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KVM Virtualization With Enomalism 2 On An Ubuntu 8.10 Server

Version 1.0
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Enomalism ECP (Elastic Computing Platform) provides a web-based control panel that lets you design, deploy, and manage virtual machines on one or more host systems (in the case of multiple systems, we speak of a cluster or cloud). This article shows how you can use Enomalism (also know as Enomaly) to manage KVM guests on one Ubuntu 8.10 server.

I do not issue any guarantee that this will work for you!

1 Preliminary Note

I'm using an Ubuntu 8.10 server with the hostname *server1.example.com* and the IP address *192.168.0.100* here as my KVM host. The server is located in a private network with a DHCP server (on the router, IP *192.168.0.1*). Enomalism usage might be different if you use it in a public network.

I'm running all the steps in this tutorial with root privileges, so make sure you're logged in as root:

```
sudo su
```

Please check if your CPU supports hardware virtualization - if this is the case, the command

```
egrep '(vmx|svm)' --color=always /proc/cpuinfo
```

should display something, e.g. like this:

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```
root@server1:~# egrep '(vmx|svm)' --color=always /proc/cpuinfo

flags           : fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush mmx fxsr sse sse2 ht syscal
l nx mmxext
 fxsr_opt rdtscp lm 3dnowext 3dnow rep_good nopl pni cx16 lahf_lm cmp_legacy svm extapic cr8_legacy 3dnowprefetch

flags           : fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush mmx fxsr sse sse2 ht syscal
l nx mmxext
 fxsr_opt rdtscp lm 3dnowext 3dnow rep_good nopl pni cx16 lahf_lm cmp_legacy svm extapic cr8_legacy 3dnowprefetch
  root@server1:~#
```

If nothing is displayed, then your processor doesn't support hardware virtualization, and you must stop here.

2 Installing Enomalism 2

First we install some prerequisites (including KVM):

```
aptitude install ssh build-essential python-dev libxen3.1-dev kvm mysql-server mysql-client libmysqlclient15-dev python-libvirt python-mysqldb
libvirt-bin python-setuptools qemu bridge-utils
```

You will be asked to provide a MySQL root password:

```
New password for the MySQL "root" user: <-- yourrootsqlpassword
 Repeat password for the MySQL "root" user: <-- yourrootsqlpassword
```

Then we go to the */opt* directory...

```
mkdir -p /opt

cd /opt
```

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... and download the latest Enomalism *.deb* package from **http://sourceforge.net/project/showfiles.php?group_id=164855&package_id=186866&release_id=667675**, e.g. as follows:

```
wget http://dfn.dl.sourceforge.net/sourceforge/enomalism/enomalism2-2.2.3.deb
```

After the download has finished, we install Enomalism as follows:

```
dpkg -i enomalism2-2.2.3.deb
```

Now we must configure Enomalism. Run

```
cd enomalism2/

scripts/init-db.sh yourrootsqlpassword enomalism enomalismpassword
```

Replace *yourrootsqlpassword* with the MySQL root password that you've set at the beginning of this tutorial. *enomalism* is the name of the database user that Enomalism will use to connect to the MySQL database, and *enomalismpassword* is the database password for the user *enomalism*. Replace both with a username/passsword of your choice.

In the */opt/enomalism2* directory, there should be a file called *server1.example.com.cfg*. We copy that file to the */opt/enomalism2/config* directory:

```
cp server1.example.com.cfg config/server1.example.com.cfg
```

Run

```
uuidgen
```

and write down the ID that the command generates (we need it in the next step where we modify */opt/enomalism2/config/server1.example.com.cfg*):

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```
root@server1:/opt/enomalism2# uuidgen
  ad152057-eb8f-4f8b-9744-c33ca44522d0
root@server1:/opt/enomalism2#
```

Now we edit */opt/enomalism2/config/server1.example.com.cfg*:

```
vi config/server1.example.com.cfg
```

Please adjust the following four values:

```
[...]
sqlobject.dburi="mysql://enomalism:enomalismpassword@localhost:3306/enomalism2"
[...]
enomalism2.baseurl="http://192.168.0.100:8080/rest/"
[...]
enomalism2.ip_addr="192.168.0.100"
[...]
enomalism2.self="ad152057-eb8f-4f8b-9744-c33ca44522d0"
[...]
```

Make sure you use the correct database user and password for the MySQL database and the correct IP address for the next two settings. In the *enomalism2.self* line, you should use the ID generated by *uuidgen*.

You will also find the settings *enomalism2.drivestorage='file'* and *enomalism2.storagetarget='file:///xen/'* in that file. Currently, Enomalism doesn't support LVM, so you should not change these settings!

Next edit */etc/libvirt/qemu.conf*...

```
vi /etc/libvirt/qemu.conf
```

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... and uncomment the line *vnc_listen = "0.0.0.0"*:

```
[...]
vnc_listen = "0.0.0.0"
[...]
```

(Otherwise you won't be able to connect to the KVM guests via VNC from a remote machine!)

Restart *libvirt-bin* afterwards:

```
/etc/init.d/libvirt-bin restart
```

Now we can start Enomalism (you should still be in the */opt/enomalism2* directory):

```
scripts/enomalism2.sh start
```

To make Enomalism start automatically whenever you boot the system, you can add the following line to */etc/rc.local*:

```
vi /etc/rc.local
```

```
[...]
cd /opt/enomalism2 && scripts/enomalism2.sh start
[...]
```

Now open a browser and go to *http://192.168.0.100:8080*. This should finish the Enomalism installation:

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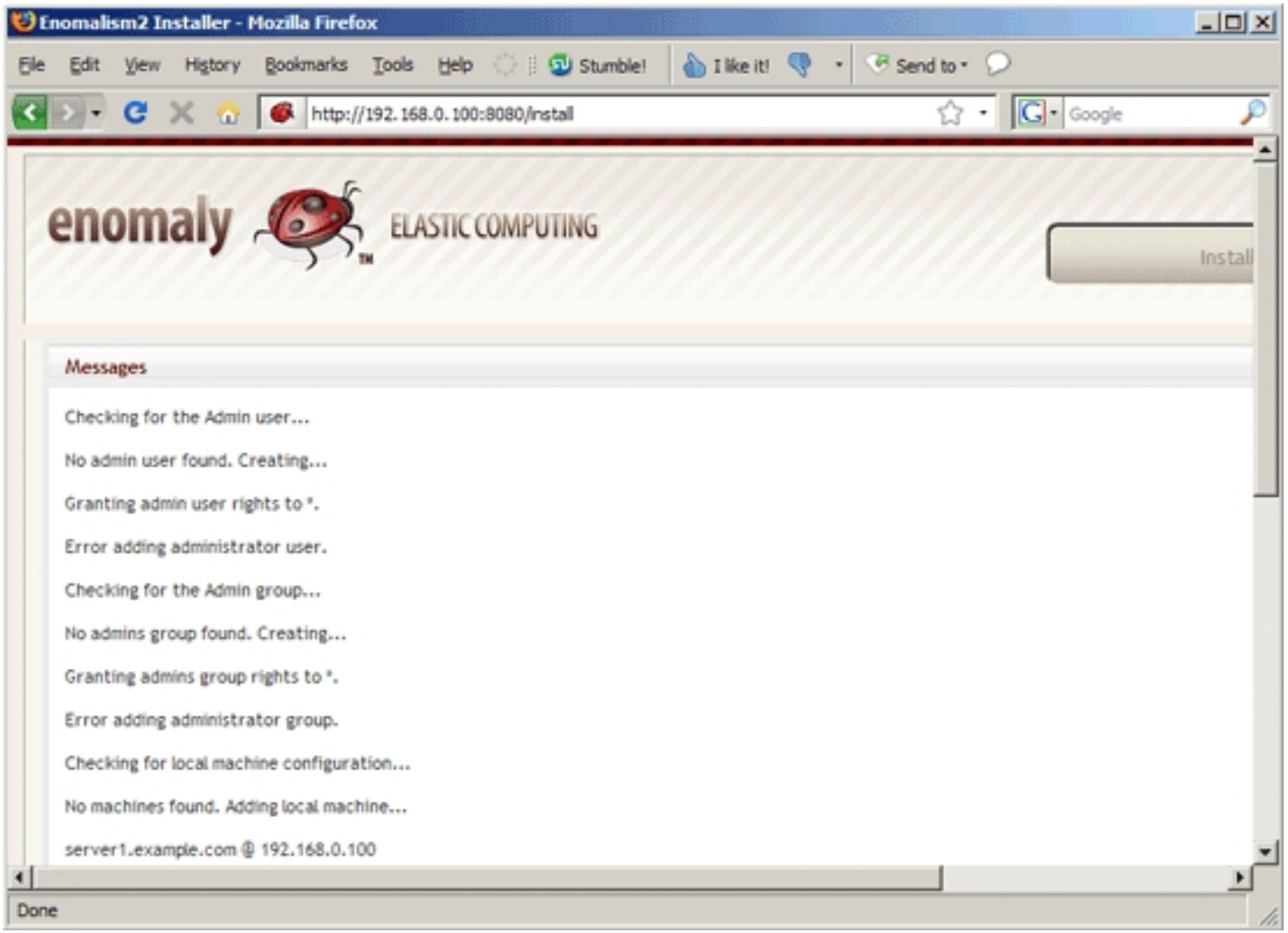
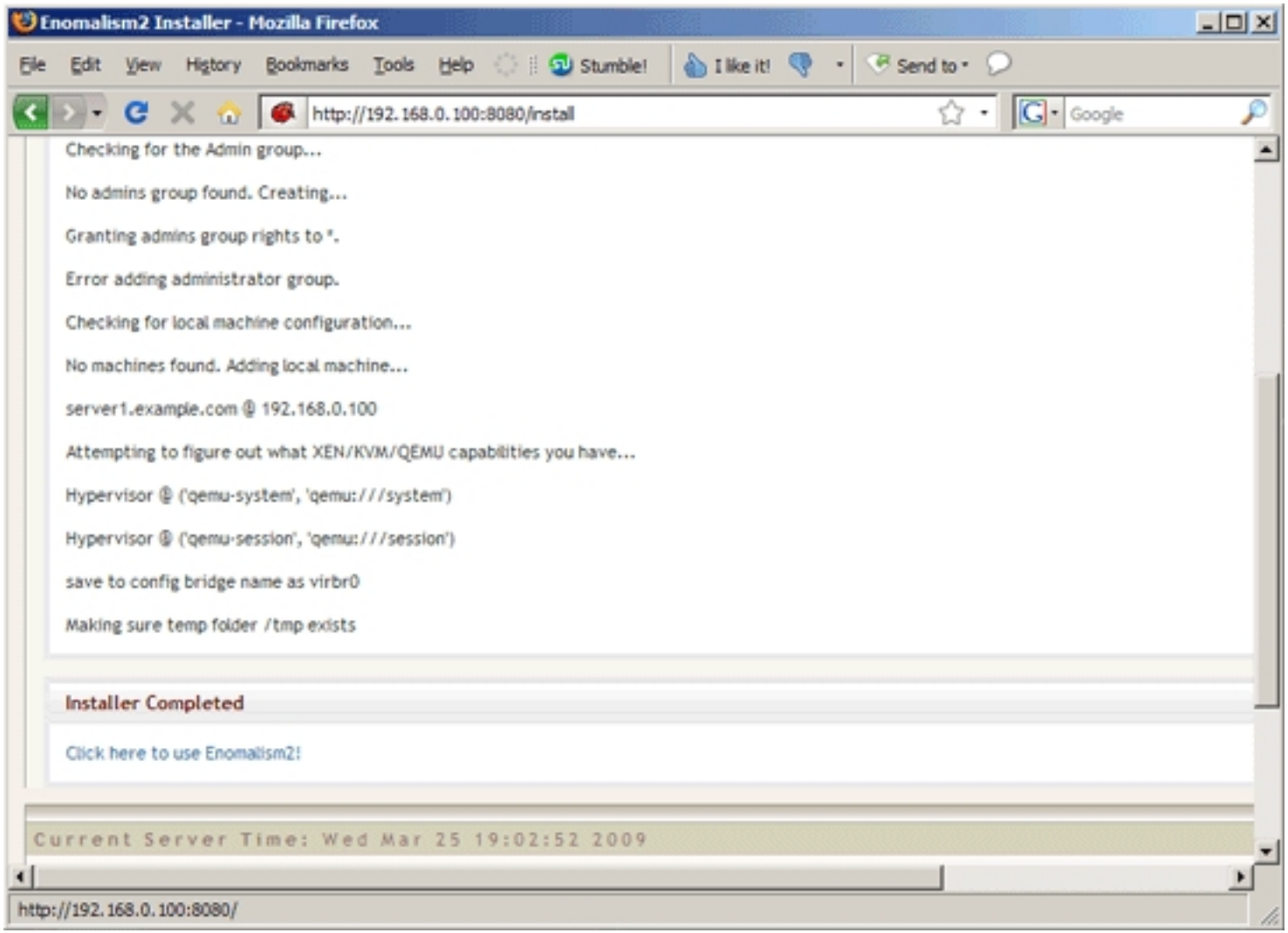


Click on the *Click here to use Enomalism2!* link:



3 Using Enomalism

You should now be at the Enomalism login prompt. The default username is *admin*, and the password is *password* (you should change this after the first

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login):

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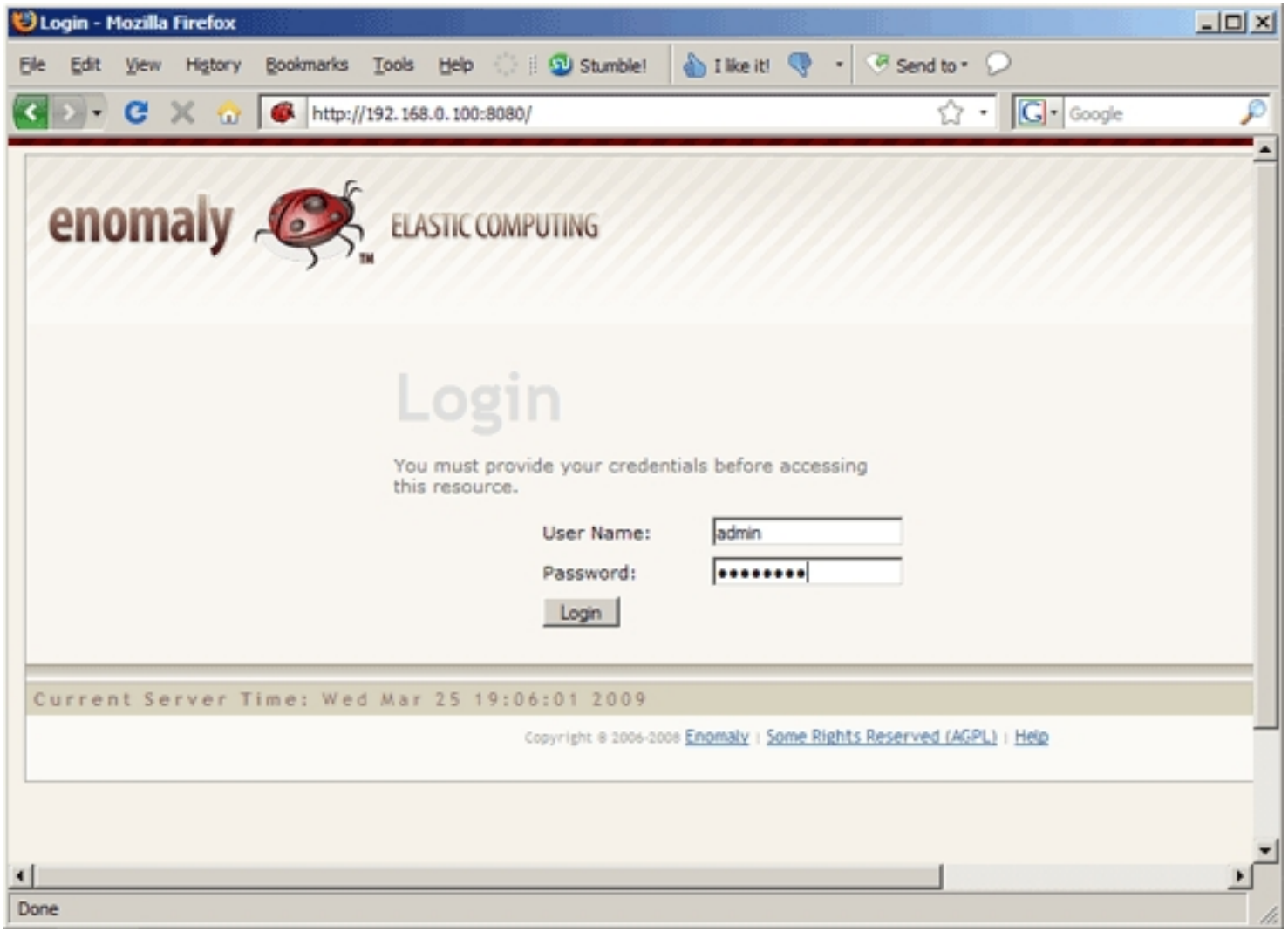

This is how the Enomalism control panel looks. The *Dashboard* lists all transactions and tells you if they were successful or not:

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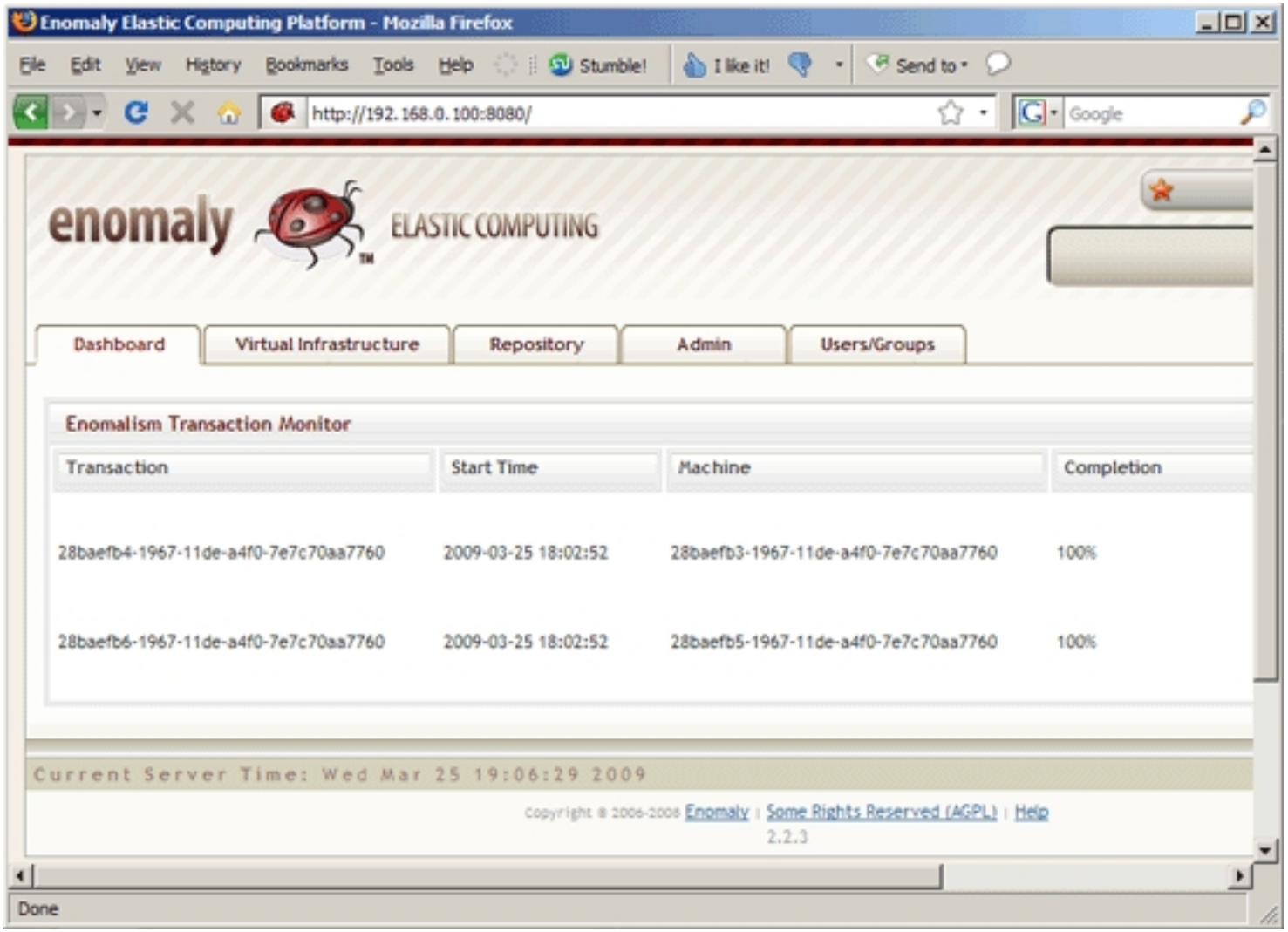

To run KVM guests, we can either create our own virtual machines or download preconfigured virtual machines from the public Enomalism repository. I will describe both methods in this tutorial. Right now I'm going to show how to use a preconfigured virtual machine from the public Enomalism repository.

