AIS EC2 User’s Guide

# Prerequisites

This document describes the process of launching an AMI (Amazon Machine Instance) as an instance on the EC2 (Elastic Compute Cloud ) that runs the AIS (Analytic Information Server) application. It is assumed that you have already completed the following steps:

1. Established an AWS Account (Amazon Web Services Account) including a User ID, password, keys, certificates. See S:\IT\cloud\AccountId.txt for more info.
2. Installed ec2 tools, java runtime, and putty on your local computer. Set the appropriate environment variables for the ec2 environment.
3. Created and saved the appropriate AMIs in S3.

Please refer to the companion document, EC2AdminGuide.doc for a detailed discussion of these prerequisites.

# Getting Started

The commands listed below are found in C:\ec2\ec2-api-tools\bin on your local computer. To run a DOS command, open a command window on your local computer and then change to the ec2 folder using “cd \ec2” from the C drive.

In the documentation below, each command is listed twice. The first one is the long form, and the second one is the short form of the command. You only need to enter one of these commands at each step.

## Viewing AMIs

**View AMIs.** To view the FIMCO AMIs (Amazon Machine Images), enter:

ec2-describe-images –o self

ec2dim –o self

Notice that the AMI ID is provided for each AMI in the list (the AMI ID is the one starting with ami-). We will need this ID to launch an instance of the AMI on EC2 (Elastic Compute Cloud).

**AIS Servers.** A server instance has a name that begins with AisSvc followed by the underlying OS and OS version. This AMI is small and fast. It just runs AIS (Analytic Information Server) as a service. It does not include a desktop, a development environment or X windows; thus, you cannot access this instance using NX client. It is intended to run one or more AIS contexts that can be accessed by other instances of AIS, or by using a remote client such as RIDE, an Excel-aware C# client, a Web browser, or an XML-aware client such as Flash.

**AIS IDE.** In the above list, an AIS IDE (Integrated Development Environment) has a name that begins with AisDev followed by the underlying OS and OS version. This image includes a KDE desktop, AIS source, an Eclipse IDE, QT, and MySql. It is primarily for use by developers who wish to modify AIS. An instance of this image may be accessed using an NX client from either Microsoft Windows or Linux.

## Managing Instances

An image is just a bunch of bytes stored on a disk. In order to transform an image into a program running on a computer, you may load this image into a computer that is maintained by Amazon either in the United States or in Europe. When the image is loaded, the computer begins execution by starting up the operating system that is part of the image. You can launch one or more instances of each image listed above, depending upon the computational task involved as described below.

### Launch a Server Instance

**Launch.** To launch an instance of one of the above AMIs, using enter one of the following commands in a command window on your local computer:

ec2-run-instances ami-335fb85a –k gsg-keypair –t m1.large

ec2run ami-335fb85a –k gsg-keypair –t m1.large

**Open Port.** An AIS service is automatically started when the instance is launched. Port 8081 is used to access to this instance using a remote client such as RIDE (Remote Integrated Development Environment). You probably won’t need to do this. To authorize access to this port, enter:

ec2-authorize default –p 8081

ec2auth default –p 8081

**Start Service.** You can check the status of the AIS service in a remote bash shell using:

service aissvc status

To start or stop the service, use:

service aissvc start

service aissvc stop

The service logs are found in /var/log/ais. Check the sysmsg.log for errors during startup. If there are no errors, but a remote connection fails, try stopping and starting the AIS service.

That’s it. The AIS server is now ready to respond to remote requests from anywhere on the internet.

Note the instance id (e.g. i-1303977a) which will be used to identify this instance. Be sure to terminate the instance when it is no longer being used to avoid incurring unnecessary charges!

### View Your Instances

To view the instances that you have launched using:

ec2-describe-instances

ec2din

It may be several minutes before the instance is started. When the instance is started, the pending items in the response to this command will be filled in. Note the instance ID (e.g. i-1303977a) which will be used to identify this instance. Replace i-1303977a below with the ID returned by the ec2din command. Use this ID to terminate the instance when it is no longer being used in order to avoid incurring unnecessary charges!

