AWS re:Start LAB

Troubleshoot CloudFormation

WEEK 11

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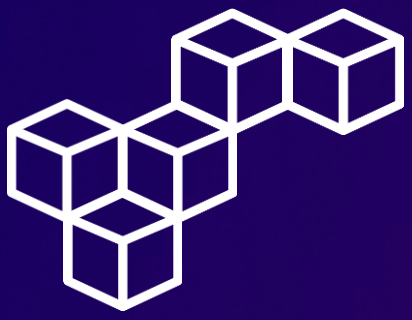

Overview

Troubleshooting CloudFormation involves using various techniques to ensure smooth stack deployments. Utilizing JMESPath to query JSON-formatted documents helps extract relevant information quickly, aiding in identifying potential issues. The AWS CLI is invaluable for diagnosing deployment problems, as it provides detailed information about stack events, resource statuses, and error messages essential for pinpointing issues.

Additionally, analyzing log files on a Linux EC2 instance can uncover reasons behind create-stack failures, offering detailed error messages and diagnostics. For failed delete-stack actions, reviewing stack events and resource dependencies is crucial to resolve underlying problems. Effective troubleshooting of CloudFormation stacks ensures reliable and efficiently managed AWS infrastructure, minimizing downtime and operational disruptions.

Topics covered

- Practice using JMESPath to query JSON-formatted documents.
- Troubleshoot the deployment of an AWS CloudFormation stack by using the AWS CLI.
- Analyze log files on a Linux EC2 instance to determine the cause of a create-stack failure.
- Troubleshoot a failed delete-stack action.

Task 1

Querying JSON-formatted data by using JMESPath

Step 1: Review the JSON document

Open the JMESPath website and copy the following JSON document.

```
{
  "desserts": [
    {
      "name": "Chocolate cake",
      "price": "20.00"
    },
    {
      "name": "Ice cream",
      "price": "15.00"
    },
    {
      "name": "Carrot cake",
      "price": "22.00"
    }
  ]
}
```

Step 2: Query the JSON document

Query the JSON-formatted data by using the following JMESPath expressions.

`desserts[1]`

```
{
  "name": "Ice cream",
  "price": "15.00"
}
```

`desserts[0].[name,price]`

```
[
  "Chocolate cake",
  "20.00"
]
```

`desserts[?name=='Carrot cake']`

```
[
  {
    "name": "Carrot cake",
    "price": "22.00"
  }
]
```

`desserts[0].name`

```
"Chocolate cake"
```

`desserts[].name`

```
[
  "Chocolate cake",
  "Ice cream",
  "Carrot cake"
]
```

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Task 1

Querying JSON-formatted data by using JMESPath

Step 3: Replace the JSON document

Replace the JSON document with the following document, which describes resources in an AWS CloudFormation stack.

```
{
    "StackResources": [
        {
            "LogicalResourceId": "VPC",
            "ResourceType": "AWS::EC2::VPC"
        },
        {
            "LogicalResourceId": "PublicSubnet1",
            "ResourceType": "AWS::EC2::Subnet"
        },
        {
            "LogicalResourceId": "CliHostInstance",
            "ResourceType": "AWS::EC2::Instance"
        }
    ]
}
```

Step 4: Determine the correct expression

Determine the correct JSMESPath expression to retrieve the LogicalResourceId of the EC2 instance resource.

```
StackResources[?ResourceType == 'AWS::EC2::Instance'].LogicalResourceId
```

Result

```
[
  "CliHostInstance"
]
```

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Task 2

Troubleshooting and working with AWS CloudFormation stacks

Step 1: Connect to the CLI Host

Establish an SSH connection to the **CLI Host** EC2 instance.

```
support@HP-Pavilion-Laptop:~/Downloads$ ssh -i labsuser.pem ec2-user@35.87.22.61
   ,     #_
   ~\_  ####_        Amazon Linux 2
  ~~  \_#####\
  ~~     \###|       AL2 End of Life is 2025-06-30.
  ~~       \#/ ___
   ~~       V~' '->
    ~~~         /    A newer version of Amazon Linux is available!
      ~~._.   _/
         _/ _/       Amazon Linux 2023, GA and supported until 2028-03-15.
       _/m/'           https://aws.amazon.com/linux/amazon-linux-2023/

[ec2-user@cli-host ~]$
```

Step 2: Configure the AWS CLI

Update the AWS CLI software with the credentials. At the prompts, enter the following information.

```
[ec2-user@cli-host ~]$ aws configure
AWS Access Key ID [None]: AKIA6GBMFHCSEU3VMASY
AWS Secret Access Key [None]: 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
Default region name [None]: us-west-2
Default output format [None]: json
[ec2-user@cli-host ~]$
```

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Task 2

Troubleshooting and working with AWS CloudFormation stacks

Step 3: Review the template file

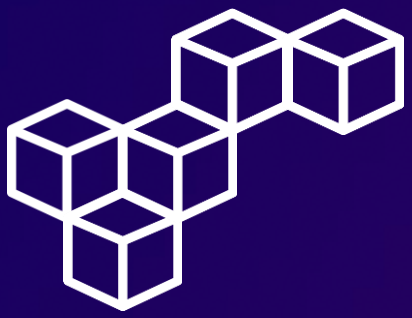
Run the following command to first observe the AWS CloudFormation template that you will use. Scroll through the template contents and observe the contents.

```
[ec2-user@cli-host ~]$ less template1.yaml
[ec2-user@cli-host ~]$
```

Step 4: Create stack

Run the following aws cloudformation create-stack command to create a stack.

```
[ec2-user@cli-host ~]$ aws cloudformation create-stack \
> --stack-name myStack \
> --template-body file://template1.yaml \
> --capabilities CAPABILITY_NAMED_IAM \
> --parameters ParameterKey=KeyName,ParameterValue=vockey
{
    "StackId": "arn:aws:cloudformation:us-west-2:975050193060:stack/myStack/5e2e4700-22b9-11ef-8c01-068f497cdc6b"
}
[ec2-user@cli-host ~]$
```



Task 2

Troubleshooting and working with AWS CloudFormation stacks

Step 5: Check the status of each resource

Check the status of each resource that is created by this stack. The watch Linux utility is used to invoke the aws cloudformation describe-stack-resources command. It runs the same command every 5 seconds, and it briefly highlights changes as they occur. The command above also uses the --output table parameter to make reading the results easier.

```
[ec2-user@cli-host ~]$ watch -n 5 -d \
> aws cloudformation describe-stack-resources \
> --stack-name myStack \
> --query 'StackResources[*].[ResourceType,ResourceStatus]' \
> --output table
```

Step 6: Review stack resources status

Observe the progress of resource creation. Notice that after almost all resources are created, they start being deleted.

```
-------------------------------------------------------------------
|                    DescribeStackResources                       |
+-----------------------------------------+-----------------------+
|  AWS::EC2::InternetGateway              |  DELETE_COMPLETE      |
|  AWS::EC2::VPC                          |  DELETE_COMPLETE      |
|  AWS::S3::Bucket                        |  DELETE_COMPLETE      |
|  AWS::EC2::Route                        |  DELETE_COMPLETE      |
|  AWS::EC2::RouteTable                   |  DELETE_COMPLETE      |
|  AWS::EC2::SubnetRouteTableAssociation  |  DELETE_COMPLETE      |
|  AWS::EC2::Subnet                       |  DELETE_COMPLETE      |
|  AWS::EC2::VPCGatewayAttachment         |  DELETE_COMPLETE      |
|  AWS::CloudFormation::WaitCondition     |  DELETE_COMPLETE      |
|  AWS::CloudFormation::WaitConditionHandle |  DELETE_COMPLETE    |
|  AWS::EC2::SecurityGroup                |  DELETE_COMPLETE      |
|  AWS::EC2::Instance                     |  DELETE_COMPLETE      |
+-----------------------------------------+-----------------------+
```

