How to Run SEEDAndroid on VirtualBox

We have already built Android VM for you. You can run this Android VM on VirtualBox by going through the instructions written here. Some steps might vary based on the VirtualBox version. The following document was prepared with VirtualBox v5.0.13 running on Windows 10 OS. You must have downloaded the SEEDAndroid image file (.zip) from our course website, if not then download it before proceeding to the following steps.
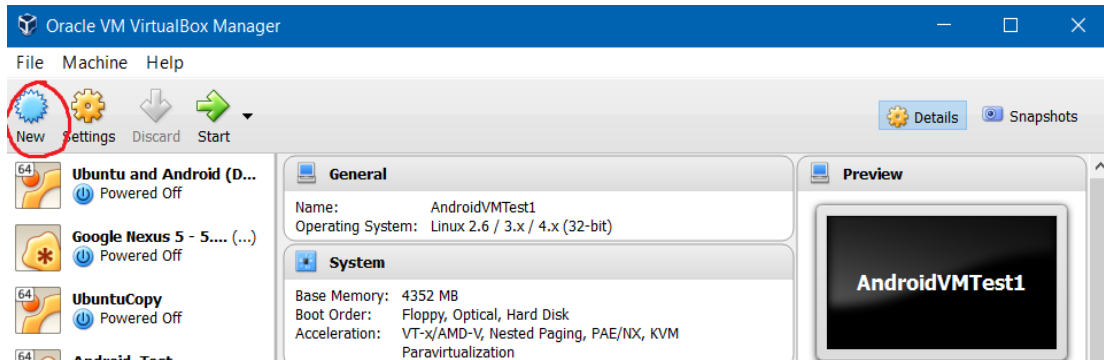
Step 1: Create a new VM in VirtualBox.

Figure 1: Creating new VM in VirtualBox

Step 2: Give a name and select the OS type.

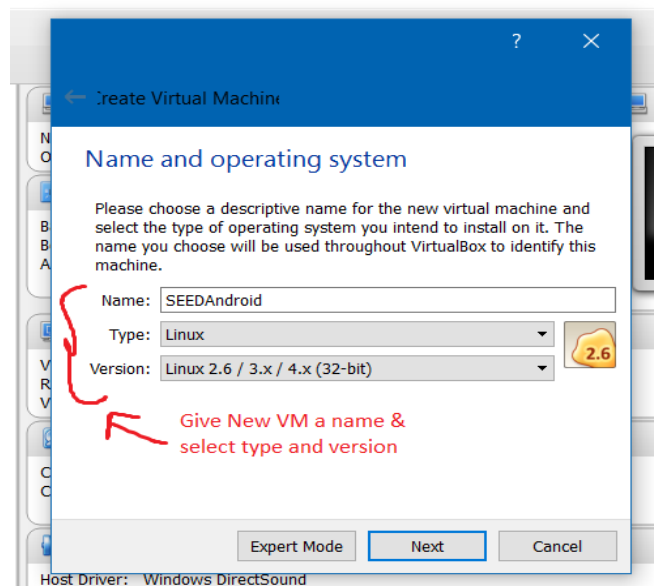Please change the parameters and options, and make them exactly like the following figure.

Figure 2: Select Type, Version and name for new VM
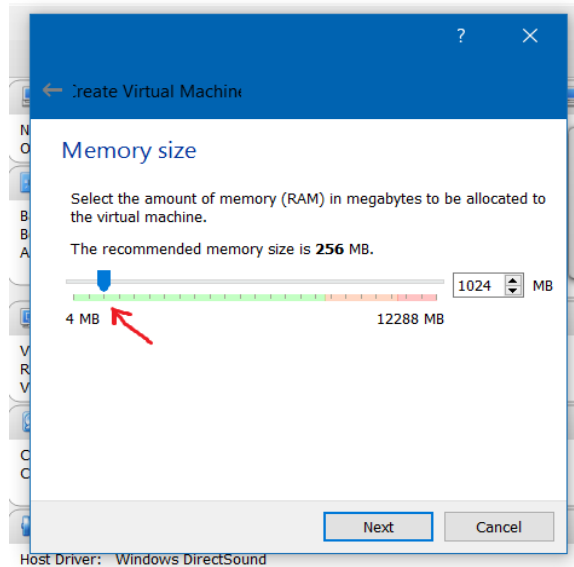
Step 3: Set the memory size for this VM.

