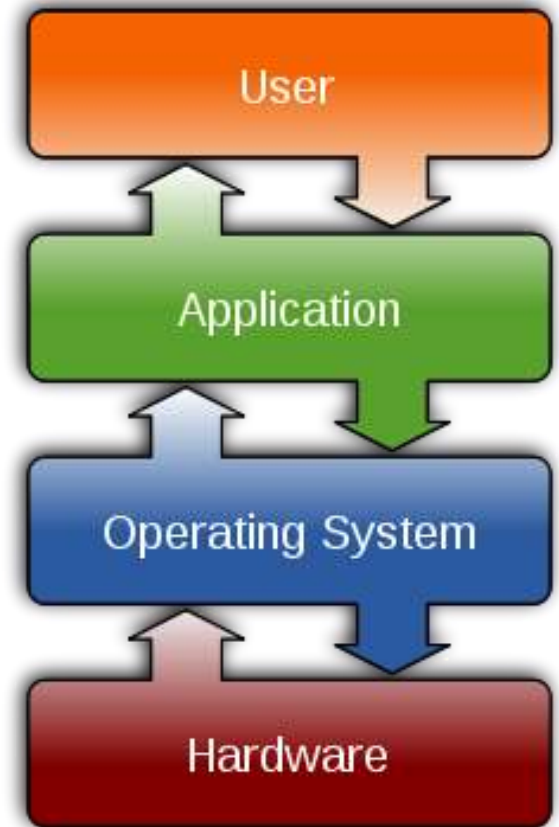


Introduction to CCSv5

Outline

◆ Intro to CCSv5

- ◆ Functional Overview
- ◆ Perspectives
- ◆ Projects
- ◆ Target Configuration
- ◆ Build Config & Options
- ◆ Licensing/Pricing
- ◆ CCSv5 – For More Info...

