CLOUD PRIMER

Connect to an AWS EC2 Instance Windows & PuTTY

Includes moving files into and out of an EC2 Instance

When you have created and launched an AWS Linux EC2 instance, you can connect to it from your computer using the Secure Shell (SSH) protocol. PuTTY is a free SSH client that allows you to do this from a local computer running Windows. Once the connection has been established, you work within the EC2 instance just like you would on a local computer running Linux.

To follow this tutorial, you will first need to create and launch a Linux EC2 instance to which you will connect. Instructions for this are found in the tutorial titled, *Create a Basic Elastic Cloud Compute (EC2) Instance*.

You must have an AWS account. If you have one, click <u>HERE</u> to sign into it.

Generate a PuTTY Private Key (.ppk) file

1. Download and install PuTTY. https://www.chiark.greenend.org.uk/~sgtatham/putty/latest.html

2. Open the folder in which PuTTY was installed (default path is C: > Program Files > PuTTY).

3. Double click on the file **puttygen.exe.**

The first thing you will see is shown in Figure 4.1.

🕜 PuTT	Y Key Generator				?	\times
ile <u>K</u> ey	Con <u>v</u> ersions	<u>H</u> elp				
Key No key						
Actions Genera	te a public/private	key pair			Generate	
Load a	n existing private k	ey file			<u>L</u> oad	\supset
Save th	e generated key		Save	p <u>u</u> blic key	<u>S</u> ave private k	ey
Parame	ters					
Type of <u>R</u> S/	key to generate: <u>D</u> S/		A	○ ED <u>2</u> 5519) SSH- <u>1</u> (F	ISA)
Numbe	of <u>b</u> its in a genera	ted key:			2048	

Figure 4.1.

Cloud technology is evolving so fast that it is likely that some details in the primer may no longer match reality when you are trying to use it. If you find mismatches (e.g. broken third-party links), please send them to support@earthdata.gov so that we can feed them into the next release of the primer.Cab ipsum, quia consed unda am, sam doluptas nem vid maionsed ut aliquia ssinctotae pra es maiorro ribus.



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- 4. Click on the **Load** button in PuTTY Key Generator (Figure 4.1) and navigate to the folder that contains the private key file *(.pem)* created during the EC2 configuration process.
- 5. Click on the **PuTTY Private Key Files** button in the lower right corner of the window (Figure 4.2) and select *All Files* (*.*).

😴 Load private key:				×
\leftrightarrow \rightarrow \checkmark \bigstar This PC \Rightarrow Documents \Rightarrow AWS \Rightarrow p	orivate keys	ٽ ~	Search private keys	Q
Organize 👻 New folder			822 -	
Stropbox ^ Name	Date modified	Type Size		
🝊 OneDrive	No items match	h your search.		
💻 This PC				
Desktop				
Documents				
🖶 Downloads				
Music				
E Pictures				
📲 Videos				
Lindows (C:)				
Seagate Backup				
🕳 Google Drive File				
🛫 usoshare (\\137.				
Seagate Backup P				
File <u>n</u> ame:		~	PuTTY Private Key Files	(*.ppk) 🗸
			PuTTY Private Key Files All Files (*.*)	(* ppk)

6. Click the box next to your private key file (.pem) to select it (Figure 4.3).

😴 Load private key:				×
\leftrightarrow \rightarrow \checkmark \uparrow \bullet This PC \Rightarrow Documents \Rightarrow AWS	> private keys	ڻ ×	Search private keys	م ر
Organize 👻 New folder				
Stephone And	Date modified	Type Size		
a OneDrive	No items ma	tch your search.		
💻 This PC				
Desktop				
Documents				
🖶 Downloads				
👌 Music				
Pictures				
🚪 Videos				
L Windows (C:)				
Seagate Backup				
🕳 Google Drive File				
🛫 usoshare (\\137.				
Seagate Backup P				
File <u>n</u> ame:		~	PuTTY Private Key Files	(*.ppk) 🗸
			PuTTY Private Key Files	(* ppk)
		•	All Files (*:*)	

Figure 4.3.

