

SourcePoint Home

Getting Started Guide for the

AAEON UP Xtreme i11

Support for v0000 and v0001 boards

Revision 2.00

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Introduction

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Contacting ASSET InterTech:

Phone: (888) 694-6250 toll free in the U.S.
+1 (949) 517-4150 outside the U.S.

For Sales contact emails and telephone numbers:

<https://www.asset-intertech.com/contact-us/>

For Support contact emails and telephone numbers:

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Revision History

Revision Number	Description	Date
1.00	Original document, describes v0000 board support	November 28, 2021
2.00	Added content for new support of v0001 (with the Type-C connector removed) AAEON UP Xtreme i11 board	May 30, 2022

Welcome!

Thank you very much for your SourcePoint Intel Individual or Institutional License purchase! We appreciate you acquiring our best-in-class debugger, and hope you enjoy using it. We strive to deliver the most powerful, easy-to-use and polished product as possible. So, please feel free to share your feedback directly at our contact information above, or via your favorite social media outlet.

As with any new tool, mastering SourcePoint takes an investment in terms of time and effort. JTAG-based debug is a fairly specialized area, and low-level “on the metal” firmware development on x86 platforms is even more so. So, in your use of the tool, you may encounter behavior that seems non-intuitive or even wrong. You may be encountering a tool corner case, a limitation inherent in JTAG or DCI, or even a bug. If so, try a few different options as may be referenced in the [Troubleshooting](#) section of this Guide, and if it persists, give us a call. We are here to serve.

Which Board and Cables to Purchase?

The board supported by your SourcePoint Individual or Institutional license is the AAEON UP Xtreme i11 board, based upon the Intel Tiger Lake CPU. As of February 2022, to address part availability issues, AAEON redesigned the v0000 boards to remove the on-board 40-pin GPIO Bus header, Intel FPGA Altera Max V, and the USB Type-C port. The new v0001 boards support DCI in a similar way as the original v0000 boards, but via the Type-A USB3.0 ports.

The new v0001 boards come in four flavors: Celeron, i3, i5 and i7. As of this writing, only the i3, i5 and i7 have been tested and are supported by your license. The Celeron version of the board has not been tested; it may work, but we recommend the i3, i5 or i7 to get the most value out of your purchase. These are Tiger Lake (TGL) UP3 CPUs that supports all the latest Intel debug and trace features such as Intel Processor Trace (Intel PT), Intel Trace Hub (ITH), Architectural Event Trace (AET), and others.



WARNING:

Do **NOT** plug a regular USB cable into the target and attempt to use DCI. Specialty cables, with VBUS snipped, are required; using a regular USB cable may possibly fry your target, or worse.

For the older v0000 boards, the only source to purchase the DCI Type-A/C cable is www.designintools.intel.com. Accessing this site requires a confidential NDA with Intel. This target has its Type-C port enabled for DCI. If you have a debug host with a Type-A port, purchase the part # ITPDCIAMCM1MU (1.0 meter) cable. The longer 1.8-meter ITPDCIAMCM2MU will work as well. If your host has a Type-C port, purchase the ITPDCIC2CD2U1M. Using Type-A/C hubs have been seen to work, but are not warranted. Type A/C adapters have been seen not to work.

For the v0001 boards, purchase the DCI Type-A/A cable. The good news is that, in addition to www.designintools.intel.com, these cables can be purchased from DataPro: <https://www.datapro.net/products/usb-3-0-super-speed-a-a-debugging-cable.html>.

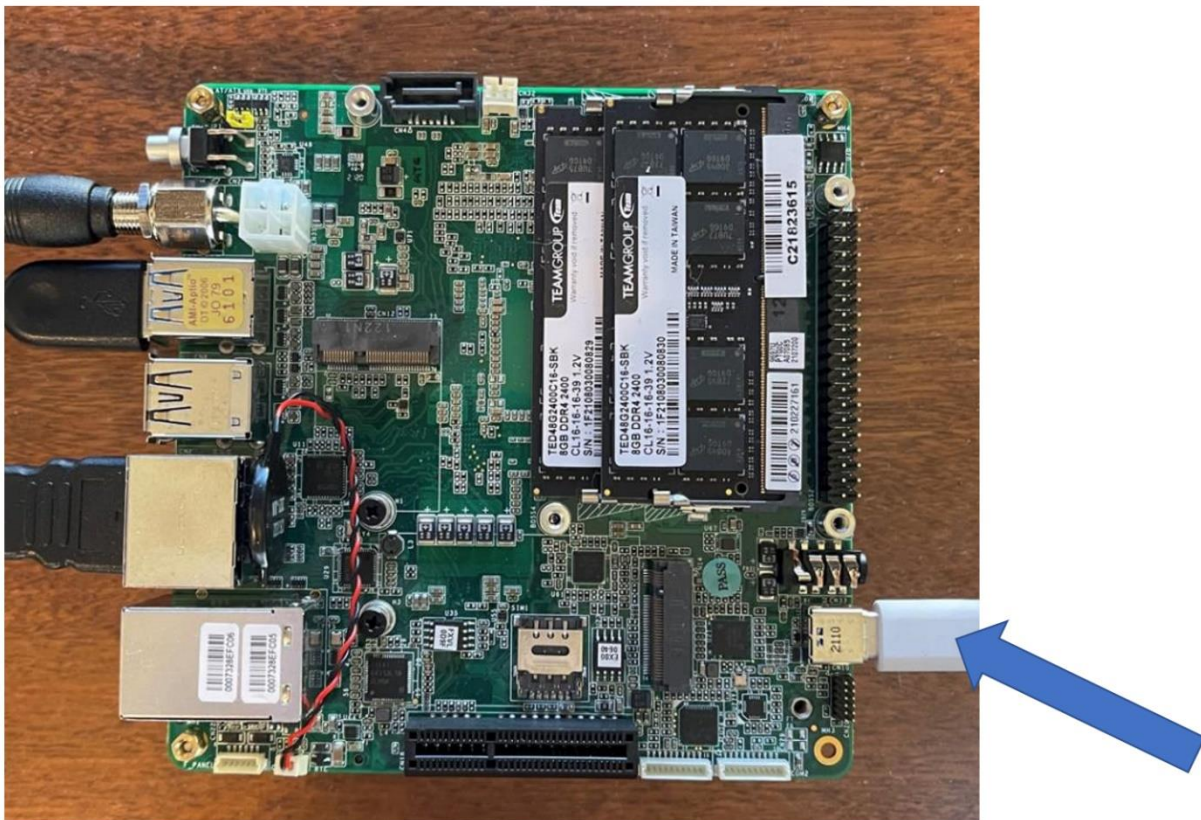
BIOS Settings

The AAEON UP Xtreme i11 boards come equipped with an AMI Aptio BIOS that is based upon typical Intel Customer Reference Board (CRB) BIOS.

For the v0001 board, if there is a need to retrieve the BIOS and re-flash the board, it can be obtained here: <https://downloads.up-community.org/download/up-xtreme-i11-0001-version-uefi-bios-v1-0/>.

Luckily, the platform comes with all the necessary hardware hooks and firmware straps to support Intel Direct Connect Interface (DCI) out of the box.

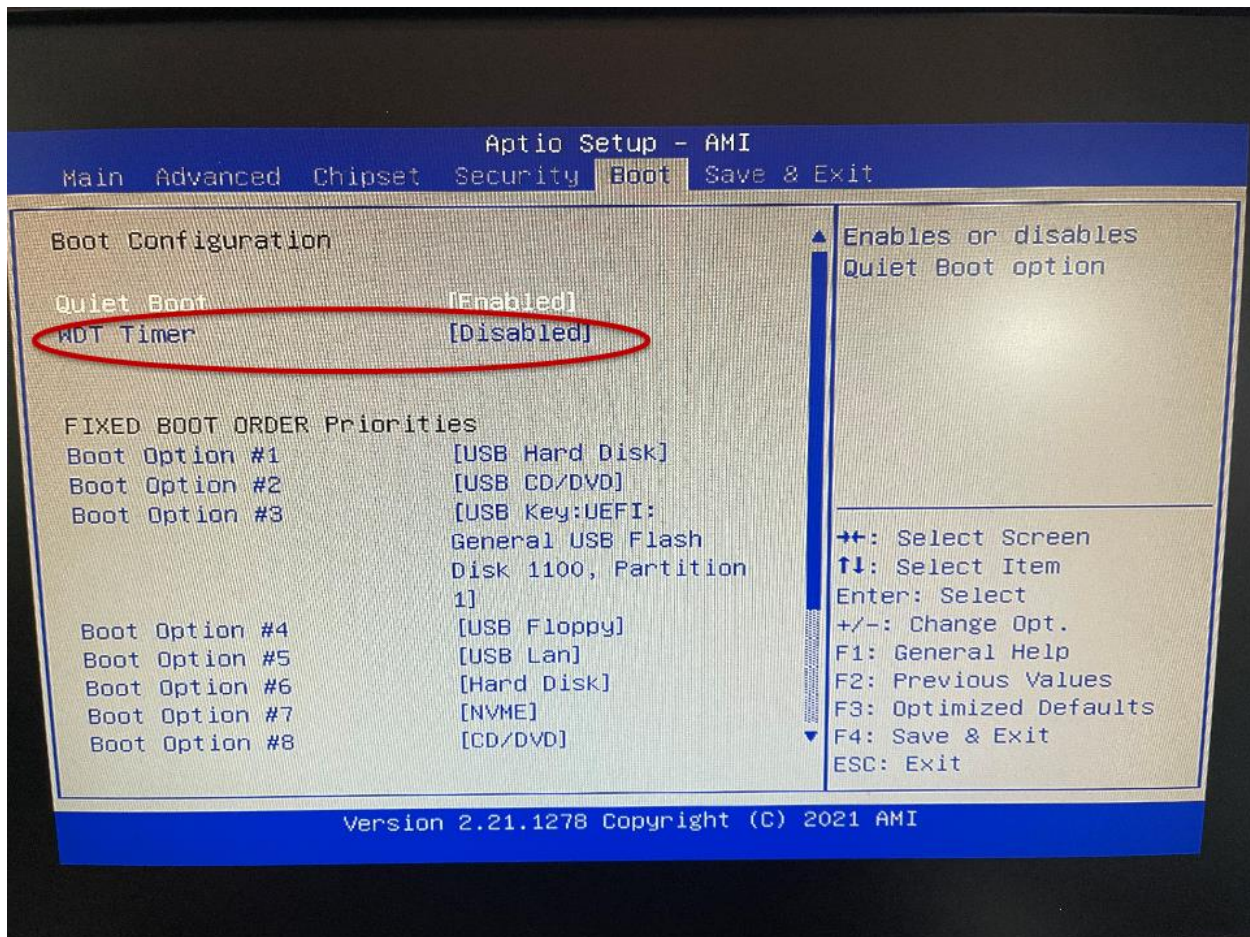
For the v0000 board, the USB Type C port on the board is the port of interest:



For the v0001 board, the Type-A/A cable can be plugged into any of the three USB3.0 ports (the blue jacks) available. All three jacks support DCI. The USB2.0 port (the black one) does not support DCI.

There is only one BIOS setting change that must be made for either the v0000 or v0001 boards: to disable the board's Watchdog Timer (WDT). Go into the BIOS Boot menu,

and set WDT Timer -> Disabled. If you don't, run-control will be successful, but the board will power-cycle every 30 seconds; putting a real crimp in your debugging!

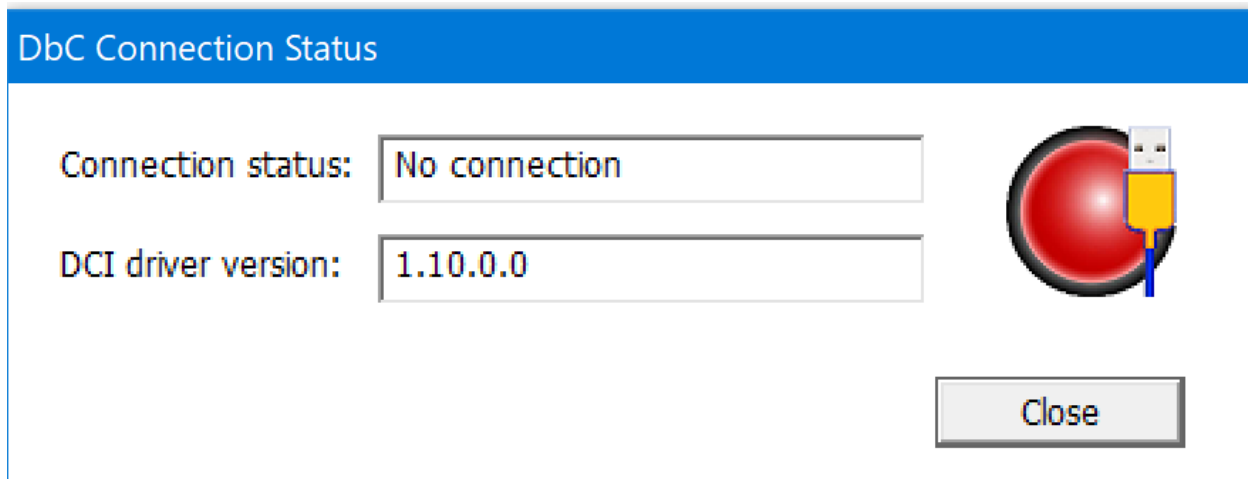


And that's all that's needed. All the Debug Settings in the CRB Advanced menu can be safely ignored. You are now ready to test your connection, and then launch SourcePoint and begin debugging.

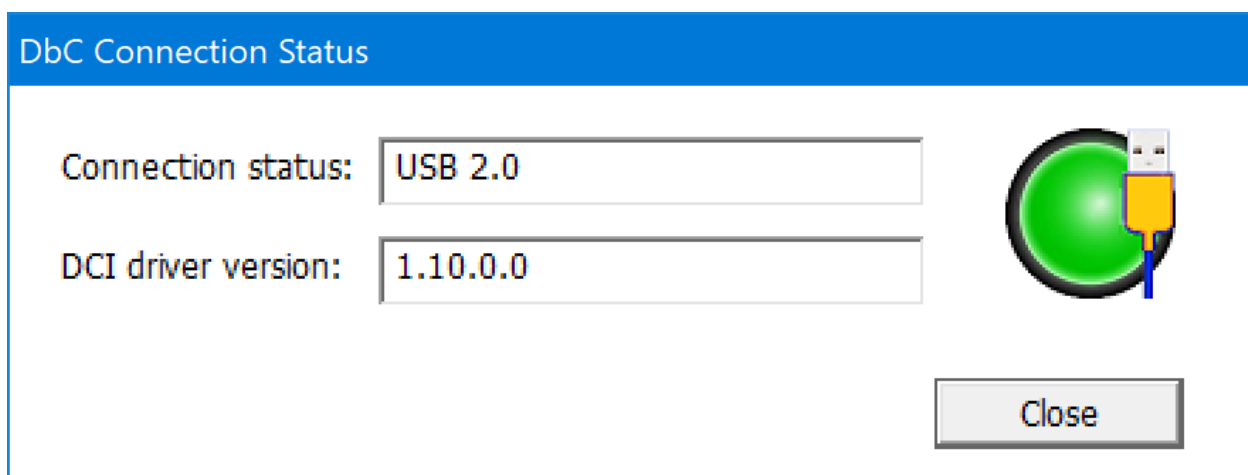
DbCStatus.exe: Red is Bad, Green and Yellow are Good

Luckily, there is a convenient application in the SourcePoint install directory that will tell you that the DCI driver is successfully installed on your computer, and it is possible to make a connection between SourcePoint and the target.

