

Creating Resources Conditionally

Locate the template in the GitHub repository, save it locally, and open it in VS Code for edits. Define a new Environment parameter with allowed values "test" and "production." Add a Conditions section with the EnvironmentIsProduction condition. Use this condition in the ReadReplica resource to create it only in the production environment. Save and upload the template to AWS CloudFormation Console. Create stacks for both environments, verifying resources are created as expected. Update the template to conditionally set DBInstanceClass using Fn::If. Add outputs like MasterDbId to reference the master DB instance. Clean up resources after testing.

Activity

1. Find the template files in our GitHub repository under the same name as the heading for easy access and edits. Find and Save the attached template locally, open it in VS Code for edits.
2. Define a new Environment parameter with allowed values test and production in the template.

```
63     ReadReplica:
64         Type: AWS::RDS::DBInstance
65         Condition: EnvironmentIsProduction
66         Properties:
67             SourceDBInstanceIdentifier: !Ref MasterDbInstance
68             DBInstanceClass: db.t4g.micro
69             Engine: mysql
```

3. Add a Conditions section after Parameters to create a condition named EnvironmentIsProduction using Fn::Equals.

```
22     Description: A valid VPC id in your AWS account
23     Environment:
24         Type: String
25         AllowedValues: [ test, production ]
26
27     Conditions:
28         EnvironmentIsProduction: !Equals [ !Ref Environment, production ]
29
30     Resources:
```

4. Use the condition EnvironmentIsProduction in the ReadReplica resource to associate its creation with the production environment.

```

63     ReadReplica:
64         Type: AWS::RDS::DBInstance
65         Condition: EnvironmentIsProduction
66         Properties:
67             SourceDBInstanceIdentifier: !Ref MasterDbInstance
68             DBInstanceClass: db.t4g.micro
69             Engine: mysql

```

5. Change the Image Id, Subnet id and Vpc id according to your region. Save and upload the updated template to AWS CloudFormation Console.
6. Create a stack for the production environment, selecting production for the Environment parameter, and verify both DB instances are created.

Provide a stack name

Stack name

ProductionDataBaseStack

Stack name must be 1 to 128 characters, start with a letter, and only contain alphanumeric characters. Character count: 23/128.

Parameters

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

Network Settings

VpcId
A valid VPC id in your AWS account

vpc-0b0c8badfef0024a4

DbSubnets
Db subnet ids as a list: <subnet1>,<subnet2>,...

Select List<AWS::EC2::Subnet::Id>

subnet-0619479663b4084af x subnet-08c772de46d053876 x subnet-0a1bbb2feaa84bb95 x

Environment

production

Cancel Previous Next

ProductionDataBaseStack

Delete Update Stack actions Create stack

Stack info Events - updated Resources Outputs Parameters Template Change sets Git sync

Table view Timeline view - new

Events (14)

Search events

Detect root cause

Timestamp	Logical ID	Status	Detailed status	Status reason
2024-12-19 14:47:39 UTC+0530	ProductionDataBaseStack	CREATE_COMPLETE	-	-
2024-12-19 14:47:38 UTC+0530	ReadReplica	CREATE_COMPLETE	-	-
2024-12-19 14:39:32 UTC+0530	ReadReplica	CREATE_IN_PROGRESS	-	Resource creation Initiated
2024-12-19 14:39:29 UTC+0530	ReadReplica	CREATE_IN_PROGRESS	-	-
2024-12-19 14:39:29 UTC+0530	MasterDbInstance	CREATE_COMPLETE	-	-

7. Delete the production stack to clean up resources.
8. Create a stack for the test environment, selecting the test for the Environment parameter, and verify only the master DB instance is created.

Provide a stack name

Stack name

TestDataBaseStack

Stack name must be 1 to 128 characters, start with a letter, and only contain alphanumeric characters. Character count: 17/128.

Parameters

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

Network Settings

VpcId

A valid VPC id in your AWS account

vpc-0b0c8badfef0024a4

DbSubnets

Db subnet ids as a list: <subnet1>,<subnet2>,...

