AN13690

Enable More USB Examples on M4 Core for RT1170

Rev. 2 — 11 July 2022 Application note

Document information

Information	Content
Keywords	AN13690, USB Examples, M4 Core, RT1170, M4 Core for RT1170
Abstract	This document describes how to migrate USB examples from M7 to M4 with different toolchains.

1 Introduction

RT1170 works with M7 and M4, on which all USB examples can run. However, all USB examples in the release package are enabled on M7. Only example `host_hid_mouse` and `dev_hid_mouse` are enabled on M4. Since USB projects on both cores share the same demo source files but with different project settings, examples are migratable.

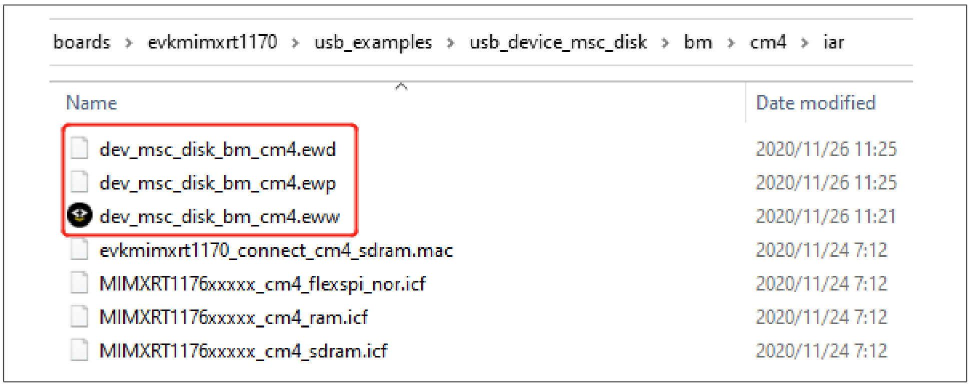
This document describes how to migrate USB examples from M7 to M4 with different toolchains. There are four main steps required:

1. Create an M4 project.
2. Rearrange source files.
3. Rearrange project files.
4. Adjust project settings.

This document takes the `dev_msc_disk_bm` as an example to show how to enable USB examples on M4 core with IAR, MDK, ARMGCC, and MCUXpresso IDE.

2 IAR

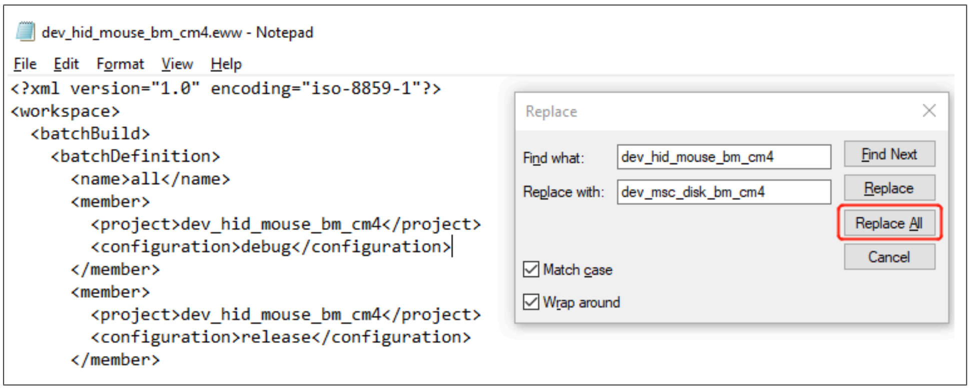
1. **Create an M4 project**
   a. Copy the *cm4* folder under *<install_dir>/boards/evkmimxrt1170/usb_examples/usb_device_hid_mouse/bm/cm4* to the folder where the example must be enabled.
   In this case, copy the *cm4* folder to *<install_dir>/boards/evkmimxrt1170/usb_examples/usb_device_msc_disk/bm*.
   b. Open the *iar* folder under *<install_dir>/boards/evkmimxrt1170/usb_examples/usb_device_msc_disk/bm/cm4/iar*.
   c. Change the filename `dev_hid_mouse_bm_cm4dev_msc_disk_bm_cm4` respectively.



boards > evkmimxrt1170 > usb_examples > usb_device_msc_disk > bm > cm4 > iar

Name	Date modified
dev_msc_disk_bm_cm4.ewd	2020/11/26 11:25
dev_msc_disk_bm_cm4.ewp	2020/11/26 11:25
dev_msc_disk_bm_cm4.eww	2020/11/26 11:21
evkmimxrt1170_connect_cm4_sdram.mac	2020/11/24 7:12
MIMXRT1176xxxxx_cm4_flexspi_nor.icf	2020/11/24 7:12
MIMXRT1176xxxxx_cm4_ram.icf	2020/11/24 7:12
MIMXRT1176xxxxx_cm4_sdram.icf	2020/11/24 7:12

   d. Open the `dev_msc_disk_bm_cm4.eww` and `dev_msc_disk_bm_cm4.ewp` files with a text editor, such as notepad, notepad++, sublime or visual studio code.
   e. Search and replace all `dev_hid_mouse_bm_cm4` with `dev_msc_disk_bm_cm4`, and then save the files.



dev_hid_mouse_bm_cm4.eww - Notepad

```
<?xml version="1.0" encoding="iso-8859-1"?>
<workspace>
  <batchBuild>
    <batchDefinition>
      <name>all</name>
      <member>
        <project>dev_hid_mouse_bm_cm4</project>
        <configuration>debug</configuration>
      </member>
      <member>
        <project>dev_hid_mouse_bm_cm4</project>
        <configuration>release</configuration>
      </member>
```

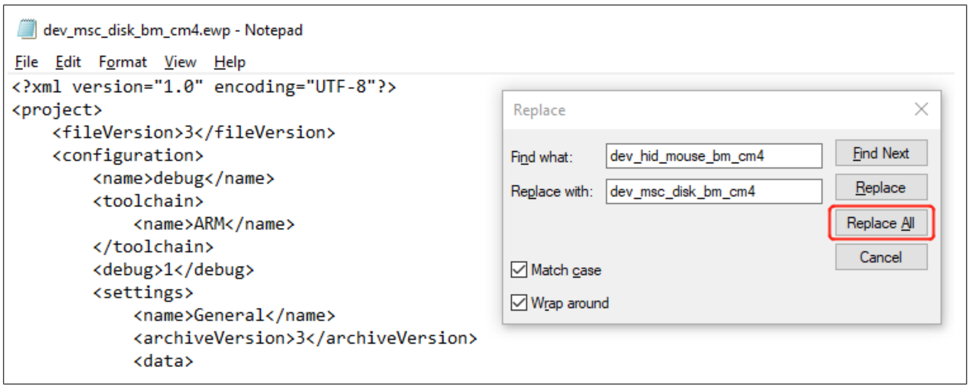
Replace

Find what: dev_hid_mouse_bm_cm4

Replace with: dev_msc_disk_bm_cm4

☑ Match case

☑ Wrap around



dev_msc_disk_bm_cm4.ewp - Notepad

```
<?xml version="1.0" encoding="UTF-8"?>
<project>
    <fileVersion>3</fileVersion>
    <configuration>
        <name>debug</name>
        <toolchain>
            <name>ARM</name>
        </toolchain>
        <debug>1</debug>
        <settings>
            <name>General</name>
            <archiveVersion>3</archiveVersion>
            <data>
```

Replace

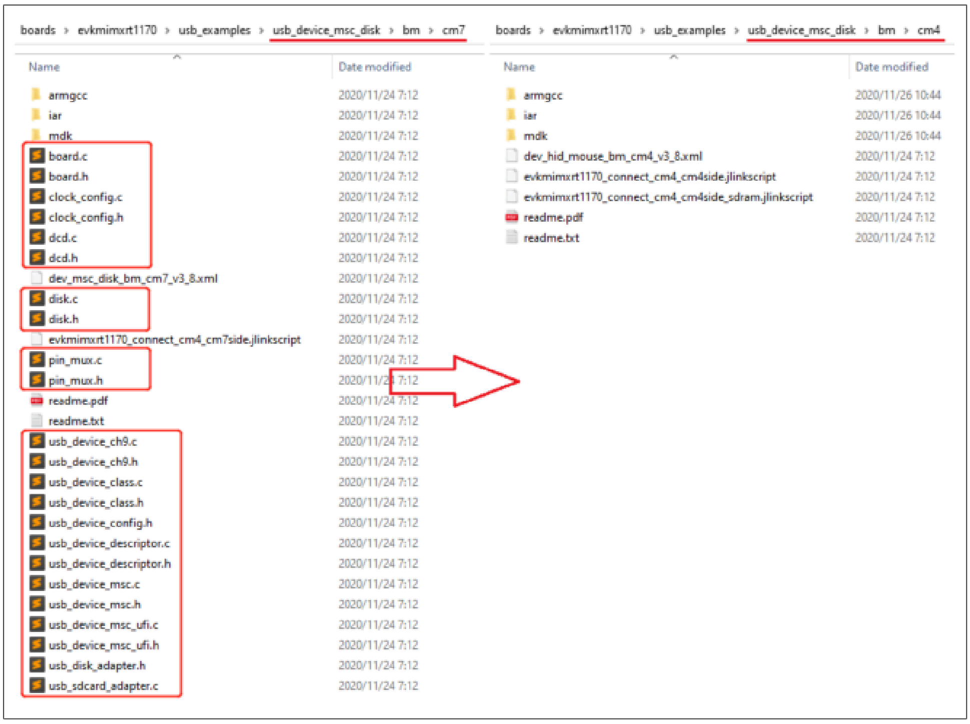
Find what: dev_hid_mouse_bm_cm4

Replace with: dev_msc_disk_bm_cm4

☑ Match case

☑ Wrap around

2. **Rearrange source files**
   a. Open the *cm4* folder under *<install_dir>/boards/evkmimxrt1170/usb_examples/usb_device_msc_disk/bm/cm4*, and delete all files with the `.c` and `.h` extension.
   b. Copy files with the `.c` and `.h` extension in the *cm7* folder under *<install_dir>/boards/evkmimxrt1170/usb_examples/usb_device_msc_disk/bm/cm7* to the *cm4* folder under *<install_dir>/boards/evkmimxrt1170/usb_examples/usb_device_msc_disk/bm/cm4*.



boards › evkmimxrt1170 › usb_examples › usb_device_msc_disk › bm › cm7

Name	Date modified
armgcc	2020/11/24 7:12
iar	2020/11/24 7:12
mdk	2020/11/24 7:12
board.c	2020/11/24 7:12
board.h	2020/11/24 7:12
clock_config.c	2020/11/24 7:12
clock_config.h	2020/11/24 7:12
dcd.c	2020/11/24 7:12
dcd.h	2020/11/24 7:12
dev_msc_disk_bm_cm7_v3_8.xml	2020/11/24 7:12
disk.c	2020/11/24 7:12
disk.h	2020/11/24 7:12
evkmimxrt1170_connect_cm4_cm7side.jlinkscript	2020/11/24 7:12
pin_mux.c	2020/11/24 7:12
pin_mux.h	2020/11/24 7:12
readme.pdf	2020/11/24 7:12
readme.txt	2020/11/24 7:12
usb_device_ch9.c	2020/11/24 7:12
usb_device_ch9.h	2020/11/24 7:12
usb_device_class.c	2020/11/24 7:12
usb_device_class.h	2020/11/24 7:12
usb_device_config.h	2020/11/24 7:12
usb_device_descriptor.c	2020/11/24 7:12
usb_device_descriptor.h	2020/11/24 7:12
usb_device_msc.c	2020/11/24 7:12
usb_device_msc.h	2020/11/24 7:12
usb_device_msc_ufi.c	2020/11/24 7:12
usb_device_msc_ufi.h	2020/11/24 7:12
usb_disk_adapter.h	2020/11/24 7:12
usb_sdcard_adapter.c	2020/11/24 7:12

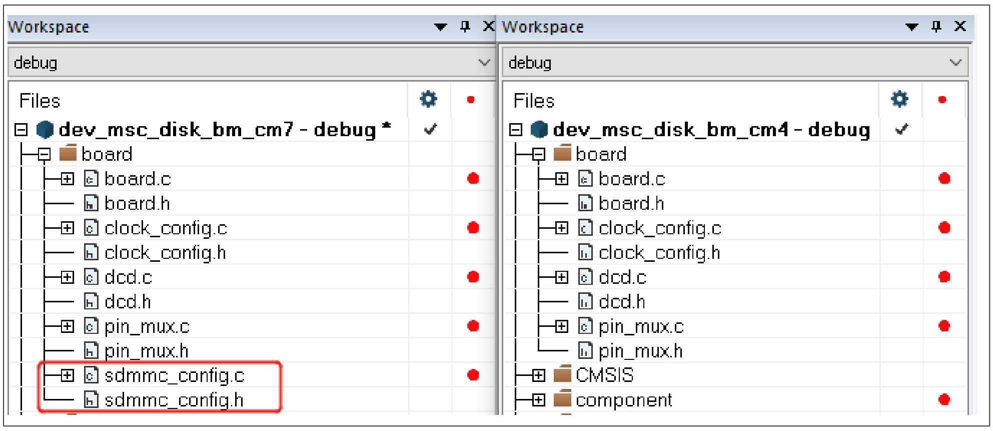
boards › evkmimxrt1170 › usb_examples › usb_device_msc_disk › bm › cm4

Name	Date modified
armgcc	2020/11/26 10:44
iar	2020/11/26 10:44
mdk	2020/11/26 10:44
dev_hid_mouse_bm_cm4_v3_8.xml	2020/11/24 7:12
evkmimxrt1170_connect_cm4_cm4side.jlinkscript	2020/11/24 7:12
evkmimxrt1170_connect_cm4_cm4side_sdram.jlinkscript	2020/11/24 7:12
readme.pdf	2020/11/24 7:12
readme.txt	2020/11/24 7:12

3. **Rearrange project files**
    a. Open `dev_msc_disk_bm_cm7` and `dev_msc_disk_bm_cm4` IAR project respectively. The two workspaces are respectively located under *<install_dir>/boards/evkmimxrt1170/usb_examples/usb_device_msc_disk/bm/cm7/iar* and *<install_dir>/boards/evkmimxrt1170/usb_examples/usb_device_msc_disk/bm/cm4/iar*.
    b. Compare the whole project directory. Find file groups that are in the `cm7` project but not `cm4` and add them to the `cm4` project.
    c. Compare the two groups with the same name. Delete files that are in the `cm4` project but not `cm7`. Find files that are in the `cm7` project but not `cm4` and add them to the `cm4` project.

