Automating Infrastructure Deployment with AWS CloudFormation

Objectives:

Deploying infrastructure in a consistent, reliable manner is difficult. It requires people to follow documented procedures without taking any undocumented shortcuts. It can also be difficult to deploy infrastructure after hours when fewer staff are available. AWS CloudFormation changes this situation by defining infrastructure in a template that can be automatically deployed—even on an automated schedule.

Task 1: Deploying a networking layer

At the top of the AWS Management Console, in the search box, search for and choose CloudFormation.

Choose Create stack > With new resources (standard) and configure these settings:

Step 1: Create stack

Prepare template: Choose Template is ready.

Template source: Choose Upload a template file > Choose file, and then choose the lab-network.yaml file that you downloaded.

Choose Next.

Step 2: Specify stack details

Stack name: lab-network

Choose Next.

Step 3: Configure stack options

In the Tags section, choose Add new tag and configure the following:

Key: application

Value: inventory

Choose Next.

Step 4: Review and create

Choose Submit.

Choose the Stack info tab.

Wait for the Status to change to CREATE_COMPLETE.

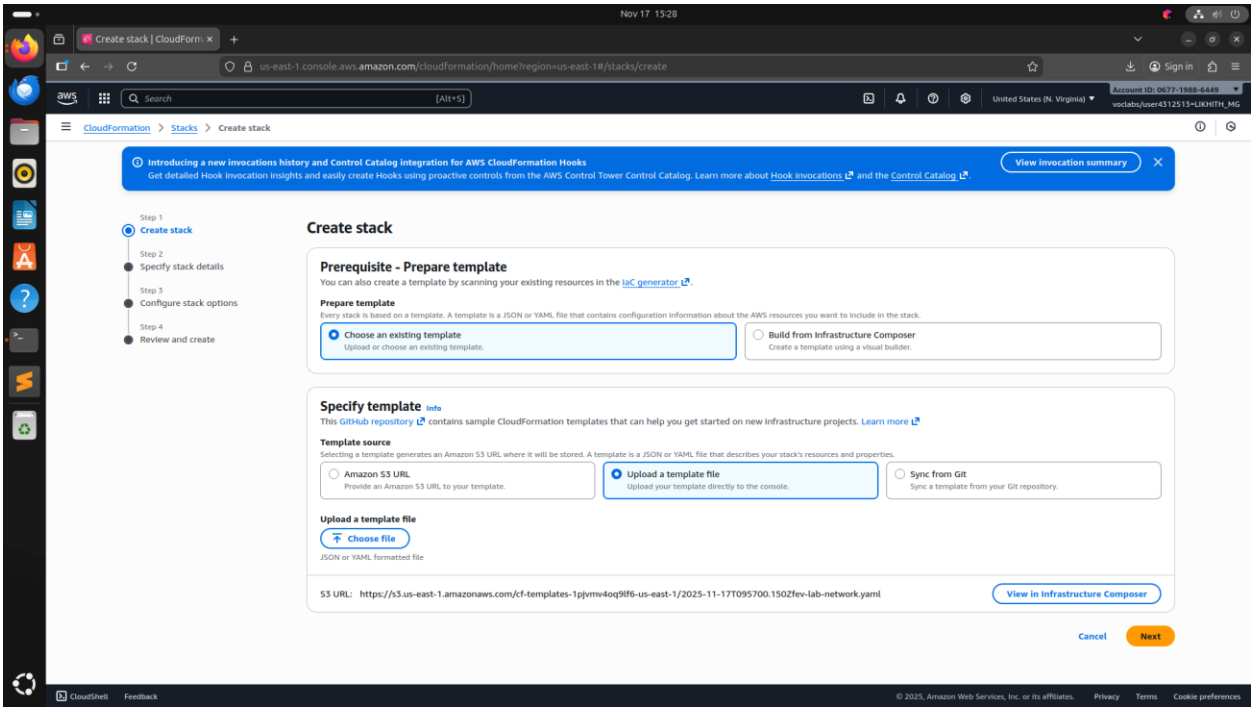
Choose Refresh every 15 seconds to update the display, if necessary.

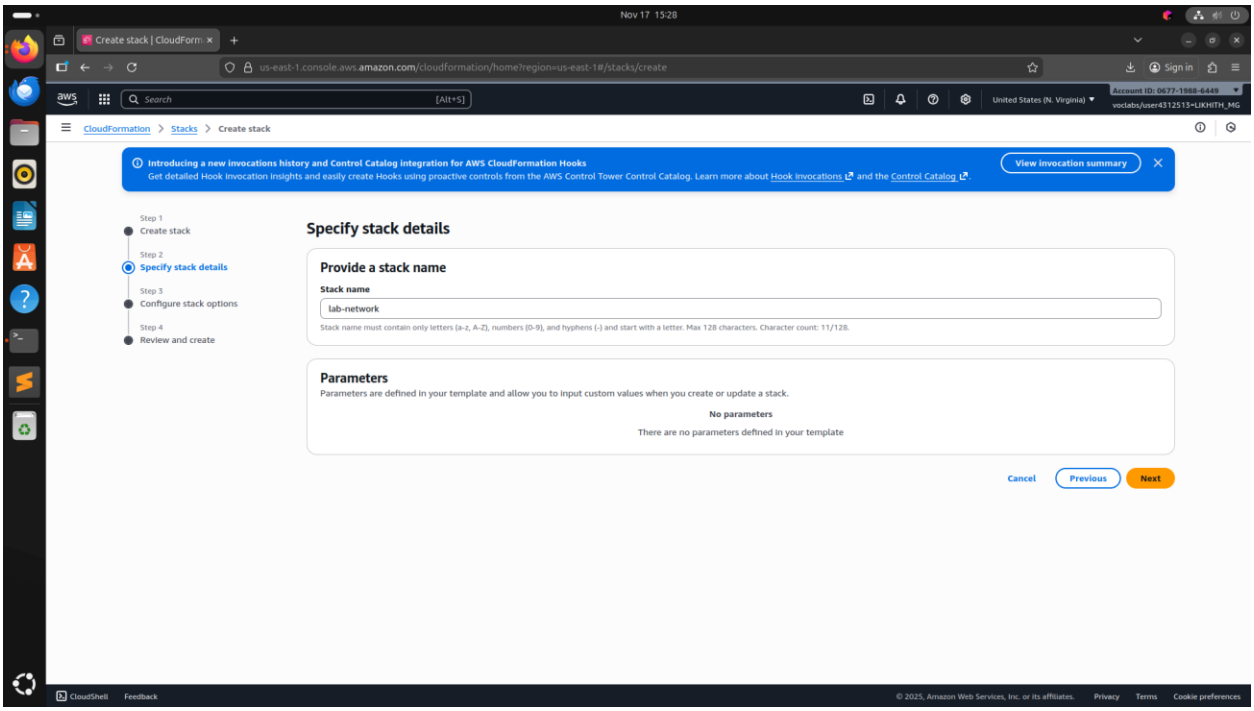
You can now examine the resources that were created.

