### Agenda

- **Introduction**
- **Reference Platform: AAEON Whiskey Lake w/DCI**
- **The Command Language**
- **Getting Help**
- **Macro buttons, User-Defined macros, Event macros**
- **The SourcePoint Assembler**
- **Built-in Macros: platform.mac, processor.mac, pch.mac, npk.mac**
- **Some helpful references**
- **Wrap-Up and Q&A**
- A very powerful JTAG-based debugger
- Optimized for low-level firmware debug
- Learning curve – *lots* of features

On AAEON Whiskey Lake (WHL) UP Xtreme board:

DCI: WHL DbC3

SourcePoint

Specialty USB cable

WhiskeylakeOpenBoardPkg
DbC3 & FSP – “Choppy Seas”
The Command Language

- A programming language very similar to ‘C’
  - Conditional logic, branching, loops, typed data, operators, functions, etc.
  - etc.
- Additional support for run-control, target access, and unique SourcePoint capabilities
  - go
  - halt
  - dbgbreak
  - step
  - fprintf
  - strcmp
  - asm/endasm
  - etc. etc.
- > 240 commands and control variables, ~ 400 pages of documentation
Examples:

go til 80io

go til 80io; wait; ax

while(ax != 0x9B47) {go til 80io; wait; ax}
Procedures are defined, and can be executed, within macro files

- Procedures have parameters (post code is “val”) as well as global and local variables
- `do/while`
- `dbgbreak` enables a breakpoint on an I/O access, named “POST80”, for port 80 and a word (16 bits)
- This routine is equivalent to:
  - `while(ax != val) {go til 80io; wait; ax}`
- Can be assigned to buttons or events
- Up to 20 buttons of your own creation
- Event macros are very powerful, and can be triggered based upon:
  - Breakpoint (any)
  - Emulator connected
  - Go
  - Project Load/Unload
  - Reset (before, after)
  - Stop
  - Target configure
  - Target power on
  - etc.
The command language provides access to the SourcePoint assembler.

Can use the command line, or within macros.

Single-pass assembler; cannot use labels not yet defined (but can use org directive for out-of-order assembly, and use command language for labels).

Example:

- `asm 1000 =`
- `mov al, 01`
- `mov al, 02`
- `mov al, 03`
- `endasm`
Useful macros within SourcePoint

- TraceHub.mac
- Platform.mac
- Processor.mac

Example:

- `define nstring strpath = defaultpath`
- `defaultpath = strpath + "\\Macros\\Intel"
- `include platform.mac`
- `pfmGetDetails()`
- `show`
Good Resources

- **SourcePoint Academy:**
  [https://www.asset-intertech.com/resources/academy/sourcepoint-academy/](https://www.asset-intertech.com/resources/academy/sourcepoint-academy/)
  “How To” Guides and all our technical documentation online

- **Blogs:**
  [https://www.asset-intertech.com/resources/blog/category/arium-probes-sourcepoint/](https://www.asset-intertech.com/resources/blog/category/arium-probes-sourcepoint/)
  Tons of articles on timely debugging and JTAG topics

- **Videos:**
  [https://www.asset-intertech.com/resources/videos/](https://www.asset-intertech.com/resources/videos/)
  Our recorded webinars: DCI debug of UEFI and hypervisor technologies on the AAEON UP Whiskey Lake and Tiger Lake boards, JTAG-based debugging of AMD EPYC servers, etc.

- **Webinars:**
  [https://www.youtube.com/c/UEFIForum/videos](https://www.youtube.com/c/UEFIForum/videos)
  Beyond Printf – Real-Time Firmware Debugging
  UEFI Debug with Intel Architectural Event Trace
  JTAG-based Debug & Trace
Wrap-Up

Questions?

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Real Insight from Code to Silicon