SourcePoint WinDbg

Getting Started Guide for the

AAEON UP Xtreme i11

Revision 1.0

Contents

Revision History

Revision Number	Description	Date
1.0	Original document	December 6, 2023

Welcome!

Thank you very much for your use of our SourcePoint WinDbg product! We hope that you get great value using our tool for your debugging efforts.

If you do encounter issues or have questions on the use of SourcePoint WinDbg, please visit our support site at https://www.asset-intertech.com/support/ to get in touch with our Support organization.

As with any new tool, mastering SourcePoint takes an investment in terms of time and effort. JTAG-based debug is a specialized area, and the JTAG, EXDI and Windows interactions sometimes behave non-deterministically – Windows in particular sometimes objects to a hardware-assisted debugger being present. We've done our best to mitigate these issues. Nonetheless, you may encounter behavior that seems non-intuitive or even wrong. If so, check out the Troubleshooting section of this document first. Secondly, view the Troubleshooting section of the Getting Started Guide for the AAEON UP Xtreme i11. Thirdly, refer to the Release Notes in the SourcePoint Academy. Finally, if you're still stuck, contact us at our Support page. We'll do our best to get you up and debugging again.

For those who are new to SourcePoint, it is highly recommended to review our Getting Started Guide for the AAEON UP Xtreme i11 to get a jumpstart before using SourcePoint WinDbg. That, and the rest of the content within the SourcePoint Academy, are highly recommended background reading.

Introduction

It is recommended that all users have a working familiarity with SourcePoint installation, licensing, and basic usage. Installation and licensing are described fully in the SourcePoint Installation and Licensing Guide that is obtained from ASSET upon initial receipt of your shipment. For basic SourcePoint usage on the AAEON UP Xtreme i11, go to the SourcePoint Academy and read the Getting Started Guide for the AAEON UP Xtreme i11 to learn the basics of SourcePoint run-control and trace.

The content that follows is based upon our using the AAEON UP Xtreme i11 Tiger Lake board. Of course, any Intel board that can support the Intel Direct Connect Interface (DCI) is suitable. Intel customers with the appropriate NDA will have access to a plethora of Customer Reference Boards (CRBs) that have DCI enabled out of the box. The AAEON UP Xtreme Whiskey Lake board (for which UEFI source code is available) is also a good platform. More information on the Whiskey Lake board is available here:

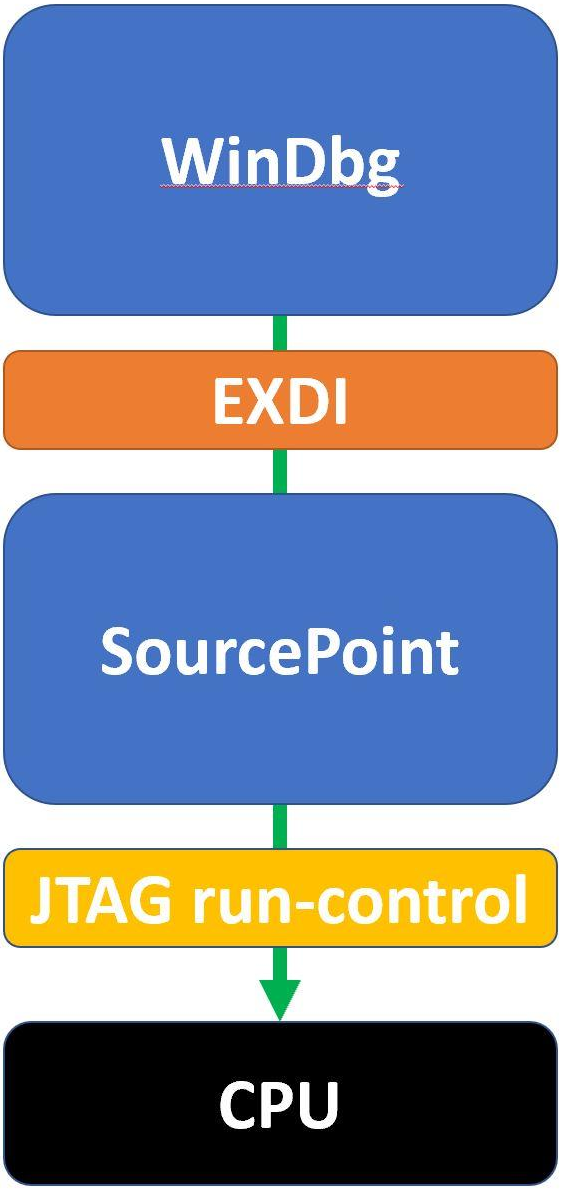
JTAG Debug using DCI on the AAEON UP Xtreme Whiskey Lake board

Hypervisor and OS Kernel Debug with DCI on the AAEON Whiskey Lake board

A key pre-requisite is that the platform must have debug consent enabled; that is, it must be in a debuggable state. If XDP access is available on the board, you can connect to it via the ASSET ECM-XDP3e hardware probe. Some small number of Commercial-Off-The-Shelf (COTS) boards support direct access via the Intel Direct Connect Interface (DCI). These include the AAEON UP Xtreme, and the AAEON UP Xtreme i11. Documenting the steps needed to enable JTAG-based debug on other boards is beyond the scope of this Guide; interested readers are referred to Satoshi Tanda's Debugging system with DCI and WinDbg.

The SourcePoint WinDbg application will work on Intel-based Windows platforms, on all CPUs that are supported by SourcePoint run-control. As of the time of this writing, all mainstream Intel CPUs are supported. AMD support will be in a future release.

A block diagram of how WinDbg is integrated with our SourcePoint debugger is as below:



The Microsoft EXtended Debug Interface (EXDI) is used to connect a WinDbg debugging session to an existing SourcePoint JTAG-based connection to a target.

WinDbg is the controller in all transactions over EXDI, and SourcePoint is the worker. That is, the solution is most stable when run-control based operations (that is, Break, Go, single-step, etc.) are initiated via WinDbg. There are exceptions that we will discuss later. But, in general, WinDbg issues debug primitive commands down to SourcePoint, which in turn uses JTAG-based run-control to perform operations on the target. Then, SourcePoint presents the results data back to WinDbg over the EXDI connection.

Power Tip: The UP Xtreme i11 boots to the UEFI shell when initially purchased. It is necessary to install Windows on the target. There are numerous references online on how to do this: it is recommended to go to the AAEON https://github.com/up-board/up-community/wiki/Windows-GSG site for helpful tips.

Power Tip: Be sure that your target has sufficient memory and storage to accommodate your Windows debugging needs. We typically recommend 16GB RAM, and a 256GB SSD.

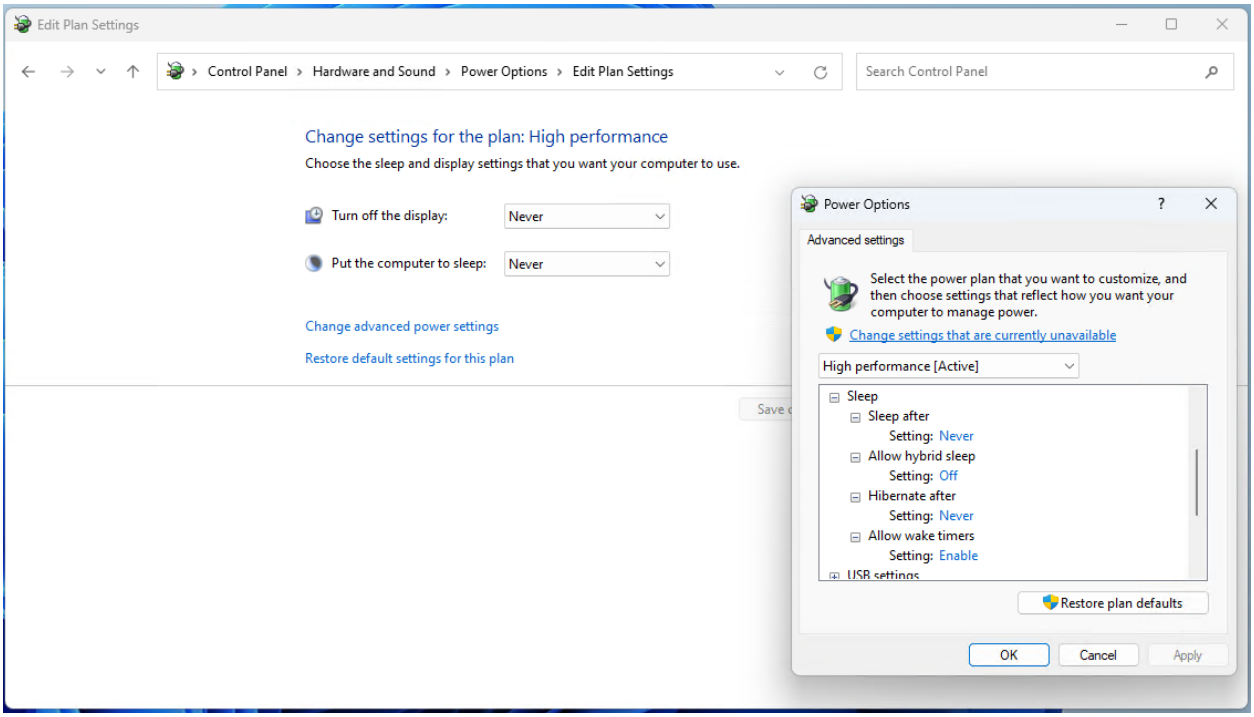
Before we get started, the target needs to be configured to not interfere overmuch with JTAG-based run-control. Then, the steps needed to set up a debugging session will be covered.

Configuring the target and setting up pre-requisites

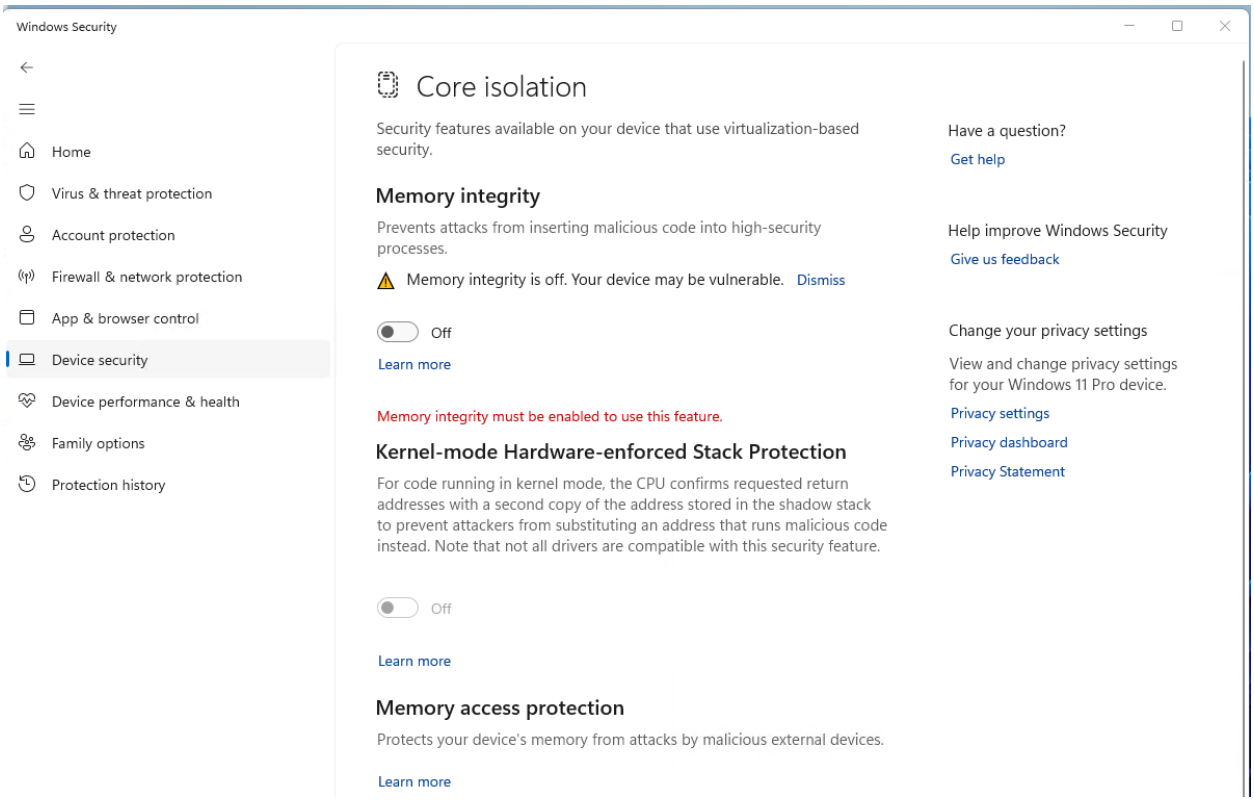
On the target, we'll need to prevent changing power states from disrupting run-control prematurely, and VMX and VBS need to be disabled.

These steps are highly recommended (as of the time of writing) to have a successful debugging session.

