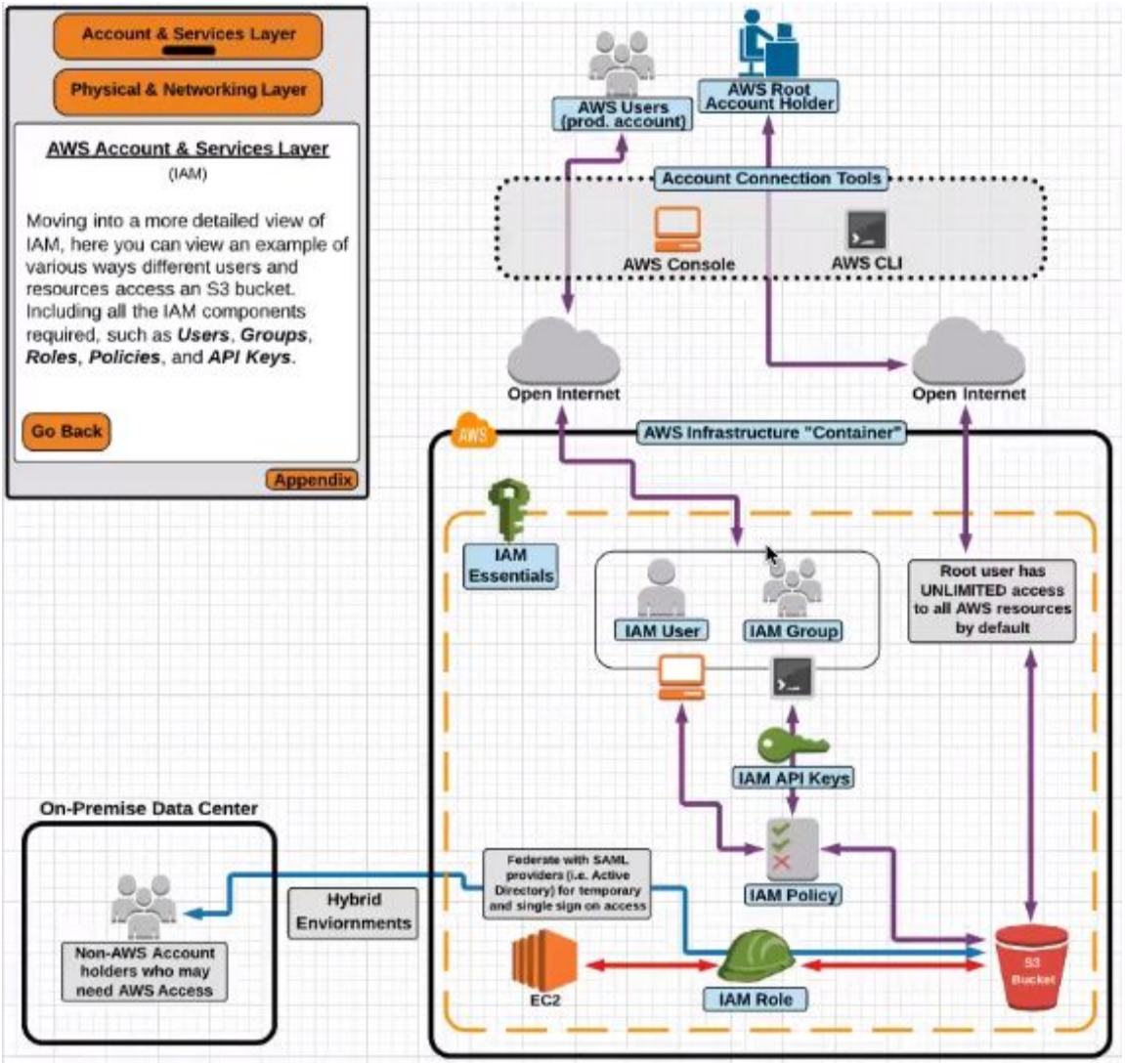


What is IAM?

- IAM (Identity & Access Management) is where you manage your AWS users, groups, roles, Access policies etc….
- IAM provides access and access permissions to AWS resources (such as EC2, S3 & DynamoDB)
- By default, new users in AWS created using IAM will have NO access to any AWS services. This is a **non-explicit deny** rule set on all new IAM users.
- Hence, for all the users (except root), permissions must be given that grant access to AWS services (this is done through IAM policies)

Best Practices

- When a new AWS root account is created, it is **"best practice"** to complete the below tasks listed in Security Status (We will do it in LAB)

