

Microsoft^(R) Windows^(R) CE.net

RTOS Debugger for Windows CE/Windows Mobile

ARM
MIPS
SuperH
XSCALE
x86

- Real Time, non-intrusive Display of Windows Mobile System Resources
- Debugging Windows Mobile Kernel
- Debugging Windows Mobile Device Drivers
- Debugging Several Windows Mobile Applications At Once
- Dynamic Thread Performance Measurement
- Windows Mobile Specific Evaluation of Real Time Trace Listing
- PRACTICE Functions for OS Data
- Windows Mobile related Pull-Down Menu

The TRACE32 System includes a configurable multitask debugger to provide symbolic debugging in real time operating systems. Our software package contains a ready-to-run configuration for the Windows CE/Mobile Real Time Kernel from Microsoft Corporation

In close cooperation with Microsoft, we built a high sophisticated Windows CE/Mobile awareness, which enables you to do a most effective debugging with the TRACE32 systems on targets running Windows CE/Mobile.

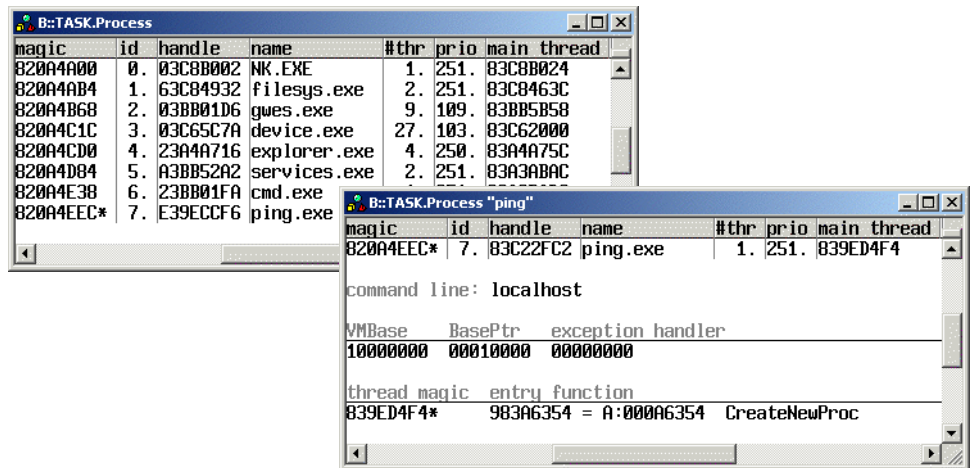
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Multitask Debugging on TRACE32 with Windows CE

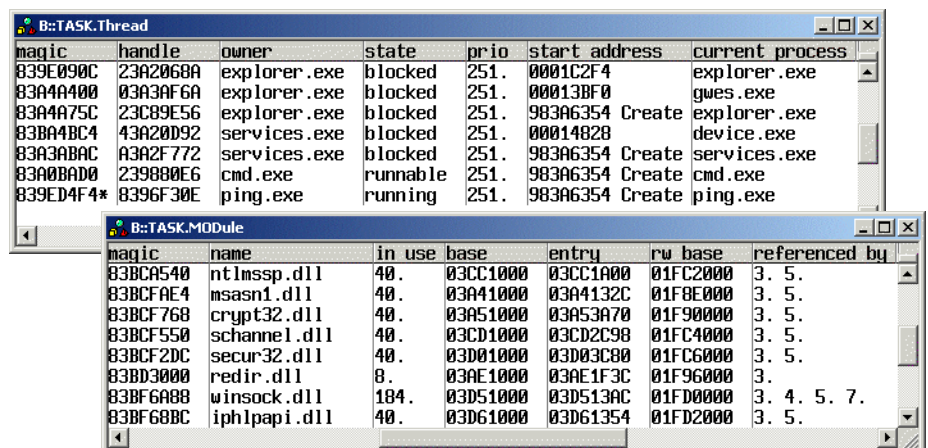
Real Time, Non-Intrusive Display of Windows CE System Resources

The TRACE32 multitask debugger for Windows CE provides display functions to show internal information. The system resources processes, threads, DLLs and builtin modules can be displayed. All this information is read out

of the target by only reading the memory. No target function is called, thus the current program flow isn't affected at all, and no instrumentation is necessary.



Process list and detailed view of one process

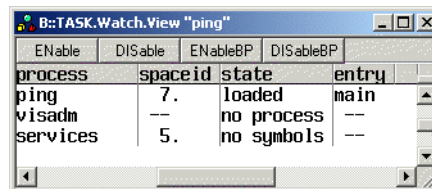


Thread list and DLL list window

Kernel and/or Application Debugging

Due to the fact, that TRACE32 is a hardware debugging tool, you are able to debug anything you want, including bootstrap code, initialization phase, interrupt routines, drivers, kernel, etc. TRACE32 includes a complete MMU support, providing mechanisms to inspect the target memory using virtual addresses or physical addresses and to show the translation tables.

