



**IBM WebSphere Application Server v7.0**

**Amazon Machine Image (AMI)**

**Get Started Guide**

09/18/2009

**WebSphere.** software

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# 1. Introduction

## 1.1 Purpose

This document details the deployment instructions for Amazon Machine Images (AMI) for IBM WebSphere Application Server 7.0 under the Amazon Elastic Compute Cloud™ (EC2™) infrastructure.

You can use this AMI to experience an IBM WebSphere Application Server v7.0 instance on Linux® using Amazon EC2. Customized modules in the AMI and steps in this document guide you through the AMI instance configuration. The remainder of this document also includes the steps for building new AMIs based on original AMI instances. You might want to build new AMIs to contain your own custom WebSphere Application Server solutions.

## 1.2 Topics covered

This document focuses on the process of setting up an instance of the AMI. The following topics are covered in detail:

- ▶ Initializing a new instance based on the AMI
  
- ▶ Accessing and managing WebSphere Application Server v7.0
  
- ▶ Building a new AMI based on an instance you customize

## 1.3 Assumptions

This documentation is intended for users who have a general working knowledge of the Linux operating system, Linux commands, and who are able to manipulate input and output. A basic understanding of how to manage WebSphere Application Server is also required. However, you can use links to the product documentation for more detailed information.

## 1.4 AMI contents and configuration

The WebSphere Application Server v7.0 AMI is a preinstalled and preconfigured instance of the product. Instances created based on these AMIs are ready to use. The product configuration includes:

- An [application server](#) profile registered to an [administrative agent](#)

•**Security enabled:** WebSphere Application Server security is enabled, with the virtuser user ID serving as the WebSphere Application Server administrator ID. During the initialization of the AMI, you are required to set the password for the virtuser ID.

•**Default Application:** WebSphere Application Server is preconfigured with the default application. The default application is accessible via `http://<public host name>:9080/snoop`.

## 2. Initializing a new instance of the AMI

The following sections outline prerequisite information and steps for creating a new instance of an AMI. Details of how to use the Amazon Web Services (AWS) tools to access AWS, set up an account, and create AMI instances are not provided here. Refer to the [Getting Started Guide on the AWS Web site](#) to become familiar with this process.

### 2.1 Amazon Instance Information

#### 2.1.1 Instance sizes

Amazon EC2 provides the flexibility to choose from a number of different instance types to meet your computing needs. Each instance provides a predictable amount of dedicated compute capacity and is charged per instance for each hour you use.

Typical deployments of IBM WebSphere Application Server v7.0 require at least a High-CPU Medium instance to have access to enough physical memory and computing power. A small instance type is sufficient for development, single-user purposes only.

AMIs for IBM WebSphere Application Server are running with a 32-bit version of SuSE Linux Enterprise Server operating system. Therefore, only 32-bit instance types can be used. For more information on instance types and pricing, visit the [Amazon EC2 Web site](#).

#### 2.1.2 Security groups

The security group you define and use when creating new instances must have additional ports authorized for WebSphere Application Server. Ensure you have the following ports authorized:

Port number	Description
-------------	-------------

24000	Default HTTP administrative port for the IBM WebSphere Application Server <a href="#">administrative agent</a> instance
24001	Default secured HTTP administrative port for the IBM WebSphere Application Server <a href="#">administrative agent</a> instance
24003	SOAP port for the IBM WebSphere Application Server <a href="#">administrative agent</a> instance
9080	Default HTTP port for the WebSphere <a href="#">Application Server</a> instance
9060	Default HTTP administrative port for the WebSphere <a href="#">Application Server</a> instance

You must use [Amazon Command Line Tools](#) to open ports 9060, 9080, 24000, 24001, and 24003.

Use the following example command to open port 9060:

```
ec2-authorize default -p 9060
```

Depending on your needs, WebSphere Application Server v7.0 has other ports that you might need to open. For example, port 8880 is the application server's SOAP port that you must open if you want to remotely deploy an application from IBM Rational® Application Developer. Read about [port settings](#) to determine which ports your WebSphere Application Server v7.0 is using.

## 2.2 Accessing the AMI instance

### 2.2.1 Console access

The AMI is configured to allow secure shell (SSH) access with automatic root user authentication, using a secure RSA private key specified at instance creation. Save the RSA private key to a local file that can be used as input to SSH.

