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Eclipse CDT 10.0 and beyond

Alexander Fedorov, ArSysOp

Who am I?

Alexander Fedorov @ ArSysOp

- Eclipse Platform Committer
- Eclipse CDT Committer
- Eclipse Passage Project Lead

Leading IDE effort

at Software Task Group

Why Eclipse CDT is the best choice?
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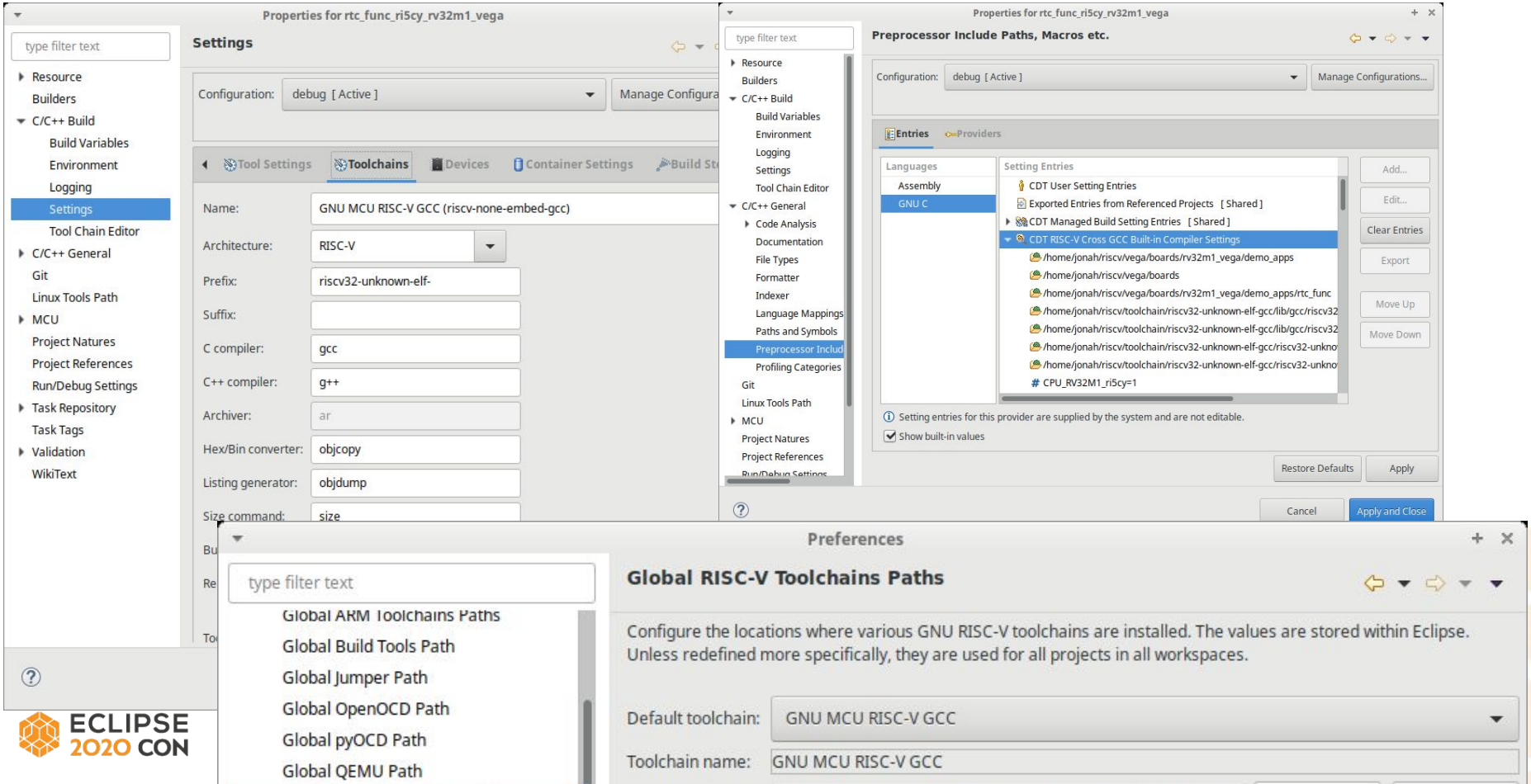
Project Maturity

- 18 years of active development
- About 35к of commits
- About 100 contributors
- 2.3M LOC in the main repo

and Functionality

- Configure and Build
- Navigate and Refactor
- Analyse and Fix
- Debug and Run
- Extend and Integrate

High Configurability



Easy Extensibility

Eclipse Platform

- Workspace hooks
- Natures and builders
- Annotations and markers
- Actions and controls
- View and perspectives
- Debug model
- Launch configurations

Eclipse CDT

- Project templates
- Build definitions
- Error parsers
- Code formatters
- Doc comment tools
- Debug info visualizers
- Indexer policies

SimRel Components

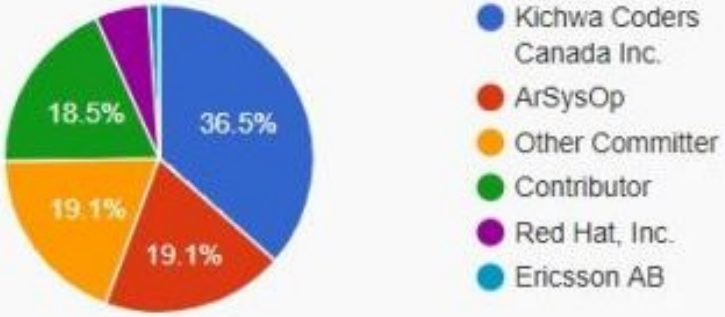
- Eclipse Modeling Framework
- Eclipse Orbit and Eclipse Platform
- Eclipse Parallel Tools Platform (PTP)
- Eclipse EGit and Eclipse Mylyn
- Eclipse TM4E and Eclipse Wild Web Developer
- Eclipse LSP4J and Eclipse LSP4E
- Eclipse Linux Tools

Who is using Eclipse CDT?

Who is actively contributing?