Task 2

Troubleshooting and working with AWS CloudFormation stacks

Step 7: Review the stack status

To see the stack status and other details, run the following aws cloudformation describe-stacks command. The output of the command will either show a status of CREATE_FAILED, ROLLBACK_IN_PROGRESS or ROLLBACK_COMPLETE.

```
[ec2-user@cli-host ~]$ watch -n 5 -d \
> aws cloudformation describe-stacks \
> --stack-name myStack \
> --output table
```

```
-----------------------------------------------------------------------------------------------------------------------------------------
|                                                      DescribeStacks                                                                   |
+---------------------------------------------------------------------------------------------------------------------------------------+
||                                                        Stacks                                                                       ||
|+----------------------------+--------------------------------------------------------------------------------------------------------+|
||  CreationTime              |  2024-06-04T21:28:21.729Z                                                                              ||
||  DeletionTime              |  2024-06-04T21:31:11.076Z                                                                              ||
||  Description               |  Lab template                                                                                          ||
||  DisableRollback           |  False                                                                                                 ||
||  EnableTerminationProtection|  False                                                                                                ||
||  StackId                   |  arn:aws:cloudformation:us-west-2:975050193060:stack/myStack/5e2e4700-22b9-11ef-8c01-068f497cdc6b       ||
||  StackName                 |  myStack                                                                                               ||
||  StackStatus               |  ROLLBACK_COMPLETE                                                                                     ||
|+----------------------------+--------------------------------------------------------------------------------------------------------+|
|||                                                    Capabilities                                                                     |||
||+-----------------------------------------------------------------------------------------------------------------------------------+||
|||  CAPABILITY_NAMED_IAM                                                                                                             |||
||+-----------------------------------------------------------------------------------------------------------------------------------+||
|||                                                  DriftInformation                                                                 |||
||+-----------------------------------------------------------------+-----------------------------------------------------------------+||
|||  StackDriftStatus                                               |  NOT_CHECKED                                                    |||
||+-----------------------------------------------------------------+-----------------------------------------------------------------+||
|||                                                   Parameters                                                                      |||
||+----------------------+--------------------------------------------------------------------------+-----------------------------+||
|||     ParameterKey     |                           ParameterValue                                 |       ResolvedValue         |||
||+----------------------+--------------------------------------------------------------------------+-----------------------------+||
|||  KeyName             |  vockey                                                                  |                             |||
|||  LabVpcCidr          |  10.0.0.0/20                                                             |                             |||
|||  PublicSubnetCidr    |  10.0.0.0/24                                                             |                             |||
|||  AmazonLinuxAMIID    |  /aws/service/ami-amazon-linux-latest/amzn2-ami-hvm-x86_64-gp2           |  ami-0676a735c5f8e67c4      |||
||+----------------------+--------------------------------------------------------------------------+-----------------------------+||
```

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Task 2

Troubleshooting and working with AWS CloudFormation stacks

Step 8: Analyze the issue

Analyze the issue by running the following aws cloudformation describe-stack-events command with a query that returns only the CREATE_FAILED events.

```
[ec2-user@cli-host ~]$ aws cloudformation describe-stack-events \
> --stack-name myStack \
> --query "StackEvents[?ResourceStatus == 'CREATE_FAILED']"
[
    {
        "StackId": "arn:aws:cloudformation:us-west-2:975050193060:stack/myStack/5e2e4700-22b9-11ef-8c01-068f497cdc6b",
        "EventId": "WaitCondition-CREATE_FAILED-2024-06-04T21:31:10.741Z",
        "ResourceStatus": "CREATE_FAILED",
        "ResourceType": "AWS::CloudFormation::WaitCondition",
        "Timestamp": "2024-06-04T21:31:10.741Z",
        "ResourceStatusReason": "WaitCondition timed out. Received 0 conditions when expecting 1",
        "StackName": "myStack",
        "ResourceProperties": "{\"Timeout\":\"60\",\"Handle\":\"https://cloudformation-waitcondition-us-west-2.s3-us-west-2
.amazonaws.com/arn%3Aaws%3Acloudformation%3Aus-west-2%3A975050193060%3Astack/myStack/5e2e4700-22b9-11ef-8c01-068f497cdc6b/5
e3090f0-22b9-11ef-8c01-068f497cdc6b/WaitHandle?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Date=20240604T212824Z&X-Amz-SignedHea
ders=host&X-Amz-Expires=86399&X-Amz-Credential=AKIAJBJSWSW6NLR67N6A%2F20240604%2Fus-west-2%2Fs3%2Faws4_request&X-Amz-Signat
ure=25c389f47a6a6c4212cde03df458c8139ad1a7e66da83da63f18ded0e7619d77\"}",
        "PhysicalResourceId": "arn:aws:cloudformation:us-west-2:975050193060:stack/myStack/5e2e4700-22b9-11ef-8c01-068f497c
dc6b/5e3090f0-22b9-11ef-8c01-068f497cdc6b/WaitHandle",
        "LogicalResourceId": "WaitCondition"
    }
]
[ec2-user@cli-host ~]$
```

Step 9: Review the stack status

Run the aws cloudformation describe-stacks command one more time.

```
[ec2-user@cli-host ~]$ aws cloudformation describe-stacks \
> --stack-name myStack \
> --output table
```

Task 2

Troubleshooting and working with AWS CloudFormation stacks

Step 10: Review the stack status

The StackStatus element indicates that the status of the stack is now ROLLBACK_COMPLETE. This status confirms that the resources that were created by the stack were deleted.

```
-----------------------------------------------------------------------------------------------------------------------
|                                                DescribeStacks                                                       |
+---------------------------------------------------------------------------------------------------------------------+
||                                                  Stacks                                                           ||
|+----------------------------+--------------------------------------------------------------------------------------+|
||  CreationTime              |  2024-06-04T21:28:21.729Z                                                            ||
||  DeletionTime              |  2024-06-04T21:31:11.076Z                                                            ||
||  Description               |  Lab template                                                                        ||
||  DisableRollback           |  False                                                                               ||
||  EnableTerminationProtection|  False                                                                              ||
||  StackId                   |  arn:aws:cloudformation:us-west-2:975050193060:stack/myStack/5e2e4700-22b9-11ef-8c01-068f497cdc6b  ||
||  StackName                 |  myStack                                                                             ||
||  StackStatus               |  ROLLBACK_COMPLETE                                                                   ||
|+----------------------------+--------------------------------------------------------------------------------------+|
||                                               Capabilities                                                        ||
|+---------------------------------------------------------------------------------------------------------------------+|
||  CAPABILITY_NAMED_IAM                                                                                             ||
|+---------------------------------------------------------------------------------------------------------------------+|
||                                             DriftInformation                                                      ||
|+-----------------------------------------------------------------+---------------------------------------------------+|
||  StackDriftStatus                                               |  NOT_CHECKED                                      ||
|+-----------------------------------------------------------------+---------------------------------------------------+|
||                                              Parameters                                                           ||
|+----------------------+-----------------------------------------------------------------------+--------------------+|
||     ParameterKey      |                          ParameterValue                               |       ResolvedValue       ||
|+----------------------+-----------------------------------------------------------------------+--------------------+|
||  KeyName              |  vockey                                                               |                    ||
||  LabVpcCidr           |  10.0.0.0/20                                                          |                    ||
||  PublicSubnetCidr     |  10.0.0.0/24                                                          |                    ||
||  AmazonLinuxAMIID     |  /aws/service/ami-amazon-linux-latest/amzn2-ami-hvm-x86_64-gp2        |  ami-0676a735c5f8e67c4  ||
|+----------------------+-----------------------------------------------------------------------+--------------------+|
```

