

[Show Submission Credentials](#)

P0. Cloud Account Setup (Required) Set up AWS, Azure and GCP accounts

✓ AWS Account Setup

✓ Azure Account Setup

✓ GCP Account Setup

AWS Account Setup

Create an AWS account and sign up to the AWS Educate portal

Welcome to the Cloud Computing course! For the projects in this course, you will work on instances provisioned on Amazon EC2 (Elastic Compute Cloud) and utilize S3 (Simple Storage System) for persistent storage. In addition, we will be working with various other Amazon Web Services (AWS) technologies such as Elastic Block Store (EBS) and CloudWatch, among others. For more information about AWS, please refer to the AWS website (<http://aws.amazon.com>), or read the AWS Primer in this course. Let's get started by creating an AWS account so that you can provision resources on AWS.

Create an AWS account

To be prepared to create an AWS account, you will need:

1. A valid US credit/debit card. AWS requires a valid US credit card to validate your identity. You will not be charged for your usage of the AWS account during this course in normal cases, since you will link your account to the course consolidated billing.
2. Mobile phone number.

3. An email address that is not associated with AWS yet. Do not use an existing AWS account for this course. We recommend that you use a personal email address to sign in.

Please follow the steps outlined below to set up your AWS account for the course:

1. Create a new AWS account at <http://aws.amazon.com> (<http://aws.amazon.com>) by clicking on **Create an AWS Account**.
2. At Step 1, enter an email address, password, and choose a name for your account.



Sign up for AWS

Explore Free Tier products with a new AWS account.

To learn more, visit aws.amazon.com/free.



Email address
You will use this email address to sign in to your new AWS account.

Password

Confirm password

AWS account name
Choose a name for your account. You can change this name in your account settings after you sign up.

Continue (step 1 of 5)

[Sign in to an existing AWS account](#)

3. At Step 2, you will provide your contact information such as full name, phone number, and address. The question "How do you plan to use AWS?" does not make any functional difference to the AWS account, and you may want to select "Personal".

Sign up for AWS

Contact Information

How do you plan to use AWS?

- Business - for your work, school, or organization
- Personal - for your own projects

4. At Step 3, you will provide your billing information. You will need to enter a credit/debit card and address information as EC2 requires a credit card on file for use. AWS may temporarily hold \$1 USD/EUR as a pending transaction for 3-5 days to verify your identity. Again, we will cover your expenses for all course-related usage of AWS. The instructions on how to link your account to the course payment are provided later.
5. At Step 4, you need to confirm your identity with your phone number. Choose "Text message (SMS)" and enter your mobile phone number. Click "Continue" and enter the verify code your phone received.

The image shows the AWS sign-up process. At the top is the AWS logo. Below it, the heading 'Sign up for AWS' is followed by 'Confirm your identity'. A sub-instruction says: 'Before you can use your AWS account, you must verify your phone number. When you continue, the AWS automated system will contact you with a verification code.' There are two options for receiving the code: 'Text message (SMS)' (selected) and 'Voice call'. A dropdown menu for 'Country or region code' is set to 'United States (+1)'. Below that is a field for 'Mobile phone number'. Under 'Security check', there is a CAPTCHA box containing the text 'b2pwdn' with several lines drawn over it, and a speaker icon and a refresh/circular arrow icon. Below the CAPTCHA is a field labeled 'Type the characters as shown above'. At the bottom is a large orange button labeled 'Send SMS (step 4 of 5)'.

6. At Step 5, please exercise caution, and **you must select the Basic (Free) support plan**. This course does not require nor allow any paid support plans. Click "Complete sign up".



Sign up for AWS

Select a support plan

Choose a support plan for your business or personal account. [Compare plans and pricing examples](#) You can change your plan anytime in the AWS Management Console.

Basic support - Free

- Recommended for new users just getting started with AWS
- 24x7 self-service access to AWS resources
- For account and billing issues only
- Access to Personal Health Dashboard & Trusted Advisor



Developer support - From \$29/month

- Recommended for developers experimenting with AWS
- Email access to AWS Support during business hours
- 12 (business)-hour response times



Business support - From \$100/month

- Recommended for running production workloads on AWS
- 24x7 tech support via email, phone, and chat
- 1-hour response times
- Full set of Trusted Advisor best-practice recommendations



Need Enterprise level support?

From \$15,000 a month you will receive 15-minute response times and concierge-style experience with an assigned Technical Account Manager. [Learn more](#)

[Complete sign up](#)

- Once you have completed the AWS sign-up and completed the phone verification process, wait for an AWS mail titled "Welcome to Amazon Web Services". This can normally take a few minutes and up to one business day. If you are unable to access AWS Services, please note that some services may take up to 24 hours to fully activate after the account creation.