In this case,

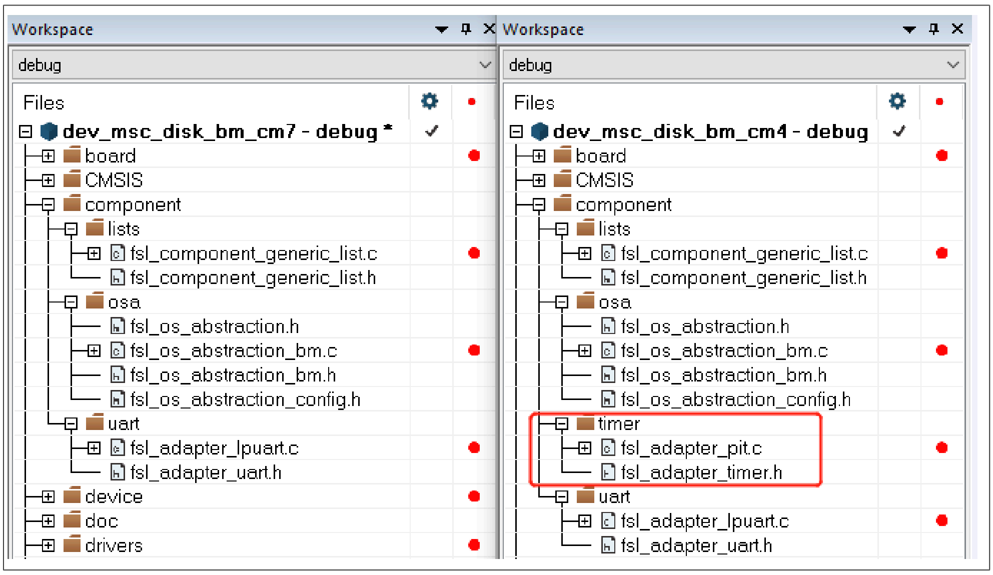
- For the `board` group, add `sdmmc_config` source files to `board` group in the `cm4` project.



```
⊟ dev_msc_disk_bm_cm7 - debug *   ✓
├⊟ board
│ ├⊞ board.c                      ●
│ ├── board.h
│ ├⊞ clock_config.c               ●
│ ├── clock_config.h
│ ├⊞ dcd.c                        ●
│ ├── dcd.h
│ ├⊞ pin_mux.c                    ●
│ ├── pin_mux.h
│ ├⊞ sdmmc_config.c               ●
│ └── sdmmc_config.h
```

```
⊟ dev_msc_disk_bm_cm4 - debug     ✓
├⊟ board
│ ├⊞ board.c                      ●
│ ├── board.h
│ ├⊞ clock_config.c               ●
│ ├── clock_config.h
│ ├⊞ dcd.c                        ●
│ ├── dcd.h
│ ├⊞ pin_mux.c                    ●
│ └── pin_mux.h
├⊞ CMSIS
├⊞ component                      ●
```

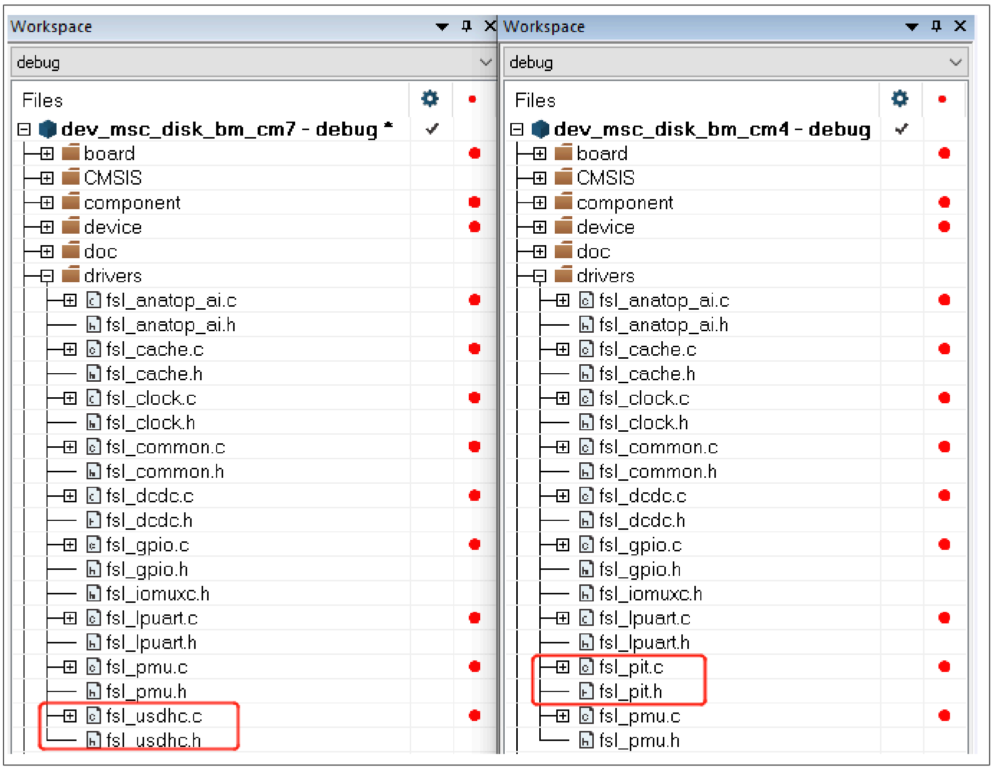
- For the `component` group, delete files associated with timer from `cm4` project and add no files.



```
Workspace
debug
Files
⊟ dev_msc_disk_bm_cm7 - debug *
  ⊞ board
  ⊞ CMSIS
  ⊟ component
    ⊟ lists
      ⊞ fsl_component_generic_list.c
        fsl_component_generic_list.h
    ⊟ osa
        fsl_os_abstraction.h
      ⊞ fsl_os_abstraction_bm.c
        fsl_os_abstraction_bm.h
        fsl_os_abstraction_config.h
    ⊟ uart
      ⊞ fsl_adapter_lpuart.c
        fsl_adapter_uart.h
  ⊞ device
  ⊞ doc
  ⊞ drivers
```

```
Workspace
debug
Files
⊟ dev_msc_disk_bm_cm4 - debug
  ⊞ board
  ⊞ CMSIS
  ⊟ component
    ⊟ lists
      ⊞ fsl_component_generic_list.c
        fsl_component_generic_list.h
    ⊟ osa
        fsl_os_abstraction.h
      ⊞ fsl_os_abstraction_bm.c
        fsl_os_abstraction_bm.h
        fsl_os_abstraction_config.h
    ⊟ timer
      ⊞ fsl_adapter_pit.c
        fsl_adapter_timer.h
    ⊟ uart
      ⊞ fsl_adapter_lpuart.c
        fsl_adapter_uart.h
```

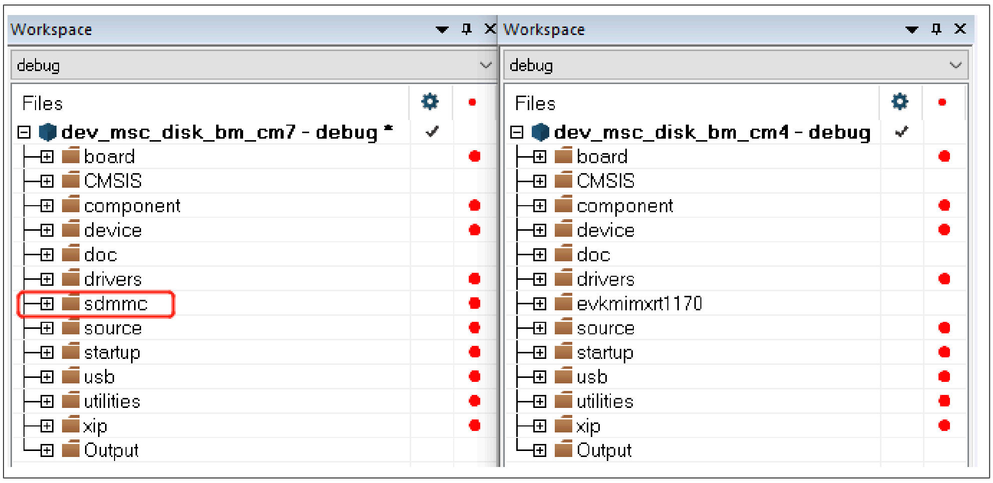
- For the `drivers` group, delete `fsl_pit` source files from the `cm4` project and add `fsl_usdhc` source files to the `cm4` project.



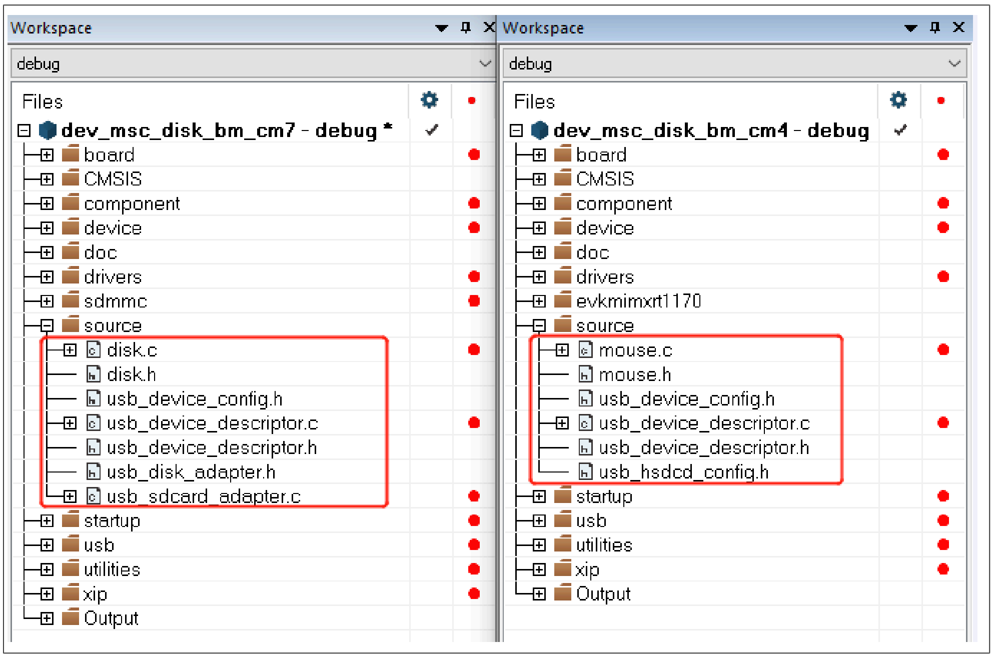
```
Workspace
debug
Files
⊟ dev_msc_disk_bm_cm7 - debug *
  ⊞ board
  ⊞ CMSIS
  ⊞ component
  ⊞ device
  ⊞ doc
  ⊟ drivers
    ⊞ fsl_anatop_ai.c
      fsl_anatop_ai.h
    ⊞ fsl_cache.c
      fsl_cache.h
    ⊞ fsl_clock.c
      fsl_clock.h
    ⊞ fsl_common.c
      fsl_common.h
    ⊞ fsl_dcdc.c
      fsl_dcdc.h
    ⊞ fsl_gpio.c
      fsl_gpio.h
      fsl_iomuxc.h
    ⊞ fsl_lpuart.c
      fsl_lpuart.h
    ⊞ fsl_pmu.c
      fsl_pmu.h
    ⊞ fsl_usdhc.c
      fsl_usdhc.h
```

```
Workspace
debug
Files
⊟ dev_msc_disk_bm_cm4 - debug
  ⊞ board
  ⊞ CMSIS
  ⊞ component
  ⊞ device
  ⊞ doc
  ⊟ drivers
    ⊞ fsl_anatop_ai.c
      fsl_anatop_ai.h
    ⊞ fsl_cache.c
      fsl_cache.h
    ⊞ fsl_clock.c
      fsl_clock.h
    ⊞ fsl_common.c
      fsl_common.h
    ⊞ fsl_dcdc.c
      fsl_dcdc.h
    ⊞ fsl_gpio.c
      fsl_gpio.h
      fsl_iomuxc.h
    ⊞ fsl_lpuart.c
      fsl_lpuart.h
    ⊞ fsl_pit.c
      fsl_pit.h
    ⊞ fsl_pmu.c
      fsl_pmu.h
```

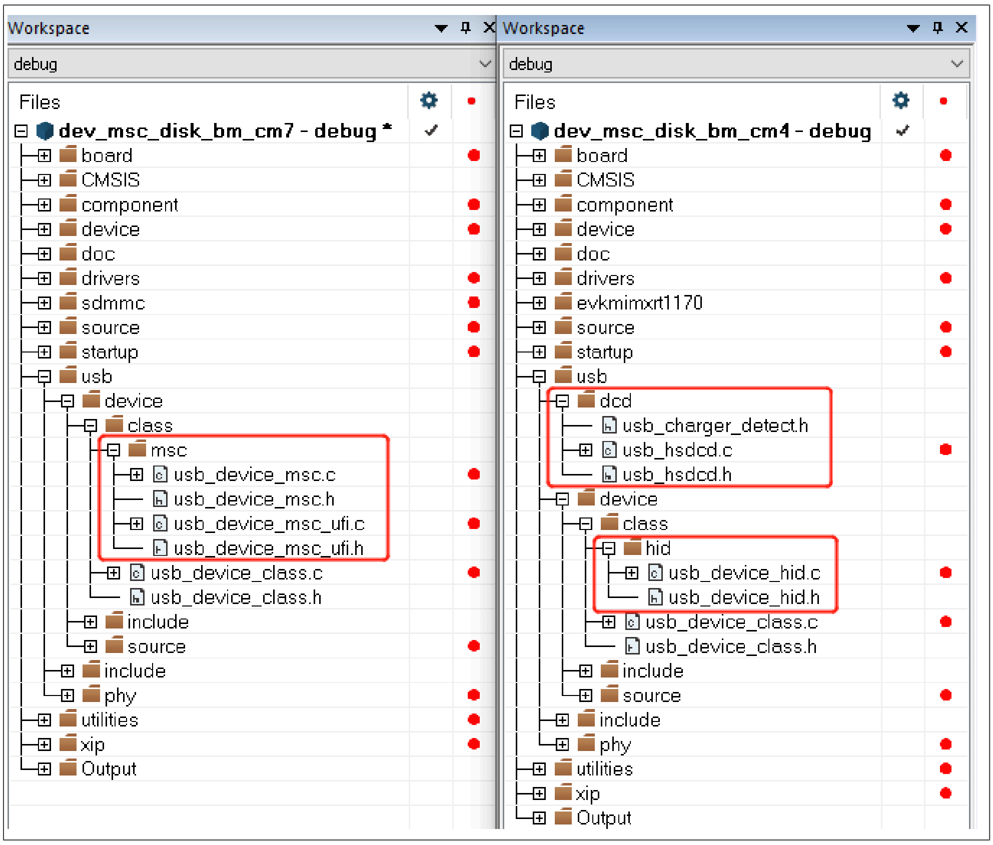
- For the `sdmmc` group, there is not `sdmmc` group in the `cm4` project. Add `sdmmc` group and its children to the `cm4` project.