Step 11: Delete the stack

Use the following aws cloudformation delete-stack command to delete the stack.

```
[ec2-user@cli-host ~]$ aws cloudformation delete-stack --stack-name myStack
[ec2-user@cli-host ~]$
```

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Task 2

Troubleshooting and working with AWS CloudFormation stacks

Step 12: Create stack

Run the aws cloudformation create-stack command again, but this time, specify that there should be no rollback on failure.

```
[ec2-user@cli-host ~]$ aws cloudformation create-stack \
> --stack-name myStack \
> --template-body file://template1.yaml \
> --capabilities CAPABILITY_NAMED_IAM \
> --on-failure DO_NOTHING \
> --parameters ParameterKey=KeyName,ParameterValue=vockey
{
    "StackId": "arn:aws:cloudformation:us-west-2:975050193060:stack/myStack/e4929d90-22ba-11ef-8d71-0277e670b3c9"
}
[ec2-user@cli-host ~]$
```

Step 13: Review stack resources status

Wait until there are no more stack resources with a status of CREATE_IN_PROGRESS. Notice that after the WaitCondition attains the status of CREATE_FAILED, the other resources keep their CREATE_COMPLETE status.

```
[ec2-user@cli-host ~]$ watch -n 5 -d \
> aws cloudformation describe-stack-resources \
> --stack-name myStack \
> --query 'StackResources[*].[ResourceType,ResourceStatus]' \
> --output table
```

```
-------------------------------------------------------------------
|                   DescribeStackResources                        |
+-----------------------------------------+-----------------------+
|  AWS::EC2::InternetGateway              |  CREATE_COMPLETE      |
|  AWS::EC2::VPC                          |  CREATE_COMPLETE      |
|  AWS::S3::Bucket                        |  CREATE_COMPLETE      |
|  AWS::EC2::Route                        |  CREATE_COMPLETE      |
|  AWS::EC2::RouteTable                   |  CREATE_COMPLETE      |
|  AWS::EC2::SubnetRouteTableAssociation  |  CREATE_COMPLETE      |
|  AWS::EC2::Subnet                       |  CREATE_COMPLETE      |
|  AWS::EC2::VPCGatewayAttachment         |  CREATE_COMPLETE      |
|  AWS::CloudFormation::WaitCondition     |  CREATE_FAILED        |
|  AWS::CloudFormation::WaitConditionHandle |  CREATE_COMPLETE    |
|  AWS::EC2::SecurityGroup                |  CREATE_COMPLETE      |
|  AWS::EC2::Instance                     |  CREATE_COMPLETE      |
+-----------------------------------------+-----------------------+
```

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Task 2

Troubleshooting and working with AWS CloudFormation stacks

Step 14: Review the stack status

Run the aws cloudformation describe-stacks command. The output should indicate that the status of the stack is now CREATE_FAILED. Significantly, however, AWS CloudFormation did not roll back the stack this time.

```
[ec2-user@cli-host ~]$ aws cloudformation describe-stacks \
> --stack-name myStack \
> --output table
```

```
-----------------------------------------------------------------------------------------------------------------------------------------------------------
|                                                                DescribeStacks                                                                           |
+---------------------------------------------------------------------------------------------------------------------------------------------------------+
||                                                                  Stacks                                                                               ||
|+-----------------------------+-------------------------------------------------------------------------------------------------------------------------+|
||  CreationTime               |  2024-06-04T21:39:16.680Z                                                                                               ||
||  Description                |  Lab template                                                                                                           ||
||  DisableRollback            |  False                                                                                                                  ||
||  EnableTerminationProtection|  False                                                                                                                  ||
||  StackId                    |  arn:aws:cloudformation:us-west-2:975050193060:stack/myStack/e4929d90-22ba-11ef-8d71-0277e670b3c9                        ||
||  StackName                  |  myStack                                                                                                                ||
||  StackStatus                |  CREATE_FAILED                                                                                                          ||
||  StackStatusReason          |  The following resource(s) failed to create: [WaitCondition].                                                           ||
|+-----------------------------+-------------------------------------------------------------------------------------------------------------------------+|
||                                                                Capabilities                                                                           ||
|+-------------------------------------------------------------------------------------------------------------------------------------------------------+|
||  CAPABILITY_NAMED_IAM                                                                                                                                 ||
|+-------------------------------------------------------------------------------------------------------------------------------------------------------+|
||                                                              DriftInformation                                                                         ||
|+-----------------------------------------------------------------------+-------------------------------------------------------------------------------+|
||  StackDriftStatus                                                     |  NOT_CHECKED                                                                  ||
|+-----------------------------------------------------------------------+-------------------------------------------------------------------------------+|
||                                                               Parameters                                                                              ||
|+----------------------+-----------------------------------------------------------------------------------+-----------------------------+|
||     ParameterKey     |                                ParameterValue                                     |       ResolvedValue         ||
|+----------------------+-----------------------------------------------------------------------------------+-----------------------------+|
||  KeyName             |  vockey                                                                           |                             ||
||  LabVpcCidr          |  10.0.0.0/20                                                                      |                             ||
||  PublicSubnetCidr    |  10.0.0.0/24                                                                      |                             ||
||  AmazonLinuxAMIID    |  /aws/service/ami-amazon-linux-latest/amzn2-ami-hvm-x86_64-gp2                    |  ami-0676a735c5f8e67c4      ||
|+----------------------+-----------------------------------------------------------------------------------+-----------------------------+|
```

