

Module 10 - Guided Lab: Automating Infrastructure Deployment with AWS CloudFormation

CloudFormation > Stacks

Stacks (1)

Stack name	Status	Created time	Description
c65590a127156613100405t1w163660496799	CREATE_COMPLETE	2022-11-13 16:30:05 UTC+0630	new bucket

CloudFormation > Stacks > Create stack

Specify stack details

Stack name

Stack name

lab-network

Stack name can include letters (A-Z and a-z), numbers (0-9), and dashes (-).

Parameters

No parameters

There are no parameters defined in your template.

Screenshot of the AWS CloudFormation console showing the creation of a new stack named "lab-network".

Configure stack options:

- Tags:**

Key	Value - optional
application	inventory
- Permissions:** IAM role - optional

Events:

Timestamp	Logical ID	Status	Status reason
2022-11-13 16:36:47 UTC+0630	lab-network	CREATE_IN_PROGRESS	User Initiated

Screenshot of the AWS CloudFormation console showing the 'lab-network' stack details and resources.

Stack Details

lab-network (CREATE_COMPLETE)

Attribute	Value
Stack ID	arn:aws:cloudformation:us-east-1:163660496799:stack/lab-network/e2210060-633a-11ed-89f2-0e322bea3bab
Status	CREATE_COMPLETE
Root stack	-
Created time	2022-11-13 16:36:47 UTC+0630
Updated time	-
Drift status	LAST_DRIFT_CHECKED

Resources

Logical ID	Physical ID	Type	Status
InternetGateway	igw-0e316813a4ae3ec6a	AWS::EC2::InternetGateway	CREATE_COMPLETE
PublicRoute	lab-n-Public-VS1OD2BBN4CD	AWS::EC2::Route	CREATE_COMPLETE
PublicRouteTable	rtb-026c411052054c4b0	AWS::EC2::RouteTable	CREATE_COMPLETE
PublicSubnet	subnet-015d60b8b3efdc59	AWS::EC2::Subnet	CREATE_COMPLETE

Screenshot of the AWS CloudFormation console showing the 'lab-network' stack details.

Stack Details:

- Stack name: lab-network
- Created: 2022-11-13 16:36:47 UTC+0630
- Status: CREATE_COMPLETE
- Region: us-east-1
- Outputs:

 - PublicSubnet: subnet-015d60b8b3eafdc59 - The subnet ID to use for public web servers
 - VPC: vpc-06054a38ae5a45ab6 - VPC ID

Events:

Timestamp	Logical ID	Status	Status reason
2022-11-13 16:37:45 UTC+0630	lab-network	CREATE_COMPLETE	-
2022-11-13 16:37:44 UTC+0630	PublicRoute	CREATE_COMPLETE	-
2022-11-13 16:37:31 UTC+0630	PublicSubnetNetworkAclAssociation	CREATE_COMPLETE	-
2022-11-13 16:37:28 UTC+0630	PublicRoute	CREATE_IN_PROGRESS	Resource creation initiated
2022-11-13 16:37:28 UTC+0630	PublicRoute	CREATE_IN_PROGRESS	-

Outputs:

Key	Value	Description	Export name
PublicSubnet	subnet-015d60b8b3eafdc59	The subnet ID to use for public web servers	lab-network-SubnetID
VPC	vpc-06054a38ae5a45ab6	VPC ID	lab-network-VPCID

The screenshot shows the AWS CloudFormation console with the 'lab-network' stack selected. The left sidebar includes links for Stacks, Drifts, StackSets, Exports, Designer, Registry (Public extensions, Activated extensions, Publisher), and Feedback. The main area displays the 'lab-network' stack details, showing two stacks: 'lab-network' (Status: CREATE_COMPLETE) and 'c65590a127156613100405t1w163' (Status: CREATE_IN_PROGRESS). The 'Template' tab is selected, showing the CloudFormation template code:

```
AWSTemplateFormatVersion: 2010-09-09
Description: >
  Network Template: Sample template that creates a VPC with DNS and public IPs enabled.

# This template creates:
#   * VPC
#   * Internet Gateway
#   * Public route Table
#   * Public Subnet

#####
# Resources section
#####

Resources:

## VPC

VPC:
  Type: AWS::EC2::VPC
  Properties:
    EnableDnsSupport: true
```

Create stack for lab-application

Screenshot of the AWS CloudFormation - Stack creation process:

Step 1: Create stack

Prerequisite - Prepare template

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

Template is ready Use a sample template Create template in Designer

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

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

Amazon S3 URL Upload a template file

Upload a template file
 lab-application.yaml
JSON or YAML formatted file

Step 2: Specify stack details

Stack name

Stack name
lab-application
Stack name can include letters (A-Z and a-z), numbers (0-9), and dashes (-).

