

# CloudFormation



# CloudFormation

## Infrastructure as Code

- Currently, we have been doing a lot of manual work
- All this manual work will be very tough to reproduce:
  - In another region
  - In another AWS account
  - Within the same region if everything was deleted
- Wouldn't it be great, if all our infrastructure was... code?
- That code would be used to create / update / delete our infrastructure

# What is CloudFormation



- CloudFormation is a declarative way of outlining your AWS Infrastructure, for any resources (most of them are supported).
- For example, within a CloudFormation template, you say:
  - I want a security group
  - I want two EC2 machines using this security group
  - I want two Elastic IPs for these EC2 machines
  - I want an S3 bucket
  - I want a load balancer (ELB) in front of these machines
- Then CloudFormation creates those for you, in the right order, with the exact configuration that you specify

## Benefits of AWS CloudFormation (1/2)

- Infrastructure as code
  - No resources are manually created, which is excellent for control
  - The code can be version controlled for example using git
  - Changes to the infrastructure are reviewed through code
- Cost
  - Each resources within the stack is tagged with an identifier so you can easily see how much a stack costs you.
  - You can estimate the costs of your resources using the CloudFormation template
  - Savings strategy: In Dev, you could automate the deletion of templates at 5 PM and recreated at 8 AM, safely



## Benefits of AWS CloudFormation (2/2)

- Productivity
  - Ability to destroy and re-create an infrastructure on the cloud on the fly
  - Automated generation of Diagram for your templates!
  - Declarative programming (no need to figure out ordering and orchestration)
- Separation of concern: create many stacks for many apps, and many layers. Ex:
  - VPC stacks
  - Network stacks
  - App stacks
- Don't re-invent the wheel
  - Leverage existing templates on the web!
  - Leverage the documentation

## How CloudFormation Works

- Templates have to be uploaded in S3 and then referenced in CloudFormation
- To update a template, we can't edit previous ones. We have to re-upload a new version of the template to AWS
- Stacks are identified by a name
- Deleting a stack deletes every single artifact that was created by CloudFormation.

# Deploying CloudFormation templates

- Manual way:
  - Editing templates in the CloudFormation Designer
  - Using the console to input parameters, etc
- Automated way:
  - Editing templates in a YAML file
  - Using the AWS CLI (Command Line Interface) to deploy the templates
  - Recommended way when you fully want to automate your flow



# CloudFormation Building Blocks

- **Templates components**

- Resources: your AWS resources declared in the template (MANDATORY)
- Parameters: the dynamic inputs for your template
- Mappings: the static variables for your template
- Outputs: References to what has been created
- Conditionals: List of conditions to perform resource creation
- Metadata

- **Templates helpers:**

- References
- Functions

<https://docs.aws.amazon.com/AWSCloudFormation/latest/UserGuide/resources-section-structure.html>

## JSON

```
"Resources" : {  
  "Logical ID" : {  
    "Type" : "Resource type",  
    "Properties" : {  
      Set of properties  
    }  
  }  
}
```

## YAML

```
Resources:  
  Logical ID:  
    Type: Resource type  
    Properties:  
      Set of properties
```

<https://aws.amazon.com/cloudformation/aws-cloudformation-templates/>

# CloudFormation Hands-On

CloudFormation ×

Stacks

StackSets

Exports

Designer

Previous console

Feedback

📘

Welcome to the redesigned AWS CloudFormation console

We've completely redesigned the console to improve the overall look and feel. [Let us know what you think!](#) Or, [switch to the previous console.](#)

×

CloudFormation > Stacks

Stacks (0)

🔄

Actions ▾

Create stack

Active ▾

🔍 Filter stacks

⚙️

Stack name	Status	Created time	▾	Description
<div><div>Empty stacks</div><div>No stacks to display</div><div>Create stack</div></div>				





CloudFormation X

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CloudFormation > Stacks

Stacks (0)

Active ▾

Filter stocks

Refresh

Actions ▾

Create stack

Stack name	Status	Created time	Description
<div>Empty stacks</div> <div>No stacks to display</div> <div>Create stack</div>			

