

By **Falko Timme**

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# **KVM Virtualization With Enomalism 2 On An Ubuntu 8.10 Server**

Version 1.0

Author: Falko Timme <ft [at] falkotimme [dot] com>

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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 known 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:

```
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
```

... and download the latest Enomalism .deb package from

[http://sourceforge.net/project/showfiles.php?group\\_id=164855&package\\_id=186866&release\\_id=667675](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/password 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*):

```
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
```

... 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):

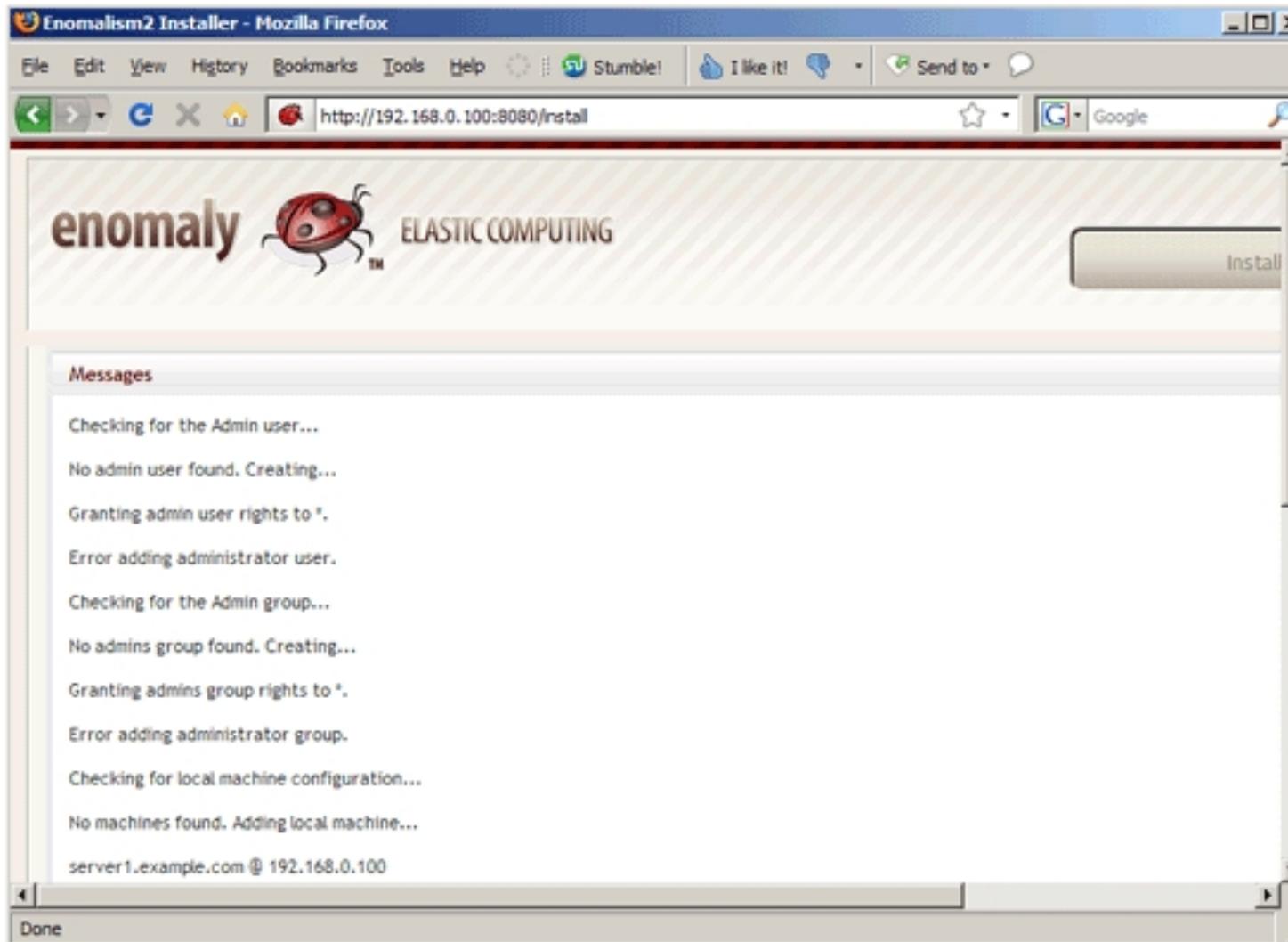
```
scripts/enomalism2.sh start
```

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

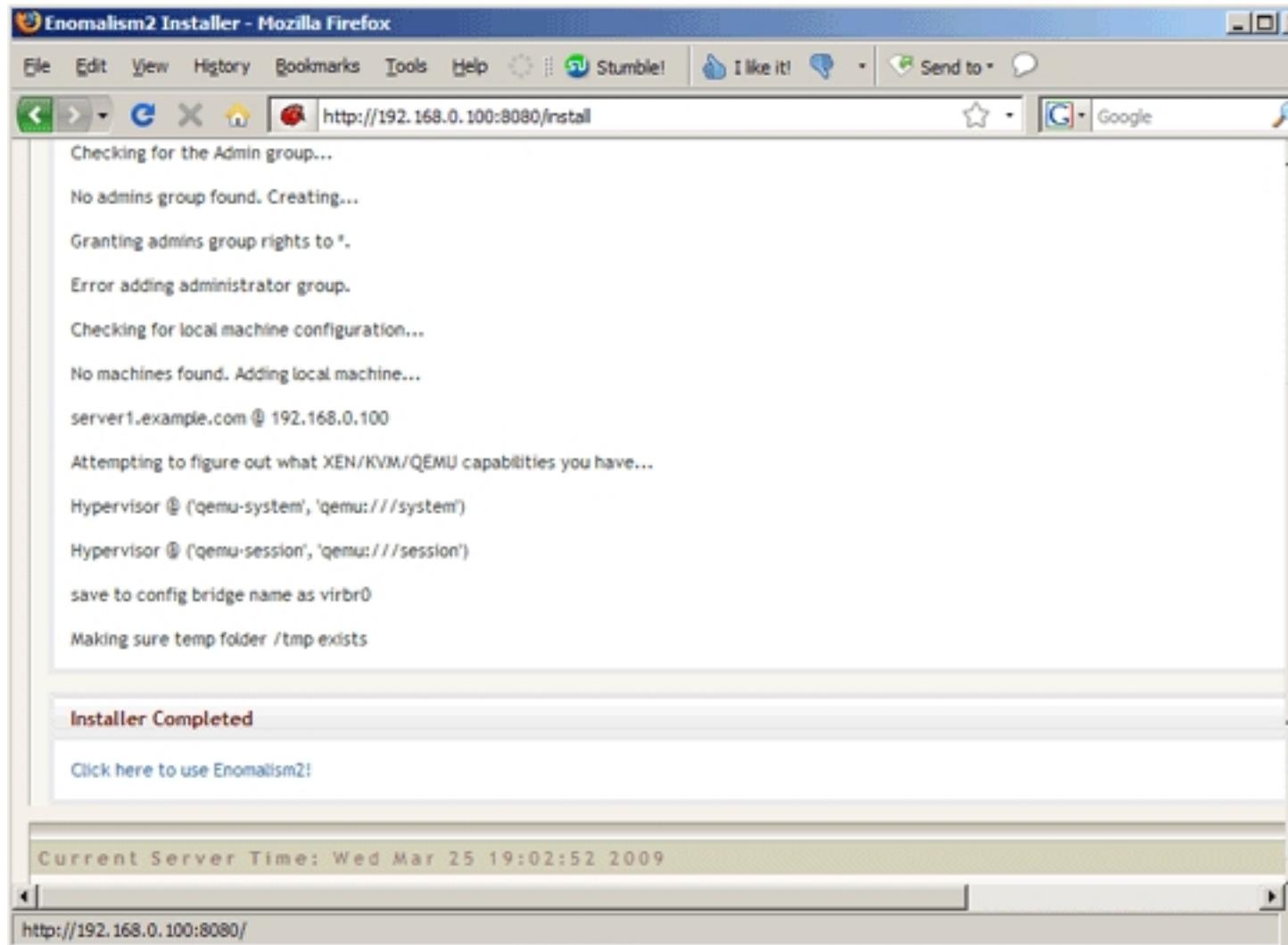
```
vi /etc/rc.local
```

```
[...]
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:



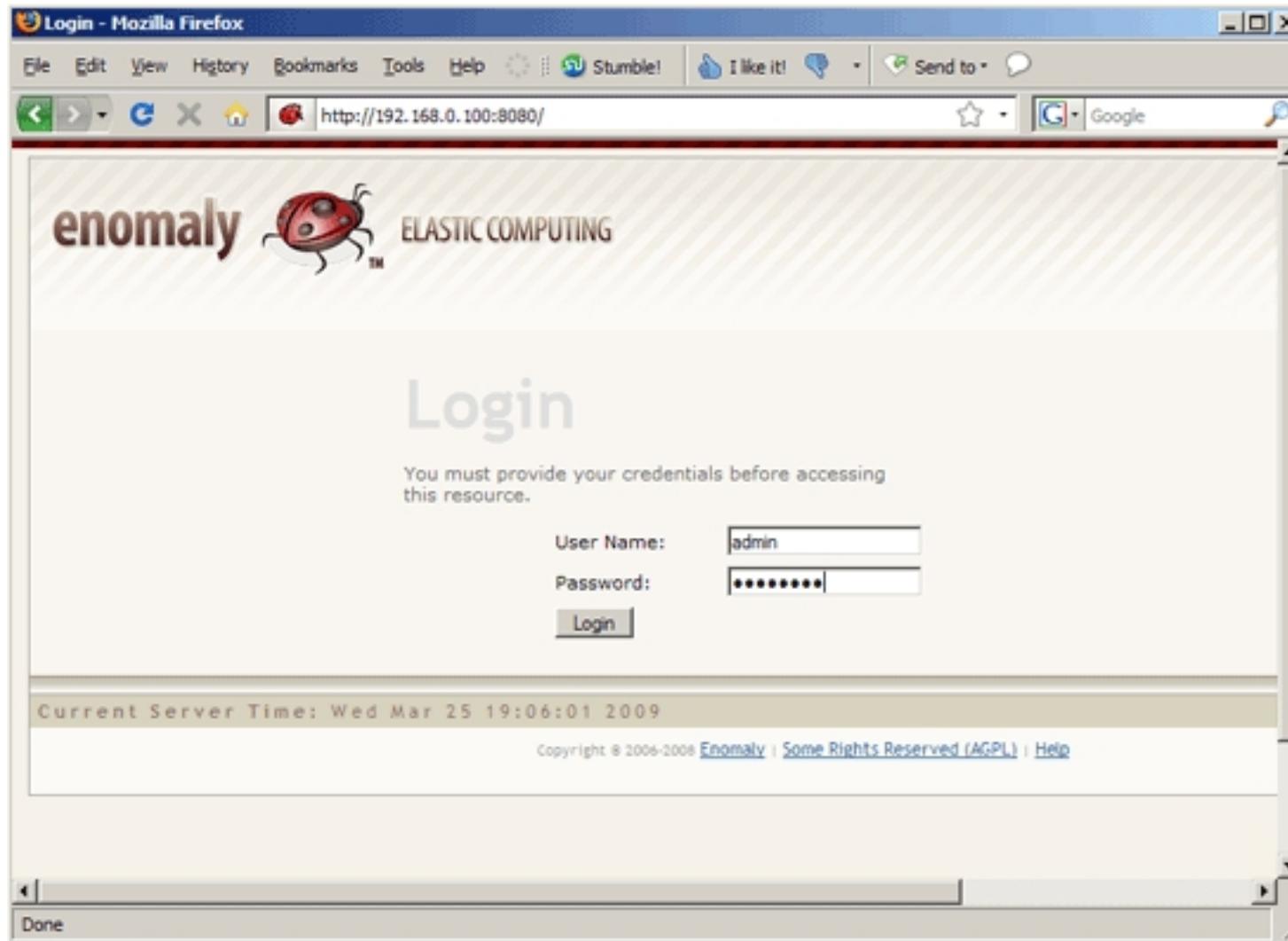
Click on the *Click here to use Enomalsm2!* link:



### 3 Using Enomalsim

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

login):



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

The screenshot shows the Enomaly Elastic Computing Platform interface running in Mozilla Firefox. The title bar reads "Enomaly Elastic Computing Platform - Mozilla Firefox". The address bar shows the URL "http://192.168.0.100:8080/". The main content area features the Enomaly logo (a red beetle) and the text "ELASTIC COMPUTING". Below this is a navigation menu with tabs: Dashboard, Virtual Infrastructure, Repository, Admin, and Users/Groups. The "Dashboard" tab is currently selected. A section titled "Enomalism Transaction Monitor" displays a table with four columns: Transaction, Start Time, Machine, and Completion. Two transactions are listed:

Transaction	Start Time	Machine	Completion
28baefb4-1967-11de-a4f0-7e7c70aa7760	2009-03-25 18:02:52	28baefb3-1967-11de-a4f0-7e7c70aa7760	100%
28baefb6-1967-11de-a4f0-7e7c70aa7760	2009-03-25 18:02:52	28baefb5-1967-11de-a4f0-7e7c70aa7760	100%

At the bottom of the page, there is a footer bar with the text "Current Server Time: Wed Mar 25 19:06:29 2009", "Copyright © 2006-2008 Enomaly | Some Rights Reserved (AGPL) | Help", and "2.2.3".

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.

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).