Navigate to `C:\Program Files (x86)\Arium\SourcePoint 7.12.XX` (where XX is your current SourcePoint release), and launch the `DbCStatus.exe`. You should see the red ball, indicating that there is no connection:

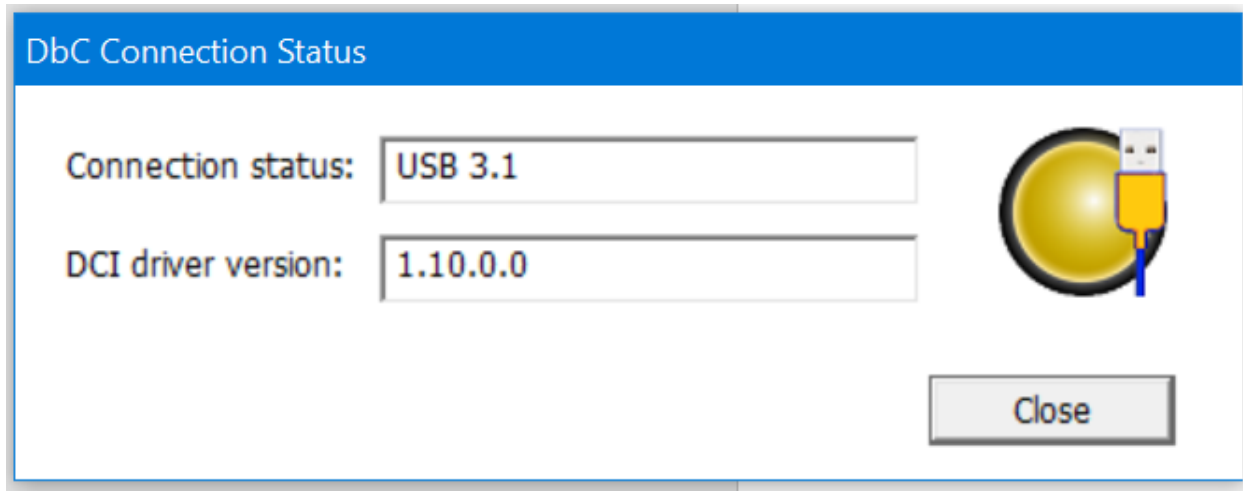


For the v0000 board, ensure that the Type-C cable is firmly connected to both the host and target, power up the UP Xtreme i11. You should hear two beeps, and in a moment the ball should turn green:



Let the platform boot to the UEFI shell. Congratulations! You have a working DCI connection. It's smooth sailing from here.

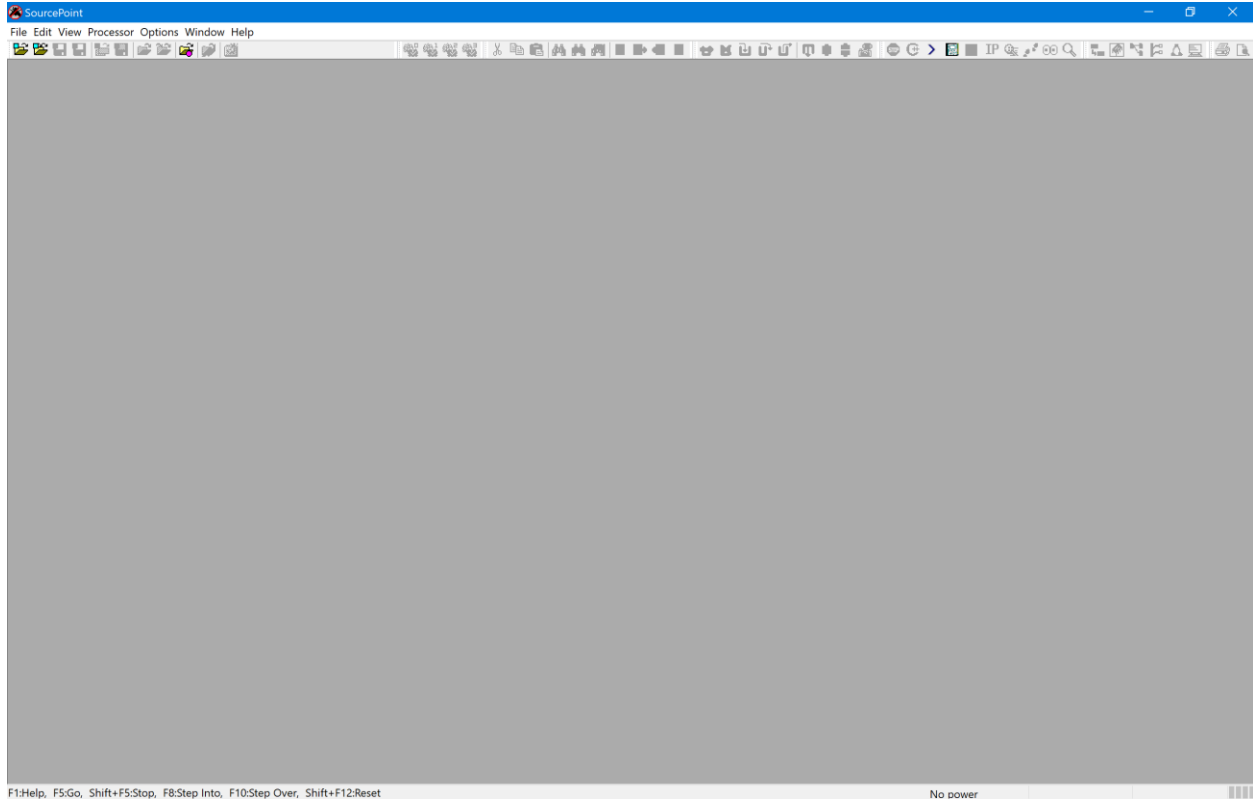
For the v0001 board, the ball will be yellow, versus the green. This is due to a flash firmware strap setting, which changes the target behavior somewhat, as you'll see below; but otherwise does not affect debugging.



Is the ball still red? Try cycling power on the target (don't just power cycle with the reset button; physically remove the power plug, then plug it back in again). Still red? See our [Troubleshooting](#) section.

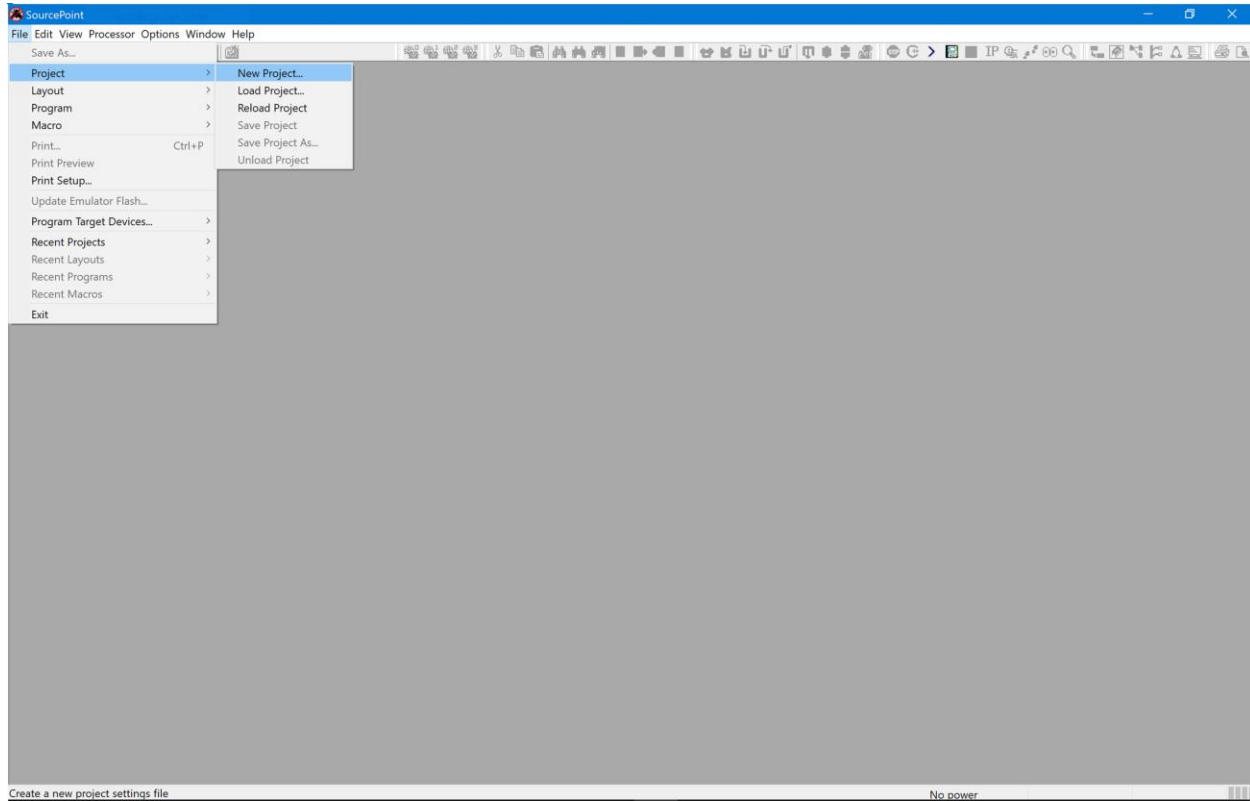
Getting Started with SourcePoint

When you launch SourcePoint for the first time, you will see the main screen, mostly grey:

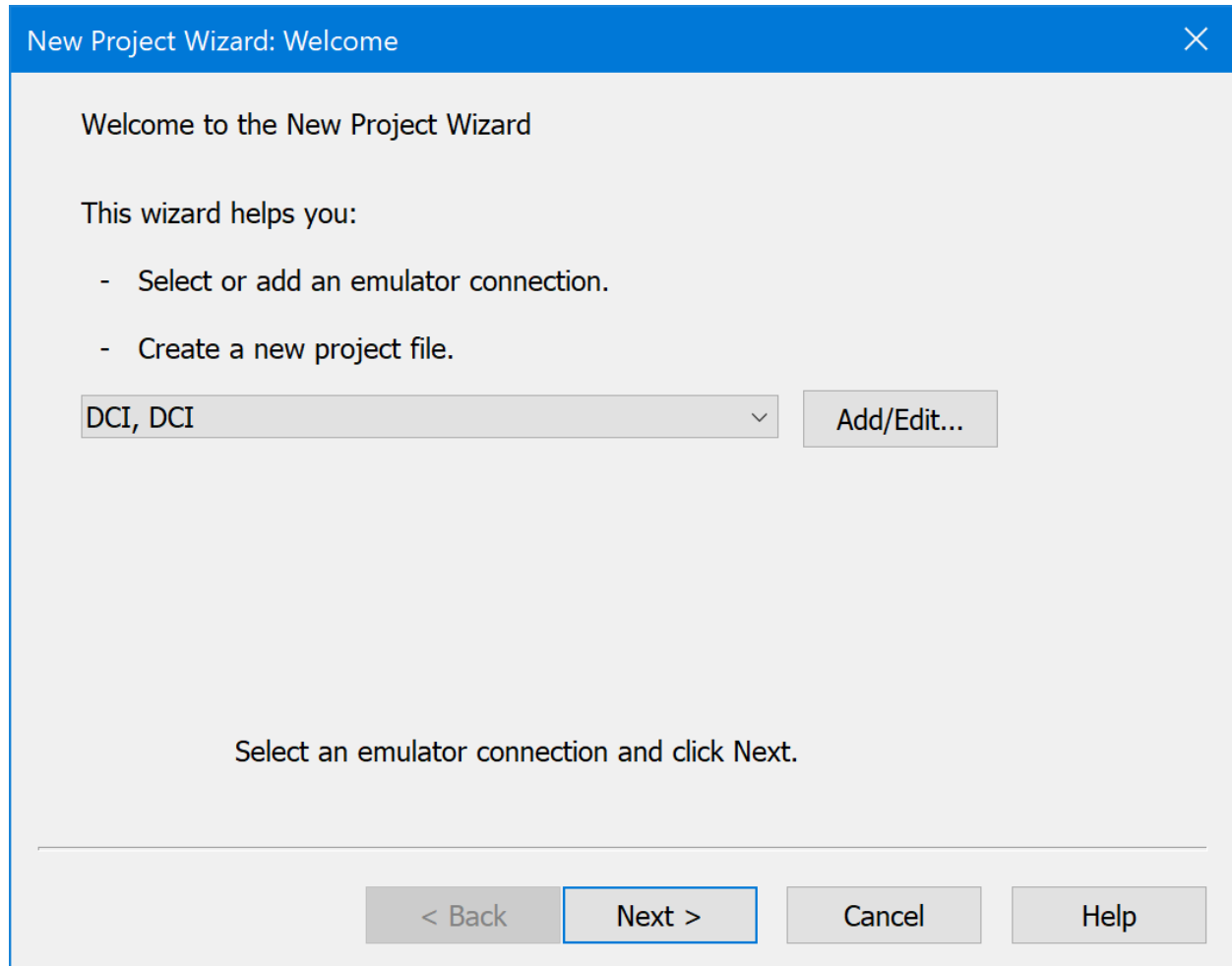


SourcePoint uses Projects (files with suffix .prj) as containers for your debugging session. You can create as many Projects as you want, with all your own preferences saved. Often, once you have the SourcePoint Project configured to your liking, you'll save it and use it repeatedly during your separate debugging sessions. Other users may wish to save a separate Project for each separate debugging session. That's really a matter of user preference and what you're debugging – it's your choice.