Click Here



CloudFormation > Stacks > Create stack

Step 1  
Specify template

Step 2  
Specify stack details

Step 3  
Configure stack options

Step 4  
Review

## 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

Amazon S3 URL

### 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

Choose file



No file chosen

JSON file

Click Here

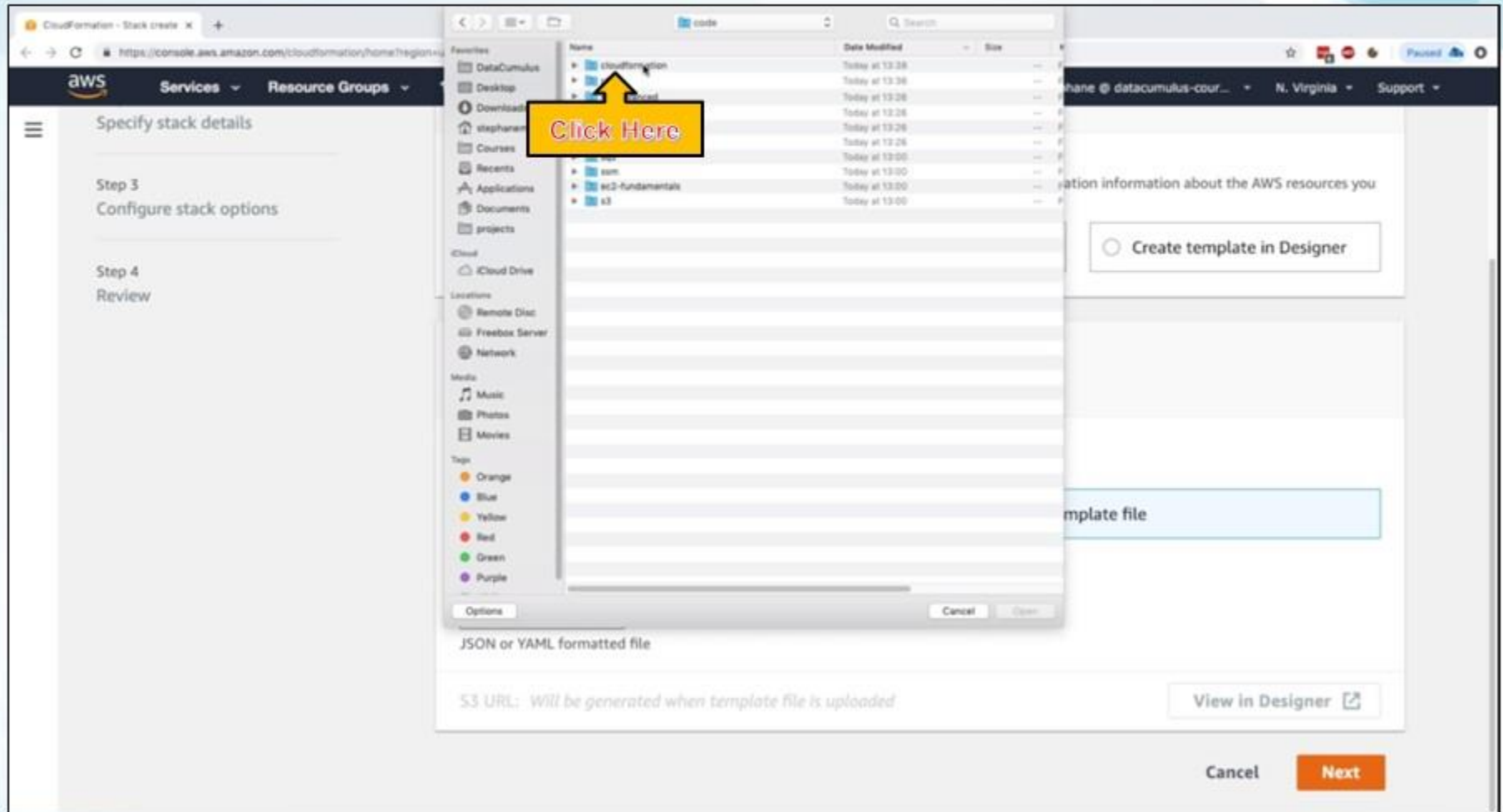
S3 URL: Will be generated when template file is uploaded

View in Designer

Cancel

Next





The screenshot shows the AWS CloudFormation console in the 'Specify stack details' step. A file explorer window is open, displaying a list of files. A yellow arrow points to the file '1-ec2-with-sg-elp.yaml' with the text 'Click Here'.

The file explorer window shows the following files:

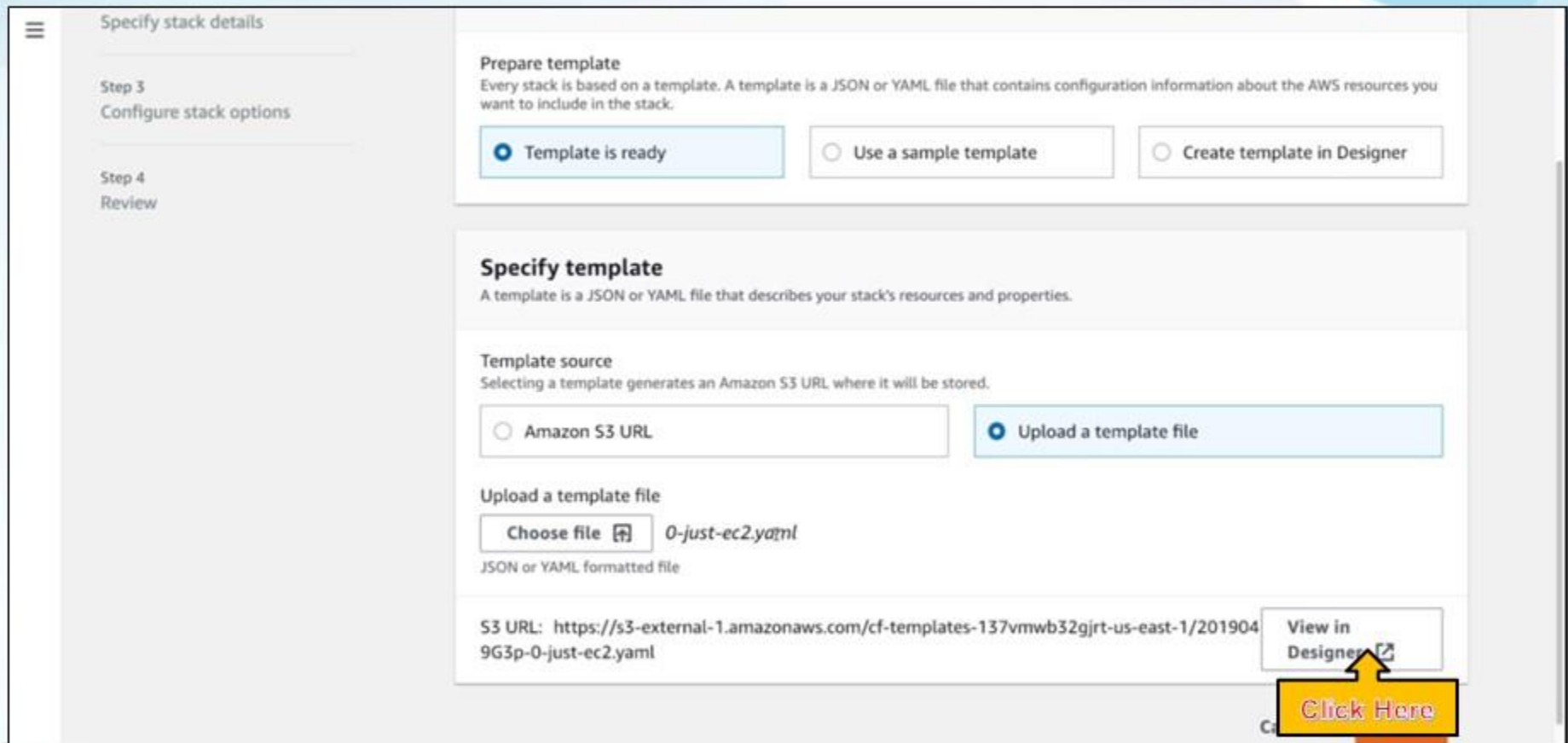
Name	Date Modified	Size
1-ec2-with-sg-elp.yaml	Today at 13:38	1 KB
0-just-ec2.yaml	Today at 13:38	106 bytes