Congratulations!

Thank you for signing up with AWS.

We are activating your account, which should take a few minutes. You will receive an email when this is complete.

[Go to the AWS Management Console](#)

[Sign up for another account](#) or [Contact Sales](#)

8. Sign in to AWS and retrieve your AWS Account ID which you can find in my account menu option under your name.

 A screenshot of the AWS Account Settings page. The top navigation bar shows "aws Services" and a search bar. On the left, there's a sidebar with links like Home, Billing, Bills, Payments, Credits, Purchase orders, Cost & Usage Reports, and Cost Categories. The main content area has sections for "Account Settings" and "Contact Information". In the "Account Settings" section, there's a form with fields for "Account Id" (containing a redacted AWS account ID), "Seller" (AWS Inc.), "Account Name" (redacted), and "Password" (*****). A note at the bottom says: "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 your billing address information associated with your Invoice, please edit it through the Payment Methods page, located [here](#)." To the right of the main content is a sidebar with links for "Account", "Organization", "Service Quotas", "Billing Dashboard", and "Security credentials". The "Account ID" field is highlighted with a red box.

9. Update your profile page (<https://projects.sailplatform.org/profile/>) on the Sail() platform and enter your AWS account ID in the aws-id field. Make sure to press "Submit" to save the value. **Note that course profile is by per course, please ensure that you are editing the aws-id field in this course. The panel heading of the profile should contain the title of this course.**

The panel header here should contain the title of this course

aws-id

193225474936



Submit

Figure: Update course profile

10. Within a couple of minutes you should receive a consolidated billing request in your email, please click and approve the request you get by email from AWS so that your AWS usage can be charged to the course consolidated payment. If you need to change your AWS ID after receiving an AWS invitation email, please create a private Piazza post with the old and new AWS IDs.

Warning

Warning

After we issue the AWS account link request, you must click and approve the consolidated billing request that you get by email. Failure to do so will result in your account not being linked and you will be **charged** using the credit/debit card on file with AWS.

You must provide your AWS account information so that the course staff links your account to the course consolidated billing. Linking your AWS account to the course consolidated billing is mandatory, otherwise, you will not be able to gain access to course-specific resources on the cloud. If you do not add the AWS account ID to your course profile and accept the AWS invitation, your project submissions will not be accepted.

Danger

Grade Penalties on Excessive Use

You are solely responsible for the usage of your AWS account. Each project in the course has an associated budget which must be followed strictly. Usage reports will be monitored by the instructors and excessive use will be grounds for grade penalties.

Your AWS account that you create and link to the course should be used **exclusively** for the projects in this course. This account must not be used for any private work or for other courses/projects at CMU or elsewhere. For example, if you receive an AWS coupon from another course, you should create a separate account for that course and redeem the coupon. Do not redeem any coupons to your AWS account for this course.

Dropping the Course

If you drop the course, please post privately on Piazza and provide your Sail() platform username so that we can drop you from the Sail() platform. We will drop you from the Sail() platform and remove your AWS account from the AWS consolidated billing. You will receive an email indicating that you will be removed from the billing account. After you have been removed from the course account, any resources that you have left running will be billed on the card you have used to sign up for AWS. Please ensure that you terminate all resources and delete your account, if you do not plan to use AWS in the future.

Sign up to the AWS Educate portal

AWS Educate is a portal to the global university community who use AWS. All CMU students who will use AWS in their courses should sign up once to AWS Educate.

If you have previously signed up for an AWS Educate Account using your @andrew.cmu.edu email address, you do not need to re-apply.

If you have not signed up yet, please sign up for an AWS Educate Account using your @andrew.cmu.edu email account. Please follow the steps outlined below in order to set up your AWS Educate account for use with the course:

1. Visit the Apply for AWS Educate (<https://www.awseducate.com/registration>) page.
2. Select **Student** and click on **Next**.
3. Fill out the application with your information and fill out your AWS Account ID when asked, click on **Next**
4. As you fill out your application, you should receive an email. Verify your email address on the next page and click on **Next**.
5. Accept the terms and conditions on the next page and finish the application.
6. You should receive an email confirmation from AWS indicating that you have successfully joined the AWS Educate program.

Information

Please take note of the difference between an AWS account and an account of the AWS Educate portal. They are two different entities for different purposes thus have nothing to do with each other.

