Midterm CloudFormation Deployment

First , create key pair

**To create a key pair using Amazon EC2**

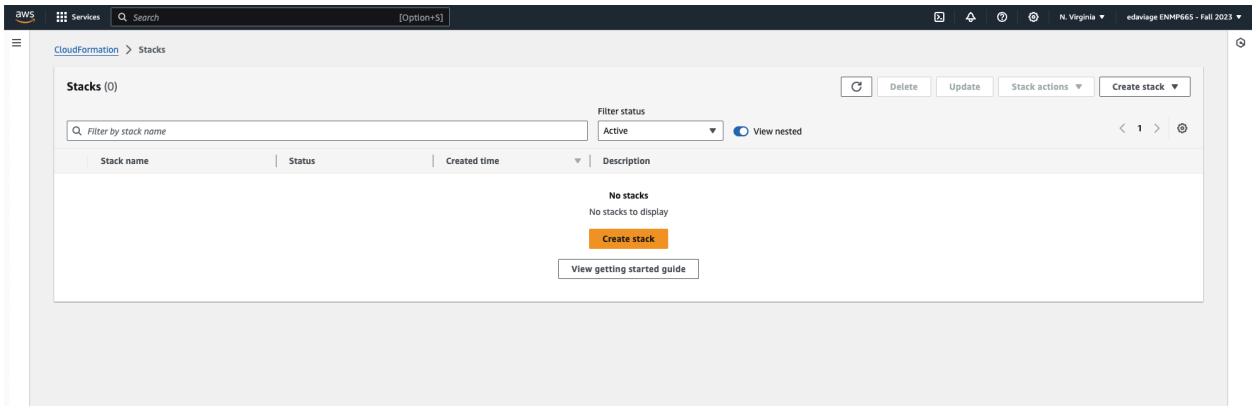
1. Open the Amazon EC2 console at https://console.aws.amazon.com/ec2/.
2. In the navigation pane, under Network & Security, choose Key Pairs.
3. Choose Create key pair.
4. For Name, enter a descriptive name for the key pair. For this project your keypair should look like this: Medcircle-Group##-KP. Replace ## with your group number.

   Amazon EC2 associates the public key with the name that you specify as the key name. A key name can include up to 255 ASCII characters. It can't include leading or trailing spaces.
5. For Key pair type, choose either RSA.
6. For Private key file format, choose the format in which to save the private key. To save the private key in a format that can be used with OpenSSH, choose pem. To save the private key in a format that can be used with PuTTY, choose ppk.
7. To add a tag to the public key, choose Add tag, and enter the key and value for the tag. Repeat for each tag.
8. Choose Create key pair.
9. The private key file is automatically downloaded by your browser. The base file name is the name that you specified as the name of your key pair, and the file name extension is determined by the file format that you chose. Save the private key file in a safe place.

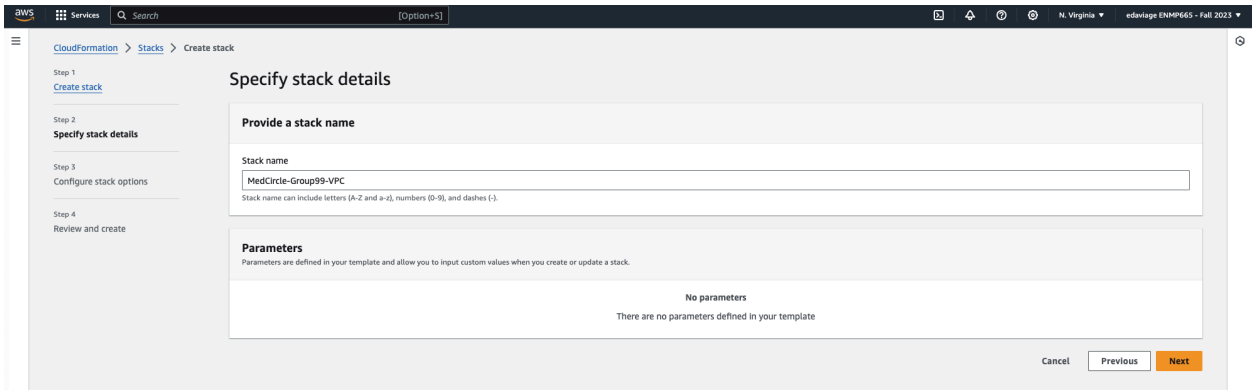
   **Important**

10. This is the only chance for you to save the private key file.
11. If you plan to use an SSH client on a macOS or Linux computer to connect to your Linux instance, use the following command to set the permissions of your private key file so that only you can read it.
12. `chmod 400 key-pair-name.pem`
13. If you do not set these permissions, then you cannot connect to your instance using this key pair.

