

# Setup Guide of AWS F1 Instance

Xilinx XUP Intern

Zheyuan Fan

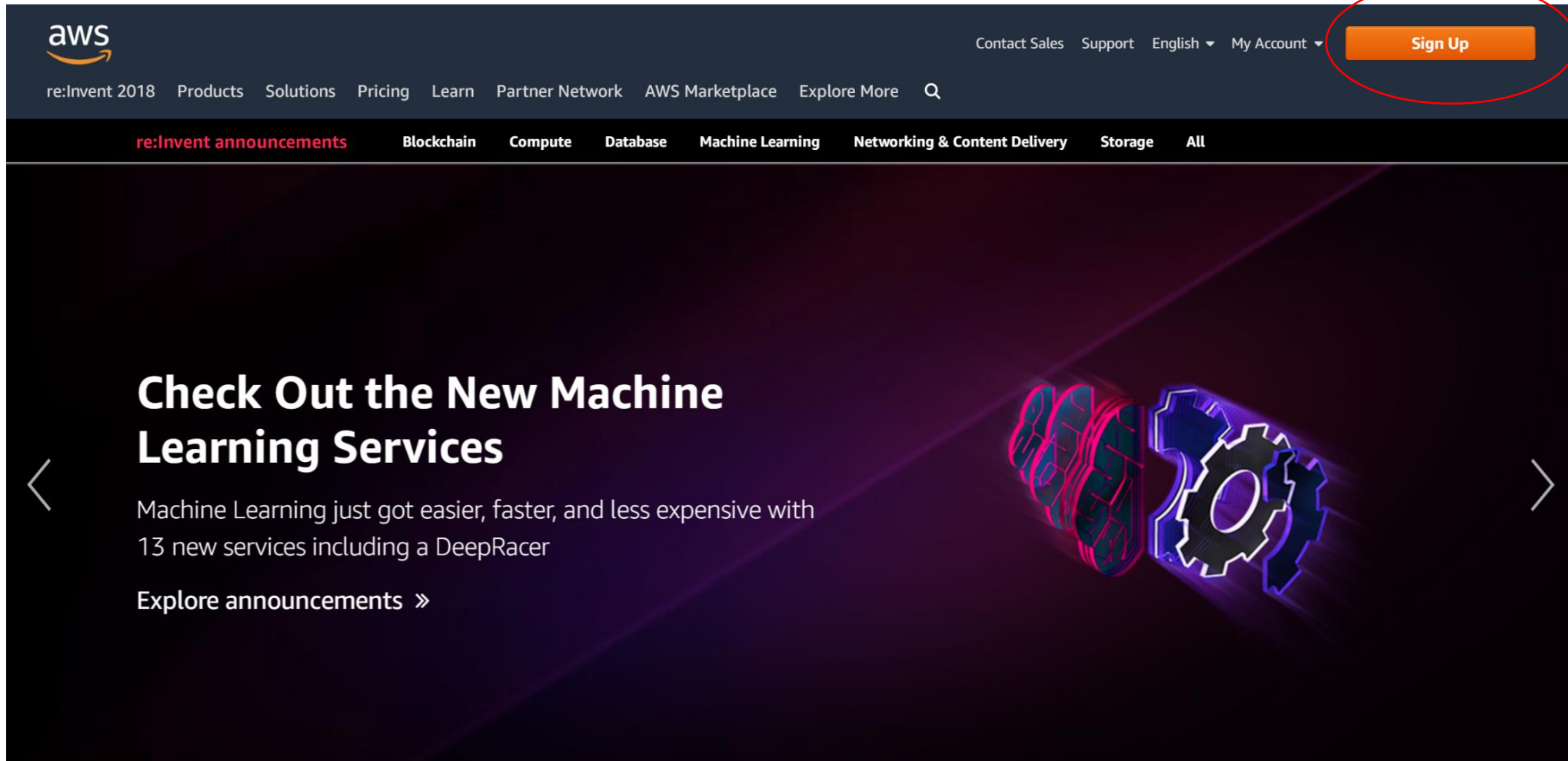
zheyuanf@xilinx.com

# Outline

- AWS Account Registration
- AWS Educate Registration
- Launch an F1 Instance
- Create an S3 bucket
- Connect to the Instance

# AWS Account Registration

aws.amazon.com



The image shows the top portion of the AWS website. The header is dark blue with the AWS logo on the left. On the right, there are links for 'Contact Sales', 'Support', 'English' (with a dropdown arrow), and 'My Account' (with a dropdown arrow). A prominent orange 'Sign Up' button is circled in red. Below the header is a navigation bar with links: 're:Invent 2018', 'Products', 'Solutions', 'Pricing', 'Learn', 'Partner Network', 'AWS Marketplace', 'Explore More', and a search icon. Below this is a secondary navigation bar with categories: 're:Invent announcements' (in red), 'Blockchain', 'Compute', 'Database', 'Machine Learning', 'Networking & Content Delivery', 'Storage', and 'All'. The main content area features a dark purple background with a glowing graphic of server racks and gears. A large heading reads 'Check Out the New Machine Learning Services'. Below it, text states 'Machine Learning just got easier, faster, and less expensive with 13 new services including a DeepRacer'. At the bottom of the banner, there is a link 'Explore announcements »' and navigation arrows on either side.

aws

Contact Sales Support English ▼ My Account ▼ **Sign Up**

re:Invent 2018 Products Solutions Pricing Learn Partner Network AWS Marketplace Explore More 🔍


re:Invent announcements Blockchain Compute Database Machine Learning Networking & Content Delivery Storage All

## Check Out the New Machine Learning Services

Machine Learning just got easier, faster, and less expensive with 13 new services including a DeepRacer

[Explore announcements »](#)

# AWS Account Registration

English ▾

## Contact Information

*All fields are required.*

Please select the account type and complete the fields below with your contact details.

Account type ⓘ

☐ Professional ☒ Personal

Full name

Phone number

Country/Region

China ▾


Address

Street, P.O. Box, Company Name, c/o

Apartment, suite, unit, building, floor, etc.