If you are using the same Andrew Email to sign up an AWS account and an account of the AWS Educate portal, each of the account has its own lifecycle.

The policy of "exclusive usage for the cloud course" only applies to an AWS account. An AWS account can be an AWS standard account (either individual or professional) or an AWS Educate starter account. The account of the AWS Educate portal has nothing to do with this policy. An AWS Educate starter account is a special AWS account that requires no credit card to join AWS. An AWS Educate Starter Account may subject to a stricter quota limit and requires additional steps (e.g., to add a credit card) when you unlink your account at the end of the semester. We recommend that you use an AWS standard account instead.

If you have any questions, when posting on Piazza, please avoid the term "AWS Educate account" and use "the account of the AWS Educate portal" to avoid confusion.

Azure Account Setup

Azure Account Setup

Microsoft Azure (<https://azure.microsoft.com/>) is a cloud computing platform and infrastructure provider developed by Microsoft for building, deploying, and managing applications and services through a global network of Microsoft-managed and Microsoft partner hosted data centers. Microsoft Azure provides users a global array of cloud services.

For more information about Azure, please refer to the Azure Website (<http://azure.microsoft.com/>) and the Azure Primers for this course.

Azure Account Sign Up

Please follow the steps outlined below in order to set up your Azure account for use with the course:

1. Sign out of all other Microsoft services, or start a new incognito/private browsing session.
2. Visit the Microsoft Accounts page (<https://www.microsoft.com/en-us/account/>) to begin the Microsoft Account (MSA) creation process.
3. Click the **Sign in** link on the Microsoft Accounts page.

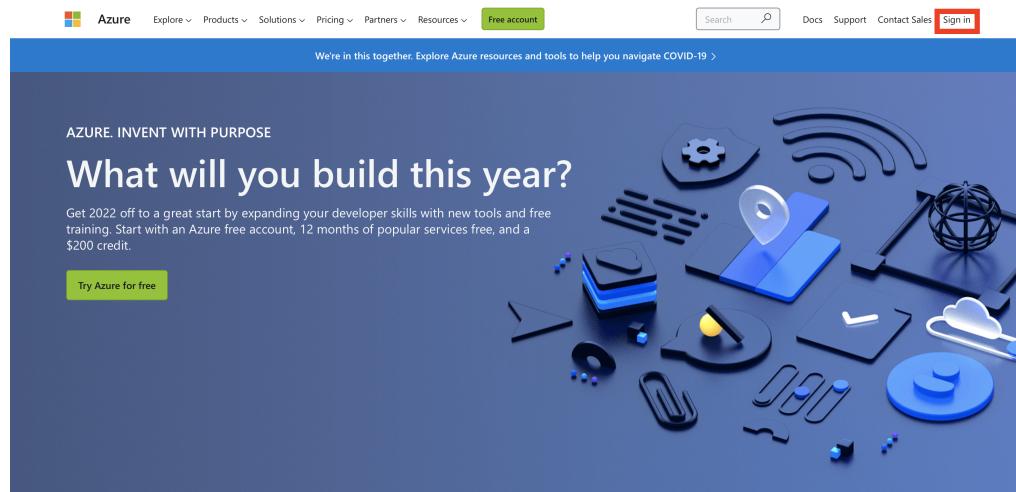


Figure: Sign in using the link in the upper right corner of Microsoft Accounts page