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Task 2

Troubleshooting and working with AWS CloudFormation stacks

Step 15: Analyze the issue

Analyze the latest details of the CREATE_FAILED event and verify that it is the same issue as before. The output of the command should again confirm that the timeout of the WaitCondition is the issue.

```
[ec2-user@cli-host ~]$ aws cloudformation describe-stack-events \
> --stack-name myStack \
> --query "StackEvents[?ResourceStatus == 'CREATE_FAILED']"
[
    {
        "StackId": "arn:aws:cloudformation:us-west-2:975050193060:stack/myStack/e4929d90-22ba-11ef-8d71-0277e670b3c9",
        "EventId": "48dfccf0-22bb-11ef-a067-063caf1d7ccf",
        "ResourceStatus": "CREATE_FAILED",
        "ResourceType": "AWS::CloudFormation::Stack",
        "Timestamp": "2024-06-04T21:42:04.853Z",
        "ResourceStatusReason": "The following resource(s) failed to create: [WaitCondition]. ",
        "StackName": "myStack",
        "PhysicalResourceId": "arn:aws:cloudformation:us-west-2:975050193060:stack/myStack/e4929d90-22ba-11ef-8d71-0277e670b3c9",
        "LogicalResourceId": "myStack"
    },
    {
        "StackId": "arn:aws:cloudformation:us-west-2:975050193060:stack/myStack/e4929d90-22ba-11ef-8d71-0277e670b3c9",
        "EventId": "WaitCondition-CREATE_FAILED-2024-06-04T21:42:04.480Z",
        "ResourceStatus": "CREATE_FAILED",
        "ResourceType": "AWS::CloudFormation::WaitCondition",
        "Timestamp": "2024-06-04T21:42:04.480Z",
        "ResourceStatusReason": "WaitCondition timed out. Received 0 conditions when expecting 1",
        "StackName": "myStack",
        "ResourceProperties": "{\"Timeout\":\"60\",\"Handle\":\"https://cloudformation-waitcondition-us-west-2.s3-us-west-2.amazon
aws.com/arn%3Aaws%3Acloudformation%3Aus-west-2%3A975050193060%3Astack/myStack/e4929d90-22ba-11ef-8d71-0277e670b3c9/e4947250-22ba-1
1ef-8d71-0277e670b3c9/WaitHandle?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Date=20240604T213919Z&X-Amz-SignedHeaders=host&X-Amz-Expir
es=86399&X-Amz-Credential=AKIAJBJSWSW6NLR67N6A%2F20240604%2Fus-west-2%2Fs3%2Faws4_request&X-Amz-Signature=d60e5e288f30f80e105e286d
b09d0f0e8040c648dd3e961400cfbb69af504230\"}",
        "PhysicalResourceId": "arn:aws:cloudformation:us-west-2:975050193060:stack/myStack/e4929d90-22ba-11ef-8d71-0277e670b3c9/e4
947250-22ba-11ef-8d71-0277e670b3c9/WaitHandle",
        "LogicalResourceId": "WaitCondition"
    }
]
[ec2-user@cli-host ~]$
```

Task 2

Troubleshooting and working with AWS CloudFormation stacks

Step 16: Get the Web Server IP

Run an aws ec2 describe-instances command to get the public IP address of the **Web Server** EC2 instance that was created by the stack.

```
[ec2-user@cli-host ~]$ aws ec2 describe-instances \
> --filters "Name=tag:Name,Values='Web Server'" \
> --query 'Reservations[].Instances[].[State.Name,PublicIpAddress]'
[
    [
        "running",
        "52.43.28.248"
    ],
    [
        "terminated",
        null
    ]
]
[ec2-user@cli-host ~]$
```

Step 17: Connect to the Web Server instance

Connect to the **Web Server** instance using SSH.

```
support@HP-Pavilion-Laptop:~/Downloads$ ssh -i labsuser.pem ec2-user@52.43.28.248
   ,     #_
   ~\_  ####_        Amazon Linux 2
  ~~  \_#####\
  ~~     \###|       AL2 End of Life is 2025-06-30.
  ~~       \#/ ___
   ~~       V~' '->
    ~~~         /    A newer version of Amazon Linux is available!
      ~~._.   _/
         _/ _/       Amazon Linux 2023, GA and supported until 2028-03-15.
       _/m/'           https://aws.amazon.com/linux/amazon-linux-2023/

[ec2-user@web-server ~]$
```

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Task 2

Troubleshooting and working with AWS CloudFormation stacks

Step 18: Analyze the log file

Analyze the **cloud-init-output.log** file. Notice the line in the log that states: No package http available. Also, notice the message: util.py[WARNING]: Failed running /var/lib/cloud/instance/scripts/part-001.

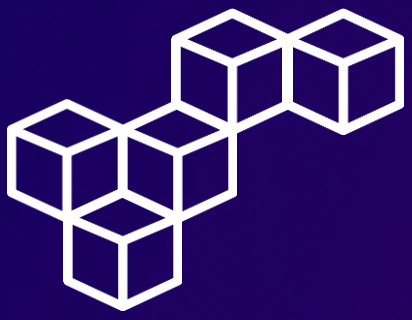
```
[ec2-user@web-server ~]$ sudo tail -6 /var/log/cloud-init-output.log
No package http available.
Error: Nothing to do
Jun 04 21:40:09 cloud-init[2326]: util.py[WARNING]: Failed running /var/lib/cloud/instance/scripts/part-001 [1]
Jun 04 21:40:09 cloud-init[2326]: cc_scripts_user.py[WARNING]: Failed to run module scripts-user (scripts in /var
/lib/cloud/instance/scripts)
Jun 04 21:40:09 cloud-init[2326]: util.py[WARNING]: Running module scripts-user (<module 'cloudinit.config.cc_scr
ipts_user' from '/usr/lib/python2.7/site-packages/cloudinit/config/cc_scripts_user.pyc'>) failed
Cloud-init v. 19.3-46.amzn2.0.2 finished at Tue, 04 Jun 2024 21:40:09 +0000. Datasource DataSourceEc2.  Up 25.96
seconds
[ec2-user@web-server ~]$
```

Step 19: Analyze the script

Analyze the **part-001** script. In summary, because no package named http could be found, the userdata script failed. Close the terminal window for the **Web Server** instance.

```
[ec2-user@web-server ~]$ sudo cat /var/lib/cloud/instance/scripts/part-001
#!/bin/bash -ex
hostnamectl set-hostname Web-Server
yum install -y http
echo '<html><h1>Hello from your web server!</h1></html>' > /var/www/html/index.html
systemctl enable httpd
systemctl start httpd
/opt/aws/bin/cfn-signal -s true 'https://cloudformation-waitcondition-us-west-2.s3-us-west-2.amazonaws.com/arn%3A
aws%3Acloudformation%3Aus-west-2%3A975050193060%3Astack/myStack/e4929d90-22ba-11ef-8d71-0277e670b3c9/e4947250-22b
a-11ef-8d71-0277e670b3c9/WaitHandle?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Date=20240604T213919Z&X-Amz-SignedHead
ers=host&X-Amz-Expires=86399&X-Amz-Credential=AKIAJBJSWSW6NLR67N6A%2F20240604%2Fus-west-2%2Fs3%2Faws4_request&X-A
mz-Signature=d60e5e288f30f80e105e286db09d0f0e8040c648dd3e961400cfbb69af504230'
[ec2-user@web-server ~]$
```

aws re/start



Task 2

Troubleshooting and working with AWS CloudFormation stacks

Step 20: Fix the issue

Update the AWS CloudFormation template. In the UserData section of the EC2 resource, change http to httpd. Confirm that the file was updated.

```
[ec2-user@cli-host ~]$ vim template1.yaml
```

```
    UserData:
      Fn::Base64: !Sub |
        #!/bin/bash -ex
        hostnamectl set-hostname Web-Server
        yum install -y httpd
        echo '<html><h1>Hello from your web server!</h1></html>' > /var/www/html/index.html
        systemctl enable httpd
        systemctl start httpd
        /opt/aws/bin/cfn-signal -s true '${WaitHandle}'
```

```
[ec2-user@cli-host ~]$ cat template1.yaml | grep httpd
         yum install -y httpd
         systemctl enable httpd
         systemctl start httpd
[ec2-user@cli-host ~]$
```

