



# Conditions

In this set of labs, we are exploring various intrinsic functions and condition statements in AWS CloudFormation templates to manage resources based on different environments (dev, prod, qa) and regions. The goal is to gain proficiency in using these functions to control the creation and configuration of AWS resources dynamically.

## Summary of Activities

### 1. Intrinsic Function for Elastic IP:

- **Objective:** Create an Elastic IP for instances in the production environment.
- **Steps:** Define a condition to check if the environment is prod, then create a stack in CloudFormation with this condition. Verify the creation of the instance with an Elastic IP.

### 2. Intrinsic Function for Security Group:

- **Objective:** Attach different security groups based on the environment (dev or prod).
- **Steps:** Define conditions to attach a specific security group for dev and the default security group for prod. Create stacks in both environments and verify the security groups.

### 3. Intrinsic Function for Security Group Prod:

- **Objective:** Add a new security group for the prod environment.
- **Steps:** Update the template to include a security group for prod. Create a stack and verify the instance has the new security group.

### 4. Intrinsic Function Not:

- **Objective:** Attach the dev security group if the environment is not prod.
- **Steps:** Add a new environment (QA) and define a condition to attach the dev security group if the environment is not prod. Create a stack in the QA environment and verify the security group.

### 5. Intrinsic Function OR:

- **Objective:** Use a specific key pair if the region is Singapore or Sydney.
- **Steps:** Define a condition to check if the region is either Singapore or Sydney. Create stacks in both regions and verify the key pairs.

### 6. Intrinsic Function AND:

- **Objective:** Use different key pairs based on the environment (CFKeyPair for dev, CFKeyPair1 for prod or qa).
- **Steps:** Define a condition using the AND function to check the environment. Create stacks in dev and prod environments and verify the key pairs.

## End Goal

The end goal is to understand and effectively use CloudFormation intrinsic functions and conditions to automate and control the deployment of AWS resources based on specific parameters like environment and region. This ensures that the infrastructure is dynamically configured and managed according to the given criteria, improving flexibility and efficiency in resource management.

## 😊 To begin with the Lab

### 😊 Intrinsic function for Elastic IP

1. In this lab we are going to use condition statements in our code. Below you can see that in our code we have added conditions that while creating our stack if we use prod as our instance then an Elastic IP will be created.
2. Now you can get these templates from GitHub. Download them and unzip the content.

```
31 Conditions:  
32   CreateEIPForProd: !Equals [!Ref EnvironmentName, prod]  
33  
34  
35 Resources:  
36   MyVMInstance:  
37     Type: AWS::EC2::Instance  
38     Properties:  
39       ImageId: !FindInMap  
40         - MyRegionMap  
41         - !Ref 'AWS::Region'  
42         - HVM64  
43       InstanceType: !FindInMap  
44         - MyEnvironmentMap  
45         - !Ref EnvironmentName  
46         - instanceType  
47       KeyName: !Ref MyKeyName  
48  
49   MyProdEIP:  
50     Type: AWS::EC2::EIP  
51     Condition: CreateEIPForProd  
52     Properties:  
53       InstanceId: !Ref MyVMInstance
```

3. Now we need to open cloud formation and create a stack. Choose the same options as shown below, upload your template and move to next page.

## 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.

Choose an existing template

Upload or choose an existing template.

Use a sample template

Choose from our sample template library.

Build from Application Composer

Create a template using a visual builder.

### Specify template Info

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

Provide an Amazon S3 URL to your template.

Upload a template file

Upload your template directly to the console.

Sync from Git - new

Sync a template from your Git repository.

#### Upload a template file

Choose file

4. Below you can see that we have given a name to our stack and in the parameters, we have chosen the environment as prod which means that an elastic IP will be created, and it will get attached to our instance.
5. After that move to the review page and create your stack.

## Specify stack details

### Provide a stack name

#### Stack name

Stack-condition-EIP

Stack name must be 1 to 128 characters, start with a letter, and only contain alphanumeric characters. Character count: 19/128.

