
Ch-1.
Introduction to Cloud computing and AWS
3RITechnologies

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

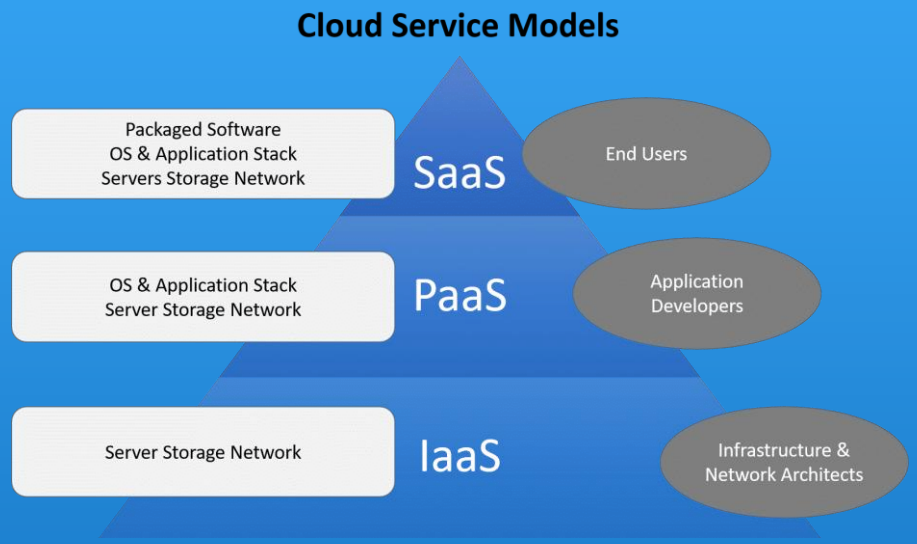
Reference models on which cloud computing is based on

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…)

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

US East
N. Virginia (6),
Ohio (3)

US West
N. California (3),
Oregon (3)

Asia Pacific
Mumbai (2),
Seoul (2),
Singapore (3),
Sydney (3),
Tokyo (4),
Osaka-Local (1)[1]

Canada
Central (2)

China
Beijing (2),
Ningxia (3)

Europe
Frankfurt (3),
Ireland (3),
London (3),
Paris (3)

South America
São Paulo (3)

AWS GovCloud (US-West) (3)

New Region (coming soon)

Bahrain

Hong Kong SAR, China

Sweden

AWS GovCloud (US-East)

8. AWS overview and its infrastructure

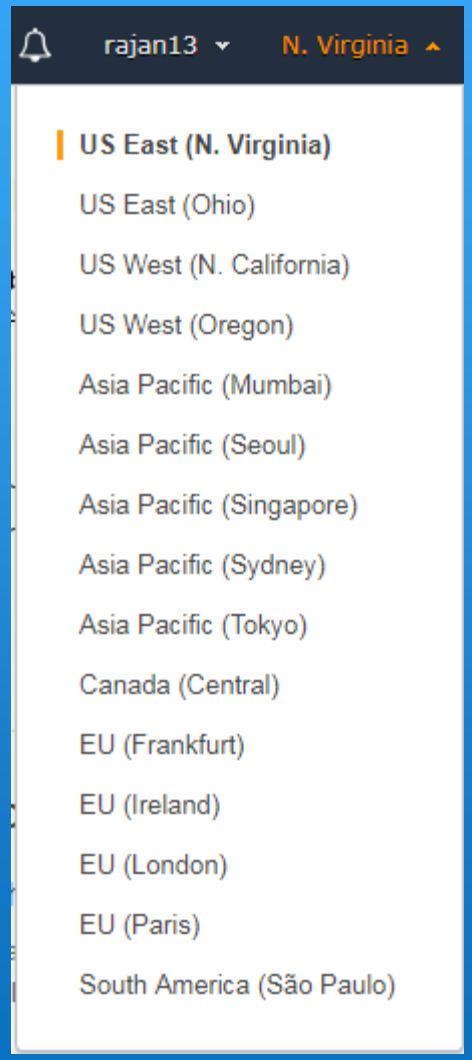
Regions:

Independent geography area that contains multiple AZs

Each region has at least 2 AZs

Name pattern : country-region-1

For example: us-east-1



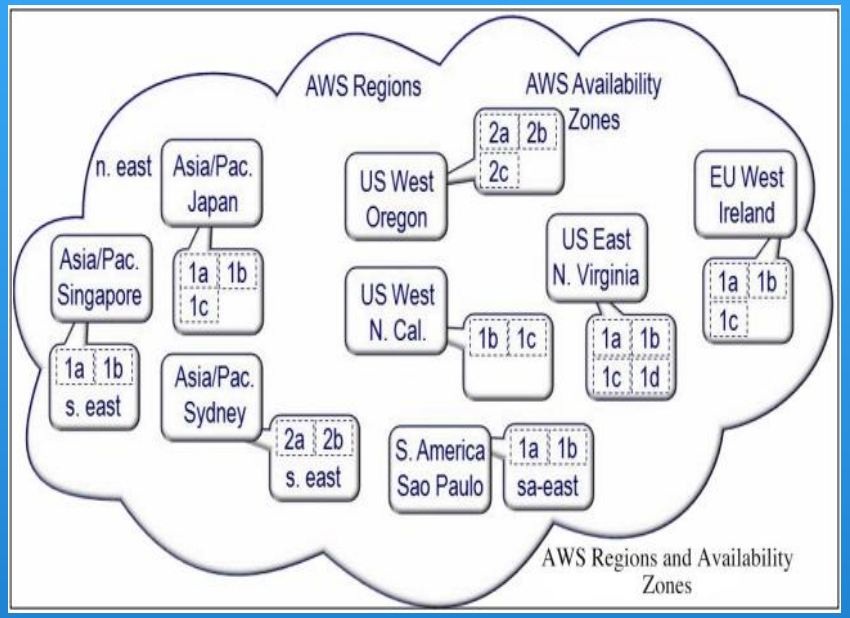
8. AWS overview and its infrastructure

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)

S3(Simple Storage Service)

EC2(Elastic Compute Cloud)

VPC(Virtual Private Network)

Load balancer

Amazon EBS(Elastic Block Storage)

Amazon DynamoDB

Amazon RDS(Relational Database Systems)

Amazon RedShift

Amazon Lambda

Amazon Elasticache

Amazon SQS(Simple Queue Service)

Amazon SNS(Simple Notification Service)

Amazon SES(Simple Email Service)

