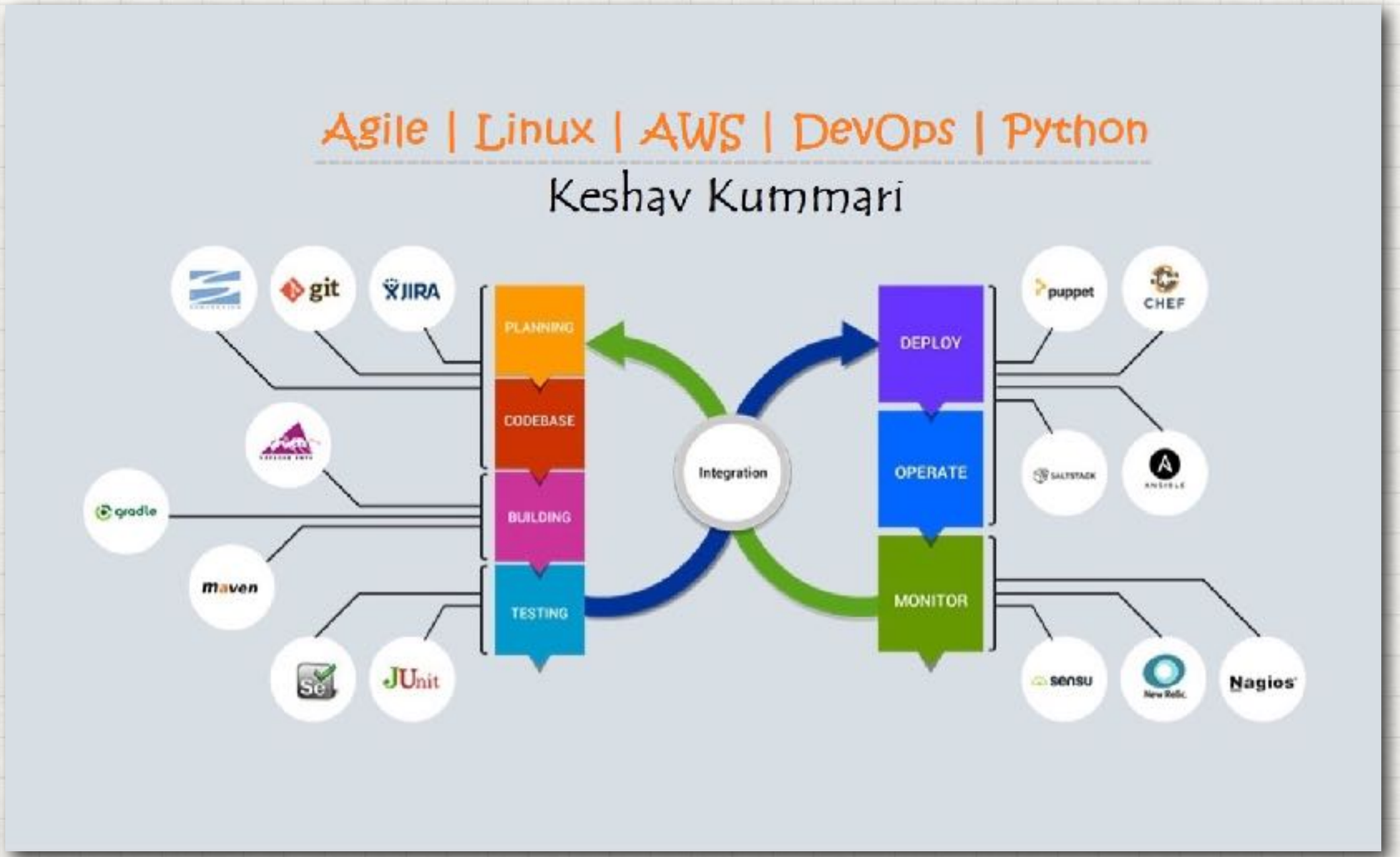