Step 21: Delete the failed stack

Use the following aws cloudformation delete-stack command to delete the failed stack.

```
[ec2-user@cli-host ~]$ aws cloudformation delete-stack --stack-name myStack
[ec2-user@cli-host ~]$
```

aws re/start

Task 2

Troubleshooting and working with AWS CloudFormation stacks

Step 22: Review the stack status

Run the aws cloudformation describe-stacks command. The output will indicate a StackStatus of DELETE_IN_PROGRESS, and then change to indicate that the stack does not exist.

```
[ec2-user@cli-host ~]$ watch -n 5 -d \
> aws cloudformation describe-stacks \
> --stack-name myStack \
> --output table
```

```
-----------------------------------------------------------------------------------------------------------------------------------
|                                                      DescribeStacks                                                             |
+---------------------------------------------------------------------------------------------------------------------------------+
||                                                        Stacks                                                                 ||
|+-----------------------------+---------------------------------------------------------------------------------------------------+|
||  CreationTime               |  2024-06-04T21:39:16.680Z                                                                         ||
||  DeletionTime               |  2024-06-04T21:54:56.835Z                                                                         ||
||  Description                |  Lab template                                                                                     ||
||  DisableRollback            |  False                                                                                            ||
||  EnableTerminationProtection|  False                                                                                            ||
||  StackId                    |  arn:aws:cloudformation:us-west-2:975050193060:stack/myStack/e4929d90-22ba-11ef-8d71-0277e670b3c9  ||
||  StackName                  |  myStack                                                                                          ||
||  StackStatus                |  DELETE_IN_PROGRESS                                                                               ||
|+-----------------------------+---------------------------------------------------------------------------------------------------+|
|||                                                    Capabilities                                                               |||
||+-----------------------------------------------------------------------------------------------------------------------------+||
|||  CAPABILITY_NAMED_IAM                                                                                                       |||
||+-----------------------------------------------------------------------------------------------------------------------------+||
|||                                                  DriftInformation                                                           |||
||+-----------------------------------------------------------------------+-----------------------------------------------------+||
|||  StackDriftStatus                                                     |  NOT_CHECKED                                        |||
||+-----------------------------------------------------------------------+-----------------------------------------------------+||
|||                                                   Parameters                                                                |||
||+----------------------+-------------------------------------------------------------------------+-----------------------------+||
|||     ParameterKey     |                              ParameterValue                             |       ResolvedValue         |||
||+----------------------+-------------------------------------------------------------------------+-----------------------------+||
|||  KeyName             |  vockey                                                                 |                             |||
|||  LabVpcCidr          |  10.0.0.0/20                                                            |                             |||
|||  PublicSubnetCidr    |  10.0.0.0/24                                                            |                             |||
|||  AmazonLinuxAMIID    |  /aws/service/ami-amazon-linux-latest/amzn2-ami-hvm-x86_64-gp2          |  ami-0676a735c5f8e67c4      |||
||+----------------------+-------------------------------------------------------------------------+-----------------------------+||
```

```
Every 5.0s: aws cloudformation describe-stacks --stack-name myStack --output table


An error occurred (ValidationError) when calling the DescribeStacks operation: Stack with id myStack does not exist
```

aws re/start

Task 2

Troubleshooting and working with AWS CloudFormation stacks

Step 23: Create stack

Now that you resolved the issue in the template, run the aws cloudformation create-stack command again.

```
[ec2-user@cli-host ~]$ aws cloudformation create-stack \
> --stack-name myStack \
> --template-body file://template1.yaml \
> --capabilities CAPABILITY_NAMED_IAM \
> --on-failure DO_NOTHING \
> --parameters ParameterKey=KeyName,ParameterValue=vockey
{
    "StackId": "arn:aws:cloudformation:us-west-2:975050193060:stack/myStack/48d90440-22bd-11ef-af52-0aa6190efe71"
}
[ec2-user@cli-host ~]$
```

Step 24: Review stack resources status

Run the aws cloudformation describe-stack-resources command again, and wait until all resources are created.

```
[ec2-user@cli-host ~]$ watch -n 5 -d \
> aws cloudformation describe-stack-resources \
> --stack-name myStack \
> --query 'StackResources[*].[ResourceType,ResourceStatus]' \
> --output table
```

```
-------------------------------------------------------------------
|                    DescribeStackResources                       |
+-----------------------------------------+-----------------------+
|  AWS::EC2::InternetGateway              |  CREATE_COMPLETE      |
|  AWS::EC2::VPC                          |  CREATE_COMPLETE      |
|  AWS::S3::Bucket                        |  CREATE_COMPLETE      |
|  AWS::EC2::Route                        |  CREATE_COMPLETE      |
|  AWS::EC2::RouteTable                   |  CREATE_COMPLETE      |
|  AWS::EC2::SubnetRouteTableAssociation  |  CREATE_COMPLETE      |
|  AWS::EC2::Subnet                       |  CREATE_COMPLETE      |
|  AWS::EC2::VPCGatewayAttachment         |  CREATE_COMPLETE      |
|  AWS::CloudFormation::WaitCondition     |  CREATE_COMPLETE      |
|  AWS::CloudFormation::WaitConditionHandle |  CREATE_COMPLETE    |
|  AWS::EC2::SecurityGroup                |  CREATE_COMPLETE      |
|  AWS::EC2::Instance                     |  CREATE_COMPLETE      |
+-----------------------------------------+-----------------------+
```

aws re/start

Task 2

Troubleshooting and working with AWS CloudFormation stacks

Step 25: Review the stack status

Run the aws cloudformation describe-stacks command. This time, your stack should be created successfully (without errors), and it should have a StackStatus of CREATE_COMPLETE.

```
[ec2-user@cli-host ~]$ aws cloudformation describe-stacks \
> --stack-name myStack \
> --output table
```

```
-----------------------------------------------------------------------------------------------------------------------------------------------
|                                                                DescribeStacks                                                               |
+---------------------------------------------------------------------------------------------------------------------------------------------+
||                                                                  Stacks                                                                   ||
|+----------------------------+--------------------------------------------------------------------------------------------------------------+|
||  CreationTime              |  2024-06-04T21:56:23.908Z                                                                                    ||
||  Description               |  Lab template                                                                                                ||
||  DisableRollback           |  False                                                                                                       ||
||  EnableTerminationProtection|  False                                                                                                      ||
||  StackId                   |  arn:aws:cloudformation:us-west-2:975050193060:stack/myStack/48d90440-22bd-11ef-af52-0aa6190efe71            ||
||  StackName                 |  myStack                                                                                                     ||
||  StackStatus               |  CREATE_COMPLETE                                                                                             ||
|+----------------------------+--------------------------------------------------------------------------------------------------------------+|
||                                                                Capabilities                                                               ||
|+-------------------------------------------------------------------------------------------------------------------------------------------+||
||  CAPABILITY_NAMED_IAM                                                                                                                     ||
|+-------------------------------------------------------------------------------------------------------------------------------------------+||
||                                                             DriftInformation                                                              ||
|+-------------------------------------------------------------------------+-----------------------------------------------------------------+||
||  StackDriftStatus                                                       |  NOT_CHECKED                                                    ||
|+-------------------------------------------------------------------------+-----------------------------------------------------------------+||
||                                                                 Outputs                                                                   ||
|+-----------------------------------+-------------------------------------------------------------------------------------------------------+||
||            OutputKey              |                                        OutputValue                                                    ||
|+-----------------------------------+-------------------------------------------------------------------------------------------------------+||
||  BucketName                       |  mystack-mybucket-khgawu9nxgra                                                                        ||
||  PublicIP                         |  54.213.148.141                                                                                       ||
|+-----------------------------------+-------------------------------------------------------------------------------------------------------+||
||                                                                Parameters                                                                 ||
|+---------------------+-----------------------------------------------------------------------------+-----------------------------+|||
||     ParameterKey     |                                ParameterValue                               |       ResolvedValue         |||
|+---------------------+-----------------------------------------------------------------------------+-----------------------------+|||
||  KeyName             |  vockey                                                                     |                             |||
||  LabVpcCidr          |  10.0.0.0/20                                                                |                             |||
||  PublicSubnetCidr    |  10.0.0.0/24                                                                |                             |||
||  AmazonLinuxAMIID    |  /aws/service/ami-amazon-linux-latest/amzn2-ami-hvm-x86_64-gp2              |  ami-0676a735c5f8e67c4      |||
|+---------------------+-----------------------------------------------------------------------------+-----------------------------+|||
```