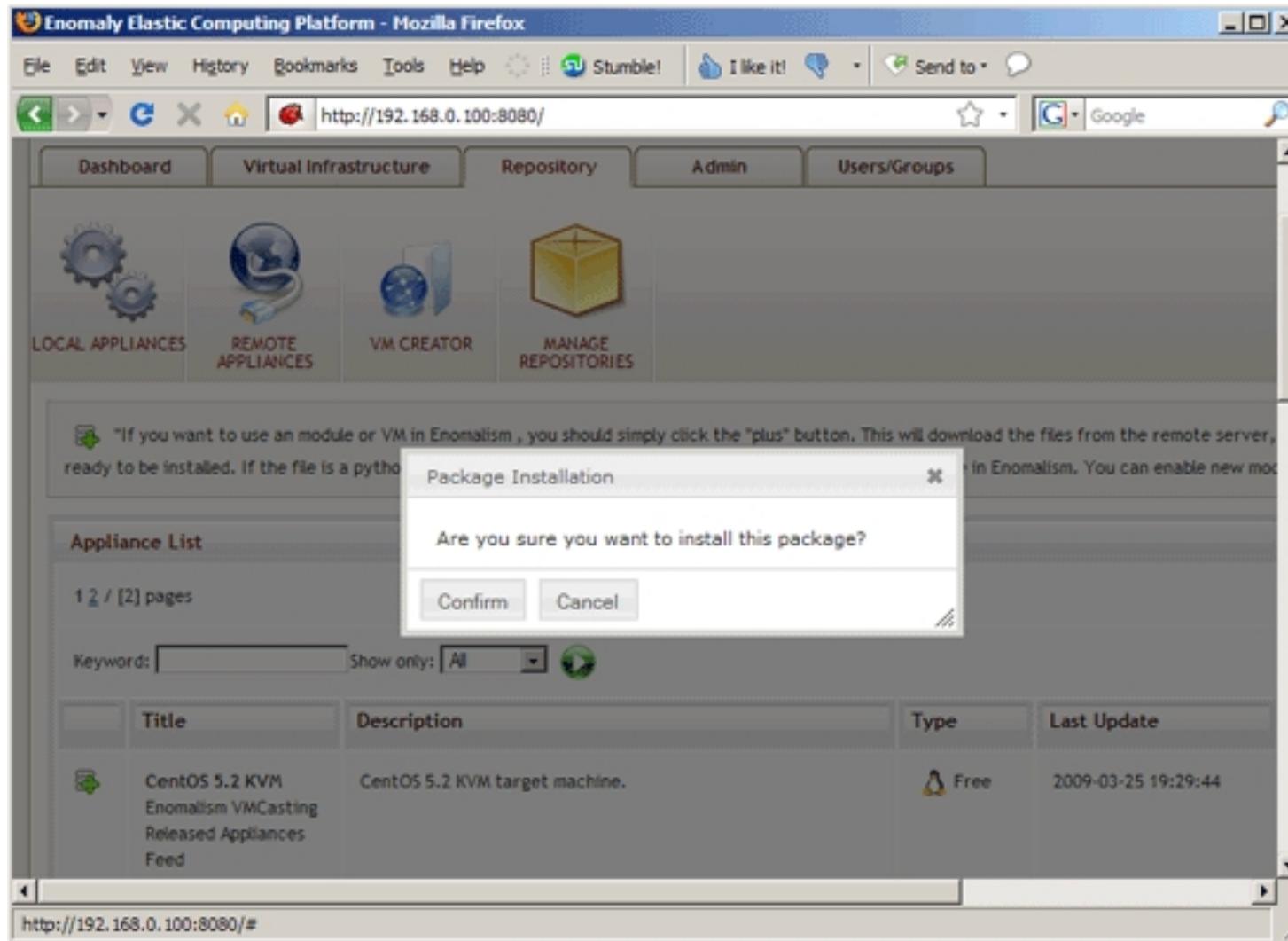
### 3.1 Using Preconfigure Appliances

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!):

The screenshot shows a Mozilla Firefox browser window displaying the Enomaly Elastic Computing Platform. The title bar reads "Enomaly Elastic Computing Platform - Mozilla Firefox". The address bar shows the URL <http://192.168.0.100:8080/>. The main menu includes File, Edit, View, History, Bookmarks, Tools, Help, and social sharing links for Stumble!, I like it!, and Send to. Below the menu is a navigation bar with tabs: Dashboard, Virtual Infrastructure, Repository, Admin (which is selected), and Users/Groups. Under the Admin tab, there are four buttons: LOCAL APPLIANCES (gear icon), REMOTE APPLIANCES (cloud with cable icon), VM CREATOR (cube icon), and MANAGE REPOSITORIES (yellow cube icon). A tooltip message above the appliance list area states: "If you want to use an module or VM in Enomalism , you should simply click the "plus" button. This will download the files from the remote server, ready to be installed. If the file is a python egg, it will be installed into your site-packages, and prepped for use in Enomalism. You can enable new mod". The main content area is titled "Appliance List" and shows a table with 12 pages. The table has columns: Title, Description, Type, and Last Update. One entry is visible: "CentOS 5.2 KVM Enomalism VMCasting Released Appliances Feed" with a description of "CentOS 5.2 KVM target machine.", type "Free", and last updated on "2009-03-25 19:29:44". At the bottom of the page is a "Done" button.

	Title	Description	Type	Last Update
	CentOS 5.2 KVM Enomalism VMCasting Released Appliances Feed	CentOS 5.2 KVM target machine.	Free	2009-03-25 19:29:44

Confirm your selection:



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):

The screenshot shows a Mozilla Firefox browser window displaying the Enomaly Elastic Computing Platform. The URL in the address bar is <http://192.168.0.100:8080/>. The main content area is titled "Download Monitor". A table lists five download entries:

	Start Time	Machine	Completion	State	Actions
	2009-03-25 19:24:28	ae201436-8b36-11dd- bbb3-269650d01a85	20%	downloaded 23% of 254 Mbytes	
-4e442d996f4b	2009-03-25 19:22:01		100%	Cannot connect to hypervisor for b16e5510-1968-11de- a4f0-7e7c70aa7760	
-4e442d996f4b	2009-03-25 19:22:01		100%	Could not connect to hypervisor for b16e5510-1968-11de- a4f0-7e7c70aa7760	
-4e442d996f4b	2009-03-25 19:21:49		100%	Cannot connect to hypervisor for 127910b4-196b- 11de-a4f0-001e90f3f002	
-4e442d996f4b	2009-03-25 19:21:49		100%	Could not connect to hypervisor for 127910b4-196b- 11de-a4f0-001e90f3f002	

At the bottom left, there is a "Done" button.

This is how it looks after the download has finished:

	Start Time	Machine	Completion	State	Actions
4e442d996f4b	2009-03-25 19:24:28	ae201436-8b36-11dd-bbb3-269650d01a85	100%	Installed package CentOS 5.2 KVM	
-4e442d996f4b	2009-03-25 19:22:01		100%	Cannot connect to hypervisor for b16e5510-1968-11de- a4f0-7e7c70aa7760	
-4e442d996f4b	2009-03-25 19:22:01		100%	Could not connect to hypervisor for b16e5510-1968-11de- a4f0-7e7c70aa7760	
-4e442d996f4b	2009-03-25 19:21:49		100%	Cannot connect to hypervisor for 127910b4-196b- 11de-a4f0-001e90f3f002	
-4e442d996f4b	2009-03-25 19:21:49		100%	Could not connect to hypervisor for 127910b4-196b- 11de-a4f0-001e90f3f002	

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

The screenshot shows a Mozilla Firefox browser window displaying the Enomaly Elastic Computing Platform. The title bar reads "Enomaly Elastic Computing Platform - Mozilla Firefox". The address bar shows the URL "http://192.168.0.100:8080/". The main menu includes File, Edit, View, History, Bookmarks, Tools, Help, Stumble!, I like it!, Send to..., and a search bar for Google.

The navigation bar at the top has tabs for Dashboard, Virtual Infrastructure, Repository, Admin, and Users/Groups. The "Virtual Infrastructure" tab is currently selected.

The main content area features four large buttons: LOCAL APPLIANCES (with two gears icon), REMOTE APPLIANCES (with a globe and cable icon), VM CREATOR (with a blue cube icon), and MANAGE REPOSITORIES (with a yellow cube icon). The "LOCAL APPLIANCES" button is highlighted.

A message box contains the text: "Installed appliances can also be removed - just click the trashcan button."

The "Appliance List" section displays a table with columns for Actions, Title, and Description. It shows one entry:

Actions	Title	Description
	CentOS 5.2 KVM	CentOS 5.2 KVM target machine.

At the bottom of the page, a status bar shows "Current Server Time: Wed Mar 25 20:20:32 2009" and a copyright notice: "Copyright © 2006-2008 Enomaly | Some Rights Reserved (AGPL) | Help".

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:

Enomaly Elastic Computing Platform - Mozilla Firefox

File Edit View History Bookmarks Tools Help Stumble! I like it! Send to Google

Dashboard Virtual Infrastructure Repository Admin Users/Groups

INFRASTRUCTURE NETWORK MANAGER ELASTIC VALET

Package to provision

CentOS 5.2 KVM (Libvirt)

Machine definition to provision on

default View XML

Preferred Target Cluster

default

If you select a target cluster, all VMs created will be provisioned against the parent machines in THIS cluster. That means that you can limit the provision against to a specific set.

Done

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:

Enomaly Elastic Computing Platform - Mozilla Firefox

File Edit View History Bookmarks Tools Help Stumble! I like it! Send to Google

http://192.168.0.100:8080/

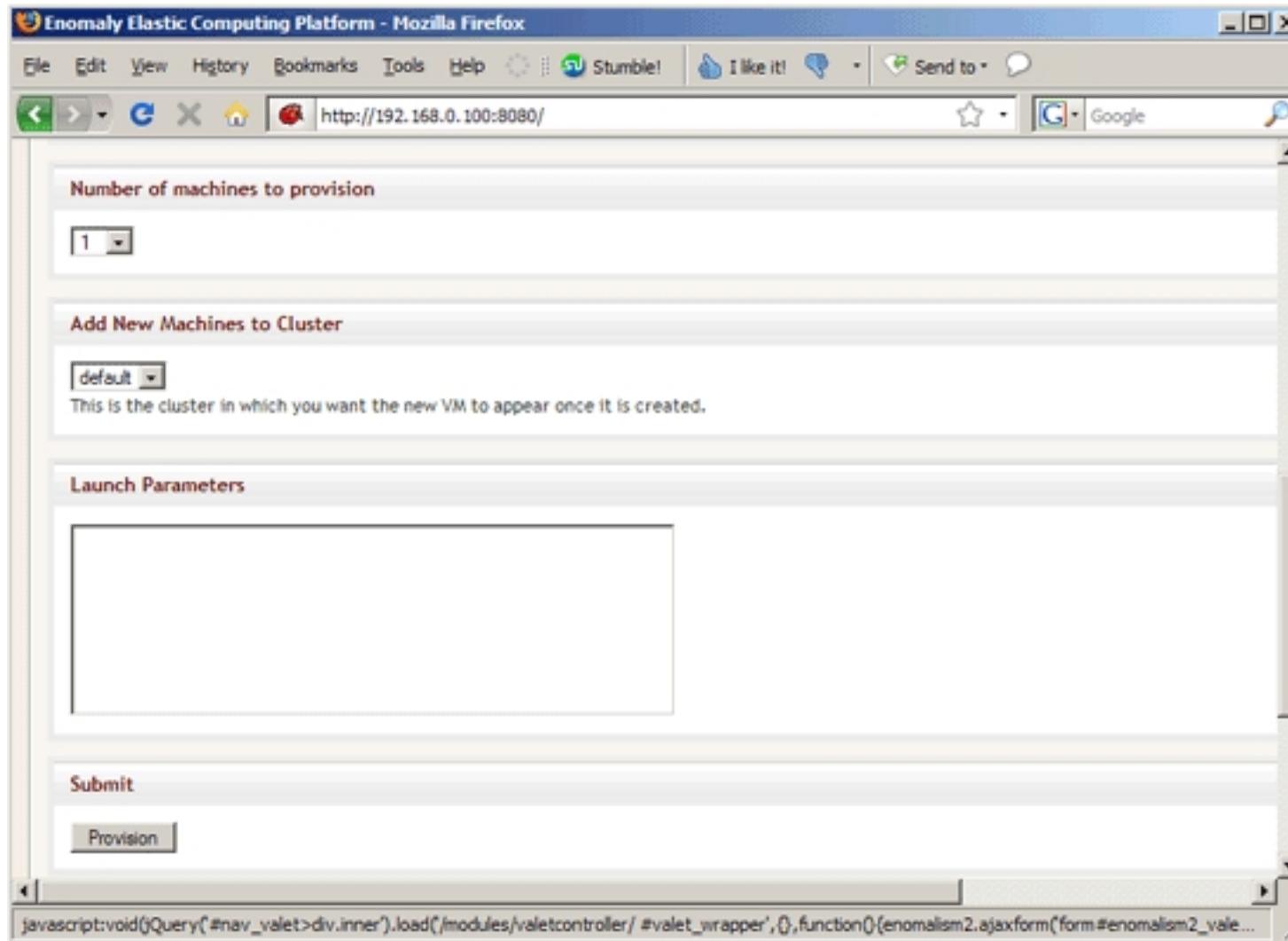
Number of machines to provision  
1

Add New Machines to Cluster  
default This is the cluster in which you want the new VM to appear once it is created.