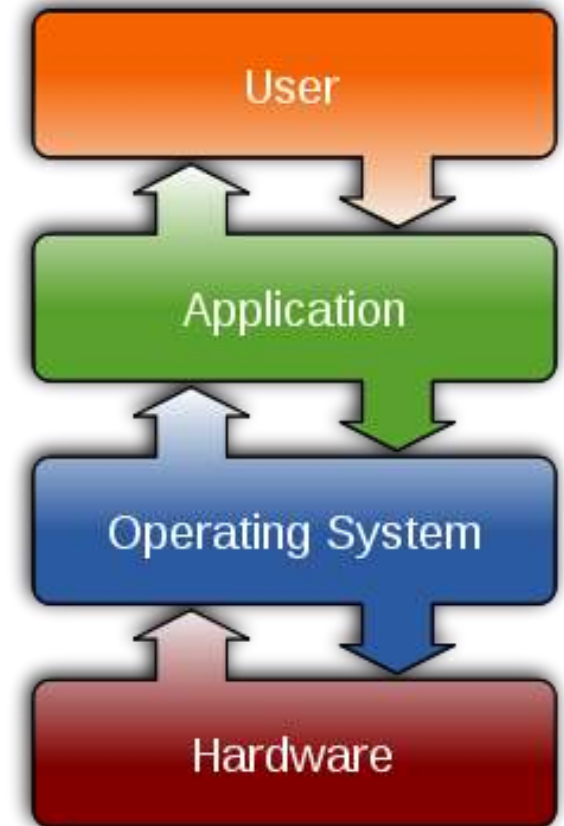


Outline

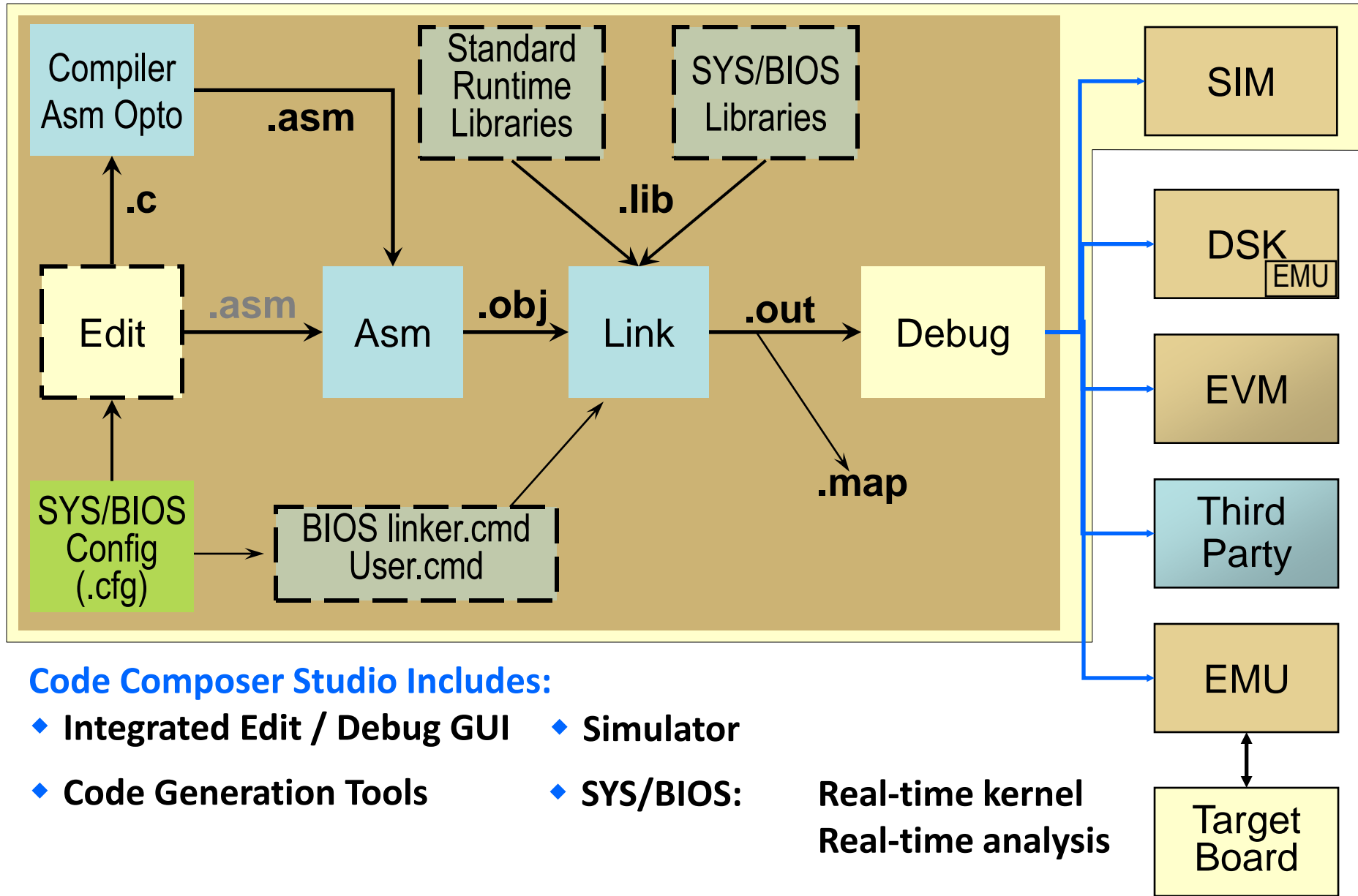
◆ Intro to CCSv5

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CCS Functional Overview



CCSv5 “GUI” Environment – Space Saving

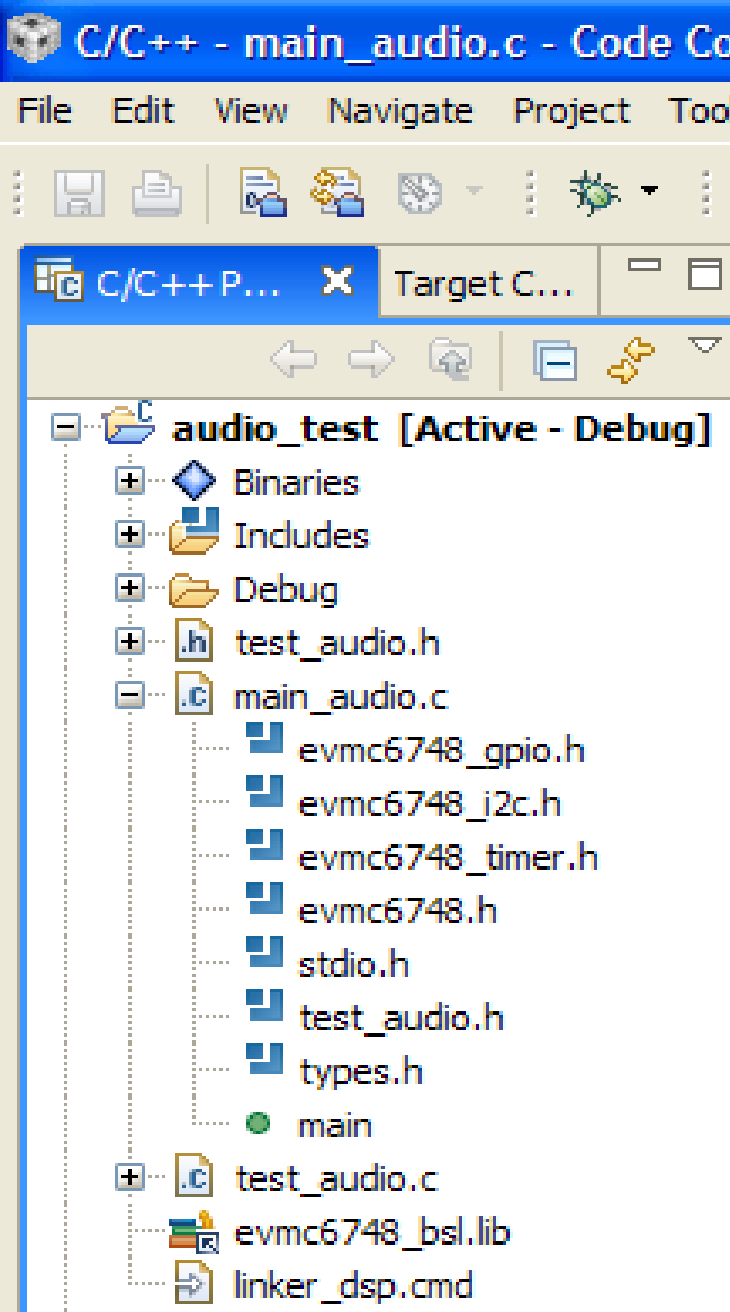
The screenshot displays the Code Composer Studio (CCSv5) interface. The top menu bar includes File, Edit, Refactor, Navigate, Search, Project, Target, Tools, Profile, Run, Scope, Window, and Help. The toolbar contains various icons for file operations, debugging, and development. The main workspace is divided into several panes:

- Left Pane:** Shows the project hierarchy for 'HelloDA830 [Debug] - DA830'. It includes a 'Device' section with 'Thread [main] (Suspended)' and a list of threads: '0 main() at main.c:4 0x118056e0' and '1 c_int00() at boot.c:27 0x118055ac'. Below this is the 'DA830 Device Cycle Accurate Simulator/TMS320C6400'.
- Editor:** Displays the source code for 'main.c'. The code includes `<stdio.h>` and `"main.h"`. The `main` function calls `john(1)` and `john(0)`. The `john` function is defined with a `flag` parameter, printing "hello world\n" if `flag == 1`, and calling `rocks()` otherwise.
- Right Pane:** Shows the 'Disassembly' view. It displays assembly instructions with addresses, hex values, and mnemonics. For example, `0x118056e8: 011B CALLP.S2 john (PC+16)` and `0x118056ea: 0626 MVK.L1 0,A4`. The 'Memory' view is also visible, showing the same data.
- Bottom Pane:** Contains the 'Console' and 'Scripting Console'. The 'Console' shows the output of the program, including 'Initializing (Completed)'. The 'Scripting Console' shows the command prompt `js:> |`.

Annotations highlight the following features:

- Customize toolbars & menus:** A yellow callout box pointing to the toolbar and menu bar.
- Perspectives contain separate window arrangements depending on what you are doing:** A yellow callout box pointing to the 'Debug' button in the toolbar.
- Tabbed editor windows:** A green callout box pointing to the 'main.c' tab in the editor.
- Tab data displays together to save space:** A green callout box pointing to the 'Disassembly' and 'Memory' tabs in the right pane.
- Fast view windows don't display until you click on them:** A yellow callout box pointing to the 'Console' and 'Scripting Console' tabs in the bottom pane.