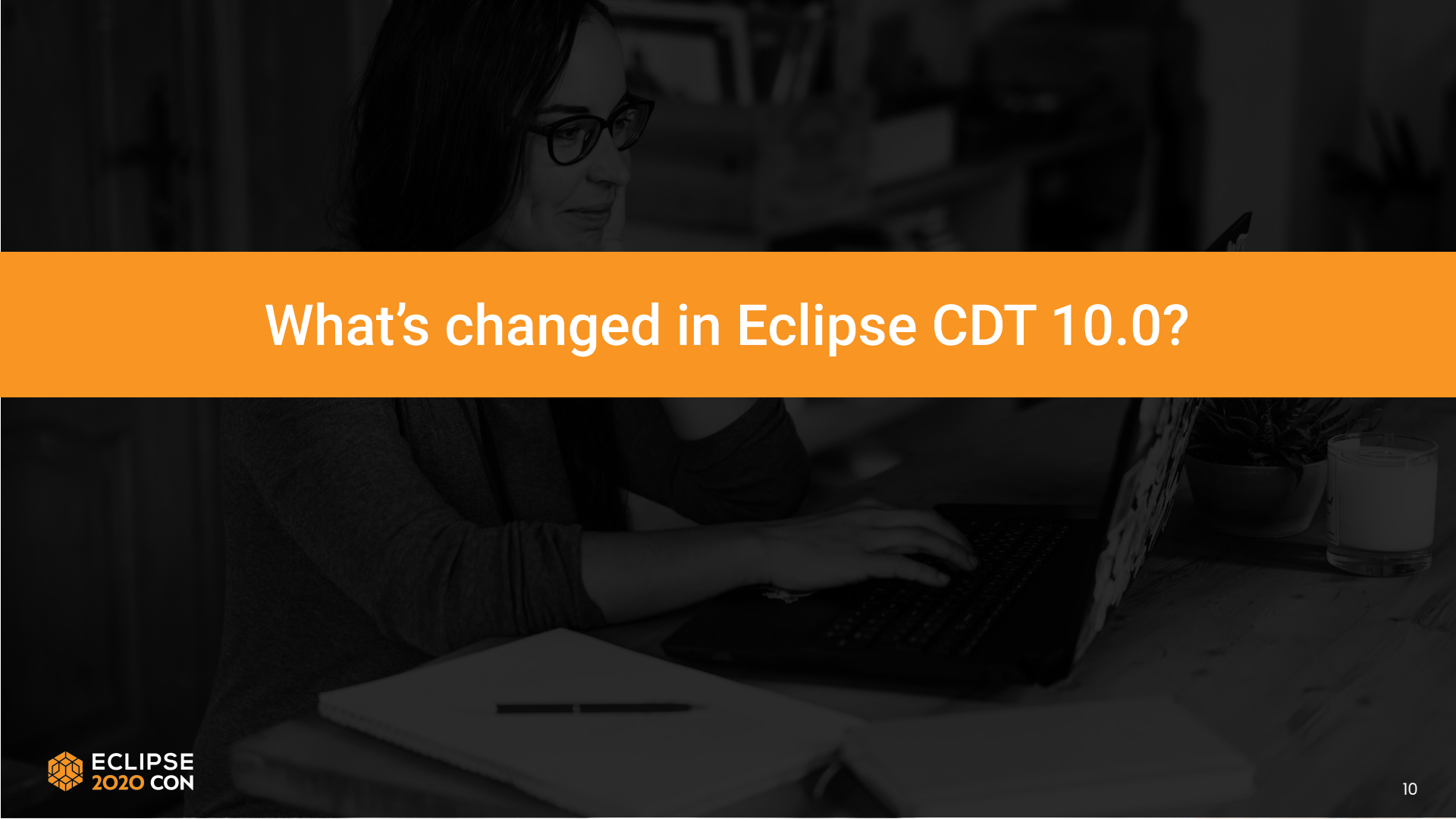
Organization Contribution Activity:

Commits on this project by supporting organization over the last three months.



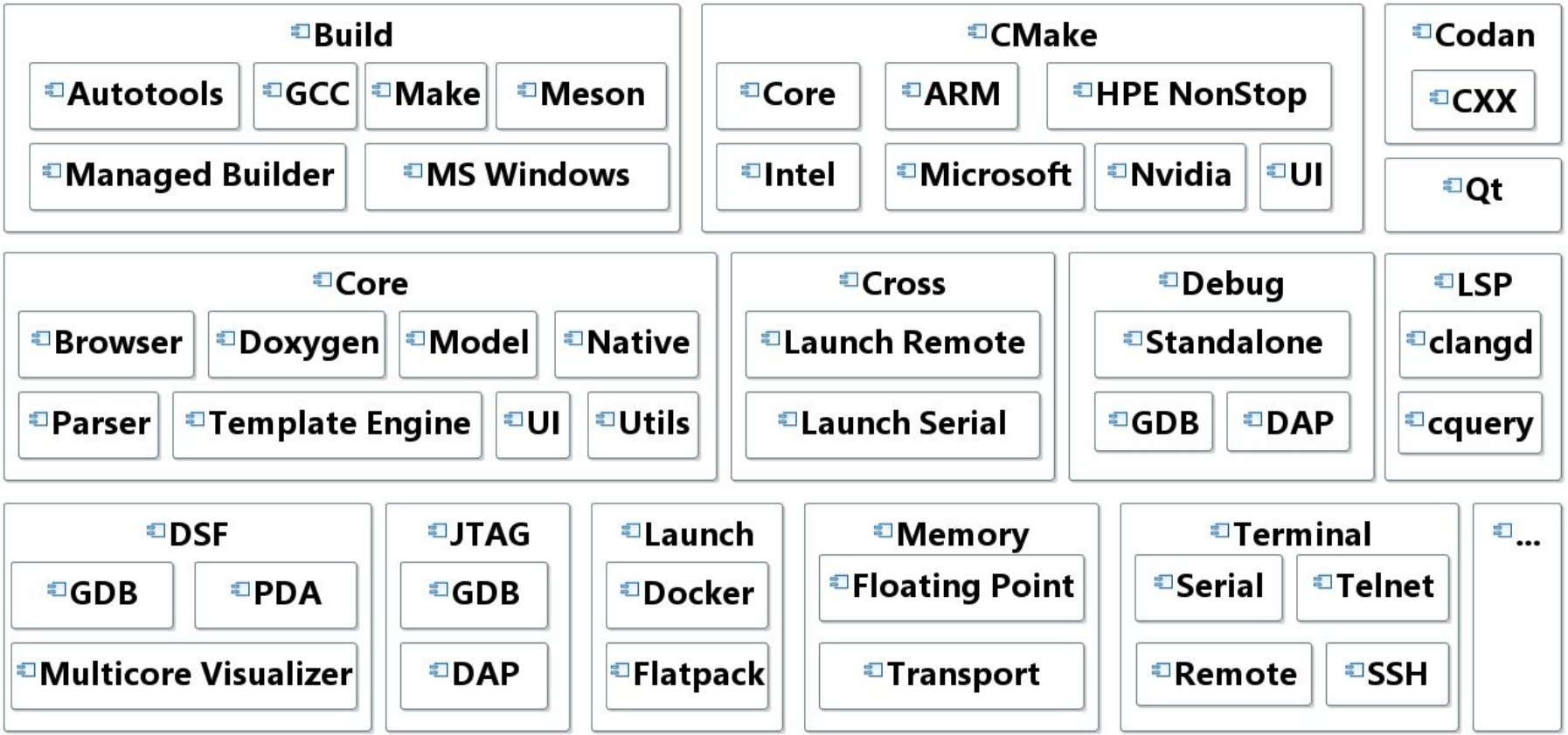
Active Member Companies:

Member companies supporting this project over the last three months.



What’s changed in Eclipse CDT 10.0?

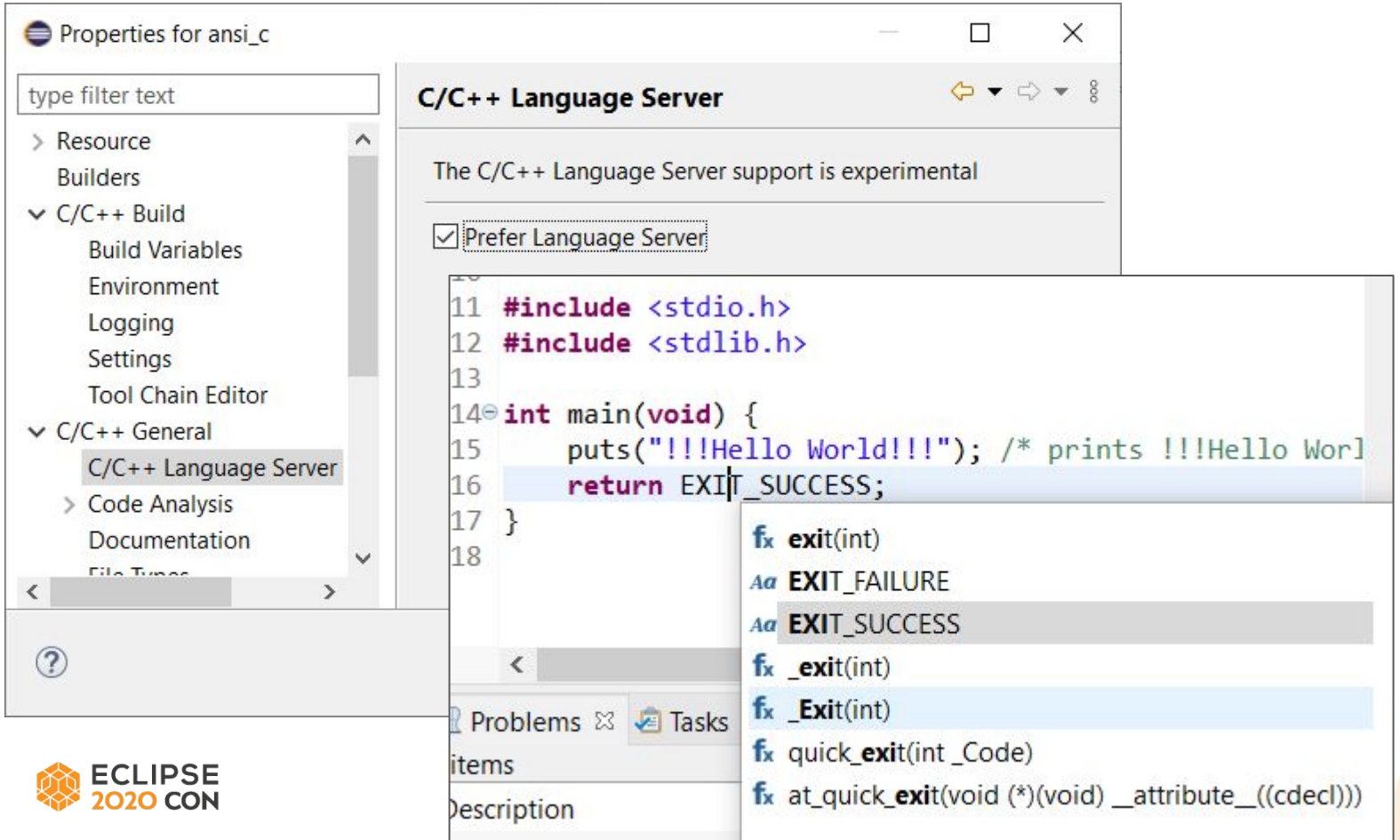
Eclipse CDT 10.0 Overview



CMake CDT Indexer Support

- Origin: https://github.com/15knots/cmake4eclipse
- Better user experience in C/C++ editors:
  a. code completion
  b. jump to declaration
  c. folding of inactive #ifdef's
- Employs compilation database (compile_commands.json)
- Compiler built-in detection
- Best for gcc, gcc based cross-compilers and clang
- Extension point to support commercial compilers

Language Server Support (experimental)



Important!

Use Generic Editor

Eclipse CDT 10.0 Breaking Changes

- Requires Java 11 as a minimum.
- Environment Variables are always case sensitive in CDT.
- Environment variables no longer support \${ to avoid expanding.
- Arduino plug-ins and features removed.
- LRParser, XLC and UPC removed.

Learn more
https://help.eclipse.org/2020-09/index.jsp?topic=%2Forg.eclipse.cdt.doc.isv%2Fguide%2Fdeprecated_API_removals.html