aws re/start

Task 2

Troubleshooting and working with AWS CloudFormation stacks

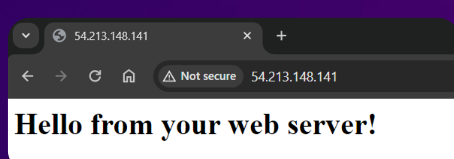
Step 26: Review the Outputs section

Also notice that the Outputs section includes the PublicIP address of the web server and the name of the S3 bucket that was created.

```
+------------------------------------------------------------------------------+
|                                   Outputs                                    |
+----------------------------+-------------------------------------------------+
|         OutputKey          |                   OutputValue                   |
+----------------------------+-------------------------------------------------+
|  BucketName                |  mystack-mybucket-khgawu9nxgra                  |
|  PublicIP                  |  54.213.148.141                                 |
+----------------------------+-------------------------------------------------+
```

Step 27: Test the web server

Test the web server by accessing the public IP address from the output of the previous command. A message should display.

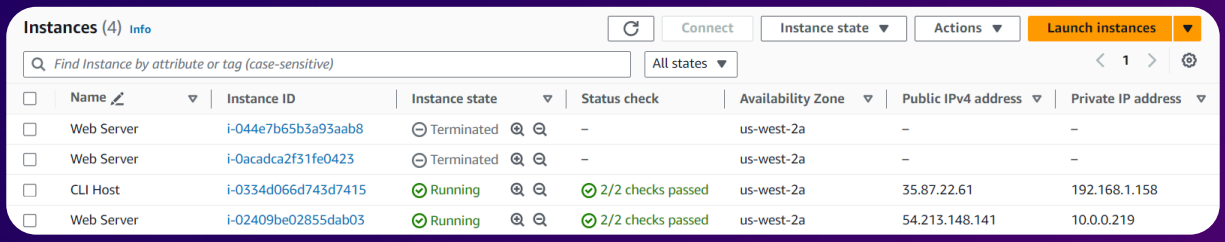


Task 3

Make manual modifications and detect drift

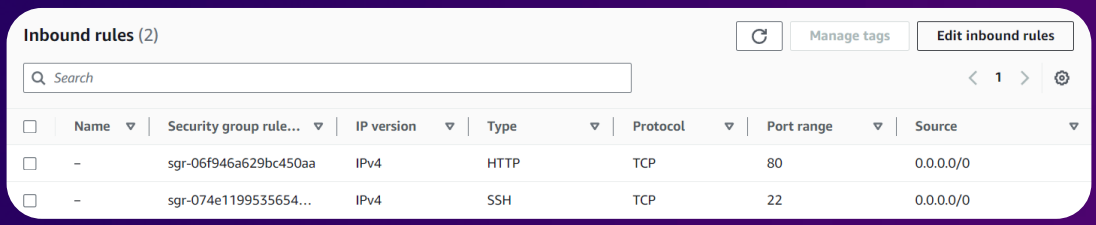
Step 1: Review EC2 Instances

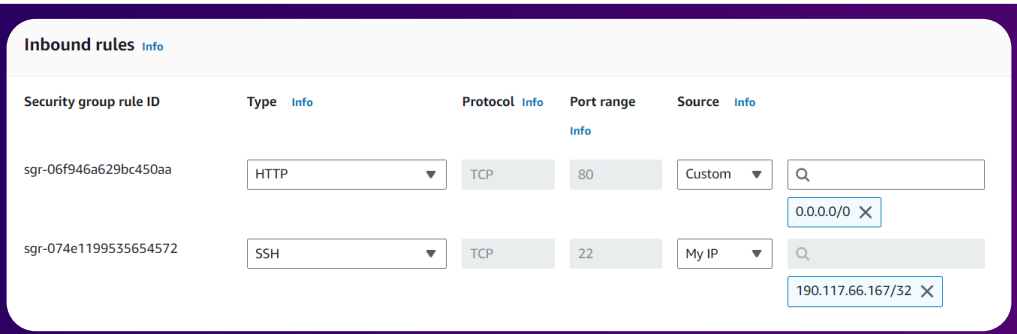
In the EC2 Management Console, navigate to the **Instances** section, and select the running **Web Server** instance.



Step 2: Modify the security groups

Select the associated **WebServerSG** security group, and edit the inbound rules to allow SSH traffic only from your IP.





aws re/start

Task 3

Make manual modifications and detect drift

Step 3: Query the bucket name

Query the bucket name and assign it to a variable named **bucketName** by running the following aws cloudformation describe-stacks command.

```
[ec2-user@cli-host ~]$ bucketName=$(\
> aws cloudformation describe-stacks \
> --stack-name myStack \
> --query "Stacks[*].Outputs[?OutputKey \
> == 'BucketName'].[OutputValue]" \
> --output text)
[ec2-user@cli-host ~]$ echo "bucketName = "$bucketName
bucketName = mystack-mybucket-qli2axrsdgmg
[ec2-user@cli-host ~]$
```

Step 4: Add an object to the S3 bucket

Add an empty object to the S3 bucket by running the following commands.

```
[ec2-user@cli-host ~]$ touch myfile
[ec2-user@cli-host ~]$ aws s3 cp myfile s3://$bucketName/
upload: ./myfile to s3://mystack-mybucket-qli2axrsdgmg/myfile
[ec2-user@cli-host ~]$ aws s3 ls $bucketName/
2024-06-04 22:46:58          0 myfile
[ec2-user@cli-host ~]$
```

Task 3

Make manual modifications and detect drift

Step 5: Start drift detection

To start drift detection on your stack, run the following aws cloudformation detect-stack-drift command. The command should return a StackDriftDetectionId.

```
[ec2-user@cli-host ~]$ aws cloudformation detect-stack-drift --stack-name myStack
{
    "StackDriftDetectionId": "bf4119a0-22be-11ef-9f1f-0aaaf00a9189"
}
[ec2-user@cli-host ~]$
```

Step 6: Monitor drift detection status

Monitor the status of the drift detection by running the following aws cloudformation describe-stack-drift-detection-status command. Notice that the output shows "StackDriftStatus": "DRIFTED“.

```
[ec2-user@cli-host ~]$ aws cloudformation describe-stack-drift-detection-status \
> --stack-drift-detection-id bf4119a0-22be-11ef-9f1f-0aaaf00a9189
{
    "StackId": "arn:aws:cloudformation:us-west-2:975050193060:stack/myStack/48d90440-22bd-11ef-af52-0aa6190efe71",
    "StackDriftDetectionId": "bf4119a0-22be-11ef-9f1f-0aaaf00a9189",
    "StackDriftStatus": "DRIFTED",
    "Timestamp": "2024-06-04T22:06:51.962Z",
    "DetectionStatus": "DETECTION_COMPLETE",
    "DriftedStackResourceCount": 1
}
[ec2-user@cli-host ~]$
```