CCSv5 (Eclipse) Benefits



◆ Eclipse Open Source Framework

- Managed make files (gMake scripting)
- Industry momentum (leverage work of others)
- Cross-platform support (Windows/Linux – 5.x)
- Plug-ins – use available or create your own

◆ Project Management

- Version control plug-ins (e.g. ClearCase)
- BIOS/CGT version PER PROJECT

◆ Licensing (free tools, floating license)

◆ Updates available via internet

Outline

◆ Intro to CCSv5

◆ Functional Overview

◆ Perspectives

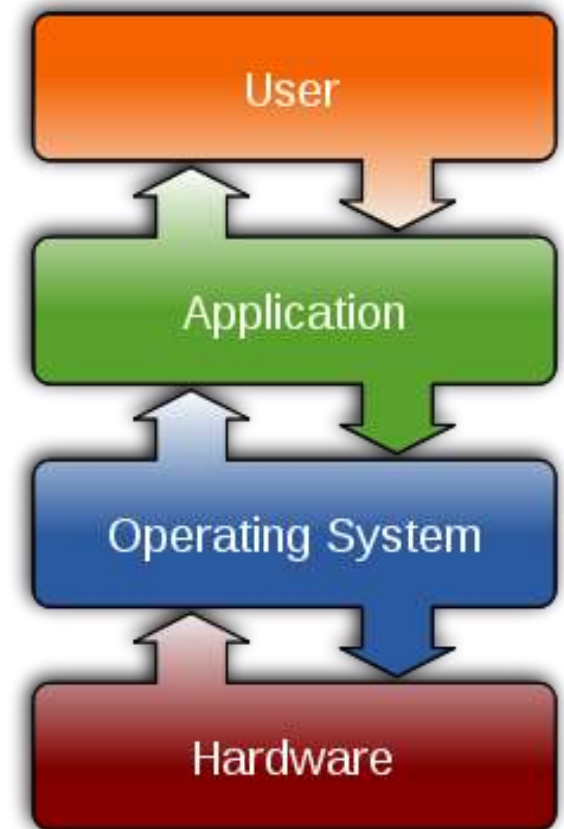
◆ Projects

◆ Target Configuration

◆ Build Config & Options

◆ Licensing/Pricing

◆ CCSv5 – For More Info...

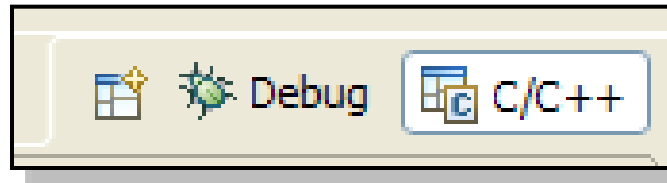


Perspectives

- ◆ **Perspectives** – a set of windows, views and menus that correspond to a specific set of tasks
- ◆ Two **default perspectives** are provided with CCSv5:

Debug

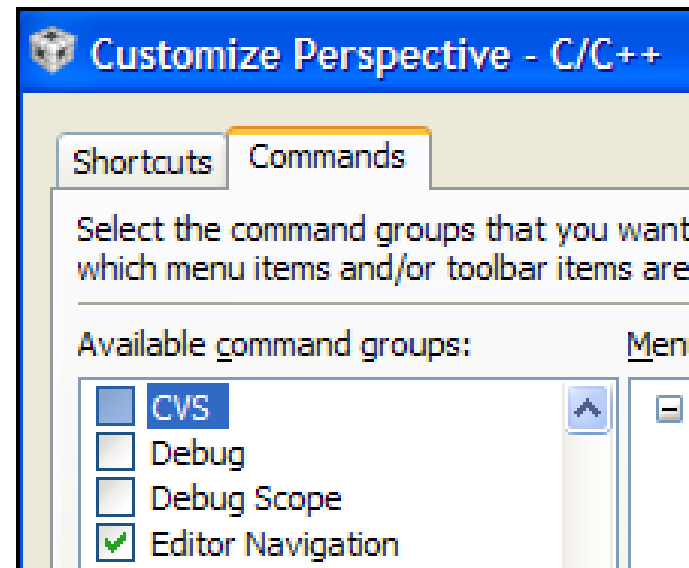
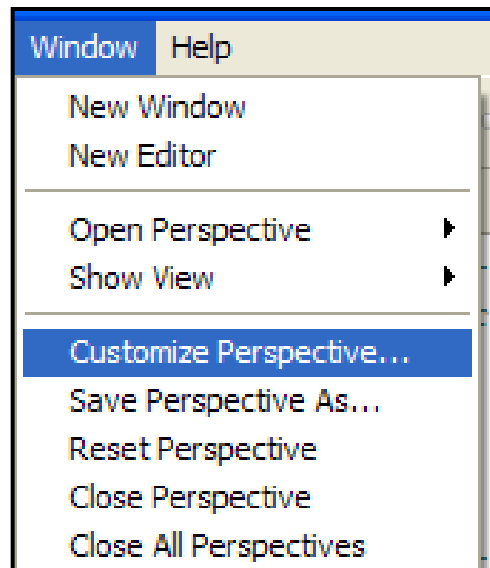
- Debug Views
- Watch/Memory
- Graphs, etc.



C/C++

- Code Dev't Views
- Project Contents
- Editor

- ◆ Users can **customize perspectives** and save them:



Outline

◆ Intro to CCSv5

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- ◆ Perspectives

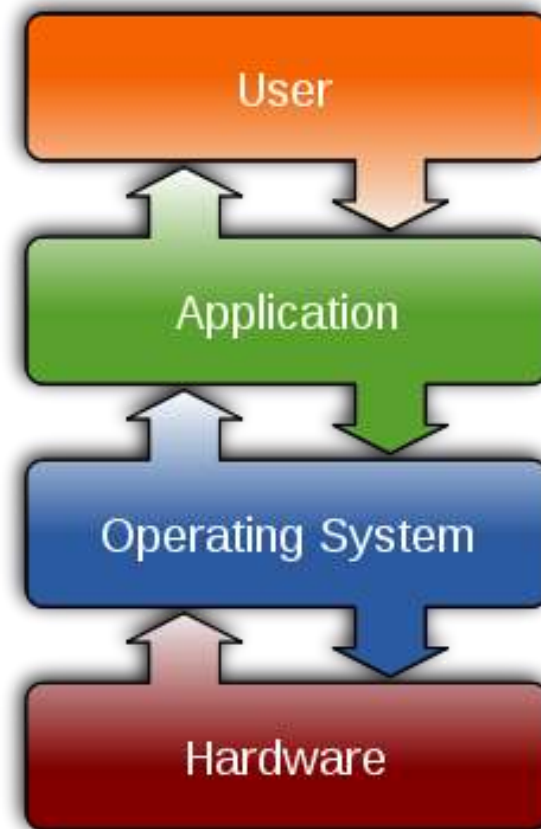
- ◆ Projects

- ◆ Target Configuration

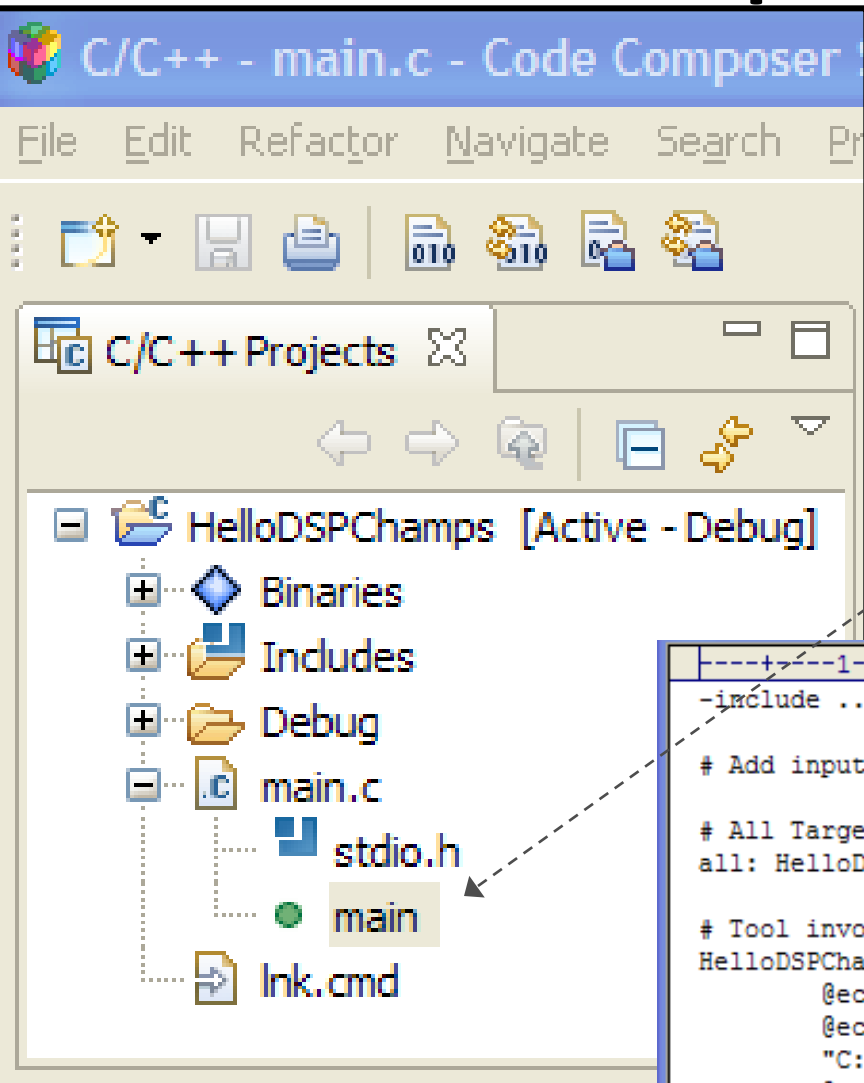
- ◆ Build Config & Options

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Eclipse “Projects”



- ◆ CCSv5 is PROJECT-centric
- ◆ Eclipse uses managed makefiles as their build scripts – as opposed to *pjt* files
- ◆ Eclipse projects are folder based
 - ◆ “Adding file” copies it to folder
 - ◆ “Linking file” references original file
 - ◆ Project explorer shows folder contents
- ◆ Project explorer lists functions

How do we create
a NEW project?

A screenshot of a makefile in the Eclipse IDE. The makefile content is as follows:

```
-include ../makefile.defs

# Add inputs and outputs from these tool invocations to the build variables

# All Target
all: HelloDSPChamps.out

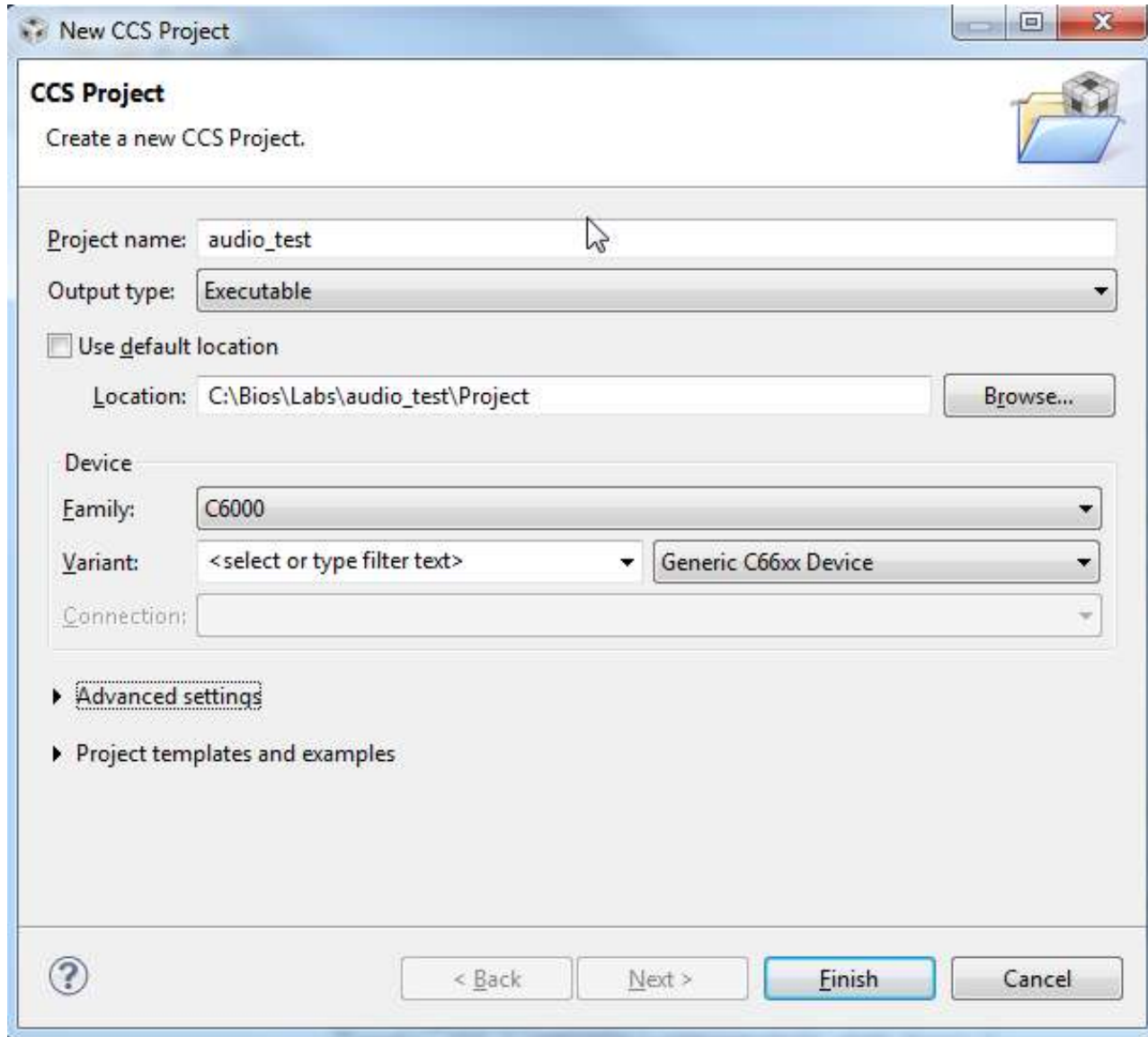
# Tool invocations
HelloDSPChamps.out: $(GEN_CMDS) $(CMD_SRCS) $(OBJS)
    @echo 'Building target: $@'
    @echo 'Invoking: C6000 Linker v6.1'
    "C:/texas_instruments/ccsv4/tools/compiler/C6000/bin/cl6x" -z --rom_m
    @echo 'Finished building target: $@'
    @echo ' '

# Other Targets
clean:
    -$(RM) $(S62_DEPS) $(ASM_DEPS) $(C55_DEPS) $(C6000_EXECUTABLE_OUTPUTS) $(
```