The AWS console shows the following steps:

- Step 3: Configure stack options
- Step 4: Review

The console also displays the following options:

- ☐ Create template in Designer
- template file
- JSON or YAML formatted file
- SS URL: Will be generated when template file is uploaded
- View in Designer
- Cancel
- Next







CloudFormation ×

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CloudFormation > Stacks

Stacks (0)

Active ▾

Stack name

Status

Created time

▾

Description

↻

Actions ▾

Create stack

Click Here

CloudFormation > Stacks > Create stack

Step 1

**Specify template**

Step 2

Specify stack details

Step 3

Configure stack options

Step 4

Review

## 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

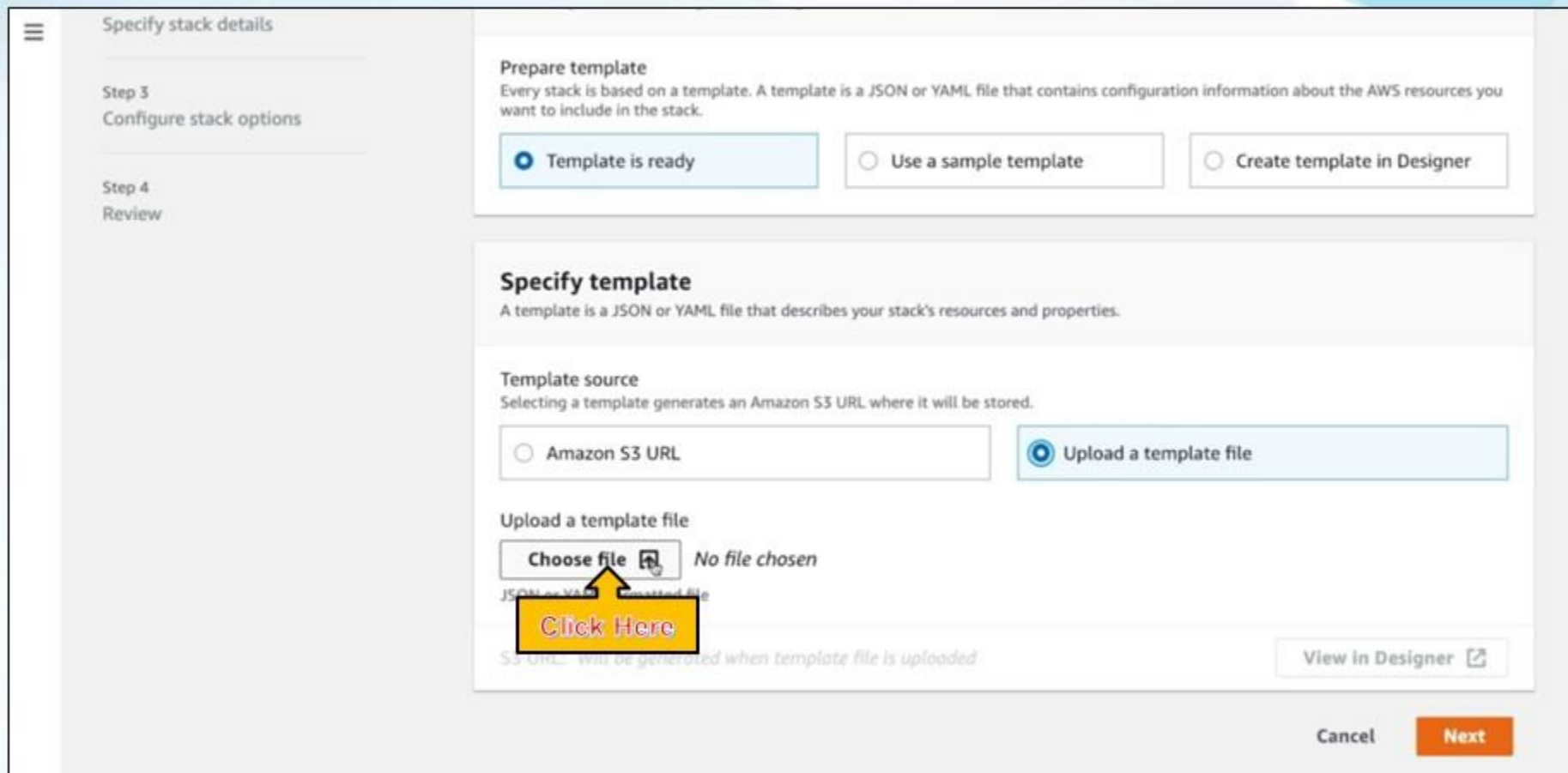
### Specify template

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

Amazon S3 URL



The screenshot shows the AWS CloudFormation console in the 'Specify stack details' step. The left sidebar contains the AWS logo, 'Services', and 'Resource Groups'. The main content area shows 'Step 3: Configure stack options' and 'Step 4: Review'. A file explorer window is open, showing a list of files. A yellow arrow points to the file '0-just-ec2.yaml' with the text 'Click Here'.

