



Ch-1. Introduction to Cloud computing and AWS



This chapter will cover following topics...

- Basics of Cloud computing
- Characteristics / Advantages of Cloud computing
- Cloud computing deployment models
- Cloud computing service model
- Basics of AWS
- Benefits of using AWS over traditional data center
- Different ways to access AWS services
- Global Infrastructure of AWS
- Important services of AWS – Walk through – High Level
- AWS account creation steps
- Management console walkthrough
- Basic account management settings
- Introduction to billing dashboard
- Setting up billing alarm and budget

1. Basics of Cloud Computing

According to Wikipedia : *“It is internet-based computing in which large groups of remote servers are networked to allow the centralized data storage, and online access to computer services or resources.”*

In simple terminologies, cloud computing is the host of services that are hosted at remote location and they are remotely accessible to us.

Host of services contains:

- networks
- servers
- storage
- applications
- services

Above services are available with minimal management efforts and less/no service provider interaction.

2. Characteristics / Advantages of Cloud Computing

High availability - Very high availability – 99.9%

Fault Tolerance - Easy fault finding and resolution

Scalability - Scale up and scale down on the go

Elasticity - Easily grow and shrink

Lower latency - Easy deployment and available in no time

Pay as you go model - Only pay what you use

3. Cloud deployment models

Private Cloud – Managed and used by single specific business or organization

- More flexibility
- Improved security
- High scalability



Public Cloud – Open and accessible to public for subscription

- Lower cost
- No maintenance
- Near unlimited scalability – on demand resources are available
- High reliability



3. Cloud deployment models(Conti..)

Community Cloud – Accessible by group of organization

Almost like public cloud except access is limited to specific community



Hybrid cloud – Combination of private and public cloud

Total control

Flexibility

Cost effectiveness

Ease



4. Cloud computing service model

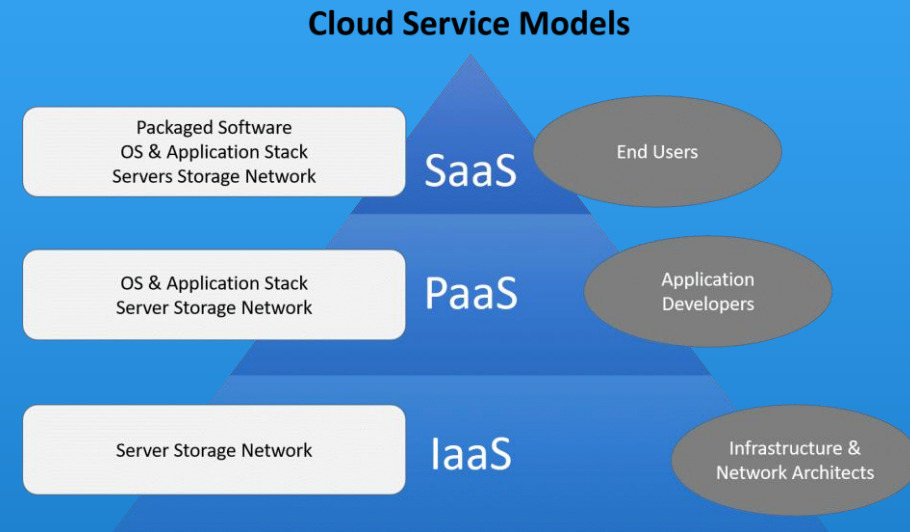
Reference models on which cloud computing is based on

Cloud services are defined in 3 categories:

Infrastructure as a service(IaaS)

Platform as a service(PaaS)

Software as a service(SaaS)



4. Cloud computing service model(Conti...)

Infrastructure as a service(IaaS)

Includes infra such as: servers, private networks, disk drives, long term storage solutions, email servers, domain name servers etc.

The customers deploy and run their own applications on these resources.

For ex : Amazon Ec2, Microsoft Azure, Rackspace, GoDaddy etc.

Platform as a service(PaaS)

The service provider makes certain core components such as databases, queues, workflow engines, email, and so on, available as services to the customer.

The customer then leverages these components for building their own applications.

For ex : AWS Elastic beanstalk, Google app engine etc.

Software as a service(SaaS)

Third-party providers using a subscription model provide end user applications to their customers.

Also called on-demand softwares.

For ex : Google drive, Office 365 etc.

5. Basics of AWS(Amazon Web Services)

Amazon Web Service(AWS) is a public cloud

AWS is leader in cloud IaaS

In 2006, AWS started offering IT services to the market
In the form of web services

Today, AWS provides a highly reliable, scalable and
low cost infrastructure platform

AWS services are being used in 190 countries around
the world



5. Basics of AWS(Amazon Web Services) (Conti...)



Kellogg's



IMDb



TATA
MOTORS



Unilever



SIEMENS



KENT
Health Care
PRODUCTS



shaadi.com



NETFLIX



hungama
DIGITAL



abof
all about fashion



vodafone



prime video



AirAsia



D-Link®



Adobe



Pinterest



DBS



airbnb



BYJU'S
The Learning App

6. Benefits of using AWS over traditional DC

No huge up front cost :

CapEx -> OpEx

Cost benefit from massive economies of scale :

bulk discounts available

No need to guess required infrastructure capacity :

grow and shrink as per your requirement

Increased speed and agility :

Independent from third party vendors and their availability

Global access :

AWS global infrastructure



7. Different ways to access AWS services

AWS management console:

Web based / browser based AWS console

AWS command line interface(CLI):

Mostly used by system administrators

Different commands to access AWS services

AWS software development kits(SDKs):

Used while developing APIs using programming languages

Query API:

By using GET and PUT HTTP requests



8. AWS overview and its infrastructure

AWS (Amazon Web Service) infrastructure is connected and isolated in the form of Regions, Availability Zones and Edge location based on geography.