For Linux SSH users, the key file is provided on the command line using the `-i` parameter; for example:

```
ssh -i <location_of_rsa_key_file> <instance public address>
```

**Important:** *Your RSA key file must have `chmod 600` permissions.*

For Putty users, [Amazon has documentation on how to configure Putty with the public key for automatic authentication.](#)

Amazon also has a [video that demonstrates how to set up Putty](#).

File transfer is allowed using secure FTP (SFTP), along with the secure key used for SSH access.

**Important:** If you initially try to access the instance with something other than secure shell (ssh), the instance might immediately terminate, since the license agreements displayed through the secure shell have not been accepted yet.

*Only SSH access using the secure key is allowed.*

## **2.3 Booting the AMI instance**

When an AMI instance is first booted and accessed over SSH, you are prompted to accept the license agreements of software components that are pre-installed on the AMI. After agreeing to the license agreements you are prompted to enter the virtuser password to configure WebSphere global security. After entering the virtuser password your WebSphere Application Server v7.0 environment is configured and starts.

### **2.3.1 Configuration modules sequence**

When an AMI instance is started for the first time, you go through the following interactive configuration steps in sequence, before the system is ready to use:

1. Pre-installed operating system and software license agreement screens
2. Password configuration screens
3. Activation confirmation screen

A description of each interactive step is listed in the following sub-sections.

### **2.3.2 Pre-installed operating system and software license agreement screens**

When an AMI instance boots for the first time, the first step is to go through the license agreement screens. These license agreement screens will be displayed on the initial ssh session for the AMI. This is to ensure that the user has accepted all required operating system and license agreements of pre-installed software components before using the instance. You must agree to all the licenses shown; otherwise, the instance terminates.

## License Agreements

---

Please read the following license agreement text carefully. You can use the "Page Down" key to scroll down to read the full message. Press ENTER to continue ...

< OK >

SUSE Linux Enterprise Server provided and licenced directly to you by Novell. Their website is novell.com.

