Project in AWS
Practice Lab

Getting Started with CloudFormation

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ABOUT THIS LAB

CloudFormation is a powerful automation service within AWS. It can be used to create simple or complex sets of infrastructure at any number of times. This hands-on lab provides a gentle introduction to CloudFormation, using it to create and update a number of S3 buckets. By the end of this hands-on lab, you will be comfortable using CloudFormation and can begin experimenting with your own templates.

LEARNING OBJECTIVES

- Create a CloudFormation Stack
- Update the CloudFormation Stack to Add an S3 Bucket
- Update the CloudFormation Stack to Rename the S3 Bucket

AWS Documentation about CloudFormation:

https://aws.amazon.com/cloudformation/faqs/#topic-0

https://docs.aws.amazon.com/AWSCloudFormation/latest/TemplateReference/aws-template-resource-type-ref.html

Source: https://learn.acloud.guru/course/certified-solutions-architect-associate/

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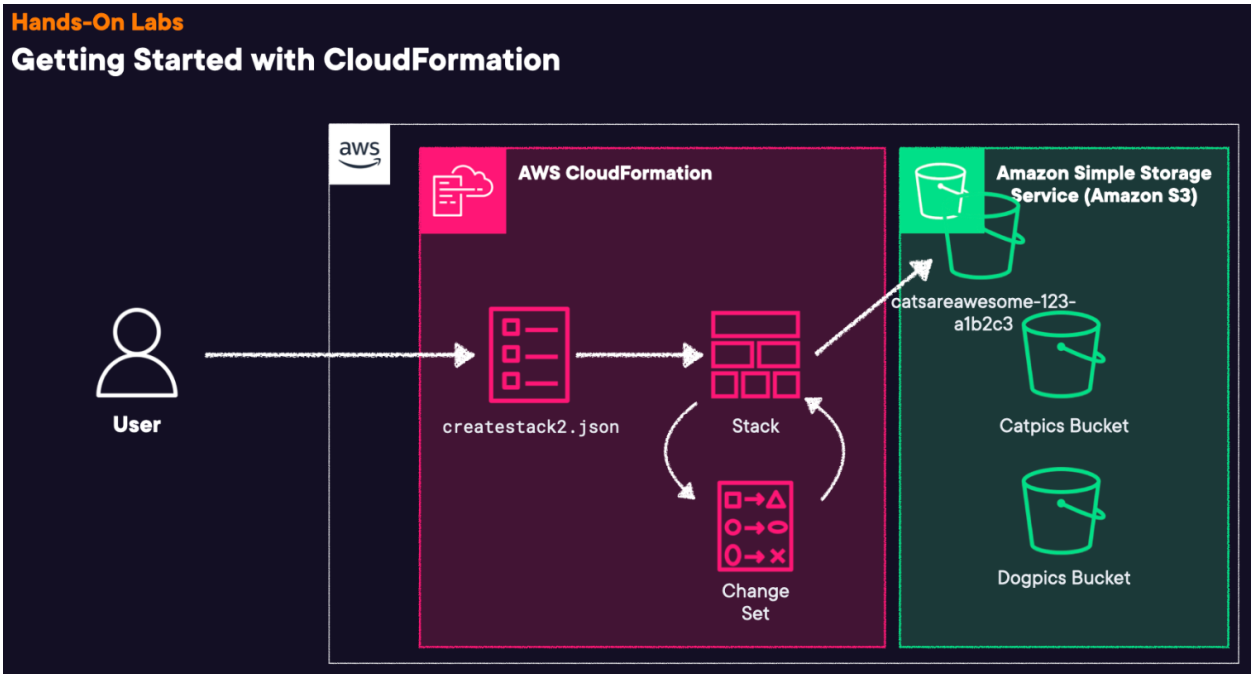
Lab Diagrams



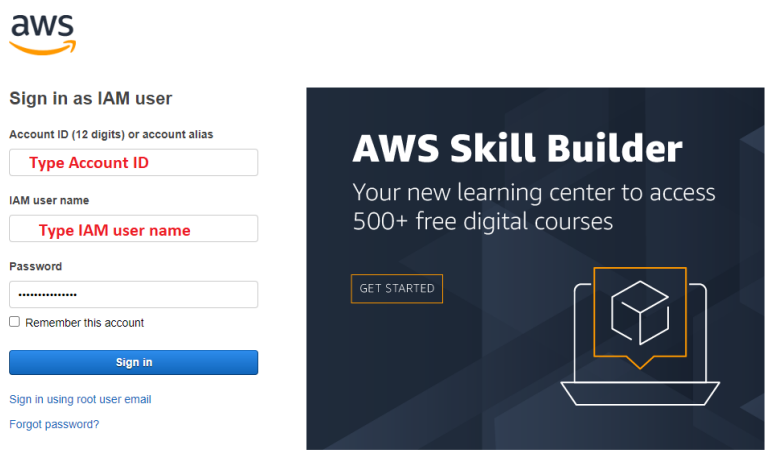
We have the AWS account in **us-east-1** Region. In this lab, you're working for a small clothing retailer, who are at the start of their cloud journey. They've asked you to come into their office and help them understand more about how CloudFormation works.

You're going to create a new CloudFormation stack using the information provided in the ***createstack.json*** file. The information from this file will create a S3 bucket in your AWS account called **Catpics**. Once you've completed this first objective, you'll be moving into the second one, which is where you'll modify your CloudFormation stack using the information found in the ***updatestack1.json*** file, you'll view the changes, which are going to be made and shown in the change set. When you submit the update, you'll provision your second S3 bucket, this time called **Dogpics**.

Once you have the two S3 buckets successfully configured in your lab environment, you'll proceed into the last step, which can be found in the configuration code in ***updatestack2.json*** file. This file updates our **Catpics** bucket name to be **catsareawesome**. Before executing the stack update, you'll review the change set again to see what CloudFormation is going to do before deploying the change and updating the S3 bucket.

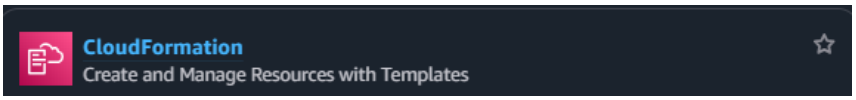
It's worth mentioning that during this lab we don't specifically delete the CloudFormation stack.

Log in to your AWS account

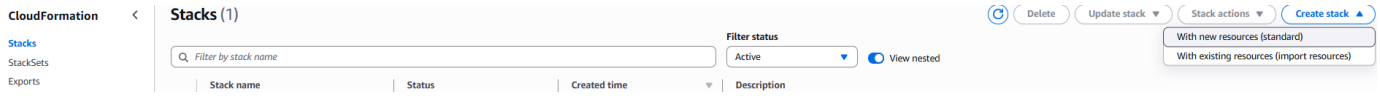


1. Create a CloudFormation Stack

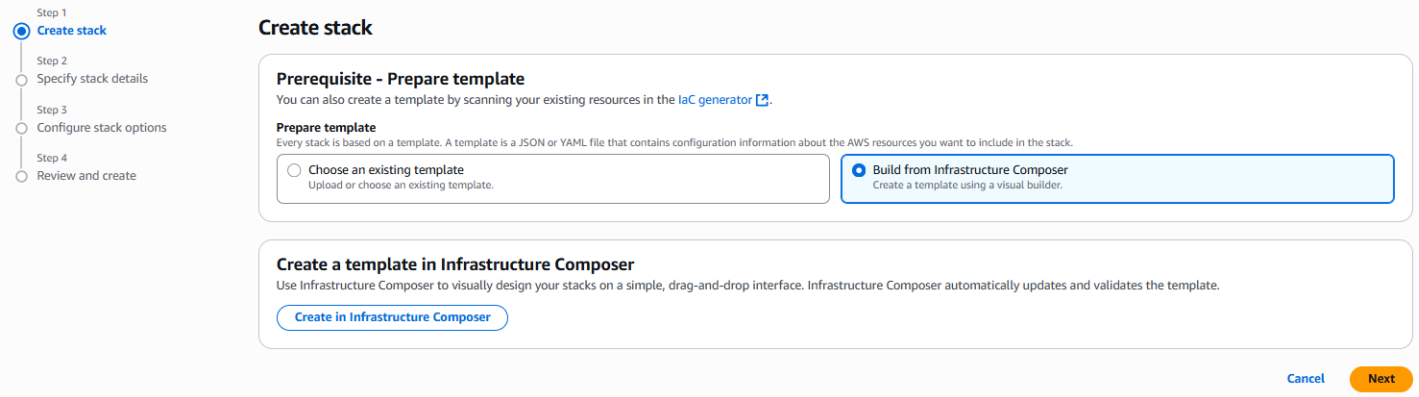
1. Once you are logged in to the AWS Management Console, navigate to **CloudFormation**.



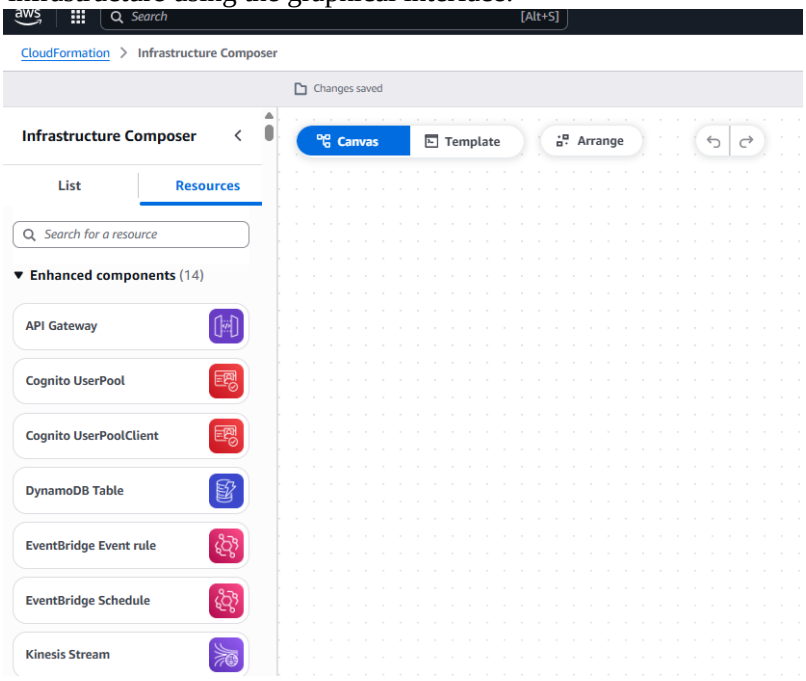
2. Click **Create stack → With new resources (standard)**.



