How to launch an Amazon Web Service (AWS) server for the 2019 ISMRM educational session

Overview

This document shows how participants in the ISMRM educational session can launch an Amazon Web Service (AWS) server with the provided Amazon Machine Image (AMI) for each demo. Participants will be able to run the demos out-of-the-box without installing any software.

We will show how to launch an AWS server (called an EC2 instance), choose an ISMRM AMI, and login to the instance.

This document is based on the Deep Learning tutorial at the ISMRM Machine Learning Workshop 2018 by Peter Chang: <u>https://github.com/peterchang77/dl_tutorial</u>.

Table of Content

Overview	1
Table of Content	1
1) Register for an AWS account	2
2) Create an EC2 instance	3
2.1) Update the AWS EC2 region	4
2.2) Create a new EC2 instance	4
2.3) Choose the AMI for the ISMRM demo you want to try	5
2.4) Configure the instance	5
2.5) Create a key pair	6
3) Connect to the instance	7
3.1a) Connect to a Linux instance via SSH	7
3.1b) Connect to a Windows instance via Remote Desktop Connection	8

1) Register for an AWS account

To start, please sign up for an AWS account from: <u>https://portal.aws.amazon.com/billing/</u> <u>signup#/start</u>

Create an AWS account
Email address
Password
Confirm password
AWS account name
Continue
Sign in to an existing AWS account
© 2018 Amazon Web Services, Inc. or its affiliates. All rights reserved. Privacy Policy Terms of Use

2) Create an EC2 instance

After logging in you will arrive at a launch page of various AWS services. To navigate to the EC2 dashboard, click on the **Services** dropdown menu in the top left hand corner of the banner. You should now have a screen that looks like this:



Click on the **EC2** link under the first **Compute** header within the first column. You have now arrived at the EC2 console (dashboard):



2.1) Update the AWS EC2 region

To ensure that you can access the ISMRM AMIs, make sure you are in region **US West** (**Oregon**). You can choose the region of service by changing the context in the top right hand corner of the banner:



2.2) Create a new EC2 instance

To create an EC2 instance, log into the EC2 console (see instructions above) to begin creating a new EC2 instance. Click the **Instances** link on the left hand toolbar and subsequently click on the blue **Launch Instance** button.



2.3) Choose the AMI for the ISMRM demo you want to try

First, pick a software demo you want to try from <u>https://www.ismrm.org/19/program_files/</u> <u>WE21.htm</u>. Then click "Community AMIs" on the left panel, search for "ismrm" in the search bar, and select the appropriate AMI for that demo. Click the blue "Select" to proceed.

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

Step 1: Choose an Amazon Machine Image (AMI)

Cancel and Exit

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. You can select an AMI provided by AWS, our user community, or the AWS Marketplace; or you can select one of your own AMIs.

Q. ismrm				×
Quick Start (0)				$ \langle \langle 1 \text{ to 5 of 5 AMIs} \rangle \rangle $
My AMIs (2)		۵	ismrm-bart-demo-draft-2019-04-30 - ami-02888517c6c824a12	Select
AWS Marketplace	(1)		ISMRM BART Demi Draft Root device type: ebs Virtualization type: hvm ENA Enabled: Yes	64-bit (x86)
Community AMIs (5	5)		ismrm-sigpy-demo-demo - ami-0388162d9845299f1	Select
Operating system Amazon Linux	Û	0	This is part of the demo for demoing SigPy in ISMRM Root device type: ebs Virtualization type: hvm ENA Enabled: Yes	64-bit (x86)
Cent OS Debian Fedora Gentoo	* C 3 3	۵	ismrm-rf-tools-demo - ami-04cecadecc149b722 ISMRM RF Tools Demo Root device type: ebs Virtualization type: hvm ENA Enabled: Yes	Select 64-bit (x86)
Other Linux Red Hat SUSE Linux Ubuntu		۵	ismrm-gropt-demo - ami-066c0fff3d7d65956 ISMRM Educational demo of GrOpt Root device type: ebs Virtualization type: hvm ENA Enabled: Yes	Select 64-bit (x86)

2.4) Configure the instance

For the second step, we need to choose the EC2 instance type. Unless you are asked to choose a more powerful machine, you should use the free tier instance **t2.micro**.

Step 2: Choose an Instance Type

Amazon EC2 provides a wide selection of instance types optimized to fit different use cases. Instances are virtual servers that can run application of CPU, memory, storage, and networking capacity, and give you the flexibility to choose the appropriate mix of resources for your applications how they can meet your computing needs.