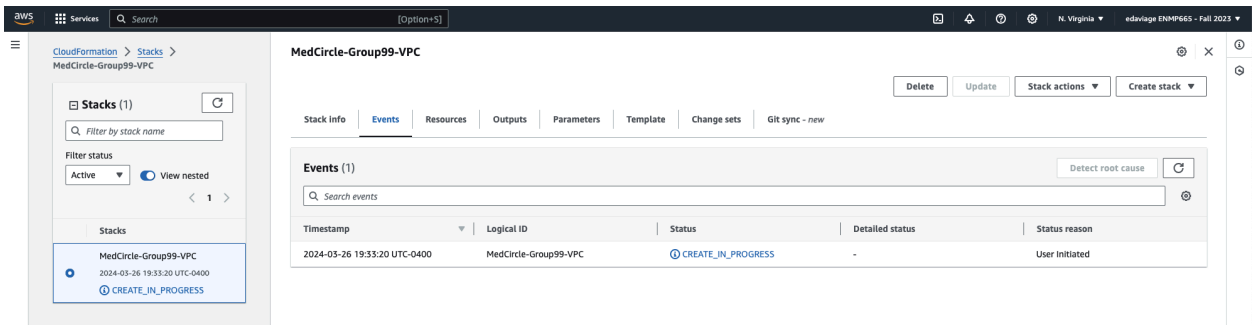
Next, deploy the MedCircle-VPC CloudFormation template



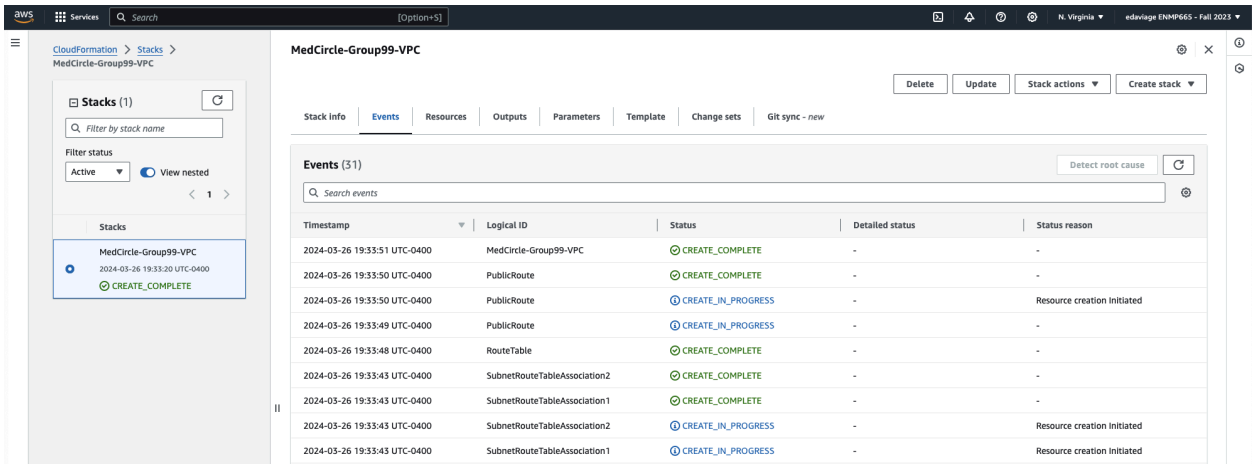

Click Create stack.
Next, choose Upload a template file and then Choose File. Select the file titled '*medcircle-vpc.yaml*' then click next.