- 7. Click on Open.
- 8. Click **OK** to close the *PuTTYgen Notice* pop-up window

9. In PuTTY Key Generator, make sure Type of key to generate value is set to RSA (Figure 4.4).

le <u>K</u> ey Con <u>v</u> ersio	ns <u>H</u> elp	PuTTYgen Notice	
Key Public key for pasting ssh-rsa AAAAB3NzaC1yc2E/ oD3tnRDU2I/4Ra6ar +ZX6gKjtX\tweOIBW H6hul4B040//xAGC	into OpenSSH authorized_keys file: AAADAQABAAABAQCNvv9A7jx67Kr3IShsFIERgBAAhxmeqszyd x 83zPnEArXYgGyAsVa3AkXJdeVnHCgwME5gZOI7urKyGoOZ2b v	Successfully imported foreign (OpenSSH SSH-2 private key (c To use this key with PuTTY, oo use the "Save private key" com save it in PuTTY's own format.	key Jid PEM format)). u need to imand to
Key fingerprint:	ssh-rsa 2048 aa:01:76:92:a4:2d:44:45:42:c0:bf:07:d3:dd:7d:07		ОК
Key comment:	imported-openssh-key		
Key passphrase:			
Confirm passphrase:			
Actions Generate a public/priv Load an existing prival Save the generated k	e key fale <u>L</u> oad ey Save p <u>u</u> blic key S ave private key	PuTTYgen Warning Are you sure you want t without a passphrase to	o save this key protect it?
Parameters Type of key to genera (•) <u>R</u> SA	te: ∑SA ○ ECDSA ○ ED25519 ○ SSH-1 (RSA)	Yes	<u>N</u> o

Figure 4.4.

10. Click Save private key.

- 11. Click Yes to close the *PuTTYgen Warning* pop-up window.
- 12. Navigate to the location you want to store your PuTTY Private Key file (.ppk) (Figure 4.5)

😴 Save private key as:					×
\leftrightarrow \rightarrow \checkmark \bigstar This PC \Rightarrow Documents \Rightarrow AWS \Rightarrow prive	vate keys		~ ⊘	Search private keys	م
Organize 🔻 New folder					= • ?
 Pictures Name Google Drive Google Drive Google Drive AWS GMTSSAR Downloads november 2017 private keys Dropbox OneDrive This PC Desktop Documents 	Date modified No items m	Type atch your search.	Size		
File <u>n</u> ame: esf_tutorial_keypair	>				~
Save as type: PuTTY Private Key Files (*.ppk)					~
∧ Hide Folders			(Save	Cancel

Figure 4.5.

- 13. Give the file a name.
- 14. Click Save.
- 15. Close the PuTTY Key Generator window.

Once you have generated a private key, you can use it whenever you need to connect to a new EC2 instance.

Connect to the EC2 instance

- 1. Click on the desktop icon or the **putty.exe** file in the PuTTY folder to open PuTTY.
- 2. Type **ubuntu@your_public_DNS** in the *Host Name (or IP address)* box (Figure 4.6).

🕵 PuTTY Configuration		?	\times
Image: Session Image: Serial	Basic options for your PuTTY see Specify the destination you want to conner Host <u>Name (or IP address)</u> Ubuntu@ec2-34-235-152-101.computes Connection type:	? estion ect to Port 22 - O Ser - O Ser - Delete Delete	×
<u>A</u> bout <u>H</u> elp	<u>O</u> pen	<u>C</u> ance	I

Figure 4.6.

The **Public DNS** for your instance is displayed in AWS in the *EC2 Management Console Instance Description* in the middle of the screen.

- 3. Set the Port to **22.**
- 4. Set the Connection Type to **SSH**.

5. Click on the + next to **SSH** to expand the choices in the *Category* pane on the left of the PuTTY Configuration window under *Connection* (Figure 4.7).



Figure 4.7.

- 6. Click **Browse** under *Authentication parameters* and navigate to the directory where your *PuTTY Private Key (.ppk)* file is located and select it.
- 7. Click Open.

If you want to save these settings to use later, navigate to **Sessions** in the PuTTY *Category* tree. Enter a name in the **Saved Sessions** box and click **Save** on the right.

8. Click **Open** in *PuTTY Configuration* to connect to your Instance.

If this is the first time you have connected to your Instance, a *PuTTY Security Alert* will ask you whether to proceed with the connection (Figure 4.8).

9. Click Yes to complete the connection.



Figure 4.8

The EC2 instance window will appear (Figure 4.9).



Figure 4.9

To view files and directories in a Linux (Ubuntu) instance, use the ls (list) and cd (change directory) commands.

Move files into & out of an AWS EC2 Instance - Windows

You can transfer files into and out of a Linux EC2 instance from a local computer running Windows by either of these methods:

1. Windows Secure Copy (WinSCP): WinSCP provides a graphical interface (GUI) that allows you to drag and drop files between your local computer and your AWS instance. This is similar to using Windows File Explorer.

2. PuTTY Secure Copy: PuTTY Secure Copy is run from the Windows Command Prompt.

Using an EC2 instance to process/analyze data requires that you move the files to be processed to the instance, and then remove the resulting products before the instance is terminated.