City

# AWS Account Registration

English ▾

## Payment Information

Please type your payment information so we can verify your identity. We will not charge you unless your usage exceeds the [AWS Free Tier Limits](#). Review [frequently asked questions](#) for more information.

Credit/Debit card number

Expiration date  
 ▾  ▾

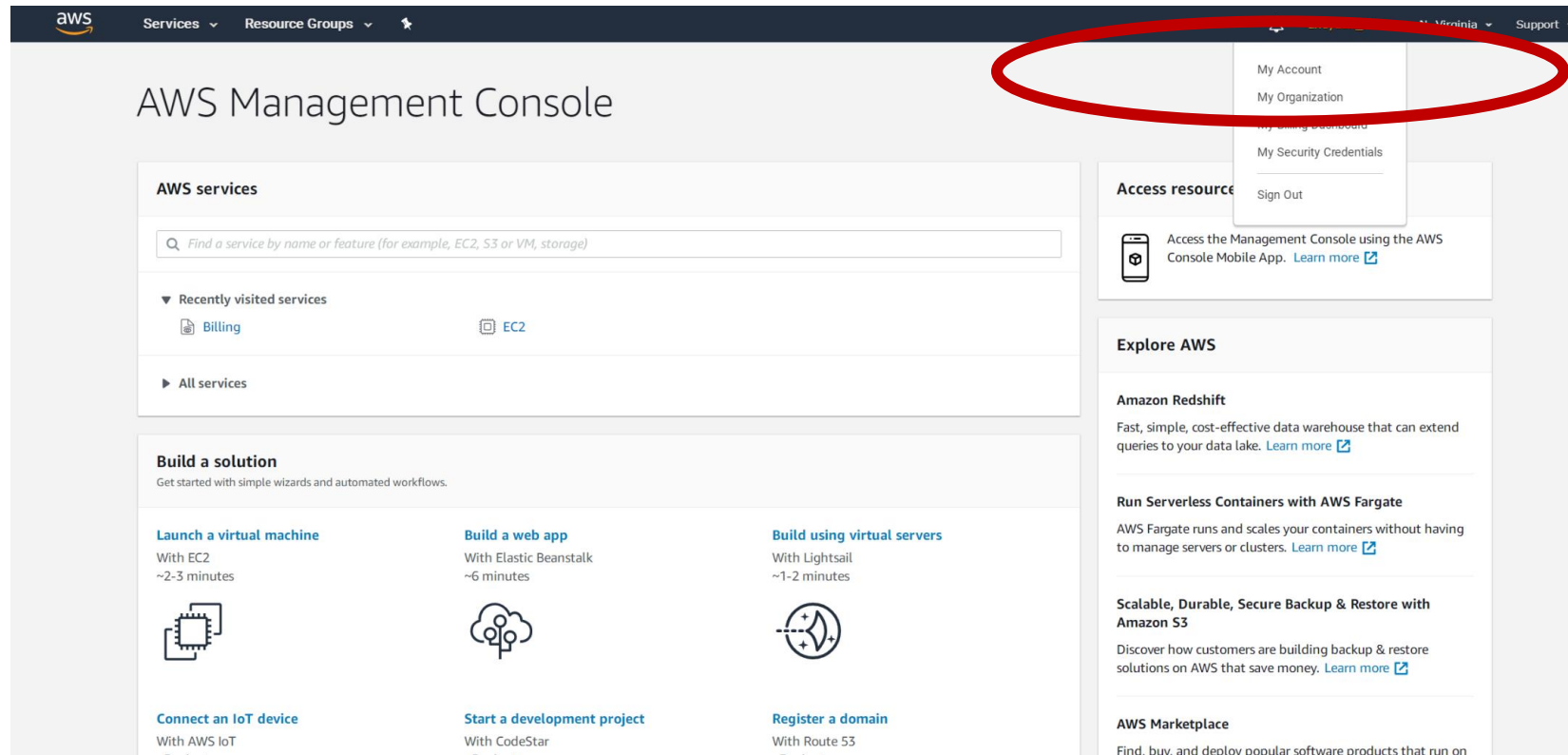
Cardholder's name

Billing address  
☒ Use my contact address  
**xilinx, No.601, Puruan Building, Pudong  
Shanghai Shanghai 201000  
CN**  
☐ Use a new address