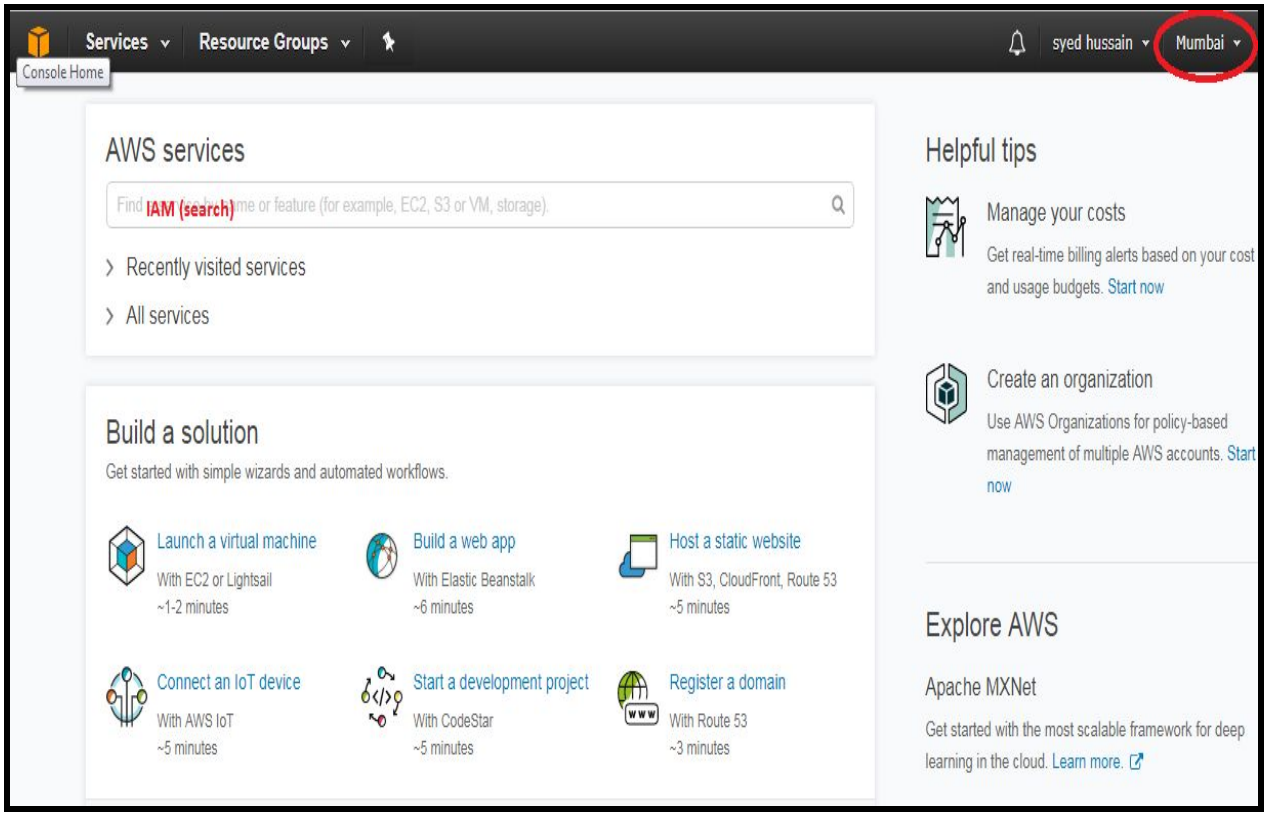
➔ Delete your root access keys

- ➔ Activate MFA on your root account
- ➔ Create individual IAM users
- ➔ User groups to assign permissions
- ➔ Apply an IAM password policy

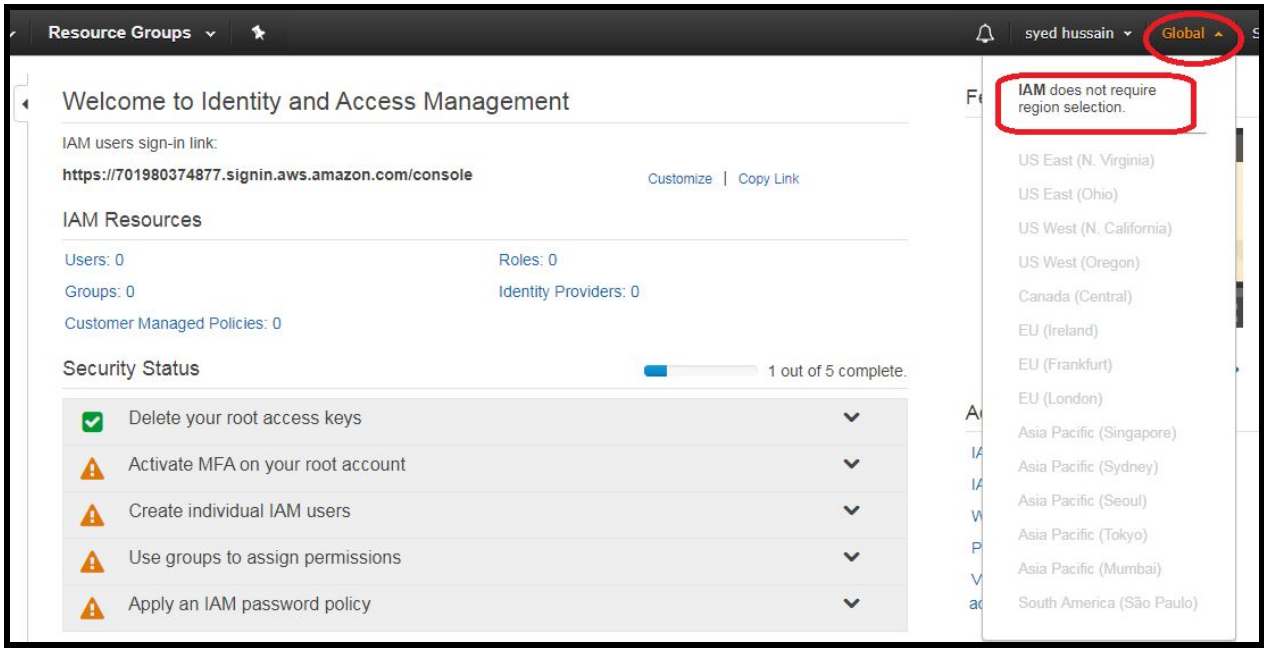
- Always login with normal user for daily work - NOT as root user
- It is best practice to follow “**Principle of Least privilege**” when administering AWS accounts,users, groups and roles.

Login to Management Console

Make sure you have selected the nearest geographic location where you want to host the AWS services. It is good for reduce the network delay and for low-latency
Hence I selected mumbai.



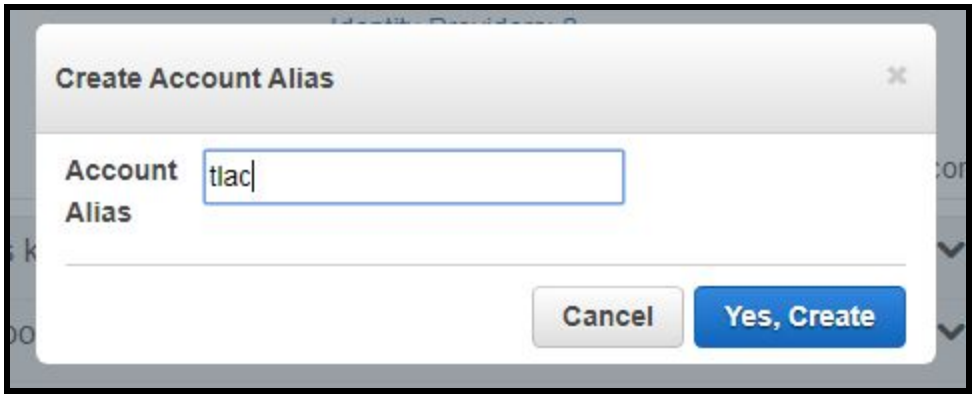
Search for IAM and navigate to its page.