Choose the Resources tab.

You see a list of the resources that were created by the template.

If the list is empty, update the list by choosing Refresh .




Nov 17 15:28
Create stack | CloudForm
us-east-1.console.aws.amazon.com/cloudformation/home?region=us-east-1#/stacks/create
Search [Alt+S]
United States (N. Virginia)
CloudFormation > Stacks > Create stack
Introducing a new invocations history and Control Catalog integration for AWS CloudFormation Hooks
Get detailed Hook invocation insights and easily create Hooks using proactive controls from the AWS Control Tower Control Catalog. Learn more about Hook invocations and the Control Catalog.
View invocation summary
Step 1 Create stack
Step 2 Specify stack details
Step 3 Configure stack options
Step 4 Review and create
Specify stack details
Provide a stack name
Stack name
lab-network
Stack name must contain only letters (a-z, A-Z), numbers (0-9), and hyphens (-) and start with a letter. Max 128 characters. Character count: 11/128.
Parameters
Parameters are defined in your template and allow you to input custom values when you create or update a stack.
No parameters
There are no parameters defined in your template
Cancel
Previous
Next
CloudShell
Feedback
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Privacy
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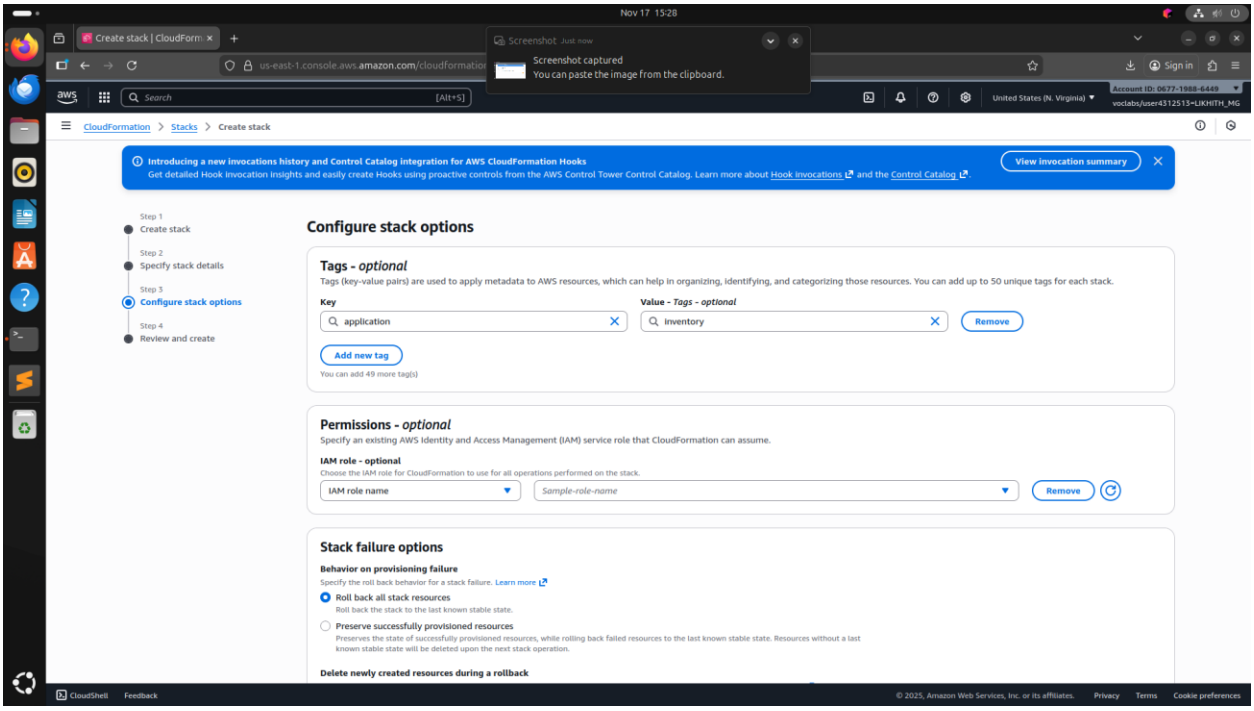
Cookie preferences