Amazon API Gateway

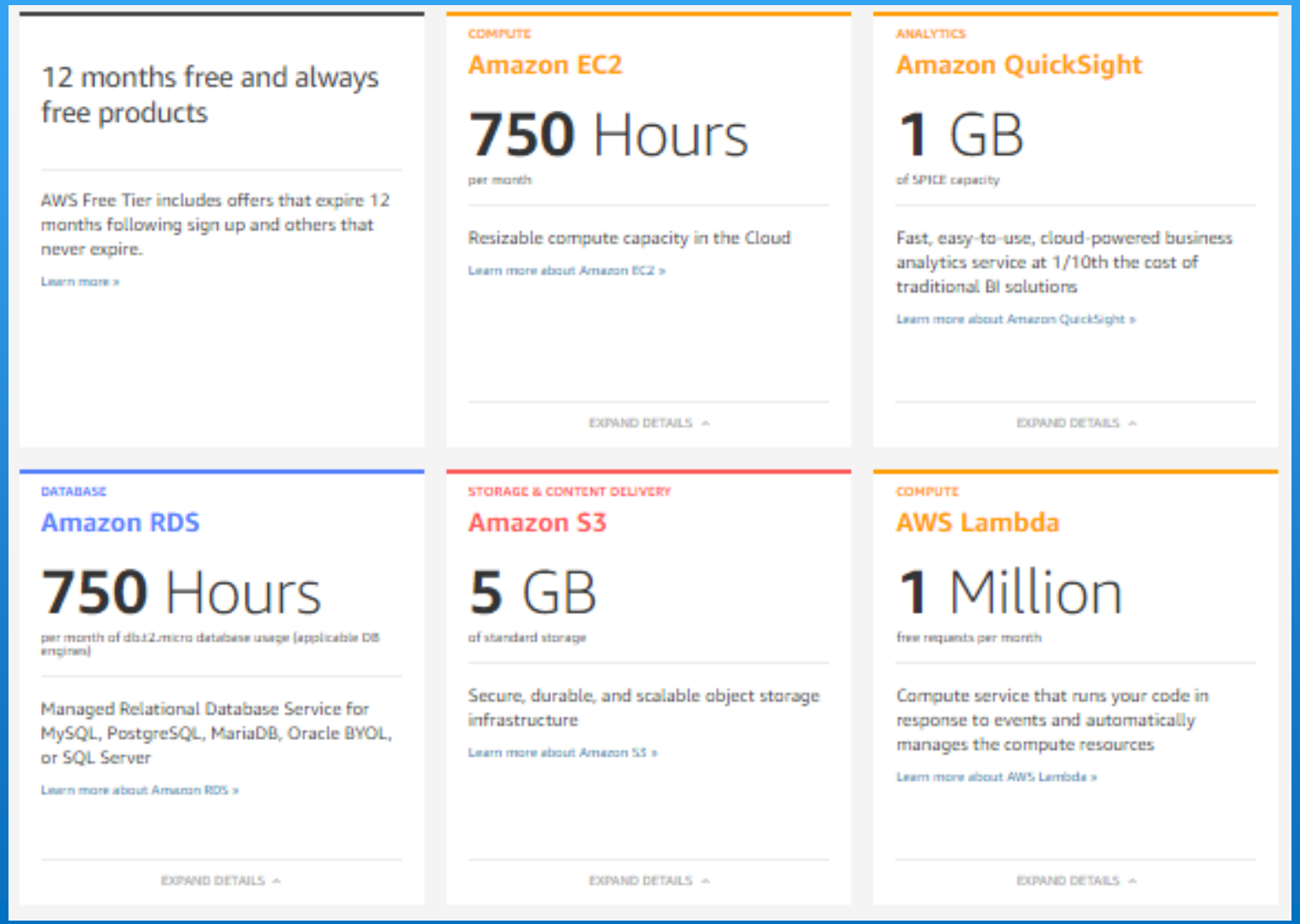
Amazon Route53

Amazon CloudFront

Amazon CloudWatch

10. AWS Account creation steps

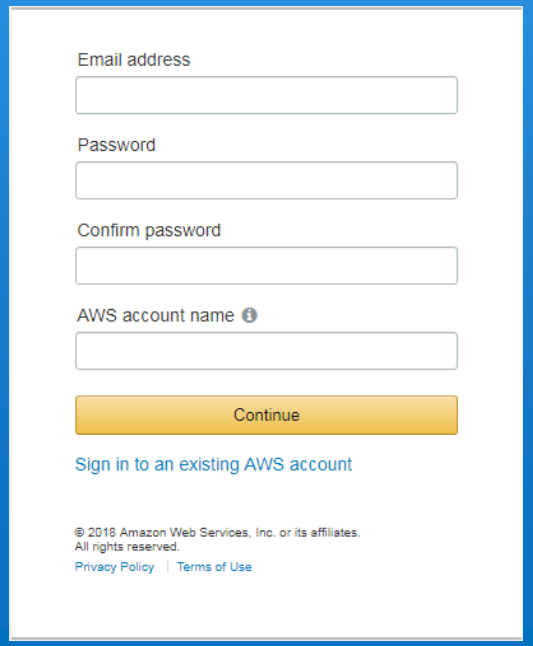
URL : https://aws.amazon.com/free/



10. AWS Account creation steps(Conti…)

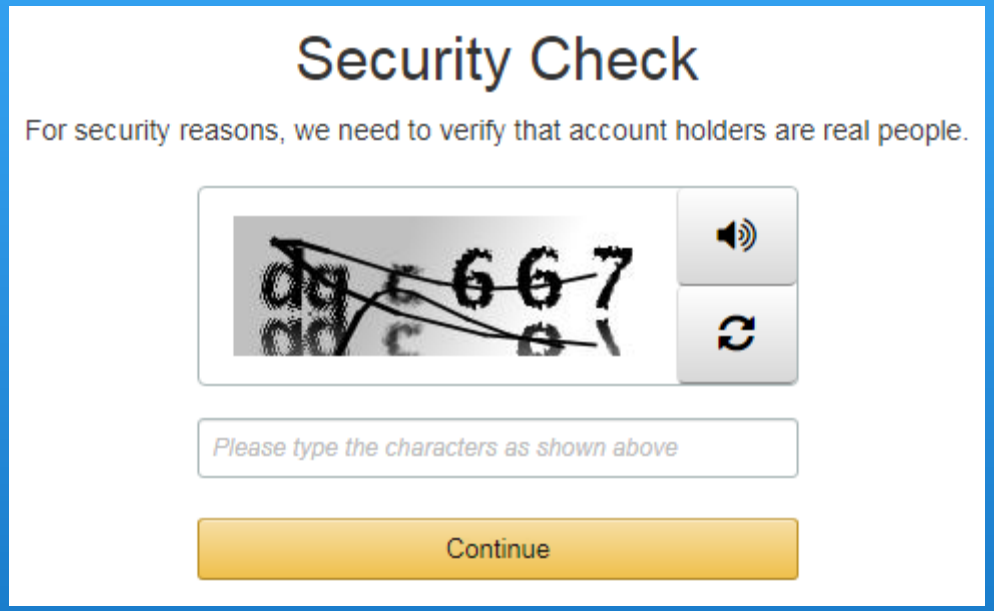
Point your browser to http://aws.amazon.com/free and click on **Create a Free Account**