- For the `source` group, delete the files in the `cm4` source group and add the files under *<install_dir>/boards/evkmimxrt1170/usb_examples/usb_device_msc_disk/bm/cm4* with the same name as in the `cm7` project.



- For the `usb` group, replace the `hid` group and its children in the `cm4` project with `msc` group in the `cm7` project and delete the `dcd` group.

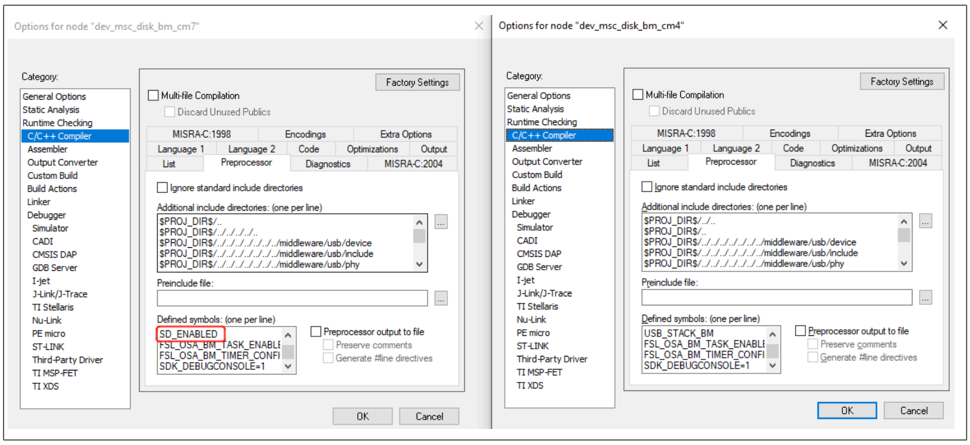


```
dev_msc_disk_bm_cm7 - debug *
├ board
├ CMSIS
├ component
├ device
├ doc
├ drivers
├ sdmmc
├ source
├ startup
├ usb
│ ├ device
│ │ ├ class
│ │ │ ├ msc
│ │ │ │ ├ usb_device_msc.c
│ │ │ │ ├ usb_device_msc.h
│ │ │ │ ├ usb_device_msc_ufi.c
│ │ │ │ └ usb_device_msc_ufi.h
│ │ │ ├ usb_device_class.c
│ │ │ └ usb_device_class.h
│ │ ├ include
│ │ └ source
│ ├ include
│ └ phy
├ utilities
├ xip
└ Output
```

```
dev_msc_disk_bm_cm4 - debug
├ board
├ CMSIS
├ component
├ device
├ doc
├ drivers
├ evkmimxrt1170
├ source
├ startup
├ usb
│ ├ dcd
│ │ ├ usb_charger_detect.h
│ │ ├ usb_hsdcd.c
│ │ └ usb_hsdcd.h
│ ├ device
│ │ ├ class
│ │ │ ├ hid
│ │ │ │ ├ usb_device_hid.c
│ │ │ │ └ usb_device_hid.h
│ │ │ ├ usb_device_class.c
│ │ │ └ usb_device_class.h
│ │ ├ include
│ │ └ source
│ ├ include
│ └ phy
├ utilities
├ xip
└ Output
```

4. **Adjust project settings**

   a. Compare the macro in the project settings: **Option** > **C/C++ compiler** > **Preprocessor**. Add the macro that is in the `cm7` project but not `cm4` to the `cm4` project.
   In this case, add the `SD_ENABLED` macro to the `cm4` project.



dev_msc_disk_bm_cm7:

□ Multi-file Compilation
□ Discard Unused Publics
□ Ignore standard include directories

Additional include directories: (one per line)

```
$PROJ_DIR$/..
$PROJ_DIR$/../../../..
$PROJ_DIR$/../../../../../../middleware/usb/device
$PROJ_DIR$/../../../../../../middleware/usb/include
$PROJ_DIR$/../../../../../../middleware/usb/phy
```

Preinclude file:

Defined symbols: (one per line)

```
SD_ENABLED
FSL_OSA_BM_TASK_ENABLE
FSL_OSA_BM_TIMER_CONFI
SDK_DEBUGCONSOLE=1
```

□ Preprocessor output to file
□ Preserve comments
□ Generate #line directives

dev_msc_disk_bm_cm4:

□ Multi-file Compilation
□ Discard Unused Publics
□ Ignore standard include directories

Additional include directories: (one per line)

```
$PROJ_DIR$/../..
$PROJ_DIR$/..
$PROJ_DIR$/../../../../../../middleware/usb/device
$PROJ_DIR$/../../../../../../middleware/usb/include
$PROJ_DIR$/../../../../../../middleware/usb/phy
```

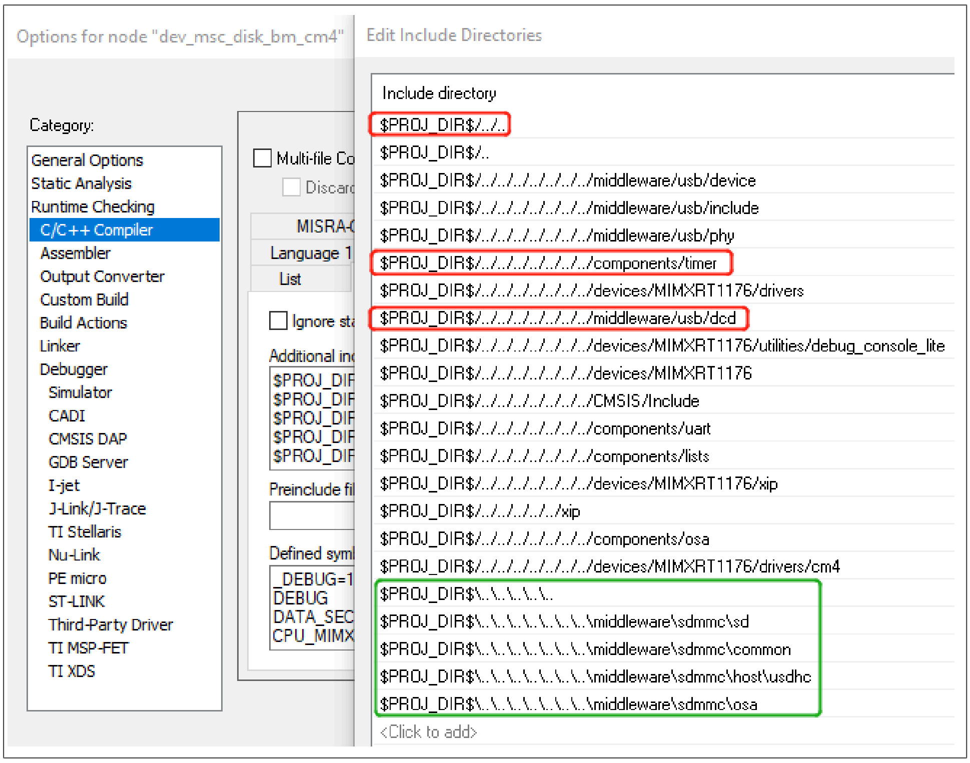
Preinclude file:

Defined symbols: (one per line)

```
USB_STACK_BM
FSL_OSA_BM_TASK_ENABLE
FSL_OSA_BM_TIMER_CONFI
SDK_DEBUGCONSOLE=1
```

□ Preprocessor output to file
□ Preserve comments
□ Generate #line directives

   b. Change the include directories in the project settings, by clicking **Option** > **C/C++ compiler** > **Preprocessor**, according to the changes of project files.
   In this case, delete the directories framed in red and add the directories in green.



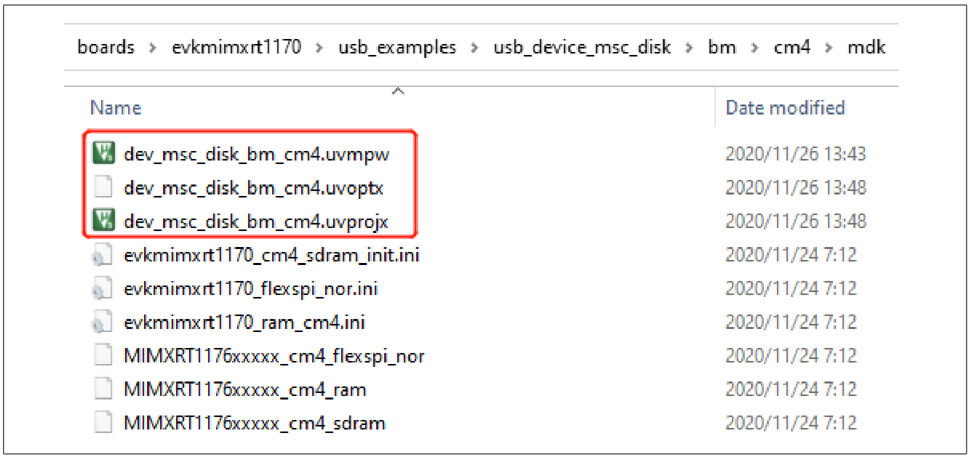
Include directory

```
$PROJ_DIR$/../..
$PROJ_DIR$/..
$PROJ_DIR$/../../../../../../../middleware/usb/device
$PROJ_DIR$/../../../../../../../middleware/usb/include
$PROJ_DIR$/../../../../../../../middleware/usb/phy
$PROJ_DIR$/../../../../../../../components/timer
$PROJ_DIR$/../../../../../../../devices/MIMXRT1176/drivers
$PROJ_DIR$/../../../../../../../middleware/usb/dcd
$PROJ_DIR$/../../../../../../../devices/MIMXRT1176/utilities/debug_console_lite
$PROJ_DIR$/../../../../../../../devices/MIMXRT1176
$PROJ_DIR$/../../../../../../../CMSIS/Include
$PROJ_DIR$/../../../../../../../components/uart
$PROJ_DIR$/../../../../../../../components/lists
$PROJ_DIR$/../../../../../../../devices/MIMXRT1176/xip
$PROJ_DIR$/../../../../../xip
$PROJ_DIR$/../../../../../../../components/osa
$PROJ_DIR$/../../../../../../../devices/MIMXRT1176/drivers/cm4
$PROJ_DIR$\..\..\..\..\..
$PROJ_DIR$\..\..\..\..\..\..\..\middleware\sdmmc\sd
$PROJ_DIR$\..\..\..\..\..\..\..\middleware\sdmmc\common
$PROJ_DIR$\..\..\..\..\..\..\..\middleware\sdmmc\host\usdhc
$PROJ_DIR$\..\..\..\..\..\..\..\middleware\sdmmc\osa
```

With all above steps done, the M7 project is successfully changed to an M4 project and the M4 example USB project can be downloaded and debugged.

3 MDK

1. **Create an M4 project**
   a. Copy the *cm4* folder under *<install_dir>/boards/evkmimxrt1170/usb_examples/usb_device_hid_mouse/bm/cm4* to the folder where the example must be enabled.
   In this case, copy the *cm4* folder under *<install_dir>/boards/evkmimxrt1170/usb_examples/usb_device_hid_mouse/bm/cm4* to the *bm* folder under *<install_dir>/boards/evkmimxrt1170/usb_examples/usb_device_msc_disk/bm*.
   b. Open the *mdk* folder under *<install_dir>/boards/evkmimxrt1170/usb_examples/usb_device_msc_disk/bm/cm4/mdk*.
   c. Change the filename *dev_hid_mouse_bm_cm4* to *dev_msc_disk_bm_cm4* respectively.