Find Your EC2 Instance Public DNS

1. Open the AWS "Instances" window in the EC2 Management Console (Figure 4.10).

The **Public DNS** of your EC2 instance displayed in this window will be used in the next two sections.

👼 🖉 🎁 EC2 Management Conso	x 👔 Connecting to Your Linux X
← → C ☆ 🔒 Secure ht	
aws Services	s 🗸 Resource Groups 🗸 🖈 🗘 hauer_testing 🗸 N. Virginia 🛪 Support 🗸
EC2 Dashboard	Launch Instance Connect Actions >
Tags	Q. Filter by tags and attributes or search by keyword
Reports Limits	Name - Instance ID - Instance Type - Availability Zone - Instance State - Status Checks - Alarm Status Public DNS (IPv4)
INSTANCES	📒 asf-insar-turorial i-0374e10baed8d17 m4.xlarge us-east-1c 🥥 running Ø 2/2 checks None 🍃 ec2-52-90-232-201.co
Instances	
Spot Requests	
Reserved Instances	4 000 P
Scheduled Instances	Instance: 🛛 i-0374e10baed8d17e2 (asf-insar-turorial) 🖉 Public DNS: ec2-52-90-232-201.compute-1.amazonaws.com
Dedicated Hosts	Description Status Checks Monitoring Tags
MIS	Instance ID i-0374e10baed8d17e2 Public DNS (IPv4) ec2-52-90-232-201 compute- 1 amazonaws com

Figure 4.10

Transferring Files Using WinSCP

- 1. Download WinSCP. <u>https://winscp.net/eng/download.php</u>
- 2. Click on **Installation package** (Figure 4.11) and then use the default installation options.

C C B Secure https://winscp.net/eng/download.php	
VinSCP Z A Construction SSH Client SFIP Client FIP Client Download Install Donate Documentation ides FAQ, Scripting .NET&CON Ubrary Screenshots Translations Support Forum Tracker History	
WinSCP Downloads	
[Download WinSCP] [WinSCP Release Notification] [Download PuTTY]	Search
Advarticamente	Google Custom Search
	What is WinSCP?
ManageEngine ServiceDesk Plus ERES Software Download WinSCP	It is award-winning SFTP client, SCP client, FTPS cli and FTP client integrated in one software program for file transfer to FTP server or sec. SFTP server, [More]
WinSCP 5.11.2	And it's free!
Installation package (9.0 MB; 656,668 downloads to date)	Released: 2017-10-10 Donate
Portable executables (7.2 Mb, 85,372 downloads to date)	PayPal
NET assembly / COM library (7.2 MB; 2,533 downloads to date)	VISA 🔤 550 mm
Source code (11.9 MB; 2,180 downloads to date)	\$9 \$19 \$49 \$99
[Release Notes, Checksums] [What's New] [Release Notifications]	About donations
Advertisements	Recommend
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Figure 4.11

- 3. Click on the Desktop icon to start WinSCP.
- 4. Click on **New Site** (Figure 4.12).

🌆 Login	- 🗆 X
New Site Dilhauer @gwa bilhauer @gwd bilhauer @sftp.gportal.jaxa.jp gima@gwa	Session Ele protocol: SFTP Host name: Port number: ec2-34-207-60-45.compute-1.amazonaws.com 22 User name: Password: Ubuntu Save Advanced
Tools ▼ Manage ▼	Login 🔽 Close Help

Figure 4.12

- 5. Enter the Public DNS displayed in your EC2 Management Console Instances window into the Host Name box.
- 6. Type **ubuntu** in the **User name** boxs.
- 7. Select the Advanced dropdown menu and, under Sessions, select Advanced.
- 8. Click on Authentication under SSH (Figure 4.13).

Advanced Site Settings		?	Х
Environment Directories Recycle bin SFTP Shell Connection Proxy Tunnel SSH Key exchange Authentication Bugs Note	□ Bypass authentication entirely Authentication options □ □ Attempt authentication using Pageant □ Attempt tkeyboard-interactive' authentication □ Respond with password to the first prompt □ Attempt TIS or CryptoCard authentication (SSH-1) Authentication parameters □ □ Allow agent forwarding Private key file: C: \Users\wehauer\Documents\AWS\private keys\asf_tutorial_ GSSAPI ○ □ Attempt GSSAPI authentication □ Allow GSSAPI gredential delegation	keypair	
<u>C</u> olor v	OK Cancel	He	p

Figure 4.13

9. Click on the 😶 button under **Private key file** and navigate to the folder where your PuTTY Private Key (.ppk) file is located and select it.

Instructions for creating a PuTTY Private Key (.ppk) file can be found in the tutorial titled *Connect to an AWS EC2 Instance – Windows & PuTTY*.