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

AmazonLinuxAMIID
/aws/service/ami-amazon-linux-latest/amzn2-ami-hvm-x86_64-gp2

NetworkStackName
Name of an active CloudFormation stack that contains the networking resources, such as the VPC and subnet that will be used in this stack.
lab-network

Buttons: Cancel, Previous, Next

Screenshot of the AWS CloudFormation console showing the 'lab-application' stack details.

Stacks (3)

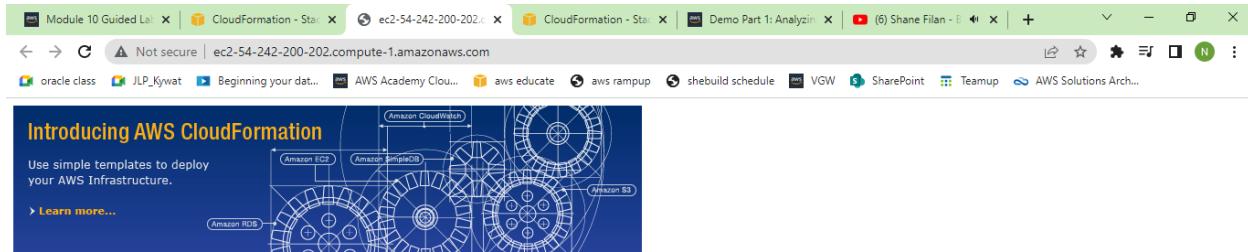
- lab-application** (CREATE_IN_PROGRESS)
- lab-network** (CREATE_COMPLETE)
- c65590a127156613100405t1w1636604** (96799)

Resources (2)

Logical ID	Physical ID	Type	Status	Module
WebServerInstance	i-03692778e6940d475	AWS::EC2::Instance	CREATE_IN_PROGRESS	-
WebServerSecurityGroup	sg-078fd684f4a5e9696	AWS::EC2::SecurityGroup	CREATE_COMPLETE	-

Outputs (1)

Key	Value	Description	Export name
URL	http://ec2-54-242-200-202.compute-1.amazonaws.com	URL of the sample website	-



Congratulations, you have successfully launched the AWS CloudFormation sample.

Name	Security group ID	Security group name	VPC ID	Description	Owner
-	sg-0927a98264882b29d	default	vpc-06054a38ae5a45ab6	default VPC security gr...	163660496799
Web Server Securit...	sg-078fd684f4a5e9696	lab-application-WebSe...	vpc-06054a38ae5a45ab6	Enable HTTP ingress	163660496799
-	sg-0378223e6835adeda	default	vpc-056d2002cd8570b53	default VPC security gr...	163660496799

The screenshot shows the AWS Management Console with the EC2 Management Console tab selected. The main view is the 'Security Groups' page, which lists three security groups:

Name	Security group ID	Security group name	VPC ID	Description
-	sg-0927a98264882b29d	default	vpc-06054a38ae5a45ab6	default VPC security gr...
<input checked="" type="checkbox"/> Web Server Securit...	sg-078fd684f4a5e9696	lab-application-WebServerSecurityGroup-P8C...	vpc-06054a38ae5a45ab6	Enable HTTP ingress
-	sg-0378223e6835adeda	default	vpc-056d2002cd8570b53	default VPC security gr...

The 'Web Server Security Group' (sg-078fd684f4a5e9696) is selected, as indicated by the checked checkbox in the first column. The browser address bar shows the URL: <https://us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#SecurityGroups>.

