TotalView port to ARM64

RogueWave SOFTWARE

Accelerating Great Code

Agenda

- **Who is Rogue Wave Software**
- **What is TotalView**
- **Why did we do the port now?**
- **What worked and what didn’t in doing the port**
- **What is its availability**
- **Next steps**

Meeting customer needs with capabilities

PREDICTIVE ANALYTICS

APPLICATION SECURITY

OPEN SOURCE SUPPORT

OPEN SOURCE AUDITING

STATIC CODE ANALYSIS

DYNAMIC ANALYSIS

CODE REFACTORING

CODE BUILDING BLOCKS

API MANAGEMENT

APPLICATION PERFORMANCE MANAGEMENT

WEB DEVELOPMENT & DEPLOYMENT

Our products and services

Tools

Klocwork On-the-fly static code analysis for app security

CodeDynamics Commercial dynamic analysis

OpenLogic Support Enterprise-grade SLA support

OpenLogic Audits Detailed open source license and security risk guidance

TotalView for HPC Scalable parallel debugging

Zend Server Enterprise PHP app server

Zend Studio PHP IDE

Zend Guard PHP encoding and obfuscation

Libraries

SourcePro OS, database, network, and analysis abstraction for C++

Visualization Real-time data visualization at scale

PV-WAVE Visual data analysis

IMSL Numerical Libraries Scalable math and statistics algorithms

HydraExpress SOA/C++ modernization framework

HostAccess Terminal emulation for Windows

Stingray MFC GUI components

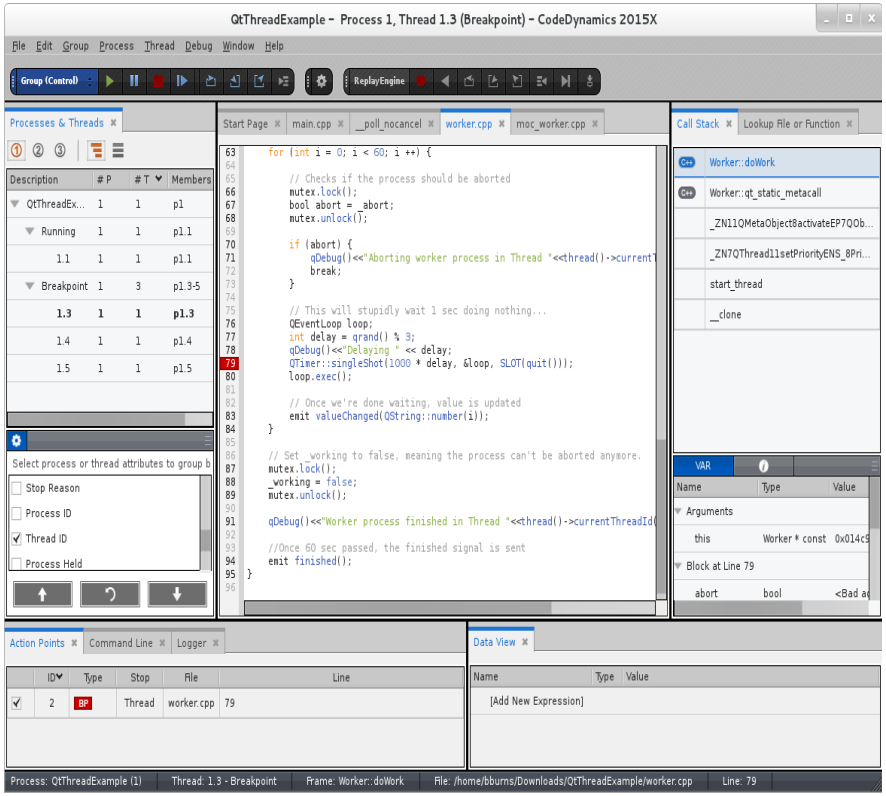
TotalView for HPC

- **Leading debug environment for HPC users**
  - **Active development for 30+ years**
  - **Thread specific breakpoints**
  - **Control individual thread execution**
  - **View thread specific stack and data**
  - **View complex data types easily**

