UEFI Basics Tutorial (12) - Using the Standard C Library

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摘要 This article details how to use the EDKII framework to write and run UEFI applications that include standard C libraries in a UEFI environment. Through specific examples, it shows the entire process from writing source code, configuring the compilation environment, compiling and generating EFI files to running under the UEFI shell. This process not only deepens th…

1. Write source code

1. Write the UEFI Application
   code C:\edkii\OvmfPkg\MyHelloWorldStdLibC\MyHelloWorldStdLibC.c,


```
#include <stdio.h>

int main(int args , char ** argv){

  int nums[10] = {4, 5, 2, 10, 7, 1, 8, 3, 6, 9};
  int i, j, temp, isSorted;

  printf("Before Sorting, ... \n");
  //排序前
  for(i=0; i<10; i++){
    printf("%d ", nums[i]);
  }
  printf("\n");

  //优化算法：最多进行 n-1 轮比较
  for(i=0; i<10-1; i++){
    isSorted = 1; //假设剩下的元素已经排序好了
    for(j=0; j<10-1-i; j++){
      if(nums[j] > nums[j+1]){
        temp = nums[j];
        nums[j] = nums[j+1];
        nums[j+1] = temp;
        isSorted = 0;
      }
      }
    if(isSorted) break; //如果没有发生交换，说明剩下的元素已经排序好了
  }

  //排序后
  printf("After Sorting, ... \n");
  for(i=0; i<10; i++){
    printf("%d ", nums[i]);
  }
```

```
  printf("\n");
  return 0;
}
```

收起 ^

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

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```
[Defines]
  INF_VERSION = 0x00010006
  BASE_NAME = MyHelloWorldStdLibC
  FILE_GUID = c912f194-7f0e-4803-b907-b757b806ec73
  MODULE_TYPE = UEFI_APPLICATION
  VERSION_STRING = 1.0
  ENTRY_POINT = ShellCEntryLib
  VALID_ARCHITECTURES = X64

[Sources]
  MyHelloWorldStdLibC.c

# 添加标准C库头文件
[Packages]
  MdePkg/MdePkg.dec
  ShellPkg/ShellPkg.dec
  StdLib/StdLib.dec

# 添加标准C库
[LibraryClasses]
  LibC
  LibStdio
  ShellCEntryLib
```

收起 ^

3. Modify the OvmfPkg/OvmfPkgX64.dsc file and add

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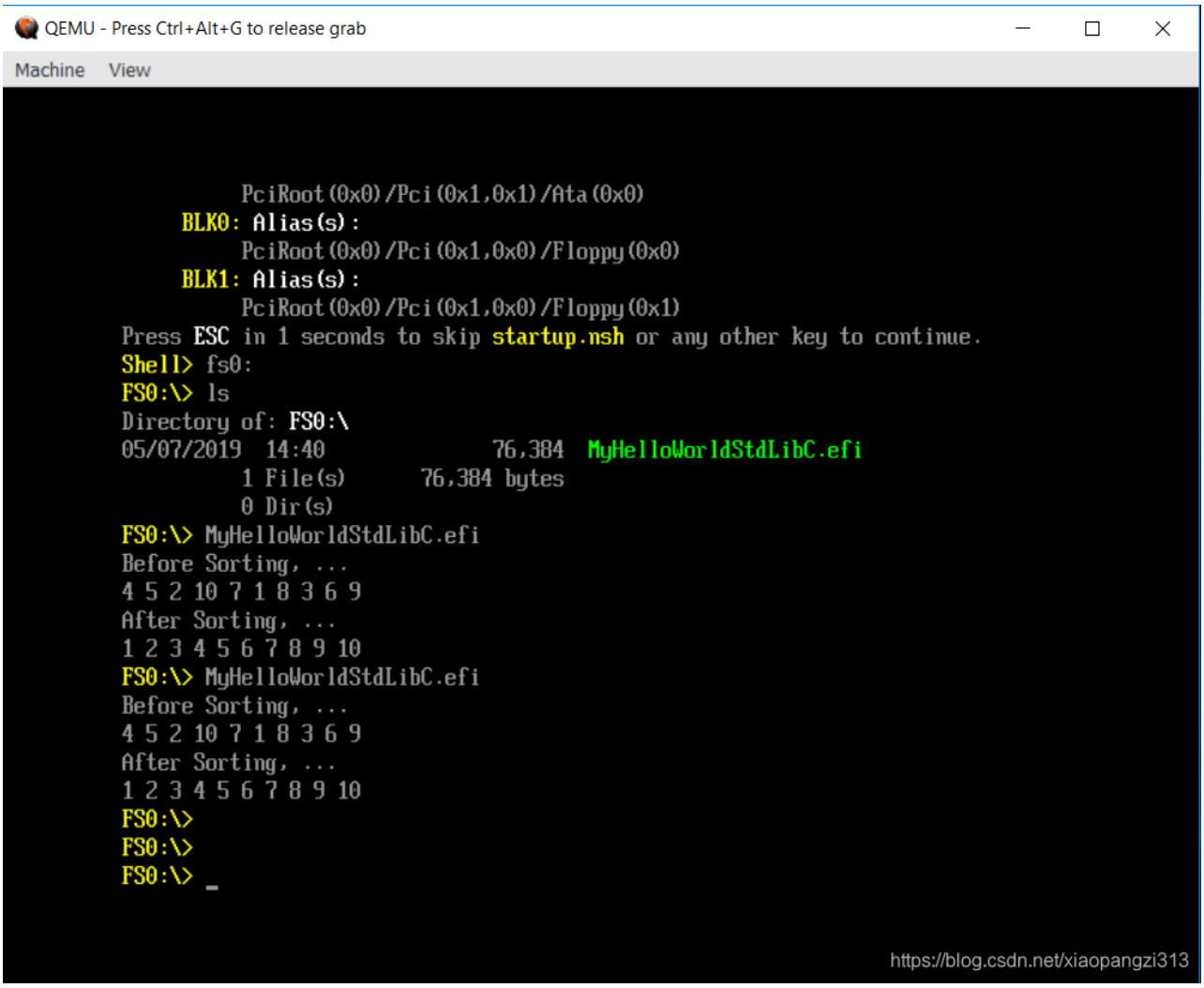
```
##############################################################################
#
#  Include Boilerplate text required for building with the Standard Libraries.
#
##############################################################################
!include StdLib/StdLib.inc
!include AppPkg/Applications/Sockets/Sockets.inc
```

2. Compile and generate EFI files

Run and `edksetup.bat` compile the entire OvmfPkg Package

3. Run UEFI APP `MyHelloWorldStdLibC.efi`

1. Copy `C:\edkii\Build\OvmfX64\DEBUG_VS2013x86\FV\OVMF.fd` to `C:\qemu` ; Copy `C:\edkii\Build\OvmfX64\DEBUG_VS2013x86\X64\OvmfPkg\MyHelloWorldStdLibC\MyHelloWorldStdLibC\OUTPUT\MyHelloWorldStdLibC.efi` to virtual disk `HDD_BOOT.img`
2. Execute `setup-qemu-x64.bat` , then `UEFI SHELL` execute in `MyHelloWorldStdLibC.efi` , the result is as follows, [External link image transfer failed, the source site may have an anti-hotlink mechanism, it is recommended to save the image and upload it directly



IV. Summary

This article compiles and runs the standard C library program by referencing the StdLib module in EKDII, and runs it under the UEFI SHELL. By using the standard C library, we can write general programs more flexibly and greatly improve development efficiency.

STDLIBC DEMO source code