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There are one or two things to note about the preconfigured appliances. First, they have a disk space of only 1 GB, so they are probably not for production use, and second, it is possible that they won't be able to bring up their *eth0* interface, i.e., they will have no networking (this happened to me when I downloaded the Ubuntu 8.04 KVM appliance; however, when I downloaded the CentOS 5.2 KVM appliance, networking was working fine).

3.1 Using Preconfigure Appliances

Go to *Repository > REMOTE APPLIANCES*. Find the virtual machine that you'd like to use and click on the plus sign in front of it (I'm going to download the CentOS 5.2 KVM guest - make sure you select a KVM guest and not a Xen guest!):

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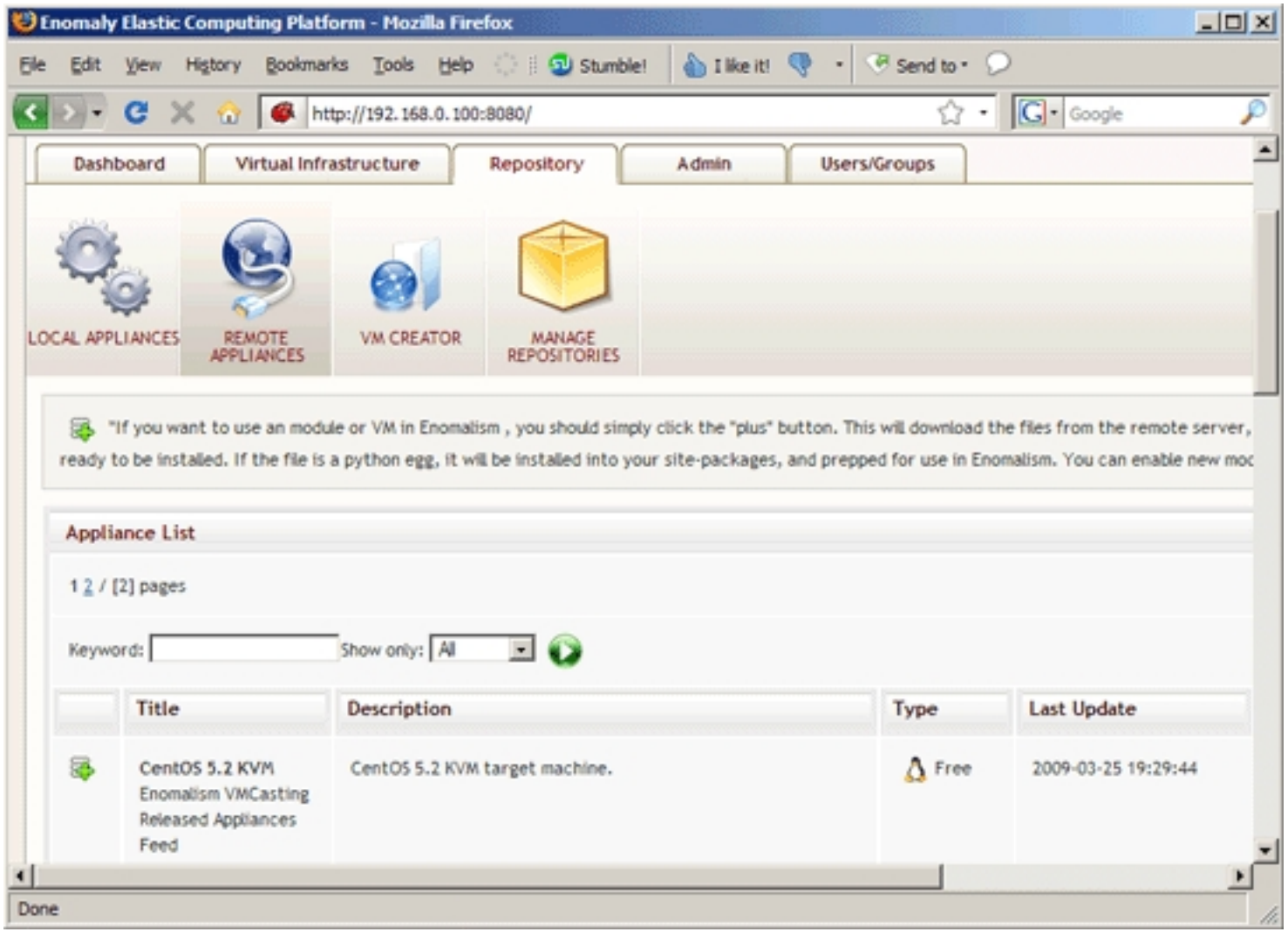

Confirm your selection:

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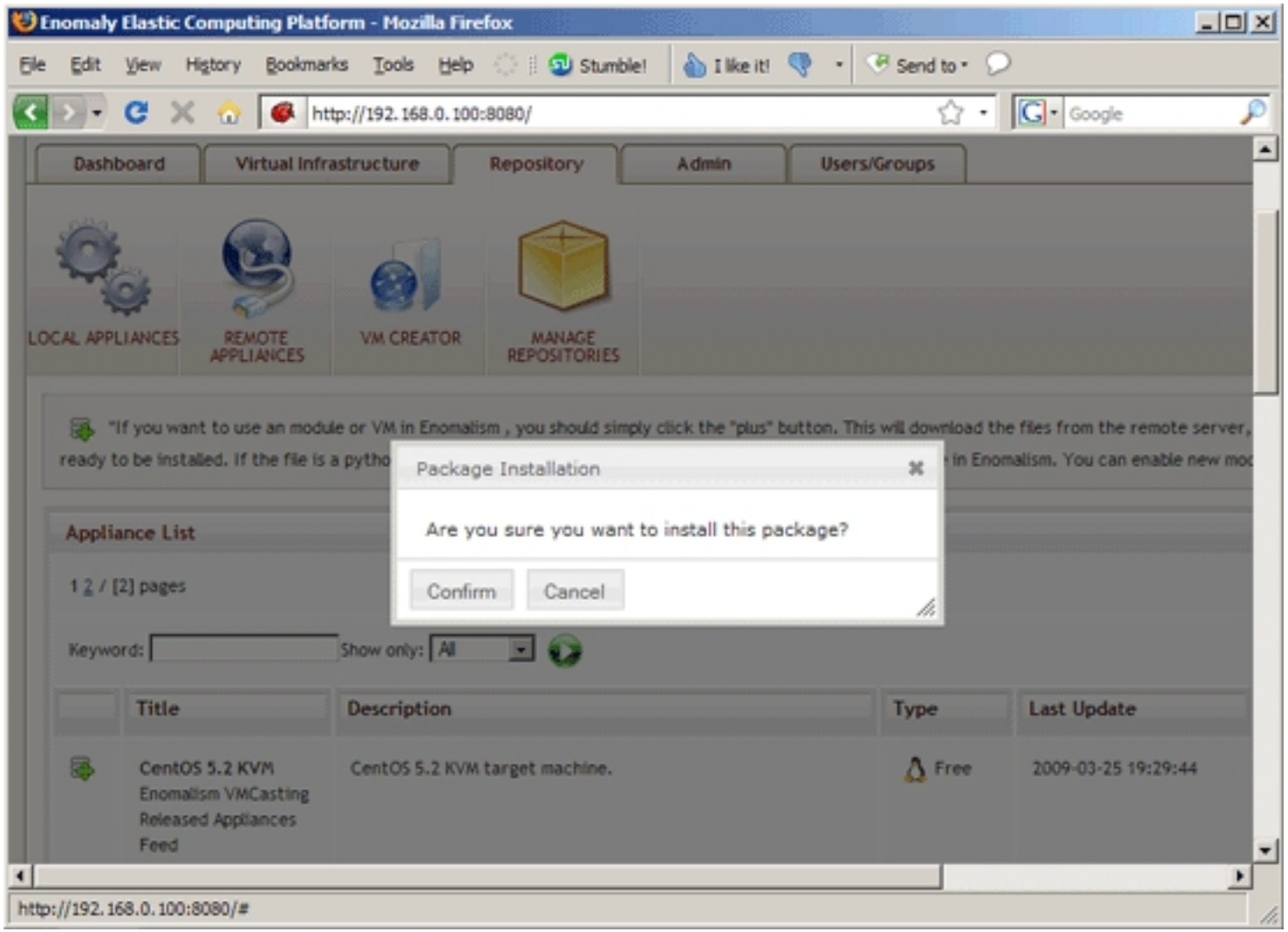

The appliance is now being downloaded in the background. This can take a few minutes. You can see the download status on the `Dashboard` (click on the blue refresh icon to update the status):

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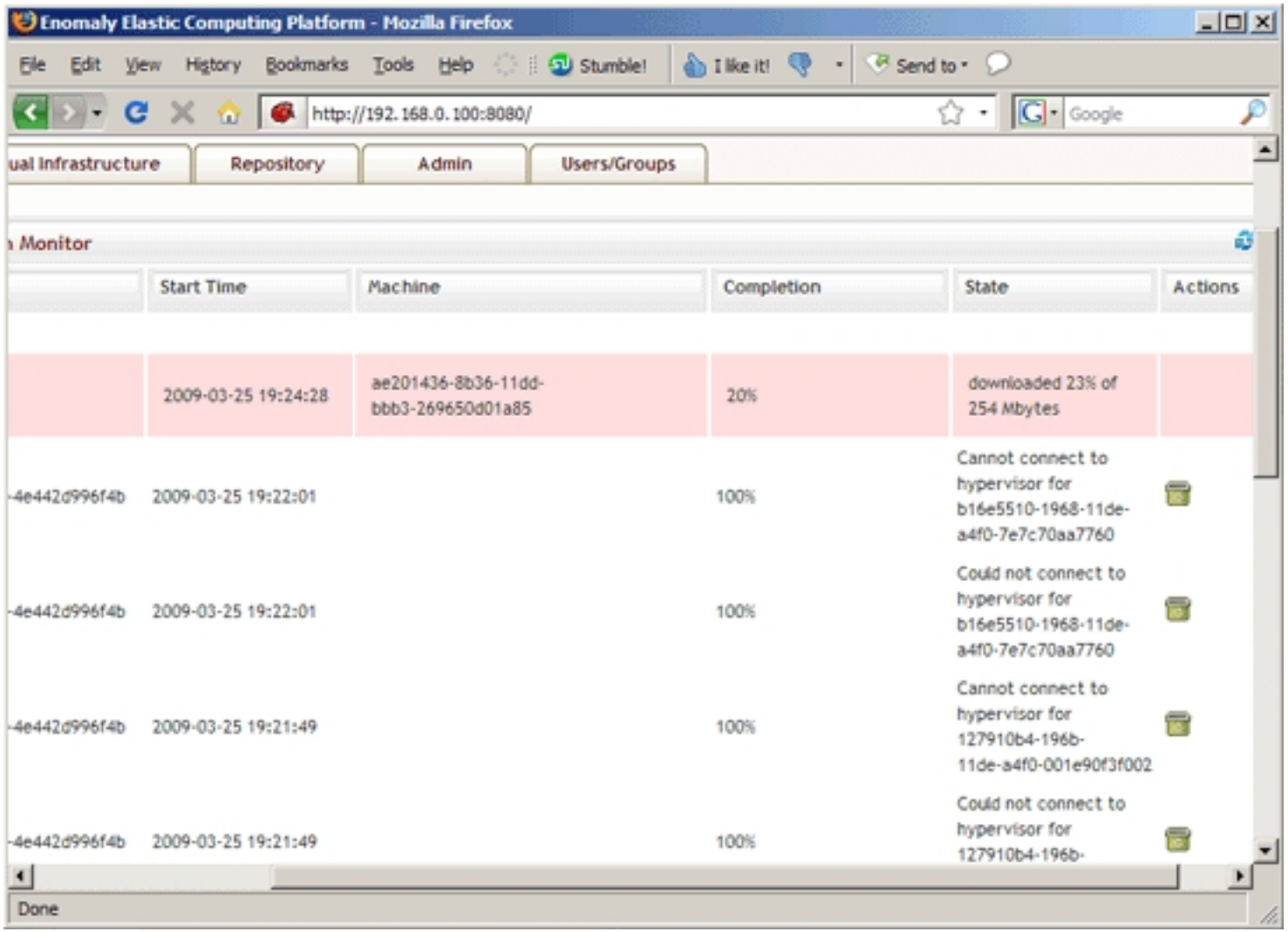

This is how it looks after the download has finished:

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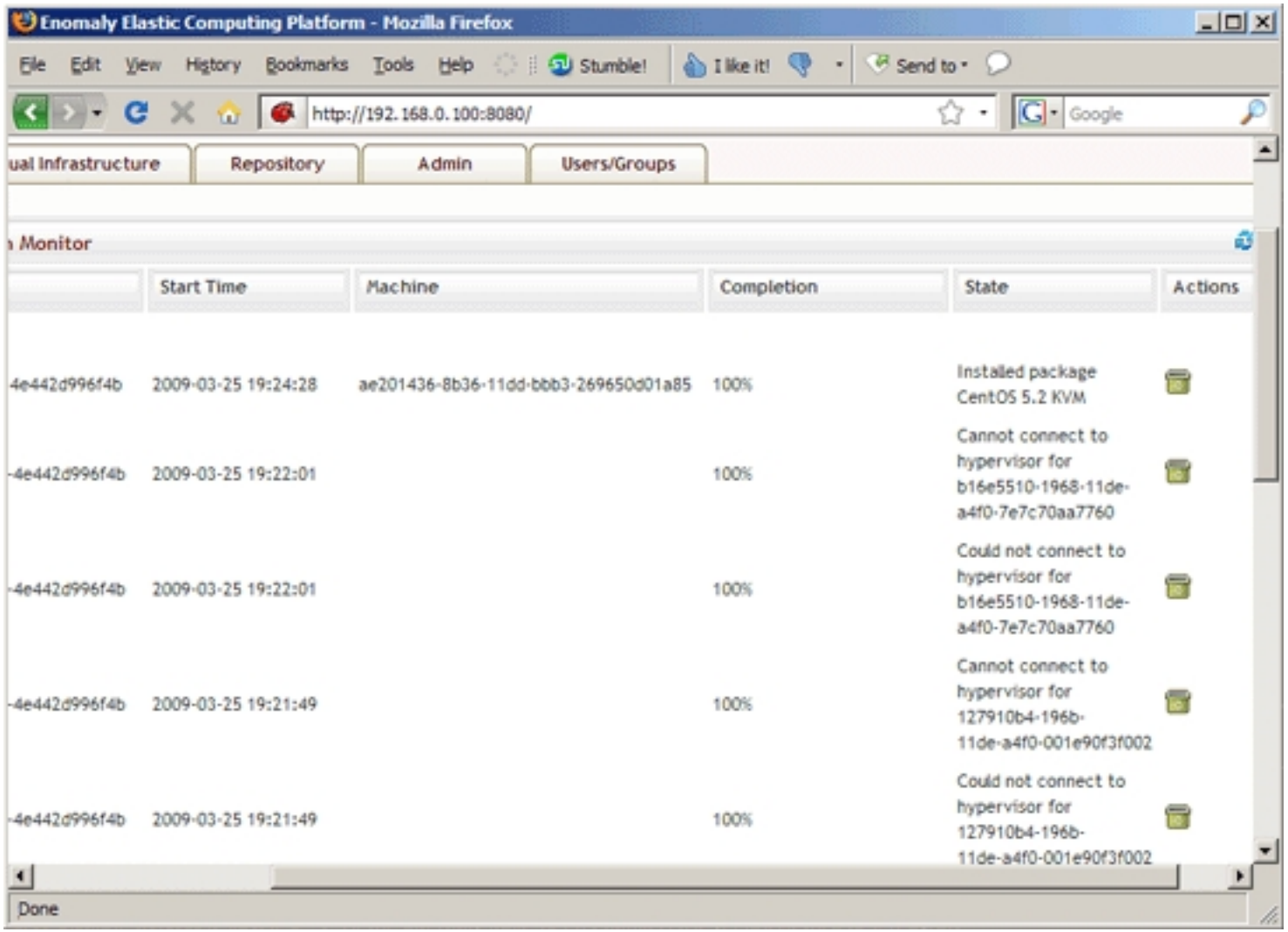

You should now find the appliance under *`Repository > LOCAL APPLIANCES`*:

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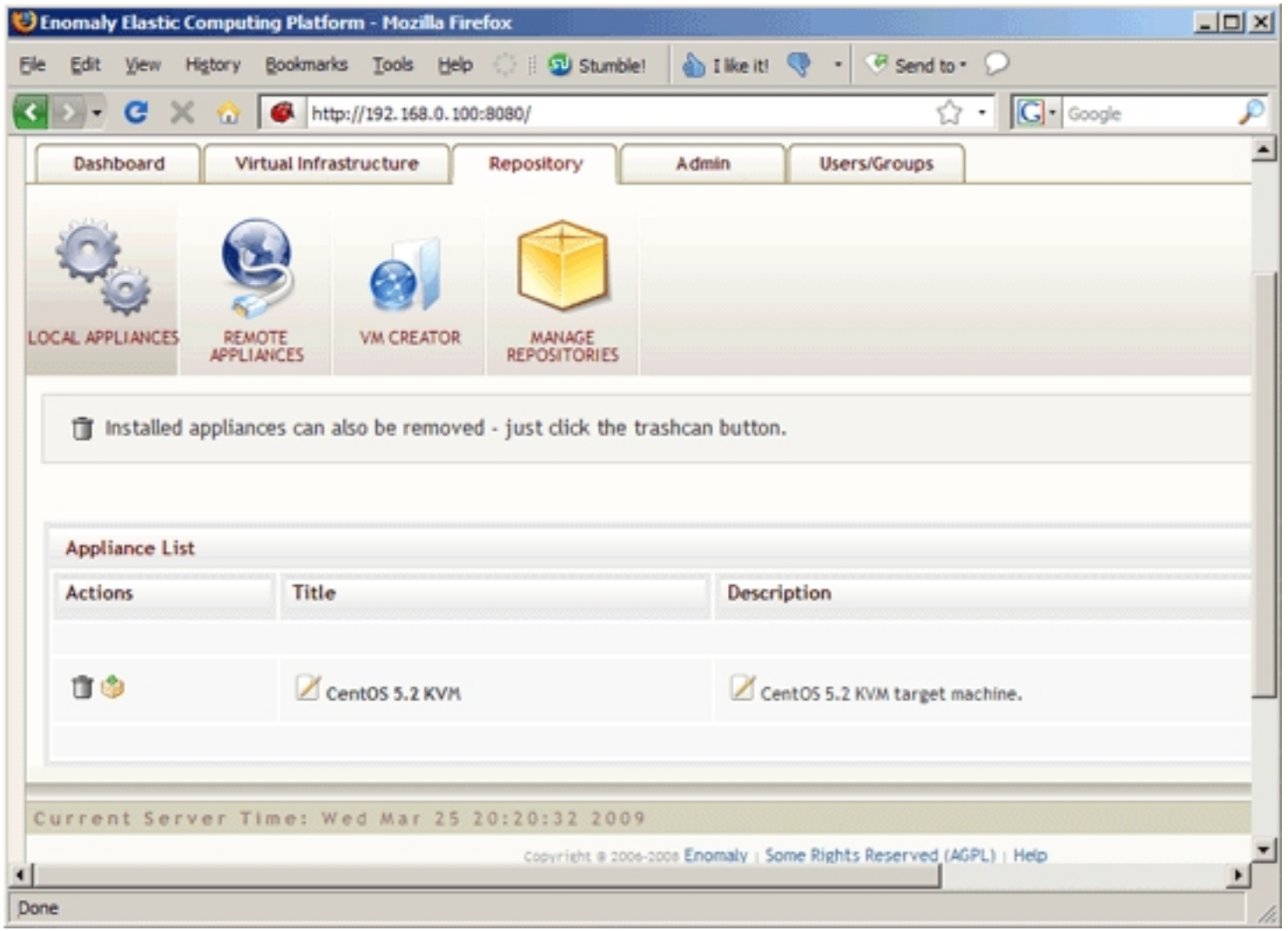