The text "make file" is written in blue above the code. A dashed arrow points from the 'main' file in the project explorer to the 'make file' text.

Creating a New Project (1)

File → New → CCS Project (in C++ perspective)



The screenshot shows the 'New CCS Project' dialog box. The title bar reads 'New CCS Project'. The main heading is 'CCS Project' with the instruction 'Create a new CCS Project.' and a folder icon. The 'Project name' field contains 'audio_test'. The 'Output type' dropdown is set to 'Executable'. There is an unchecked checkbox for 'Use default location'. The 'Location' field shows 'C:\Bios\Labs\audio_test\Project' with a 'Browse...' button. Under the 'Device' section, 'Family' is 'C6000', 'Variant' is '<select or type filter text>' with a dropdown showing 'Generic C66xx Device', and 'Connection' is empty. At the bottom, there are expandable sections for 'Advanced settings' and 'Project templates and examples'. The bottom bar contains a help icon, '< Back', 'Next >', 'Finish', and 'Cancel' buttons.

New CCS Project

Create a new CCS Project.

Project name: audio_test

Output type: Executable

☐ Use default location

Location: C:\Bios\Labs\audio_test\Project Browse...

Device

Family: C6000

Variant: <select or type filter text> Generic C66xx Device

Connection:

▶ Advanced settings

▶ Project templates and examples

? < Back Next > Finish Cancel

Creating a New Project (2)

New CCS Project

CCS Project
Create a new CCS Project.

Project name:

Output type:

☐ Use default location

Location:

Device

Family:

Variant:

Connection:

Advanced settings

Device endianness:

Compiler version:

Output format:

Linker command file:

Runtime support library:

Project templates and examples

Creating a New Project (3)

New CCS Project

Create a new CCS Project.

Project name:

Output type:

☐ Use default location

Location:

Device

Family:

Variant:

Connection:

▶ Advanced settings

▼ Project templates and examples

type filter text

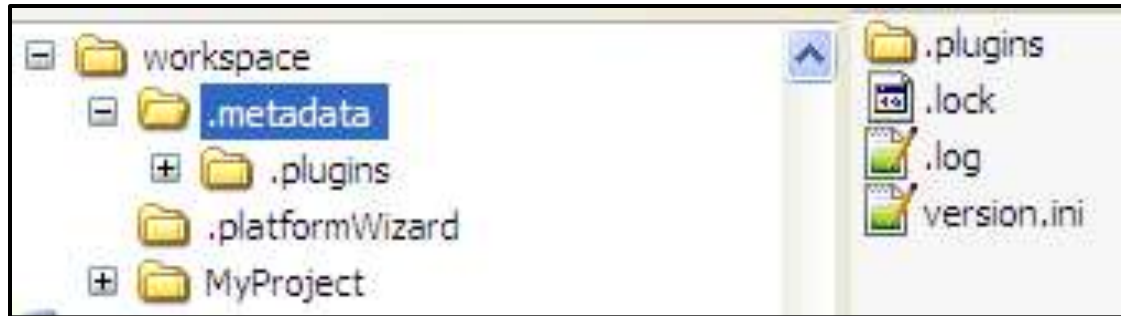
- ▶ IPC and I/O Examples
- ▶ Multicore System Analyzer (UIA)
- ▶ **SYS/BIOS**
 - Minimal**
 - Typical
 - Typical (with separate config project)
- ▶ Generic Examples

This example has a fairly minimal .cfg which is set up for a static application where all objects are defined statically (via configuration tool and/or target structures). Dynamic memory allocation has been disabled. The .cfg file creates a single task which has a couple of print statements and a Task_sleep() call.