10. Click on the **OK** button to close the *Advanced Site Settings* window.

If you want to save your settings to use again later, click on the **Save** button in the WinSCP *Login* window (Figure 4.14). A pop-up window will appear where you can name the settings.

11. Click the **Login** button.

Login	-	
 New Site billhauer@gwa billhauer@gwd billhauer@gwd billhauer@sftp.gportal.jaxa.jp gima@gwa 	Session Eile protocol: SFTP Host name: ec2-34-207-60-45.compute-1.amazonaws.com	Po <u>r</u> t number: 22 ♥
	Ubuntu	<u>d</u> vanced ▼
<u>T</u> ools ▼ <u>M</u> anage	▼ Login ▼ Close	Help

- Figure 4.14
- 12. The first time you connect to your instance, you will be asked about connecting to an unknown server. Click the **Yes** button to continue (Figure 4.15).

Warning	? ×		
	Continue connecting to an unknown server and add its host key to a cache?		
	The server's host key was not found in the cache. You have no guarantee that the server is the computer you think it is.		
	The server's ssh-ed25519 key fingerprint is: ssh-ed25519 256 0c:5c:81:c2:f4:04:a5:24:a4:88:3c:2b:96:1a:58:29		
	If you trust this host, press Yes. To connect without adding host key to the cache, press No. To abandon the connection press Cancel.		
	Yes No Cancel Copy Key Help		
	Figure 4.15		

NOTE: If you stop your EC2 instance and restart it, a new Public DNS will be assigned. You will need to copy and paste this into the WinSCP Host name box before you can connect.

After you have connected, the left pane of the window will display the file contents of your computer and the right pane displays the contents of your EC2 instance (Figure 4.16).

🏂 ubuntu - ubuntu@ec2-34	4-207-60-45	.compute-1.amazon	aws.com - WinSCP				- 0	×
Local Mark Files Comma	nds <u>S</u> essio	n Options Remote	Help					
🖶 🚝 🕞 Synchronize	🖬 🥜 🗔	🛛 🚳 🚔 Queue	Transfer Settings Defa	ult	• 🦪 •			
ubuntu@ec2-34-207-60-	45 compute		No. Service					
ubuntu@ec2-34-207-00-	45.compute	- namazonaws.com				A		
C: Windows Y 20 10 10 10 10 10 10 10 10 10 10 10 10 10				ubuntu				
Name	Size	Туре	Changed	^	Name	Size	Changed	
		Parent directory	10/16/2017 11:42:34 AM		1		10/11/2017 5:01:37 F	M
.android		File folder	10/4/2016 3:40:39 PM		SLC		11/2/2017 1:12:11 PI	M
.dbvis		File folder	9/20/2016 9:11:26 AM		bash_history	0 KB	11/2/2017 1:12:33 PI	M
.gimp-2.6		File folder	9/20/2016 9:11:27 AM		config.s1a.txt	4 KB	10/12/2017 1:56:24 F	M
.gissjava		File folder	9/20/2016 9:11:27 AM		GNU_License.txt	37 KB	11/2/2017 12:29:12 F	M
idl		File folder	9/20/2016 9:11:27 AM		Instructions_GMT5SAR_Cloud_Data_Recipe_v1.1.bxt	20 KB	11/2/2017 10:50:07 4	AM
.matplotlib		File folder	11/3/2017 10:19:34 AM		ORBITS.tar	6,099,71	2/3/2015 11:22:13 AI	м
.oracle_jre_usage		File folder	1/30/2017 9:14:15 AM		rocS1GMT5SAR.py	14 KB	10/12/2017 1:55:49 F	M
.qgis2		File folder	11/3/2017 10:19:27 AM					
.QtWebEngineProcess		File folder	7/14/2016 2:57:55 PM					
.snap		File folder	8/16/2017 11:26:52 AM					
splunk		File folder	1/13/2017 11:48:42 AM					
.thumbnails		File folder	9/20/2016 9:11:52 AM					
Calibre Library		File folder	9/20/2016 9:49:59 AM					
Contacts		File folder	10/16/2017 11:42:49 AM					
Desktop		System Folder	10/25/2017 12:06:19 PM					
Documents		System Folder	10/17/2017 1:47:27 PM					
Downloads		System Folder	11/8/2017 10:11:25 AM					
Dropbox		File folder	10/27/2017 3:45:02 PM					
eolisa		File folder	1/2/2017 5:12:03 PM					
Favorites		File folder	10/16/2017 11:42:49 AM					
Soogle Drive		File folder	10/16/2017 1:48:19 PM					
DLWorkspace71		File folder	9/20/2016 10:26:07 AM	~	<			
B of 80.9 KB in 0 of 36			191	hidden	0 B of 5.81 GB in 0 of 7		1	1 hidd
						A 55	TD-3 1 0-3	24.37

Figure 4.16

13. Drag and drop files from your computer into your EC2 instance to process. When processing is complete, drag and drop the products from EC2 to your computer.