Before we start the appliance, we have to provision it (this means, the appliance is just a template from which we create KVM guests). Go to *`Virtual Infrastructure > ELASTIC VALET`* and select the CentOS 5.2 KVM appliance. In the other drop-down menus, select *`default`*, then scroll down:

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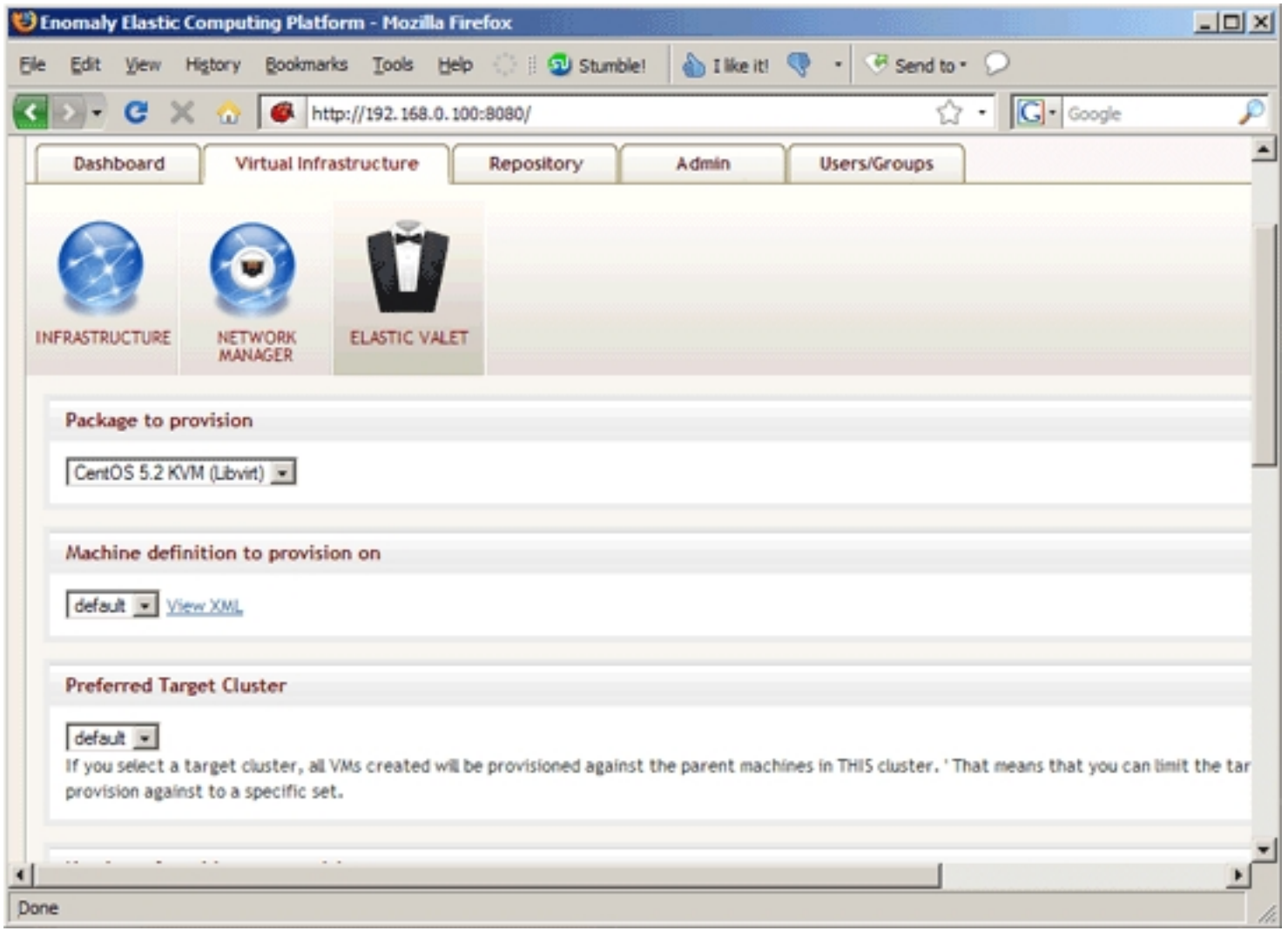

Right now, we want to create just one guest, so we select `1` in the `Number of machines to provision` drop-down menu. Click on `Provision` afterwards:

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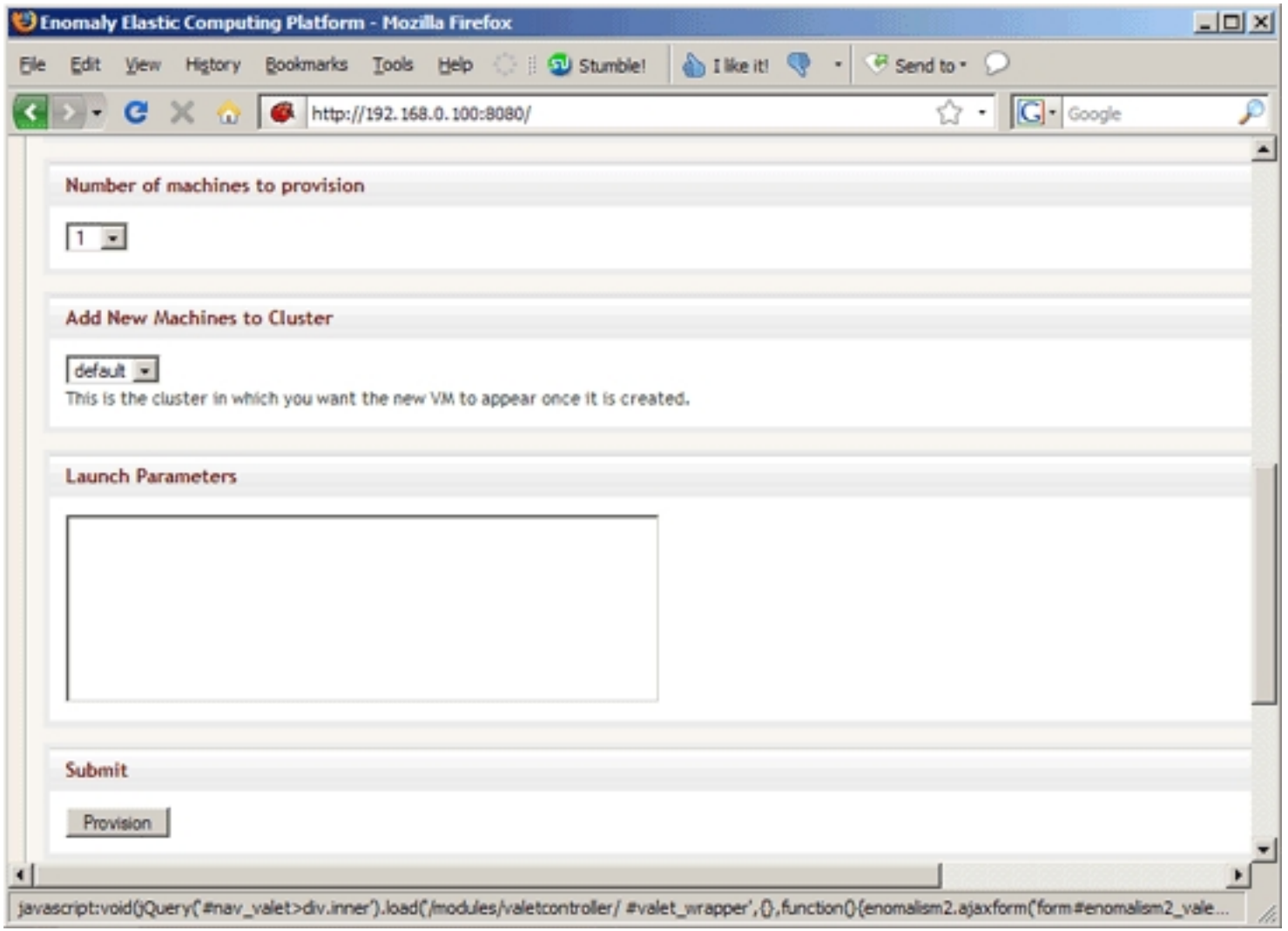
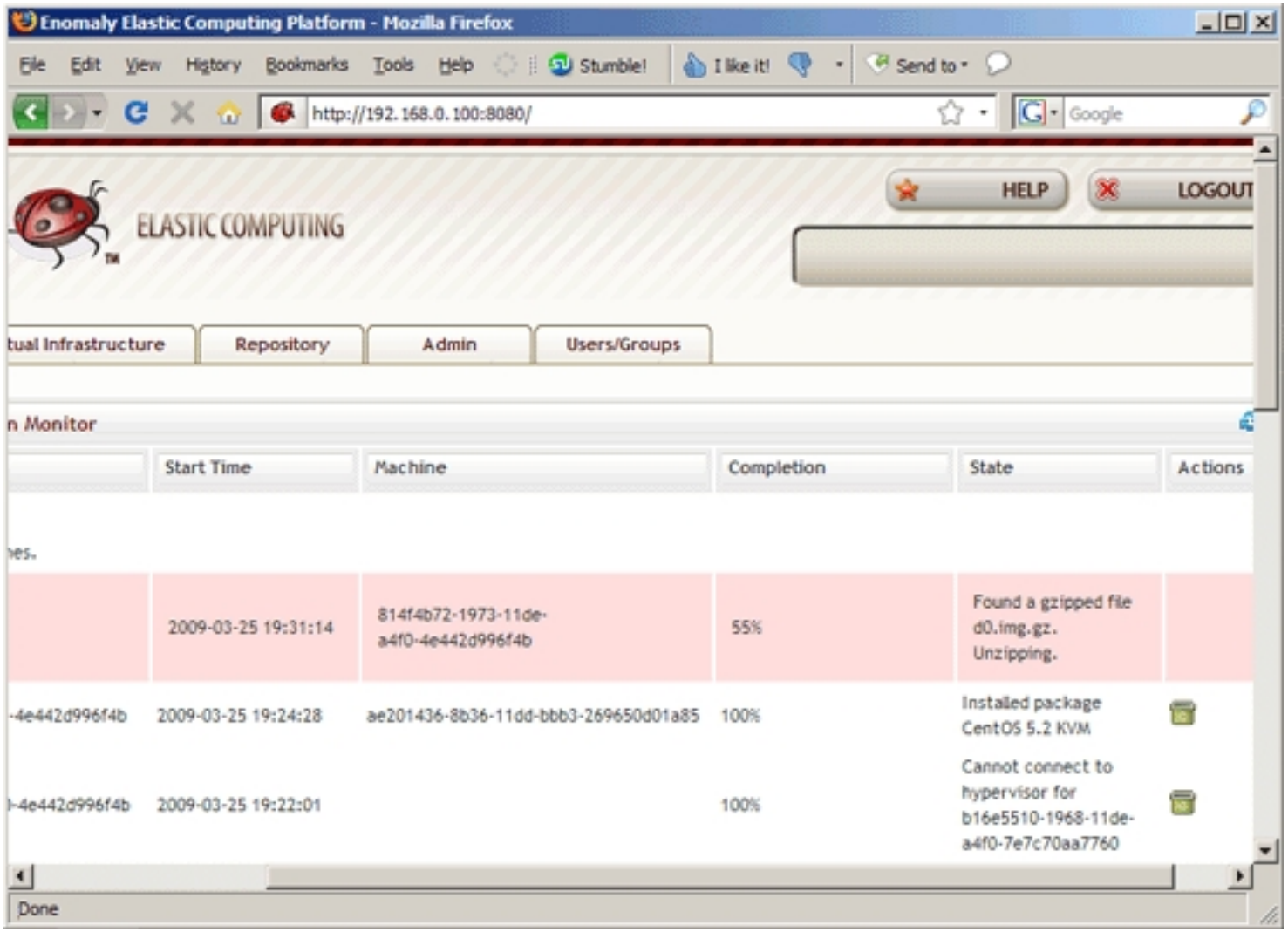


The template is now being unzipped. Again, this can take some minutes, and you can check the status on the `Dashboard`:



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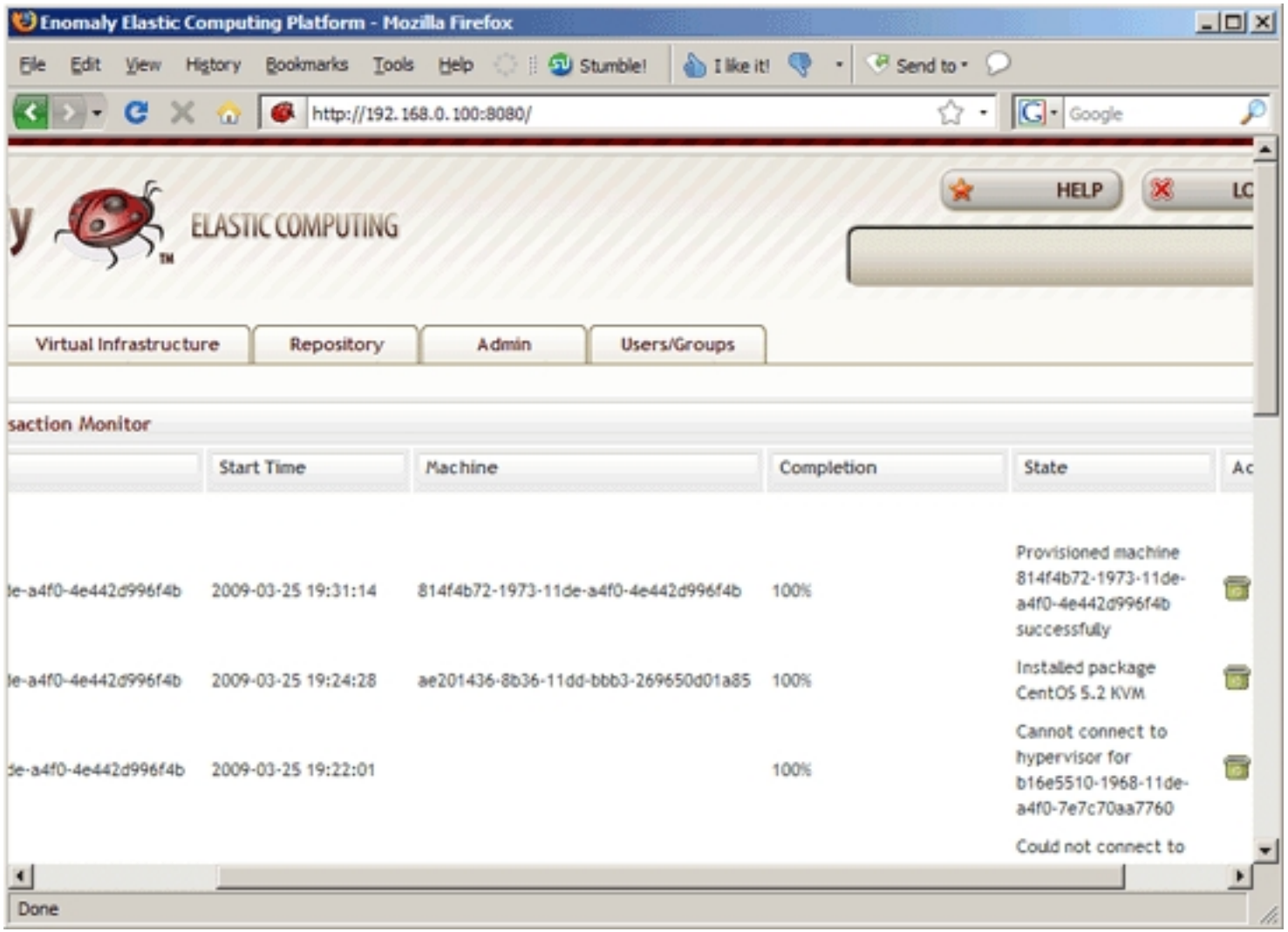

Afterwards, go to *Virtual Infrastructure > INFRASTRUCTURE*. Click on the refresh button in the left frame. You should find that *server1.example.com* is a member of the cluster named *default*, and that there's one virtual machine on *server1.example.com* (named *814f4b...* in this example). Click on that virtual machine in the left frame, and the virtual machine summary should load in the main frame:

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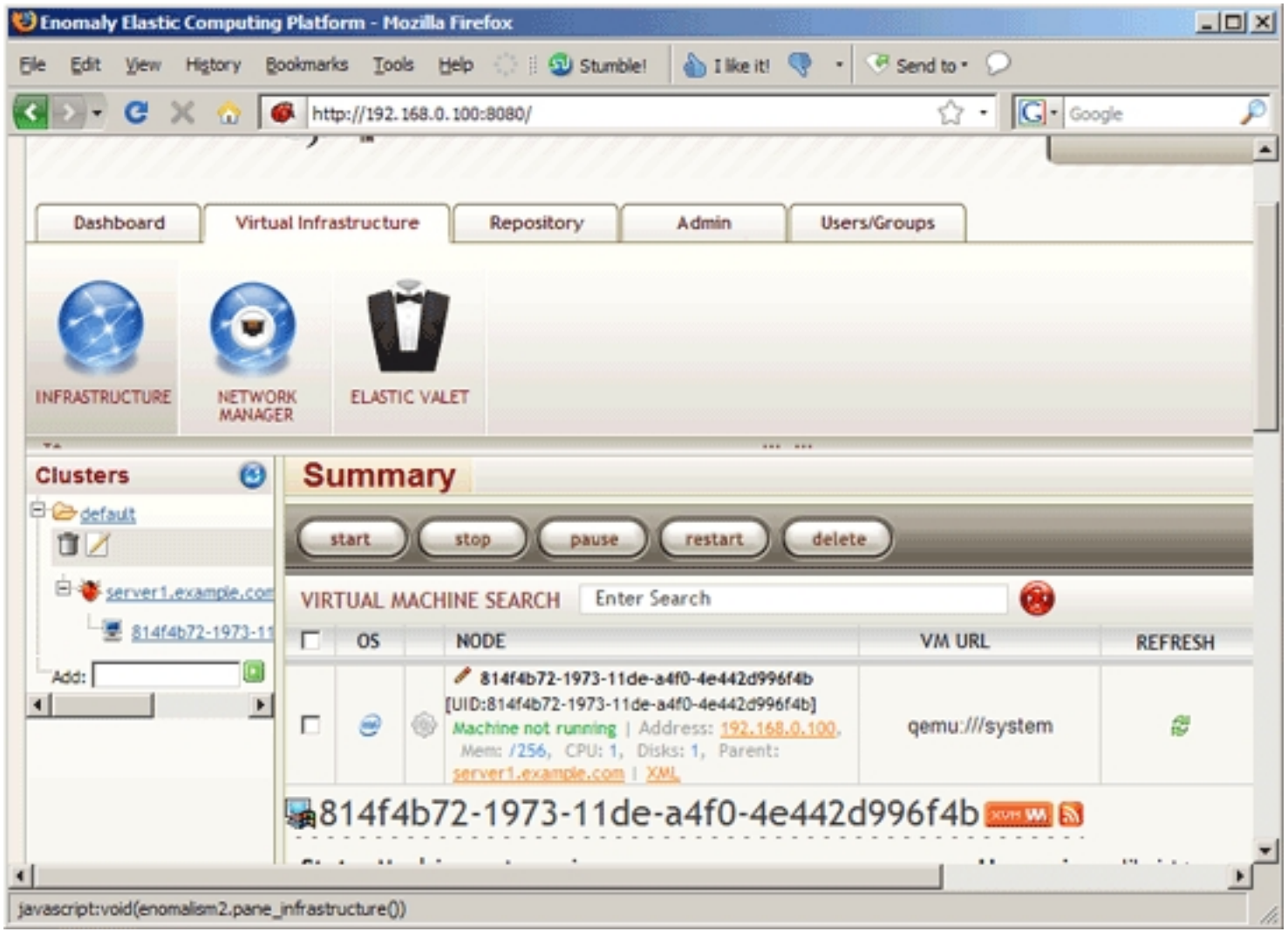

It's a good idea to rename the virtual machine to something less cryptic, so click on the pencil left of the virtual machine name...

