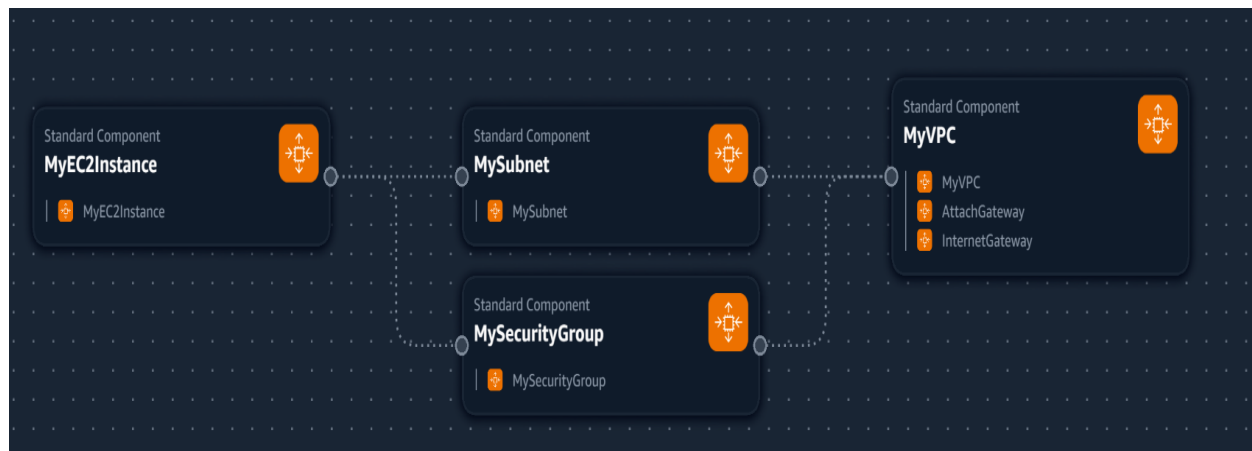


# AWS re/Start Challenge Lab - Using **AWS CloudFormation** to create an AWS VPC and Amazon EC2 instance

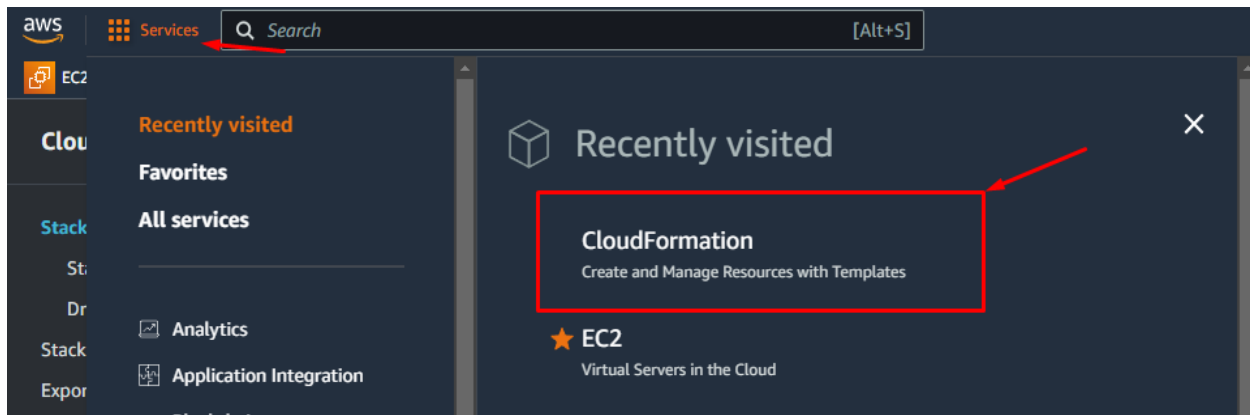
## Lab Overview:

This lab is an environment for creating an Amazon VPC and Amazon EC2 instance (and other supporting elements) using an AWS CloudFormation template. The goal of this lab is to create a CloudFormation template with the following components:

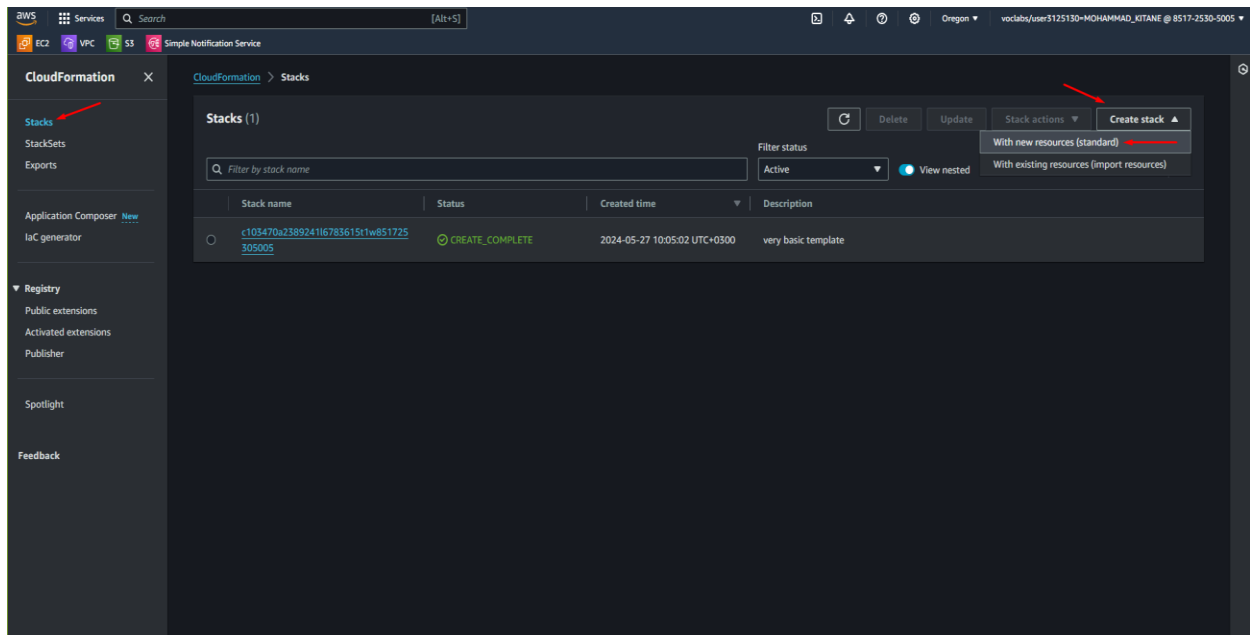
- **An Amazon Virtual Private Cloud.**
- **An internet gateway attached to the VPC.**
- **Security groups for accessing the VPC configured to allow SSH from anywhere.**
- **A private subnet within the VPC.**
- **An Amazon EC2 instance (a T3.micro) within the private subnet.**



## Step 1:



## Step 2:



### Step 3:

**Create stack**

Step 1: Create stack  
Step 2: Specify stack details  
Step 3: **Specify stack details**  
Step 4: Review and create

**Prerequisite - Prepare template**

Prepare template  
Every stack is based on a template. A template is a JSON or YAML file that contains configuration information about the AWS resources you want to include in the stack.

☒ Choose an existing template  
Upload or choose an existing template.

☐ Use a sample template  
Choose from our sample template library.

☐ Build from Application Composer  
Create a template using a visual builder.

**Specify template**  
A template is a JSON or YAML file that describes your stack's resources and properties.

Template source  
Selecting a template generates an Amazon S3 URL, where it will be stored.

☐ Amazon S3 URL  
Provide an Amazon S3 URL to your template.

☒ Upload a template file  
Upload your template directly to the console.

☐ Sync from Git - new  
Sync a template from your Git repository.

Upload a template file  
**Choose file**  
JSON or YAML, formatted file

S3 URL: `https://s3.us-west-2.amazonaws.com/cf-templates-16qgrg8m5qz-us-west-2/2024-05-27T075005.7462poj-VPC_EC2_LabSetup.yaml`

[View in Application Composer](#)

Cancel **Next**

### Step 4:

**Specify stack details**

Step 1: Create stack  
Step 2: Specify stack details  
Step 3: Configure stack options  
Step 4: **Review and create**

**Provide a stack name**

Stack name  
**VPC-EC2-LabSetup**  
Stack name must contain only letters, numbers, dashes. Must start with a letter.  
Stack name must be 1 to 128 characters, start with a letter, and only contain alphanumeric characters. Character count: 16/128.

