

UEFI Basic Tutorial (15) - Get UEFI MemoryMap

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This article introduces a C code for obtaining EFI memory map, which repeatedly calls GetMemoryMap function until the complete memory map information is successfully obtained. The code shows how to check memory types such as reserved memory and loader code, and counts the number of different types of memory pages.

The summary is generated in [C Know](#) , supported by DeepSeek-R1 full version, [go to experience](#)>

1. Write source code

AI generated projects [登录复制](#)

```
1  EfiMemoryMapSize = 0;
2  EfiMemoryMap = NULL;
3  Status = gBS->GetMemoryMap (
4      &EfiMemoryMapSize,
5      EfiMemoryMap,
6      &EfiMapKey,
7      &EfiDescriptorSize,
8      &EfiDescriptorVersion
9  );
10 ASSERT (Status == EFI_BUFFER_TOO_SMALL);
11 do {
12
13     EfiMemoryMap = AllocatePool (EfiMemoryMapSize);
14     if (EfiMemoryMap == NULL){
15         DEBUG ((EFI_D_ERROR, "ERROR!! Null Pointer returned by AllocatePool ()\n"));
16         ASSERT_EFI_ERROR (EFI_OUT_OF_RESOURCES);
17         return Status;
18     }
19     Status = gBS->GetMemoryMap (
20         &EfiMemoryMapSize,
21         EfiMemoryMap,
22         &EfiMapKey,
23         &EfiDescriptorSize,
24         &EfiDescriptorVersion
25     );
26     if (EFI_ERROR(Status)) {
27         FreePool (EfiMemoryMap);
28     }
29 } while (Status == EFI_BUFFER_TOO_SMALL);
30
31 DEBUG((DEBUG_ERROR | DEBUG_PAGE,"[CSDN] EfiMemoryMapSize=0x%x EfiDescriptorSize=0x%x EfiMemoryMap=0x%x \n", EfiMemoryMapSize, EfiDescriptorSize, (UINTN)EfiMemoryMap));
32
33
```

```

33 EfiMemoryMapEnd = (EFI_MEMORY_DESCRIPTOR *)((UINT8 *)EfiMemoryMap + EfiMemoryMapSize);
34 EfiEntry = EfiMemoryMap;
35
36 DEBUG((DEBUG_ERROR | DEBUG_PAGE, "===== %S===== Start\n", L"CSDN MemMap"));
37
38 while (EfiEntry < EfiMemoryMapEnd) {
39
40     if (EfiEntry->Type == EfiReservedMemoryType){
41         DEBUG((DEBUG_ERROR | DEBUG_PAGE, "[CSDN] EfiReservedMemoryType  %3d %16lx pn %16lx \n", EfiEntry->Type, EfiEntry->PhysicalStart, EfiEntry->NumberOfPages));
42         ReservedMemoryTypePage = ReservedMemoryTypePage + EfiEntry->NumberOfPages;
43     }else if (EfiEntry->Type == EfiLoaderCode){
44         DEBUG((DEBUG_ERROR | DEBUG_PAGE, "[CSDN] EfiLoaderCode  %3d %16lx pn %16lx \n", EfiEntry->Type, EfiEntry->PhysicalStart, EfiEntry->NumberOfPages));
45         LoaderCodePage = LoaderCodePage + EfiEntry->NumberOfPages;
46     }
47 }

```

收起 ^

2. 编译 Generate EFI file & 运行

The image shows two windows side-by-side. The left window is a QEMU terminal running the UEFI Interactive Shell v2.2. It displays the 'Mapping table' for FS0 and lists files in the directory: MyHelloWorldSmbios.efi, SmbiosTest.efi, MyVariable.efi, and MyMemMap.efi. The file 'MyMemMap.efi' is highlighted with a red box. The right window is a Windows command prompt running 'Select Administrator: C:\WINDOWS\system32\cmd.exe'. It displays the 'CSDN MemMap' dump, which is a table of EFI memory regions. Red arrows point from the QEMU terminal to the command prompt: one from 'mem type' to the 'Type' column, one from 'mem physical start addr' to the 'PhysicalStart' column, and one from 'mem page num' to the 'NumberOfPages' column. The table includes entries for EfiBootServicesCode, EfiConventionalMemory, EfiACPIMemoryNVS, EfiBootServicesData, EfiLoaderCode, EfiReservedMemoryType, EfiRuntimeServicesData, EfiACPIReclaimMemory, and EfiACPIMemoryNVS.

