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A Note on Using C/C++ Compiler Packages for 32-, 16-, and 8-Bit MCUs

When using the C/C++ compiler packages for 32-, 16-, and 8-bit MCUs listed below, take note of the following problem:

- With using the `-cpu=stride` option during linking (LNK-0010)

Compiler packages:

- C/C++ compiler package for the SuperH RISC engine family
 - C/C++ compiler package for the RX family
 - C/C++ compiler package for the M16C series and the R8C family
 - C/C++ compiler package for the H8SX, H8S, and H8 families
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1. Products and Versions Concerned

- C/C++ compiler package for the SuperH RISC engine family
V.9.03 Release 00 ~ V.9.04 Release 00
- C/C++ compiler package for the RX family
V.1.00 Release 00 ~ V.1.01 Release 00
- C/C++ compiler package for the M16C series and the R8C family
V.6.00 Release 00
- C/C++ compiler package for the H8SX, H8S, and H8 families
V.6.02 Release 02 and V.7.00 Release 00

2. Description

When you try to divide and allocate a section by using the `-cpu=stride` option, the section may not be divided and overlap with another if an absolute address section exists within the address range specified by the `-cpu=<memory type>` option.

2.1 Conditions

This problem arises if the following conditions are all satisfied:

- (1) The `-cpu=stride` and the `-cpu=<memory type>=<address range>` options are used.
- (2) An absolute-address section (here after called `tbl1`) is defined.
- (3) A section to be divided (called `tbl2`) exists within the address range specified by one option in (1).
- (4) Along with the sections in (2) and (3), another section (called `tbl3`) exists. They are allocated in the increasing order of addresses and called `tbl1`, `tbl2`, and `tbl3` in the above order.
- (5) The sections in (2) and (3) are the same in memory type specified by the `-cpu=<memory type>` option.

2.2 Examples

Examples in C/C++ compiler package for M16C series and the R8C family:

tp1.a30

```
.section tbl1,romdata ; Condition (2)
.org 0C000h
.lword 1,2,3,4
.lword 5,6,7,8
```

```
.section tbl2,romdata ; Condition (3)
.lword 1,2,3,4
.lword 5,6,7,8
```

```
.section tbl3,romdata ; Condition (4)
.lword 1,2,3,4
.lword 5,6,7,8
```

```
.end
```

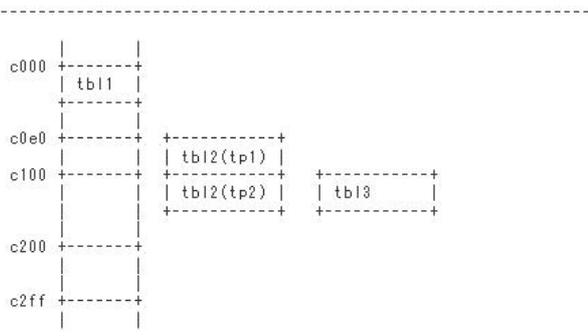
tp2.a30

```
.section tbl2,romdata ; Condition (3)
.lword 1,2,3,4
.lword 5,6,7,8
.end
```

Example of command lines:

```
> optlnk tp1.obj tp2.obj
  -start=tbl2/c0e0,tbl3/c100           Condition (4)
  -cpu=rom=c000-c0ff,fix=c100-c1ff,rom=c200-c2ff Conditions (1), (5)
  -cpu=stride                          Condition (1)
-----
```

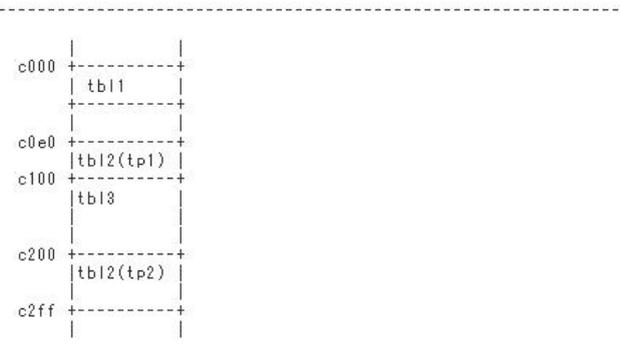
For an example of the allocation of the section that has not been divided



In this example, all the tbl2 sections are not divided, and the tbl2 section in the tp2.a30 file overlaps with tbl3 in it, resulting in the following error message being outputted:

L2321 (E) Section "tbl3" overlaps section "tbl2"

For an example of the allocation of the section that has been divided properly



In this example, all the tbl2 sections are divided and allocated in the next address range (rom=c200-c2ff), which has the same memory type "rom" as tbl2.

3. Workarounds

To avoid the problem, use either of the following methods:

- (1) Do not define the section in Condition (3) with absolute addresses, but allocate it by using the -start option. To do so, follow these steps:

- (a) Change the absolute address section to a relocatable one.

Example -----

```

tp1.a30
.section tbl1,romdata ; Absolute address section changed
; .org 0C000h ; to relocatable one. .lword
1,2,3,4 .lword 5,6,7,8
. . . . .
.end
  
```

- (b) Specify the beginning address of the section changed in (a) by using the -start option.

Example of command line:

```

-----
-start=tbl1/C000,tbl2/C0E0,tbl3/C100
  
```

- (2) Do not use the -cpu=stride option, but allocate sections. To do so, follow these steps:

(a) Rename the section (tbl2 in tp2.a30) allocated outside of the address range specified by the -cpu option.

Example

```
-----  
tp2.a30  
.section tbl2_1,romdata ; Section renamed.  
.lword 1,2,3,4  
.lword 5,6,7,8  
.end  
-----
```

(b) Allocate the section renamed in (a) within the address range specified by the -cpu option by using the -start option.

Example of command line:

```
-----  
-start=tbl2/C0E0,tbl3/C100,tbl2_1/C200  
-----
```

4. Schedule of Fixing the Problem

We plan to fix this problem in the following versions of compiler packages:

- C/C++ compiler package for the SuperH RISC engine family
V.9.05 Release 00
 - C/C++ compiler package for the RX family
V.1.02 Release 00
 - C/C++ compiler package for the M16C series and the R8C family
V.6.01 Release 00
 - C/C++ compiler package for the H8SX, H8S, and H8 families
V.7.00 Release 01
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