Nov 17 15:28
Screenshot captured
You can paste the image from the clipboard.
CloudFormation > Stacks > Create stack
Introducing a new invocations history and Control Catalog integration for AWS CloudFormation Hooks
View invocation summary
Step 1 Create stack
Step 2 Specify stack details
Step 3 Configure stack options
Step 4 Review and create
Configure stack options
Tags - optional
Key
application
Value - optional
inventory
Remove
Add new tag
You can add 49 more tag(s)
Permissions - optional
Specify an existing AWS Identity and Access Management (IAM) service role that CloudFormation can assume.
IAM role - optional
IAM role name
Sample-role-name
Remove
Stack failure options
Behavior on provisioning failure
Roll back all stack resources
Preserve successfully provisioned resources
Delete newly created resources during a rollback
CloudShell
Feedback
© 2025, Amazon Web Services, Inc. or its affiliates.
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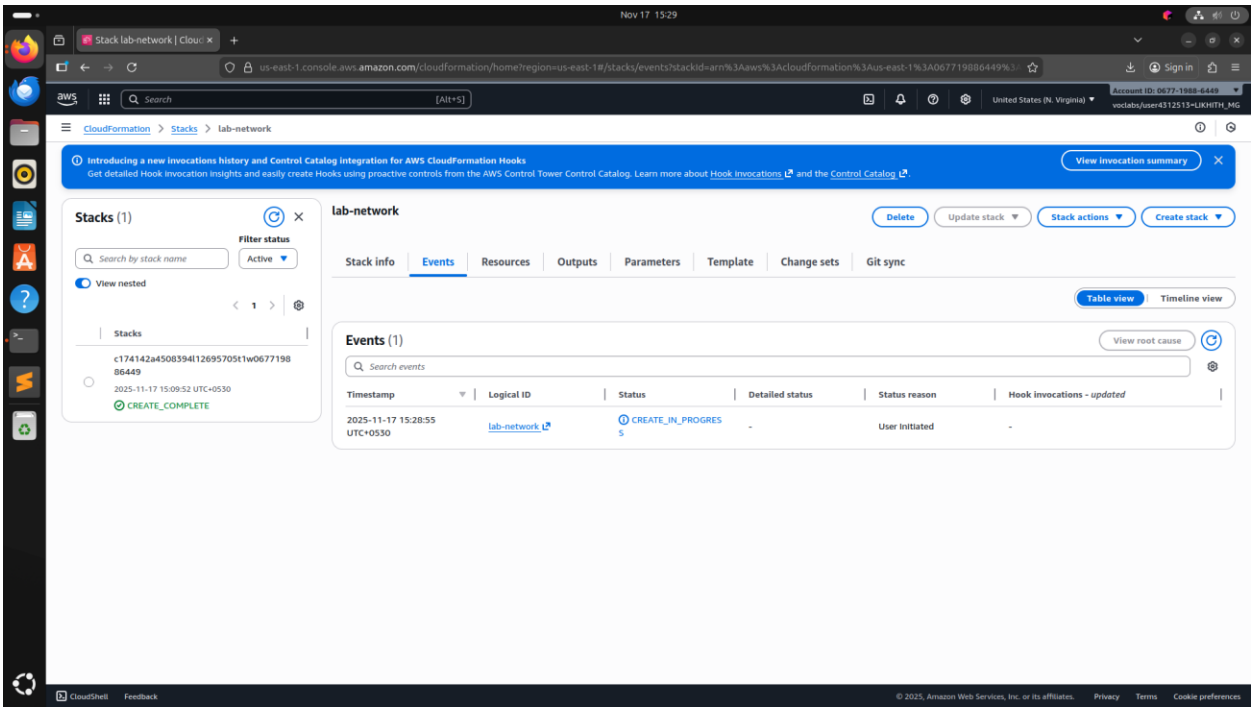


Task 2: Deploying an application layer

Create stack > With new resources (standard), and then configure these settings:

Step 1: Create Stack

Prepare template: Choose Template is ready.

Template source: Choose Upload a template file > Choose file, and then choose the lab-application.yaml file that you downloaded.

Choose Next.

Step 2: Specify stack details

Stack name: lab-application

Notice the NetworkStackName: lab-network

Choose Next.

The Network Stack Name parameter tells the template the name of the first stack that you created (lab-network), so it can retrieve values from the outputs.

Step 3: Configure stack options

In the Tags section, choose Add new tag and configure the following:

Key: application

Value: inventory

Choose Next.

Step 4: Review and create

Choose Submit.

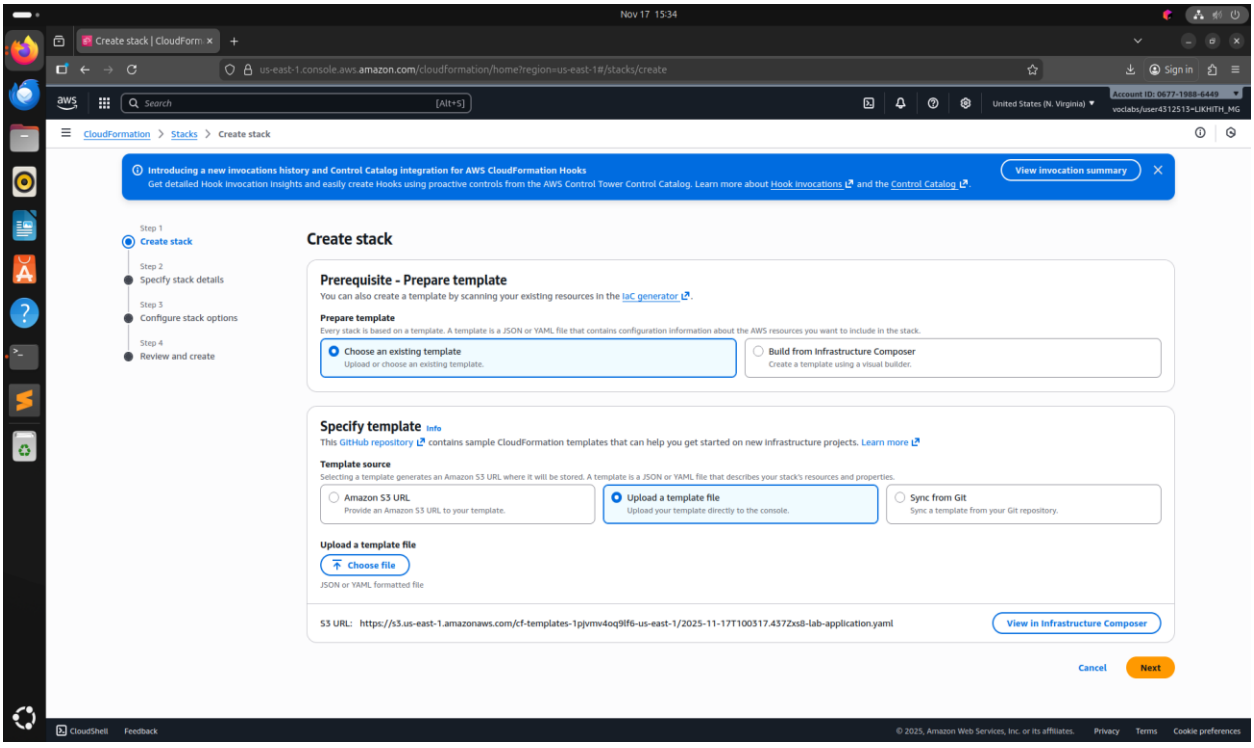
While the stack is being created, examine the details in the Events tab and the Resources tab. You can monitor the progress of the resource-creation process and the resource status.