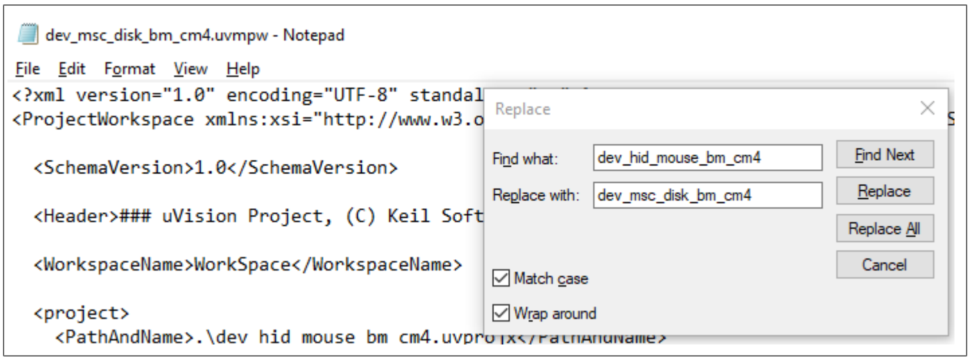


boards › evkmimxrt1170 › usb_examples › usb_device_msc_disk › bm › cm4 › mdk

Name	Date modified
dev_msc_disk_bm_cm4.uvmpw	2020/11/26 13:43
dev_msc_disk_bm_cm4.uvoptx	2020/11/26 13:48
dev_msc_disk_bm_cm4.uvprojx	2020/11/26 13:48
evkmimxrt1170_cm4_sdram_init.ini	2020/11/24 7:12
evkmimxrt1170_flexspi_nor.ini	2020/11/24 7:12
evkmimxrt1170_ram_cm4.ini	2020/11/24 7:12
MIMXRT1176xxxxx_cm4_flexspi_nor	2020/11/24 7:12
MIMXRT1176xxxxx_cm4_ram	2020/11/24 7:12
MIMXRT1176xxxxx_cm4_sdram	2020/11/24 7:12

d. Open the *dev_msc_disk_bm_cm4.uvmpw*, *dev_msc_disk_bm_cm4.uvoptx, anddev_msc_disk_bm_cm4.uvprojx* files with a text editor, such as notepad, notepad++, sublime or visual studio code.

e. Search and replace all `dev_hid_mouse_bm_cm4` with `dev_msc_disk_bm_cm4`, and then save the files.



dev_msc_disk_bm_cm4.uvmpw - Notepad

```
<?xml version="1.0" encoding="UTF-8" standal
<ProjectWorkspace xmlns:xsi="http://www.w3.o

  <SchemaVersion>1.0</SchemaVersion>

  <Header>### uVision Project, (C) Keil Soft

  <WorkspaceName>WorkSpace</WorkspaceName>

  <project>
    <PathAndName>.\dev hid mouse bm cm4.uvpro
```

Replace

Find what: dev_hid_mouse_bm_cm4

Replace with: dev_msc_disk_bm_cm4

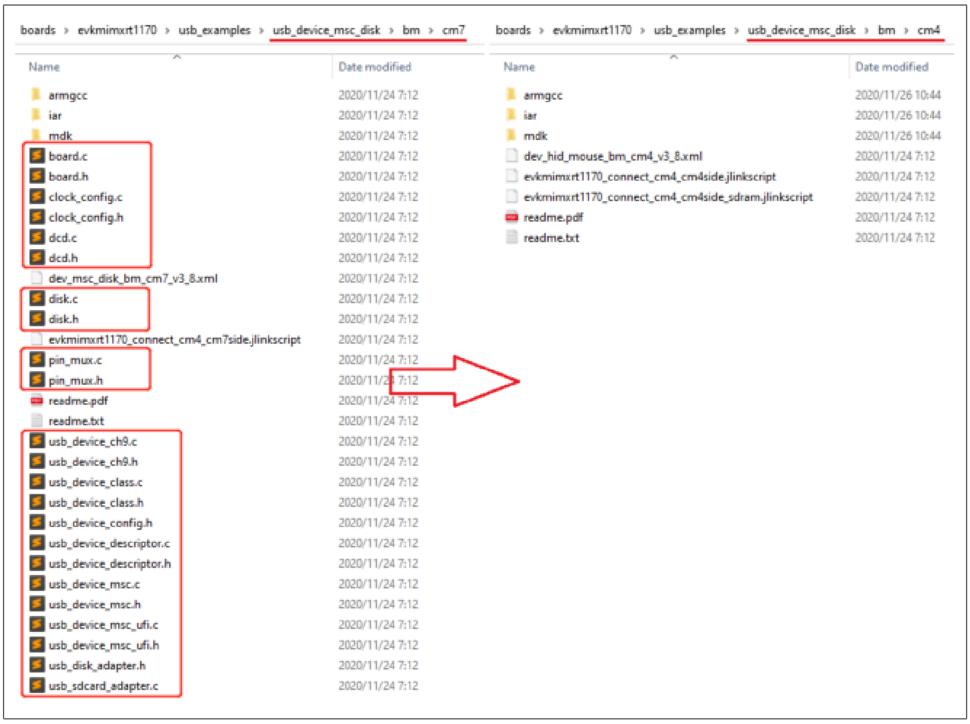
☑ Match case

☑ Wrap around

2. **Rearrange source files**

a. Open the *cm4* folder under *<install_dir>/boards/evkmimxrt1170/usb_examples/usb_device_msc_disk/bm/cm4*, and delete all files with the `.c` and `.h` extension.

b. Copy files with the `.c` and `.h` extension in the *cm7* folder under *<install_dir>/boards/evkmimxrt1170/usb_examples/usb_device_msc_disk/bm/cm7* to the *cm4* folder under *<install_dir>/boards/evkmimxrt1170/usb_examples/usb_device_msc_disk/bm/cm4*.



boards › evkmimxrt1170 › usb_examples › usb_device_msc_disk › bm › cm7

Name	Date modified
armgcc	2020/11/24 7:12
iar	2020/11/24 7:12
mdk	2020/11/24 7:12
board.c	2020/11/24 7:12
board.h	2020/11/24 7:12
clock_config.c	2020/11/24 7:12
clock_config.h	2020/11/24 7:12
dcd.c	2020/11/24 7:12
dcd.h	2020/11/24 7:12
dev_msc_disk_bm_cm7_v3_8.xml	2020/11/24 7:12
disk.c	2020/11/24 7:12
disk.h	2020/11/24 7:12
evkmimxrt1170_connect_cm4_cm7side.jlinkscript	2020/11/24 7:12
pin_mux.c	2020/11/24 7:12
pin_mux.h	2020/11/24 7:12
readme.pdf	2020/11/24 7:12
readme.txt	2020/11/24 7:12
usb_device_ch9.c	2020/11/24 7:12
usb_device_ch9.h	2020/11/24 7:12
usb_device_class.c	2020/11/24 7:12
usb_device_class.h	2020/11/24 7:12
usb_device_config.h	2020/11/24 7:12
usb_device_descriptor.c	2020/11/24 7:12
usb_device_descriptor.h	2020/11/24 7:12
usb_device_msc.c	2020/11/24 7:12
usb_device_msc.h	2020/11/24 7:12
usb_device_msc_ufi.c	2020/11/24 7:12
usb_device_msc_ufi.h	2020/11/24 7:12
usb_disk_adapter.h	2020/11/24 7:12
usb_sdcard_adapter.c	2020/11/24 7:12

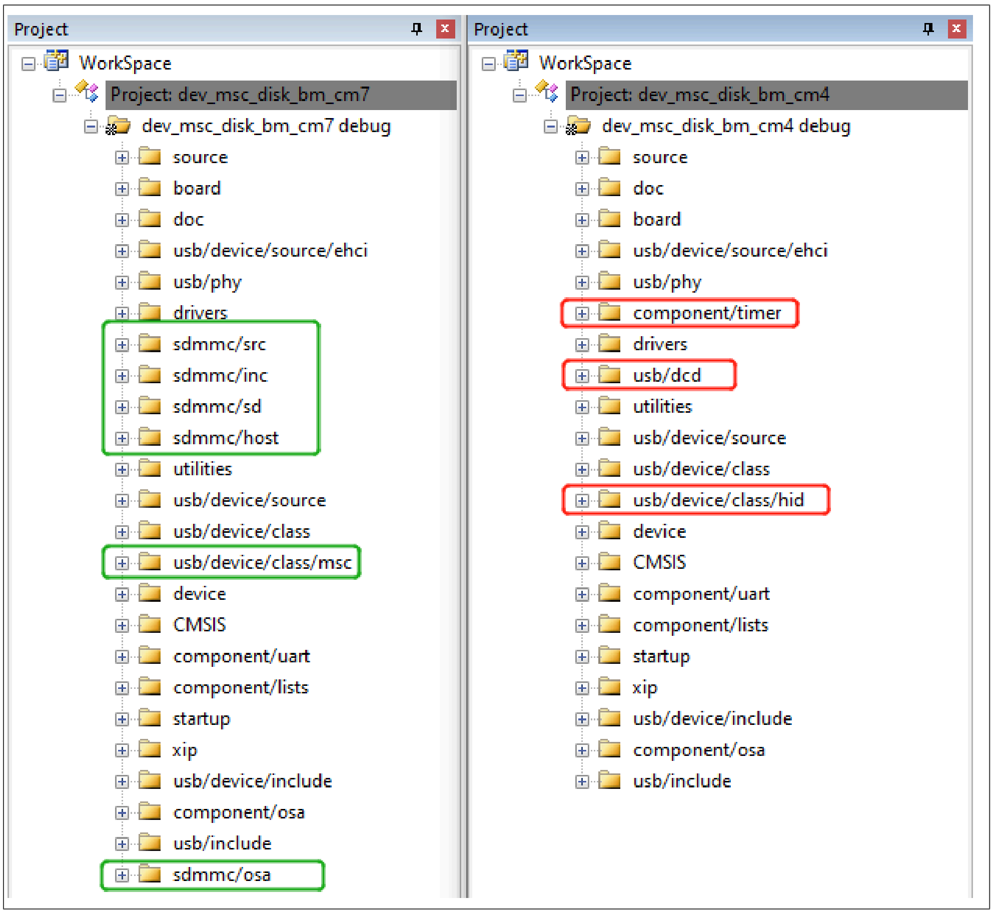
boards › evkmimxrt1170 › usb_examples › usb_device_msc_disk › bm › cm4

Name	Date modified
armgcc	2020/11/26 10:44
iar	2020/11/26 10:44
mdk	2020/11/26 10:44
dev_hid_mouse_bm_cm4_v3_8.xml	2020/11/24 7:12
evkmimxrt1170_connect_cm4_cm4side.jlinkscript	2020/11/24 7:12
evkmimxrt1170_connect_cm4_cm4side_sdram.jlinkscript	2020/11/24 7:12
readme.pdf	2020/11/24 7:12
readme.txt	2020/11/24 7:12

3. **Rearrange project files**
   a. Open `dev_msc_disk_bm_cm7` and `dev_msc_disk_bm_cm4` MDK project respectively. The two workspaces are respectively located in *<install_dir>/boards/evkmimxrt1170/usb_examples/usb_device_msc_disk/bm/cm7/mdk* and *<install_dir>/boards/evkmimxrt1170/usb_examples/usb_device_msc_disk/bm/cm4/ mdk*.
   b. Compare the whole project directory, delete groups that are in the `cm4` project but not `cm7`. In the `cm4` project, add groups that are in the `cm7` project but not `cm4`.
   c. Compare the two groups with the same name. Delete files that are in the `cm4` project but not `cm7`. Add files that are in the `cm7` project but not `cm4`.

   In this case,

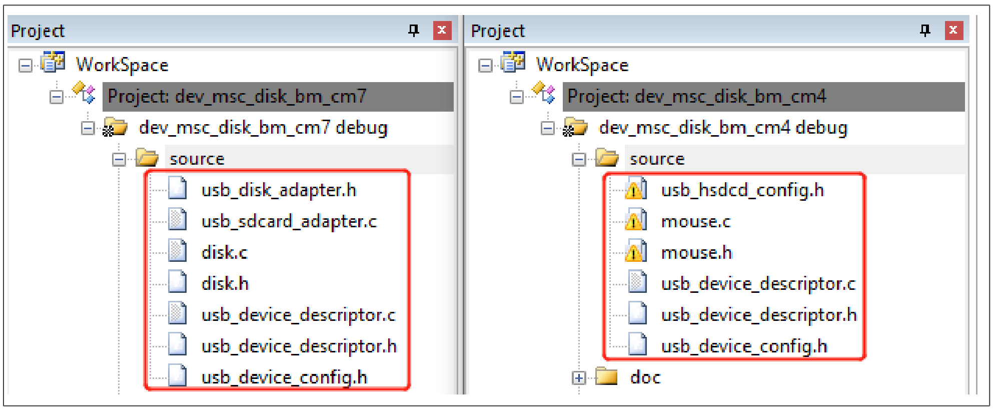
   - Delete the groups framed in the red box in the `cm4` project and add the groups framed in the green box to the `cm4` project.



```
Project
WorkSpace
  Project: dev_msc_disk_bm_cm7
    dev_msc_disk_bm_cm7 debug
      source
      board
      doc
      usb/device/source/ehci
      usb/phy
      drivers
      sdmmc/src
      sdmmc/inc
      sdmmc/sd
      sdmmc/host
      utilities
      usb/device/source
      usb/device/class
      usb/device/class/msc
      device
      CMSIS
      component/uart
      component/lists
      startup
      xip
      usb/device/include
      component/osa
      usb/include
      sdmmc/osa
```

```
Project
WorkSpace
  Project: dev_msc_disk_bm_cm4
    dev_msc_disk_bm_cm4 debug
      source
      doc
      board
      usb/device/source/ehci
      usb/phy
      component/timer
      drivers
      usb/dcd
      utilities
      usb/device/source
      usb/device/class
      usb/device/class/hid
      device
      CMSIS
      component/uart
      component/lists
      startup
      xip
      usb/device/include
      component/osa
      usb/include
```

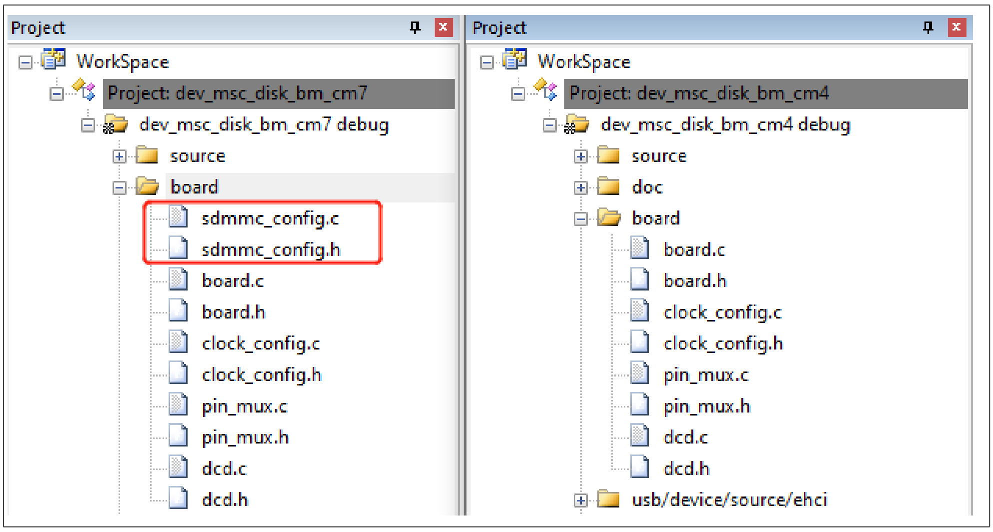
- For the `source` group, delete the files in the *source* group in the `cm4` project and add files under *<install_dir>boards/evkmimxrt1170/usb_examples/usb_device_msc_disk/bm/cm4* with the same name as files in `cm7` project.



```
Project
WorkSpace
  Project: dev_msc_disk_bm_cm7
    dev_msc_disk_bm_cm7 debug
      source
        usb_disk_adapter.h
        usb_sdcard_adapter.c
        disk.c
        disk.h
        usb_device_descriptor.c
        usb_device_descriptor.h
        usb_device_config.h
```

```
Project
WorkSpace
  Project: dev_msc_disk_bm_cm4
    dev_msc_disk_bm_cm4 debug
      source
        usb_hsdcd_config.h
        mouse.c
        mouse.h
        usb_device_descriptor.c
        usb_device_descriptor.h
        usb_device_config.h
      doc
```

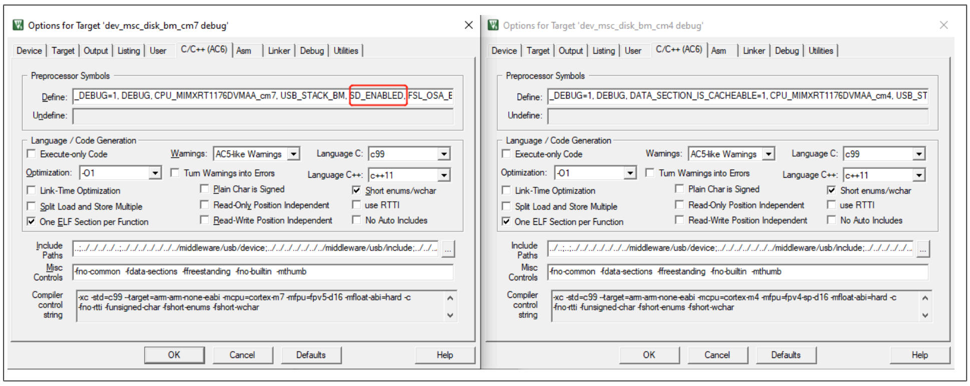
- For the `board` group, add *sdmmc_config* source files to the *board* group in the `cm4` project.