< **h** accept > < Abort >

Novell SLES10 License Agreement

^ (+)  
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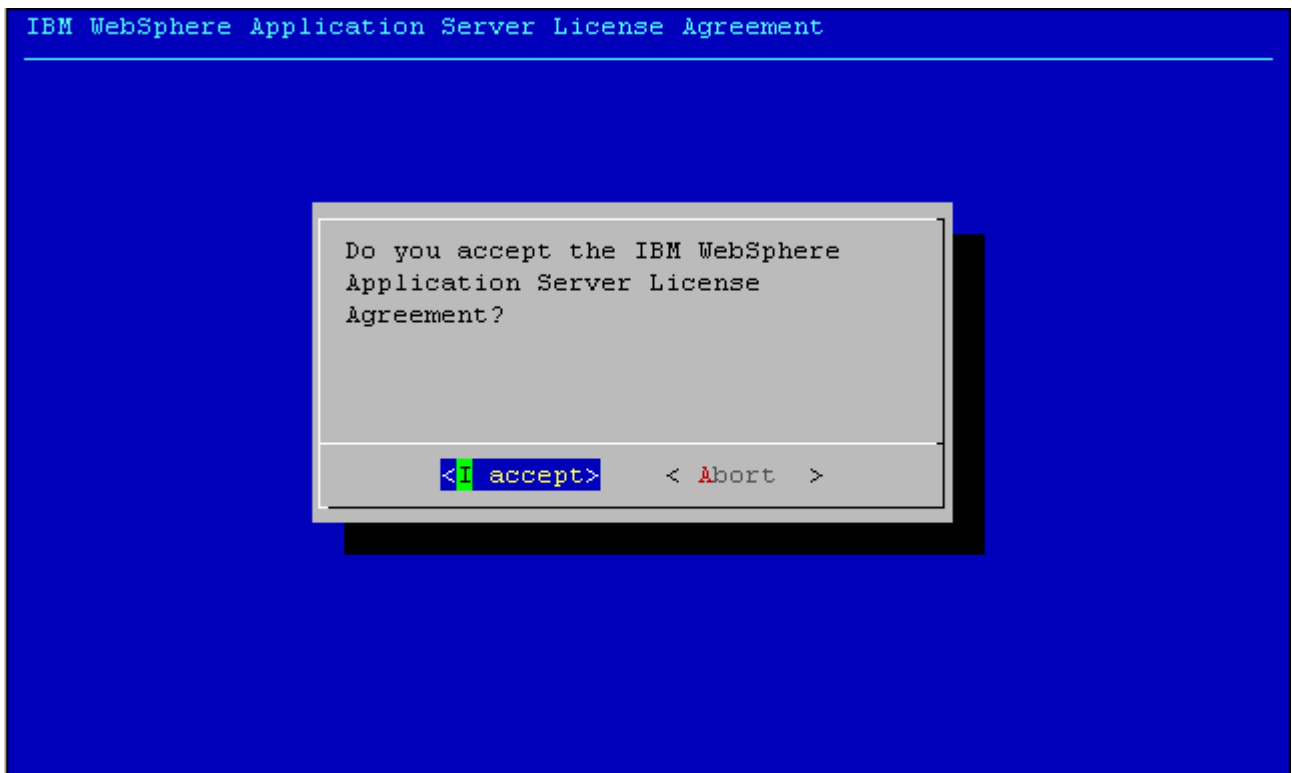
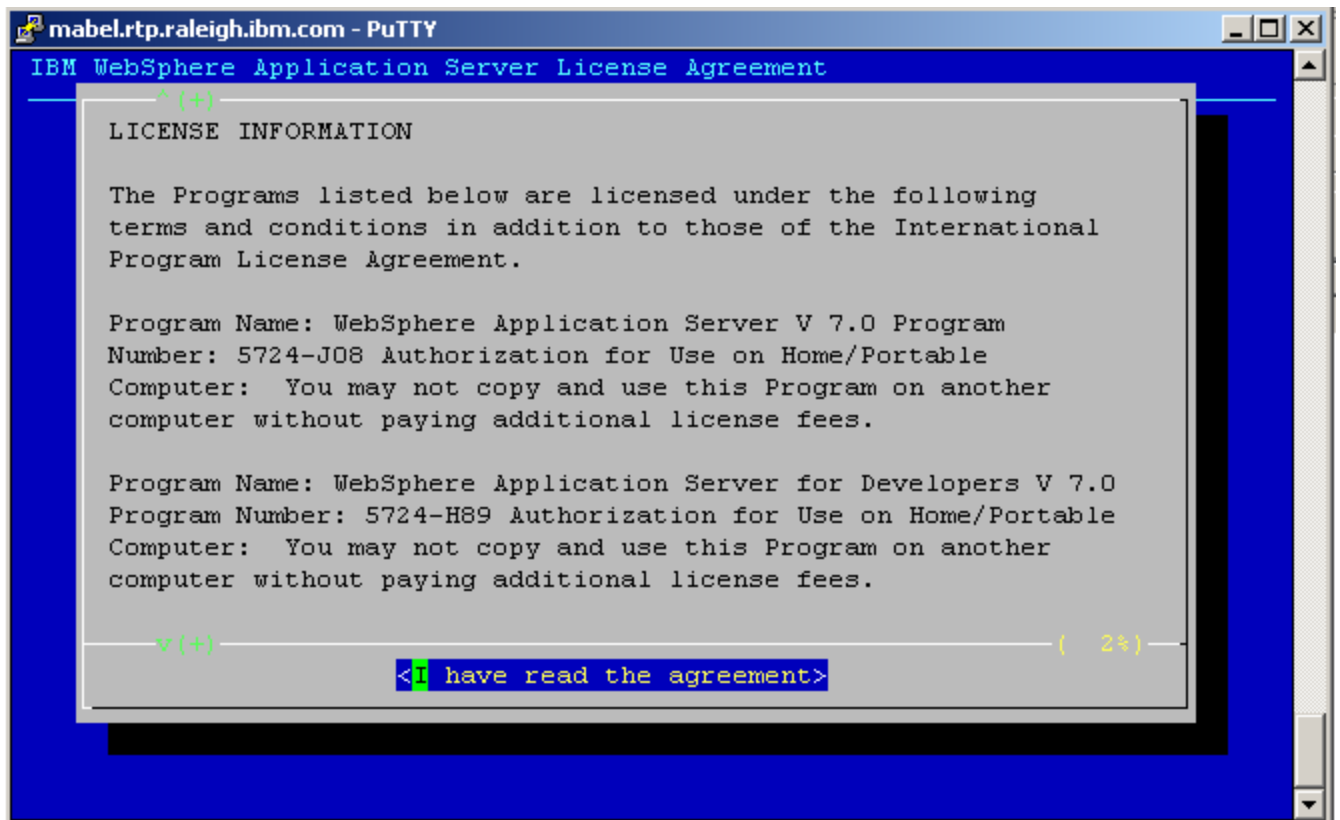
( 5\*)