3. Under **Prerequisite - Prepare template**, select **Build from Infrastructure Composer**.
4. Select the **Create in Infrastructure Composer** button that appears below.



5. This opens up the infrastructure composer window, which allows you to drag and drop icons and configure your infrastructure using the graphical interface.



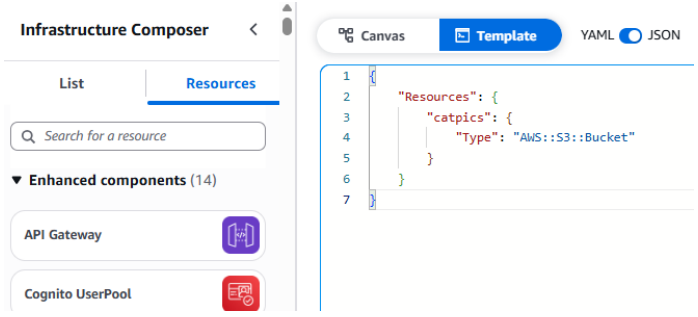
6. Instead, at the top of the page, select the **Template** button. We're going to enter our first template ourselves.

7. Navigate back to your text editor and open the ***createstack.json*** file.

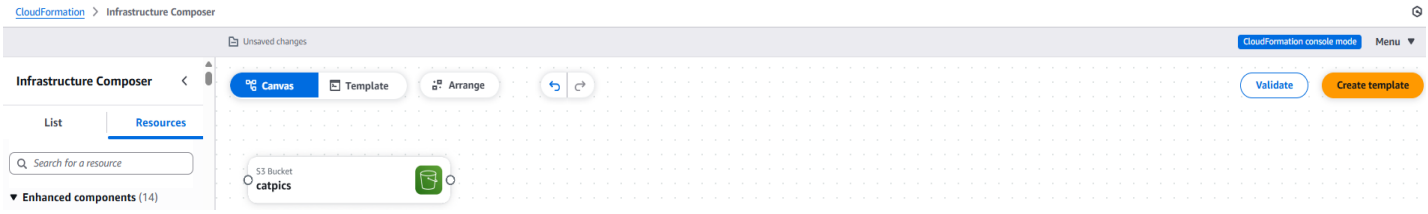
8. Copy all the information within the ***createstack.json*** file.

```
{
  "Resources": {
    "catpics": {
      "Type": "AWS::S3::Bucket"
    }
  }
}
```

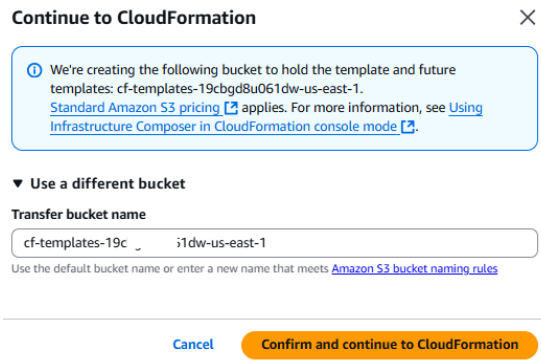
9. Navigate back to your CloudFormation browser tab, and in the template pane, delete the code and paste in the file information you just copied. JSON is automatically identified.



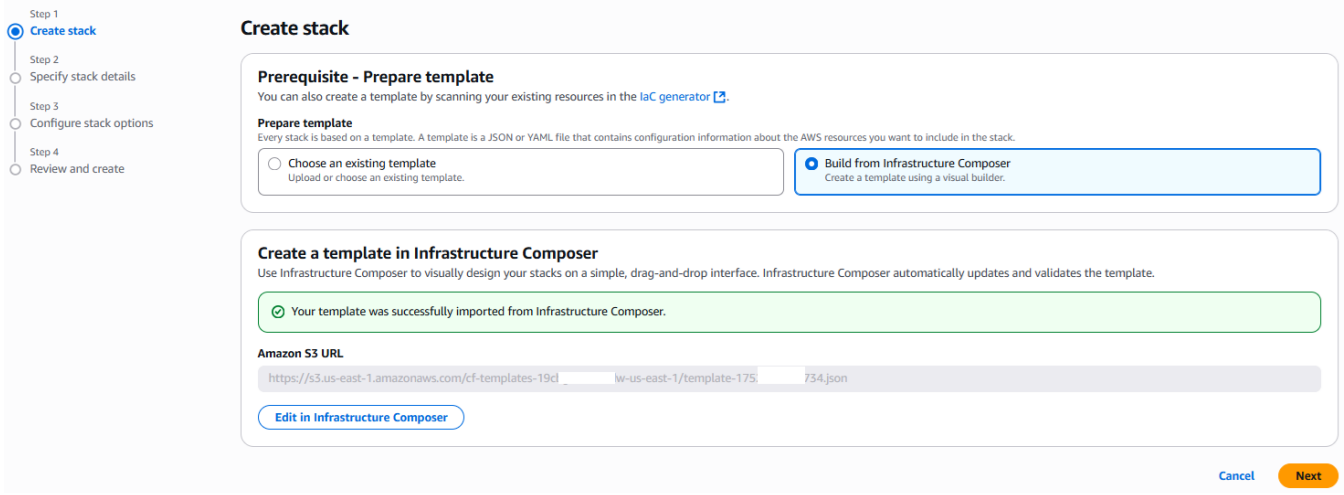
10. In **Canvas**, you can see the code represented graphically.
11. Click on **Create template**.



12. CloudFormation will use a bucket to transfer the information to. The bucket name is provided for us and we don't need to change the naming convention, so keep the bucket name as it is. Click on the **Confirm and continue to CloudFormation** button on the pop-up window.