To adjust the power settings in Windows, open the Control Panel > Hardware and Sounds > Power Options > Edit Plan Settings and set these per the below:



For Windows VBS, go into Windows Security > Device Security > Core Isolation and turn Memory Integrity off:



For VMX, boot the Tiger Lake board to BIOS settings menu (pressing the F7 key when restarting), enter the Advanced BIOS Setup (by entering the password upassw0rd) and follow the menu path `CRB Setup > CRB Advanced > CPU Configuration` and change “Intel (VMX) Virtualization Technology” to **Disabled**. Save and exit and restart.

Power Tip: Go to `CRB Setup > CRB Advanced > Platform Settings > VTIO` and make sure it is set to Disabled. This is the default in the AAEON Tiger Lake Debug BIOS, but it’s worthwhile checking.

NOTE: Debugging with VBS enabled will be covered in a future revision of this document.

Now you’re ready to set up a debugging session.

How to Establish a SourcePoint WinDbg Session

Power Tip: If you're new to using WinDbg directly on a hardware target, getting acquainted with this beforehand will be very helpful. Setting up WinDbg/kdnet is described here:
https://learn.microsoft.com/en-us/windows-hardware/drivers/debugger/setting-up-a-network-debugging-connection-automatically
and getting started with kernel debug using WinDbg is here:
https://learn.microsoft.com/en-us/windows-hardware/drivers/debugger/getting-started-with-windbg--kernel-mode-
NOTE: With SourcePoint WinDbg, there is no need for the Ethernet connection described in the above links, as all the traffic is over EXDI. Nonetheless, the target must be in a debuggable state prior to launching WinDbg.

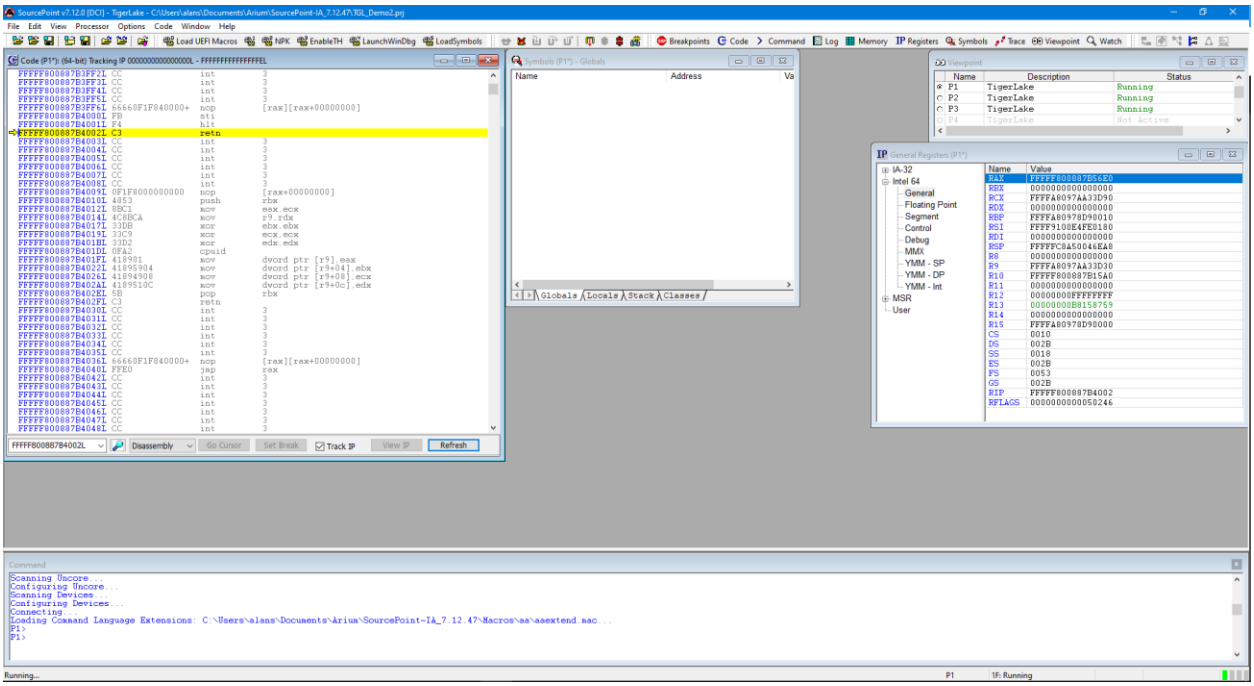
Four steps are needed to begin a debugging session with SourcePoint WinDbg:

1. Connect SourcePoint to the target
2. Run the StartWinDbgExdi macro
3. Issue a Break from WinDbg
4. Load symbols with the LoadCurrent macro.

Step 1: Connect SourcePoint to the target

Boot the target to Windows. Log into the Windows desktop.

Follow the steps as described in the Getting Started with SourcePoint section of the Getting Started Guide for the AAEON UP Xtreme i11. Your screen should look something like this:

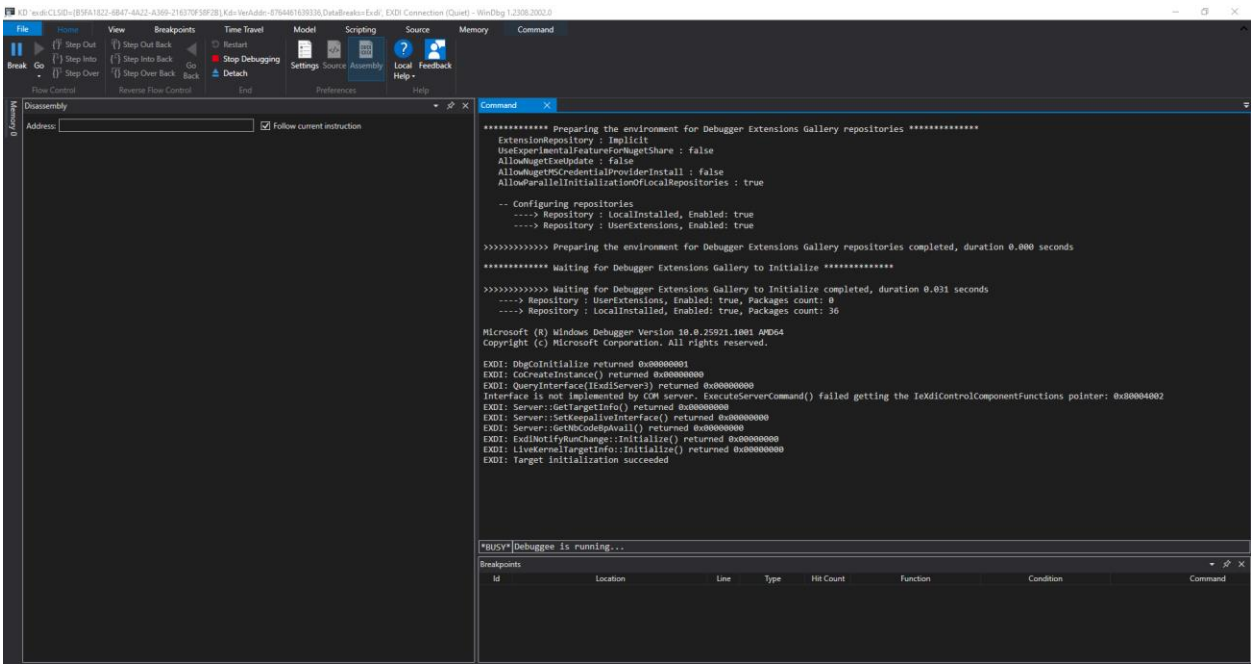


Halt the target by hitting the Stop button in SourcePoint Icon Toolbar at the top:

You may have to hit the Refresh button to see code displayed in the Code window.

Step 2: Run the StartWinDbgExdi macro

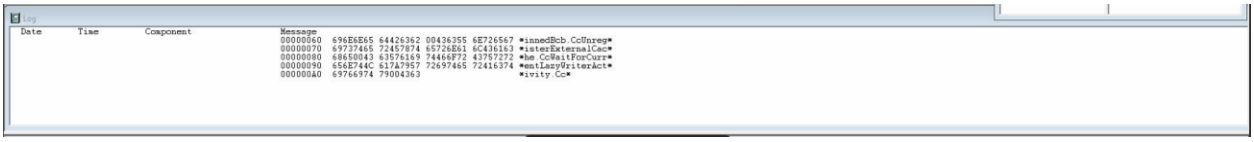
Next, it is time to run the StartWinDbgExdi.mac SourcePoint macro, that launches WinDbg and establishes the EXDI connection. Go to the File menu, select `Macro > Load Macro…` and select `C:\Users\<your name>\Documents\Arium\SourcePoint-IA_7.12.XX\Macros\WinDbg\StartWinDbgExdi.mac`. After about 10 seconds, WinDbg will open:



Power Tip: You can assign a button in the SourcePoint Icon Toolbar at the top to perform a one-click equivalent to the above operation, or to run any other macro. Refer to the SourcePoint User Guide or online help for how to do this.

Step 3: Issue a Break from WinDbg

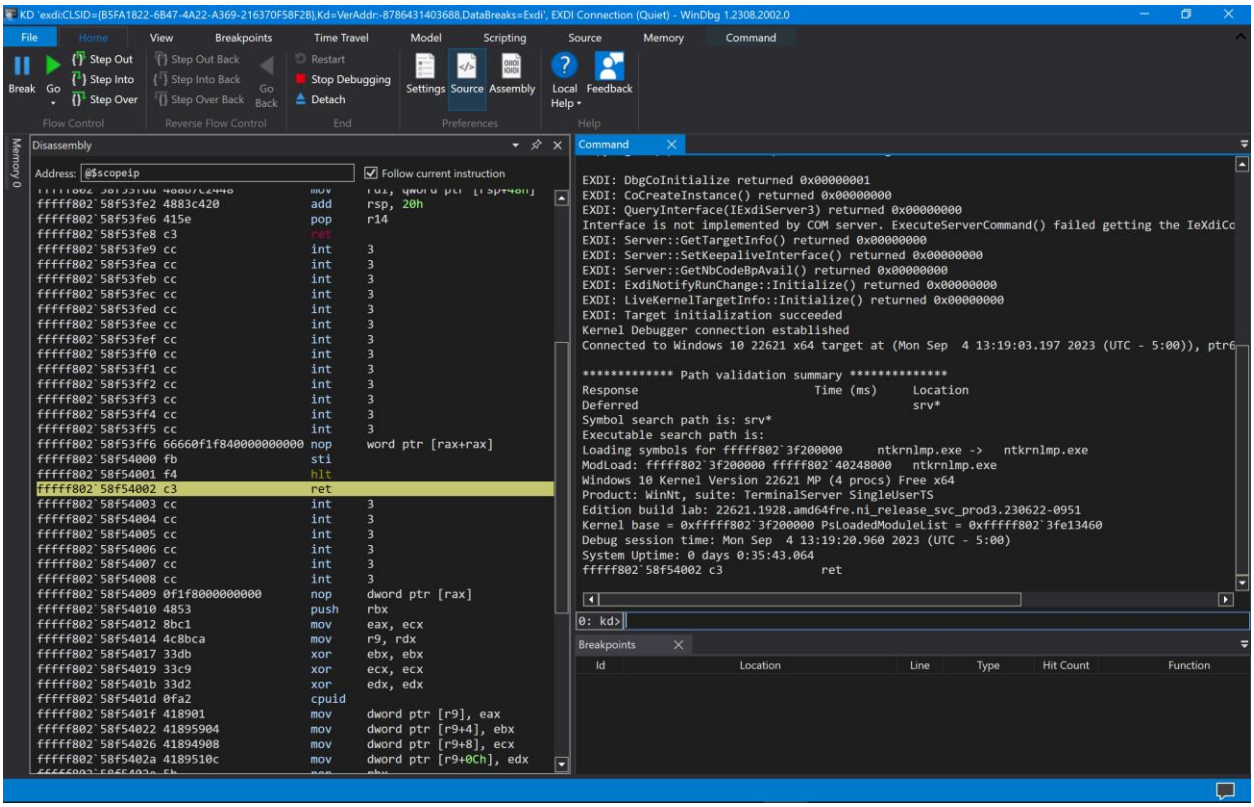
Now, hit the Break key within WinDbg. It will take ~ 30-50 seconds for SourcePoint to read the kernel memory and retrieve all the symbol information needed to match what WinDbg has (in terms of the Microsoft symbol server, or a local symbol cache). If you have the SourcePoint Log window open, you can see the symbol information being uploaded to WinDbg:

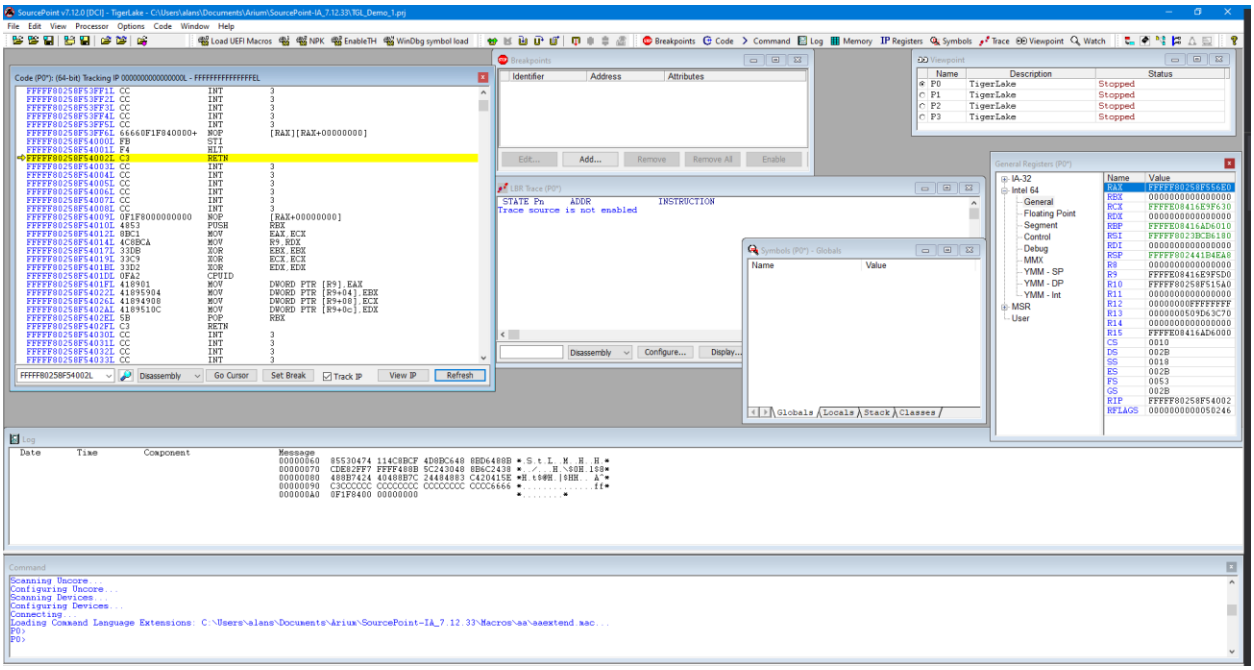


If you don't have the Log window open, you will nonetheless see the SourcePoint "Dashboard Lights" at the bottom right lighting up as the JTAG-based memory reads are done:

When the symbol load is complete, you will see that WinDbg and SourcePoint break at the same place.

The SourcePoint Code and WinDbg Disassembly window show the same location. Both are typically halted on logical processor 0, at a `RET` instruction:



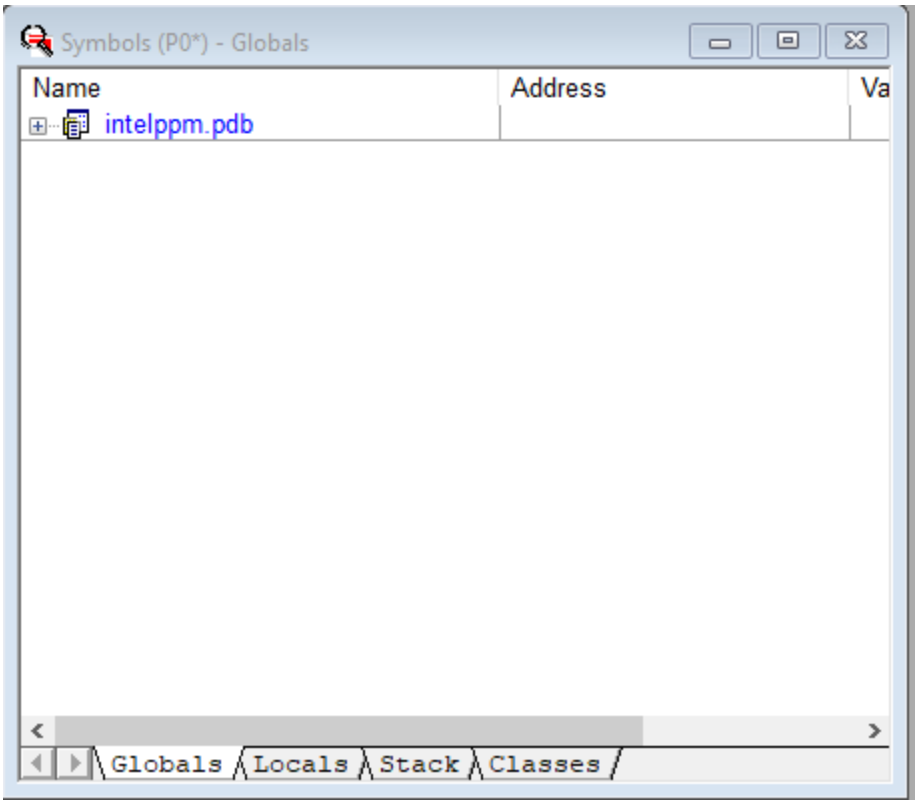


Step 4: Load symbols with the LoadCurrent macro

Symbols that are visible to WinDbg have to be made visible to SourcePoint as well, if we're going to get the most out of the joint solution. Follow the following steps:

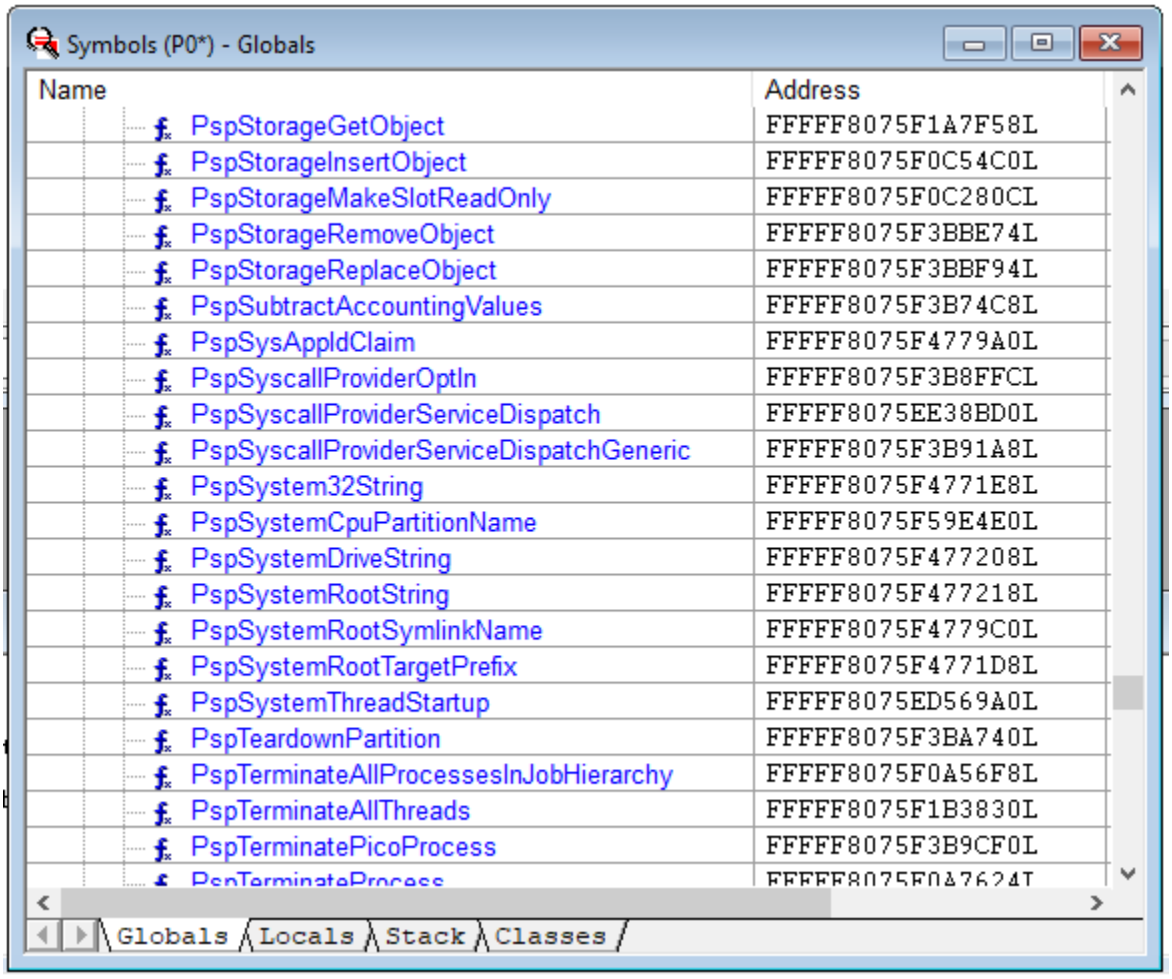
Ensure that the target is in a Stopped state. Hit Break within WinDbg if necessary.

Load the symbols by going into SourcePoint, under the File menu, select `Macro > Load Macro…` and select `C:\Users\<your computer>\Documents\Arium\SourcePoint-IA_7.12.XX\Macros\WinDbg\Load Current.mac`. After about 10 seconds, the SourcePoint Symbols window will display the module that the current instruction is in:



Interestingly, SourcePoint will display the symbols associated with intelppm.pdb. WinDbg does not display those symbols.

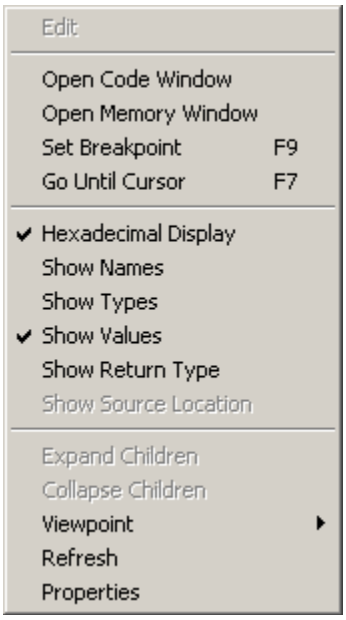
Expand the Labels within the Symbols window, and then you will see it populated with all functions that are in the current module, for example:



Power Tip: If WinDbg accesses symbols outside of intelppm.pdb (which it will during any typical debugging session), you'll need to run another "LoadCurrent.mac" to additionally access these new symbols within SourcePoint.

Power tip: Right-click on a function name within the SourcePoint Symbols window, and you'll see a rich number of capabilities that can be applied to that function, such as setting breakpoints, opening the function's Code window, etc.

All the Windows kernel function name symbols are displayed in the SourcePoint symbols window, under the `Globals` tab. You can right-click in the window to see the function addresses as well as function names. Right-clicking on a function name gives you the context-sensitive options to work with these functions:



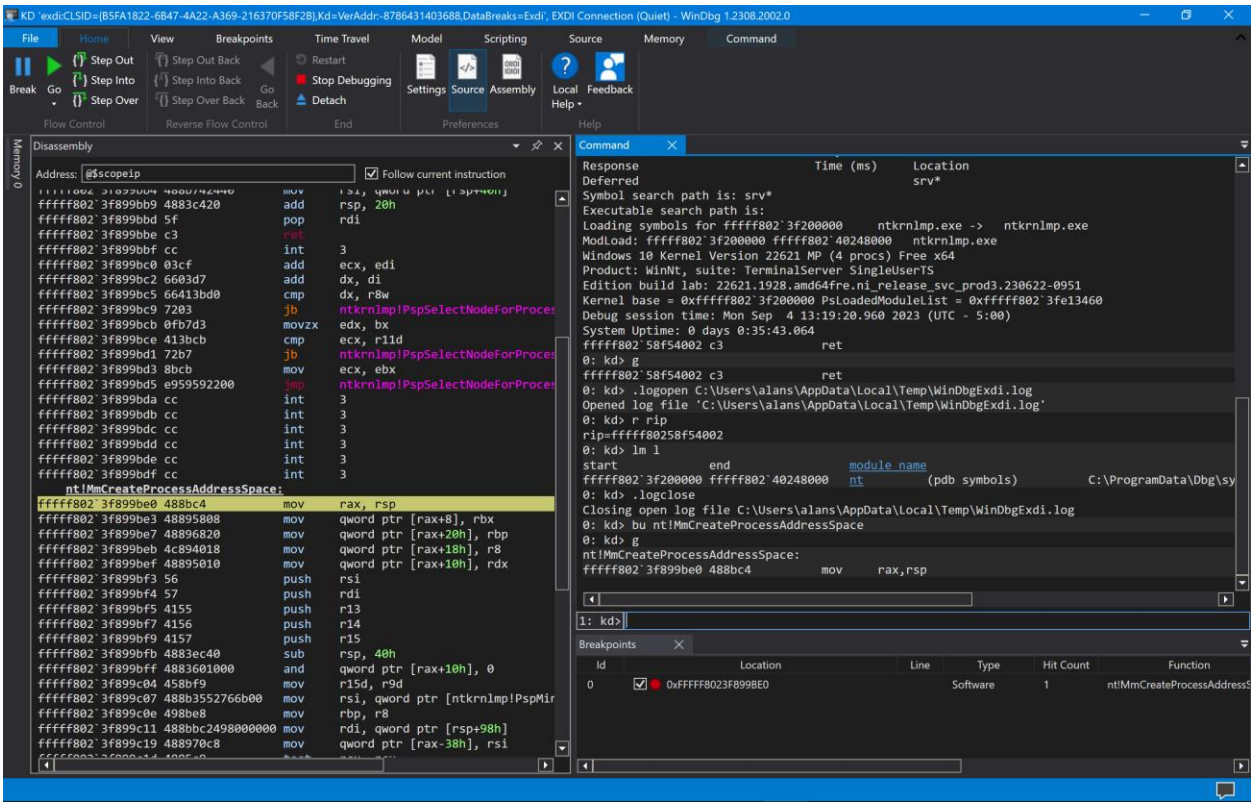
Now, it is possible to see the power of the two applications applied together. As an example, go into WinDbg and set a breakpoint on the entry point to the function `MmCreateProcessAddressSpace`:

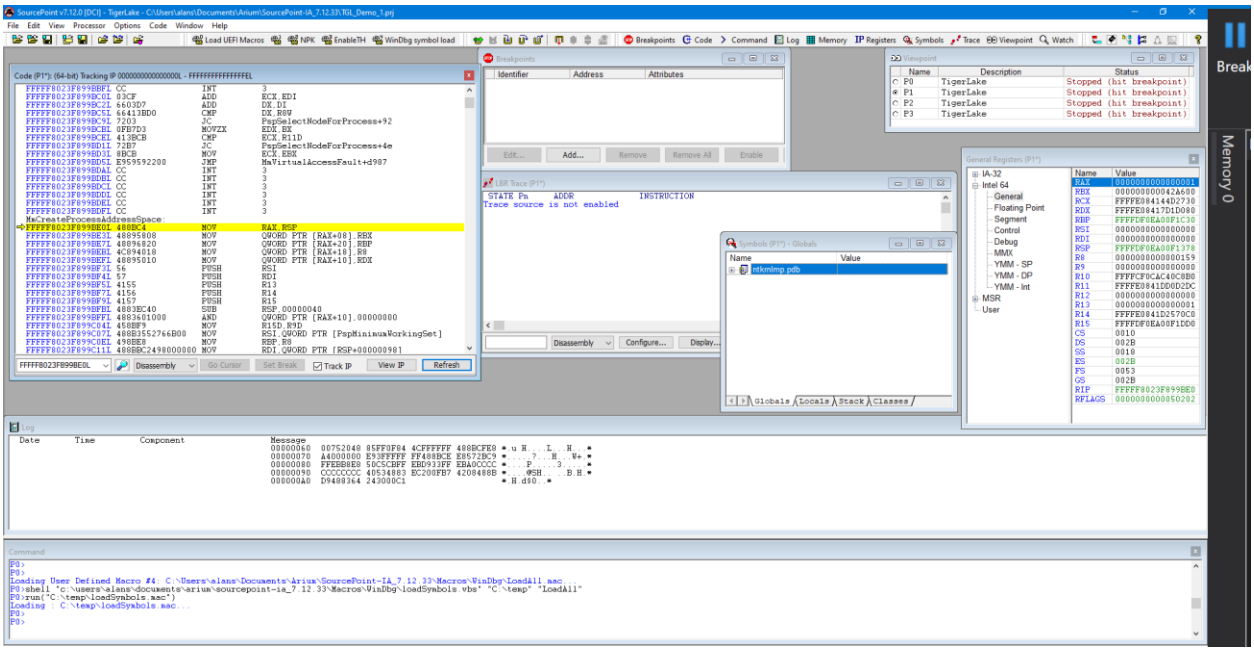
```
bp nt!MmCreateProcessAddressSpace
```

Then hit Go within WinDbg.

Sometimes the breakpoint is hit right away. You might need to move the target's mouse around, or open a window on the target, before the breakpoint is hit.

You can then see the break in both applications. They are symmetrical:

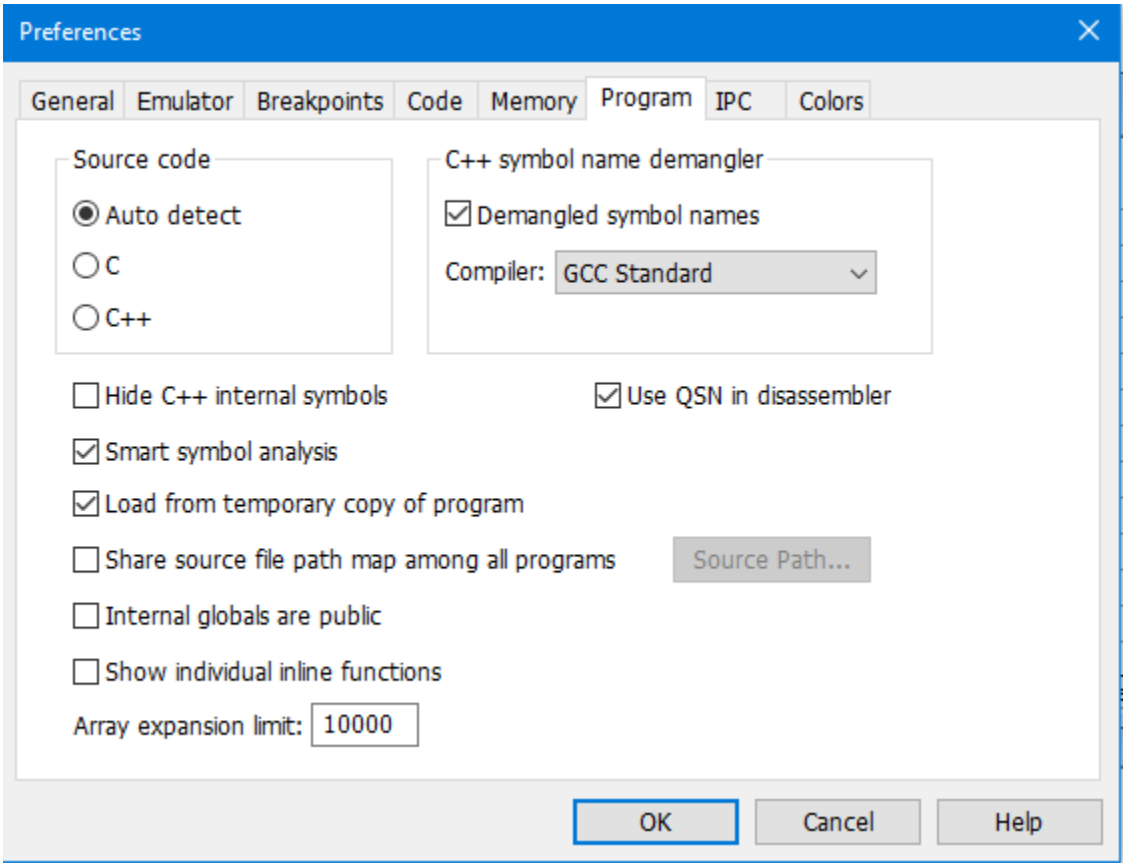

KD 'exdi:CLSID={B5FA1822-6B47-4A22-A369-216370F58F2B},Kd=VerAddr:-8786431403688,DataBreaks=Exdi', EXDI Connection (Quiet) - WinDbg 1.2308.2002.0
File
Home
View
Breakpoints
Time Travel
Model
Scripting
Source
Memory
Command
Break
Go
Step Out
Step Into
Step Over
Step Out Back
Step Into Back
Step Over Back
Go Back
Restart
Stop Debugging
Detach
Settings
Source
Assembly
Local Help
Feedback
Flow Control
Reverse Flow Control
End
Preferences
Help
Disassembly
Address: @$scopeip
Follow current instruction
fffff802`3f899bb9 4883c420 add rsp, 20h
fffff802`3f899bbd 5f pop rdi
fffff802`3f899bbe c3 ret
fffff802`3f899bbf cc int 3
fffff802`3f899bc0 03cf add ecx, edi
fffff802`3f899bc2 6603d7 add dx, di
fffff802`3f899bc5 66413bd0 cmp dx, r8w
fffff802`3f899bc9 7203 jb ntkrnlmp!PspSelectNodeForProces
fffff802`3f899bcb 0fb7d3 movzx edx, bx
fffff802`3f899bce 413bcb cmp ecx, r11d
fffff802`3f899bd1 72b7 jb ntkrnlmp!PspSelectNodeForProces
fffff802`3f899bd3 8bcb mov ecx, ebx
fffff802`3f899bd5 e959592200 jmp ntkrnlmp!PspSelectNodeForProces
fffff802`3f899bda cc int 3
fffff802`3f899bdb cc int 3
fffff802`3f899bdc cc int 3
fffff802`3f899bdd cc int 3
fffff802`3f899bde cc int 3
fffff802`3f899bdf cc int 3
nt!MmCreateProcessAddressSpace:
fffff802`3f899be0 488bc4 mov rax, rsp
fffff802`3f899be3 48895808 mov qword ptr [rax+8], rbx
fffff802`3f899be7 48896820 mov qword ptr [rax+20h], rbp
fffff802`3f899beb 4c894018 mov qword ptr [rax+18h], r8
fffff802`3f899bef 48895010 mov qword ptr [rax+10h], rdx
fffff802`3f899bf3 56 push rsi
fffff802`3f899bf4 57 push rdi
fffff802`3f899bf5 4155 push r13
fffff802`3f899bf7 4156 push r14
fffff802`3f899bf9 4157 push r15
fffff802`3f899bfb 4883ec40 sub rsp, 40h
fffff802`3f899bff 4883601000 and qword ptr [rax+10h], 0
fffff802`3f899c04 458bf9 mov r15d, r9d
fffff802`3f899c07 488b3552766b00 mov rsi, qword ptr [ntkrnlmp!PspMir
fffff802`3f899c0e 498be8 mov rbp, r8
fffff802`3f899c11 488bbc2498000000 mov rdi, qword ptr [rsp+98h]
fffff802`3f899c19 488970c8 mov qword ptr [rax-38h], rsi
Command
Response Time (ms) Location
Deferred srv*
Symbol search path is: srv*
Executable search path is:
Loading symbols for fffff802`3f200000 ntkrnlmp.exe -> ntkrnlmp.exe
ModLoad: fffff802`3f200000 fffff802`40248000 ntkrnlmp.exe
Windows 10 Kernel Version 22621 MP (4 procs) Free x64
Product: WinNt, suite: TerminalServer SingleUserTS
Edition build lab: 22621.1928.amd64fre.ni_release_svc_prod3.230622-0951
Kernel base = 0xfffff802`3f200000 PsLoadedModuleList = 0xfffff802`3fe13460
Debug session time: Mon Sep 4 13:19:20.960 2023 (UTC - 5:00)
System Uptime: 0 days 0:35:43.064
fffff802`58f54002 c3 ret
0: kd> g
fffff802`58f54002 c3 ret
0: kd> .logopen C:\Users\alans\AppData\Local\Temp\WinDbgExdi.log
Opened log file 'C:\Users\alans\AppData\Local\Temp\WinDbgExdi.log'
0: kd> r rip
rip=fffff80258f54002
0: kd> lm l
start end module name
fffff802`3f200000 fffff802`40248000 nt (pdb symbols) C:\ProgramData\Dbg\sy
0: kd> .logclose
Closing open log file C:\Users\alans\AppData\Local\Temp\WinDbgExdi.log
0: kd> bu nt!MmCreateProcessAddressSpace
0: kd> g
nt!MmCreateProcessAddressSpace:
fffff802`3f899be0 488bc4 mov rax,rsp
1: kd>
Breakpoints
Id Location Line Type Hit Count Function
0 0xFFFFF8023F899BE0 Software 1 nt!MmCreateProcessAddressS


Break
Memory 0

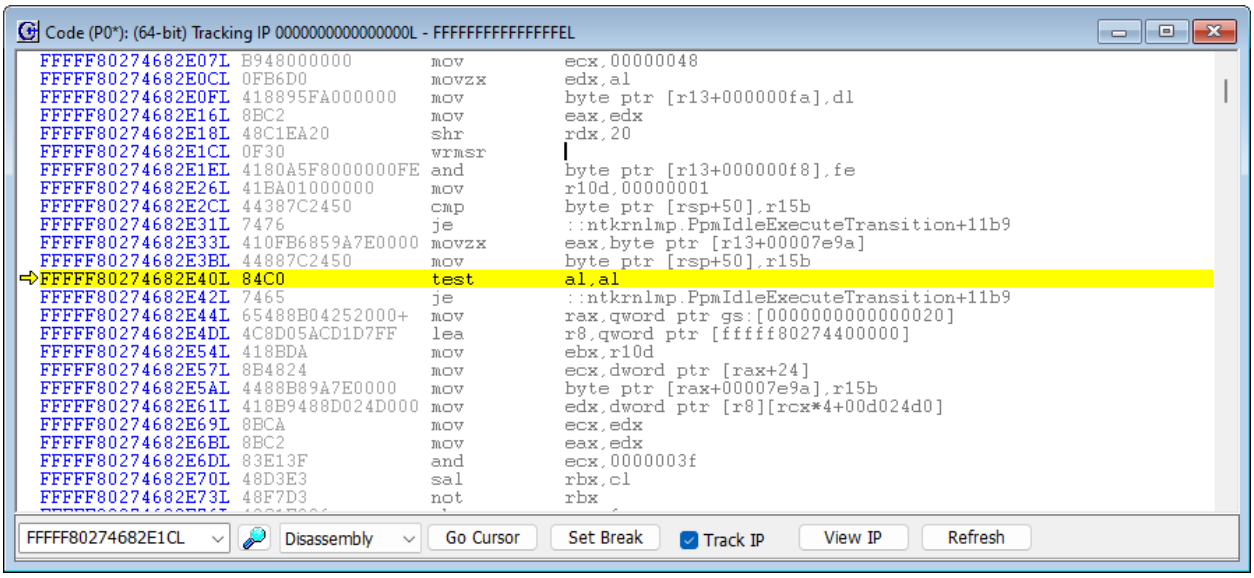
Getting SourcePoint to display module names as well as function names

WinDbg displays the fully qualified symbol name, including the module name, in its windows, as in `nt!MmCreateProcessAddressSpace`. SourcePoint truncates them by default to solely the function name, as in `MmCreateProcessAddressSpace`.

