VMware Fusion Network Settings – Part1

(Version 1.0)

One of the areas that has been simplified in the first release of VMware Fusion is the configuration of the virtual network settings. Similar to the Windows and Linux hosted variants of VMware products, there are 2 network interfaces setup during the installation of Fusion, plus a bridge from Fusion to the computer's active NIC. The 2 virtual network cards that are configured are the host-only network, vmnet1, and the NAT network interface, vmnet8. To learn more about these configurations I would suggest that the documentation for VMware Workstation 6 networking is read, as Fusion is derived from the same codebase. See the [VMware Workstation 6 online manual](#) and specifically the section on "Configuring a Virtual Network", and especially the parts relating to Linux.

What Fusion doesn't easily let you do is manually configure the IP address ranges used by vmnet1 and vmnet8, or add additional virtual networks; e.g. vmnet2, etc. This first article demonstrates how to change the Fusion network settings, allowing the IP address range to be specified for the default connections. Before we start the process we need to understand a few of the files used to configure Fusion. In the "/Library/Application Support/VMware Fusion/" directory are several files and sub-directories important to the Fusion application.

/Library/Application Support/VMware Fusion/	
boot.sh	Bash script used to start and stop VMware Fusion daemons and kexts.
config	Holds vmnet1 subnet and mask settings
locations	Installation database, settings, folders and files
vmnet-dhcp.conf	Template for DHCP daemon configuration file
vmnet-nat.conf	Template for NAT daemon configuration file
vmware-config-net.pl	Perl script to configure Fusion
/Library/Application Support/VMware Fusion/vmnet1	
dhcp.conf	DHCP daemon configuration file
/Library/Application Support/VMware Fusion/vmnet8	
dhcp.conf	DHCP daemon configuration file
nat.conf	NAT daemon configuration file
nat.mac	MAC address used for NAT device

Step 1 – Reset Fusion Settings

Before you start, please ensure you have no running guests and that you have closed the fusion application. The first stage is to ensure we are at a known state with the various files used by Fusion. The simplest way to do this is to remove the "locations" file and re-run the Perl configuration script. Start a terminal session and then switch to the main directory for Fusion. We will then remove the file:

```
$cd /Library/Application\ Support/VMware\ Fusion/
$sudo rm locations
```

Next is to run the Perl configuration script, which will regenerate all the relevant files:

```
$sudo ./vmware-config-net.pl

Configuring a NAT network for vmnet8.

'ping' -q -t 10 192.168.119.1 > /dev/null status = 2
The subnet 192.168.119.0/255.255.255.0 appears to be unused.

The file /Library/Application Support/VMware Fusion/vmnet8/dhcpd.conf that
this program was about to install already exists.  Overwrite? [yes]

The file /var/db/vmware/vmnet-dhcpd-vmnet8.leases that this program was
about to install already exists.  Overwrite? [yes]

The file /var/db/vmware/vmnet-dhcpd-vmnet8.leases~ that this program was
about to install already exists.  Overwrite? [yes]

The file /Library/Application Support/VMware Fusion/vmnet8/nat.conf that
this program was about to install already exists.  Overwrite? [yes]

Configuring a host-only network for vmnet1.

Do you want this program to probe for an unused private subnet?
(yes/no/help)
[yes]

'ping' -q -t 10 172.16.225.1 > /dev/null status = 2
The subnet 172.16.225.0/255.255.255.0 appears to be unused.

The file /Library/Application Support/VMware Fusion/vmnet1/dhcpd.conf that
this program was about to install already exists.  Overwrite? [yes]

The file /var/db/vmware/vmnet-dhcpd-vmnet1.leases that this program was
about to install already exists.  Overwrite? [yes]

The file /var/db/vmware/vmnet-dhcpd-vmnet1.leases~ that this program was
about to install already exists.  Overwrite? [yes]
```