### Parameters

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

#### EnvironmentName

Select the environment

prod

#### MyKeyName

Select Key name

CFKeyPair

Cancel

Previous

Next

6. Here you can see that our stack has been created.

## Stack-condition-EIP

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

Events (9)					
Timestamp		Logical ID	Status	Detailed status	Status reason
2024-07-19 17:01:29 UTC+0530		Stack-condition-EIP	<span>CREATE_COMPLETE</span>	-	-
2024-07-19 17:01:29 UTC+0530		MyVMIstance	<span>CREATE_COMPLETE</span>	-	-
2024-07-19 17:01:26 UTC+0530		MyProdEIP	<span>CREATE_COMPLETE</span>	-	-
2024-07-19 17:01:10 UTC+0530		MyProdEIP	<span>CREATE_IN_PROGRESS</span>	-	Resource creation initiated
2024-07-19 17:01:09 UTC+0530		MyProdEIP	<span>CREATE_IN_PROGRESS</span>	-	-
2024-07-19 17:01:08 UTC+0530		MyVMIstance	<span>CREATE_IN_PROGRESS</span>	<span>CONFIGURATION_COMPLETE</span>	Eventual consistency check initiated
2024-07-19 17:00:57 UTC+0530		MyVMIstance	<span>CREATE_IN_PROGRESS</span>	-	Resource creation initiated
2024-07-19 17:00:56 UTC+0530		MyVMIstance	<span>CREATE_IN_PROGRESS</span>	-	-
2024-07-19 17:00:53 UTC+0530		Stack-condition-EIP	<span>CREATE_IN_PROGRESS</span>	-	User Initiated

- Also, if you go to EC2 you will see your instance is running with an Elastic IP attached to your instance.

The screenshot shows the AWS EC2 Instances page. At the top, there's a search bar and filters for 'Instance state' set to 'running'. Below the header is a table with columns for 'Name', 'Instance ID', 'Instance state', 'Instance type', 'Status check', 'Alarm status', and 'Availability Zone'. One row is selected, showing 'i-09add7ec0b5da2f09' as the Name, 'Running' as the state, 't2.small' as the type, and 'Initializing' as the status check. The Availability Zone is 'ap-southeast-1b'. On the left, a sidebar shows the instance summary with details like Public IPv4 address (13.213.111.245), Instance state (Running), Private IP DNS name (ip-172-31-35-214.ap-southeast-1.compute.internal), Instance type (t2.small), and VPC ID (vpc-0c438557fe24ea59e). On the right, it lists Private IPv4 addresses (172.31.35.214), Public IPv4 DNS (ec2-13-213-111-245.ap-southeast-1.compute.amazonaws.com), and Elastic IP addresses (13.213.111.245 [Public IP]).

## Intrinsic function for Security Group

- Now we are going to add a condition where if we choose dev while creating a stack then a new security group will be attached to our instance. But if we choose prod then the case will be different.
- So, open your code as this time the code snippet is very long to take a snapshot.
- Now go to cloud formation and create your stack. Then choose the same options as shown below and upload your template.

The screenshot shows the AWS CloudFormation 'Create stack' page. In the 'Prerequisite - Prepare template' section, there are three options: 'Choose an existing template' (selected), 'Use a sample template', and 'Build from Application Composer'. In the 'Specify template' section, there are three options: 'Amazon S3 URL' (disabled), 'Upload a template file' (selected), and 'Sync from Git - new'. Below these, there's a button to 'Choose file'.

- So, below you can see that we have given our stack a name and, in the parameters, we have chosen dev as our environment.
- After that just move to the review page and create your stack.

## Specify stack details

**Provide a stack name**

Stack name  
Stack-condition-SG  
Stack name must be 1 to 128 characters, start with a letter, and only contain alphanumeric characters. Character count: 18/128.