Figure 3: Select Memory Size

Step 4: Select the hard drive file.

Extract downloaded SEEDUbuntu image file (.zip file) on your host machine. You are going to attach extracted files to this new VM. While attaching these extracted files to the new VM, VirtualBox will not make copy of these files to new VM's directory. VirtualBox will directly use the files which you have selected. So if you delete these extracted files, the VM will not work. So make sure to put extracted file in secure place on your hard disk.
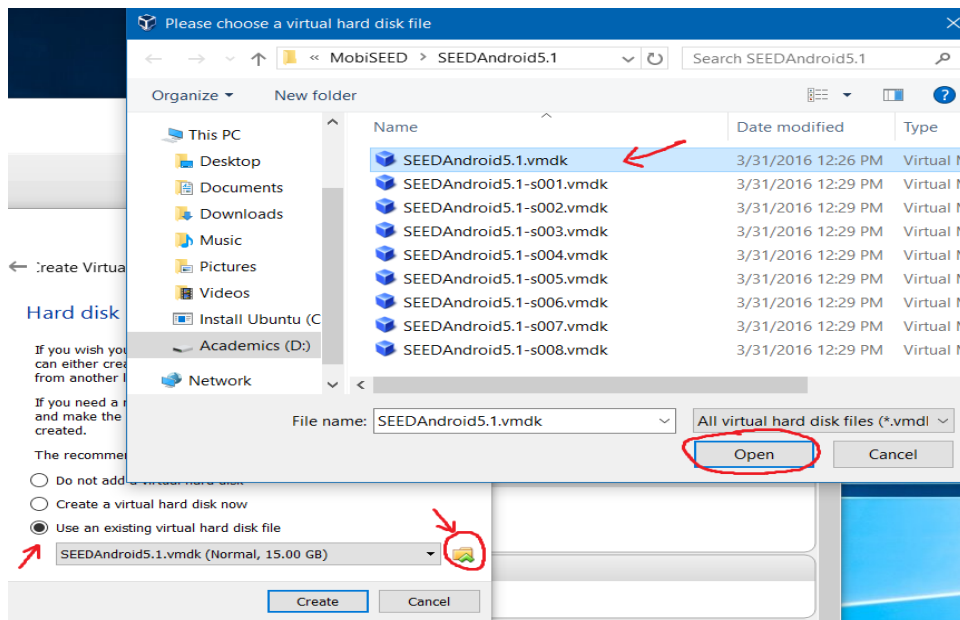

Figure 4: Select existing virtual hard disk file

Step 5: Configure general settings.

Go to the settings of newly created SEEDAndroid VM. After going into settings, go to the System settings as shown in the following figure 5. You will see multiple tabs over there such as Motherboard, Processor and Acceleration. By default, pointing device pointing to the "USB Tablet" as shown in figure 5. Every time you boot up your SEEDAndroid VM you need to enable mouse integration option from Input menu of your VM to capture mouse events. But if you change this to "PS/2 Mouse" as shown in figure 6, this option will enable mouse integration option automatically and you can capture mouse events inside of your SEEDAndroid VM by clicking inside the VM screen.
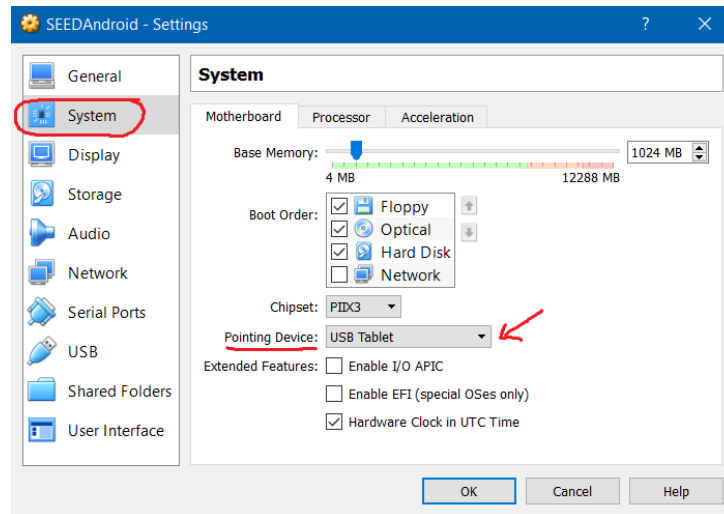