The module name prefix can be displayed by enabling SourcePoint's Qualified Symbol Name (QSN) format. In the Options menu, select Preferences, and click on "Use QSN in disassembler".



The Code window display will now look something like this:



Power Tip: Note that SourcePoint's syntax is slightly different from WinDbg's:

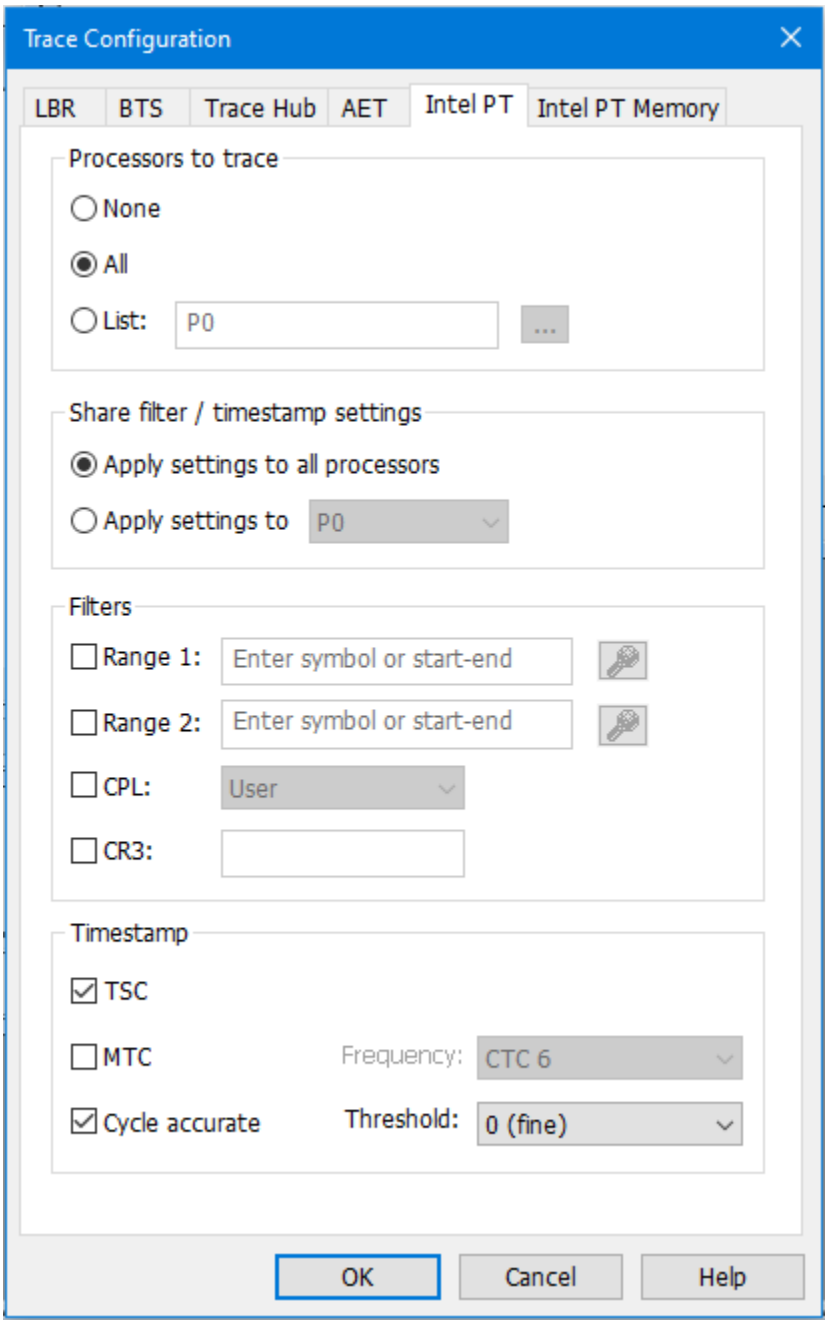
```
WinDbg:          ntkrnlmp!PpmIdleExecuteTransition+11b9
SourcePoint:     ::ntkrnlmp.PpmIdleExecuteTransition+11b9
```

Using Intel Processor Trace

Once using run-control is mastered, it is worthwhile testing out some of the SourcePoint advanced trace features, such as Intel PT.

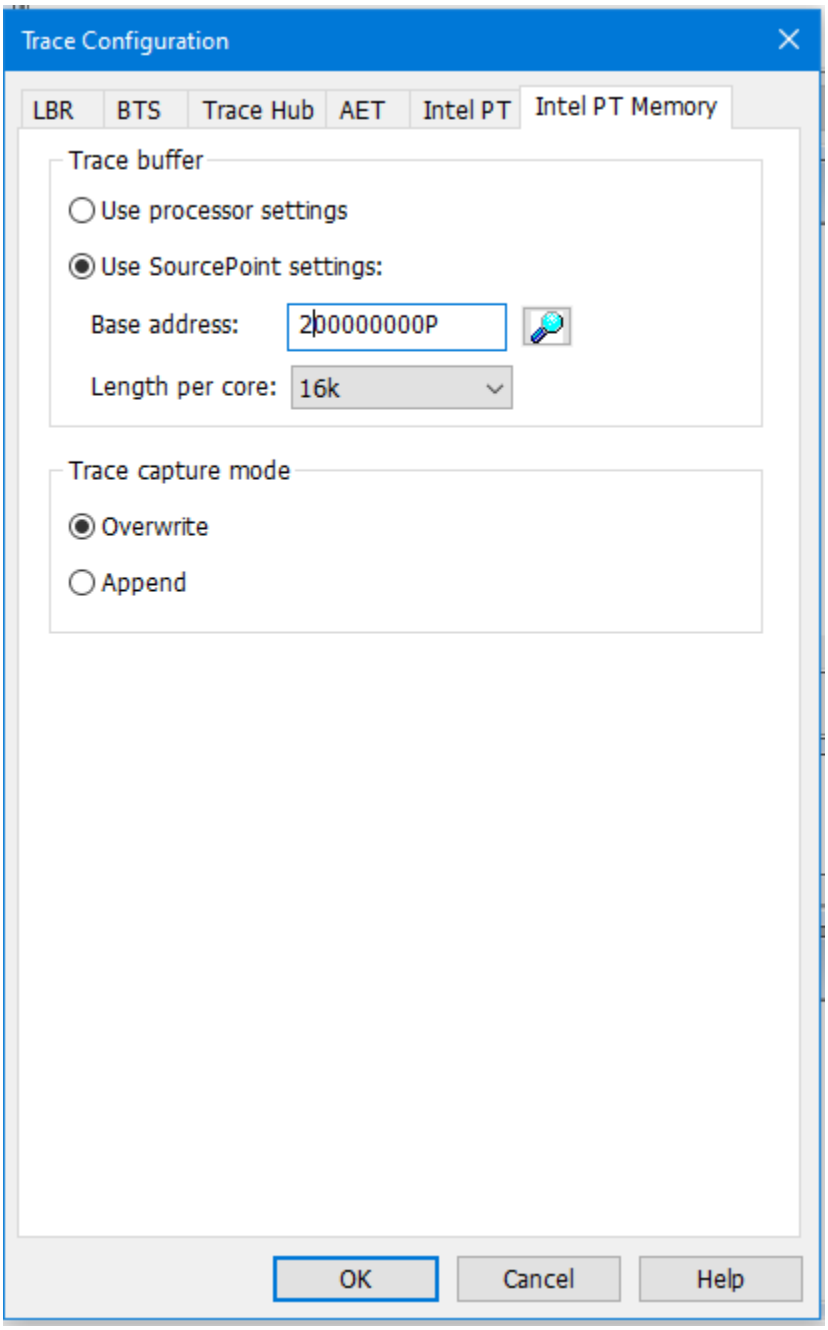
First, ensure that the target is in a Stopped state. If not, issue a Break from within WinDbg.

Then, within SourcePoint, open up a Trace window, click on the Configure, and then click on the Intel PT tab at the top:



Click on “All” Processors to Trace”, or select a processor from the list. Ensure both `TSC` and `Cycle accurate` are enabled.

Then click on the Intel PT Memory tab, and use a spare memory area to store the trace data:

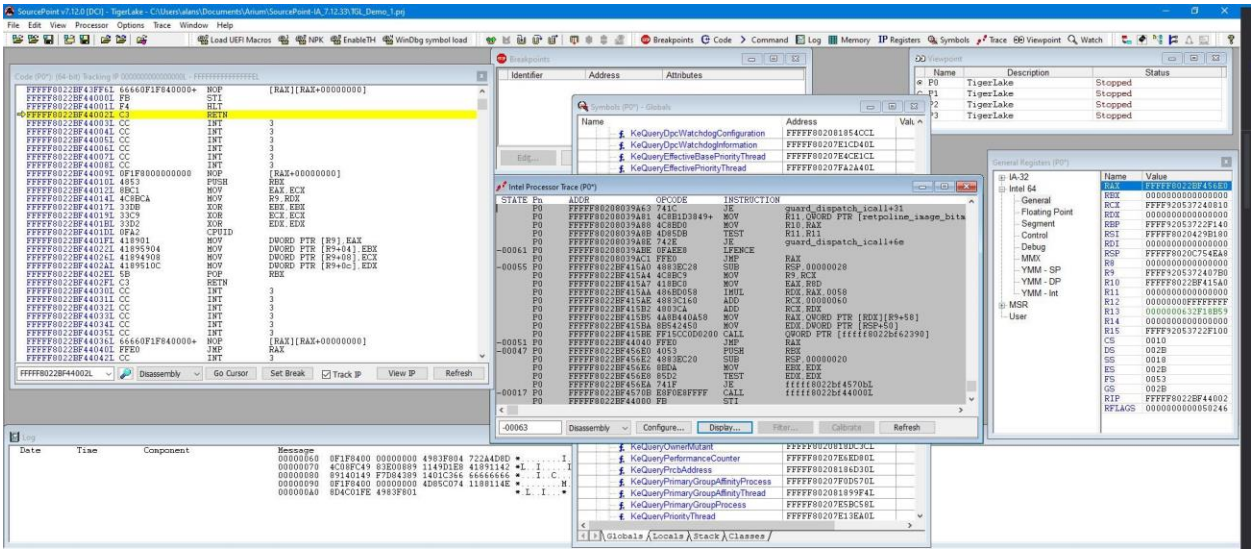


NOTE: “Use processor settings” can be selected if the BIOS has been set up with this. For the UP Xtreme i11 board, this is not the default.

Click OK. The Intel Processor Trace window will, after a few seconds, refresh with some data. This first set of execution trace is not valid. It’s a feature of SourcePoint that enables a JTAG “hotplug” dump of processor instructions if the emulator had been

unplugged and then plugged back in again. Only subsequent Go and Stop will yield valid trace data.

