

Atollic development tools for STM32



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!

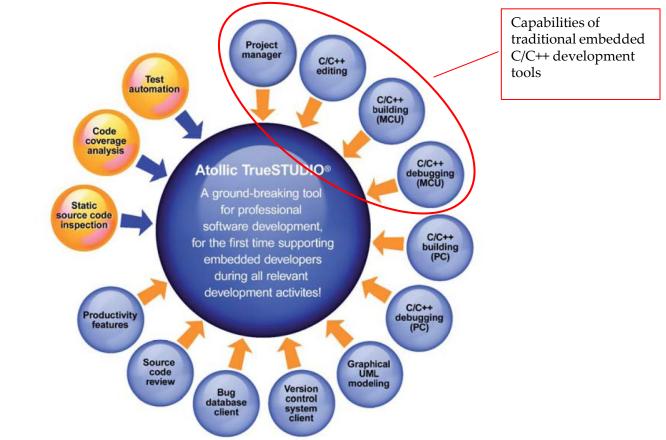
TrueVERIFIER



All products integrate together in the same IDE!



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

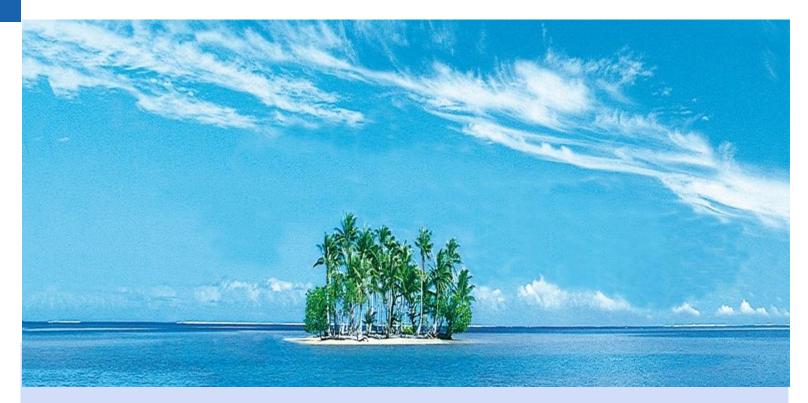
Embedded System

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



Atollic TrueSTUDIO[®]



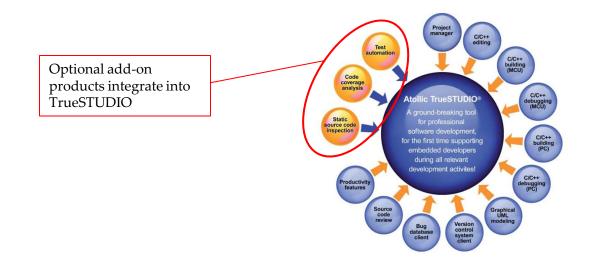
Atollic TrueSTUDIO[®]

- 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





Editing features

"Embedded passion"



6

Editors

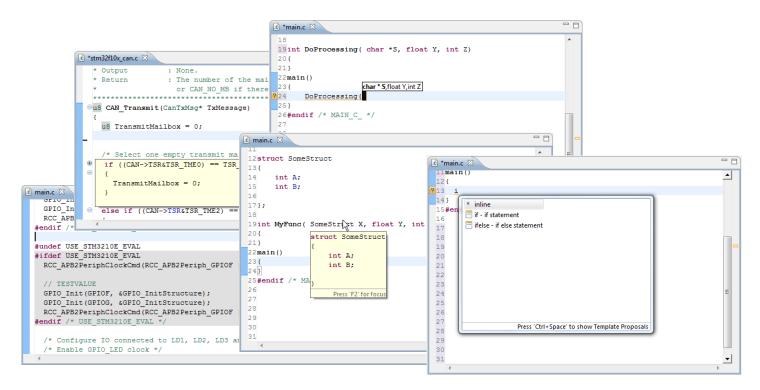
* (* 1 * * * *	<pre>32f10x_canc 13 Output : None. Return : The number of the mailbox that is used for transmission</pre>		 ♥ ■ □ ♥ ■ □ ♥ Outline X ↓^q_z ■ □ ♥ include/makefile.init ● RM ♥ include sources.mk
S cortexm3_macros. S .globl _BASEPRICONFI .globl _GetBASEPRI .globl _REV_HalfWord .globl _REV_Word	<pre>/* Select one empty transmit mailbox */ if ((CAN->TSR&TSR_TME0) == TSR_TME0) { TransmitMailbox = 0; } else if ((CAN->TSR&TSR_TME2) == TSR_TME2) makefile X</pre>	 MRS_PSP MRS_MSP MRS_MSP MRS_MSP SETPRIMASK RESETPRIMASK SETFAULTMASK RESETFAULTMASK RESETFAULTMASK RESETPRICONFIG GE4BASEPRI REV_HalfWord 	 include subdir.mk include stm32FWilb/src/su include objects.mk include objects.mk t^o ifneq (\$(MAKECMDGOALS),cl t^o ifneq (\$(strip \$(C_DEPS)) include \$(C_DEPS) all
/*;***********************************	<pre>all: IoToggle.elf secondary-outputs # Tool invocations IOToggle.elf: \$(053) \$(USER_OBJS) @echo 'Building target: \$0' @echo 'Invoking: C Linker' arm-none-eabi-gcc \$(0503) \$(USER_OBJS) \$(LIBS) -o "IOToggle.elf" -T"J:\T @echo 'Finished building target: \$0' @echo ' ' IOToggle.hex: IOToggle.elf @echo ' Invoking: ObjCopyFlash' arm-none-eabi-objcopy -0 ihex IOToggle.elf "IOToggle.hex" @echo 'Finished building: \$0'</pre>	©REV_Word	 IoToggle.elf @echo 'Building target S @echo 'Invoking: C Linker @echo 'Finished building @echo 'Finished building @echo 'Invoking: ObjCopyF . arm-none-eabi-objCopyF . arm-none-eabi-objCopyF . @echo 'Finished building: @echo 'I
	gecho 'rinished bullding: \$g'		P P