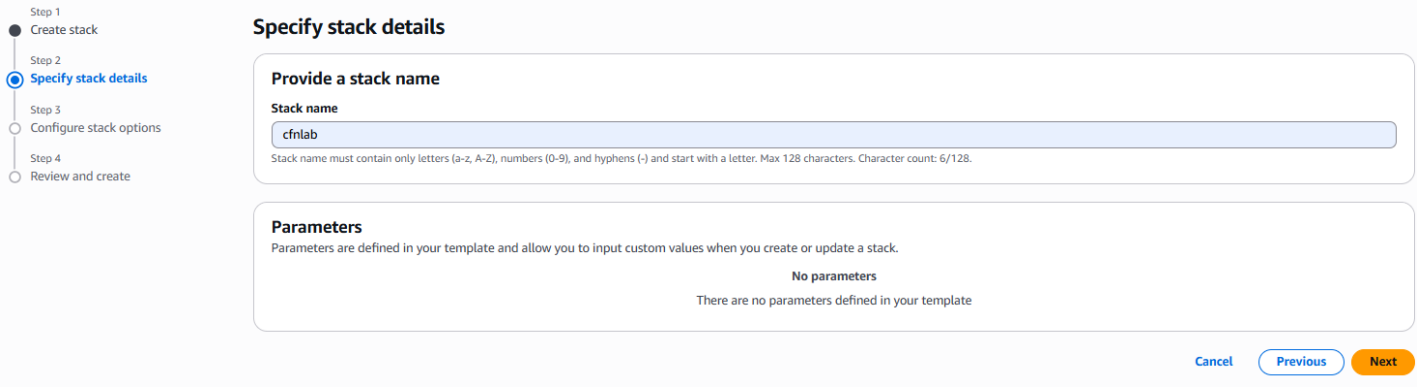


13. This has now uploaded our template file to an Amazon S3 bucket. In the bottom right corner, click **Next**.

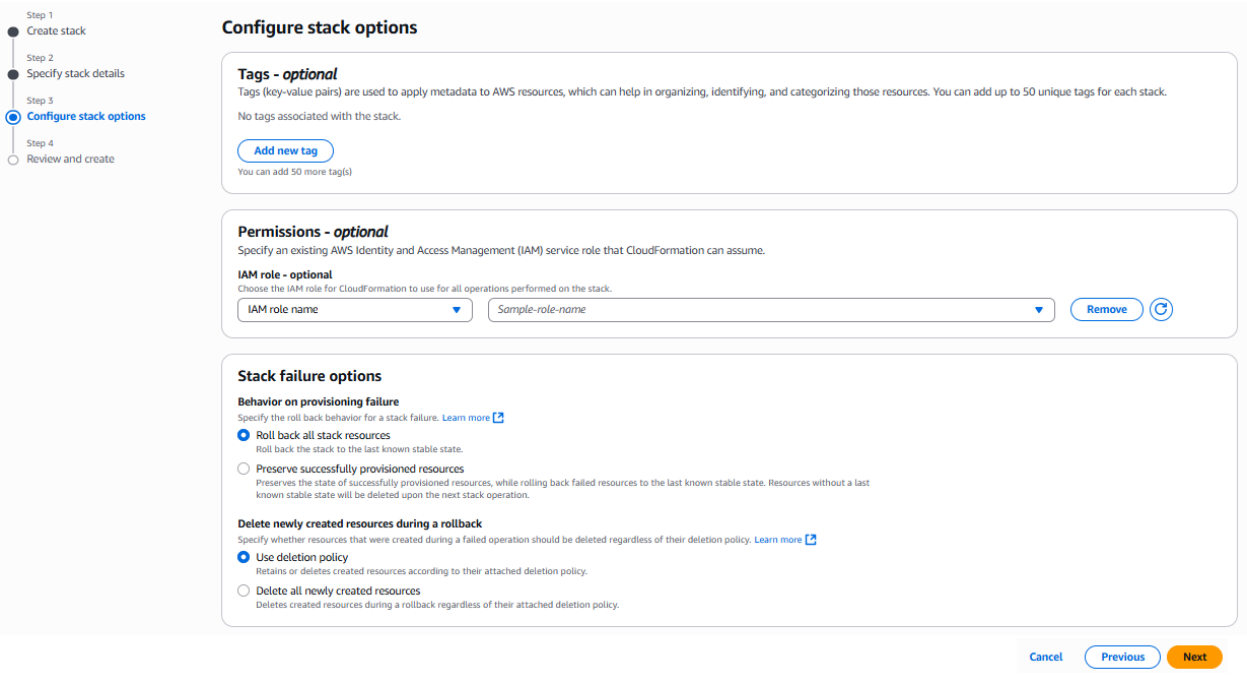


14. For **Stack name**, enter ***cfnlab***.

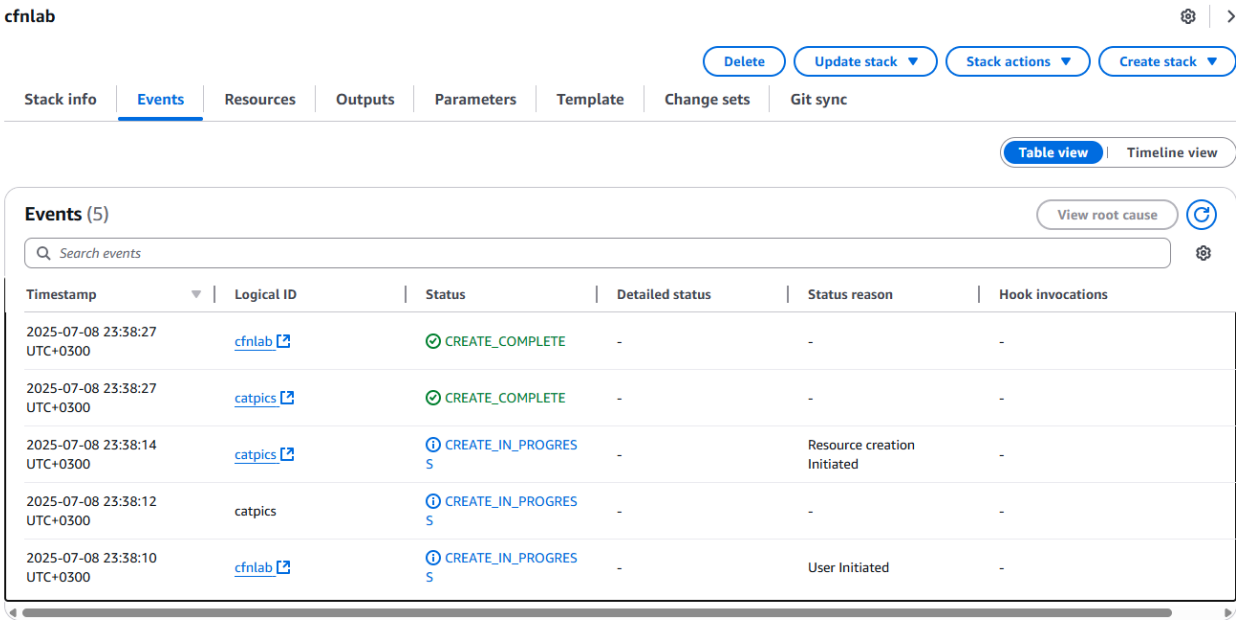
15. Click **Next**.



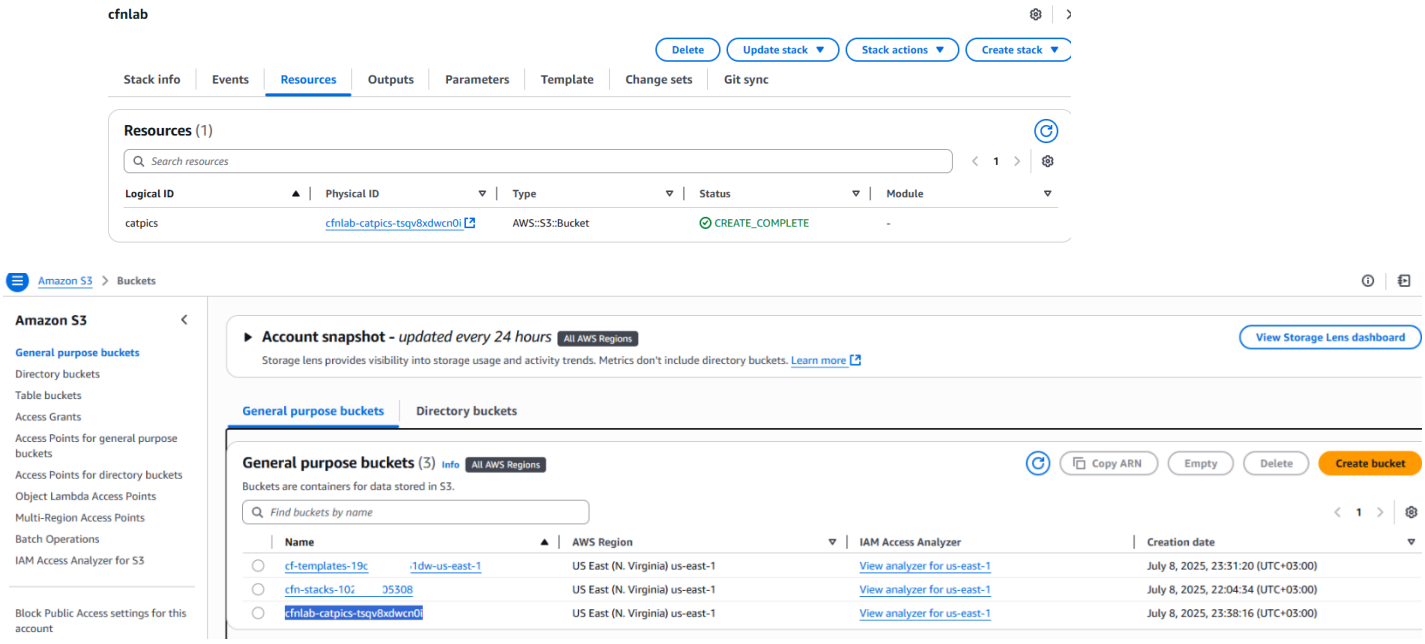
16. Scroll through the available stack options, leaving them all at the defaults, and click **Next**.



17. Review your selections, and click **Submit**.
18. Refresh the **Events** section to watch the progress. As you can see, our ***cfnlab*** stack has initiated and the resources are beginning to be created. We can see the **catpics** bucket has been created.