Now it's time to create the Project. Under `File > Project...` select `New Project`:



You'll be presented by the New Project Wizard (NPW). The emulator connection should be via DCI:



After hitting `Next`, you'll be prompted for the Project Name, Location to store the Project, and the location of the Target Configuration file:

New Project Wizard: Project File

Project file

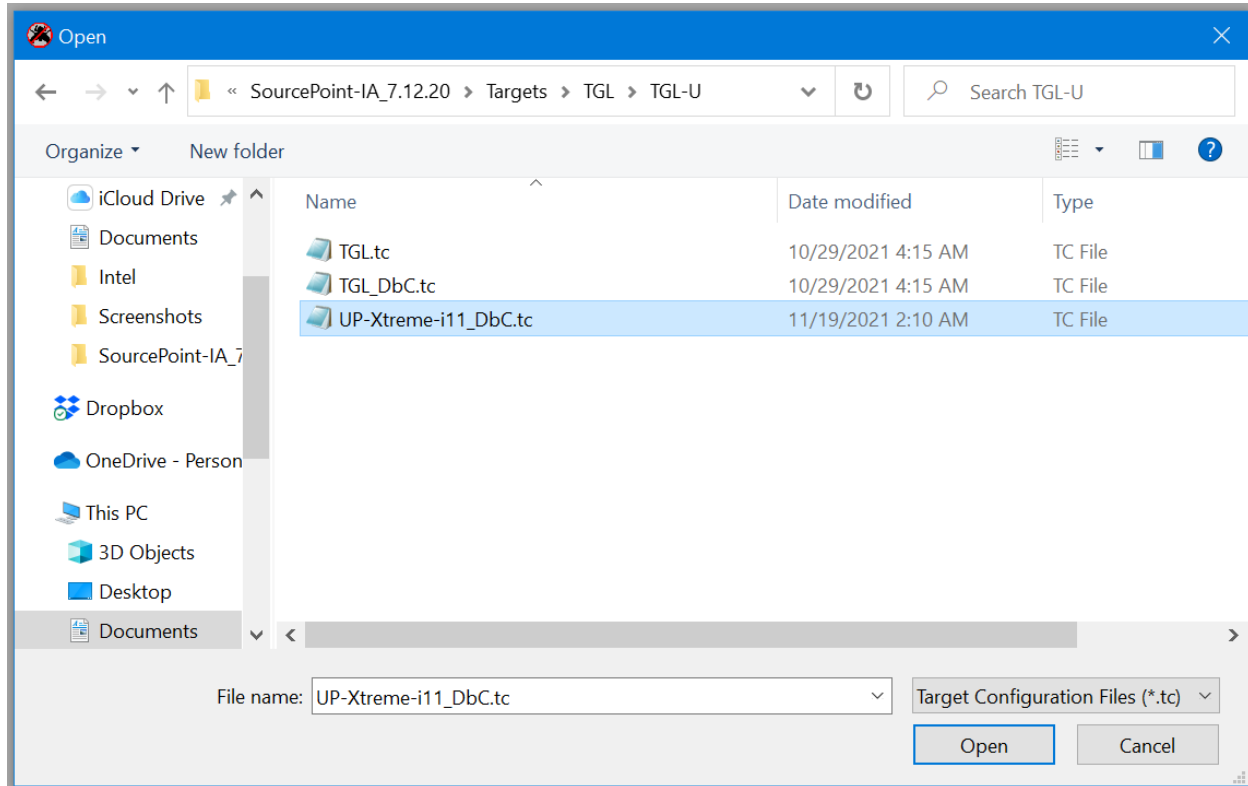
File name:

Location:

Target configuration file

Note that the Target Configuration (TC) files located in `C:\My Documents\Arium\Targets` are used in conjunction with the `jtag-devices.xml` file to define the specific silicon and SourcePoint settings necessary to ensure a successful DCI connection.

For the UP Xtreme i11 boards, custom TC files have been created, so you shouldn't do an `Identify Target` to automatically select the TC file of interest. Rather, manually select the specific TC file that is customized for this target (`TGL\UP-Xtreme-i11_DbC.tc`) and hit `Open`:



Then, your screen should look something like this:

New Project Wizard: Project File

Project file

File name: My Tiger Lake Project

Location: C:\Users\alans\Documents\Arium\SourcePoint-IA_ Browse...

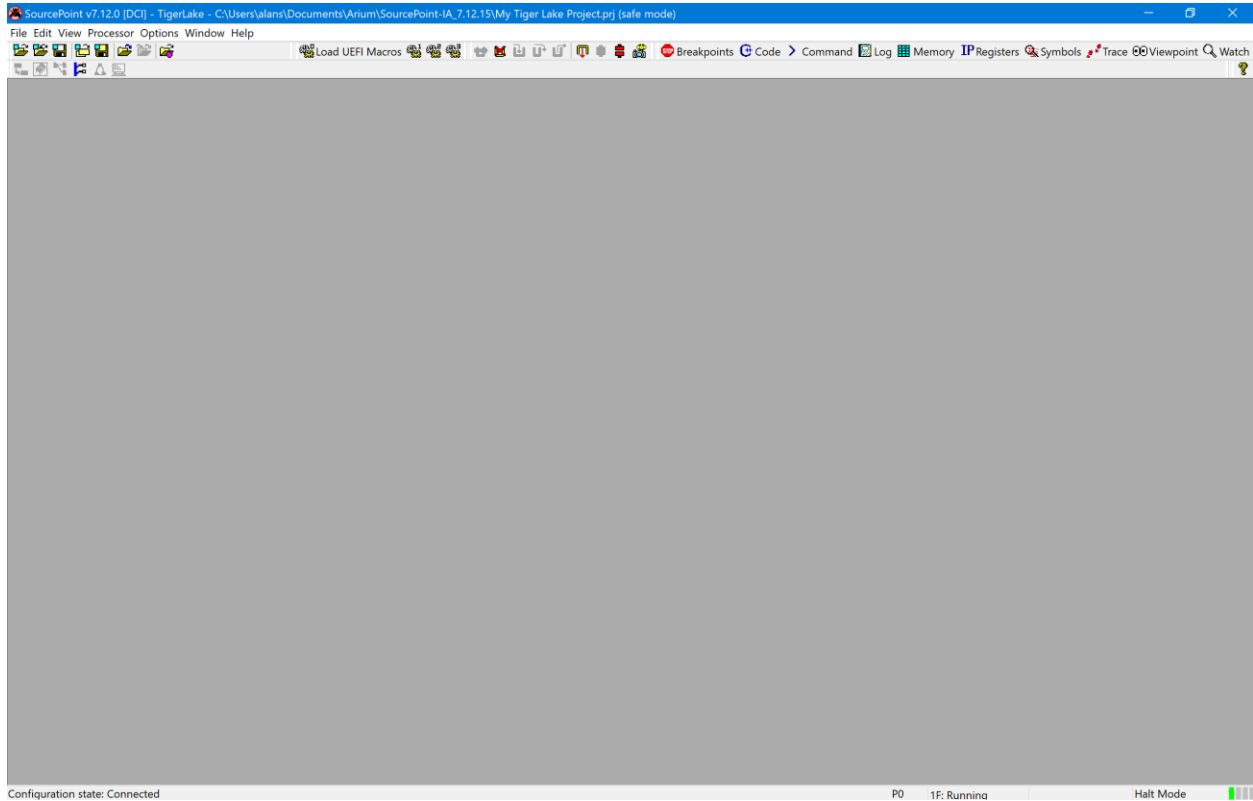
Target configuration file

C:\Users\alans\Documents\Arium\SourcePoint-IA_7.12.15\Ta Browse...

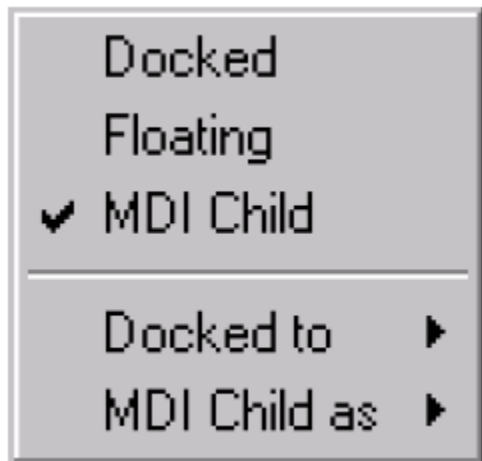
Identify Target

< Back Next > Cancel Help

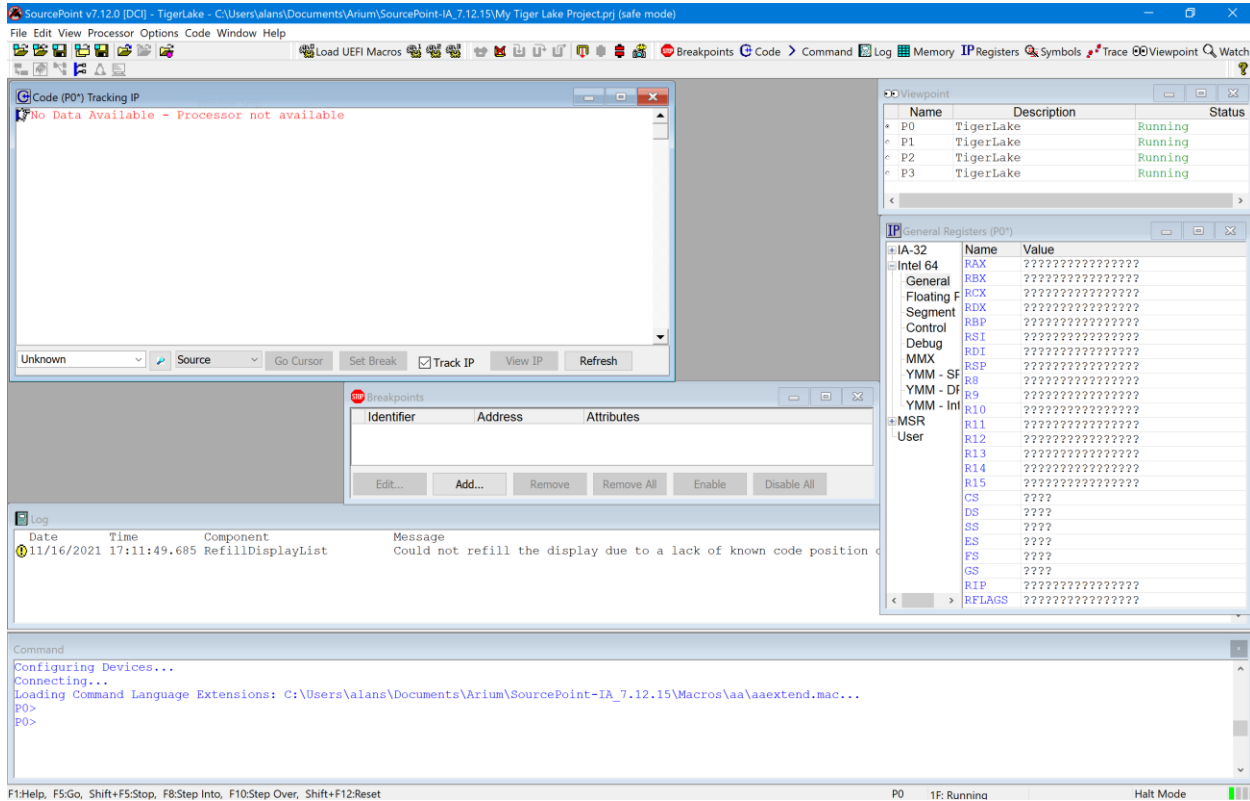
Hit **Next**, then **Finish**, and SourcePoint should successfully connect to the target. You should see “JtagTest: Successful operation” followed by “Configuration state: Connected” in the Status bar at the bottom left:



Now the fun part begins. Click on the buttons at the top to set up the Viewpoint, Code, Command, Registers and other windows to your own preference. Move the windows around and resize them to take best advantage of your available screen real estate. You can right-click in the title bar of each window to change its type and, for example, to dock the window to the bottom, right side, etc.

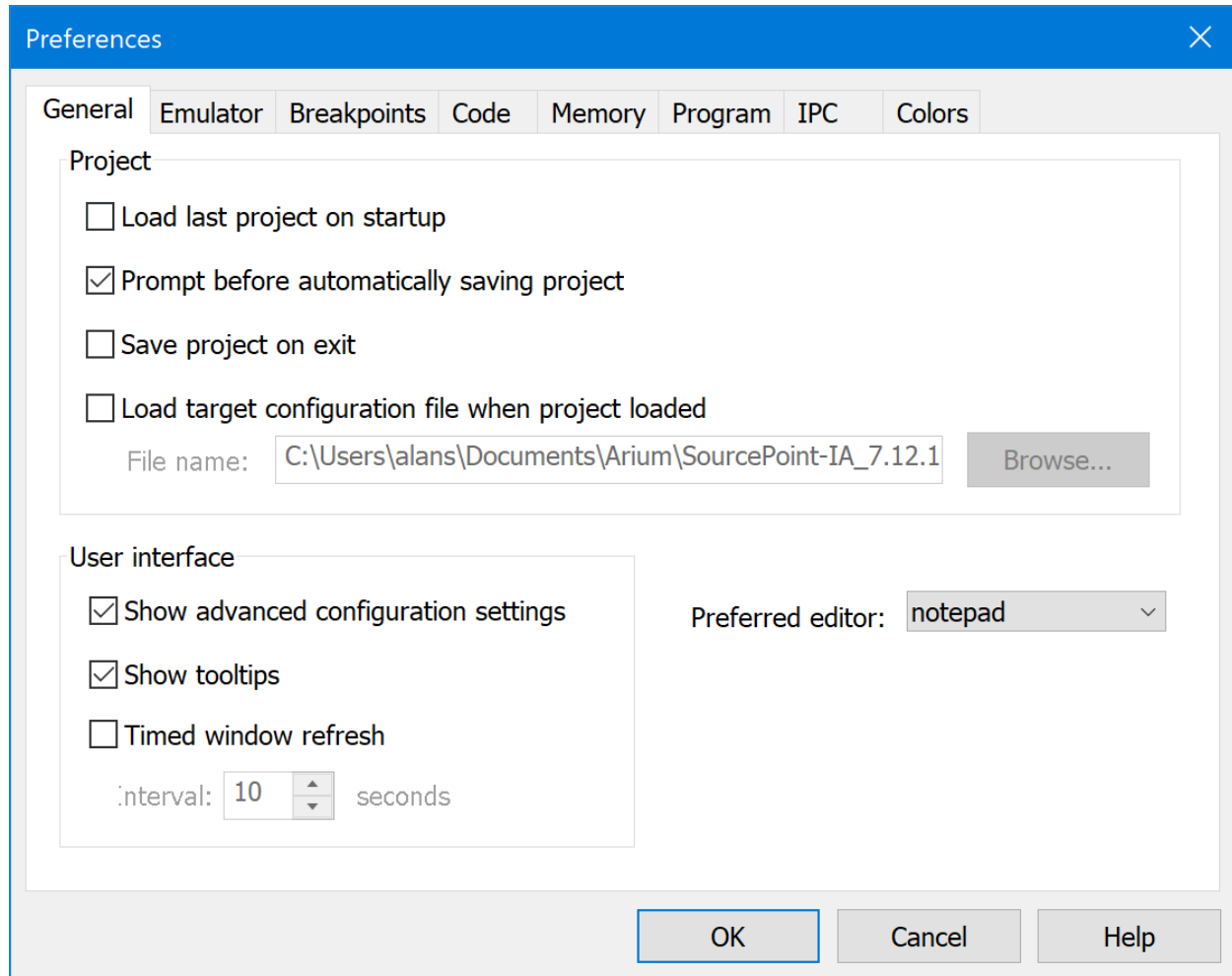


A sample layout is below:



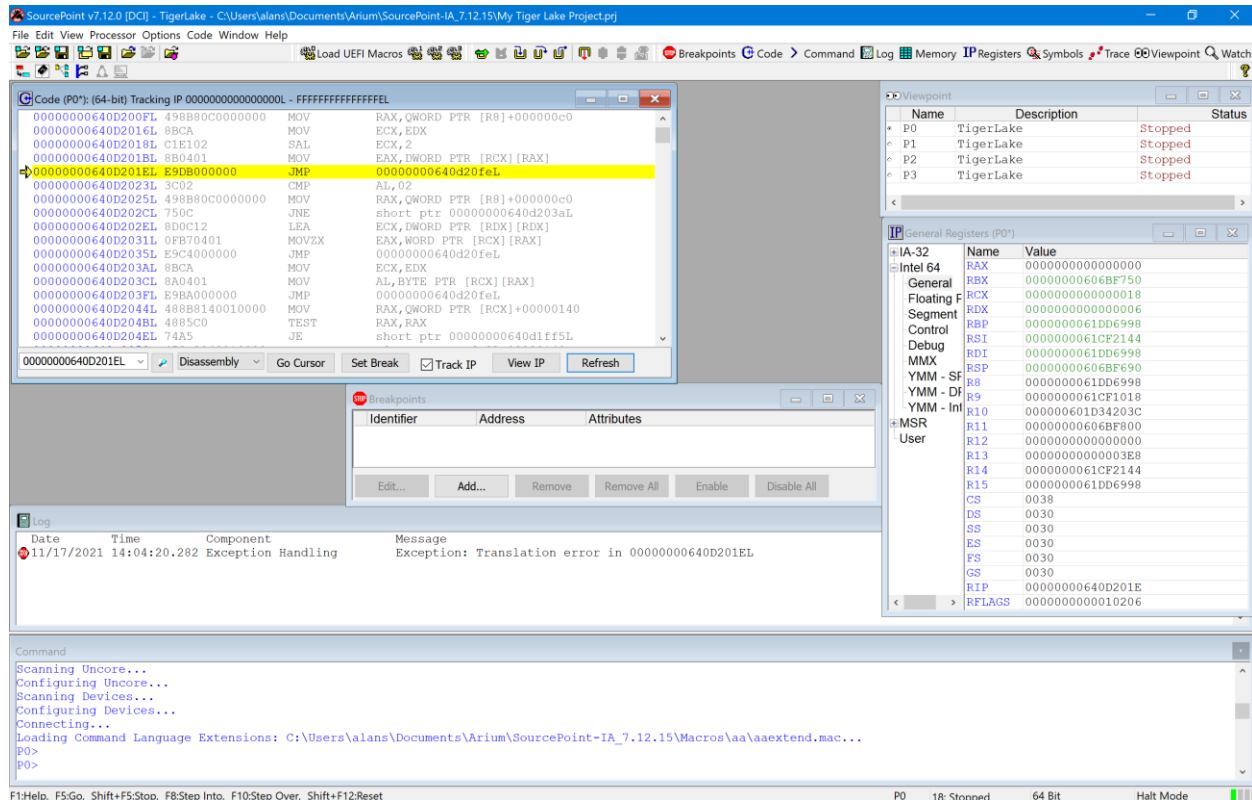
Power Tip: the window layout can be saved as a separate file to your Project. That way, when you create a new Project, you can just Load the layout file separately, without having to create and move the windows around again. Choose **File > Layout > Save Layout...** to create a .lyt file, and then do a **Load Layout...** to save yourself time every time you create a new Project.

Power Tip: Exploring **Options > Preferences...** and some of the other menu items may give you some more labor-saving ideas. For instance, I like to ensure that both **Load last project on startup** and **Save project on exit** are disabled. This gives me more control on entry and exit from the application:



This is a good point to do a `Project > Save Project...` That way, you don't have to start all over, if for some reason your project gets messed up.

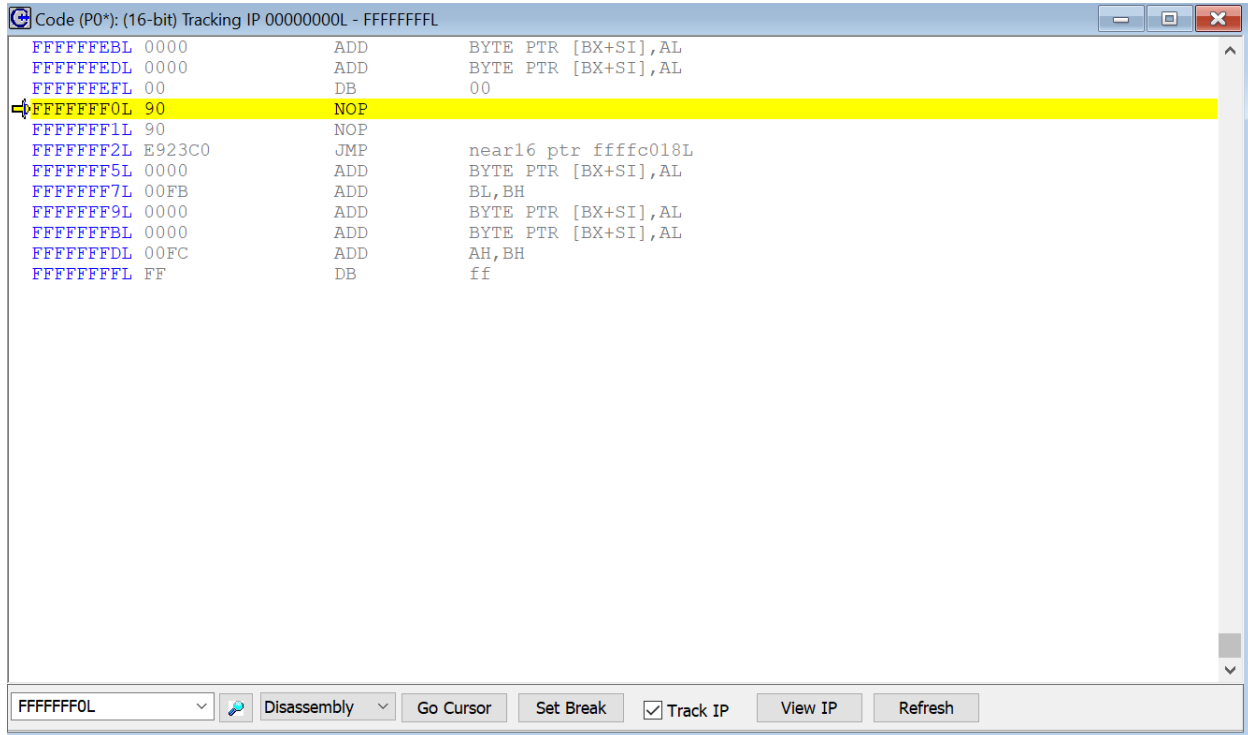
At this point, you are ready to fully begin your debug session. Many of the operations can be accessed via the toolbar at the top of the screen. You can issue a `Stop` on the target, `Step Into`, `Reset` it and halt at the reset vector, set some breakpoints, `Go` to the breakpoint, and so on.



Hit the **Refresh** button in the Code window after the first Stop. This is only necessary once; the Code window will automatically refresh with all run-control operations (stop, go, single-step, etc.) afterwards.

Refer to the [SourcePoint User Guide](#) in your install directory for detailed instructions on using all of the tool's features.

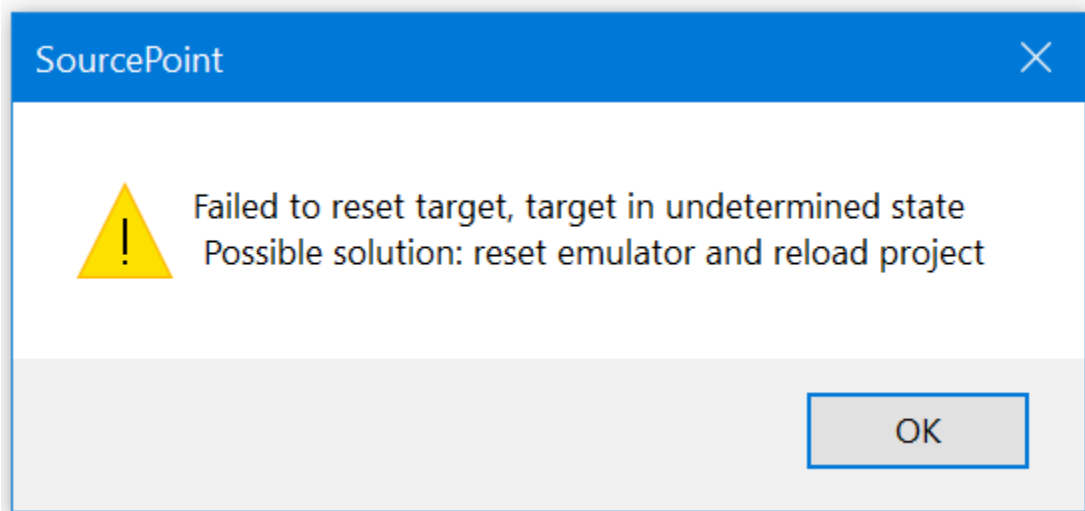
The v0000 board will halt automatically at the reset vector when you hit the SourcePoint Reset button:



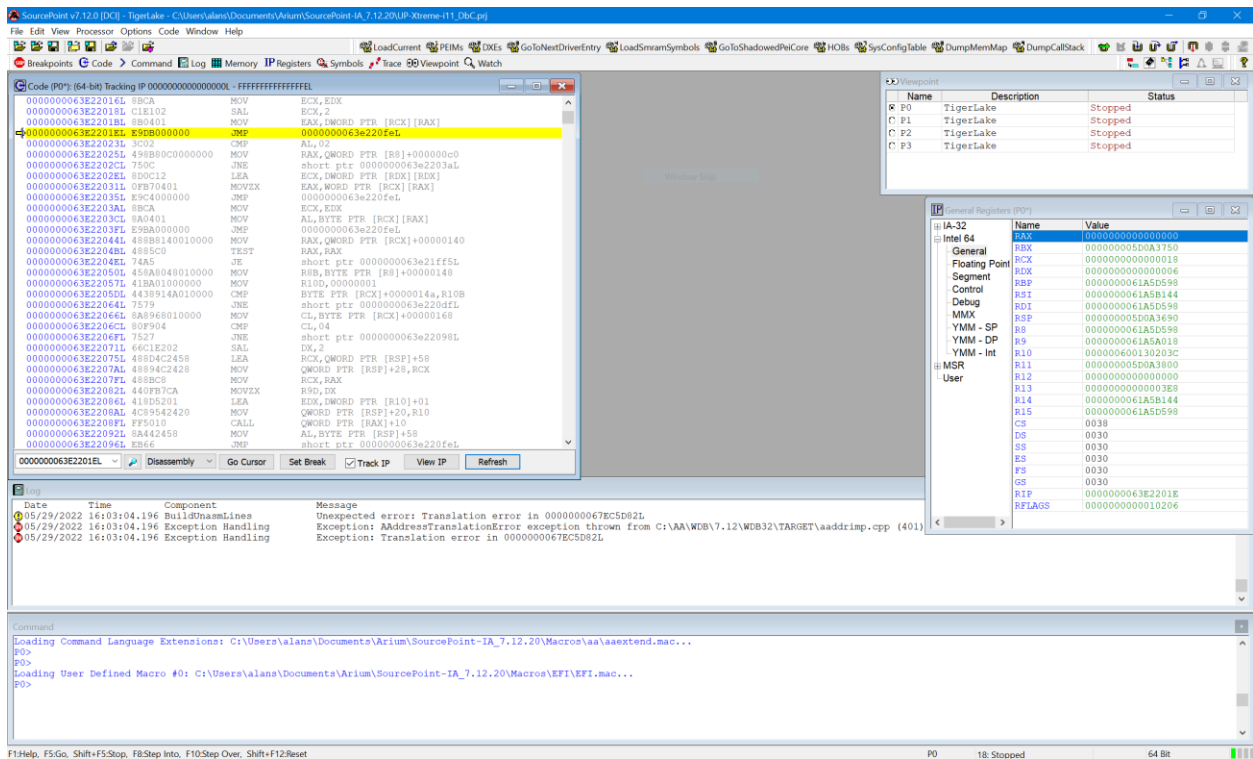
This is desirable, because often you wish to start at early SEC or PEI to debug the portion of UEFI of interest.