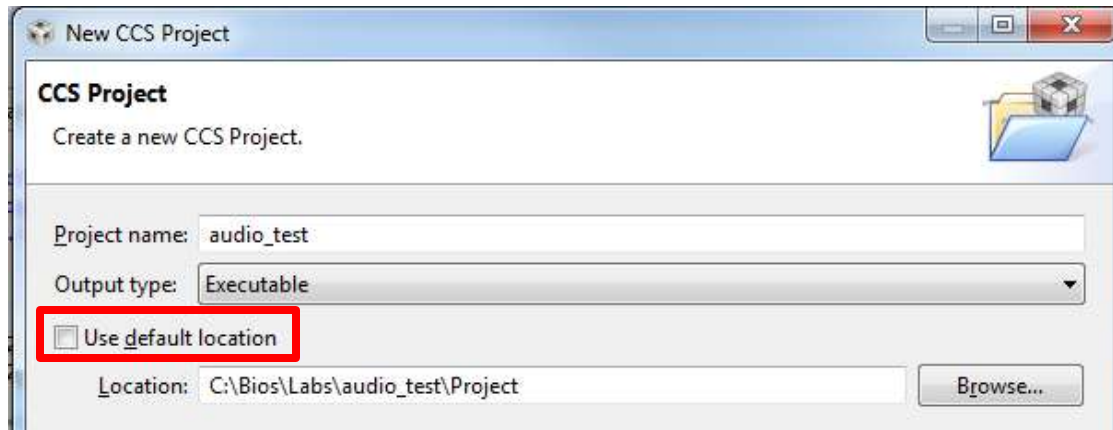
- **Not using SYS/BIOS?**
 - Choose “Empty Project”
- **Using SYS/BIOS?**
 - Choose “Minimal” under SYS/BIOS

Eclipse “Workspace”

- ◆ **Workspace** – A “container” for Eclipse metadata and the default location for all projects
- ◆ **Default Location:** \My Documents\workspace:



- ◆ Can change “default” workspace location if desired
- ◆ User can also locate projects in specific folders:



Outline

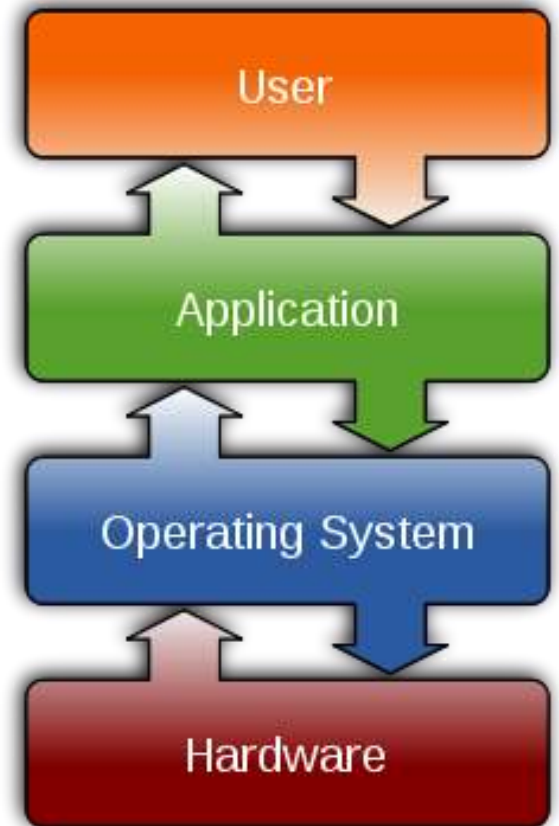
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◆ Target Configuration

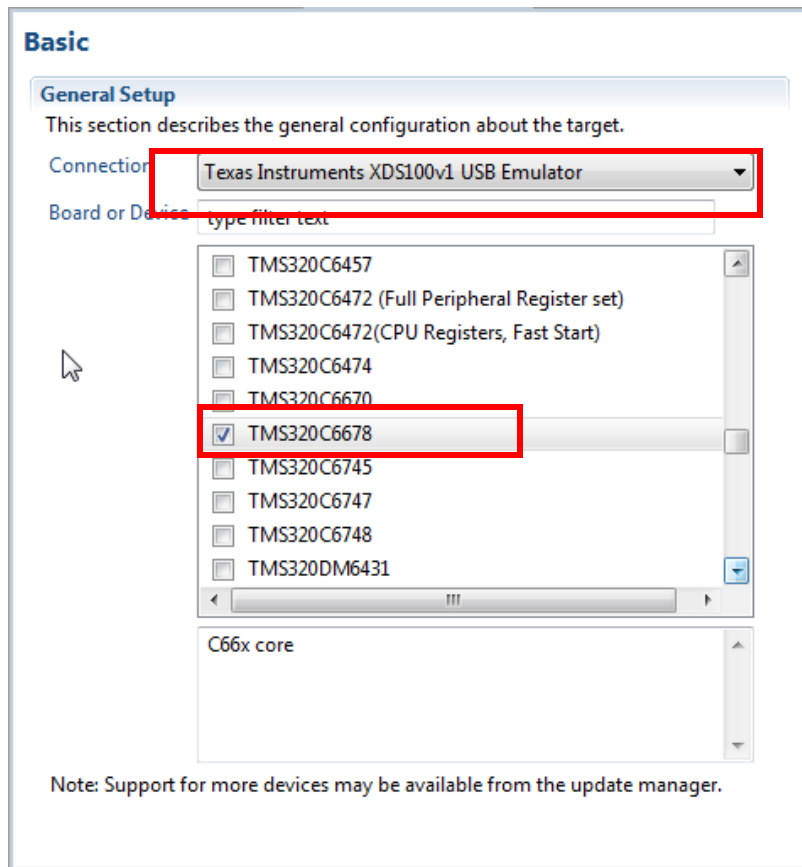
- ◆ Build Config & Options
- ◆ Licensing/Pricing
- ◆ CCSv5 – For More Info...

◆ Intro to SYS/BIOS



Creating a New Target Config File (.ccxml)

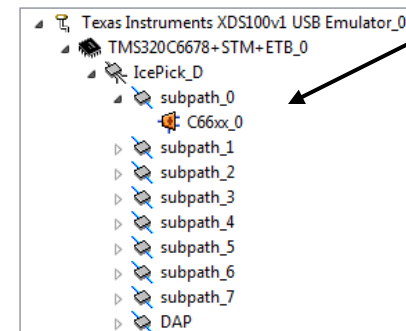
- ◆ **Target Configuration** – defines your “target” – i.e. emulator/device used, GEL scripts (replaces the old CCS Setup)
- ◆ Use on a per-project basis (add to project or create User Defined)



Advanced Tab

Target Configuration

All Connections



Cpu Properties

C66xx CGEM+FP CPU

Set the properties of the selected cpu.

☐ Bypass

initialization script ..\..\emulation\boards\evmc6678\gel\evmc6678l.gel

Browse...