Name	Date Modified	Size
1-ec2-with-sg-elb.yaml	Today at 13:38	1 KB
0-just-ec2.yaml	Today at 13:38	160 bytes

JSON or YAML formatted file



Specify stack details

Step 3

Configure stack options

Step 4

Review

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

Choose file

0-just-ec2.yaml

JSON or YAML formatted file

S3 URL: https://s3-external-1.amazonaws.com/cf-templates-137vmwb32girt-us-east-1/2019049sUI-0-just-ec2.yaml

View in Designer

Cancel

Next

Click Here

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CloudFormation > Stacks > Create stack

Step 1  
Specify template

Step 2  
Specify stack details

Step 3  
Configure stack options

Step 4  
Review

## Specify stack details

### Stack name

Stack name

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.

No parameters

There are no parameters defined in your template

Cancel

Previous

Next

Click Here

## Advanced options

You can set additional options for your stack, like notification options and a stack policy. [Learn more.](#)

### ► Stack policy

Defines the resources that you want to protect from unintentional updates during a stack update.

### ► Rollback configuration

Specify alarms for CloudFormation to monitor when creating and updating the stack. If the operation breaches an alarm threshold, CloudFormation rolls it back. [Learn more.](#)

### ► Notification options

### ► Stack creation options

Cancel

Previous

Next

Click Here

## Notification options

No notification options  
There are no notification options defined

## Stack creation options

Rollback on failure

Enabled

Timeout

-

Termination protection

Disabled

► Quick-create link

Cancel

Previous

Create change set

Create stack

Click Here

## CloudFormation ×

### Stacks

**Stack details**

Change sets

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CloudFormation > Stacks > MyDemoTemplate: Stack details

## MyDemoTemplate

Actions ▼

Stack info

**Events**

Resources

Outputs

Parameters

Template

### Events

Timestamp



Logical ID

Status

Status reason

18 Feb 2019 12:41:01

MyDemoTemplate

 CREATE\_IN\_PROGR  
ESS

User Initiated



Click Here

# CloudFormation X

Stacks

Stack details

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CloudFormation > Stacks > MyDemoTemplate: Stack details

## MyDemoTemplate

Actions ▼

Stack info

Events

Resources

Outputs

Parameters

Template

### Events

Search events

Timestamp	Logical ID	Status	Status reason
18 Feb 2019 12:41:07	MyInstance	CREATE_IN_PROGRESS	Resource creation Initiated
18 Feb 2019 12:41:05	MyInstance	CREATE_IN_PROGRESS	-
18 Feb 2019 12:41:01	MyDemoTemplate	CREATE_IN_PROGRESS	User Initiated



EC2 Dashboard

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Elastic IPs

Placement Groups

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Connect

Actions

Filter by tags and attributes or search by keyword

1 to 1 of 1

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS (IPv4)	IPv4 Public IP
	i-04564dc93bbd1dcf3	t2.micro	us-east-1a	running	Initializing	None	ec2-3-89-217-17.comp...	3.89.217.17

Instance: i-04564dc93bbd1dcf3

Public DNS: ec2-3-89-217-17.compute-1.amazonaws.com

Description

Status Checks

Monitoring

Tags

Instance ID	i-04564dc93bbd1dcf3	Public DNS (IPv4)	ec2-3-89-217-17.compute-1.amazonaws.com
Instance state	running	IPv4 Public IP	3.89.217.17
Instance type	t2.micro	IPv6 IPs	-
Elastic IPs		Private DNS	ip-172-31-82-56.ec2.internal
Availability zone	us-east-1a	Private IPs	172.31.82.56
Security groups	default, view inbound rules, view outbound rules	Secondary private IPs	
Scheduled events	No scheduled events	VPC ID	vpc-e119cb9b
AMI ID	amzn-ami-hvm-2017.03.1.20170623-x86_64-gp2 (ami-a4c7edeb2)	Subnet ID	subnet-bc088592
Platform	-	Network interfaces	eth0
IAM role	-	Source/dest. check	True
Key pair name	-	T2/T3 Unlimited	Disabled
Owner	387124123361	EBS-optimized	False
Launch time	February 18, 2019 at 1:41:06 PM UTC+1 (less than one hour)	Root device type	ebs
Termination protection	False	Root device	/dev/xvda
Lifecycle	normal	Block devices	/dev/xvda

EC2 Dashboard

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Launch Instance

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Actions

Filter by tags and attributes or search by keyword

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS (IPv4)	IPv4 Public IP
	i-04564dc93bbd1dcf3	t2.micro	us-east-1a	running	Initializing	None	ec2-3-89-217-17.comp...	3.89.217.17

Availability zone

us-east-1a

Security groups

default, view inbound rules, view outbound rules

Scheduled events

No scheduled events

AMI ID

amzn-ami-hvm-2017.03.1.20170623-x86\_64-gp2 (ami-a4c7edb2)