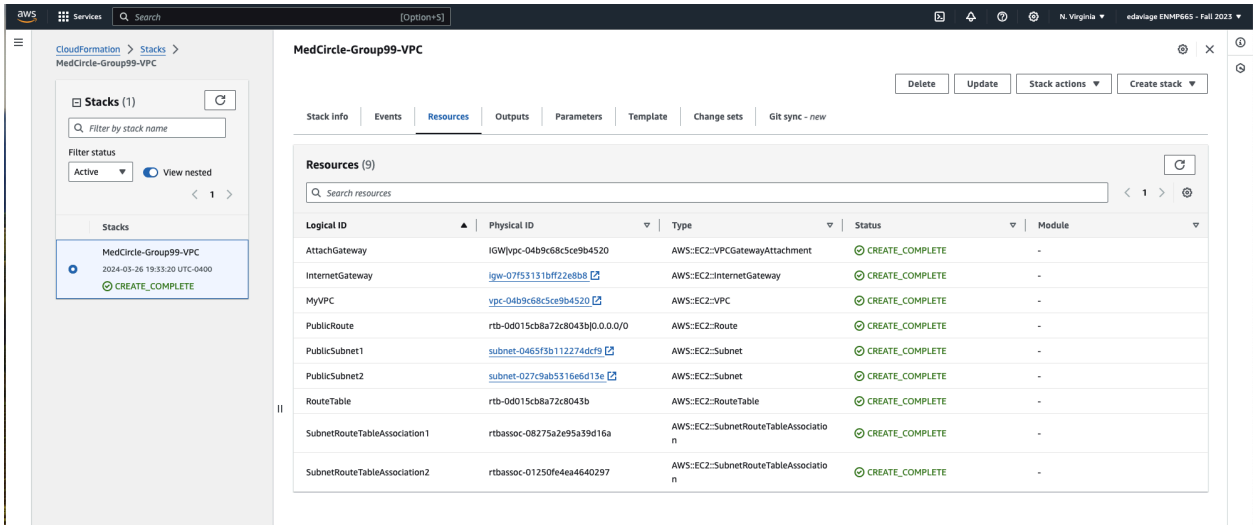

The stack name should be Medcircle-Group##-VPC. Replace ## with your group number then click next. Scroll all the way to the bottom and click next then scroll all the way to the bottom and click submit. You will then see the stack begin to deploy. You can click the refresh button next to Detect root cause to see your progress.



When it is complete you will see the status CREATE_COMPLETE.




You now need to edit the file '*MedCircle-SG.yml*. First click on the Stack Name of the stack you just created, 'MedCircle-Group##-VPC'.
Next click on the Resources tab. In the Resources tab, copy the Physical ID of MyVPC. It should start with the letters VPC. Paste it to a notepad. Then copy the Physical ID of PublicSubnet1. Paste it to a notepad.

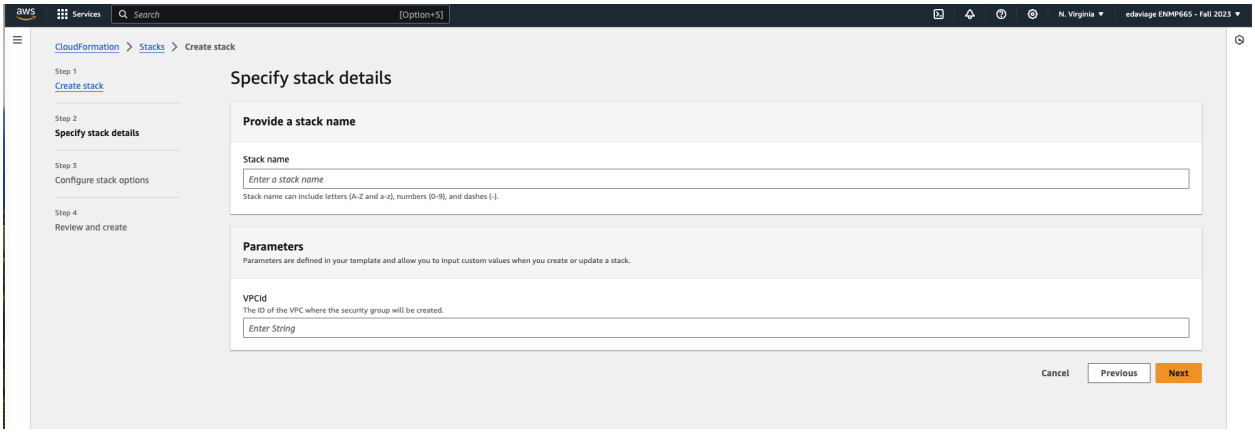



Next, open your local copy of *MedCircle-SG.yml* in a text editor. Copy the VPC ID from your notepad to the VpcID section in Resources. There is a note that says "**YOU MUST CHANGE THE VPC ID**"**.** Once this has been changed, save this file.