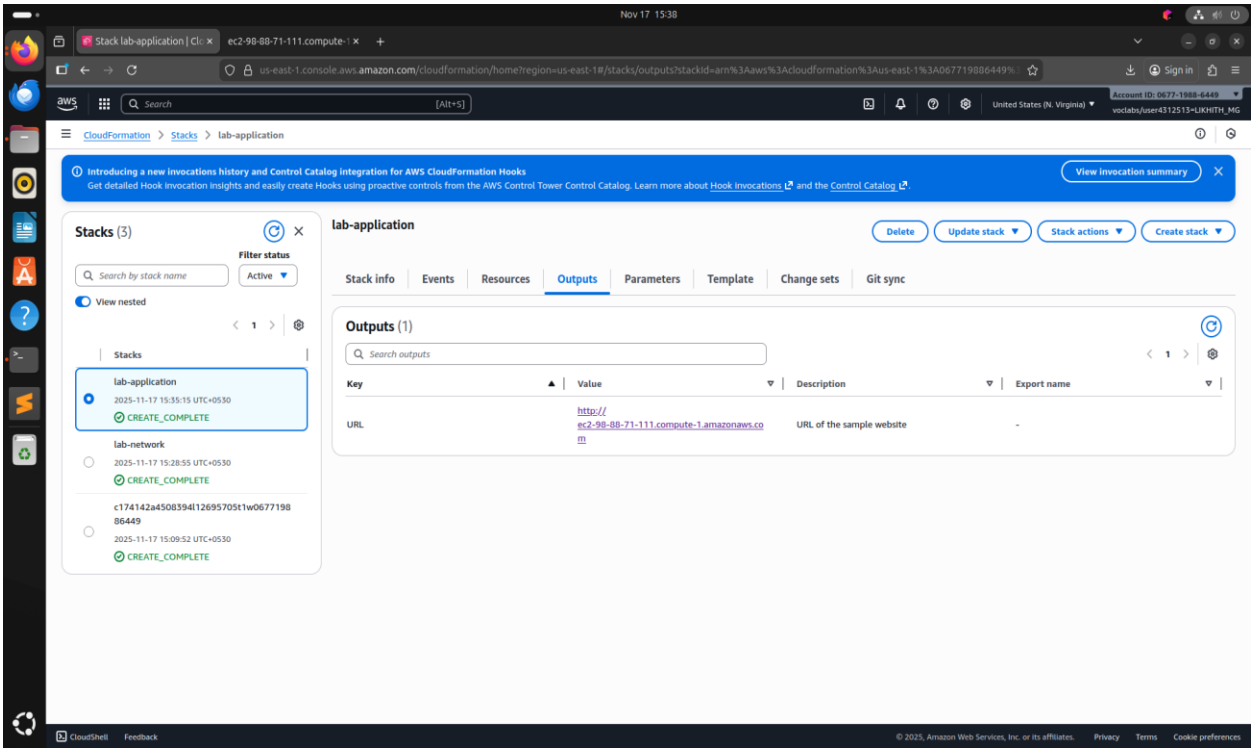
In the Stack info tab, wait for the Status to change to CREATE_COMPLETE.

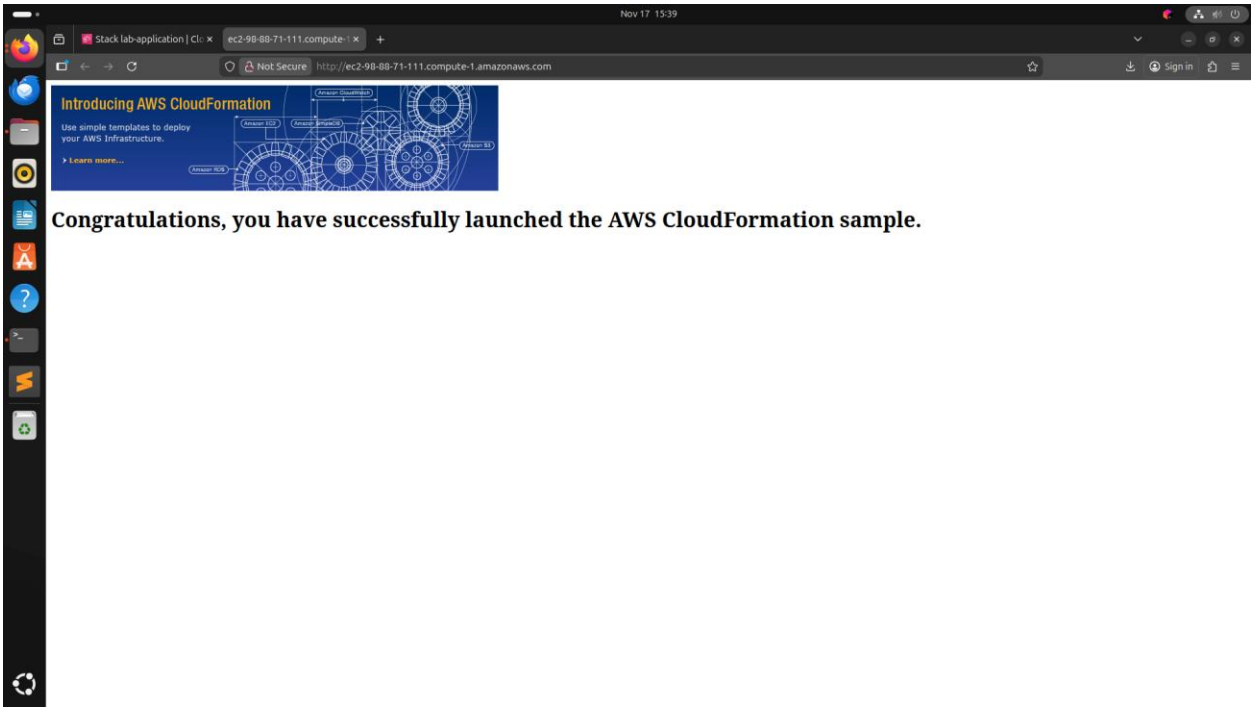
Your application is now ready!