19. Navigate to S3 in a new browser tab. You should see the newly created ***cfnlab-catpics*** bucket.

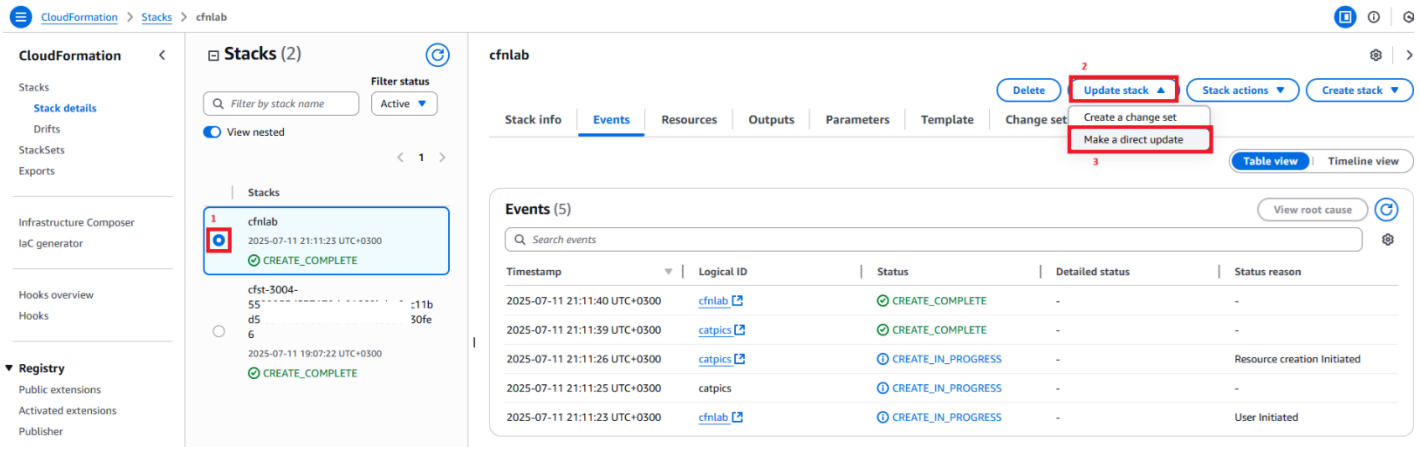


2. Update the CloudFormation Stack to Add an S3 Bucket

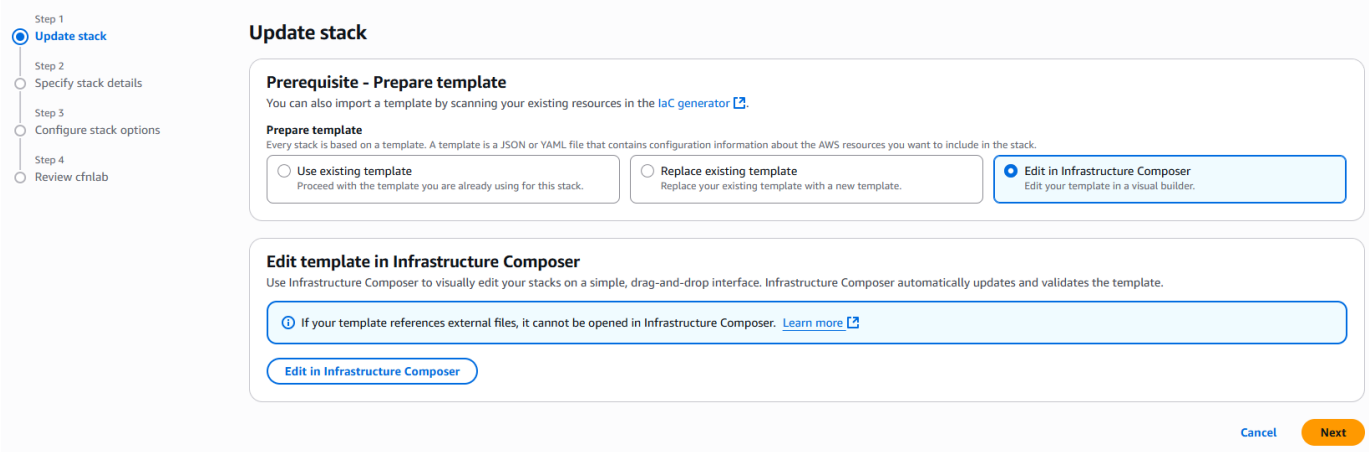
1. Navigate back to your text editor and open the ***updatestack1.json*** file.
2. Copy all the information within the ***updatestack1.json*** file. We'll create a second S3 bucket, this time it's going to be called **dogpics**.

```
{
  "Resources": {
    "catpics": {
      "Type": "AWS::S3::Bucket"
    },
    "dogpics": {
      "Type": "AWS::S3::Bucket"
    }
  }
}
```

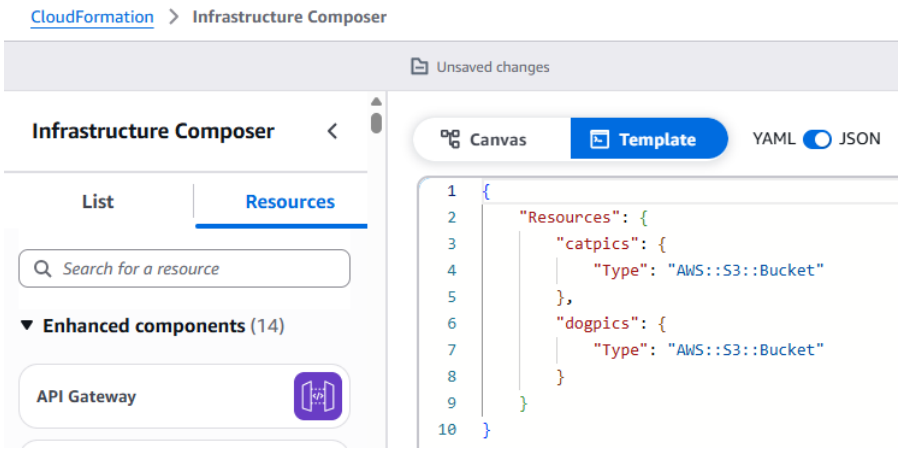
3. Navigate back to your CloudFormation browser tab, and on the left side under **Stacks**, ensure ***cfnlab*** is selected.
4. In the upper right corner, click **Update stack → Make a direct update**.



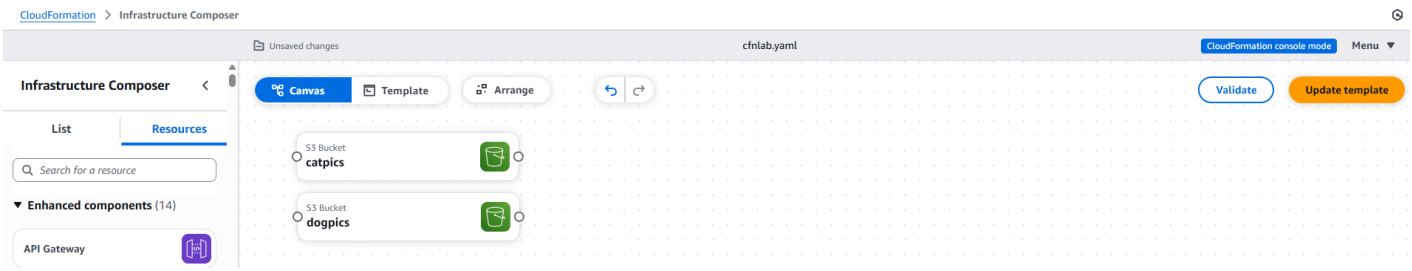
5. Under **Prerequisite - Prepare template**, select **Edit in Infrastructure Composer**.
6. Click **Edit in Infrastructure Composer**.



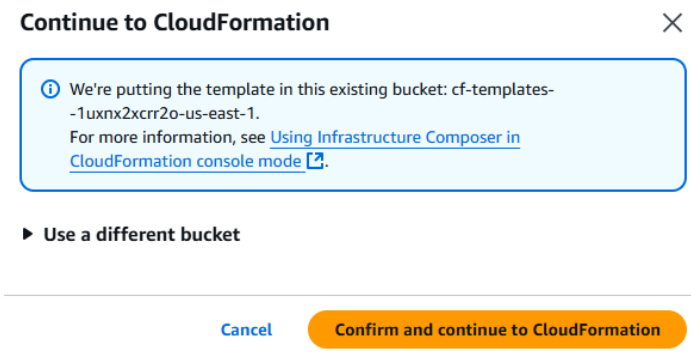
7. At the top of the page, select the **Template** button tab and then replace the current template with the template information you just copied.



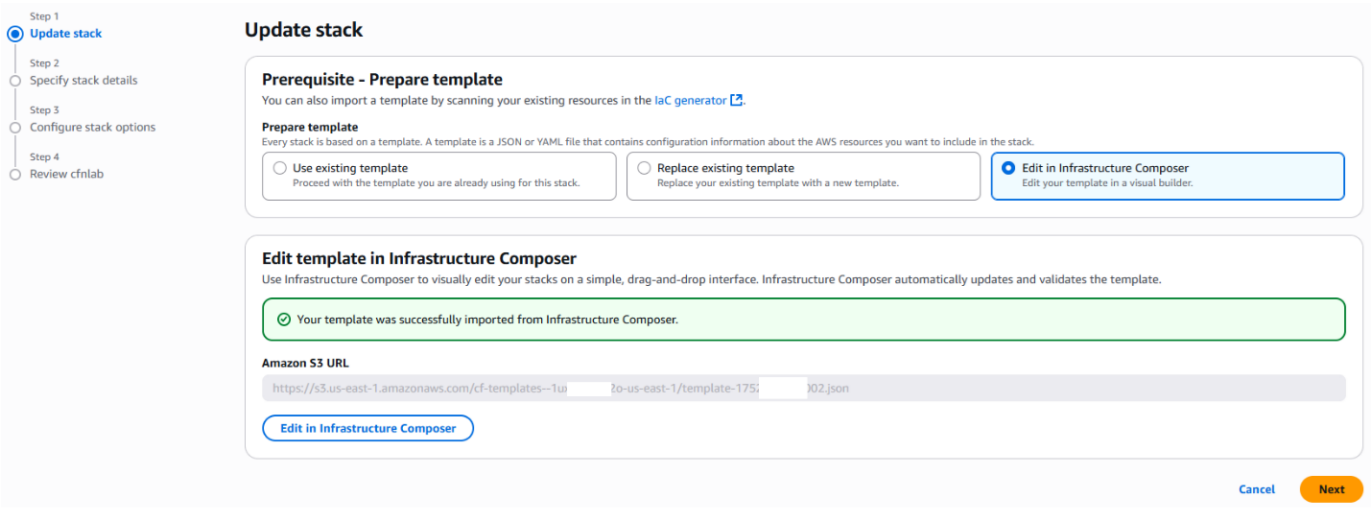
8. In **Canvas**, you can see the code represented graphically.
9. At the upper right corner, click **Update template**.

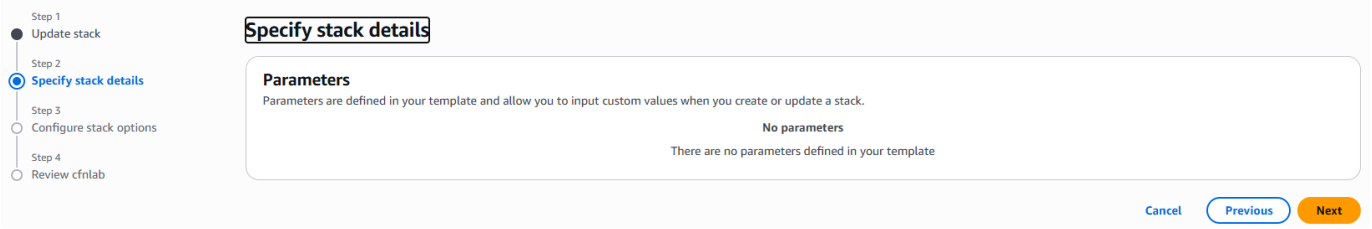


10. Click **Confirm and continue to CloudFormation**.



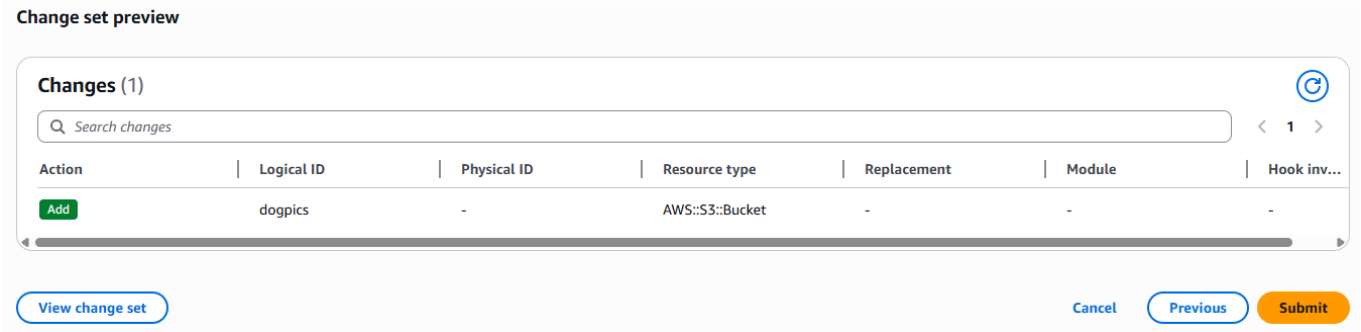
11. Click **Next** until you get to the **Review cfnlab** page.



