VECTOR

VectorCAST with QEMU

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Restrictions Public Document

Abstract Information on using QEMU as a test platform

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1 Overview

This application note provides guidance on configuring VectorCAST to execute tests using QEMU, a versatile open-source machine emulator and virtualizer. Leveraging QEMU as a VectorCAST test platform offers several advantages:

- Enables the use of the same compiler and settings as your software development project.
- Runs directly on the host platform, ensuring a self-contained testing environment.
- Facilitates early testing, even before hardware becomes available.
- Allows test development on QEMU, with the ability to execute final tests on target hardware.
- Provides faster test execution compared to running tests on physical hardware.

Currently, VectorCAST supports the following QEMU platforms:

- **Arm**
  - Cortex-A7
  - Cortex-A9
  - Cortex-A15
  - Cortex-M0
  - Cortex-M3
  - Cortex-M4
  - Cortex-M7
  - Cortex-M33
  - Cortex-M55
  - Cortex-R5F
- **Arm64**
  - Cortex-A53
  - Cortex-A57
  - Cortex-A72
- **DDC-I DEOS**
- **QNX**
- **Linux**

For assistance in configuring VectorCAST for a different processor or architecture, please contact support@vector.com.

2 Setup

2.1 Use Case: Selecting the Proper Configuration

To use QEMU as your test platform, select the appropriate VectorCAST configuration. For DDC-I DEOS and QNX, choose the appropriate compiler and specify your architecture—no QEMU-specific settings are required. For Arm, Arm64, and Linux, select GNU Target in the Compiler configuration. Under GNU Target, choose Linux for all Linux distributions and Bare Board for Arm and Arm64.

For Linux, simply select your architecture, as no QEMU-specific settings are needed. For Arm and Arm64, choose the QEMU board corresponding to your chip (e.g., Cortex-M3, Cortex-M4). Finally, select C if testing only C code, or C++ if testing C++, or a mix of C and C++.

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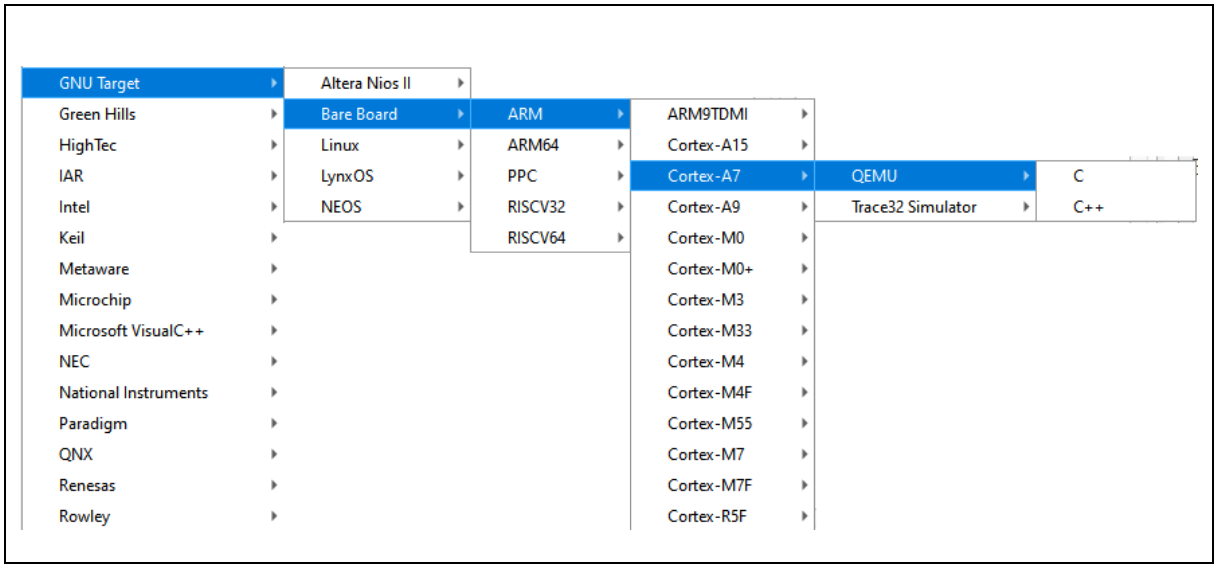

Figure 1 – Selecting the QEMU Configuration

Once selected either C or any C++ version, the configuration will show up in the project and the compiler node will be populated with the proper data, seen in Figure 2.