Choose the Outputs tab.

Copy the URL that is displayed, open a new web browser tab, paste the URL, and press ENTER.







Task 3: Updating a Stack

At the top of the AWS Management Console, in the search box, search for and choose EC2.

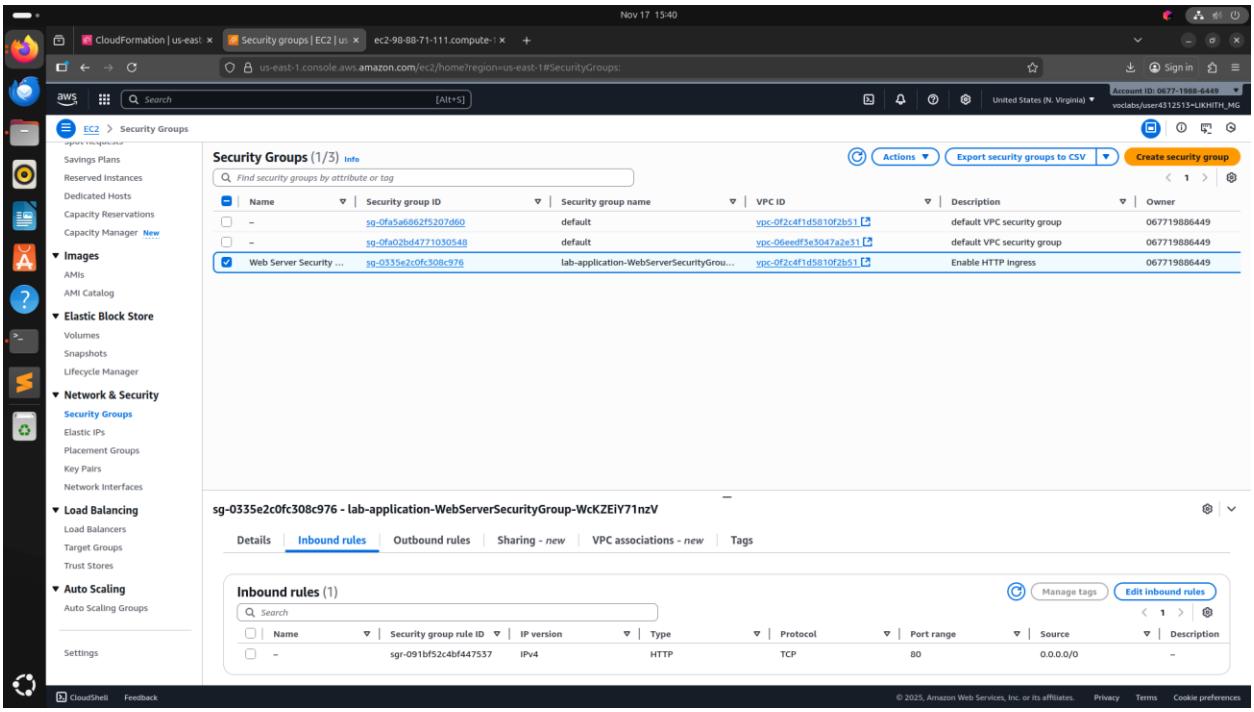
In the left navigation pane, in the Network & Security section, choose Security Groups.

Select the check box for lab-application-WebServerSecurityGroup.

Choose the Inbound rules tab.

Currently, only one rule is in the security group. The rule permits HTTP traffic.

You now return to AWS CloudFormation to update the stack.



From the Services menu at the top, choose CloudFormation.

Open the context (right-click) menu for the following link and download the updated template to your computer: lab-application2.yaml

From the Stacks list of the AWS CloudFormation console, choose lab-application.

Choose Update and configure these settings:

Prepare template: Choose Replace current template.

Template source: Choose Upload a template file.

Upload a template file: Choose file, and then choose the lab-application2.yaml file that you downloaded.

Choose Next on each of the next three screens to go to the Review lab-application page.

In the Change set preview section at the bottom of the page, AWS CloudFormation displays the following resources that will be updated:

Choose Submit.

In the Stack info tab, wait for the Status to change to UPDATE_COMPLETE.