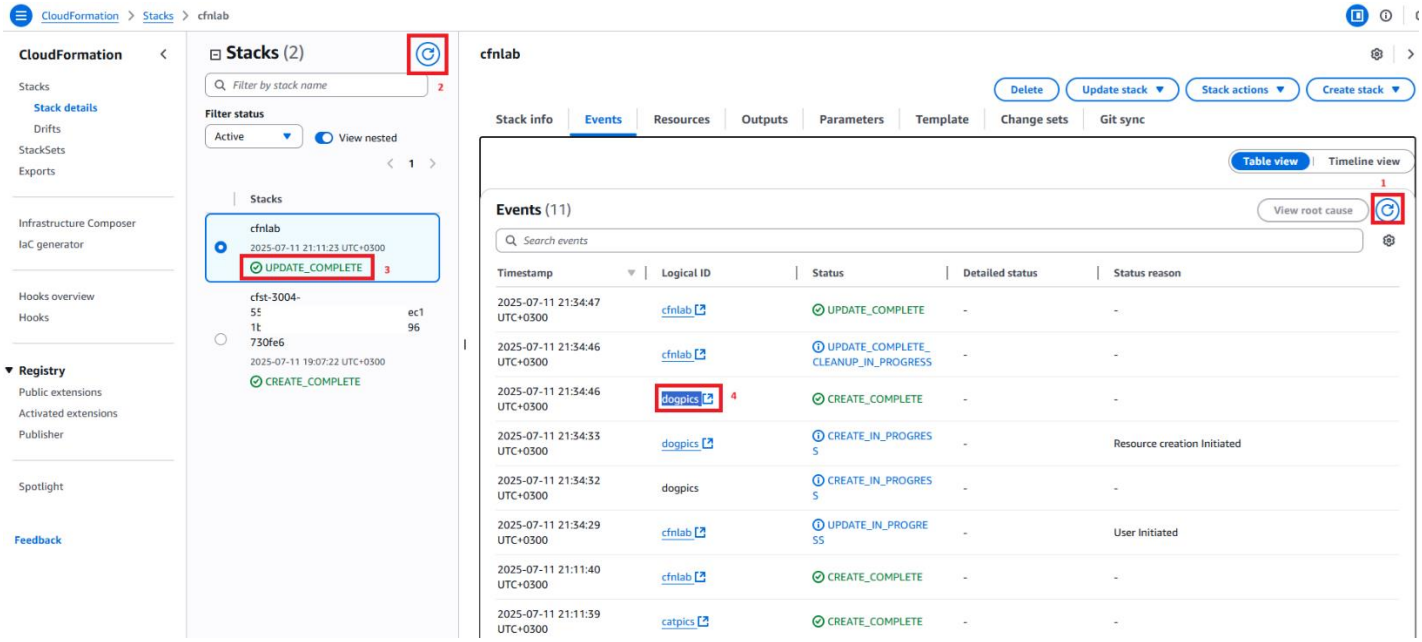


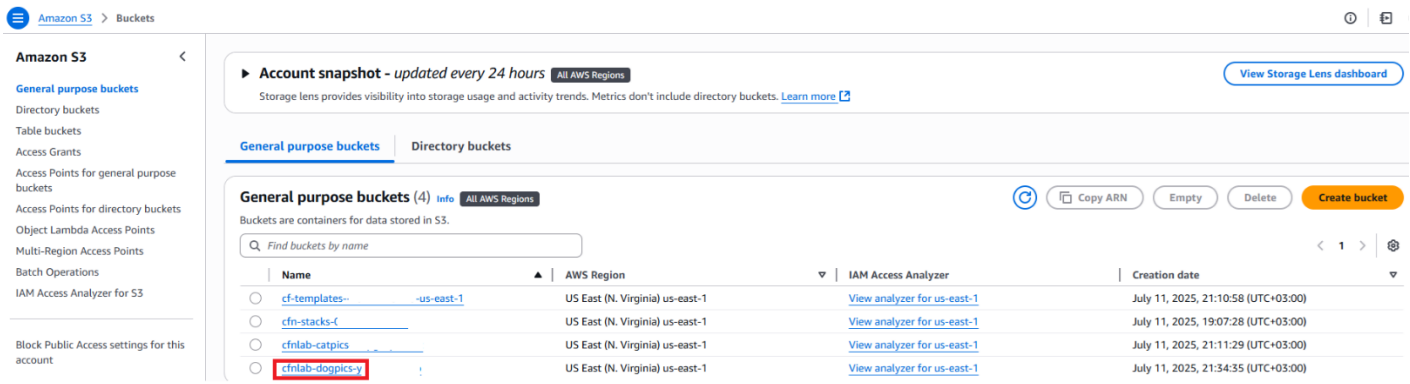
12. Scroll down to the **Change set preview** section and review the changes that will be made based on the ***updatestack1.json*** template. You should see a new **dogpics** resource will be added.

13. Click **Submit**.



14. Refresh the **Events** section to watch the progress.
15. Once it's finished updating, click on the refresh button on the left side next to **Stacks**. Under ***cfnlab***, you should see the update is complete.
16. Navigate to the S3 browser tab and refresh the page. You should see the new **dogpics** bucket.



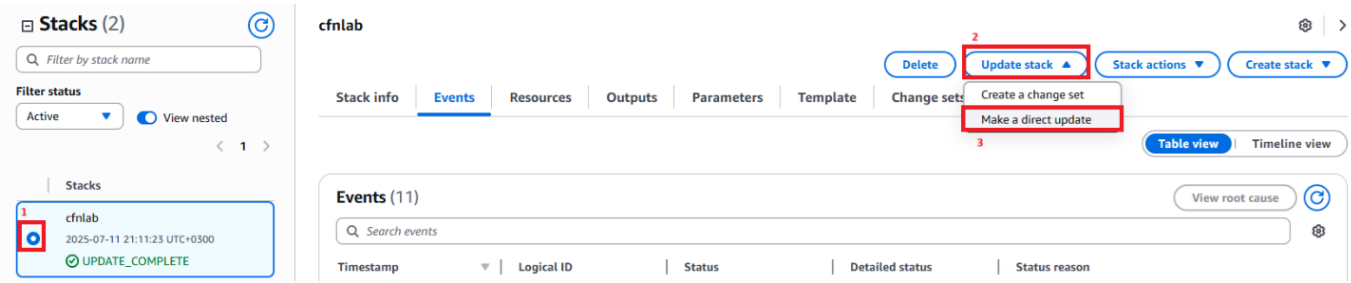


3. Update the CloudFormation Stack to Rename the S3 Bucket

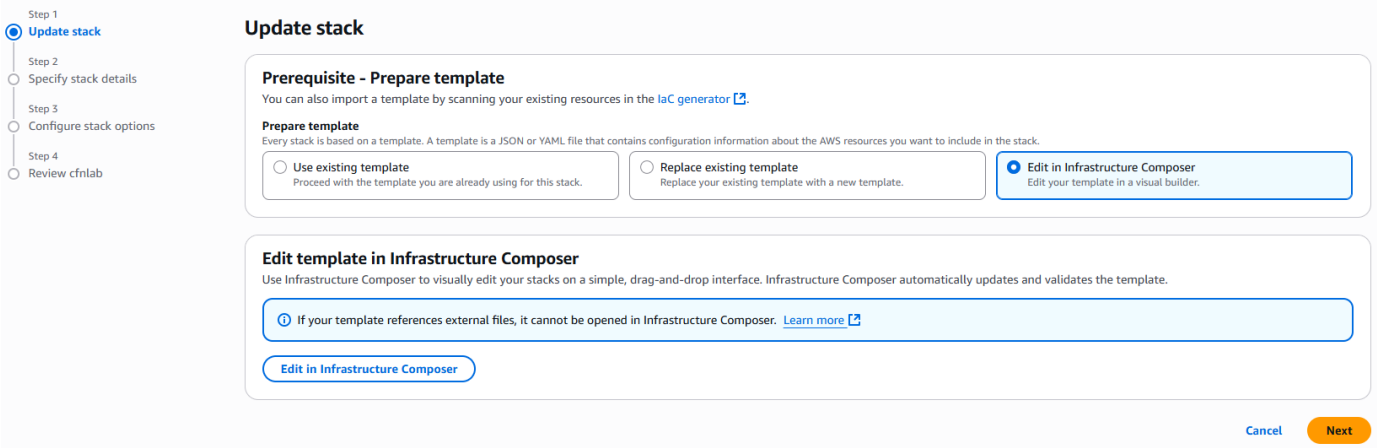
1. Open the ***updatestack2.json*** file in a text editor.
2. Change or add to the **123** characters in **catsareawesome123** to something unique (e.g., a string of random alphanumeric characters such as **catsareawesome123thisismybucketforgarfield<add-random-numbers>**). But to see the importance of unique names, we will keep for the moment "**catsareawesome123**".
3. Copy the contents of the file, and navigate back to the CloudFormation browser tab.

```
{
   "Resources": {
      "catpics": {
         "Type": "AWS::S3::Bucket",
         "Properties": {
            "BucketName": "catsareawesome123"
         }
      },
      "dogpics": {
         "Type": "AWS::S3::Bucket"
      }
   }
}
```

4. On the left side under **Stacks**, ensure ***cfnlab*** is selected.
5. In the upper right corner, click **Update**.



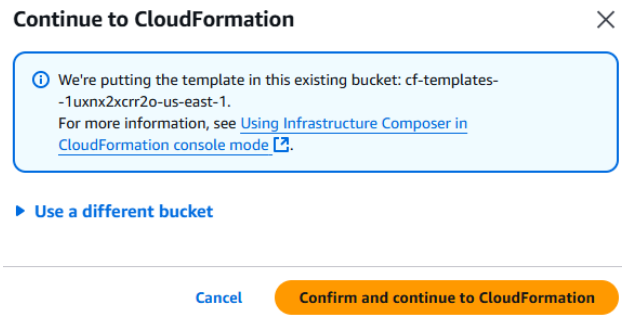
6. Under **Prerequisite - Prepare template**, select **Edit in Infrastructure Composer**.
7. Click **Edit in Infrastructure Composer**.