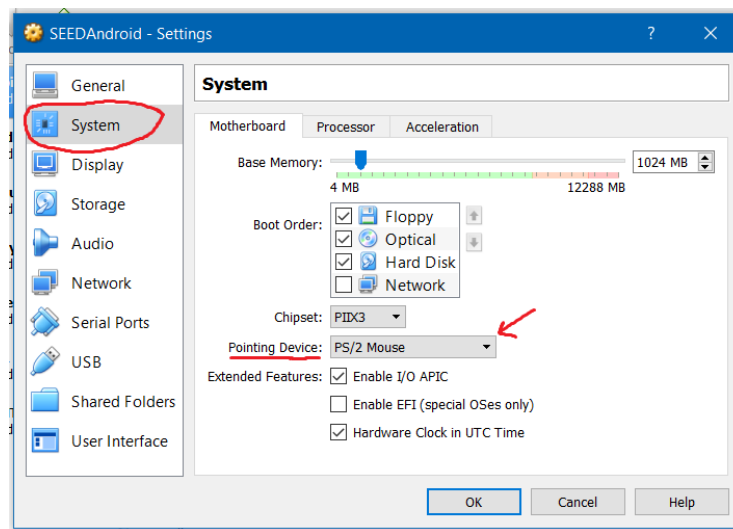Figure 5: Default Settings for Pointing Device

Figure 6: Updated Settings for Pointing Device

You also need to enable PAE/NX bit located in the Processor tab of the System setting as shown in the following figure 7. PAE stands for "Physical Address Extension", which enables 32-bit x86 CPUs to access more than 4 GB of RAM. NX bit stands for No-eXecute. By enabling this bit, you can make certain areas of memory as non-executable, the processor will then refuse to execute any code residing in these areas of memory. Such protection mechanism is achieved to overcome buffer overflow type of attack. Since we are using Ubuntu as out Recovery OS in SEEDAndroid VM, and it requires PAE/NX support from the CPU, we need to toggle this option. Otherwise, it will not boot up and show an error message asking for such support.
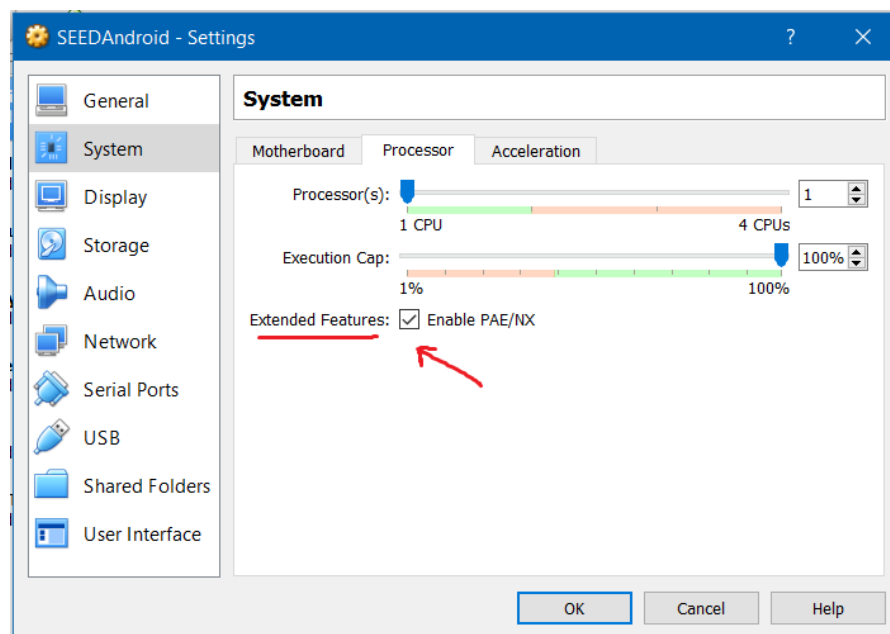

Figure 7: Enabling PAE/NX bit

Step 6: Configure network settings.