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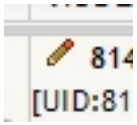

... and give the virtual machine a new name:

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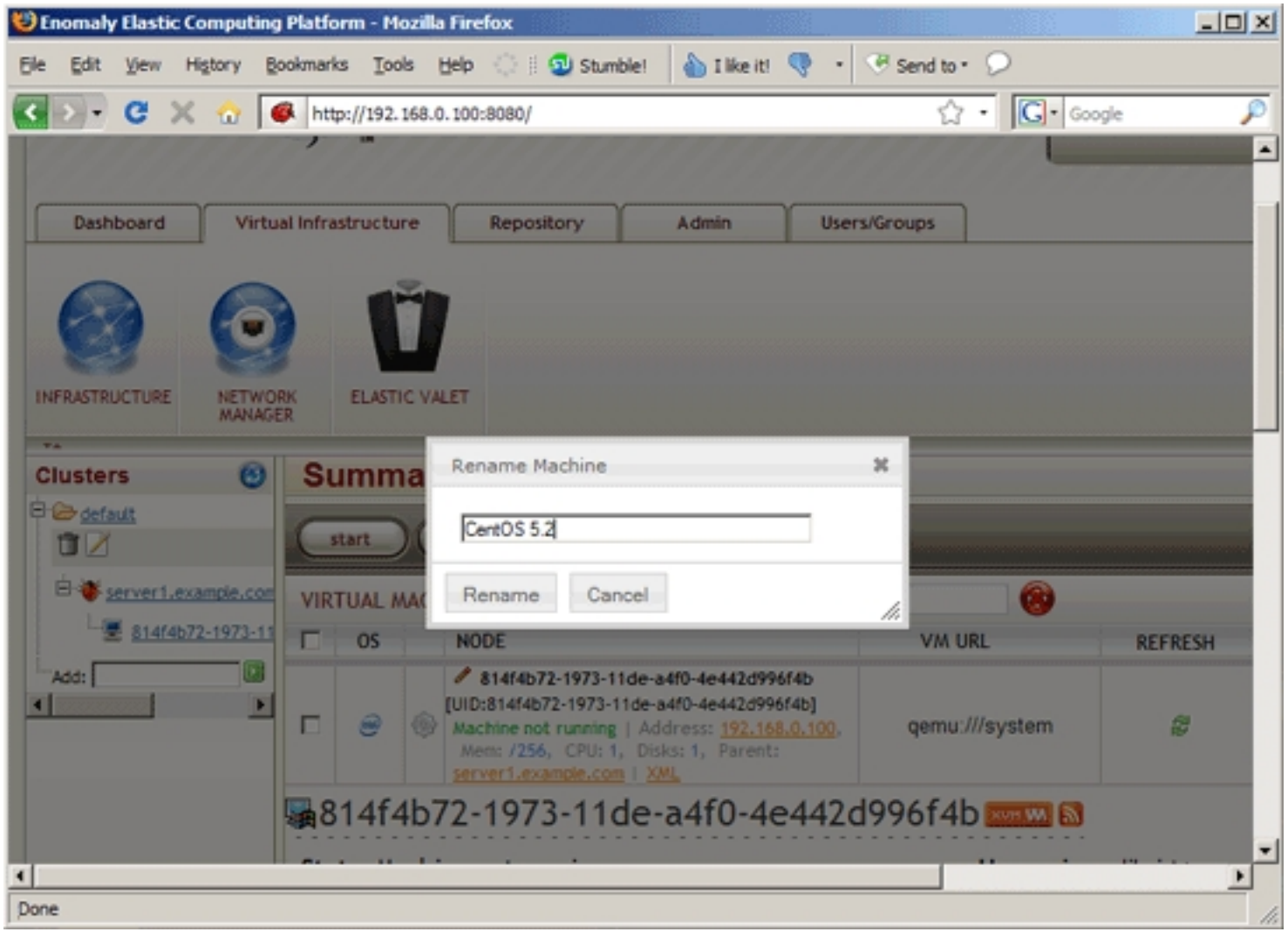

You can now start that virtual machine by clicking on the *start this virtual machine* link:

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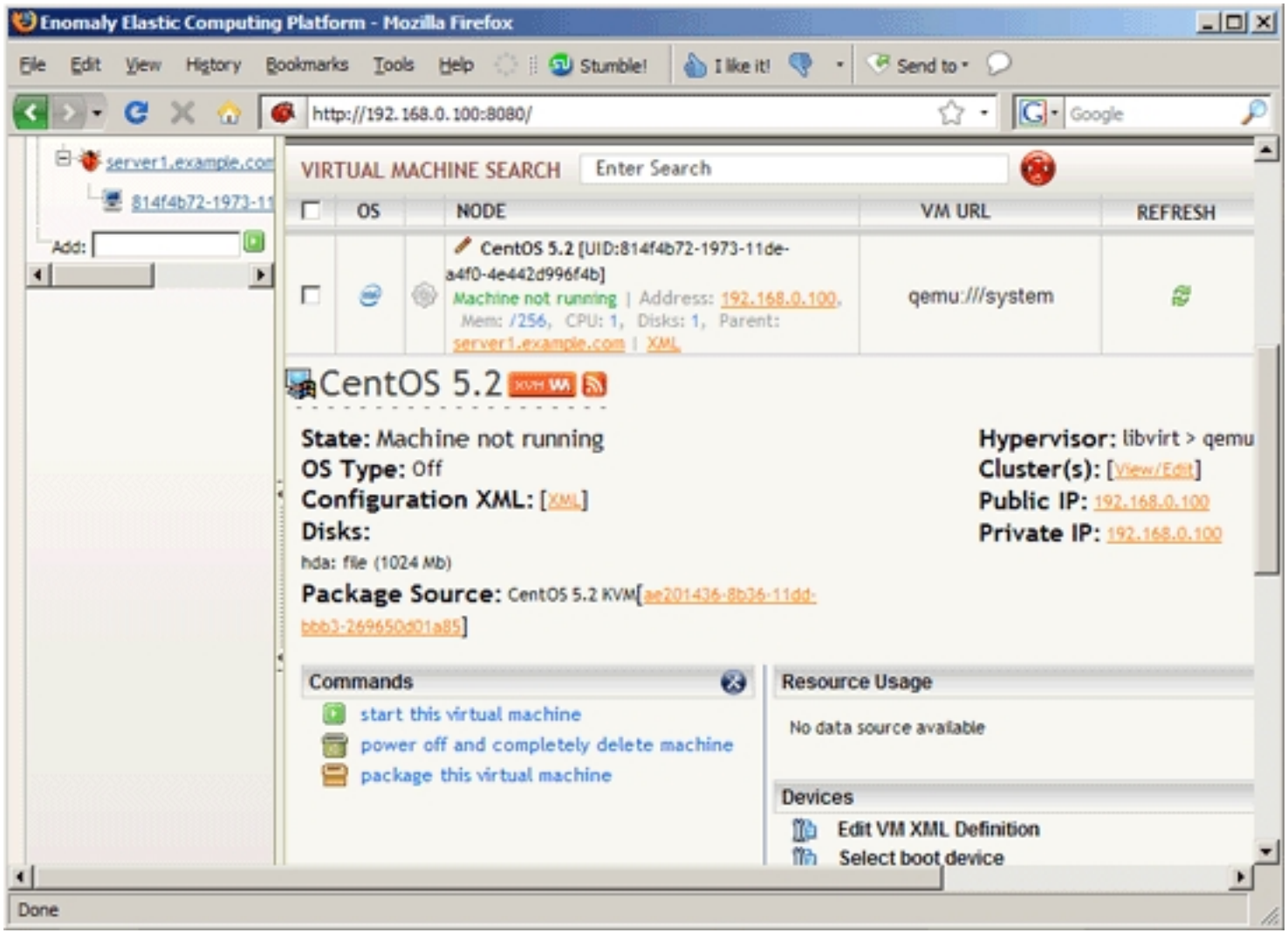

Confirm that you want to start the virtual machine:

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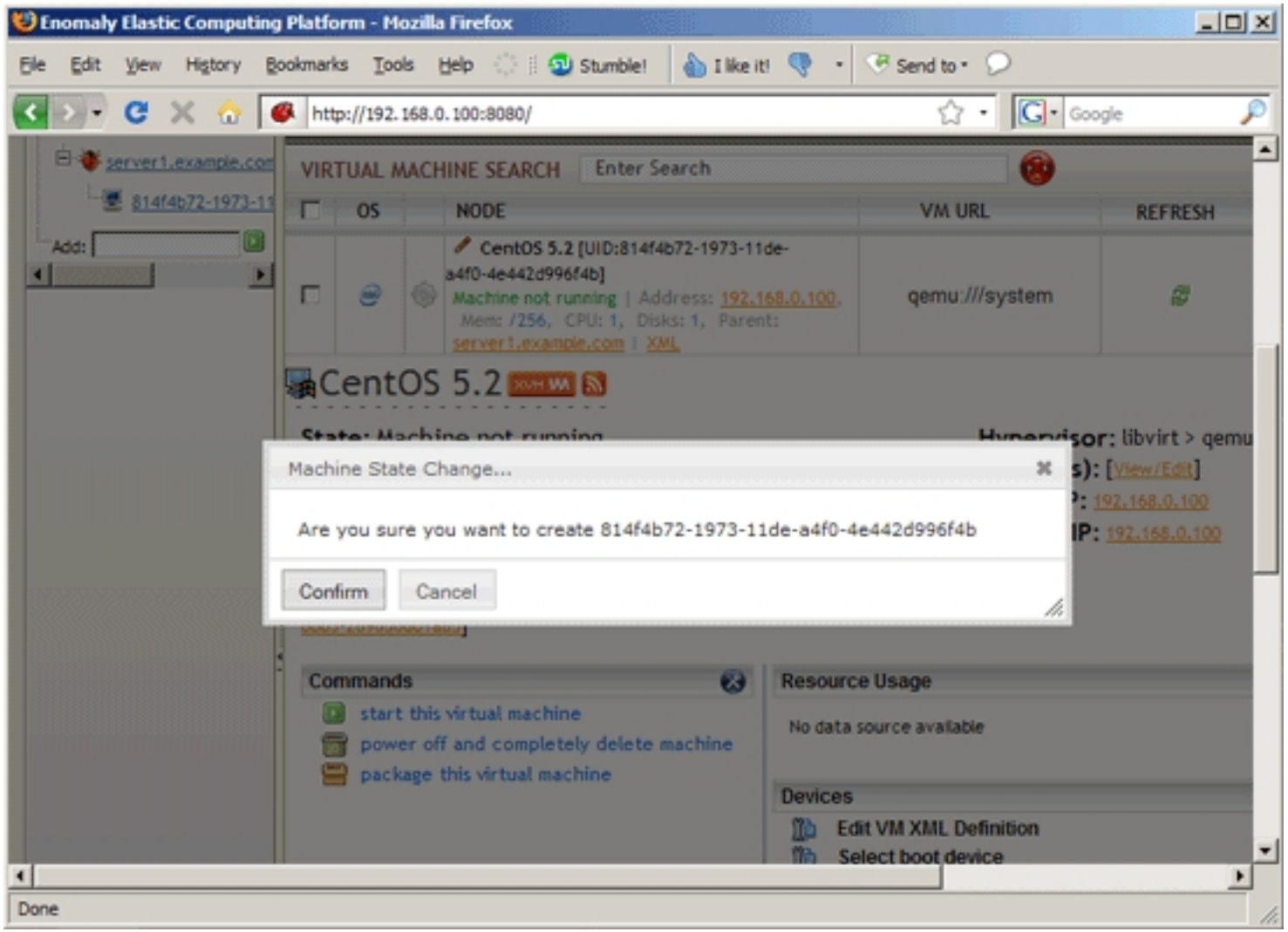

In the virtual machine summary, there should now be some new links (e.g. suspend, poweroff, reboot). The interesting link is the one that reads *`VNC to this VM (via the parent)`*. This will open Enomalism's built-in VNC client (written in JAVA). (Of course, you can use any other VNC client to connect to the virtual machine, e.g. **TightVNC**. In the lower right corner of the summary, you will find details how to do this (IP and port).)

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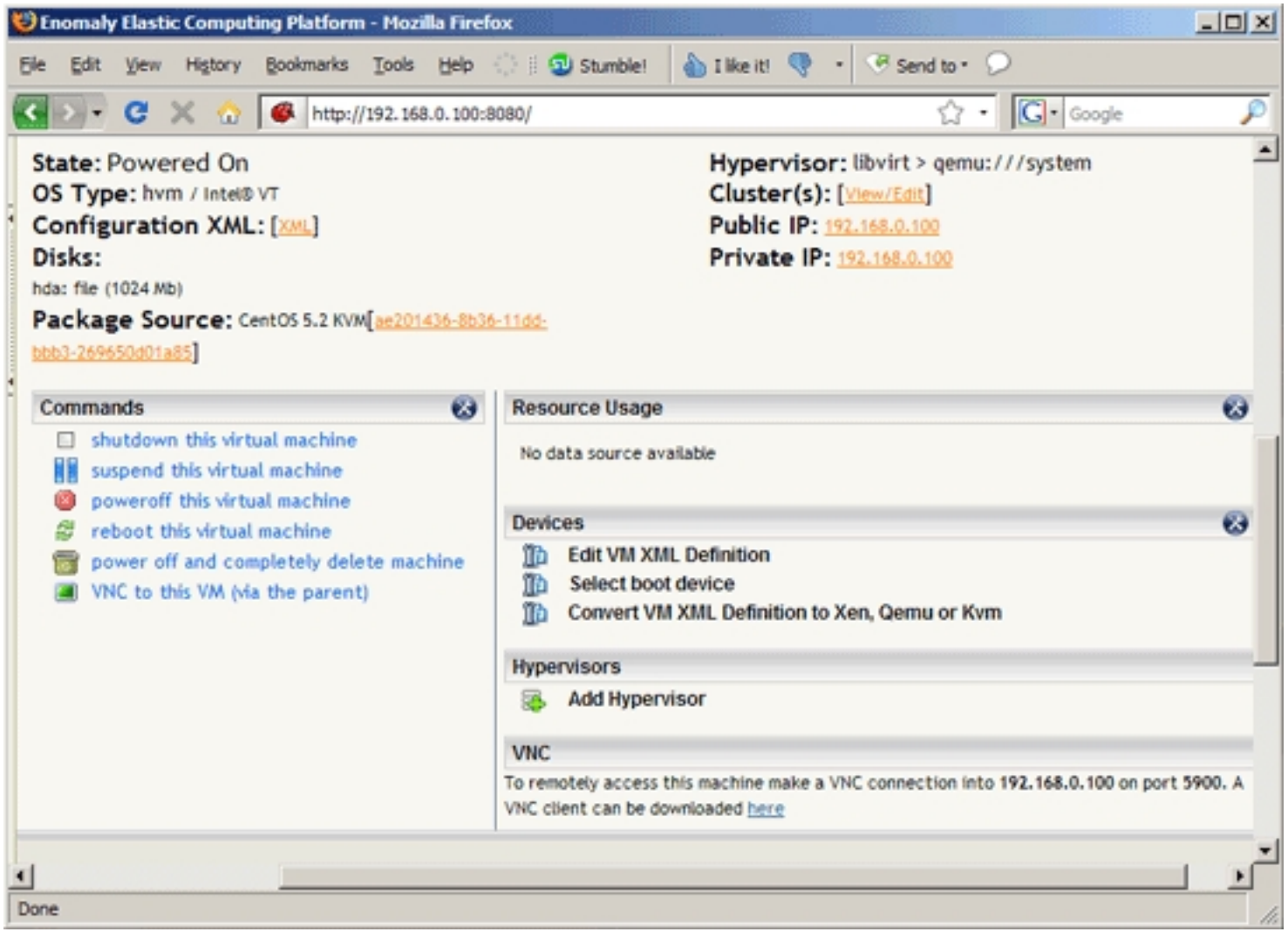
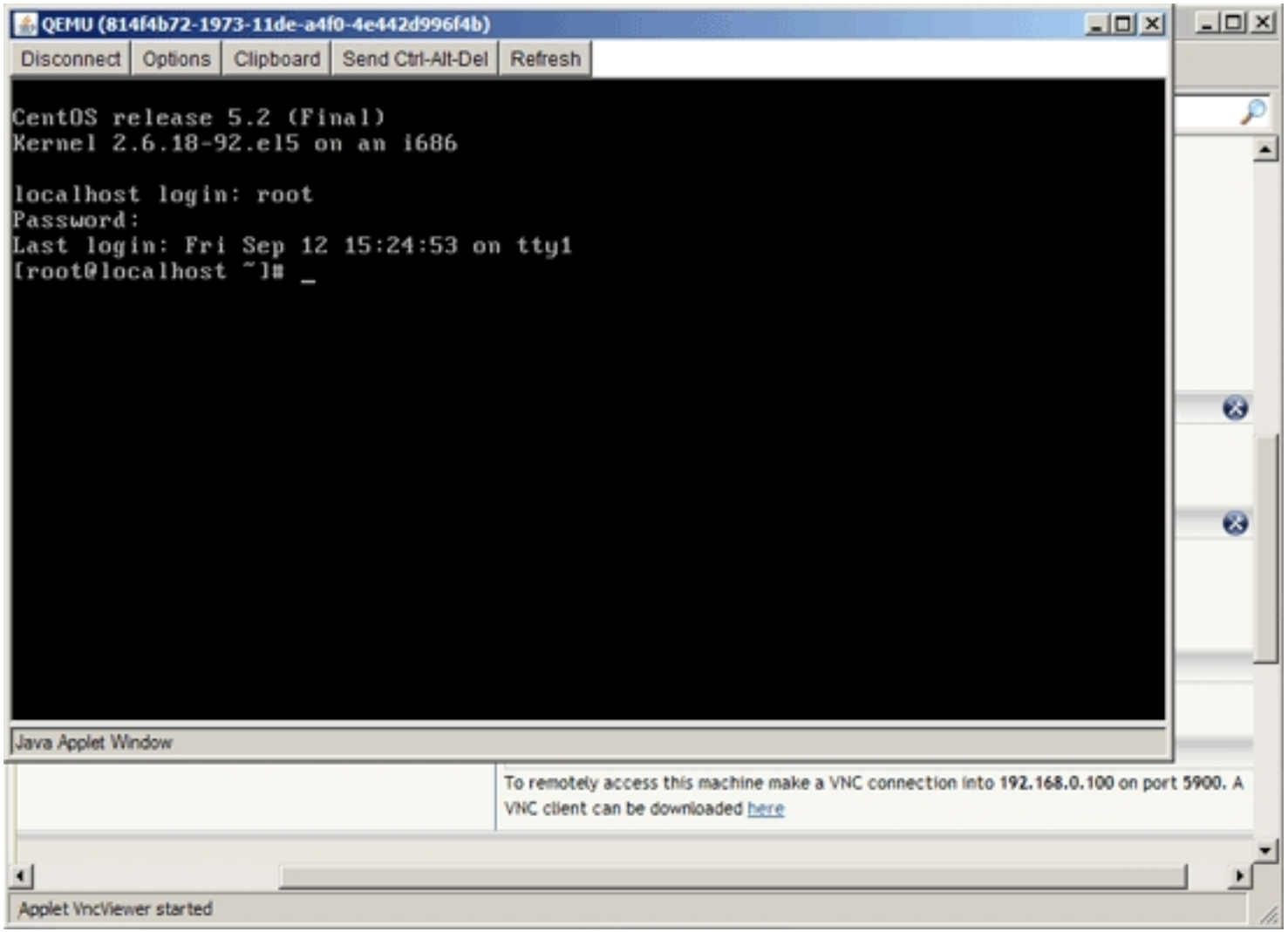


This is how the JAVA VNC client looks (the default login for the public Enomalism appliances is `root:password`):



3.2 Creating Our Own Virtual Machines

Instead of using the preconfigured appliances, we can also create our own virtual machines. Go to *Repository > VM CREATOR*. Click on the *Browse...*

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button...