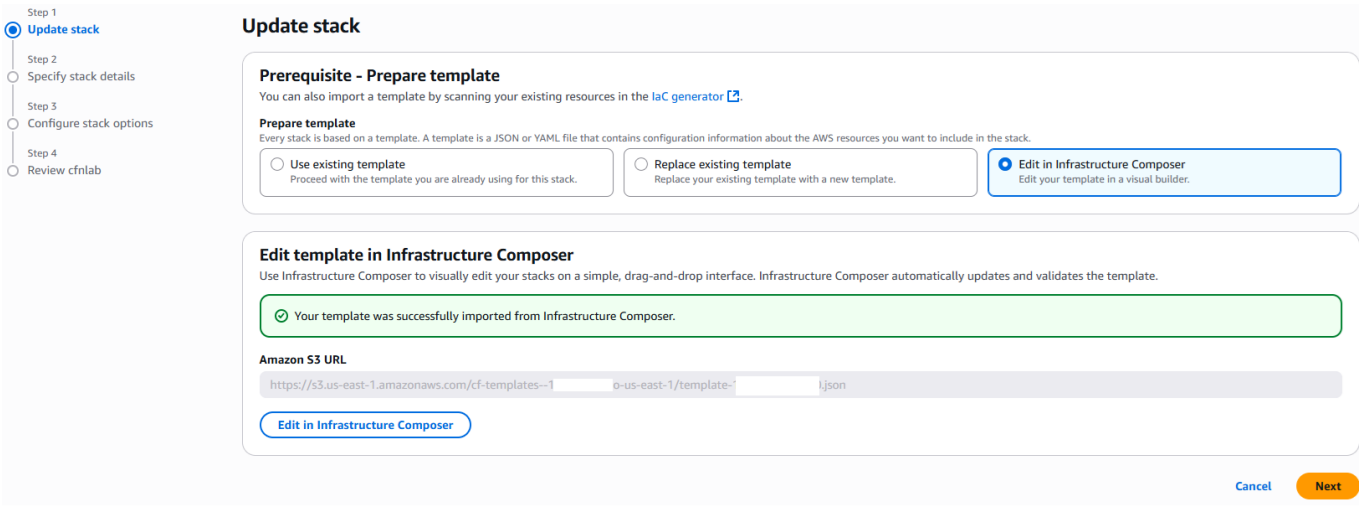
8. At the top of the page, select the **Template** button tab and then replace the current template with the template information you just copied.

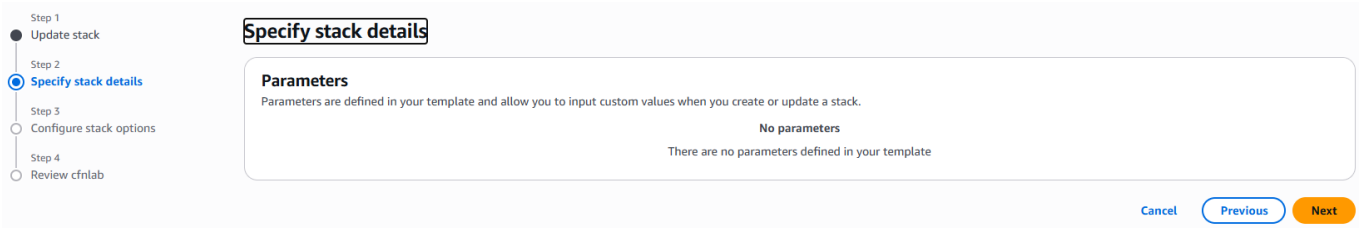
9. Up the upper right corner, click **Update template**.

10. Click **Confirm and continue to CloudFormation**.

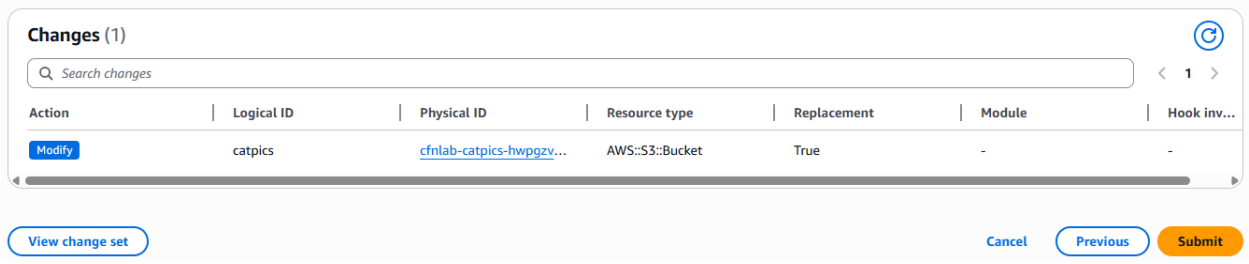


11. Click **Next** until you get to the **Review cfnlab page**.

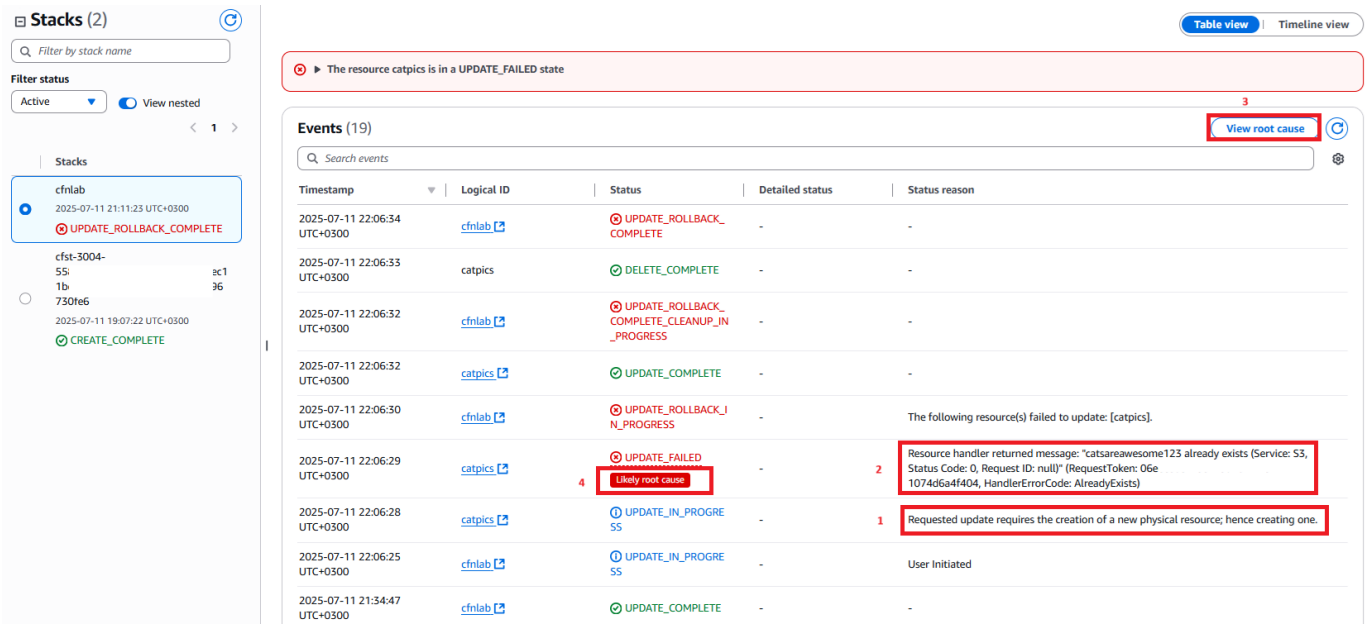




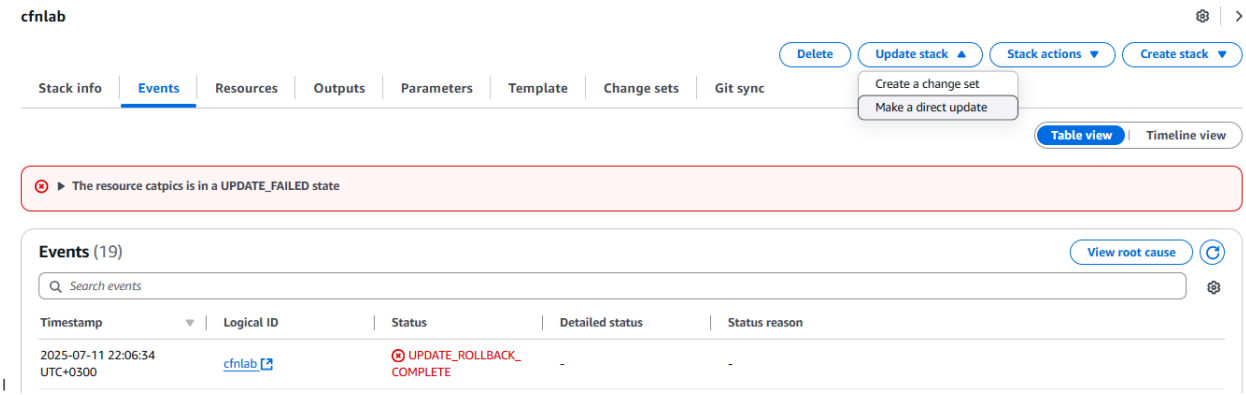
12. Scroll down to the **Change set preview** section and review the changes. Under **Replacement**, you should see **True** is displayed (this means that you cannot rename an S3 bucket). This means AWS is going to create a new S3 bucket (**catsareawesome123**) and delete the old bucket (**catpics**).
13. Click **Submit**.



