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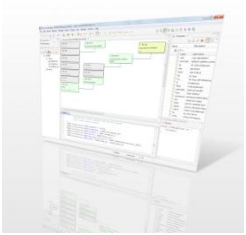
Atollic development tools for STM32

Fenway Embedded Systems

Professional development, code analysis and test automation tools

The embedded systems development tool for the next decade!

TrueSTUDIO

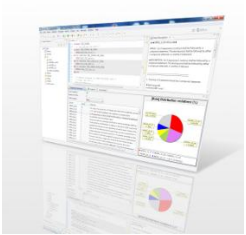


Measure test quality with dynamic execution flow analysis!

TrueANALYZER

Ensure coding standards compliance with professional code inspection!

TrueINSPECTOR



Get superior software quality with embedded test automation!

TrueVERIFIER

All products integrate together in the same IDE!

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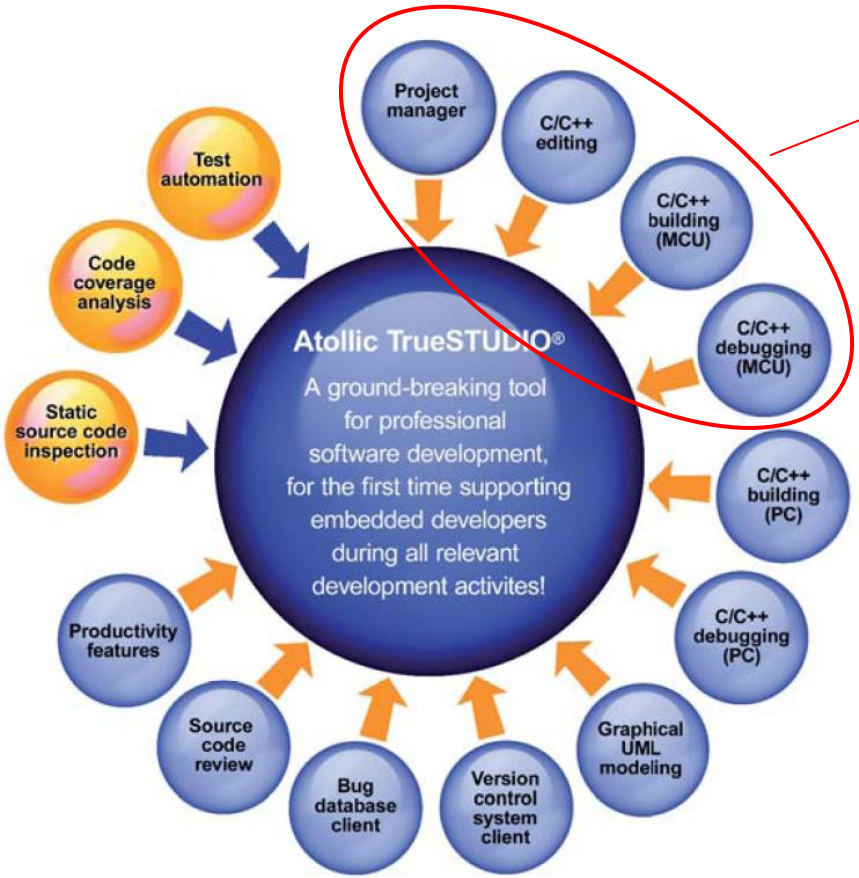
Finally an embedded tool that addresses the problems of today!



Atollic tools cover a much wider set of developer problems than just edit/compile/debug!

STM32 target support

Device families:

- STM32 High density devices
- STM32 Medium density devices
- STM32 Low density devices
- STM32 Connectivity line devices
- STM32 Low density Value Line devices
- STM32 Medium density Value Line devices
- STM32 XL density devices
- STM32 High density Value Line devices
- STM32 Ultralow power devices
- STM32 F-2 High-performance devices
- STM32F4xx devices
- STM32W RF devices

EVB boards:

- STM3210E-EVAL
- STM3210E-EVAL_XL
- STM3210B-EVAL
- STM3210C-EVAL
- STM32100B-EVAL
- STM32100E-EVAL
- STM32L152-EVAL
- STM322xG-EVAL
- STM324xG-EVAL
- STM32F4-DISCOVERY
- STM32W_MB851
- STM32VL_Discovery
- STM32L_Discovery
- IAR_STM32F103ZE
- KEIL_MCBSTM32

JTAG probes:

- STLINK (no SWV)
- STLINK/V2 (SWV)
- JLINK (SWV)
- gdbserver compatible ones

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Atollic TrueSTUDIO®

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Atollic TrueSTUDIO®

- Eclipse IDE with GNU C/C++ compiler & debugger
  - A high-end IDE for professional developers
  - Based on the GNU C/C++ compiler & debugger
- Much more than just an embedded C/C++ product
  - Includes ARM compiler & debugger (for embedded development)
  - Includes x86/PC compiler & debugger (for Windows PC development)
  - Parallel compilation and multiprocessor debug
  - System analysis and real-time tracing with SWV
  - Includes UML editors for graphical modeling
  - Includes version control system GUI client
  - Includes bug database GUI client
  - Includes code review & code review meeting support

Atollic TrueSTUDIO®

- High-end add-on products (optional)
  - TrueINSPECTOR®: Static source code inspection (MISRA®-C:2004) and code metrics measurements
  - TrueANALYZER®: Measure test quality in target (aircraft-grade code-coverage analysis)
  - TrueVERIFIER™: Embedded systems test automation in targets