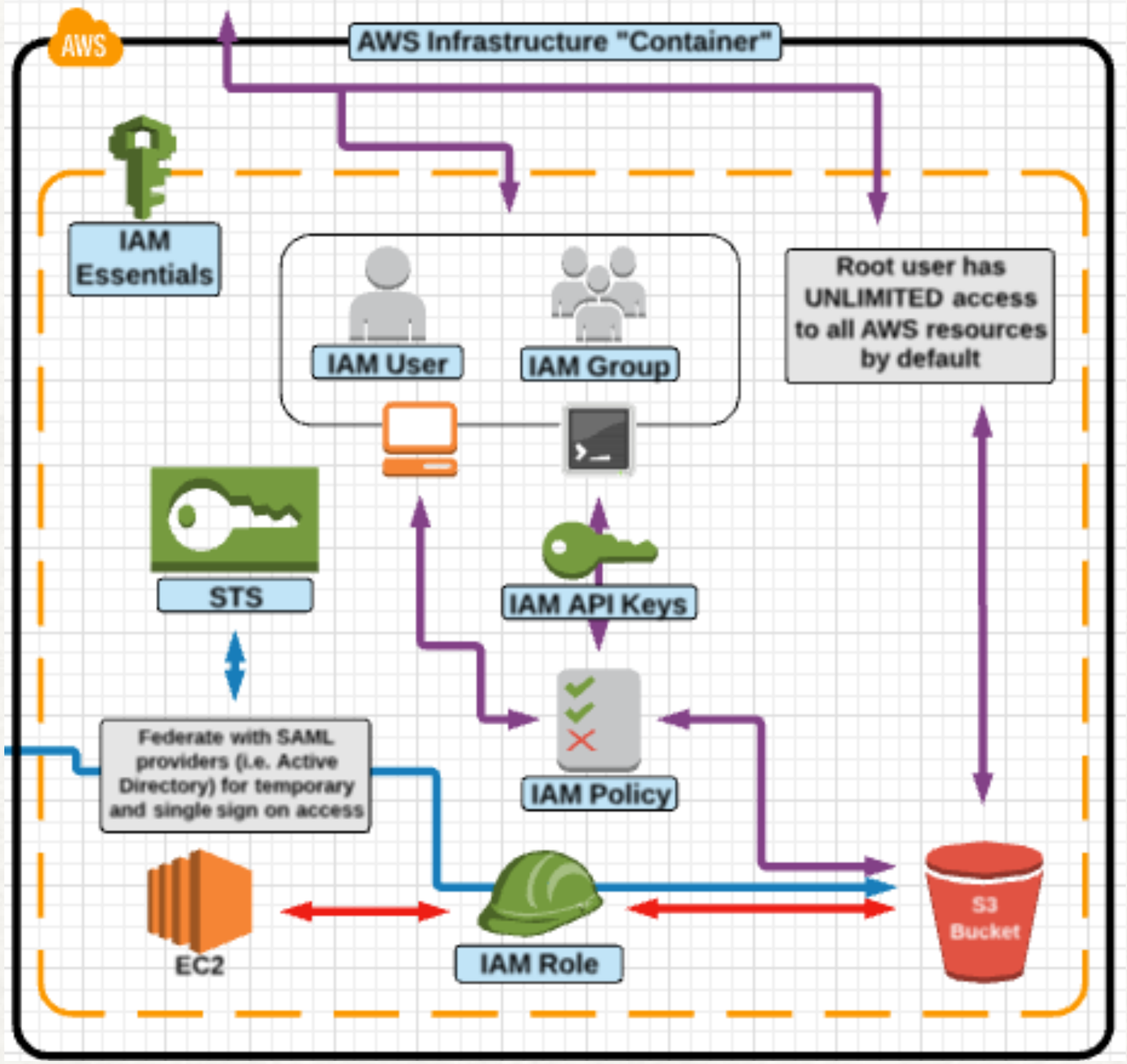
# AWS