Here the most important thing you notice here is that it changes to Global location.
It means **IAM is not region specific, it applies globally for your account**

Second thing you will notice here is URL Link for IAM page, You can customize that link as per your company standard instead of that default link
https://companyname.signin.aws.amazon.com/console

Click on Customize
Then



Now you will see as below
IAM users sign-in link:
https://tlac.signin.aws.amazon.com/console

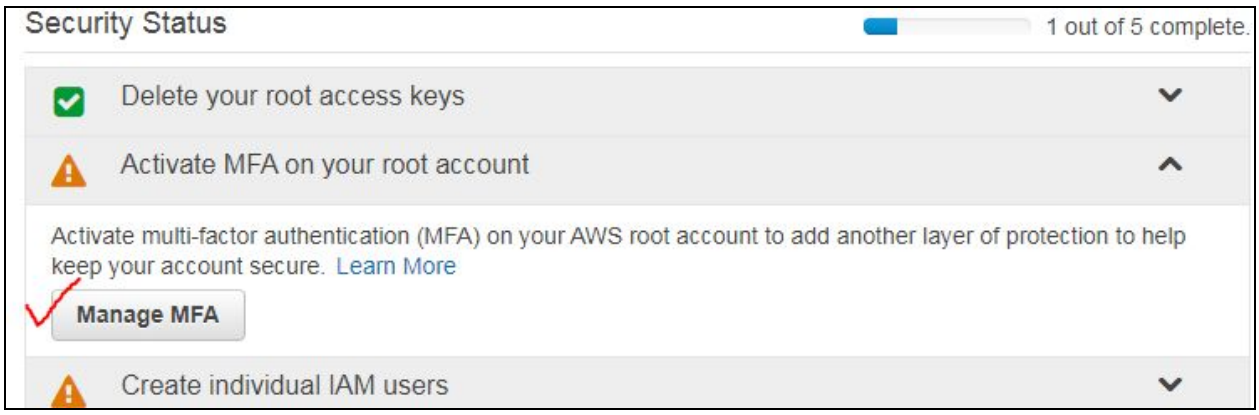
Root Account :

First-Time Access Only:Your Root Account Credentials
When you create an AWS account, you create an account (or "root") identity, which you use to sign in to AWS.You can sign in to the AWS Management Console using this root identity—that is, the email address and password that you provided when creating the account. This combination of your **email address and password** is also called your r**oot account credentials**.
When you use your root account credentials, you have complete, unrestricted access to all resources in your AWS account, including access to your billing information and the ability to change your password.
This level of access is necessary when you first setup your account. However, it's recommended that you don't use root account

credentials for everyday access. It is not possible to restrict the permissions that are granted to the root account. Never share root Credentials.
Follow the below best practice for root credentials

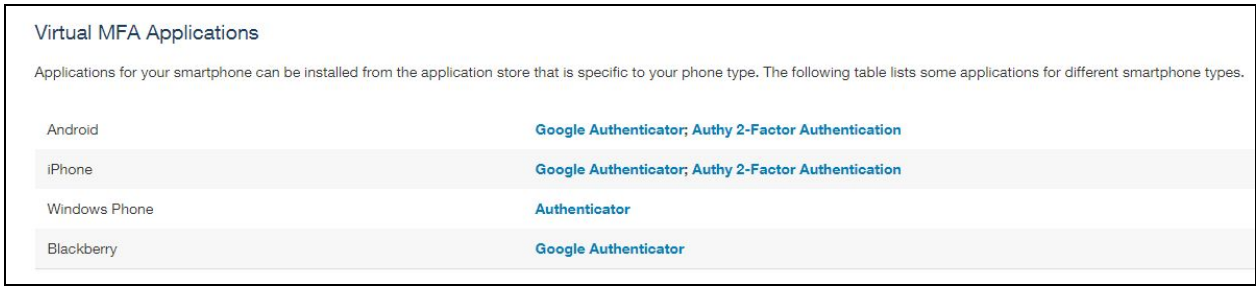
1) **By default root account access keys are removed**

2) Second thing is MFA (Multi-Factor Authentication)



