1. Start a EC2 Instance with Parameter KEY NAME, VPC, Subnet using Cloudformation Template.

2. Install Nginx in EC2 and put it in a ASG.

i) First by Userdata

ii) By Metadata

3. Create a Sample Index file and copy this file using MetaData into EC2 Instance

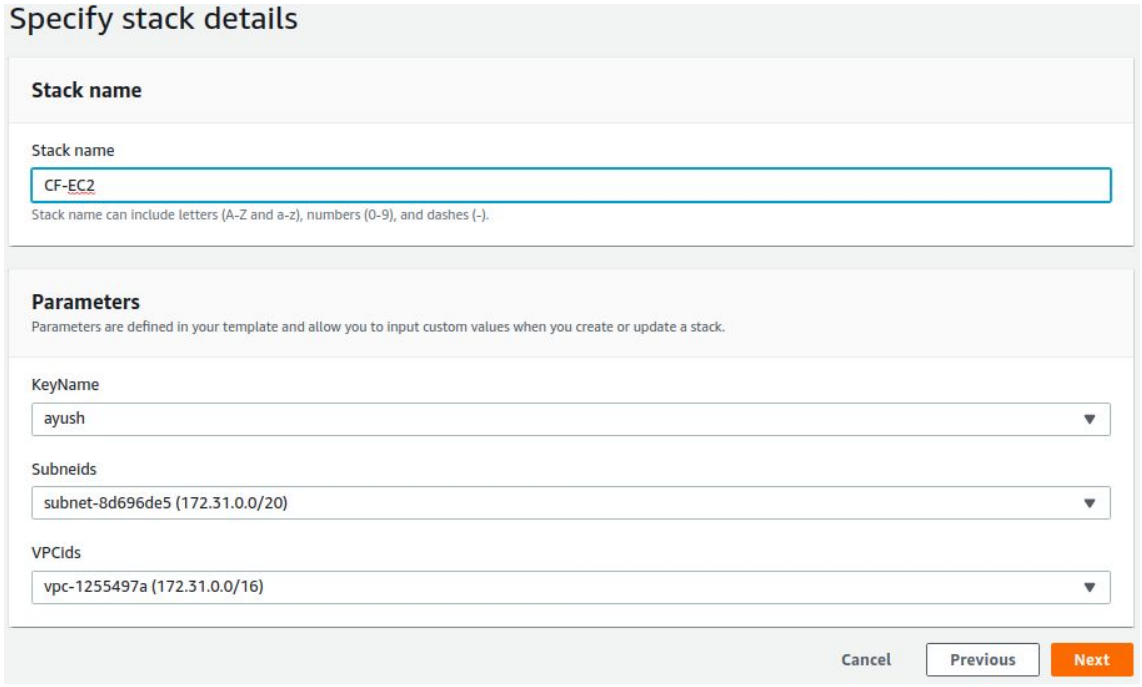
4. Changing the content of Index should reload the nginx config automatically in EC2 Instance

5. Perform ASG Rolling Update with the change in UserData in above Cloudformation Template

Cloudformation Tasks (Hint : use cloudformation:: init and cfn-hup)

REFERENCE :
https://github.com/awslabs/aws-cloudformation-templates/blob/master/aws/services/AutoScaling/AutoScalingRollingUpdates.yaml

Look Instance.yml given for cloud formation refrence




```yaml
Parameters:
  KeyName:
    Type: AWS::EC2::KeyPair::KeyName
  VPCids:
    Type: AWS::EC2::VPC::Id
  Subneids:
    Type: AWS::EC2::Subnet::Id

Resources:
#EC2 INSTANCE LAUNCH
  Ec2Instance:
    Type: AWS::EC2::Instance
    Properties:
      InstanceType: t2.micro
      KeyName: KeyName
      SecurityGroupIds:
        - sg-895c5de7
      SubnetId: Subnetids
      ImageId: ami-0fc20dd1da406780b
      Tags:
        - Key: Name
          Value: CF-EC2
        - Key: Owner
          Value: Ayush
      UserData:
        Fn::Base64:
          !Sub |
            #!/bin/bash
            echo "update"
            apt update -y
            echo "install nginx"
            apt install -y nginx
            echo "install python setup-tools"
            apt install -y python-setuptools
            echo "mkdir"
            mkdir -p /opt/aws/bin
            echo "download-s3"
            wget https://s3.amazonaws.com/cloudformation-examples/aws-cfn-bootstrap-latest.tar.gz
```