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



6

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)

		type filter text		Key			41. Ga 1				(⇒ ▼ ⇒ ▼
main.c 🛛		General			,,						4
* AS A RESULT, STMICROELECTRONICS SU * INDIRECT OR CONSEQUENTIAL DAMAGES * CONTENT OF SUCH FIRMMARE AND/OR TI	WITH RESPECT TO #	ANY CL: STOMER: Label Dev	nd Fonts corations		eme: Microsoft Visu	ual Stud	io 🔻				
* INFORMATION CONTAINED HEREIN IN CO		Compare/Pa Content Typ	Compare/Patch				Binding		When	Category	User
*******	**************	Editors	-		About					Help	
		File Asso	ciations		Activate Editor		F12		In Windows	Window	
/* Includes		Text Edit		E	Activate Task		Ctrl+F9		In Windows	Navigate	
<pre>#include "stm32f10x_lib.h" #include "platform config.h"</pre>			ssibility		Add Block Com	ment	Ctrl+Shif	+/	C/C++ Editor	C/C++ Source	
#Include "platform config.n"			tations		Add Bookmark		Ctrl+F2		In Windows	Edit	
/* Private typedef			rlinking		Add Include		Ctrl+Shif		C/C++ Editor	C/C++ Source	
		Linke Quick	d Mode		Add Memory Block Ctrl+			м	In Memory View	Run/Debug Task	
/* c main.c ⊠		Spelli			Add Task Repos	sitory				Task	
		spen									
/* {		Kevs	-	Co	ny Command	nhind C	Command Restore Co	mmand			
	Declarate X	Keys		Co	opy Command	nbind C	Command Restore Co	mmand	~ -		
	Bookmarks 🛛	Keys		<u>C</u> c	opy Command	nbind C	Command Restore Co	mmand			
GP #ifdef DEBUG	4 items	Keys						mmand		-	
GP #ifdef DEBUG Er debug(); #endif	4 items Description	Keys	Resource	<u>⊆</u> c Path		nbind C		mmand			
<pre>Gp #ifdef DEBUG Er debug(); #endif /* System Clocks Configurati</pre>	4 items Description		Resource main.c	Path			on	mmand		When	
GP #ifdef DEBUG Er debug(); #endif	4 items Description	tart here		Path	ggle/src	Locati	on 1	mmand			
<pre>GP #ifdef DEBUG Er debug(); #endif /* System Clocks Configurati. RCC_Configuration();</pre>	4 items Description Graphic functions st Pointer errors at last Speed optimization	art here loop iteration	main.c	Path IOTo IOTo	ggle/src ggle/src	Locati line 14	on 1	mmand			
<pre>GP #ifdef DEBUG Er debug(); #endif /* System Clocks Configurati. RCC_Configuration(); /* NVIC Configuration ******</pre>	4 items Description Graphic functions st Pointer errors at last Speed optimization	tart here loop iteration needed here	main.c main.c	Path IOTo IOTo IOTo	ggle/src ggle/src ggle/src	Location line 14 line 97	on	mmand		When	
<pre>GP #ifdef DEBUG Er debug(); #endif /* System Clocks Configurati. RCC_Configuration();</pre>	4 items Description Graphic functions st Pointer errors at last Speed optimization Start of Initialisation	tart here loop iteration needed here	main.c main.c main.c	Path IOTo IOTo IOTo	ggle/src ggle/src ggle/src	Location line 14 line 97 line 71	on	mmand			5
<pre>GP #ifdef DEBUG Er debug(); #endif /* System Clocks Configuration RCC_Configuration (); /* NVIC Configuration ****** NVIC Configuration ();</pre>	4 items Description Graphic functions st Pointer errors at last Speed optimization Start of Initialisation 2017 Ta	art here loop iteration needed here code sks ⊠	main.c main.c main.c	Path IOTo IOTo IOTo	ggle/src ggle/src ggle/src	Location line 14 line 97 line 71	on	mmand		When	
<pre>GP GP GP Fr debug(); #endif /* System Clocks Configuration RCC_Configuration(); /* NVIC Configuration ****** NVIC Configuration(); /* Configuration(); /* Configure all unused GPIO</pre>	4 items Description Graphic functions st Pointer errors at last Speed optimization Start of Initialisation 2 item 2 item	tart here loop iteration needed here code sks 🕅	main.c main.c main.c	Path IOTo IOTo IOTo	ggle/src ggle/src ggle/src qqle/src	Location line 14 line 97 line 71 line 13	on 1 8			When	Export CSV
<pre>GP #ifdef DEBUG Er debug(); #endif /* System Clocks Configuration RCC_Configuration (); /* NVIC Configuration ****** NVIC Configuration ();</pre>	4 items Description Graphic functions st Pointer errors at last Speed optimization Start of Initialisation 2 item educe the pow	tart here loop iteration needed here code sks X s ! Description	main.c main.c main.c	Path IOTo IOTo IOTo	ggle/src ggle/src ggle/src gqle/src qqle/src Resource	Locatio line 14 line 97 line 71 line 13	on 1 8 Path	Location	Туре	When	Export CSV
<pre>GP GP Er 4 6 7 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 9 9 9 9</pre>	4 items Description Graphic functions st Pointer errors at last Speed optimization Start of Initialisation 2 item educe the pow	art here loop iteration needed here code sks & s 1 Description 1 Improve sorting speed	main.c main.c main.c	Path IOTo IOTo IOTo	ggle/src ggle/src ggle/src qqle/src Resource stm32f10x_	Location line 14: line 97 line 71 line 13:	on 1 8 Path IOToggle/stm32FWI	Location line 77	Type Task	When	
<pre>GP GP Fr debug(); #endif /* System Clocks Configuration RCC_Configuration(); /* NVIC Configuration ****** NVIC Configuration(); /* Configuration(); /* Configure all unused GPIO trigger OFF), this will r immunity against EMI/EMC RCC_APB2PeriphClockCmd (RCC_A</pre>	4 items Description Graphic functions st Pointer errors at last Speed optimization Start of Initialisation 2 item educe the pow	tart here loop iteration needed here code sks X s ! Description	main.c main.c main.c	Path IOTo IOTo IOTo	ggle/src ggle/src ggle/src gqle/src qqle/src Resource	Location line 14: line 97 line 71 line 13:	on 1 8 Path	Location	Туре	When	Export CSV
<pre>GP GP Fr debug(); #endif /* System Clocks Configuration RCC_Configuration(); /* NVIC Configuration ****** NVIC Configuration(); /* Configuration(); /* Configure all unused GPIO trigger OFF), this will r immunity against EMI/EMC RCC_APB2PeriphClockCmd (RCC_A</pre>	4 items Description Graphic functions st Pointer errors at last Speed optimization Start of Initialisation 2 item educe the pow PB2Periph_GPI	art here loop iteration needed here code sks & s 1 Description 1 Improve sorting speed	main.c main.c main.c	Path IOTo IOTo IOTo	ggle/src ggle/src ggle/src qqle/src Resource stm32f10x_	Location line 14: line 97 line 71 line 13:	on 1 8 Path IOToggle/stm32FWI	Location line 77	Type Task	When	Export CSV
<pre>GP GP Fr debug(); #endif /* System Clocks Configuration RCC_Configuration(); /* NVIC Configuration ****** NVIC Configuration(); /* Configuration(); /* Configure all unused GPIO trigger OFF), this will r immunity against EMI/EMC RCC_APB2PeriphClockCmd (RCC_A</pre>	4 items Description Graphic functions st Pointer errors at last Speed optimization Start of Initialisation 2 item educe the pow PB2Periph_GPI	art here loop iteration needed here code sks & s 1 Description 1 Improve sorting speed	main.c main.c main.c	Path IOTo IOTo IOTo	ggle/src ggle/src ggle/src qqle/src Resource stm32f10x_	Location line 14: line 97 line 71 line 13:	on 1 8 Path IOToggle/stm32FWI	Location line 77	Type Task	When	Export CSV Apply

