

CS 395 Special Topics: Cloud Computing **Using *Nova***

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Managing Instances in *Nova*

- OpenStack Dashboard
- Firefox with Hybridfox Plugin
- Command line tools like euca2ools
- Custom applications developed using EC2 APIs

Practice in Class

- euca2ools
 - Ubuntu APT (Advanced Packaging Tools)
 - Source code installation
 - VirtualBox if it is required
- hybridfox
 - Firefox

OpenStack Dashboard

Creating Keypairs

Projects

PROJ

Instances

Images

Keys

Volumes

Creating Keypairs

Keys

Key pairs are ssh credentials which are injected into images when they are launched. Creating a new key pair registers the public key and downloads the private key (a pem file). *Protect and use the key as a normal private key.*

Key Pair Name	Fingerprint	
mykey	8c:90:35:70:90:d4:25:47:18:86:66:cd:4f:ef:2c:ff	Delete

Create New Keypair

Name

newkeypair

Create

Dashboard
Home

OpenStack Dashboard

Launching an instance

PROJ

Instances

Images

Keys

Volumes

Images

Images are snapshots of running systems which can easily be deployed to run one or more instances.

Project Images

No images currently available.

OpenStack Images

No images currently available.

Community Images

ID	Description	Owner
ami-00000003	bucket1/serverfinal.img.manifest.xml	Launch
ami-0000000b	suseendran2/windows2008nova.img.manifest.xml	Launch

OpenStack Dashboard

Terminating an instance

The screenshot shows the OpenStack Cloud Computing dashboard. The top navigation bar includes the OpenStack logo, the text "OpenStack Cloud Computing", and links for "Sign Out" and "Change Password". The left sidebar contains a menu with "Home", "Projects", "PROJ" (selected), "Instances", "Images", "Keys", and "Volumes". The main content area is titled "Instances" and includes a description: "Instances are virtual servers launched from images. You can launch instances from the [images tab](#)." Below this is a table with columns: ID, Image, Size, IP, and State. Two instances are listed, both in a "running" state. The first instance has ID "i-00000047 (Server 71)", Image "ami-00000003", Size "m1.tiny", and IP "10.1.1.1". The second instance has ID "i-00000048 (Server 70)", Image "ami-00000003", Size "m1.small", and IP "10.1.1.2". Both instances have "Terminate" and "Show Console" buttons. A yellow tooltip with the text "Terminating an instance" is positioned over the "Terminate" button of the second instance. The bottom left corner shows a "Dashboard" link and a "Home" link.

OpenStack Cloud Computing

Sign Out
Change Password

Home
Projects
PROJ
Instances
Images
Keys
Volumes

Project: proj Region: nova

Instances

Instances are virtual servers launched from images. You can launch instances from the [images tab](#).

ID	Image	Size	IP	State
i-00000047 (Server 71)	ami-00000003	m1.tiny	10.1.1.1	running
i-00000048 (Server 70)	ami-00000003	m1.small	10.1.1.2	running