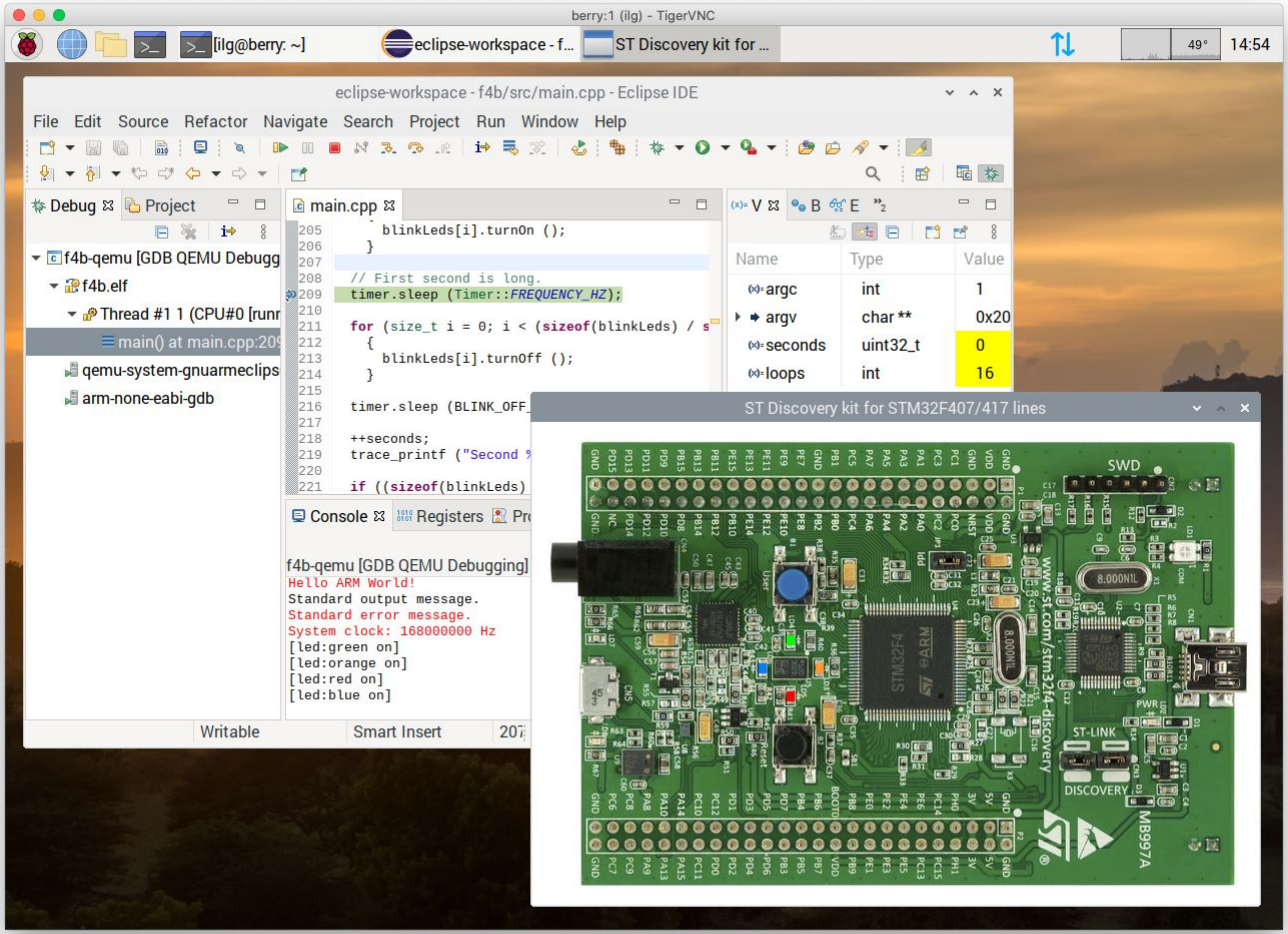
Eclipse Embedded CDT

Eclipse Embedded CDT

- create/build/manage embedded ARM/AArch64/RISC-V applications
- ready to run templates for some ARM Cortex-M processors
- debugging support via JTAG/SWD
- examine and modify peripheral registers during debug sessions
- supports a wide range of 32 and 64-bit toolchains

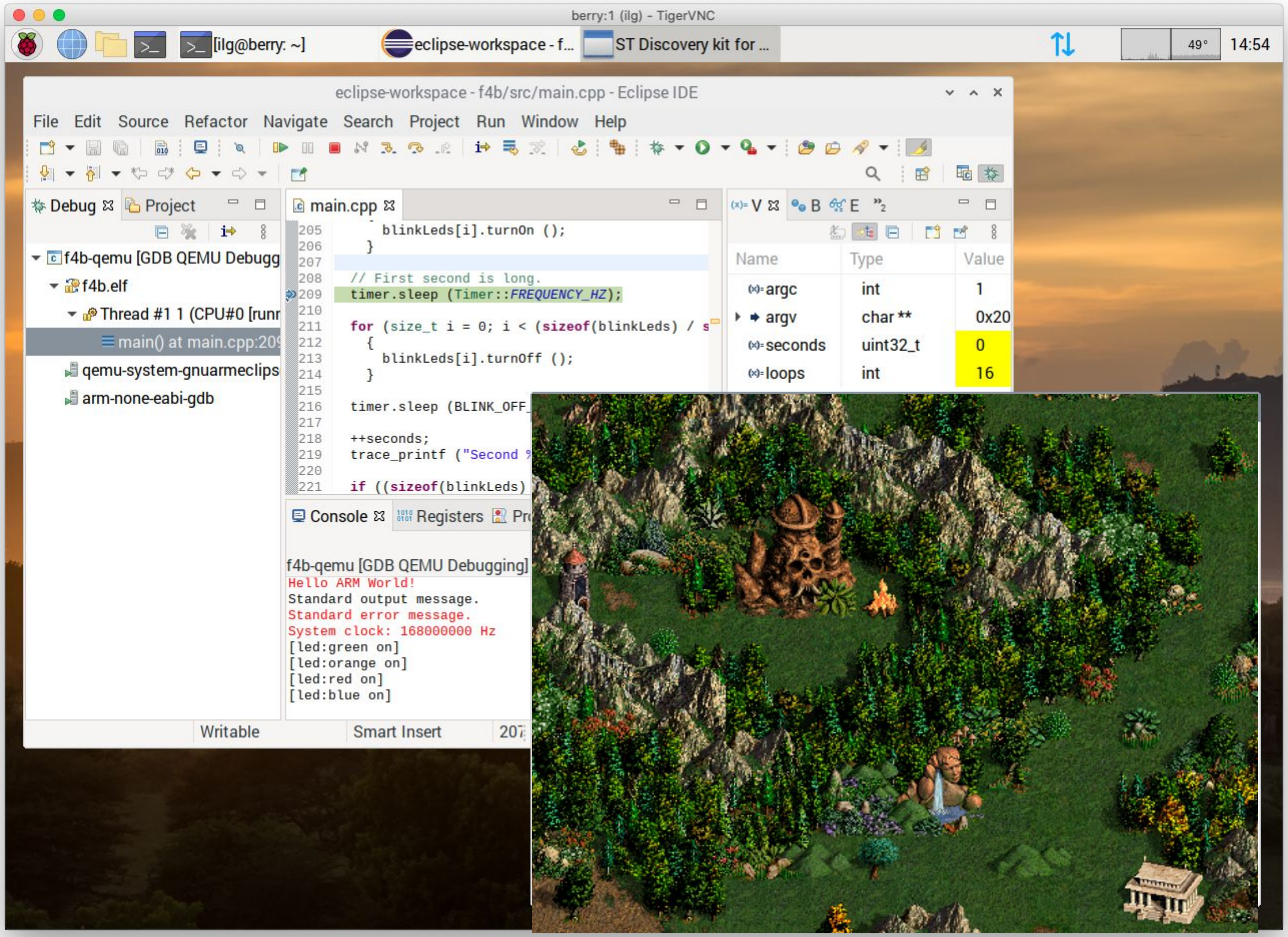
Started to supply “Embedded C/C++” package for 2020-12!