#	Region & Number of Availability Zones	New Region (coming soon)
	US East N. Virginia (6), Ohio (3)	Bahrain
	US West N. California (3), Oregon (3)	Hong Kong SAR, China
	Asia Pacific Mumbai (2), Seoul (2), Singapore (3), Sydney (3), Tokyo (4), Osaka-Local (1) ¹	Sweden
	Canada Central (2)	AWS GovCloud (US-East)
	China Beijing (2), Ningxia (3)	
	Europe Frankfurt (3), Ireland (3), London (3), Paris (3)	
	South America São Paulo (3)	
	AWS GovCloud (US-West) (3)	

8. AWS overview and its infrastructure

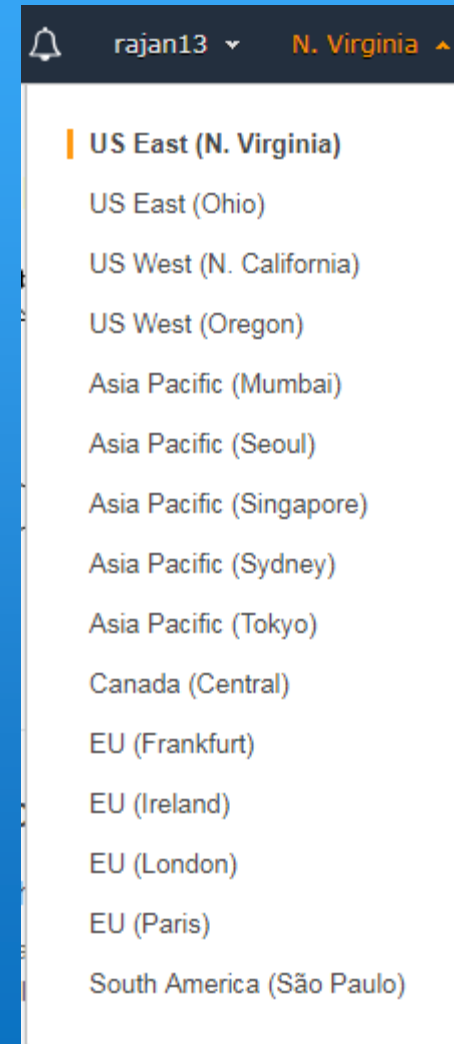
Regions:

Independent geography area that contains multiple AZs

Each region has at least 2 AZs

Name pattern : country-region-1

For example: us-east-1



8. AWS overview and its infrastructure

Availability zones:

One or more data center(DC) within a region

All AZs are internally connected through dedicated low latency network

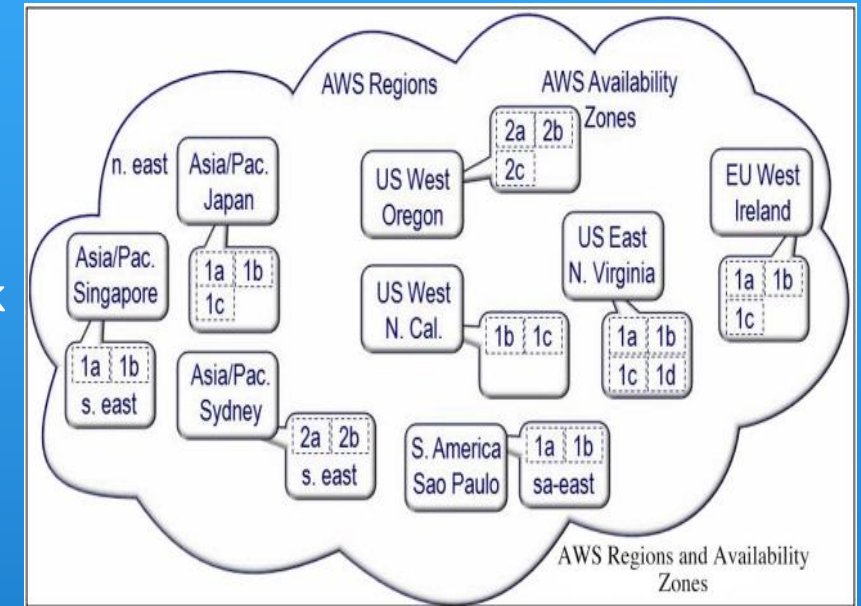
For example: us-east-1A, us-east-1B...