- **Track memory leaks in running applications**
- **Supports C/C++ on Linux**

- **Allowing the business to have**
  - **Predictable development schedules**
  - **Less time spent debugging**

- **ARM support**
  - **Beta just concluded**
  - **Early access available November 2016 – version 2016.07**
  - **Full release planned for Feb 2017 – version 2017.1**



Why now

- **Industry interest in ARM v8**
    - **HPC**
    - **Commercial accounts**
- **Analysts predict growth**
    - **~20% of HPC within 5 years**
- **Customer requests**
    - **Directly to us**
    - **At conferences**
    - **Part of RFPs**
- **Chosen by Fujitsu for Post-K**

Thank you to Cavium and NVIDIA

Cavium supplied us with a ThunderX board to develop on
NVIDIA supplied a Jetson TX1 for testing/demonstration

Porting steps

- Board bring up
  - Started with Cavium machine Ubuntu 14.04
  - Basic package installation
- Built layers
  - New dev
    - Write platform specific content
    - ARM 64 registers
    - Instruction sets
  - Compiled CLI version
    - Fixed issues
  - Adapt existing
    - Ptrace
    - Watchpoints
    - Stack unwinding
    - Memory debugging
      - Linux based
      - Don't worry about physical layout
- Testing
  - Built on Nvidia Jetson Tx1
    - Unbuntu 16.04
    - Generally worked
    - Kernel watchpoints crashed
    - Nvidia is investigating

General comments

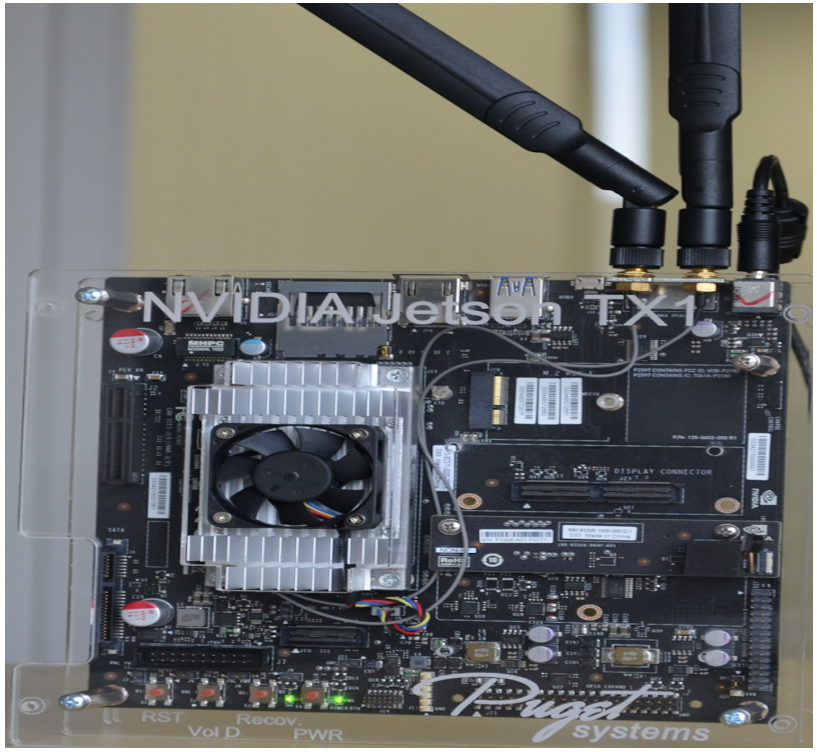
- Overall view
  - Linux leveraging Ubuntu 14.04
    - Port was made more straight forward
    - Package installation was simpler
- Issues
  - Can't unwind stacks frames with no debug data
  - No ReplayEngine support
  - Limitations supporting user level threads
- General Comment
  - Needed to read kernel sources
    - Watchpoints
    - Signal Stack frames