Terminating an instance

Dashboard
Home

OpenStack Dashboard

Displaying the console output

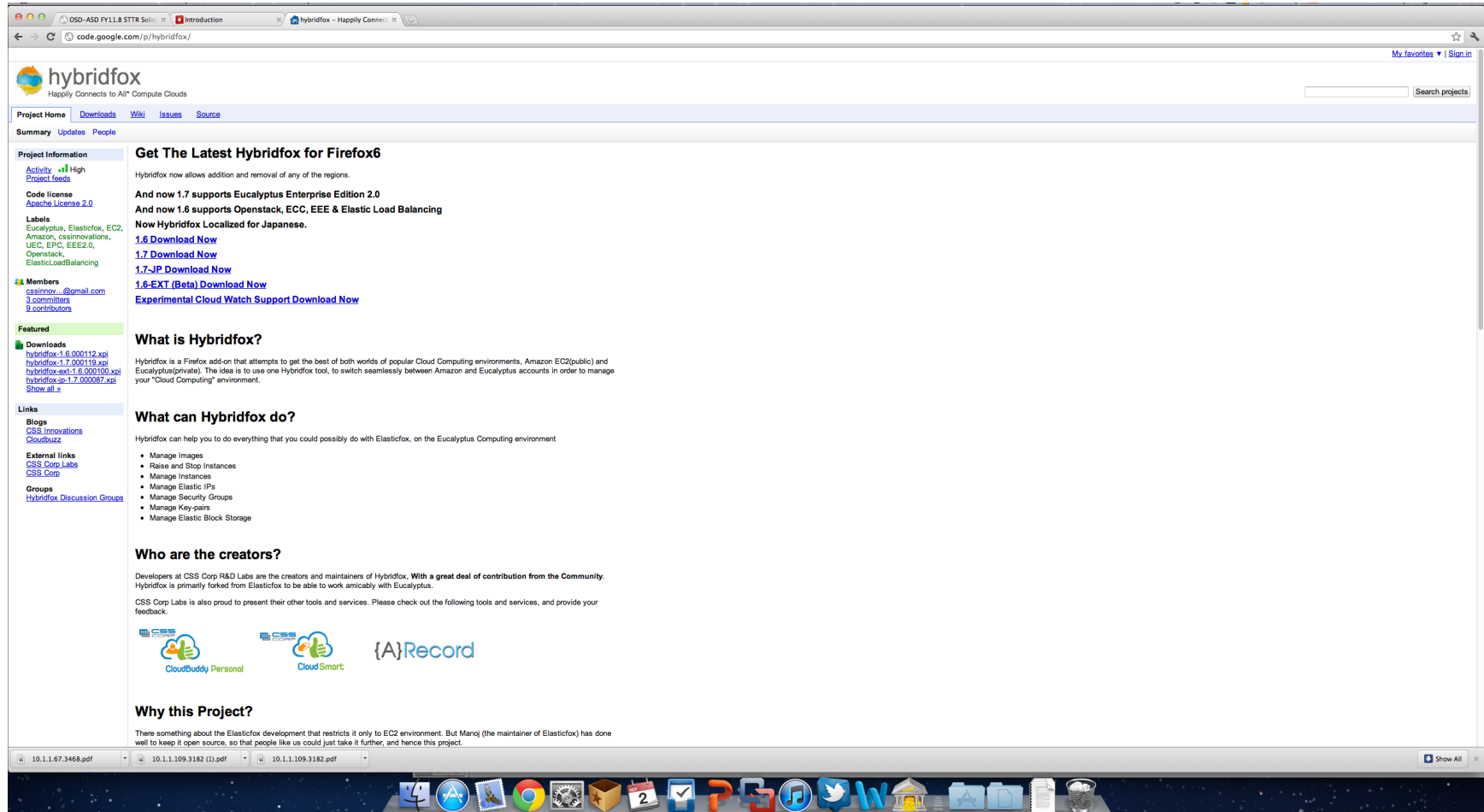
The screenshot shows the OpenStack Cloud Computing dashboard. The left sidebar contains navigation links: Home, Projects, PROJ (selected), Instances, Images, Keys, and Volumes. The main content area is titled 'Instances' and includes a description: 'Instances are virtual servers launched from images. You can launch instances from the [images tab](#).' Below this is a table of instances.

ID	Image	Size	IP	State	Actions
i-00000047 (Server 71)	ami-00000003	m1.tiny	10.0.0.1	running	Terminate Show Console
i-00000046 (Server 70)	ami-0000000b	m1.small	10.0.0.2	running	Terminate Show Console

A yellow callout box with the text 'Displaying the Console Output' points to the 'Show Console' button for the instance 'i-00000046 (Server 70)'.