4. Click the **Create one!** link to create a new MSA.

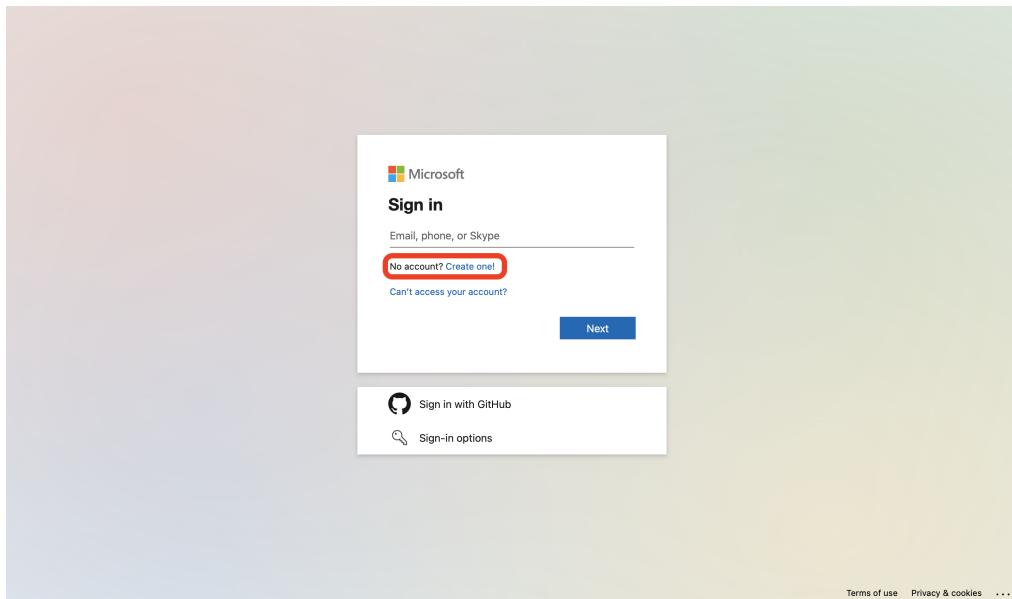


Figure: Elect to create a new MSA.

5. Enter a valid, **personal** email address and select a **new** password for the MSA. After completing the form, press **Next**.
6. You will receive a verification email from **account-security-noreply@accountprotection.microsoft.com**. Alternatively, you may be asked for a phone number to receive a security code via SMS. Enter the security code from the email or SMS message and press next.

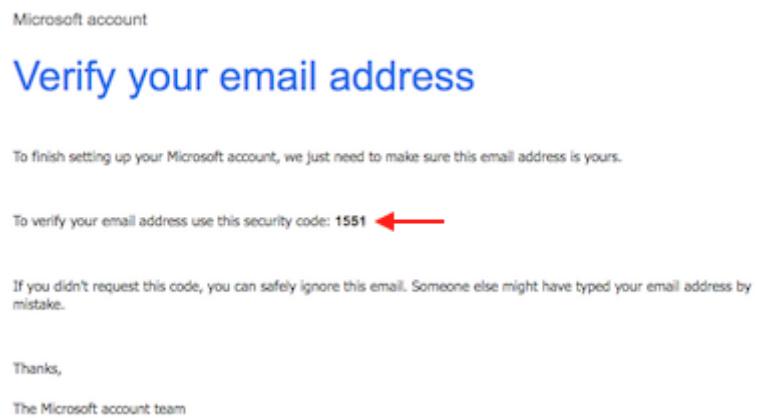


Figure: Microsoft verification email.

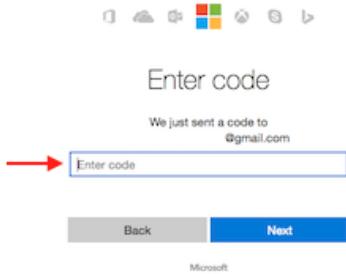


Figure: Enter the security code from the verification email

Set up Azure Classroom Subscriptions

Azure Subscriptions

You can access the Azure portal after you have signed in but, you need at least one subscription in the Azure account to access Azure services. Subscriptions are the basic unit where all resources are contained. Each Azure subscription also forms an isolated billing unit. You can isolate groups of resources to serve different purposes, by using multiple subscriptions with separate billing methods.

In this course, you will use **Azure Classroom Subscriptions**, a subscription type for education, to provision Azure resources and complete the projects.

Set up your subscription with a code

To complete the activities in this primer and course projects, you will need to visit Azure Education Hub and enter a code to set up your subscription. Please follow the below instruction and complete the actions.

Retrieve the code

To retrieve the code, update your course profile (<https://projects.sailplatform.org/profile>) with your Microsoft Account email in the `azure-subscription-email` field. **Note that course profile is by per course, please ensure that you are editing the `azure-subscription-email` field in this course. The panel heading of the profile should contain the title of this course.**

The code will be disclosed in the `azure-invite-code` field under the course profile after you submit your Azure subscription email.