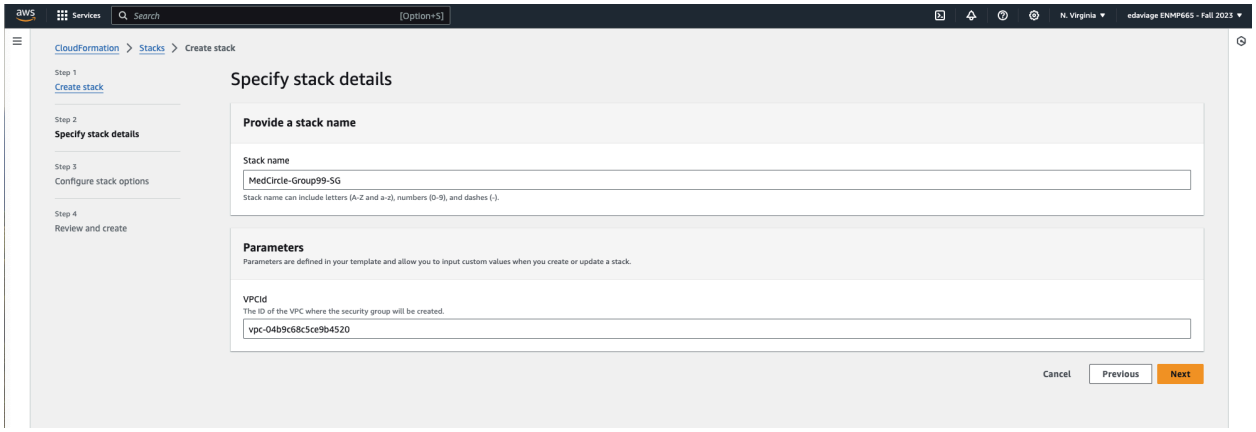
```yaml
AWSTemplateFormatVersion: '2010-09-09'
Description: Security Group for Web Application

Parameters:
  VPCId:
    Type: String
    Description: The ID of the VPC where the security group will be created.

Resources:
  WebAppSecurityGroup:
    Type: AWS::EC2::SecurityGroup
    Properties:
      GroupName: WebAppSG # Optional, can be omitted
      GroupDescription: Security group for web application
      VpcId: vpc-04b9c68c5ce9b4520 #YOU MUST CHANGE THE VPC ID
      SecurityGroupIngress:
        - IpProtocol: tcp
          FromPort: 80
          ToPort: 80
          CidrIp: 0.0.0.0/0 # Allows access from any IP address
        - IpProtocol: tcp
          FromPort: 443
          ToPort: 443
          CidrIp: 0.0.0.0/0 # Allows access from any IP address
      SecurityGroupEgress:
        - IpProtocol: -1 # Allows all outbound traffic
          CidrIp: 0.0.0.0/0

Outputs:
  SecurityGroupId:
    Description: The ID of the security group
    Value: !Ref WebAppSecurityGroup
```

Next, deploy the MedCircle-SG CloudFormation template. On this screen, click the Create stack button. Select '*With new resources (standard)*'.
You will follow the same procedure as before to deploy '*MedCircle-SG.yml*'.

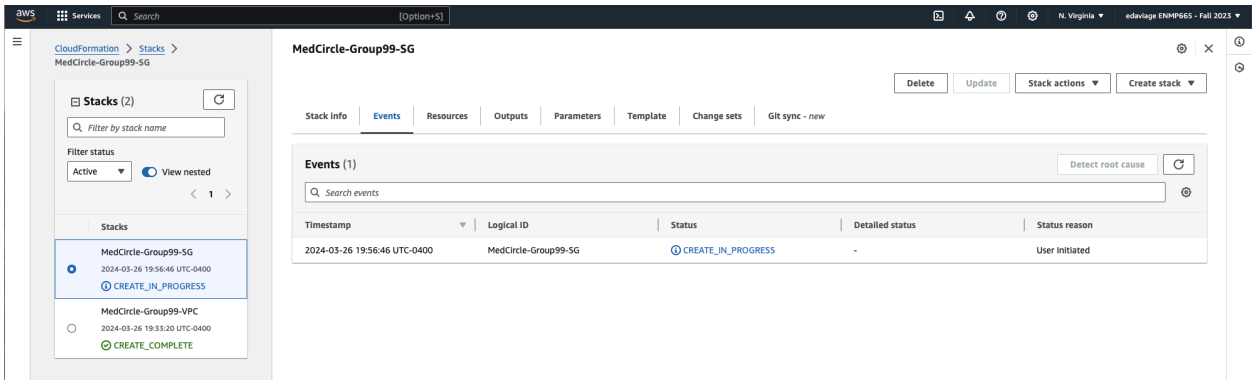
Next you will see Specify stack details:



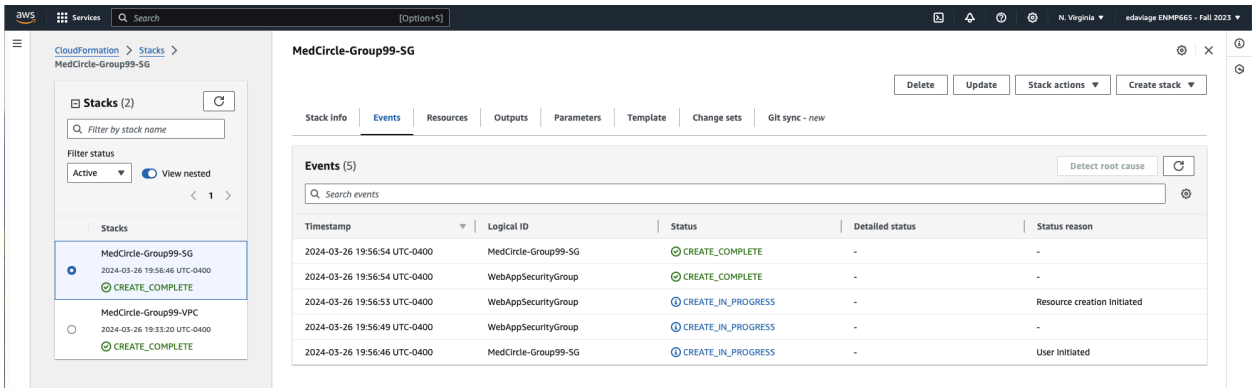

The Stack name should be MedCircle-Group##-SG.
The VPC-Id should be the same one that you copied to your notepad.




Now click next. Scroll to the bottom and click next again. Then scroll to the bottom and click submit. You will then see the stack begin to deploy. You can click the refresh button next to Detect root cause to see your progress.



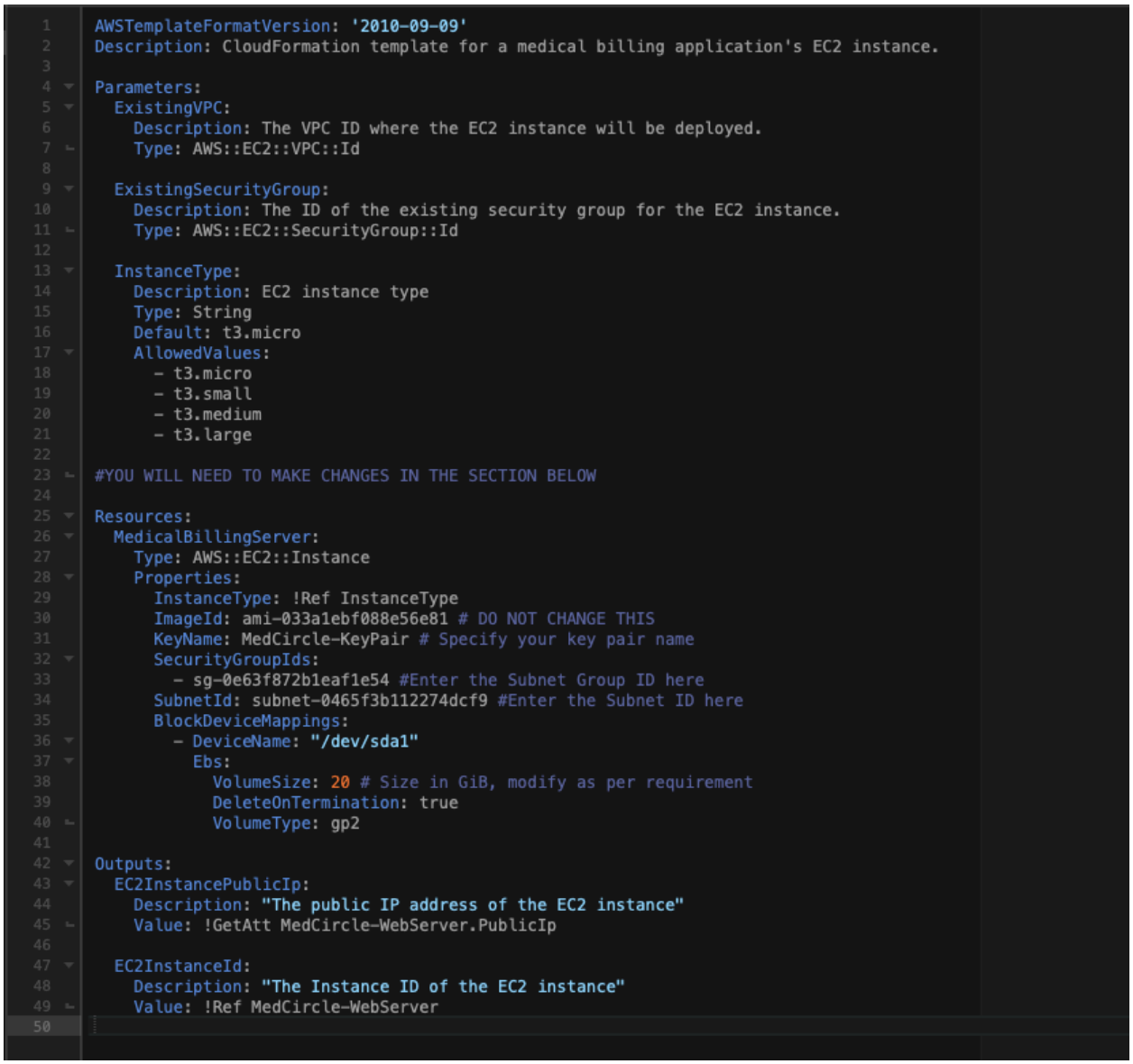

When it is complete you will see the status CREATE_COMPLETE.




