UEFI Basics Tutorial (V) - A Preliminary Study on PPI



This article introduces the PPI (PEIM-to-PEIM Interface) communication mechanism in UEFI environment in detail, and shows how to use PeiServicesInstallPpi and PeiServicesLocatePpi to register and obtain services between PEIM modules and access resources through specific examples.

The summary is generated in C Know, supported by DeepSeek-R1 full version, go to experience>

1. Write source code

1. Write C:\edkii\OvmfPkg\MyHelloWorldInstallPPI\MyHelloWorldInstallPPI.c,

```
C
                                                                                                        Al generated projects
                                                                                                                               登录复制
                                                                                                                                         run
    #include <uefi.h>
    #include <Library/UefiLib.h>
    #include <Library/BaseLib.h>
    #include <Library/DebugLib.h>
    #include <Library/BaseMemoryLib.h>
    #include <Library/UefiDriverEntryPoint.h>
    #include <Library/PeimEntryPoint.h>
    #include <Library/PeiServicesLib.h>
    #include <Library/PeiServicesTablePointerLib.h>
    #include <Pi/PiHob.h>
11
    #include <Pi/PiPeiCis.h>
12
13
    EFI GUID qMyHelloWorldPEIGUID = { 0xbdb38129, 0x4d65, 0x39f4, { 0x72, 0x12, 0x68, 0xcf, 0x5a, 0x19, 0xa, 0xf8 }};
14
```

```
15
 16 EFI STATUS
 17 | EFIAPI
 18 | PrintHelloMsg (
     IN CHAR16 * Msg
 19
 20
       )
twen {
       DEBUG ((EFI D ERROR, "[MyHelloWorldPPI] PrintHelloMsg : %s \n", Msg));
twen
       return EFI SUCCESS;
twen
twen }
 25
     typedef EFI_STATUS (EFIAPI * PRINTMSG)(CHAR16 *Msg);
 26
     typedef struct _EFI_HELLOWORLD_PROTOCOL {
         PRINTMSG PrintMsg;
 28
 29
     }EFI_HELLOWORLD_PROTOCOL;
 30
     EFI_HELLOWORLD_PROTOCOL mHelloWorldPpi = {
 31
 32
         PrintHelloMsg
 33
     };
 34
 35 | EFI PEI PPI DESCRIPTOR
                               mPpiListCodePpi = {
       (EFI_PEI_PPI_DESCRIPTOR_PPI | EFI_PEI_PPI_DESCRIPTOR_TERMINATE_LIST),
 36
 37
       &gMyHelloWorldPEIGUID,
       &mHelloWorldPpi
 38
 39
     };
 40
 41 EFI_STATUS
 42 | EFIAPI
 43 MyHelloWorldInstallPPIEntry(
 44
                EFI_PEI_FILE_HANDLE FileHandle,
 45
       IN CONST EFI PEI SERVICES
                                     **PeiServices
 46
 47
 48
       EFI STATUS
                                               Status = EFI SUCCESS;
       DEBUG ((EFI_D_ERROR, "[MyHelloWorldPPI] MyHelloWorldInstallPPIEntry Start..\n"));
 49
 50
       PeiServicesInstallPpi (&mPpiListCodePpi);
       DEBUG ((EFI_D_ERROR, "[MyHelloWorldPPI] MyHelloWorldInstallPPIEntry End..\n"));
 51
 52
 53
       return Status;
```

2. Write C:\edkii\OvmfPkg\MyHelloWorldInstallPPI\MyHelloWorldInstallPPI.inf,

```
登录复制
 C
                                                                                                         Al generated projects
                                                                                                                                          run
  1 [Defines]
       INF VERSION = 0 \times 00010006
       BASE_NAME = MyHelloWorldInstallPPI
       FILE_GUID = 69E6DE5D-F09E-485E-9936-EB70FDCFC82A
       MODULE TYPE = PEIM
       VERSION_STRING = 1.0
       ENTRY POINT = MyHelloWorldInstallPPIEntry
  9
     [Sources]
 10
       MyHelloWorldInstallPPI.c
 11
 12
     [Packages]
 13
       MdePkg/MdePkg.dec
 14
       ShellPkg/ShellPkg.dec
 15
       MdeModulePkg/MdeModulePkg.dec
 16
 17
     [LibraryClasses]
 18
       BaseLib
 19
       PeimEntryPoint
 20
       BaseMemoryLib
       DebugLib
twen
       PeiServicesLib
twen
       PrintLib
twen
twen
       #PeiLib
 25
       #EfiCommonLib
 26
 27
     [depex]
 28
       TRUE
 29
 30
4 • •
                                                                    收起 へ
```