In many of our MobileSEED labs, we need to run multiple guest VMs, and these VMs should be able to to (1) reach out to the Internet, (2) communicate with each other. Therefore, in order to achieve all these 2 goals, we have to use a new network adapter introduced by VirtualBox called "NAT Network". The improved Network Address Translation (NAT Network) adapter works in a similar way to "local area network" or LAN. It enables VMs communication within same local network as well as the communication to the Internet. All the communications go through this single adapter. As show in Figure 8, gateway router transfers the packets among the VMs and transfers the packets from local network to Internet.
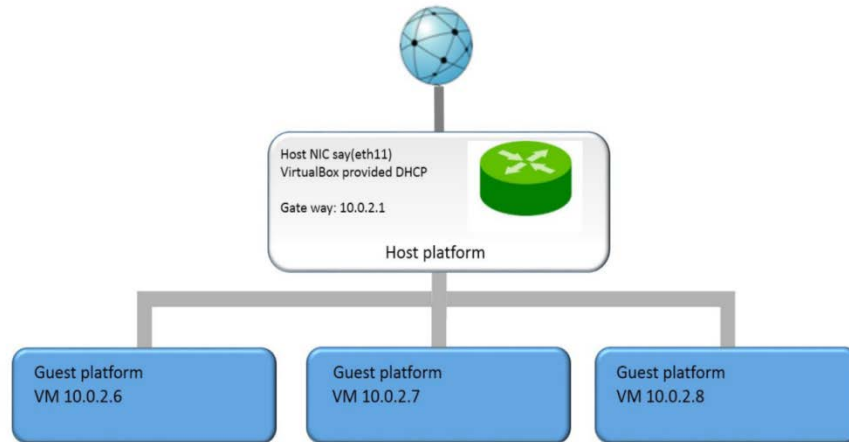
Figure 8: NAT Network

1. As show in following Figure, click the "File" on the top left of the VirtualBox main UI. Then choose "Preferences…" option.

Figure 9: Select File from Menu

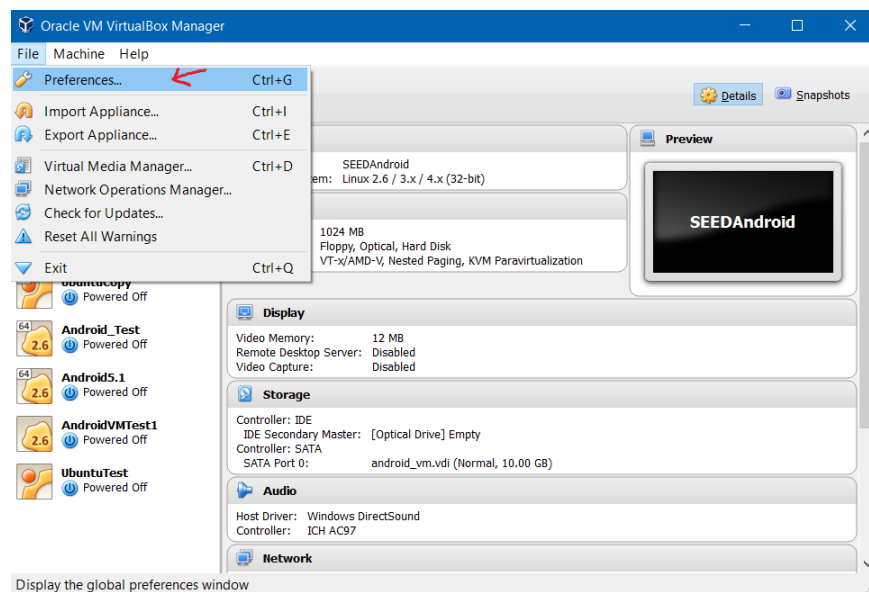2. After choosing "Preferences...", select Network tab from the left panel.