Click on ***Manage MFA***

Select ***Virtual MFA device*** and then Next

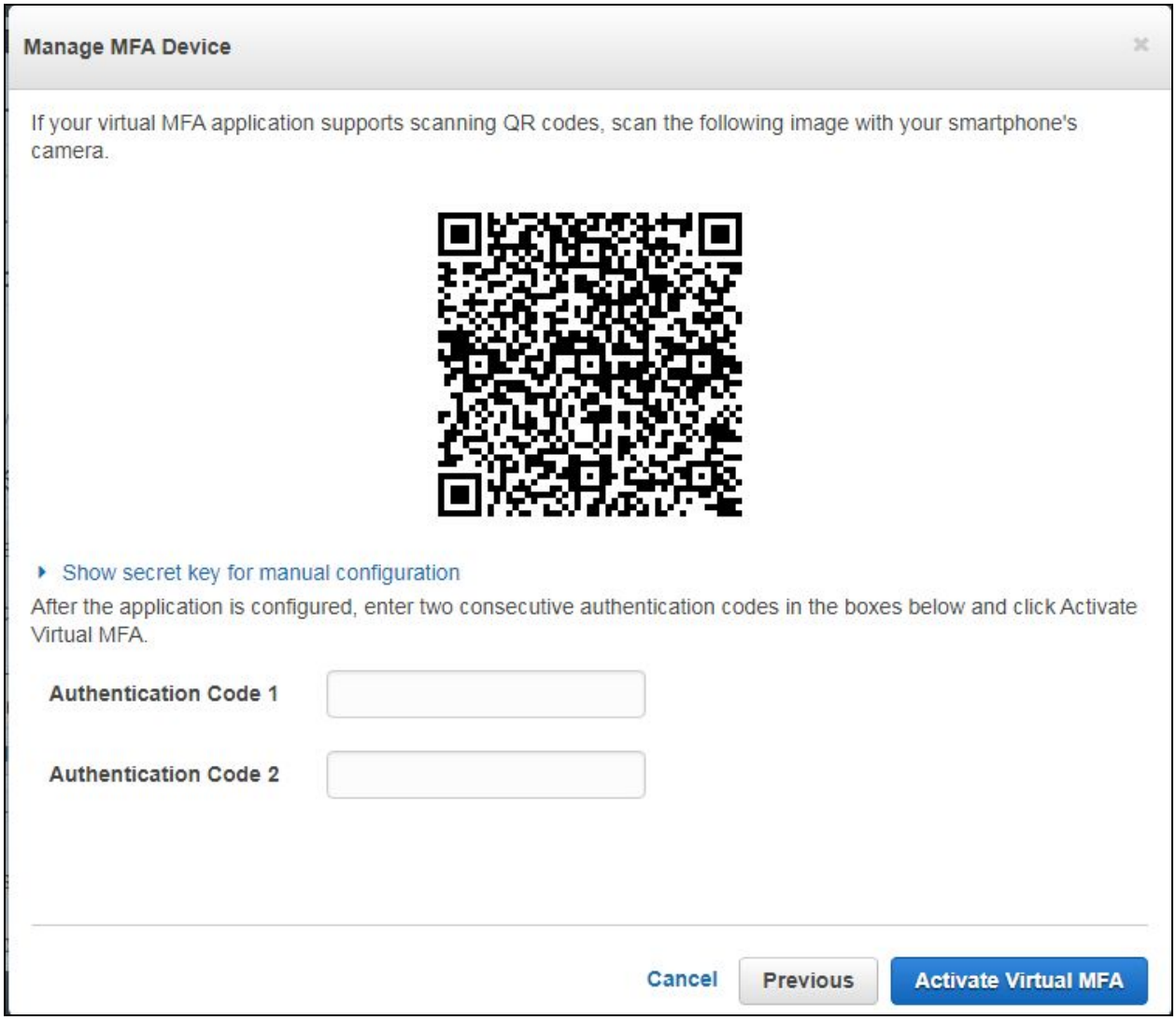


Virtual MFA Applications

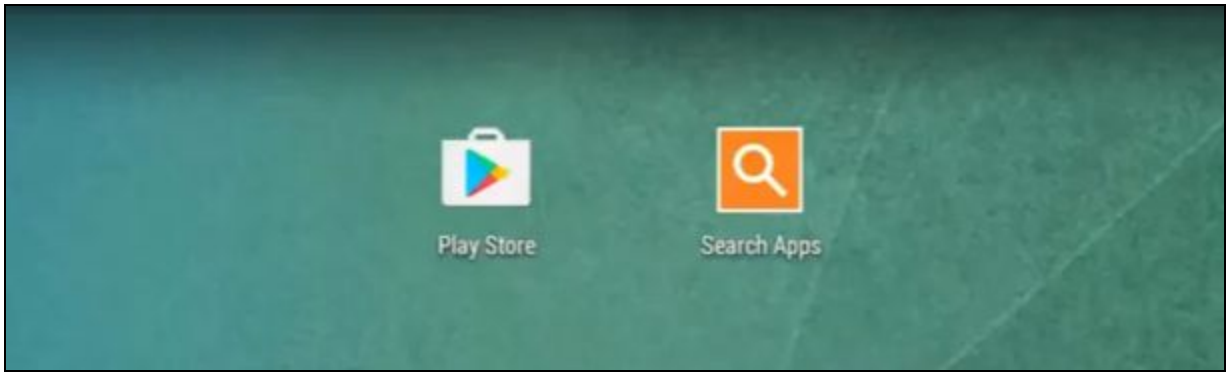
Applications for your smartphone can be installed from the application store that is specific to your phone type. The following table lists some applications for different smartphone types.

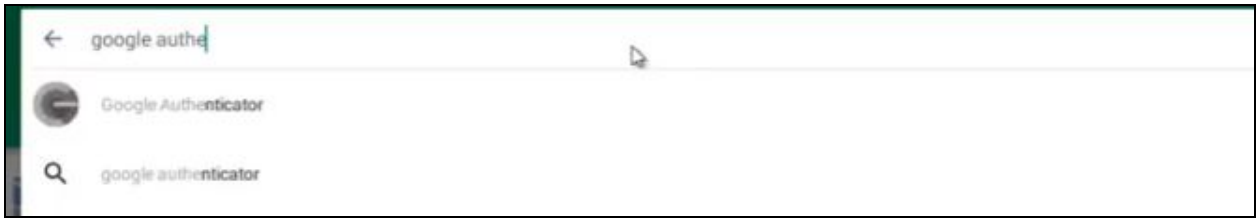
Android	Google Authenticator; Authy 2-Factor Authentication
iPhone	Google Authenticator; Authy 2-Factor Authentication
Windows Phone	Authenticator
Blackberry	Google Authenticator

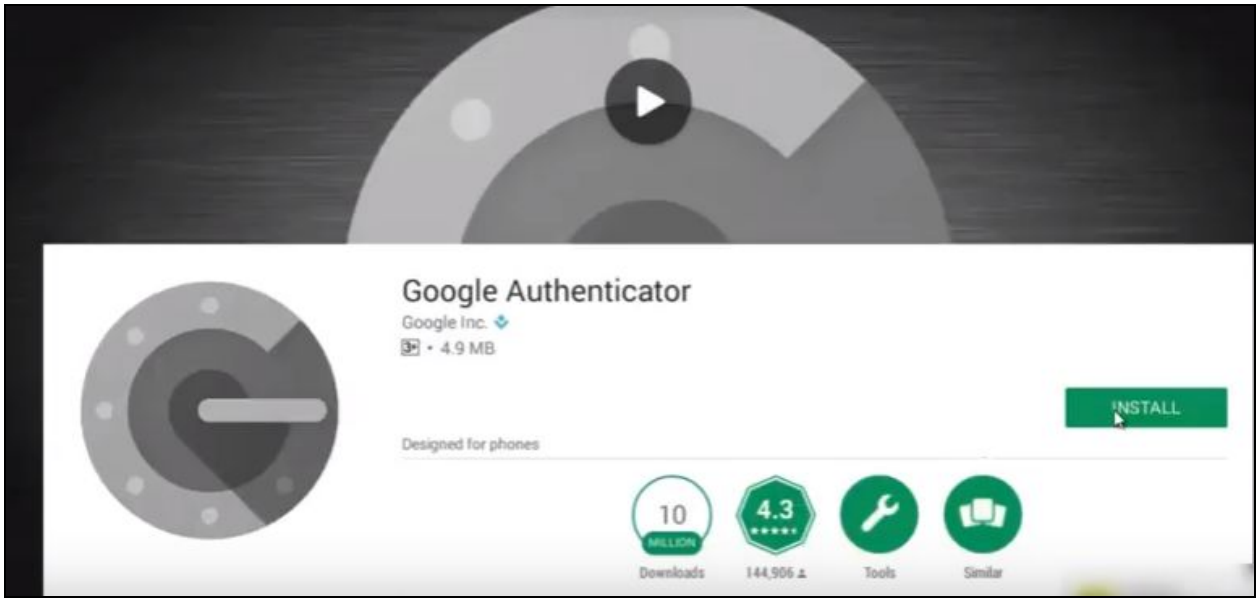
Click on ***Next Step***



In order to fill up the above screen ,You need to go on your **Smartphone**, Go to **play Store**