Filter	All instance types	Current	generation 💌	Show/Hide Colum	ns				
Curr	Currently selected: t2.micro (Variable ECUs, 1 vCPUs, 2.5 GHz, Intel Xeon Family, 1 GiB memory, EBS only)								
	Family •	Туре –	vCPUs () -	Memory (GiB) 👻	Instance Storage (GB) (i)	EBS-Optimized Available (i)			
	General purpose	t2.nano	1	0.5	EBS only	-			
	General purpose	t2.micro Free tier eligible	1	1	EBS only	-			

On the top set of links, click on **Review** to see a summary of the EC2 settings. Click on the bottom right hand **Launch** button.

Instance Details	Edit instance details
► Storage	Edit storage
▶ Tags	Edit tags
	Cancel Previous Launch

2.5) Create a key pair

The final step is to create a key pair to remotely connect to your EC2 instance. To do so type in a key pair name (for example: default) and click **Download Key Pair**. It is important to remember the name and location of this downloaded key. If you lose this key you will be unable to access the EC2 instance. A recommended strategy to store AWS key pairs is to place it in a hidden folder easily accessible from your home folder (~/.aws). After downloading and saving the SSH key, click Launch Instance to complete the EC2 creation process.

Select	an existing key pair or create a new key pair \times						
A key pair consists of a public key that AWS stores, and a private key file that you store. Together, they allow you to connect to your instance securely. For Windows AMIs, the private key file is required to obtain the password used to log into your instance. For Linux AMIs, the private key file allows you to securely SSH into your instance.							
Note: The about rem	selected key pair will be added to the set of keys authorized for this instance. Learn more noving existing key pairs from a public AMI.						
Create	e a new key pair 🗘						
Key p	air name						
defau	Download Key Pair						
	You have to download the private key file (*.pem file) before you can continue. Store it in a secure and accessible location. You will not be able to download the file again after it's created.						
	Cancel Launch Instances						

Note that some OS's may automatically append a *.txt to the end of your *.pem file when downloading. If so, please rename it. Also change the permissions on the SSH key to not be publicly viewable (otherwise SSH client will not accept the key):

chmod 400 ~/.aws/default.pem

3) Connect to the instance

There are separate instructions on connecting to Linux and Windows instances. If demos based on Linux, please go though 3.1a. For Windows, please go through 3.2b.

3.1a) Connect to a Linux instance via SSH

Instructions to ssh to the Linux instance can be found by selecting a particular EC2 instance (blue check box to the left of the instance name) and clicking the **Connect** button.

aw	S Services ~ Resource Groups ~ 🕻 🗘 pohang @ hadleytab ~ Oregon ~ Supp	ort 🕶
EC2 Das Events	nboard Launch Instance V Connect Actions V Q 😋 📀	¢
Tags	Q Filter by tags and attributes or search by keyword	32 >
Reports Limits	Connect To Your Instance X	ks
INSTANC	I would like to connect with OA standalone SSH client A Java SSH Client directly from my browser (Java required)	cs
Spot Re	To access your instance:	(S
Dedicate	 Open an SSH client, (ind out now to connect using Pull 11) Locate your private key file (peter-default.pem). The wizard automatically detects the key you used to launch the instance. 	
Schedul	3. Your key must not be publicly viewable for SSH to work. Use this command if needed:	
IMAGES	chmod 400 peter-default.pem	
AMIs	4. Connect to your instance using its Public DNS:	
Bundle *	ec2-35-160-231-250.us-west-2.compute.amazonaws.com	
ELASTIC Volumes	Example:	чэ
Snapsho	ssh -i "peter-default.pem" ubuntu@ec2-35-160-231-250.us-west-Z.compute.amazonaws.com	(s
	Please note that in most cases the username above will be correct, however please ensure that you read your AMI usage	cs
Security	instructions to ensure that the AMI owner has not changed the default AMI username.	
Elastic II Placeme	Be careful here to use the full path name of your *.pem file. If you are following along the tutorial and used the same naming conventions, your file will be located in <i>",</i> aws/default.pem". Otherwise make sure you recall where the file was downloaded to and write out it's full oath name here.	
Key Pair		
Network	Close	

SSH to the instance the ssh key:

ssh -i "/path/to/your/pem/file" ubuntu@[ec2-public-dns]

Note the you should replace **[ec2-public-dns]** with your EC2 instances public DNS. In the above screenshot this would be **ec2-35-160-231-250.us-west-2.compute.amazonaws.com**. Assuming that your SSH key is located at **~/.aws/default.pem** (if you followed the instructions per EC2 creation above) then the full command would be:

```
ssh -i "~/.aws/default.pem" ubuntu@c2-35-160-231-250.us-
west-2.compute.amazonaws.com
```

You should now be successfully logged into your remote SSH session.

