Multi region heap memory divide example
(stm32f407 black board with 1MB external sram)
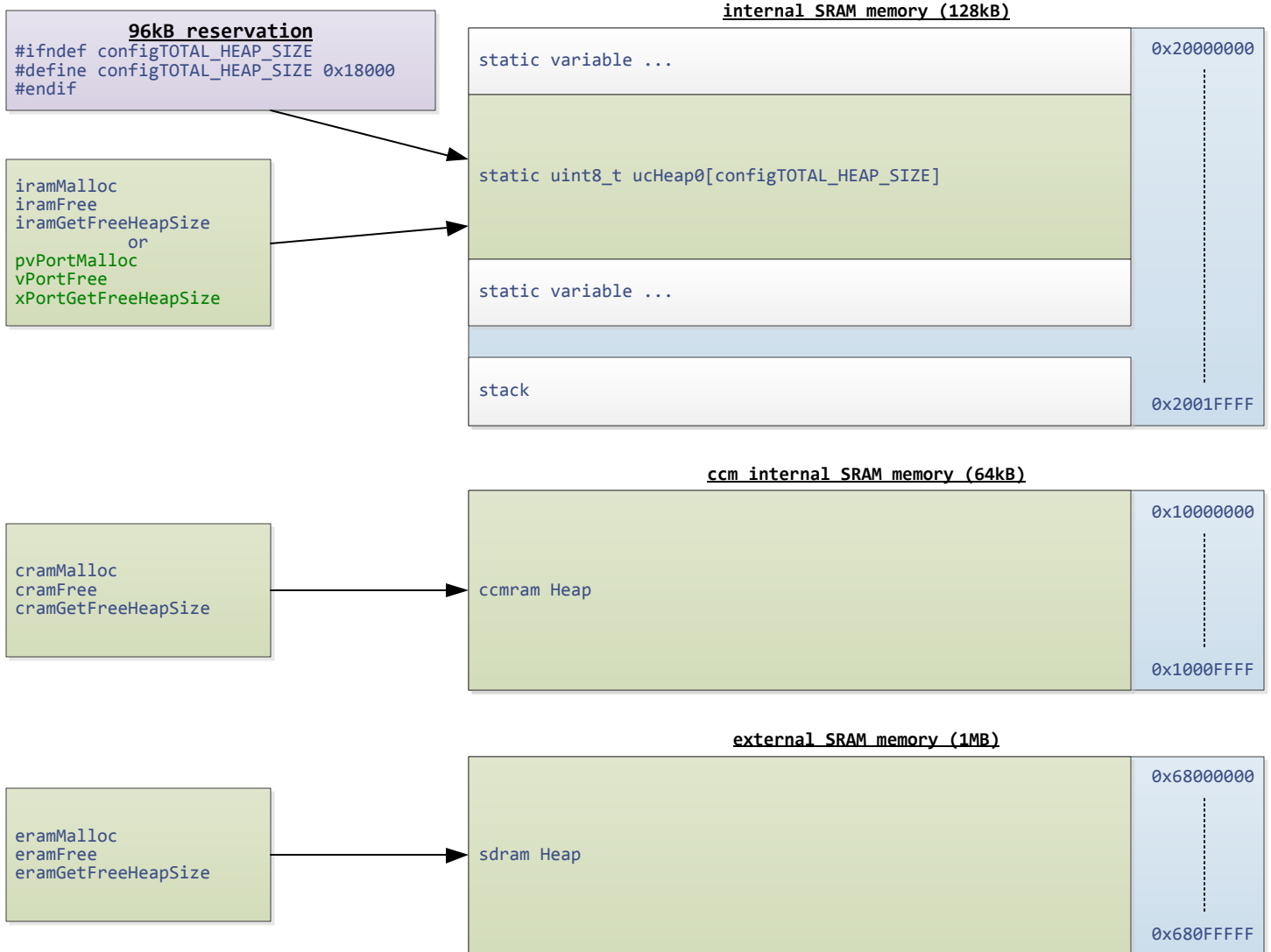
96kB reservation
```
#ifndef configTOTAL_HEAP_SIZE
#define configTOTAL_HEAP_SIZE 0x18000
#endif
```

```
iramMalloc
iramFree
iramGetFreeHeapSize
          or
pvPortMalloc
vPortFree
xPortGetFreeHeapSize
```

internal SRAM memory (128kB)

```
static variable ...
```
0x20000000

```
static uint8_t ucHeap0[configTOTAL_HEAP_SIZE]
```

```
static variable ...
```

```
stack
```
0x2001FFFF

```
cramMalloc
cramFree
cramGetFreeHeapSize
```

ccm internal SRAM memory (64kB)

0x10000000

```
ccmram Heap
```

0x1000FFFF

```
eramMalloc
eramFree
eramGetFreeHeapSize
```

external SRAM memory (1MB)

0x68000000

```
sdram Heap
```

0x680FFFFF

multi_heap_4.h

```c
/* Heap region number (1..6) */
#define HEAP_NUM       3

/* region 0 heap static reservation (if not used freertos -> check the free RAM size for setting) */
#ifndef configTOTAL_HEAP_SIZE
#define configTOTAL_HEAP_SIZE    0x18000
#endif

#define HEAP_0         ucHeap0[configTOTAL_HEAP_SIZE] // internal sram heap reservation if freertos used

/* regions table: adress and size (internal sram region (0), ccmram region (1), external ram region (2) ) */
#define HEAP_REGIONS   {{ (uint8_t *) &ucHeap0, sizeof(ucHeap0) },\
                        { (uint8_t *) 0x10000000, 0x10000       },\
                        { (uint8_t *) 0x68000000, 0x100000      }};

/* internal sram memory (region 0) procedures (*iramMalloc, iramFree, iramGetFreeHeapSize) */
#define iramMalloc(a)         multiPortMalloc(0, a)
#define iramFree(a)           multiPortFree(0, a)
#define iramGetFreeHeapSize(a)  multiPortGetFreeHeapSize(0)
#define iramGetMinimumEverFreeHeapSize multiPortGetMinimumEverFreeHeapSize(0)

/* ccm ram memory (region 1) procedures (*cramMalloc, cramFree, cramGetFreeHeapSize) */
#define cramMalloc(a)         multiPortMalloc(1, a)
#define cramFree(a)           multiPortFree(1, a)
#define cramGetFreeHeapSize(a)  multiPortGetFreeHeapSize(1)
#define cramGetMinimumEverFreeHeapSize multiPortGetMinimumEverFreeHeapSize(1)

/* external ram memory (region 2) procedures (*eramMalloc, eramFree, eramGetFreeHeapSize) */
#define eramMalloc(a)         multiPortMalloc(2, a)
#define eramFree(a)           multiPortFree(2, a)
#define eramGetFreeHeapSize(a)  multiPortGetFreeHeapSize(2)
#define eramGetMinimumEverFreeHeapSize multiPortGetMinimumEverFreeHeapSize(2)
```
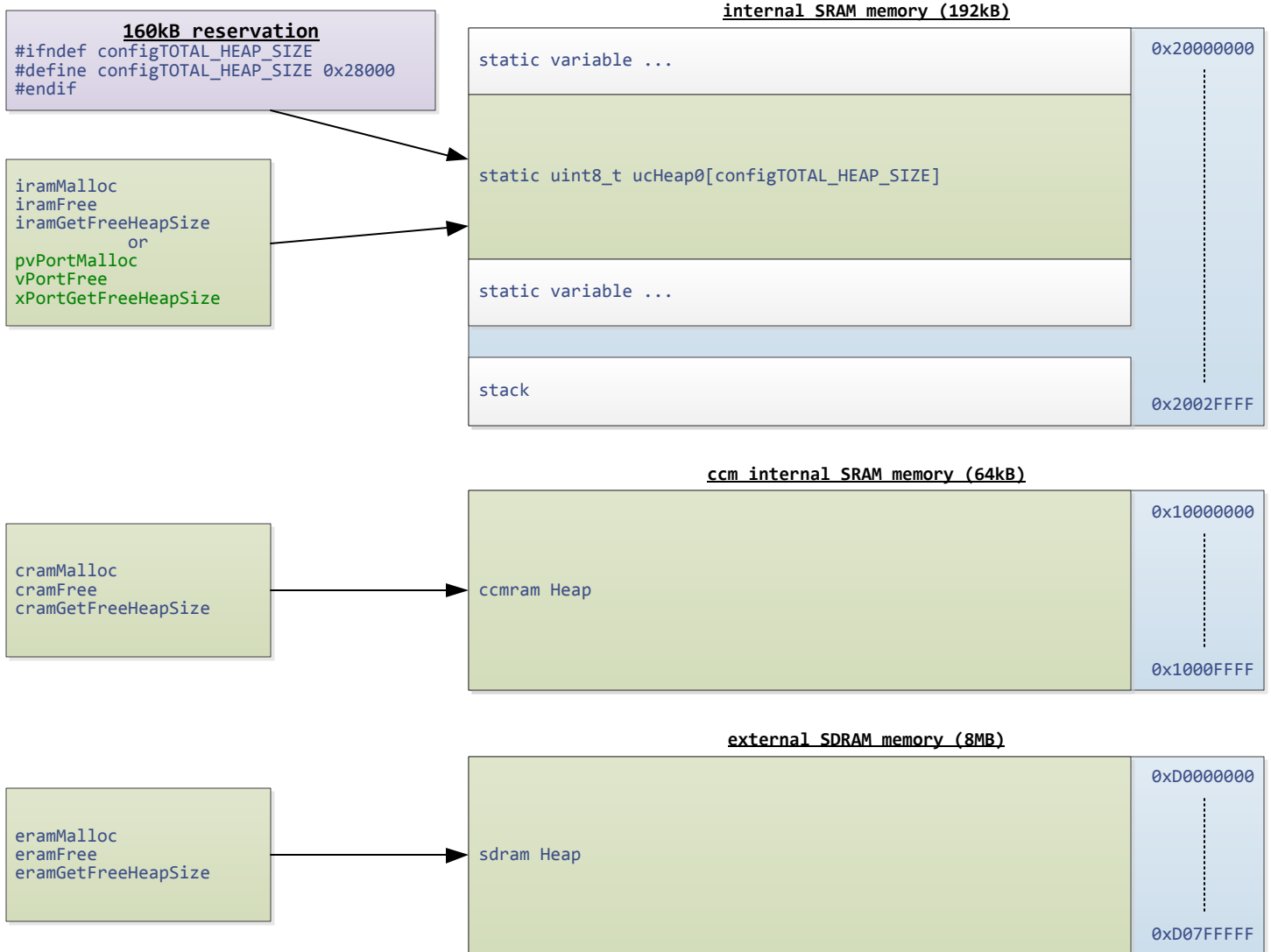
Multi region heap memory divide example
(stm32f429 discovery board with 8MB external sdram)