Enter below details, as shown:



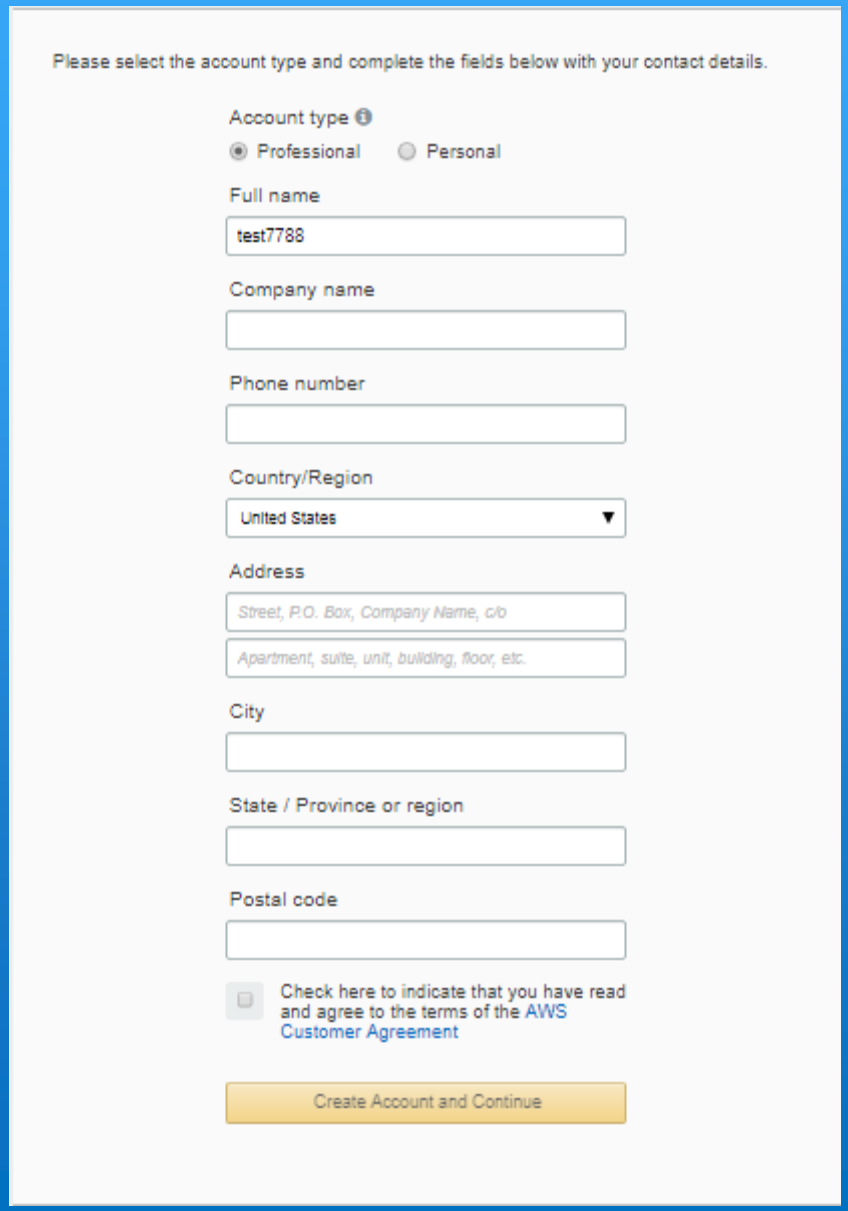
10. AWS Account creation steps(Conti…)

Enter captcha code to proceed



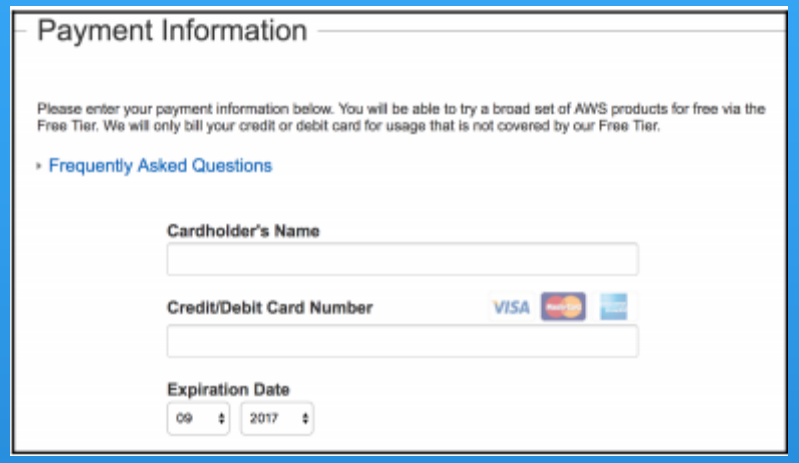
10. AWS Account creation steps(Conti...)