Launch Parameters

Submit  
Provision

javascript:void(jQuery('#nav\_valet>div.inner').load('/modules/valetcontroller/#valet\_wrapper',{},function(){enomalism2.ajaxform('form#enomalism2\_valet...'))});



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

The screenshot shows a Mozilla Firefox browser window displaying the Enomaly Elastic Computing Platform. The URL in the address bar is <http://192.168.0.100:8080/>. The page title is "Enomaly Elastic Computing Platform - Mozilla Firefox". The interface includes a top navigation bar with links for File, Edit, View, History, Bookmarks, Tools, Help, Stumble!, I like it!, Send to..., and a search bar with Google and a magnifying glass icon. A logo of a red ladybug with the text "ELASTIC COMPUTING" is visible. The main content area shows a "Task Monitor" table with the following data:

	Start Time	Machine	Completion	Status	Actions
	2009-03-25 19:31:14	814f4b72-1973-11de-a4f0-4e442d996f4b	55%	Found a gzipped file d0.img.gz. Unzipping.	
-4e442d996f4b	2009-03-25 19:24:28	ae201436-8b36-11dd-bbb3-269650d01a85	100%	Installed package CentOS 5.2 KVM	
-4e442d996f4b	2009-03-25 19:22:01		100%	Cannot connect to hypervisor for b16e5510-1968-11de-a4f0-7e7c70aa7760	

At the bottom of the table, there is a "Done" button.

The screenshot shows a Mozilla Firefox browser window with the title "Enomaly Elastic Computing Platform - Mozilla Firefox". The address bar displays the URL <http://192.168.0.100:8080/>. The main content area features a logo with a red cell-like icon and the text "ELASTIC COMPUTING". Below the logo is a navigation menu with tabs: "Virtual Infrastructure", "Repository", "Admin", and "Users/Groups". A sub-menu titled "Action Monitor" is currently selected. The main area contains a table with the following data:

	Start Time	Machine	Completion	State	Action
fe-a4f0-4e442d996f4b	2009-03-25 19:31:14	814f4b72-1973-11de-a4f0-4e442d996f4b	100%	Provisioned machine 814f4b72-1973-11de-a4f0-4e442d996f4b successfully	
fe-a4f0-4e442d996f4b	2009-03-25 19:24:28	ae201436-8b36-11dd-bbb3-269650d01a85	100%	Installed package CentOS 5.2 KVM.	
fe-a4f0-4e442d996f4b	2009-03-25 19:22:01		100%	Cannot connect to hypervisor for b16e5510-1968-11de-a4f0-7e7c70aa7760	

At the bottom left of the interface, there is a "Done" button.

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:

The screenshot shows the Enomaly Elastic Computing Platform interface running in Mozilla Firefox. The URL in the address bar is <http://192.168.0.100:8080/>. The main navigation menu at the top includes File, Edit, View, History, Bookmarks, Tools, Help, Stumble!, I like it!, Send to..., and a search bar for Google.

The top navigation bar has tabs for Dashboard, Virtual Infrastructure (which is selected), Repository, Admin, and Users/Groups. Below the tabs are three icons: INFRASTRUCTURE (blue globe), NETWORK MANAGER (blue gear), and ELASTIC VALET (black tuxedo).

The left sidebar is titled "Clusters" and shows a tree structure with "default" expanded, revealing "server1.example.com" which contains a node with ID "814f4b72-1973-11de-a4f0-4e442d996f4b". There is also an "Add:" button.

The main content area is titled "Summary" and features several control buttons: start, stop, pause, restart, and delete. Below these buttons is a "VIRTUAL MACHINE SEARCH" input field with placeholder text "Enter Search" and a magnifying glass icon.

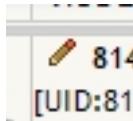
A table lists virtual machines with columns for OS, NODE, VM URL, and REFRESH. One row is shown:

OS	NODE	VM URL	REFRESH
	814f4b72-1973-11de-a4f0-4e442d996f4b [UID:814f4b72-1973-11de-a4f0-4e442d996f4b] Machine not running   Address: 192.168.0.100. Mem: /256, CPU: 1, Disks: 1, Parent: <a href="#">server1.example.com</a>   XML	qemu:///system	

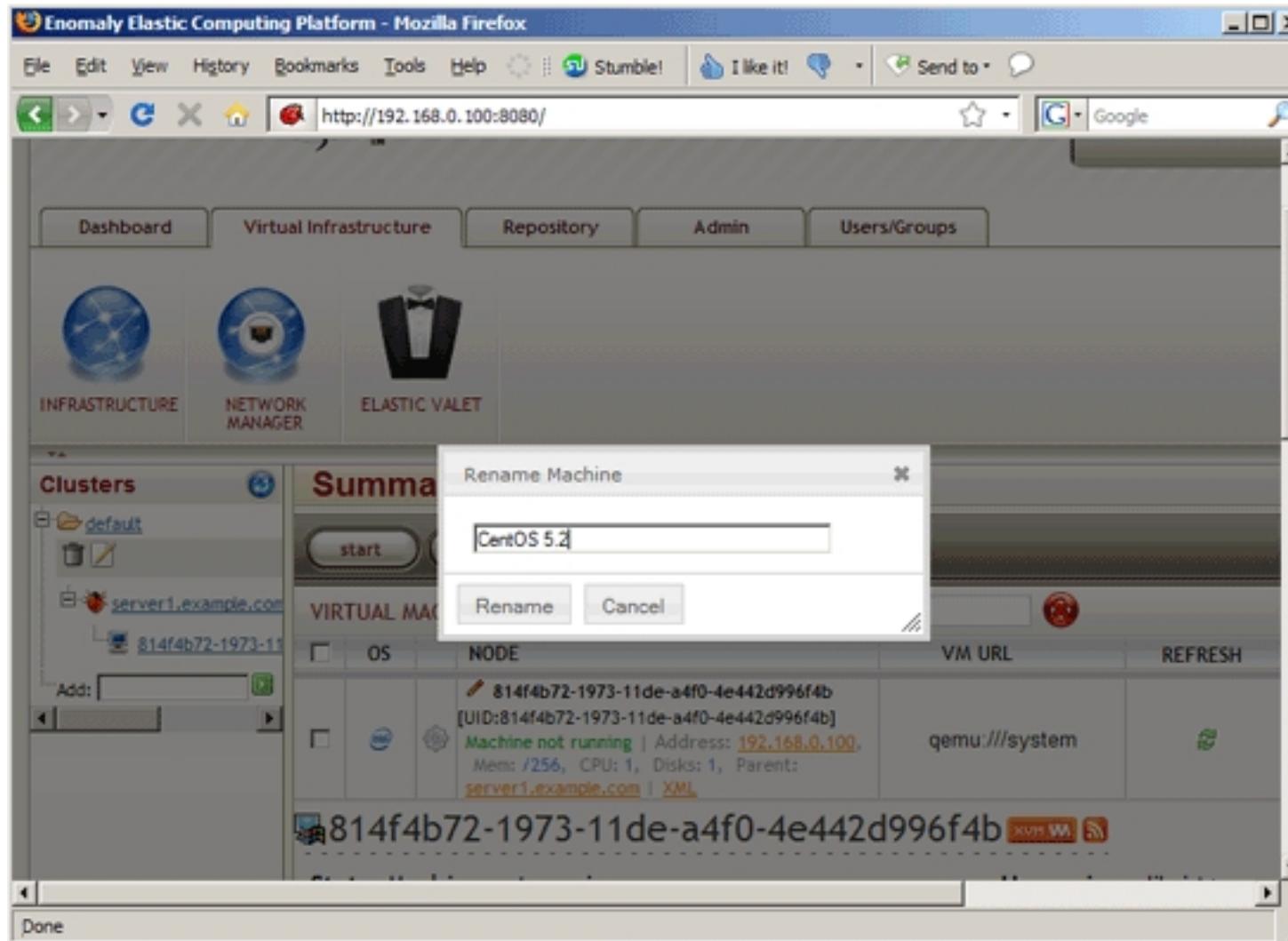
Below the table, the virtual machine name "814f4b72-1973-11de-a4f0-4e442d996f4b" is displayed again with edit and refresh buttons.

The status bar at the bottom of the browser window shows the JavaScript code: "javascript:void(enomalsim2.pane\_infrastructure())".

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...



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



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