- For the `drivers` group, delete `fsl_pit` source files in the `cm4` project and add `fsl_usdhc` source files to the `cm4` project.

4. **Adjust project settings**

   a. Compare the macro in the project settings by clicking **Option** -> **C/C++**. Add a macro that is in the `cm7` project but not `cm4`.
   In this case, add the *SD_ENABLED* macro to the `cm4` project.


Options for Target 'dev_msc_disk_bm_cm7 debug'
Device
Target
Output
Listing
User
C/C++ (AC6)
Asm
Linker
Debug
Utilities
OK
Cancel
Defaults
Help
Options for Target 'dev_msc_disk_bm_cm4 debug'

Options for Target 'dev_msc_disk_bm_cm7 debug'

Preprocessor Symbols
Define: _DEBUG=1, DEBUG, CPU_MIMXRT1176DVMAA_cm7, USB_STACK_BM, SD_ENABLED, FSL_OSA_E
Undefine:

Language / Code Generation
□ Execute-only Code — Warnings: AC5-like Warnings — Language C: c99
Optimization: -O1 — □ Turn Warnings into Errors — Language C++: c++11
□ Link-Time Optimization — □ Plain Char is Signed — ☑ Short enums/wchar
□ Split Load and Store Multiple — □ Read-Only Position Independent — □ use RTTI
☑ One ELF Section per Function — □ Read-Write Position Independent — □ No Auto Includes

Include Paths: ..;../../../../..;../../../../../../../middleware/usb/device;../../../../../../../middleware/usb/include;../../...
Misc Controls: -fno-common -fdata-sections -ffreestanding -fno-builtin -mthumb
Compiler control string: -xc -std=c99 --target=arm-arm-none-eabi -mcpu=cortex-m7 -mfpu=fpv5-d16 -mfloat-abi=hard -c -fno-rtti -funsigned-char -fshort-enums -fshort-wchar

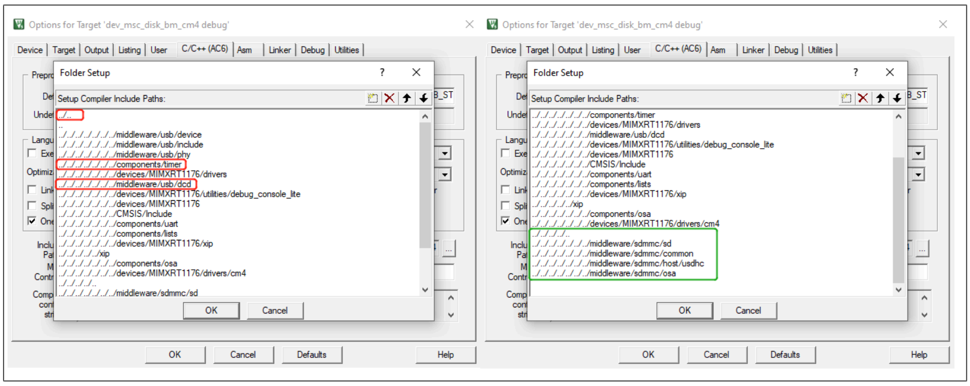
Options for Target 'dev_msc_disk_bm_cm4 debug'

Preprocessor Symbols
Define: _DEBUG=1, DEBUG, DATA_SECTION_IS_CACHEABLE=1, CPU_MIMXRT1176DVMAA_cm4, USB_ST
Undefine:

Language / Code Generation
□ Execute-only Code — Warnings: AC5-like Warnings — Language C: c99
Optimization: -O1 — □ Turn Warnings into Errors — Language C++: c++11
□ Link-Time Optimization — □ Plain Char is Signed — ☑ Short enums/wchar
□ Split Load and Store Multiple — □ Read-Only Position Independent — □ use RTTI
☑ One ELF Section per Function — □ Read-Write Position Independent — □ No Auto Includes

Include Paths: ../..;..;../../../../../../../middleware/usb/device;../../../../../../../middleware/usb/include;../../../../../...
Misc Controls: -fno-common -fdata-sections -ffreestanding -fno-builtin -mthumb
Compiler control string: -xc -std=c99 --target=arm-arm-none-eabi -mcpu=cortex-m4 -mfpu=fpv4-sp-d16 -mfloat-abi=hard -c -fno-rtti -funsigned-char -fshort-enums -fshort-wchar

   b. Change the include paths in the project settings, by clicking **Option** > **C/C++**, according to the changes of project files.
   In this case, delete the paths framed in the red box and add the paths framed in the green box.



Folder Setup — Setup Compiler Include Paths:

```
../..
..
../../../../../../../middleware/usb/device
../../../../../../../middleware/usb/include
../../../../../../../middleware/usb/phy
../../../../../../../components/timer
../../../../../../../devices/MIMXRT1176/drivers
../../../../../../../middleware/usb/dcd
../../../../../../../devices/MIMXRT1176/utilities/debug_console_lite
../../../../../../../devices/MIMXRT1176
../../../../../../../CMSIS/Include
../../../../../../../components/uart
../../../../../../../components/lists
../../../../../../../devices/MIMXRT1176/xip
../../../../../xip
../../../../../../../components/osa
../../../../../../../devices/MIMXRT1176/drivers/cm4
../../../../..
../../../../../../../middleware/sdmmc/sd
```

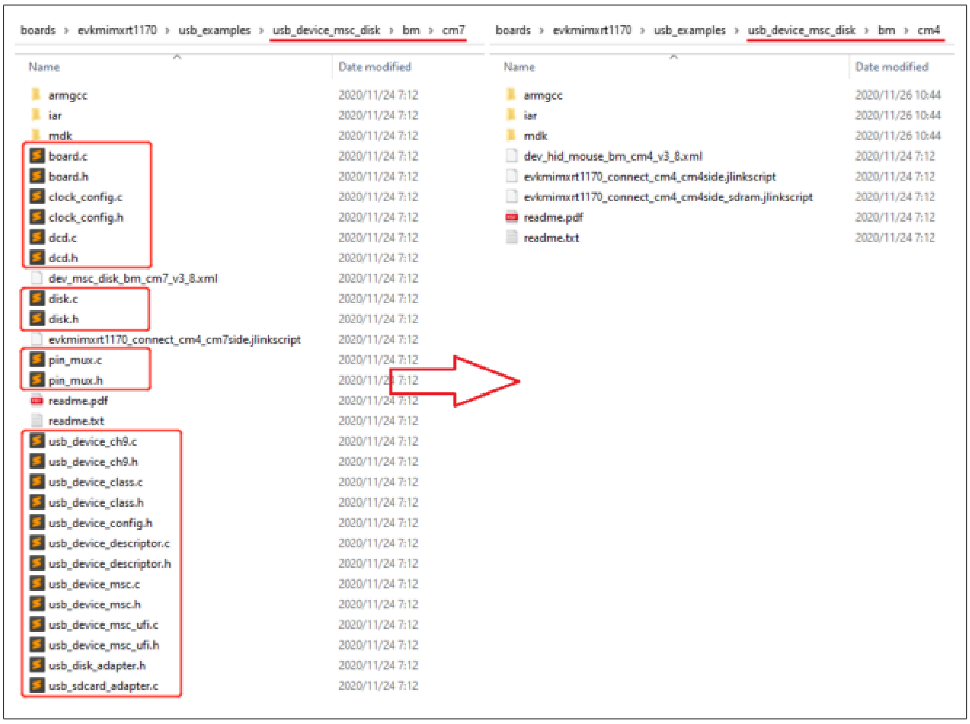
Folder Setup — Setup Compiler Include Paths:

```
../../../../../../../components/timer
../../../../../../../devices/MIMXRT1176/drivers
../../../../../../../middleware/usb/dcd
../../../../../../../devices/MIMXRT1176/utilities/debug_console_lite
../../../../../../../devices/MIMXRT1176
../../../../../../../CMSIS/Include
../../../../../../../components/uart
../../../../../../../components/lists
../../../../../../../devices/MIMXRT1176/xip
../../../../../xip
../../../../../../../components/osa
../../../../../../../devices/MIMXRT1176/drivers/cm4
../../../../..
../../../../../../../middleware/sdmmc/sd
../../../../../../../middleware/sdmmc/common
../../../../../../../middleware/sdmmc/host/usdhc
../../../../../../../middleware/sdmmc/osa
```

With all above steps done, the M7 project is successfully changed to an M4 project and the M4 example USB project can be downloaded and debugged.

4 ARMGCC

1. **Create an M4 project**
   a. Copy the *cm4* folder under *<install_dir>/boards/evkmimxrt1170/usb_examples/usb_device_hid_mouse/bm/cm4* to the folder where the example must be enabled.
   In this case, Copy *<install_dir>/boards/evkmimxrt1170/usb_examples/usb_device_hid_mouse/bm/cm4* to *<install_dir>/boards/evkmimxrt1170/usb_examples/usb_device_msc_disk/bm*.
   b. Open the *CMakeLists.txt* of the example. The file is located under *<install_dir>/boards/evkmimxrt1170/usb_examples/usb_device_msc_disk/bm/cm4/ armgcc*.
   c. Search and replace all `dev_hid_mouse_bm_cm4` with `dev_msc_disk_bm_cm4`, and then save the files.
2. **Rearrange source files**
   a. Open the *cm4* folder under *<install_dir>/boards/evkmimxrt1170/usb_examples/usb_device_msc_disk/bm/cm4* folder and delete all files with the `.c` and `.h` extension.
   b. Copy files with the `.c` and `.h` extension in the *cm7* folder under *<install_dir>/boards/evkmimxrt1170/usb_examples/usb_device_msc_disk/bm/cm7* to the *cm4* folder under *<install_dir>/boards/evkmimxrt1170/usb_examples/usb_device_msc_disk/bm/cm4*.



boards › evkmimxrt1170 › usb_examples › usb_device_msc_disk › bm › cm7

Name	Date modified
armgcc	2020/11/24 7:12
iar	2020/11/24 7:12
mdk	2020/11/24 7:12
board.c	2020/11/24 7:12
board.h	2020/11/24 7:12
clock_config.c	2020/11/24 7:12
clock_config.h	2020/11/24 7:12
dcd.c	2020/11/24 7:12
dcd.h	2020/11/24 7:12
dev_msc_disk_bm_cm7_v3_8.xml	2020/11/24 7:12
disk.c	2020/11/24 7:12
disk.h	2020/11/24 7:12
evkmimxrt1170_connect_cm4_cm7side.jlinkscript	2020/11/24 7:12
pin_mux.c	2020/11/24 7:12
pin_mux.h	2020/11/24 7:12
readme.pdf	2020/11/24 7:12
readme.txt	2020/11/24 7:12
usb_device_ch9.c	2020/11/24 7:12
usb_device_ch9.h	2020/11/24 7:12
usb_device_class.c	2020/11/24 7:12
usb_device_class.h	2020/11/24 7:12
usb_device_config.h	2020/11/24 7:12
usb_device_descriptor.c	2020/11/24 7:12
usb_device_descriptor.h	2020/11/24 7:12
usb_device_msc.c	2020/11/24 7:12
usb_device_msc.h	2020/11/24 7:12
usb_device_msc_ufi.c	2020/11/24 7:12
usb_device_msc_ufi.h	2020/11/24 7:12
usb_disk_adapter.h	2020/11/24 7:12
usb_sdcard_adapter.c	2020/11/24 7:12

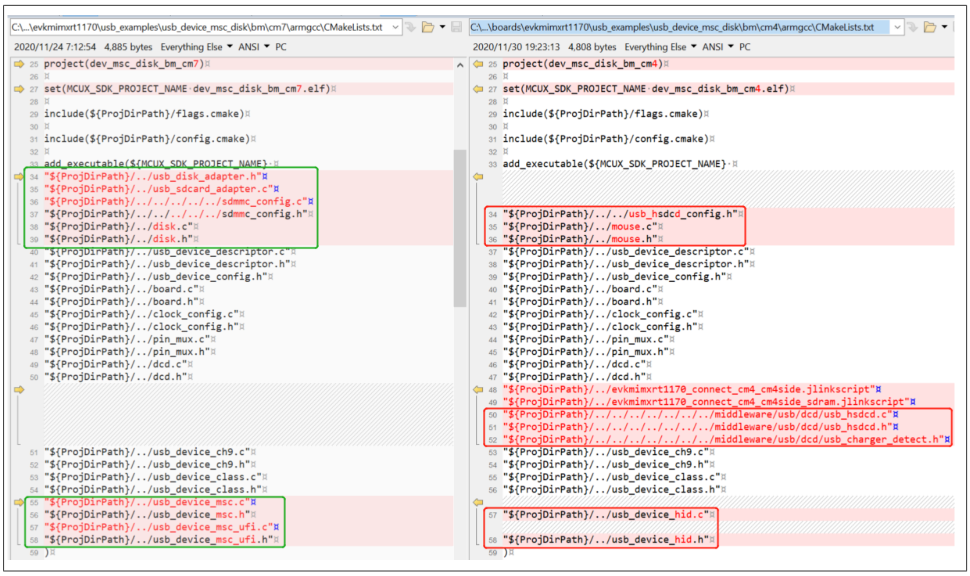
boards › evkmimxrt1170 › usb_examples › usb_device_msc_disk › bm › cm4

Name	Date modified
armgcc	2020/11/26 10:44
iar	2020/11/26 10:44
mdk	2020/11/26 10:44
dev_hid_mouse_bm_cm4_v3_8.xml	2020/11/24 7:12
evkmimxrt1170_connect_cm4_cm4side.jlinkscript	2020/11/24 7:12
evkmimxrt1170_connect_cm4_cm4side_sdram.jlinkscript	2020/11/24 7:12
readme.pdf	2020/11/24 7:12
readme.txt	2020/11/24 7:12

3. **Rearrange project files**
   a. Open the *CMakeLists.txt* of the two examples respectively. The two files are respectively located under *<install_dir>/boards/evkmimxrt1170/usb_examples/*

usb_device_msc_disk/bm/cm7/armgcc and *<install_dir>/boards/evkmimxrt1170/usb_examples/usb_device_msc_disk/bm/cm4/ armgcc*.

b. Search the **add_executable** section in the *cm7* and *cm4* projects. Delete files that are in the `cm4` project but not `cm7`. Add files that are in the `cm7` project but not `cm4` to the `cm4` project.
In this case, delete the files in red box and add the files in the green box to the `cm4` project.