For demos with graphic interfaces, please add the -Y flag to enable X11:

```
ssh -i "/path/to/your/pem/file" -Y ubuntu@[ec2-public-dns]
```

For demos with Jupiter notebook, please add the -L 127.0.0.1:8888:127.0.0.1:8888 flag to enable port tunneling (so that you can open the notebook in your local browser):

ssh -i "/path/to/your/pem/file" -L 127.0.0.1:8888:127.0.0.1:8888
ubuntu@[ec2-public-dns]

● ● ●					
Warning: No xauth data; using fake authentication data for X11 forwarding. Welcome to Ubuntu 16.04.2 LTS (GNU/Linux 4.4.0-1022-aws x86_64)					
<pre>* Documentation: https://help.ubuntu.com * Management: https://landscape.canonical.com * Support: https://ubuntu.com/advantage</pre>					
Get cloud support with Ubuntu Advantage Cloud Guest: http://www.ubuntu.com/business/services/cloud					
90 packages can be updated. 0 updates are security updates.					
*** System restart required *** Last login: Thu Mar 1 08:25:30 2018 from 128.218.42.49 ubuntu@ip-10-0-255-251:~\$					

3.1b) Connect to a Windows instance via Remote Desktop Connection

To connect to a Windows EC2 instance, Windows and Mac users can use **Remote Desktop Connection.** This should be installed by default on Windows machines. For macOS, it can be downloaded from the App Store: <u>https://itunes.apple.com/us/app/microsoft-remote-</u> <u>desktop-10/id1295203466</u> And for Ubuntu, you can use Remmina, which is included in the distribution.

Instructions to connect to the Windows instance can be found by selecting a particular EC2 instance (blue check box to the left of the instance name) and clicking the **Connect** button.

	aws	Services	 Resource Groups 	×	۶			\$	Frank Ong	× (
	EC2 Dashboard Events		Launch Instance 🔻	Conr	nect	Actions Y				
	Tags		Q Filter by tags and attrib	utes o	r searc	h by keyword				0
	Reports		Namo – In	etance	ID	 Instance Type 	Availability Zono -	Ineta	- atate	State
	Limits			otariot		- moranee type	Availability 2016	motal	ilee State -	Jan
	INSTANCES		Connect To Yo	ur Ir	nsta	nce			×	
1	Launch Templates		You can connect to you	ur Wind	i swot	nstance using a remote de	sktop client of your choi	ce, an	d by	
	Spot Requests		downloading and runni	ng the	RDP :	shortcut file below:				2
	Reserved Instance	s			I.	Download Remote Deskt	op File			> 2
	Dedicated Hosts		When promoted coops	et to s	our in	stance using the following	dataile.			
	Scheduled Instanc	es	Public	DNS	ec2-	34-222-149-31.us-west-2.	compute.amazonaws.co	m		
	Capacity Reservati	ions	User r	ame	Admi	inistrator				
	IMAGES		Pass	word	Ge	t Password				
	AMIs		If you've joined your ins	stance	to a d	irectory, you can use your	directory credentials to a	conne	ct to your	
	Bundle Tasks		instance.		nnoot	ing to your instance, place	a see our connection do	-	atation	
Ξ	ELASTIC BLOCK STO	DRE	ir you need any assista	nce co	rinect	ing to your instance, pleas	e see our connection do	cume	ntation.	
	Volumes									m
	Snapshots								Close	
	Lifecycle Manager									_

Click the **Download Remote Desktop file** to download a *.rdp file. Then click **Get Password** to get to the next page:

Connect To Your Instance > Get Password	×
The following Key Pair was associated with this instance when it was created.	
Key Name aws-ec2.pem	
In order to retrieve your password you will need to specify the path of this Key Pair on your local machine:	
Key Pair Path Choose File no file selected	
Or you can copy and paste the contents of the Key Pair below:	
Decrypt Passwor	d
Back Close	

Click **Choose File** and select the *.pem Key pair you created in Step 2. Then click **Decrypt Password** and the password will be shown.

Open the *.rdp file you downloaded with the remote connection software, and then enter the password:

000	ec2-34-222-149-31.	us-west-2.compute.amazonaws.com - ec2-34-22	2-149								
Conne	Enter your user ac		-34-222-								
_	This user account will be used to connect to										
PC).											
	Username:	Administrator									
	Password:										
		Cancel Continue									

You should now be successfully logged into your remote Windows machine.

	Ruccarea, ICO MARC 11/1998. Inclana ID: - (CN-6-64181000014a) Palara IP: Address, 24:223-2341.21 Inclana Iost 12:34120 Inclana Iost 12:34120 And Managare JAMBIA Deal Managare JAMBIA Version Electromarca: Lon to Moderate
а ра 6 m	