You can also view the console output generated on startup, using:

ec2-get-console-output i-1303977a

ec2gcons i-1303977a

### Terminate the Instance

From a command window on your local computer when you are not using an instance, be sure to terminate the executing instance using:

ec2-terminate-instances i-1303977a

ec2kill i-1303977a

where the instance ID is obtained from ec2din command.

## Connecting to an Instance

### Start a Remote Shell

You can instantiate a remote bash shell on your local Windows machine by opening a command window and entering:

putty

In the PuTTY Configuration dialog, expand SSH -> Auth and enter the path to the private key file for authentication:

C:\ec2\id\_rsa-gsg-keypair.ppk

Highlight Session and enter the host name:

root@ec2-xxx.compute-1.amazonaws.com

Replace xxx with the URL shown by ec2-describe-instances for this instance. Click on Open to bring up a remote bash shell that is connected to your new instance.

### Start a Remote IDE

Check out an AIS folder that contains a version of ride (AIS Remote Integrated Development Environment) that is appropriate for your local computer from SourceForge subversion repository (details to be determined…) or from your local StarTeam repository. For example, you may wish to checkout ais32 if you are running Microsoft Windows. Start up an instance of ride on your local computer by selecting ride32.exe in the ais32 root folder.

**Start an Instance.** An instance of one of the above AMIs must be started before you can connect to it. Follow the instructions above to launch an instance and use the ec2din command to view the URL associated with the instance that you wish to connect to. The digits following the ec2- prefix in the URL are the IP address of the instance. In the directions below, substitute the IP address for your instance for the IP address shown. If you are starting a development version, it will take several minutes for the URL to appear (it is shown as pending until the instance has booted).

**Connecting to AisSvc.** A connection dialog should be automatically opened when you start ride. If not, select the connection toolbar icon on the left to open a Connection Manager dialog. Select Add Server button on the right side panel. Add the following entries to the dialog:

Server: AisSvcUb8.10

IP Address: 174.129.129.244

Port: 8081

Select OK to close the Add Server dialog. Select the Open Server button on the right side panel or you can expand the entry for this server by selecting the plus on the left of the server entry. Note the messages shown in the status bar at the bottom of the Connection Manager dialog while ride connects to the server in EC2.

You should get a logon dialog. The userID and the password are “admin”. Once you are connected, you can open a remote session, start new contexts, etc. After opening a session, you can close the Connection Manager dialog and begin to use the interface provided to monitor the server operation and to develop your AIS application.

If you encounter a problem, open a remote bash shell. You can check the status of the service and the message logs as noted in Start Service section above.

### Start an NX Client

**Configure.** This section only applies to a development instance that provides a desktop. NXClient must be installed on your local computer. Start a fresh instance of NXClient on your local computer. You should have a logon dialog. Click on the Configure button in the lower left corner. In the Server group, enter the URL of the instance (see “Start An Instance” section above for details). Select Unix and KDE in the Desktop group and select Available Area in the Display area. Click on the Ok button when done.

**Login.** Enter sysadmin as the Login name and enter g0t0.com as the password. Click on the Login button. Click on Yes button if an Authenticity dialog appears. Assuming that the URL is correct and that the AIS development instance is ready, you will have a remote KDE desktop available on your local computer. If it fails, wait a few minutes and try again.

## Data Transfer Options

Only one data transfer option is shown here. However, taking snapshots of EBS volumes (described in the next section) also transfers a collection of files to S3. There are several 3rd party applications that carry out transfers, but they all have significant limitations if a large number of files are to be transferred.

### Upload Files to an Instance

To upload one or more files from your local computer, in a local command window, enter:

pscp –i id\_rsa-gsg-keypair.ppk files… root@ec2-xxx.compute-1.amazonaws.com:/path

Replace xxx with the URL for your particular instance and replace path with the path to the destination in the instance’s file system. The xxx portion of the URL is, in fact, the IP address assigned to the instance. For example, to upload the X.509 certificate to the mnt folder of this AMI instance, enter:

cd \ec2

pscp -i id\_rsa-gsg-keypair.ppk cert-\*.pem root@ec2-xxx.compute-1.amazonaws.com:/mnt

Replace xxx with the URL for your particular instance. Run the command ec2din to get the current URL for your instance. If you get are asked if you trust the host question in response to this command, enter “y”. Note that files uploaded to an instance will not be saved when the instance is terminated!

