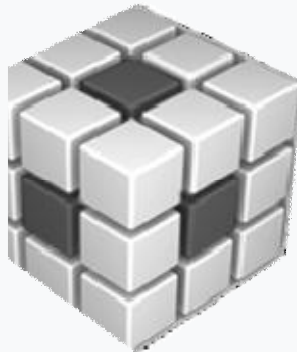


Code Composer Studio

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Developer(s)	Texas Instruments
Initial release	1999; 20 years ago
Stable release	8.1 (8.1.0.00011) / 13 June 2018 ; 9 months ago
Operating system	Windows, Linux and macOS
Platform	IA-32 and x86-64
Available in	1 languages
Type	Integrated Development Environment
Website	ti.com/ccstudio

Code Composer Studio (CCStudio or CCS) is an integrated development environment (IDE) to develop applications for Texas Instruments (TI) embedded processors.

Texas Instruments embedded processors include TMS320 DSPs, OMAP system-on-a-chip, DaVinci system-on-a-chip, Sitara applications processors, Hercules microcontrollers, Simplelink MCUs (MSP432 and Wireless connectivity^[2] microcontrollers), MSP430 and Tiva/Stellaris microcontrollers. It also enables debugging on several subsystems such as Ducati,^[3] IVA Accelerator^[4] and PRU-ICSS.^[5]

Code Composer Studio is primarily designed as for embedded project design and low-level (baremetal) JTAG based debugging. However, the latest releases are based on unmodified versions of the Eclipse open source IDE, which can be easily extended to include support for OS level application debug (Linux, Android, Windows Embedded) and open source compiler suites such as GCC.

Early versions included a real time kernel called DSP/BIOS and its later inception SYS/BIOS. Currently, the successor to these tools, the TI-RTOS embedded tools ecosystem, is available for downloading as a free plugin to Code Composer Studio.

History

Originally Code Composer was a product from a company called GO DSP located in Toronto, Canada, and it was acquired by TI in 1997.^[6] After the acquisition, Code Composer was bundled with a real-time kernel named DSP/BIOS^[7] and its name was appended with the word Studio.

CCS releases up until 3.3 were based on a proprietary interface, but TI was already working in parallel on the development of an IDE based on the open-source Eclipse. This IDE was named Code Composer Essentials (CCE) and was designed for the MSP430 line of microcontrollers. This expertise was used to completely overhaul the previous CCS and starting with release 4.0 all versions are also based on Eclipse.

Code Composer was originally developed for DSP development, therefore one of its main differentiators at the time was the availability of graphical visualization tools (XY graphs, FFT magnitude and phase, constellation, raw image visualization) and support for visualizing memory in several numeric formats (decimal, floating-point).

Starting in 2015, a Cloud computing version of CCS was introduced and is part of the suite TI Cloud Tools,^[8] which also hosts Resource Explorer^[9] and Pinmux.^[10]

Versions

Code Composer

4.10 (latest version in 2001). Supported all TMS320 DSPs at that time: C2x, C24x, C3x, C4x, C5x, C54x and C6x. The version for C3x/C4x is still sold by Texas Instruments' partner Spectrum Digital.^[11] Support varied through the years, initially Windows 95, NT4 and 98, with the latest release supporting 2000 and XP.