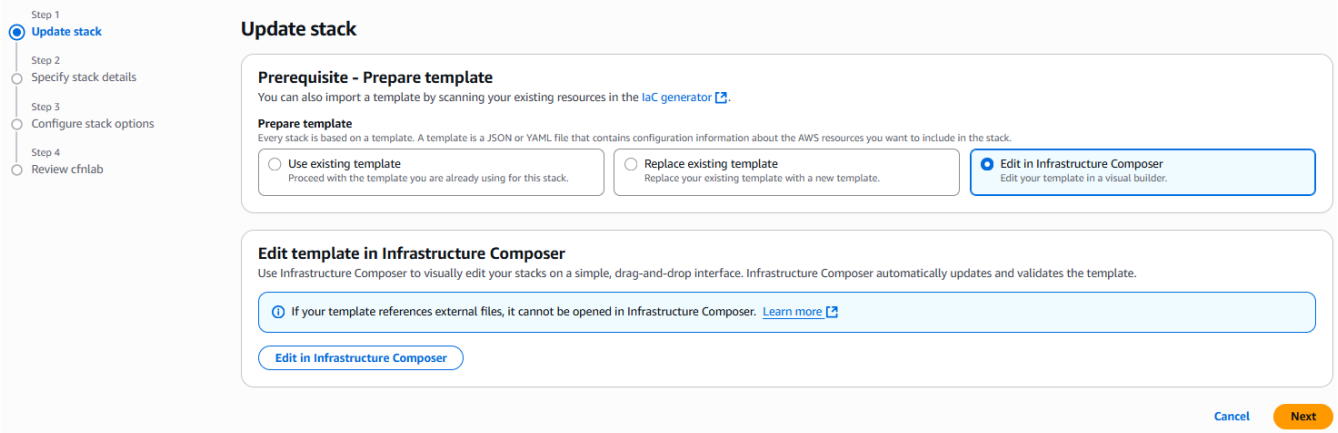
14. The request has been initiated, and it's noted that "Requested update requires the creation of a new physical resource". Unfortunately, someone already has "**catsareawesome123**" S3 bucket. So, this is not going to work. Amazon provides a "**View root cause**" button at the top. By clicking on this, it will show us what the likely root cause is for why your CloudFormation stack has failed.



15. Let’s click on **Update stack** again.
16. Click **Make a direct update**.

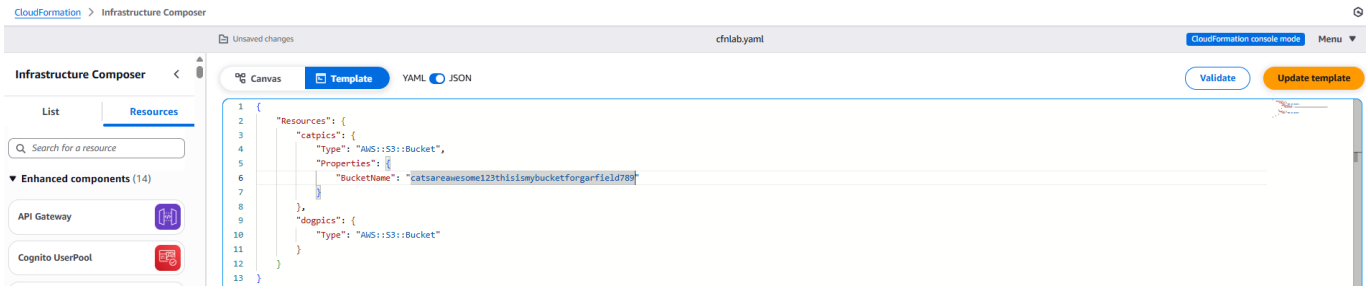


17. Under **Prerequisite - Prepare template**, select **Edit in Infrastructure Composer**.
18. Click **Edit in Infrastructure Composer**.

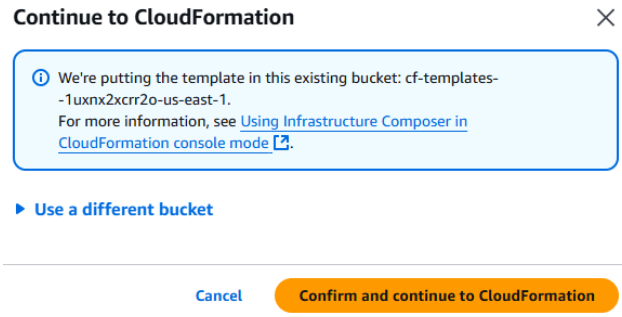


19. At the top of the page, select the **Template** button tab and then replace the current template with the template information you just copied from ***updatestack2.json***. Keep the recommendation from the beginning, such as **catsareawesome123thisismybucketforgarfield<add-random-numbers>**).

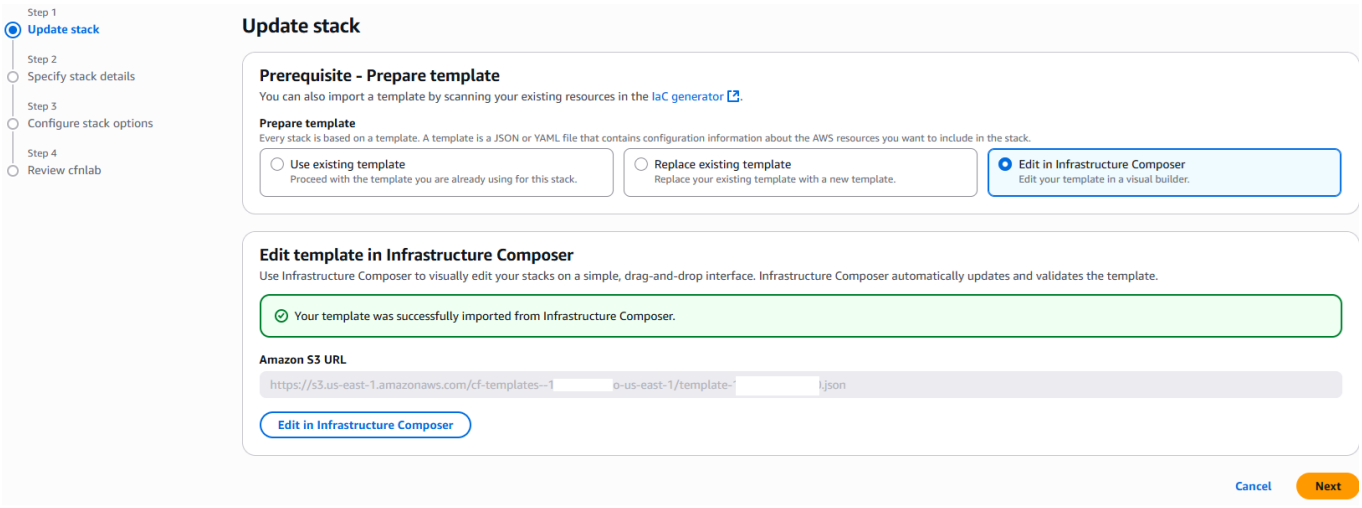
20. Up the upper right corner, click **Update template**.

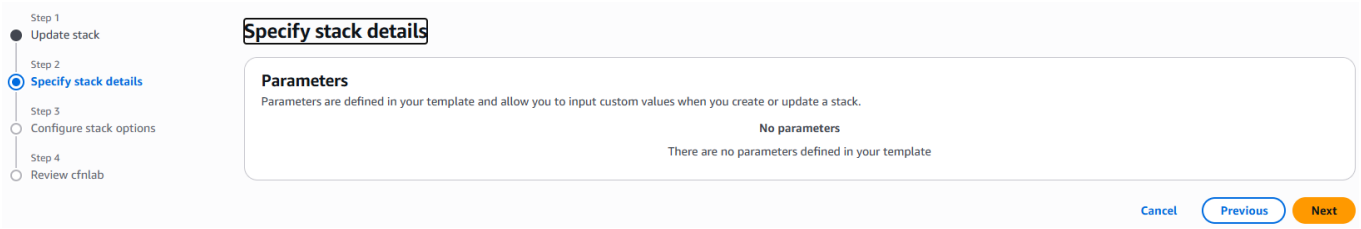


21. Click **Confirm and continue to CloudFormation**.



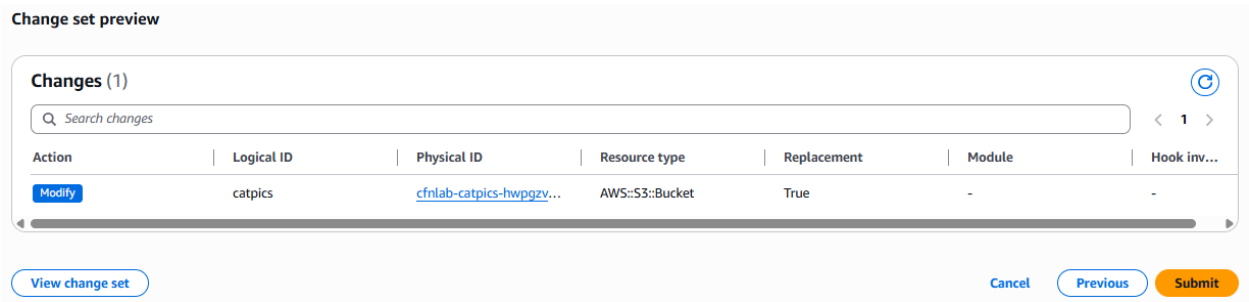
22. Click **Next** until you get to the **Review cfnlab page**.