The screenshot shows a Mozilla Firefox browser window titled "Enomaly Elastic Computing Platform - Mozilla Firefox". The address bar displays the URL <http://192.168.0.100:8080/>. The main content area is a "VIRTUAL MACHINE SEARCH" interface.

**VIRTUAL MACHINE SEARCH**

	OS	NODE	VM URL	REFRESH
<input type="checkbox"/>		CentOS 5.2 [UID:814f4b72-1973-11de-a4f0-4e442d996f4b] Machine not running   Address: <a href="http://192.168.0.100">192.168.0.100</a> , Mem: /256, CPU: 1, Disks: 1, Parent: <a href="#">server1.example.com</a>   <a href="#">XML</a>	<a href="#">qemu:///system</a>	

**CentOS 5.2**

**State:** Machine not running      **Hypervisor:** libvirt > qemu  
**OS Type:** Off      **Cluster(s):** [[View/Edit](#)]  
**Configuration XML:** [[XML](#)]      **Public IP:** [192.168.0.100](http://192.168.0.100)  
**Disks:**  
hda: file (1024 Mb)  
**Package Source:** CentOS 5.2 KVM [[ae201436-8b36-11dd-bbb3-269650d01a85](#)]

**Commands**

- start this virtual machine
- power off and completely delete machine
- package this virtual machine

**Resource Usage**  
No data source available

**Devices**

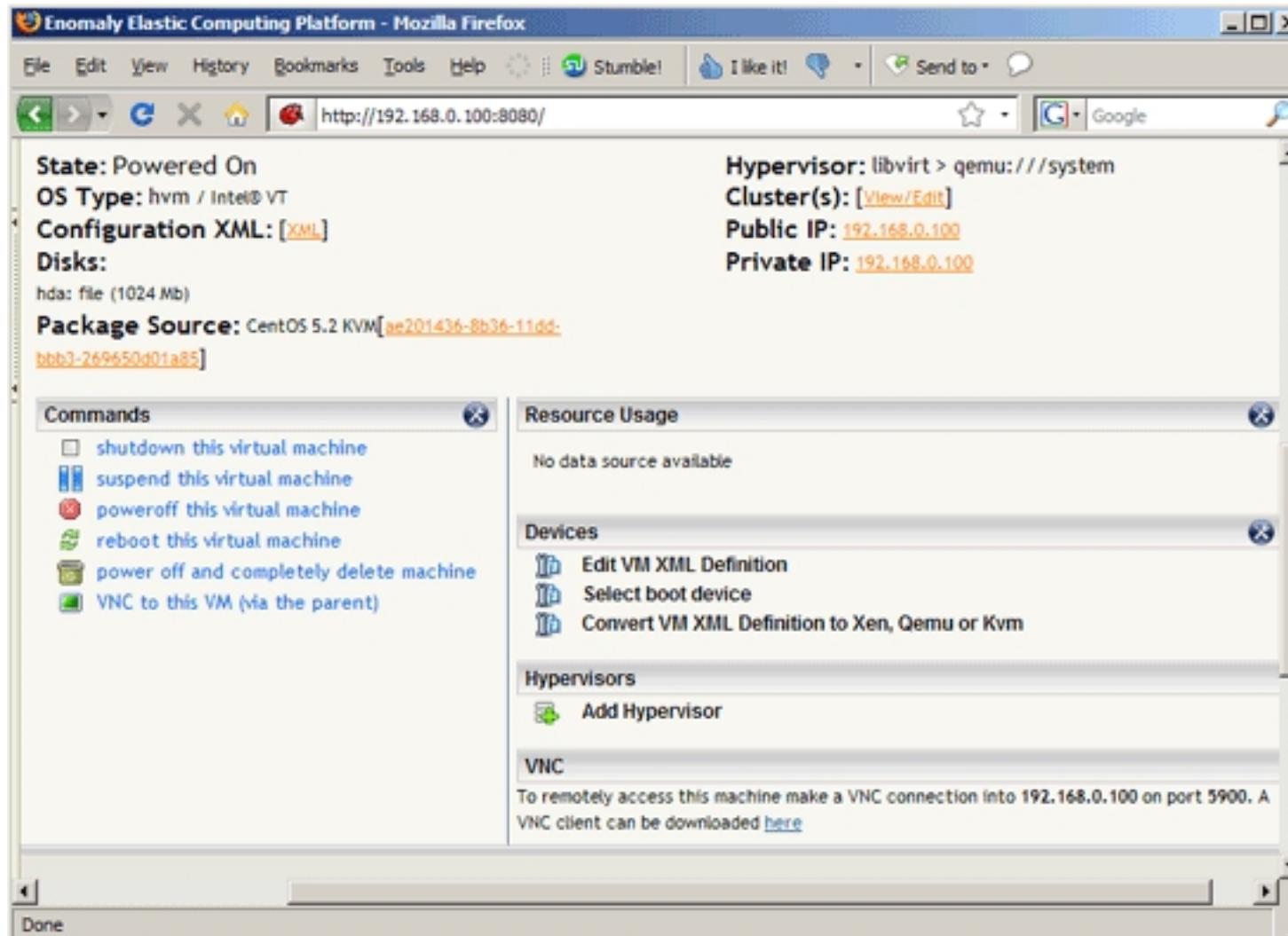
- Edit VM XML Definition
- Select boot device

Done

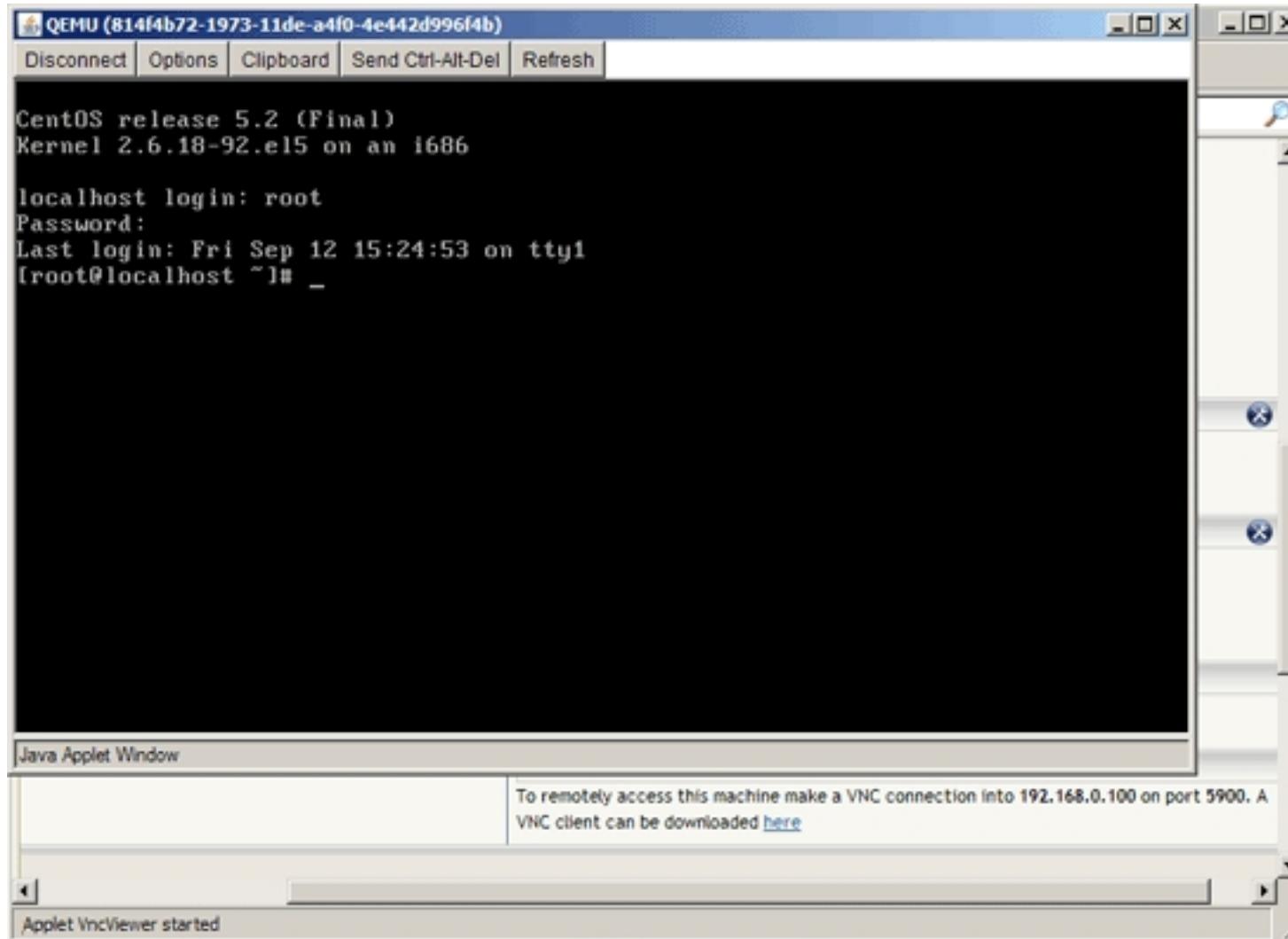
Confirm that you want to start the virtual machine:

The screenshot shows a Mozilla Firefox browser window displaying the Enomaly Elastic Computing Platform. The URL in the address bar is <http://192.168.0.100:8080/>. The main content area is titled "VIRTUAL MACHINE SEARCH" and contains a table with columns: OS, NODE, VM URL, and REFRESH. One row is visible for "CentOS 5.2 [UID:814f4b72-1973-11de-a4f0-4e442d996f4b]". Below this table, a modal dialog box is open for the "CentOS 5.2" VM. The dialog title is "Machine State Change..." and contains the message "Are you sure you want to create 814f4b72-1973-11de-a4f0-4e442d996f4b". It has "Confirm" and "Cancel" buttons. To the right of the dialog, a tooltip provides details about the hypervisor setup: "Hypervisor: libvirt > qemu", "CPU: 1", "Memory: 256", "IP: 192.168.0.100", and "Port: 192.168.0.100". The bottom left of the dialog shows a "Commands" section with links: "start this virtual machine", "power off and completely delete machine", and "package this virtual machine". The bottom right shows a "Resource Usage" section stating "No data source available". A "Devices" section includes links for "Edit VM XML Definition" and "Select boot device". At the very bottom left of the main interface, there is a "Done" button.

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).)



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...*

button...

The screenshot shows a web browser window for the Enomaly Elastic Computing Platform. The URL in the address bar is <http://192.168.0.100:8080/>. The main menu at the top includes File, Edit, View, History, Bookmarks, Tools, Help, Stumble!, I like it!, Send to..., and a search bar for Google.

The navigation bar below the menu has tabs for Dashboard, Virtual Infrastructure, Repository, Admin, and Users/Groups. The Admin tab is currently selected.

The main content area features four large buttons: LOCAL APPLIANCES (blue gear icon), REMOTE APPLIANCES (blue globe with cable icon), VM CREATOR (blue cube icon), and MANAGE REPOSITORIES (yellow cube icon). The VM CREATOR button is highlighted.

Below these buttons, there is a section titled "Upload file or select it on server". It contains a "Filename:" input field, a "Browse..." button, and a note: "This option allows you to create a new VM by selecting a CDROM, DVD, or ISO image to boot from." It also says: "You can then complete the configuration via the VNC console." A dropdown menu labeled "File on server: no selection" is shown.

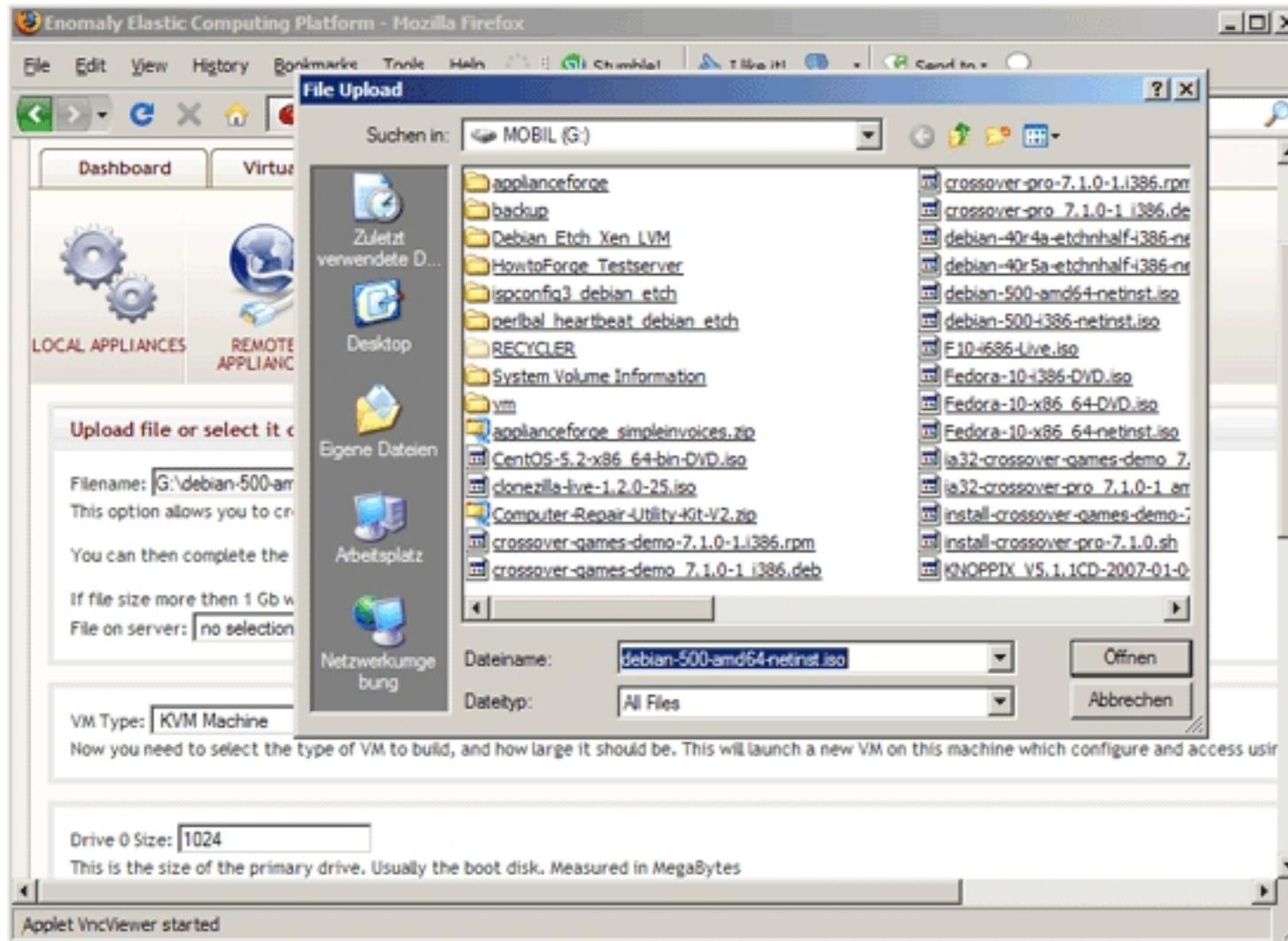
Further down, there is a "VM Type:" dropdown set to "KVM Machine". A note next to it says: "Now you need to select the type of VM to build, and how large it should be. This will launch a new VM on this machine which configure and access usir".

At the bottom of the form, there is a "Drive 0 Size:" input field containing "1024" and a note: "This is the size of the primary drive. Usually the boot disk. Measured in MegaBytes".

A JavaScript code snippet is visible in the bottom right corner of the form area:

```
javascript:void(jQuery('#appliance_inner').load('/modules/lv_machine_create/upload_file_form#lv_upload', {}, function(data){enomalsm2.file_upload_form(...