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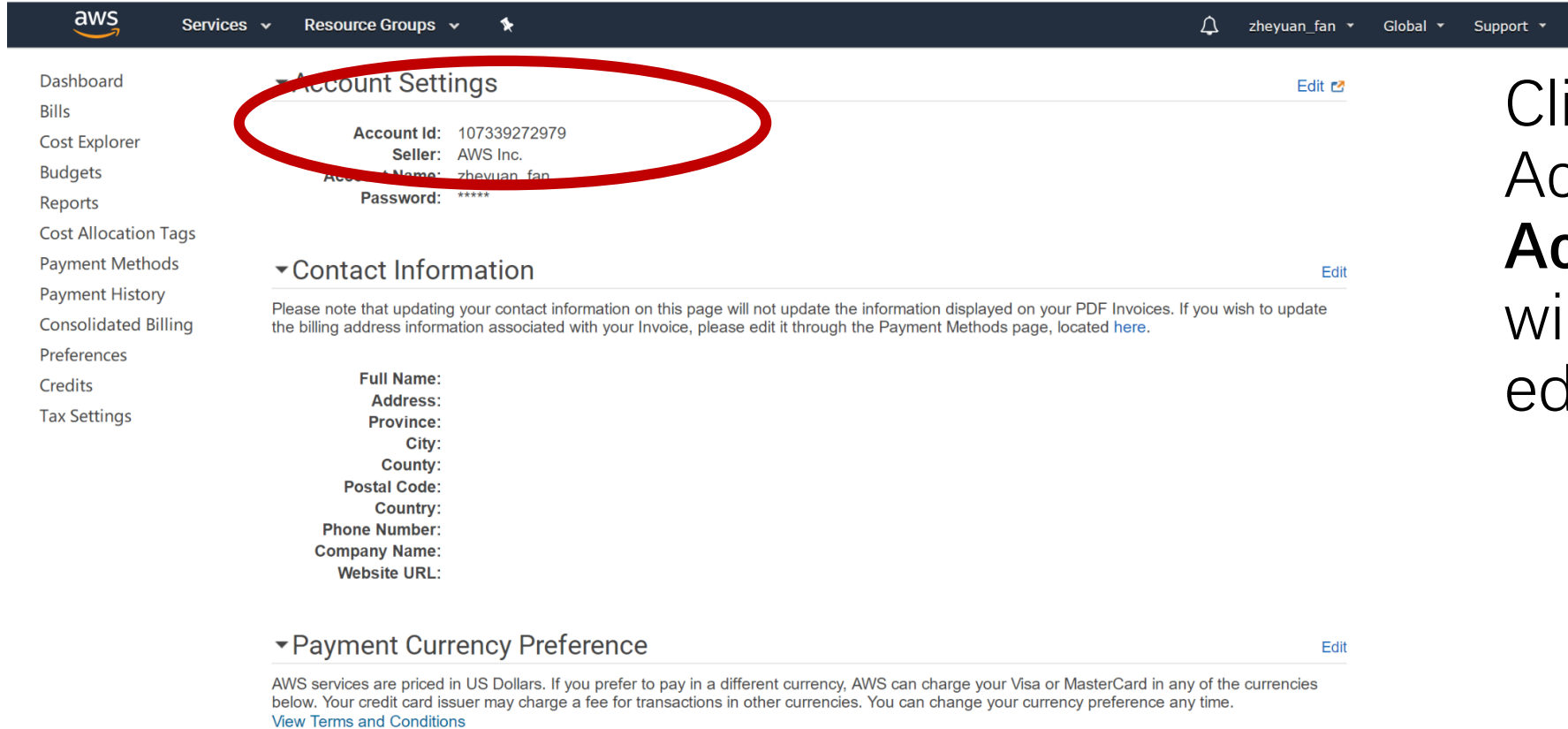
\*Mention that here needs Visa/Mastercard card

# AWS Account Registration



Click on the 'My Account', copy the **Account ID** which will be used for the educate registration.

# AWS Account Registration



The screenshot shows the AWS Account Settings page. The top navigation bar includes the AWS logo, 'Services', 'Resource Groups', a star icon, a notification bell, the user 'zheyuan\_fan', 'Global', and 'Support'. The left sidebar lists various AWS management tools. The main content area is divided into three sections: 'Account Settings', 'Contact Information', and 'Payment Currency Preference'. The 'Account Settings' section is circled in red and contains the following information:

Field	Value
Account Id	107339272979
Seller	AWS Inc.
Account Name	zheyuan_fan
Password	*****

The 'Contact Information' section includes a disclaimer and a list of fields for contact details:

Please note that updating your contact information on this page will not update the information displayed on your PDF Invoices. If you wish to update the billing address information associated with your Invoice, please edit it through the Payment Methods page, located [here](#).

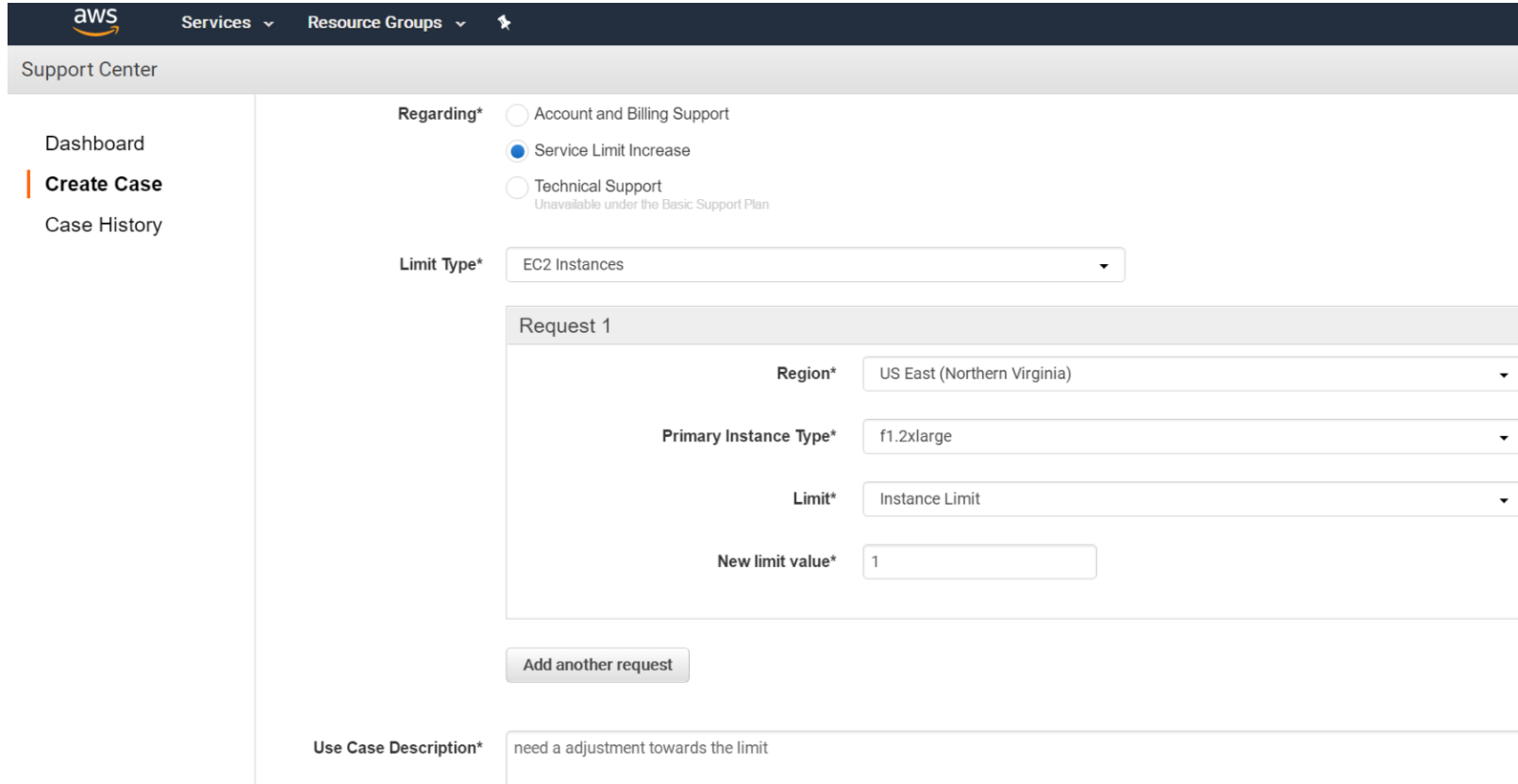
Field	Value
Full Name	
Address	
Province	
City	
County	
Postal Code	
Country	
Phone Number	
Company Name	
Website URL	