## KESHAV KUMMARI



# AWS - IAM




AWS - IAM

# AWS - IAM

- IAM Essentials :
- IAM is where you manage your AWS USERS,GROUPS, and ROLES and their access to AWS accounts and services.
  - IAM Provides access and access permissions to AWS resources(such as EC2, S3, & DynamoDB)
  - IAM is global to all AWS regions, creating a user account will apply to all the regions
- The common use of IAM is to manage:
  - Users
  - Groups
  - Roles
  - IAM Access Policies
  - API Keys
  - Specify a password Policy as well as manage MFA requirements on a per user basis

- By default, any new IAM user you create in an AWS account is created with NO Access to any AWS services.
- This is a non-explicit deny rule set on all new IAM users.
- For all users(Besides the root user), permissions must be given that grant access to AWS services(This is done through IAM Policies)

- When a new AWS root account is created, it is "Best Practice" to complete the tasks listed in IAM under "Security Status".
- **Which include:**

  Delete your root access keys

  Activate MFA on your root account

  Create individual IAM users

  User groups to assign permissions

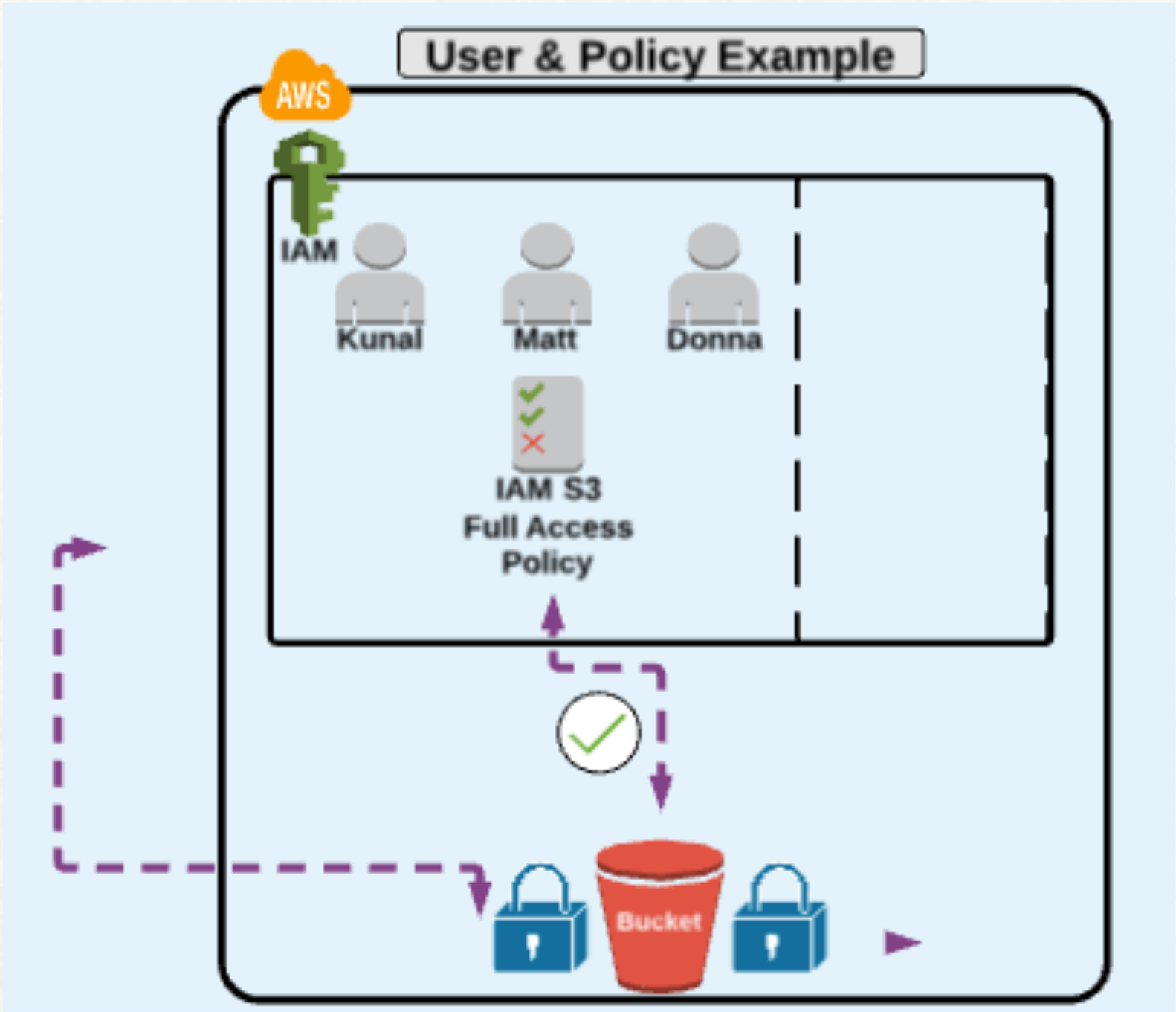