You won't need to answer any questions as the vmware-config-net.pl script auto answers them for you. Next we want to restart the services with these new values just to check that everything is working:

```
$sudo ./boot.sh --restart

VMware Fusion 50460: Shutting down VMware Fusion:
No matching processes were found
No matching processes were found
No matching processes were found
No matching processes were found
kextunload: unload id com.vmware.kext.vmcrosstalk failed (result code
0xe00002c2)
kextunload: unload kext /Library/Application Support/VMware
Fusion/kexts/vmmon.kext succeeded
kextunload: unload kext /Library/Application Support/VMware
Fusion/kexts/vmci.kext succeeded
kextunload: unload kext /Library/Application Support/VMware
Fusion/kexts/vmioplug.kext succeeded
kextunload: unload kext /Library/Application Support/VMware
Fusion/kexts/vmnet.kext succeeded

VMware Fusion 50460: Starting VMware Fusion:
kextload: /Library/Application Support/VMware Fusion/kexts/vmmon.kext
loaded successfully
kextload: /Library/Application Support/VMware Fusion/kexts/vmci.kext loaded
successfully
kextload: /Library/Application Support/VMware Fusion/kexts/vmioplug.kext
loaded successfully
kextload: /Library/Application Support/VMware Fusion/kexts/vmnet.kext
loaded successfully
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Configured subnet: 192.168.119.0
Setting vmnet-dhcp IP address: 192.168.119.254
Opened: ?
Recving on      VNet/vmnet8/192.168.119.0
Sending on      VNet/vmnet8/192.168.119.0
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For info, please visit http://www.isc.org/dhcp-contrib.html

Configured subnet: 172.16.225.0
Setting vmnet-dhcp IP address: 172.16.225.254
Opened: ?
Recving on      VNet/vmnet1/172.16.225.0
Sending on      VNet/vmnet1/172.16.225.0
```

Check that the network interfaces have been correctly configured:

```
$ifconfig -a

< Removed other output for simplicity >
vmnet8: flags=8863<UP,BROADCAST,SMART,RUNNING,SIMPLEX,MULTICAST> mtu 1500
        inet 192.168.119.1 netmask 0xffffff00 broadcast 192.168.119.255
        ether 00:50:56:c0:00:08
vmnet1: flags=8863<UP,BROADCAST,SMART,RUNNING,SIMPLEX,MULTICAST> mtu 1500

        inet 172.16.225.1 netmask 0xffffff00 broadcast 172.16.225.255
        ether 00:50:56:c0:00:01
```

Note that your IP address ranges will almost certainly not match the ones in the sample output shown above. Don't worry we are going to fix that with the next step.

Step 2 – Modify the IP address ranges

We should now have a clean "locations" file to work from. Using an editor, such as nano, open the file with write permissions via sudo or as root user, if you have enabled the account. Here nano is being run under sudo:

```
$sudo nano locations
```

This should bring up the nano editor screen.

```
GNU nano 1.2.4                    File: locations

answer LIBDIR /Library/Application Support/VMware Fusion
answer NETWORKING yes
answer VNET_8_NAT yes
answer VNET_8_HOSTONLY_HOSTADDR 192.168.119.1
answer VNET_8_HOSTONLY_NETMASK 255.255.255.0
file /Library/Application Support/VMware Fusion/vmnet8/dhcpd.conf 1185970219
file /var/db/vmware/vmnet-dhcpd-vmnet8.leases
file /var/db/vmware/vmnet-dhcpd-vmnet8.leases~
file /Library/Application Support/VMware Fusion/vmnet8/nat.conf 1185970219
answer VNET_1_HOSTONLY_HOSTADDR 172.16.225.1
answer VNET_1_HOSTONLY_NETMASK 255.255.255.0
answer VNET_1_HOSTONLY_SUBNET 172.16.225.0
answer VNET_1_DHCP yes
file /Library/Application Support/VMware Fusion/vmnet1/dhcpd.conf 1185970239
file /var/db/vmware/vmnet-dhcpd-vmnet1.leases
file /var/db/vmware/vmnet-dhcpd-vmnet1.leases~
file /Library/Application Support/VMware Fusion/config 1185970239


                       [ Read 17 lines ]
^G Get Help  ^O WriteOut  ^R Read File ^Y Prev Page ^K Cut Text  ^C Cur Pos
^X Exit      ^J Justify   ^W Where Is  ^V Next Page ^U UnCut Txt ^T To Spell
```

We need to alter the following settings in the "locations" file:

- VNET_8_HOSTONLY_HOSTADDR
- VNET_8_HOSTONLY_NETMASK
- VNET_1_HOSTONLY_HOSTADDR
- VNET_1_HOSTONLY_NETMASK
- VNET_1_HOSTONLY_SUBNET