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

EnvironmentName  
Select the environment  
dev

MyKeyName  
Select Key name  
CFKeyPair

Cancel Previous Next

6. In the events tab you can see that our stack got created successfully.

Stack-condition-SG					
Stack info	Events	Resources	Outputs	Parameters	Template
<a href="#">Stacks</a> <a href="#">Delete</a> <a href="#">Update</a> <a href="#">Stack actions ▾</a> <a href="#">Create stack ▾</a>					
Events (10)					
<a href="#">Search events</a>	<a href="#">Detect root cause</a>	<a href="#">C</a>			
Timestamp	Logical ID	Status	Detailed status	Status reason	
2024-07-19 17:32:27 UTC+0530	Stack-condition-SG	<span>CREATE_COMPLETE</span>	-	-	
2024-07-19 17:32:27 UTC+0530	MyVMinstance	<span>CREATE_COMPLETE</span>	-	-	
2024-07-19 17:32:07 UTC+0530	Stack-condition-SG	<span>CREATE_IN_PROGRESS</span>	<span>CONFIGURATION_COMPLETE</span>	Eventual consistency check initiated	
2024-07-19 17:32:07 UTC+0530	MyVMinstance	<span>CREATE_IN_PROGRESS</span>	<span>CONFIGURATION_COMPLETE</span>	Eventual consistency check initiated	
2024-07-19 17:31:55 UTC+0530	MyVMinstance	<span>CREATE_IN_PROGRESS</span>	-	Resource creation Initiated	
2024-07-19 17:31:53 UTC+0530	MyVMinstance	<span>CREATE_IN_PROGRESS</span>	-	-	
2024-07-19 17:31:53 UTC+0530	DevEnvSecurityGroup	<span>CREATE_COMPLETE</span>	-	-	
2024-07-19 17:31:53 UTC+0530	DevEnvSecurityGroup	<span>CREATE_IN_PROGRESS</span>	-	Resource creation Initiated	
2024-07-19 17:31:50 UTC+0530	DevEnvSecurityGroup	<span>CREATE_IN_PROGRESS</span>	-	-	
2024-07-19 17:31:48 UTC+0530	Stack-condition-SG	<span>CREATE_IN_PROGRESS</span>	-	User Initiated	

7. Below you can see that the instance was created, and a new security group has been attached to our instance.

Instances (1/1) <a href="#">Info</a>																	
<a href="#">Find Instance by attribute or tag (case-sensitive)</a>		<a href="#">All states ▾</a>	<a href="#">Connect</a>	<a href="#">Instance state ▾</a>	<a href="#">Actions ▾</a> <a href="#">Launch instances</a> ▾												
<input checked="" type="checkbox"/> <a href="#">Instance state = running</a> <a href="#">X</a>	<a href="#">Clear filters</a>																
<input checked="" type="checkbox"/> <a href="#">Name ↴</a>	<a href="#">Instance ID</a>	<a href="#">Instance state</a>	<a href="#">Instance type</a>	<a href="#">Status check</a>	<a href="#">Alarm status</a> <a href="#">Availability Zone</a> ▾												
<input checked="" type="checkbox"/> <a href="#">i-0d6f45fc26e50f30f</a>	<a href="#">i-0d6f45fc26e50f30f</a>	<span>Running</span> <a href="#">C</a> <a href="#">Q</a>	t2.micro	<span>Initializing</span>	<a href="#">View alarms +</a> ap-southeast-1a												
<a href="#">i-0d6f45fc26e50f30f</a>																	
<a href="#">Details</a> <a href="#">Status and alarms</a> <a href="#">Monitoring</a> <a href="#">Security</a> <a href="#">Networking</a> <a href="#">Storage</a> <a href="#">Tags</a>																	
<b>▼ Security details</b> <table> <tr> <td>IAM Role</td> <td>Owner ID</td> <td>Launch time</td> </tr> <tr> <td>-</td> <td>878895308172</td> <td>Fri Jul 19 2024 17:31:55 GMT+0530 (India Standard Time)</td> </tr> <tr> <td>Security groups</td> <td></td> <td></td> </tr> <tr> <td><a href="#">sg-0c54238b59d720a54 (Stack-condition-SG-DevEnvSecurityGroup-EAbKjjWCLj3i)</a></td> <td></td> <td></td> </tr> </table>						IAM Role	Owner ID	Launch time	-	878895308172	Fri Jul 19 2024 17:31:55 GMT+0530 (India Standard Time)	Security groups			<a href="#">sg-0c54238b59d720a54 (Stack-condition-SG-DevEnvSecurityGroup-EAbKjjWCLj3i)</a>		
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- So, now we will create another stack. Again, click on Create Stack. Then give your stack a name and choose environment as prod then move to review page and create your stack.