Figure 10: Select Preferences from File

3. As shown in the following figure, "+" button to create new NAT Networks (NatNetwork). If you have NatNetwork setup already, you don't need to create new one. You can use it just as it is and follow step 4. Once you click on "+" button, it will create NatNetwork for you and update its entry into the NAT Networks list. Now double click on the NatNetwork, and look at its specifications. Set the specifications as same as in the following figure.
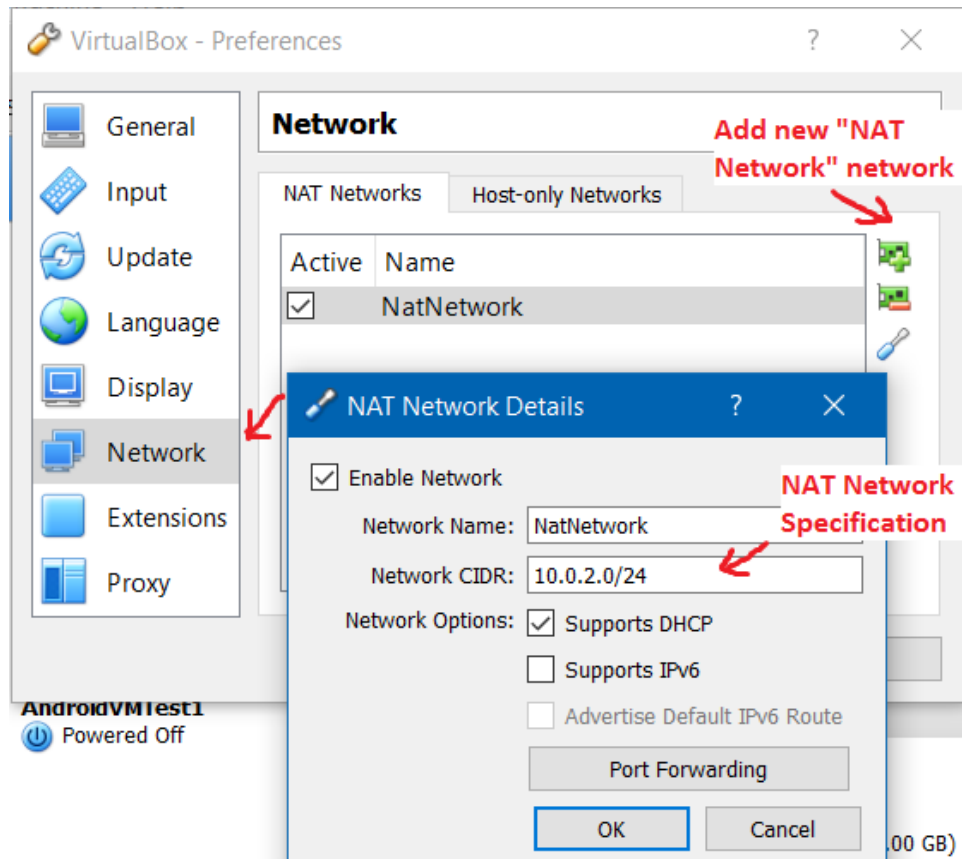