<i have read the agreement>

Novell SLES10 License Agreement

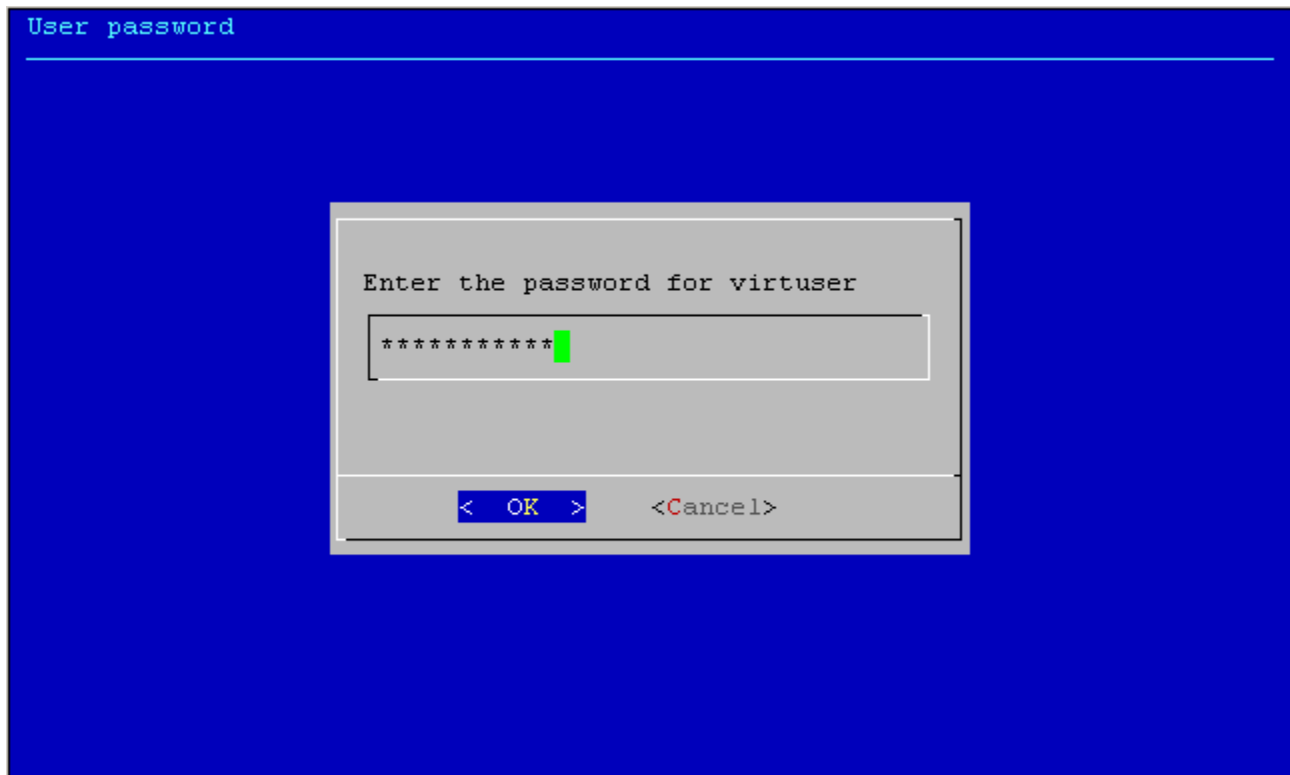
Do you accept the Novell SLES10  
License Agreement?