internal SRAM memory (192kB)

160kB reservation
```
#ifndef configTOTAL_HEAP_SIZE
#define configTOTAL_HEAP_SIZE 0x28000
#endif
```

```
static variable ...

static uint8_t ucHeap0[configTOTAL_HEAP_SIZE]

static variable ...

stack
```

0x20000000

0x2002FFFF

```
iramMalloc
iramFree
iramGetFreeHeapSize
         or
pvPortMalloc
vPortFree
xPortGetFreeHeapSize
```

ccm internal SRAM memory (64kB)

```
cramMalloc
cramFree
cramGetFreeHeapSize
```

ccmram Heap

0x10000000

0x1000FFFF

external SDRAM memory (8MB)

```
eramMalloc
eramFree
eramGetFreeHeapSize
```

sdram Heap

0xD0000000

0xD07FFFFF

multi_heap_4.h

```c
/* Heap region number (1..6) */
#define HEAP_NUM      3

/* region 0 heap static reservation (if not used freertos -> check the free RAM size for setting) */
#ifndef configTOTAL_HEAP_SIZE
#define configTOTAL_HEAP_SIZE    0x28000
#endif

#define HEAP_0        ucHeap0[configTOTAL_HEAP_SIZE] // internal sram heap reservation if freertos used

/* regions table: adress and size (internal sram region (0), ccmram region (1), external ram region (2) ) */
#define HEAP_REGIONS  {{ (uint8_t *) &ucHeap0, sizeof(ucHeap0) },\
                       { (uint8_t *) 0x10000000, 0x10000      },\
                       { (uint8_t *) 0xD0000000, 0x800000     }};

/* internal sram memory (region 0) procedures (*iramMalloc, iramFree, iramGetFreeHeapSize) */
#define iramMalloc(a)        multiPortMalloc(0, a)
#define iramFree(a)          multiPortFree(0, a)
#define iramGetFreeHeapSize(a)  multiPortGetFreeHeapSize(0)
#define iramGetMinimumEverFreeHeapSize multiPortGetMinimumEverFreeHeapSize(0)

/* ccm ram memory (region 1) procedures (*cramMalloc, cramFree, cramGetFreeHeapSize) */
#define cramMalloc(a)        multiPortMalloc(1, a)
#define cramFree(a)          multiPortFree(1, a)
#define cramGetFreeHeapSize(a)  multiPortGetFreeHeapSize(1)
#define cramGetMinimumEverFreeHeapSize multiPortGetMinimumEverFreeHeapSize(1)

/* external ram memory (region 2) procedures (*eramMalloc, eramFree, eramGetFreeHeapSize) */
#define eramMalloc(a)        multiPortMalloc(2, a)
#define eramFree(a)          multiPortFree(2, a)
#define eramGetFreeHeapSize(a)  multiPortGetFreeHeapSize(2)
#define eramGetMinimumEverFreeHeapSize multiPortGetMinimumEverFreeHeapSize(2)
```