Dashboard
Home

Firefox with Hybridfox Plugin



Firefox with Hybridfox Plugin

Download and Installation

- <http://code.google.com/p/hybridfox/downloads/list>

 hybridfox

Happily Connects to All* Compute Clouds

Project Home

Downloads

Wiki

Issues

Source

Search

Current downloads

↑

for

Search

Filename ▾

Summary + Labels ▾

Uploaded ▾

ReleaseDate ▾

Size ▾

DownloadCount ▾

...

hybridfox-ext-1.6.000121.xpi

Hybridfox-Ext

Aug 24

Aug 24

212 KB

65

hybridfox-1.7.000119.xpi

Hybridfox 1.7 *Featured*

Aug 23

Aug 23

235 KB

331

hybridfox-1.6.000112.xpi

Hybridfox 1.6 *Featured*

Aug 23

Aug 23

219 KB

141

hybridfox-1.6.000104.xpi

Hybridfox 1.6

Jul 25

Jul 25

222 KB

413

hybridfox-ext-1.6.000100.xpi

Hybridfox-ext-1.6 *Featured*

Jun 29

Jun 29

205 KB

261

hybridfox-1.6.000083.xpi

Hybridfox 1.6.83

Jun 23

Jun 23

182 KB

281

hybridfox-1.7.000089.xpi

Hybridfox 1.7.89

Jun 23

Jun 23

216 KB

1414

hybridfox-jp-1.7.000087.xpi

Hybridfox-jp-1.7.87 *Featured*

Jun 22

Jun 22

233 KB

268

hybridfox-jp-1.6.000081.xpi

Hybridfox-jp-1.6.81

Jun 20

Jun 20

197 KB

78

hybridfox-jp-1.6.000081.xpi

Hybridfox in Japanese

Jun 8

Jun 8

189 KB

77

Hybridfox_Developer_Manual_v1.pdf

Hybridfox Developer Manual

May 31

May 31

64.6 KB

94

Hybridfox_User_Manual_v1.pdf

Hybridfox User Manual

May 22

May 22

2.4 MB

395

hybridfox-1.6.000056.xpi

Hybridfox 1.6

May 18

May 18

182 KB

352

hybridfox-1.7.000068.xpi

Hybridfox 1.7 Stable Version

May 18

May 18

215 KB

1157

hybridfox-1.7.000063.xpi

Hybridfox-1.7.63

May 16

May 16

215 KB

146

hybridfox-1.7.000067.xpi

Fixed an ugly error

May 9

May 9

218 KB

323

hybridfox-1.6.000044.xpi

Openstack Support

May 6

May 6

183 KB

199

hybridfox-1.7.000062.xpi

Hybridfox 1.7 with support for EEE2.0

May 6

May 6

218 KB

143

hybridfox-1.7.000047.xpi

Hybridfox 1.7.47

May 3

May 3

218 KB

224

hybridfox-1.7.000044.xpi

1.7 version Hybridfox. A little above BETA!

Apr 29

Apr 29

217 KB

218

hybridfox-1.6.000041.xpi

Hybridfox now supports Firefox 4

Mar 23

Mar 23

181 KB

1532

hybridfox-1.6.000037.xpi

Hybridfox with Japanese Endpoint Support

Mar 4

Mar 4

186 KB

704

hybridfox-1.6.000030.xpi

Now add/remove any region

Oct 2010

181 KB

4112

hybridfox-1.6.000024.xpi

Added support for Asia Pacific region.

Apr 2010

181 KB

4612

hybridfox-1.6.000019.xpi

Hybridfox for Eucalyptus and Amazon EC2 (Added Support for Firefox 3.6)

Mar 2010

180 KB

2284

hybridfox-1.6.000006.xpi

Hybridfox for Eucalyptus and Amazon EC2

Dec 2009

179 KB

1177

hybridfox-1.6.000000.xpi

Hybridfox for Eucalyptus and Amazon EC2

Nov 2009

179 KB

932

elasticfox-1.6.000107.xpi

Elasticfox for Eucalyptus and EC2

Nov 2009

181 KB

1397

1 - 28 of 28

Firefox with Hybridfox Plugin

Set Up Credentials

Account Name	AWS Access Key
kyounggho	9131972e-7883-42c5-9ab2-66eb7d3...