- 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)

Name	Description	Edit Tem	piate								
III C/C++		Name:	class								
catch	catch block	Description	class declaration								
class	class declaration										
comment	default multiline comme	Pattern:	class \${name} {		The cursor position af						
📑 do	do while statement		<pre>public:</pre>	cursor		demo.c 🛛					
📄 else	else block		\${Cursor}	date dollar							
😑 elseif	else if block					⊖static void state machine task(void)					
📑 for	for loop		private:	enclosing_method							
📑 for	for loop with temporary		};	enclosing_method_arguments		Bool is reset;					
🚍 if	if statement			enclosing_project							
📑 ifelse	if else statement			file		<pre>printf("Task is running\n");</pre>					
📑 main	main method			line_selection							
namespace	namespace declaration			return_type		Name: printf					
📄 new	create new object			time		Prototype: int printf (const char *format,)					
📑 stderr	print to standard error			todo		Description:					
📑 stdout	print to standard output		*	user		printf accepts a series of arguments, applies to each a format specifier fr					
switch	switch case statement			word_selection		data to stdout, without a terminating NUL character. The behavior of pr arguments for the format, printf returns when it reaches the end of the t					
🚍 try	try catch block		Insert Variable	year		arguments than the format requires, excess arguments are ignored.					
😑 using	using a namespace					arguments than the format requires, excess arguments are ignored.					
						fprintf is like printf, except that output is directed to the stream fd rather					
		?									
III		\odot				sprintf is like printf, except that output is directed to the buffer str, and a					
Preview						undefined if more output is generated than the buffer can hold.					
witch (\${key}) {			-			convint is like covint event that output is limited to at most size butes					
case \${value}:			🗈 *demo.c 🛛								
\${cursor}						state fct = STATE FCT FUNCTION2;					
break;			// Clear	rr Zoom state if on and	a kev is presse	new state fct = TRUE;					
default:			1.5	~~~~		, new_state_ict = ikoE;					
break;			{ I The	word 'Clearrr' is not correctly spelled		۰ III ا					
			4 quick	fixes available:							
			a a C	hange to 'Clearer'							
				nore 'Clearrr' during the current sess	ion r active get	descr					
				isable spell checking							
		*									
		P		dd 'Clearrr' to dictionary		-					
				Press 'F2' f	or focus						

- 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

a Open Element	Search
Choose an element (? = any character, * = any string):	
RCC* Files included by 'mai	in.c(/IOToggle/src)' - in workspace
Visible element types:	Containing text:
	10x_lib.h 🔹 🔲 Case sensitive
🔽 🖸 Enumeration 🖉 🕕 Union 🛛 🖉 🖉 Eurotion 🔗 🗨 Va	n32f10x_map.h (* = any string, ? = any character, \ = escape for literals: * ? \) Regular expression
# Macros	stm32f10x_conf.h
Matching elements:	File name patterns:
RCC_HSICmd(enum {stm32f10x_type.h:2505})	*.c
RCC_HSICMd(enum {stm32f10x_type.n:2303}) RCC IROHandler()	ITStatus Patterns are separated by a comma (* = any string, ? = any character)
RCC_ICOnfig(unsigned char, enum {stm32f10x_type,h:2505})	RESET
RCC_LSEConfig(unsigned char)	Ca Search
RCC LSICmd(enum {stm32f10x type.h:2505})	
RCC MCOConfig(unsigned char)	S File Search S C/C++ Search s
RCC PCLK1Config(unsigned long int) Callers of RCC_Configuration() - /IOToggle/src/main	Search string (* = any string, ? = any character):
RCC_PCLK2Config(unsigned long int) A RCC_Configuration()	
 RCC_PLLCmd(enum {stm32f10x_type.h:2505}) main() 	RCC* Case sensitive
 RCC_PLLConfig(unsigned long int, unsigned long in Reset_Handler() 	Cearch For Limit To
 RCC_RTCCLKCmd(enum {stm32f10x_type.h:2505}) 	Class / Struct Function Variable Declarations Definitions Search Cancel
RCC RTCCLKConfinitut & Search	Union Method Field
Qualified name and locatio 'Init' - 1 219 matches in workspace (*.c)	Enumeration Enumerator Namespace
● (global) RCC_PCLK2Co 🔺 😂 IOToggle	V Typedef Macro Any Element
A 🗁 STC	
▲ C main.c (29 matches)	Scope
⇒ 24: GPIO_InitTypeDef GPIO_InitStructure;	Workspace Selected resources Enclosing projects
⇒ 62: GPIO_InitStructure.GPIO_Pin = GPIO_Pin_All;	
⇒ 63: GPIO InitStructure.GPIO_Mode = GPIO_Mode_AIN; ⇒ 64: GPIO Init(GPIOA, &GPIO InitStructure);	O Working set:
⇒ 64: GPIO_Init(GPIOA, & GPIO_InitStructure); ⇒ 65: GPIO_Init(GPIOB, & GPIO_InitStructure);	
⑦ OK Cancel	(?) Customize Search Cancel
	Search Cancel

