Activity 7

The process involves deploying, updating, and deleting an AWS CloudFormation stack using the AWS CLI. First, use the aws cloudformation deploy command to create the stack, specifying the stack name, template file, and parameter overrides (e.g., subnet ID). Once created, verify the stack status (CREATE_COMPLETE) and resources using the describe-stacks and describe-stack-resources commands. To update the stack, modify the template, then redeploy using the same deploy command. Finally, delete the stack with delete-stack and confirm deletion using the wait and describe-stacks commands. The end goal is to manage infrastructure as code efficiently.

What we have in the Activity:

1. Infrastructure as Code (IaC):

- Automate the creation, update, and management of AWS resources using templates written in JSON or YAML.

2. Template-Driven Automation:

- Define resources and dependencies declaratively, ensuring consistent and repeatable deployments.

3. Resource Management:

- Manage a wide range of AWS services, including EC2, S3, RDS, Lambda, and more, as well as third-party resources.

4. Stack Management:

- Group resources into stacks for easier deployment, updating, and deletion in a single operation.

5. Change Sets:

- Preview changes before applying updates to stacks, minimizing risks and ensuring transparency.

Activity

1. Find the template files in our GitHub repository under the same name as the heading for easy access and edits. Find and Save the attached template locally, open it in VS Code for edits.
2. Navigate to the folder containing the activity template.

3. Use aws cloudformation deploy with the --stack-name option to name your stack. Specify the template file using the --template-file option with the file path. Provide required parameters using --parameter-overrides with the parameter name and value (e.g., subnet ID). Press Enter to execute the deployment and wait for the stack creation to complete.

```
PS C:\Users\Ishika> aws cloudformation deploy --stack-name Solution7Stacks --template
-file "C:\internship\Section 7\section-7-activity-template-final\section-7-activity-t
emplate.yaml" --parameter-overrides WebServerSubnet=subnet-0a1bbb2feaa84bb95

Waiting for changeset to be created..
Waiting for stack create/update to complete
Successfully created/updated stack - Solution7Stacks
```

4. Check stack status with aws cloudformation describe-stacks using --stack-name.


```
PS C:\Users\Ishika> aws cloudformation describe-stacks --stack-name Solution7Stacks
{
    "Stacks": [
        {
            "StackId": "arn:aws:cloudformation:eu-west-1:878893308172:stack/Solution7
Stacks/e744ae00-b6d2-11ef-9f3b-0a175ebbed7f",
            "StackName": "Solution7Stacks",
            "ChangeSetId": "arn:aws:cloudformation:eu-west-1:878893308172:changeSet/a
wscli-cloudformation-package-deploy-1733820240/4ddf583d-f501-487c-8927-00f86012a7bb",
            "Description": "Section 7 Activity template.  This template creates an EC
2 instance and an EBS volume attached to it.",
            "Parameters": [
                {
                    "ParameterKey": "WebServerSubnet",
                    "ParameterValue": "subnet-0a1bbb2feaa84bb95"
                }
            ],
            "CreationTime": "2024-12-10T08:44:01.194000+00:00",
            "LastUpdatedTime": "2024-12-10T08:44:07.906000+00:00",
```


5. View stack resources using aws cloudformation describe-stack-resources with --stack-name.


```
PS C:\Users\Ishika> aws cloudformation describe-stack-resources --stack-name Solution
7Stacks
{
    "StackResources": [
        {
            "StackName": "Solution7Stacks",
            "StackId": "arn:aws:cloudformation:eu-west-1:878893308172:stack/Solution7
Stacks/e744ae00-b6d2-11ef-9f3b-0a175ebbed7f",
            "LogicalResourceId": "EbsVolume",
            "PhysicalResourceId": "vol-0df19e9193b4e5fd0",
            "ResourceType": "AWS::EC2::Volume",
            "Timestamp": "2024-12-10T08:44:31.188000+00:00",
            "ResourceStatus": "CREATE_COMPLETE",
            "DriftInformation": {
                "StackResourceDriftStatus": "NOT_CHECKED"
            }
        },
        {
            "StackName": "Solution7Stacks",
            "StackId": "arn:aws:cloudformation:eu-west-1:878893308172:stack/Solution7
Stacks/e744ae00-b6d2-11ef-9f3b-0a175ebbed7f",
            "LogicalResourceId": "WebServerInstance",
            "PhysicalResourceId": "i-0a90f234dd246540d",
            "ResourceType": "AWS::EC2::Instance",
            "Timestamp": "2024-12-10T08:44:23.026000+00:00",
            "ResourceStatus": "CREATE_COMPLETE",
            "DriftInformation": {
                "StackResourceDriftStatus": "NOT_CHECKED"
            }
```