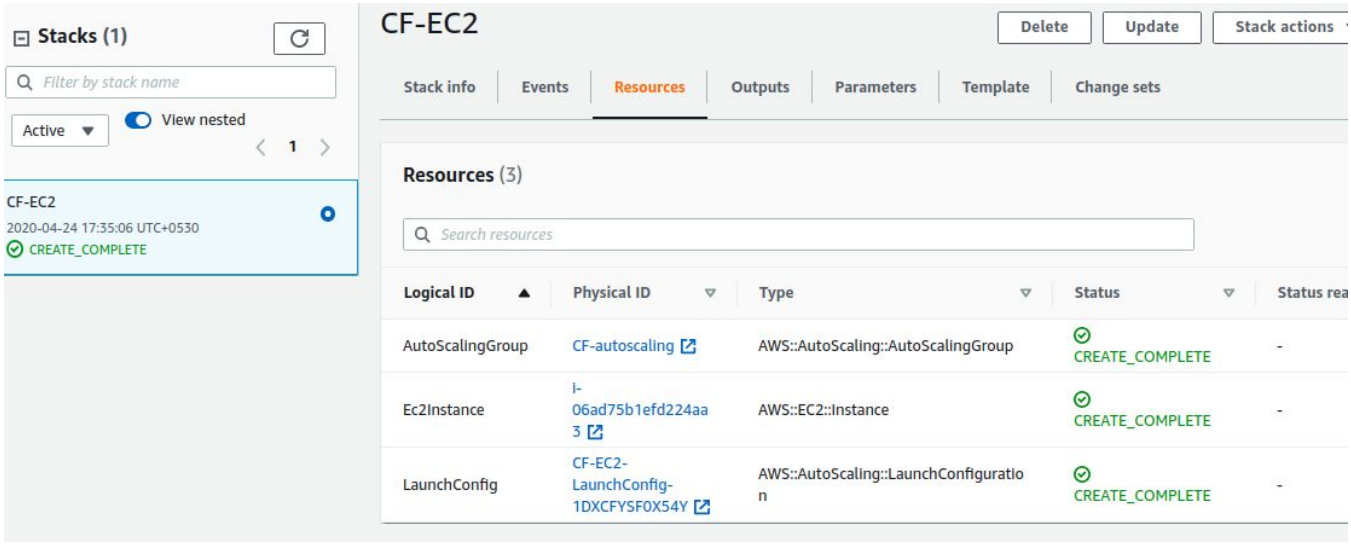
```
  UserData:
    Fn::Base64:
      !Sub |
        #!/bin/bash
        echo "update"
        apt update -y
        echo "install nginx"
        apt install -y nginx
        echo "install python setup-tools"
        apt install -y python-setuptools
        echo "mkdir"
        mkdir -p /opt/aws/bin
        echo "download-s3"
        wget https://s3.amazonaws.com/cloudformation-examples/aws-cfn-bootstrap-latest.tar.gz
        echo "python easy_install"
        python /usr/lib/python2.7/dist-packages/easy_install.py --script-dir /opt/aws/bin aws-cfn-bootstrap-latest.tar.gz
        echo "cnf-innit"
        /opt/aws/bin/cfn-init -v --stack ${AWS::StackName} --region ${AWS::Region} --resource Ec2Instance --configsets SetupEnvironment,UpdateEnvironment
        /opt/aws/bin/cfn-signal -e $? --stack ${AWS::StackName} --region ${AWS::Region} --resource Ec2Instance

  Metadata:
    AWS::CloudFormation::Init:
```