You now need to edit the file '*MedCircle-2024.yml*. First click on the Stack Name MedCircle-Group##-SG. Next click on the Resources tab. In the Resources tab, copy the Physical ID of WebAppSecurityGroup. It should start with the letters SG. Paste it to

a notepad. You will also need the Subnet ID that you copied to the notepad and the name of the Key Pair that you created at the beginning.

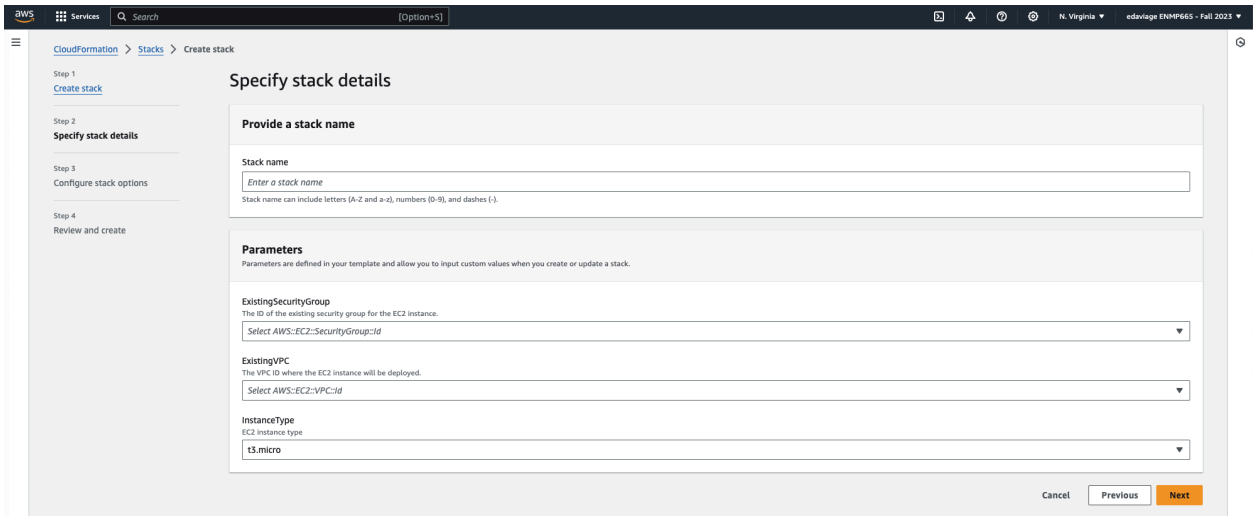
Next, open your local copy of *MedCircle-2024.yml* in a text editor. Replace the *SecurityGroupIds*, the *SubnetId* and the *KeyName*. Once this has been changed, save this file.



```yaml
AWSTemplateFormatVersion: '2010-09-09'
Description: CloudFormation template for a medical billing application's EC2 instance.

Parameters:
  ExistingVPC:
    Description: The VPC ID where the EC2 instance will be deployed.
    Type: AWS::EC2::VPC::Id

  ExistingSecurityGroup:
    Description: The ID of the existing security group for the EC2 instance.
    Type: AWS::EC2::SecurityGroup::Id

  InstanceType:
    Description: EC2 instance type
    Type: String
    Default: t3.micro
    AllowedValues:
      - t3.micro
      - t3.small
      - t3.medium
      - t3.large

#YOU WILL NEED TO MAKE CHANGES IN THE SECTION BELOW

Resources:
  MedicalBillingServer:
    Type: AWS::EC2::Instance
    Properties:
      InstanceType: !Ref InstanceType
      ImageId: ami-033a1ebf088e56e81 # DO NOT CHANGE THIS
      KeyName: MedCircle-KeyPair # Specify your key pair name
      SecurityGroupIds:
        - sg-0e63f872b1eaf1e54 #Enter the Subnet Group ID here
      SubnetId: subnet-0465f3b112274dcf9 #Enter the Subnet ID here
      BlockDeviceMappings:
        - DeviceName: "/dev/sda1"
          Ebs:
            VolumeSize: 20 # Size in GiB, modify as per requirement
            DeleteOnTermination: true
            VolumeType: gp2

Outputs:
  EC2InstancePublicIp:
    Description: "The public IP address of the EC2 instance"
    Value: !GetAtt MedCircle-WebServer.PublicIp

  EC2InstanceId:
    Description: "The Instance ID of the EC2 instance"
    Value: !Ref MedCircle-WebServer
```