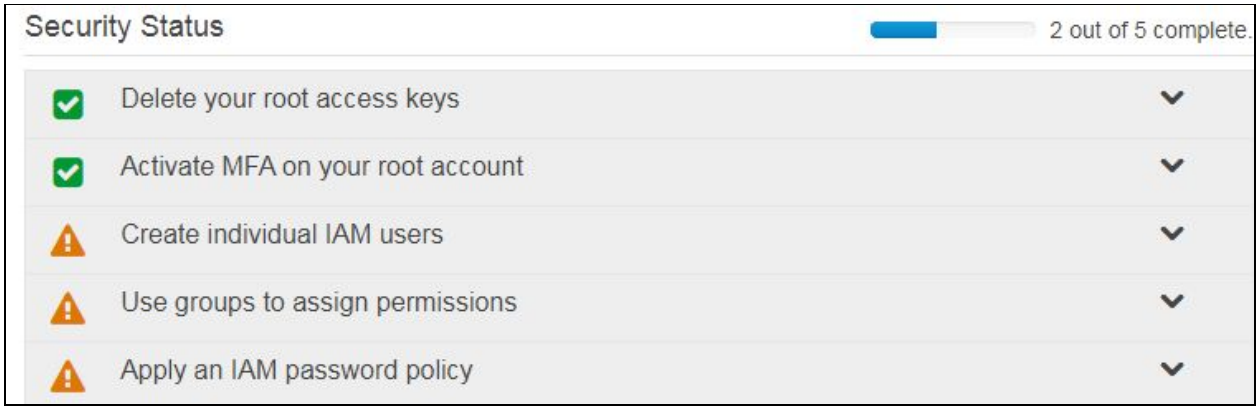




Install and Open it
Then scan that above code presented in the above screen on AWS site
And enter the numbers in AWS Site to that above page

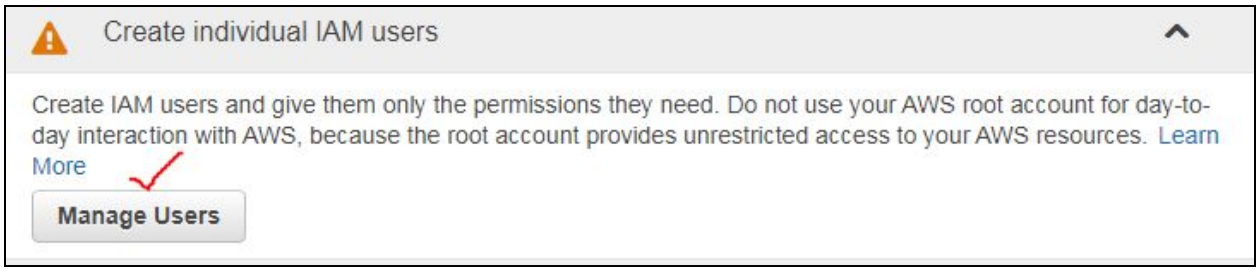
Click on ***Activate Virtual MFA button***

Now the status of security is looks like below



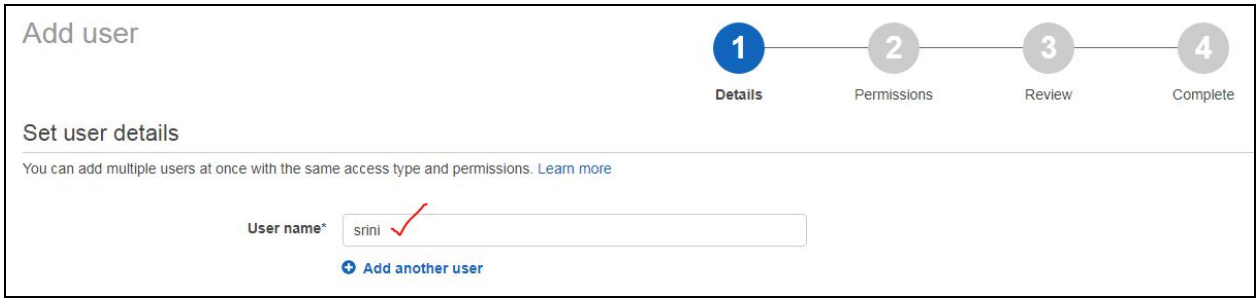
Due to this MFA setting, whenever you try to login , you have to enter OTP which you get in your smartphone. Hence more security you place to your root credentials.