Account Name:

AWS Access Key:

AWS Secret Access Key:

Preferred Region:

Region Name	Type	Endpoint URL
-------------	------	--------------

Region Name:

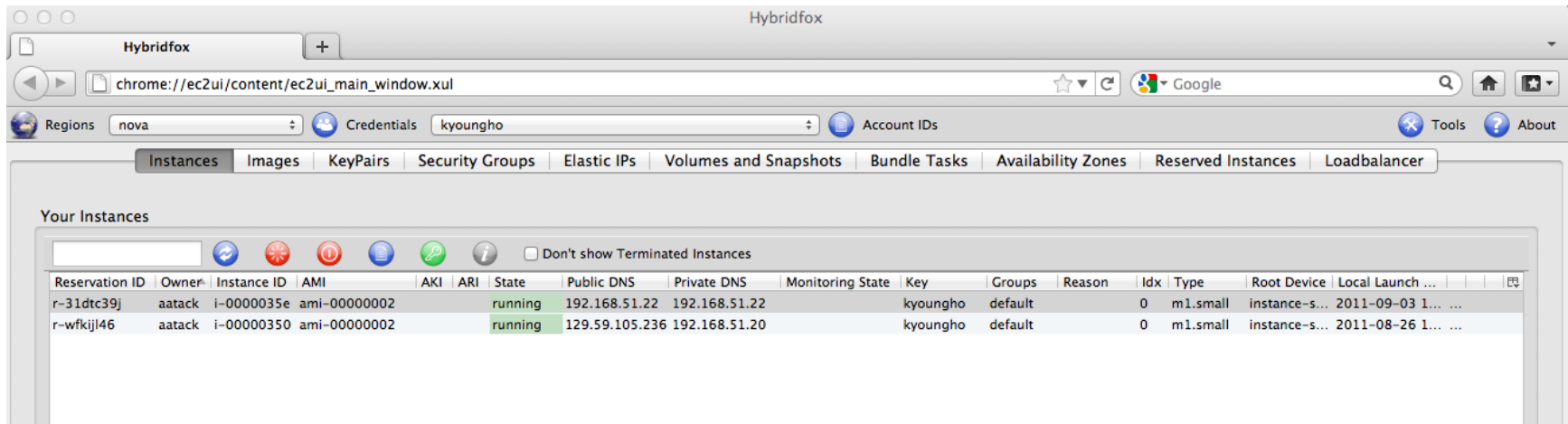
Type:

Endpoint URL:

```
NOVARC=$(readlink -f "${BASH_SOURCE:-${0}}" 2>/dev/null) ||
NOVARC=$(python -c 'import os,sys; print
os.path.abspath(os.path.realpath(sys.argv[1]))' "${BASH_SOURCE:-${0}}")
NOVA_KEY_DIR=${NOVARC%/*}
export EC2_ACCESS_KEY="9131972e-7883-42c5-9ab2-66eb7d3d0f7d:aatack"
export EC2_SECRET_KEY="dd4e51b0-d9b8"
export EC2_URL="http://129.59.104.94:8773/services/Cloud"
export S3_URL="http://129.59.104.94:3333"
export EC2_USER_ID=42 # nova does not use user id, but bundling requires it
export EC2_PRIVATE_KEY=${NOVA_KEY_DIR}/pk.pem
export EC2_CERT=${NOVA_KEY_DIR}/cert.pem
export NOVA_CERT=${NOVA_KEY_DIR}/cacert.pem
export EUCALYPTUS_CERT=${NOVA_CERT} # euca-bundle-image seems to require this set
alias ec2-bundle-image="ec2-bundle-image --cert ${EC2_CERT} --privatekey $
{EC2_PRIVATE_KEY} --user 42 --ec2cert ${NOVA_CERT}"
alias ec2-upload-bundle="ec2-upload-bundle -a ${EC2_ACCESS_KEY} -s ${EC2_SECRET_KEY} --url
${S3_URL} --ec2cert ${NOVA_CERT}"
export NOVA_API_KEY="9131972e-7883-42c5-9ab2-66eb7d3d0f7d"
export NOVA_USERNAME="kyounggho"
export NOVA_PROJECT_ID="aatack"
export NOVA_URL="http://129.59.104.94:8774/v1.0/"
```