- 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

	💭 Shell 🔀					🖉 🚮 🛤 🍸 🗖 🗖	
	Wicked Shell 2.0.4 - Cmd.exe						
	J:\TrueSTUDIO_STM32\	ide\workspace\IOTo	ggle\src>copy *.	* j:\		*	
E ⁰ Compare main.c Current and Local Revision							
C Compare		📄 Batch Files 🛛					\mid 🖗 🗱 🔛 🗖 🗖
Translation Unit		Batch File		Parameters			Testleaded
• main		c:\users\ASW-MU-Adr	A	192.0.0.1 JKPG	echo Batch Test script S		
	<	c:\users\ASW-MU-Adr	min\Desktop\OldPC		echo		TestLog.txt
					echo. date find "current" echo. time find "current"		
					echo. >> TestLog.txt		
C Compare Viewer							*
Local: main.c	Local history: main.c 10 apr 2009 18.41	•					•
<pre>#endif /* USE_STM3210E_EVAL */</pre>	RCC_APB2PeriphClockCmd(H		alculator 🛛	DEG RAD GRAD H	EX DEC BIN Store Recall Cle	ear LastResult C AC <	: << ▽ □ □
#undef USE STM3210E EVAL	<pre>#endif /* USE_SIM3210E_EV#</pre>	AL */				12 * 3	+ (asin (e^ ? 🔥
#ifdef USE_STM3210E_EVAL	/* Configure IO connecte						
RCC_APB2PeriphClockCmd(RCC_APB2Periph_GPIC	/* Enable GPIO_LED cloc}						
// TESTVALUE	RCC_APB2PeriphClockCmd(F	RCC_APB2Periph)
GPIO_Init(GPIOF, &GPIO_InitStructure);	GPIO_InitStructure.GPIO_			1/n ^2 sqrt	7 8 9		
GPIO_Init(GPIOG, &GPIO_InitStructure); RCC APB2PeriphClockCmd(RCC APB2Periph GPIC	GPIO_InitStructure.GPIO GPIO InitStructure.GPIO			e^ log 10^	4 5 6		
#endif /* USE STM3210E EVAL */	GPIO_INItStructure.GPIO_ GPIO_INIt(GPIO_LED, &GPI	IO InitStructu			1 2 3		
	History 8			OR AND XOR	0 . +/-		-
/* Configure IO connected to LD1, LD2, LD3	while (1)	sin	cos tan a	asin acos atan	A B C		
	Revision Time	sinh	cosh tanh		D E F		
	■ 2009-04-17	22.09					
		21.16				-	
	•		III				

- 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

"Embedded passion"



6

Project manager

C Project	t of selected type			C Project	
				Select debug configuration	Project Explorer 🛛 🗖 🗖
Project name:	C Project Select Configurations			Debug type	2 4 €
Use defau	Select platforms and configurations y Project type: Executable	C Project TrueSTUDIO® Build Select hardware and build	-	JTAG SEGGER J-Link Simulator This selection will setup an debug configuration tar	 ▲ ♀ IOToggle → ♀ Binaries → ⋒ Includes ↓ ► Debug
Execu	Toolchains: Atollic ARM Tools Configurations:	Target Evaluation board:	STM3210E-EVAL	with default ip:port settings. Custom settings could be set under Debug Configu	ati → Src → ③ cortexm3_macro.s
🔵 Ti 👝 Make	♥ ॐ Debug ♥ ॐ Release	Microcontroller family: Microcontroller: Floating point: Code location:	All STM32F103ZE Software implementation FLASH		 Imain.c Imain.c
Show proje		Instruction set ARM Thumb Endianess Big endian			 HSEStartUpStatus Delay(vu32) NVIC_Configuration(v RCC_Configuration(vc Delay(vu32)
0	Use "Advanced settings" button to ec Additional configurations can be add	Optimization Remove unused cod Remove unused dat			main(void) NVIC Configuration(v
	Use "Manage configurations" button		e type information (RTTI)		
	? <u>B</u> ack	?	< Back Next >	Einish Cancel	→ h stm32f10x_it.h .

