[UEFI Basics] EDK Network Framework (VLAN)

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摘要 This article introduces the role of VLAN in MNP, especially the role of VlanConfigDxe.inf module as a helper module. It focuses on the Supported and Start functions of VlanConfigDriverBinding, and covers the creation of VLAN structure, in stallation of VLAN configuration interface, and precautions for VLAN management, especially the special treatment of VLANID0.

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VLAN

VLAN Code Overview

There are many VLAN introductions in MNP. One of the important reasons for the existence of MNP is to handle VLAN. The NetworkPkg\VlanConfigDxe\VlanConfigDxe.inf introduced in this article is actually just a help module. The real VLAN configuration is still in MNP .

VLAN is also a UEFI Driver Model, so it will be installed `EFI_DRIVER_BINDING_PROTOCOL` . Its implementation is as follows:

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```c
EFI_DRIVER_BINDING_PROTOCOL  gVlanConfigDriverBinding = {
  VlanConfigDriverBindingSupported,
  VlanConfigDriverBindingStart,
  VlanConfigDriverBindingStop,
  0xa,
  NULL,
  NULL
};
```

So let's first introduce its Supported function and Start function.

VlanConfigDriverBindingSupported

VLAN depends on MNP , so its Supported function will detect whether the interface configured with VLAN is installed. Its implementation is quite simple:

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```c
EFI_STATUS
EFIAPI
VlanConfigDriverBindingSupported (
  IN EFI_DRIVER_BINDING_PROTOCOL  *This,
  IN EFI_HANDLE                   ControllerHandle,
  IN EFI_DEVICE_PATH_PROTOCOL     *RemainingDevicePath OPTIONAL
  )
{
  Status = gBS->OpenProtocol (
                 ControllerHandle,
                 &gEfiVlanConfigProtocolGuid,
                 (VOID **)&VlanConfig,
                 This->DriverBindingHandle,
                 ControllerHandle,
                 EFI_OPEN_PROTOCOL_BY_DRIVER
                 );
}
```

It should be noted `gEfiVlanConfigProtocolGuid` that it does not have to be installed in MNP , it can also be installed by the network card driver itself.

VlanConfigDriverBindingStart

The Start function mainly completes two things:

1. Create a VLAN structure:

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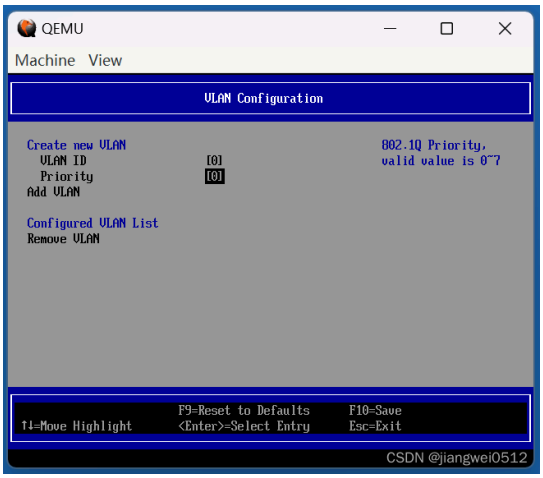
```c
typedef struct {
  UINTN                           Signature;

  EFI_HII_CONFIG_ACCESS_PROTOCOL  ConfigAccess;
  EFI_HII_HANDLE                  HiiHandle;
  EFI_HANDLE                      DriverHandle;
  EFI_DEVICE_PATH_PROTOCOL        *ChildDevicePath;

  EFI_HANDLE                      ControllerHandle;
  EFI_HANDLE                      ImageHandle;
  EFI_DEVICE_PATH_PROTOCOL        *ParentDevicePath;
  EFI_VLAN_CONFIG_PROTOCOL        *VlanConfig;
  CHAR16                          *MacString;

  UINT16                          NumberOfVlan;
  UINT16                          VlanId[MAX_VLAN_NUMBER];
} VLAN_CONFIG_PRIVATE_DATA;
```

2. Install the VLAN configuration interface. Finally, you can find the VLAN configuration interface under Setup, as shown below:



Since the focus of the VLAN module is actually the UI configuration content, it will not be expanded in detail here.

However, one thing to note is that if there is no VLAN configuration originally (more accurately, there is only 0/0 configuration), and then a VLAN is configured here, the original one will be deleted, leaving only the MNP service corresponding to the configured VLAN. Therefore, if you want to have a configuration with ID 0 and priority 0, you need to create it explicitly here.