Set up the subscription with the code

1. Visit this site (<https://aka.ms/JoinEdu>) and enter the code.

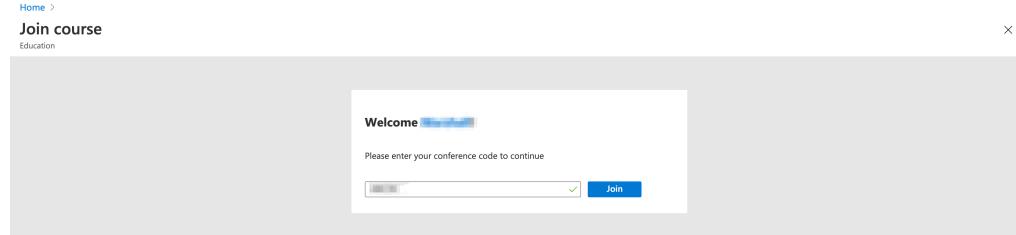


Figure: Enter the code

2. After entering the code, you will be redirected to the Azure Education Hub. Press the blue **Setup lab** button.

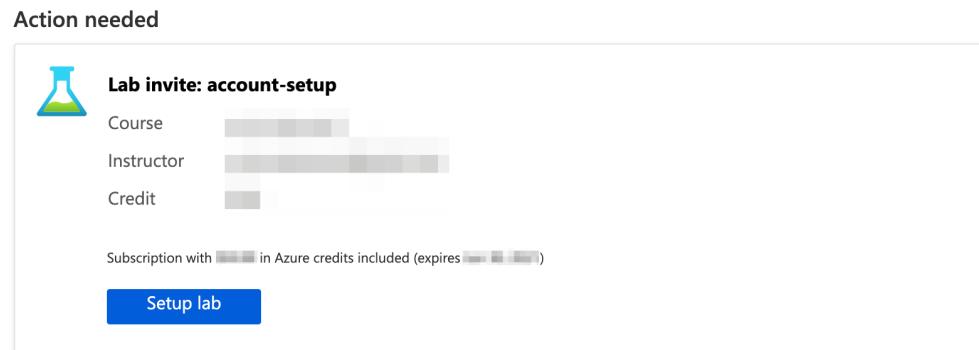


Figure: Setup Lab from the Azure Education Hub in the Azure Portal

3. If this is the *first* time you are using the Azure Education Hub and Azure Classroom subscriptions, you may be asked to accept the **Microsoft Azure Sponsorship 2** Agreement. Fill in the required information to proceed. Microsoft Azure Sponsorship 2 (<https://azure.microsoft.com/en-us/offers/ms-azr-0143p/>) is the education sponsorship offer type that all the Azure Classroom subscriptions belong to and this offer enables you to work with Azure with no payment method required on your end.
4. You can move on once the lab setup is completed successfully.

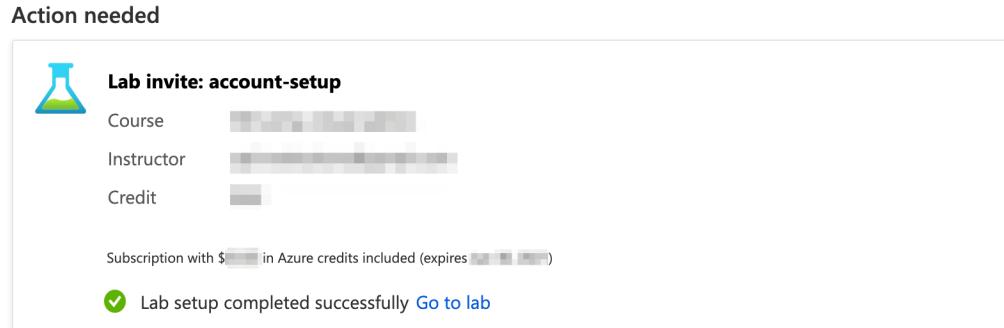


Figure: Lab setup completed successfully

Information

Azure Lab assignment email

You may receive an Azure lab assignment email after submitting your code. This email is a reminder to set up your Azure lab assignment. The "Accept lab assignment" button will redirect to the Azure Education Hub in the Azure Portal.

