EDK II source code analysis --- USB protocol EHCI (example) 2

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摘要 This article explores the initialization process of USB bus drivers and USB device drivers. Through the UsbBusControllerDriverStart function, it explains how to determine and start the USB bus driver, and initialize it through UsbBusBuildProtocol. In addition, it also introduces the driver initialization steps of USB devices (such as MassStorage), including the device restart process. The content combines code and flowcharts to help readers understand the core concepts and technical details of USB dr…

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The previous section mainly talked about the general process of USB host controller driver. Next, we will mainly talk about USB bus driver and USB device driver.

USB bus driver

Again, let's start with the following function:

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```
EFI_STATUS
EFIAPI
UsbBusControllerDriverStart (
  IN EFI_DRIVER_BINDING_PROTOCOL  *This,
  IN EFI_HANDLE                   Controller,
  IN EFI_DEVICE_PATH_PROTOCOL     *RemainingDevicePath
  )
{......
```

Try to open USB BUS Protocol to determine whether the UsbBus driver has been started on the current host controller handle.

If it is the first time to start, you need to call UsbBusBuildProtocol() for initialization.

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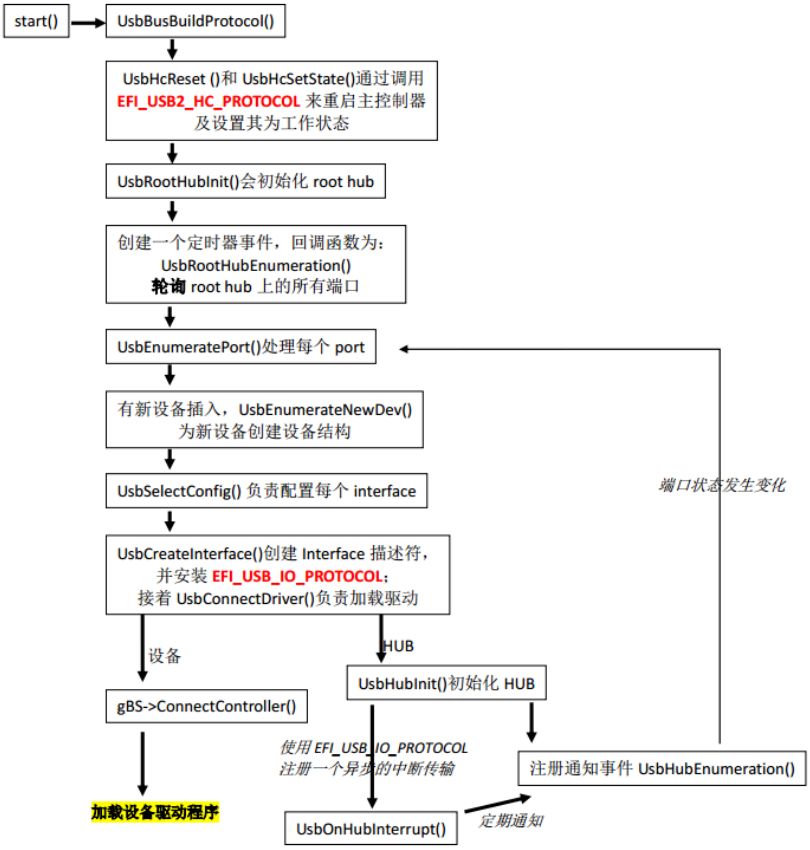
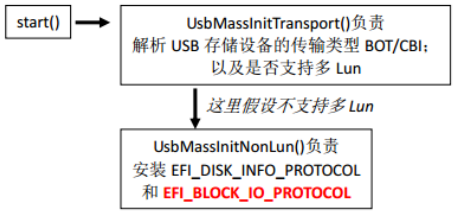
```
//
   // If first start, build the bus execute environment and install bus protocol
   //
   REPORT_STATUS_CODE (EFI_PROGRESS_CODE, (EFI_IO_BUS_USB | EFI_P_PC_ENABLE));
   Status = UsbBusBuildProtocol (This, Controller, RemainingDevicePath);
```

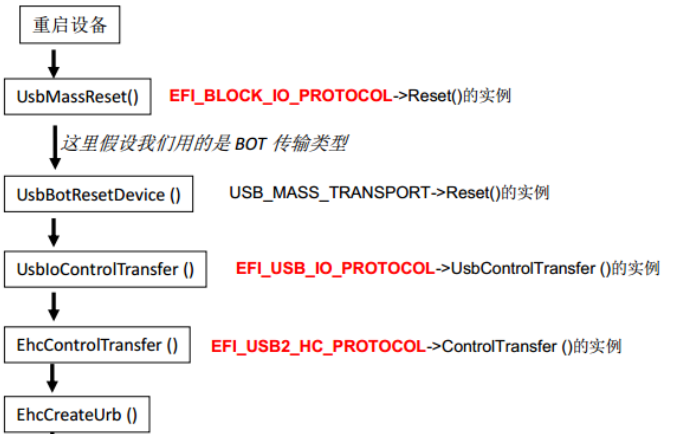
The overall process is as follows:



USB Device (Mass Storage) driver initialization process



Restart the USB (MASS DEVICE) device




```
//把组装好的Qh插入EHCI主控制器的Asynchronous Schedule List
//以便硬件执行传输命令
  EhcLinkQhToAsync (Ehc, Urb->Qh);
//阻塞式的执行此次control传输
  Status = EhcExecTransfer (Ehc, Urb, TimeOut);
//从Asynchronous Schedule List中将其移除
  EhcUnlinkQhFromAsync (Ehc, Urb->Qh);
```

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