Let's update lab-applicatin

The screenshot shows the AWS CloudFormation console with the Stacks page open. There are three stacks listed:

Stack name	Status	Created time	Description
lab-application	CREATE_COMPLETE	2022-11-13 16:42:02 UTC+0630	Application Template: Demonstrates how to reference resources from a different stack. This template provisions an EC2 instance in a VPC Subnet provisioned in a different stack.
lab-network	CREATE_COMPLETE	2022-11-13 16:36:47 UTC+0630	Network Template: Sample template that creates a VPC with DNS and public IPs enabled.
c65590a127156613100405t1w163660496799	CREATE_COMPLETE	2022-11-13 16:30:05 UTC+0630	new bucket

The screenshot shows the AWS CloudFormation console with the Update stack process open for the lab-application stack. The 'Replace current template' option is selected under the Prerequisite - Prepare template step.

Prerequisite - Prepare template

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

Use current template Replace current template Edit template in designer

Specify template

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

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

Amazon S3 URL Upload a template file

Replace

View change set preview

Notification options

SNS topic ARN

No notification options

There are no notification options defined

Change set preview

Changes (1)						
Action	Logical ID	Physical ID	Resource type	Replacement	Module	Hook invocations
Modify	WebServerSecurityGr...	sg-078fd684f4...	AWS::EC2::Secur...	False	-	-

[View change set](#)

[Cancel](#) [Previous](#) [Submit](#)

Feedback Looking for language selection? Find it in the new Unified Settings

Type here to search

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Change set ID: arn:aws:cloudformation:us-east-1:163660496799:changeSet/lab-appli-p7dwbg9t2-f5r5e28j3q7/a436fe68-6155-4d6c-ad06-daa7a95cce79

Status: CREATE_COMPLETE

Description: Application Template: Demonstrates how to reference resources from a different stack. This template provisions an EC2 instance in a VPC Subnet provisioned in a different stack.

Created time: 2022-11-13 16:50:06 UTC+0630

Status reason: -

Execution status: AVAILABLE

Changes | Input | Template | JSON changes | Hook invocations

Changes (1)

Changes (1)						
Action	Logical ID	Physical ID	Resource type	Replacement	Module	Hook invocations
Modify	WebServerSecurityGrou...	sg-078fd684f4a5e9696	AWS::EC2::SecurityGrou...	False	-	-

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Update in progress

The screenshot shows the AWS CloudFormation console with a stack named 'lab-application'. The status is 'UPDATE_IN_PROGRESS'. The events table shows 16 entries, mostly for resource creation ('CREATE_COMPLETE') and some for the update process ('UPDATE_IN_PROGRESS').

Timestamp	Logical ID	Status	Status reason
2022-11-13 16:51:36 UTC+0630	lab-application	① UPDATE_IN_PROGRESS	User Initiated
2022-11-13 16:44:16 UTC+0630	lab-application	✓ CREATE_COMPLETE	-
2022-11-13 16:44:14 UTC+0630	DiskMountPoint	✓ CREATE_COMPLETE	-
2022-11-13 16:43:59 UTC+0630	DiskMountPoint	① CREATE_IN_PROGRESS	Resource creation Initiated
2022-11-13 16:43:43 UTC+0630	DiskMountPoint	① CREATE_IN_PROGRESS	-
2022-11-13 16:43:41 UTC+0630	DiskVolume	✓ CREATE_COMPLETE	-
2022-11-13 16:43:35 UTC+0630	DiskVolume	① CREATE_IN_PROGRESS	Resource creation Initiated
2022-11-13 16:43:33 UTC+0630	DiskVolume	① CREATE_IN_PROGRESS	-

The screenshot shows the AWS CloudFormation console with a stack named 'lab-application'. The status is 'UPDATE_COMPLETE'. The events table shows 20 entries, mostly for resource creation ('CREATE_COMPLETE') and some for the update process ('UPDATE_IN_PROGRESS').