Firefox with Hybridfox Plugin

Describe Instances



The screenshot shows the Hybridfox web interface running in a Firefox browser. The browser's address bar displays the URL `chrome://ec2ui/content/ec2ui_main_window.xul`. The interface includes a navigation bar with tabs for **Instances**, **Images**, **KeyPairs**, **Security Groups**, **Elastic IPs**, **Volumes and Snapshots**, **Bundle Tasks**, **Availability Zones**, **Reserved Instances**, and **Loadbalancer**. The **Instances** tab is active, showing a table of EC2 instances. The table has columns for Reservation ID, Owner, Instance ID, AMI, AKI, ARI, State, Public DNS, Private DNS, Monitoring State, Key, Groups, Reason, Idx, Type, Root Device, Local Launch, and a final column with a magnifying glass icon. Two instances are listed, both in a 'running' state. Above the table, there is a search bar, a 'Don't show Terminated Instances' checkbox, and several status icons (blue, red, green, grey).

Reservation ID	Owner	Instance ID	AMI	AKI	ARI	State	Public DNS	Private DNS	Monitoring State	Key	Groups	Reason	Idx	Type	Root Device	Local Launch	
r-31dtc39j	aatack	i-0000035e	ami-00000002			running	192.168.51.22	192.168.51.22		kyoungho	default		0	m1.small	instance-s...	2011-09-03 1...	...
r-wfkijl46	aatack	i-00000350	ami-00000002			running	129.59.105.236	192.168.51.20		kyoungho	default		0	m1.small	instance-s...	2011-08-26 1...	...

Euca2ools

- <http://open.eucalyptus.com/wiki/Euca2oolsGuide>



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Read eucalyptus documentation

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 - [Installation from source](#)
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 - [Installing Euca2ools on OpenSUSE 11](#)
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 - [Debian Squeeze](#)
 - ▶ [Using Euca2ools Overview](#)
 - [Changelog](#)
 - [License](#)
 - [Interacting with Walrus \(1.6\)](#)
 - [Interacting with Block Storage \(1.6\)](#)
 - [Image Creator's Guide](#)
 - [Known issues with Eucalyptus 1.6](#)
 - [Changelog](#)

Euca2ools User Guide

Euca2ools are command-line tools for interacting with Web services that export a REST/Query-based API compatible with Amazon EC2 and S3 services. The tools can be used with both Amazon's services and with installations of the Eucalyptus open-source cloud-computing infrastructure. The tools were inspired by command-line tools distributed by Amazon (api-tools and ami-tools) and largely accept the same options and environment variables. However, these tools were implemented from scratch in Python, relying on the [Boto](#) library and [M2Crypto](#) toolkit.

Summary of Features

- Query of availability zones (i.e. clusters in Eucalyptus)
- SSH key management (add, list, delete)
- VM management (start, list, stop, reboot, get console output)
- Security group management
- Volume and snapshot management (attach, list, detach, create, bundle, delete)
- Image management (bundle, upload, register, list, deregister)
- IP address management (allocate, associate, list, release)

[« Getting Started Using Eucalyptus \(1.6\)](#) | [UP](#) | [Installation from source »](#)

[Printer-friendly version](#)

Navigation

- [Recent posts](#)

User login

Username: *

Password: *

Log in

- [Create new account](#)
- [Request new password](#)

Euca2ools

Installation on Ubuntu

```
# sudo apt-get install euca2ools
```

```
# unzip nova.zip
```

```
# . ./novarc
```

Euca2ools

Installation on Mac OSX

- Install wget
 - <http://www.macupdate.com/app/mac/33951/wget>
- Install Euca2ools using the shell
 - C compiler(gcc) is required to be installed

```
# sh install_euca_tools.sh
```