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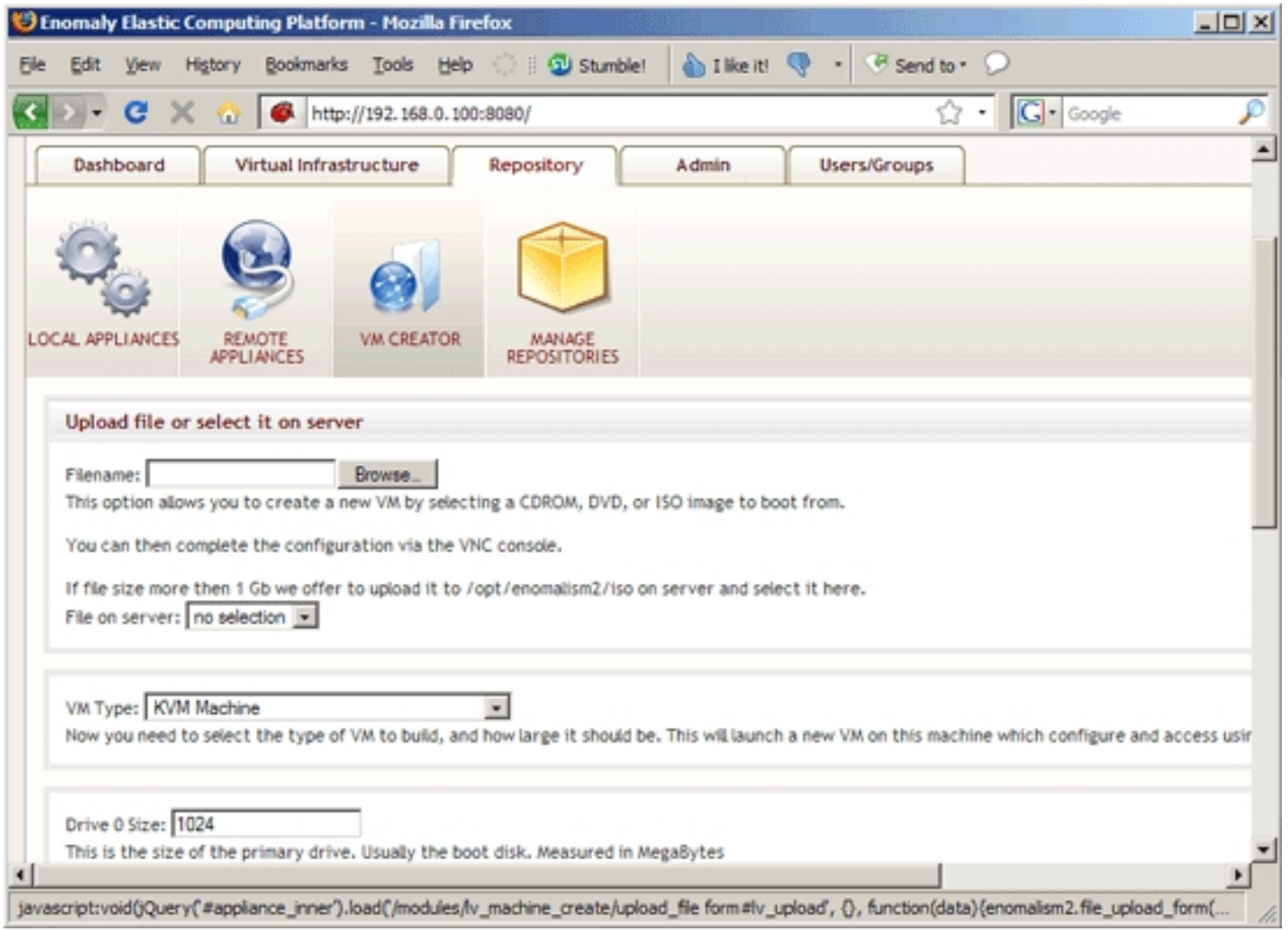

... select an operating system ISO image from your local hard drive (I'm going to install a Debian Lenny guest, so I select the *debian-500-amd64-netinst.iso* from my local hard drive):

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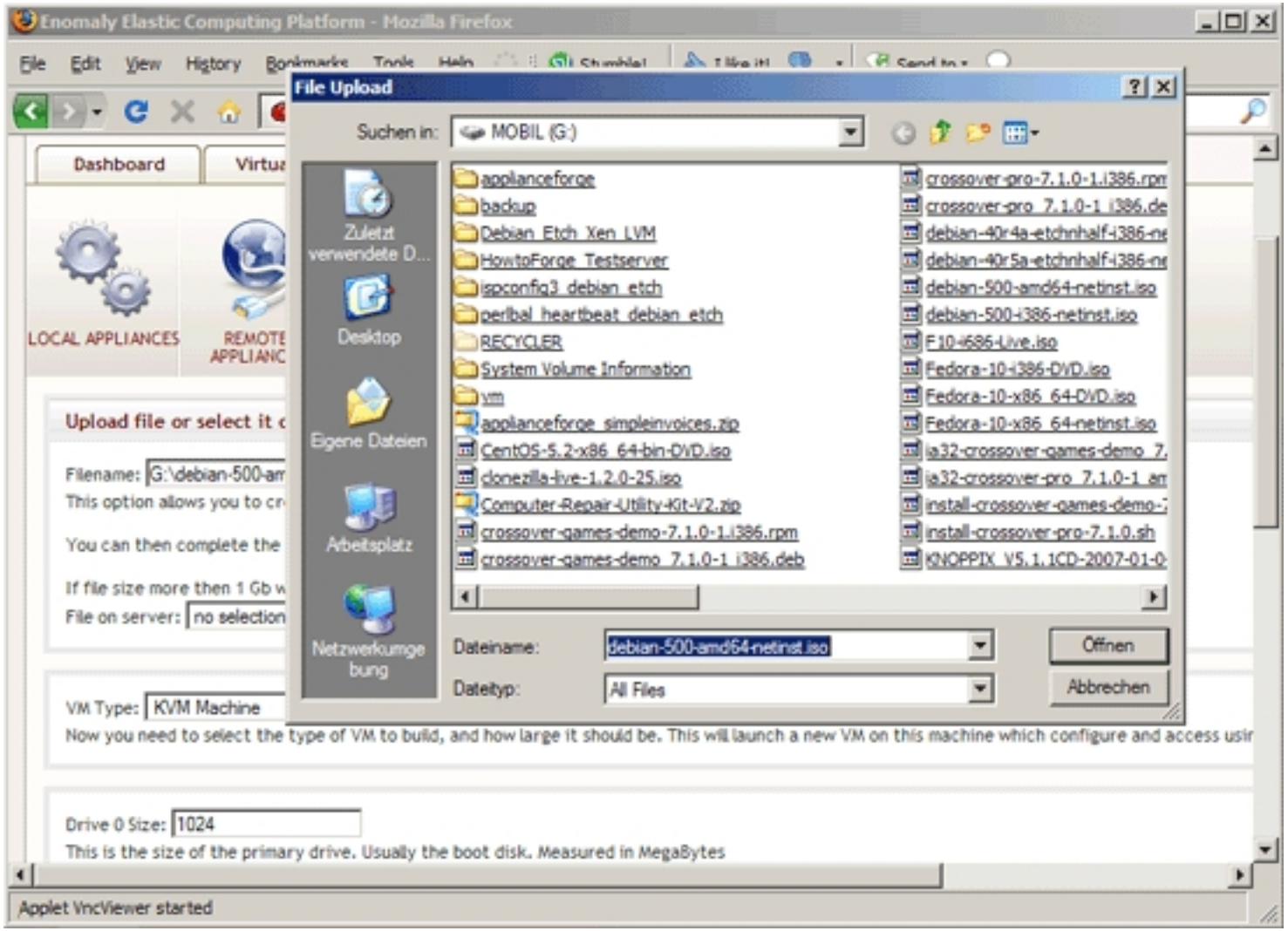

Next select *KVM Machine* in the *VM Type* drop-down menu and specify the size of the guest image (e.g. 4048 MB) as well as the memory that you want to allocate to the guest:

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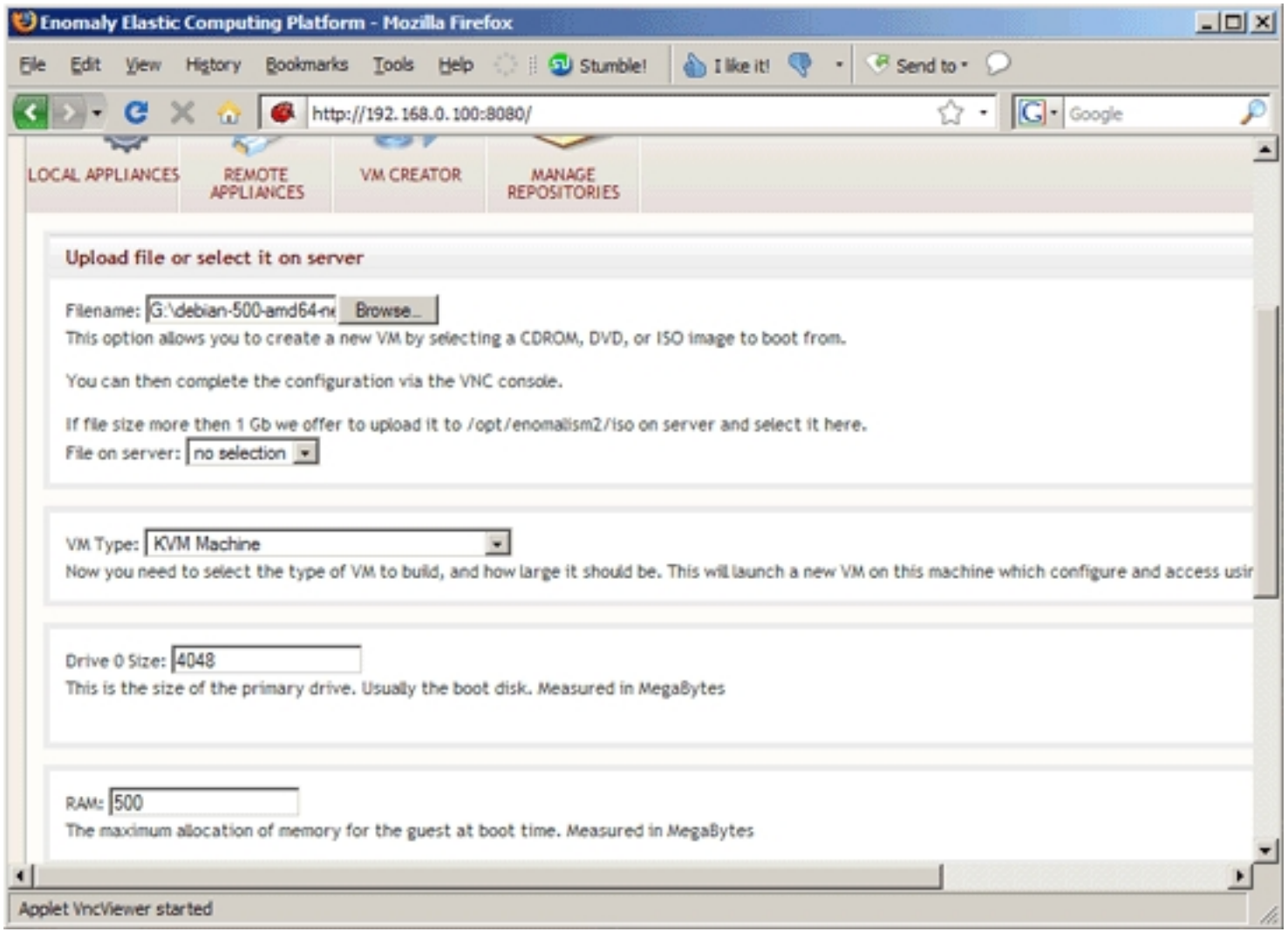

If your host system has more than one CPU core, you can specify the number of virtual CPUs for the guest. Click on `Create` afterwards:

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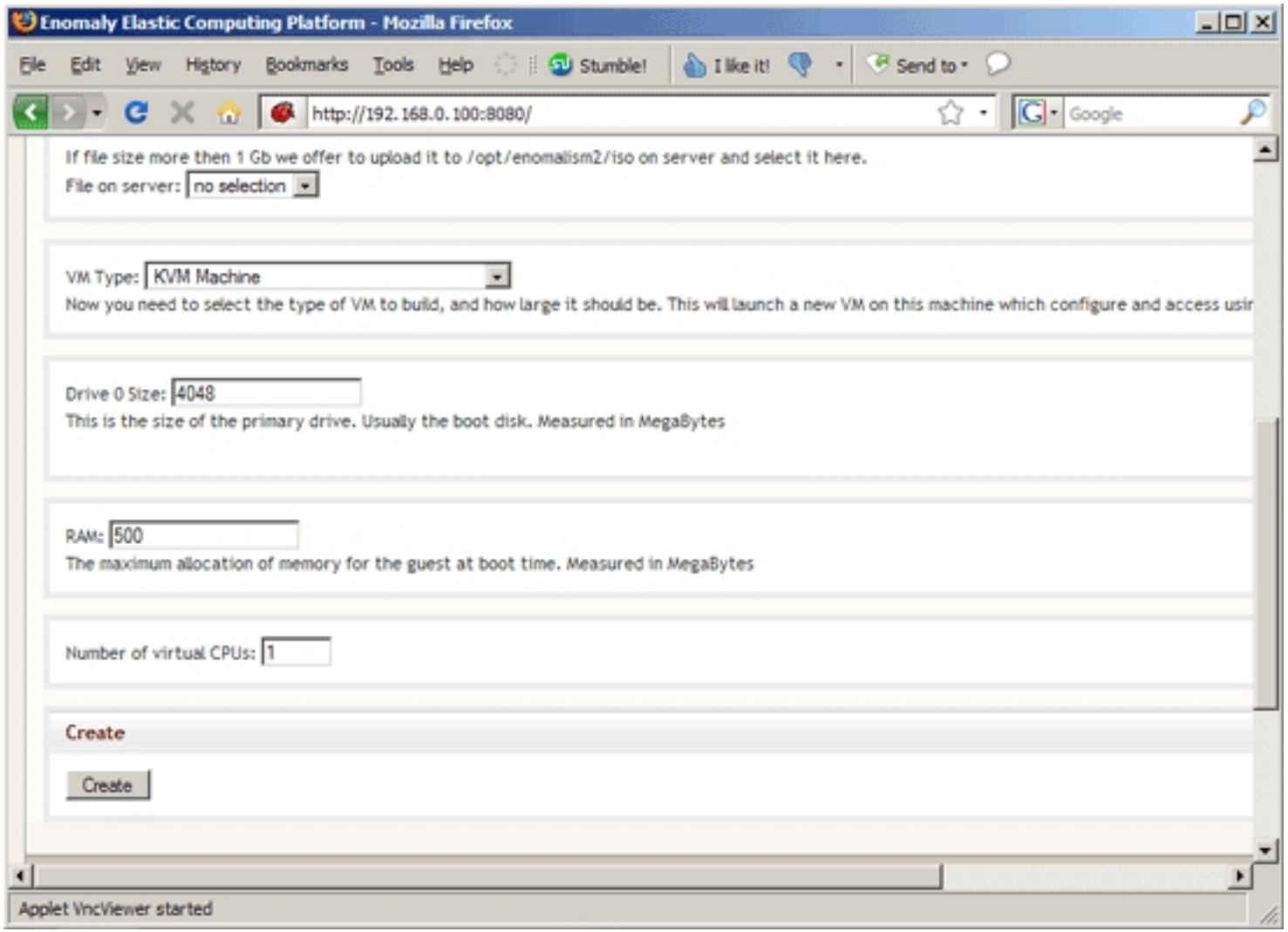

The ISO image is now being uploaded to the Ubuntu 8.10 KVM host:

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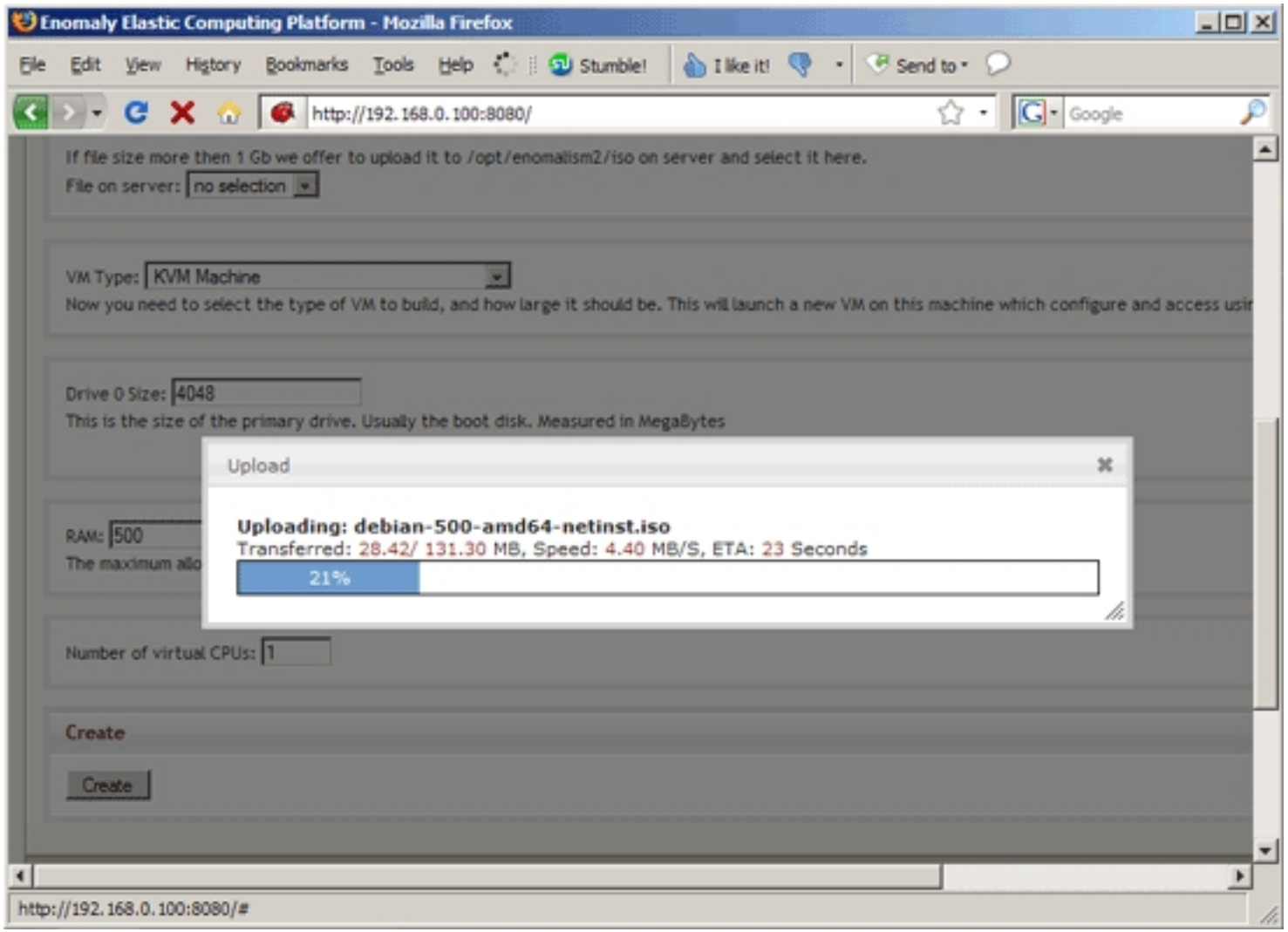