**Parameters**  
Parameters are defined in your template and allow you to input custom values when you create or update a stack.

No parameters  
There are no parameters defined in your template.

Cancel Previous **Next**

## Step 5:

**Configure stack options**

**Tags - optional**  
Tags (key-value pairs) are used to apply metadata to AWS resources, which can help in organizing, identifying, and categorizing those resources. You can add up to 50 unique tags for each stack.

Key:  Value - optional:  [Remove](#)

[Add new tag](#)  
You can add 49 more tags

**Permissions - optional**  
Specify an existing AWS Identity and Access Management (IAM) service role that CloudFormation can assume.

**IAM role - optional**  
Choose the IAM role for CloudFormation to use for all operations performed on the stack.

IAM role name:  [Remove](#) [Refresh](#)

**Stack failure options**

**Behavior on provisioning failure**  
Specify the roll back behavior for a stack failure. [Learn more](#)

☒ **Roll back all stack resources**  
Roll back the stack to the last known stable state.

☐ **Preserve successfully provisioned resources**  
Preserves the state of successfully provisioned resources, while rolling back failed resources to the last known stable state. Resources without a last known stable state will be deleted upon the next stack operation.

**Delete newly created resources during a rollback**  
Specify whether resources that were created during a failed operation should be deleted regardless of their deletion policy. [Learn more](#)

☐ **Use deletion policy**  
Retains or deletes created resources according to their attached deletion policy.

☒ **Delete all newly created resources**  
Deletes created resources during a **rollback** regardless of their attached deletion policy.

## Step 6:

**Advanced options**  
You can set additional options for your stack, like notification options and a stack policy. [Learn more](#)

**Stack policy - optional**  
Defines the resources that you want to protect from unintentional updates during a stack update.

**Rollback configuration - optional**  
Specify alarms for CloudFormation to monitor when creating and updating the stack. If the operation breaches an alarm threshold, CloudFormation rolls it back.

**Notification options - optional**  
Specify a new or existing Amazon Simple Notification Service topic where notifications about stack events are sent.

**Stack creation options - optional**  
Specify the timeout and termination protection options for stack creation.

[Cancel](#) [Previous](#) [Next](#)

## Step 7:

The screenshot shows the 'Review and create' step in the AWS CloudFormation console. The left sidebar lists the steps: Step 1: Create stack, Step 2: Specify stack details, Step 3: Configure stack options, and Step 4: Review and create (highlighted with a red box). The main area is titled 'Review and create' and contains two sections: 'Step 1: Specify template' and 'Step 2: Specify stack details'. In the 'Step 1' section, the 'Prerequisite - Prepare template' shows 'Template ready'. The 'Template' section shows the 'Template URL' as 'https://s3.us-west-2.amazonaws.com/169rgelmsqje-us-west-2/2024-05-27/1075005.7462pqj-VPC\_EC2\_LabSetup.yaml' and a 'Stack description' explaining the lab's goal. In the 'Step 2' section, the 'Provide a stack name' field is filled with 'VPC-EC2-LabSetup'. At the bottom right, a red arrow points to the 'Submit' button.

## Step 8:

The screenshot shows the AWS CloudFormation console with the 'VPC-EC2-LabSetup' stack selected. The left sidebar shows the 'Stacks' section with 'VPC-EC2-LabSetup' highlighted (indicated by a red box and a red arrow). The main area displays the 'Events' tab for the stack. The 'Events' table shows the following data:

Timestamp	Logical ID	Status	Detailed status	Status reason
2024-05-27 11:03:04 UTC+0300	VPC-EC2-LabSetup	CREATE_IN_PROGRESS	-	User Initiated

## Step 9:

The screenshot shows the AWS CloudFormation console for the 'VPC-EC2-LabSetup' stack. The 'Events' tab is selected, displaying a list of 22 events. A red arrow points to the 'CREATE\_COMPLETE' event for the stack, which occurred at 2024-05-27 11:03:04 UTC+0300.