```

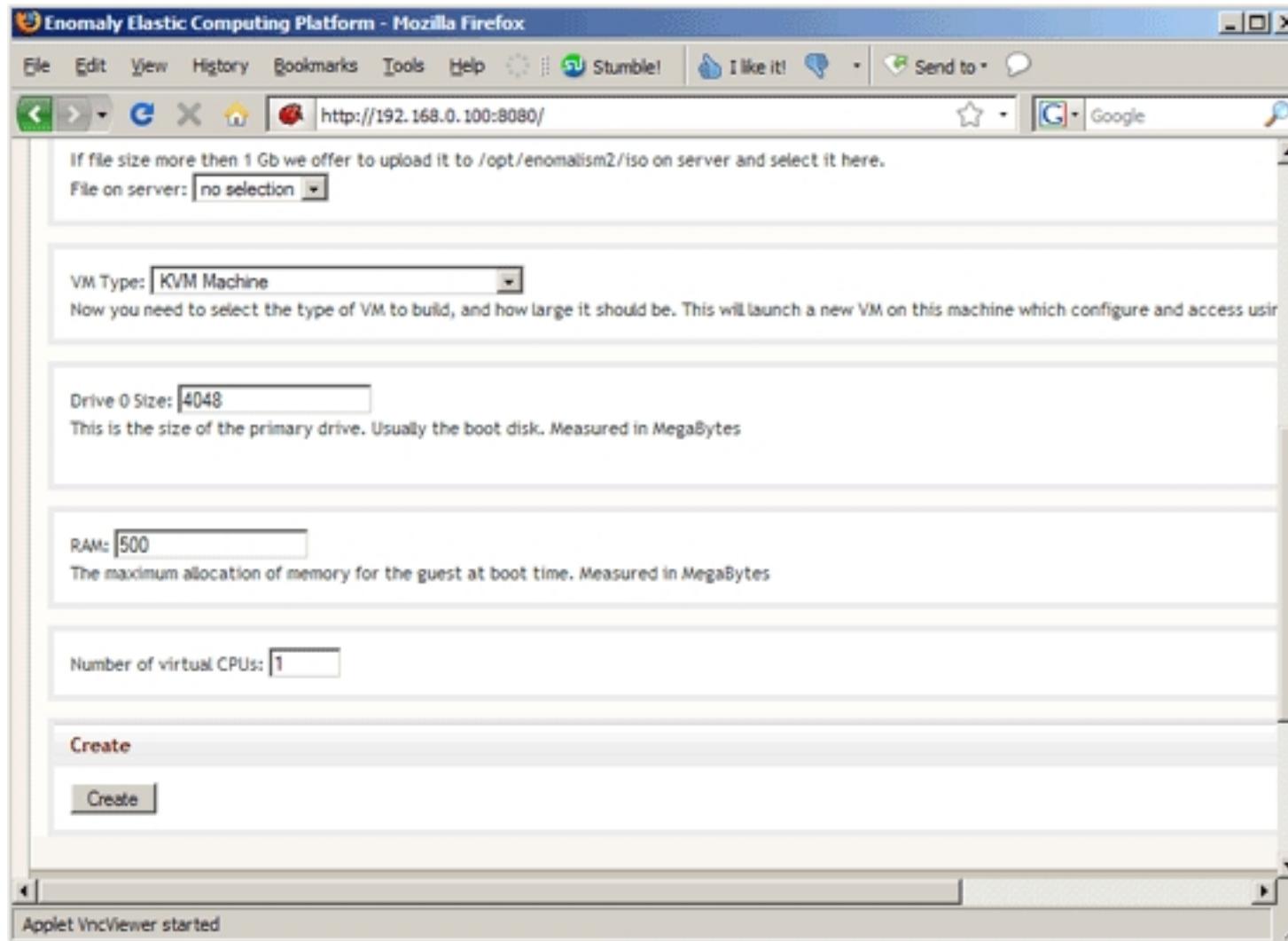
... select an operating system ISO image from your local hard drive (I'm going to install a Debian Lenny guest, so I select the *debian-500-amd64-netinst.iso* from my local hard drive):



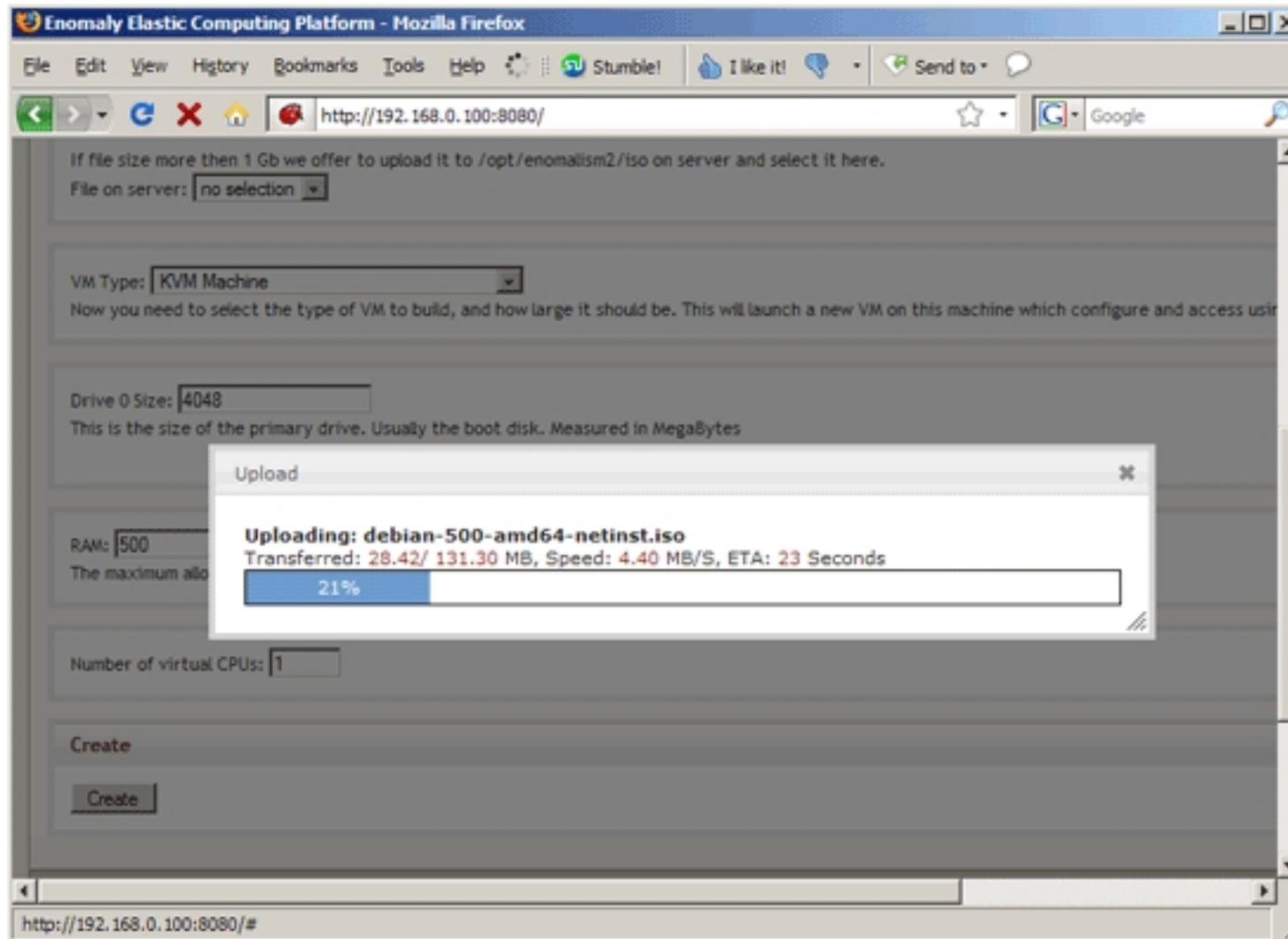
Next select *KVM Machine* in the *VM Type* drop-down menu and specify the size of the guest image (e.g. 4048 MB) as well as the memory that you want to allocate to the guest:

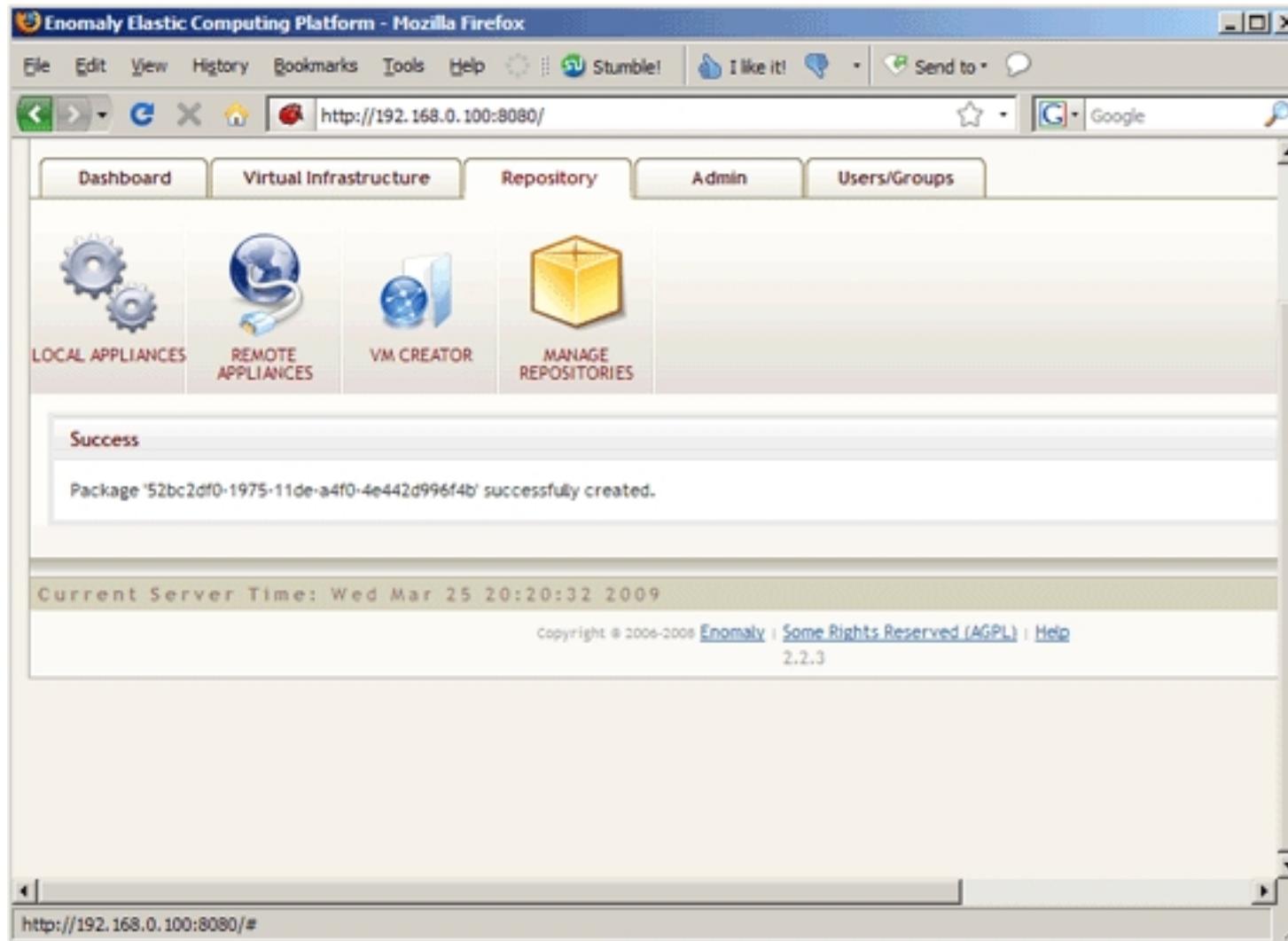
The screenshot shows a Mozilla Firefox browser window titled "Enomaly Elastic Computing Platform - Mozilla Firefox". The URL in the address bar is <http://192.168.0.100:8080/>. The page is titled "VM CREATOR". The top navigation bar includes links for LOCAL APPLIANCES, REMOTE APPLIANCES, VM CREATOR, and MANAGE REPOSITORIES. Below the navigation bar, there is a section titled "Upload file or select it on server" with a "Filename" input field containing "G:\debian-500-amd64-n" and a "Browse..." button. A note below says, "This option allows you to create a new VM by selecting a CDROM, DVD, or ISO image to boot from. You can then complete the configuration via the VNC console. If file size more than 1 Gb we offer to upload it to /opt/enomalsim2/iso on server and select it here." A dropdown menu for "File on server" shows "no selection". The next section is titled "VM Type" with a dropdown menu set to "KVM Machine". A note below says, "Now you need to select the type of VM to build, and how large it should be. This will launch a new VM on this machine which configure and access usir". The final section shown is "Drive 0 Size" with an input field containing "4048". A note below says, "This is the size of the primary drive. Usually the boot disk. Measured in MegaBytes". At the bottom of the page, a status message reads "Applet VncViewer started".

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:



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





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:

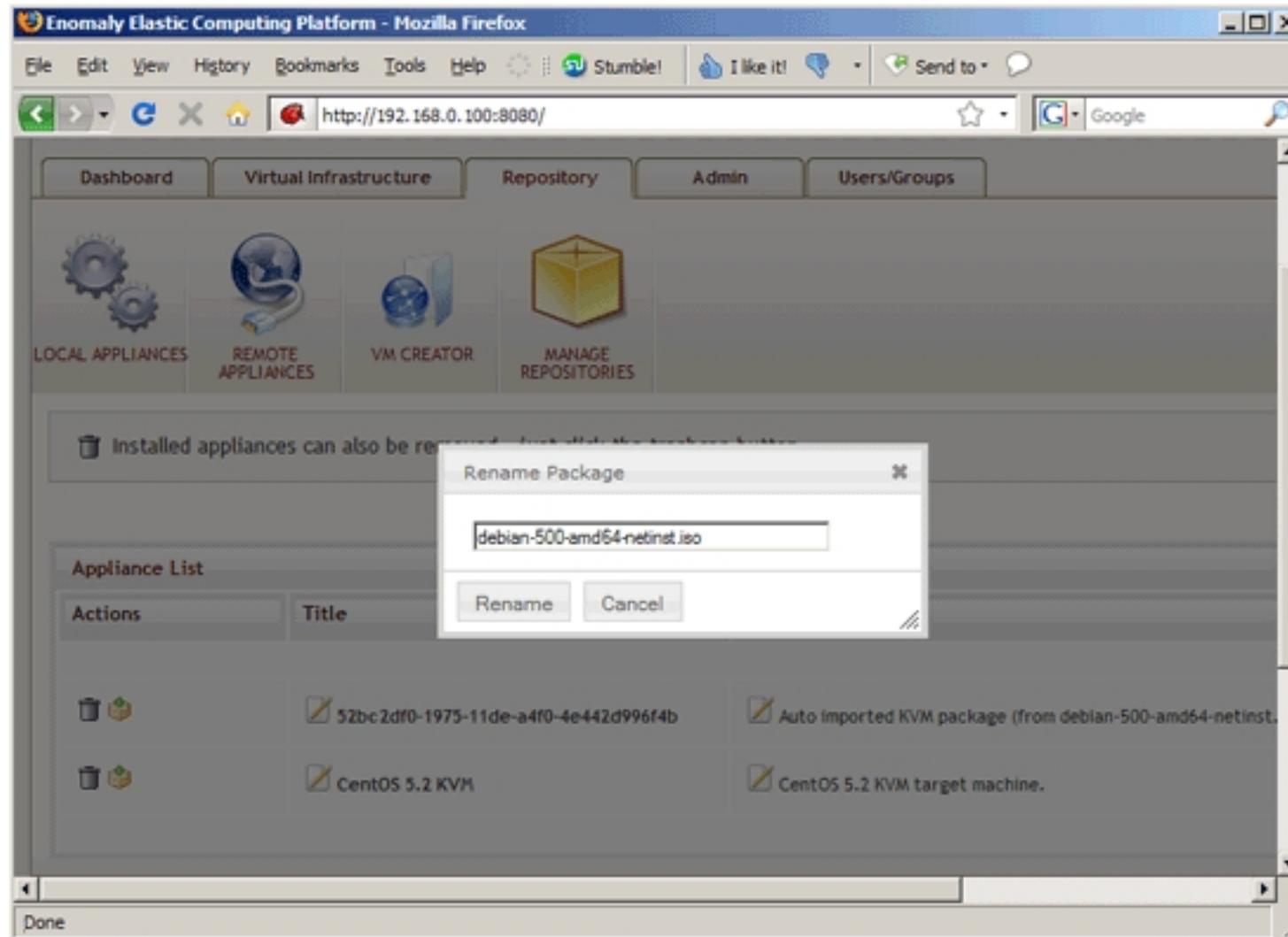
The screenshot shows the Enomaly Elastic Computing Platform interface running in Mozilla Firefox. The title bar reads "Enomaly Elastic Computing Platform - Mozilla Firefox". The address bar shows the URL <http://192.168.0.100:8080/>. The main menu includes File, Edit, View, History, Bookmarks, Tools, Help, Stumble!, I like it!, Send to..., and a search bar for Google.