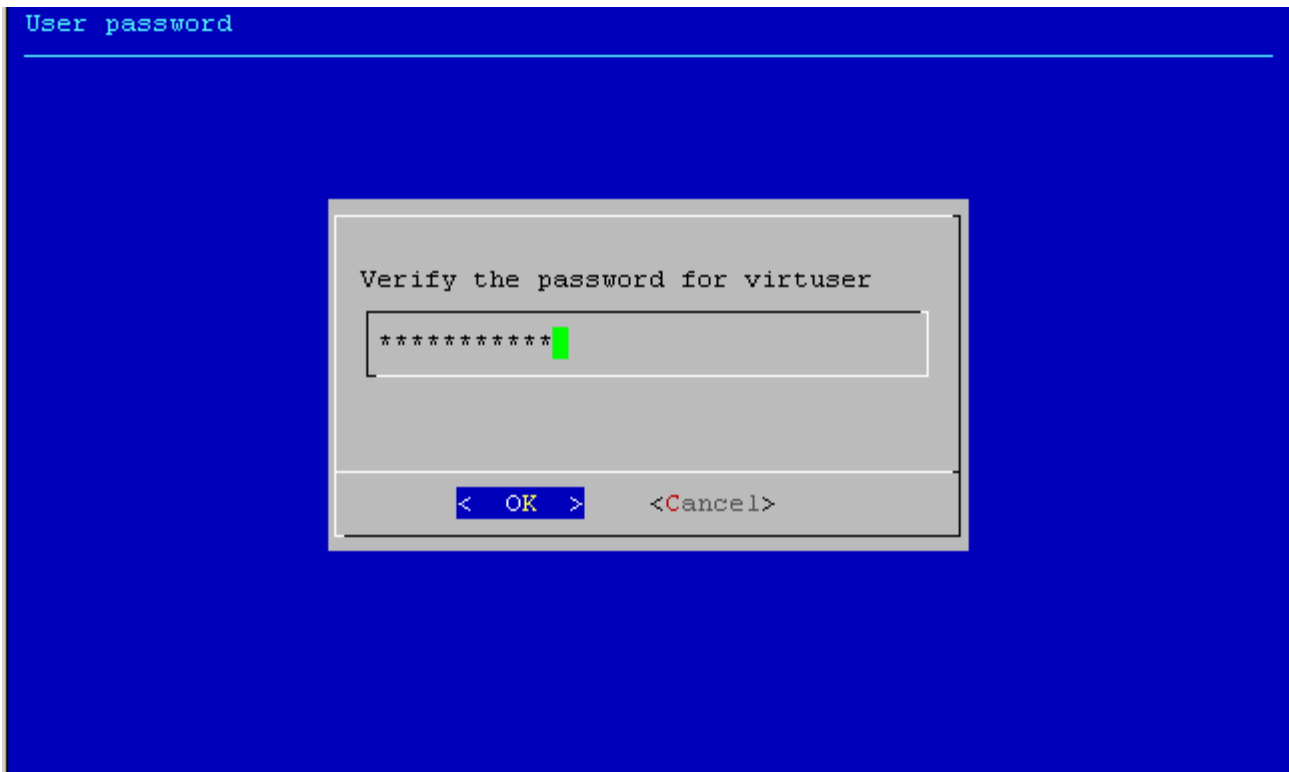
<i accept> < Abort >



### 2.3.3 User password configuration screens

The next set of screens require you to set the passwords for the virtuser user, which is the WebSphere Application Server administrative user. Use virtuser to log in to the WebSphere Application Server [administration console](#). This user is an operating system user and virtuser is the WebSphere administrative user stored within the file-based [Federated Repository](#).





### 2.3.4 Activation confirmation

After you enter the virtuser password, your IBM WebSphere Application Server v7.0 AMI environment is configured and starts. The AMI is ready for use when the “Instance ready for use...” message is displayed.

```
Updating profile. Please wait.....  
Wed Jun 10 21:05:00 EDT 2009
```

```
registered.  
ADMU8036I: Registering the node with an AdminAgent.  
ADMU8042I: Node has been successfully registered.  
ADMU8040I: The administrative agent is initializing the administrative  
subsystem for the registered node.  
ADMU8014I: The administrative subsystem for registered node has been  
successfully initialized.  
ADMU8041I: The administrative agent is starting the administrative subsystem  
for the registered node.  
ADMU8015I: The administrative subsystem for registered node has been  
successfully started.  
ADMU8012I: Application Server with path  
/opt/IBM/WebSphere/AppServer/profiles/AppSrv01 has been successfully  
registered.  
ADMU0116I: Tool information is being logged in file  
/opt/IBM/WebSphere/AppServer/profiles/AppSrv01/logs/server1/startServ  
er.log  
ADMU0128I: Starting tool with the AppSrv01 profile  
ADMU3100I: Reading configuration for server: server1  
ADMU3200I: Server launched. Waiting for initialization status.  
ADMU3000I: Server server1 open for e-business; process id is 3570  
Wed Jun 10 21:12:11 EDT 2009  
Instance ready for use...  
domU-12-31-39-03-36-05:~ #
```

