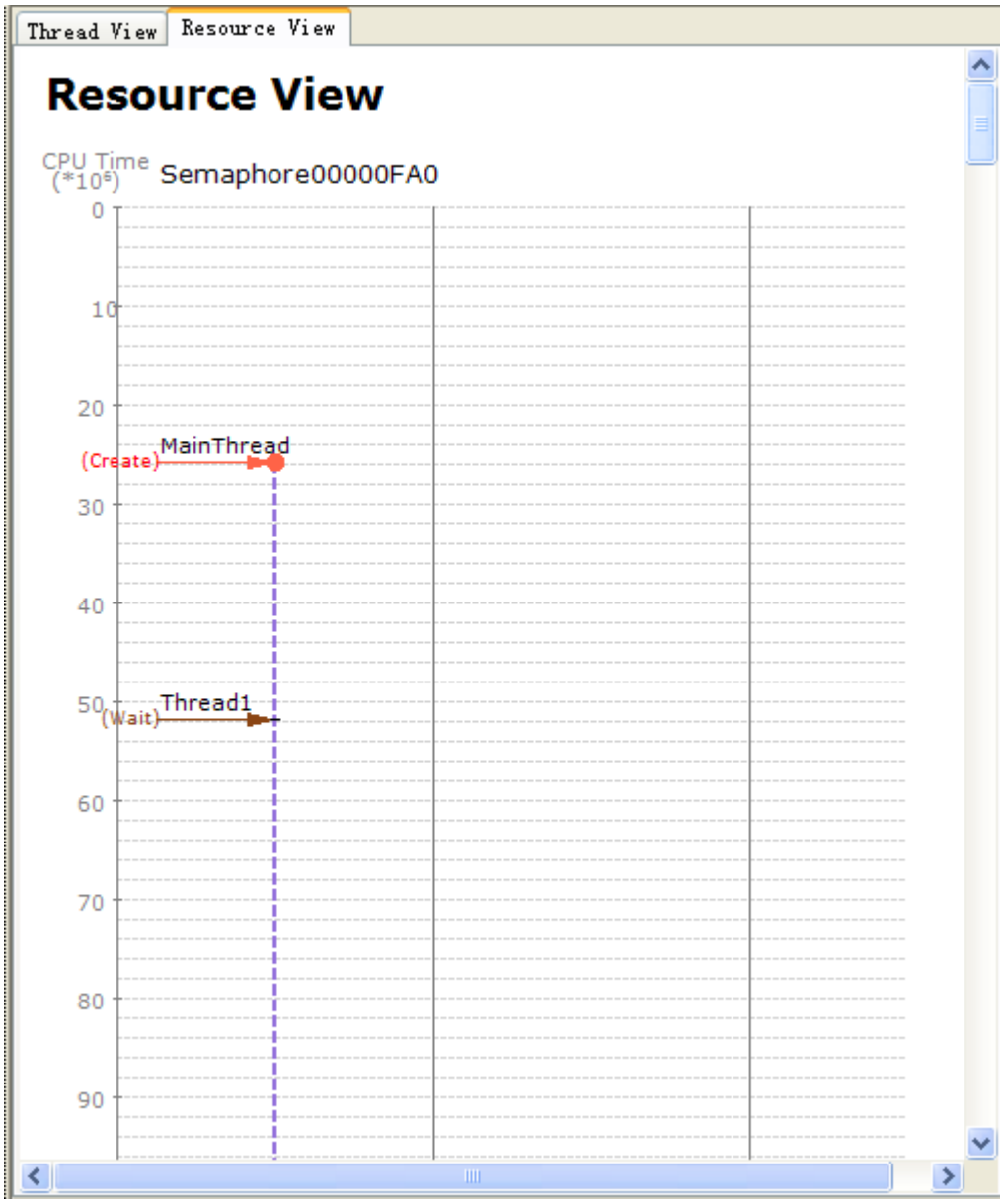

Figure. 3-7 Resource View

- Also, by clicking the message in the *message box* on the left, you can highlight the one in the *thread view*.(Figure 3-8)