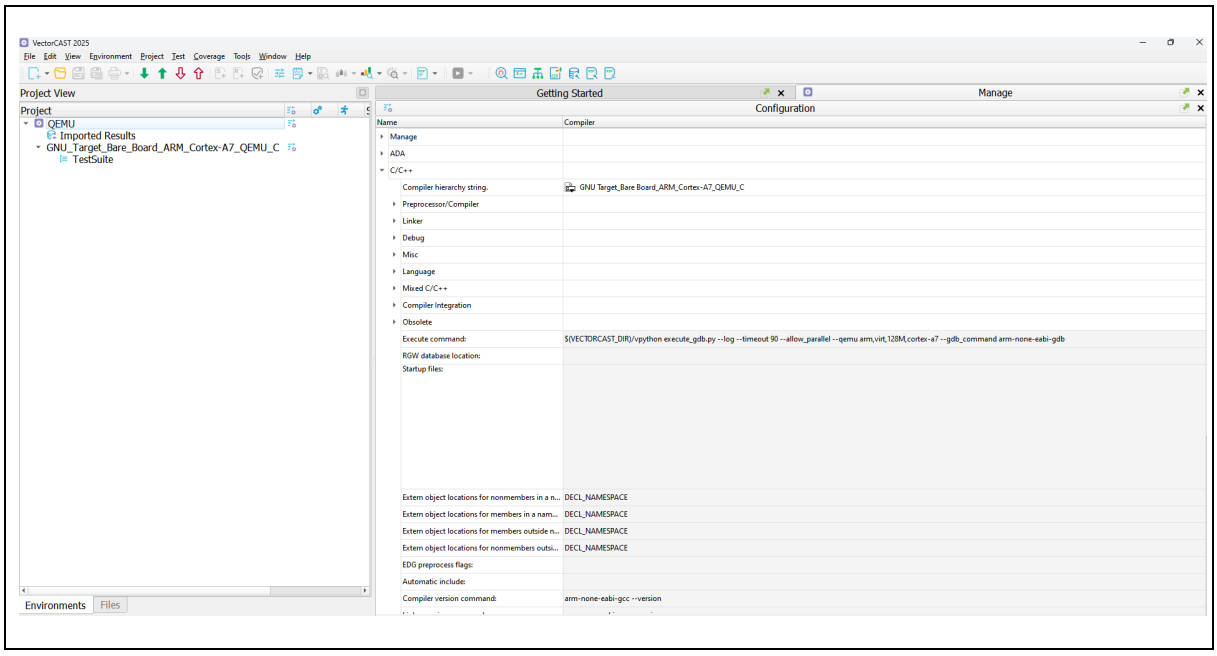

Figure 2 – Project Configuration

2.2 Use Case: Environment Setup

You need to download and install QEMU on your computer. You can get it from: QEMU Download. After installation, add the QEMU installation directory to your system path to enable VectorCAST to access the QEMU executables. On Windows, the default installation directory is typically `C:\Program Files\QEMU` or a similar location.

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Once QEMU is installed and the executable directory is added to your path, you are ready to start testing with VectorCAST.

2.3 Use Case: Building Environments

Following the setup instructions in this document should allow the building of VectorCAST environments that can be run on QEMU. If you encounter difficulties in building environments contact support@vector.com.

2.4 Use Case: Testcase Execution

Instructions in this document should be enough to execute testcases on the QEMU emulator without any further modifications. If you encounter difficulties in executing testcases contact support@vector.com.

2.5 Use Case: Debugging

Debugging VectorCAST testcases is done using gdb.