Select List<AWS::EC2::Subnet::Id>

subnet-0619479663b4084af

subnet-08c772de46d053876

subnet-0a1bbb2feaa84bb95

Environment

test

Cancel

Previous

Next

TestDataBaseStack

⚙️ >

Delete

Update

Stack actions

Create stack

Stack info

Events - updated

Resources

Outputs

Parameters

Template

Change sets

Git sync

Table view

Timeline view - new

Events (11)

Detect root cause

⚙️

Search events

Timestamp	Logical ID	Status	Detailed status	Status reason
2024-12-19 14:41:02 UTC+0530	TestDataBaseStack	CREATE_COMPLETE	-	-
2024-12-19 14:41:01 UTC+0530	MasterDbInstance	CREATE_COMPLETE	-	-
2024-12-19 14:34:26 UTC+0530	MasterDbInstance	CREATE_IN_PROGRESS	-	Resource creation Initiated
2024-12-19 14:34:24 UTC+0530	MasterDbInstance	CREATE_IN_PROGRESS	-	-
2024-12-19 14:34:23 UTC+0530	DbSecurityGroup	CREATE_COMPLETE	-	-

TestDataBaseStack

⚙️ >

Delete

Update

Stack actions

Create stack

Stack info

Events - updated

Resources

Outputs

Parameters

Template

Change sets

Git sync

Resources (3)

Search resources

< 1 >

⚙️

Logical ID	Physical ID	Type	Status	Module
DbSecurityGroup	sg-0977471cd1b2dd71a	AWS::EC2::SecurityGroup	CREATE_COMPLETE	-
DbSubnetGroup	testdatabasestack-dbsubnetgroup-v41cwwahlbwd	AWS::RDS::DBSubnetGroup	CREATE_COMPLETE	-
MasterDbInstance	testdatabasestack-masterdbinstance-0ggqriug5bhi	AWS::RDS::DBInstance	CREATE_COMPLETE	-

9. Delete the test stack to clean up resources and confirm the condition's functionality.

Configuring Resource Attributes Conditionally

1. Find the template files in our GitHub repository under the same name as the heading for easy access and edits. Find and Save the attached template locally, open it in VS Code for edits.
2. Start with the previous template that includes the EnvironmentIsProduction condition.
3. Remove the hard coded value for the DBInstanceClass property in the master database instance. Use the Fn::If function to conditionally set DBInstanceClass to db.t2.small for production and db.t4g.micro otherwise.

```
49 MasterDbInstance:
50   Type: AWS::RDS::DBInstance
51   Properties:
52     DBInstanceClass: !If [ EnvironmentIsProduction, db.t4g.small, db.t4g.micro ]
53     Engine: mysql
54     MultiAZ: false
55     PubliclyAccessible: true
```

4. Save the updated template and upload it to AWS CloudFormation Console.
5. Create a stack for the production environment, selecting production for the Environment parameter.

Provide a stack name

Stack name

ProductionDataBaseStack

Stack name must be 1 to 128 characters, start with a letter, and only contain alphanumeric characters. Character count: 23/128.

Parameters

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

Network Settings

VpcId

A valid VPC id in your AWS account

vpc-0b0c8badfe0024a4

DbSubnets

Db subnet ids as a list: <subnet1>,<subnet2>,...

Select List<AWS::EC2::Subnet::Id>

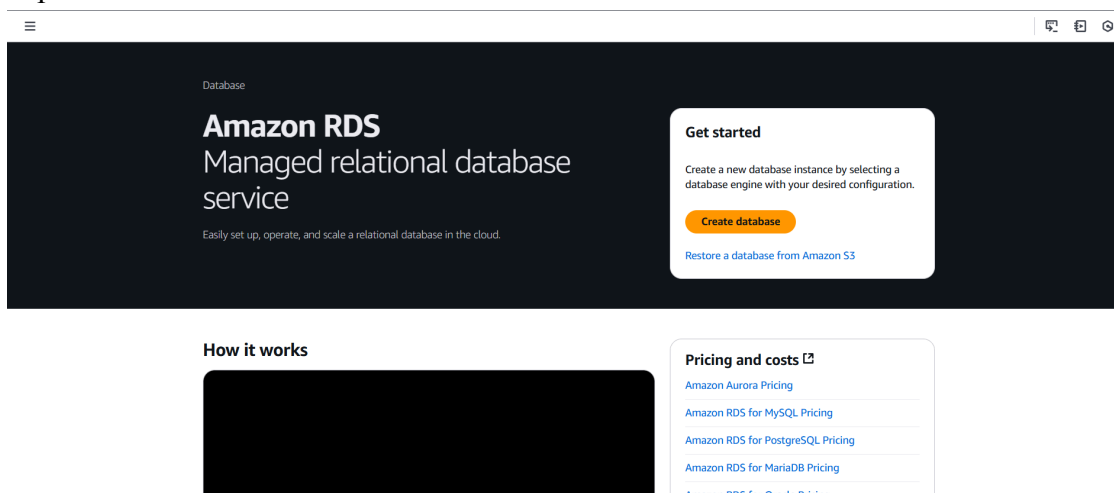
subnet-0619479663b4084af x subnet-08c772de46d053876 x subnet-0a1bbb2feaa84bb95 x