C:\...\evkmimxrt1170\usb_examples\usb_device_msc_disk\bm\cm7\armgcc\CMakeLists.txt

2020/11/24 7:12:54 4,885 bytes Everything Else ANSI PC

```
project(dev_msc_disk_bm_cm7)

set(MCUX_SDK_PROJECT_NAME dev_msc_disk_bm_cm7.elf)

include(${ProjDirPath}/flags.cmake)

include(${ProjDirPath}/config.cmake)

add_executable(${MCUX_SDK_PROJECT_NAME} 
"${ProjDirPath}/../usb_disk_adapter.h"
"${ProjDirPath}/../usb_sdcard_adapter.c"
"${ProjDirPath}/../../../../../sdmmc_config.c"
"${ProjDirPath}/../../../../../sdmmc_config.h"
"${ProjDirPath}/../disk.c"
"${ProjDirPath}/../disk.h"
"${ProjDirPath}/../usb_device_descriptor.c"
"${ProjDirPath}/../usb_device_descriptor.h"
"${ProjDirPath}/../usb_device_config.h"
"${ProjDirPath}/../board.c"
"${ProjDirPath}/../board.h"
"${ProjDirPath}/../clock_config.c"
"${ProjDirPath}/../clock_config.h"
"${ProjDirPath}/../pin_mux.c"
"${ProjDirPath}/../pin_mux.h"
"${ProjDirPath}/../dcd.c"
"${ProjDirPath}/../dcd.h"
"${ProjDirPath}/../usb_device_ch9.c"
"${ProjDirPath}/../usb_device_ch9.h"
"${ProjDirPath}/../usb_device_class.c"
"${ProjDirPath}/../usb_device_class.h"
"${ProjDirPath}/../usb_device_msc.c"
"${ProjDirPath}/../usb_device_msc.h"
"${ProjDirPath}/../usb_device_msc_ufi.c"
"${ProjDirPath}/../usb_device_msc_ufi.h"
)
```

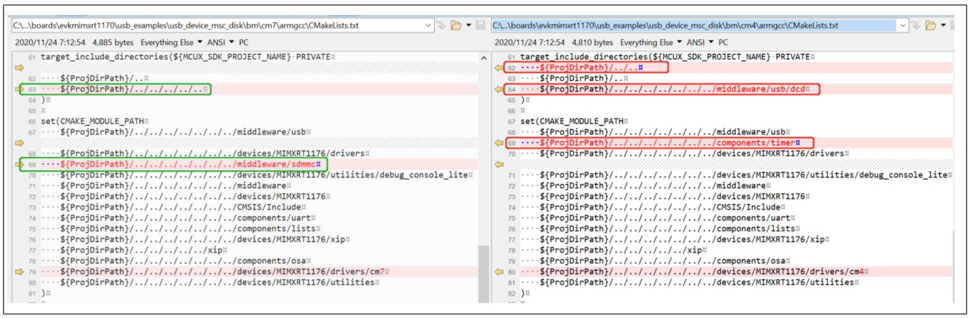
C:\...\boards\evkmimxrt1170\usb_examples\usb_device_msc_disk\bm\cm4\armgcc\CMakeLists.txt

2020/11/30 19:23:13 4,808 bytes Everything Else ANSI PC

```
project(dev_msc_disk_bm_cm4)

set(MCUX_SDK_PROJECT_NAME dev_msc_disk_bm_cm4.elf)

include(${ProjDirPath}/flags.cmake)

include(${ProjDirPath}/config.cmake)

add_executable(${MCUX_SDK_PROJECT_NAME} 
"${ProjDirPath}/../../usb_hsdcd_config.h"
"${ProjDirPath}/../mouse.c"
"${ProjDirPath}/../mouse.h"
"${ProjDirPath}/../usb_device_descriptor.c"
"${ProjDirPath}/../usb_device_descriptor.h"
"${ProjDirPath}/../usb_device_config.h"
"${ProjDirPath}/../board.c"
"${ProjDirPath}/../board.h"
"${ProjDirPath}/../clock_config.c"
"${ProjDirPath}/../clock_config.h"
"${ProjDirPath}/../pin_mux.c"
"${ProjDirPath}/../pin_mux.h"
"${ProjDirPath}/../dcd.c"
"${ProjDirPath}/../dcd.h"
"${ProjDirPath}/../evkmimxrt1170_connect_cm4_cm4side.jlinkscript"
"${ProjDirPath}/../evkmimxrt1170_connect_cm4_cm4side_sdram.jlinkscript"
"${ProjDirPath}/../../../../../../../middleware/usb/dcd/usb_hsdcd.c"
"${ProjDirPath}/../../../../../../../middleware/usb/dcd/usb_hsdcd.h"
"${ProjDirPath}/../../../../../../../middleware/usb/dcd/usb_charger_detect.h"
"${ProjDirPath}/../usb_device_ch9.c"
"${ProjDirPath}/../usb_device_ch9.h"
"${ProjDirPath}/../usb_device_class.c"
"${ProjDirPath}/../usb_device_class.h"
"${ProjDirPath}/../usb_device_hid.c"
"${ProjDirPath}/../usb_device_hid.h"
)
```

4. **Adjust project settings**

a. Search the **target_include_directories**, **CMAKE_MODULE_PATH**, and **# include modules** section one by one. Add macros that are in the `cm7` project but not `cm4` to the `cm4` project.
In this case, remove the paths framed in the red box from the `cm4` project and add the paths framed in the green box.
Note: *Modify the include modules with the `cm7` suffix to `cm4`.*
For example, modify `driver_usdhc_MIMXRT1176_cm7` to `driver_usdhc_MIMXRT1176_cm4`.



C:\...\boards\evkmimxrt1170\usb_examples\usb_device_msc_disk\bm\cm7\armgcc\CMakeLists.txt

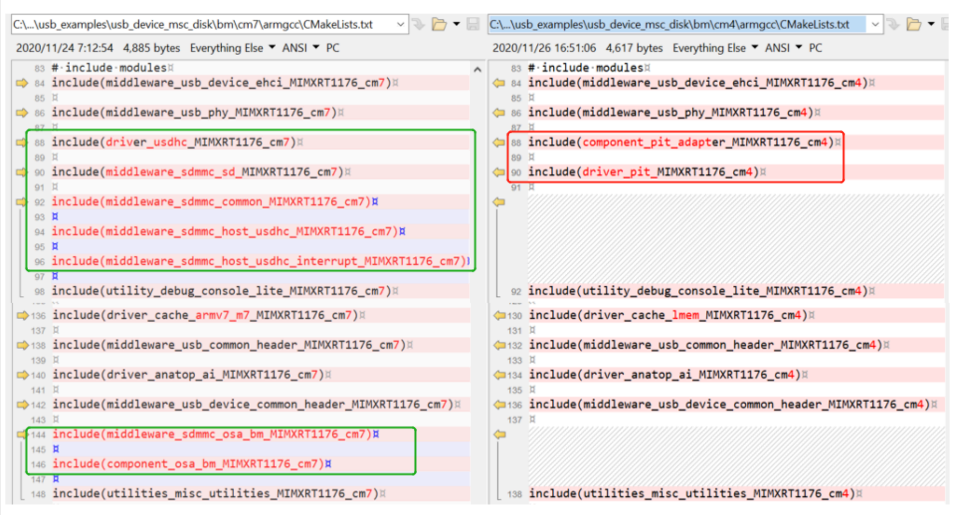
2020/11/24 7:12:54 4,885 bytes Everything Else ANSI PC

```
target_include_directories(${MCUX_SDK_PROJECT_NAME} PRIVATE
    ${ProjDirPath}/..
    ${ProjDirPath}/../../../../..
)

set(CMAKE_MODULE_PATH
    ${ProjDirPath}/../../../../../../../middleware/usb
    ${ProjDirPath}/../../../../../../../devices/MIMXRT1176/drivers
    ${ProjDirPath}/../../../../../../../middleware/sdmmc
    ${ProjDirPath}/../../../../../../../devices/MIMXRT1176/utilities/debug_console_lite
    ${ProjDirPath}/../../../../../../../middleware
    ${ProjDirPath}/../../../../../../../devices/MIMXRT1176
    ${ProjDirPath}/../../../../../../../CMSIS/Include
    ${ProjDirPath}/../../../../../../../components/uart
    ${ProjDirPath}/../../../../../../../components/lists
    ${ProjDirPath}/../../../../../../../devices/MIMXRT1176/xip
    ${ProjDirPath}/../../../../../xip
    ${ProjDirPath}/../../../../../../../components/osa
    ${ProjDirPath}/../../../../../../../devices/MIMXRT1176/drivers/cm7
    ${ProjDirPath}/../../../../../../../devices/MIMXRT1176/utilities
)
```

C:\...\boards\evkmimxrt1170\usb_examples\usb_device_msc_disk\bm\cm4\armgcc\CMakeLists.txt

2020/11/24 7:12:54 4,810 bytes Everything Else ANSI PC

```
target_include_directories(${MCUX_SDK_PROJECT_NAME} PRIVATE
    ${ProjDirPath}/../..
    ${ProjDirPath}/..
    ${ProjDirPath}/../../../../../../../middleware/usb/dcd
)

set(CMAKE_MODULE_PATH
    ${ProjDirPath}/../../../../../../../middleware/usb
    ${ProjDirPath}/../../../../../../../components/timer
    ${ProjDirPath}/../../../../../../../devices/MIMXRT1176/drivers
    ${ProjDirPath}/../../../../../../../devices/MIMXRT1176/utilities/debug_console_lite
    ${ProjDirPath}/../../../../../../../middleware
    ${ProjDirPath}/../../../../../../../devices/MIMXRT1176
    ${ProjDirPath}/../../../../../../../CMSIS/Include
    ${ProjDirPath}/../../../../../../../components/uart
    ${ProjDirPath}/../../../../../../../components/lists
    ${ProjDirPath}/../../../../../../../devices/MIMXRT1176/xip
    ${ProjDirPath}/../../../../../xip
    ${ProjDirPath}/../../../../../../../components/osa
    ${ProjDirPath}/../../../../../../../devices/MIMXRT1176/drivers/cm4
    ${ProjDirPath}/../../../../../../../devices/MIMXRT1176/utilities
)
```



C:\...\usb_examples\usb_device_msc_disk\bm\cm7\armgcc\CMakeLists.txt

2020/11/24 7:12:54 4,885 bytes Everything Else ANSI PC

```
# include modules
include(middleware_usb_device_ehci_MIMXRT1176_cm7)

include(middleware_usb_phy_MIMXRT1176_cm7)

include(driver_usdhc_MIMXRT1176_cm7)

include(middleware_sdmmc_sd_MIMXRT1176_cm7)

include(middleware_sdmmc_common_MIMXRT1176_cm7)

include(middleware_sdmmc_host_usdhc_MIMXRT1176_cm7)

include(middleware_sdmmc_host_usdhc_interrupt_MIMXRT1176_cm7)

include(utility_debug_console_lite_MIMXRT1176_cm7)
include(driver_cache_armv7_m7_MIMXRT1176_cm7)

include(middleware_usb_common_header_MIMXRT1176_cm7)

include(driver_anatop_ai_MIMXRT1176_cm7)

include(middleware_usb_device_common_header_MIMXRT1176_cm7)

include(middleware_sdmmc_osa_bm_MIMXRT1176_cm7)

include(component_osa_bm_MIMXRT1176_cm7)

include(utilities_misc_utilities_MIMXRT1176_cm7)
```

