FAQ0115

Frequently Asked Questions

Application notes on use of AC6 compiler

Questions:

One of the following circumstances may happen during the use of ARM Compiler version 6 (AC6)

- Scenario: code execution speed slows down
- Scenario: many more stacks are needed
- Scenario: Failure to run offline
- Scenario: Failure to print via printif

Answer:

- Scenario: Code run at a slower speed

The possible reason is that the user selected AC5 default optimization level (-O0) rather than AC6 default optimization level (–Oz image size).

Solution: select AC6 default optimization level (-Oz image size).

- Scenario 2: Many more stacks are needed

When AC6 compiler's –O0 level is used, n-level conditional expression may require a huge amount of stacks.

Solution: use an optimization level other than –O0.

- Scenario 3: Failure to run offline

When AC6 compiler's –O0 level is used without checking "Microlab" option, it is likely to cause offline run failure (it can be used in debugging mode but it would fail after unplugging downloader)

Solution: Check the "Microlab" option.

- Scenario 4: Printf failed to work

AC6 compiler differs from AC5 in terms of printf initialization.

Solution: See the following printf example based on AT32 BSP

Note: The latest BSP version on ARTERY's official website has no such problem.

Printf is located: \project\at32f403a_407_board\at32f403a_407_board.c

Find ***at32_board.c*** (it is located in BSP \project\at_start_f403a\examples\usart\printf). Original code is as follows:

```
/* Support printf function, useMicroLib is unnecessary */
#ifdef __CC_ARM
  #pragma import(__use_no_semihosting)
  struct __FILE
  {
    int handle;
  };

  FILE __stdout;

  void _sys_exit(int x)
  {
    x = x;
  }
#endif

#ifdef __GNUC__
  /* With GCC/RAISONANCE, small printf (option LD Linker->Libraries->Small printf
     set to 'Yes') calls __io_putchar() */
  #define PUTCHAR_PROTOTYPE int __io_putchar(int ch)
#else
  #define PUTCHAR_PROTOTYPE int fputc(int ch, FILE *f)
    #endif /* __GNUC__ */
```

Changed code is as follows. This is to enable normal use of printf on both AC5, AC6 compilers.

```
/* suport printf function, usemicrolib is unnecessary */
#if (__ARMCC_VERSION > 6000000)
  __asm (".global __use_no_semihosting\n\t");
  void _sys_exit(int x)
  {
    x = x;
  }
  /* __use_no_semihosting was requested, but _ttywrch was */
  void _ttywrch(int ch)
  {
    ch = ch;
  }
  FILE __stdout;
#else
 #ifdef __CC_ARM
  #pragma import(__use_no_semihosting)
  struct __FILE
  {
    int handle;
  };
  FILE __stdout;
  void _sys_exit(int x)
  {
    x = x;
  }
 #endif
#endif


#if defined ( __GNUC__ ) && !defined (__clang__)
```

```
    #define PUTCHAR_PROTOTYPE int __io_putchar(int ch)
#else
    #define PUTCHAR_PROTOTYPE int fputc(int ch, FILE *f)
#endif
```

Type: MCU application
Applicable products: AT32 Family
Main function: AC6 compiler
Other function: None

Document revision history

Date	Revision	Changes
2022.3.2	2.0.0	Initial release

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