3) Create individual IAM users

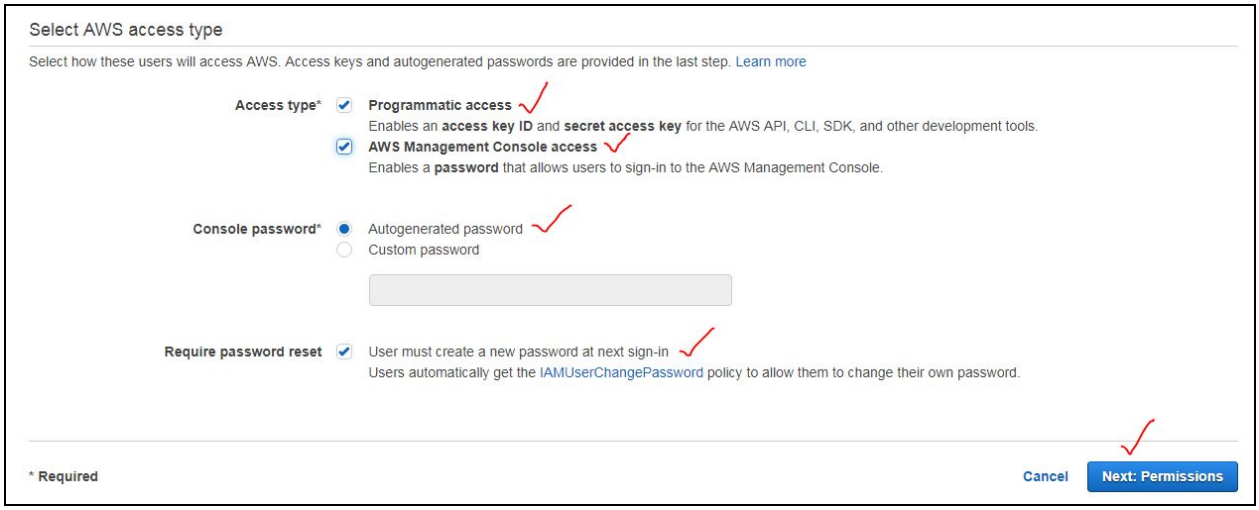


Click on Manage Users

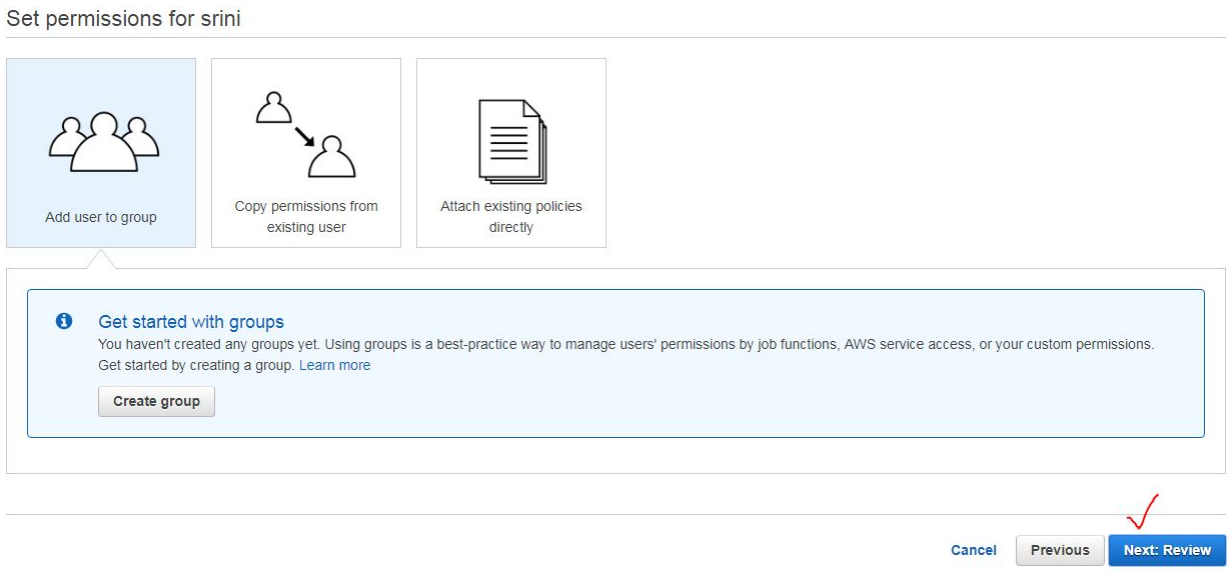
Click on Add user



Create 2 users as “admin” and “srini” (don’t give any permissions as of now)
(Remember the important point that user will have no permissions by default)