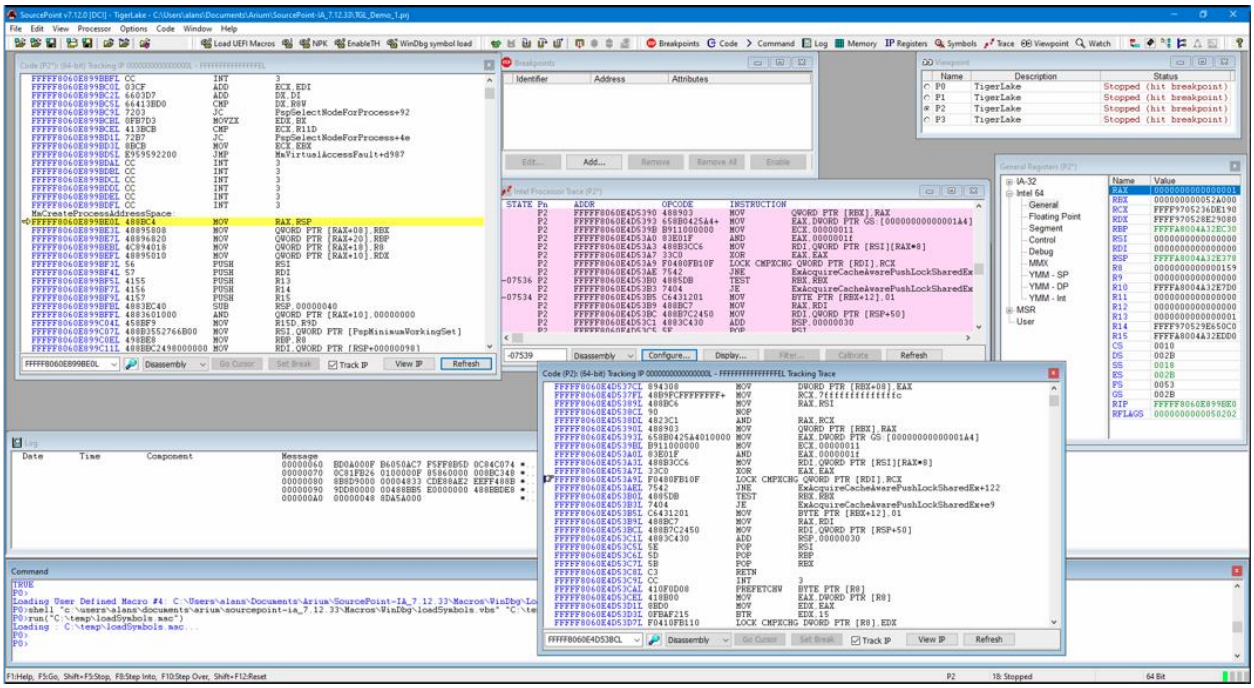
Then hit Go from within WinDbg, and then hit Break, and you will see something like the below in SourcePoint:



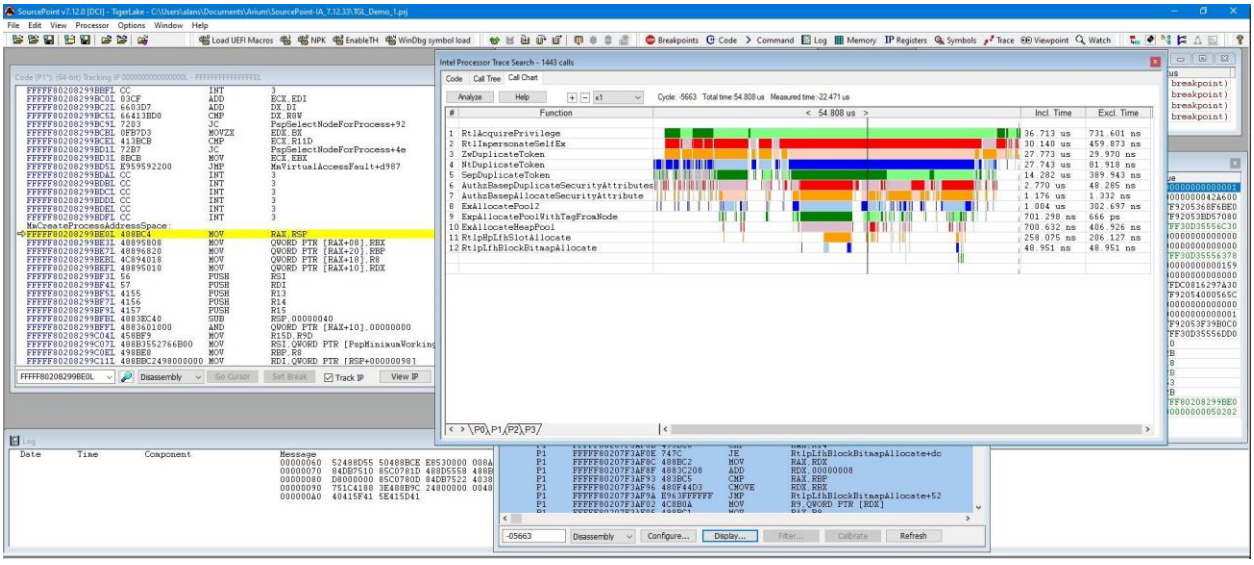
Feel free to resize the Intel Processor Trace window, and make it Floating, to see the trace data.

Click on the `Display` button within the Intel PT window, and be sure to click the appropriate buttons to ensure you see the symbols. These would include Object Code, Symbols, Pseudo-ops, Instruction Lines, Data Lines, and Labels Lines in the Disassembly section; and Source Lines in the Source code section.

You can click the cursor at any code line within the Intel Processor Trace window, and right-click to open up a Tracking Trace window that shows you the code and symbols (if available) for that line of code. You'll see the below when you open up the Tracking Trace window at an arbitrary line of the traceback:



To see a visual display of the trace data, right-click within the Intel Processor Trace window, click on `Trace Search…`, click on the `Call Chart` tab, and hit `Analyze`. You'll see something like this:



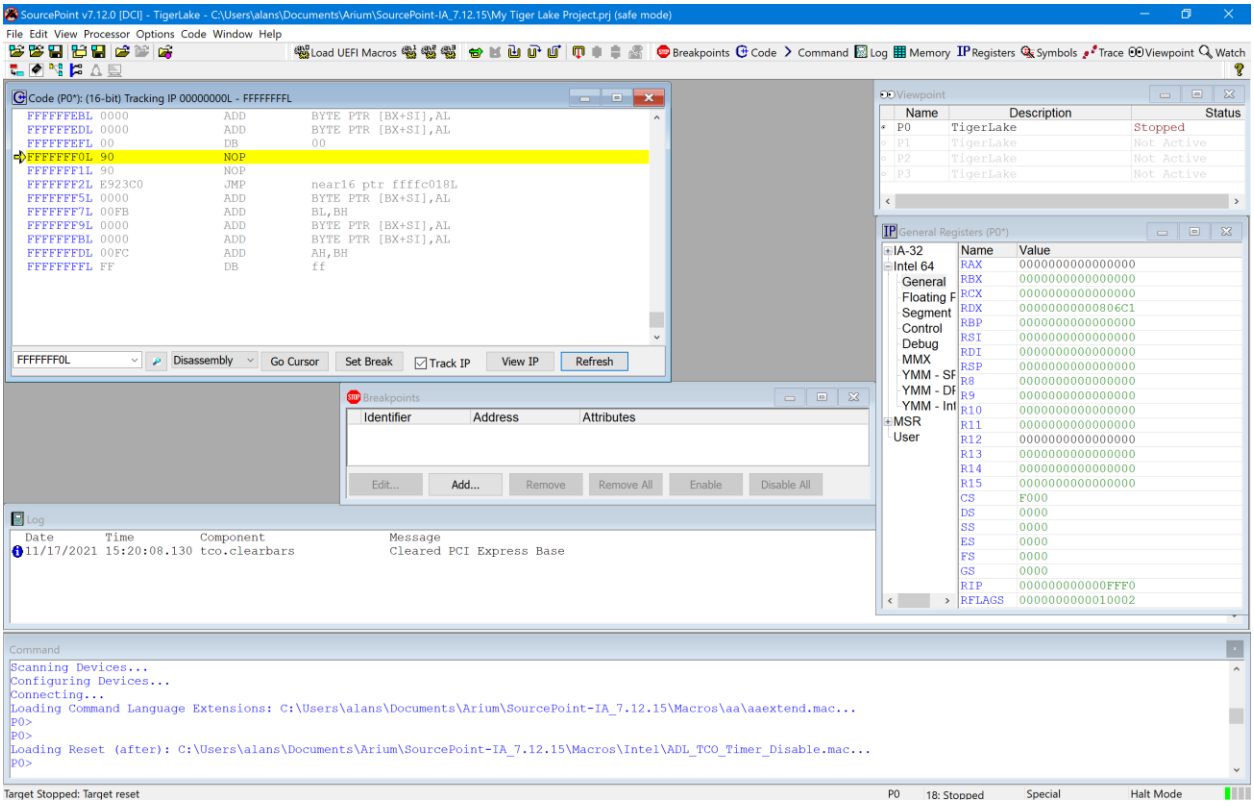
Move the time arrow by clicking on a section of code, or use your arrow keys. Expand the view of a particular area of code with the mouse wheel, or using the Expand (starts at x1) drop-down or +/- buttons at the top.

Event Trace

First Step: Configuring the Intel Trace Hub

Event tracing is accomplished with the Intel Trace Hub (ITH). Fortunately, using DCI, events supported by the ITH can be streamed directly out of system reset. The one limitation that exists is that some events (like Port IN/OUT tracing) happen so frequently at some points of the boot process that they overwhelm the capacity of the USB 2.0 (DbC2) connection and event processing, and thus cause trace buffer overflows – but these should be rare as long as the events collected are relatively close to the debug point of interest.

The first thing to do is to configure the ITH. Reset the target by clicking on the Reset button in the Icon Toolbar at the top of the screen, and it will halt at the reset vector, physical address FFFFFFF0:



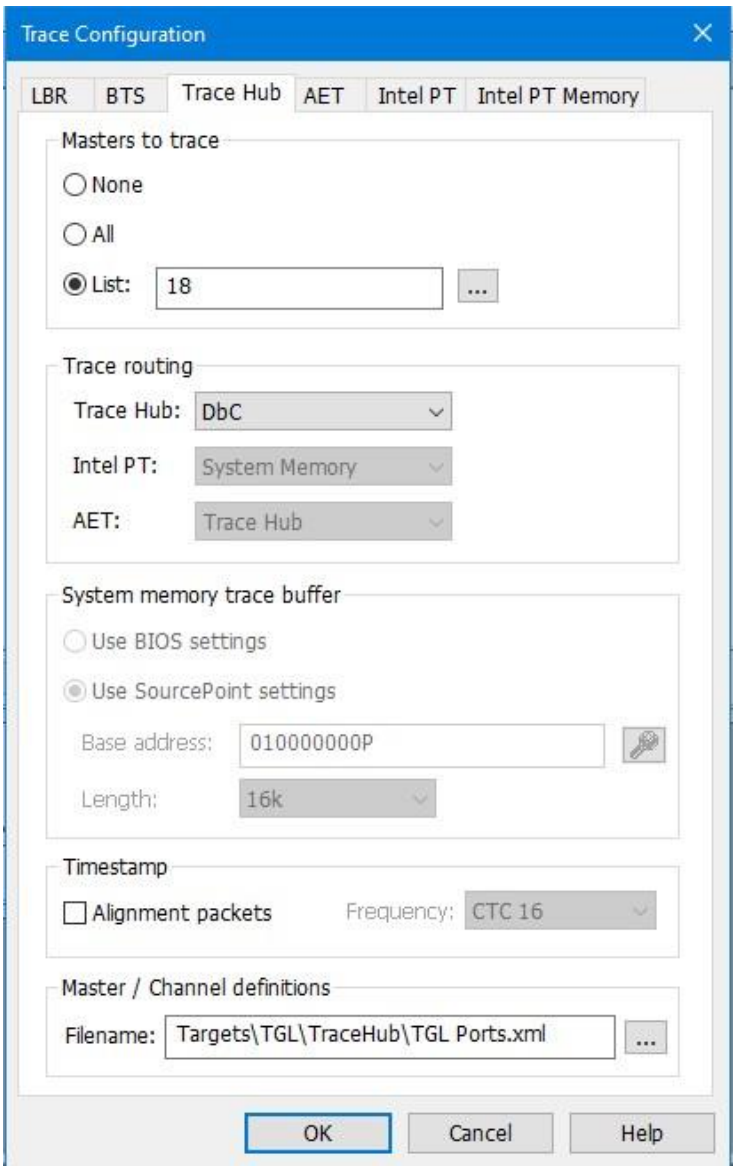
The next step is to run the ITH macros that enable the Trace Hub and hide it from the OS. Fortunately, SourcePoint comes equipped with a couple of macro buttons built in to make this process easier, At the top of the screen, you'll see two buttons labeled `NPK`

and `EnableTH`. Click on these, one at a time. Wait about five seconds after clicking on the second button.