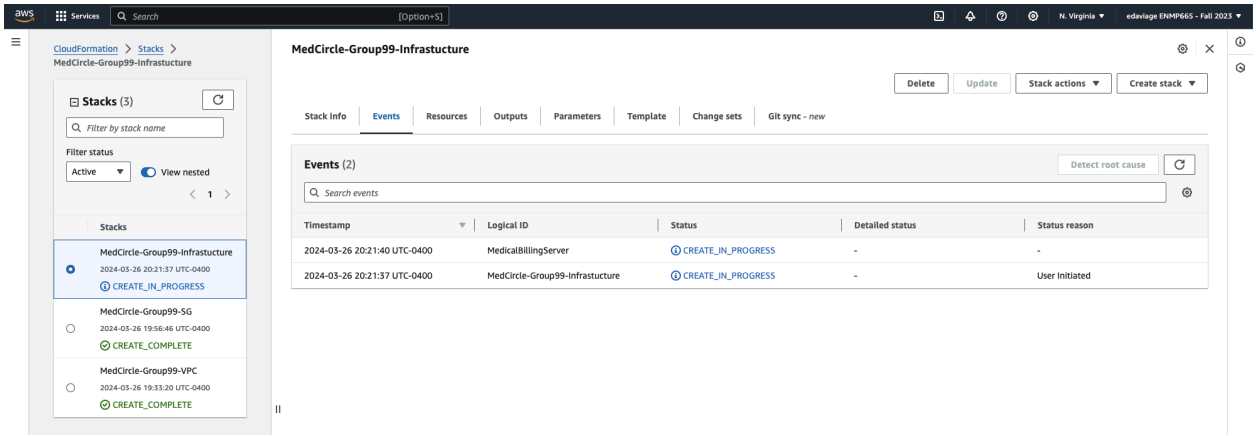
Next, deploy the MedCircle-2024 CloudFormation template the same as you have deployed the previous two templates.

Next you will see Specify stack details:

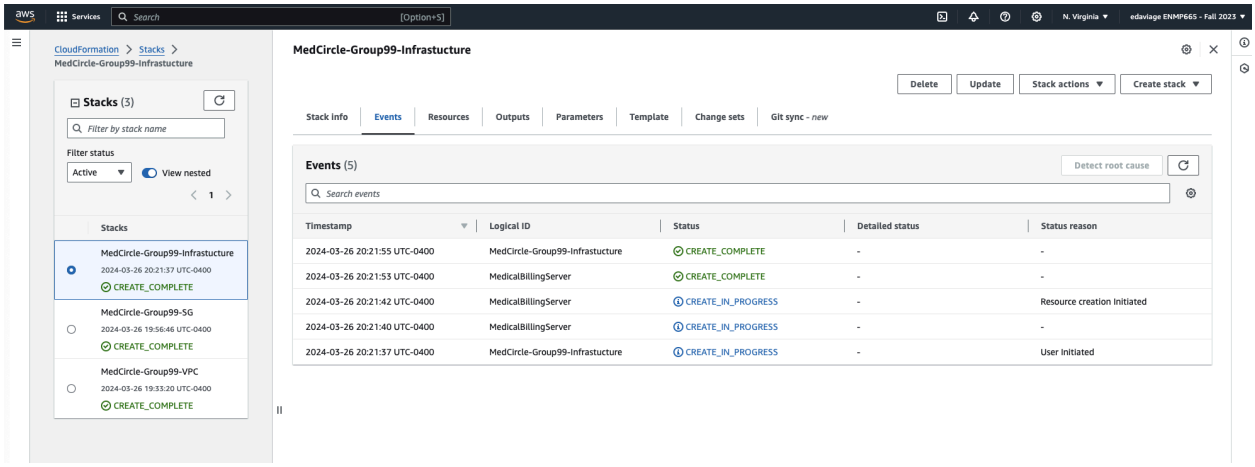



The Stack name should be MedCircle-Group##-Infrastructure.
The ExistingSecurityGroup should be WebAppSG. It will be in the pull down menu.
The ExistingVPC should be MedCircle-Group##-VPC
The InstanceType can be left as t3.Micro