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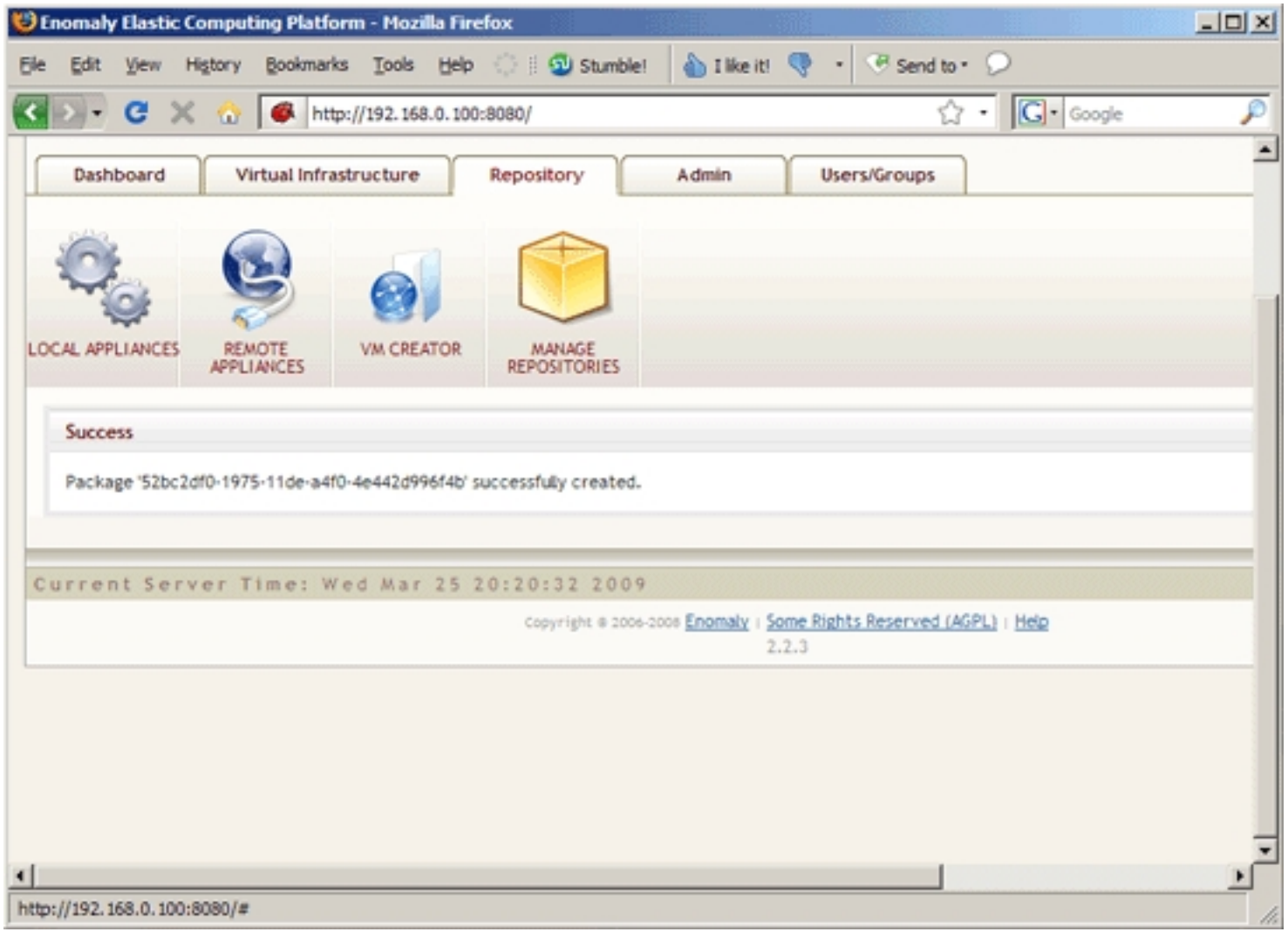

Afterwards, you can find the ISO image under *`Repository > LOCAL APPLIANCES`*. It has a cryptic name, so you should rename it to something more intuitive:

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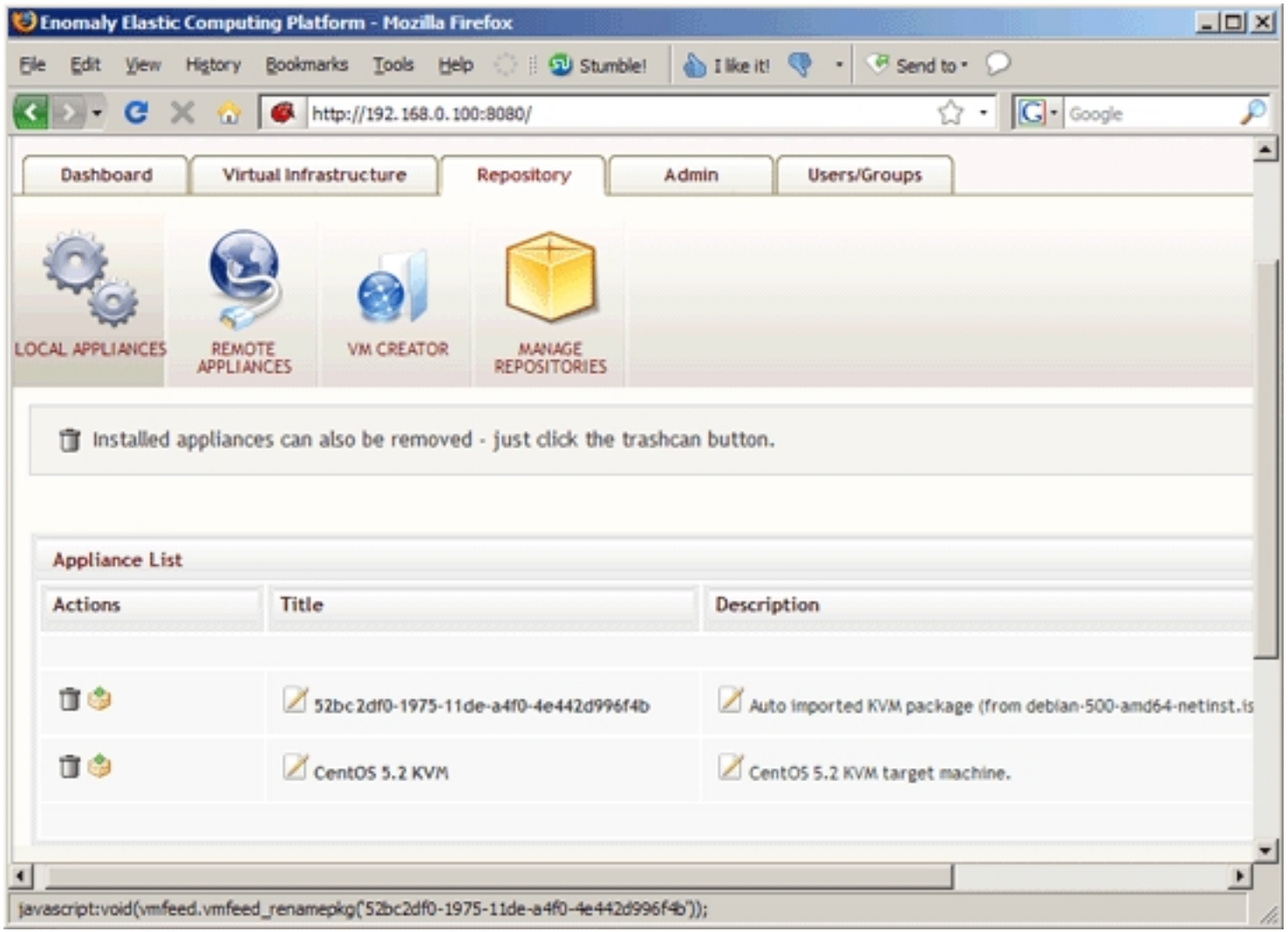

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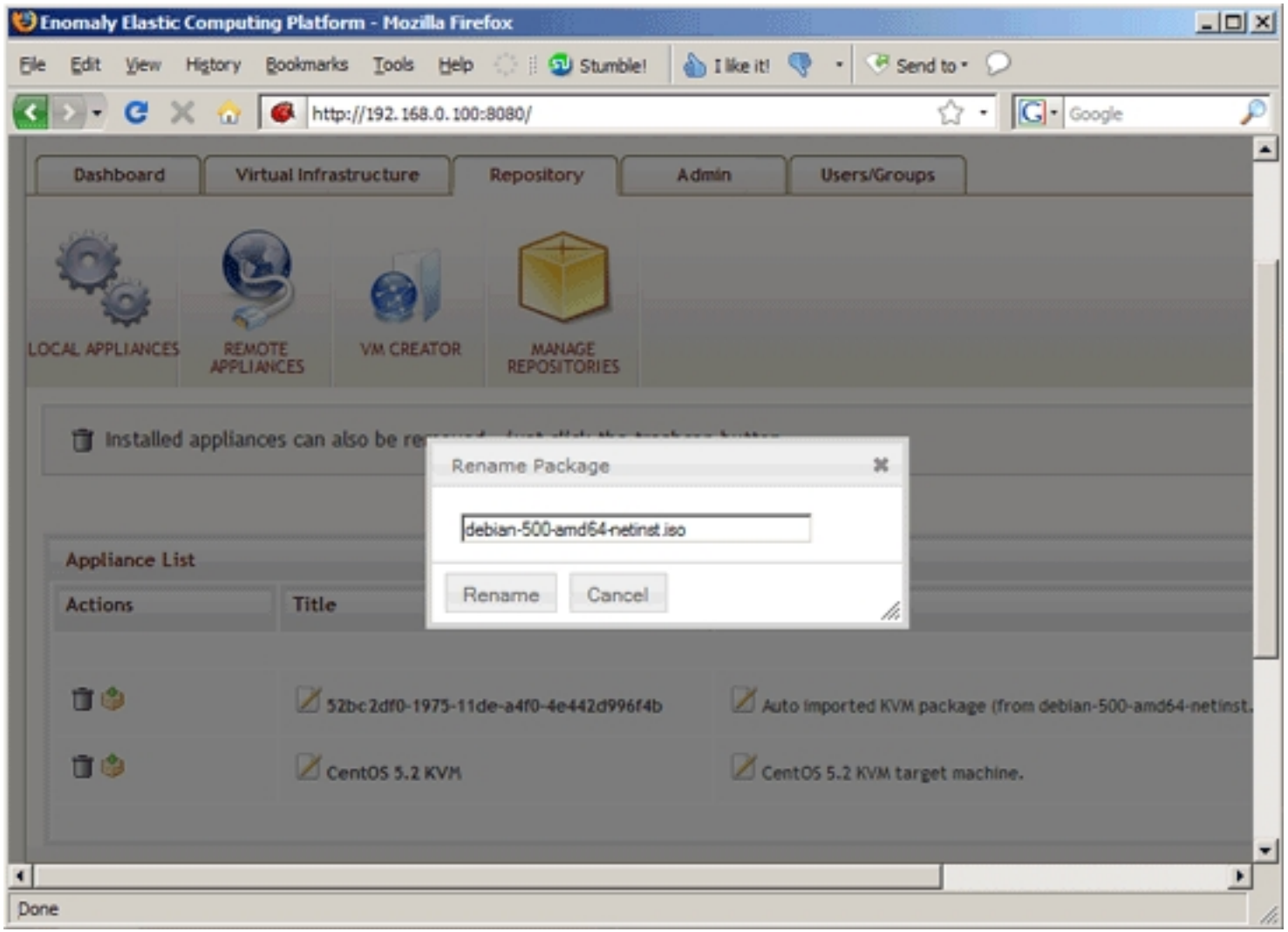

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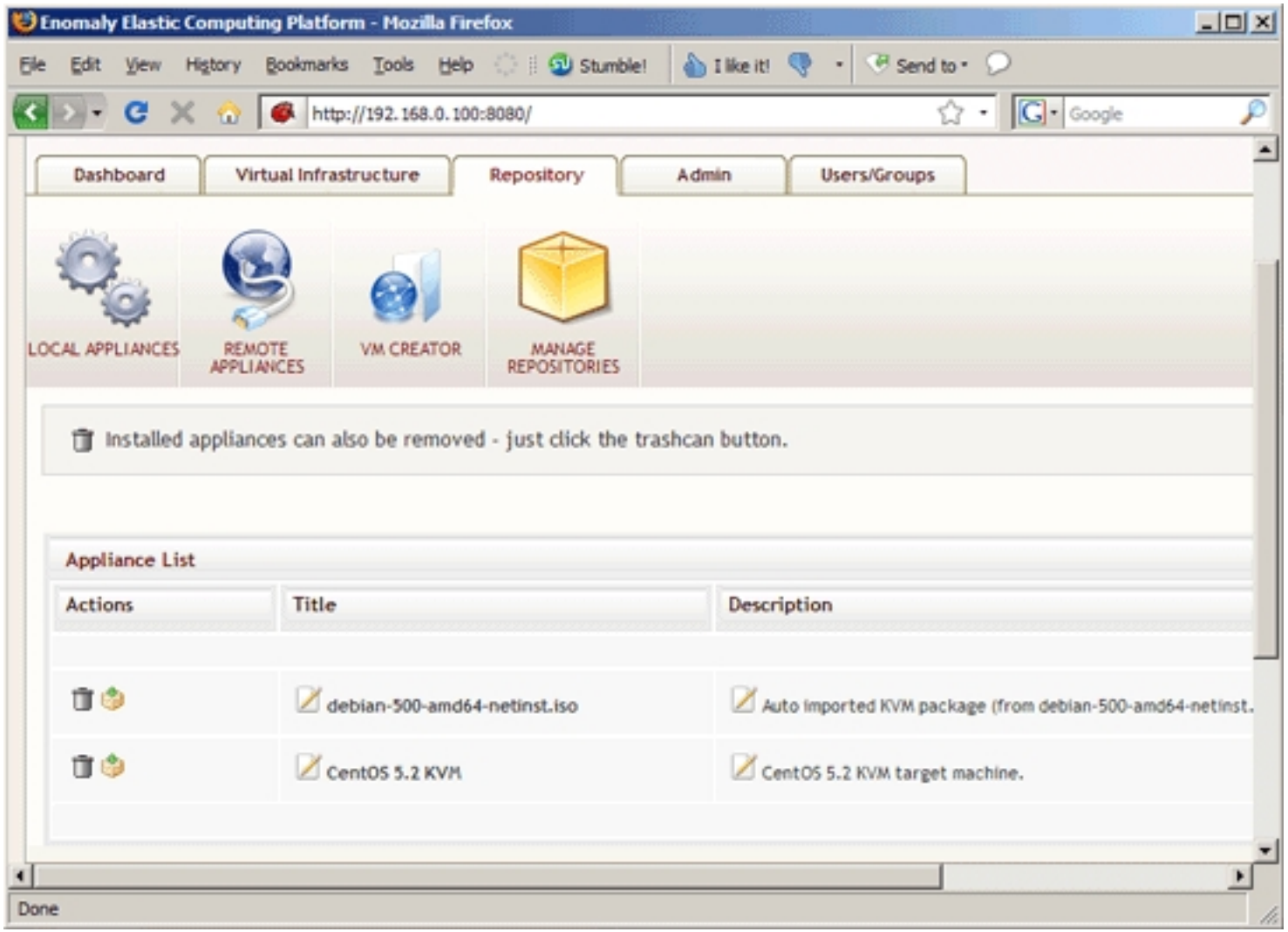

To create a virtual machine from the ISO image, go to *`Virtual Infrastructure > ELASTIC VALET`*, select the ISO image and click on *`Provision`*:

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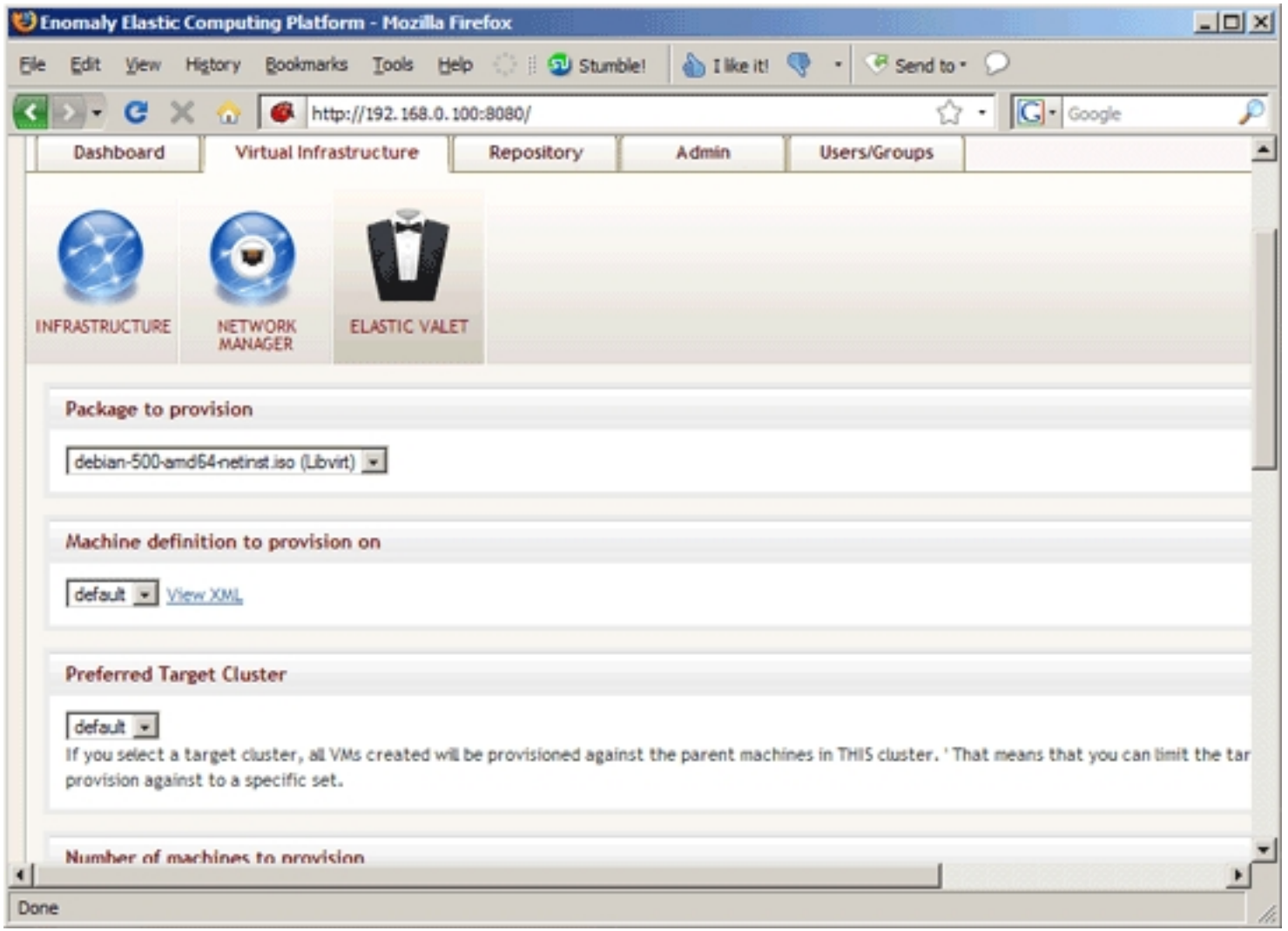
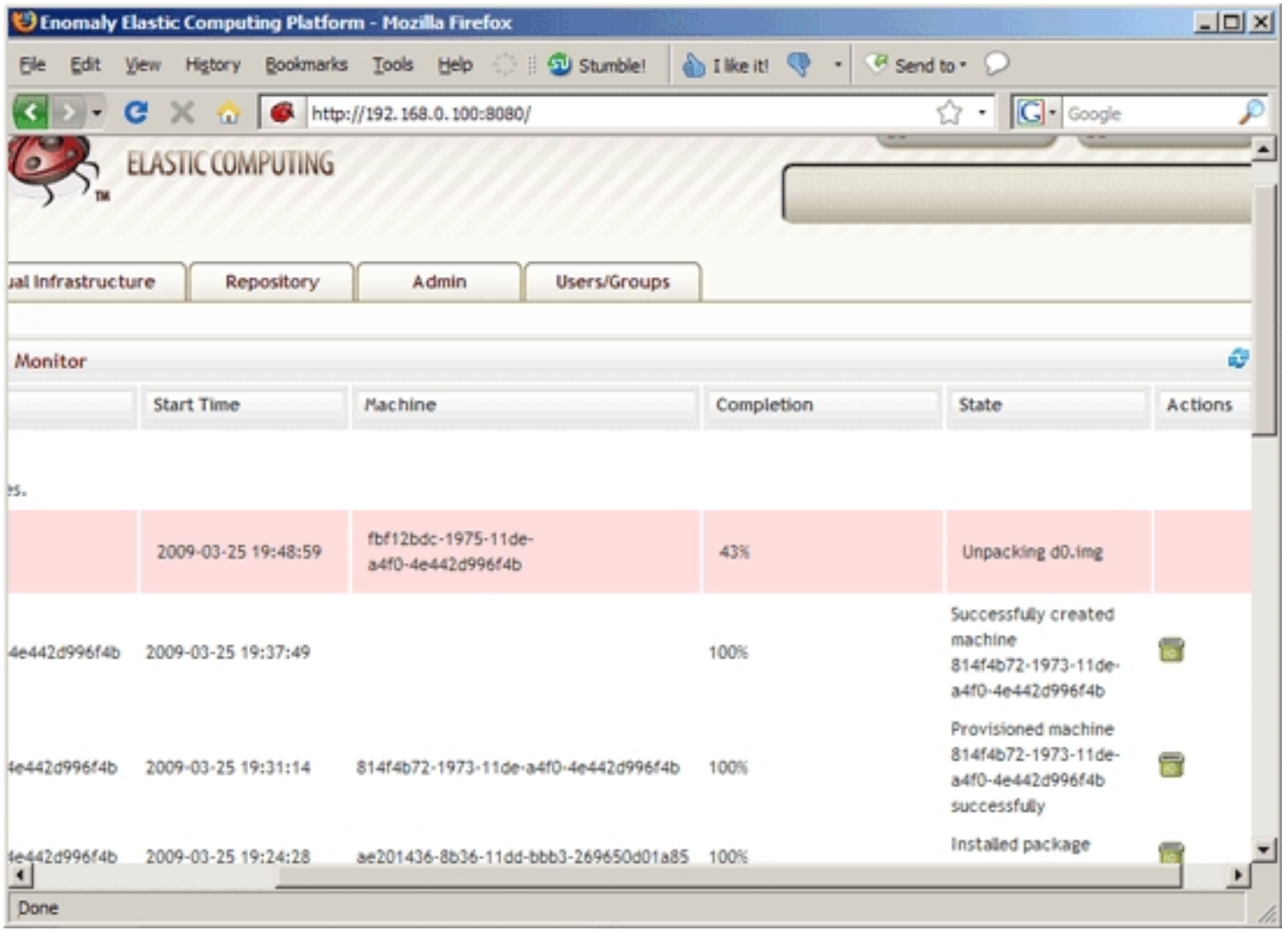


