Rocks-In-The-Box - A Virtual Rocks Cluster in a VirtualBox

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When you've got a newly racked and stacked pile of servers, installing Rocks can get you up and running in an amazingly short time. But, Rocks makes certain assumptions about the way your cluster should be configured. Most of the time this is probably right, but sometimes you want to make changes. Accomplishing this can be tricky because Rocks is based on a highly disciplined structure that takes some time to understand.

When you do need to figure out how to change Rocks most of you probably do what I do, which is to have a pile of old machines to use as a test cluster. This works fine, but it can be a nuisance to have to keep installing Rocks over and over again as you try your changes. There is a better way.

VirtualBox (http://www.virtualbox.org/) is one of the free virtualization packages that have become quite popular recently. With VirtualBox you can get rid of that pile of servers and instead, replace it with just one box. This box will be the host machine on which your entire test Rocks cluster will run. Using the "snapshot" feature of VirtualBox, you can easily rollback your test cluster to any previous configuration.

This note describes how to create a 64-bit Rocks cluster contained entirely in one box. It's assumed that you understand how to use VirtualBox, that you know how to install Rocks, and that you have a VirtualBox host machine with enough resources to support your virtual cluster. If your host machine doesn't support 64-bits or it doesn't support the Intel VT-x or AMD AMD-V extensions then you'll have to install a 32-bit version of Rocks. Since you’re not going to actually run any production jobs on your virtual cluster you don’t need lots of CPU resources. Just to clarify, Rocks is only installed into a virtual machine on your VirtualBox host machine. You should not install it on the host itself.

The first thing to do is to download and install VirtualBox on your VirtualBox host machine following the instructions on the VirtualBox website. Then, copy the ".iso" file of the version of Rocks that you want to install to your host machine. In my example, I put this file in "/usr/local/src/rocks-5.3.x86_64.iso". Once you’ve done this then you’re ready to create your virtual frontend.

The following script creates and starts a virtual machine named “Rocks-Frontend” with 1GB of RAM and 50GB of virtual disk. This disk space is actually allocated on demand so the amount of disk space on your host harddrive will be much less. You should be able to use the virtual console via any of the methods supported by VirtualBox. The easiest way is to use the monitor, keyboard, and mouse of the host system.

```
VBoxManage createvm --name "Rocks-Frontend" --ostype RedHat_64 --register

VBoxManage modifyvm "Rocks-Frontend" --memory 1000 --vram 32 --nic1 intnet -
-nic2 nat --audio none --nictype1 82540EM --nictype2 82540EM --boot1 dvd --
boot2 disk --boot3 none --boot4 none

VBoxManage createhd --filename "Rocks-Frontend.vdi" --size 50000 --variant
Standard --remember

VBoxManage storagectl "Rocks-Frontend" --name "SATA Controller" --add sata --
controller IntelAhci

VBoxManage storageattach "Rocks-Frontend" --storagectl "SATA Controller" --
port 0 --device 0 --type hdd --medium "Rocks-Frontend.vdi"

VBoxManage openmedium dvd /usr/local/src/rocks-5.3.x86_64.iso

VBoxManage storagectl "Rocks-Frontend" --name "IDE Controller" --add ide --
controller PIIX4

VBoxManage storageattach "Rocks-Frontend" --storagectl "IDE Controller"
--port 0 --device 0 --type dvddrive --medium /usr/local/src/rocks-
5.3.x86_64.iso

VBoxManage startvm "Rocks-Frontend"
```

Once this virtual machine starts you install the Rocks frontend the same way you would on a real frontend machine, except that you should not enter any of the network information in the *eth0*, *eth1*, and the miscellaneous settings screens. Instead, you can just accept all the defaults. The DHCP server within VirtualBox automatically assigns your frontend an address on a virtual private virtual network created by VirtualBox. The normal private Rocks cluster network is actually another virtual network that's created by VirtualBox. This virtual network doesn't use any real cables so it's very fast.

In the “Welcome to Rocks” screen, use the default “Fully Qualified Host Name” but feel free to change the other entries.

When you're ready to start creating your virtual compute nodes, first login to the virtual frontend and start “insert-ethers” as you normally would. Choose “compute node” as the appliance type. Then, run the following script:

```
VBoxManage createvm --name "Rocks-Compute-0-0" --ostype RedHat_64 --register
VBoxManage modifyvm "Rocks-Compute-0-0" --memory 1000 --vram 32 --nic1 intnet
--audio none --nictype1 82540EM --boot1 net --boot2 disk --boot3 none --boot4
none

VBoxManage createhd --filename "Rocks-Compute-0-0.vdi" --size 50000 --variant
Standard --remember

VBoxManage storagectl "Rocks-Compute-0-0" --name "SATA Controller" --add sata
--controller IntelAhci

VBoxManage storageattach "Rocks-Compute-0-0" --storagectl "SATA Controller" -
-port 0 --device 0 --type hdd --medium "Rocks-Compute-0-0.vdi"

VBoxManage storagectl "Rocks-Compute-0-0" --name "IDE Controller" --add ide -
-controller PIIX4

VBoxManage startvm "Rocks-Compute-0-0"
```

This creates and starts a virtual machine called “Rocks-Compute-0-0” again with 1GB of RAM and 50GB of dynamically allocated virtual disk. This virtual machine automatically uses PXE when booting. Run this script for each virtual compute node you want to create, making sure you change “-0-0” to a new sequence each time. As you create each compute node, you’ll see a new console window displaying the normal Rocks compute node installation screens. The “insert-ethers” screen should show the normal information as each compute node is recognized and booted.

The only problem I had in figuring out how to create Rocks-In-The-Box was what name to use for the fully-qualified host name. The Rocks developers say it should be a name that doesn’t resolve to anything but I occasionally had a problem where the entry for the frontend in /etc/hosts shows ‘xxxx’ instead of an IP address. Please let me know if this happens to you.