Timestamp	Logical ID	Status	Detailed status	Status reason
2024-05-27 11:03:36 UTC+0300	VPC-EC2-LabSetup	CREATE_COMPLETE	-	-
2024-05-27 11:03:35 UTC+0300	MyEC2Instance	CREATE_COMPLETE	-	-
2024-05-27 11:03:24 UTC+0300	MyEC2Instance	CREATE_IN_PROGRESS	-	Resource creation initiated
2024-05-27 11:03:23 UTC+0300	MySubnet	CREATE_COMPLETE	-	-
2024-05-27 11:03:22 UTC+0300	MyEC2Instance	CREATE_IN_PROGRESS	-	-
2024-05-27 11:03:22 UTC+0300	InternetGateway	CREATE_COMPLETE	-	-
2024-05-27 11:03:22 UTC+0300	MySecurityGroup	CREATE_COMPLETE	-	-
2024-05-27 11:03:22 UTC+0300	MySecurityGroup	CREATE_IN_PROGRESS	-	Resource creation initiated
2024-05-27 11:03:21 UTC+0300	AttachGateway	CREATE_COMPLETE	-	-
2024-05-27 11:03:21 UTC+0300	-	CONFIGURATION_COMPLETE	-	Eventual consistency check

## Step 10:

The screenshot shows the AWS CloudFormation console for the 'VPC-EC2-LabSetup' stack. The 'Outputs' tab is selected, displaying a table with 5 outputs. A red box highlights the 'Outputs' table, and a red arrow points to the 'Stack details' link in the left sidebar.

Key	Value	Description	Export name
InstanceId	i-01073e0f8e5a7000	The ID of the EC2 Instance	-
SubnetId	subnet-03aeb239d64111391	The ID of the Subnet	-
VPCId	vpc-0e1d5e3ce126958a6	The ID of the VPC	-

VPC and EC2 Successfully created ✓

## Step 11:

The screenshot shows the AWS Management Console interface for the 'Instances' page. The instance 'Lab192' is selected, and its details are displayed. Red boxes and arrows highlight the following information:

- Instance ID:** i-01073e9fbc5ea7000 (highlighted with a red box and arrow labeled '1')
- VPC ID:** vpc-0e1d3e3ce126958a6 (Lab192) (highlighted with a red box and arrow labeled '2')
- Subnet ID:** subnet-03aeb239d64111391 (Lab192) (highlighted with a red box and arrow labeled '3')

The instance details include:

- Hostname type: IP name: ip-10-0-1-136.us-west-2.compute.internal
- Private IP: ip-10-0-1-136.us-west-2.compute.internal
- Instance type: t3.micro
- VPC ID: vpc-0e1d3e3ce126958a6 (Lab192)
- Subnet ID: subnet-03aeb239d64111391 (Lab192)

The console also shows a warning message from AWS Compute Optimizer regarding the user's permissions.

## Step 12:

The screenshot shows the AWS CloudFormation console for the **VPC-EC2-LabSetup** stack. The left sidebar shows the **Stack details** tab selected. The main panel displays the stack's status as **Active** and lists two stacks: **VPC-EC2-LabSetup** and **c105470a2389241678361541w851725305005**. The **Template** tab is selected, showing the full CloudFormation template. A red arrow points to the **Template** tab, and another red arrow points to the **Template** section header. The template content is as follows:

```
AWSTemplateFormatVersion: '2010-09-09'
Description: >
  This lab is an environment for creating an Amazon VPC and Amazon EC2 Instance
  (and other supporting elements) using an AWS CloudFormation template.
  The goal of this lab is to create a CloudFormation template with specified components.

Resources:
  MyVPC:
    Type: 'AWS::EC2::VPC'
    Properties:
      CidrBlock: 10.0.0.0/16
      EnableDnsSupport: true
      EnableDnsHostnames: true

  InternetGateway:
    Type: 'AWS::EC2::InternetGateway'

  AttachGateway:
    Type: 'AWS::EC2::VPCGatewayAttachment'
    Properties:
      VpcId:
        Ref: MyVPC
      InternetGatewayId:
        Ref: InternetGateway

  MySecurityGroup:
    Type: 'AWS::EC2::SecurityGroup'
    Properties:
      GroupDescription: Allow SSH access from anywhere
      VpcId:
```