Optional add-on products integrate into TrueSTUDIO

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Editing features

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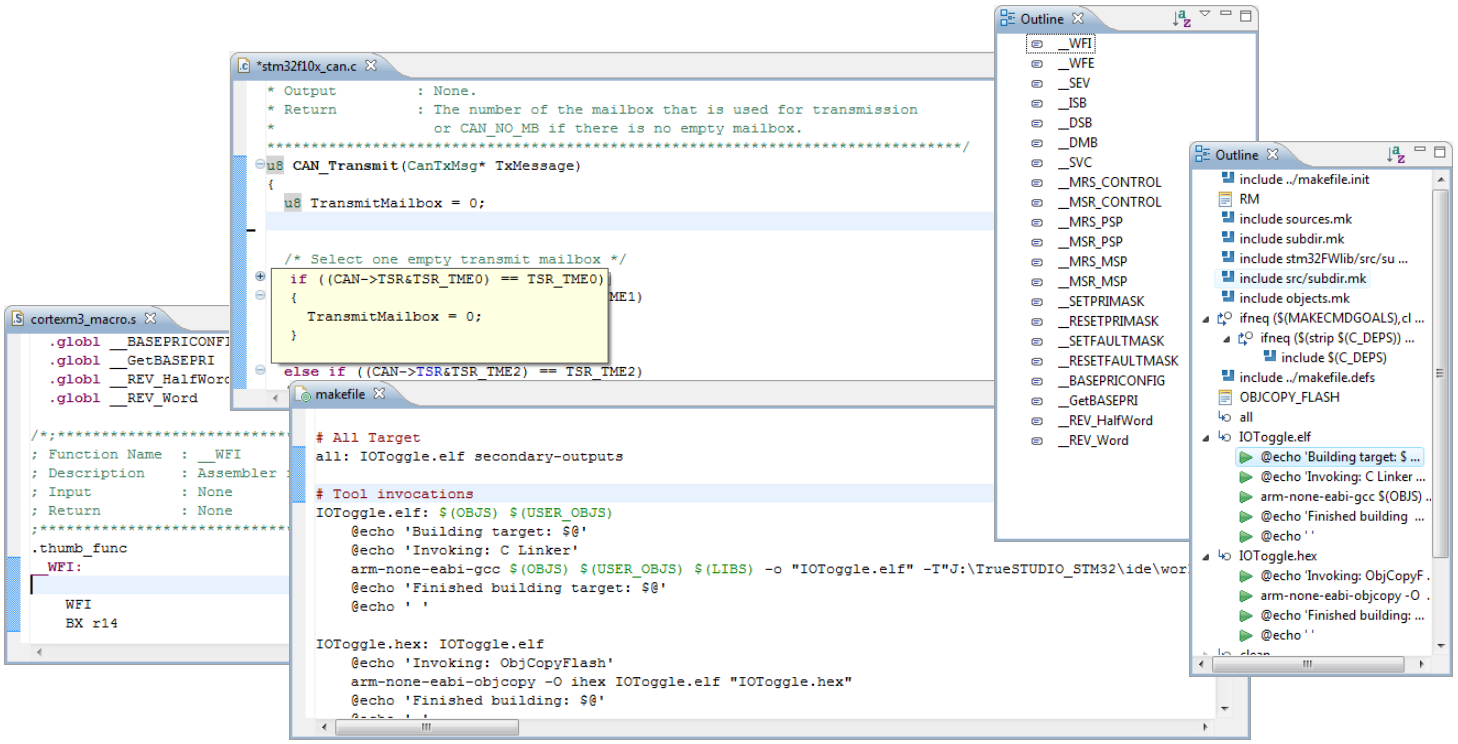
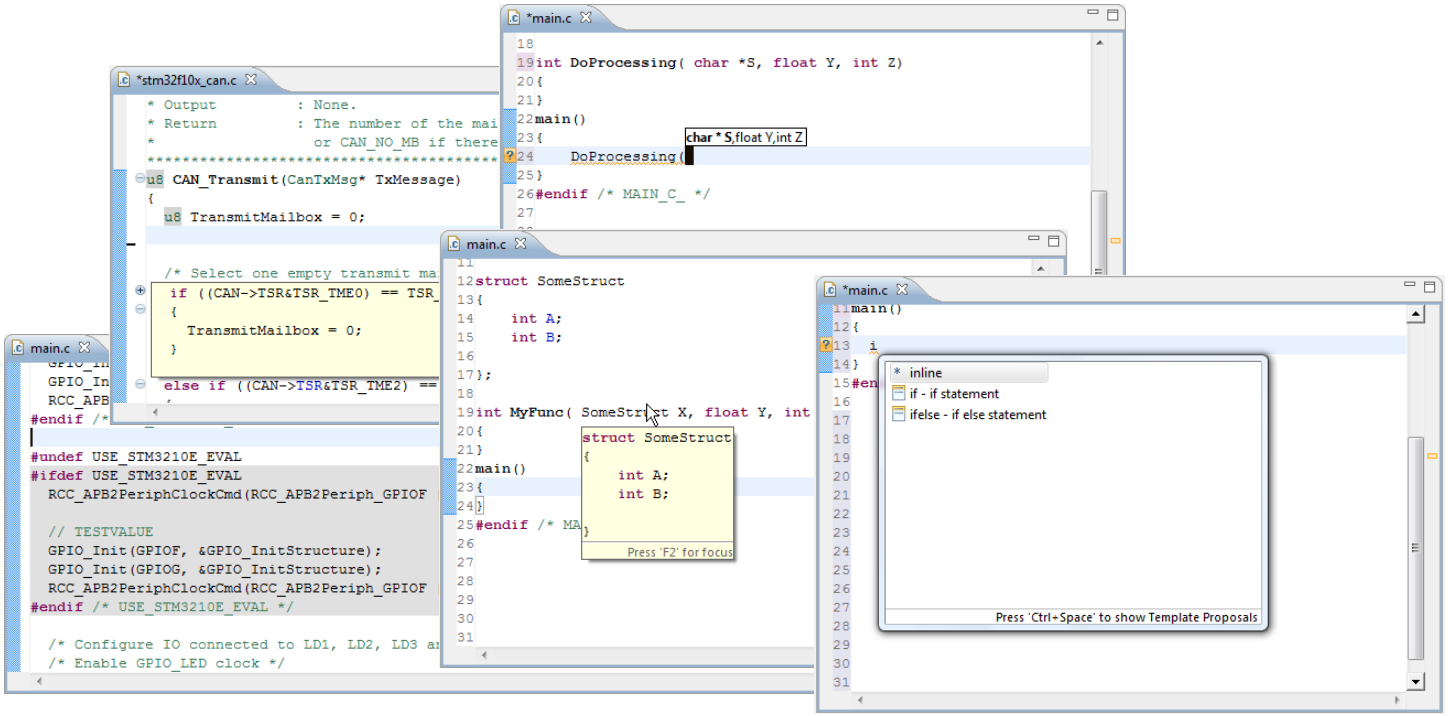
Editors



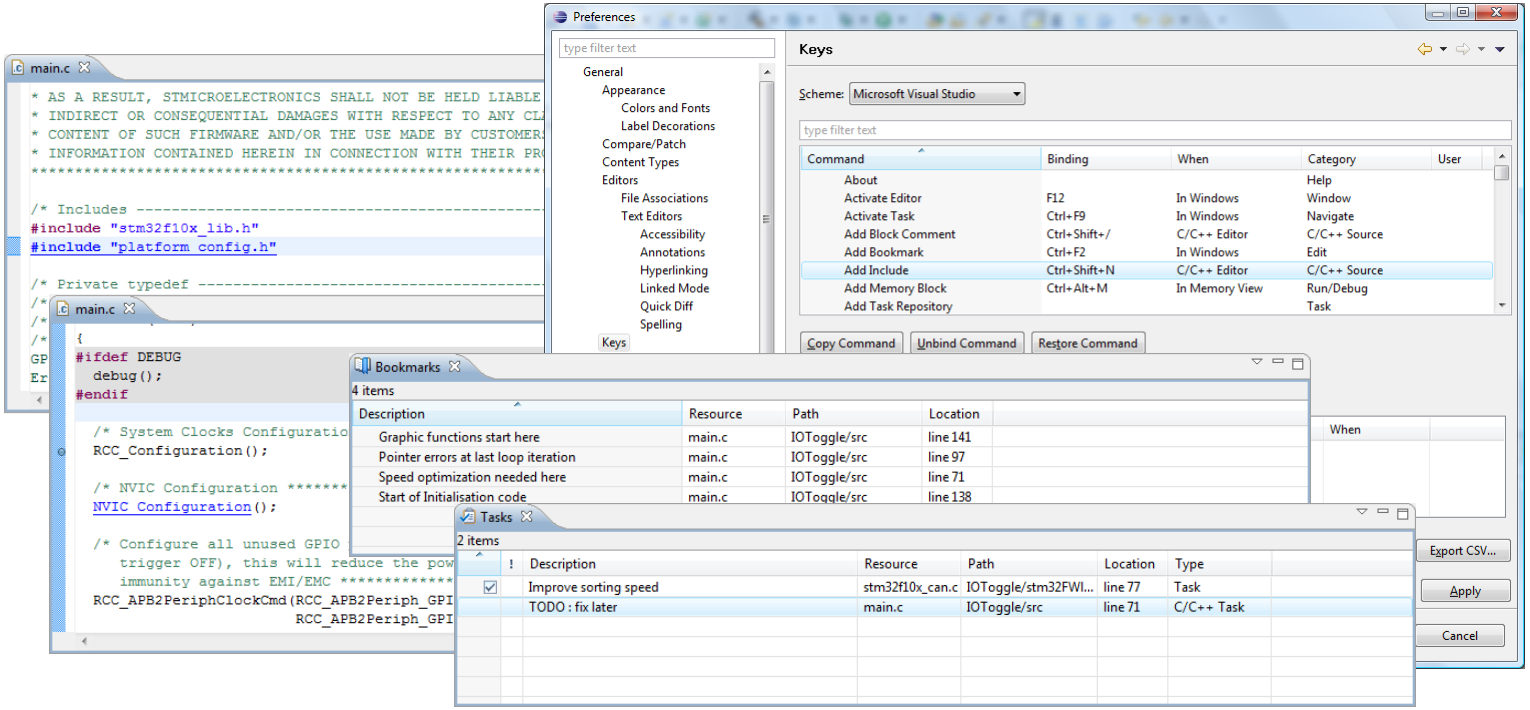
- C/C++ editor
- Assembler editor
- Makefile editor
- Outline views

Advanced editing (1/3)



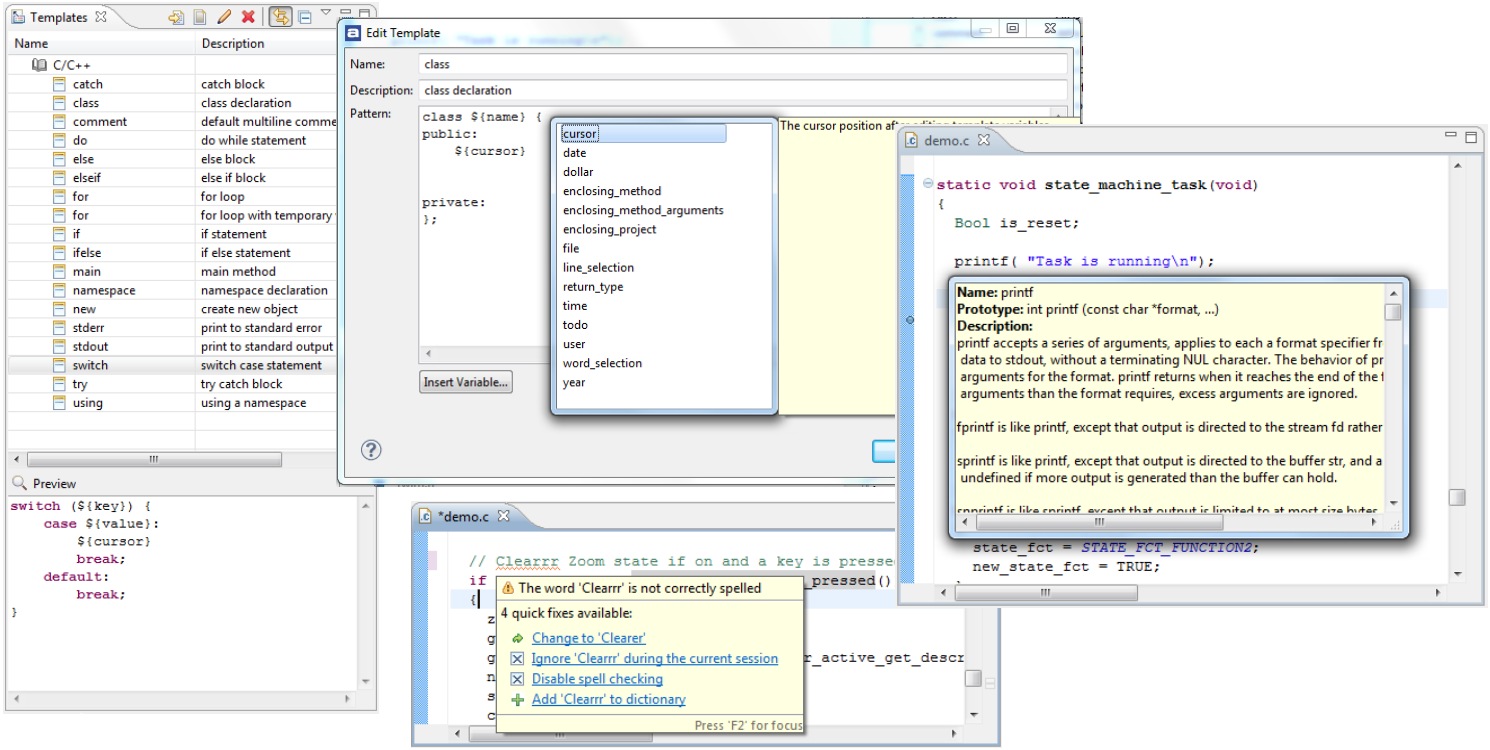
- Real-time pre-processor evaluation with colour visualisation
- Symbol type assistance & parameter hints
- Content assist, code completion & code templates
- Smart editing with configurable coding style
- Macro expansion browser (singlestep macro expansion forward/backward)

Advanced editing (2/3)



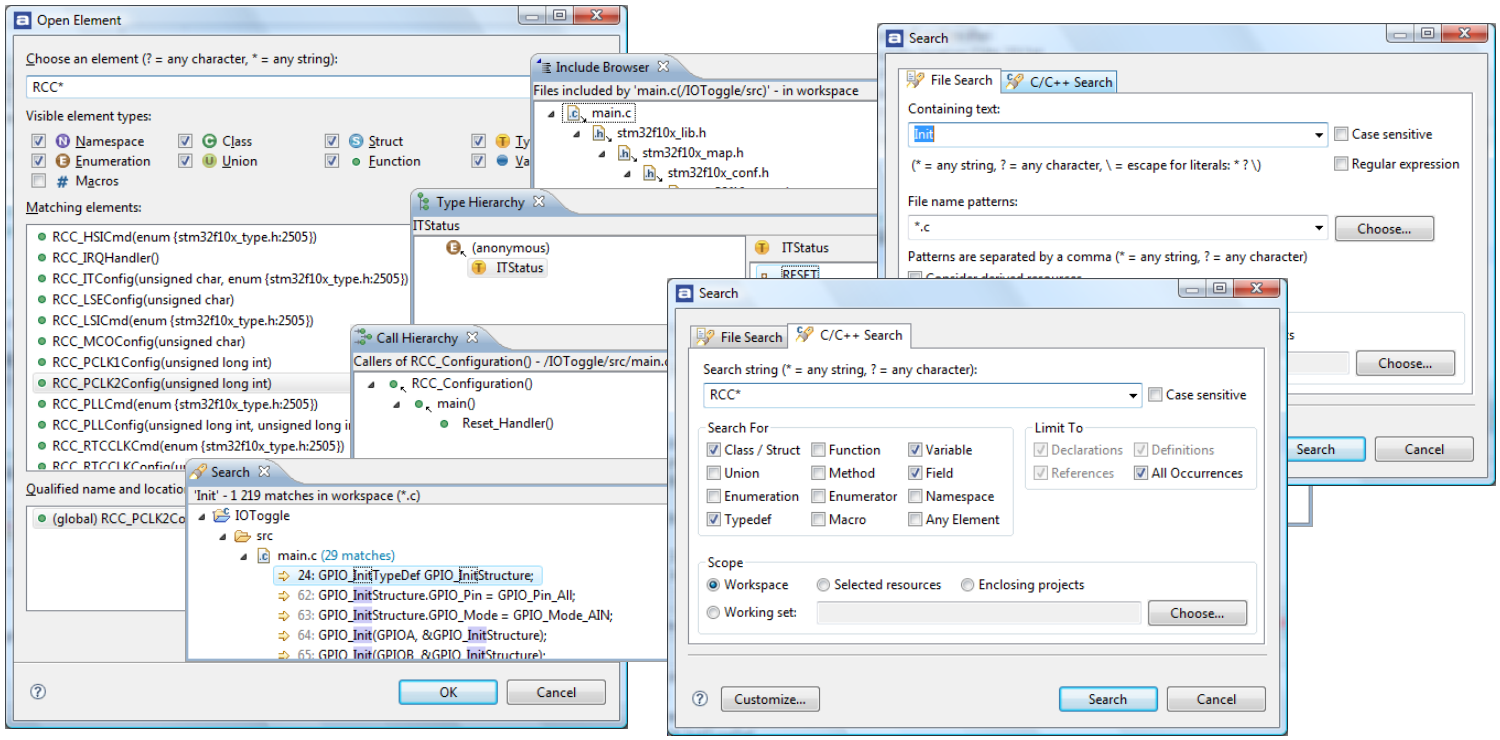
- Open include files & “go-to definition” with hypertext-links
- Bookmark & to-do lists (with automatic task detection keywords)
- Configurable keyboard bindings (Emacs, MS-VisualStudio, Eclipse, etc)
- Advanced refactoring (history, record & playback)

Advanced editing (3/3)



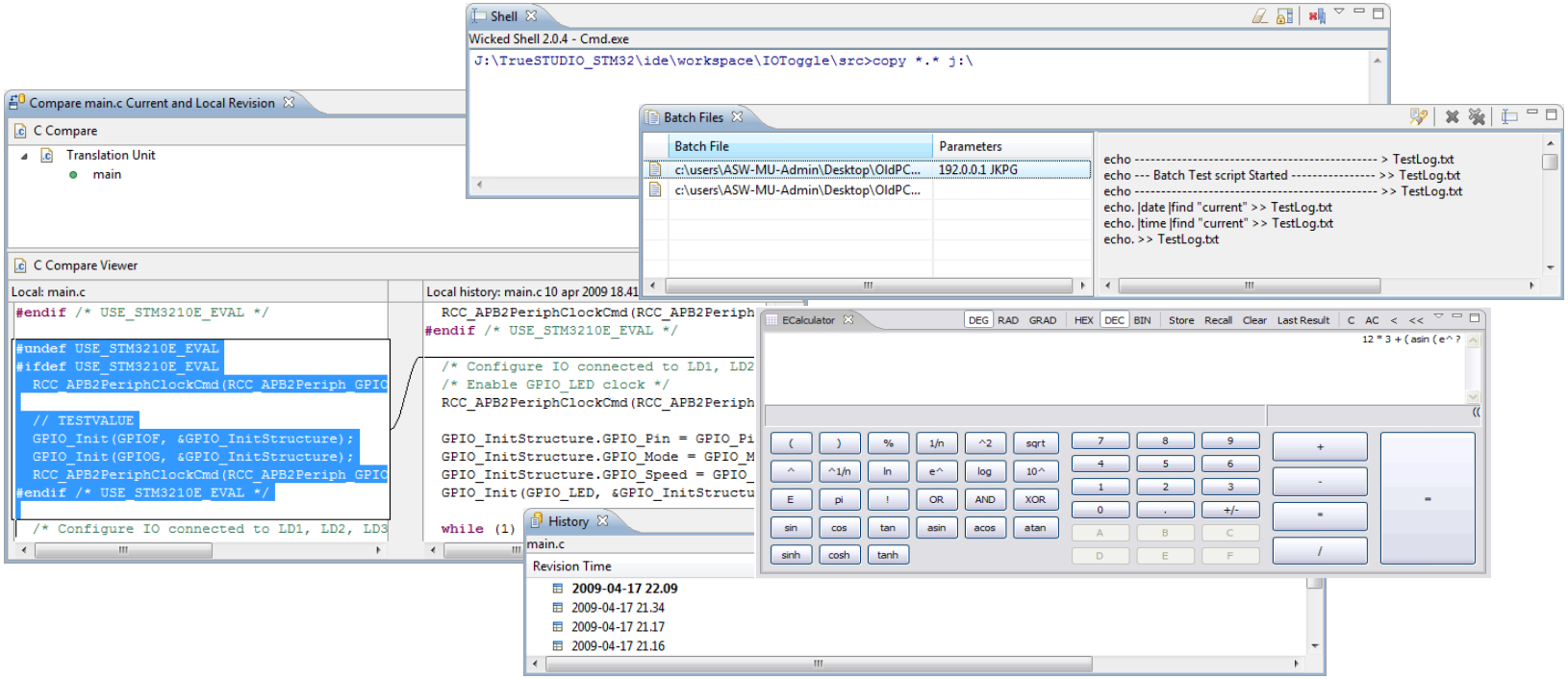
- C runtime library manual as editor tooltips
- Drag & drop of pre-defined code templates
- User defined templates with dynamically expanded variables
- Spell checker in C/C++ comments

C/C++ symbol indexer



- C/C++ indexer and symbol database (multi-file)
- #include dependency, Class browser, Symbol browser, Call hierarchy etc
- Advanced text- & “find-in-files” search with regular expressions
- C/C++ search with grammar filtering and “search-as-you-type”

Productivity features



- Graphical file compare
- Compare files with each other or with older versions of itself
- Execute MS/DOS commands and batch files
- Programmer's calculator with HEX/DEC/BIN conversions

Build system

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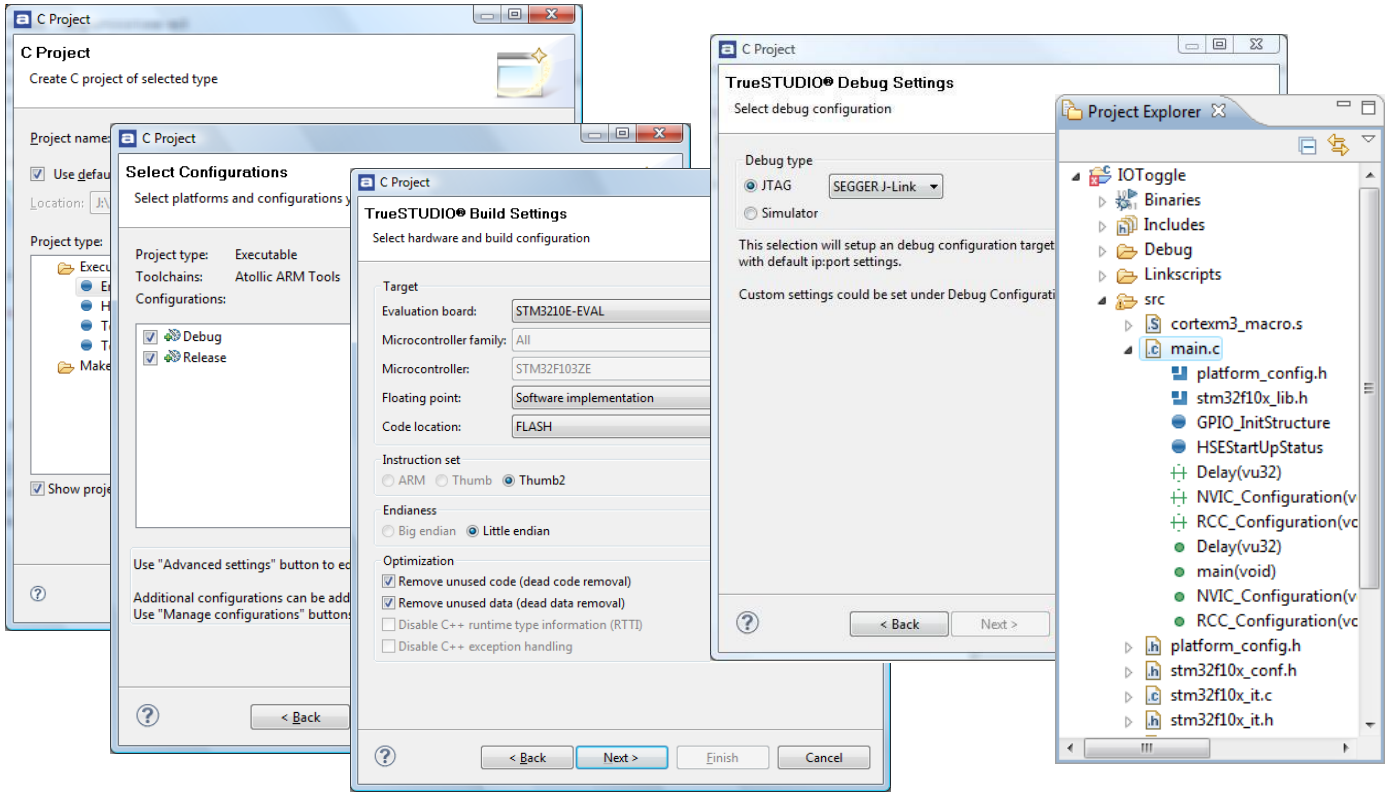
Project manager



- Target specific “New C/C++ project“ wizard
- Auto-generates targets specific example projects
- Auto-configures build tools and debugger
- Project explorer

Build system

- GNU command line tools
  - C/C++ compiler, assembler, linker, debugger, etc
  - C/C++ runtime and math libraries for C and C++
  - Atollic start-up code - initializations before “main()” starts
- Build system
  - Managed mode (GUI for project configuration)
  - Unmanaged mode (makefile for project configuration)
  - Supports parallel compilation (shorter build times)

Compiler quality

- Almost all commercial compilers on the market are good today
  - Normally +/- 5% in difference in code size
  - But results differ from source code file to source code file
  - Not possible to say that compiler ”X” is best in all cases
- We use the GNU tools
  - Increasingly becoming a de-facto standard
  - Academic compiler research mostly use GNU for implementation tests
  - Developed and maintained by many companies, including ARM
  - Used in EmbeddedLinux, Android, QNX and WindRiver platforms
  - Also used in PC-Linux for x86 (desktops and servers)
  - Probably the most well tested compiler in the world (perhaps except Microsoft VisualStudio for C#)
- Testing
  - Tested and maintained by many companies, including ARM
  - Atollic runs ~85.000 test cases on every compiler release

Debugger

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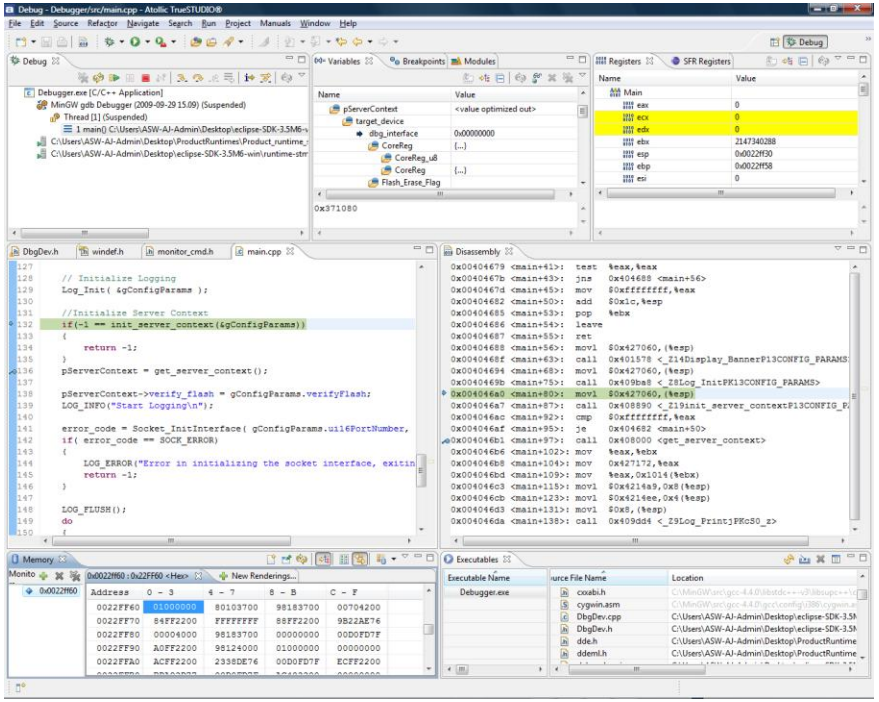
Debugger



- Advanced debugger GUI
- Full execution control functions
- Complex code & data breakpoints
- Colour coded syntax in source code view
- CPU register view
- SFR register view
- Process view
- Breakpoint view
- Variable watch & Expressions views
- Memory view
- Disassembly view
- Breakpoint actions (play MP3, etc)

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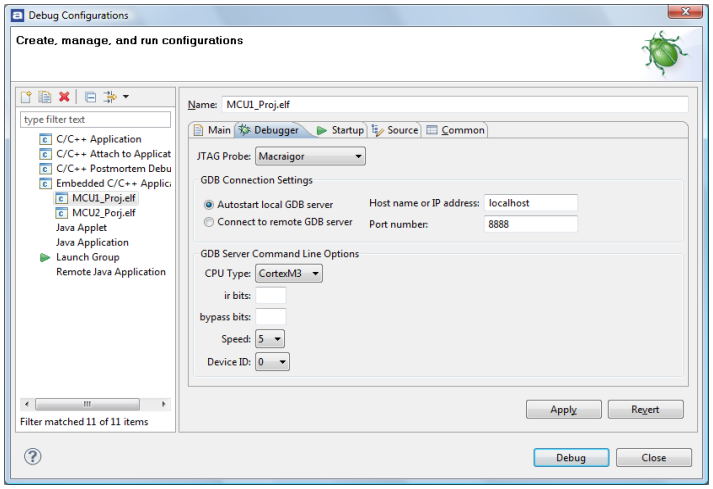
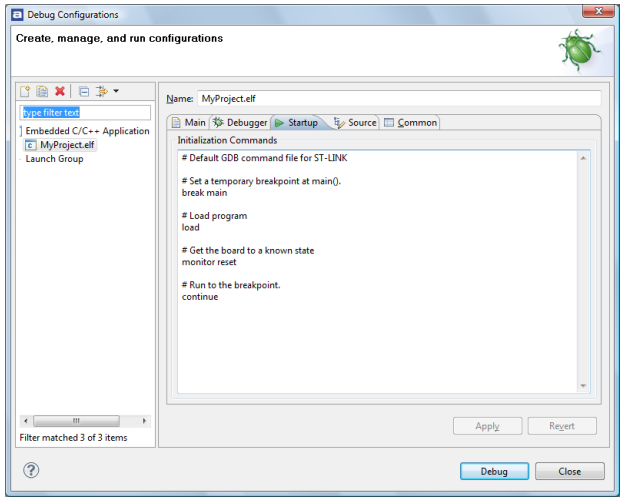
Debugger configurations



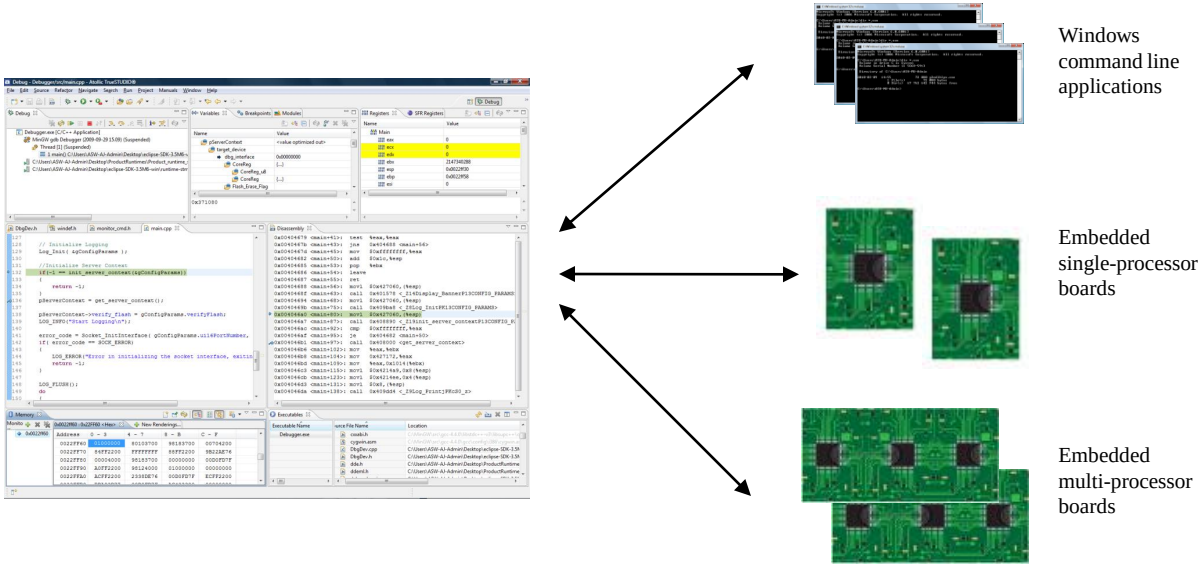
- Atollic-proprietary debug configuration & debug launch mechanism
- Simplified & adapted for embedded developers
- Supports multiple debug configurations in the same project
- Ready-made debug configurations for all supported EVB * JTAG combinations
- Supports many JTAG probes (Segger J-LINK, ST-LINK etc)
- Support for generic 3rd party gdbservers as well (Abatron, Ronetix, etc)
- Auto-start and auto-stop of debug servers
- Integrated configuration GUI for debug servers

Debugger commands & scripts



- ~700 debugger commands can be entered manually in the debugger Console view
- Advanced debugger tasks can be automated using debugger scripts
  - Scripts execute debugger commands, interact with application data, etc
  - Scripts supports iterations and conditional execution
- Debugger scripts are :
  - Started manually from the debugger Console view
  - Started automatically on a breakpoint hit (“breakpoint event handler”)
- Breakpoint event handlers can automatically resume application being debugged

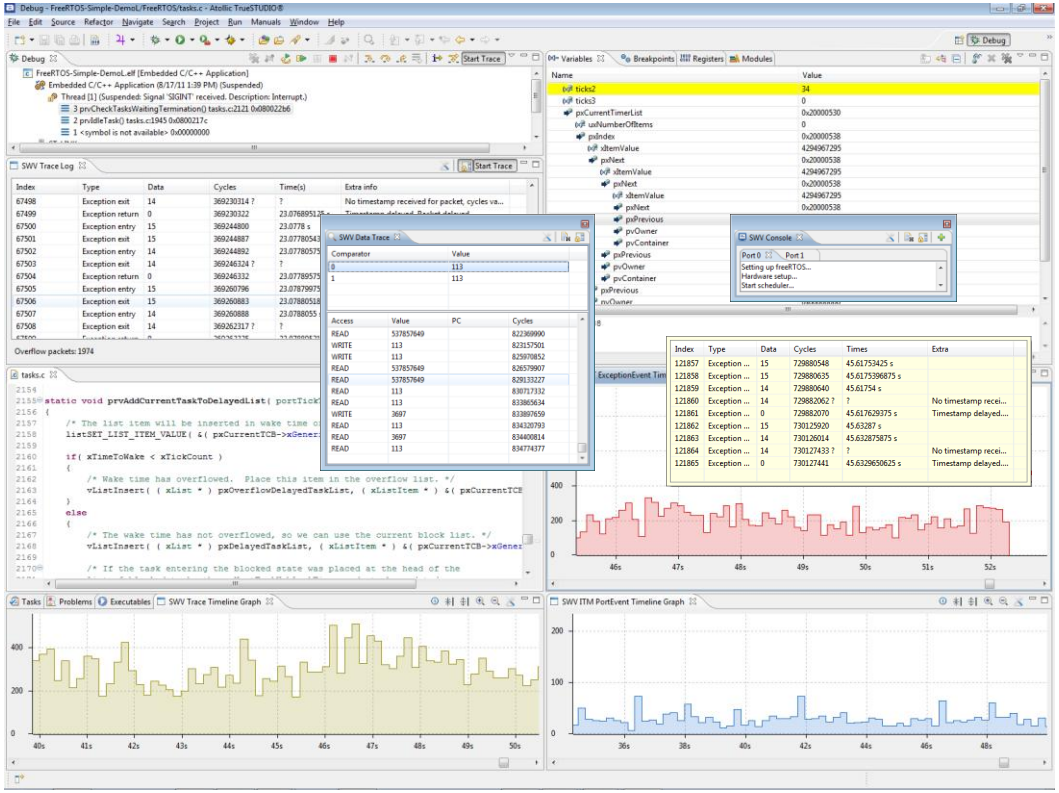
Multiprocessor debug



- Support for simultaneous debug (using the same GUI) of any number of CPU's, in any combination, of the following types:
  - Windows command line applications (PC *.exe files)
  - Single-processor boards (ARM *.elf files)
  - Multi-processor boards (ARM *.elf files)
- Allows debugging across system boundaries (i.e. debug both sides of two communicating devices from within the same debugger)
- A single mouse-click swaps context and the debugger display a different application/CPU

Real-time tracing

with Serial Wire Viewer (SWV)



- Real-time data view with data trace
- Real-time trace logs & timeline charts for different event types
- Tooltips for detailed event analysis in timeline charts
- Console for ITM printf() redirection

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UML

Graphical modeling of software

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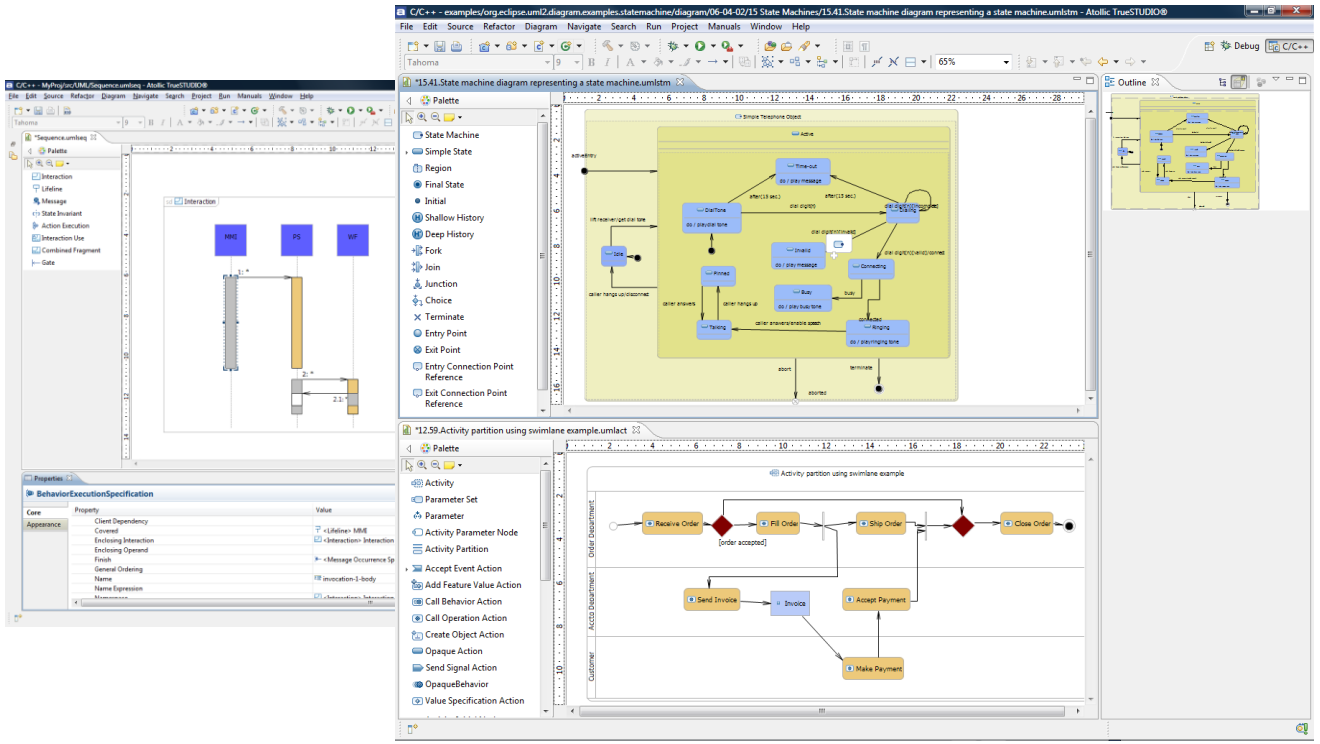
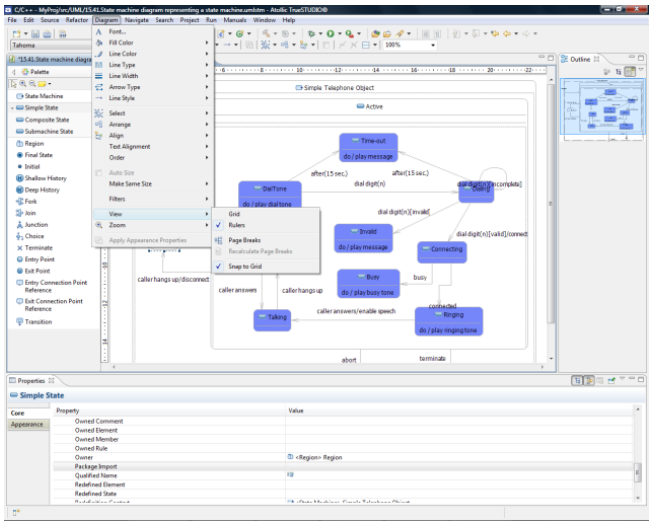
UML modeling (1/2)



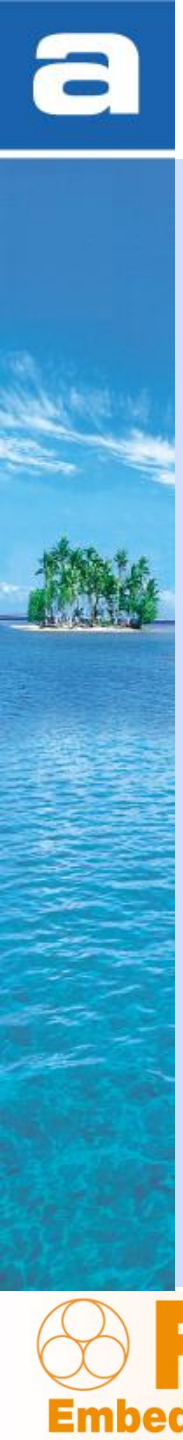
- Atollic TrueSTUDIO® supports model driven design & architecture.
- Integrated UML diagram editors enable software developers to:
  - Capture requirements and use cases
  - Model structural design and dynamic behavior
  - Visualize and document the software architecture

UML modeling (2/2)



TThe following UML diagram editors are included:

- Activity diagram editor
- Class diagram editor
- Component diagram editor
- Composite structures diagram editor
- Deployment diagram editor
- Sequence diagram editor
- State machine diagram editor
- Use case diagram editor



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Team collaboration and complexity management tools

Version control system GUI client
Bug database GUI client
Code review & code review meetings