Platform

amzn-ami-hvm-2017.03.1.20170623-x86\_64-gp2 (ami-a4c7edb2)

IAM role

Key pair name

Owner

Launch time

Termination protection

Lifecycle

Monitoring

Alarm status

Kernel ID

RAM disk ID

Placement group

Virtualization

hvm

Reservation

r-056b22bfc52e59b0

AMI launch index

0

Private IPs

172.31.82.56

Secondary private IPs

VPC ID

vpc-e119cb9b

Subnet ID

subnet-bc088592

Network interfaces

eth0

Source/dest. check

True

Tx/Rx

Unlimited

Disabled

BS-optimized

False

Root device type

ebs

Root device

/dev/xvda

Block devices

/dev/xvda

Graphics ID

Accelerator ID

Capacity Reservation

Capacity Reservation Settings

None

# CloudFormation

## Stacks

Stack details

Change sets

Drifts

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## MyDemoTemplate

Actions

Stack info

Events

Resources

Outputs

Parameters

Template

### Events

Search events

Timestamp	Logical ID	Status	Status reason
18 Feb 2019 12:41:42	MyDemoTemplate	CREATE_COMPLETE	-
18 Feb 2019 12:41:39	MyInstance	CREATE_COMPLETE	-
18 Feb 2019 12:41:07	MyInstance	CREATE_IN_PROGRESS	Resource creation Initiated
18 Feb 2019 12:41:05	MyInstance	CREATE_IN_PROGRESS	-

## CloudFormation X

### Stacks

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CloudFormation > Stacks

### Stacks (1)



Actions ▾

Create stack

Active ▾

Q Filter stacks



	Stack name	Status	Created time	Description
<input type="radio"/>	<a href="#">MyDemoTemplate</a>	CREATE_CO...	Mon, 18 Feb 2019 12:41:01 GMT	-

EC2 Dashboard

Events

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Actions

Filter by tags and attributes or search by keyword

1 to 1 of 1

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS (IPv4)	IPv4 Public IP
	i-04564dc93bbd1dcf3	t2.micro	us-east-1a	running	Initializing	None	ec2-3-89-217-17.comp...	3.89.217.17

Instance: i-04564dc93bbd1dcf3

Public DNS: ec2-3-89-217-17.compute-1.amazonaws.com

Description

Status Checks

Monitoring

Tags

Add/Edit Tags

Key	Value	
aws:cloudformation:logical-id	MyInstance	Show Column
aws:cloudformation:stack-id	arn:aws:cloudformation:us-east-1:387124123361:stack/MyDemoTemplate/72a01030-337a-11e9-8868-12d48e821f84	Show Column
aws:cloudformation:stack-name	MyDemoTemplate	Show Column

## CloudFormation X

### Stacks

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CloudFormation > Stacks

### Stacks (1)

Active ▼

Q Filter stacks



Actions ▼

Create stack



	Stack name	Status	Created time	Description
<input type="radio"/>	<a href="#">MyDemoTemplate</a>	✔ CREATE_CO...	Mon, 18 Feb 2019 12:41:01 GMT	-

Click Here



# CloudFormation X

## Stacks

Stack details

Change sets

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CloudFormation > Stacks > MyDemoTemplate: Stack details

## MyDemoTemplate

Stack info

Events

Resources

Outputs

Parameters

Template

### Overview

Stack name

MyDemoTemplate

Root stack

-

Stack ID

arn:aws:cloudformation:us-east-1:387124123361:stack/MyDemoTemplate/72a01030-337a-11e9-8868-12d48e821f84

Stack status

✔ CREATE\_COMPLETE

Stack status reason

-

Drift status

⊖ NOT\_CHECKED

Last drift check time

Termination protection

Actions ▾

Update stack

Cancel update stack

Click Here

rollback

Edit termination protection

Create change set

View drift results

Detect drift

Delete stack

CloudFormation > Stacks > MyDemoTemplate: Update stack

Step 1  
Specify template

Step 2  
Specify stack details

Step 3  
Configure stack options

Step 4  
Review

## Update 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.

☒ Use current template

☐ Replace current template

☐ Edit template in designer

Click Here

Cancel

Next

## Specify stack details

### Step 3

#### Configure stack options

### Step 4

#### Review

#### 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

#### Upload a template file

Choose file 

No file chosen

Click Here

S3 URL: Will be generated when template file is uploaded

View in Designer 

Cancel

Next

The screenshot shows the AWS CloudFormation console in the 'Specify stack details' step. A file explorer window is open, showing a list of files. A yellow arrow points to the file 'i-ec2-with-eg-tp.yaml' with the text 'Click Here'.

The file explorer window displays the following files:

Name	Date Modified	Size
i-ec2-with-eg-tp.yaml	Today at 13:38	1 KB
i-ec2.yaml	Today at 13:38	186 bytes

The background console shows the 'Specify stack details' step, with options to 'Edit template in designer' and 'View in Designer'.