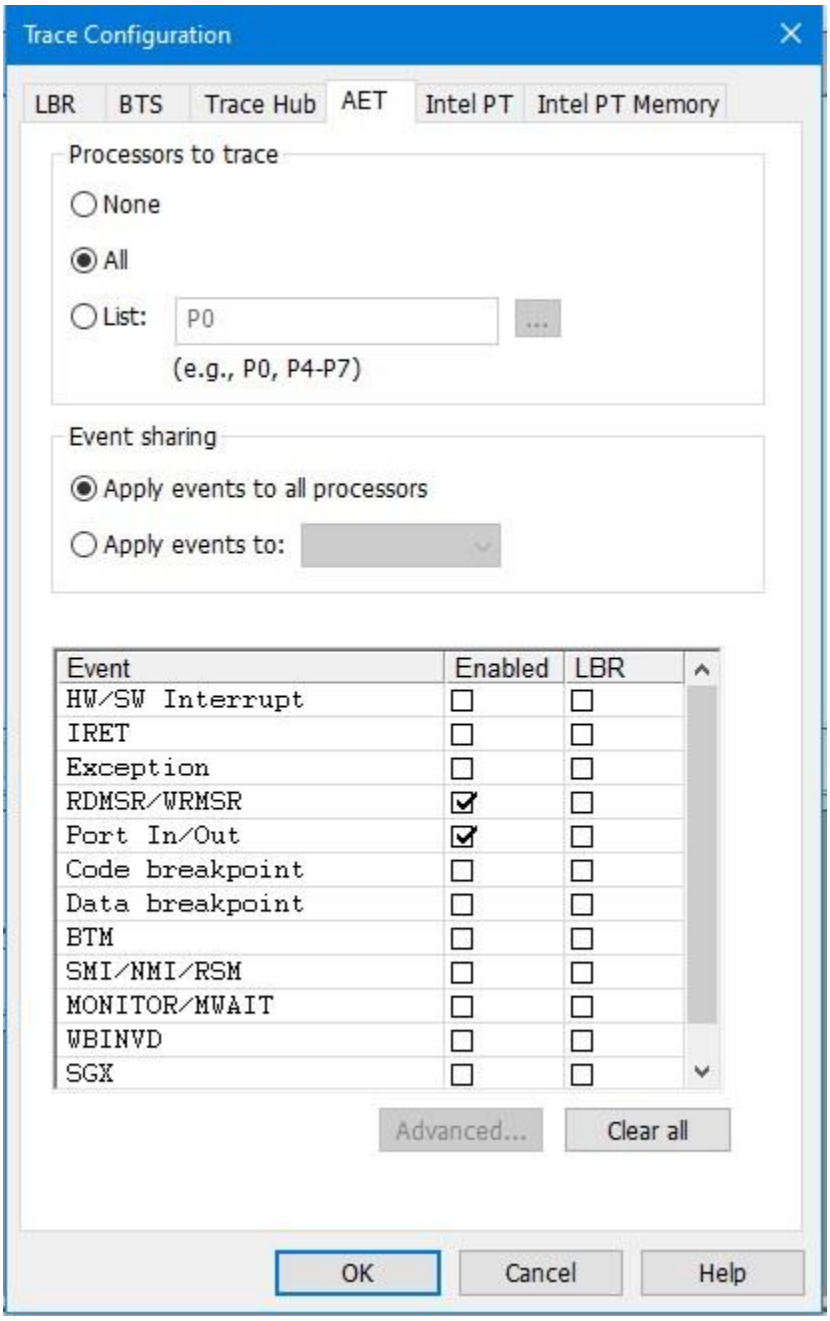
You can then boot up to Windows (or not).

Second Step: Set up Architectural Event Trace

Now, it's time to tell the Trace Hub what you want to trace. Click on the `Trace` button in the toolbar at the top, to open the Trace window; then click on the `Configure…` button; then click on the `Trace Hub` tab. Set the settings as below for the Tiger Lake platform:



Once the Trace Hub has been enabled for the features you need, click on the `AET` tab, select `All` as `Processors to trace`, and select `RDMSR/WRMSR` and `Port In/Out` as events to trace:

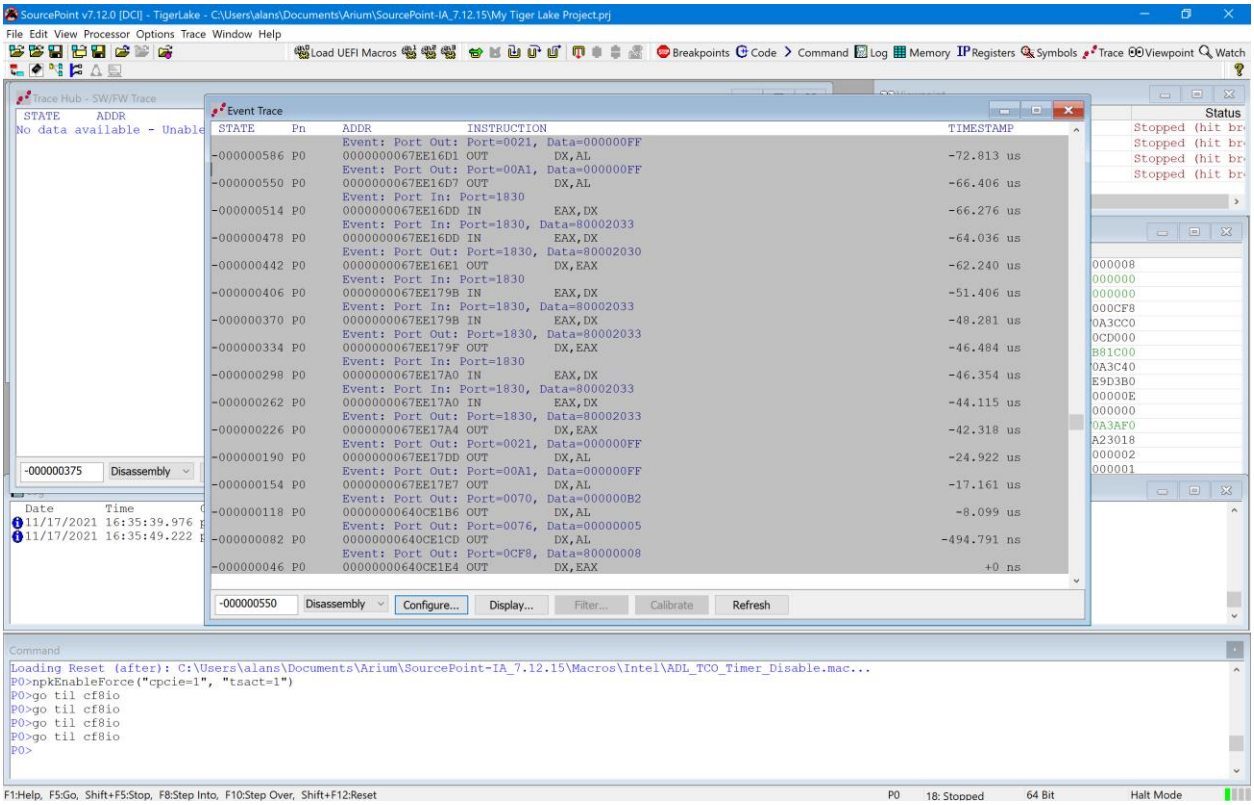


Now, you can simply do a Go/Stop to capture the event trace data. Below shows the use the `Command` window to simulate a break on any read/write of, say, port x'CF8', the PCI CONFIG_ADDRESS. This is conveniently done by issuing at the `Command` window `P0>` prompt:

```
go til cf8io
```

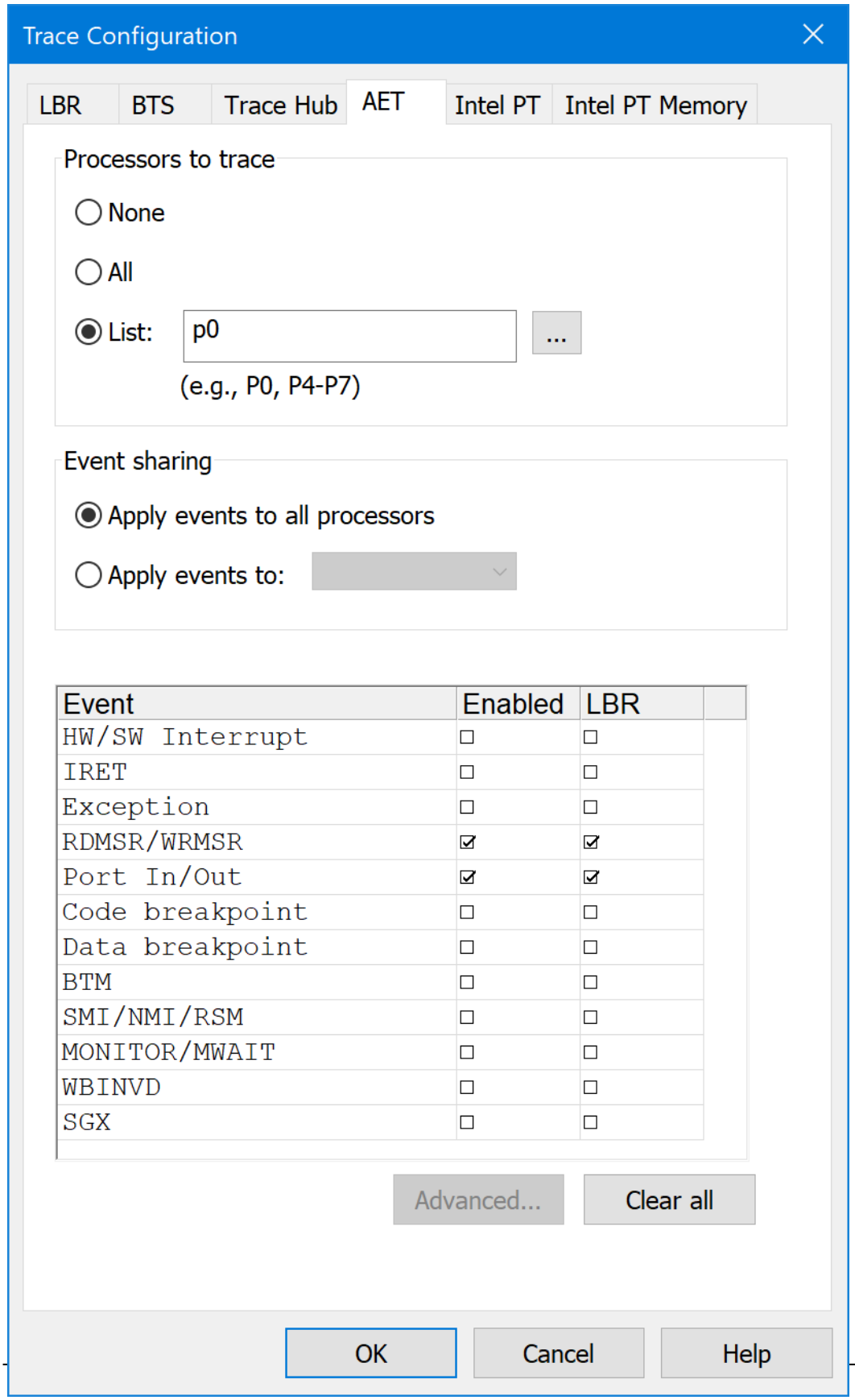
This will run the target until the next IN or OUT to CF8.

After issuing the command, you'll see something like this:



Scrolling up a little, you'll see a mix of `Port In/Out` and `RDMSR/WRMSR`. All timestamped.

Power tip: The Last Branch Record (LBR) stack associated with each event can be captured as well. This is a very powerful debugging utility, especially when troubleshooting code execution leading up to events before system memory is initialized and Intel Processor Trace is available.


Trace Configuration
LBR
BTS
Trace Hub
AET
Intel PT
Intel PT Memory
Processors to trace
None
All
List:
p0
...
(e.g., P0, P4-P7)
Event sharing
Apply events to all processors
Apply events to:
Event
Enabled
LBR
HW/SW Interrupt
IRET
Exception
RDMSR/WRMSR
Port In/Out
Code breakpoint
Data breakpoint
BTM
SMI/NMI/RSM
MONITOR/MWAIT
WBINVD
SGX
Advanced...
Clear all
OK
Cancel
Help

Troubleshooting Tips

Chances are, you'll run into something strange during your testing. We're the first to admit that JTAG-based run-control and trace are not always deterministic. JTAG is a 30-year hardware protocol, and when something goes astray at a very low level within the chip, SourcePoint tries to (but sometimes doesn't) recover gracefully. There will be times that the board will power cycle on its own. Or the firmware thinks that a thread is running but gets out of sync with the SourcePoint software, which thinks it's halted. Or the DbCStatus.exe ball stays red instead of turning green, while you swear you have a good DbC connection. Sometimes you have no choice but to quit SourcePoint and power cycle the target. That usually clears up the one-of's. But, of course, that means quitting out of WinDbg (preferably first), then quitting out of SourcePoint, power-cycling the target, and then re-establishing the connections from scratch. Tedious.