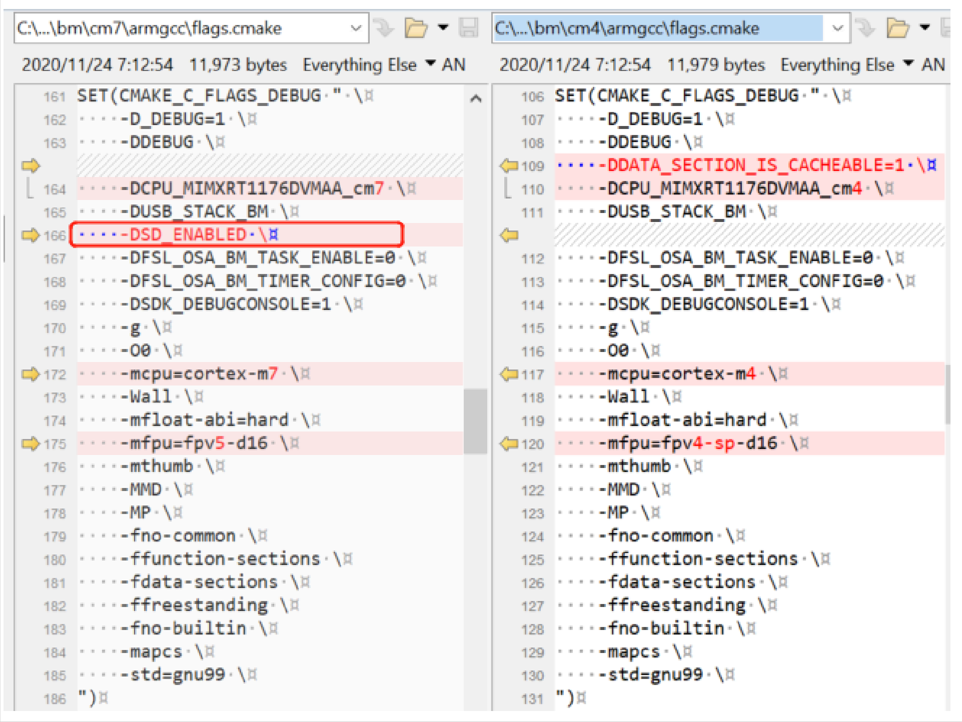
C:\...\usb_examples\usb_device_msc_disk\bm\cm4\armgcc\CMakeLists.txt

2020/11/26 16:51:06 4,617 bytes Everything Else ANSI PC

```
# include modules
include(middleware_usb_device_ehci_MIMXRT1176_cm4)

include(middleware_usb_phy_MIMXRT1176_cm4)

include(component_pit_adapter_MIMXRT1176_cm4)

include(driver_pit_MIMXRT1176_cm4)

include(utility_debug_console_lite_MIMXRT1176_cm4)
include(driver_cache_lmem_MIMXRT1176_cm4)

include(middleware_usb_common_header_MIMXRT1176_cm4)

include(driver_anatop_ai_MIMXRT1176_cm4)

include(middleware_usb_device_common_header_MIMXRT1176_cm4)

include(utilities_misc_utilities_MIMXRT1176_cm4)
```

b. Open the `flags.cmake` of the two examples respectively. The two files are respectively located in *<install_dir>/boards/evkmimxrt1170/usb_examples/usb_device_msc_disk/bm/cm7/armgcc* and *<install_dir>/boards/evkmimxrt1170/usb_examples/usb_device_msc_disk/bm/cm4/ armgcc*.

c. Search the **CMAKE_C_FLAGS_DEBUG** section in the `cm4` and `cm7` projects. Compare the macros and add the macro that is in the `cm7` project but not `cm4` to the `cm4` project.
In this case, add the *SD_ENABLED* macro to the `cm4` project.



C:\...\bm\cm7\armgcc\flags.cmake

2020/11/24 7:12:54 11,973 bytes Everything Else AN

```
SET(CMAKE_C_FLAGS_DEBUG " \
    -D_DEBUG=1 \
    -DDEBUG \
    -DCPU_MIMXRT1176DVMAA_cm7 \
    -DUSB_STACK_BM \
    -DSD_ENABLED \
    -DFSL_OSA_BM_TASK_ENABLE=0 \
    -DFSL_OSA_BM_TIMER_CONFIG=0 \
    -DSDK_DEBUGCONSOLE=1 \
    -g \
    -O0 \
    -mcpu=cortex-m7 \
    -Wall \
    -mfloat-abi=hard \
    -mfpu=fpv5-d16 \
    -mthumb \
    -MMD \
    -MP \
    -fno-common \
    -ffunction-sections \
    -fdata-sections \
    -ffreestanding \
    -fno-builtin \
    -mapcs \
    -std=gnu99 \
")
```

C:\...\bm\cm4\armgcc\flags.cmake

2020/11/24 7:12:54 11,979 bytes Everything Else AN

```
SET(CMAKE_C_FLAGS_DEBUG " \
    -D_DEBUG=1 \
    -DDEBUG \
    -DDATA_SECTION_IS_CACHEABLE=1 \
    -DCPU_MIMXRT1176DVMAA_cm4 \
    -DUSB_STACK_BM \
    -DFSL_OSA_BM_TASK_ENABLE=0 \
    -DFSL_OSA_BM_TIMER_CONFIG=0 \
    -DSDK_DEBUGCONSOLE=1 \
    -g \
    -O0 \
    -mcpu=cortex-m4 \
    -Wall \
    -mfloat-abi=hard \
    -mfpu=fpv4-sp-d16 \
    -mthumb \
    -MMD \
    -MP \
    -fno-common \
    -ffunction-sections \
    -fdata-sections \
    -ffreestanding \
    -fno-builtin \
    -mapcs \
    -std=gnu99 \
")
```

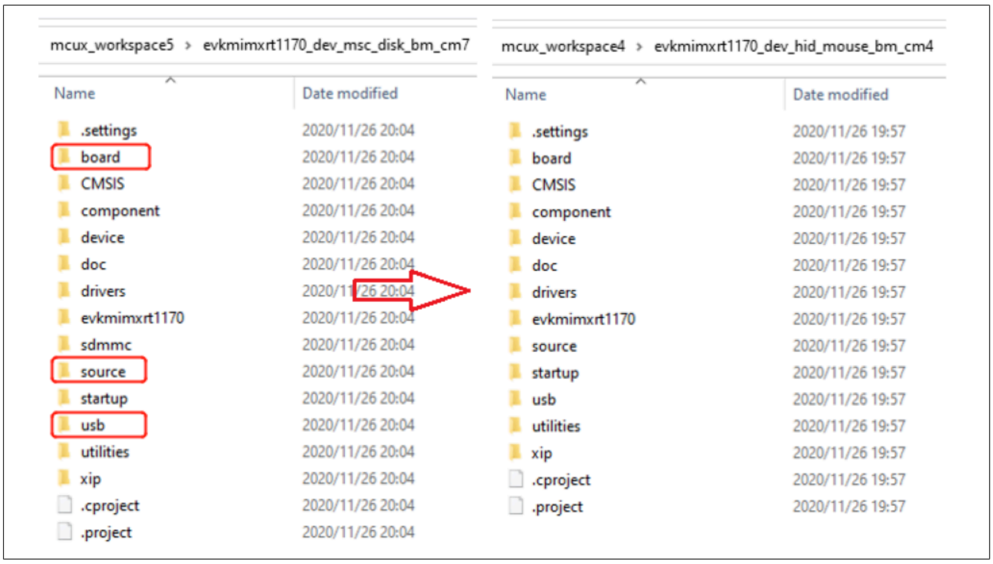
With all above steps done, the M7 project is successfully changed to an M4 project and the M4 example USB project can be downloaded and debugged.

5 MCUXpresso IDE

1. **Rearrange source files**
   a. Import `dev_msc_disk_bm_cm7` and `dev_hid_mouse_bm_cm4` example.
   b. Open the directory of the two examples in the file explorer.
   c. Compare the whole project directory and add the folders that are in the `cm7` project but not `cm4` to the `cm4` project.
   d. Compare the two folders. Delete the files that are in the `cm4` project but not `cm7` and add the files that are in the `cm7` project but not `cm4` to the `cm4` project.

   In this case,

   - For the `board`, `source`, and `usb` folders, replace them in the `cm4` project with the folder in the `cm7` directory.



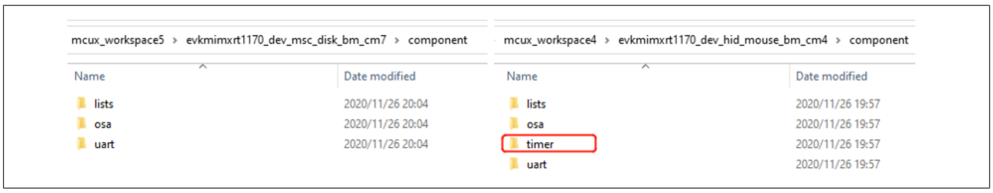
mcux_workspace5 › evkmimxrt1170_dev_msc_disk_bm_cm7

Name	Date modified
.settings	2020/11/26 20:04
board	2020/11/26 20:04
CMSIS	2020/11/26 20:04
component	2020/11/26 20:04
device	2020/11/26 20:04
doc	2020/11/26 20:04
drivers	2020/11/26 20:04
evkmimxrt1170	2020/11/26 20:04
sdmmc	2020/11/26 20:04
source	2020/11/26 20:04
startup	2020/11/26 20:04
usb	2020/11/26 20:04
utilities	2020/11/26 20:04
xip	2020/11/26 20:04
.cproject	2020/11/26 20:04
.project	2020/11/26 20:04

mcux_workspace4 › evkmimxrt1170_dev_hid_mouse_bm_cm4

Name	Date modified
.settings	2020/11/26 19:57
board	2020/11/26 19:57
CMSIS	2020/11/26 19:57
component	2020/11/26 19:57
device	2020/11/26 19:57
doc	2020/11/26 19:57
drivers	2020/11/26 19:57
evkmimxrt1170	2020/11/26 19:57
source	2020/11/26 19:57
startup	2020/11/26 19:57
usb	2020/11/26 19:57
utilities	2020/11/26 19:57
xip	2020/11/26 19:57
.cproject	2020/11/26 19:57
.project	2020/11/26 19:57

   - For the `component` folder, delete the `timer` folder in the `cm4` directory.



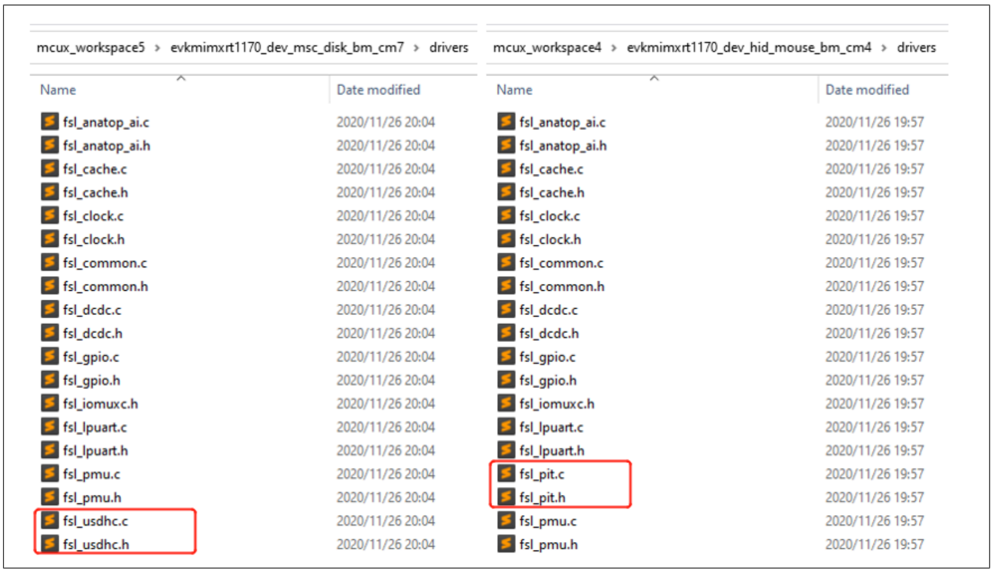
mcux_workspace5 › evkmimxrt1170_dev_msc_disk_bm_cm7 › component

Name	Date modified
lists	2020/11/26 20:04
osa	2020/11/26 20:04
uart	2020/11/26 20:04

mcux_workspace4 › evkmimxrt1170_dev_hid_mouse_bm_cm4 › component

Name	Date modified
lists	2020/11/26 19:57
osa	2020/11/26 19:57
timer	2020/11/26 19:57
uart	2020/11/26 19:57

   - For the `drivers` folder, delete `fsl_pit` source files in the `cm4` project and add `fsl_usdhc` source files to the `cm4` directory.



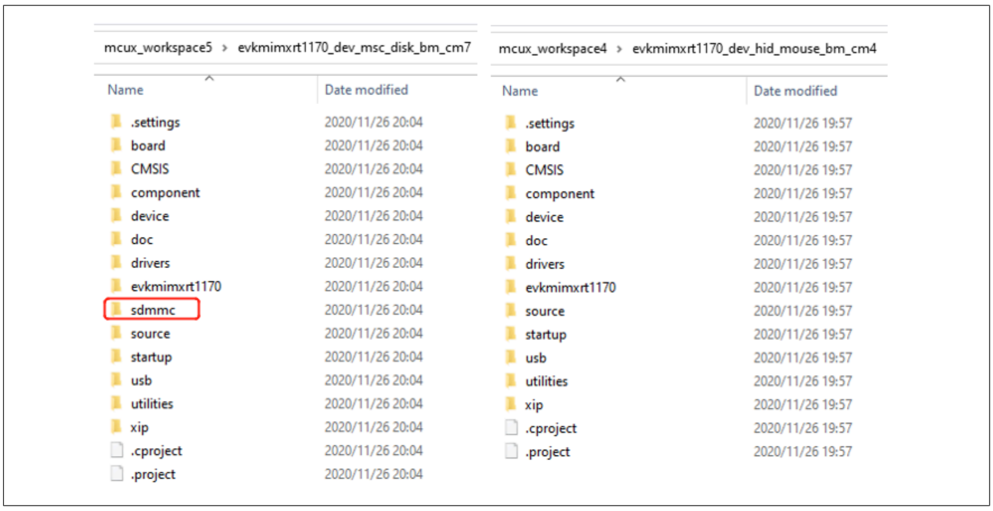
mcux_workspace5 > evkmimxrt1170_dev_msc_disk_bm_cm7 > drivers

Name	Date modified
fsl_anatop_ai.c	2020/11/26 20:04
fsl_anatop_ai.h	2020/11/26 20:04
fsl_cache.c	2020/11/26 20:04
fsl_cache.h	2020/11/26 20:04
fsl_clock.c	2020/11/26 20:04
fsl_clock.h	2020/11/26 20:04
fsl_common.c	2020/11/26 20:04
fsl_common.h	2020/11/26 20:04
fsl_dcdc.c	2020/11/26 20:04
fsl_dcdc.h	2020/11/26 20:04
fsl_gpio.c	2020/11/26 20:04
fsl_gpio.h	2020/11/26 20:04
fsl_iomuxc.h	2020/11/26 20:04
fsl_lpuart.c	2020/11/26 20:04
fsl_lpuart.h	2020/11/26 20:04
fsl_pmu.c	2020/11/26 20:04
fsl_pmu.h	2020/11/26 20:04
fsl_usdhc.c	2020/11/26 20:04
fsl_usdhc.h	2020/11/26 20:04

mcux_workspace4 > evkmimxrt1170_dev_hid_mouse_bm_cm4 > drivers

Name	Date modified
fsl_anatop_ai.c	2020/11/26 19:57
fsl_anatop_ai.h	2020/11/26 19:57
fsl_cache.c	2020/11/26 19:57
fsl_cache.h	2020/11/26 19:57
fsl_clock.c	2020/11/26 19:57
fsl_clock.h	2020/11/26 19:57
fsl_common.c	2020/11/26 19:57
fsl_common.h	2020/11/26 19:57
fsl_dcdc.c	2020/11/26 19:57
fsl_dcdc.h	2020/11/26 19:57
fsl_gpio.c	2020/11/26 19:57
fsl_gpio.h	2020/11/26 19:57
fsl_iomuxc.h	2020/11/26 19:57
fsl_lpuart.c	2020/11/26 19:57
fsl_lpuart.h	2020/11/26 19:57
fsl_pit.c	2020/11/26 19:57
fsl_pit.h	2020/11/26 19:57
fsl_pmu.c	2020/11/26 19:57
fsl_pmu.h	2020/11/26 19:57

- For the `sdmmc` folder, copy it to the `cm4` project.