Timestamp	Logical ID	Status	Status reason
2022-11-13 16:52:05 UTC+0630	lab-application	✓ UPDATE_COMPLETE	-
2022-11-13 16:52:04 UTC+0630	lab-application	① UPDATE_COMPLETE_CLEANUP_IN_PROGRESS	-
2022-11-13 16:51:58 UTC+0630	WebServerSecurityGroup	✓ UPDATE_COMPLETE	-
2022-11-13 16:51:42 UTC+0630	WebServerSecurityGroup	① UPDATE_IN_PROGRESS	-
2022-11-13 16:51:36 UTC+0630	lab-application	① UPDATE_IN_PROGRESS	User Initiated
2022-11-13 16:44:16 UTC+0630	lab-application	✓ CREATE_COMPLETE	-
2022-11-13 16:44:14 UTC+0630	DiskMountPoint	✓ CREATE_COMPLETE	-

EC2-inbound rules have one more rules due to changes in yaml file in cloud formation

The screenshot shows the AWS CloudFormation console with the URL <https://us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#ModifyInboundSecurityGroupRules:securityGroupId=sg-078fd684f4a5e9696>. The page displays the 'Edit inbound rules' section for a security group. It lists two existing rules:

Security group rule ID	Type	Protocol	Port range	Source	Description - optional
sgr-072c3e39a77ef7961	HTTP	TCP	80	Custom	Q
sgr-089cfe49a34fa72ea	SSH	TCP	22	Custom	Q

Below the table is an 'Add rule' button. At the bottom are 'Cancel', 'Preview changes', and 'Save rules' buttons.

Choose designer

The screenshot shows the AWS CloudFormation console with the URL https://us-east-1.console.aws.amazon.com/cloudformation/home?region=us-east-1#. The left sidebar has the 'Designer' tab selected. The main content area displays the 'AWS CloudFormation' homepage with the heading 'Model and provision all your cloud infrastructure'. It includes a 'Create a CloudFormation stack' button and a 'How it works' section with a video thumbnail.

The screenshot shows the AWS CloudFormation Designer interface. At the top, there are several tabs: "Module 10 Guided Lab - Automate", "AWS CloudFormation Designer", "Demo Part 1: Analyzing AWS Clo...", and a YouTube video tab. Below the tabs, the main window has a header with "File: 'new template'" and a search bar. On the left, a sidebar lists "Resource types" including ACMPCA, APS, AccessAnalyzer, AmazonMQ, Amplify, AmplifyUIBuilder, ApiGateway, ApiGatewayV2, and AppConfig. The main workspace is a grid where resources can be拖放 (dragged and dropped). A message box in the center says "To start building your template, drag resources from the Resources pane." Below the workspace, there are tabs for "Parameters", "Mappings", "Conditions", "Metadata", and "Outputs". A code editor shows the beginning of a CloudFormation template:

```
1 {  
2   "Parameters": {}  
3 }
```