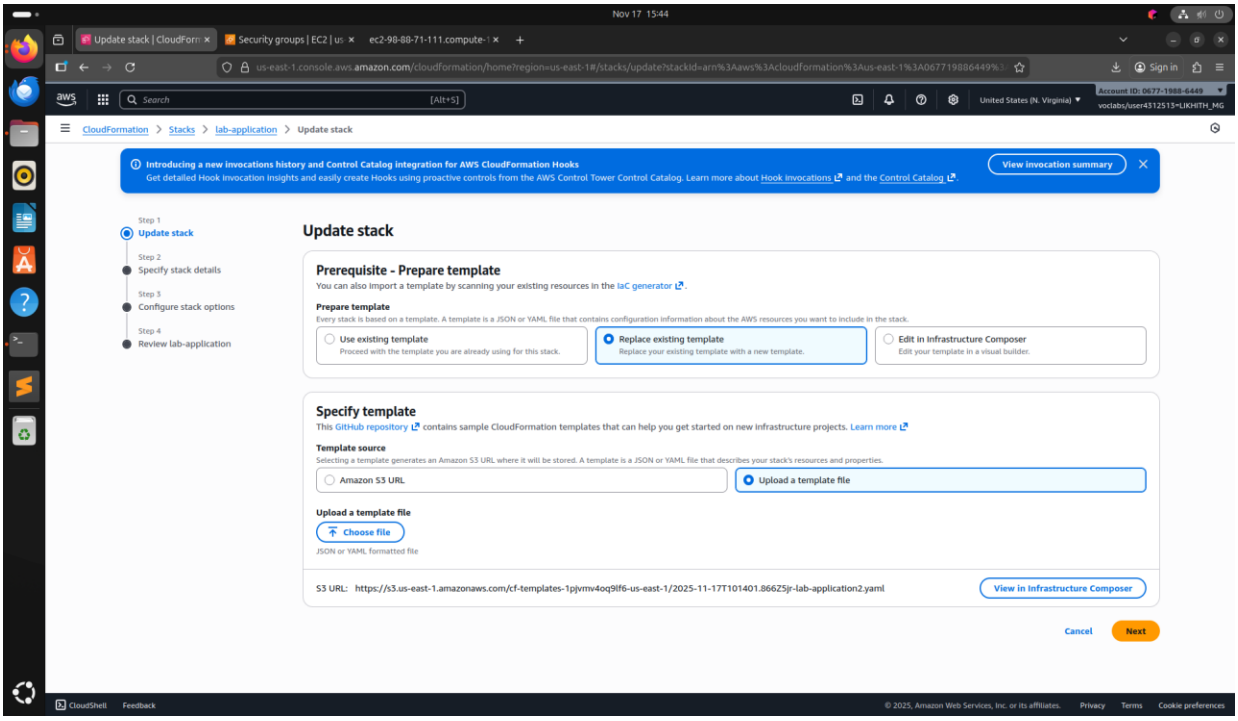
Update the status by choosing Refresh every 15 seconds, if necessary.

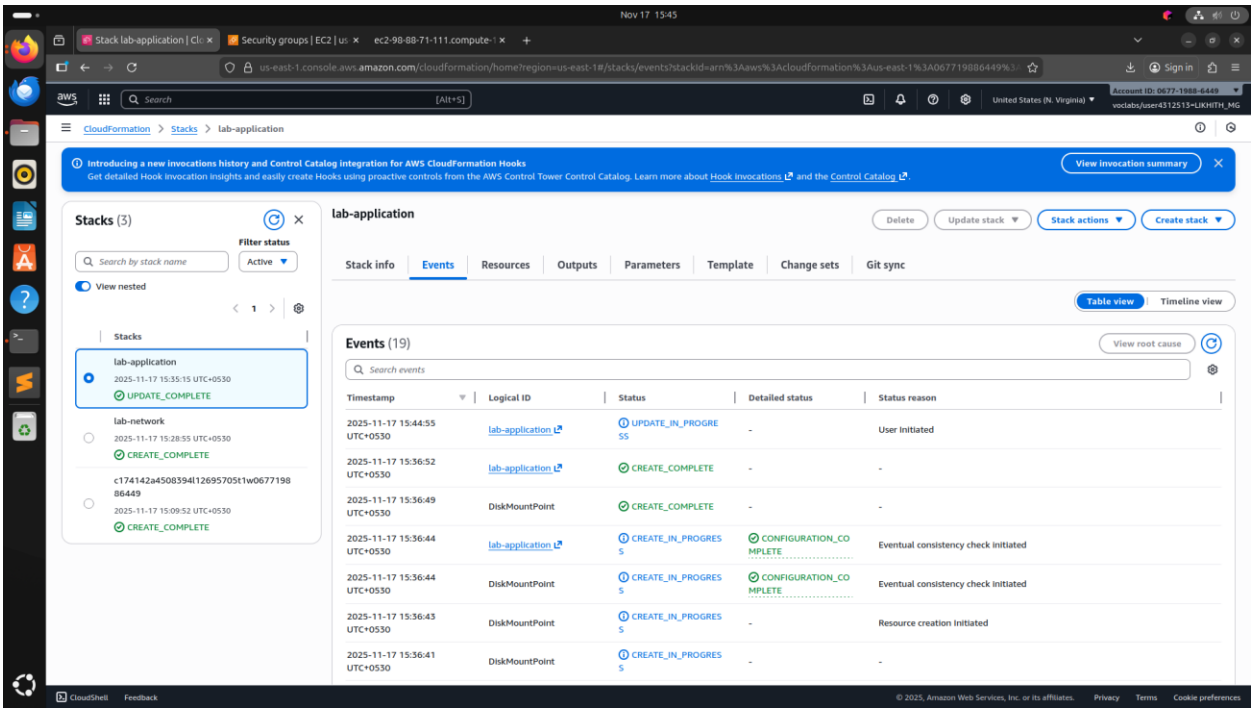
You can now verify the change.