Edge location:

It is smaller Point of Presence(PoP) service used to cache content through Cloudfront CDN

Generally nos. of Edge locations are always more than nos. of AZs

Delhi, Chennai, Mumbai and Hyderabad are the edge locations in India



9. Important services of AWS – High level Walkthrough

IAM(Identity and Access Management)

Amazon Lambda

S3(Simple Storage Service)

Amazon ElastiCache

EC2(Elastic Compute Cloud)

Amazon SQS(Simple Queue Service)

VPC(Virtual Private Network)

Amazon SNS(Simple Notification Service)

Load balancer

Amazon SES(Simple Email Service)

Amazon EBS(Elastic Block Storage)

Amazon API Gateway

Amazon DynamoDB

Amazon Route53

Amazon RDS(Relational Database Systems)

Amazon CloudFront

Amazon RedShift

Amazon CloudWatch

10. AWS Account creation steps

URL : <https://aws.amazon.com/free/>

The screenshot displays the AWS Free Tier page, organized into a 2x3 grid of service cards. Each card features a category header, the service name, the free tier limit, a brief description, and a link to learn more. The services shown are:

- COMPUTE**: Amazon EC2, 750 Hours per month, Resizable compute capacity in the Cloud.
- ANALYTICS**: Amazon QuickSight, 1 GB of SPICE capacity, Fast, easy-to-use, cloud-powered business analytics service.
- DATABASE**: Amazon RDS, 750 Hours per month of db.t2.micro database usage, Managed Relational Database Service.
- STORAGE & CONTENT DELIVERY**: Amazon S3, 5 GB of standard storage, Secure, durable, and scalable object storage.
- COMPUTE**: AWS Lambda, 1 Million free requests per month, Compute service that runs your code in response to events.

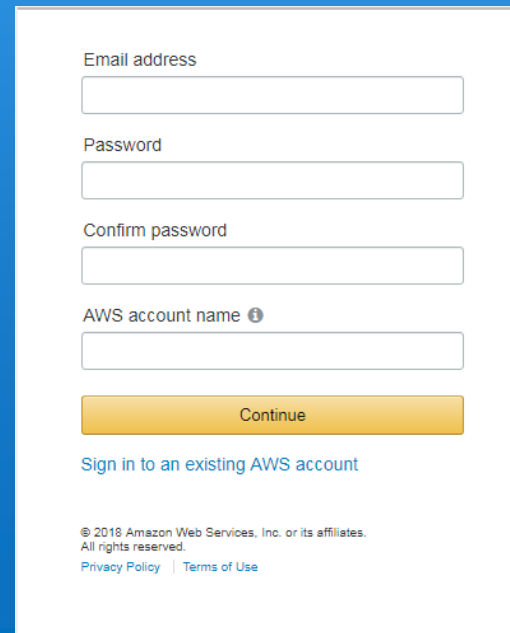
Each card also includes an "EXPAND DETAILS" link at the bottom.

10. AWS Account creation steps(Conti...)

Point your browser to <http://aws.amazon.com/free> and click on **Create a Free Account**



Enter below details, as shown:


A screenshot of the AWS account creation form. It is a white rectangular box with a thin border. Inside, the fields are: "Email address" with a text input field; "Password" with a text input field; "Confirm password" with a text input field; "AWS account name" with a text input field and a small information icon to its right. Below these fields is a yellow "Continue" button. Under the button is a link "Sign in to an existing AWS account". At the bottom, in small text, is "© 2018 Amazon Web Services, Inc. or its affiliates. All rights reserved." followed by links for "Privacy Policy" and "Terms of Use".



10. AWS Account creation steps(Conti...)

Enter captcha code to proceed

Security Check

For security reasons, we need to verify that account holders are real people.





Please type the characters as shown above

Continue

10. AWS Account creation steps(Conti...)

Enter contact details to proceed

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

Account type ⓘ

☒ Professional ☐ Personal

Full name

test7788

Company name

Phone number

Country/Region

United States ▼

Address

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

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

City

State / Province or region

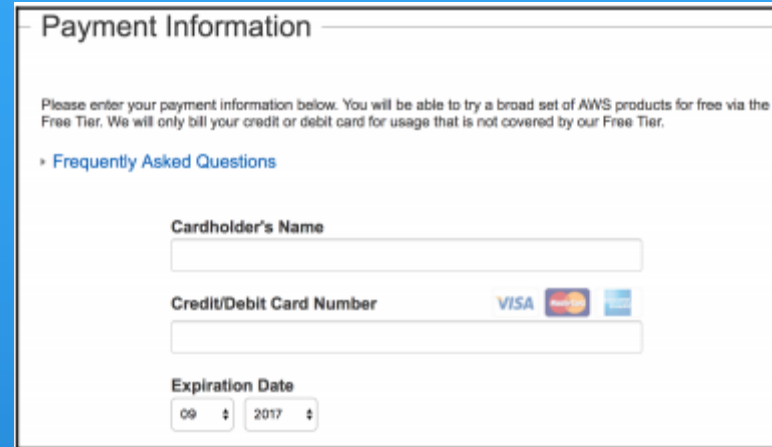
Postal code

☐ Check here to indicate that you have read and agree to the terms of the [AWS Customer Agreement](#)

Create Account and Continue

10. AWS Account creation steps(Conti...)

Enter payment details






The screenshot shows the 'Payment Information' section of the AWS account creation process. It includes a title bar, a paragraph of text explaining the Free Tier, a link to 'Frequently Asked Questions', and three input fields: 'Cardholder's Name', 'Credit/Debit Card Number' (with VISA, MasterCard, and American Express logos), and 'Expiration Date' (with dropdown menus for month and year).

Payment Information

Please enter your payment information below. You will be able to try a broad set of AWS products for free via the Free Tier. We will only bill your credit or debit card for usage that is not covered by our Free Tier.