The ISO image is now being unpacked - this can take some minutes, and you can check the status on the `Dashboard`:



Afterwards, go to *Virtual Infrastructure > INFRASTRUCTURE* and click on the refresh button in the left frame. There should now be a new guest:

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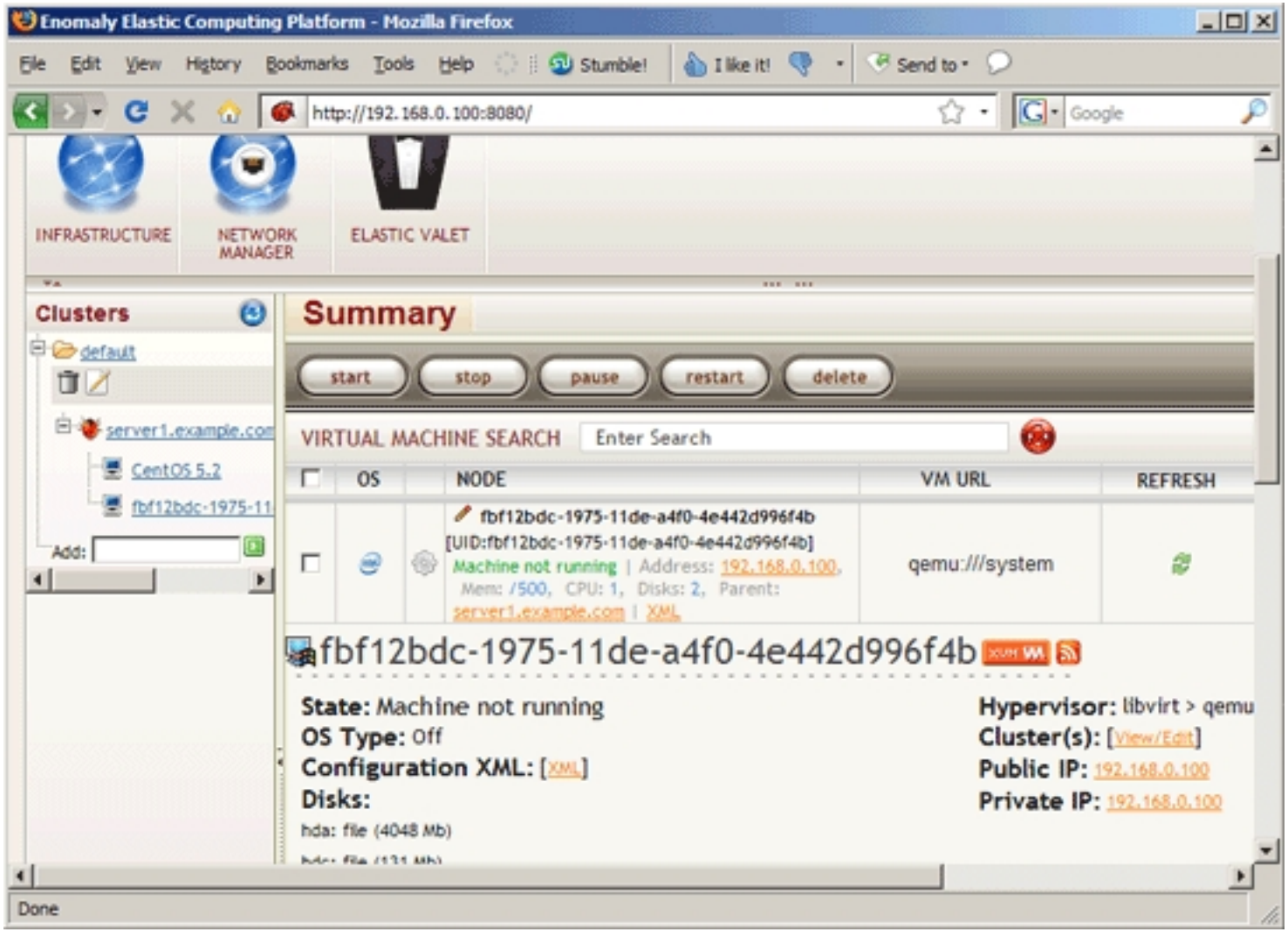
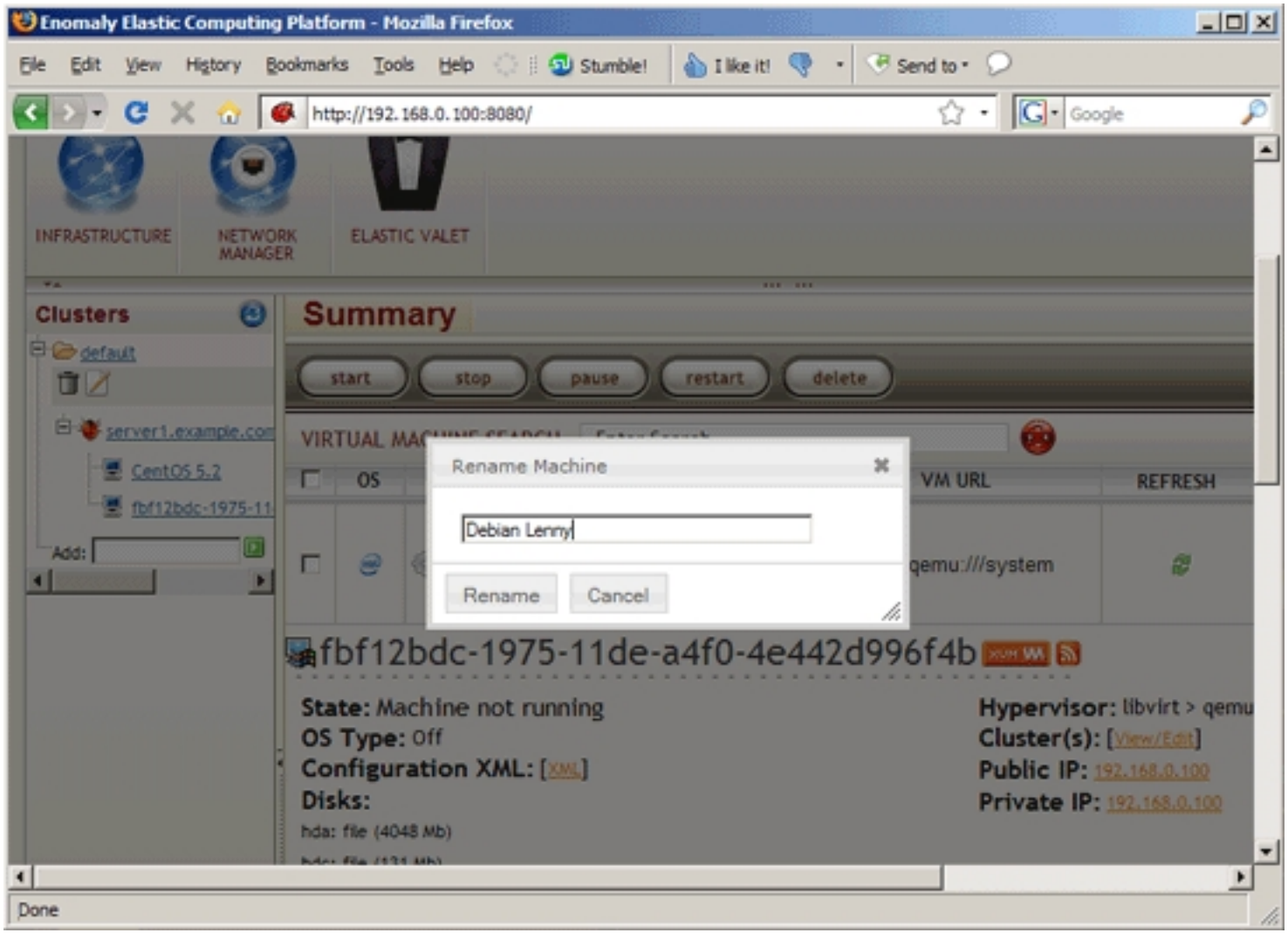


Rename that guest to something less cryptic:



In the virtual machine summary, click on *`Select boot device`*...

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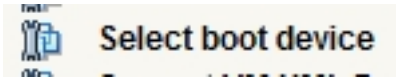

... and choose *DVD/CD-ROM*:

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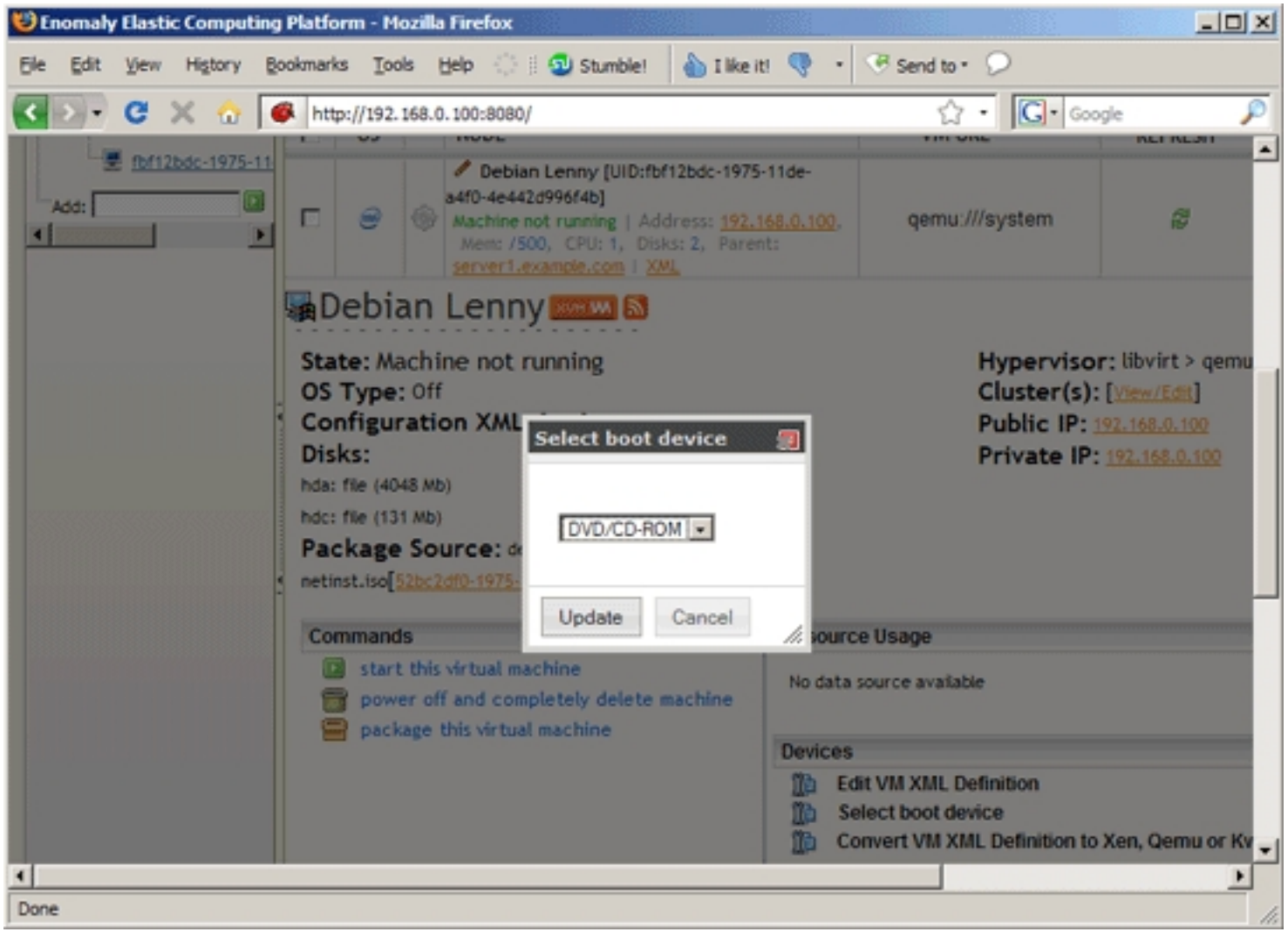

Then start the virtual machine:

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Click on the *VNC to this VM (via the parent)* link to start Enomalism's built-in JAVA VNC client (or use your own VNC client)...

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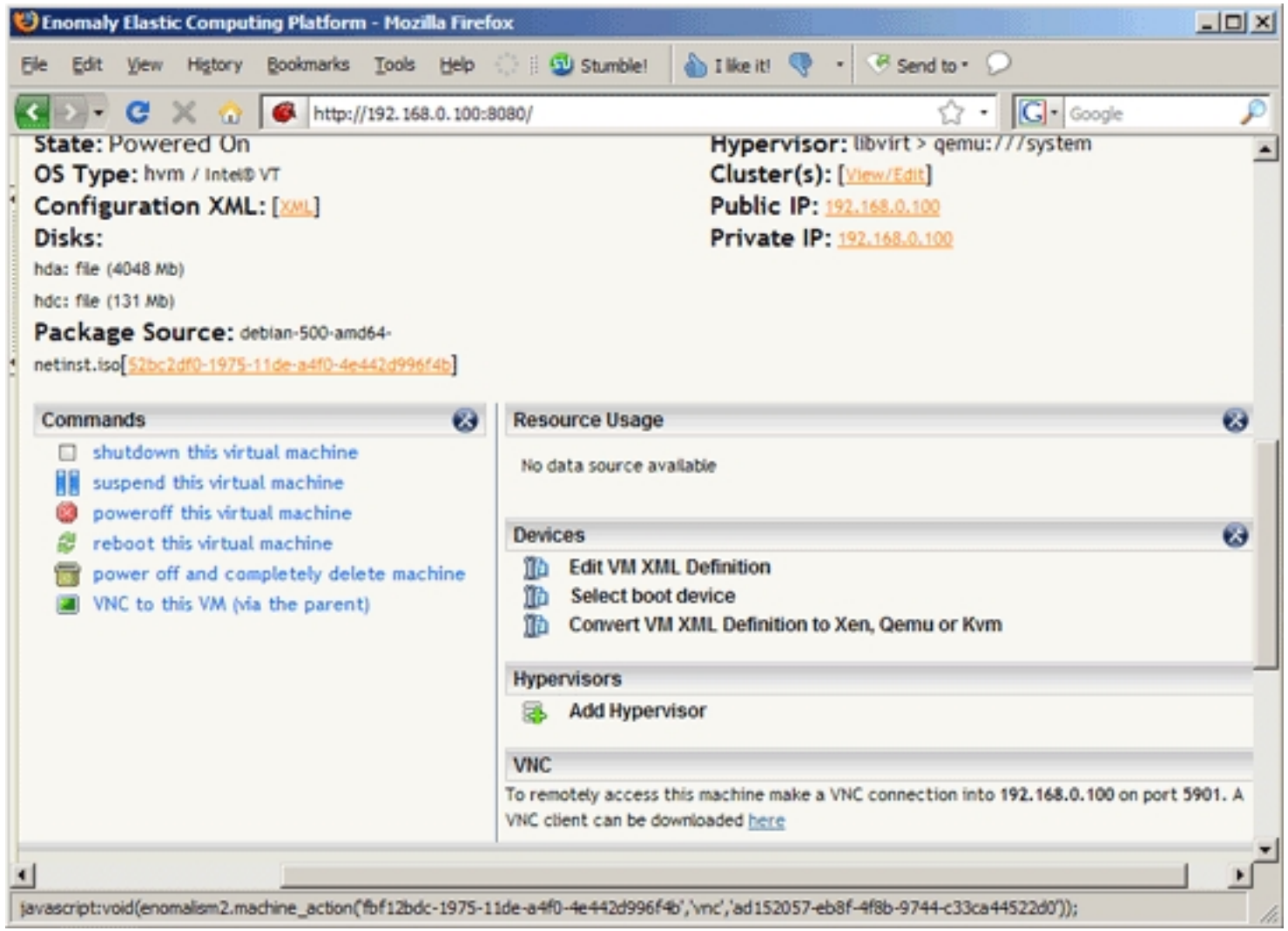

... and install the guest operating system, as you would usually do on a physical system:

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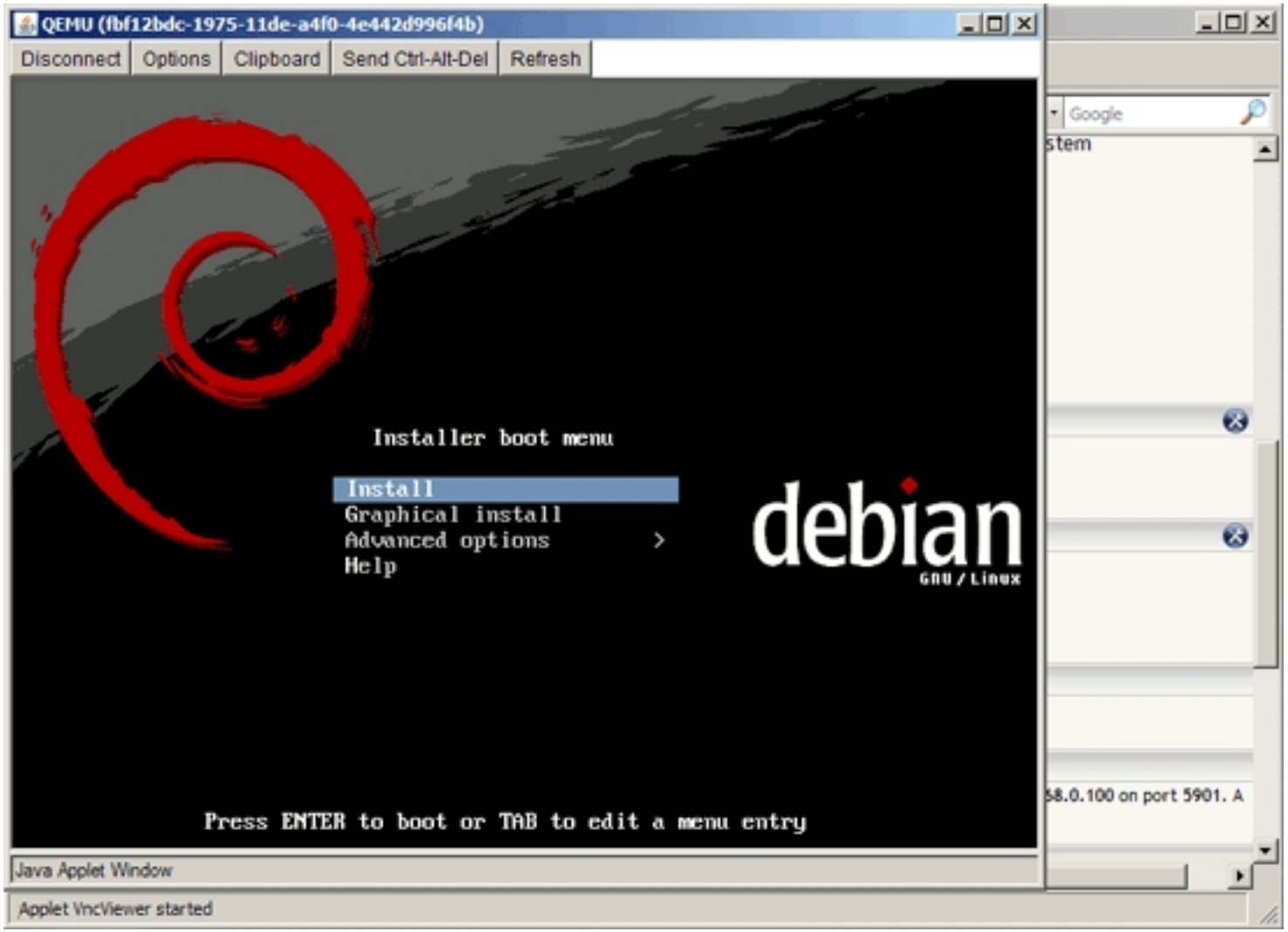