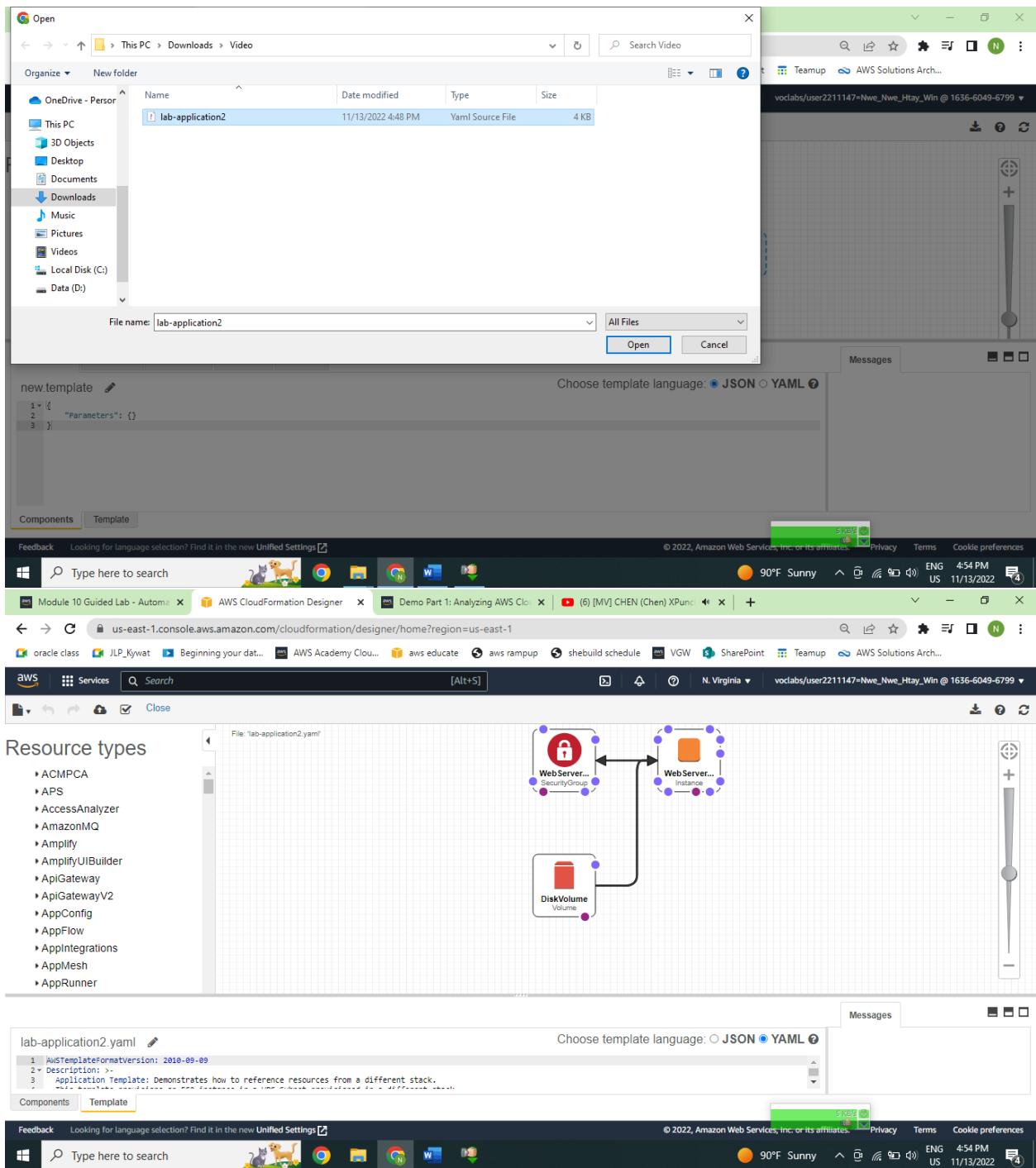
On the right, there's a "Choose template language" dropdown set to JSON, and a "Messages" panel. The status bar at the bottom shows system information like battery level, signal strength, and date/time.

Open a template dialog box (centered over the workspace):

A Warning: All unsaved changes will be lost. Choose a template to proceed or Cancel to go back without losing your changes.

Local file Amazon S3 bucket

Cancel Open



Screenshot of the AWS CloudFormation Designer interface showing a template diagram and YAML code.

Resource types:

- Cloud9
- EnvironmentEC2
- CloudFormation
- CloudFront
- CloudTrail
- CloudWatch
- CodeArtifact
- CodeBuild
- CodeCommit
- CodeDeploy

Diagram: A network diagram showing a **WebServer... SecurityGroup** connected to a **WebServer... Instance**, which is connected to a **DiskVolume**.

Template (lab-application2.yaml):

```

121     Metadata:
122       'AWS::CloudFormation::Designer':
123         id: 3f6f6fde-d461-4a80-a1f0-b7197eda388c
124       C9EEC22A9...
125     Type: 'AWS::Cloud9::EnvironmentEC2'
126     Properties: {}
127   Metadata:
128     'AWS::CloudFormation::Designer':

```

Choose template language: JSON (radio button) **YAML** (radio button)

Let's delete

Screenshot of the AWS CloudFormation console showing the Stacks list.

CloudFormation > Stacks

Stacks (3)

Stack name	Status	Created time	Description
lab-application	UPDATE_COMPLETE	2022-11-13 16:42:02 UTC+0630	Application Template: Demonstrates how to reference resources from a different stack. This template provisions an EC2 instance in a VPC Subnet provisioned in a different stack.
lab-network	CREATE_COMPLETE	2022-11-13 16:36:47 UTC+0630	Network Template: Sample template that creates a VPC with DNS and public IPs enabled.
c65590a127156613100405t1w163660496799	CREATE_COMPLETE	2022-11-13 16:30:05 UTC+0630	new bucket

Screenshot of the AWS CloudFormation console showing the Stacks page. A modal dialog titled "Delete lab-application?" is open, asking if the user wants to delete the stack. The dialog states: "Deleting this stack will delete all stack resources. Resources will be deleted according to their DeletionPolicy. Learn more".