Learn more https://projects.eclipse.org/projects/iot.embed-cdt



Eclipse Embedded CDT on Raspberry Pi 4 (based on Eclipse Platform for Aarch64)

Eclipse Embedded CDT on Raspberry Pi 4 (not a toy!)



Eclipse CDT and Open Hardware Group

CORE-V IDE

- Eclipse Modeling Framework
- Eclipse Platform
- Eclipse CDT
- Eclipse Embedded CDT (GNU MCU/ARM Eclipse Plug-ins)

CORE-V IDE: planned items

- Integrate GCC-based toolchain from Embecosm
- Integrate LLVM-based toolchain from Thales
- Add “Hello World” sample project
- Provide project templates
- Publish binaries to be a foundation for downstream solutions

https://github.com/openhwgroup/core-v-ide-cdt

Eclipse CDT and Platform IO

Embedded development

PlatformIO is a professional collaborative platform for embedded development that support multiple IDE including Eclipse

- **800+ target boards** (development kits)
- **20+ software frameworks**

  (Arduino, ARM mbed, CMSIS, ESP-IDF, FreeRTOS, STM32Cube, Zephyr RTOS, and others)
- **30+ semiconductor architectures** and **development platforms**

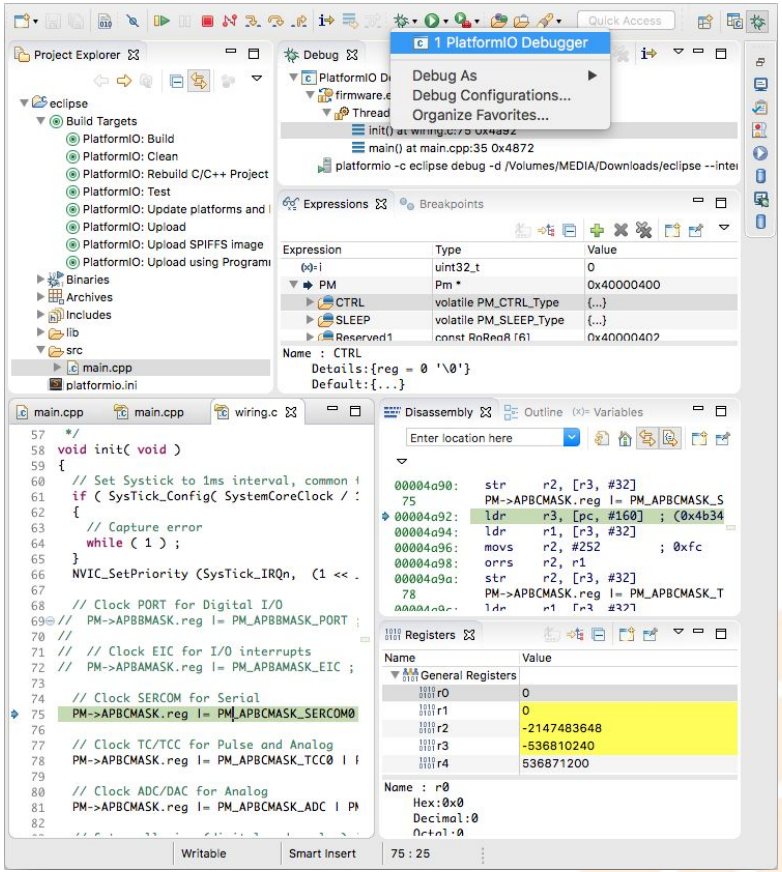
  (ARM, AVR, Espressif 8266/32, MCS-51, MSP430, PIC32, STM8, RISC-V, and others)
- Over **10,000 libraries**
- **All famous operating systems**

  (Windows, macOS, Linux, FreeBSD, Linux ARMv6+, card-sized PCs)

PlatformIO

Eclipse integration

- Multi-board and Multi-architecture programming experience
- Debugging, Unit Testing, Static Analysis, Firmware Inspection, and Remote Development out-of-the-box
- Developers can work simultaneously on the same embedded project using different development environments and the favourite operating system
- Code for any supported framework can be compiled and uploaded to a target platform in minutes
- Developers no longer have to manually find and assemble an environment of toolchains



Creating Safe Products with Eclipse CDT
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Compliant Safety Plan & Safety Case

ISO 26262-2: **6.4.5-13**

Safety Plan (Process)

- System Safety Concept
- Hardware Safety Concept
- Software Safety Concept
- Tools: ISO 26262-2: **6.4.6.5.i**

Tool **C**lassification **R**eport

Tool **S**afety **M**anual

Tool **Q**ualification **P**lan

Tool **Q**ualification **R**eport

Create Safe Product

Safe Product

ISO 26262-2: **6.4.8**

Safety **C**ase

- System SC
- Hardware SC
- Software SC
- Tools:

Safe **T**ool **U**sage **R**eport

TCR

TSM

TQP

TQR

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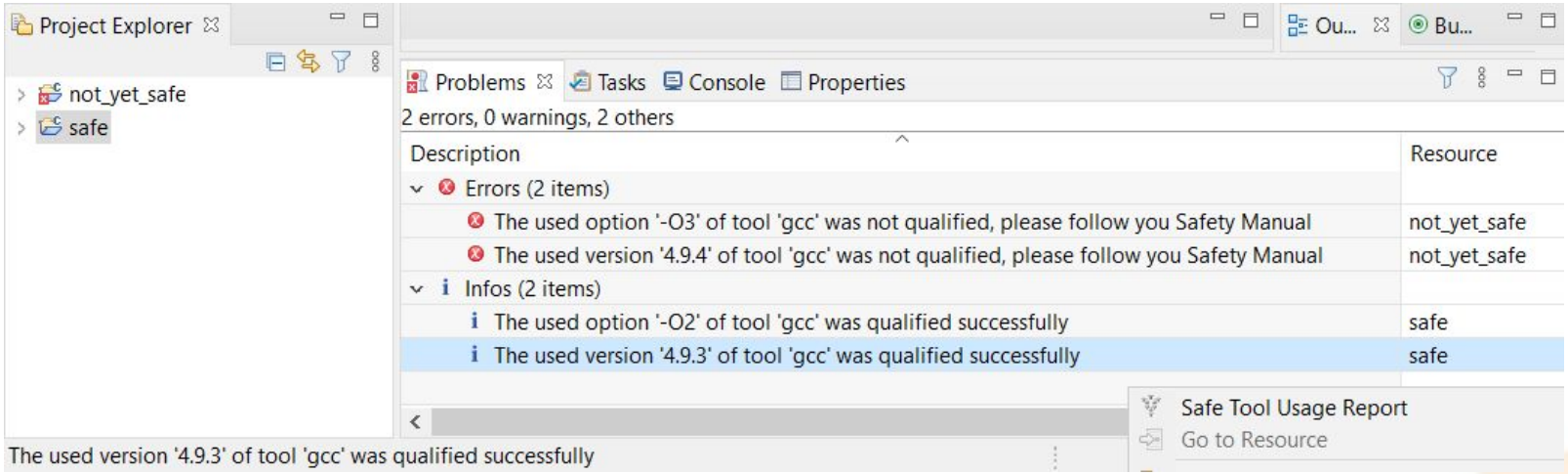
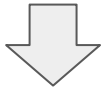
Contact Validas

