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CloudFormation Template Case Study

Problem Statement:

You work for TechArkit Corporation. Your corporation wants to launch a new web-based application. The development team has prepared the code, but it has not been tested yet. The development team needs the system admins to build a web server to test the code, but the system admins are not available.

Tasks To Be Performed:

1. Web tier: Launch an instance in a public subnet and that instance should allow HTTP and SSH from the internet.
2. Application tier: Launch an instance in a private subnet of the web tier and it should allow only SSH from the public subnet of Web Tier-3.
3. DB tier: Launch an RDS MYSQL instance in a private subnet and it should allow connection on port 3306 only from the private subnet of Application Tier-4.
4. Setup a Route 53 hosted zone and direct traffic to the EC2 instance.

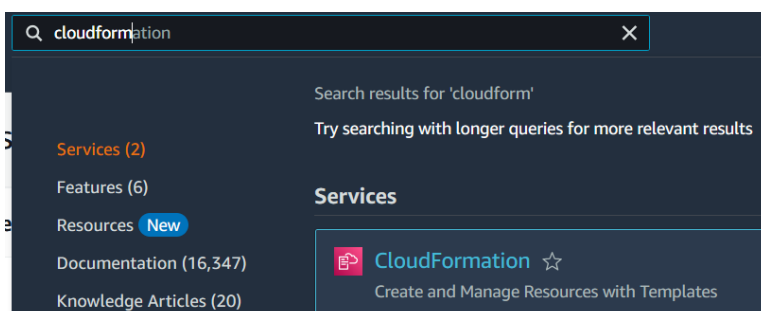
You have been also asked to propose a solution so that:

1. The development team can test their code without having to involve the system admins and can invest their time in testing the code rather than provisioning, configuring, and updating the resources needed to test the code.
2. Make sure when the development team deletes the stack, RDS DB instances should not be deleted.

Answer:

To resolve the above statement, we need to create a CloudFormation template create a stack in the CloudFormation template, and deploy the stack.

Login to AWS Console and navigate to CloudFormation.



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No stacks

No stacks to display

Create stack

View getting started guide

Click on **Create Stack**



CaseStudy1-Template.json

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

CaseStudy1-Template.json

JSON or YAML formatted file

S3 URL: <https://s3.us-east-1.amazonaws.com/cf-templates-gpx1g187pf2-us-east-1/2023-11-04T093104.011Z3za-CaseStudy1-Template.json>

Select Template is ready → Upload a template file → Choose File and select the file

Click **Next**

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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.

AMI
The Ubuntu AMI to use.

InstanceTypeParameter
Enter instance size. Default is t2.micro.

Key
Select from Existing Keys.

MasterUserPassword
The password for the administrator user.

MasterUsername
The username for the administrator user.

Cancel Previous **Next**

Provide the Stack Name (Any Name)

Select the Key value if there is no Key, first create the Key and select.

Provide the Master User Password using [a-z][A-Z][0-9] Do not use the special characters stack will fail while deploying.

Click **Next**

Permissions

IAM role - optional
Choose the IAM role for CloudFormation to use for all operations performed on the stack.
IAM role name Remove

Stack failure options

Behavior on provisioning failure
Specify the roll back behavior for a stack failure. [Learn more](#)

☒ Roll back all stack resources
Roll back the stack to the last known stable state.

☐ Preserve successfully provisioned resources
Preserves the state of successfully provisioned resources, while rolling back failed resources to the last known stable state. Resources without a last known stable state will be deleted upon the next stack operation.

Delete newly created resources during a rollback
Specify whether resources that were created during a failed operation should be deleted regardless of their deletion policy. [Learn more](#)

☒ Use deletion policy
Retains or deletes created resources according to their attached deletion policy.

☐ Delete all newly created resources
Deletes created resources during a rollback regardless of their attached deletion policy.

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.

Notification options

Stack creation options

Cancel Previous **Next**

Add Tags for future use

Select the IAM role to create this stack, if not selected it will use your AWS login details.

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Click **Next**

Click **Submit**

The screenshot shows the AWS CloudFormation console. On the left, the 'Stacks' list shows a stack named 'three-tier-deployment' with a status of 'CREATE_IN_PROGRESS'. The main panel shows the 'Events' tab for this stack. It displays a single event with the following details:

Timestamp	Logical ID	Status	Status reason
2023-11-04 15:09:12 UTC+0530	three-tier-deployment	CREATE_IN_PROGRESS	User Initiated

The deployment will take a few minutes wait for a few minutes and check the status.

The screenshot shows the AWS CloudFormation console after the deployment has completed. The 'Events' tab now shows 60 events. The events are listed in chronological order, showing the progression from resource creation to completion.

Timestamp	Logical ID	Status	Status reason
2023-11-04 15:15:27 UTC+0530	MyDNSRecord	CREATE_IN_PROGRESS	Resource creation Initiated
2023-11-04 15:15:26 UTC+0530	MyDNSRecord	CREATE_IN_PROGRESS	-
2023-11-04 15:15:25 UTC+0530	LinuxPublicInstance	CREATE_COMPLETE	-
2023-11-04 15:15:13 UTC+0530	HostedZone	CREATE_COMPLETE	-
2023-11-04 15:15:09 UTC+0530	SubnetBRouteTableAssociationPrivate	CREATE_COMPLETE	-
2023-11-04 15:15:03 UTC+0530	PublicInternetRoute	CREATE_COMPLETE	-



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three-tier-deployment

DeleteUpdateStack actions▼Create stack▼

Stack infoEventsResourcesOutputsParametersTemplateChange sets

Resources (21)

<1>

⚙️

Logical ID	Physical ID	Type	Status	Module
ElasticIPAddress	52.71.185.9	AWS::EC2::EIP	✔️ CREATE_COMPLETE	-
HostedZone	Z084781739EDKFONL4ZG1	AWS::Route53::HostedZone	✔️ CREATE_COMPLETE	-
InstanceSecurityGroup	sg-0330e11e3cc00bd86	AWS::EC2::SecurityGroup	✔️ CREATE_COMPLETE	-
InstanceSecurityGroupData Base	sg-0b8d3b71225cd83e	AWS::EC2::SecurityGroup	✔️ CREATE_COMPLETE	-
InstanceSecurityGroupPrivate	sg-0540b0454291173d	AWS::EC2::SecurityGroup	✔️ CREATE_COMPLETE	-
InternetGateway	igw-08a1217e3d602813d	AWS::EC2::InternetGateway	✔️ CREATE_COMPLETE	-
LinuxPrivate	i-0e4049f3fc1c0cec9	AWS::EC2::Instance	✔️ CREATE_COMPLETE	-
LinuxPublicInstance	i-094a667d3dacc548a	AWS::EC2::Instance	✔️ CREATE_COMPLETE	-
MyDNSRecord	www.techarkit.com	AWS::Route53::RecordSet	✔️ CREATE_COMPLETE	-

Check the **Resources** tab and see how it is going.

Stack infoEventsResourcesOutputsParametersTemplateChange sets

Events (68)

Detect root cause - beta

🔄

Timestamp	Logical ID	Status	Status reason
2023-11-04 15:22:47 UTC+0530	three-tier-deployment	✔️ CREATE_COMPLETE	-
2023-11-04 15:22:42 UTC+0530	RDSDBInstance	✔️ CREATE_COMPLETE	-

The above message indicates that the stack is deployed successfully.

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