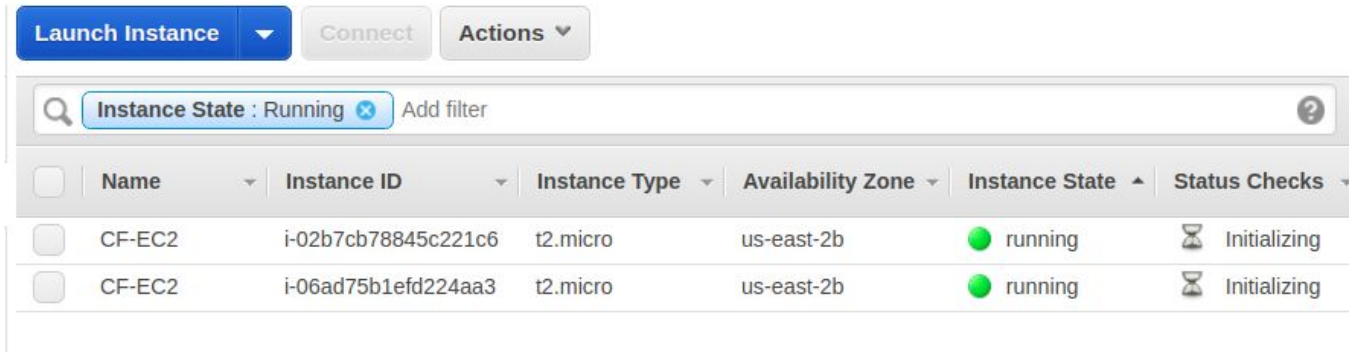
```
  Metadata:
    AWS::CloudFormation::Init:

      configSets:
        SetupEnvironment:
          - setupCfnHup
        UpdateEnvironment:
          - updateHostsFile

      setupCfnHup:
        files:
          '/var/www/html/index.html':
            content: !Sub  |
              <h1>Deployed via Cloud formation</h1>
            mode: '000644'
            owner: root
            group: root

          '/etc/cfn/cfn-hup.conf':
            content: !Sub |
              [main]
              stack=${AWS::StackId}
              region=${AWS::Region}
              interval=1
            mode: '000400'
            owner: root
            group: root
```

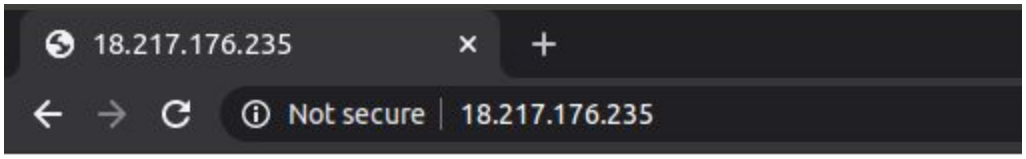
```
  '/etc/cfn/hooks.d/cfn-auto-reloader.conf':
    content: !Sub |
      [cfn-auto-reloader-hook]
      triggers=post.update
      path=Resources.Ec2Instance.Metadata.AWS::CloudFormation::Init
      action=/opt/aws/bin/cfn-init --verbose --stack=${AWS::StackName} --region=${AWS::Region} --resource=Ec2Instance --configsets UpdateEnvironment
      runas=root
    mode: '000400'
    owner: root
    group: root

  '/lib/systemd/system/cfn-hup.service':
    content: !Sub |
      [Unit]
      Description=cfn-hup daemon
      [Service]
      Type=simple
      ExecStart=/opt/aws/bin/cfn-hup
      Restart=always
      [Install]
      WantedBy=multi-user.target
    mode: '000400'
    owner: root
    group: root

commands:
  01enable_cfn_hup:
    command : systemctl enable cfn-hup.service
  02start_cfn_hup:
    command : systemctl start cfn-hup.service
```

```
updateHostsFile:
  commands:
    reload_nginx:
      command: nginx -s reload
```

```
#AUTOSCALING CONFIGURATION

  AutoScalingGroup:
    Type: AWS::AutoScaling::AutoScalingGroup
    Properties:
      AutoScalingGroupName: CF-autoscaling
      LaunchConfigurationName: !Ref 'LaunchConfig'
      AvailabilityZones:
        - us-east-2b
        - us-east-2a
      MaxSize: 2
      MinSize: 1
      DesiredCapacity: 1
      Tags:
      - Key: Name
        Value: CF-EC2
        PropagateAtLaunch: "true"
      - Key: Owner
        Value: Ayush
        PropagateAtLaunch: "true"
    UpdatePolicy:
      AutoScalingRollingUpdate:
        MaxBatchSize: '1'
        MinInstancesInService: '1'
        PauseTime: PT15M
        WaitOnResourceSignals: 'true'
```