But, the v0001 board has an incomplete implementation of DbC2, as you can see from the yellow ball reference earlier, so a couple of extra steps are needed to get there:

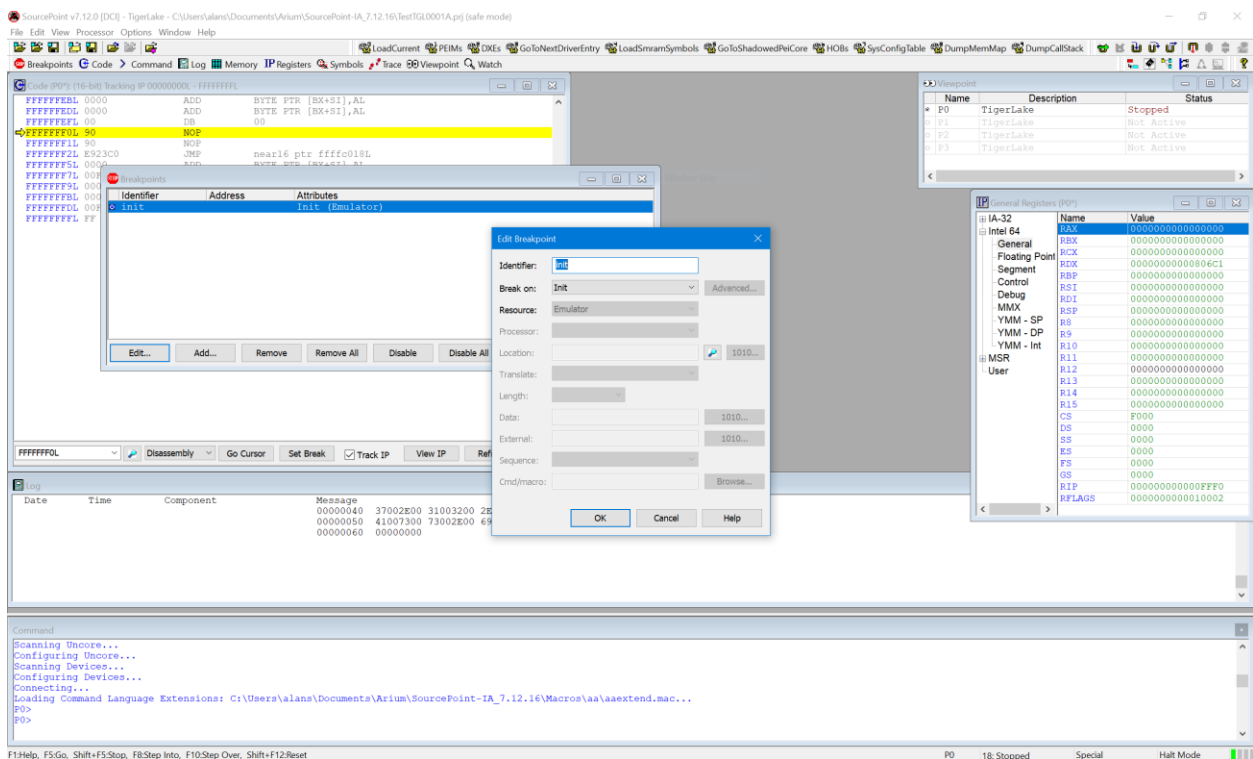
Firstly, after hitting the Reset button, an error message is thrown:



Hit OK, and then hit Go, to boot again to the UEFI shell (or as far as it will go before stopping autonomously). Then Stop and Refresh in the Code window if needed:

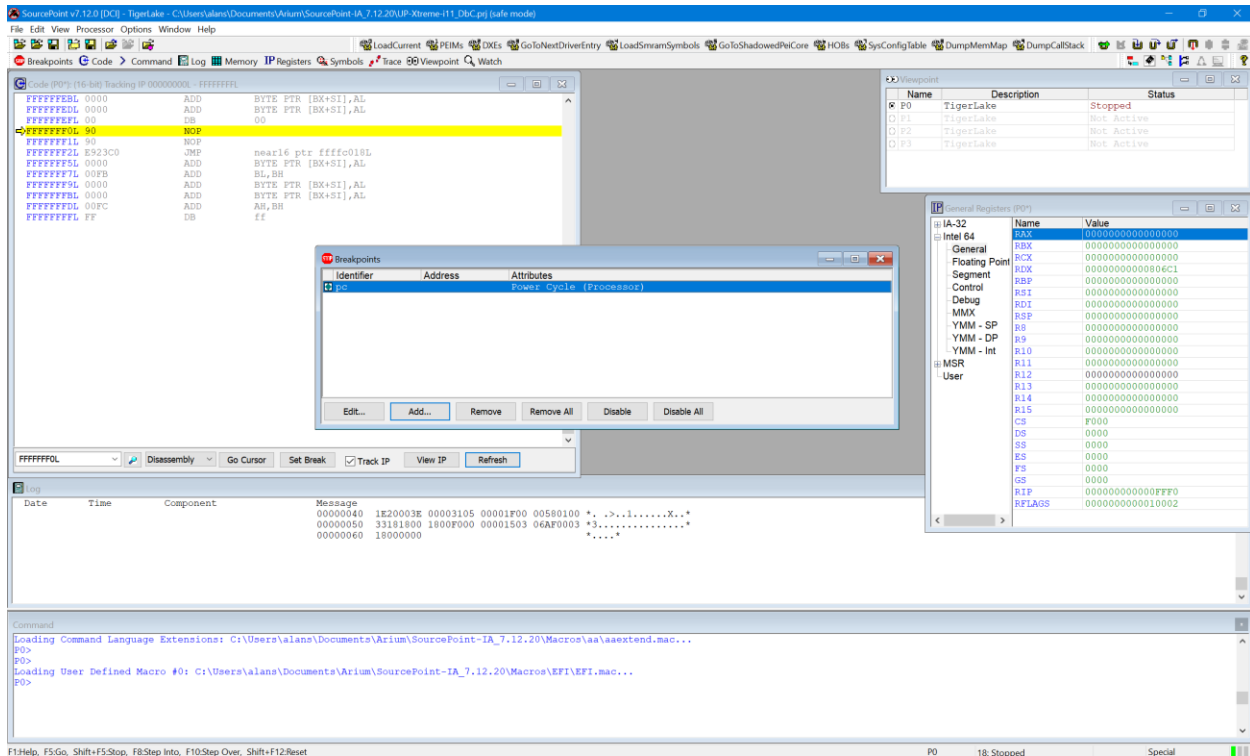


Click on the Breakpoints button, and then set an Init breakpoint:



Hit Go.

Hit the **Reset** button again, and wait 20 seconds. Voila! You're at the reset vector:



Note that for the v0001 board, hitting Go will not necessarily take you all the way up to the UEFI shell; rather, it will break (Stop) for an Unknown Reason autonomously somewhere in DXE, often right after the splash screen display.

Address	Hex Value	Instruction	Comment
0000000063C5CA03L	CC	INT	3
0000000063C5CA04L	8B0596090000	MOV	EAX, DWORD PTR [0000000063c5d3a0]
0000000063C5CA0AL	85C0	TEST	EAX, EAX
0000000063C5CA0CL	750B	JNE	short ptr 0000000063c5ca19L
0000000063C5CA0EL	B80000D0FE	MOV	EAX, fed00000
0000000063C5CA13L	890587090000	MOV	DWORD PTR [0000000063c5d3a0], EAX
0000000063C5CA19L	4805F0000000	ADD	RAX, 000000f0
0000000063C5CA1FL	448B00	MOV	R8D, DWORD PTR [RAX]
0000000063C5CA22L	3BCA	CMP	ECX, EDX
0000000063C5CA24L	730F	JNC	short ptr 0000000063c5ca35L
0000000063C5CA26L	413BD0	CMP	EDX, R8D
0000000063C5CA29L	7703	JA	short ptr 0000000063c5ca2eL
0000000063C5CA2BL	B001	MOV	AL, 01
0000000063C5CA2DL	C3	RETN	
0000000063C5CA2EL	443BC1	CMP	R8D, ECX
0000000063C5CA31L	72F8	JC	short ptr 0000000063c5ca2bL
0000000063C5CA33L	3BCA	CMP	ECX, EDX
0000000063C5CA35L	760A	JBE	short ptr 0000000063c5ca41L
0000000063C5CA37L	443BC1	CMP	R8D, ECX
0000000063C5CA3AL	7305	JNC	short ptr 0000000063c5ca41L
0000000063C5CA3CL	443BC2	CMP	R8D, EDX
0000000063C5CA3FL	77EA	JA	short ptr 0000000063c5ca2bL
0000000063C5CA41L	3BCA	CMP	ECX, EDX
0000000063C5CA43L	0F94C0	SETB	AL
0000000063C5CA46L	C3	RETN	
0000000063C5CA47L	CC	INT	3
0000000063C5CA48L	4053	PUSH	RBX
0000000063C5CA4AL	4883EC20	SUB	RSP, 00000020
0000000063C5CA4EL	33DB	XOR	EBX, EBX
0000000063C5CA50L	8B054E090000	MOV	EAX, DWORD PTR [0000000063c5d3a4]
0000000063C5CA56L	83C048	ADD	EAX, 00000048

This is a “feature” of either the different DbC2 implementation, or the fact that this BIOS is resetting the XHCI controller – you’ll hear the beep from the DbCStatus.exe application – it’s still under investigation. But regardless, SourcePoint will retain control of the target, and you can continue debugging.

Congratulations, you have mastered SourcePoint’s basic capabilities, and are using run-control. Many users are content to just use these basic operations, because run-control by itself is very powerful. However, if you wish to master the product and use some of its more advanced features, read on.

Advanced Topics: Using Trace

Trace is by far one of the most useful debugging utilities for triaging the most difficult, hard-to-reproduce bugs. Fortunately, the Tiger Lake CPU is equipped with all the latest-and-greatest trace logic, and SourcePoint supports them all.

Let's look at a few of them, and how to configure their use in SourcePoint.

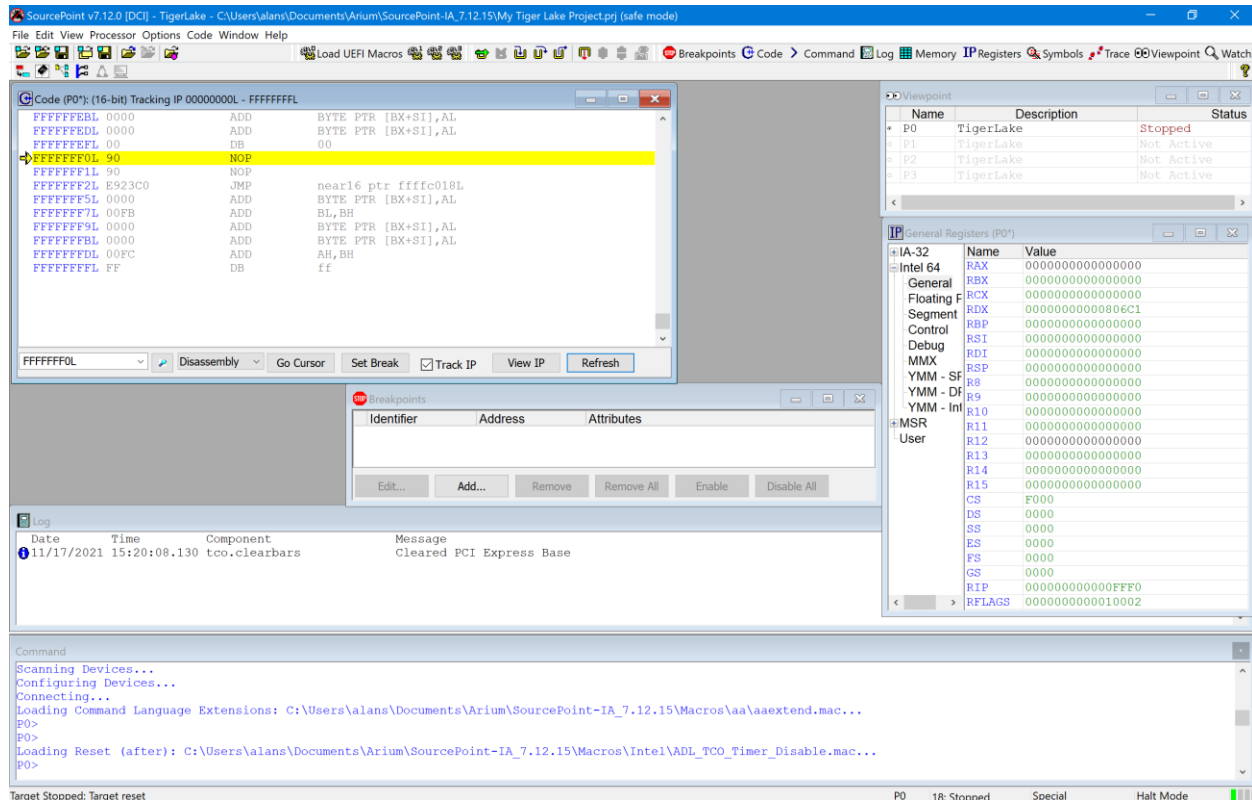
Intel Trace Hub: SVEN

Event tracing on the TGL platform is accomplished by 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 buffer overflows – but these should be rare as long as the events collected are relatively close to the debug point of interest.

System Visibility Event Nexus (SVEN) is a means by which, within the AMI BIOS, printf statements are output through the ITH, as opposed to the serial port. This speeds up the boot time, and reduces the likelihood of port latency contributing to the masking of bugs.

NOTE: SVEN is only supported within the BIOS for the v0000 board. For the v0001 board, finish setting up the ITH per the steps below, and then skip ahead to the section on [Architectural Event Trace](#).

The first thing to do is to configure the ITH. Reset the target and halt at the reset vector, address FFFFFFFF0:

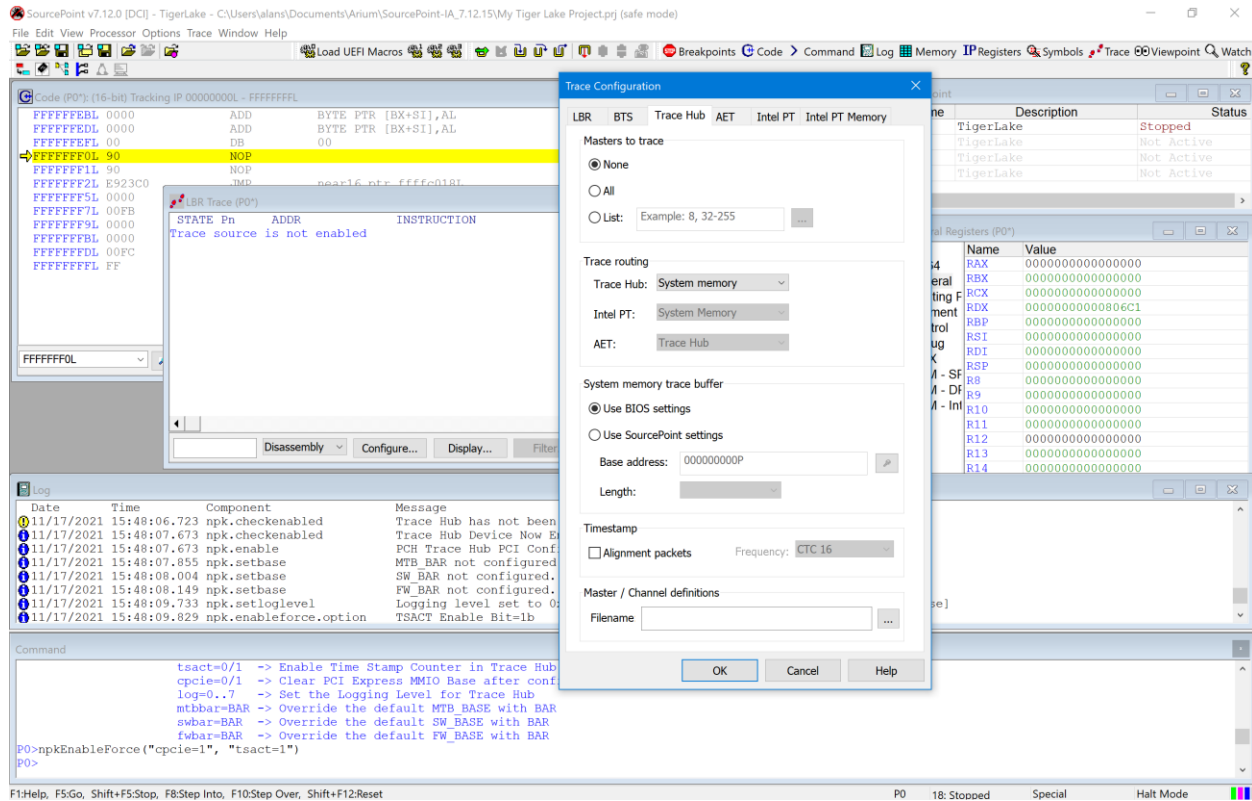


The next step is to load in the ITH macros. This is accomplished by File > Macro > Load Macros... and selecting C:\My Documents\Arium\SourcePoint-IA_7.12.15\Macros\Intel\TraceHub.mac. Then, in the Command window, at the P0> prompt, type:

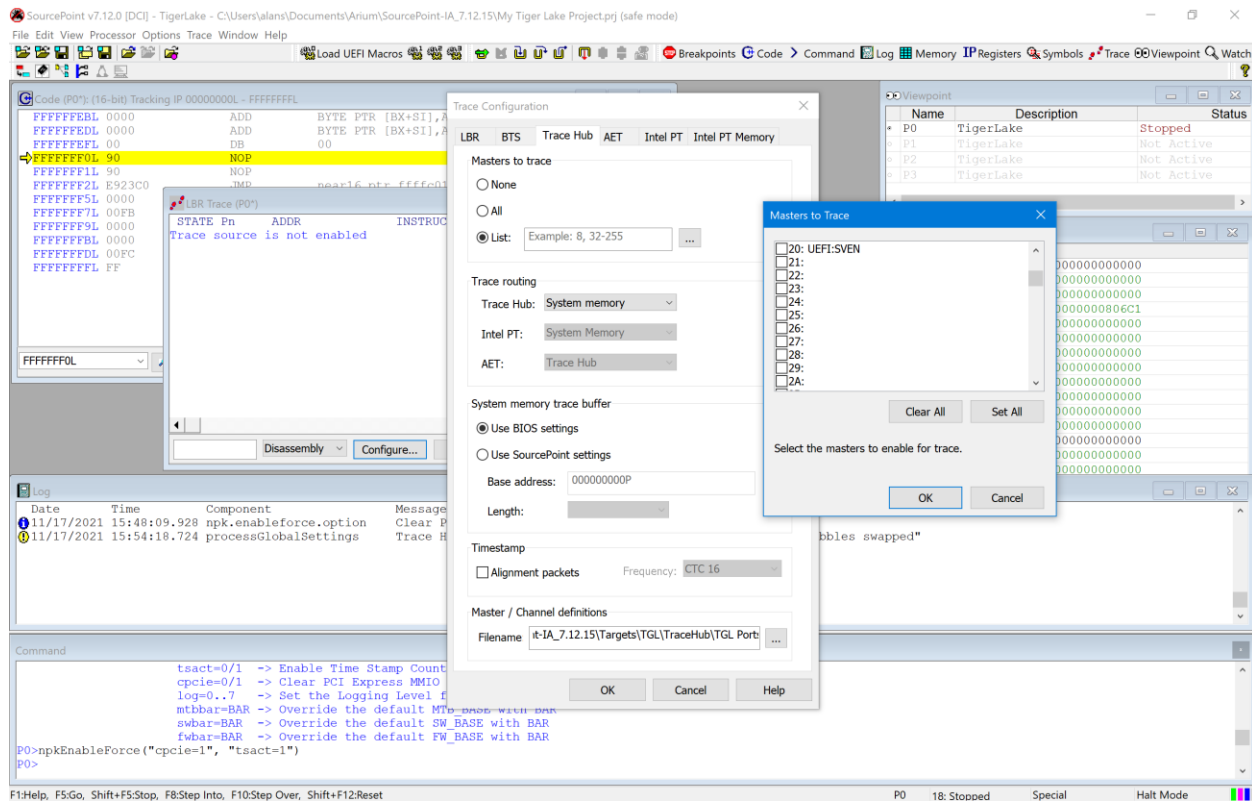
```
npkEnableForce("cpcie=1", "tsact=1")
```

Power tip: If you want to know more about what this macro can do, type `npkEnableForce_Help()`.

Now, it's time to set up the ITH, and let it know what you want to trace. Click on the Trace button in the toolbar at the top, click on the Configure... button, and then click on the Trace Hub tab:



If they're not already set, go to the bottom and click select the C:\MyDocuments\Arium\SourcePoint-IA_7.12.15\Targets\TGL\TraceHub\TGL Ports.xml file to define the Master / Channel definitions. Click OK, and then go back in again, click on List under Masters to trace and select the ellipses (...) to look at the choices available:



For now, select 20: (UEFI:SVEN) and 48 (UEFI:SVEN). Also, under Trace Routing, select Trace Hub and set to DbC:

Trace Configuration

LBR
BTS
Trace Hub
AET
Intel PT
Intel PT Memory

Masters to trace

☐ None
☐ All
☒ List:

20,48

...

Trace routing

Trace Hub:

DbC

Intel PT:

System Memory

AET:

Trace Hub

System memory trace buffer

☒ Use BIOS settings
☐ Use SourcePoint settings

Base address:

000000000P

⌨

Length:

Timestamp

☐ Alignment packets

Frequency:

CTC 16

Master / Channel definitions

Filename:

it-IA_7.12.15\Targets\TGL\TraceHub\TGL Ports

...

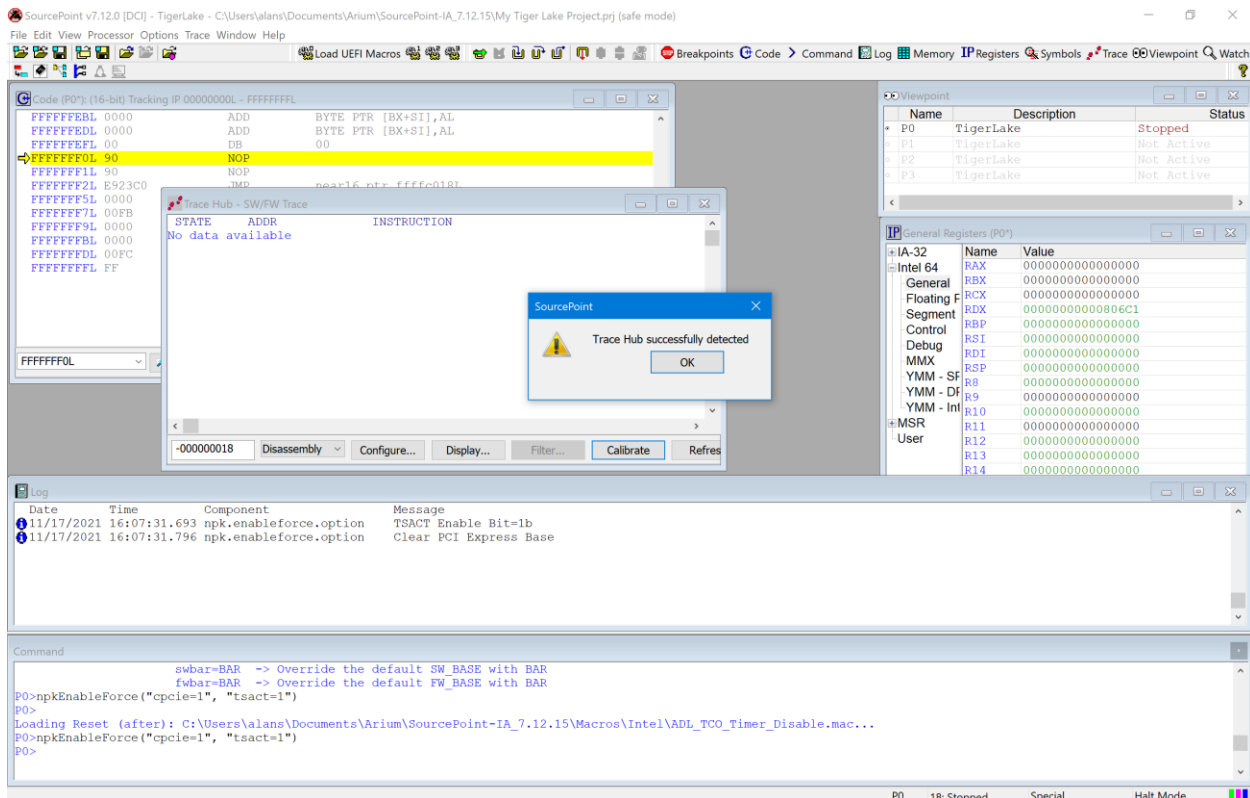
OK

Cancel

Help

Hit OK.

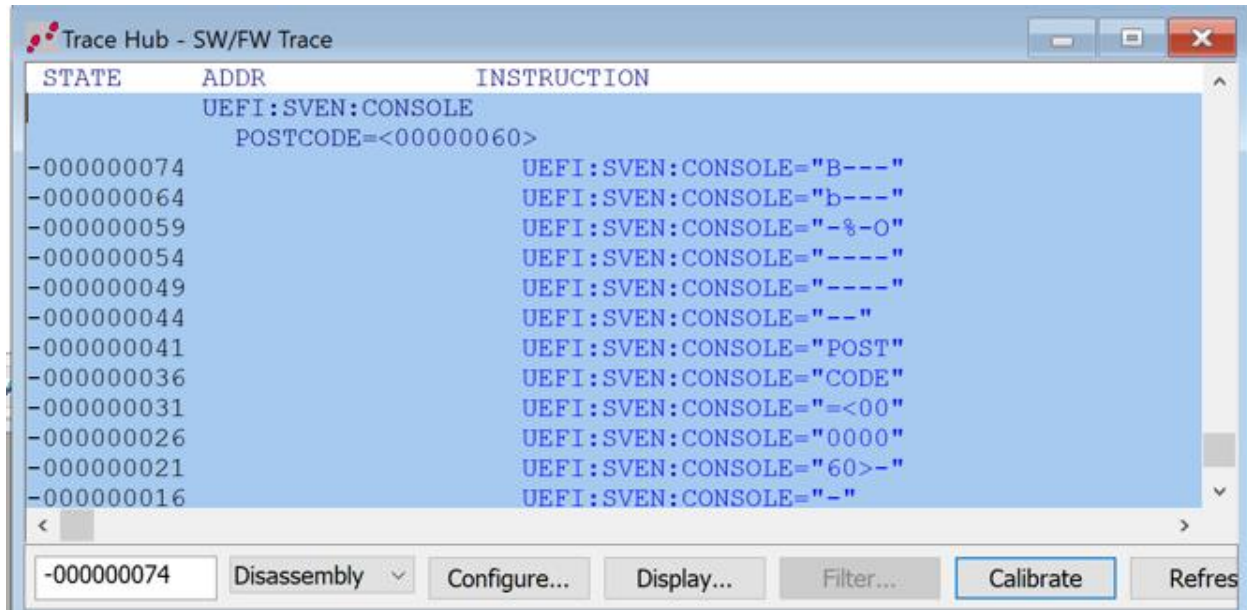
Now, and this is very important, you need to calibrate the ITH. The Trace window should be right-clicked and set to Trace Hub – SW/FW Trace (if it isn't already). Click on the Calibrate button, and you should be rewarded with it being successfully detected:



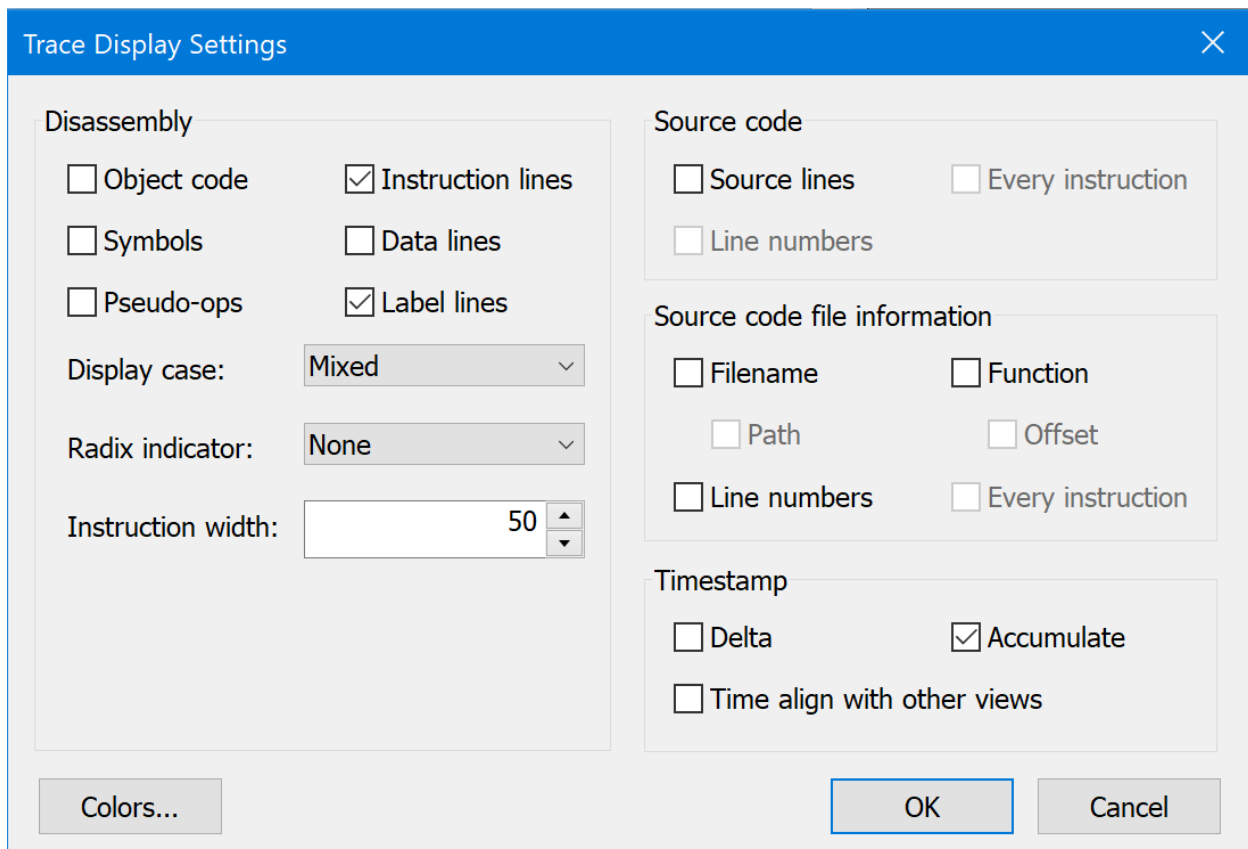
Power tip: The Calibrate button only needs to be used once per project. The `npkEnableForce("cpcei=1", "tsact=1")` command must be re-issued after each reset.