The 'Payment Currency Preference' section includes a disclaimer and a link to view terms and conditions:

AWS services are priced in US Dollars. If you prefer to pay in a different currency, AWS can charge your Visa or MasterCard in any of the currencies below. Your credit card issuer may charge a fee for transactions in other currencies. You can change your currency preference any time. [View Terms and Conditions](#)

Click on the 'My Account', copy the **Account ID** which will be used for the educate registration.

# AWS Account Registration



The screenshot shows the AWS Support Center interface. The top navigation bar includes the AWS logo, 'Services', and 'Resource Groups'. The left sidebar contains 'Dashboard', 'Create Case' (highlighted), and 'Case History'. The main content area is titled 'Support Center' and contains the following fields:

- Regarding\***: Radio buttons for 'Account and Billing Support', 'Service Limit Increase' (selected), and 'Technical Support' (with a note 'Unavailable under the Basic Support Plan').
- Limit Type\***: A dropdown menu showing 'EC2 Instances'.
- Request 1**: A section containing:
  - Region\***: A dropdown menu showing 'US East (Northern Virginia)'.
  - Primary Instance Type\***: A dropdown menu showing 'f1.2xlarge'.
  - Limit\***: A dropdown menu showing 'Instance Limit'.
  - New limit value\***: A text input field containing '1'.
- Add another request**: A button.
- Use Case Description\***: A text input field containing 'need a adjustment towards the limit'.

Go to the Support Center and open a case.

Ask for an adjustment on the limit of the FPGA instances.

(The limit number of a new-open account is 0.)

\*It might takes hours to get it solved



# AWS Educate Registration

[www.awseducate.com/registration](https://www.awseducate.com/registration)

- After finishing Educate Registration, you will get 100\$ credit in your account
- Take out your phone, scan the **QR Code** we offer. Remember to select the country as 'China'.



Apply to join AWS Educate

## Step 2/3: Tell us about yourself

Preferred Language:

English ▼

Institution Name

*Start typing the name of your school and select from the list. If you don't see your school, enter the full name, example: Harvard University*

Country ▼

City (where your school is located)

--None-- ▼

First Name

Last Name

Field of Study ▼

Email

# AWS Educate Registration

Step 2/3: Tell us about yourself

Preferred Language: English ▼

Institution Name China ▼  
Start typing the name of your school and select from the list. If you don't see your school, enter the full name, example: Harvard University

City (where your school is located) State (where your school is located) ▼

First Name Last Name

Field of Study ▼ Email  
Please provide a valid, current email issued by your institution. Example: your\_name@your\_school.edu

Grade Level ▼ Grad Month ▼ Grad Year ▼

Birth Month ▼ Birth Year ▼ Promo Code

[Frequently Asked Questions](#)

\*Choose 'China' in the Country label, so that we can approve the registration as soon as possible

# AWS Educate Registration



Apply to join AWS Educate

Step 3/3: Choose one of the following

Preferred Language:

English ▼

☒ Click here to enter an AWS Account ID

*Approved students are sent a welcome email and benefits including an AWS promotional code.*

[Don't have one? Sign up now](#)

☐ Click here to select an AWS Educate Starter Account

*An AWS Educate Starter Account is a free, capped-account that doesn't require a credit card. There are some Usage limitations including an approximately 25% reduction in access to AWS services. Because Starter Accounts are capped, a separate AWS promotional code is not provided.*

[Frequently Asked Questions](#)

Please note that any personal information you provide will be treated in accordance with the [AWS Educate Terms and Conditions](#) and [AWS Privacy Notice](#)

NEXT



\*Select the First box, fill in the account ID you get before

# AWS Educate Registration

- Now check your education mail box, click on the link to verify your application.