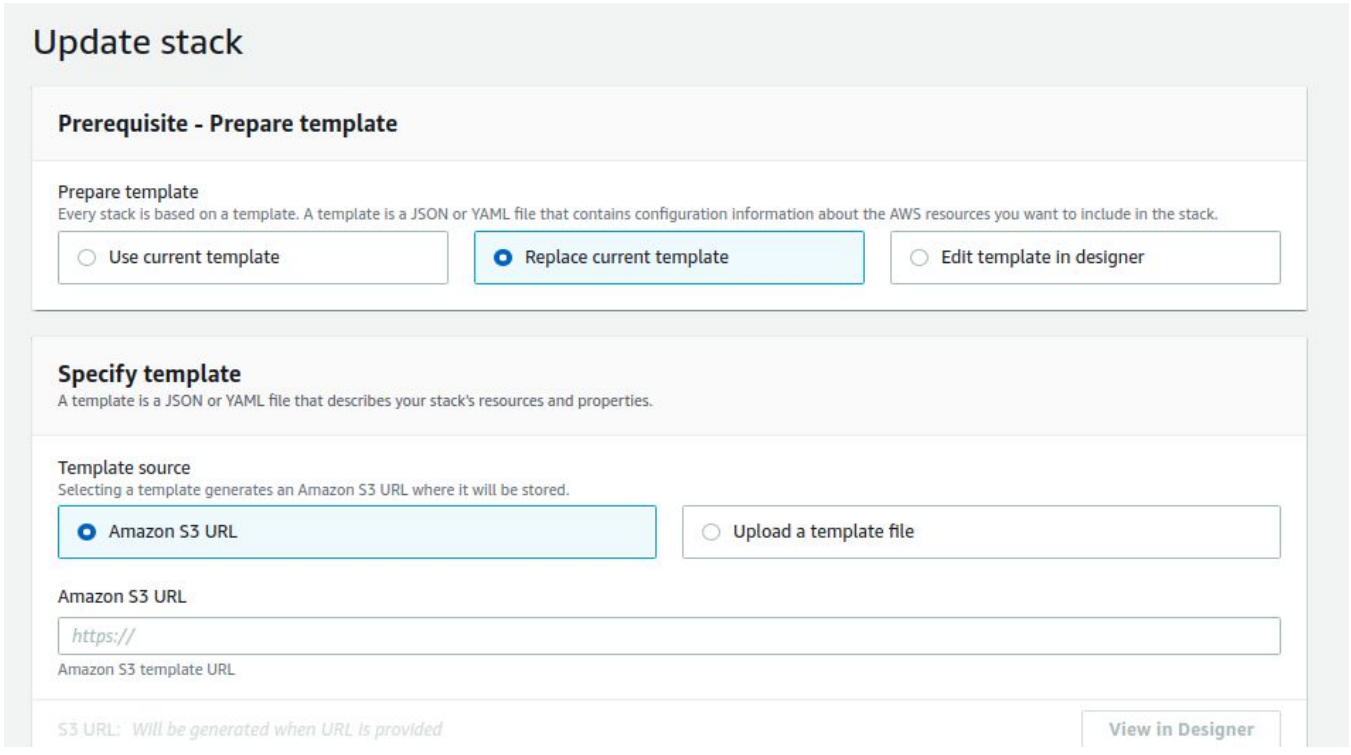


Deployed via Cloud formation

Deployed via Cloud formation

Updating userdata for update rolling

```
  UserData:
    Fn::Base64:
      !Sub |
        #!/bin/bash
        echo "update"
        apt update -y
        echo "install nginx"
        echo "this is for rolling update"       #for rolling upddate
        apt install -y nginx
        echo "install python setup-tools"
        apt install -y python-setuptools
        echo "mkdir"
        mkdir -p /opt/aws/bin
        echo "download-s3"
        wget https://s3.amazonaws.com/cloudformation-examples/aws-cfn-bootstrap-latest.tar.gz
        echo "python easy_install"
        python /usr/lib/python2.7/dist-packages/easy_install.py --script-dir /opt/aws/bin aws-cfn-bootstrap-latest.tar.gz
        echo "cnf-innit"
        /opt/aws/bin/cfn-init -v --stack ${AWS::StackName} --region ${AWS::Region} --resource LaunchConfig --configsets SetupEnvironment,UpdateEnvironment
        /opt/aws/bin/cfn-signal -e $? --stack ${AWS::StackName} --region ${AWS::Region} --resource AutoScalingGroup

Metadata:
  AWS::CloudFormation::Init:

    configSets:
      SetupEnvironment:
        - setupCfnHup
      UpdateEnvironment:
        - updateHostsFile

    setupCfnHup:
      files:
        '/var/www/html/index.html':
          content: !Sub  |
            <h1>Deployed via Cloud formation updated</h1>
          mode: '000644'
          owner: root
```



Events (19)

Search events

Timestamp	Logical ID	Status	Status reason
2020-04-24 17:46:10 UTC+0530	AutoScalingGroup	UPDATE_IN_PROGRESS	New instance(s) added to autoscaling group - Waiting on 1 resource signal(s) with a timeout of PT15M.
2020-04-24 17:44:53 UTC+0530	AutoScalingGroup	UPDATE_IN_PROGRESS	Temporarily setting autoscaling group MinSize and DesiredCapacity to 2.