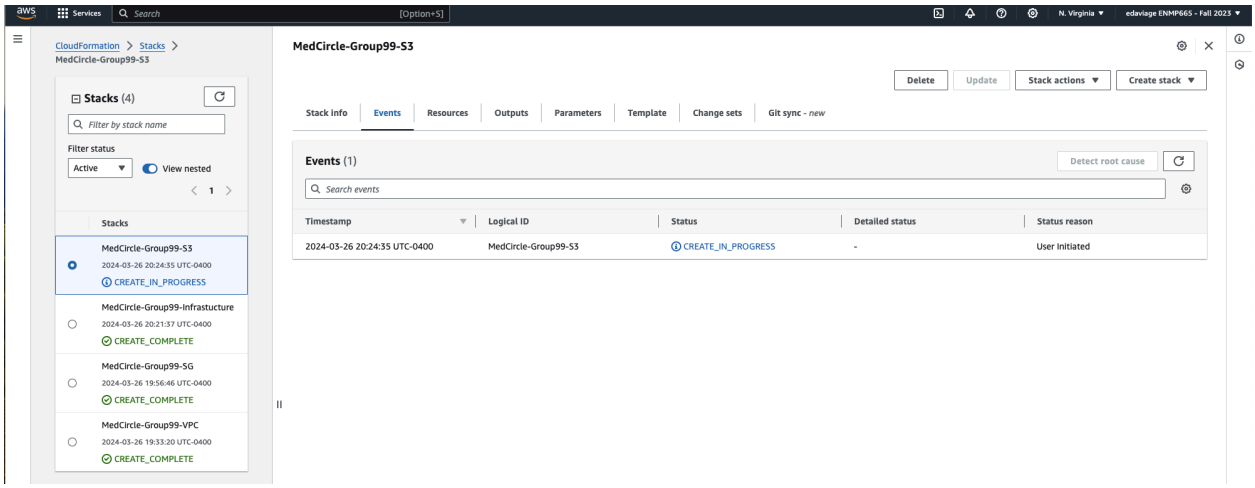
Click next. Scroll to the bottom and click Submit. You should see the stack begin to deploy.



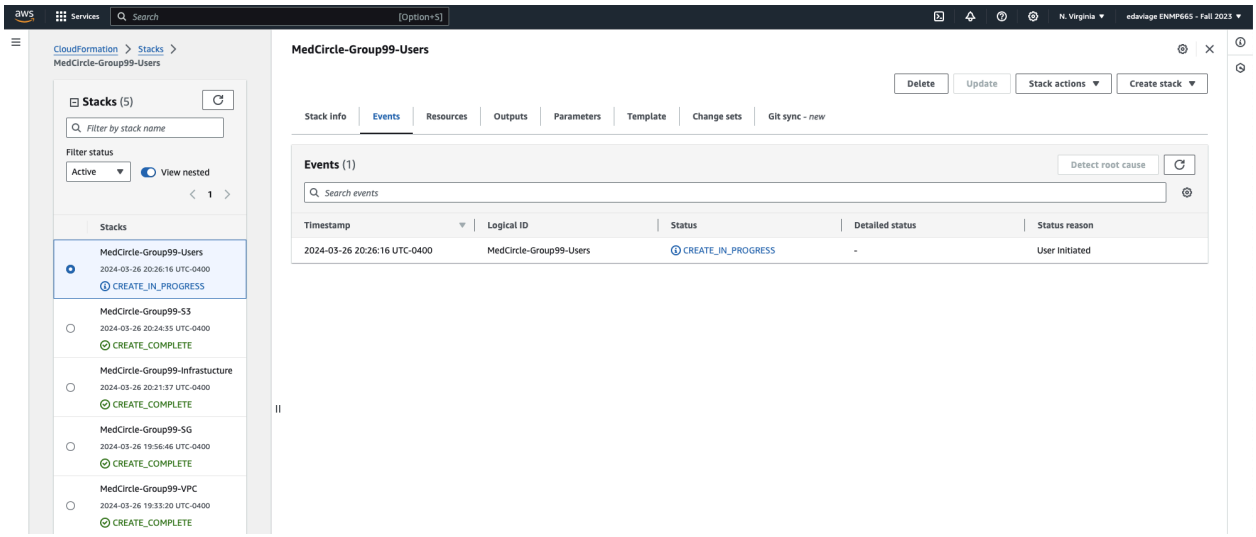
When the stack is complete you should see this:




Next deploy the MedCircle-S3Bucket.yml template. There are no parameters.



And finally the MedCircle-CreateUser.yml template. There are no parameters.




The sample architecture has now been deployed. NOTE: This is NOT a working infrastructure. This is intended to give you an idea of the configuration and has some glaring security issues as well as some that need to be through.