

VNEC - Virtual Machine Configuration Guide

François Gagnon
fgagnon@sce.carleton.ca

NMAI Research Group
www.nmai.ca
Carleton University

Version: 0.1
Last Modified: November 3, 2008

Abstract

This document describes the configuration process to make a virtual machine usable with VNEC. Currently, VNEC only supports VMWare Workstation 5 virtual machines. We assume that the virtual machine has been created and only explain the configuration specific to VNEC. For information on how to create a virtual machine with VMWare, see the VMWare Workstation 5 user's manual.

The instructions provided here assume VMWare Workstation 5 is used. VNEC will also work with VMWare Workstation 6, but the configuration instructions may have to be adapted.

VNEC relies on two types of virtual machines: standard and dispatcher.

The standard virtual machines are the most common. they are used to build a network and as the actors in an experiment. In the rest of the document, unless explicitly stated, we use virtual machine (or VM for short) to denote a standard virtual machine.

The dispatcher (currently there is only a single dispatcher in an experiment) is used to link the controller (physical machine) to the standard VM and allows dispatching commands from the controller to the VM. The dispatcher VM can be downloaded from VNEC website (vnec.sourceforge.net).

The rest of this document explain how to configure both a standard and a dispatcher VM. Section 1 provides the instructions to configure a standard VM and Section 2 provides the instructions to configure a dispatcher VM.

1 Standard VM Configuration

The standard VM must be located in the “\$VNEC_Standard_VM_Folder” which is defined in the file “\$VNEC_Path/CONFIG/Preference.txt”.

The standard VM configuration procedure has the following ten steps:

1. Working directory creation
2. Set the VM name
3. IP address configuration
4. VMWare tools installation (optional)
5. Shared folder configuration (optional)
6. Revert to snapshot settings
7. Java installation
8. Taking a first snapshot
9. VMTaskRunner.jar installation

10. Taking a final snapshot

of which two (2 and 3) are optional. Each step is detailed individually below.

First of all, you need to power on the virtual machine. Note that to run correctly VNEC might require the VM to be running as root (or administrator). Thus we suggest that you perform the following operations while logged as root (or administrator).

1.1 Working directory Creation creation

For Unix guest VM (Linux, FreeBSD, OpenBSD, and NetBSD), the working directory is `"/home/vnec/"`. For Windows guest VM it is `"C:\vnec\"`.

Create the working directory on the guest VM. The working directory should contain at least two files: `"config.txt"` and `"java.txt"`. The file `"config.txt"` contains the following entries:

```
VMNAME = XYZ
```

```
VMOSTYPE = ABC
```

Where XYZ is the name of the VM (see Section 1.2) and ABC is one of the following strings describing the VM OS:

- Windows
- Linux
- FreeBSD
- OpenBSD
- NetBSD

The file `"java.txt"` contains the path to the java utilities (see Section 1.7)

1.2 Set the VM name

Each VM must have a unique name. For VNEC, the name of a VM is the folder containing the `.vmx` file for that VM. So to change the name of a VM, all one has to do is change the name of the corresponding folder.

1.3 IP Address Configuration

Click on the “VM” menu and then select “Settings”. Then selection the “Ethernet” item and check the “Custom: Specific virtual network” option. Finally, select “VMNet2” from the drop down menu.

Now choose an IP address to assign to that VM. The address must be in the 10.92.X.Y network (note that X=254 is reserved to VNEC utility VM, thus we suggest to avoid using addresses in that range). Each VM must have its own IP address, so make sure the IP you selected is not listed in the file “\$VNEC_Path/CONFIG/VMIPAddress.csv”.

Now set the VM IP address to be the static value you chose previously with the 255.255.0.0 netmask. Make sure the IP address has been permanently changed; one way of knowing is to reboot the VM and see if the IP settings have persisted.

For Unix guest OS, the file “/etc/hosts” has to be modified to reflect the IP configuration. Typically, this file will contain an entry for the loopback IP address 127.0.0.1 mapped to the name localhost. A new entry must be made for the IP assigned to the current host and the host name. Figure 1 provide an example of the file “/etc/hosts”.

Finally, add an entry to the file “\$VNEC_Path/CONFIG/VMIPAddress.csv”. Each entry contains four fields. Each field is enclosed into a pair of double quote and fields are separated by a semi-colon. A typical entry would look like:

```
”NMAIFreeBSD5_0”;”lnc0”;”Ethernet”;”10.92.1.6”
```

Where the first field (NMAIFreeBSD5_0) is the name of the VM. The second (lnc0) is the interface name for the guest OS. The third one (Ethernet) is the VMWare interface name (usually Ethernet0). And the last one (10.92.1.6) is the IP address.

Figure 1: Example of “/etc/hosts”

```
127.0.0.1 localhost
10.92.1.11 FreeBSD70
```

1.4 VMWare tools installation (optional)

This step is optional and can only be performed on some VM (mainly Linux and Windows). We suggest to install the VMWare tools whenever possible. For more information on VMWare tool installation, refer to VMWare Workstation user’s guide.