- 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

"Embedded passion"



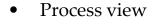
a

Debugger

📬 • 📾 📓 🕸 • O • Q • 🙋 😂 🛷 • 🌛 🖄 •	\$] • \$ \$ \$ \$ • \$ •				🖽 🕸 Debug					
Debug 🛙 🗖	04- Variables 🕄 🗣 Breakpoi	ints 🛋 Modules	- 0	IIII Registers 13	🔹 SFR Registers 👘 👘	~ =				
¹ (a) (b) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c		🐑 🐽 🖂 🔄 🚱 💕	* % *	Name	Value					
C Debugger.exe [C/C++ Application]	Name	Value	*	Main Main						
MinGW gdb Debugger (2009-09-29 15.09) (Suspended)	pServerContext	<value optimized="" out=""></value>	100	lite eax	0					
Thread [1] (Suspended)	arget_device			iiii ecx	0					
1 main() C:\Users\ASW-AJ-Admin\Desktop\eclipse-SDK-3.5M6-v C:\Users\ASW-AJ-Admin\Desktop\ProductRuntimes\Product runtime :	dbg_interface	0x00000000		ini edx	0 2147340288					
C:\Users\ASW-AJ-Admin\Desktop\ProductNuntimes\Product_runtime_ C:\Users\ASW-AJ-Admin\Desktop\eclipse-SDK-3.5M6-win\runtime-stm	CoreReg	{}		1210 esp	0:0022#50					
C. (ases a gravitation (besit objections, approximation on the sol	CoreReg_u			Illi ebp	0x00221156					
	CoreReg	{}		ing esi	0					
	Flash_trase_Fi	ag m		4		•				
	0x371080			- 54						
e			+	4		,				
🖹 DbgDev.h 👔 windef.h 👔 monitor_cmd.h 👔 main.cpp 🖄		Disassembly 8				~ =				
127	-	0x00404679 <main+4< td=""><td>1)>: tes</td><td>t %eax,%eax</td><td></td><td></td></main+4<>	1)>: tes	t %eax,%eax						
128 // Initialize Logging	·	0x0040467b <main+4< td=""><td></td><td></td><td>main+56></td><td>- ñ</td></main+4<>			main+56>	- ñ				
129 Log Init (&gConfigParams);		0x0040467d <main+4< td=""><td></td><td></td><td></td><td></td></main+4<>								
130		0x00404682 <main+5< td=""><td></td><td></td><td>2</td><td></td></main+5<>			2					
131 //Initialize Server Context		0x00404685 <main+5< td=""><td></td><td colspan="6">pop %ebx Leave</td></main+5<>		pop %ebx Leave						
<pre>132 if(-1 == init_server_context(&gConfigParams)) 133 (</pre>		0x00404686 <main+5< td=""><td></td><td colspan="5"></td></main+5<>								
133 (134 return -1:		0x00404687 <main+3 0x00404688 <main+3< td=""><td></td><td colspan="6">ret mov1 \$0x427060,(%esp)</td></main+3<></main+3 		ret mov1 \$0x427060,(%esp)						
135 }		0x0040468f <main+6< td=""><td></td><td colspan="5">all 0x401578 <_Z14Display_BannerP13CONFIG_PAR</td></main+6<>		all 0x401578 <_Z14Display_BannerP13CONFIG_PAR						
<pre>pServerContext = get_server_context();</pre>		0x00404694 <main+6< td=""><td>68>: mov</td><td colspan="6" rowspan="5"><pre>>: movl \$6x427060,[kexp] >: call 0x409ba8 < ZELog InitPKISCONFIG_PARAMS> >: movl \$6x427060,[kexp] >: call 0x408880 < Z19init_server_contextFI3CONFIG >: cap \$6x0fffffff, keax</pre></td></main+6<>	68>: mov	<pre>>: movl \$6x427060,[kexp] >: call 0x409ba8 < ZELog InitPKISCONFIG_PARAMS> >: movl \$6x427060,[kexp] >: call 0x408880 < Z19init_server_contextFI3CONFIG >: cap \$6x0fffffff, keax</pre>						
137		0x0040469b <main+1< td=""><td></td></main+1<>								
<pre>138 pServerContext->verify_flash = gConfigParams.v</pre>	verifyFlash;	0x004046a0 <main+8< p=""></main+8<>								
<pre>139 LOG_INFO("Start Logging\n"); 140</pre>		0x004046a7 <main+8 0x004046ac <main+8< td=""><td></td></main+8<></main+8 								
141 error code = Socket InitInterface(gConfigPara	ung.uil6PortNumber	0x004046af <main+5< td=""><td></td></main+5<>								
142 1f(error code == SOCK ERROR)	and the action of the state of the	@0x004046b1 <main+5< td=""><td></td><td></td><td>(get server context></td><td></td></main+5<>			(get server context>					
143 (0x004046b6 <main+1< td=""><td></td><td colspan="5"></td></main+1<>								
144 LOG_ERROR("Error in initializing the socke	t interface, exitin	0x004046b8 <main+1< td=""><td></td><td></td><td></td><td></td></main+1<>								
145 return -1;		0x004046bd <main+1 0x004046c3 <main+1< td=""><td></td><td></td><td></td><td></td></main+1<></main+1 								
147		0x004046cb <main+1< td=""><td></td><td></td><td></td><td></td></main+1<>								
148 LOG_FLUSH();		0x004046d3 <main+1< td=""><td></td><td colspan="6"></td></main+1<>								
149 do		0x004046da <main+1< td=""><td>138>: cal</td><td></td><td>_Z9Log_PrintjPKcS0_z></td><td></td></main+1<>	138>: cal		_Z9Log_PrintjPKcS0_z>					
150 4		-								
	[교] # (과) # - 것 ^{[2} [2									
		Executables as	100		🔗 🖮 🛪	0				
Monito 🖕 🗶 🎉 0x0022ff60 : 0x22FF60 <hex> 🔅 🔶 🌵 New Renderings</hex>		Executable Name	urce File N	ame	Location					
	C - F *	Debugger.exe	h cou							
0022FF60 01000000 80103700 981837	00 00704200			win.asm						
	00 9822AE76			Dev.cpp	C:\Users\ASW-AJ-Admin\Desktop\eclipse-S					
0022FF70 84FF2200 FFFFFFFF 88FF22			h Dbc	Dev.h	C:\Users\ASW-AJ-Admin\Desktop\eclipse-S	DK-3.51				
0022FF70 84FF2200 FFFFFFFF 88FF22 0022FF80 00004000 98183700 000000	00 00D0FD7F					A				
			🖻 dde		C:\Users\ASW-AJ-Admin\Desktop\ProductF					
0022FF80 00004000 98183700 000000	00 0000000 00		🖻 dde	h mLh	C:\Users\ASW-AJ-Admin\Desktop\ProductF C:\Users\ASW-AJ-Admin\Desktop\ProductF					