Qualification Kit

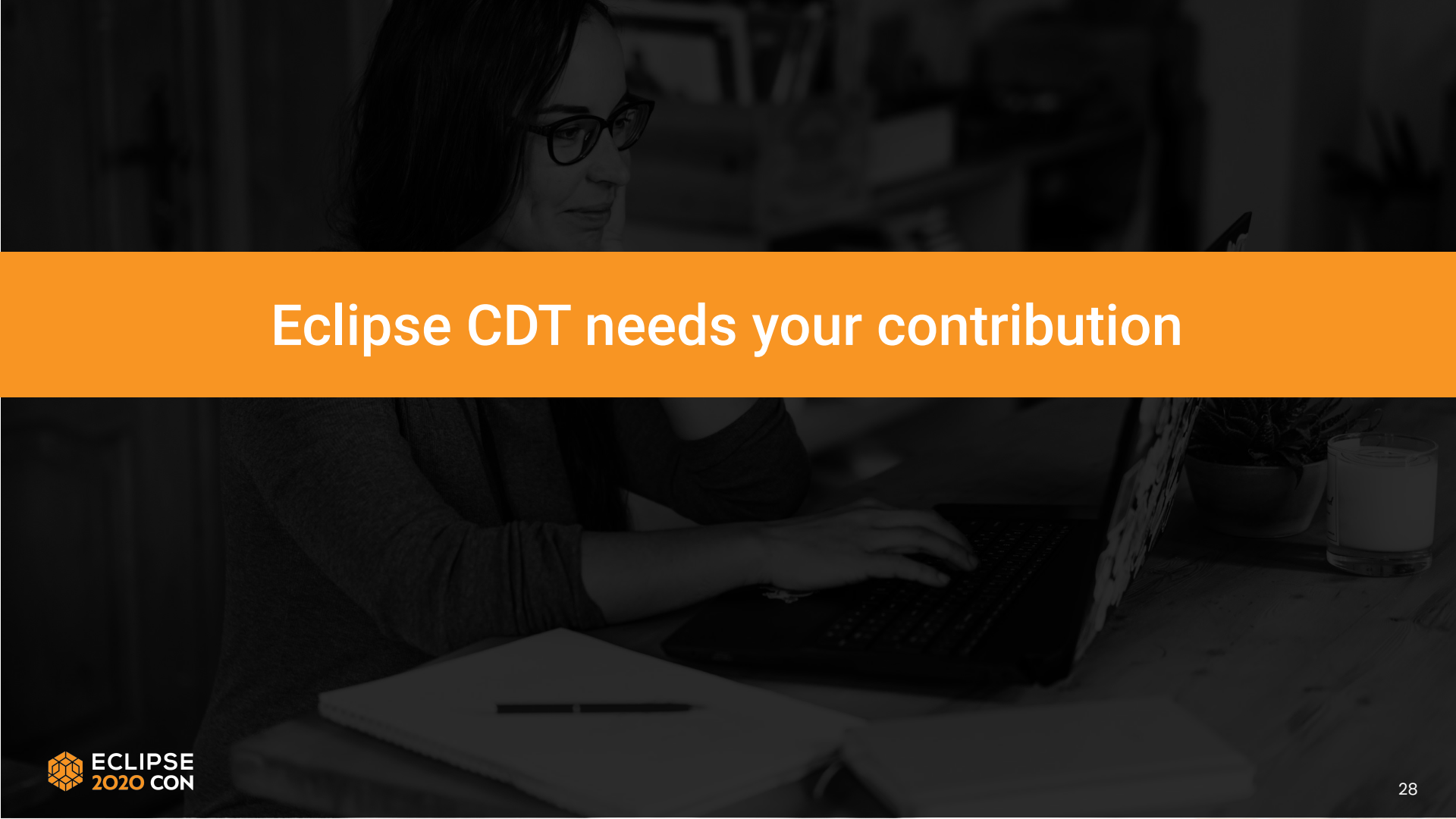
IDE Integration

Project Metadata





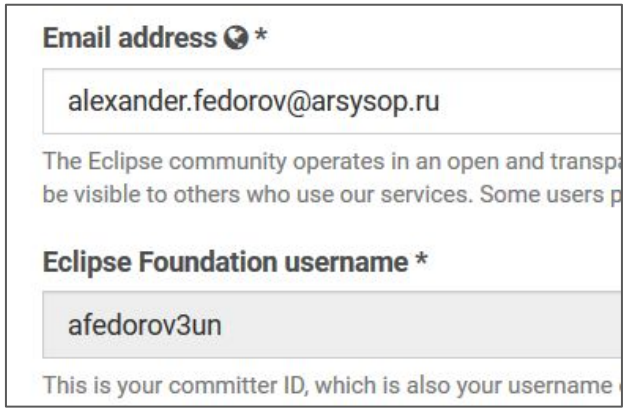
Safe Tool Usage Report



Eclipse CDT needs your contribution

Step 1: Eclipse Account

1. Create account at https://www.eclipse.org/

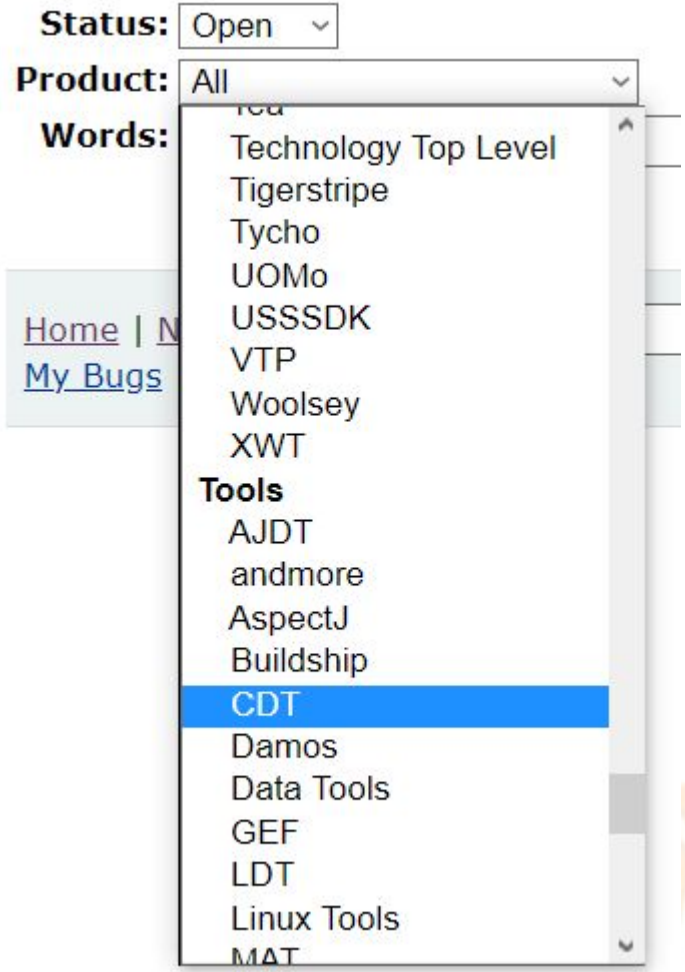


2. Sign Eclipse Contributor Agreement (electronically)

3. Specify your GitHub id in your Eclipse profile

Step 2: Bugzilla

1. Login to Bugzilla
   https://bugs.eclipse.org/bugs
2. Configure notifications
   https://bugs.eclipse.org/bugs/userprefs.cgi?tab=email
3. Actualize existing and create new records



Step 3: Gerrit

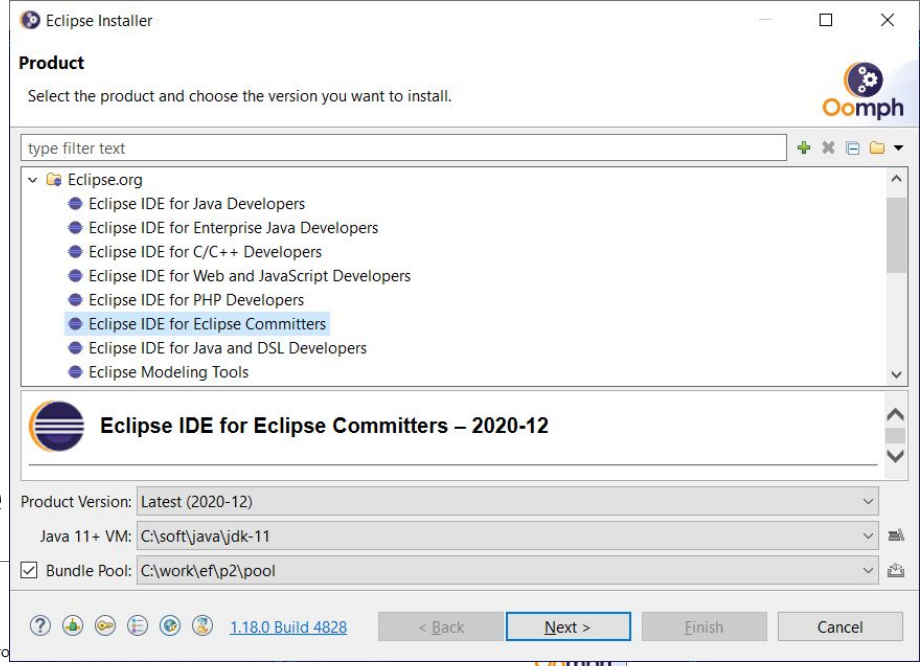
1. Login to Gerrit https://git.eclipse.org/r/

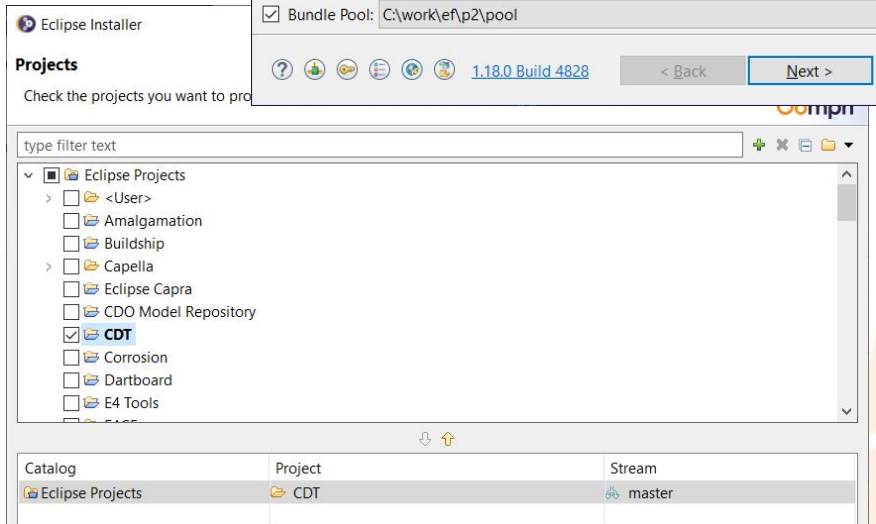
2. Upload SSH keys
   https://git.eclipse.org/r/settings/#SSHKeys

3. Configure notifications
   https://git.eclipse.org/r/settings/#Notifications

Step 4: Oomph

1. Download Eclipse Installer
2. Switch to “Advanced” mode
3. Select “Eclipse IDE for Eclipse Committers” package
4. Select “CDT” project