The navigation bar at the top has tabs: Dashboard, Virtual Infrastructure (which is selected), Repository, Admin, and Users/Groups. Below the tabs are four icons: LOCAL APPLIANCES (two blue gears), REMOTE APPLIANCES (a blue globe with a cable), VM CREATOR (a blue cube with a gear), and MANAGE REPOSITORIES (a yellow cube).

A message box states: "Installed appliances can also be removed - just click the trashcan button." Below this is the "Appliance List" table:

Actions	Title	Description
	52bc2df0-1975-11de-a4f0-4e442d996f4b	Auto imported KVM package (from debian-500-amd64-netinst.iso)
	CentOS 5.2 KVM	CentOS 5.2 KVM target machine.

At the bottom of the page is a JavaScript code snippet: `javascript:void(vmfeed.vmfeed_renamepkg('52bc2df0-1975-11de-a4f0-4e442d996f4b'));`



The screenshot shows a Mozilla Firefox browser window with the title "Enomaly Elastic Computing Platform - Mozilla Firefox". The address bar displays the URL <http://192.168.0.100:8080/>. The main interface has a navigation bar with tabs: Dashboard, Virtual Infrastructure, Repository, Admin, and Users/Groups. The Admin tab is currently selected. Below the tabs, there are four buttons: LOCAL APPLIANCES (gear icon), REMOTE APPLIANCES (cloud with cable icon), VM CREATOR (3D cube icon), and MANAGE REPOSITORIES (yellow cube icon). A message box contains the text: "Installed appliances can also be removed - just click the trashcan button." Below this is the "Appliance List" section, which includes a table with columns: Actions, Title, and Description. The table contains two entries:

Actions	Title	Description
	debian-500-amd64-netinst.iso	Auto imported KVM package (from debian-500-amd64-netinst.)
	CentOS 5.2 KVM	CentOS 5.2 KVM target machine.

At the bottom left of the interface, there is a "Done" button.

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

The screenshot shows the Enomaly Elastic Computing Platform interface running in Mozilla Firefox. The URL in the address bar is <http://192.168.0.100:8080/>. The main menu at the top includes File, Edit, View, History, Bookmarks, Tools, Help, Stumble!, I like it!, Send to..., and a search bar with Google.

The navigation bar below the menu has tabs for Dashboard, Virtual Infrastructure, Repository, Admin, and Users/Groups. The Virtual Infrastructure tab is currently selected.

Below the tabs, there are three large icons:

- INFRASTRUCTURE**: Represented by a globe icon.
- NETWORK MANAGER**: Represented by a coffee cup icon.
- ELASTIC VALET**: Represented by a tuxedo icon.

The main content area contains several configuration sections:

- Package to provision**: A dropdown menu showing "debian-500-amd64-netinst.iso (Libvirt)".
- Machine definition to provision on**: A dropdown menu set to "default" with a "View XML" link.
- Preferred Target Cluster**: A dropdown menu set to "default". A note below states: "If you select a target cluster, all VMs created will be provisioned against the parent machines in THIS cluster. That means that you can limit the provision against to a specific set."
- Number of machines to provision**: A horizontal slider bar with a value of 1.

At the bottom left is a "Done" button.

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

The screenshot shows a Mozilla Firefox browser window displaying the Enomaly Elastic Computing Platform. The URL in the address bar is <http://192.168.0.100:8080/>. The main content area is titled "ELASTIC COMPUTING". Below the title, there is a navigation bar with tabs: "Virtual Infrastructure", "Repository", "Admin", and "Users/Groups". The "Virtual Infrastructure" tab is currently selected. Underneath the navigation bar, the word "Monitor" is displayed. A table titled "Monitor" is shown, listing several machine provisioning entries. The columns of the table are: Start Time, Machine, Completion, State, and Actions. The table contains the following data:

	Start Time	Machine	Completion	State	Actions
fbf12bdc-1975-11de-a4f0-4e442d996f4b	2009-03-25 19:48:59	fbf12bdc-1975-11de-a4f0-4e442d996f4b	43%	Unpacking d0.img	
4e442d996f4b	2009-03-25 19:37:49		100%	Successfully created machine 814f4b72-1973-11de-a4f0-4e442d996f4b	
4e442d996f4b	2009-03-25 19:31:14	814f4b72-1973-11de-a4f0-4e442d996f4b	100%	Provisioned machine 814f4b72-1973-11de-a4f0-4e442d996f4b successfully	
4e442d996f4b	2009-03-25 19:24:28	ae201436-8b36-11dd-bbb3-269650d01a85	100%	Installed package	

At the bottom left of the table, there is a "Done" button.

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

The screenshot shows the Enomaly Elastic Computing Platform interface running in Mozilla Firefox. The URL in the address bar is <http://192.168.0.100:8080/>. The interface has a top navigation bar with links for File, Edit, View, History, Bookmarks, Tools, Help, and social sharing options (Stumble!, I like it!, Send to...). Below the navigation is a toolbar with icons for back, forward, search, and refresh.

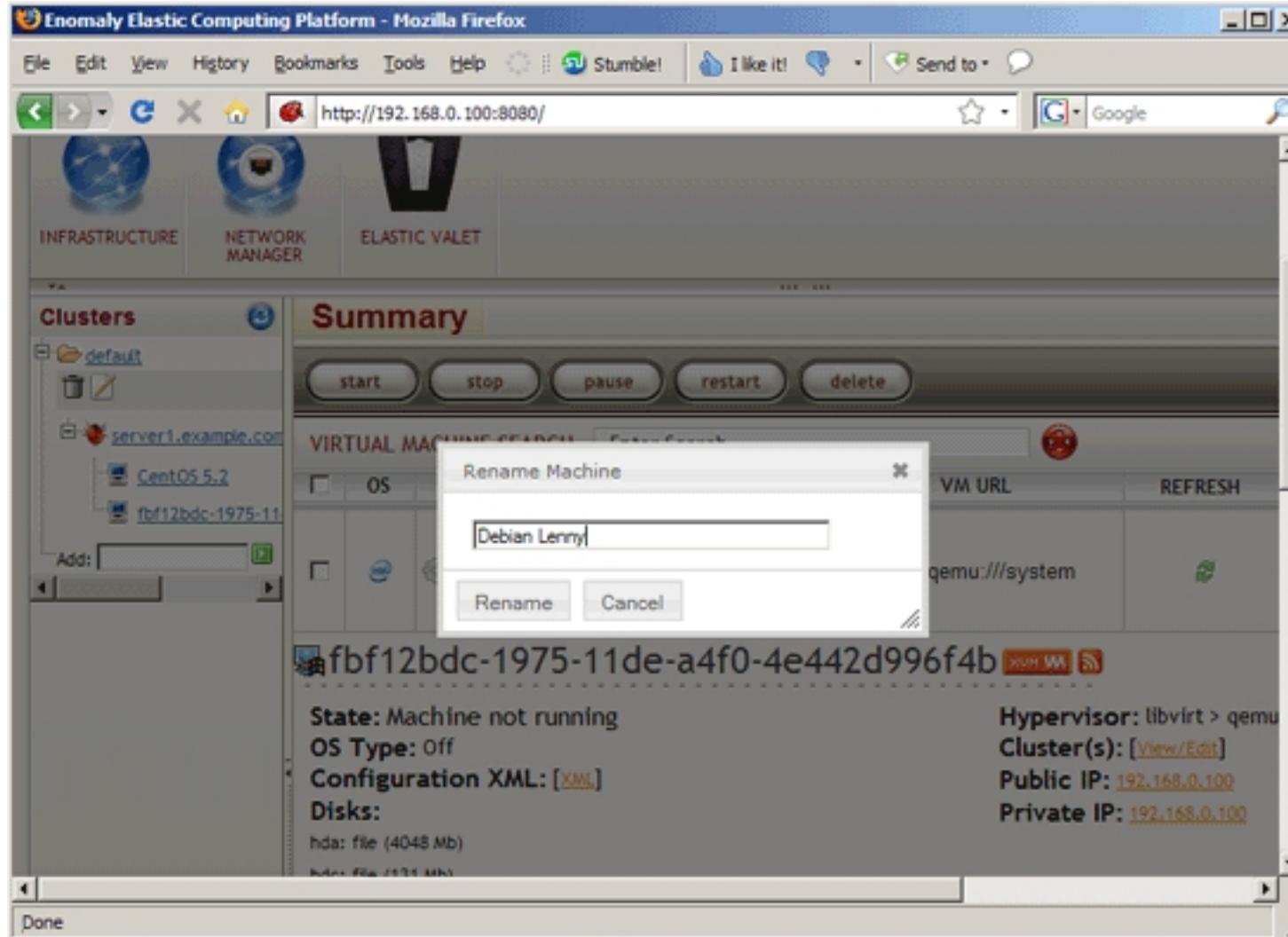
The main area features three large icons: INFRASTRUCTURE (blue globe), NETWORK MANAGER (blue gear), and ELASTIC VALET (keyhole). To the left, a sidebar titled "Clusters" shows a tree structure with a "default" cluster expanded, containing a node "server1.example.com" which has two virtual machines: "CentOS 5.2" and "fbf12bdc-1975-11de-a4f0-4e442d996f4b". A text input field "Add:" is present below the cluster tree.

The central part of the interface is titled "Summary" and contains a "VIRTUAL MACHINE SEARCH" bar with an "Enter Search" input field and a magnifying glass icon. Below this are four control buttons: start, stop, pause, restart, and delete. A table lists the virtual machines:

<input type="checkbox"/>	OS	NODE	VM URL	REFRESH
<input type="checkbox"/>		fbf12bdc-1975-11de-a4f0-4e442d996f4b [UID:fbf12bdc-1975-11de-a4f0-4e442d996f4b] Machine not running   Address: <a href="http://192.168.0.100">192.168.0.100</a> , Mem: /500, CPU: 1, Disks: 2, Parent: <a href="#">server1.example.com</a>   <a href="#">XML</a>	<a href="#">qemu:///system</a>	

A detailed view of the selected VM "fbf12bdc-1975-11de-a4f0-4e442d996f4b" is shown below. It includes fields for State (Machine not running), OS Type (Off), Configuration XML (with a link to XML), Disks (hda: file (4048 Mb)), Hypervisor (libvirt > qemu), Cluster(s) (with a View/Edit link), Public IP (192.168.0.100), and Private IP (192.168.0.100).

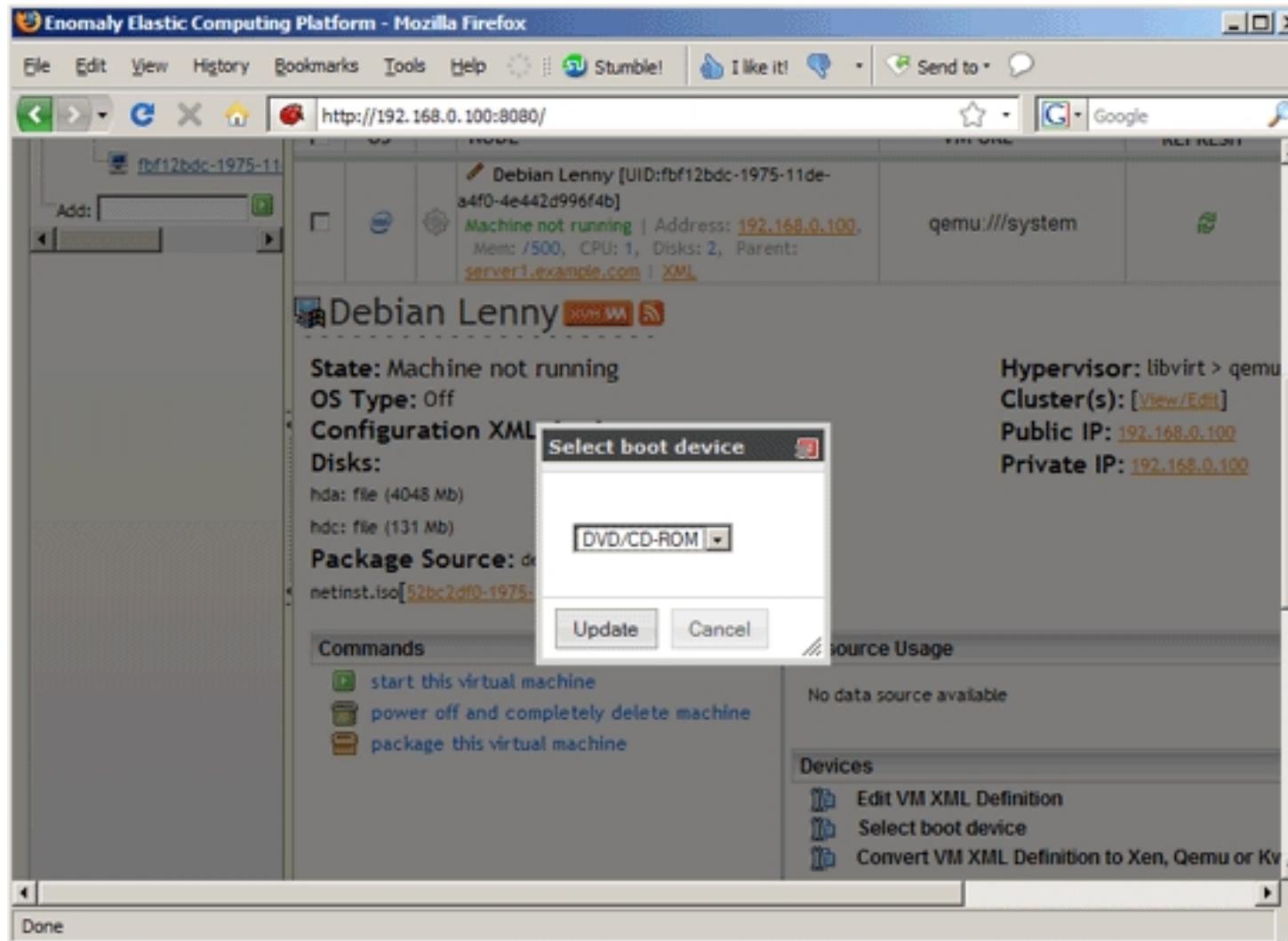
Rename that guest to something less cryptic:



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



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



Then start the virtual machine:



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)...