**Password.** If you are asked for a password, the key was not available or one or more minus signs were not interpreted as an ASCII minus when you pasted from the above line. Retype all the minus signs in the command in the console and re-run the command.

## Elastic Block Storage

Documentation on EBS (Elastic Block Storage) can be found in the Amazon Web Services, Technical Documentation page at <http://aws.amazon.com/documentation/> . Just select the Amazon Elastic Compute Cloud Developer Guide and then navigate to “Introduction to Amazon Elastic Block Store” section of the document. Rather than reproduce this document, an example of the use of EBS is presented.

**EBS Volume.** An EBS Volume is a disk storage area that supports a persistent file system that can be connected to an EC2 instance. The data in the EBS Volume persists even if the instance fails or is terminated. Further, a “snapshot” of an EBS Volume can be saved in S3 (Simple Storage System).

### Creating an EBS Volume

**Create Volume.** To create a 100 Gb. volume in the same zone as our instance, open a command window on your local computer and enter:

ec2-create-volume --size 100 --zone us-east-1a

ec2addvol -s 100 -z us-east-1a

Either command will return a volume ID which will be needed in subsequent commands. To check the existence of the volume, enter:

ec2-describe-volumes vol-6b06e502

ec2dvol vol-6b06e502

Substitute the volume ID returned by the create-volume command for vol-6b06e502.

**Attach Volume.** Assuming that you are currently running an instance as noted in the “Launch a Server Instance” section above, enter the following command in your local command window:

ec2-attach-volume vol-6b06e502 --instance i-a75833ce --device /dev/sdh

ec2attvol vol-6b06e502 -i i-a75833ce -d /dev/sdh

The volume is not visible to the instance as a new file storage device.

### Constructing an EBS File System

In order to use an EBS volume, a file system must be created on the volume. Assuming that the instance is Linux-based, we use a remote bash shell to create a file system and copy files from the instance to the volume. Commands have a # prefix to denote that they are to be entered in a remote bash shell. See the above section named “Start a Remote Shell” for more information on starting a remote bash shell.

**Create File System.** Enter the following command in a remote bash shell to create a file system:

# mkfs –t ext3 /dev/sdh

Depending upon the size of volume, this command may take a while.

Mount the file system on /mnt/ebs using the following two commands:

# mkdir /mnt/ebs

# mount /dev/sdh /mnt/ebs

You can use this mounted file system for all the files that you wish to preserve across multiple instantiations of an AMI in the same manner as any other file system.

### Backup an EBS Volume

Although disks are very reliable, the disk holding this volume can fail; however, the volume can be backed up to S3 using a snapshot. This snapshot can also be used to initialize a newly created volume.

**Snapshots.** We return to the command window on our local computer to perform a snapshot. To create a snapshot of an EBS volume, enter the command:

ec2-create-snapshot vol-6b06e502

ec2addsnap vol-6b06e502

Substitute the volume ID for your volume for vol-6b06e502. This create-snapshot command will return a snapshot ID of the form snap-30b84559. The status will be pending until the backup is completed. You can check the status using:

ec2-describe-snapshots

ec2dsnap

When the backup is completed, the status will change to “completed” and the percentage will change to 100%.

**Detach.** We can detach a volume from an instance. Be sure to unmount the volume before detaching the volume from an instance! From the remote bash shell, enter the command:

# umount –d /dev/sdh

Then, from the command window on your local computer, enter the command:

ec2-detach-volume vol-6b06e502

ec2detvol vol-6b06e502

The EBS volume will remain attached even if the instance is terminated. The volume will be automatically attached when this AMI is restarted.

**Delete.** Finally, a volume can be deleted using the delete-volume command. From a command window on your local computer, enter the command:

ec2-delete-volume vol-6b06e502

ec2delvol vol-6b06e502

A snapshot can also be deleted using a similar command:

ec2-delete-snapshot snap-30b84559

ec2delsnap snap-30b84559