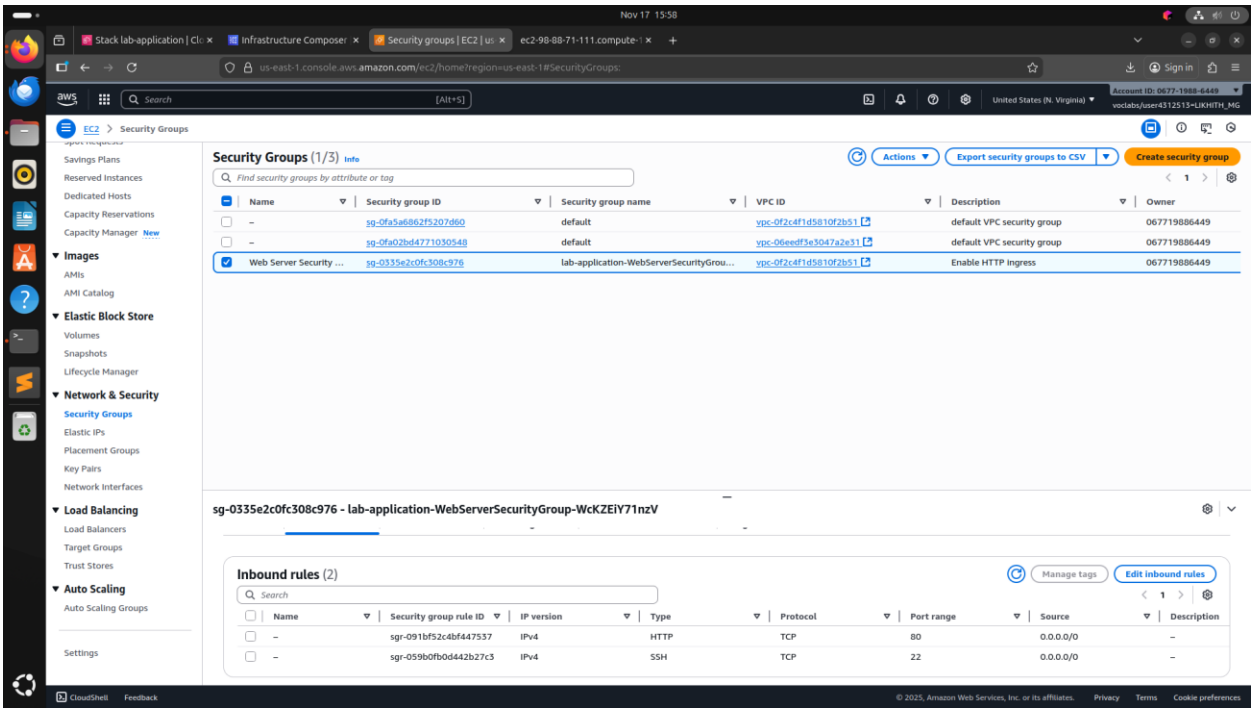
Return to the Amazon EC2 console, and from the left navigation pane, choose Security Groups.

In the Security Groups list, choose lab-application-WebServerSecurityGroup.

The Inbound rules tab should display an additional rule that allows HTTPS traffic over TCP port 443.

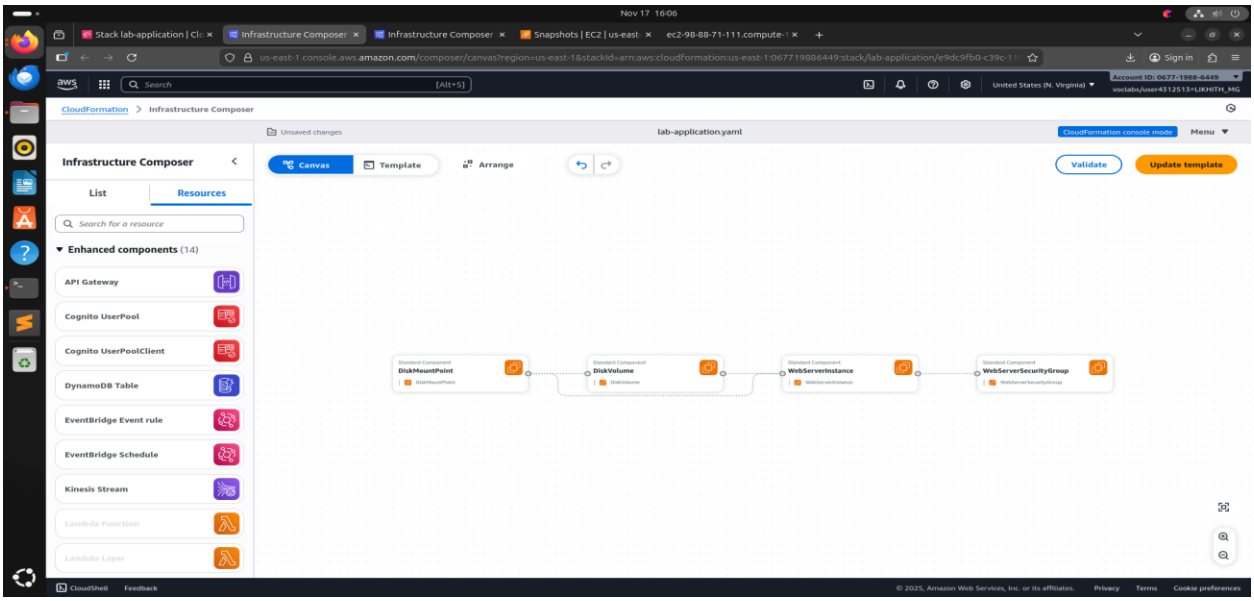






Task 4: Exploring templates with AWS CloudFormation Designer

Cloud formation -> SELECT Stack -> Template -> SELECT View Infrastructure Composer



Task 5: Deleting the stack

AWS CloudFormation console by choosing Close at the top of the Designer page (choose Leave page if prompted).

In the list of stacks, choose the lab-application link.

Choose Delete.

On the Delete stack? dialog box, choose Delete.

You can monitor the deletion process in the Events tab and update the screen by choosing Refresh occasionally. You might also see an events log entry that indicates that the EBS snapshot is being created.

Wait for the stack to be deleted. It will disappear from the stacks list.