Task 3

Make manual modifications and detect drift

Step 7: Describe the drifted resources

Describe the resources that drifted by running the following aws cloudformation describe-stack-resource-drifts command.

```
[ec2-user@cli-host ~]$ aws cloudformation describe-stack-resource-drifts \
> --stack-name myStack
{
    "StackResourceDrifts": [
        {
            "StackId": "arn:aws:cloudformation:us-west-2:975050193060:stack/myStack/48d90440-22bd-11ef-af52-0aa6190efe71",
            "ActualProperties": "{\"Tags\":[{\"Key\":\"Name\",\"Value\":\"Lab IGW\"}]}",
            "ResourceType": "AWS::EC2::InternetGateway",
            "Timestamp": "2024-06-04T22:06:52.814Z",
            "PhysicalResourceId": "igw-07e6b52db103156b7",
            "StackResourceDriftStatus": "IN_SYNC",
            "ExpectedProperties": "{\"Tags\":[{\"Value\":\"Lab IGW\",\"Key\":\"Name\"}]}",
            "PropertyDifferences": [],
            "LogicalResourceId": "IGW"
        },
        {
```

Step 8: Review resources drift status

Run an aws ec2 cloudformation describe-stack-resources command with a --query parameter that will return only the resource type, resource status, and drift status.

```
[ec2-user@cli-host ~]$ aws cloudformation describe-stack-resources \
> --stack-name myStack \
> --query 'StackResources[*].[ResourceType,ResourceStatus,DriftInformation.StackResourceDriftStatus]' \
> --output table
-------------------------------------------------------------------------------
|                          DescribeStackResources                             |
+-----------------------------------------+-----------------+---------------+
|  AWS::EC2::InternetGateway              |  CREATE_COMPLETE |  IN_SYNC      |
|  AWS::EC2::VPC                          |  CREATE_COMPLETE |  IN_SYNC      |
|  AWS::S3::Bucket                        |  CREATE_COMPLETE |  IN_SYNC      |
|  AWS::EC2::Route                        |  CREATE_COMPLETE |  IN_SYNC      |
|  AWS::EC2::RouteTable                   |  CREATE_COMPLETE |  IN_SYNC      |
|  AWS::EC2::SubnetRouteTableAssociation  |  CREATE_COMPLETE |  NOT_CHECKED  |
|  AWS::EC2::Subnet                       |  CREATE_COMPLETE |  IN_SYNC      |
|  AWS::EC2::VPCGatewayAttachment         |  CREATE_COMPLETE |  NOT_CHECKED  |
|  AWS::CloudFormation::WaitCondition     |  CREATE_COMPLETE |  NOT_CHECKED  |
|  AWS::CloudFormation::WaitConditionHandle |  CREATE_COMPLETE |  NOT_CHECKED  |
|  AWS::EC2::SecurityGroup                |  CREATE_COMPLETE |  MODIFIED     |
|  AWS::EC2::Instance                     |  CREATE_COMPLETE |  IN_SYNC      |
+-----------------------------------------+-----------------+---------------+
[ec2-user@cli-host ~]$
```

Task 3

Make manual modifications and detect drift

Step 9: Retrieve the drifted resource details

Retrieve the specific details of the drift for the resource that has a StackResourceDriftStatus of MODIFIED.

```
[ec2-user@cli-host ~]$ aws cloudformation describe-stack-resource-drifts \
> --stack-name myStack \
> --stack-resource-drift-status-filters MODIFIED
{
    "StackResourceDrifts": [
        {
            "StackId": "arn:aws:cloudformation:us-west-2:975050193060:stack/myStack/48d90440-22bd-11ef-af52-0aa6190efe71",
            "ActualProperties": "{\"GroupDescription\":\"Enable access to web server\",\"GroupName\":\"WebServerSG\",\"SecurityGroupIngress\":[{
\"CidrIp\":\"190.117.66.167/32\",\"FromPort\":22,\"IpProtocol\":\"tcp\",\"ToPort\":22},{\"CidrIp\":\"0.0.0.0/0\",\"FromPort\":80,\"IpProtocol\":
\"tcp\",\"ToPort\":80}],\"Tags\":[{\"Key\":\"Name\",\"Value\":\"WebServerSG\"}],\"VpcId\":\"vpc-07854778602c647f7\"}",
            "ResourceType": "AWS::EC2::SecurityGroup",
            "Timestamp": "2024-06-04T22:06:55.410Z",
            "PhysicalResourceId": "sg-00f634aecc98dfdd3",
            "StackResourceDriftStatus": "MODIFIED",
            "ExpectedProperties": "{\"GroupDescription\":\"Enable access to web server\",\"GroupName\":\"WebServerSG\",\"SecurityGroupIngress\":
[{\"CidrIp\":\"0.0.0.0/0\",\"FromPort\":22,\"IpProtocol\":\"tcp\",\"ToPort\":22},{\"CidrIp\":\"0.0.0.0/0\",\"FromPort\":80,\"IpProtocol\":\"tcp\
",\"ToPort\":80}],\"Tags\":[{\"Key\":\"Name\",\"Value\":\"WebServerSG\"}],\"VpcId\":\"vpc-07854778602c647f7\"}",
            "PropertyDifferences": [
                {
                    "PropertyPath": "/SecurityGroupIngress/0/CidrIp",
                    "ActualValue": "190.117.66.167/32",
                    "ExpectedValue": "0.0.0.0/0",
                    "DifferenceType": "NOT_EQUAL"
                }
            ],
            "LogicalResourceId": "WebSecurityGroup"
        }
    ]
}
[ec2-user@cli-host ~]$
```

Step 10: Try updating the stack

Try updating the stack. The output indicates that an error occurred. The aws cloudformation update-stack command will not automatically resolve drift, though drift has occurred.

```
[ec2-user@cli-host ~]$ aws cloudformation update-stack \
> --stack-name myStack \
> --template-body file://template1.yaml \
> --parameters ParameterKey=KeyName,ParameterValue=vockey

An error occurred (ValidationError) when calling the UpdateStack operation: No updates are to be performed.
[ec2-user@cli-host ~]$
```

Task 4

Attempt to delete the stack

Step 1: Try deleting the stack

Try deleting the stack by running the following aws cloudformation delete-stack command.

```
[ec2-user@cli-host ~]$ aws cloudformation delete-stack --stack-name myStack
[ec2-user@cli-host ~]$
```

Step 2: Review stack resources status

Observe the results by running the aws cloudformation describe-stack-resources command. Notice that most of the resources are successfully deleted. However, there is one resource that fails to delete. It is the S3 bucket.

```
[ec2-user@cli-host ~]$ watch -n 5 -d \
> aws cloudformation describe-stack-resources \
> --stack-name myStack \
> --query 'StackResources[*].[ResourceType,ResourceStatus]' \
> --output table
```

```
-------------------------------------------------------------------
|                    DescribeStackResources                       |
+-----------------------------------------+-------------------+
|  AWS::EC2::InternetGateway              |  DELETE_COMPLETE  |
|  AWS::EC2::VPC                          |  DELETE_COMPLETE  |
|  AWS::S3::Bucket                        |  DELETE_FAILED    |
|  AWS::EC2::Route                        |  DELETE_COMPLETE  |
|  AWS::EC2::RouteTable                   |  DELETE_COMPLETE  |
|  AWS::EC2::SubnetRouteTableAssociation  |  DELETE_COMPLETE  |
|  AWS::EC2::Subnet                       |  DELETE_COMPLETE  |
|  AWS::EC2::VPCGatewayAttachment         |  DELETE_COMPLETE  |
|  AWS::CloudFormation::WaitCondition     |  DELETE_COMPLETE  |
|  AWS::CloudFormation::WaitConditionHandle |  DELETE_COMPLETE  |
|  AWS::EC2::SecurityGroup                |  DELETE_COMPLETE  |
|  AWS::EC2::Instance                     |  DELETE_COMPLETE  |
+-----------------------------------------+-------------------+
```