Code Composer Studio

- 1.x (1999). General release that dropped support for C2x, C3x, C4x and C5x DSPs. v1.3 added support for ARM.^[12] Supports Windows 95, 98, 98SE, NT4 and 2000, as well as Sun Solaris 2.6, 2.7 and 8.
- 2.0 (2001). General release that added support for the upcoming C55x and C64x DSPs. Across the years it added support for TMS470 ARM7 (2.10), OMAP ARM9 plus C55x DSP (2.10) and C2x DSPs (2.12). Supports Windows 98SE, Me, 2000 and XP.
- 3.0 (2005). Limited release that supported only C62x, C64x and C67x DSPs. Supports Windows 2000 and XP.
- 3.1 (2005). General release. Supports Windows 2000 and XP.
- 3.2 (2006). Limited release that supported only the new C64x+ DSPs. Supports Windows 2000 and XP.
- 3.3 (2006). General release that supported all device families, and across the years it added support for OMAP Cortex A8 plus C64x+ DSP, TMS570 (ARM Cortex R4), C672x and C674x DSPs (3.3.82). A limited version for C24x DSPs only is still sold by TI.^[13] Supports Windows 2000 and XP.
- 4.0 (2009). General release based on a modified version of Eclipse 3.2. Dropped support for C24x DSPs and added support for MSP430, Stellaris (ARM Cortex M3) and DaVinci devices. Adds support for SYSBIOS and its updated debug components (ROV, Execution Graph) while keeping support for DSP/BIOS legacy debug components (RTA, LOG_Printf). Supports Windows XP, Vista and 7. Release 4.2 introduced the Grace plug-in and SYSBIOS for MSP430 devices.
- 5.0 (2010). General release that uses an unmodified version of Eclipse 3.6 and later 3.7. It was hosted also in Linux. Added support for C66x DSPs, Sitara (ARM9 and Cortex A8) and Tiva (ARM Cortex M4) devices. Supports Windows XP and 7. Release 5.3 implements a completely reworked Trace interface as well as version 2.0 of Grace.
- 6.0 (2014). General release that uses an unmodified version of Eclipse 4.3. Added support for CC26x and CC32x wireless microcontrollers. Dropped support for C54x DSPs. Supports Windows XP, 7 and 8.x.
- 6.1 (2015). General release that uses an unmodified version of Eclipse 4.4. Introduced beta support for Mac OS X. Added support for CC25x and MSP432 (the introductory Mac version supports only MSP devices). Supports Windows XP, 7 and 8.x.
- 6.1.1 Added support for SimpleLink™ CC26xx and CC13xx MCU platform of devices. Added support for automatic firmware update for XDS110. Added OS X platform support for CCS for MCU devices (Beta). Improved EnergyTrace tool for profiling application's energy consumption, battery lifetime, monitoring internal device states and determining execution hotspots (statistical function profile).
- 6.1.2 Bug fixes. First OS X released to the public in Beta. Last version that supports the Grace plug-in.

- 6.1.3 Integration with Eclipse v4.5.1 and CDT 8.7. Added support for OS X for MCU devices. Support for GCC for MSP430. Improved Cortex A15 SM debug support. Improved EnergyTrace tool for profiling application's energy consumption, battery lifetime, monitoring internal device states and determining execution hotspots (statistical function profile).
- 6.2.0 (2016). First 64-bit version for Linux (Windows still 32-bit). Beta release of the online Resource Explorer.
- 7.0.0 (2016). Integration with Eclipse 4.6 with CDT 9.0 and JRE 8. First release that is free of charge and without limitations for all devices and Debug Probes. Production release of the online Resource Explorer. Dropped support for Windows XP and the Stellaris devices.
- 7.1.0 (2016). Bug fixes. Added support for EnergyTrace HDR (High Dynamic Range) for Simplelink MCUs. Beta version of ROV2.
- 7.2.0 (2017). Bug fixes. Production version of ROV2.
- 7.3.0 (2017). Bug fixes.
- 7.4.0 (2017). Bug fixes and other updates including device support.
- 8.1.0 (2018). Bug fixes.

CCS Cloud1.0 (2015). General release that adds support for all MSP430, MSP432 and Tiva C device families.

- 1.1 (2015). General release that adds debug capabilities for all devices above. Added CC2650 device support.
- 1.6 (2017). General release with bug fixes.

JTAG Debug probe support

Historically CCS supported only JTAG debug probes from TI - also called XDS emulators.^[16] The XDS510-class and the more advanced XDS560-class emulators are supported across all releases, but the new low-cost XDS100-class emulator started to be supported starting with the latest patches to release 3.3.^[17]

Releases 4.x added support for an updated design of the existing XDS100-class emulator (called XDS100v2) and, in release 4.2, added support for an updated design of the XDS560-class emulator (called XDS560v2).^{[17][18]}

Release 5.2 added support for the new XDS200-class emulators.^[19]

Up until release 4.x, CCS supported only XDS emulators. With the integration of MSP430 and Stellaris microcontrollers, support was added for their respective JTAG debug probes: MSP-FET430 (both parallel and USB versions) and ICDI.^[18]

Release 5.x also saw the introduction of Beta support for Jlink JTAG debug probes from Segger.^[20]

Release 6.0.x saw the introduction of the new MSP-FET debug probe for MSP430 devices^[21] and the new XDS200-class^[22] of debug probes for processors.

Release 6.1.x saw the introduction of the new XDS110-class^[23] of debug probes for processors. It also saw the migration to full production support for Jlink JTAG debug probes from Segger.^[20]

Release 7.x saw the integration of Jlink JTAG debug probes from Segger^[20] directly in the CCS installer. It is also the first release to support the standalone version of XDS110.^[23]

64-bit releases do not support Spectrum Digital XDS510USB JTAG debuggers.