Additionally, TRACE32 has a special MMU support for several address spaces, which allows you to debug several Windows CE applications (processes) at once. An internal logic provides you with an easy access to all process memory spaces. A special process detection mechanism allows to halt the application exactly on the entry point of a process, allowing you to debug your process right from main().



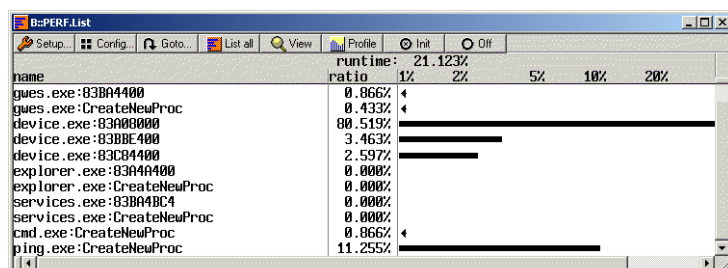
process	spaceid	state	entry
ping	7.	loaded	main
visadm	--	no process	--
services	5.	no symbols	--

Process watch list

Dynamic Thread Performance Measurement

While Windows CE is running, TRACE32 is capable of recurrently evaluating the current running thread and collecting the results. The percentage, each thread consumes of the system, is then displayed graphically and

updated permanently. The longer time you let the measurement run, the more exact are the results. This feature is available even without any hardware trace.



name	ratio
ping.exe:CreateNewProc	11.255%
cmd.exe:CreateNewProc	0.866%
services.exe:CreateNewProc	0.000%
services.exe:83BA4BC4	0.000%
explorer.exe:CreateNewProc	0.000%
explorer.exe:83C94400	2.597%
device.exe:83C94400	3.463%
device.exe:83BBE400	90.519%
device.exe:830B0000	0.433%
gues.exe:CreateNewProc	0.000%
gues.exe:83BA4400	0.866%

Performance measurement list

Windows CE Specific Display of Trace Listing

The data recorded in the real time trace buffer (if available) can be displayed and interpreted specific to the operating system. The thread switches are

displayed symbolically, either exclusively or in addition to other information.

Statistic Evaluation and Graphic Display of Thread Run Times

Out of the real time trace buffer (if available), the analyzer can calculate statistic tables of thread run times and thread switches. A graphical diagram

shows which thread was active at a specific time, giving a clear view of the behaviour of the system.

Thread Related Evaluation of Function Run Times

The statistic and graphic evaluation of function calls and function run times (if available) can be done dependant to the actual running thread. This is nec-

essary, if different threads call one single function at the same time, or if a thread switch occurs in between the function.

Statistic Evaluation and Graphic Display of Thread States

If covered by the real time trace, these tabular and graphical analyses of the status of threads show the various states (i.e. running, ready, waiting, suspended and undefined) and times each

thread spent in each state. A graphical view of the data can help to highlight prioritisation problems, critical paths etc.

PRACTICE Functions for OS Data

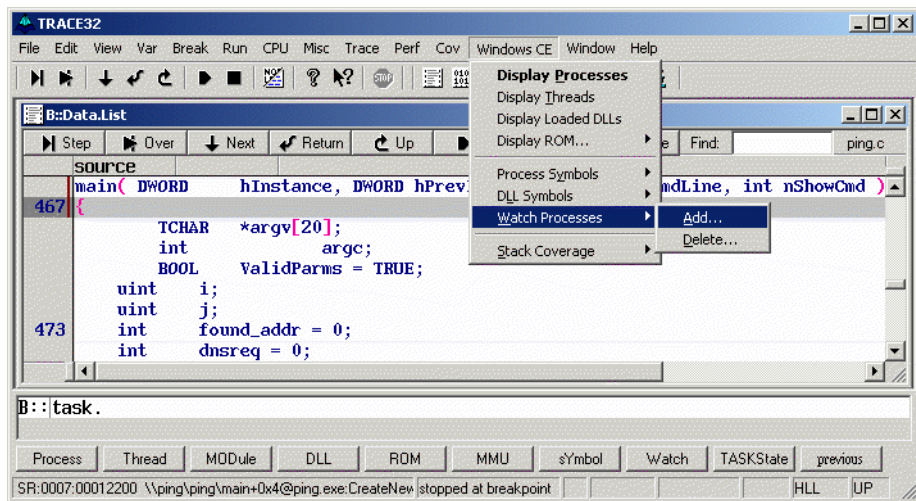
The support includes extended PRACTICE functions for process specific data. E.g. the function "task.proc.spa-

ceid ("ping")" returns an id specifying the MMU memory area that this process uses.

Windows CE Related Pull-Down Menu

Because the menu bar of the TRACE32 user interface can be fully customized, you can create a new pull down menu, including operating system specific commands. We deliver

Windows CE support with an example for such specific menues, which provides fast and easy access to the Windows CE features.



TRACE32 with source window and opened Windows CE menu

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