2020-04-24 17:44:53 UTC+0530	AutoScalingGroup	UPDATE_IN_PROGRESS	Rolling update initiated. Terminating 1 obsolete instance(s) in batches of 1, while keeping at least 1 instance(s) in service. Waiting on resource signals with a timeout of PT15M when new instances are added to the autoscaling group.
2020-04-24 17:44:50 UTC+0530	AutoScalingGroup	UPDATE_IN_PROGRESS	-
2020-04-24 17:44:49 UTC+0530	LaunchConfig	UPDATE_COMPLETE	-
2020-04-24 17:44:48 UTC+0530	LaunchConfig	UPDATE_IN_PROGRESS	Resource creation Initiated
2020-04-24 17:44:48 UTC+0530	LaunchConfig	UPDATE_IN_PROGRESS	Requested update requires the creation of a new physical resource; hence creating one.
2020-04-24 17:44:44 UTC+0530	CF-EC2	UPDATE_IN_PROGRESS	User Initiated
2020-04-24 17:36:38 UTC+0530	CF-EC2	CREATE_COMPLETE	-
2020-04-24 17:36:37 UTC+0530	AutoScalingGroup	CREATE_COMPLETE	-

Events (27)

Search events

Timestamp	Logical ID	Status	Status reason
2020-04-24 18:14:59 UTC+0530	ec2-cf	UPDATE_COMPLETE	-
2020-04-24 18:14:59 UTC+0530	LaunchConfig	DELETE_COMPLETE	-
2020-04-24 18:14:59 UTC+0530	LaunchConfig	DELETE_IN_PROGRESS	-
2020-04-24 18:14:58 UTC+0530	ec2-cf	UPDATE_COMPLETE_CLEANUP_IN_PROGRESS	-
2020-04-24 18:14:56 UTC+0530	AutoScalingGroup	UPDATE_COMPLETE	-
2020-04-24 18:14:55 UTC+0530	AutoScalingGroup	UPDATE_IN_PROGRESS	Successfully terminated instance(s) [i-0f95ba069a5b78f00] (Progress 100%).
2020-04-24 18:14:54 UTC+0530	AutoScalingGroup	UPDATE_IN_PROGRESS	Terminating instance(s) [i-0f95ba069a5b78f00]; replacing with 0 new instance(s).
2020-04-24 18:14:53 UTC+0530	AutoScalingGroup	UPDATE_IN_PROGRESS	Received SUCCESS signal with UniqueId i-07362d708a502bb18

Deployed via Cloud formation updated