Task 4

Attempt to delete the stack

Step 3: Review the stack status

Run the aws cloudformation describe-stacks command to see the stack status. The StackStatus shows a DELETE_FAILED status. The StackStatusReason shows The following resource(s) failed to delete: [MyBucket]. CloudFormation will not delete a bucket that has objects in it. This is to help guard against accidental data loss.

```
[ec2-user@cli-host ~]$ aws cloudformation describe-stacks \
> --stack-name myStack \
> --output table
```

```
-------------------------------------------------------------------------------------------------------------------------------------------------
|                                                                DescribeStacks                                                                 |
+-----------------------------------------------------------------------------------------------------------------------------------------------+
||                                                                  Stacks                                                                     ||
|+-----------------------------+---------------------------------------------------------------------------------------------------------------+|
||  CreationTime               |  2024-06-04T21:56:23.908Z                                                                                     ||
||  DeletionTime               |  2024-06-04T22:10:15.770Z                                                                                     ||
||  Description                |  Lab template                                                                                                 ||
||  DisableRollback            |  False                                                                                                        ||
||  EnableTerminationProtection|  False                                                                                                        ||
||  StackId                    |  arn:aws:cloudformation:us-west-2:975050193060:stack/myStack/48d90440-22bd-11ef-af52-0aa6190efe71             ||
||  StackName                  |  myStack                                                                                                      ||
||  StackStatus                |  DELETE_FAILED                                                                                                ||
||  StackStatusReason          |  The following resource(s) failed to delete: [MyBucket].                                                      ||
|+-----------------------------+---------------------------------------------------------------------------------------------------------------+|
||                                                               Capabilities                                                                  ||
|+-------------------------------------------------------------------------------------------------------------------------------------------+|
||  CAPABILITY_NAMED_IAM                                                                                                                         ||
|+-------------------------------------------------------------------------------------------------------------------------------------------+|
||                                                             DriftInformation                                                                ||
|+-------------------------------------------------------+-----------------------------------------------------------------------------------+|
||  LastCheckTimestamp                                   |  2024-06-04T22:06:52.300Z                                                         ||
||  StackDriftStatus                                     |  DRIFTED                                                                          ||
|+-------------------------------------------------------+-----------------------------------------------------------------------------------+|
||                                                                 Outputs                                                                     ||
|+-----------------------------------+-------------------------------------------------------------------------------------------------------+|
||            OutputKey              |                                          OutputValue                                                  ||
|+-----------------------------------+-------------------------------------------------------------------------------------------------------+|
||  BucketName                       |  mystack-mybucket-khgawu9nxgra                                                                        ||
||  PublicIP                         |  54.213.148.141                                                                                       ||
|+-----------------------------------+-------------------------------------------------------------------------------------------------------+|
||                                                               Parameters                                                                    ||
|+---------------------+-----------------------------------------------------------------------------------+-------------------------+|
||     ParameterKey     |                                      ParameterValue                               |       ResolvedValue     ||
|+---------------------+-----------------------------------------------------------------------------------+-------------------------+|
||  KeyName             |  vockey                                                                           |                         ||
||  LabVpcCidr          |  10.0.0.0/20                                                                      |                         ||
||  PublicSubnetCidr    |  10.0.0.0/24                                                                      |                         ||
||  AmazonLinuxAMIID    |  /aws/service/ami-amazon-linux-latest/amzn2-ami-hvm-x86_64-gp2                    |  ami-0676a735c5f8e67c4  ||
|+---------------------+-----------------------------------------------------------------------------------+-------------------------+|
```

aws re/start

Task 5

Challenge: Keep the file in the S3 bucket, but Still Delete the Stack

Step 1: Get the bucket logical resource ID

Query the bucket logical resource ID, assign it to a variable named **bucketLogicalID** by running the following aws cloudformation describe-stack-resources command.

```
[ec2-user@cli-host ~]$ bucketLogicalID=$(aws cloudformation describe-stack-resources \
> --stack-name myStack \
> --query "StackResources[?ResourceType == 'AWS::S3::Bucket'].LogicalResourceId" \
> --output text)
[ec2-user@cli-host ~]$ echo "bucketLogicalID = "$bucketLogicalID
bucketLogicalID = MyBucket
[ec2-user@cli-host ~]$
```

Step 2: Delete the stack

Run the following aws cloudformation delete-stack command using the --retain-resources parameter to retain the S3 bucket, ensuring the stack can be successfully deleted.

```
[ec2-user@cli-host ~]$ aws cloudformation delete-stack \
> --stack-name myStack \
> --retain-resources $bucketLogicalID
[ec2-user@cli-host ~]$
```

Task 5

Challenge: Keep the file in the S3 bucket, but Still Delete the Stack

Step 3: Review stack deletion

Run the following aws cloudformation describe-stacks command to verify that the stack was successfully deleted.

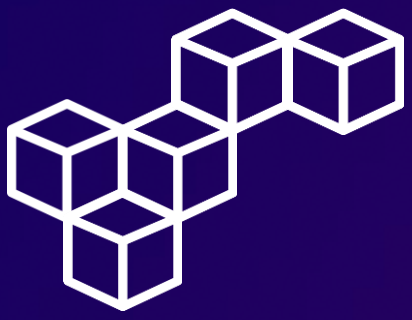
```
[ec2-user@cli-host ~]$ aws cloudformation describe-stacks \
> --stack-name myStack \
> --output table

An error occurred (ValidationError) when calling the DescribeStacks operation: Stack with id myStack does not exist
[ec2-user@cli-host ~]$
```

Step 4: Review bucket retention

Run the following aws s3 ls command to verify that the S3 bucket and its contents were not deleted.

```
[ec2-user@cli-host ~]$ aws s3 ls $bucketName/
2024-06-04 22:46:58          0 myfile
[ec2-user@cli-host ~]$
```

aws re/start



Conclusions

aws cloudformation create-stack
The cloudformation create-stack command enables automated provisioning of AWS resources based on defined CloudFormation templates, ensuring consistent infrastructure deployment.

aws cloudformation describe-stacks
The cloudformation describe-stacks command provides detailed information about the status and configuration of CloudFormation stacks, aiding in monitoring and management.

aws cloudformation detect-stack-drift
The cloudformation detect-stack-drift command identifies differences between stack resources and their expected configurations, helping maintain infrastructure consistency.

aws cloudformation update-stack
The cloudformation update-stack command allows for modifying existing CloudFormation stacks to accommodate infrastructure changes without needing to recreate resources.

aws cloudformation delete-stack
The cloudformation delete-stack command facilitates the removal of CloudFormation stacks and their associated resources, streamlining resource management and cost control.

aws re/start

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