Figure 11: NAT Network configuration

4. Now go to the SEEDAndroidVM settings, you need to power off the VM before making the following changes. Like the following figure, enable Adapter 1(at the same time, disable the other adapters), and choose "NAT Network".
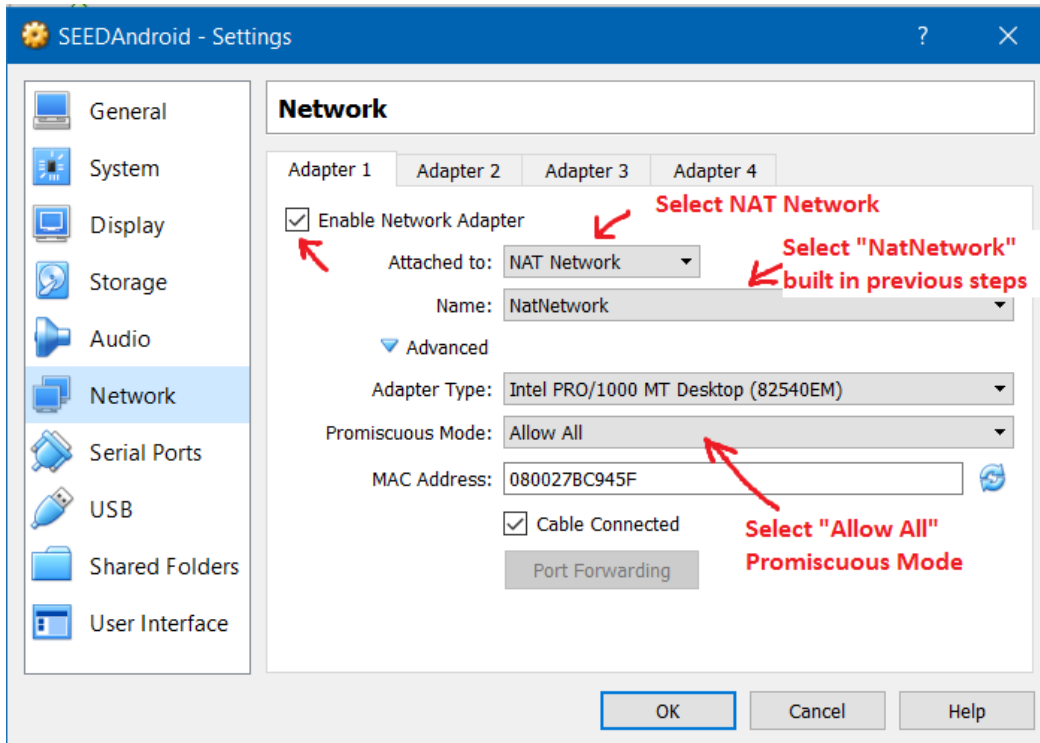
Figure 11: Enable NAT Network in SEEDAndroid VM
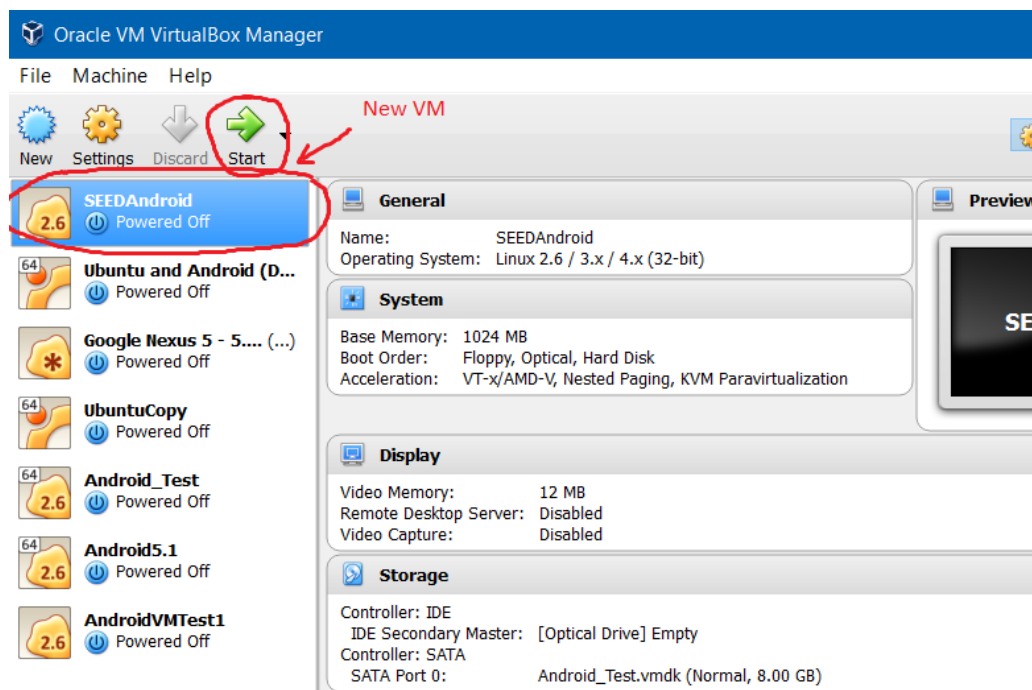
Step 7: Start New SEEDAndroidVM.