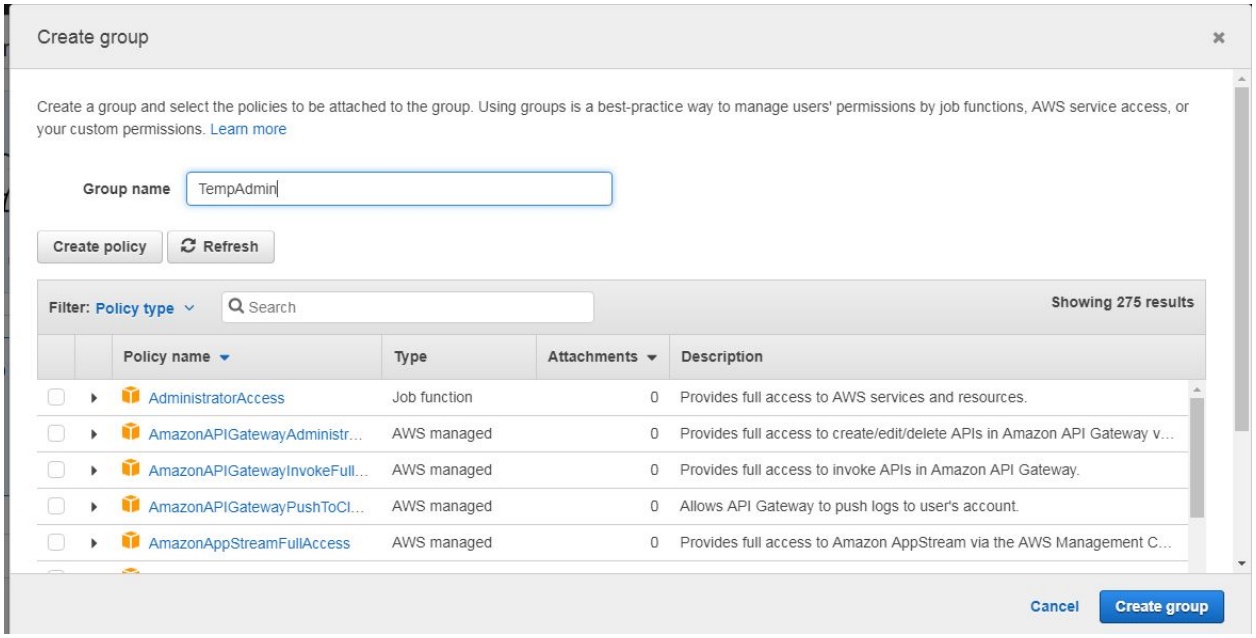


Then Click on Next:Permissions



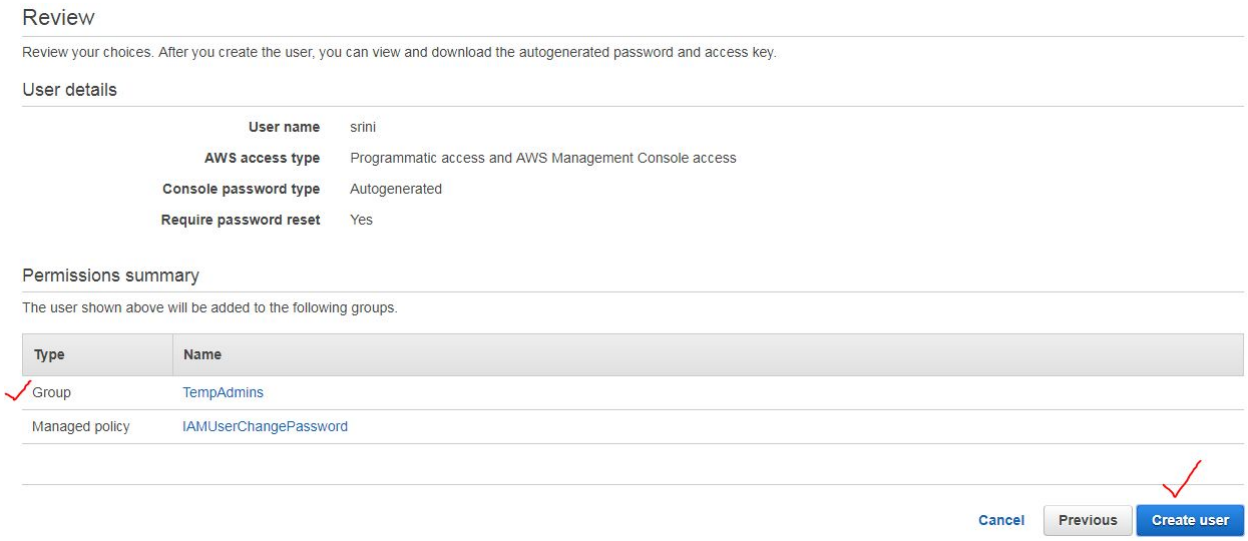
Then Click on ***Next Review***

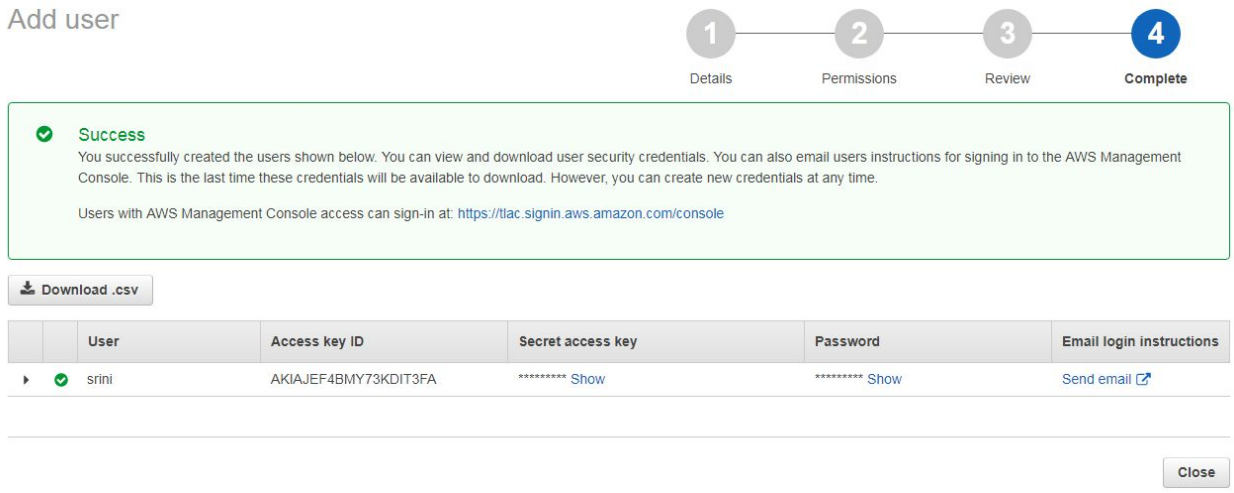
Or Create group by name Admin-Group or TempAdmin (don't attach any policy as of now)