Environment

production

Cancel Previous Next

6. Verify in the RDS Console that the master instance class is db.t4g.micro and the read replica is created.



Amazon RDS > Databases

Databases (3)

Filter by databases

DB identifier	Status	Role	Engine	Region ...	Size	Recommendations
productiondatabasestack-masterdbinst	Available	Primary	MySQL Co...	eu-west-1c	db.t4g.micro	

productiondatabasestack-masterdbinstance-yewukztkmptn

Related

Filter by databases

DB identifier	Status	Role	Engine	Region ...	Size	Recommendations
productiondatabasestack-masterdbinst	Available	Primary	MySQL Co...	eu-west-1c	db.t4g.micro	

Connectivity & security

Endpoint & port

Endpoint: productiondatabasestack-masterdbinstance-yewukztkmptn.c924886w4bjie.u-west-1.rds.amazonaws.com

Port: 3306

Networking

Availability Zone: eu-west-1c

VPC: vpc-0b0c8badfef0024a4

Subnet group: productiondatabasestack-

Security

VPC security groups: ProductionDataBaseStack-DbSecurityGroup-W9JOpGNy42Fd (sg-0e188296dc8cd6d46)

Active

Publicly accessible: Yes

7. Delete the production stack after testing.

ProductionDataBaseStack

Delete Update Stack actions Create stack

Stack info Events - updated Resources Outputs Parameters Template Change sets Git sync

Table view Timeline view - new

Events (12)

Search events

Detect root cause

Timestamp	Logical ID	Status	Detailed status	Status reason
2024-12-06 18:05:28 UTC+0530	MasterDbInstance	DELETED_IN_PROGRESS	-	-

8. Create another stack for the test environment, selecting test for the Environment parameter.

Provide a stack name

Stack name

TestDataBaseStack

Stack name must be 1 to 128 characters, start with a letter, and only contain alphanumeric characters. Character count: 17/128.

Parameters

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

Network Settings

VpcId

A valid VPC id in your AWS account

vpc-0b0c8badfef0024a4

DbSubnets

Db subnet ids as a list: <subnet1>,<subnet2>,...

Select List<AWS::EC2::Subnet::Id>

subnet-0619479663b4084af subnet-08c772de46d053876 subnet-0a1bbb2feaa84bb95

Environment

test

Cancel Previous Next

9. Verify in the RDS Console that the master instance class is db.t2.micro without a read replica.

testdatabasestack-masterdbinstance-0qgqriug5bhi

Modify

Actions

Summary

DB identifier

testdatabasestack-masterdbinstance-0qgqriug5bhi

CPU

3.46%

Status

Deleting

Class

db.t4g.micro

Role

Instance

Current activity

0 Connections

Engine

MySQL Community

Region & AZ

eu-west-1a

Recommendations

Connectivity & security

Monitoring

Logs & events

Configuration

Zero-ETL integrations

Maintenance & backups

Data

Connectivity & security

Endpoint & port

Endpoint

testdatabasestack-masterdbinstanc-e-0qgqriug5bhi.c924886w4bjj.eu-west-1.rds.amazonaws.com

Port

3306

Networking

Availability Zone

eu-west-1a

VPC

vpc-0b0c8badfef0024a4

Subnet group

testdatabasestack-dbsubnetgroup-

Security

VPC security groups

TestDataBaseStack-DbSecurityGroup-j76wNsLQDisd (sg-0977471cd1b2dd71a)

Active

Publicly accessible

Yes

10. Delete the test stack to clean up resources.

CloudFormation > Stacks > TestDataBaseStack

Stacks (2)

Filter by stack name

Filter status

Active

View nested

Stacks

TestDataBaseStack

2024-12-19 14:34:13 UTC+0530

DELETE_IN_PROGRESS

ProductionDataBaseStack

2024-12-19 14:33:11 UTC+0530

DELETE_IN_PROGRESS

TestDataBaseStack

Delete

Update

Stack actions

Create stack

Stack info

Events - updated

Resources

Outputs

Parameters

Template

Change sets

Git sync

Table view

Timeline view - new

Events (13)