The screenshot shows a Mozilla Firefox browser window titled "Enomaly Elastic Computing Platform - Mozilla Firefox". The address bar displays the URL <http://192.168.0.100:8080/>. The main content area provides information about a virtual machine:

- State:** Powered On
- OS Type:** hvm / Intel® VT
- Configuration XML:** [\[XML\]](#)
- Hypervisor:** libvirt > qemu:///system
- Cluster(s):** [\[View/Edit\]](#)
- Public IP:** [192.168.0.100](#)
- Private IP:** [192.168.0.100](#)

**Disks:**

- hda: file (4048 Mb)
- hdc: file (131 Mb)

**Package Source:** debian-500-amd64-  
netinst.iso [52bc2df0-1975-11de-a4f0-4e442d996f4b]

**Commands**

- shutdown this virtual machine
- suspend this virtual machine
- poweroff this virtual machine
- reboot this virtual machine
- power off and completely delete machine
- VNC to this VM (via the parent)

**Resource Usage**

No data source available

**Devices**

- Edit VM XML Definition
- Select boot device
- Convert VM XML Definition to Xen, Qemu or Kvm

**Hypervisors**

- Add Hypervisor

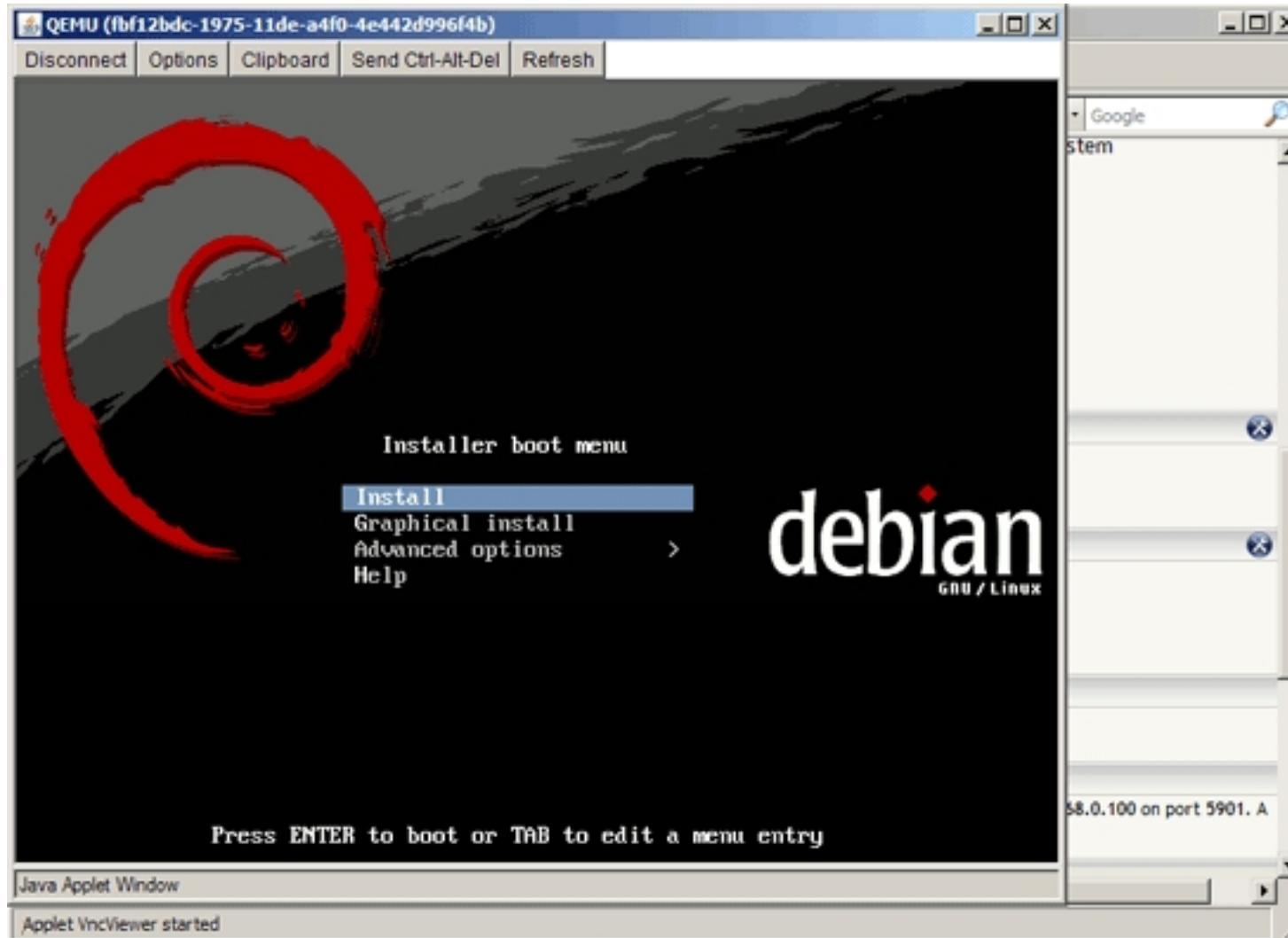