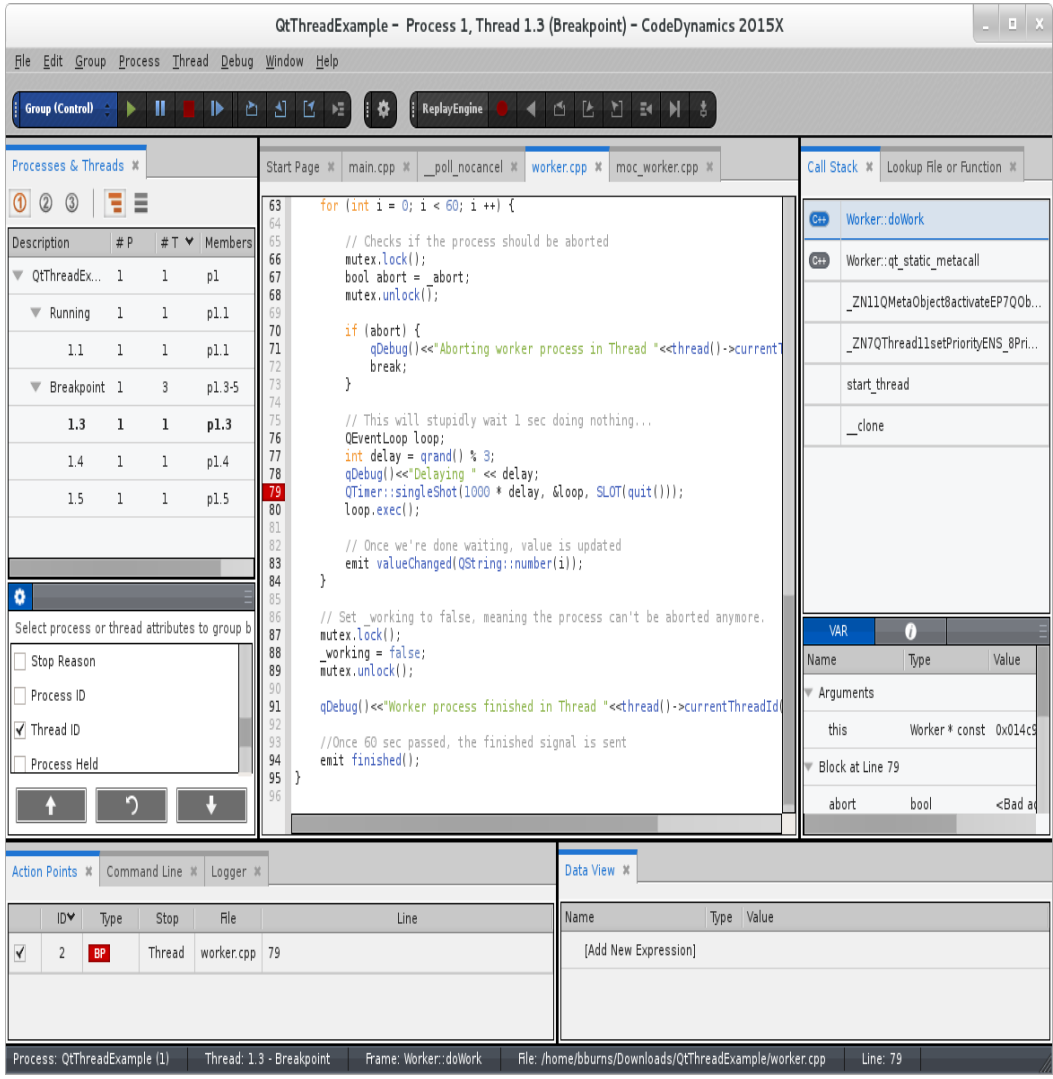
Next Steps

- **Currently tested it on the 2 machines listed**
  - **Want to test on more ARM systems**
- **Should work on other recent versions of Linux Oses**
  - **Suse**
  - **Red Hat**
  - **Plan to get systems and test it**
- **Isn't currently licensed like x86 products**
  - **Plan to get that implemented in Feb release**
- **Work on issues listed on last slide**

Come by for a demo

- **Rogue Wave Software**
- **Booth number 2425**
- **Demo on a NVIDIA Jetson TX1**





Questions?

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