Please note that at the end of the installation, the Debian guest needs a reboot:

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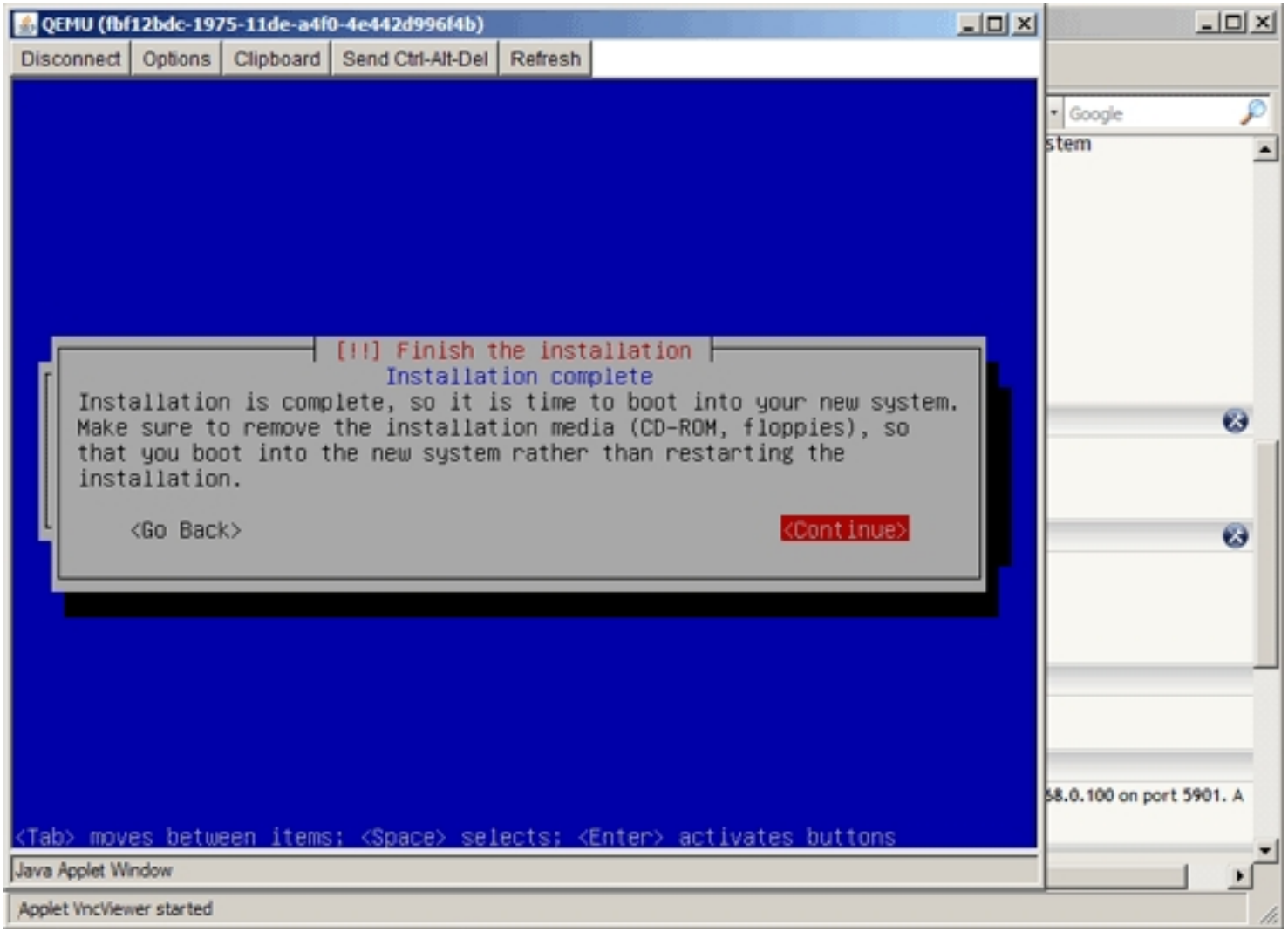

The guest will then try to boot from CD-ROM again which results in a failure:

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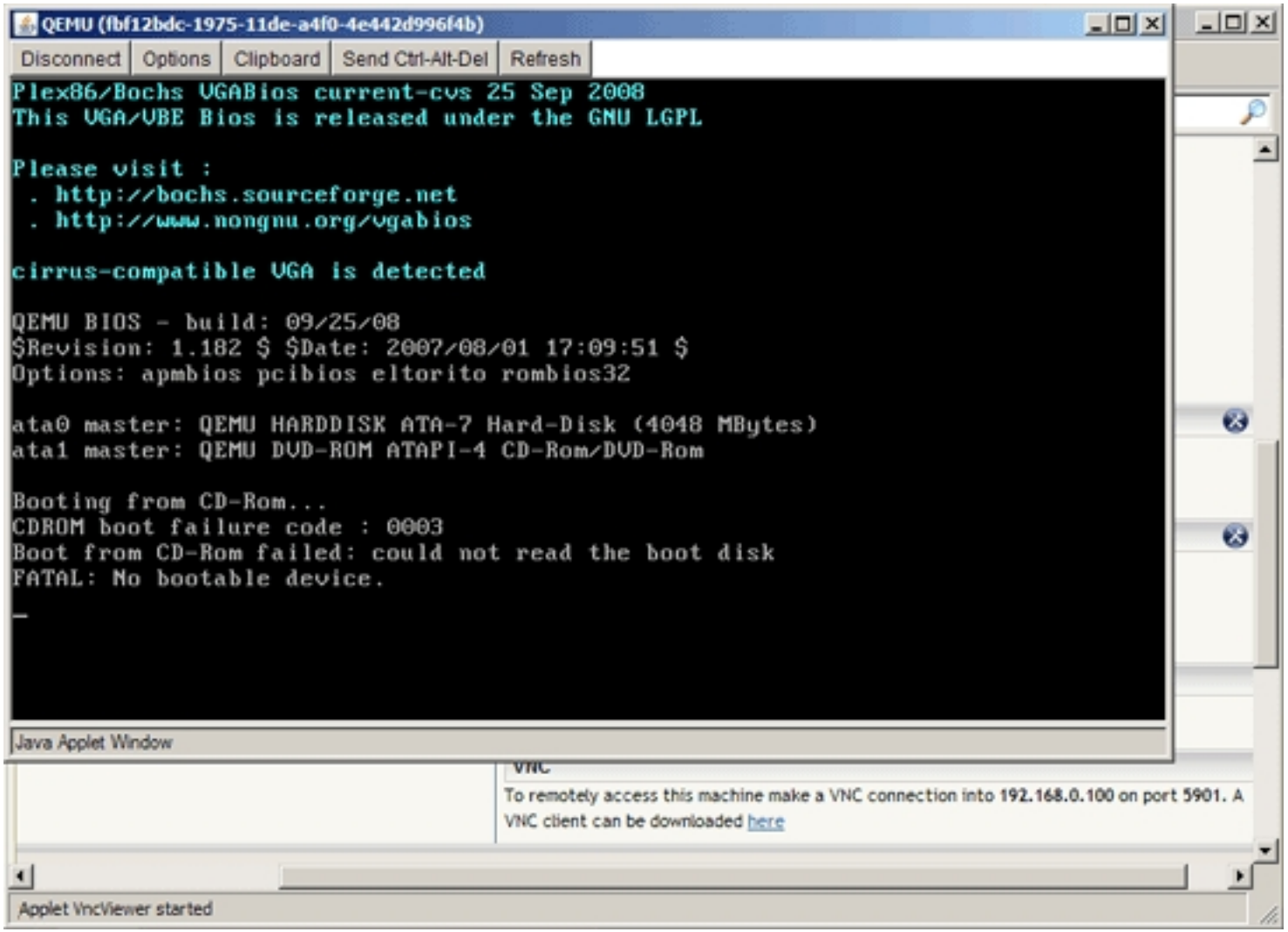

To fix this problem, power down the guest (using the *`poweroff this virtual machine`* link):

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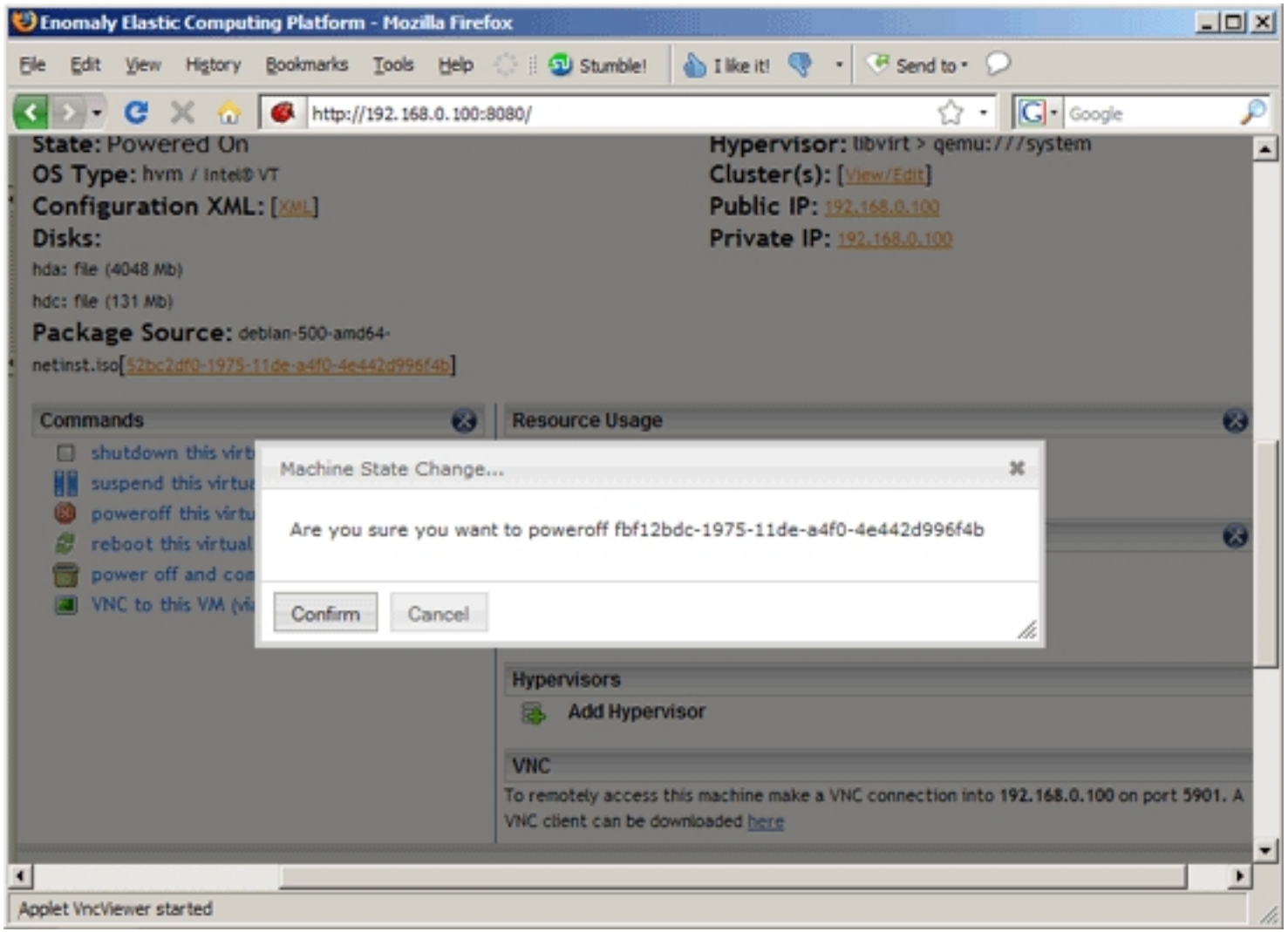

Then click on *`Select boot device`* again...

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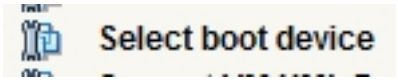

... and select *Hard drive*:

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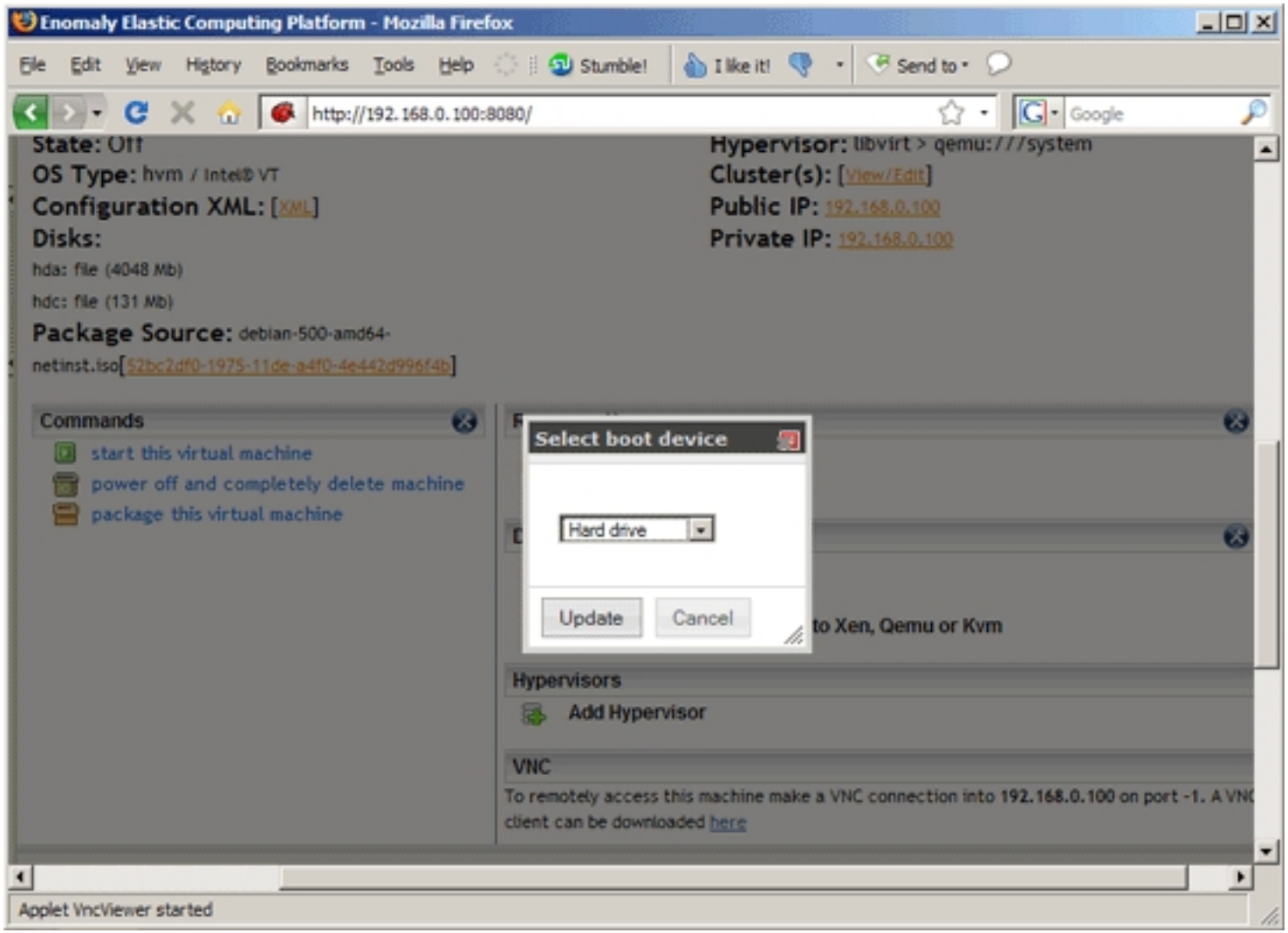

Now start the guest again using the *`start this virtual machine`* link:

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You can now connect to the guest via VNC again, and it should now boot without any problem:

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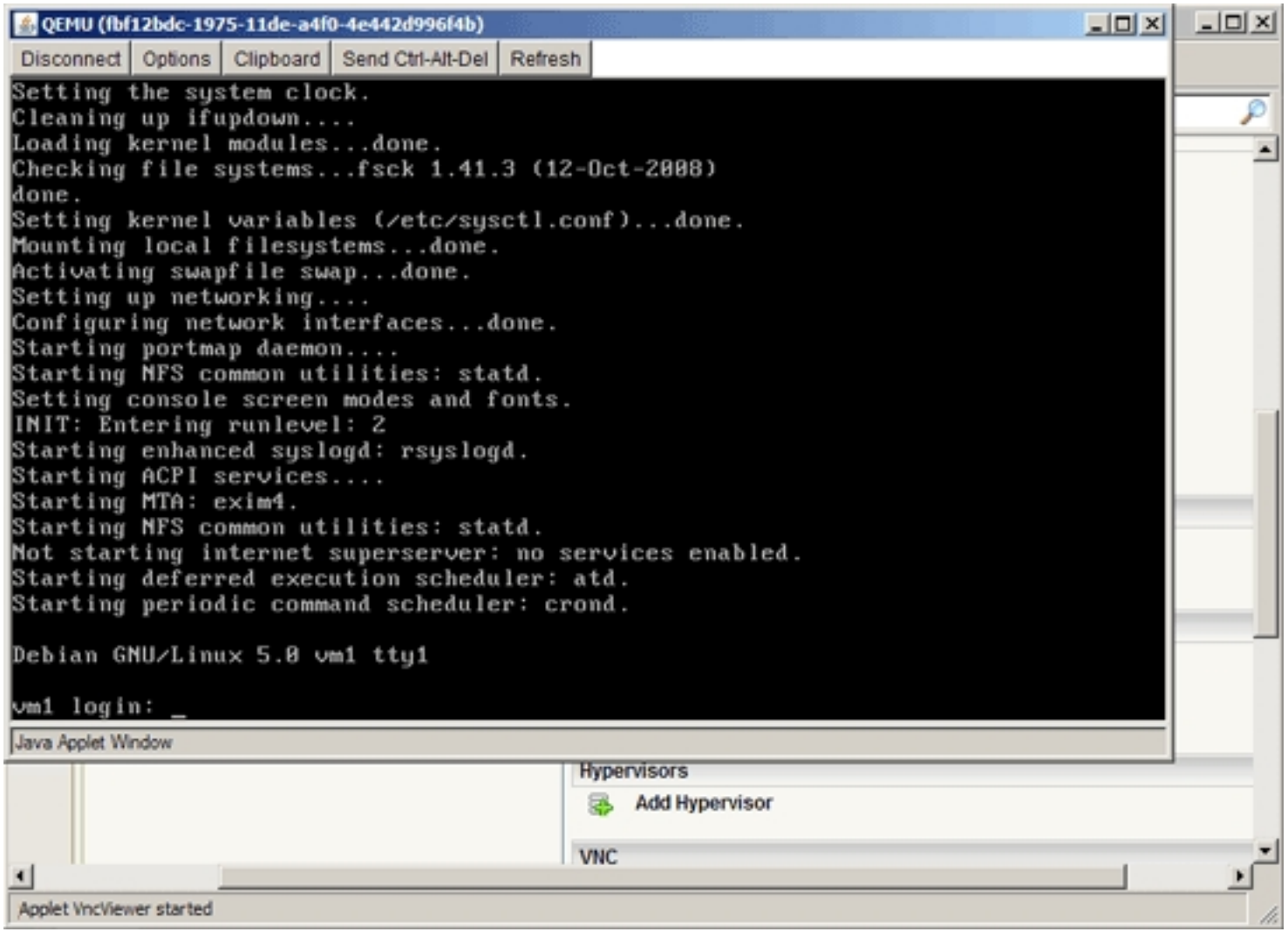

If you are experiencing any problems with Enomalism, you can take a look at the Enomalism logs in the `/opt/enomalism2/logs` directory.

4 Links

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- Enomalism/Enomaly: **http://www.enomalism.com/**
- Ubuntu: **http://www.ubuntu.com/**

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