**VNC**

To remotely access this machine make a VNC connection into 192.168.0.100 on port 5901. A VNC client can be downloaded [here](#)

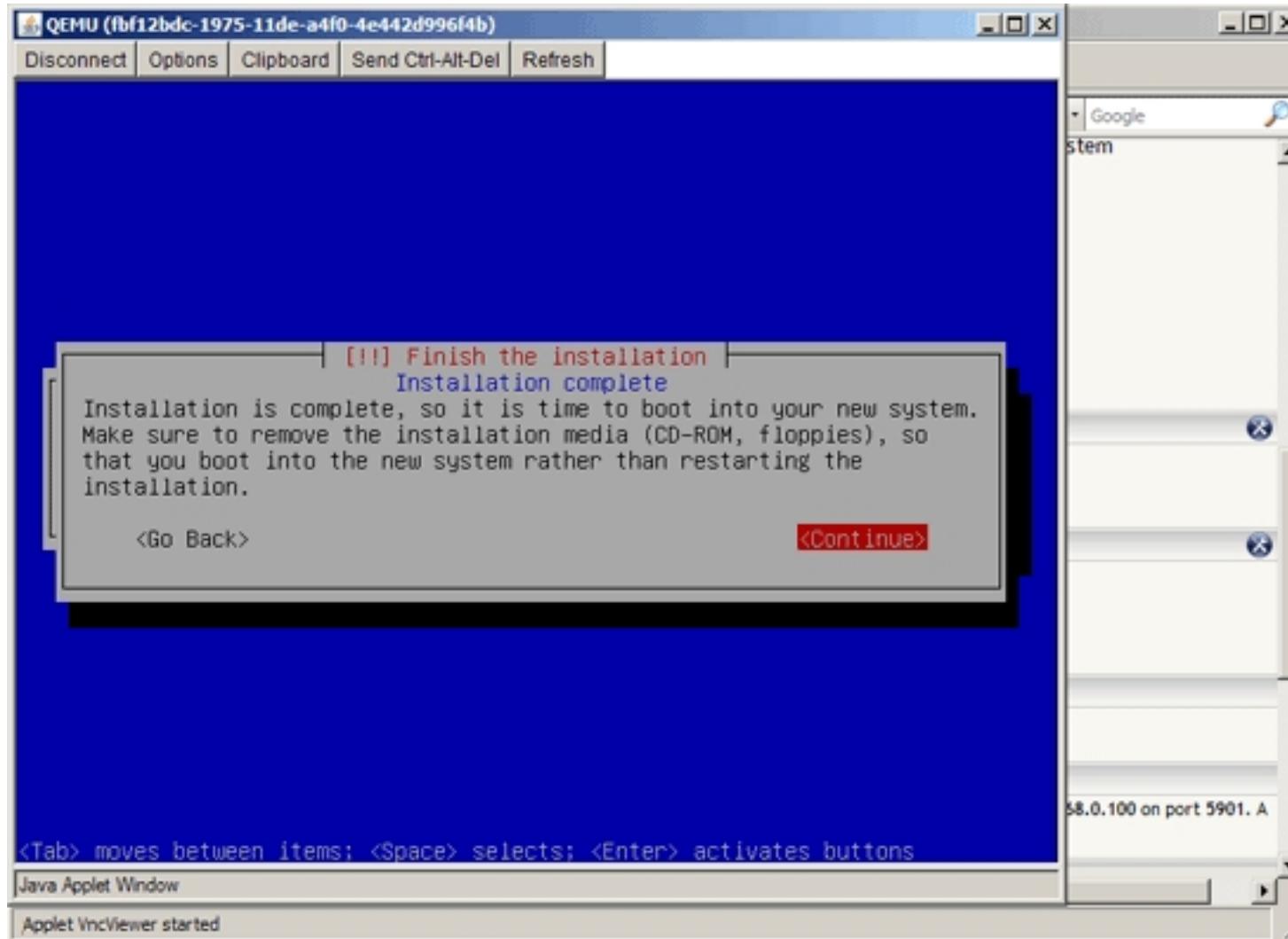
At the bottom of the page, there is a JavaScript code snippet:

```
javascript:void(enomalsim2.machine_action('fbf12bdc-1975-11de-a4f0-4e442d996f4b','vnc','ad152057-eb8f-4f8b-9744-c33ca44522d0'));
```

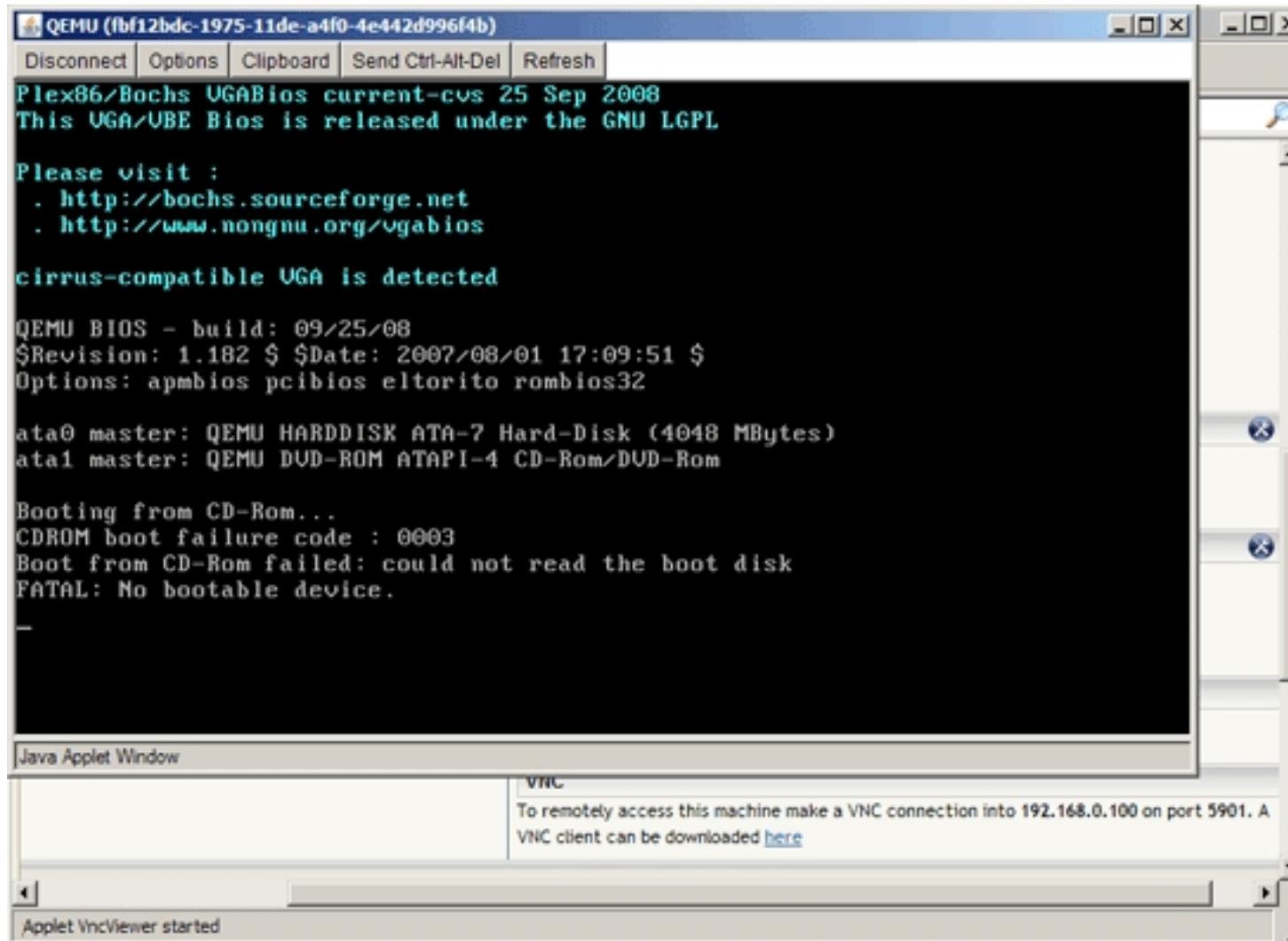
... and install the guest operating system, as you would usually do on a physical system:



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

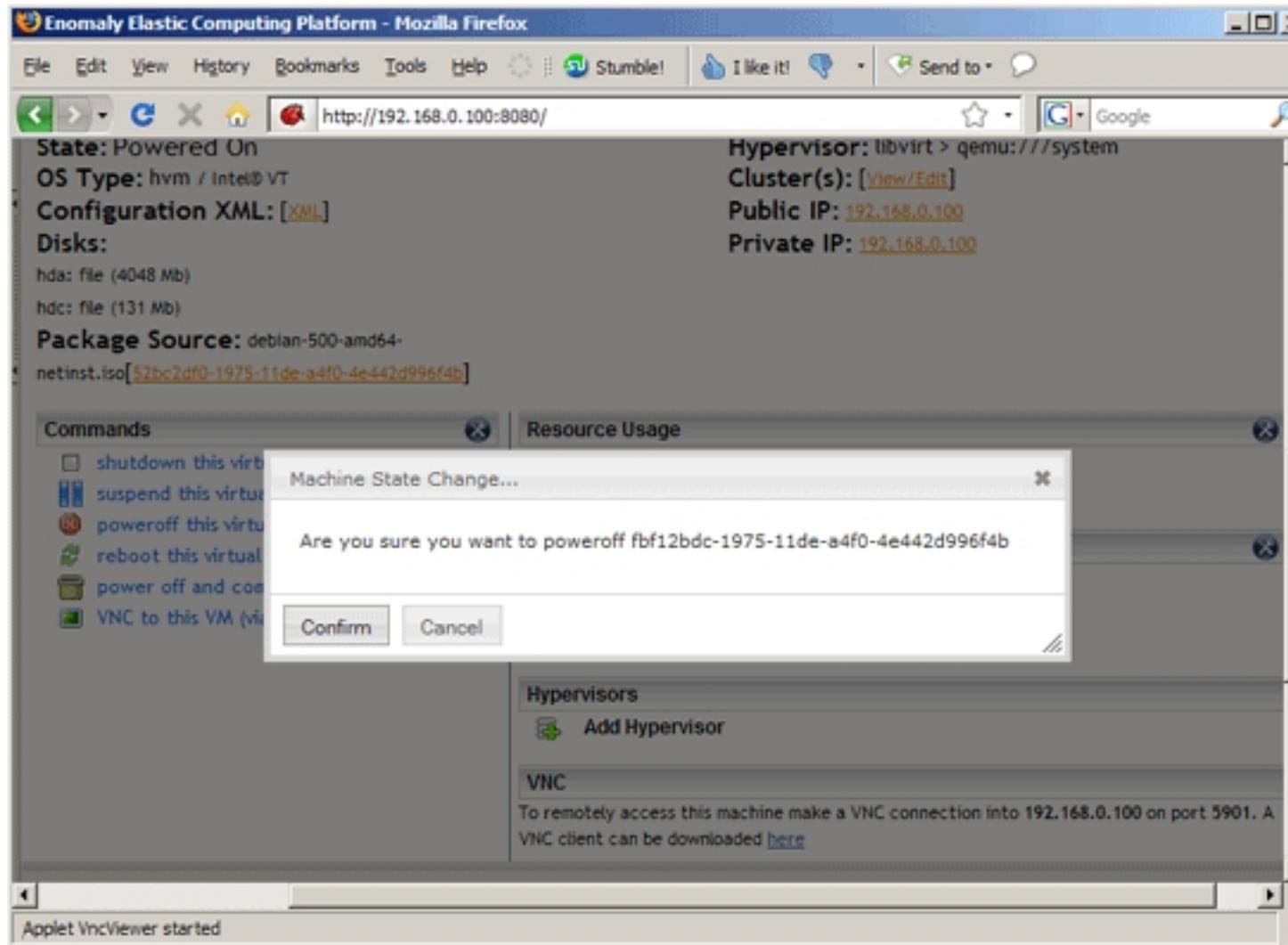


The guest will then try to boot from CD-ROM again which results in a failure:

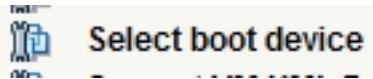


To fix this problem, power down the guest (using the `poweroff this virtual machine` link):

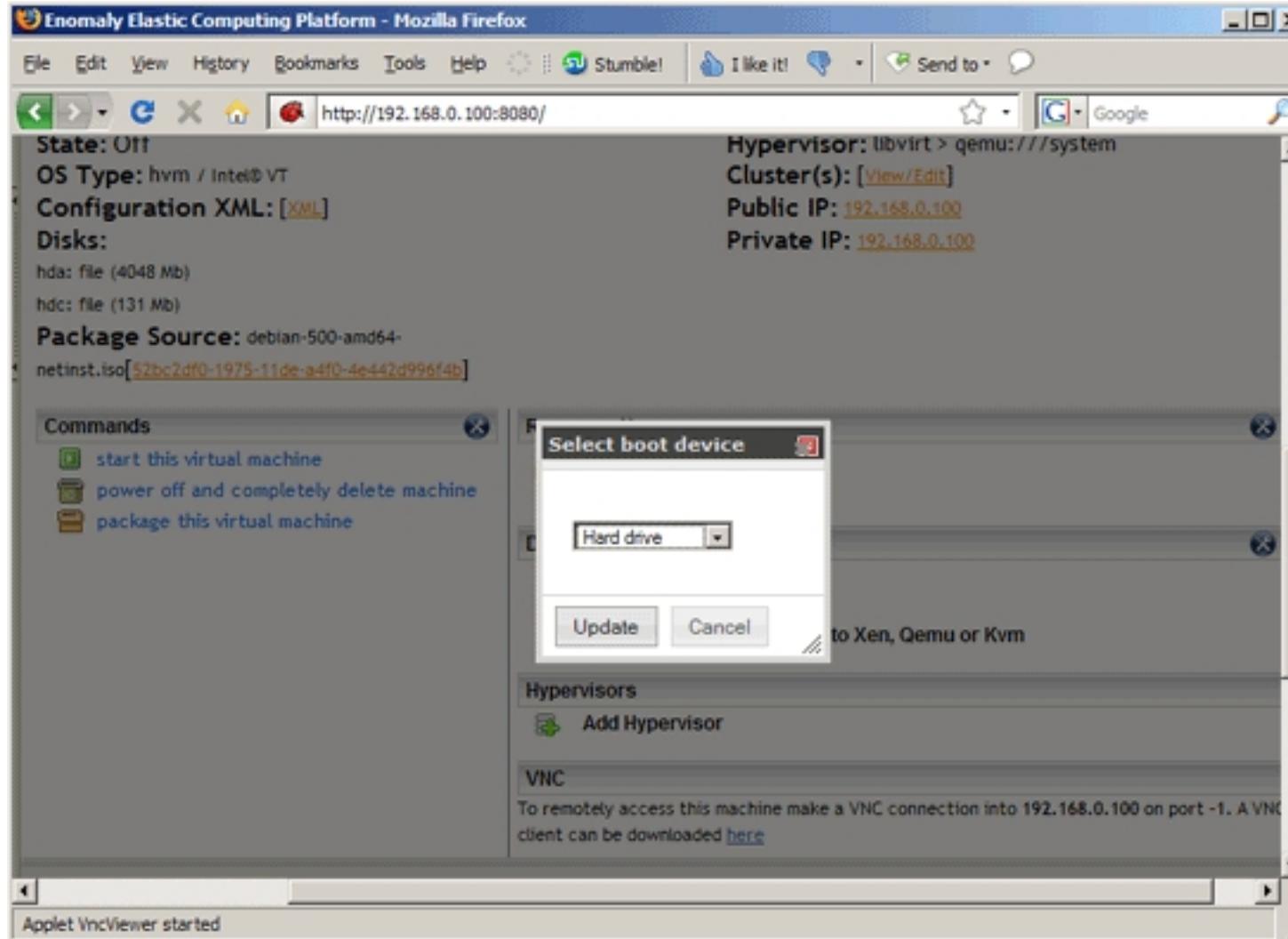




Then click on *Select boot device* again...



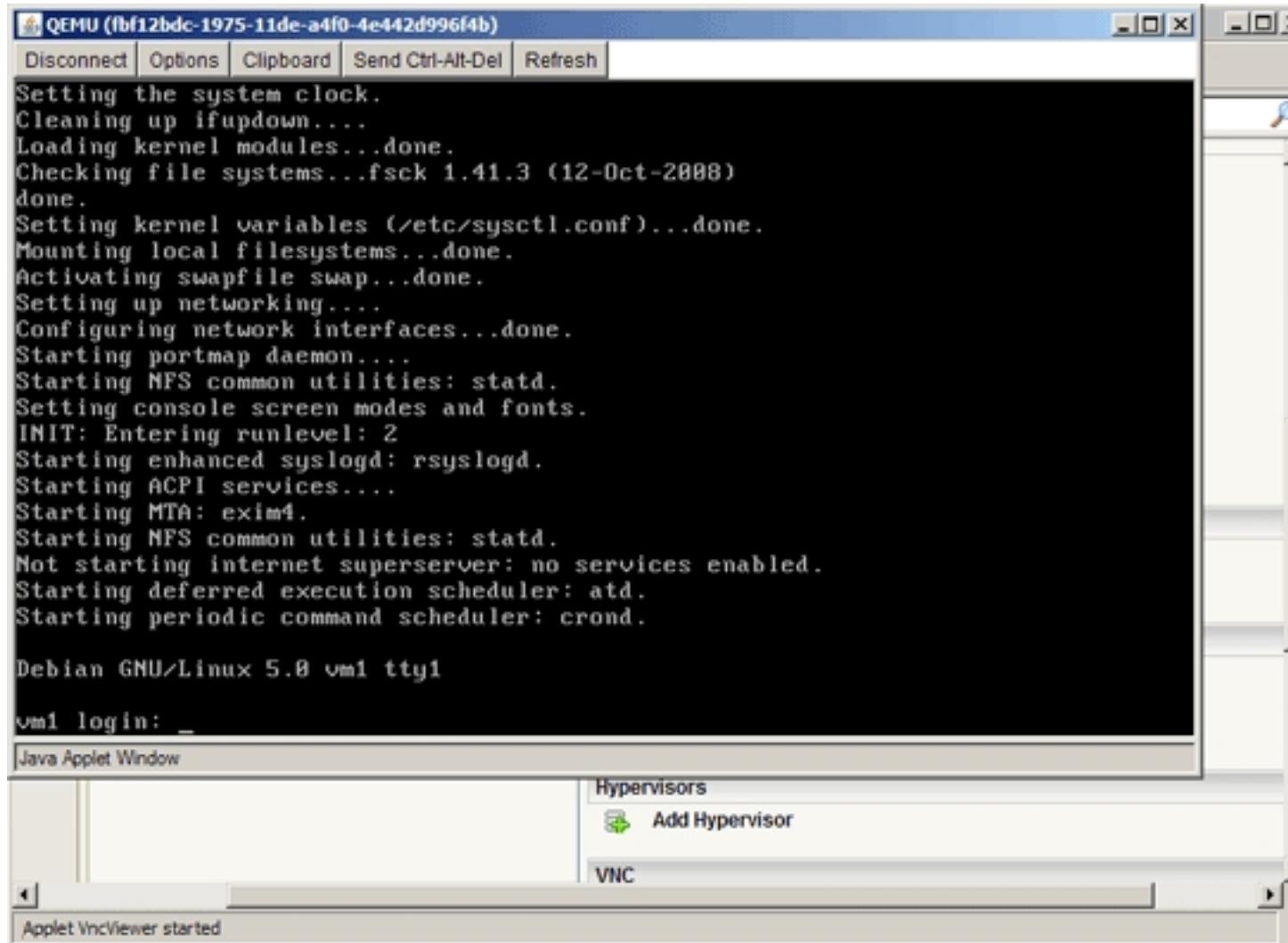
... and select *Hard drive*:



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



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



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

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