Specify stack details

Provide a stack name

Stack name  
Stack-condition-SG

Stack name must be 1 to 128 characters, start with a letter, and only contain alphanumeric characters. Character count: 18/128.

**Parameters**

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

EnvironmentName  
Select the environment  
prod

MyKeyName  
Select Key name  
new

Cancel Previous Next

- Below you can see that our stack has been created, and now move to EC2.

Stack-condition-SG

Stack info	Events	Resources	Outputs	Parameters	Template	Change sets	Git sync - new	Stacks	Delete	Update	Stack actions ▾	Create stack ▾																																																																																									
Events (9)																																																																																																					
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2024-07-19 18:01:54 UTC+0530	MyVMinstance	CREATE_IN_PROGRESS	-	Resource creation initiated																																																																																																	
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2024-07-19 18:01:49 UTC+0530	Stack-condition-SG	CREATE_IN_PROGRESS	-	User Initiated																																																																																																	

- Here you can see that our instance created is of t2.small type and it has an elastic IP attached to it.
- Also, if you check for the security group the default SG has been assigned to it.

**Instances (1/1) [Info](#)**

Find Instance by attribute or tag (case-sensitive)

All states ▾

Instance state = running [X](#) [Clear filters](#)

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4 ...
<a href="#">i-02c9c10e7d030976a</a>	i-02c9c10e7d030976a	<a href="#">Running</a> <a href="#">View details</a> <a href="#">Edit</a>	t2.small	<a href="#">Initializing</a>	<a href="#">View alarms</a> <a href="#">+</a>	ap-southeast-2a	ec2-13-210-99-140.ap...	13.210.99.140

**i-02c9c10e7d030976a**

[Details](#) [Status and alarms](#) [Monitoring](#) [Security](#) [Networking](#) [Storage](#) [Tags](#)

**Instance summary [Info](#)**

Instance ID	<a href="#">i-02c9c10e7d030976a</a>	Public IPv4 address	<a href="#">13.210.99.140</a> <a href="#">open address</a>
IPv6 address	-	Instance state	<a href="#">Running</a>
Hostname type	IP name: ip-172-31-12-113.ap-southeast-2.compute.internal	Private IP DNS name (IPv4 only)	<a href="#">ip-172-31-12-113.ap-southeast-2.compute.internal</a>
Answer private resource DNS name	-	Instance type	t2.small
Auto-assigned IP address	-	VPC ID	<a href="#">vpc-009af1c4df3b5a9da</a>

Private IPv4 addresses	<a href="#">172.31.12.113</a>
Public IPv4 DNS	<a href="#">ec2-13-210-99-140.ap-southeast-2.compute.amazonaws.com</a> <a href="#">open address</a>
Elastic IP addresses	<a href="#">13.210.99.140</a> [Public IP]
AWS Compute Optimizer finding	<a href="#">Opt-in to AWS Compute Optimizer for recommendations.</a> <a href="#">Learn more</a>

**i-02c9c10e7d030976a**

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**Security details**

IAM Role	<a href="#">Owner ID</a>	Launch time
-	<a href="#">878895308172</a>	Fri Jul 19 2024 18:01:53 GMT+0530 (India Standard Time)
Security groups	<a href="#">sg-0f6c14eee2e0601c7 (default)</a>	

**Inbound rules**

Name	Security group rule ID	Port range	Protocol	Source	Security groups	Description
-	sgr-016855af8d3586c30	All	All	<a href="#">sg-0f6c14eee2e0601c7</a>	<a href="#">default</a>	-

**Outbound rules**

12. Once you are done delete your stack.

## 😊 Intrinsic function for Security Group Prod

1. This time to our template we will add a security group for the prod environment as well.
2. So, go and observe the template then go to cloud formation and click on create stack. Then choose your environment as prod in parameters after giving your stack a name.