Euca2ools

Creation of Key pairs

```
# euca-add-keypair kyounggho > kyounggho.pem
```

```
# chmod 600 kyounggho.pem
```

Euca2ools

Launching Instances

```
# euca-run-instances -k kyounggho -t m1.small ami-2  
# euca-describe-instances  
# euca-reboot-instances i-1  
# euca-get-console-output
```

Euca2ools

Configure Network Connectivity

```
# euca-authorize default -P tcp -p 22 -s 0.0.0.0/0
```

```
# euca-authorize default -P icmp -t -1:-1
```

```
# euca-allocate-address
```

```
ADDRESS 129.59.105.236
```

```
# euca-associate-address -i i-1 129.59.105.236
```

Euca2ools

Accessing Instances

```
# ssh -i kyounggho.pem ubuntu@129.59.105.236
```

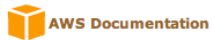
Euca2ools

Terminating Instances

euca-terminate-instances i-1

Amazon EC2 API Reference

- <http://docs.amazonwebservices.com/AWSEC2/latest/APIReference/>



Amazon Elastic Compute Cloud
API Reference (API Version 2011-07-15)

Search:

- Welcome
- List of Actions by Function
- Actions
- Data Types
- Common Query Parameters
- Error Codes
- Amazon EC2 Resources
- Document History

AWS Documentation » Amazon EC2 » API Reference » Welcome



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Welcome

This is the *Amazon Elastic Compute Cloud API Reference*. This guide provides detailed information about Amazon Elastic Compute Cloud (Amazon EC2) actions, data types, parameters, and errors. For detailed information about Amazon EC2 features and their associated API calls, go to the [Amazon Elastic Compute Cloud User Guide](#).

Amazon EC2 is a web service that provides resizable computing capacity—literally, server instances in Amazon's data centers—that you use to build and host your software systems. With Amazon EC2, you can get access to infrastructure resources using APIs or web tools and utilities.

**Note**
This guide also includes the actions for Amazon Virtual Private Cloud (Amazon VPC). For more information about the service, go to the [Amazon Virtual Private Cloud User Guide](#).

This reference has a single set of topics for both the Query and SOAP APIs (the actions are the same for both APIs). The topic for a given action shows the Query API request parameters. The XML request elements for the SOAP API have names that are very similar to the Query API parameter names. You can view the XML request elements in the WSDL, or look at the proxy classes that a SOAP toolkit generates from the WSDL. Therefore you can look at the topic for a given action and see what you need to provide for either the Query API or the SOAP API. You can also see what the XML response looks like (it's the same for both APIs).

Current WSDL (2011-07-15)	Location of the current WSDL
Making API Requests	Information about using the API
List of Actions by Function	List of the Amazon EC2 actions by function
Actions	Alphabetical list of all Amazon EC2 actions
Data Types	Alphabetical list of all Amazon EC2 data types
Common Query Parameters	Parameters that all Query actions can use
Error Codes	Client and server errors the API returns
Amazon EC2 product page	Information about this product

[Document Conventions](#)
[Terms of Use](#)

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Amazon EC2 API Reference

Describe Images

Example Request

This example describes the ami-be3adfd7 AMI.

```
https://ec2.amazonaws.com/?Action=DescribeImages
&ImageId.1=ami-be3adfd7
&AUTHPARAMS
```