Detect root cause

Search events

Timestamp	Logical ID	Status	Detailed status	Status reason
2024-12-19 14:57:47 UTC+0530	MasterDbInstance	DELETE_IN_PROGRESS	-	-
2024-12-19 14:57:45 UTC+0530	TestDataBaseStack	DELETE_IN_PROGRESS	-	User Initiated
2024-12-19 14:41:02 UTC+0530	TestDataBaseStack	CREATE_COMPLETE	-	-
2024-12-19 14:41:01 UTC+0530	MasterDbInstance	CREATE_COMPLETE	-	-
2024-12-19 14:34:26 UTC+0530	MasterDbInstance	CREATE_IN_PROGRESS	-	Resource creation Initiated

Introduction to Outputs

1. Find the template files in our GitHub repository under the same name as the heading for easy access and edits. Find and Save the attached template locally, open it in VS Code for edits.

- Open the template from the previous document or the provided version attached to the lecture resources. Scroll to the end of the template to locate or define the Outputs section. Add a new output with a unique logical ID, e.g., MasterDbId. Set the Value attribute by referencing the MasterDbInstance resource using intrinsic functions. Optionally, add a Description for the output, such as "Master database instance identifier."

```
72 | | | | - !Ref DbSecurityGroup
73 |
74 | Outputs:
75 |   MasterDbId:
76 |     Value: !Ref MasterDbInstance
77 |     Description: Master database instance identifier
```

- Save the template.
- Upload the template to the AWS CloudFormation Console using the 'Create stack' option. Name the stack (e.g., TestDatabaseStack) and configure parameters like VPC, DB subnets, and environment. Proceed through the steps in the console to the 'Review' page and click 'Create stack.'

Provide a stack name

Stack name

Stack name must be 1 to 128 characters, start with a letter, and only contain alphanumeric characters. Character count: 17/128.

Parameters

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

Network Settings

VpcId
A valid VPC id in your AWS account

DbSubnets
Db subnet ids as a list: <subnet1>,<subnet2>,...

Environment

Cancel Previous Next

TestDataBaseStack

Delete Update Stack actions Create stack

Stack info Events - updated Resources Outputs Parameters Template Change sets Git sync

Table view Timeline view - new

Events (11)

Detect root cause

Search events

Timestamp	Logical ID	Status	Detailed status	Status reason
2024-12-19 14:41:02 UTC+0530	TestDataBaseStack	CREATE_COMPLETE	-	-
2024-12-19 14:41:01 UTC+0530	MasterDbInstance	CREATE_COMPLETE	-	-
2024-12-19 14:34:26 UTC+0530	MasterDbInstance	CREATE_IN_PROGRESS	-	Resource creation Initiated
2024-12-19 14:34:24 UTC+0530	MasterDbInstance	CREATE_IN_PROGRESS	-	-
2024-12-19 14:34:23 UTC+0530	DbSecurityGroup	CREATE_COMPLETE	-	-

5. Wait for the stack creation to complete, then check the Outputs tab for the new output. Verify the key (logical ID) and value (DB identifier) of the output, along with its description.

TestDataBaseStack

Stack info | Events - updated | Resources | **Outputs** | Parameters | Template | Change sets | Git sync

Delete Update Stack actions Create stack

Outputs (1)

Search outputs

< 1 >

Key	Value	Description	Export name
MasterDbId	testdatabasestack-masterdbinstance-lxfap3ctr8ir	Master database instance identifier	-

6. Delete the stack to clean up resources after confirming the output.

TestDataBaseStack

Stack info | **Events - updated** | Resources | Outputs | Parameters | Template | Change sets | Git sync

Delete Update Stack actions Create stack

Table view Timeline view - new

Events (19)

Search events

Detect root cause

Timestamp	Logical ID	Status	Detailed status	Status reason
2024-12-07 13:30:16 UTC+0530	TestDataBaseStack	DELETED_COMPLETE	-	-
2024-12-07 13:30:16 UTC+0530	DbSecurityGroup	DELETED_COMPLETE	-	-
2024-12-07 13:30:16 UTC+0530	DbSubnetGroup	DELETED_COMPLETE	-	-
2024-12-07 13:30:15 UTC+0530	DbSubnetGroup	DELETED_IN_PROGRESS	-	-
2024-12-07 13:30:15 UTC+0530	DbSecurityGroup	DELETED_IN_PROGRESS	-	-