  Apply an IAM password policy

- Best Practice is to login and do daily work as an IAM user - NOT as root user.
- It is also best to always best to practice the "Principal of Least Privilege" when administering AWS accounts, users, groups, and roles.

# IAM - USERS

- When first created, by default an IAM user has a non-explicit "deny" for all AWS services
- And does NOT have access to use them until a policy granting allow access has been applied to the user or to the group the user belogns to.
- IAM users receive unique access credentials so you do not(and should not) share with others.
- User credentials should NEVER be stored or passed to an EC2 instance.
- Users can have group and regular user policies apply to them - meaning a user can have multiple IAM policies applied to them at any given time.
- By default, an explicit deny always overrides an explicit allow from attached IAM policies.
- MFA can be configured on a per user basis for login and resource access/actions.

# AWS IAM - USER




AWS - IAM User

# IAM - GROUPS

- 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.
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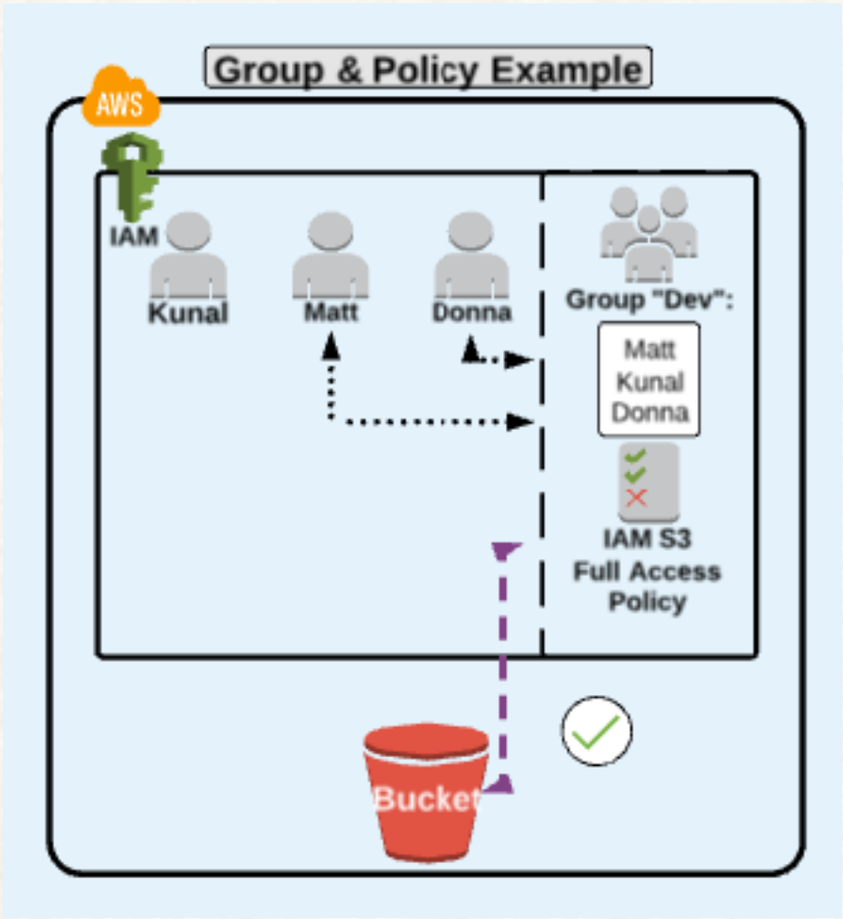