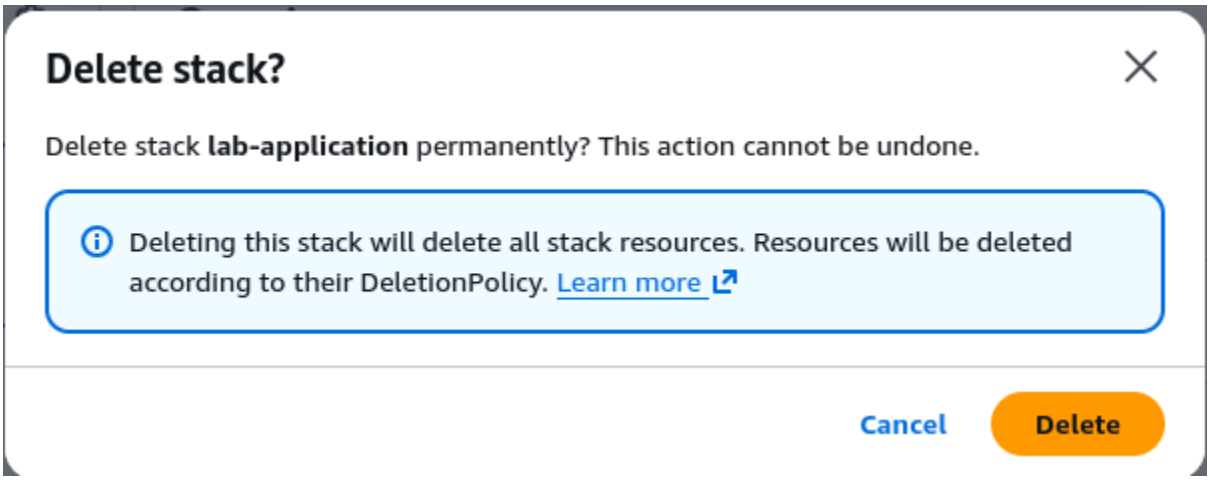
The application stack was removed, but the network stack remained untouched. This scenario reinforces the idea that different teams (for example, the network team or the application team) can manage their own stacks.

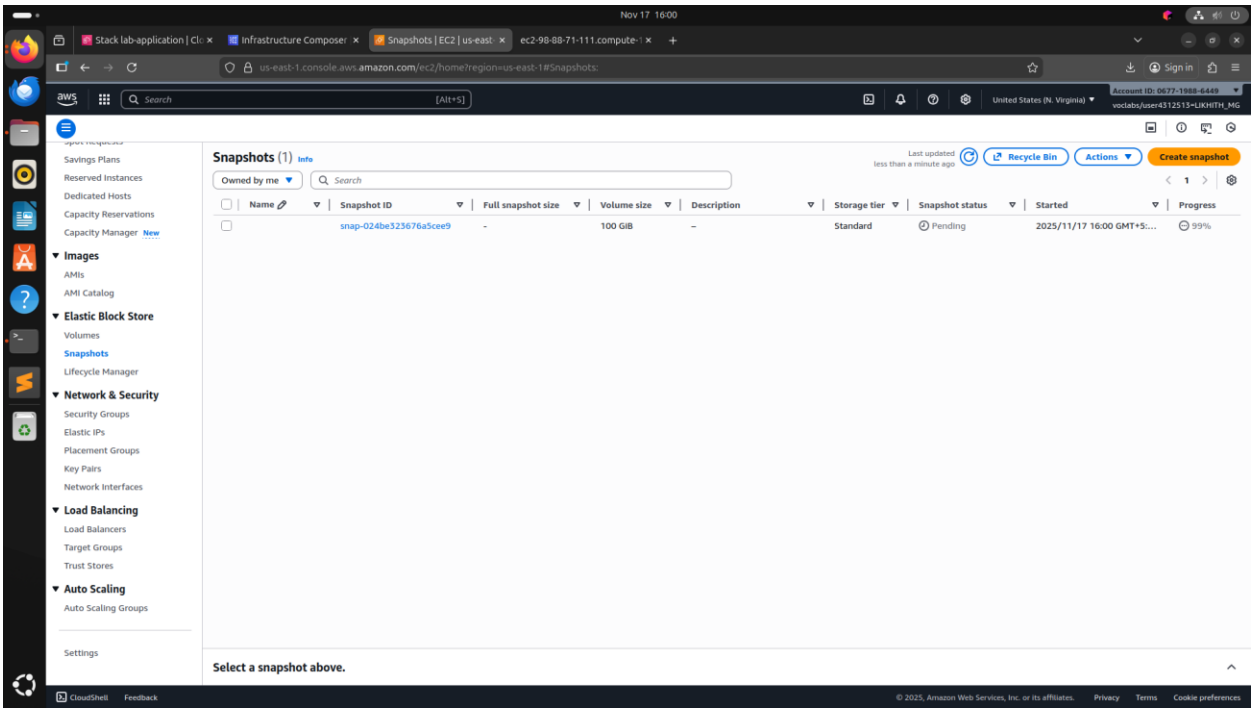
You will now verify that a snapshot of the EBS volume was created before the EBS volume was deleted.

From the Services menu, choose EC2.

In the left navigation pane, in the Elastic Block Store section, choose Snapshots.

You see a snapshot Web Data with a Started time in the last few minutes, and it changes to Completed soon.


Delete stack?
Delete stack lab-application permanently? This action cannot be undone.
Deleting this stack will delete all stack resources. Resources will be deleted according to their DeletionPolicy. Learn more
Cancel
Delete


Nov 17 16:00
Stack lab-application | Cl
Infrastructure Composer
Snapshots | EC2 | us-east-
ec2-98-88-71-111.compute-1
us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#Snapshots:
Sign in
Search
[Alt+S]
United States (N. Virginia)
Account ID: 0677-1988-6449
voclabs/user4312515=LIKHITH_MG
Savings Plans
Reserved Instances
Dedicated Hosts
Capacity Reservations
Capacity Manager New
Images
AMIs
AMI Catalog
Elastic Block Store
Volumes
Snapshots
Lifecycle Manager
Network & Security
Security Groups
Elastic IPs
Placement Groups
Key Pairs
Network Interfaces
Load Balancing
Load Balancers
Target Groups
Trust Stores
Auto Scaling
Auto Scaling Groups
Settings
Snapshots (1) Info
Last updated less than a minute ago
Recycle Bin
Actions
Create snapshot
Owned by me
Search
Name
Snapshot ID
Full snapshot size
Volume size
Description
Storage tier
Snapshot status
Started
Progress
snap-024be323676a5cee9
-
100 GiB
-
Standard
Pending
2025/11/17 16:00 GMT+5:...
99%
Select a snapshot above.
CloudShell
Feedback
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