In the example below vmnet8 is set to use 172.16.8.1 and vmnet1 to 172.16.1.1. You may wish to change masks etc., but for this simple exercise we will concentrate on address ranges.

```
  GNU nano 1.2.4                  File: locations                Modified

answer LIBDIR /Library/Application Support/VMware Fusion
answer NETWORKING yes
answer VNET_8_NAT yes
answer VNET_8_HOSTONLY_HOSTADDR 172.16.8.1
answer VNET_8_HOSTONLY_NETMASK 255.255.255.0
file /Library/Application Support/VMware Fusion/vmnet8/dhcpd.conf 1185970219
file /var/db/vmware/vmnet-dhcpd-vmnet8.leases
file /var/db/vmware/vmnet-dhcpd-vmnet8.leases~
file /Library/Application Support/VMware Fusion/vmnet8/nat.conf 1185970219
answer VNET_1_HOSTONLY_HOSTADDR 172.16.1.1
answer VNET_1_HOSTONLY_NETMASK 255.255.255.0
answer VNET_1_HOSTONLY_SUBNET 172.16.1.0
answer VNET_1_DHCP yes
file /Library/Application Support/VMware Fusion/vmnet1/dhcpd.conf 1185970239
file /var/db/vmware/vmnet-dhcpd-vmnet1.leases
file /var/db/vmware/vmnet-dhcpd-vmnet1.leases~
file /Library/Application Support/VMware Fusion/config 1185970239


^G Get Help  ^O WriteOut  ^R Read File ^Y Prev Page ^K Cut Text  ^C Cur Pos
^X Exit      ^J Justify   ^W Where Is  ^V Next Page ^U UnCut Txt ^T To Spell
```

Use Ctrl-O and Ctrl-X to save the file and exit nano.

Step 3 – Apply modified settings

Finally we run through the same sequence of commands as in Step 1 to apply the settings to Fusion. Firstly run the Perl configuration script, which will show slightly different output this time.

```
$sudo ./vmware-config-net.pl

Configuring a NAT network for vmnet8.

Configuring a host-only network for vmnet1.

The host-only network is currently configured to use the private subnet
172.16.1.0/255.255.255.0.  Do you want to keep these settings? [yes]
```

Secondly, restart the Fusion daemons and kernel extensions, plus re-configure virtual NICs.

```
$sudo ./boot.sh --restart

VMware Fusion 50460: Shutting down VMware Fusion:
No matching processes were found
No matching processes were found
No matching processes were found
No matching processes were found
kextunload: unload id com.vmware.kext.vmcrosstalk failed (result code
0xe00002c2)
kextunload: unload kext /Library/Application Support/VMware
Fusion/kexts/vmmon.kext succeeded
kextunload: unload kext /Library/Application Support/VMware
Fusion/kexts/vmci.kext succeeded
kextunload: unload kext /Library/Application Support/VMware
Fusion/kexts/vmioplug.kext succeeded
kextunload: unload kext /Library/Application Support/VMware
Fusion/kexts/vmnet.kext succeeded

VMware Fusion 50460: Starting VMware Fusion:
kextload: /Library/Application Support/VMware Fusion/kexts/vmmon.kext
loaded successfully
kextload: /Library/Application Support/VMware Fusion/kexts/vmci.kext loaded
successfully
kextload: /Library/Application Support/VMware Fusion/kexts/vmioplug.kext
loaded successfully
kextload: /Library/Application Support/VMware Fusion/kexts/vmnet.kext
loaded successfully
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Configured subnet: 172.16.8.0
Setting vmnet-dhcp IP address: 172.16.8.254
Opened: ?
Recving on     VNet/vmnet8/172.16.8.0
Sending on     VNet/vmnet8/172.16.8.0
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Configured subnet: 172.16.1.0
Setting vmnet-dhcp IP address: 172.16.1.254
Opened: ?
Recving on     VNet/vmnet1/172.16.1.0
Sending on     VNet/vmnet1/172.16.1.0
```

Finally, we double check to see the virtual Ethernet cards are correctly configured.

```
$ifconfig -a

< Removed other output for simplicity >
vmnet8: flags=8863<UP,BROADCAST,SMART,RUNNING,SIMPLEX,MULTICAST> mtu 1500
        inet 172.16.8.1 netmask 0xffffff00 broadcast 172.16.8.255
        ether 00:50:56:c0:00:08
vmnet1: flags=8863<UP,BROADCAST,SMART,RUNNING,SIMPLEX,MULTICAST> mtu 1500
        inet 172.16.1.1 netmask 0xffffff00 broadcast 172.16.1.255
        ether 00:50:56:c0:00:01
```

You should now be able to start Fusion and power on guests, and make use of the re-configured virtual networking. All this was tested on the release version of VMware Fusion 1.0 (build 51348). The test machine was running Mac OS X 10.4.10.

In the second part, I will be looking at how to add additional virtual adapters to Fusion.

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