# Launch Instance

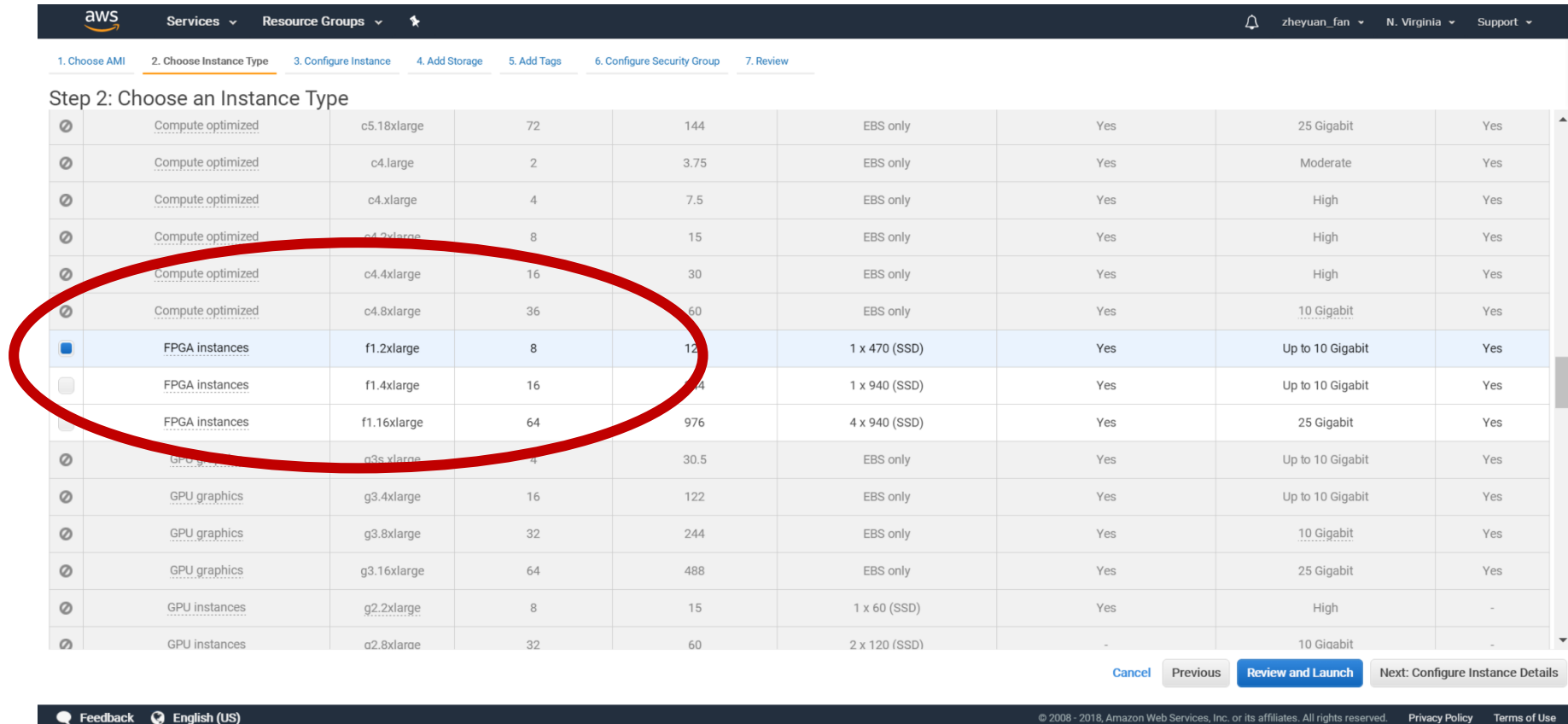
The screenshot shows the AWS console interface for launching an instance. The top navigation bar includes the AWS logo, 'Services', 'Resource Groups', and a user profile 'zheyuan\_fan' in the 'N. Virginia' region. The main content area is titled 'Step 1: Choose an Amazon Machine Image (AMI)'. On the left, there's a sidebar with filters: 'My AMIs (0)', 'AWS Marketplace (6)', 'Community AMIs (8)', 'Categories' (Infrastructure Software (6)), 'Operating System' (Clear Filter), 'All Linux/Unix' (CentOS (5), Ubuntu (1)), 'Software Pricing Plans' (Free (3), Hourly (3), Annual (2)), and 'Region' (Current Region (6), All Regions (43)). The main list of AMIs includes:

- Vivado & SDx 2018.2 Developer AMI** by Xilinx. Price: \$0.36/hr or \$2,696/yr (15% savings) for software + AWS usage fees. Updated: 9/21/18.
- Xilinx ML Suite** by Xilinx. Price: \$0.00/hr for software + AWS usage fees. Updated: 11/28/18.
- Data Analytics Acceleration Stack using Postgres, Preview Edition** by Xilinx. Price: \$0.00/hr for software + AWS usage fees. Updated: 4/2/18.
- FPGA Developer AMI** by Amazon Web Services. Price: \$0.00/hr for software + AWS usage fees. Updated: 10/2/18. This AMI is highlighted with a red circle.

Each AMI entry has a 'Select' button. The bottom of the page shows a footer with 'Feedback', 'English (US)', and copyright information: '© 2008 - 2019, Amazon Web Services, Inc. or its affiliates. All rights reserved. Privacy Policy Terms of Use'.

\*Set the region to **N.Virginia**, and select **FPGA Developer AMI** by searching for 'xilinx' in AWS Marketplace.

# Launch Instance



The screenshot shows the AWS Management Console interface for launching an instance. The top navigation bar includes the AWS logo, 'Services', 'Resource Groups', and user information. The breadcrumb trail indicates the current step is '2. Choose Instance Type'. The main content area displays a table of instance types, categorized by 'Compute optimized', 'FPGA instances', and 'GPU instances'. The 'FPGA instances' section is highlighted with a red oval, and the 'f1.2xlarge' instance type is selected, indicated by a blue square icon and a blue background for its row.

Instance Type	Instance Size	VCpus	Memory (GiB)	Storage	Network	Accelerator
Compute optimized	c5.18xlarge	72	144	EBS only	Yes	25 Gigabit
Compute optimized	c4.large	2	3.75	EBS only	Yes	Moderate
Compute optimized	c4.xlarge	4	7.5	EBS only	Yes	High
Compute optimized	c4.2xlarge	8	15	EBS only	Yes	High
Compute optimized	c4.xlarge	16	30	EBS only	Yes	High
Compute optimized	c4.8xlarge	36	60	EBS only	Yes	10 Gigabit
<b>FPGA instances</b>	<b>f1.2xlarge</b>	<b>8</b>	<b>12</b>	<b>1 x 470 (SSD)</b>	<b>Yes</b>	<b>Up to 10 Gigabit</b>
FPGA instances	f1.4xlarge	16	24	1 x 940 (SSD)	Yes	Up to 10 Gigabit
FPGA instances	f1.16xlarge	64	976	4 x 940 (SSD)	Yes	25 Gigabit
GPU instances	g3.xlarge	16	30.5	EBS only	Yes	Up to 10 Gigabit
GPU graphics	g3.4xlarge	16	122	EBS only	Yes	Up to 10 Gigabit
GPU graphics	g3.8xlarge	32	244	EBS only	Yes	10 Gigabit
GPU graphics	g3.16xlarge	64	488	EBS only	Yes	25 Gigabit
GPU instances	g2.2xlarge	8	15	1 x 60 (SSD)	Yes	High
GPU instances	g2.8xlarge	32	60	2 x 120 (SSD)	-	10 Gigabit

At the bottom of the table, there are buttons for 'Cancel', 'Previous', 'Review and Launch', and 'Next: Configure Instance Details'.