The screenshot shows the AWS CloudFormation console for the **VPC-EC2-LabSetup** stack. The left sidebar shows the **Stack details** tab selected. The main panel displays the stack's status as **Active** and lists two stacks: **VPC-EC2-LabSetup** and **c105470a2389241678361541w851725305005**. The **Template** tab is selected, showing the full CloudFormation template. A red arrow points to the **Template** tab, and another red arrow points to the **Template** section header. The template content is as follows:

```
GroupDescription: Allow SSH access from anywhere
VpcId:
  Ref: MyVPC
SecurityGroupIngress:
  - IpProtocol: tcp
    FromPort: 22
    ToPort: 22
    CidrIp: 0.0.0.0/0

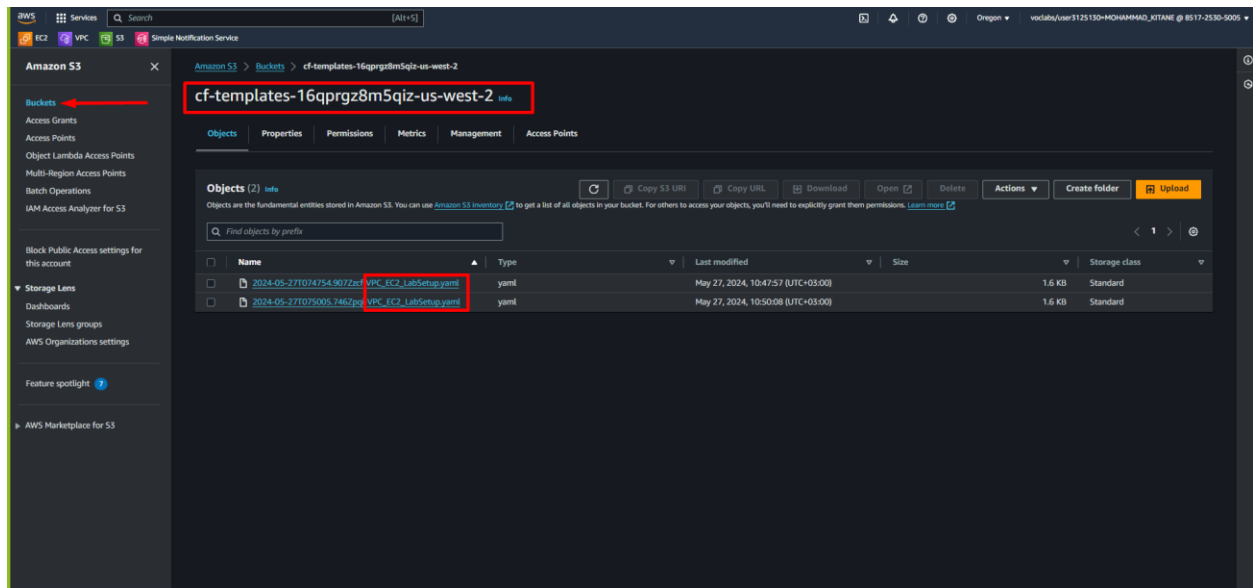
MySubnet:
  Type: 'AWS::EC2::Subnet'
  Properties:
    VpcId:
      Ref: MyVPC
    CidrBlock: 10.0.1.0/24
    MapPublicIpOnLaunch: false

MyEC2Instance:
  Type: 'AWS::EC2::Instance'
  Properties:
    InstanceType: t3.micro
    ImageId: ami-01c4de4b3abdeeb # Amazon Linux 2023
    SubnetId:
      Ref: MySubnet
    SecurityGroupIds:
      - Ref: MySecurityGroup

Outputs:
  VPCId:
    Description: The ID of the VPC
    Value:
      Ref: MyVPC
  SubnetId:
    Description: The ID of the Subnet
    Value:
      Ref: MySubnet
  InstanceId:
    Description: The ID of the EC2 Instance
    Value:
      Ref: MyEC2Instance
```



## Step 13:



## Final Diagram:

