

Description: Guide to using memory dump utilities to help debug applications.

OS Requirement: Win 2000, XP Pro, Server 2003, Vista, Server 2008, Windows 7

General Requirement: N/A

Introduction

In some special scenarios, it may happen that software does not perform as one would expect. This may include malfunctions, software crashes and other unwanted behavior.

These problems are often the results of incompatibilities or configuration issues. Sometimes, these problems are difficult to reproduce in ICONICS controlled environment, being able to collect as much information as possible is a necessary to resolve the problem and get everything up and running.

Several tools are useful in debugging an application; the Performance Monitor and ICONICS TraceWorX32 are amongst many of the tools. In this Application Note, we will introduce two useful tools called Dr. Watson and User Mode Process Dumper, which allows taking a snapshot of an application memory so that an engineer can look into these logs to isolate an issue.

Dr. Watson

Dr. Watson is a built-in Windows utility, available in Windows XP and Windows 2003 Server. Dr. Watson needs to be properly setup and initialized on the machine having problems to generate a useful dump and log file.

1. Go to Start → Run, type “drwtsn32 -i” (without quotes) and click OK to initial the Dr. Watson tool.

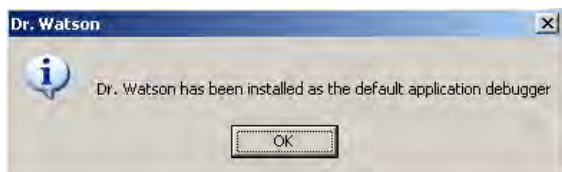


Figure 1 - Initial Dr. Watson Tool as Default

2. Go to Start → Run again, type “drwtsn32” (without quotes), and click OK to open Dr. Watson configurator
3. In the dialog shown in **Error! Reference source not found.**2, make sure the log file path and the crash dump path are locations you can remember and the other options are set as shown as well.
4. The Visual Notification and the Dump Symbol Table options are optional. It is recommended that you use the

visual notification so that you know when Dr. Watson is invoked on a crashed file.

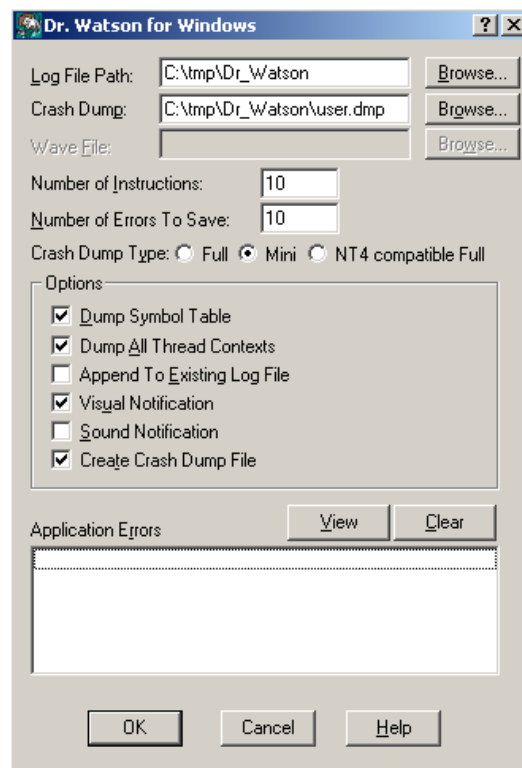


Figure 2 - Dr. Watson Dialog

5. Once a crash has occurred, please be sure to send the dump file and the log file to your support engineer at ICONICS for further review and analysis.

DrVista (DrWatson on Vista)

Even though Microsoft no longer supplies Dr. Watson with Vista, there is still a way to create a dump and log file to developers for diagnosing software problems.

You can download the utility from <http://www.hotcomm.com/ftp/pub/DrVista.exe>. The settings are the same compared to setting up Dr. Watson.

NOTE: It may happen that Dr. Watson (or Dr. Vista) will not create a proper memory dump file, or simply will not be supported in some 64bit operating systems. When this happens, we can use another tool for creating log and dump file. One of them is User Mode Process Dumper.

User Mode Process Dumper

User Mode Process Dumper is a debug utility that Microsoft distributes to users on its website. You will need to download and extract this file. As of when this application note was written, the most recent version is 8.1, which can be downloaded from the following link:

<http://www.microsoft.com/downloads/details.aspx?FamilyID=E089CA41-6A87-40C8-BF69-28AC08570B7E&displaylang=en&displaylang=en>

The installation is quite straight-forward. The downloaded file will create a folder containing the installation files for several platforms; you just need to pick the proper one. Once you have completed the installation, the Process Dumper will be available from your Control Panel.

Configuring User Mode Process Dumper

From the graphical user interface of this software, you can specify which applications you want to generate dump files for on some specific conditions.

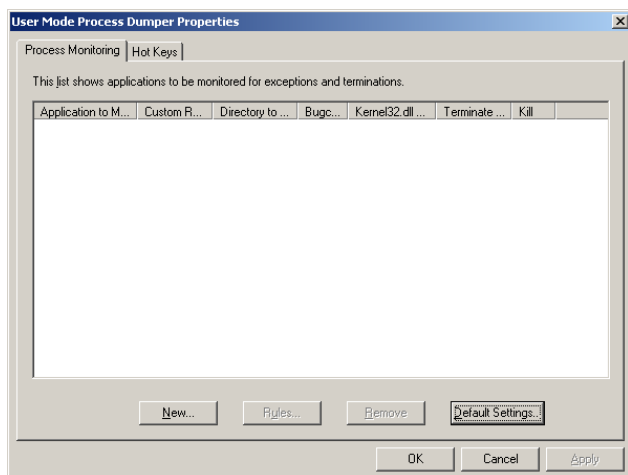


Figure 3 - The Process Dumper User Interface

For example, in our case we want to create a set of rules to dump GraphWorX32 memory when there is a problem. You can use the default rules provided by the Process Dumper, or you can specify your own. We have decided to customize the rules to have full control over the process.

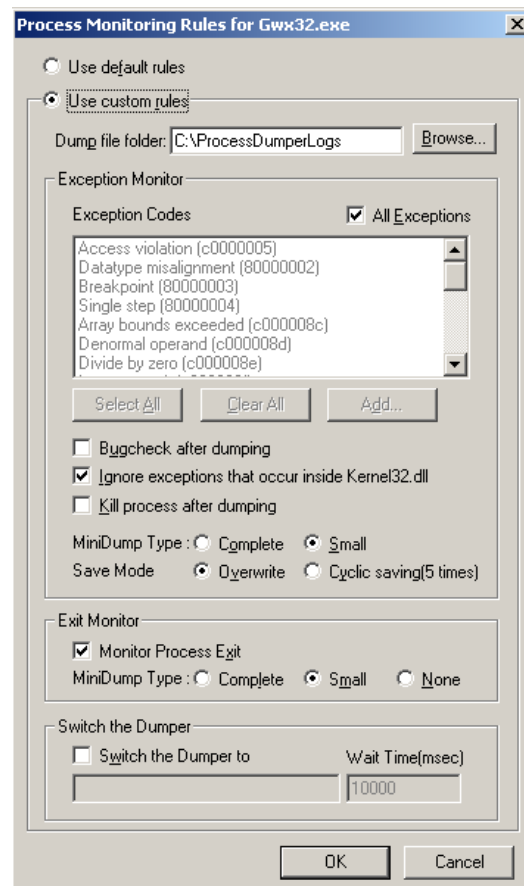


Figure 4 - Configuring Custom Rules for the Gwx32.exe Process

In the above settings, we have selected to put the dump files in a specific folder and we have chosen to create a memory dump file whenever an exception occurs. You can customize these and the other settings in this window. You can also create rules for other interested processes.

Utilizing User Mode Process Dumper

According to the settings we specified earlier, the Process Dumper will be able to perform its task automatically whenever an exception occurs without a direct intervention from the user.

However, you might be interested in getting a memory dump file at a specific time (i.e. after the software ran for 1 hour, or maybe just before doing some task). This is possible by invoking the Process Dumper from the command line.



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.pdb files, together with the new executable files, contain additional tracing information. These are not install by default due to large file sizes.

Example of steps for debugging GraphWorX32 crash with Technical Support:

1. You will receive a new Gwx32.exe and Gwx32.pdb files.
2. You will replace the old Gwx32.exe file with new ones (make sure that you make a backup of the old one), and copy Gwx32.pdb file to the same folder.
3. You will set the Dr.Watson (or other tool) as described previously.
4. Run the application (in this case GraphWorX32), and wait for the crash (or exception, or anything that is the problem).
5. Check the Dump File folder to see if a new Log file and a new memory dump file were created (e.g. drwtsn32.log, user.dmp)
6. Send all these files (Gwx32.exe, Gwx32.pdb, drwtsn32.log, user.dmp) to Technical Support (or upload to ftp).

Now, technical support (and a technical engineer) should have all necessary information, and probably will find the reason for the crash.

Using the Dump Files

It will be possible to use some debugging utility, like WinDbg, to analyze the dump file. By analyzing the dump file an engineer might be able to understand what happened and why. For this reason, Dr. Watson (Dr. Vista) and Process Dumper are valuable tools when debugging a problem.

Considering the low-level nature of this utility, Dr. Watson (Dr. Vista) and Process Dumper should be used in those cases where ICONICS TraceWorX32, Event Viewer or the Performance Monitor are not enough to understand what is happening.

.pdb Files

When you are debugging a problem with Technical Support, you will be asked to replace the old executable file and copy a new file with the .pdb extension into the same folder. These