[Frequently Asked Questions](#)

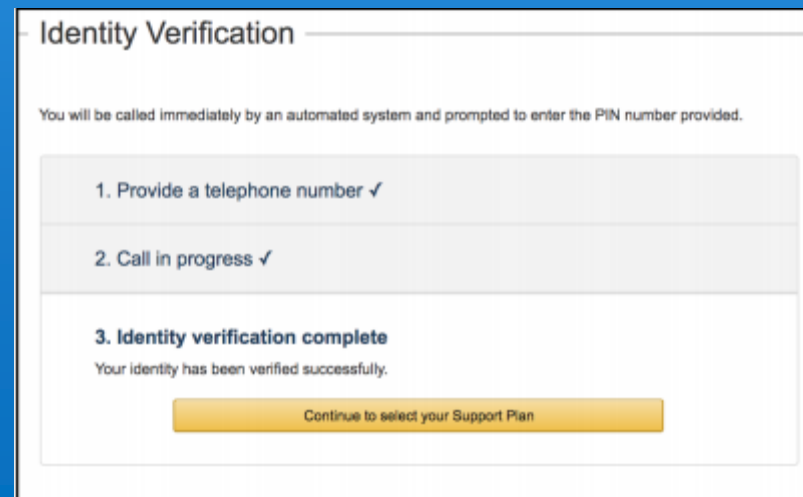
Cardholder's Name

Credit/Debit Card Number   

Expiration Date

09 2017

Next, Amazon executes an identity verification step. It includes a call back via an automated system to verify your telephone number. You will also need to enter a four digit PIN (displayed on your screen) when prompted.



The screenshot shows the 'Identity Verification' section of the AWS account creation process. It includes a title bar, a paragraph of text explaining the automated call, a progress list with three steps (1. Provide a telephone number ✓, 2. Call in progress ✓, 3. Identity verification complete), and a button to 'Continue to select your Support Plan'.

Identity Verification

You will be called immediately by an automated system and prompted to enter the PIN number provided.

1. Provide a telephone number ✓

2. Call in progress ✓

3. Identity verification complete

Your identity has been verified successfully.

[Continue to select your Support Plan](#)

10. AWS Account creation steps(Conti...)

Select your **Support Plan**: You can subscribe to one of: **Basic**, **Developer**, **Business**, or **Enterprise** plans. It is recommend subscribing to the **Basic** plan at this stage.

Support Plan

AWS Support offers a selection of plans to meet your needs. All plans provide 24x7 access to customer service, AWS documentation, whitepapers, and support forums. For access to technical support and additional resources to help you plan, deploy, and optimize your AWS environment, we recommend selecting a support plan that best aligns with your AWS usage.

All customers receive free Basic Support.

Basic Support

☒ **Basic**

Description: Customer Service for account and billing questions and access to the AWS Community Forums.

Price: Included

☐ **Developer**

Use case: Experimenting with AWS

Description: One primary contact may ask technical questions through Support Center and get a response within 12–24 hours during local business hours.

Price: Starts at \$29/month (scales based on usage)

☐ **Business**

Use case: Production use of AWS

Description: 24x7 support by phone and chat, 1-hour response to urgent support cases, and help with common third-party software. Full access to AWS Trusted Advisor for optimizing your AWS infrastructure, and access to the AWS Support API for automating your support cases and retrieving Trusted Advisor results.

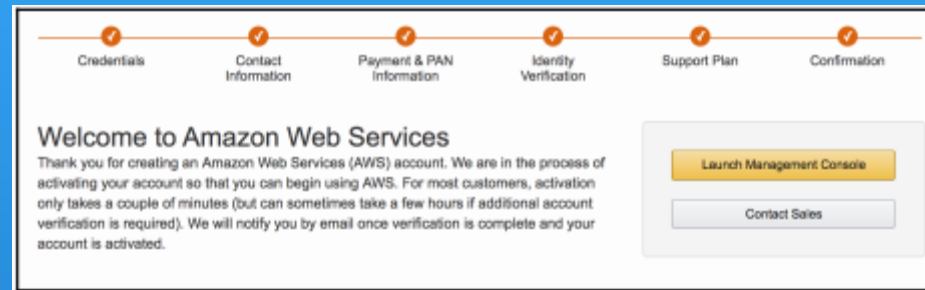
Price: Starts at \$100/month (scales based on usage)

To explore all features and benefits of AWS Support, including plan comparisons and pricing samples, [click here](#).

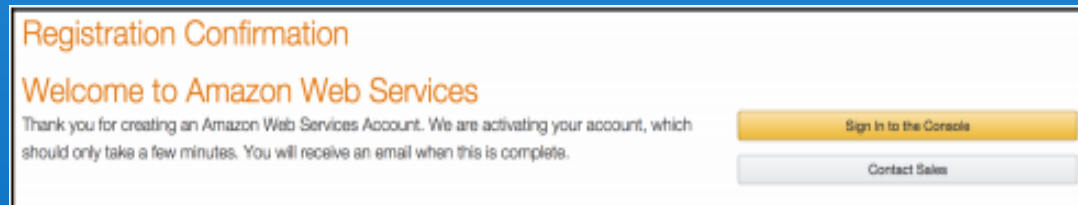
Continue

10. AWS Account creation steps(Conti...)

At **Confirmation** stage, you have completed all the steps requiring your input for setting up an AWS account (see all the steps checked at the top of your screen as shown). Click on **Launch Management Console**:



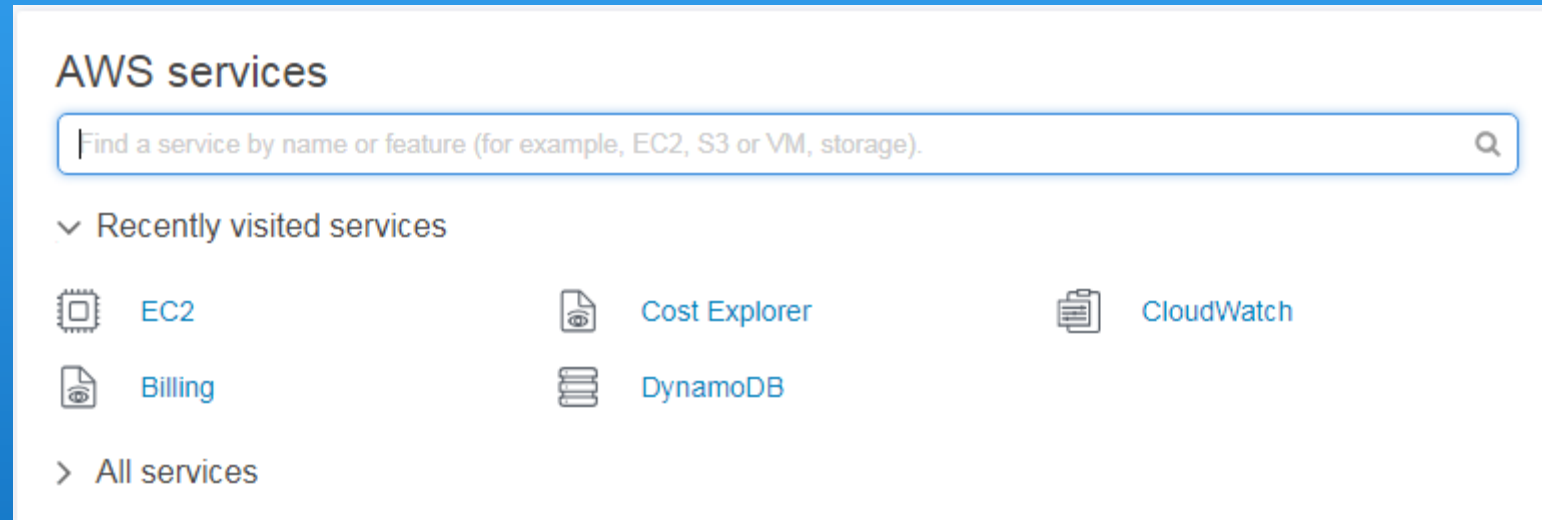
At this stage, you have successfully created an AWS account, and you are ready to start using the services offered by Amazon Web Services. On clicking **Sign-in to the Console** button, you will be requested to log in



11. AWS management console walkthrough

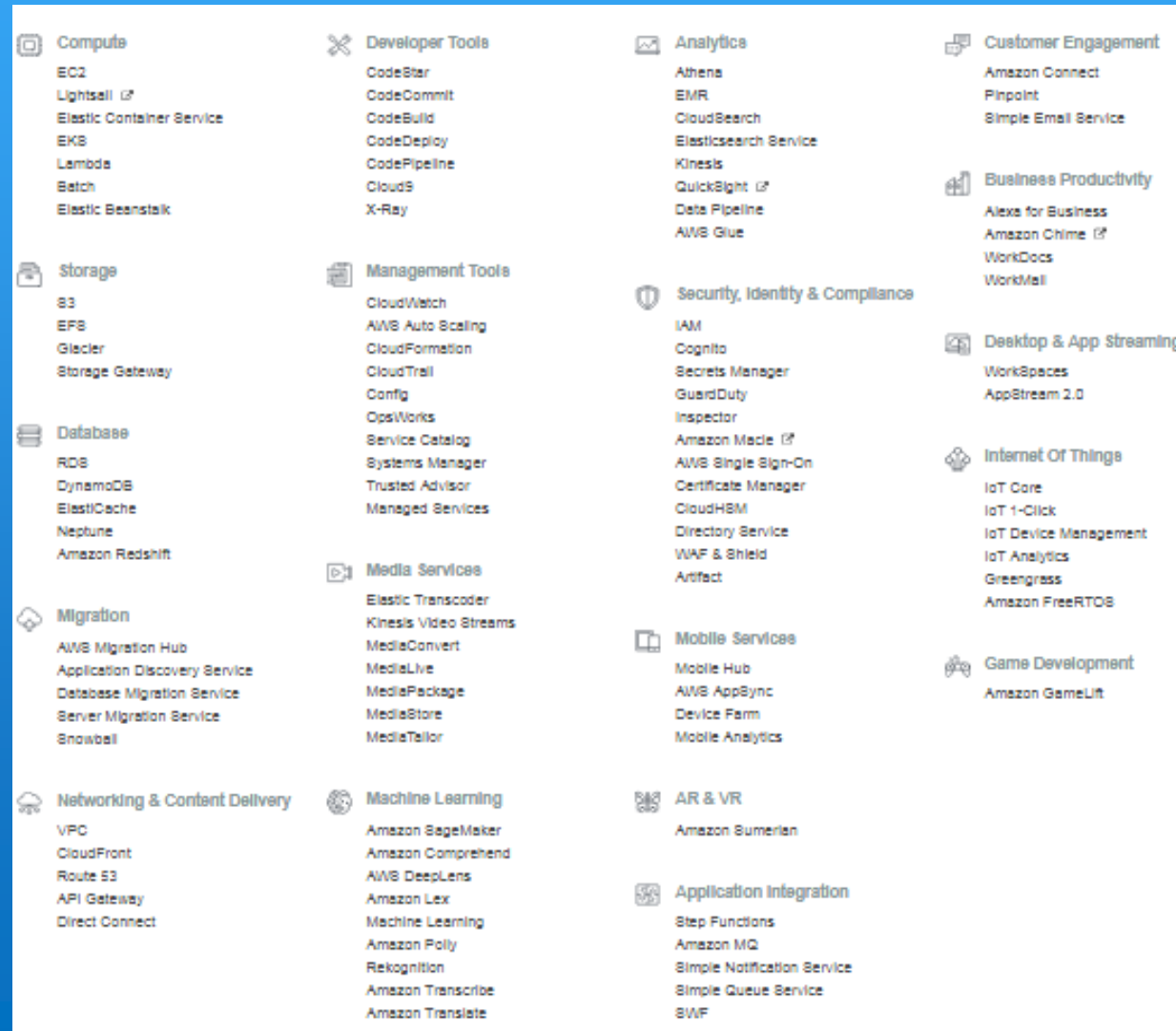
The AWS management console is the central location from where you can access all Amazon services. The management console has links to the following:

The home screen of the console is shown as follows:



11. AWS management console walkthrough(Conti...)

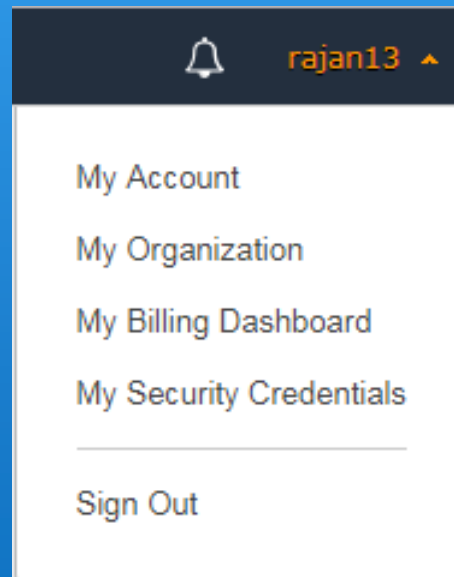
Click on **All services** to expand the display. This view lists all the AWS services available in a specific Amazon region.



11. AWS management console walkthrough(Conti...)

Account-related information:

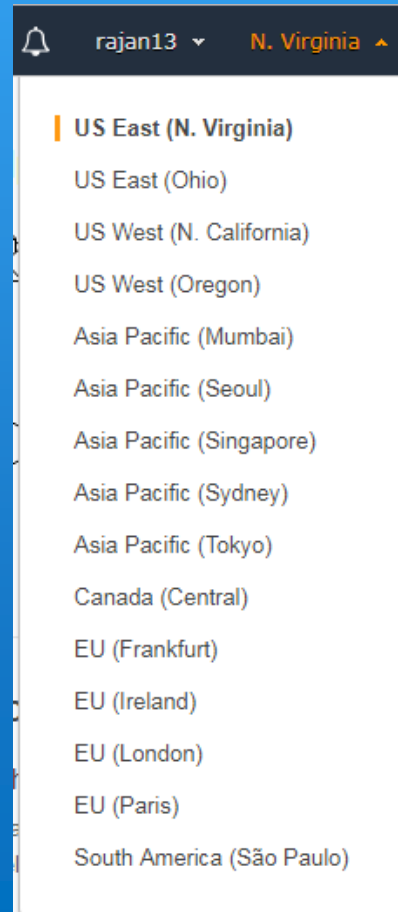
This allows you to access your account-related data. It includes security credentials needed to access the AWS resources, and the **My Billing Dashboard** option gives you real-time information on your current month's billing:



11. AWS management console walkthrough(Conti...)

Amazon regions:

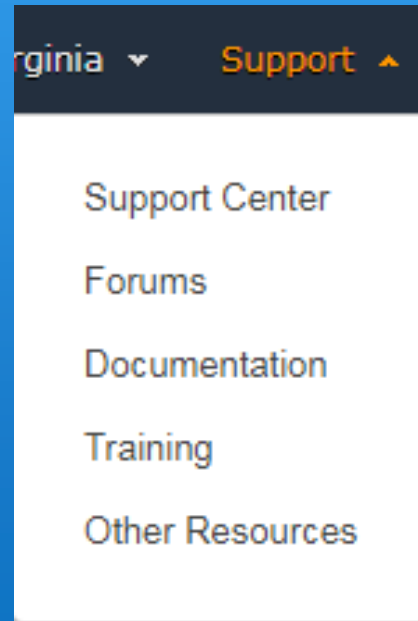
This option allows you to access the Amazon Web Services in a specific region. For example, the list of Amazon Web Services, shown earlier, were for the **US East(N. Virginia)** region:



11. AWS management console walkthrough(Conti...)

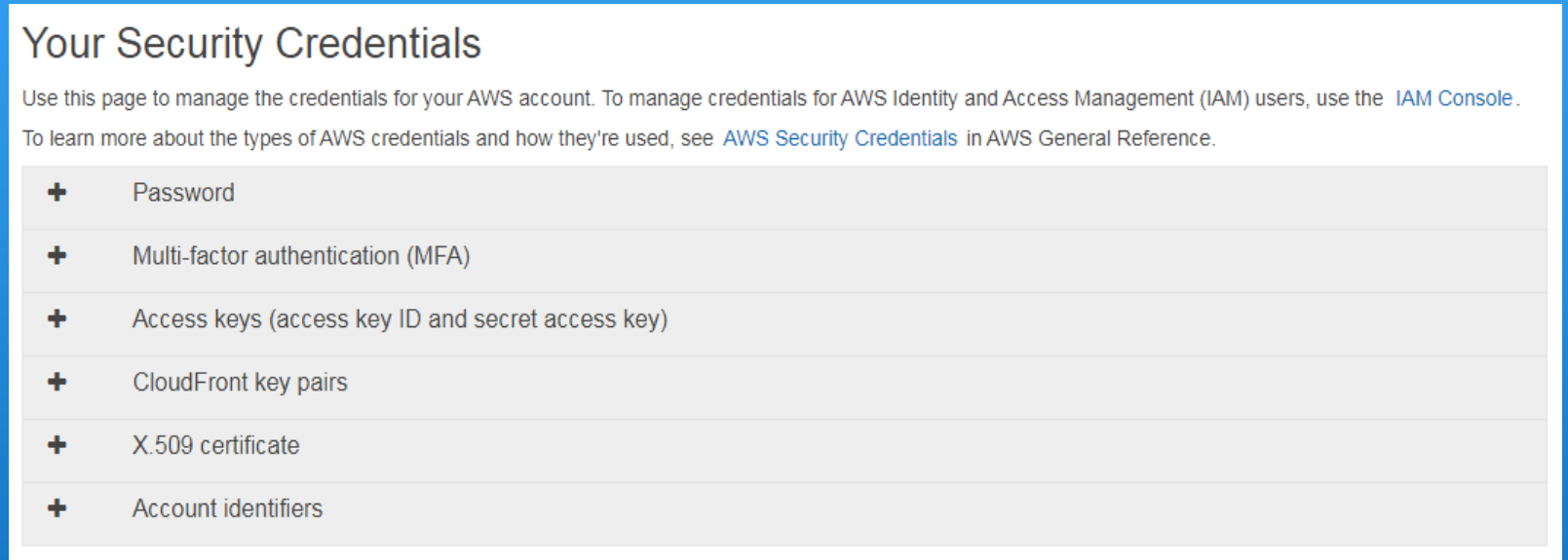
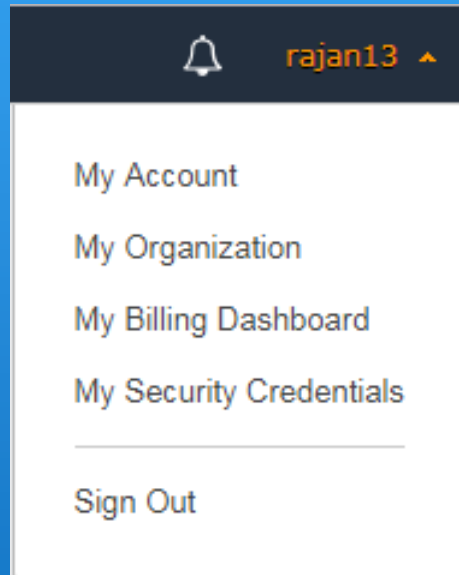
Help:

Click on the **Support** menu (located on the title bar) to access help-related items. You can navigate to help, forums and support pages



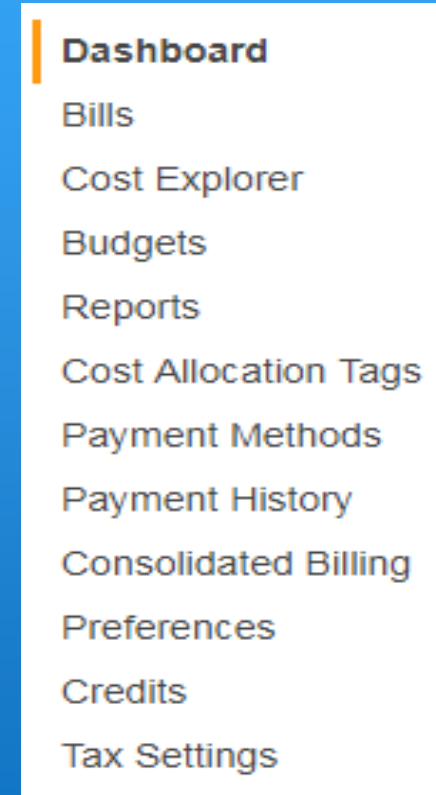
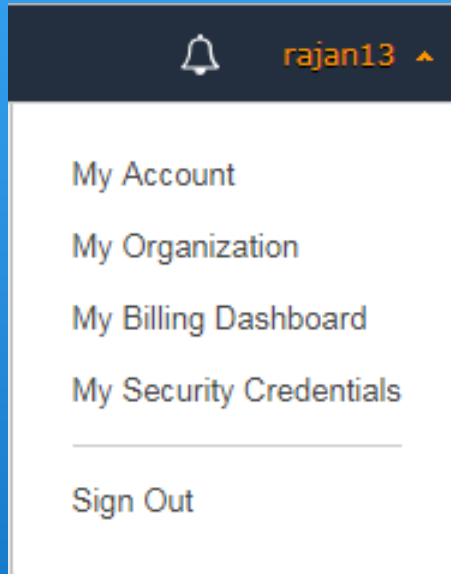
12. Basic account management settings

For account management settings, click on My Security Credential as shown in below screenshot



13. Introduction to billing dashboard

Click on **My billing dashboard** as shown in below screenshot



14. Setting up billing alarm and budget

To get billing, you need to enable **Receive PDF invoice by email** option

Preferences

Billing Preferences

☒ **Receive PDF Invoice By Email**

Turn on this feature to receive a PDF version of your invoice by email. Invoices are generally available within the first three days of the month.