- Advanced debugger GUI
- Full execution control functions
- Complex code & data breakpoints
- Colour coded syntax in source code view
- CPU register view
- SFR register view

Embedded Systen



- Breakpoint view
- Variable watch & Expressions views
- Memory view
- Disassembly view
- Breakpoint actions (play MP3, etc)

Debugger configurations

Image: Second	Create, manage, and run co	nfigurations	Ś
Apply Reyert	type filter text C/C+- Application C/C+- Attach to Applica- C/C+- Postmortem Debu C/C+- Postmortem Debu C/C+- Postmortem Debu C/C+- Postmortem Debu C/C+- Application Java Application Java Application Java Application	Main (% Debugger) Startup (Source) Common JTAG Probe Macraigor) GDB Connection Settings Autostart local GDB server Host name or IP address: localhost Connect to remote GDB server Port number: 8888 GDB Server Command Line Options CPU Type ContexMB • ir bits: bypass bits: Speed: 5 •	
		Арріұ	Revert

- 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

Embedded Svste

• Integrated configuration GUI for debug servers

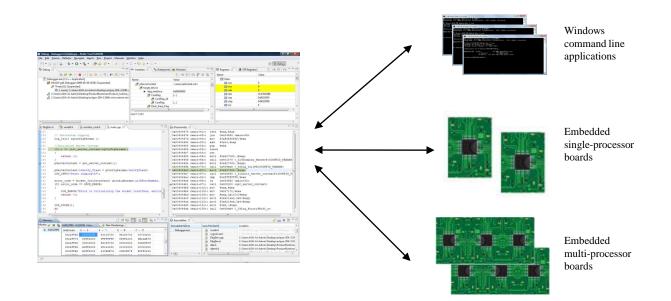
Debugger commands & scripts

Debug Configurations Create, manage, and run co	nfigurations
C C C C C C C C C C C C C C C C C C C	Bame MyProjectelf Main (\$ Debugger) Startup & Source) Common Initialization Commands # Ordanii GBB command (iii fer 57-LINK # Sta temporary breakpoint at main(). break main # Load program load # Get the bank to a known state monitor reset # Run to the breakpoint. continue
Filter matched 3 of 3 items	Apply Reyert
?	Debug Close

- ~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)

Embedded Systen

- 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)

	nurce Refactor <u>N</u> avig		- Q @			1.01.2.71.2									日間 (第)	Outring
		2.0				t 12 1 14 1 t 00 .e ≅ 1		ave el	04- Variabl		ts III Registers				1 4 B	
Debug 🕄		in boundary of the		er 😳 🖛 🗄	- P1 3	1 NO 18 -0 1	🕶 👯 Start frace	9 0		es 📣 💦 🔭 Breakpoir	ts elli Kegisters	n viodules			1 44 H 1	~ 2
	OS-Simple-DemoL.elf [I bedded C/C++ Applicat							Ê.	Name				Value			
	Thread [1] (Suspended:			n: Interrupt.)					bill tick				34 0			
	= 3 prvCheckTasksWa	itingTerminat	tion() tasks.c:2121 0x08							CurrentTimerList			0 0x20000530	2		
	2 prvldleTask() tasks									unNumberOfitems			0			
	= 1 < symbol is not av	nilable> 0x000	00000						*	pxindex			0x20000538			
6			10					,		M xltemValue			4294967295			
SWV Trace	Log 13						Start Te	ace 🗖		🕈 poNext			0x20000538			
							the second second			ovi≇ xitemValue ≠ pxNext			4294967295 0x20000538			
Index	Туре	Data	Cycles	Time(s)	Extra in			^		pxNext pxRemValue			0x20000538 4294967295			
67498	Exception exit	14	369230314 ?	?		estamp received fo				pxNext			0x20000538			
67499	Exception return	0	369230322	23.07689512	i Timed	amon deleved Davis	at data and			and a final second					Ø	
67500		15	369244800	23.0778 s	SWV Data	Turn (2)				PrOwner		SWV Conso		91 P		
67501 67502	Exception exit Exception entry	15 14	369244887 369244892	23.07780543 23.07780575	_	THOSE DO		4	š 🕅 🌆	PvContainer	0			<u>A</u> B	H (2) H (1) H	
67502 67503	Exception entry Exception exit	14	369244892	23.07780575	Comparator		Value			Previous			Port 1			
67504	Exception exit		369246324 7	23,07789575	10		113			* pvOwner		Setting up free Hardware setu	ERTOS		* I	
67505		15	369260796	23.07879975	1		113			pvContainer pxPrevious		Start schedule	r		-	
67506	Exception exit	15	369260883	23.07880518						P nyOwner		-				
67507	Exception entry		369260888	23.0788055	-	1			10			1	01			_
67508	Exception exit	14	369262317 ?	?	Access	Value	PC	Cycles	^	18						
67800	Consellan asking	.0	360363338	22.070005.22	READ	537857649 113		822369990 823157501								
Overflow pac	ckets: 1974				WRITE	113		82315/501 825970852			Index Type 121857 Except	Data ion 15	Cycles 729880548	Times 45.61753425 s	Extra	
2156 { 2157 2158 2159 2160 2161	<pre>/* The list it/ listSET_LIST_II if(xTimeToWake {</pre>	m vill be EM_VALUE : < xTick0	e inserted in w (&(pxCurrentT Count)	ake time of CB->xGener:	WRITE READ READ READ	113 3697 113 3697 113		833865634 833897659 834320793 834400814 834774377	ļ		121862 Except 121863 Except 121864 Except	ion 14 ion 0 ion 15 ion 14 ion 14 ion 0	729882062 ? 729882070 730125920 730126014 730127433 ? 730127441	45.617629375 s 45.63287 s 45.632875875 s ? 45.6329650625 s	No timestamp del Timestamp del No timestamp Timestamp del	ayed
2162			erflowed. Plac						400 -							
2163	vListInsert	((xList	 *) pxOverflo 	wDelayedTas	kList, (xListItem *) & (pxCurren	STICE	1							
2165	else										<u></u>		-			-
2166	(200 -			1777	L	A Local	"L'UU	1221
2167	/* The wake	time has	s not overflowe	d, so we ca	n use the	current blo	ck list. */		1		-			00		1
2168	vListInser	((whist	t *) pxDelayed	TaskList, (xListIte	m •) 6 (pxC	urrentTCB->x	Sener	0							i.
21708	/* If the t	ask enter	ring the blocke	d state was	placed a	t the head o	f the	100		46s	475	48s	49s	50s	51s	52s
an 1 (17) -									(m. e.u						0 41 11	(B) (C)
Tasks 🔯 I	Problems 🕖 Executabi	es SWV 1	Trace Timetine Graph			9	श्व का वर्ष	2.0	LI SWV II	M PortEvent Timeline G	raph 13				이 위 취	a a
	Problems 😧 Executabl	es 🗈 SWV T		л Г			• * ! *	. <u></u>	200	M PortEvent Timeline G	icaph 23				◎ * ≑	@ (
									p	l	J.		الــ	2		L
40s	41s 42s	43s	445	45s 4	6s 4	17s 48s	495	50s	0	365	385	405	425	44s	465 4	185
	41s 42s	43s	445	45s 4	6s 4	17s 48s		SOs ,	0	365	385	405	42s	44s	465 4	185