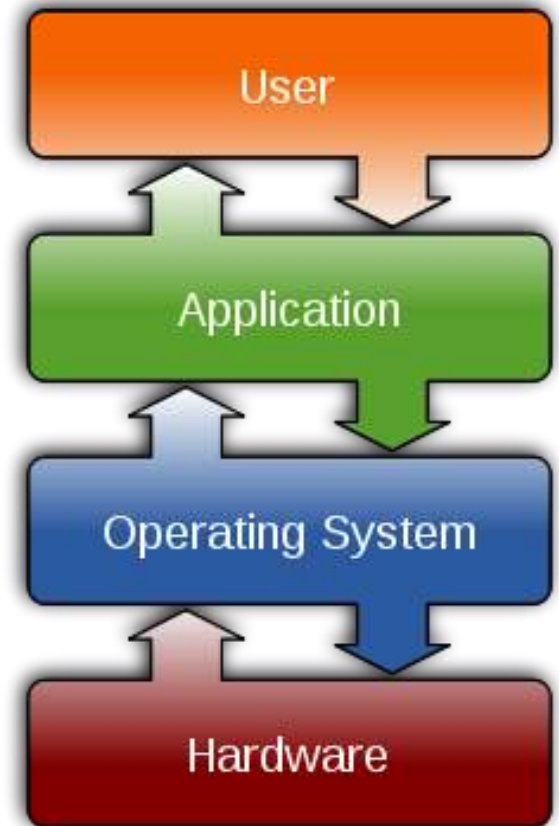
☐ Slave Processor

Specify GEL script here

Outline

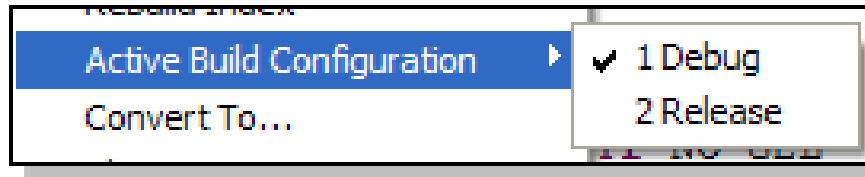
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Two Default Build Configurations

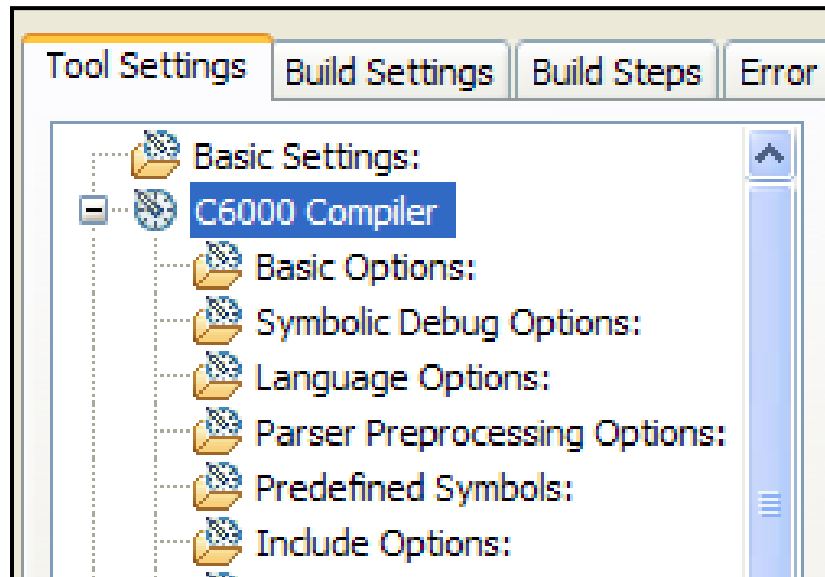
- ◆ **Build Configuration** – a set of build options for the compiler and linker (e.g. optimization levels, include DIRs, debug symbols, etc.)
- ◆ CCSv5 comes std with two DEFAULT build configs: Debug & Release:



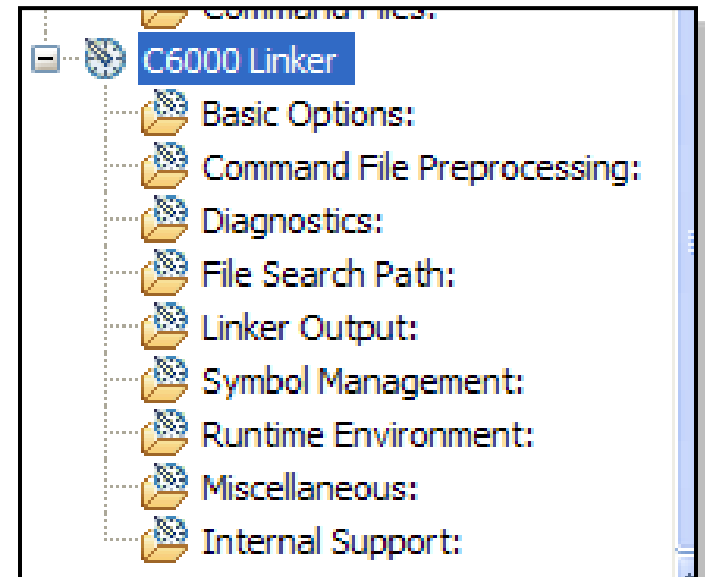
User can create their own config if desired

- ◆ User can modify compiler/linker options via “Build Properties”:

Compiler



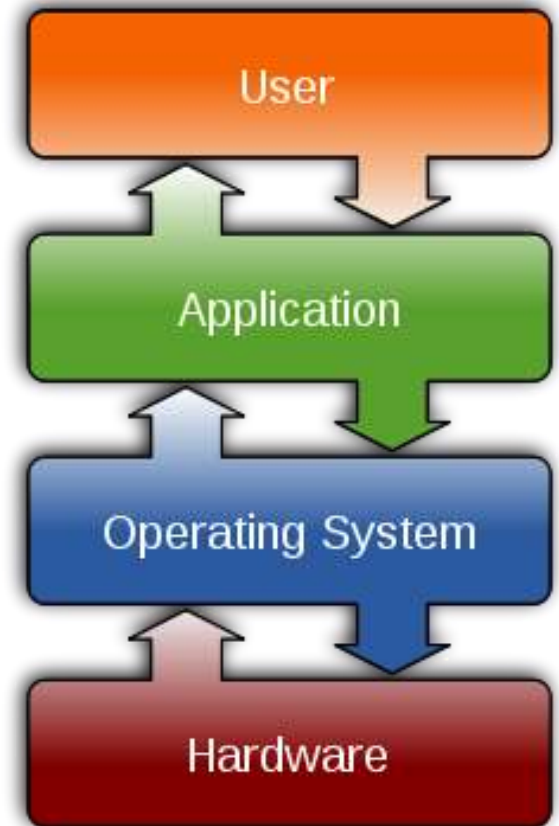
Linker



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CCSv5 Licensing & Pricing

◆ Licensing

- Wide variety of options (node locked, floating, time based...)
- All versions (full, DSK, free tools) use same image
- Updates readily available via the internet