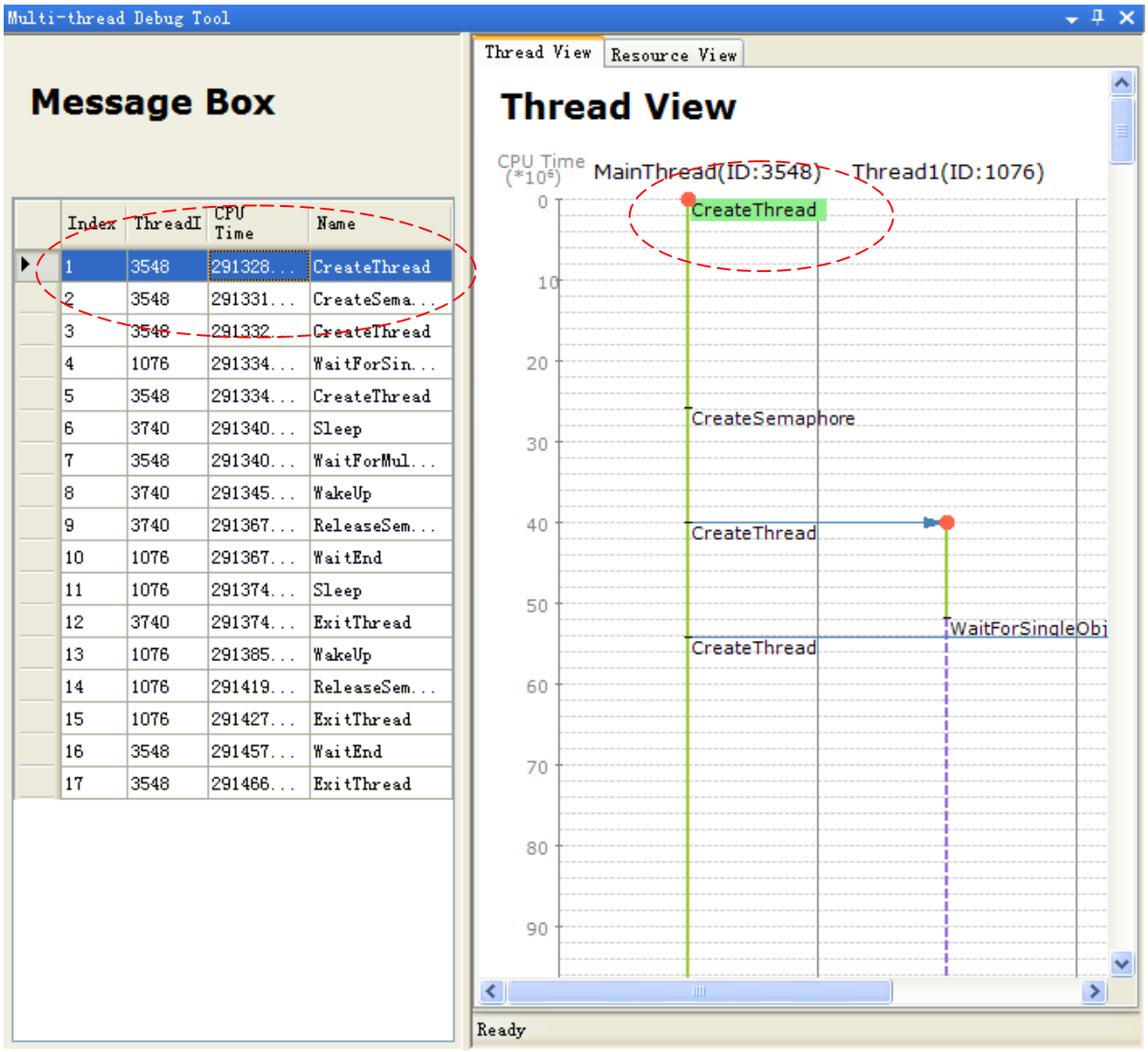

Figure 3-8 message highlight