Stack name	Status	Created time	Description
lab-application	DELETE_IN_PROGRESS	2022-11-13 16:42:02 UTC+0630	Application Template: Demonstrates how to reference resources from a different stack. This template provisions an EC2 instance in a VPC Subnet provisioned in a different stack.
lab-network	CREATE_COMPLETE	2022-11-13 16:36:47 UTC+0630	Network Template: Sample template that creates a VPC with DNS and public IPs enabled.
c65590a12715663100405t1w163660496799	CREATE_COMPLETE	2022-11-13 16:30:05 UTC+0630	new bucket

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Screenshot of the AWS CloudFormation console showing the Stacks page. A modal dialog titled "Delete initiated for arn:aws:cloudformation:us-east-1:163660496799:stack/lab-application/9dd2eda0-633b-11ed-b3b5-12be4e101797" is open, indicating the deletion process has started.

Stack name	Status	Created time	Description
lab-application	DELETE_IN_PROGRESS	2022-11-13 16:42:02 UTC+0630	Application Template: Demonstrates how to reference resources from a different stack. This template provisions an EC2 instance in a VPC Subnet provisioned in a different stack.
lab-network	CREATE_COMPLETE	2022-11-13 16:36:47 UTC+0630	Network Template: Sample template that creates a VPC with DNS and public IPs enabled.
c65590a12715663100405t1w163660496799	CREATE_COMPLETE	2022-11-13 16:30:05 UTC+0630	new bucket

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Screenshot of the AWS CloudFormation console showing the Stacks page. A modal dialog is open at the top right indicating a delete operation for a stack named 'lab-network'.

CloudFormation - Stacks

Stacks

- Stack details
- Drifts
- StackSets
- Exports

Designer

Registry

- Public extensions
- Activated extensions
- Publisher

Feedback

CloudFormation - Stacks

Stacks (2)

Stack name	Status	Created time	Description
lab-network	CREATE_COMPLETE	2022-11-13 16:36:47 UTC+0630	Network Template: Sample template that creates a VPC with DNS and public IPs enabled.
c65590a127156613100405t1w163660496799	CREATE_COMPLETE	2022-11-13 16:30:05 UTC+0630	new bucket

EC2 - Snapshots

Snapshot details | EC2 Manager

Snapshot settings

Snapshot ID: snap-0114604db976055f0 (Web Data)	Size: 100 GiB	Progress: Available (100%)	Snapshot status: Completed
Owner: 163660496799	Volume ID: vol-086f616b9a7d84bf2	Started: Sun Nov 13 2022 16:59:03 GMT+0630 (Myanmar Time)	Product codes: -
Encryption: Not encrypted	KMS key ID: -	KMS key alias: -	KMS key ARN: -
Fast snapshot restore: -	Description: -		

Permissions **Storage tier** **Tags**

Snapshot share permissions **Modify permissions**

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Snapshot of EC2

Screenshot of the AWS Management Console EC2 Management Home page (https://us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#Home):

- Resources:** You are using the following Amazon EC2 resources in the US East (N. Virginia) Region:

Instances (running)	0	Dedicated Hosts	0	Elastic IPs	0
Instances	1	Key pairs	1	Load balancers	0 API Error
Placement groups	0	Security groups	3	Snapshots	1
Volumes	1				

(Info: Easily size, configure, and deploy Microsoft SQL Server Always On availability groups on AWS using the AWS Launch Wizard for SQL Server. Learn more)
- Account attributes:**
 - Supported platforms: VPC
 - Default VPC: vpc-056d2002cd8570b53
 - Settings: EBS encryption, Zones, EC2 Serial Console, Default credit specification, Console experiments
- Explore AWS:**
 - 10 Things You Can Do Today to Reduce AWS Costs
 - Explore how to effectively manage your AWS costs without compromising on performance or capacity. Learn more

Screenshot of the AWS Management Console Snapshots | EC2 Management page (https://us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#Snapshots):

- Snapshots (1):**

Name	Snapshot ID	Size	Description	Storage...	Snapshot status	Started
Web Data	snap-0114604db976055f0	100 GB	-	Standard	Completed	2022/11/13 16:59 GMT+6...

Select a snapshot above.