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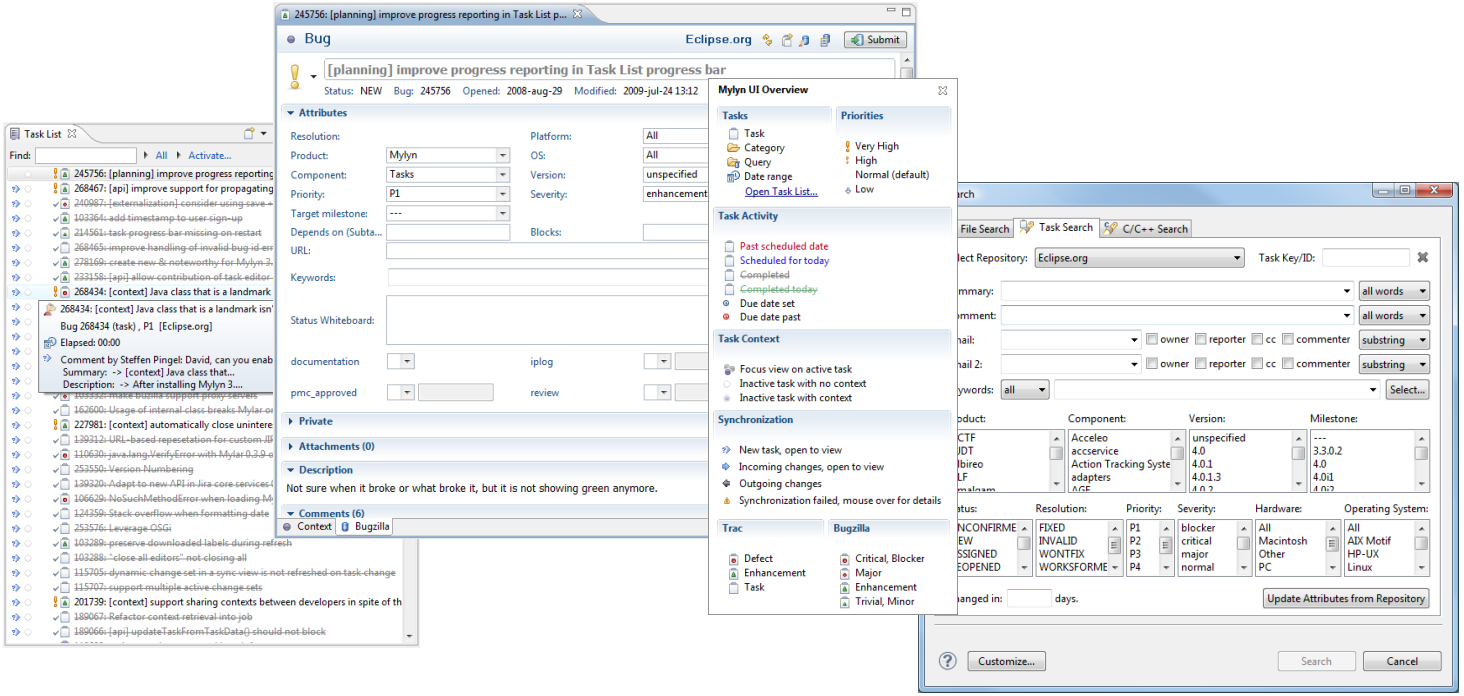
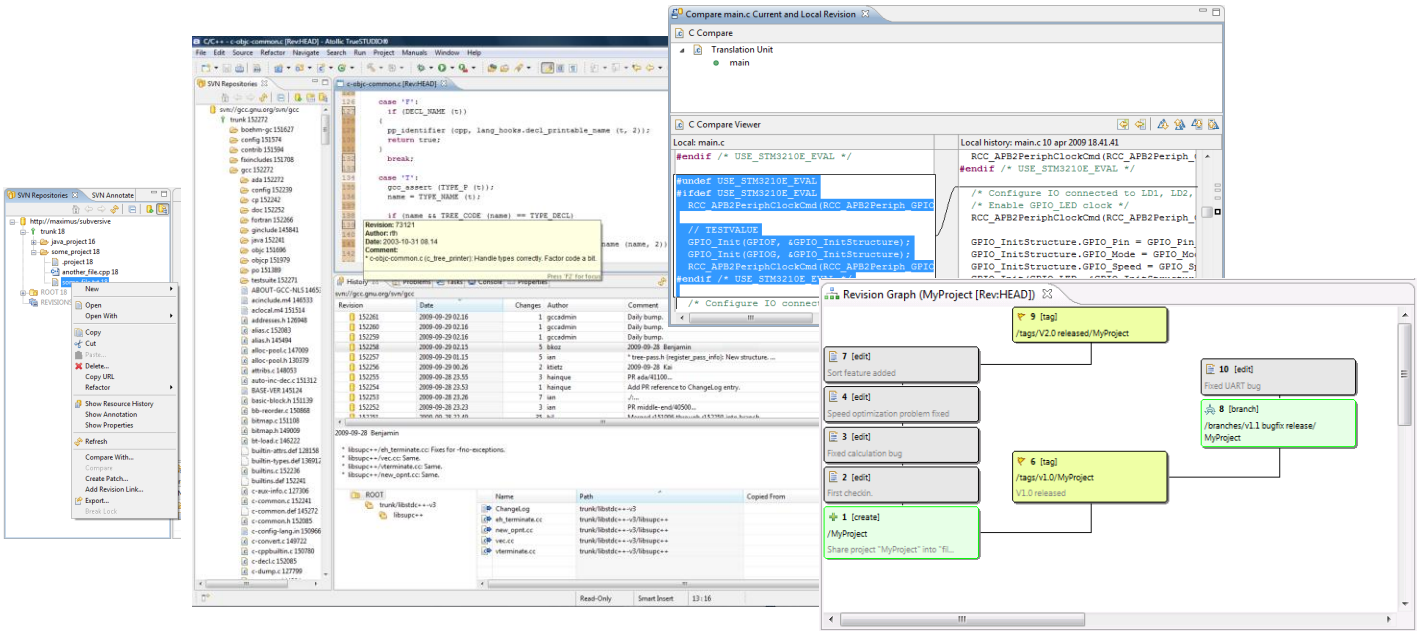
Bug database client



- Fully integrated GUI client
  - Supports local mode & servers (Bugzilla, Trac, Mantis)
  - Task queries, task search, task lists, task editor, task scheduling
  - Improves team work capabilities & developer productivity
  - Issue management and work/task scheduling + task time calculation
  - Context management & attach screenshots to issues

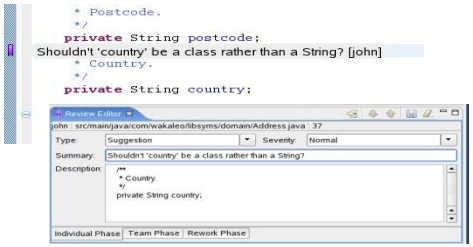
Version control system client

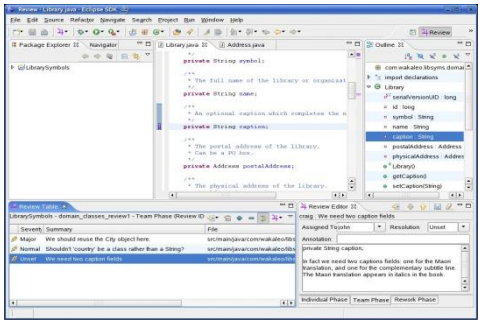


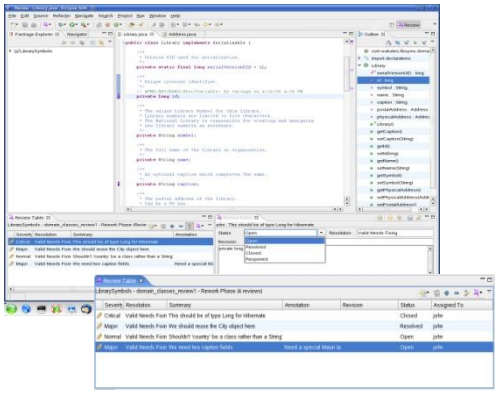
Fully integrated GUI client for SVN & CVS

- Check-in/out and Branch/merge (including a merge-conflict editor)
- Repository & history browser
- File revision annotations, file difference viewer and revision graph viewer
- Full traceability of all lines, in all files, throughout complete project history
  - Who did what, when and why?
  - What did the code look like at time or version X?
  - Who added code line X, when and why?

Code review & review meetings







1. Individual phase

Developers add code review comments to source code lines in the TrueSTUDIO editor

2. Team phase

All code review comments are discussed in a code review meeting

(or two developers discuss each other's comments in a peer review)

3. Rework phase

Developers fix review comments that have been assigned to him/her

Source code review process (for better quality!)

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DEMO

Improve your software development with Atollic TrueSTUDIO®!

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