When right clicking on a testcase and select 'Execute with Debug' VectorCAST will launch the QEMU emulator, then launch gdb. VectorCAST will set a breakpoint on the function under test. Type continue at the gdb prompt and execution should stop at the function under test.

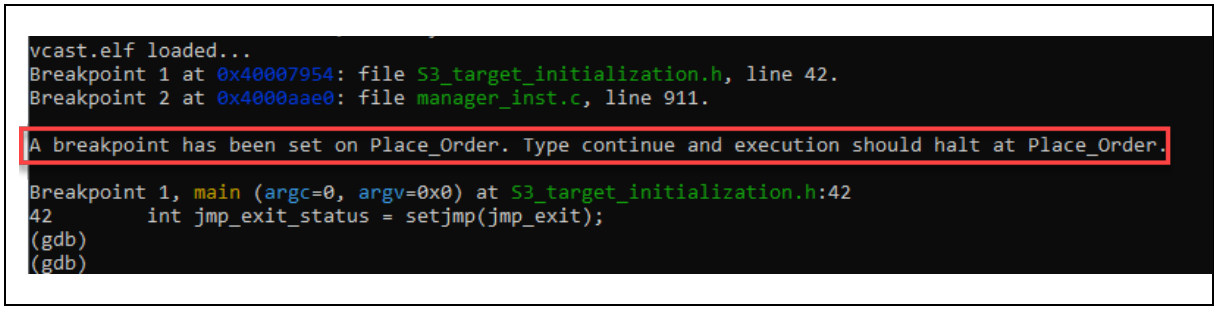

Figure 3 – Execute with Debug

You can use Eclipse to debug testcases by adding '–debugger eclipse' to the "Execute with Debug" field. If Eclipse is not in your system's default path, then you may need to specific its full path, such as : '—debugger c:\path\to\eclipse'.

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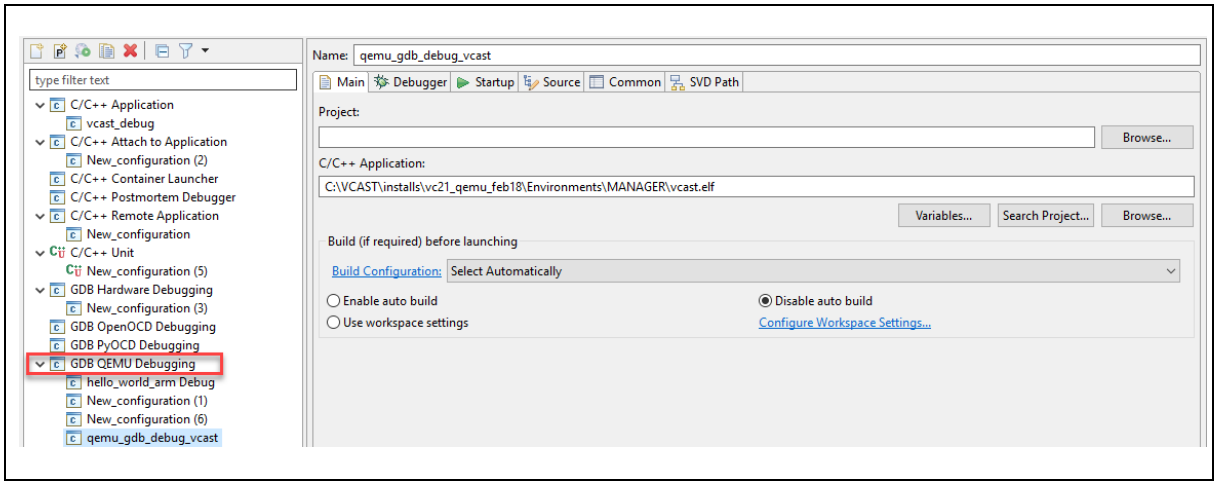

Figure 4 – Eclipse Debugging

3 Additional Resources

https://www.qemu.org/

4 Trademarks

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5 Contacts

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