- 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

Embedded Syste

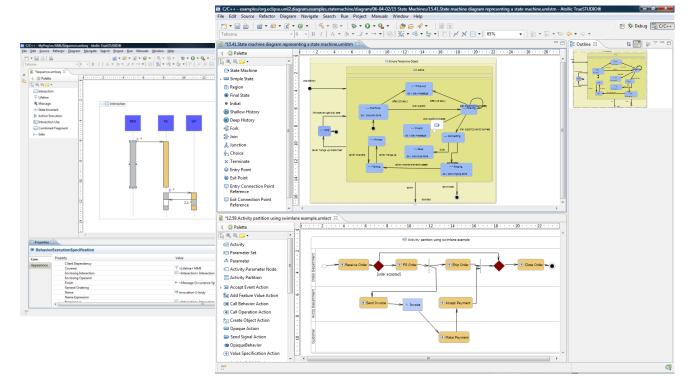
UML Graphical modeling of software

"Embedded passion"



8

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

Fenway Embedded Systems

UML modeling (2/2)

						ori x
				ct Ru	Manuals Window Help	
11 × 61 8		A Font			👔 • 🕼 • 🐘 • 🐘 • 🕖 • 🗛 • 🖉 • 🖓 • 🕼 🛞 👔 👘 👘 👘 👘 • 🖓 •	
Tahoma		A Fill Col		•		
115.41 State	machine diagn	J Line C		•	Coutine 🛙	
d C Palette		HI Line Ty		•		4 🖻
		Line W				a 📖
		🔮 Arrow	Тура		Simple Telephone Object	
🕒 State Ma		-+ Line St	tyle			
 Simple St 		367 Select			Active	- fer-
Composi	ite State	18 Arrang				-77 -
Submach	hine State	be Align				-
(1) Region			lionment			-
Final Stat	te	Order			do/olavmessage	
 Initial 						
G Shallow I	History	Auto 5			after(15 sec) after(15 sec)	
Ceep His		Make 1	Same Size	•	DaiTone dial digh(n) dial dight(n/incorrokita)	
- Fork		Filters				
I Join		View			do / plav dialtone dal diptin (mvald)	
A Junction		 Zoom 		- 1	Cons Cons Conservation	
A Choice					- Invalid / fial disk in Just 4 / month	
× Terminal		Apply	Appearance Properties		Page Breaks	
C Entry Pei					Recalculate Page Breaks do / play message Connecting	
		2			Snap to Grid	
Exit Point			callerhangs up/disc		Bury busy	
Entry Co Reference	nnection Point	1	Carrent names opposite		caller answers callerhangs up dis / absulture mea	
	nection Point	1			caller answers caller hangs up do / play busy tone	
Reference		7			calleranswers/enable speech conhected	
Transitio	n	1			Taking	
					do / play ringing tone	
		-				
					abort terminate -	
Properties						9 B
📟 Simple S	itate					
Core	Property				Value	
Appearance		d Comment				
		d Element d Member				
		d Member d Rule				
	Owne				(Region> Region	
	Packa	ge Import				
		ied Name			9	
		ined Dement				
		ined State			The official Metablican County Talachana Oblication	

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





Team collaboration and complexity management tools

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

"Embedded passion"