Cost Management Preferences

☒ **Receive Free Tier Usage Alerts**

Turn on this feature to receive email alerts when your AWS service usage is approaching, or has exceeded, the AWS Free Tier usage limits. If you wish to receive these alerts at an email address that is not the primary email address associated with this account, please specify the email address below.

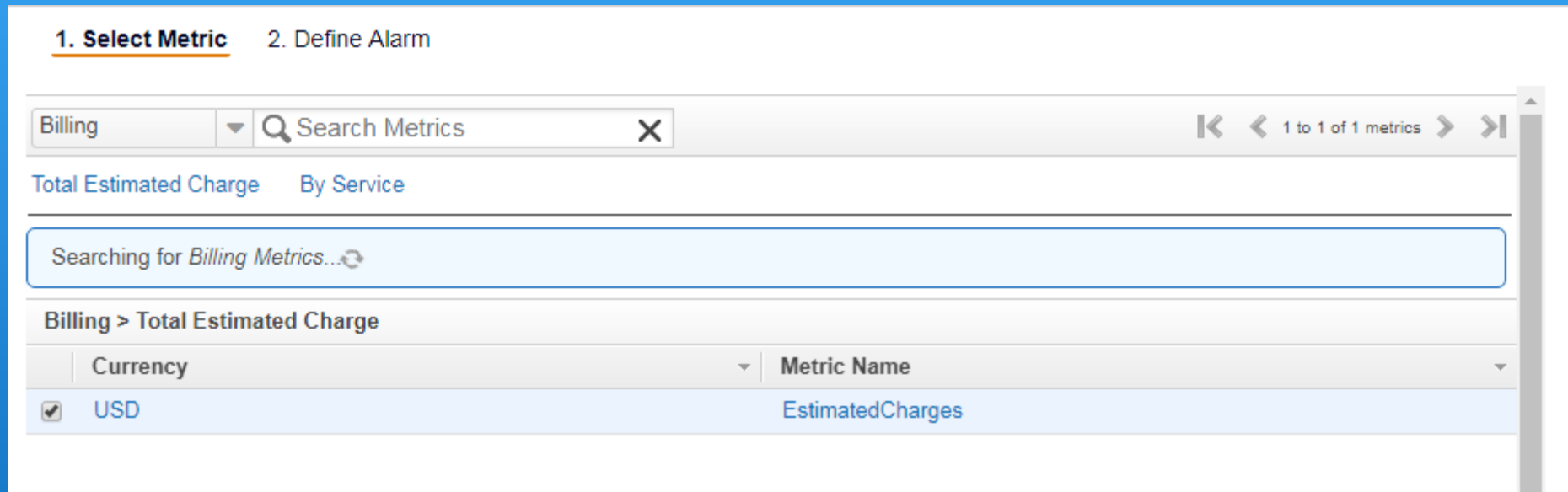
Email Address:

☒ **Receive Billing Alerts**

Turn on this feature to monitor your AWS usage charges and recurring fees automatically, making it easier to track and manage your spending on AWS. You can set up billing alerts to receive email notifications when your charges reach a specified threshold. Once enabled, this preference cannot be disabled. [Manage Billing Alerts](#) or try the [new budgets feature!](#)

14. Setting up billing alarm and budget(Conti...)

To set budget and its alarm, we will use **Cloudwatch** service. It is region specific service, so select region first and Go to **Cloudwatch** service and select metric as below:



1. Select Metric 2. Define Alarm

Billing Search Metrics X 1 to 1 of 1 metrics

Total Estimated Charge By Service

Searching for *Billing Metrics...*

Billing > Total Estimated Charge

	Currency	Metric Name
<input checked="" type="checkbox"/>	USD	EstimatedCharges

14. Setting up billing alarm and budget(Conti...)

In next step, define alarm threshold and relative actions

1. Select Metric

2. Define Alarm

Alarm Threshold

Provide the details and threshold for your alarm. Use the graph on the right to help set the appropriate threshold.

Name:


Description:

Whenever charges for: EstimatedCharges

is:

Additional settings

Provide additional configuration for your alarm.

Treat missing data as: 

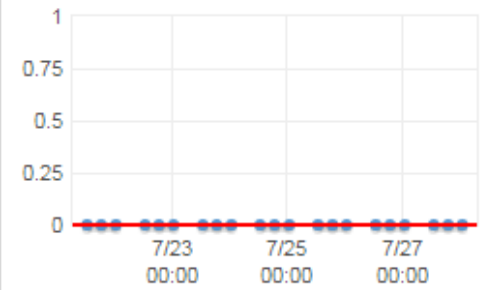
Actions

Define what actions are taken when your alarm changes state.

Alarm Preview

This alarm will trigger when the blue line goes up to or above the red line

EstimatedCharges >= 0 for 1 datapoints within 6 hours



Namespaces: AWS/Billing

Currency:

Metric Name:

Summary

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See you soon...

Thank You!