- Select 'f1.x2large'. This is with Xilinx VU9P device.

# Launch Instance

The screenshot displays the AWS Management Console interface during the 'Step 7: Review Instance Launch' process. A modal dialog is open, prompting the user to 'Select an existing key pair or create a new key pair'. The dialog contains the following text:

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 the instance. For Linux AMIs, the private key file allows you to securely connect to your instance.

Note: The selected key pair will be added to the set of keys authorized for this instance. Learn more about [removing existing key pairs from a public AMI](#).

Below the text, there is a dropdown menu with 'Create a new key pair' selected, followed by a text input field for 'Key pair name' containing the placeholder text 'this is a name you set by yourself'. A 'Download Key Pair' button is visible to the right of the input field.

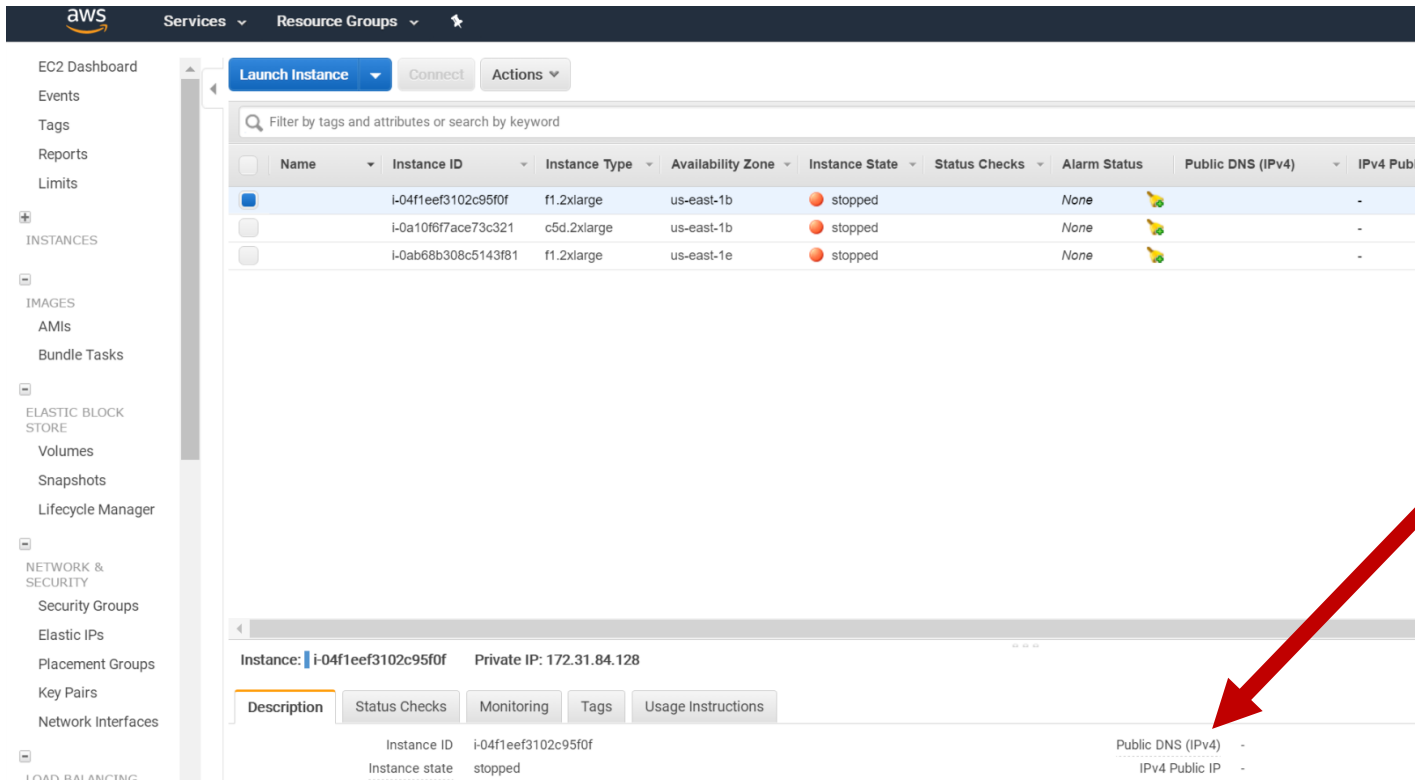
A blue callout box at the bottom of the dialog states: 'You have to download the private key file (\*.pem file) before you can continue. Store it in a secure and accessible location. You will not be able to download the file again after it's created.'

The background of the console shows the instance configuration steps: 1. Choose AMI, 2. Choose Instance Type, 3. Configure Instance, 4. Add Storage, 5. Add Tags, 6. Configure Security Group, and 7. Review. The 'Xilinx ML Suite' AMI is selected, and the 'f1.2xlarge' instance type is chosen. The 'Launch' button is visible at the bottom right of the console.

Create a new key pair and download the .pem file to your local computer.  
We need it to connect to the instance.

# Connect to the Instance

\*You can 'stop' the instance temporarily when you don't use it on your EC2 Dashboard, during that AWS will pause charging.



The screenshot shows the AWS Management Console interface for the EC2 Dashboard. The left sidebar contains navigation links for various services. The main content area displays a table of EC2 instances. The first instance is selected, and its details are shown below the table. A red arrow points to the 'Public DNS (IPv4)' column of the selected instance.