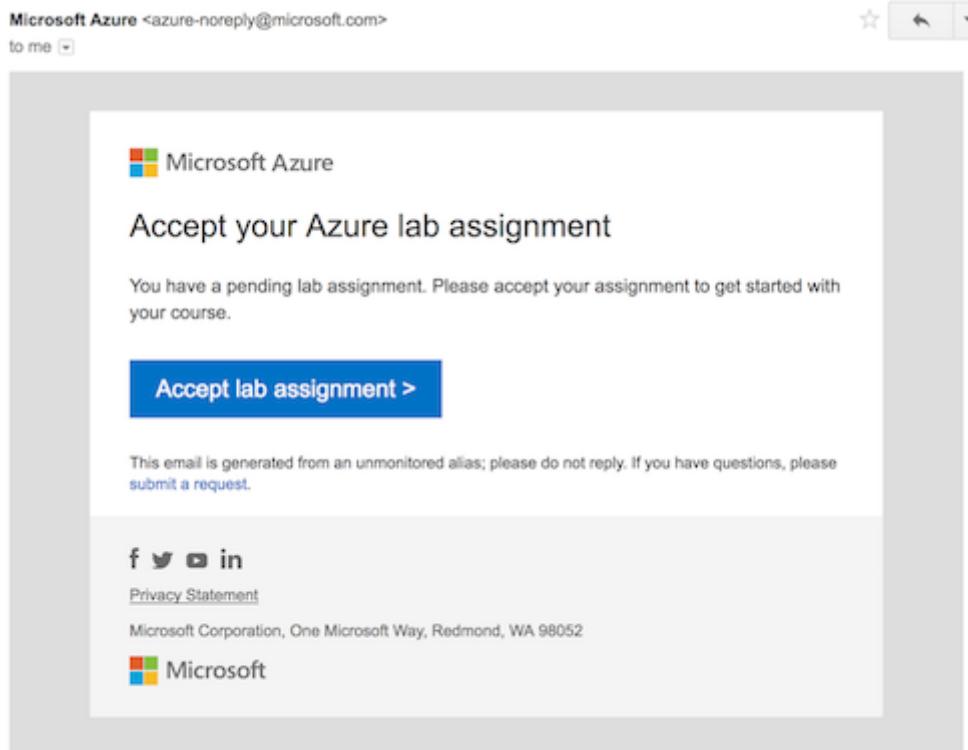


Figure: An Azure Lab assignment email

No action is required in regard to this email this time because you have already set up the lab after entering the code.

Warning

Monitor your budget

The Azure Classroom subscription has its own cost monitoring portal which is different from the Cost Management + Billing (https://portal.azure.com/#blade/Microsoft_Azure_Billing/ModernBillingMenuBlade/BillingAccounts) blade used by most subscription types. Please use the Azure Education Hub to check the remaining budget of Azure Classroom subscription (click the Course summary card and the classroom link). **Please bear in mind that your subscription will be disabled if you spend over the subscription budget.** Once you exceed the budget, you will **NOT** be able to continue working on Azure. Therefore it is imperative to monitor your budget usage and properly manage your resources. In every project on Azure, there is a recommended budget.

Experiment with Subscriptions

You have received at least 1 subscriptions now. You have An Azure Classroom Subscription by completing the cloud account setup primer.

Visit the Azure portal. Click upper-right first Cloud Shell icon on the page header of the Azure portal.



Figure: Cloud Shell icon on the page header

On the initial start, select any available subscription and select "Create storage", it will create a new storage account and add it into a new resource group for you.

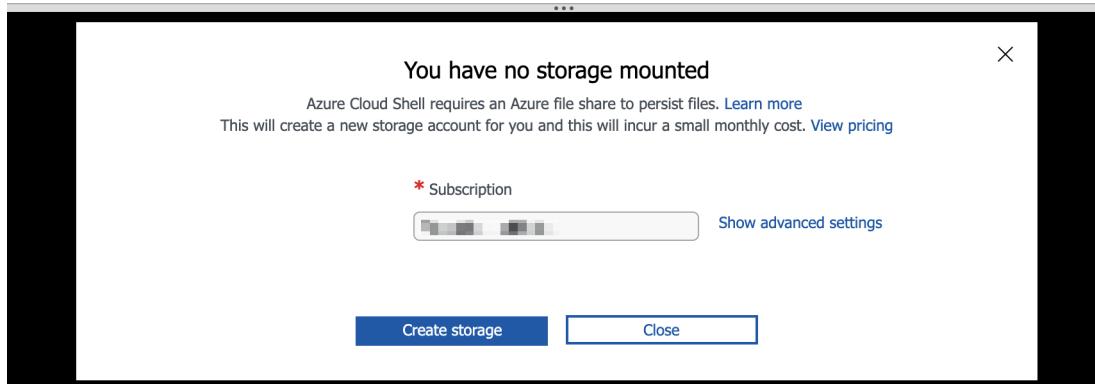


Figure: Create storage for Cloud Shell on the initial start

Storage accounts					
Default Directory					
+ Add Edit columns Refresh Assign tags Delete					
Subscriptions: 1 of 2 selected – Don't see a subscription? Open Directory + Subscription settings					
<input type="text"/> Filter by name... Microsoft Azure Spon... All resource groups All types All locations All tags					
2 items					
<input type="checkbox"/>	NAME ↑	<input type="checkbox"/>	TYPE ↑	<input type="checkbox"/>	KIND ↑
<input type="checkbox"/>	cs28b33331ed327x4abd...	<input type="checkbox"/>	Storage account	<input type="checkbox"/>	RESOURCE GROUP ↑↓
				<input type="checkbox"/>	cloud-shell-storage-eastus
				<input type="checkbox"/>	LOCATION ↑↓
				<input type="checkbox"/>	East US