6. Update the template by modifying or commenting out resources (e.g., VolumeAttachment). Save the updated template and redeploy using the same deploy command.

```
41
42    #  VolumeAttachment:
43    #    Type: AWS::EC2::VolumeAttachment
44    #    Properties:
45    #      Device: /dev/sdf
46    #      InstanceId: !Ref WebServerInstance
47    #      VolumeId: !Ref EbsVolume
48
49
```

7. Verify the stack update and resources using the describe-stacks and describe-stack-resources commands.

```
aws cloudformation deploy --stack-name Solution7Stacks --template
-file "C:\internship\Section 7\section-7-activity-template-final\section-7-activity-t
emplate.yaml" --parameter-overrides WebServerSubnet=subnet-0a1bbb2feaa84bb95

Waiting for changeset to be created..
Waiting for stack create/update to complete
Successfully created/updated stack - Solution7Stacks
```

```
PS C:\Users\Ishika> aws cloudformation describe-stacks --stack-name Solution7Stacks
{
    "Stacks": [
        {
            "StackId": "arn:aws:cloudformation:eu-west-1:878893308172:stack/Solution7
Stacks/e744ae00-b6d2-11ef-9f3b-0a175ebbed7f",
            "StackName": "Solution7Stacks",
            "ChangeSetId": "arn:aws:cloudformation:eu-west-1:878893308172:changeSet/a
wscli-cloudformation-package-deploy-1733821186/7f40bedc-b202-42ac-932c-5dcd9fcb3f5f",
            "Description": "Section 7 Activity template.  This template creates an EC
2 instance and an EBS volume attached to it.",
            "Parameters": [
                {
                    "ParameterKey": "WebServerSubnet",
                    "ParameterValue": "subnet-0a1bbb2feaa84bb95"
                }
            ],
            "CreationTime": "2024-12-10T08:44:01.194000+00:00",
            "LastUpdatedTime": "2024-12-10T08:59:53.287000+00:00",
            "RollbackConfiguration": {},
            "StackStatus": "UPDATE_COMPLETE",
            "DisableRollback": false,
```

8. Delete the stack using aws cloudformation delete-stack with the --stack-name option.

```
PS C:\Users\Ishika> aws cloudformation delete-stack --stack-name Solution7Stacks
PS C:\Users\Ishika> aws cloudformation describe-stacks --stack-name Solution7Stacks
{
    "Stacks": [
        {
            "StackId": "arn:aws:cloudformation:eu-west-1:878893308172:stack/Solution7
Stacks/e744ae00-b6d2-11ef-9f3b-0a175ebbed7f",
            "StackName": "Solution7Stacks",
            "Description": "Section 7 Activity template.  This template creates an EC
2 instance and an EBS volume attached to it.",
            "Parameters": [
                {
                    "ParameterKey": "WebServerSubnet",
                    "ParameterValue": "subnet-0a1bbb2feaa84bb95"
                }
            ],
            "CreationTime": "2024-12-10T08:44:01.194000+00:00",
            "DeletionTime": "2024-12-10T09:03:07.112000+00:00",
            "LastUpdatedTime": "2024-12-10T08:59:53.287000+00:00",
            "RollbackConfiguration": {},
            "StackStatus": "DELETE_IN_PROGRESS",
```

9. Confirm deletion by running aws cloudformation wait stack-delete-complete with --stack-name.

```
PS C:\Users\Ishika> aws cloudformation wait stack-delete-complete --stack-name Soluti
on7Stacks
PS C:\Users\Ishika> aws cloudformation describe-stacks --stack-name Solution7Stacks

An error occurred (ValidationError) when calling the DescribeStacks operation: Stack
with id Solution7Stacks does not exist
PS C:\Users\Ishika>
```