☰

Specify stack details

Step 3  
Configure stack options

Step 4  
Review

**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


**Upload a template file**

Choose file 

1-ec2-with-sg-eip.yaml

JSON or YAML formatted file

S3 URL: <https://s3-external-1.amazonaws.com/cf-templates-137vmwb32gjrt-us-east-1/2019049aE9-1-ec2-with-sg-eip.yaml>

View in Designer 

Click Here

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File: 'template1'

ServerSec...  
SecurityGroup

SSHSecuri...  
SecurityGroup

MyInstance  
Instance

MyEIP  
EIP

Resource types

- AmazonMQ
- ApiGateway
- ApiGatewayV2
- AppStream
- AppSync
- ApplicationAutoScaling
- Athena
- AutoScaling
- AutoScalingPlans
- Batch
- Budgets

template1

Choose template language: ☐ JSON ☒ YAML

```

1 ---
2 Parameters:
3   SecurityGroupDescription:
4     Description: Security Group Description
5     Type: String
6
7 Resources:
8   MyInstance:
9     Type: AWS::EC2::Instance
10    Properties:
11      AvailabilityZone: us-east-1a
12      ImageId: ami-a4c7edb2
13      InstanceType: t2.micro

```

Components

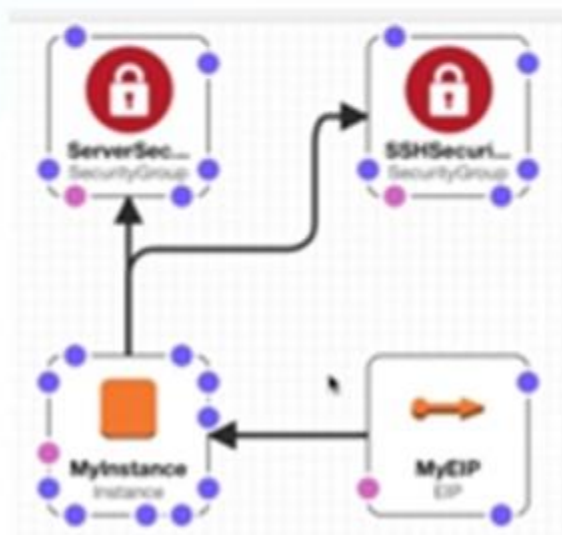
Template

Messages



## Exercise

- **Modify the CloudFormation Template**
  - Make EC2 Instance accessible to all via SSH.
  - Make EC2 Instance accessible to all via HTTP (80).
  - Attach an Elastic IP to your EC2 Instance.





template1 Choose template language: ☐ JSON ☒ YAML 

```
20   Type: AWS::EC2::EIP
21 -   Properties:
22     InstanceId: !Ref MyInstance
23
24   # our EC2 security group
25 -   SSHSecurityGroup:
26     Type: AWS::EC2::SecurityGroup
27 -   Properties:
28     GroupDescription: Enable SSH access via port 22
29     SecurityGroupIngress:
30 -     - CidrIp: 0.0.0.0/0
31       FromPort: 22
32       IpProtocol: tcp
33       ToPort: 22
34
35   # our second EC2 security group
36 -   ServerSecurityGroup:
37     Type: AWS::EC2::SecurityGroup
38 -   Properties:
39     GroupDescription: !Ref SecurityGroupDescription
40     SecurityGroupIngress:
41 -     - IpProtocol: tcp
42       FromPort: 80
43       ToPort: 80
44       CidrIp: 0.0.0.0/0
45 -     - IpProtocol: tcp
46       FromPort: 22
```

template1 

Choose template language: ☒ JSON ☐ YAML 

```

28   GroupDescription: enable ssh access via port 22
29   SecurityGroupIngress:
30 -   - CidrIp: 0.0.0.0/0
31     FromPort: 22
32     IpProtocol: tcp
33     ToPort: 22
34
35   # our second EC2 security group
36 -   ServerSecurityGroup:
37     Type: AWS::EC2::SecurityGroup
38 -   Properties:
39     GroupDescription: !Ref SecurityGroupDescription
40     SecurityGroupIngress:
41 -   - IpProtocol: tcp
42     FromPort: 80
43     ToPort: 80
44     CidrIp: 0.0.0.0/0
45 -   - IpProtocol: tcp
46     FromPort: 22
47     ToPort: 22
48     CidrIp: 192.168.1.1/32
49
50 - Outputs:
51 -   ElasticIP:
52     Description: Elastic IP Value
53     Value: !Ref MyEIP
54

```

Components Template

☰

Specify stack details

Step 3  
Configure stack options

Step 4  
Review

**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


**Upload a template file**

Choose file 

1-ec2-with-sg-eip.yaml

JSON or YAML formatted file

S3 URL: <https://s3-external-1.amazonaws.com/cf-templates-137vmwb32gjr-us-east-1/2019049aE9-1-ec2-with-sg-eip.yaml>

[View in Designer](#) 

Cancel

Next

Click Here

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CloudFormation > Stacks > MyDemoTemplate: Update stack

Step 1  
Specify template

Step 2  
**Specify stack details**

Step 3  
Configure stack options

Step 4  
Review

## Specify stack details

### Parameters

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

#### SecurityGroupDescription

Security Group Description

Cancel

Previous

Next

Click Here



## Advanced options

You can set additional options for your stack, like notification options and a stack policy. [Learn more.](#)

### ► Stack policy

Defines the resources that you want to protect from unintentional updates during a stack update.