Enter contact details to proceed

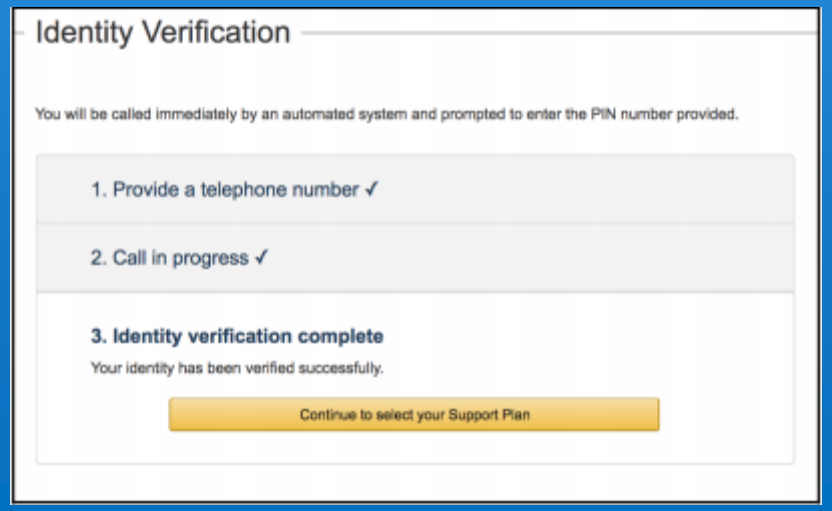


10. AWS Account creation steps(Conti…)

Enter payment details

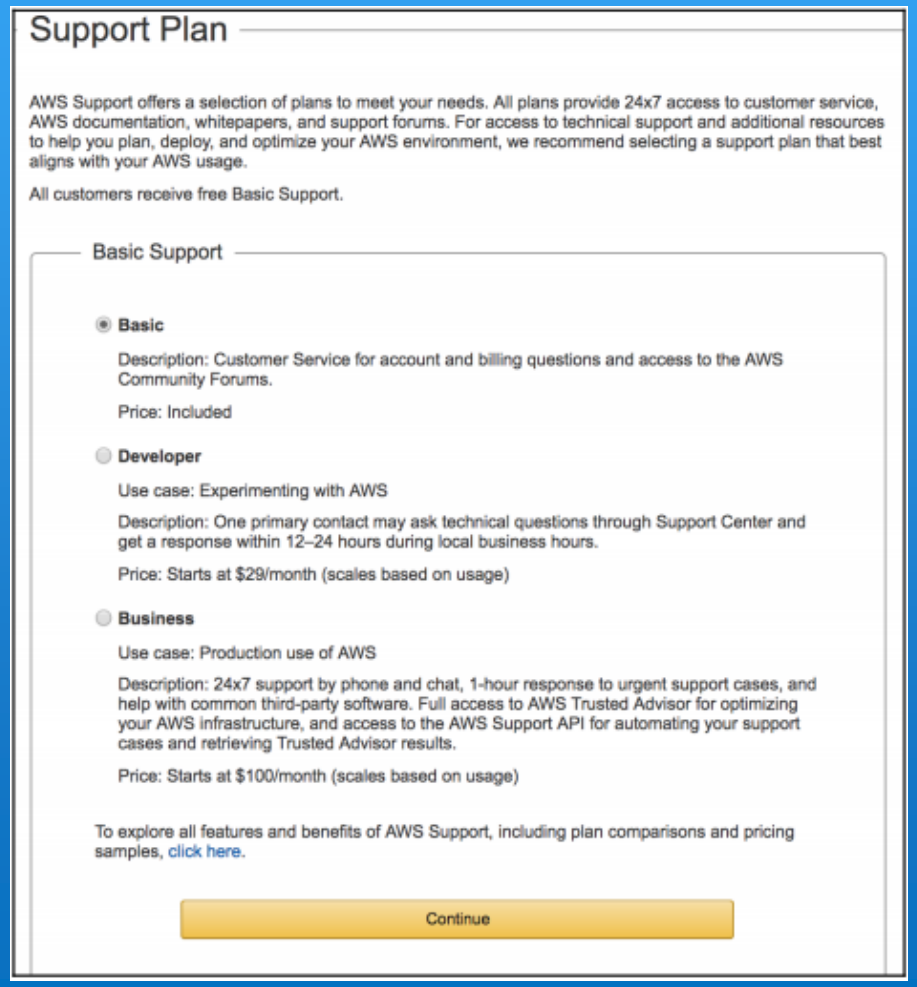


Next, Amazon executes an identity verification step. It includes a call back via an automated system to verify your telephone number. You will also need to enter a four digit PIN (displayed on your screen) when prompted.



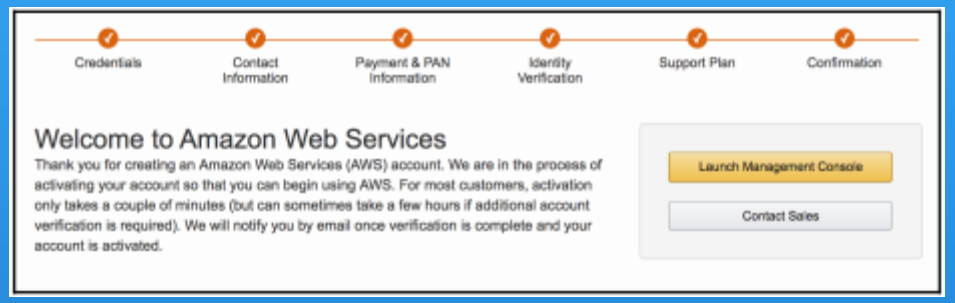
10. AWS Account creation steps(Conti...)

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.

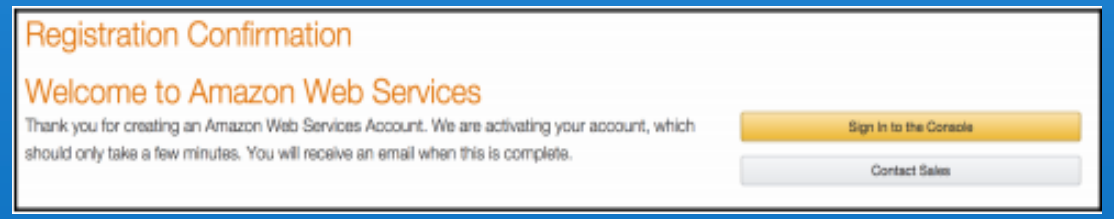


10. AWS Account creation steps(Conti…)

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**:



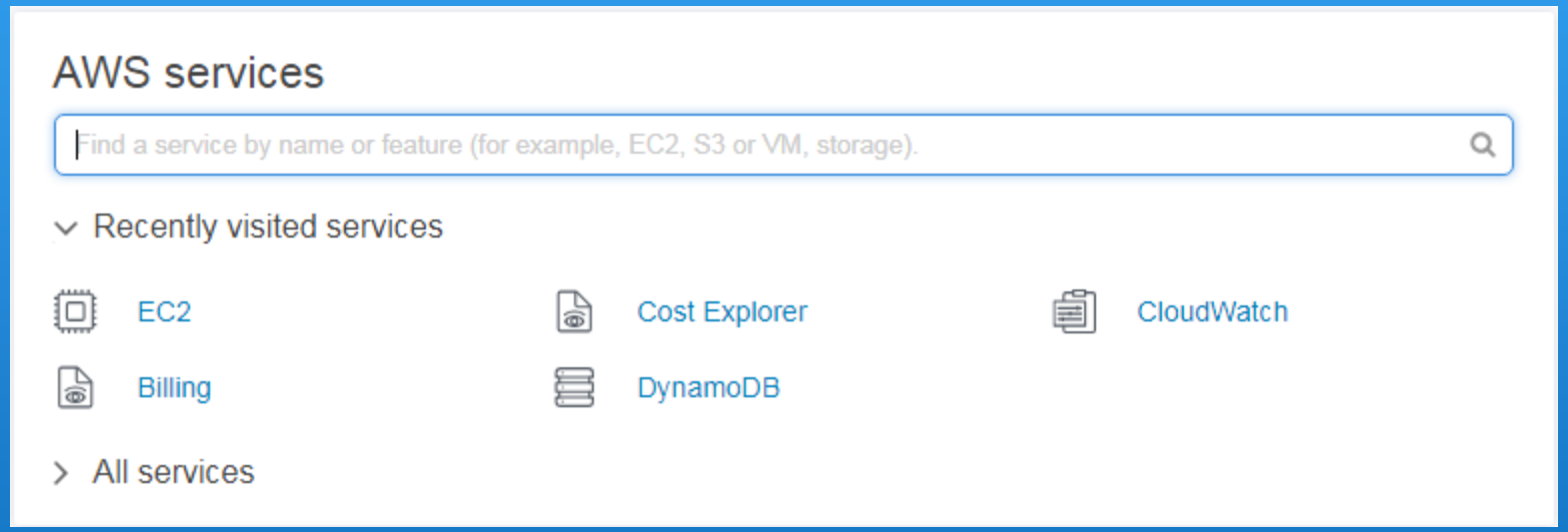
At this stage, you have successfully created an AWS account, and you are ready to start using the services offered by Amazon Web Services. On clicking **Sign-in to the Console** button, you will be requested to log in



11. AWS management console walkthrough

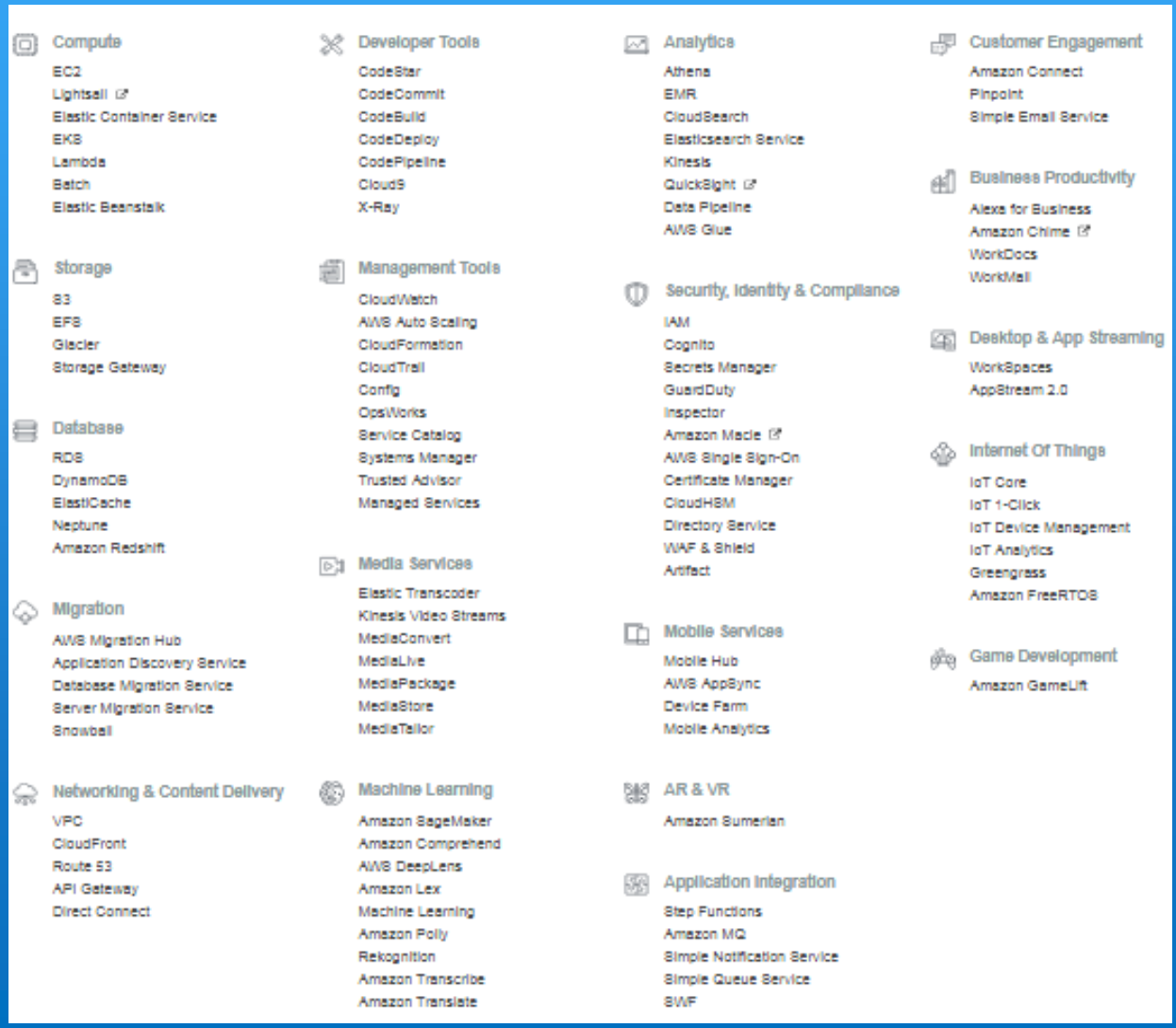
The AWS management console is the central location from where you can access all Amazon services. The management console has links to the following:

The home screen of the console is shown as follows:



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

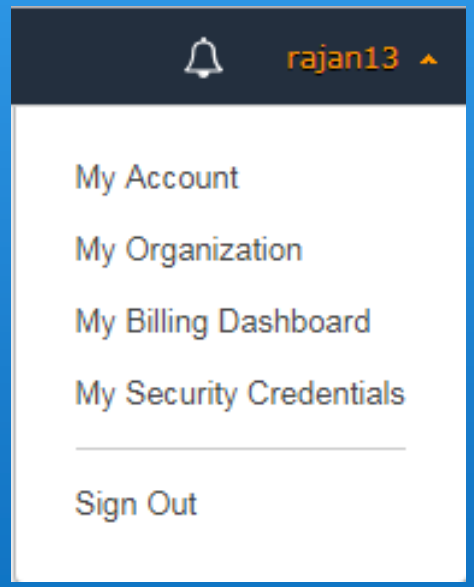
Click on **All services** to expand the display. This view lists all the AWS services available in a specific Amazon region.