C All generated projects 登录复制 run

```
#include <uefi.h>
     #include <Library/UefiLib.h>
     #include <Library/BaseLib.h>
     #include <Library/DebugLib.h>
     #include <Library/BaseMemoryLib.h>
     #include <Library/UefiDriverEntryPoint.h>
     #include <Library/PeimEntryPoint.h>
     #include <Library/PeiServicesLib.h>
     #include <Library/PeiServicesTablePointerLib.h>
 10
     #include <Pi/PiHob.h>
 11
     EFI GUID gMyHelloWorldPEIGUID = { 0xbdb38129, 0x4d65, 0x39f4, { 0x72, 0x12, 0x68, 0xcf, 0x5a, 0x19, 0xa, 0xf8 }};
 12
 13
 14
     typedef EFI STATUS (EFIAPI * PRINTMSG)(CHAR16 *Msg);
 16
     typedef struct _EFI_HELLOWORLD_PROTOCOL {
 17
         PRINTMSG PrintMsg;
 18
     }EFI HELLOWORLD PROTOCOL;
 19
     //ShellCEntryLib call user interface ShellAppMain
twen EFI_STATUS
twen EFIAPI
twen MyHelloWorldLocatePPIEntry(
       IN
                EFI PEI FILE HANDLE FileHandle,
twen
 25
       IN CONST EFI PEI SERVICES
                                     **PeiServices
 26
 27
 28
       EFI STATUS Status = EFI SUCCESS;
 29
       EFI HELLOWORLD PROTOCOL *mHelloWorldPpi = NULL;
       DEBUG ((EFI_D_ERROR, "[MyHelloWorldPPI] MyHelloWorldLocatePPIEntry Locate PPI Start..\n"));
 30
 31
       Status = PeiServicesLocatePpi (
 32
                &gMyHelloWorldPEIGUID,
 33
                Θ,
 34
                NULL,
 35
                (VOID **)&mHelloWorldPpi
 36
                );
 37
       if (EFI ERROR(Status)){
           DEBUG ((EFI_D_ERROR, "[MyHelloWorldPPI] MyHelloWorldLocatePPIEntry Locate PPI Fail..%r\n",Status));
 38
 39
           return Status;
```

```
40
 41
       mHelloWorldPpi->PrintMsg(L"2019 CSDN Locate PPI Hello World ...\n");
 42
       DEBUG ((EFI D ERROR, "[MyHelloWorldPPI] MyHelloWorldLocatePPIEntry Locate PPI End..\n"));
 43
       return Status;
 44
4 0 }
                                                                   收起 へ
```

4. Write C:\edkii\OvmfPkg\MyHelloWorldLocatePPI\MyHelloWorldLocatePPI.inf

C

Al generated projects 登录复制 [Defines] INF VERSION = 0×00010006 BASE NAME = MyHelloWorldLocatePPI FILE GUID = 69E6DE6D-F39F-485f-9037-EB70FDCFC82B MODULE TYPE = PEIM VERSION STRING = 1.0 ENTRY POINT = MyHelloWorldLocatePPIEntry 9 [Sources] MyHelloWorldLocatePPI.c 10 11 12 [Packages] 13 MdePkg/MdePkg.dec 14 ShellPkg/ShellPkg.dec 15 MdeModulePkg/MdeModulePkg.dec 16 17 [LibraryClasses] 18 BaseLib 19 PeimEntryPoint 20 BaseMemoryLib DebugLib twen PeiServicesLib twen twen PrintLib #PeiLib twen 25 #EfiCommonLib 26 27 [depex] 28 TRUE **4**

run

5. Modify C:\edkii\OvmfPkg\OvmfPkgX64.dsc

Al generated projects C 登录复制 run [Components] 2 # PEI Phase modules INF OvmfPkg/MyHelloWorldInstallPPI/MyHelloWorldInstallPPI.inf INF OvmfPkg/MyHelloWorldLocatePPI/MyHelloWorldLocatePPI.inf 8 . . . 6. Modify C:\edkii\OvmfPkg\OvmfPkgX64.fdf C Al generated projects 登录复制 run

```
1  [FV.PEIFV]
2  ...
3  #
4  # PEI Phase modules
5  #
6  INF  OvmfPkg/MyHelloWorldInstallPPI/MyHelloWorldInstallPPI.inf
7  INF  OvmfPkg/MyHelloWorldLocatePPI/MyHelloWorldLocatePPI.inf
8  ...
```

2. Compile and generate EFI files

Run and edksetup.bat compile the entire OvmfPkg Package

3. Run HelloWorld PPI Driver

1. Copy C:\edkii\Build\OvmfX64\DEBUG_VS2013x86\FV\OVMF.fd to C:\qemu

2. The output of executing is as follows, setup-gemu-x64.bat | findstr MyHelloWorldPPI

Business

```
C:\aemu>setup-aemu-x64.bat | findstr MvHelloWorldPPI
WARNING: Image format was not specified for 'HDD BOOT.img' and probing guessed raw.
        Automatically detecting the format is dangerous for raw images, write operations on block 0 will be restricted
        Specify the 'raw' format explicitly to remove the restrictions.
[MyHelloWorldPPI] MyHelloWorldInstallPPIEntry Start..
[MvHelloWorldPPI] MvHelloWorldInstallPPIEntrv End..
[MvHelloWorldPPI] MvHelloWorldLocatePPIEntry Locate PPI Start..
[MyHelloWorldPPI] PrintHelloMsg : 2019 CSDN Locate PPI Hello World ...
[MyHelloWorldPPI] MyHelloWorldLocatePPIEntry Locate PPI End..
                                                                                             https://blog.csdn.net/xiaopangzi313
```

IV. Summary

PPI (PEIM-to-PEIM Interface) is a communication method between PEIM drivers. In this article, MyHelloWorldInstallPPI the module PeiServicesInstallPpi provides the mPpiListCodePpi service, and MyHelloWorldLocatePPI the module PeiServicesLocatePpi obtains the mPpiListCodePpi object and accesses the member functions of the object to access the driver MyHelloWorldInstallPPI resources.

PPI DEMO source code

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