The IBM WebSphere Application Server v7.0 AMI is now ready for use. Both the administrative agent and the application server are started by default. Use the following URL to access the administrative console:

<http://<ec2-public-server-name>:24000/ibm/console>

### 3. Working with an AMI instance

Now that you have instantiated an instance of an AMI for WebSphere Application Server v7.0, you can begin using the system. For more information on how to administer, customize, and develop applications, refer to the [WebSphere Application Server online product documentation](#).

#### 3.1 File system locations

Item	Location
WebSphere Application Server v7.0	/opt/IBM/WebSphere/AppServer
<a href="#">Administrative agent</a> profile	/opt/IBM/WebSphere/AppServer/profiles/AdminAgent01
<a href="#">Application server</a> profile	/opt/IBM/WebSphere/AppServer/profiles/AppSrv01
<a href="#">Update Installer</a>	/opt/IBM/WebSphere/AppServer/UpdateInstaller

#### 3.2 Starting and stopping WebSphere Application Server

Use the administrative console (<http://<ec2-public-server-name>:24000/ibm/console>) or the [startServer.sh](#) and [stopServer.sh](#) shell scripts, respectively, to start and stop the application server profile.

Open a secure shell session:

- To start the application server profile, enter:
  - `/opt/IBM/WebSphere/AppServer/profiles/AppSrv01/bin/startServer.sh server1`
- To stop the application server profile, enter:
  - `/opt/IBM/WebSphere/AppServer/profiles/AppSrv01/bin/stopServer.sh server1 -user virtuser -password <password>`
- To start the [administrative agent](#) profile, enter:
  - `/opt/IBM/WebSphere/AppServer/profiles/AdminAgent01/bin/startServer.sh adminagent`
- To stop the [administrative agent](#) profile, enter:
  - `/opt/IBM/WebSphere/AppServer/profiles/AdminAgent01/bin/stopServer.sh adminagent -user virtuser -password <password>`

**Important:** With the stopServer.sh script, you must specify the administrative user, virtuser, and password, which were provided in the password configuration panels during initial setup of this instance.

### 3.3 User accounts

As previously mentioned, the virtuser user ID is the WebSphere Application Server administration ID that you use to log into WebSphere Application Server as the administrator. This ID is stored in a file-based [Federated Repository](#) so that the account password can be set up during instance initialization.

## 4. Servicing instances

WebSphere Application Server v7.0 can be serviced on the AMI instance just like any other native installation of this software. Corrective service packages, such as interim fixes, which address a particular product issue, or fix packs, which are regular, cumulative roll-ups of interim fixes into a single installable unit, are available to be downloaded from [IBM Support for WebSphere Application Server v7.0](#).

From this site, you can search using problem symptoms and receive information on technotes, redbooks, and fixes that might address your problem.

Fix pack and interim fix installations require the use of the Update Installer, which is embedded in the AMI at /opt/IBM/WebSphere/AppServer/UpdateInstaller. For instructions on how to use Update Installer, refer to the [Update Installer documentation](#).

## 5. Repackaging the AMI

After customizing an instance of an AMI for WebSphere Application Server v7.0 with custom applications in the default application server and administrative agent profiles, you might want to build a new AMI based on existing AMI instances. The EC2 tools are already installed and configured on your instance; therefore, complete the following instructions to prepare and upload a new AMI.

1. Run the /root/waslicense/resetami.sh command.
2. Enter in the WebSphere Application Server global security password for virtuser.

The AMI for WebSphere Application Server v7.0 attempts to reset your AMI to its initial state while preserving the current state of the administrative agent and application server profiles. After the reset is complete, the next ssh login triggers the default AMI activation sequence documented in Section [2.3 Booting the AMI instance](#).

```
ip-10-244-46-112:~ # /root/waslicense/resetami.sh
```

User password

Enter the password for virtuser

\*\*\*\*\*

< OK >

<Cancel>

User password

Verify the password for virtuser

\*\*\*\*\*

< OK >    <Cancel>

Stopping the admin agent...