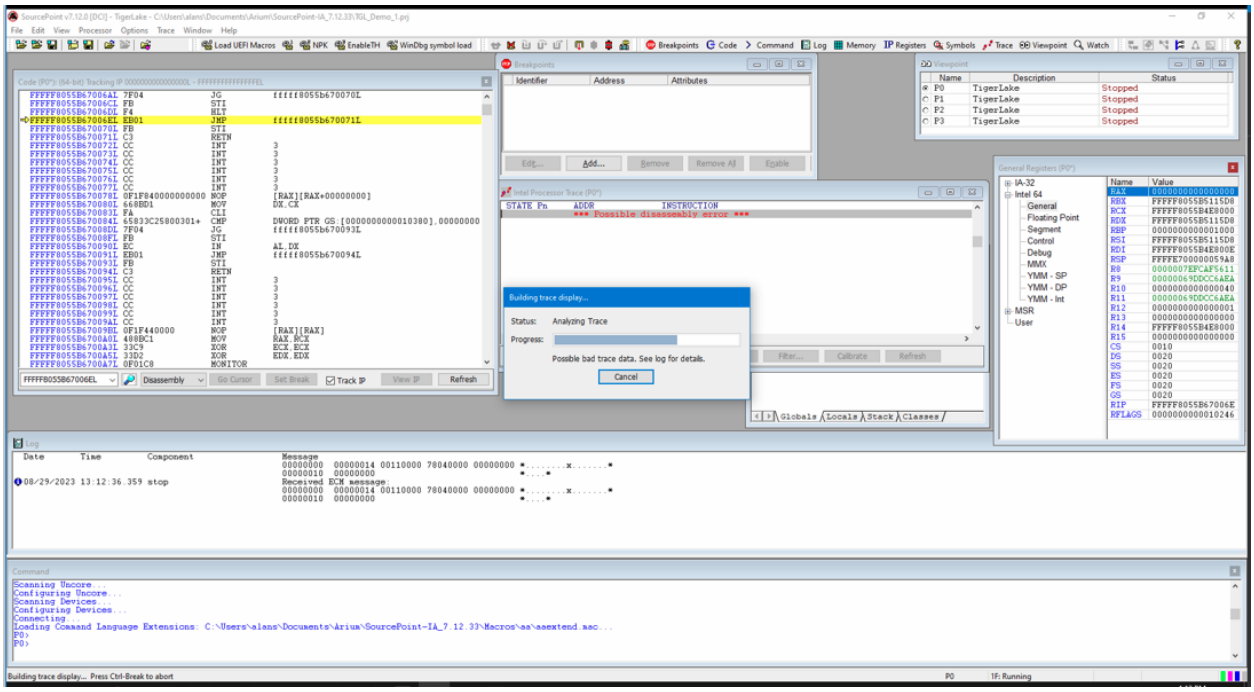
And, we all know that WinDbg has its quirks as well. And Windows sometimes objects to the presence of JTAG-assisted debuggers. Combine the three, and, well, you're bound to run into some bugs and misbehaviors.

Hopefully you don't run into this too many times. But, on the other hand, if you didn't, we'd have nothing to fix. 😊

In the meantime, here are errata for the UP Xtreme i11, and the steps needed to mitigate where possible.

Intel PT "Possible bad trace data"

The format of Intel PT trace data changes from SKU to SKU, platform to platform. It's a lot for us to keep up with. More often than not, you'll see this error message(s) displayed below:



SourcePoint will say “Possible bad trace data. See log for details.” It will then do its level-best to make sense of the trace data, and present it in a legible form. Most of the time, it succeeds.

Mangled function names

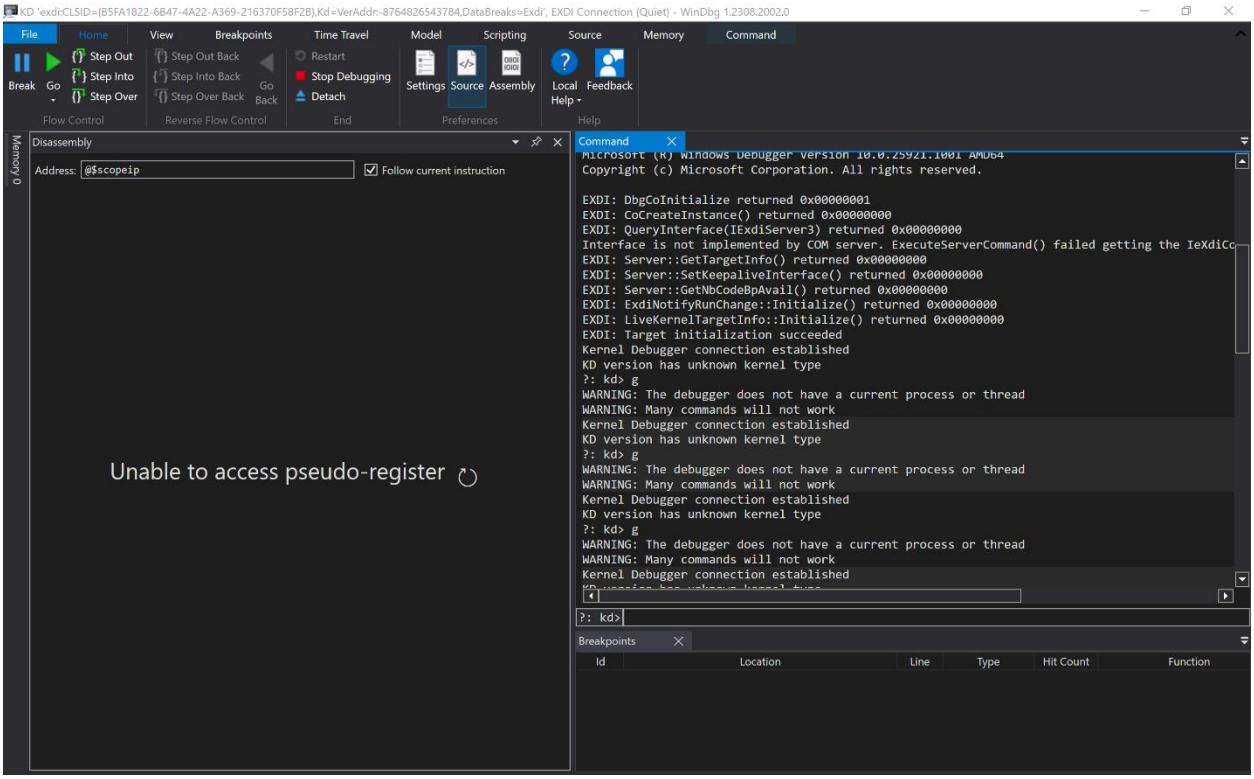
You may sometimes see a mangled function name, as in:

```
JNE ??_C@_0BH@CBDMLJDN@RtlCreateUnicodeString@
```

SourcePoint does not have a built-in C++ name demangler. It’s on the to-do list.

WinDbg doesn’t like debugging over EXDI with VBS Enabled

Virtualization-Based Security must be turned off on the target for the EXDI connection to work. If VBS is on, when you launch StartWinDbgEXDI.vbs, you’ll see the below:



Interestingly, the SourcePoint connection to the target still works fine. We are working on this.

WinDbg Register window slows things down badly

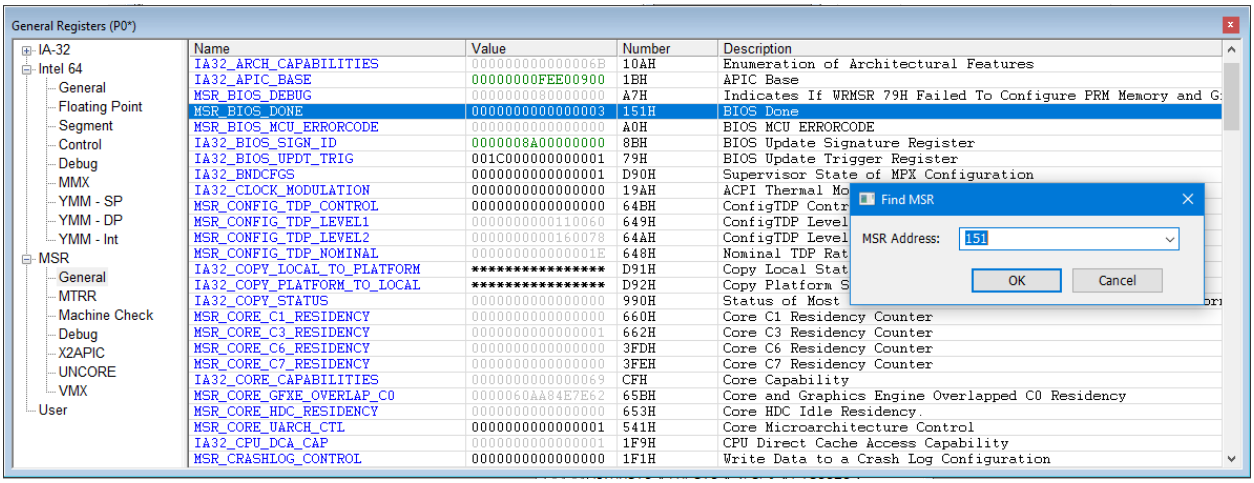
Having the Registers window open within WinDbg slows things down quite a bit. Updating the WinDbg Registers view causes EXDI to transact hundreds of memory reads. This can cause problems. In particular, it has been seen to cause failures of the symbol load from WinDbg to SourcePoint. LoadCurrent.mac will fail quietly.

If it remains open, you may at some point see the below within WinDbg:

Registers

Name	Value
User	Unexpected
Kernel	Unexpected
SIMD	Unexpected
VFP	Unexpected
FloatingPoint	Unexpected
CET	Unexpected

Close it out (presuming that you had it open), and consider using the SourcePoint Registers window instead. You can see all the GPRs, Control Registers, Debug Registers, MSRs, VMX registers, and many more. And context-sensitive help (right-click) provides the selective ability to find a particular MSR, open a Code or Memory window, and other features.

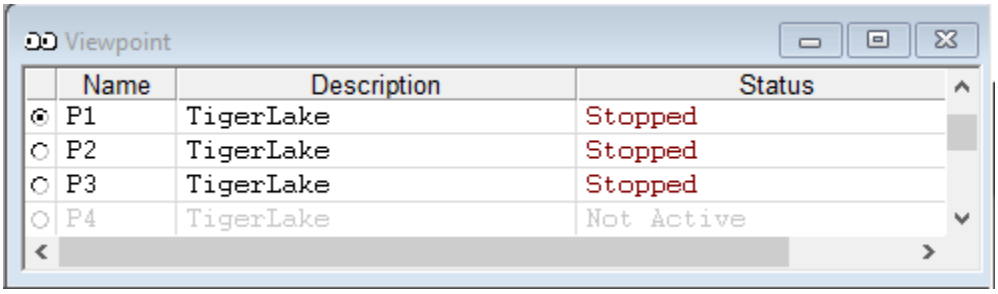


WinDbg FP register display is not working

WinDbg does not display the floating point registers. SourcePoint displays the registers correctly.

Viewpoint window not refreshing initially

When you first halt the target in Windows from SourcePoint, not all logical processors will display “Stopped” properly:



This is an outcome of an auto-scrolling usability enhancement feature developed recently to allow large-thread-count binned platforms to dynamically display the start of the stopped processors. This discrepancy can be safely ignored. Once all active processors have been discovered by run-control, the display will refresh correctly.

Pause in Initial Symbol Load

Intermittently, after issuing the first Break in WinDbg, in the middle of the memory reads associated with the symbol loading, WinDbg stops sending commands to SourcePoint, and the transactions stop. The SourcePoint Dashboard Lights stop flashing, and a look at the Log window shows no traffic.

This issue seems to be very host and target specific. On some, it does not occur at all. In others, we see more frequent failures.

The only option at this point is to quit out of WinDbg and SourcePoint, power cycle the target, and start over. It is currently under investigation.

Intel PT and AET don't synchronize timestamps

It is possible to run both Intel PT and AET concurrently, with synchronized timestamps. Thus, one could click on a particular event within the AET window, and the Intel PT window will automatically refresh and display the exact code that invoked the event. Then, you can trace back as far as you wish to view the code execution that might have led to, for example, a concurrency bug. Very powerful.

However, sometimes the Intel PT window doesn't refresh properly. This is to be fixed in the next release. As a workaround, for the moment, use AET in conjunction with LBR.

.reload spurious error messages

.reload issues from WinDbg runs very slowly. And, towards the end, it puts out spurious error messages. These can be ignored. This will be addressed in an upcoming release.

LoadCurrent versus LoadAll

The LoadCurrent macro makes the symbols available within the module at the current instruction pointer visible to SourcePoint. In an upcoming release, we will deliver a LoadAll macro that loads all symbols visible within WinDbg to SourcePoint.

Windows crashes

If you work with SourcePoint WinDbg long enough, you'll likely crash Windows at some point. Sometimes Automatic Repair will clean things up, sometimes it won't. In which case you will need to re-install Windows. Really, it's no different from reinstalling Windows in a VM, only more onerous.

Drop us a note on our Support line, or call us, if you can reproduce this.

Conclusion

Thank you for getting this far! We hope that you have enjoyed the ride, and are using the power of SourcePoint WinDbg successfully in your debugging and learning journeys. There are many new things to discover in the Windows kernel enabled by this technology.

Feel free to browse the SourcePoint Academy at https://www.asset-intertech.com/sourcepoint-academy/ for helpful reference guides, help material and "how to" videos.

If you ever have any questions, please call, email or open a Support Case here: https://www.asset-intertech.com/support/. We'll be glad to help!