1.5 Shared folder configuration (optional)

Again, this step is optional and can only be performed on a VM if it has the VMWare tools installed.

To configure the shared folder, click on the “VM” menu and then select “Settings”. Now choose the “Options” tab and click on the “Shared Folder” item. Click the “Add” button, then the “Next” button. Enter “share” in the “Name” field and the value of `$VNEC_Shared_Folder` (You can find this value in the file “`$VNEC_Path/CONFIG/Preference.txt`”) in the “Host Folder” field. Then hit “Next” and “Finish”.

For Linux guest VM, you are done and you should be able to access the new shared folder from “`/mnt/hgfs/share/`”.

For Windows guest VM, you should be able to access the new shared folder from “`\\.\host\Shared Folders\share\`”. The last thing to do for Windows VM is to map the drive letter “S:” towards the folder “`\\.\host\Shared Folders\`”.

1.6 Revert to snapshot settings

Click on the “VM” menu and then select “Settings”. Now choose the “Options” tab and click on the “Snapshots” item. Finally, select the “Revert to snapshot” radio button.

1.7 Java installation

You must install Java JDK 1.5 or 1.6 in the virtual machine. At this point, you will need to transfer files into the guest VM. If the shared folder has been configured (see 1.5) for the guest VM, it can easily be used to transfer files. Otherwise, you can put the files on a CD (you can also just create an iso image and tell VMWare Workstation user’s guide) and access it from the VM or set up a FTP server and put the files there.

Once the JDK is installed, find out the folder containing the “java”, “javac” and “rmiregistry” utilities. For instance, in Windows it could be “`C:\Program Files\Java\jdk1.5.0_14\bin\`”.

Then create a file named “java.txt” in the working directory (see 1.1) and edit that file so it contains the full name of the folder discussed above (don’t forget the trailing ‘\’).

1.8 Taking a first snapshot

Take a first snapshot of the VM and name it “VM Configured”.

1.9 VMTaskRunner.jar installation

Copy the following files in the working directory:

- VMTaskRunner-X.Y.jar¹
- commons-logging-A.B.C.jar
- rmiio-D.E.F.jar

Once this is done, you can start the VMTaskRunner by using the command:
“java -jar VMTaskRunner-X.Y.jar -rmi”

1.10 Taking a final snapshot

Take a final snapshot of the VM and name it “VMTaskRunner Ready RMI”.

At this point you are done and you can power off the VM. Once it is powered off, you should make sure that it will open correctly for VNEC by powering back on and checking that it will resume to the final snapshot (without actually booting the OS).

2 Dispatcher VM Configuration

You can either download the dispatcher VM available from the VNEC website (vnece.sourceforge.net) or configure your own.

2.1 Using the dispatcher available

After downloading VNECDispatcher1.zip, extract it in the VNEC_Util_VM_Folder folder. Power on the virtual machine, the OS will boot. Login with the user “root” and the password “Carleton1”. It is configured to use “S:\” as a shared folder, so you might have to modify it according to your entry in “\$VNEC_Path/CONFIG/Preference.txt”.

¹Make sure you have the same version of the VMTaskRunner.jar as your version of VNEC-X.Y.jar

Change directory to “/home/vnec/” and run the command “/usr/java/jdk1.6.0_04/bin/java -jar Dispatcher-X.Y.jar”. Take a snapshot named “Dispatcher Ready” and stop the virtual machine (Do not shutdown the OS, simply stop the VM through the stop button).

2.2 Creating your own dispatcher

However, if you need to build you own dispatcher, follow these instructions.

The dispatcher VM must be located in the “\$VNEC_Util_VM_Folder” which is defined in the file “\$VNEC_Path/CONFIG/Preference.txt”.

The first eight configuration steps for dispatcher VM are like standard VM (see 1.1 to 1.8) with the following exception:

- The dispatcher must be named “VNECDispatcher1”, see step 1.2.
- The VMWare tools must be installed in the dispatcher, thus step 1.4 is mandatory.
- The Shared folder must be configured in the dispatcher, so step 1.5 is mandatory.

After these eight steps, only two steps remains (they are detailed below):

1. Dispatcher.jar installation
2. Taking a final snapshot

2.3 Dispatcher.jar installation

Copy the following files in the working directory:

- Dispatcher-X.Y.jar²
- commons-logging-A.B.C.jar
- rmiio-D.E.F.jar

Once this is done, you can start the Dispatcher by using the command:

“java -jar Dispatcher-X.Y.jar”

²Make sure you have the same version of the Dispatcher-X.Y.jar as your version of VNEC-X.Y.jar

2.4 Taking a final snapshot

Take a final snapshot of the VM and name it “Dispatcher Ready”.

At this point you are done and you can power off the VM. Once it is powered off, you should make sure that it will open correctly for VNEC by powering back on and checking that it will resume to the final snapshot (without actually booting the OS).