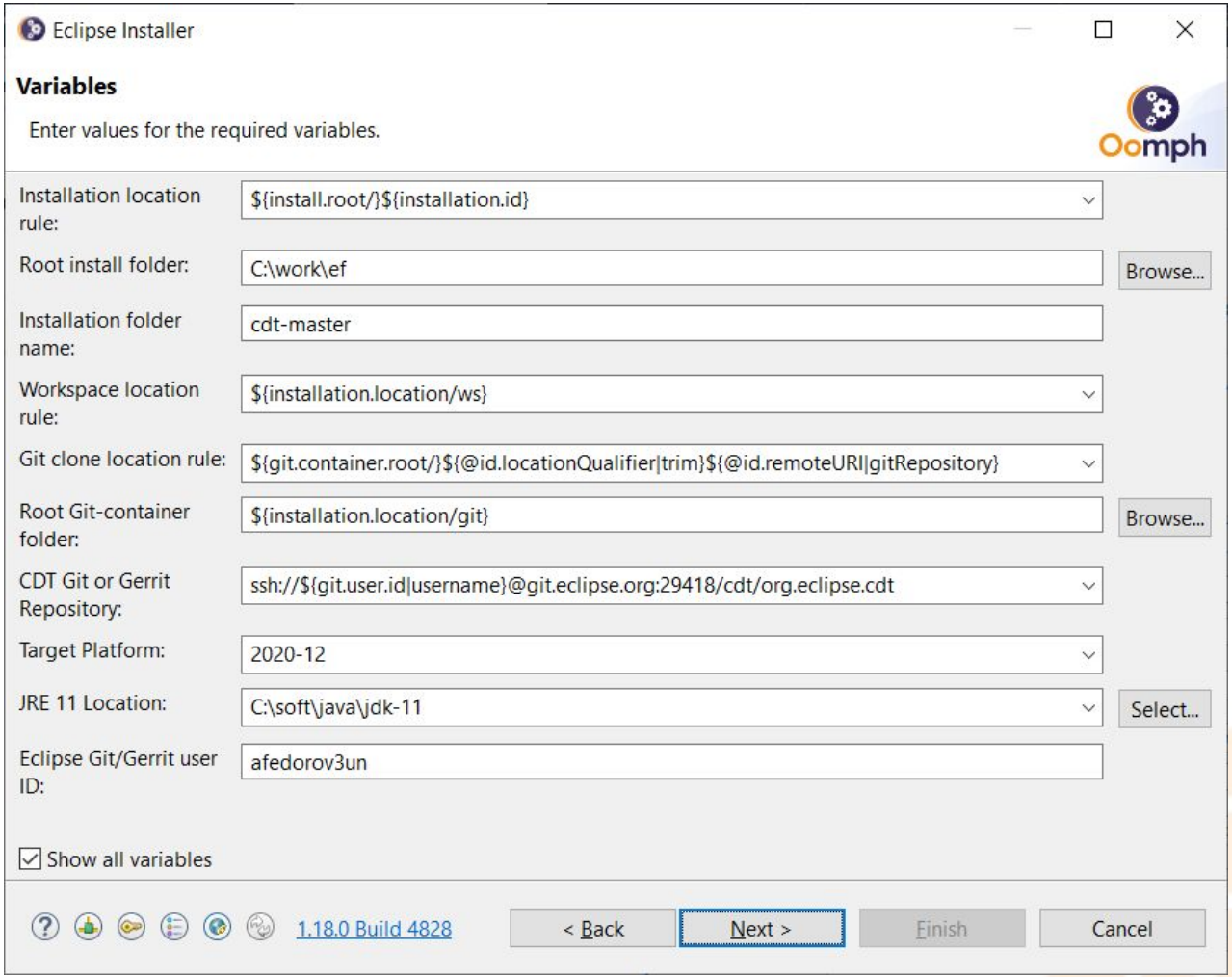




Step 4: Oomph (2)

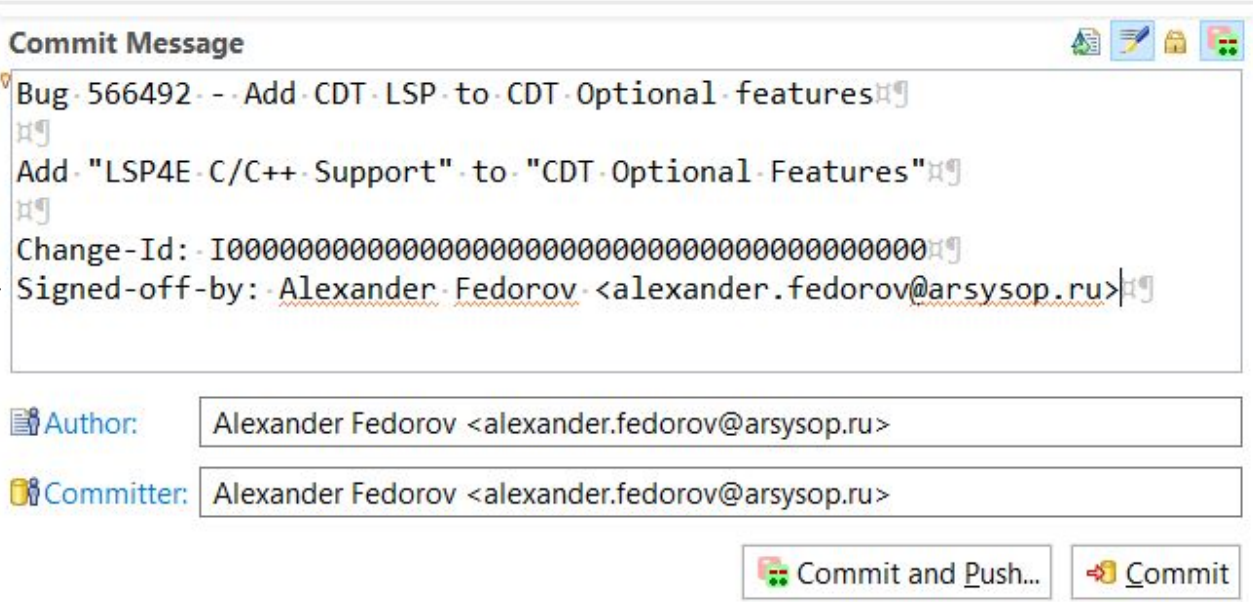
Gerrit

User ID



Step 5: Patch

Important!



1. Select a bug
2. Prepare a patch
3. Compose commit message.
4. Commit and Push to Gerrit
5. Follow the review comments

Contact us: cdt-dev@eclipse.org

Thank you!

Join the conversation:

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Evaluate the Sessions

Sign in and vote at Eclipsecon.org:

-1	0	+1

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