Configuring MAC addresses

Every network interface adapter has a *Media Access Control (MAC) address*—sometimes called a hardware address—that uniquely identifies the device on the network. On physical network adapters, the MAC is assigned by the manufacturer and permanently entered in the adapter's firmware. The MAC address is a 6-byte hexadecimal value, the first three bytes of which are an organizationally unique identifier (OUI) that specifies the manufacturer, and the last three bytes of which identify the adapter itself.

The MAC address is essential to the operation of a LAN, so the virtual network adapters on a Hyper-V server need to have them. The server has at least one real MAC address, provided in its physical network adapter, but Hyper-V cannot use that one address for all the virtual adapters connecting VMs to the network.

Instead, Hyper-V creates a pool of MAC addresses during the installation of the role and it assigns addresses from this pool to VMs as you create them. To view or modify the MAC address pool for the Hyper-V server, you open the Virtual Switch Manager and, under Global Network Settings, select MAC Address Range, as shown in Figure 3-29.

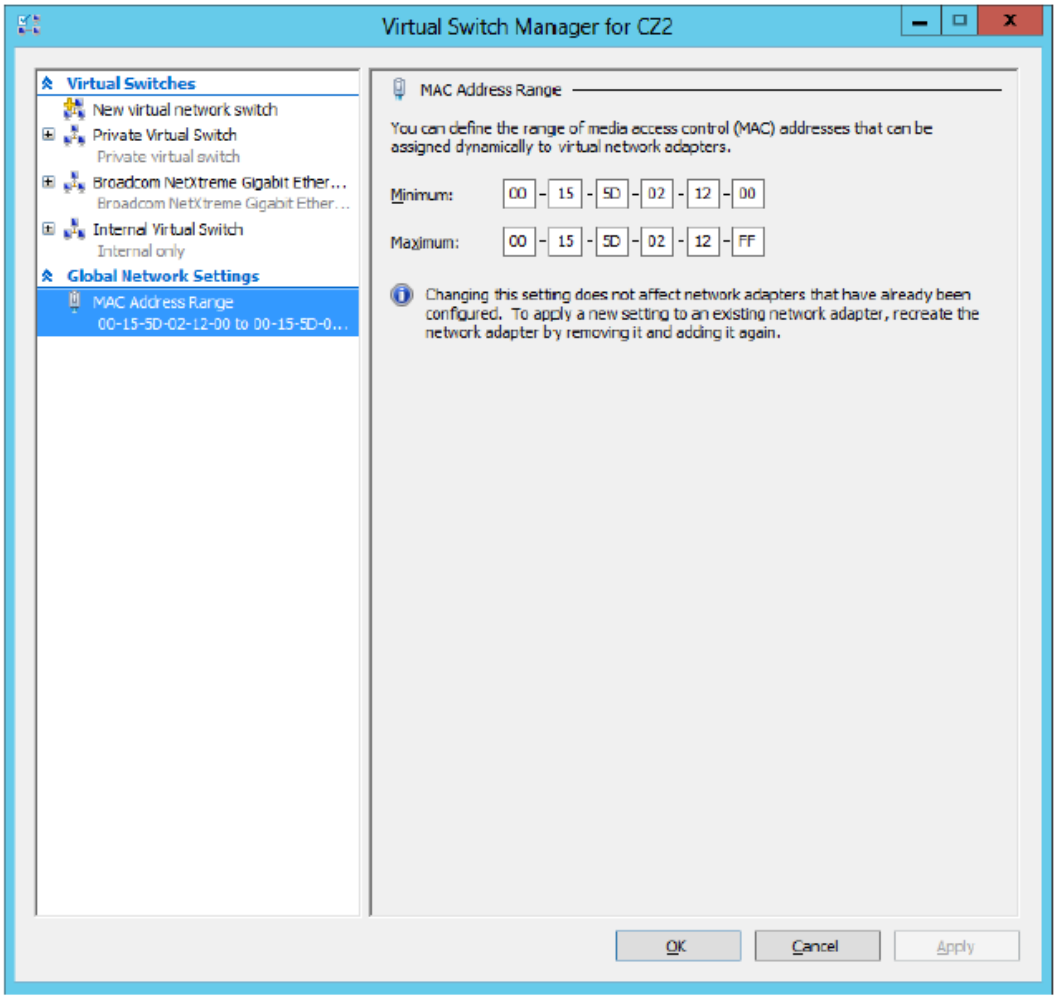

FIGURE 3-29 The MAC Address Range in the Virtual Switch Manager

The first three bytes of the MAC address range are always 00-15-5D, which is an OUI registered by Microsoft. The fourth and fifth bytes of the MAC address are the last two bytes of the IP address assigned to the server's physical network adapter, converted to hexadecimal notation. The sixth and last byte of the MAC address contains the range of values from 00 to FF, which provides 256 possible addresses.

The Hyper-V server assigns the MAC addresses to the network adapters in VMs as administrators create the adapters. The adapters retain their MAC addresses permanently or until the adapter is removed from the VM. The server reclaims any unused addresses and reuses them.

The default pool of 256 addresses is expected to be sufficient for most Hyper-V VM configurations, but if it is not, you can modify the Minimum and Maximum values to enlarge the pool. To prevent address duplication, you should change the second-to-last byte only, making it into a range of addresses like the last byte.

For example, the range illustrated in the figure provides 256 addresses with the following values:

```
00-15-1D-02-12-00 to 00-15-1D-02-12-FF
```

Modifying only the least significant digit, as in the following values, increases the pool from 256 to 4,096:

```
00-15-1D-02-10-00 to 00-15-1D-02-1F-FF
```

WARNING **MAC ADDRESSES**

When you modify the MAC address pool and you have other Hyper-V servers on your network, you must be careful not to create an overlap situation in which duplicate MAC addresses can occur or networking problems can result.