Important: Files must be transferred from your EC2 instance to your computer before you terminate the instance! When you transfer files, a copy of the files will be left on the instance. These will be deleted when the instance is terminated.

Transferring Files Using PuTTY Secure Copy (SCP)

Windows 10 Users

1.Click on the **Start** button **f** at the extreme left of the Taskbar (Figure 4.17).



Figure 4.17

- 2. Scroll down the list of Apps to the Windows System folder.
- 3. Select Command Prompt.

You can also click the **Start** button and type cmd; then select **Command Prompt** from the search results. In either case, the *Command Prompt* window will open (Figure 4.18).

Command Prompt	-	×
Vicrosoft Windows (Version 10.0.15063)		^
(c) 2017 Microsoft Corporation. Hil rights reserved.		
C:\Users\wehauer>		

Figure 4.18

Windows 7 users

- 1. Click on the **Start** button 🔗 at the left of the Taskbar.
- 2. Type cmd in the Search programs and files box (Figure 4.19).



Figure 4.19

3. Select Command Prompt from the search results.

The Command Prompt window will open as in Figure 4.18 above.

When using PSCP to transfer files between your computer and your EC2 instance, your *PuTTY Private Key (.ppk)* file must be in the folder you are working in, or you must provide a <u>path</u> in the PSCP command to the folder in which the file is located.

For example, if *AWSkey.ppk* file is stored in a folder named *keys*, include the path C:\Users\username\keys\AWSkey.ppk in the PSCP command.

Move a file into your EC2 instance

1. At the Windows command prompt, type (notice where spaces are placed):

C:\> pscp -i yourkey.ppk yourfilename ubuntu@public_DNS:/home/ubuntu/

- 2. Move your *awskey.ppk* file to your *Downloads* folder using Windows File Explorer or provide a path to the folder in which your .ppk file is located.
- 3. Navigate to your *Downloads* folder using the <u>change directory</u> (cd) command at the Windows command prompt.

C:\Users\username>cd Downloads

and press Enter.

4. Type the PSCP command, which includes your *.ppk* filename (and path if necessary), the name of the file you want to transfer, the *Public DNS* of your EC2 instance, and the path to a folder in your instance: (Figure 4.20).

C:\> pscp -i awskey.ppk S1A_EW_GRD.zip ubuntu@ec2-52-89-147-172.us-east-2.compute.amazonaws.

```
com:/home/ubuntu/

Command Prompt

Command Pro
```

Figure 4.20

C:\> pscp -i C:\<path>\yourkey.ppk C:\<path>\yourfilename ubuntu@public_DNS:/home/ubuntu

Command syntax: brackets <> indicate optional <u>paths</u> to your *.ppk* file and the file you want to move *if they are not in the folder you are in*

Move a file out of your EC2 instance

1. At the Windows command prompt, type:

C:\> pscp -i yourkey.ppk ubuntu@publicDNS:/home/ubuntu/yourfilename C:\[local_destination_path]\[folder]

Example: Move a product generated from an application out of your EC2 instance PRODUCT directory to the Data folder on your Windows computer.

2. Use Windows File Explorer to move a copy of my *awskey.ppk* file to your *Data* folder or provide a path to the folder in which your .ppk file is located.

NOTE: If you don't include a local destination path and folder in the command, the file will download into the folder the command is run from. In this case, the command syntax would be:

C:\> pscp -i C:\[path]\yourkey.ppk ubuntu@publicDNS:/home/ubuntu/[folder]/filename

3. At the Windows command prompt, navigate to your *Data* folder using the <u>change directory</u> (cd) command:

C:\> cd Data

And press Enter.

4. At the command prompt, type the PSCP command, which includes your *.ppk* filename, the Public DNS of your EC2 instance, and the name of the file you want to transfer.

C:\> pscp -i C:\[path]\yourkey.ppk ubuntu@public_DNS:/home/ubuntu/[path]/yourfilename C:\[local_destination_path]

C:\> pscp -i awskey.ppk ubuntu@ec2-52-89-147-172.us-east-2.compute.amazonaws.com:/home/ubuntu/PRODUCT/F2_unw_phase.tif C:\data_files

Important: Files must be transferred from your EC2 instance to your computer before you terminate the instance or they will be deleted!