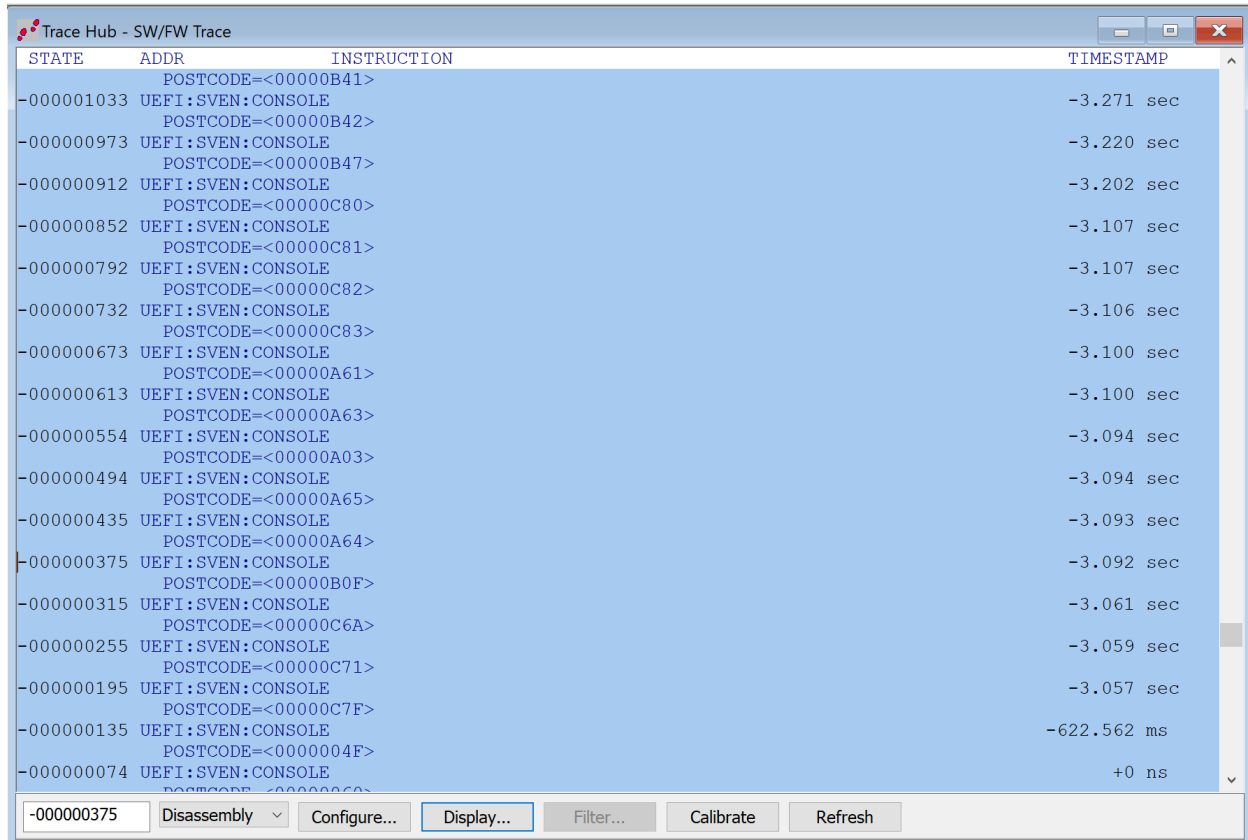
NOTE: SVEN is only supported within the BIOS for the v0000 board. For the v0001 board, skip ahead to the section on [Architectural Event Trace](#).

Then, hit the Go button in the top toolbar, and boot to the UEFI shell. Then hit Stop. You will see the SVEN printf data in all its glory:



Actually, it looks better if you select the `Display...` button, and de-select Data lines:





STATE	ADDR	INSTRUCTION	TIMESTAMP
		POSTCODE=<00000B41>	
-000001033	UEFI:SVEN:CONSOLE	POSTCODE=<00000B42>	-3.271 sec
-000000973	UEFI:SVEN:CONSOLE	POSTCODE=<00000B47>	-3.220 sec
-000000912	UEFI:SVEN:CONSOLE	POSTCODE=<00000C80>	-3.202 sec
-000000852	UEFI:SVEN:CONSOLE	POSTCODE=<00000C81>	-3.107 sec
-000000792	UEFI:SVEN:CONSOLE	POSTCODE=<00000C82>	-3.107 sec
-000000732	UEFI:SVEN:CONSOLE	POSTCODE=<00000C83>	-3.106 sec
-000000673	UEFI:SVEN:CONSOLE	POSTCODE=<00000A61>	-3.100 sec
-000000613	UEFI:SVEN:CONSOLE	POSTCODE=<00000A63>	-3.100 sec
-000000554	UEFI:SVEN:CONSOLE	POSTCODE=<00000A03>	-3.094 sec
-000000494	UEFI:SVEN:CONSOLE	POSTCODE=<00000A65>	-3.094 sec
-000000435	UEFI:SVEN:CONSOLE	POSTCODE=<00000A64>	-3.093 sec
-000000375	UEFI:SVEN:CONSOLE	POSTCODE=<00000B0F>	-3.092 sec
-000000315	UEFI:SVEN:CONSOLE	POSTCODE=<00000C6A>	-3.061 sec
-000000255	UEFI:SVEN:CONSOLE	POSTCODE=<00000C71>	-3.059 sec
-000000195	UEFI:SVEN:CONSOLE	POSTCODE=<00000C7F>	-3.057 sec
-000000135	UEFI:SVEN:CONSOLE	POSTCODE=<0000004F>	-622.562 ms
-000000074	UEFI:SVEN:CONSOLE	POSTCODE=<00000060>	+0 ns

At the bottom of the window, there is a toolbar with the following buttons: Disassembly (dropdown) Configure... Display... Filter... Calibrate Refresh

This BIOS is not particularly verbose, so all we see here are the POST codes. But, you get the idea.

Architectural Event Trace

Click on the **Trace** button in the top toolbar, and select **Configure...** again. Within the **Trace Hub** tab, add '18' to the list of Masters to trace.

Trace Configuration

LBR
BTS
Trace Hub
AET
Intel PT
Intel PT Memory

Masters to trace

☐ None
☐ All
☒ List:

18,20,48

...

Trace routing

Trace Hub:

DbC

Intel PT:

System Memory

AET:

Trace Hub

System memory trace buffer

☒ Use BIOS settings
☐ Use SourcePoint settings

Base address:

000000000P

Length:

8M

Timestamp

☐ Alignment packets

Frequency:

CTC 16

Master / Channel definitions

Filename:

it-IA_7.12.15\Targets\TGL\TraceHub\TGL Ports

...

OK

Cancel

Help

Then click on the AET tab, select p0 as Processors to trace, and select RDMSR/WRMSR and Port In/Out as events to trace:

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	<input type="checkbox"/>	<input type="checkbox"/>
IRET	<input type="checkbox"/>	<input type="checkbox"/>
Exception	<input type="checkbox"/>	<input type="checkbox"/>
RDMSR/WRMSR	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Port In/Out	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Code breakpoint	<input type="checkbox"/>	<input type="checkbox"/>
Data breakpoint	<input type="checkbox"/>	<input type="checkbox"/>
BTM	<input type="checkbox"/>	<input type="checkbox"/>
SMI/NMI/RSM	<input type="checkbox"/>	<input type="checkbox"/>
MONITOR/MWAIT	<input type="checkbox"/>	<input type="checkbox"/>
WBINVD	<input type="checkbox"/>	<input type="checkbox"/>
SGX	<input type="checkbox"/>	<input type="checkbox"/>

Advanced...
Clear all

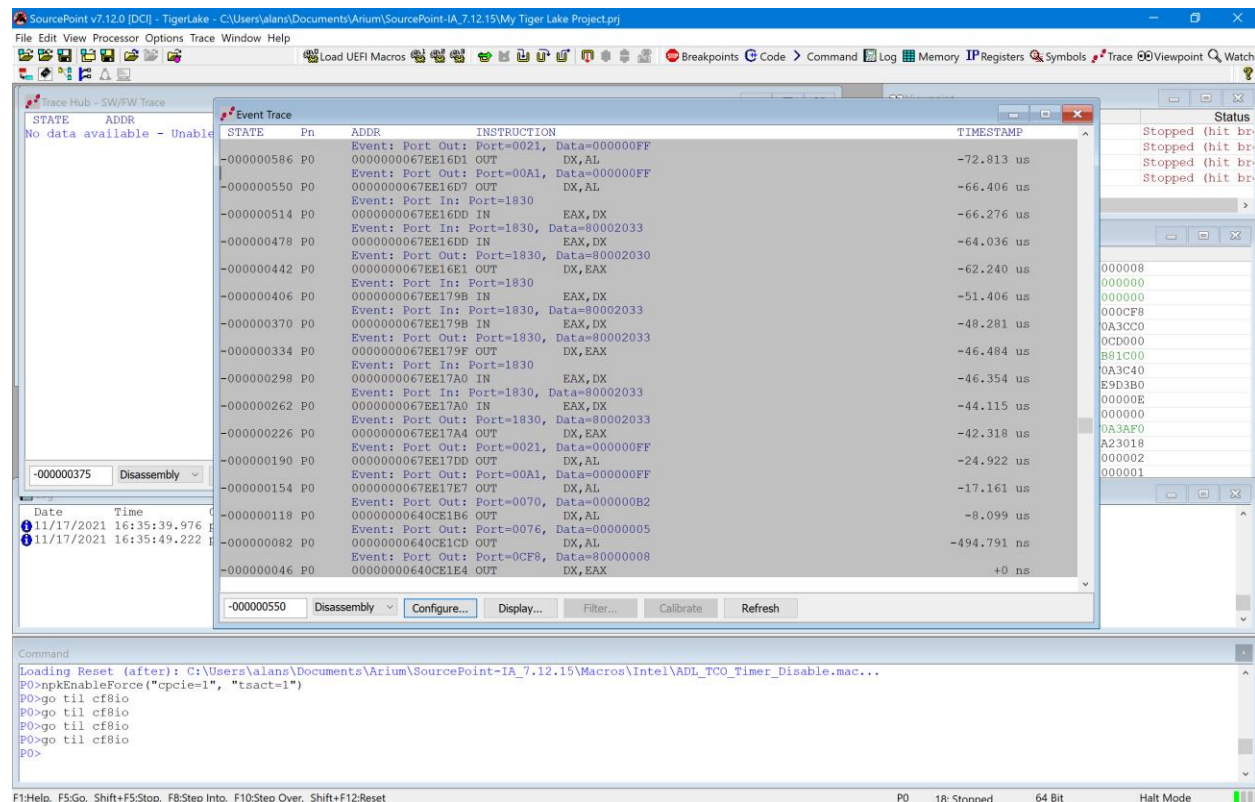
OK
Cancel
Help

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, and with a STATE that can be used to correlate with other trace sources.

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	<input type="checkbox"/>	<input type="checkbox"/>
IRET	<input type="checkbox"/>	<input type="checkbox"/>
Exception	<input type="checkbox"/>	<input type="checkbox"/>
RDMSR/WRMSR	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Port In/Out	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Code breakpoint	<input type="checkbox"/>	<input type="checkbox"/>
Data breakpoint	<input type="checkbox"/>	<input type="checkbox"/>
BTM	<input type="checkbox"/>	<input type="checkbox"/>
SMI/NMI/RSM	<input type="checkbox"/>	<input type="checkbox"/>
MONITOR/MWAIT	<input type="checkbox"/>	<input type="checkbox"/>
WBINVD	<input type="checkbox"/>	<input type="checkbox"/>
SGX	<input type="checkbox"/>	<input type="checkbox"/>