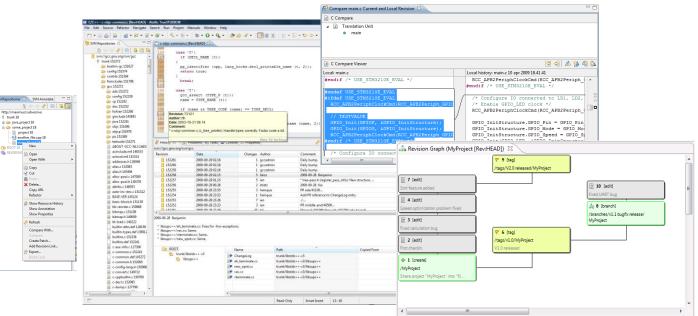
Bug database client

	a 245756: [planning) improve progress reporting in T	ask List p 🕅								
	e Bug			Ecli	pse.org 🗞 👩 🥬	Submit					
	0 [planni	ng] improve progress re	eporting in Task Li	ist progress	bar	- A					
	· · · · · · · · · · · · · · · · · · ·	W Bug: 245756 Opened: 200			Mylyn UI Overview	2	2				
		n bug. 245750 opened. 200	to dug 25 Mounted. 24	000 Jul 24 15.12							
	▼ Attributes				Tasks	Priorities					
Task List 🛛	 Resolution: 		Platform:	All	Task Category	Very High					
Find: All All Activate	Product:	Mylyn -	OS:	All	Gategory Gategory	: High					
245756: [planning] improve progress rep		Tasks 💌	Version:	unspecified	Date range	Normal (default)					
n 268467: [api] improve support for propag		P1 -	Severity:	enhancement	Open Task List	& Low	irch				
 240987: [externalization] consider using s 240364: add timestamp to user sign-up 	Target milestone:	··· •			Task Activity						
v v	1 1	t	Blocks:		Tusk Activity		File Search 🗦	🖗 Task Search 🛛 🌮 C/C++	Search		
> 268465: improve handling of invalid bug					Past scheduled date						
⇒ √a 278169: create new & noteworthy for My					Scheduled for today		lect Repository:	Eclipse.org	▼ Ta	ask Key/ID:	ж
⇒ ○ → a 233158: [api] allow contribution of task e					Completed Completed today						
n 268434: [context] Java class that is a land					 Due date set 		mmary:			•	all words 🔻
 268434: [context] Java class that is a landma Pup 268434 (ask) D1 [Estinge and 	status Whiteboard				 Due date past 		mment:			-	all words 🔻
bug 200454 (task), P1 (Eclipse.org)					Task Context		hail:	•	owner 🔲 reporter 📃	cc Commenter	substring *
 Elapsed: 00:00 Comment by Steffen Pingel: David, can you 	and the second										
Summary: -> [context] Java class that	nab documentation	.	iplog	-	Focus view on active		hail 2:	▼	owner 📗 reporter 🔳	;c 📃 commenter	substring 🔻
Description: -> After installing Mylyn 3	pmc approved	-	review	-	 Inactive task with no 		words: all	•			▼ Select
105552: make buzilla support proxy serve 162600: Usage of internal class breaks My			TEVIEW		Inactive task with co	ontext					
>>> 227981: [context] automatically close uni					Synchronization		pduct:	Component:	Version:	Milestone:	<i>i</i>
⇒ ○ √ 139312: URL-based repesetation for custo							CTF	 Acceleo 	 unspecified 	· ···	~
	3.9-0				New task, open to vi		JDT Ibireo	accservice Action Tracking Sy	4.0 4.0.1	3.3.0.2	
	 Description 				 Incoming changes, e Outgoing changes 	open to view	LF	adapters	4.0.1.3	4.0i1	
 		oroke or what broke it, but it is	not showing green any	more.		ed, mouse over for details	malgam	AGE	102	4 0:2	*
					 Synchronization rain 	ed, mouse over for details	atus:	Resolution: Priority	r: Severity: Ha	rdware: Op	perating System:
🄊 O 🗸 📋 253576: Leverage OSGi	👄 Context 🚦 Bug	zilla			Trac	Bugzilla	NCONFIRME -	FIXED 🔺 P1	 blocker Al 		
⇒ √a 103289: preserve downloaded labels duri	g-refresh						EW SSIGNED	INVALID WONTFIX			IX Motif P-UX
⇒ → 103288: "close all editors" not closing all 115705					Defect	Critical, Blocker	EOPENED +	WORKSFORME + P4	major Of		nux v
		ange			Enhancement Task	Major Enhancement	coreneo				
201739: [context] support sharing context]		re of th			L TOSK	Trivial, Minor	langed in:	days.	[Update Attributes fr	rom Repository
> 189067: Refactor context retrieval into jol											
🄹 🔹 🗸 📋 189066: [api]-updateTaskFromTaskData()	hould not block	-									
· · · · · · · · · · · ·								_			
						C	Customize.			Search	Cancel

- 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



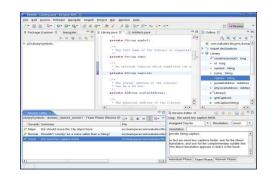
Fully integrated GUI client for SVN & CVS

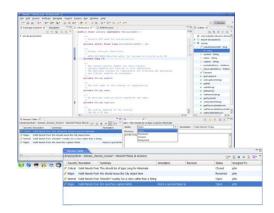
- Check-in/out and Branch/merge (including a merge-conflict editor)
- Repository & history browser
- File revision annotations, file difference viewer and revision graph viewer
- Full traceability of all lines, in all files, throughout complete project history
 - Who did what, when and why?
 - What did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



Code review & review meetings

	te String p					
ouldn't 'e	country' be a c	lass rather	than a	String? [john]		
* Co	untry.					
*/						
priva	te String o	country;				
	ditor 🗷			S & (· · ·	
ohn : src/ma	n/java/com/wakaleo/li	bsyms/domain//	Address jav.	a : 37		
Type: Summary:	Suggestion	-	Seventy:	Normal	-	
	Shouldn't 'country' be a class rather than a String?					
Description	Country.					
Description		private String country;				
Description	private String count	inv;				
Description	private String count	iry;			18	





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!)





DEMO

Improve your software development with Atollic TrueSTUDIO[®]!

www.atollic.com

"Embedded passion"





Contact Us

atollic

• Italy

Fenway Embedded Systems Via Don Giovanni Minzoni, 31 20010 Arluno (MI) - Italy *Tel.* +39 02 97310120 *Email:* sales@fenwayembedded.com *Web:* www.fenwayembedded.com

• Headquarter

Atollic AB Science Park Jönköping Gjuterigatan 7 SE-553 18 Jönköping – Sweden *Email:* sales@atollic.com *Web:* www.atollic.com



HW&SW development products

atollic ab

Science Park Jönköping Gjuterigatan 7 SE-553 18 Jönköping Sweden

atollic inc.

115 Route 46 Building F, Suite 1000 Parsippany NJ, 070504 USA

www.atollic.com

Fenway Embedded Systems