Example Response

```
<DescribeImagesResponse xmlns="http://ec2.amazonaws.com/doc/2011-07-15/">
  <requestId>59dbff89-35bd-4eac-99ed-be587EXAMPLE</requestId>
  <imagesSet>
    <item>
      <imageId>ami-be3adfd7</imageId>
      <imageLocation>amazon/getting-started</imageLocation>
      <imageState>available</imageState>
      <imageOwnerId>206029621532</imageOwnerId>
      <isPublic>true</isPublic>
      <architecture>i386</architecture>
      <imageType>machine</imageType>
      <kernelId>aki-d3376696</kernelId>
      <ramdiskId>ari-e73766a2</ramdiskId>
      <imageOwnerAlias>amazon</imageOwnerAlias>
      <name>getting-started</name>
      <description>Fedora 8 vl.11 i386 lvm-rootVG-rootFS ext3 ec2pnp enabled</description>
      <rootDeviceType>ebs</rootDeviceType>
      <rootDeviceName>/dev/sda</rootDeviceName>
      <blockDeviceMapping>
        <item>
          <deviceName>/dev/sda</deviceName>
          <ebs>
            <snapshotId>snap-32885f5a</snapshotId>
            <volumeSize>15</volumeSize>
            <deleteOnTermination>>false</deleteOnTermination>
          </ebs>
        </item>
      </blockDeviceMapping>
      <virtualizationType>paravirtual</virtualizationType>
      <tagSet/>
      <hypervisor>xen</hypervisor>
    </item>
  </imagesSet>
```

Amazon EC2 API Reference

Describe Images (ISIS Cloud)

Firefox

http://129.59.104.94:8773/services/Cloud/?AWSAccessKeyId=9131972e-7883-42c5-9ab2-66eb7d3d077d%3Aaatack&Action=DescribeImages&Owner.1=self&SignatureMethod=HmacSHA256&SignatureVersion=2&Timestamp=2011-09-01T01%3A06%3A06&Version=2009

Amazon Elastic Compute C... http://129.5...XPNH3I53C%3D

This XML file does not appear to have any style information associated with it. The document tree is shown below.

```
<DescribeImagesResponse>
  <requestId>C-VS08D3IK4WGR6PA2K</requestId>
  <imagesSet>
    <item>
      <displayName>vf-generic_20110829_1</displayName>
      <description/>
      <imageOwnerId/>
      <isPublic>true</isPublic>
      <imageId>ami-00000006</imageId>
      <imageState>available</imageState>
      <rootDeviceType>instance-store</rootDeviceType>
      <architecture/>
      <imageLocation>None (vf-generic_20110829_1)</imageLocation>
      <kernelId>aki-00000001</kernelId>
      <rootDeviceName>/dev/sda1</rootDeviceName>
      <imageType>machine</imageType>
    </item>
    <item>
      <displayName>JW_071811</displayName>
      <description/>
      <imageOwnerId>meta_analysis</imageOwnerId>
      <isPublic>true</isPublic>
      <imageId>ami-00000004</imageId>
      <imageState>available</imageState>
      <rootDeviceType>instance-store</rootDeviceType>
      <architecture>i386</architecture>
      <imageLocation>snapshot (JW_071811)</imageLocation>
      <kernelId>aki-00000001</kernelId>
      <rootDeviceName>/dev/sda1</rootDeviceName>
      <imageType>machine</imageType>
    </item>
    <item>
      <displayName>JW_071311</displayName>
      <description/>
      <imageOwnerId/>
      <isPublic>true</isPublic>
      <imageId>ami-00000003</imageId>
      <imageState>available</imageState>
      <rootDeviceType>instance-store</rootDeviceType>
      <architecture/>
      <imageLocation>Ubuntu 11.04 Server Snapshot (JW_071311)</imageLocation>
      <kernelId>aki-00000001</kernelId>
      <rootDeviceName>/dev/sda1</rootDeviceName>
      <imageType>machine</imageType>
    </item>
    <item>
      <displayName>Ubuntu 11.04 Server Image</displayName>
      <description/>
      <imageOwnerId/>
      <isPublic>true</isPublic>
      <imageId>ami-00000002</imageId>
      <imageState>available</imageState>
      <rootDeviceType>instance-store</rootDeviceType>
      <architecture>i386</architecture>
      <imageLocation>
        Ubuntu 11.04 Server Image (Ubuntu 11.04 Server Image)
      </imageLocation>
    </item>
  </imagesSet>
</DescribeImagesResponse>
```

Done