### ► Rollback configuration

Specify alarms for CloudFormation to monitor when creating and updating the stack. If the operation breaches an alarm threshold, CloudFormation rolls it back. [Learn more.](#)

### ► Notification options

Cancel

Previous

Next

Click Here

## Change set preview

### Changes (4)

< 1 >

Action ▼	Logical ID ▲	Physical ID	Resource type ▼	Replacement
Add	MyEIP	-	AWS::EC2::EIP	-
Modify	MyInstance	i-04564dc93bbd1dcf3 <a href="#">🔗</a>	AWS::EC2::Instance	True
Add	SSHSecurityGroup	-	AWS::EC2::SecurityGroup	-
Add	ServerSecurityGroup	-	AWS::EC2::SecurityGroup	-

Cancel

Previous

View change set

Update stack

Click Here

## Events

Timestamp	Logical ID	Status	Status reason
18 Feb 2019 12:46:18	ServerSecurityGroup	⌚ CREATE_IN_PROGRESS	Resource creation Initiated
18 Feb 2019 12:46:14	SSHSecurityGroup	⌚ CREATE_IN_PROGRESS	-
18 Feb 2019 12:46:13	ServerSecurityGroup	⌚ CREATE_IN_PROGRESS	-
18 Feb 2019 12:45:56	MyDemoTemplate	⌚ UPDATE_IN_PROGRESS	User Initiated
18 Feb 2019 12:41:42	MyDemoTemplate	✅ CREATE_COMPLETE	-
18 Feb 2019 12:41:39	MyInstance	✅ CREATE_COMPLETE	-

## Events





Timestamp	Logical ID	Status	Status reason
18 Feb 2019 12:46:26	MyInstance	UPDATE_IN_PROGRESS	Resource creation Initiated
18 Feb 2019 12:46:24	MyInstance	UPDATE_IN_PROGRESS	Requested update requires the creation of a new physical resource; hence creating one.
18 Feb 2019 12:46:19	SSHSecurityGroup	CREATE_COMPLETE	-
18 Feb 2019 12:46:19	ServerSecurityGroup	CREATE_COMPLETE	-
18 Feb 2019 12:46:18	SSHSecurityGroup	CREATE_IN_PROGRESS	Resource creation Initiated
18 Feb 2019 12:46:18	ServerSecurityGroup	CREATE_IN_PROGRESS	Resource creation Initiated

EC2 Dashboard

Events

Tags

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INSTANCES

**Instances**

Launch Templates

Spot Requests

Reserved Instances

Dedicated Hosts

Scheduled Instances

Capacity Reservations

IMAGES

AMIs

Bundle Tasks

Launch Instance

Connect

Actions

Filter by tags and attributes or search by keyword

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS (IPv4)	IPv4 Public IP
	i-04564dc93bbd1dcf3	t2.micro	us-east-1a	terminated		None	-	-
	i-0bbd36873dbc20e2c	t2.micro	us-east-1a	running	Initializing	None	ec2-3-208-35-201.com...	3.208.35.201

Instance: i-04564dc93bbd1dcf3 Public DNS: -

Description

Status Checks

Monitoring


**Tags**

Click Here

Key

Value

Loading...

Description	Status Checks	Monitoring	Tags	
Instance ID	i-0bbd36873dbc2ce2c		Public DNS (IPv4)	ec2-3-208-35-201.compute-1.amazonaws.com
Instance state	running		IPv4 Public IP	3.208.35.201
Instance type	t2.micro		IPv6 IPs	-
Elastic IPs	3.208.35.201*		Private DNS	ip-172-31-87-93.ec2.internal
Availability zone	us-east-1 		Private IPs	172.31.87.93
Security groups	MyDemoTemplate-SSHSecurityGroup-X1023TVDT41I, MyDemoTemplate-ServerSecurityGroup-FNDXR9H32IXD. <a href="#">view inbound rules</a> . <a href="#">view outbound rules</a>		Secondary private IPs	
Scheduled events	No scheduled events		VPC ID	vpc-e119cb9b
AMI ID	amzn-ami-hvm-2017.03.1.20170623-x86_64-gp2 (ami-a4c7edb2)		Subnet ID	subnet-bc088592
Platform	-		Network interfaces	eth0
IAM role	-		Source/dest. check	True
Key pair name	-		T2/T3 Unlimited	Disabled
Owner	387124123361		EBS-optimized	False
Launch time	February 18, 2019 at 1:46:26 PM UTC+1 (less than one hour)		Root device type	ebs
Termination protection	False		Boot mode	legacy



EC2 Dashboard

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Snapshots

Lifecycle Manager

Create Security Group Actions

Filter by tags and attributes or search by keyword

Name	Group ID	Group Name	VPC ID	Description
	sg-01ab776654f05396a	launch-wizard-3	vpc-e119cb9b	launch-wizard-3 created 2019-01-08T16:45:27.396+0
	sg-0654f51c2773dd36f	launch-wizard-2	vpc-e119cb9b	launch-wizard-2 created 2019-01-02T12:53:46.347+0
	sg-0745c8f210b172392	launch-wizard-1	vpc-e119cb9b	launch-wizard-1 created 2018-11-27T12:41:55.987+0
	sg-08eeb4bc11b52e8dd	MyDemoTemplate-SSHSecurityGroup-X1023TVDT41I	vpc-e119cb9b	Enable SSH access via port 22
	sg-0c13d4addfa3ed268	MyDemoTemplate-ServerSecurityGroup-FNDXR9H32IXD	vpc-e119cb9b	I can control the description of the security group
	sg-875d4ecb	default	vpc-e119cb9b	default VPC security group

Security Group: sg-0c13d4addfa3ed268

Description

Inbound

Outbound

Tags

MyDemoTemplate-ServerSecurityGroup-FNDXR9H32IXD

sg-0c13d4addfa3ed268

Group description

I can control the description of the security group

VPC ID

vpc-e119cb9b

Click Here

Security Group: sg-0c13d4addfa3ed268

Description

Inbound

Outbound

Tags

Edit

Click Here

Type ⓘ	Protocol ⓘ	Port Range ⓘ	Source ⓘ	Description ⓘ
HTTP	TCP	80	0.0.0.0/0	
SSH	TCP	22	192.168.1.1/32	

[Create Security Group](#)
[Actions](#)