11. AWS management console walkthrough(Conti…)

Account-related information:

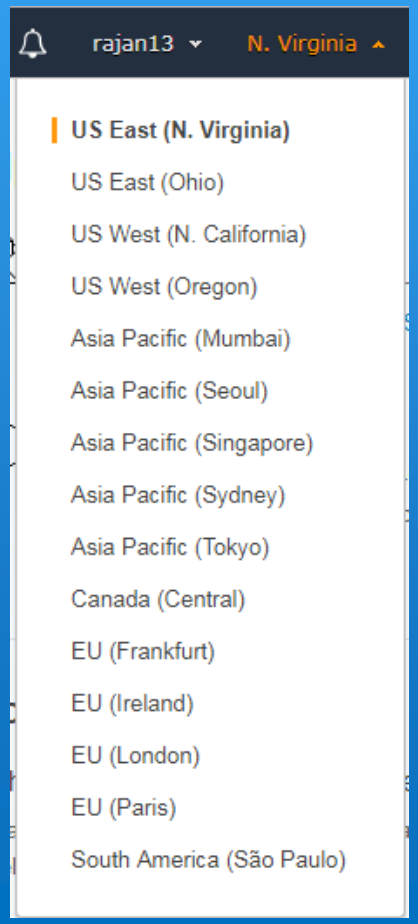
This allows you to access your account-related data. It includes security credentials needed to access the AWS resources, and the **My Billing Dashboard** option gives you real-time information on your current month's billing:



11. AWS management console walkthrough(Conti…)

Amazon regions:

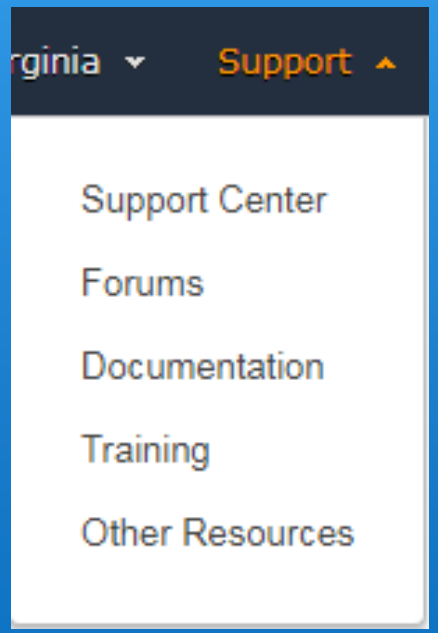
This option allows you to access the Amazon Web Services in a specific region. For example, the list of Amazon Web Services, shown earlier, were for the **US East(N. Virginia)** region:



11. AWS management console walkthrough(Conti…)

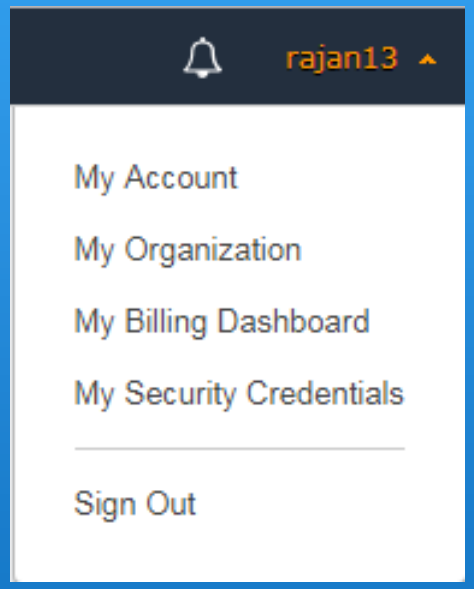
Help:

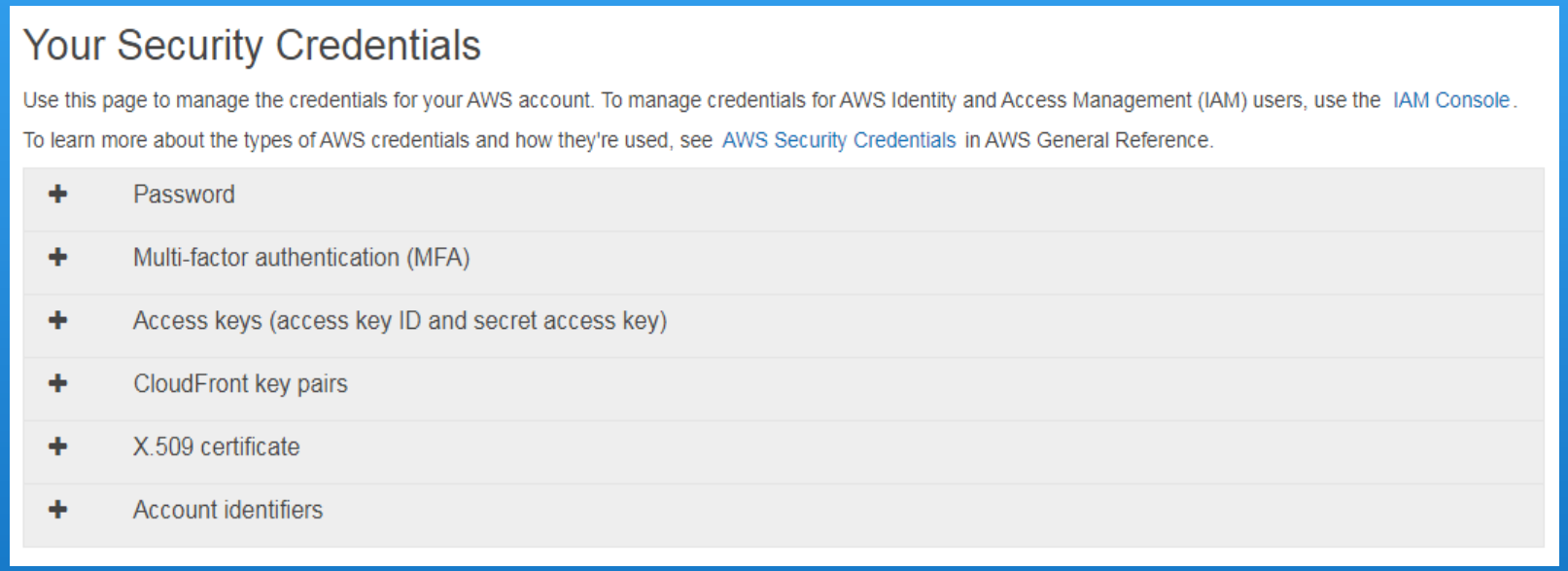
Click on the **Support** menu (located on the title bar) to access help-related items. You can navigate to help, forums and support pages