◆ Pricing

- Reasonable pricing – includes FREE options noted below



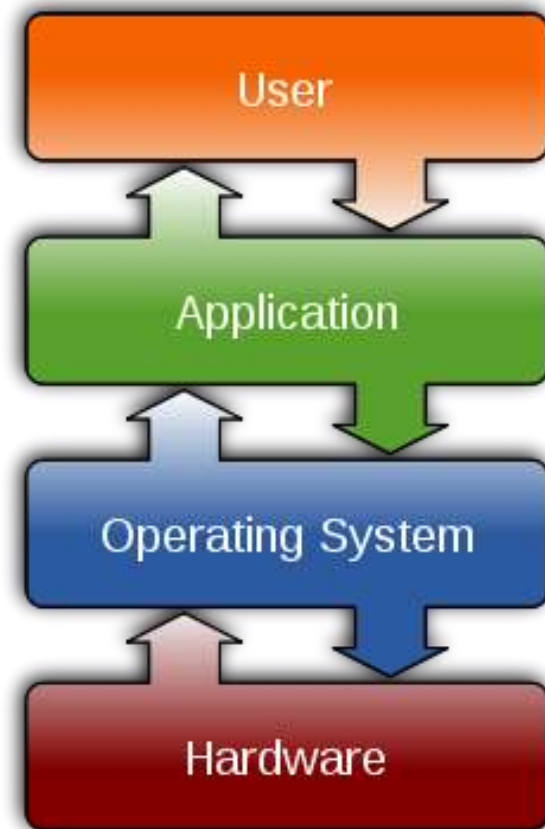
Item	Description	Price
Platinum Eval Tools	Full tools with 30 day limit (all EMU)	FREE
Platinum Bundle	EVM, sim, XDS100 use	FREE ☺
Platinum Node Locked	Full tools tied to a machine	\$495 (1)
Platinum Floating	Full tools shared across machines	\$795 (1)
Microcontroller Core	MSP/C2000 code size limited	FREE
Microcontroller Node Locked	MSP/C2000	\$445

☺ - Recommended Option: purchase Dev Kit, use XDS100v1-2, & Free CCSv5

Outline

◆ Intro to CCSv5

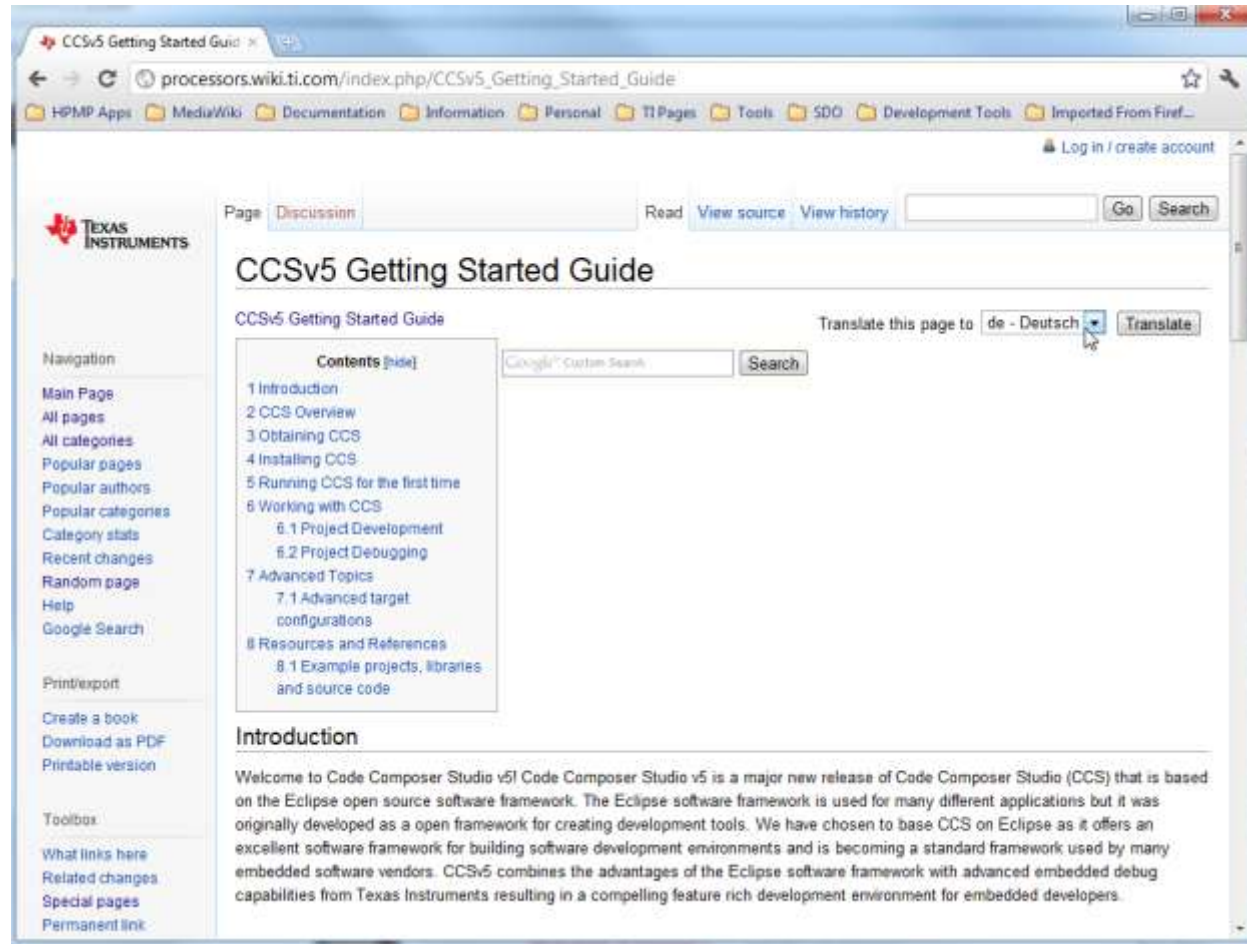
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CCSv5 – For More Information

Links for:

- Downloading CCSv5
- Installation Help
- Licensing
- Tutorials
- BIOS Projects
- ETC.



Questions?