Type	PhysicalStart	NumberOfPages
[CSDN] EfiBootServicesCode	0	1
[CSDN] EfiConventionalMemory	1000	9F
[CSDN] EfiConventionalMemory	100000	700
[CSDN] EfiACPIMemoryNVS	800000	8
[CSDN] EfiConventionalMemory	808000	8
[CSDN] EfiACPIMemoryNVS	810000	F0
[CSDN] EfiBootServicesData	900000	C00
[CSDN] EfiConventionalMemory	1500000	1AA36
[CSDN] EfiBootServicesData	1BF36000	20
[CSDN] EfiConventionalMemory	1BF50000	22E3
[CSDN] EfiLoaderCode	1E239000	E5
[CSDN] EfiBootServicesData	1E31E000	481
[CSDN] EfiBootServicesCode	1E79F000	13E
[CSDN] EfiACPIMemoryNVS	1E8DD000	14
[CSDN] EfiReservedMemoryType	1E8F1000	1E
[CSDN] EfiBootServicesCode	1E90F000	182
[CSDN] EfiRuntimeServicesData	1EA91000	8A
[CSDN] EfiConventionalMemory	1EB18000	182
[CSDN] EfiBootServicesData	1ECCD000	1E
[CSDN] EfiConventionalMemory	1ECEB000	18
[CSDN] EfiBootServicesData	1ED03000	1
[CSDN] EfiConventionalMemory	1ED04000	3
[CSDN] EfiBootServicesData	1ED07000	D14
[CSDN] EfiConventionalMemory	1FA18000	1
[CSDN] EfiBootServicesCode	1FA1C000	17F
[CSDN] EfiRuntimeServicesCode	1FB9B000	30
[CSDN] EfiRuntimeServicesData	1FBCB000	24
[CSDN] EfiReservedMemoryType	1FBEF000	4
[CSDN] EfiACPIReclaimMemory	1FBF3000	8
[CSDN] EfiACPIMemoryNVS	1FBFB000	4
[CSDN] EfiBootServicesData	1FBFF000	201
[CSDN] EfiConventionalMemory	1FE00000	83
[CSDN] EfiBootServicesData	1FE83000	20
[CSDN] EfiBootServicesCode	1FEA3000	25
[CSDN] EfiBootServicesData	1FEC8000	9
[CSDN] EfiBootServicesCode	1FED1000	23
[CSDN] EfiRuntimeServicesData	1FEF4000	84
[CSDN] EfiACPIMemoryNVS	1FF78000	88
[CSDN] EfiBootServicesData Page Number:	1FFE	31MB
[CSDN] EfiBootServicesCode Page Number:	488	4MB
[CSDN] EfiACPIReclaimMemory Page Number:	8	0MB
[CSDN] EfiACPIMemoryNVS Page Number:	198	1MB
[CSDN] EfiReservedMemoryType Page Number:	22	0MB

This is a memmap dump demo. You can use this demo to get the current BIOS mem region allocation. You can also use the built-in memmap command in the shell to view the current memory map.

QEMU - Press Ctrl+Alt+G to release grab

Machine

View

RT_Code

000000001FB9B000-000000001FBCAFFF

0000000000000030

800000000000000F

RT_Data

000000001FBCB000-000000001FBEEFFF

0000000000000024

800000000000000F

Reserved

000000001FBEB000-000000001FBF2FFF

0000000000000004

000000000000000F

ACPI_Recl

000000001FBF3000-000000001FBFAFFF

0000000000000008

000000000000000F

ACPI_NUS

000000001FBFB000-000000001FBFEFFF

0000000000000004

000000000000000F

BS_Data

000000001FBFF000-000000001FDFFFFF

00000000000000201

000000000000000F

Available

000000001FE00000-000000001FE82FFF

0000000000000003

000000000000000F

BS_Data

000000001FE83000-000000001FEA2FFF

0000000000000020

000000000000000F

BS_Code

000000001FEA3000-000000001FEC7FFF

0000000000000025

000000000000000F

BS_Data

000000001FEC8000-000000001FED0FFF

0000000000000009

000000000000000F

BS_Code

000000001FED1000-000000001FEF3FFF

0000000000000023

000000000000000F

RT_Data

000000001FEF4000-000000001FFF7FFF

00000000000000084

800000000000000F

ACPI_NUS

000000001FFF8000-000000001FFFFFFF

00000000000000088

000000000000000F

Reserved

:

34

Pages

(139,264

Bytes)

LoaderCode:

225

Pages

(921,600

Bytes)

LoaderData:

0

Pages

(0

Bytes)

BS_Code

:

1,160

Pages

(4,751,360

Bytes)

BS_Data

:

8,189

Pages

(33,542,144

Bytes)

RT_Code

:

48

Pages

(196,608

Bytes)

RT_Data

:

306

Pages

(1,253,376

Bytes)

ACPI_Recl

:

8

Pages

(32,768

Bytes)

ACPI_NUS

:

408

Pages

(1,671,168

Bytes)

MMIO

:

0

Pages

(0

Bytes)

Press ENTER to continue or 'Q' break:

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[Mem map DEMO source code](#)

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