ADMU0116I: Tool information is being logged in file  
/opt/IBM/WebSphere/AppServer/profiles/AdminAgent01/logs/adminagent/st  
ADMU0128I: Starting tool with the AdminAgent01 profile  
ADMU3100I: Reading configuration for server: adminagent  
ADMU3201I: Server stop request issued. Waiting for stop status.  
ADMU4000I: Server adminagent stop completed.

Stopping the app server...

ADMU0116I: Tool information is being logged in file  
/opt/IBM/WebSphere/AppServer/profiles/AppSrv01/logs/server1/stopServe  
ADMU0128I: Starting tool with the AppSrv01 profile  
ADMU3100I: Reading configuration for server: server1  
ADMU3201I: Server stop request issued. Waiting for stop status.  
ADMU4000I: Server server1 stop completed.

Resetting the security files...

Starting the admin agent...

ADMU0116I: Tool information is being logged in file  
/opt/IBM/WebSphere/AppServer/profiles/AdminAgent01/logs/adminagent/st  
ADMU0128I: Starting tool with the AdminAgent01 profile  
ADMU3100I: Reading configuration for server: adminagent  
ADMU3200I: Server launched. Waiting for initialization status.  
ADMU3000I: Server adminagent open for e-business; process id is 4311

```

ADMU8045I: Node has been successfully deregistered.
ADMU8043I: The administrative agent is stopping the administrative subsystem
for the deregistered node.
ADMU8016I: The administrative subsystem for deregistered node has been
successfully stopped.
ADMU8044I: The administrative agent is destroying the administrative subsystem
for the deregistered node.
ADMU8017I: The administrative subsystem for deregistered node has been
successfully destroyed.
ADMU8013I: Application Server with path
/opt/IBM/WebSphere/AppServer/profiles/AppSrv01 has been successfully
deregistered.
Stopping the admin agent...
ADMU0116I: Tool information is being logged in file
/opt/IBM/WebSphere/AppServer/profiles/AdminAgent01/logs/adminagent/st
opServer.log
ADMU0128I: Starting tool with the AdminAgent01 profile
ADMU3100I: Reading configuration for server: adminagent
ADMU3201I: Server stop request issued. Waiting for stop status.
ADMU4000I: Server adminagent stop completed.

Removing the lock file...
Reset complete...
domU-12-31-39-00-DD-E4:~/waslicense # █

```

3. Specify the location of your private key and certificate files for the -k and -c parameters; for example:

```
ec2-bundle-vol -k /mnt/pk.pem -c /mnt/cert.pem -u <AWS_ID> -pami_v1 -d /mnt/ec2
```

- a. Provide your 12-digit AWS ID in place of <AWS\_ID>.
  - b. Specify a meaningful package name for the new AMI, instead of ami\_v1.
4. Place the new bundle in the /mnt directory, which has enough space to support the new image. The example places the package in the /mnt/ec2 directory, which is a directory you must create.

For more information on this command, refer to the Amazon documentation: <http://docs.amazonwebservices.com/AWSEC2/latest/DeveloperGuide/CLTRG-ami-bundle-vol.html>.

5. Upload the bundle. This requires a storage bucket. Buckets help you organize all of your AMIs. If the bucket you specify does not exist, it will be created for you; for example:

```
ec2-upload-bundle -b ami_bucket -m /mnt/ec2/ami_v1.manifest.xml -a <AWS_access_key> -s <AWS_secret_access_key> --retry
```

- a. Specify the bucket to use instead of `ami_bucket`. Also specify the bundle's manifest file and location instead of `/mnt/ec2/ami_v1.manifest.xml`
- b. Provide your AWS access and secret access keys for the `-a` and `-s` parameters, which can be obtained from **Your Account > Access Identifiers** after logging into Amazon Web Services (<http://aws.amazon.com/>).
- c. Lastly, the `-retry` option ensures the upload continues where it left off if there was a network error.

## What to do next

Register your new AMI. Again, you need your private key and certificate files for this operation.

1. Enter the following command:  

```
cd /root/ec2/bin  
./ec2-register -K /mnt/pk.pem -C /mnt/cert.pem ami_bucket/ami_v1.manifest.xml
```
2. Instead of `ami_bucket/ami_v1.manifest.xml`, specify the bucket and manifest name that you used during upload.

After registration, you are now ready to create instances based on your new AMI.

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