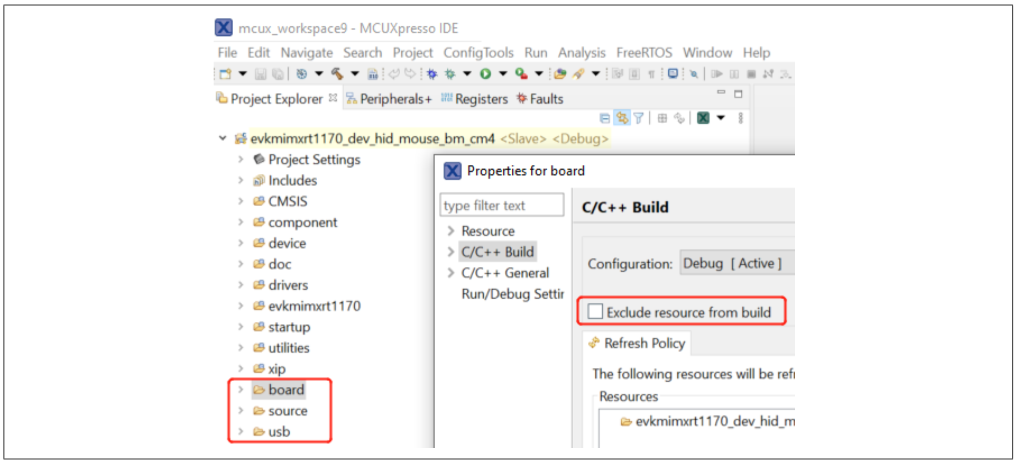
mcux_workspace5 > evkmimxrt1170_dev_msc_disk_bm_cm7

Name	Date modified
.settings	2020/11/26 20:04
board	2020/11/26 20:04
CMSIS	2020/11/26 20:04
component	2020/11/26 20:04
device	2020/11/26 20:04
doc	2020/11/26 20:04
drivers	2020/11/26 20:04
evkmimxrt1170	2020/11/26 20:04
sdmmc	2020/11/26 20:04
source	2020/11/26 20:04
startup	2020/11/26 20:04
usb	2020/11/26 20:04
utilities	2020/11/26 20:04
xip	2020/11/26 20:04
.cproject	2020/11/26 20:04
.project	2020/11/26 20:04

mcux_workspace4 > evkmimxrt1170_dev_hid_mouse_bm_cm4

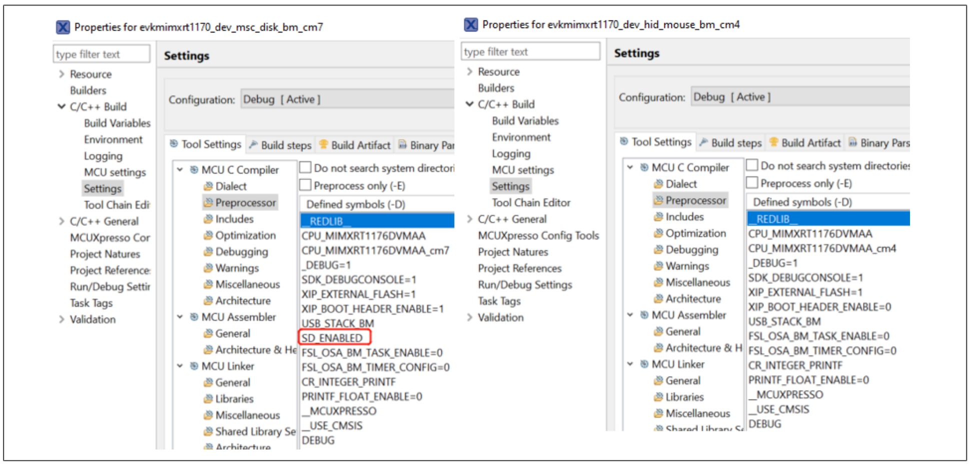
Name	Date modified
.settings	2020/11/26 19:57
board	2020/11/26 19:57
CMSIS	2020/11/26 19:57
component	2020/11/26 19:57
device	2020/11/26 19:57
doc	2020/11/26 19:57
drivers	2020/11/26 19:57
evkmimxrt1170	2020/11/26 19:57
source	2020/11/26 19:57
startup	2020/11/26 19:57
usb	2020/11/26 19:57
utilities	2020/11/26 19:57
xip	2020/11/26 19:57
.cproject	2020/11/26 19:57
.project	2020/11/26 19:57

2. **Rearrange project files**
   After the source files are updated, the project files are loaded to the `cm4` project automatically. No manual updates to the project files are required.
   Due to the deletion in Rearrange source files, for the *board*, *source* and *usb* folders, an option must be deleted in the properties. Right click **board** -> **properties** -> **C/C++build** and uncheck **Exclude resource from build**. Perform the same operation in the **source** and **usb** folders.



□ Exclude resource from build

3. **Adjust project settings**
    a. Compare the macro in the project settings, by clicking **Properties** -> **C/C++ Build** -> **Setting** -> **MCU C Compiler** -> **Preprocessor**. Add the macro that is in the `cm7` project but not in `cm4` to the `cm4` project.
    In this case, the macro is `SD_ENABLED`.



Configuration: Debug [Active]

□ Do not search system directori
□ Preprocess only (-E)

Defined symbols (-D)

```
__REDLIB__
CPU_MIMXRT1176DVMAA
CPU_MIMXRT1176DVMAA_cm7
_DEBUG=1
SDK_DEBUGCONSOLE=1
XIP_EXTERNAL_FLASH=1
XIP_BOOT_HEADER_ENABLE=1
USB_STACK_BM
SD_ENABLED
FSL_OSA_BM_TASK_ENABLE=0
FSL_OSA_BM_TIMER_CONFIG=0
CR_INTEGER_PRINTF
PRINTF_FLOAT_ENABLE=0
__MCUXPRESSO
__USE_CMSIS
DEBUG
```

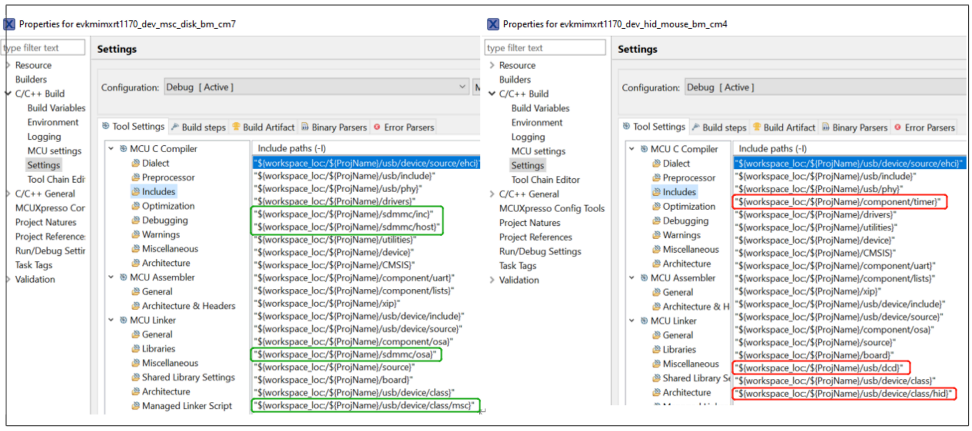
Configuration: Debug [Active]

□ Do not search system directories
□ Preprocess only (-E)

Defined symbols (-D)

```
__REDLIB__
CPU_MIMXRT1176DVMAA
CPU_MIMXRT1176DVMAA_cm4
_DEBUG=1
SDK_DEBUGCONSOLE=1
XIP_EXTERNAL_FLASH=1
XIP_BOOT_HEADER_ENABLE=0
USB_STACK_BM
FSL_OSA_BM_TASK_ENABLE=0
FSL_OSA_BM_TIMER_CONFIG=0
CR_INTEGER_PRINTF
PRINTF_FLOAT_ENABLE=0
__MCUXPRESSO
__USE_CMSIS
DEBUG
```

    b. Change the include paths in the project settings, by clicking **Properties** -> **C/C++ Build** -> **Setting** -> **MCU C Compiler** -> **Includes**, according to the changes of project files.
    In this case, delete the paths framed in the red box and add the paths in the green box.



Configuration: Debug [Active]

Include paths (-I)

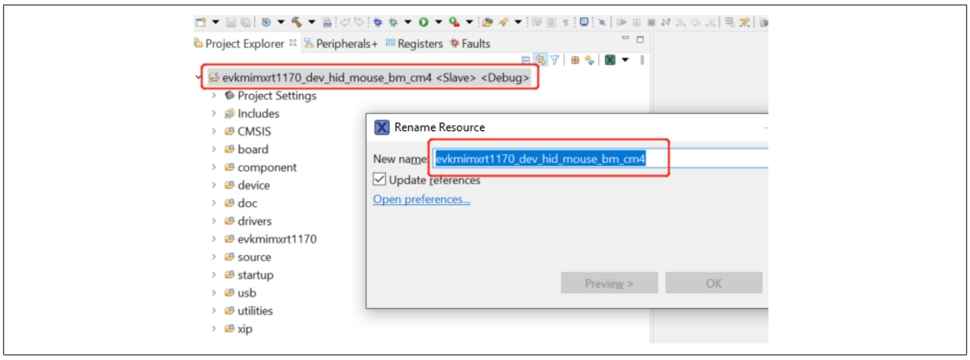
```
"${workspace_loc:/${ProjName}/usb/device/source/ehci}"
"${workspace_loc:/${ProjName}/usb/include}"
"${workspace_loc:/${ProjName}/usb/phy}"
"${workspace_loc:/${ProjName}/drivers}"
"${workspace_loc:/${ProjName}/sdmmc/inc}"
"${workspace_loc:/${ProjName}/sdmmc/host}"
"${workspace_loc:/${ProjName}/utilities}"
"${workspace_loc:/${ProjName}/device}"
"${workspace_loc:/${ProjName}/CMSIS}"
"${workspace_loc:/${ProjName}/component/uart}"
"${workspace_loc:/${ProjName}/component/lists}"
"${workspace_loc:/${ProjName}/xip}"
"${workspace_loc:/${ProjName}/usb/device/include}"
"${workspace_loc:/${ProjName}/usb/device/source}"
"${workspace_loc:/${ProjName}/component/osa}"
"${workspace_loc:/${ProjName}/sdmmc/osa}"
"${workspace_loc:/${ProjName}/source}"
"${workspace_loc:/${ProjName}/board}"
"${workspace_loc:/${ProjName}/usb/device/class}"
"${workspace_loc:/${ProjName}/usb/device/class/msc}"
```

Configuration: Debug [Active]

Include paths (-I)

```
"${workspace_loc:/${ProjName}/usb/device/source/ehci}"
"${workspace_loc:/${ProjName}/usb/include}"
"${workspace_loc:/${ProjName}/usb/phy}"
"${workspace_loc:/${ProjName}/component/timer}"
"${workspace_loc:/${ProjName}/drivers}"
"${workspace_loc:/${ProjName}/utilities}"
"${workspace_loc:/${ProjName}/device}"
"${workspace_loc:/${ProjName}/CMSIS}"
"${workspace_loc:/${ProjName}/component/uart}"
"${workspace_loc:/${ProjName}/component/lists}"
"${workspace_loc:/${ProjName}/xip}"
"${workspace_loc:/${ProjName}/usb/device/include}"
"${workspace_loc:/${ProjName}/usb/device/source}"
"${workspace_loc:/${ProjName}/component/osa}"
"${workspace_loc:/${ProjName}/source}"
"${workspace_loc:/${ProjName}/board}"
"${workspace_loc:/${ProjName}/usb/dcd}"
"${workspace_loc:/${ProjName}/usb/device/class}"
"${workspace_loc:/${ProjName}/usb/device/class/hid}"
```

4. **Change project name**
   a. Right-click **project name** -> **rename**, change the filename `dev_hid_mouse_bm_cm4` to `dev_msc_disk_bm_cm4`, and then click **OK**.



New name: evkmimxrt1170_dev_hid_mouse_bm_cm4

☑ Update references

With all above steps done, the M7 project is successfully changed to an M4 project and the M4 example USB project can be downloaded and debugged.

6 Note

1. The above steps provide the method based on the `dev_hid_mouse_bm` example to enable the `dev_msc_disk_bm` example on the M4 core. For other examples, similar way applies to change an M7 project to an M4 project.
2. To enable FreeRTOS examples, refer to *dev_hid_mouse_freertos*.
3. To enable USB host examples, refer to *host_hid_mouse_bm* or *host_hid_mouse_freertos*.

7 Revision history

This table summarizes revisions to this document.

Table 1. Revision history

Revision number	Date	Substantive changes
0	20 January 2021	Initial release
1	01 June 2021	Updated for MCUXpresso SDK v2.10.0
2	11 July 2022	Editorial and layout changes

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Document identifier: AN13690