Figure: Azure creates new storage account and resource group for Cloud Shell on the initial start

Set and confirm the default subscription in Azure CLI

In the Azure Cloud Shell, run the following Azure CLI commands to fetch the details of your account and subscription. Recall that the "#" symbol denotes comments in Bash and here we use Bash comments to provide you with the instructions of each command. You do not need to input the comments to the Azure Cloud Shell. You only need to input the actual commands which are after the "\$" symbol.

```
# --all: List all subscriptions, rather than just 'Enabled' ones. It can
# help show the subscriptions that are expired or out of budget.
$ az account list --all --output table

# If the command above does not display the subscription, add the --refresh option and retry.
# --refresh: Retrieve up-to-date subscriptions. It can help
# retrieve a subscription right after you accept a Lab.
# You may be asked to log in again with the --refresh option.
$ az account list --all --refresh --output table
```

If you have multiple subscriptions, you can use the command below to change the default subscription. In this project, the default subscription should be the Azure Classroom subscription. Please replace the <subscription name or id> with the subscription name or id that you want to set as the default one.

```
$ az account set --subscription <subscription name or id>
```

After you set the default subscription, below is an example output of the `az account list --all --output table` command. There is expected to be at least 1 subscription(s) with the Enabled state. The subscription name will be `cloud-admin + Roster`. In the Azure CLI, the name of an Azure classroom subscription may also display as `Microsoft Azure Sponsorship 2` which is an alias which represents the education sponsorship offer type which all the Azure Classroom subscriptions belong to.

Name	CloudName	SubscriptionId	State	IsDefault
cloud-admin <username>	AzureCloud	<UUID>	Enabled	True

FAQ

Q: My Azure subscription gets disabled, however, Azure Education Hub shows that I have not exceeded the budget.

A: You have exceeded the budget. The spending takes time to get aggregated and show up on Azure Education Hub. There is a delay before a cloud service provider can update and report the cost data to you. With the number of users, implementing a real-time, accurate cost report system is not financially feasible for the cloud service providers as of today. Instead of relying on the reported spending, as a cloud practitioner, you need to calculate the hourly cost and plan the budget before you provision resources. If you disagree, please wait for 6 hours so that the spending gets updated on Azure Education Hub.

GCP Account Setup

Google Cloud Platform (GCP) Account Setup

Danger

Warning

When creating a GCP Account, **DO NOT** use any institute issued email address, e.g. an email with the domain `@andrew.edu.cmu`. You can redeem a coupon to an institute issued email address as normal; however, if your institute does not enable GCP feature of G Suite, you will not be able to use the account and you effectively lose the credits of the coupon.

Hence, you must use your personal email address and we recommend you to use a Gmail address ending with `@gmail.com`. Again, a G Suite enabled email at your institute domain is **NOT** a Gmail address that you should use for our course.

For the projects in this course, you will create and work with infrastructure using GCP's Compute services (Compute Engine, Container Engine, Networking, etc), Storage services (Cloud Storage, Cloud SQL, Persistent Disk, etc), Monitoring services, and Big Data services.

For more information about the products GCP offers, please refer to GCP's product page (<https://cloud.google.com/products>) and the Google Cloud Platform Primer.

You will start by creating a new Google account that will only be used for this course.

Please use an incognito/private browsing session to avoid encountering any issues.

The course staff understands that students may have their own Google accounts for personal or work use, and potentially even their own personal or work GCP accounts setup - due to these realities, we require that you create a new Google account.

GCP Account

Please follow the steps outlined below in order to set up your new Google account for use with the course:

1. Create a new Google account by visiting <https://accounts.google.com/SignUp> (<https://accounts.google.com/SignUp>) in an incognito/private browsing session.
2. For your username, we recommend that you choose a username that you can easily differentiate from your other Gmail accounts.
3. After you've finished the Sign Up form, click the Next Step button, and Agree to the Privacy and Terms Agreement. Click Continue on the following page.
4. You should have been directed to <https://www.google.com> (<https://www.google.com>) as your new user, `yourandrewid.gcp@gmail.com`. To ensure this is the case, click on the top right icon of the screen to validate that your email, `yourandrewid.gcp@gmail.com`, appears in the dropdown.
5. Now make sure to visit <https://gmail.com>, login with your new Gmail, and create an email forwarding rule (<https://support.google.com/mail/answer/10957?hl=en>) to forward email from your new Gmail for GCP to your primary email address. This step will enable you to receive the GCP budget alarms in a timely manner.

