SourcePoint™ with Intel® Trace Hub

SourcePoint ASSET InterTech's flagship software debugger has now added some power for Intel architecture tracing by adding support for Intel's Trace Hub. SourcePoint debugger now brings the power of the Intel Trace Hub and Intel Processor Trace (PT) to speed your insight to your toughest software problems.

SourcePoint is the debugger of choice for many Unified Extensible Firmware Interface (UEFI) developers including Intel and now with the addition of Trace Hub tracing code execution and finding that elusive bug is now but a trace away.

TraceHub is an implementation in silicon, of enabling Trace from various hardware and software sources. This technology employs a MIPI STPv2.1 protocol so that the trace data from these various sources can be encoded and streamed off the system to be captured and displayed in SourcePoint. This is first enhancement, outside of the Real Time Instruction Trace (RTIT) on Atom processors, which provides a meaningful trace without performance penalties for Intel Core and Xeon code developers.

Trace Hub Setup
SourcePoint manages the TraceHub setup of selecting the trace stream from various sources. The software trace stream sources are Intel Architecture Application Cores, Firmware Cores, and Chipset Cores. The hardware trace streams are from Intel Processor Trace (PT), Architectural Event Trace, and others.

Figure 1 shows how to manage the trace from the various sources, configure filters and timestamp settings. Simple and straightforward.

Intel Processor Trace Setup
SourcePoint provides a means for intuitive configuration of selecting the desired data gathered from the different trace sources. One trace source is Intel PT, and Figure 2 shows how to configure processor trace setting to all cores or selected cores. Adding timestamps allows for easy correlation of data between traces. The final configuration item is to manage the Trace Hub
buffer. The current trace buffer destination is target memory, Figure 3. This can be controlled by the BIOS or SourcePoint, depending on how and where you want the trace buffer controlled.

**Trace Display and Analysis**

The data can be displayed in various forms. Raw trace, with or without timestamps, with assembly, source or both. Grabbing raw trace can be informative, but does not necessarily bring clarity to the problem. Often more information about the data collected needs to be added.

Displaying more information within the trace will provide for more clarity, but in some instances adds so much data the code seems to get lost.

SourcePoint has the ability to link the trace data to the specific code source providing clarity in understanding the code execution flow, whether it be from a processor core, chipset cores, the Software HUB or other hardware sources. Figure 4 is an example of Code view with Intel Processor Trace interlocked to provide detail with clarity.
System Trace Analysis
Another benefit of trace hub is a system view of code execution. By using other trace sources like, chip set and software hub, we can expand the time window so that a better view of system execution can be provided. In the previous example, the trace covered milliseconds of execution time. In Figure 5, the ME (chip set) and UEFI (software hub) trace could cover seconds of execution. This allows for a trace capture of a full boot sequence depending upon the target memory buffer size.

So the user, with a minimal amount of instrumentation, can trace progress of a variety of items such as hardware registers, from another piece of silicon in the target such as an FPGA, or trace FIFO, or message handles, or even message streams, and SourcePoint can provide clear, precise trace views all with time stamp correlation exposing the system effects on the code while simultaneously tracking all these forms of data. By assigning master and channel, via a editable XML file, the developer has total control over what data is trace on a given channel. The data can be color coded, providing even more clarity into code execution flow from the systems perspective. Multiple examples of XML for assigning or formatting are provided with the online help.

SourcePoint provides the developers the ability to flex their creativity and provide trace views into the system execution that match the needs of the developer.

SourcePoint for IA
SourcePoint offers a number of unique but highly intuitive features, making it an exceptional debugger for today’s Intel Architecture projects.

A good debug solution offers the programmer or developer layers of debugging options, from the simple breakdown of code into ever smaller iterations to the ability to capture and analyze huge amounts of execution history in a single run. With the addition of Trace Hub the ability to trace code execution without negative side effects has finally been achieved and puts real muscle into trace for the Intel architectures thanks in part to SourcePoint.
For a demonstration of this exciting new technology contact your local sales SourcePoint representative.

http://www.asset-intertech.com/company/contact

Trace Hub Benefits

System Trace visibility
- Not only code on IA but ME and SMM events
- Capture seconds of boot execution in trace

Shorten Time to insight
- Better system visibility (macro) with
- Instruction level precision when needed

Decrease Root Cause analysis time 30%
- See bug symptom and manifestation in a single trace or multiple views.

Find the toughest Asynchronous Bugs Quickly
- See code execution complexities clearly