12. Basic account management settings

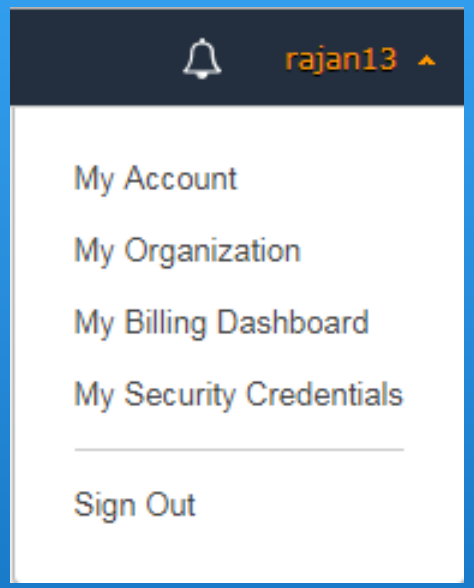
For account management settings, click on My Security Credential as shown in below screenshot

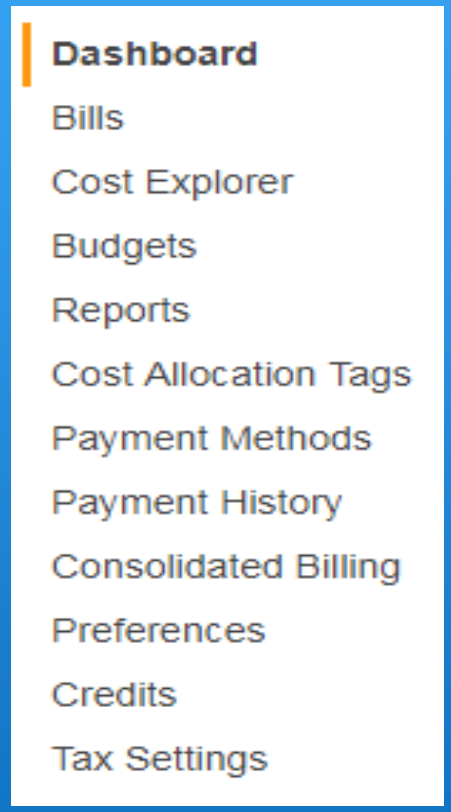




13. Introduction to billing dashboard

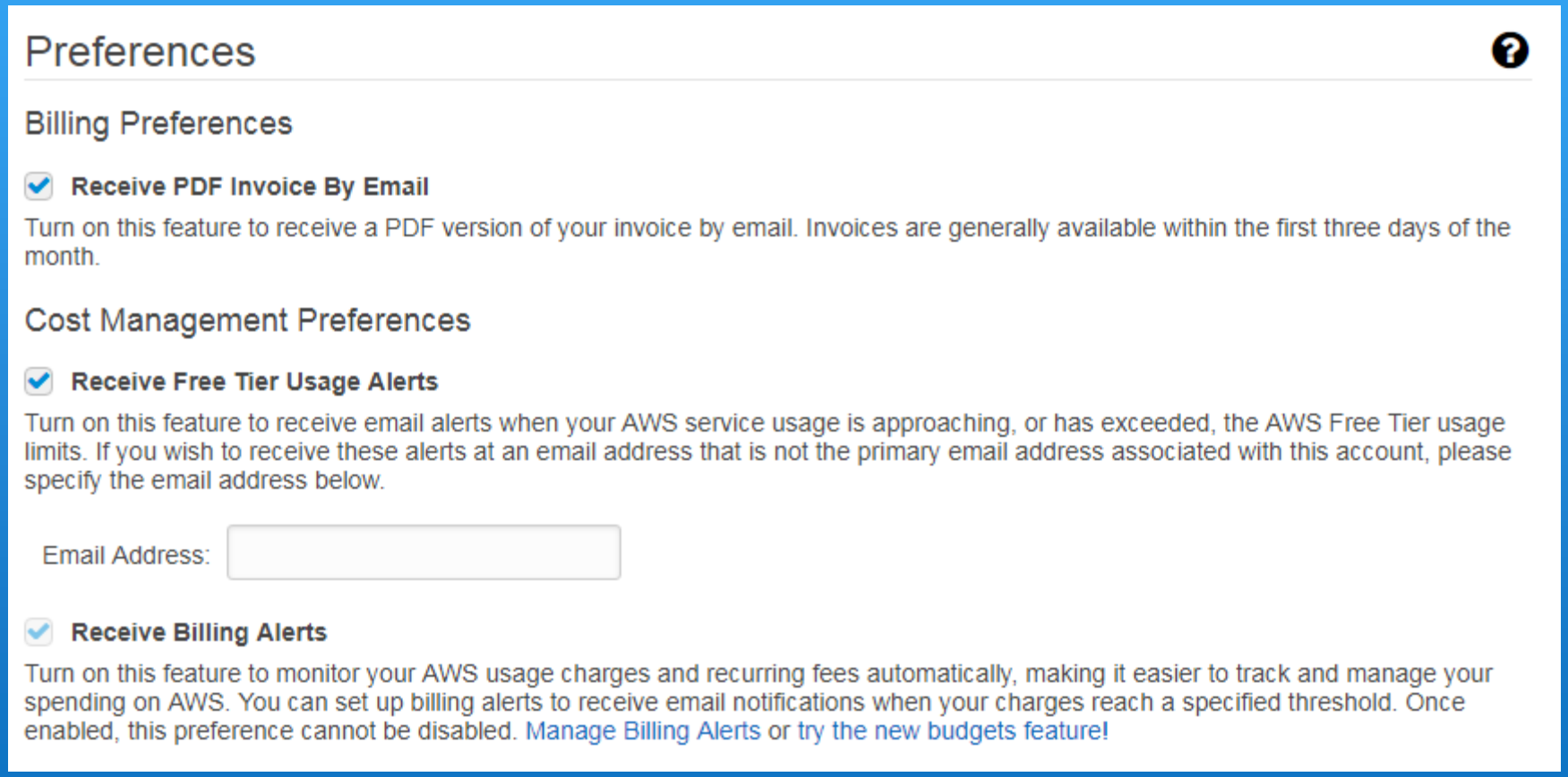
Click on **My billing dashboard** as shown in below screenshot