6. In the same incognito browser session, visit <https://console.cloud.google.com>

(<https://console.cloud.google.com>).

7. You should be greeted with the following message

Welcome User!

Create and manage your Google Cloud Platform instances, disks, networks, and other resources in one place. ...

8. Select "Yes" to the Email preferences and Terms of Service and the usage agreement, then click Continue.

Retrieving GCP coupon for this course

The \$50 GCP coupon will be available in your course profile (<https://projects.sailplatform.org/profile>) under the `gcp-coupon` heading within 24 hours **once you completed the required activities of the AWS and Azure setup in this primer, as a proof that you have started working on this course.** The coupon is in the format of `xxxx-xxxx-xxxx-xxxx`; if the value is `GCP_COUPON`, please wait patiently until you receive the coupon.

You can post on Piazza to request GCP coupons if and only if you have waited for more than 24 hours. If so, provide your Sail() platform username and the evidence that you have already completed the required activities of the AWS and Azure setup.

Note that course profile is by per course, please ensure that you are using the GCP coupon for this course. The panel heading of the profile should contain the title of this course.

Redeeming GCP coupon for your Google account

1. Visit <https://console.cloud.google.com/education> (<https://console.cloud.google.com/education>) in **private mode in your browser to avoid logging in with a wrong account by mistake if you have multiple active Google accounts.**
2. Login using your Google account. **Double check you have selected the correct Google account. The purpose of using an incognito/private browsing session is to ensure that you only have one Google account logged in.**
3. Enter your provided coupon code from your course profile.
4. Select "Yes" or "No" to be emailed about updates regarding feature announcements, performance suggestions, feedback surveys and special offers.
5. Click "Accept and Continue".

This will create a billing account for your GCP account. To view and change billing accounts, go to <https://console.cloud.google.com/billing> (<https://console.cloud.google.com/billing>).

(Optional) Getting an additional \$300 GCP Free Tier Credit by supplying a credit card

1. Login to the GCP Console
2. If your account is new, in the top right of the new page, there should be a "Sign Up For Free Trial" button - click it!
3. Select an option for receive notifications and select "Yes" to the Terms of Service agreement, then click Agree and continue.

4. Now you have to create a billing account. **BE SURE TO SELECT INDIVIDUAL FOR YOUR ACCOUNT TYPE.** Enter in your desired name and address and a payment method, but don't worry, you'll be getting \$300 USD in credits without charge.
5. Once you've completed that form click "Start My Free Trial".
6. You should receive a welcome message thanking you for starting the free trial with \$300 to spend until it expires.

Deploying your first project

1. Feel free to select "Tour the Console" to take a guided tour of the features of GCP or select "Got it" to proceed.
2. For your first project (which may have been created for you), go to <https://console.cloud.google.com/billing/> (<https://console.cloud.google.com/billing/>) and select your "My First Project" project from the dropdown to the right of the "Google Cloud Platform" worded logo - and ensure that the billing account you just created is enabled for that project (it should be named like "My Billing Account". **If you selected "Got it", your first project might not have been created. To remedy this select the "Project" dropdown and create a project titled "My First Project", then repeat this step to ensure you know how to associate a billing account with a project.**
3. Now your CMU Cloud Computing GCP Account is ready for use!

(Danger) Upgrading to a paid account

While using the \$300 Free Tier credits you may be subjected to certain restrictions in terms of resources your account can provision. For example, you can only provision a limited number of VMs and storage.

If you need to use more resource quotas, GCP allows you to upgrade your account to a paid account **at your own risk**.

On upgrading your account you will no longer be subjected to any restrictions as mentioned above. However, if your coupon expires or you exceed the credits, GCP **WILL NOT WARN YOU** and directly charge your credit card.

We therefore strongly recommend you exercise caution if you decide to upgrade your account to a paid account. You can create budget alarms to monitor the spending and receive warning emails.

Grade Penalties on Excessive Use

You are solely responsible for the usage of your GCP account and should not exceed the financial limits of the coupons you are provided by course management - so be cautious!

As we encouraged you to create a new Google account specifically for this course, free trial should aid you for the first two months of the course.

Usage reports will be monitored by the instructors and excessive use will be grounds for grade penalties.

The GCP account that you have created for the course should be used **exclusively** for the projects in this course.

This account must not be used for any private work or for other courses/projects at CMU or elsewhere.

Dropping the Course

Please ensure that you terminate all resources and cancel your GCP account (<https://support.google.com/accounts/answer/32046?hl=en>) if you do not plan to use GCP with this account in the future.