# IAM - POLICY

- A policy is a document that formally states one or more permissions.
- By default, an explicit deny always overrides and an explicit allow.
- This allows for the use of a "deny all" policy to quickly restrict ALL access that a user may have through multiple attached policies.
- IAM provides pre-built policy templates to assign to users and groups, examples include:
- Administrator Access : Fully 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. User can only view what is in an S3 bucket)
- You can also create custom IAM permission policies using the POLICY GENERATOR or written from scratch.
- More than one Policy can be attached to a user or group at the same time.
- Policies can not be directly attached to AWS resources(Such as an EC2 instance)

# AWS - IAM POLICY DOCUMENT

**IAM Policy Example (admin access)**

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": "*",
      "Resource": "*"
    }
  ]
}
```

**Custom "deny all" Policy**

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Deny",
            "Action": "*",
            "Resource": "*"
        }
    ]
}
```

# AWS - IAM - ROLE

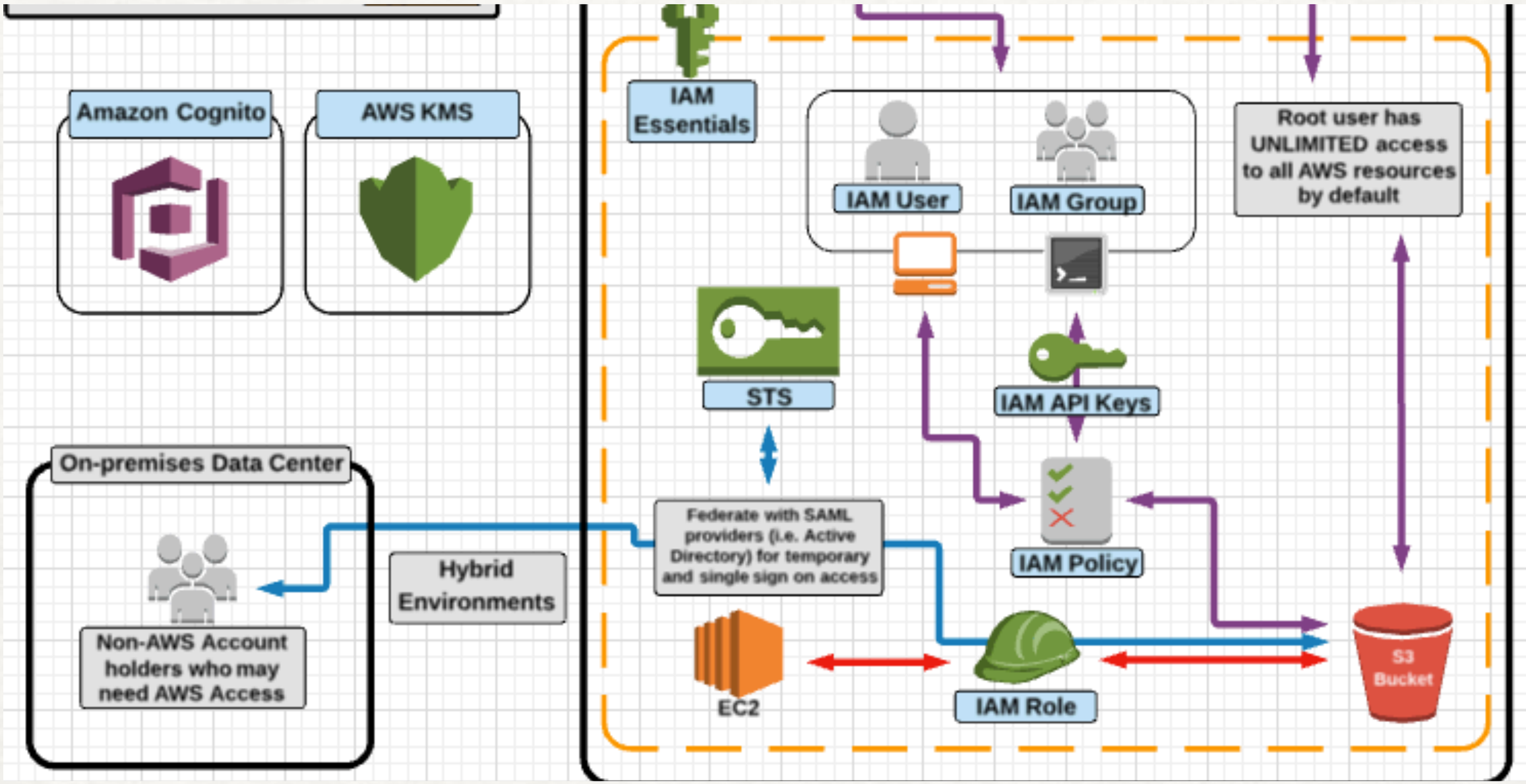
- A role is something that another entity can "assume", and in doing so acquires the specific permissions defined by the role.
- In the context of this course, "Entities" that can assume a role include AWS resources(Such as an EC2 instance) OR a non-AWS account holder who may need temporary access to an AWS resource(Through a service like Active Directory).
- Roles must be used because policies can not 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.(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 used instead