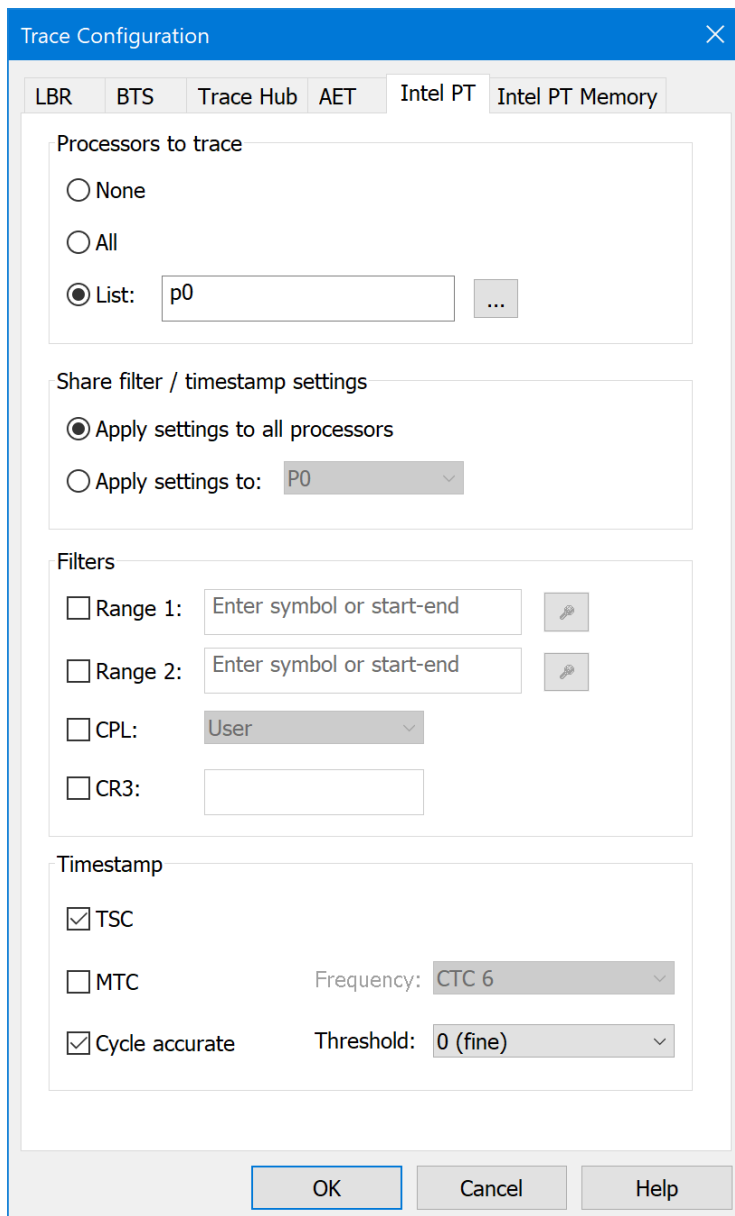
Advanced...
Clear all

OK
Cancel
Help

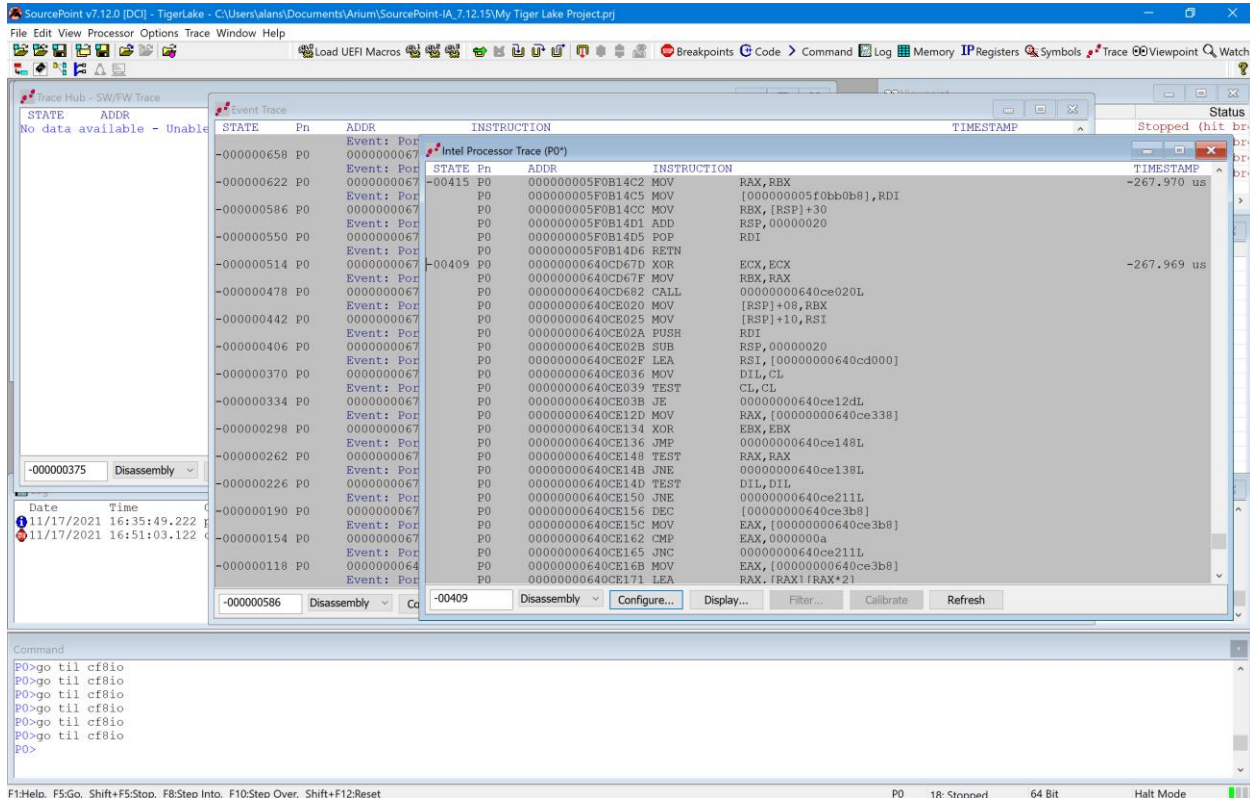
Intel Processor Trace

Intel PT is available only after system memory is initialized.

It's easy to set up. Click on the `Trace` button in the top toolbar, click the `Configure...` button, click on the `Intel PT` tab, put `p0` in `Processors to trace`, and click on `TSC` and `Cycle accurate` under the `Timestamp` heading:



That's all. Then use the `go til cf8io` trick to capture some instruction trace data:



There's a lot more that you can see and do with these Trace utilities. SourcePoint can use Intel PT to display a Call Chart and Call Tree. You can open up Code Tracking windows that update dynamically as you walk through the code, showing you exactly where you are and the interaction between code and events. When you have source and symbols available, the firmware flow becomes much more intuitive and visual. Indulge your curiosity and imagination.

The video at <https://www.asset-intertech.com/wp-content/uploads/2021/11/UP-Xtreme-i11-Getting-Started.mp4> shows some of these capabilities. The [SourcePoint User Guide](#) also provides a very thorough, comprehensive review of the tool. And visit our [SourcePoint Academy](#) for helpful "How To" content.

Troubleshooting Tips

At some point, you'll run into something strange. 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, 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 if the issue is repeatable, we ask that you collect as much information as you can, and open a ticket with us at <https://www.asset-intertech.com/support/>. We'll respond as soon as possible.

In the meantime, here are a few errata that we've noticed on the UP Xtreme i11, and the steps needed to mitigate.

Firmware gets out of sync with software

On the host PC using DCI, functionality is roughly partitioned between software (SourcePoint application with its GUI) and firmware (lower-level run-control primitives). Broad-brushing it, SourcePoint software on the host communicates with the firmware, that encapsulates JTAG traffic into packets which are sent to the PCH, which in turn performs the JTAG mastering function.

Somewhere along the line, the firmware may get out of sync with the software. You may see symptoms like:

In the Viewpoint window, the threads are shown as Running, whereas the Status Bar at the bottom right shows Stopped.

P0 in the Viewpoint window is Running, with one or more threads below it are in the Stopped state.

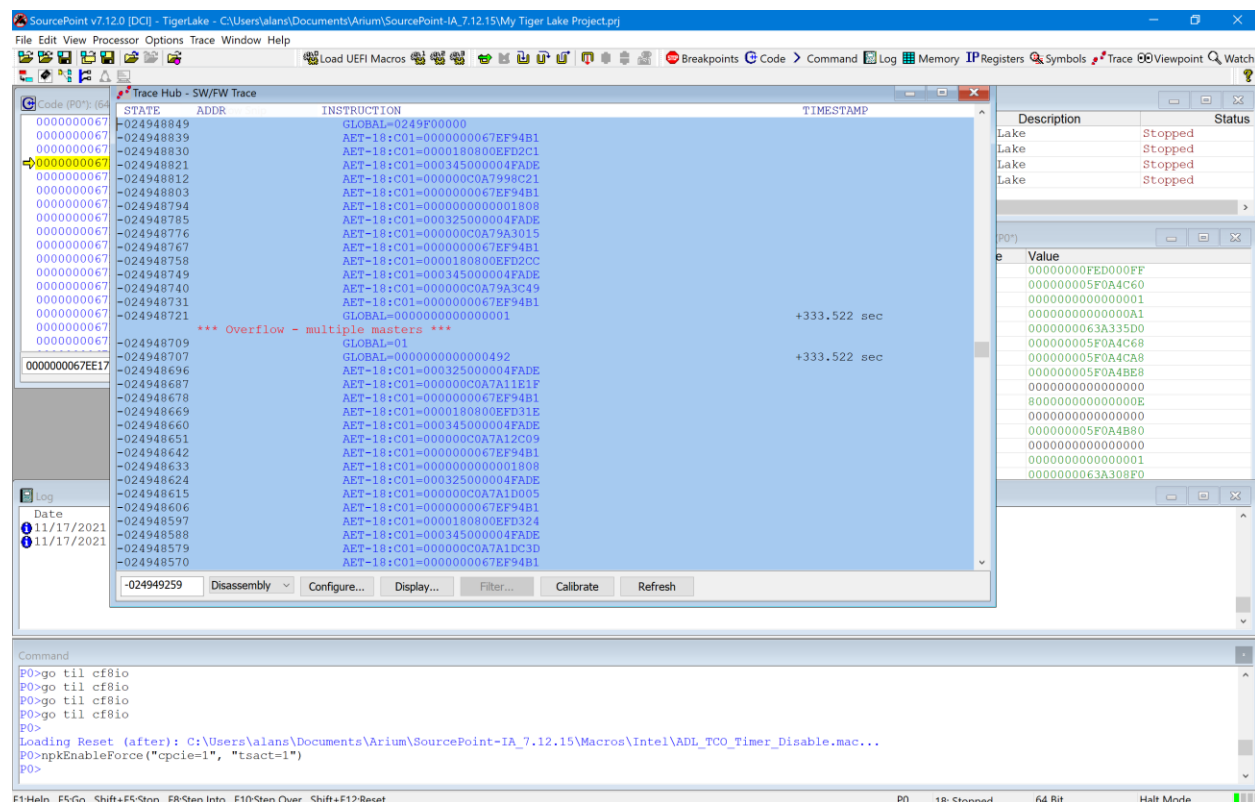
If this happens, you'll likely have to quit SourcePoint, kill the AssetDCI process (see below), power-cycle the target, then start over. Sorry. Then please enter `aaalog = 20987` in the `Command` window, and try to reproduce. We're extremely interested in these cases, so capture the verbose logs in the `Log` window and send to us.

Trace buffer overflows

DCI traffic processing has its limitations. When you try to collect too much trace data, the trace buffer overflows, causing aberrant behavior.

Although the trace data is highly compressed, some trace sources, in particular with AET, running through the Trace Hub can exceed the capacity of the USB 2.0 connection. In theory running at 480Mbps, in practicality SourcePoint can only process trace data at approximately 100Mbps. Beyond that, we collect ~ 20kB of trace data before a buffer in SourcePoint overflows, and we don't recovery gracefully.

You'll see these symptoms of this occurrence in the SW/FW Trace window:



A few of these overflows are no big deal. But, if you're tracing a huge amount of data, SourcePoint may spin, as it tries to process all that data, and deal with the mess. Sometimes, after maybe a few minutes, it recovers. Sometimes, you end up in limbo.

The only solution at this point is to quit SourcePoint, do an `End task` on the AssetDCI Background process, power cycle the target, and start over:

Name	Status	31% CPU	84% Memory
Adobe Collaboration Synchronizer 21.7 (32 bit)		0%	1.2 MB
Adobe Collaboration Synchronizer 21.7 (32 bit)		0%	1.1 MB
Adobe Collaboration Synchronizer 21.7 (32 bit)		0%	2.0 MB
Adobe Collaboration Synchronizer 21.7 (32 bit)		0%	2.2 MB
Adobe Genuine Software Integrity Service		0%	1.2 MB
Adobe Genuine Software Service		0%	1.7 MB
Adobe Installer		0%	0.9 MB
Adobe IPC Broker (32 bit)		0%	2.8 MB
Adobe Update Service		0%	1.1 MB
Application Frame Host		0%	8.3 MB
ariumlmd daemon		0%	1.4 MB
AssetDCI (32 bit)		0%	51.5 MB
CCLibraries		0%	0.1 MB
CCXProcess		0%	0.1 MB

Ultimately, we're working on improving the performing of the AssetDCI driver, and behaving more graciously when overflow is encountered. But, in the interim, it is key to ensure that the trace data collected is relatively "sparse". Focus your debugging in the specific area of interest. Don't try to collect all Port IN/OUT from reset through to the UEFI shell. At 750K I/Os per second, you'll swamp the host debugger processing, and you can't deal with all that data anyway.

Note that this only happens with AET – that is, you can only overflow by collecting too much AET data. It does not apply to LBR, SW/FW Trace, SVEN, or Intel Processor Trace. It may take some trial and error to limit the scope of your event data collection.

NOTE: Release 7.12.18 and later addressed the performance of the ASSET DCI driver. Except in very rare circumstances, trace buffer overflows should not be seen. We've preserved this section of the Getting Started Guide in case they are still encountered out in the wild – please contact our [Support](#) line directly if you see one.

Intel Processor Trace – Slow!

When you configure Intel PT, you can specify the size of the buffer in system memory to collect trace data:

The screenshot shows the 'Trace Configuration' dialog box with the 'Intel PT Memory' tab selected. The 'Trace buffer' section has two radio buttons: 'Use processor settings' (unselected) and 'Use SourcePoint settings:' (selected). Below these, the 'Base address' is set to '100000000P' with a key icon to its right. The 'Length per core' is set to '16k' in a dropdown menu, which is currently open, showing a list of options from '16k' to '2G'. The 'Trace capture mode' section has two radio buttons: 'Overwrite' (selected) and 'Append' (unselected). At the bottom of the dialog are 'OK', 'Cancel', and 'Help' buttons.

Trace Configuration

LBR BTS Trace Hub AET Intel PT Intel PT Memory

Trace buffer

☐ Use processor settings

☒ Use SourcePoint settings:

Base address: 100000000P

Length per core: 16k

Trace capture mode

☒ Overwrite

☐ Append

16k
32k
64k
128k
256k
512k
1M
2M
4M
8M
16M
32M
64M
128M
256M
512M
1G
2G

OK Cancel Help

Note that Intel PT directs instruction trace data to system memory. Although highly compact and efficient, we are not streaming over DCI to the host in this case; we buffer the code execution data until the platform is halted, at which point SourcePoint uses JTAG over DCI to collect the trace data out of system memory, reconstruct and display it. JTAG operates at fairly low speeds, and for large buffer sizes the transfer of all that data can be slow. It starts to become noticeable beyond a buffer size of 64kB. If you try to collect 1GB of data from system memory over JTAG, you can enjoy a cup of coffee and cake while this is in process. SourcePoint will display as Not Responding, and you'll get the "grey screen" if you're too persistent. SourcePoint will eventually recover, but in the interest of time and frustration, it's probably best not to try to save huge collections of instruction trace. Focus your debug efforts in the vicinity of the bug.

My board is not booting – what now?

Once in a while, especially during an intense debug session, we have found that the target goes into la-la land. You get to the UP splash screen, and then it just stops. Or the screen stays black. SourcePoint run-control continues to work, but it won't boot all the way up to the UEFI shell. Quitting SourcePoint, unplugging the DCI cable, killing the AssetDCI process – all are good steps in this instance, when you need to recover.

But then, once in a while, you wait the needed 20 seconds; and it doesn't boot. The screen stays blank or frozen.

Don't panic! For reasons we're not sure of just yet, after about 60 seconds, the board "wakes up" and should boot all the way to the UEFI shell.

There's only one thing: it has gone back to the factory settings, so you need to reset the WDT timer, as per [BIOS Settings](#) section in this manual.

Then, you'll be back in business.

Conclusion

Thank you for getting this far! We hope that you have enjoyed the ride, and are using the power of SourcePoint successfully in your debugging and learning journeys.

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!