 Filter by tags and attributes or search by keyword

 1 to 6 of 6

Name	Group ID	Group Name	VPC ID	Description
<input type="checkbox"/>	sg-01ab776654f05396a	launch-wizard-3	vpc-e119cb9b	launch-wizard-3 created 2019-01-08T16:45:27.396+0
<input type="checkbox"/>	sg-0654f51c2773dd36f	launch-wizard-2	vpc-e119cb9b	launch-wizard-2 created 2019-01-02T12:53:46.347+0
<input type="checkbox"/>	sg-0745c8f210b172392	launch-wizard-1	vpc-e119cb9b	launch-wizard-1 created 2018-11-27T12:41:55.987+0
<input type="checkbox"/>	sg-08eeb4bc11b52e8dd	MyDemoTemplate-SSHSecurityGroup-X1023TVDT41I	vpc-e119cb9b	Enable SSH access via port 22
<input checked="" type="checkbox"/>	sg-0c13d4addfa3ed268	MyDemoTemplate-ServerSecurityGroup-FNDXR9H32IXD	vpc-e119cb9b	I can control the description of the security group
<input type="checkbox"/>	sg-875d4ecb	default	vpc-e119cb9b	default VPC security group

Security Group: sg-0c13d4addfa3ed268


[Description](#)
[Inbound](#)
[Outbound](#)
[Tags](#)
[Add/Edit Tags](#)

Key	Value	
aws:cloudformation:logical-id	ServerSecurityGroup	<a href="#">Show Column</a>
aws:cloudformation:stack-id	arn:aws:cloudformation:us-east-1:387124123361:stack/MyDemoTemplate/72a01030-337a-11e9-8868-12d48e821f84	<a href="#">Show Column</a>
aws:cloudformation:stack-name	MyDemoTemplate	<a href="#">Show Column</a>

CloudFormation > Stacks > MyDemoTemplate: Stack details

# MyDemoTemplate

Actions ▼

Stack info

Events

Resources

Outputs

Parameters

Template

Click Here

## Events

Search events

Timestamp

Logical ID

Status

Status reason

18 Feb 2019 12:48:46

MyDemoTemplate

✓  
UPDATE\_COMPLETE

-

18 Feb 2019 12:48:46

MyInstance

⊖  
DELETE\_COMPLETE

-

18 Feb 2019 12:47:38

MyInstance

⌚  
DELETE\_IN\_PROGRESS

-

CloudFormation > Stacks > MyDemoTemplate: Stack details

# MyDemoTemplate

Actions ▼

Stack info

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## Resources (1)

🔍 *Search resources*



Click Here

Logical ID ▲	Physical ID ▼	Type ▼	Status ▼	Status reason ▼
MyInstance	i-04564dc93bbd1dcf3 <a href="#">🔗</a>	AWS::EC2::Instance	✅ CREATE_COMPLETE	-

CloudFormation > Stacks > MyDemoTemplate: Stack details

# MyDemoTemplate

Actions ▼

Stack info

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Click Here

## Resources (4)

Search resources

Logical ID ▲	Physical ID ▼	Type ▼	Status ▼	Status reason ▼
MyEIP	3.208.35.201 <a href="#">↗</a>	AWS::EC2::EIP	✔ CREATE_COMPLETE	-
MyInstance	i-0bbd36873dbc2ce2c <a href="#">↗</a>	AWS::EC2::Instance	✔ UPDATE_COMPLETE	-
SSHSecurityGroup	MyDemoTemplate-SSHSecurityGroup-X1023TVDT41I <a href="#">↗</a>	AWS::EC2::SecurityGroup	✔ CREATE_COMPLETE	-
ServerSecurityGroup	MyDemoTemplate-ServerSecurityGroup-FNDXR9H32IXD <a href="#">↗</a>	AWS::EC2::SecurityGroup	✔ CREATE_COMPLETE	-



CloudFormation > Stacks > MyDemoTemplate: Stack details

MyDemoTemplate

Click Here

Actions ▼

Stack info

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## Outputs (1)

Search outputs

Key ▲	Value ▼	Description ▼	Export name ▼
ElasticIP	3.208.35.201	Elastic IP Value	-

## Exercise

- **Add another EC2 Instance to your stack and distribute the load on both instances.**
  - Remove Elastic IP.
  - Add another security group for ELB.
  - Make ELB accessible to all via HTTP (80)
  - Make sure communication to EC2 is allowed only from ELB.
  - Login to EC2 Instance, If it is not accessible figure out the reason and make it accessible.
- **Modify the CloudFormation Template for Mumbai Region.**

CloudFormation ×

Stacks

StackSets

Exports

Designer

Previous console

Feedback

CloudFormation > Stacks

Stacks (1)

Active ▾

Actions ▾

Create stack

Click Here

	Stack name	Status	Created time	Description
	MyDemoTemplate	UPDATE_CO...	Mon, 18 Feb 2019 12:41:01 GMT	-

CloudFormation > Stacks

Stacks (1)



Actions ▼

Create stack

Update stack

Cancel update stack

Continue update rollback

Edit termination protection

Create change set for current stack

View drift results

Detect drift

Delete stack

Click Here

Active ▼

Q Filter stacks

Stack name

Status

Created time

Stack name	Status	Created time
MyDemoTemplate	UPDATE_CO...	Mon, 18 Feb 2019 12:41:01 GMT

MyDemoTemplate

UPDATE\_CO...

Mon, 18 Feb 2019 12:41:01 GMT

### Delete MyDemoTemplate?



Are you sure you want to delete this stack?

**Stack name:**

MyDemoTemplate

Deleting a stack deletes all stack resources.

Cancel

Delete

Click Here

# Thank You