- Until recently, you could only assign a role to an EC2 instance during the EC2 instance's 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 uses of rules:**
- 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(i.e. Facebook, Google) assume an "Identity Provider Access" role.
- Create "Cross Account" access where a use from one account can assume a role with permissions in another account.

# AWS - ROLE


ROLE

# AWS - IAM - STS




STS

# AWS - IAM - STS

- STS - Security Token Service
- STS allows you to create temporary security credentials that grant trusted users access to your AWS resources.
- These temporary credentials are for short-term use, and can be active for a few minutes to several hours.
- Once expired, they can no longer be used to access your AWS resources.
- When requested through an STS API call, credentials are returned with three components:
- Security Token
- An Access Key ID
- A Secret Access Key

# STS BENEFITS

- No distributing or embedding long-term AWS security credentials in an application.
- Grant access to AWS resources without having to create an IAM identity for them.
- The basis for IAM roles and identity federation.
- Since the credentials are temporary, you do not have to rotate or revoke them.
- You decide how long they are active for.

# WHEN TO USE STS

- Identity Federation:
- Enterprise identity federation(Authenticate through your companies network)
- STS supports Security Assertion Markup Language(SAML), which allows for use of Microsoft Active Directory(Of your own solutions).
- Web identity federation(3rd Party identity providers, i.e. Facebook, Google, Amazon)
- Roles for Cross-Account Access:
- Used for organisations that have more than one AWS account.
- Roles for Amazon EC2(and other AWS services)
- Grant access an to application running on an EC2 instance to access other AWS services without having to imbed credentials

# STS API CALLS

- AssumeRole : Cross-Account delegation and Federation through a Custom Identity Broker
- AssumeRoleWithWebIdentity : Federation through a Web-based identity Provider
- AssumeRoleWithSAML : Federation through an Enterprise Identity Provider Compatible with SAML 2.0
- GetFederationToken : Federation through a custom identity broker
- GetSessionToken : Temporary Credentials for users in untrusted environments