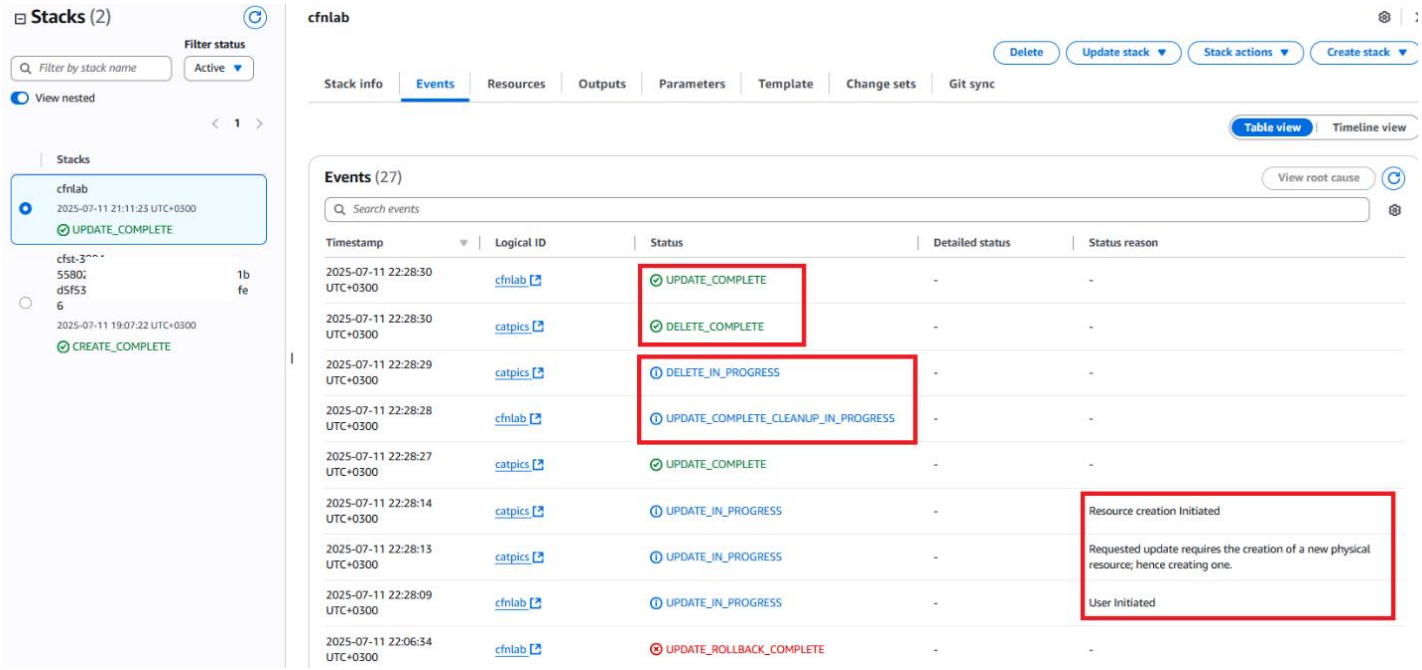


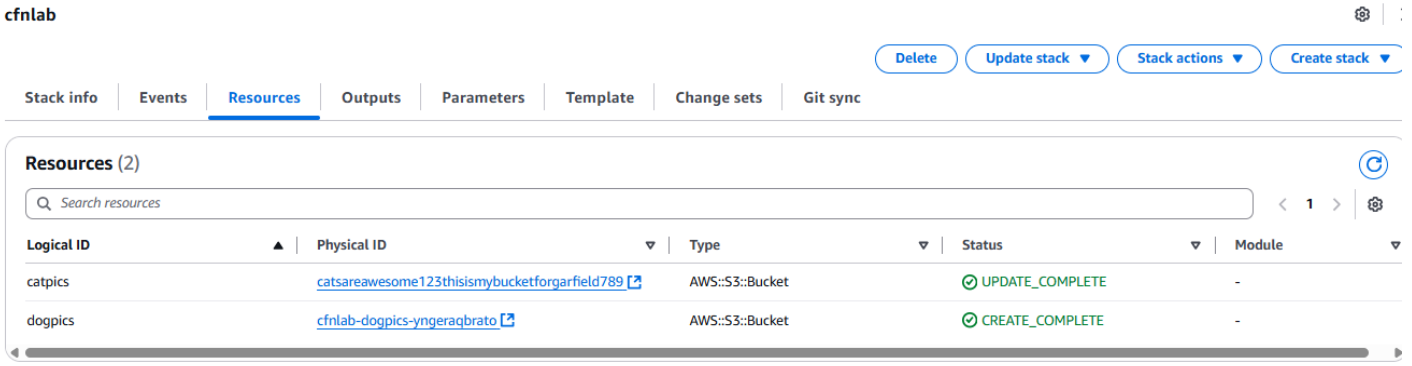
23. Scroll down to the **Change set preview** section and review the changes. Under **Replacement**, you should see **True** is displayed (this means that you cannot rename an S3 bucket).

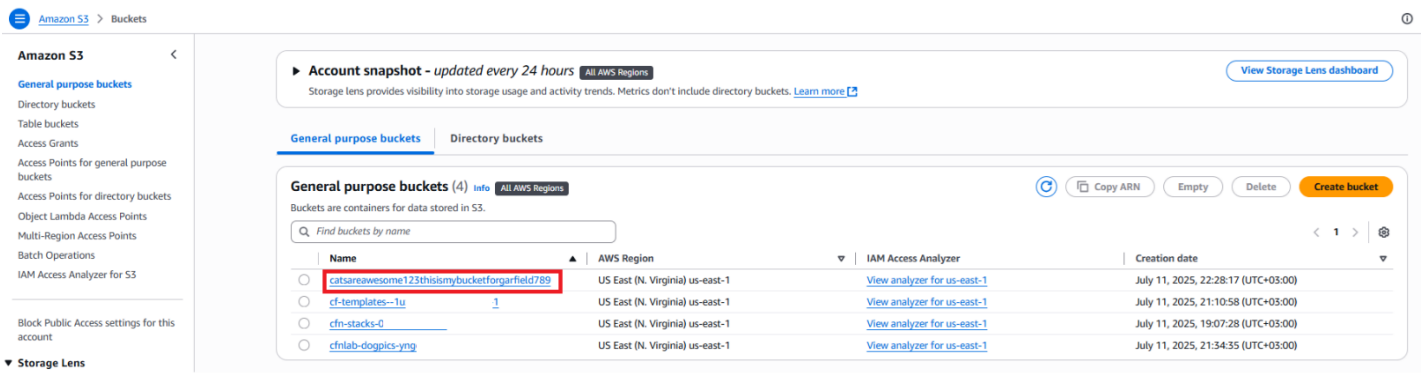
24. Click **Submit**.



25. This time our update is complete. You should now see the **catsareawesome123thisismybucketforgarfield(with your chosen string)** bucket, and see the **catpics** bucket was deleted.


Stacks (2)
Filter status
Filter by stack name
Active
View nested
Stacks
cfnlab
2025-07-11 21:11:23 UTC+0300
UPDATE_COMPLETE
2025-07-11 19:07:22 UTC+0300
CREATE_COMPLETE
cfnlab
Delete
Update stack
Stack actions
Create stack
Stack info
Events
Resources
Outputs
Parameters
Template
Change sets
Git sync
Table view
Timeline view
Events (27)
View root cause
Search events
Timestamp
Logical ID
Status
Detailed status
Status reason
2025-07-11 22:28:30 UTC+0300
cfnlab
UPDATE_COMPLETE
2025-07-11 22:28:30 UTC+0300
catpics
DELETE_COMPLETE
2025-07-11 22:28:29 UTC+0300
catpics
DELETE_IN_PROGRESS
2025-07-11 22:28:28 UTC+0300
cfnlab
UPDATE_COMPLETE_CLEANUP_IN_PROGRESS
2025-07-11 22:28:27 UTC+0300
catpics
UPDATE_COMPLETE
2025-07-11 22:28:14 UTC+0300
catpics
UPDATE_IN_PROGRESS
Resource creation Initiated
2025-07-11 22:28:13 UTC+0300
catpics
UPDATE_IN_PROGRESS
Requested update requires the creation of a new physical resource; hence creating one.
2025-07-11 22:28:09 UTC+0300
cfnlab
UPDATE_IN_PROGRESS
User Initiated
2025-07-11 22:06:34 UTC+0300
cfnlab
UPDATE_ROLLBACK_COMPLETE


cfnlab
Delete
Update stack
Stack actions
Create stack
Stack info
Events
Resources
Outputs
Parameters
Template
Change sets
Git sync
Resources (2)
Search resources
Logical ID
Physical ID
Type
Status
Module
catpics
catsareawesome123thisismybucketforgarfield789
AWS::S3::Bucket
UPDATE_COMPLETE
dogpics
cfnlab-dogpics-yngeraqbrato
AWS::S3::Bucket
CREATE_COMPLETE


Amazon S3
Buckets
Amazon S3
General purpose buckets
Directory buckets
Table buckets
Access Grants
Access Points for general purpose buckets
Access Points for directory buckets
Object Lambda Access Points
Multi-Region Access Points
Batch Operations
IAM Access Analyzer for S3
Block Public Access settings for this account
Storage Lens
Account snapshot - updated every 24 hours
All AWS Regions
Storage lens provides visibility into storage usage and activity trends. Metrics don't include directory buckets. Learn more
View Storage Lens dashboard
General purpose buckets
Directory buckets
General purpose buckets (4)
Info
All AWS Regions
Buckets are containers for data stored in S3.
Copy ARN
Empty
Delete
Create bucket
Find buckets by name
Name
AWS Region
IAM Access Analyzer
Creation date
catsareawesome123thisismybucketforgarfield789
US East (N. Virginia) us-east-1
View analyzer for us-east-1
July 11, 2025, 22:28:17 (UTC+03:00)
cf-templates--1u
US East (N. Virginia) us-east-1
View analyzer for us-east-1
July 11, 2025, 21:10:58 (UTC+03:00)
cfn-stacks-0
US East (N. Virginia) us-east-1
View analyzer for us-east-1
July 11, 2025, 19:07:28 (UTC+03:00)
cfnlab-dogpics-yng
US East (N. Virginia) us-east-1
View analyzer for us-east-1
July 11, 2025, 21:34:35 (UTC+03:00)