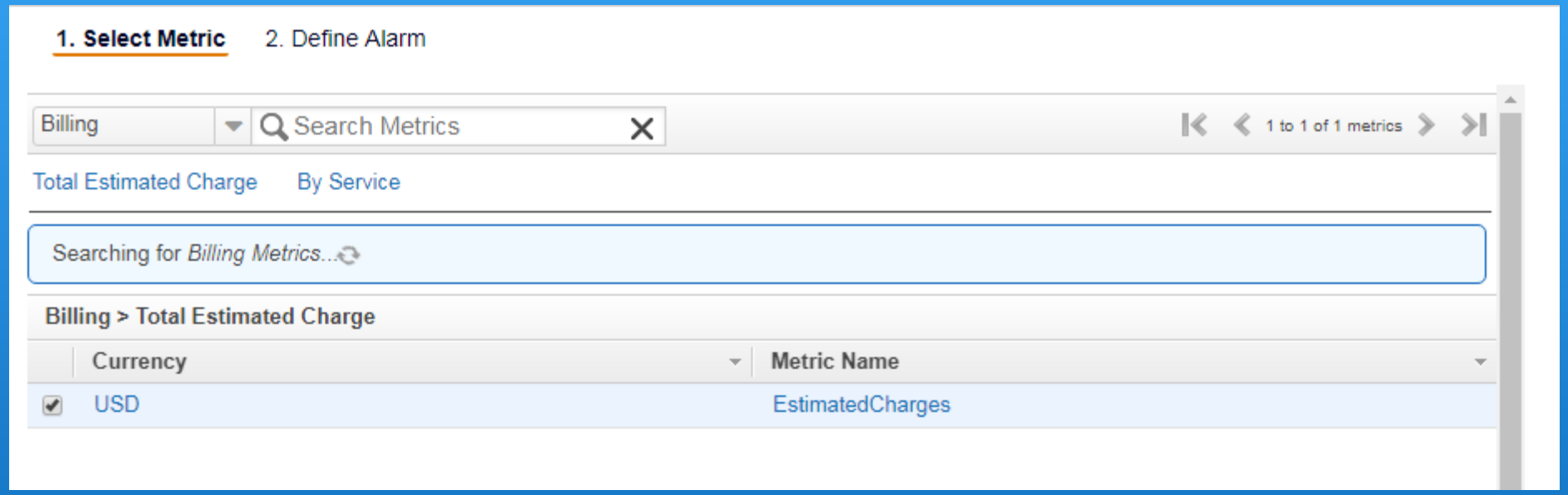
14. Setting up billing alarm and budget

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



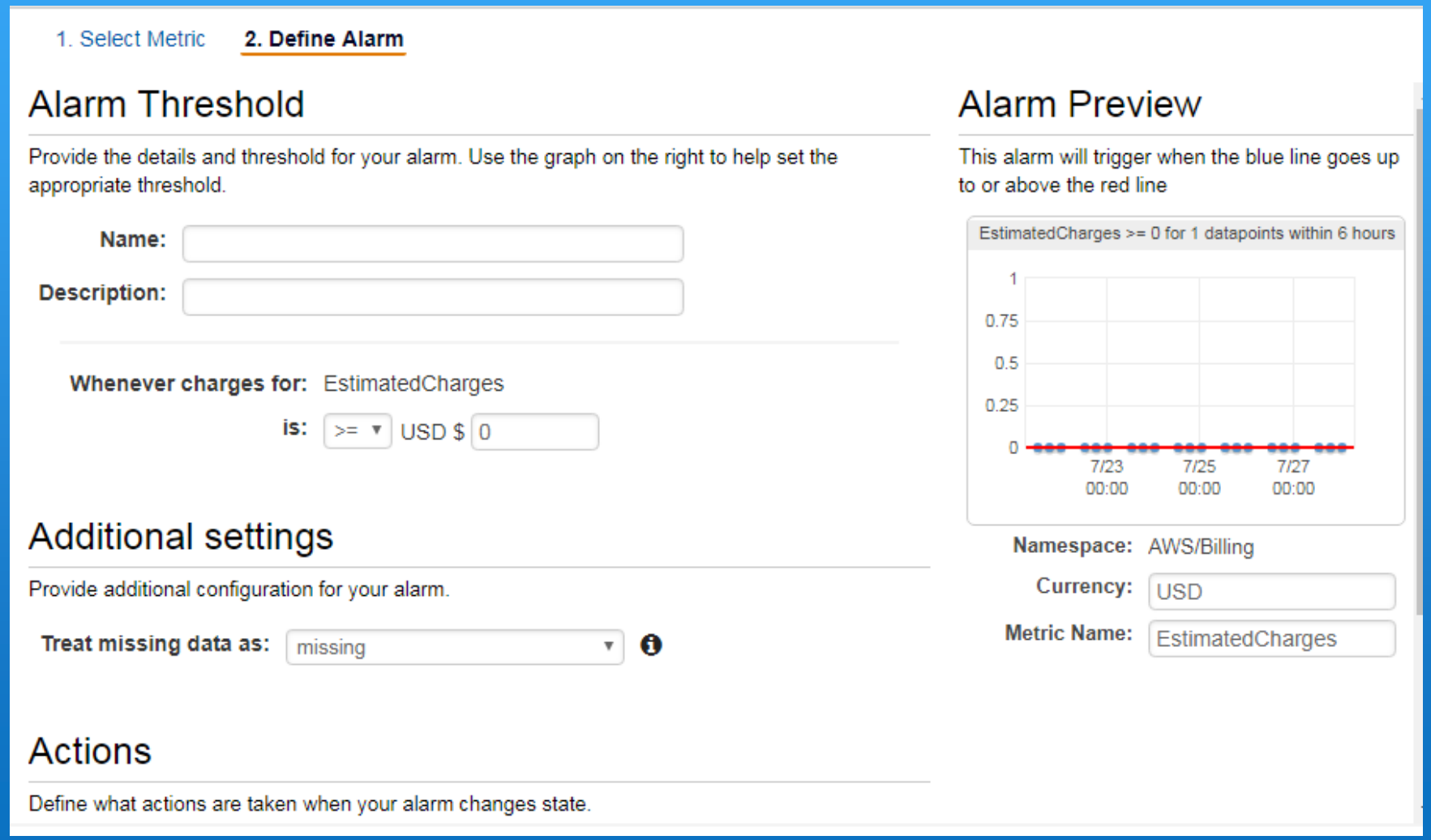
14. Setting up billing alarm and budget(Conti…)

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:



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

In next step, define alarm threshold and relative actions



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