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS (IPv4)	IPv4 Public IP
	i-04f1eef3102c95f0f	f1.2xlarge	us-east-1b	stopped	None	None	-	-
	i-0a10f6f7ace73c321	c5d.2xlarge	us-east-1b	stopped	None	None	-	-
	i-0ab68b308c5143f81	f1.2xlarge	us-east-1e	stopped	None	None	-	-

Instance: **i-04f1eef3102c95f0f** Private IP: 172.31.84.128

**Description** Status Checks Monitoring Tags Usage Instructions

Instance ID: i-04f1eef3102c95f0f  
Instance state: stopped

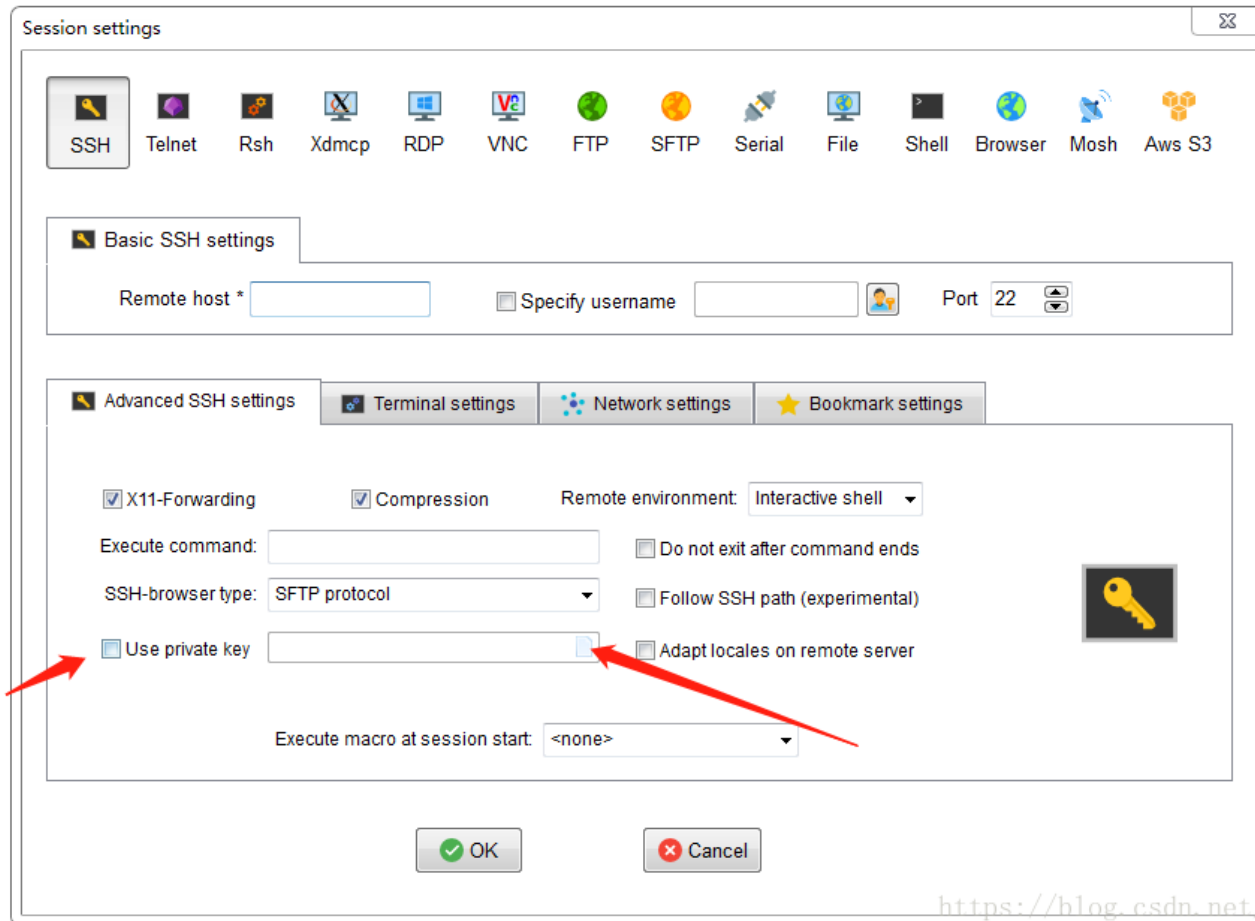
Public DNS (IPv4): -  
IPv4 Public IP: -

Get the  
ipv4  
address  
here



# Connect to the Instance

## \*Connect from Windows



<https://mobaxterm.mobatek.net/download.html>

Use mobaxterm (or other ssh tools like Putty) to connect to the remote EC2 Instance with private key(.pem file)

\* Username is centos

# Connect to the Instance

## \*Connect from Mac or Linux

- Open your command line shell and change the directory to the location of the private key file that you created when you launched the instance.
- Use the **chmod** command to make sure your private key file isn't publicly viewable. For example, if the name of your private key file is my-key-pair.pem, use the following command:

**chmod 400 my-key-pair.pem**

- Use the following SSH command to connect to the instance:

**ssh -i /path/my-key-pair.pem username@ip**

ssh centos@ip

# Connect to the Instance

- Then we allow the instance can be connected with username and password.