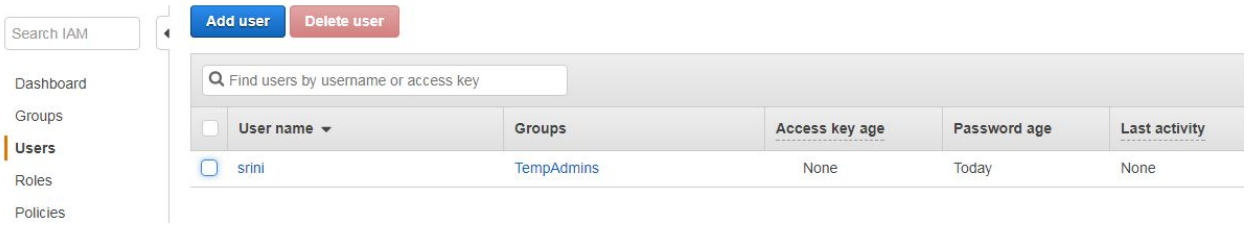
Create a TempAdmins

And add user to this group

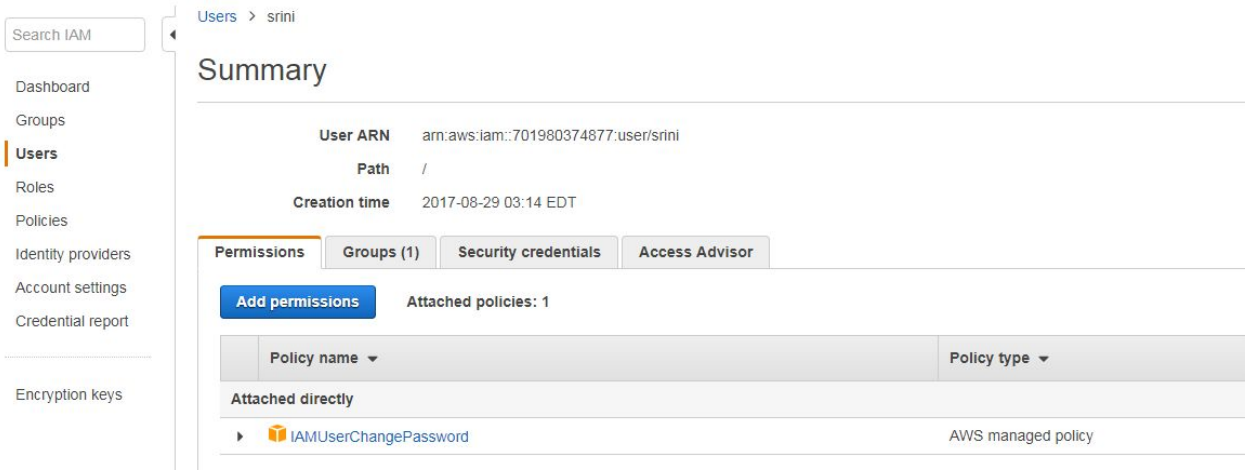




List users



To manage user properties, Go inside the user



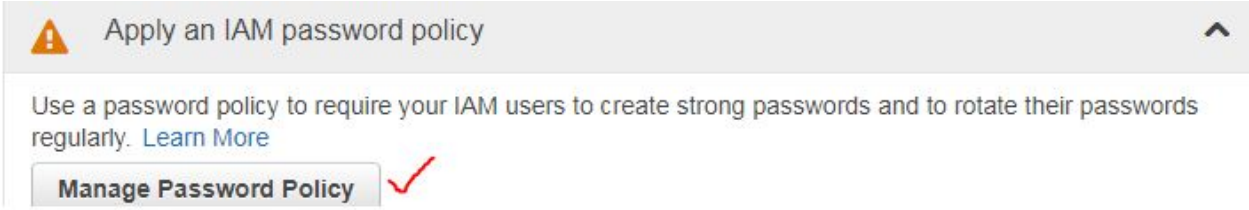
You can change permission individually to individual users
You can provide or revoke group membership
Security credentials or manage password for console you can do it)
Assign MFA and change it from here
If you want to cut off the programmatic access that also u can do it.

4) User groups to assign permissions

You can create a new group like EC2admin
Select the policy type like EC2 related policies
Amazon EC2 full access , Next , create Group

Then Group action and add users or delete user etc…..

5)



You can set password properties here as per your company requirement.

ROLES - we will see in EC2 section why we are using those one

NOTE: Make sure to store the access key and secret key at some good location , if you lost then only way to get back is to create again.

<u>IAM POLICIES</u>

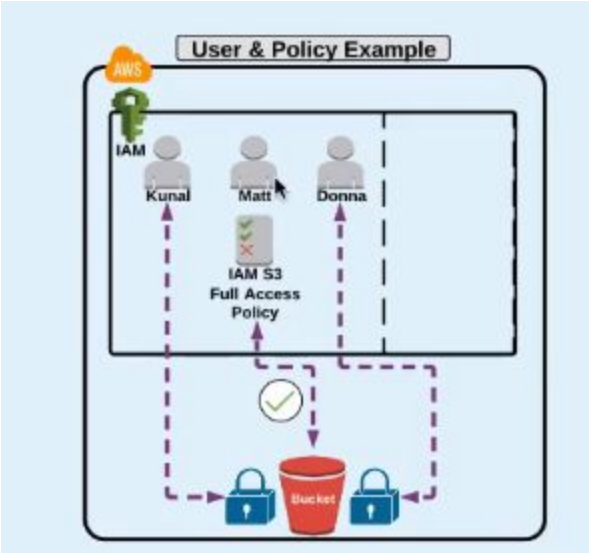
- A policy is a document that formally states one or more permissions
- IAM is providing some in-build policy templates to assign to users and groups

For example:
Administrator access: Full access to ALL AWS resources
Power user access : Admin access except it does not allow user/group management
Read Only access : Only view AWS resources (i.e. users can only view what is in an S3 bucket)
- More than one policy can be attached to a user or group at the same time
- Policies cannot be directly attached to AWS resources (such as an EC2 instance)
- By default, an **explicit deny** rule always overrides and an **explicit allow** rule

It means that the use of a “deny all” policy to quickly restrict ALL access that a user may have through multiple attached policies.
- You can also create custom IAM permission policies using the **policy generator** or written from scratch

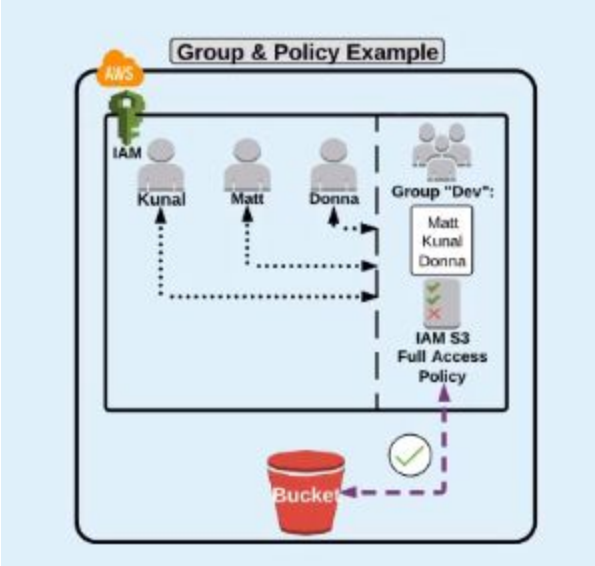
IAM user (normal)

- when first created, by default an IAM user has a non-explicit "deny" for all AWS services - means it does not have access to anything until a policy granting allow access has been applied to the user or to the group the user belongs to.
- Users is applied with **single policy or multiple policies** applied to them at any given time
- Users are added to group also so that he will get all right as per hte policies assigned to that group.
- MFA can be applied on a per user basis for login and resource access/actions.
- IAM users receive unique access credentials so you do not (and should not) share with others
- User credential should NEVER be stored or "passed" to an EC2 instance



IAM Group

- Allow you to assign IAM permission policies to more than one user at a time
- This ability allows for easier access management to AWS resources.



IAM ROLES

- A role is something that another entity can “assume”, and in doing so acquires the specific permissions defined in the role
- In the context of this course, “entities” that can assume a role include
    (a) AWS resources (such as EC2 instance)
    (b) non-AWS account holder who may need temporary access to an AWS resource (through a service like Active Directory)
- Roles must be used because policies cannot be directly attached to AWS services

For example:
If you are using an EC2 instance and it need to access an S3 bucket:
-Instance should assume a role from IAM with the proper required permissions (supp S3 read only)
- Instance can then perform actions based on the role it assumes (read from S3)
- You “can” but should never pass or store credentials in or to an EC2 instance - so roles are

- Until recently, you could only assign a role to an EC2 instance during the EC2 instance creation process. However, you can now assign/change a role that is assigned to an EC2 instance after the creation process via the CLI or the EC2 management console
- An EC2 instance can only have ONE role attached at a time

Other example where we use the roles:

- Other users can assume a “role” for temporary access to AWS accounts and resources through having something like Active Directory or Single Sign On service (facebook, Google) assume an “Identity Provider Access” role.
- Create “cross account” access where a user from one account can assume a role with permissions in another account