Figure 11: Start SEEDUbuntu

Step 8: Booting up SEEDAndroid VM

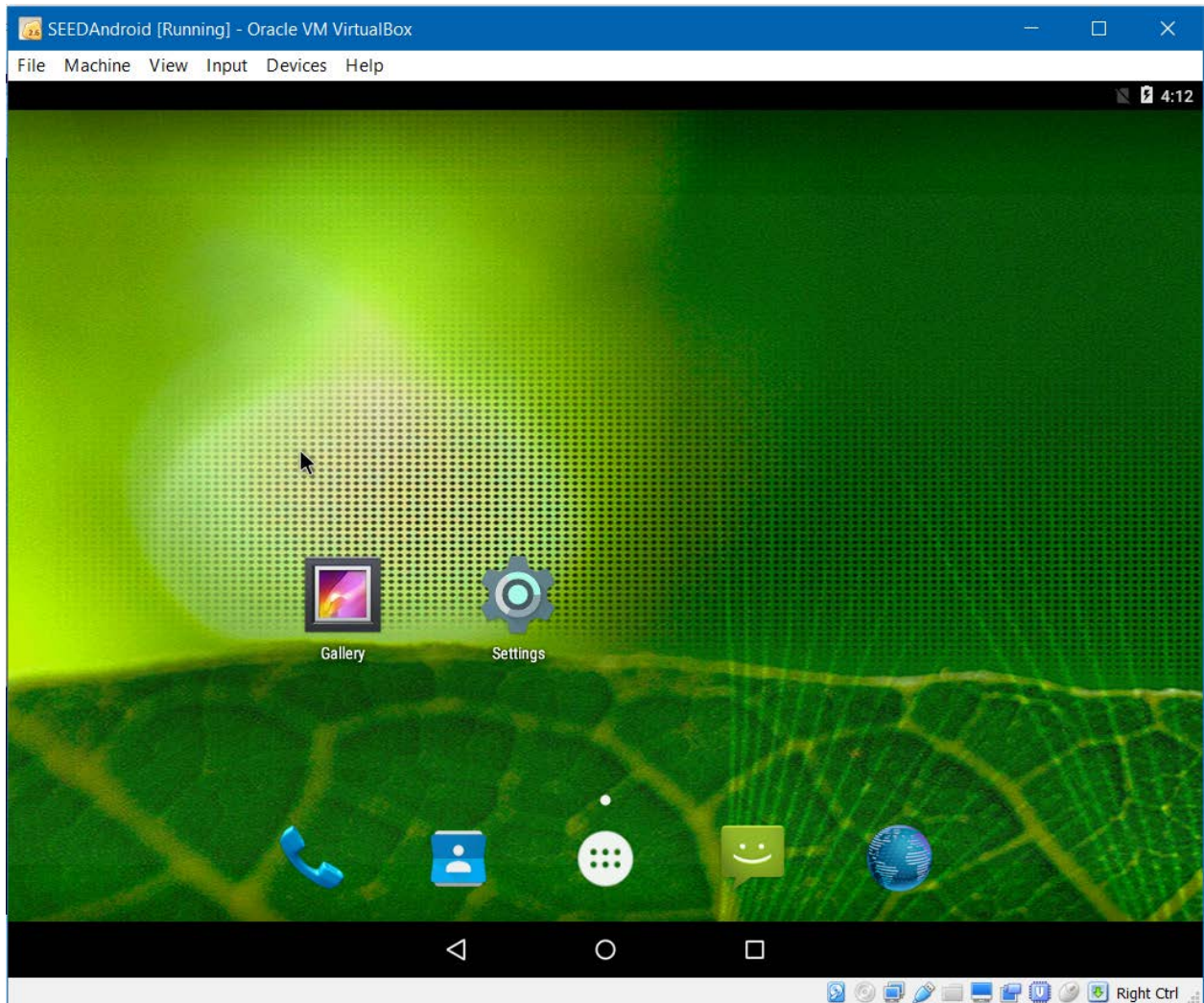When you start your SEEDAndroid VM, it will boot up into the Main Android OS as shown in following figure 12.

Figure 12: Running SEEDAndroid VM