#set password for root account and centos

sudo passwd root

sudo passwd centos

#set **PasswordAuthentication** to be **yes** in /etc/ssh/sshd\_config

sudo vim /etc/ssh/sshd\_config

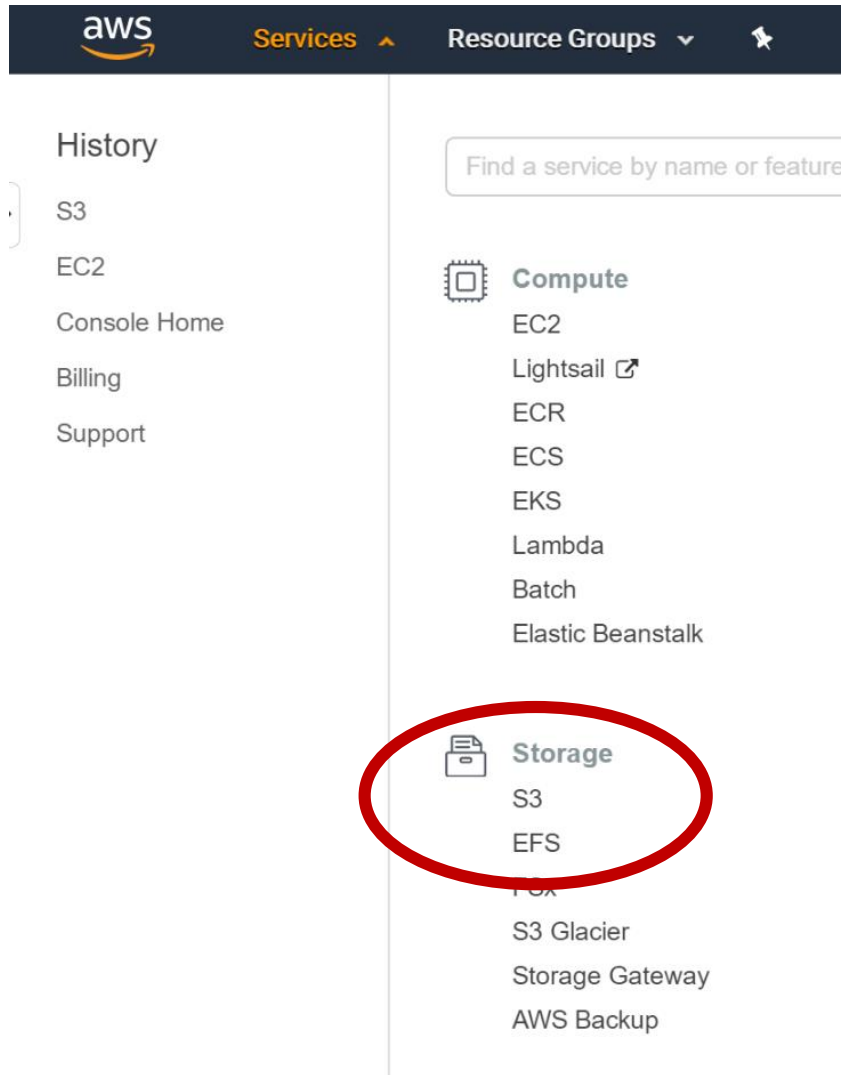
#find **PasswordAuthentication** and change it

PasswordAuthentication yes

#restart ssh

sudo service sshd restart

# Create an S3 bucket



An Amazon S3 bucket is required to create to run the Amazon FPGA Image (AFI) creation service. The bucket will contain a tar file and logs which are generated from the Amazon FPGA Image (AFI) creation service.

# Create an S3 bucket

In this step, you will use the AWS Management Console to create an Amazon S3 bucket. Keep in mind that your bucket's name must be globally unique. If you get an error that your bucket name already exists, try adding additional numbers or characters until you find an unused name.

- Navigate to the AWS Management Console: <https://console.aws.amazon.com>
- In the AWS Management Console choose Services then select S3 under Storage.
- Choose '+ Create Bucket'
- Provide a globally unique name for your bucket such as 'afibucket'. If you get an error that your bucket name already exists, try variations until you find an unused name
- Select the Region you've chosen for F1 usage - US East (N.Virginia),[US West (Oregon) or EU (Ireland)]
- Choose 'Create' in the lower left of the dialog without selecting a bucket to copy settings from

# Create an S3 bucket

The screenshot shows the AWS Management Console interface with the 'Create bucket' wizard open. The wizard has four steps: 1. Name and region, 2. Configure options, 3. Set permissions, and 4. Review. The first step is active. The 'Bucket name' field contains 'fpga20190118'. The 'Region' dropdown is set to 'US East (N. Virginia)'. There is a section for 'Copy settings from an existing bucket' with a dropdown showing 'Select bucket (optional)' and '1 Buckets'. At the bottom, there are 'Create', 'Cancel', and 'Next' buttons. The left sidebar shows 'Amazon S3' and 'Buckets'. The top navigation bar includes 'Services', 'Resource Groups', and user information 'zheyuan\_fan'.

aws Services Resource Groups zheyuan\_fan Global Support

## Create bucket

1 Name and region 2 Configure options 3 Set permissions 4 Review

**Name and region**

**Bucket name** ⓘ

fpga20190118

**Region**

US East (N. Virginia) ▼

**Copy settings from an existing bucket**

Select bucket (optional) 1 Buckets ▼

Create Cancel Next



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# Create an S3 bucket

Once you have created your bucket, create two folders to store the design checkpoints (DCPs) and log files generated by SDAccel:

- In the S3 console, select and click on the name of your newly created bucket to open it
- Choose '+ Create folder'
- Provide a name for the folder which will be used to store design checkpoints (DCPs)
- Click 'Save'
- Choose '+ Create folder'
- Provide a name for the folder which will be used to store SDAccel log files
- Click 'Save'

# Create an S3 bucket

 Services ▾ Resource Groups ▾ 

 zheyuan\_fan ▾ Global ▾ Support ▾


Amazon S3 > fpga20190118


Overview


Properties

Permissions

Management


 Type a prefix and press Enter to search. Press ESC to clear.

 Upload



 Create folder

Download



Actions ▾

US East (N. Virginia) 

Viewing 1 to 2

<input type="checkbox"/> Name ▾	Last modified ▾	Size ▾	Storage class ▾
<input type="checkbox"/>  DCPs	--	--	--
<input type="checkbox"/>  log	--	--	--

Viewing 1 to 2

 Feedback  English (US)

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# Reference

[https://github.com/Xilinx/SDAccel\\_Examples/wiki/Prerequisites-for-working-with-SDAccel-on-AWS-F1](https://github.com/Xilinx/SDAccel_Examples/wiki/Prerequisites-for-working-with-SDAccel-on-AWS-F1)