## Specify stack details

**Provide a stack name**

Stack name  
Stack-condition-SG-Prod  
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.

EnvironmentName  
Select the environment  
prod

MyKeyName  
Select Key name  
new

Cancel Previous Next

- After that move to the review page and create your stack. Below you can see that our stack has been created successfully.

Stack-condition-SG-Prod						<input type="button" value="Stacks"/>	<input type="button" value="Delete"/>	<input type="button" value="Update"/>	<input type="button" value="Stack actions ▾"/>	<input type="button" value="Create stack ▾"/>					
Stack info	Events	Resources	Outputs	Parameters	Template	Change sets	Git sync - new								
<b>Events (11)</b>															
<input type="button" value="Search events"/> Detect root cause															
Timestamp	Logical ID		Status		Detailed status		Status reason								
2024-07-19 18:10:18 UTC+0530	MyVMinstance			CREATE_COMPLETE	-		-								
2024-07-19 18:10:16 UTC+0530	MyProdEIP			CREATE_COMPLETE	-		-								
2024-07-19 18:09:59 UTC+0530	MyProdEIP			CREATE_IN_PROGRESS	-		Resource creation initiated								
2024-07-19 18:09:58 UTC+0530	MyProdEIP			CREATE_IN_PROGRESS	-		-								
2024-07-19 18:09:58 UTC+0530	MyVMinstance			CREATE_IN_PROGRESS		CONFIGURATION_COMPLETE	Eventual consistency check initiated								
2024-07-19 18:09:47 UTC+0530	MyVMinstance			CREATE_IN_PROGRESS	-		Resource creation initiated								
2024-07-19 18:09:45 UTC+0530	MyVMinstance			CREATE_IN_PROGRESS	-		-								
2024-07-19 18:09:44 UTC+0530	ProdEnvSecurityGroup			CREATE_COMPLETE	-		-								
2024-07-19 18:09:42 UTC+0530	ProdEnvSecurityGroup			CREATE_IN_PROGRESS	-		Resource creation initiated								
2024-07-19 18:09:42 UTC+0530	ProdEnvSecurityGroup			CREATE_IN_PROGRESS	-		-								
2024-07-19 18:09:39 UTC+0530	Stack-condition-SG-Prod			CREATE_IN_PROGRESS	-		User Initiated								

- Now in EC2 you can see that our instance has been created and an elastic IP has attached to it as we have seen earlier.

**Instances (1/1) Info**

Instance state = running  Clear filters

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4 ...
i-04828eff52ba9640e	i-04828eff52ba9640e	Running	t2.small	Initializing	<a href="#">View alarms +</a>	ap-southeast-2a	ec2-3-106-33-61.ap-so...	3.106.33.61

**i-04828eff52ba9640e**

[Details](#) | [Status and alarms](#) | [Monitoring](#) | [Security](#) | [Networking](#) | [Storage](#) | [Tags](#)

**Instance summary**

Instance ID <a href="#">i-04828eff52ba9640e</a>	Public IPv4 address <a href="#">3.106.33.61   open address</a>	Private IPv4 addresses <a href="#">172.31.15.11</a>
IPv6 address -	Instance state Running	Public IPv4 DNS <a href="#">ec2-3-106-33-61.ap-southeast-2.compute.amazonaws.com   open address</a>
Hostname type IP name: ip-172-31-15-11.ap-southeast-2.compute.internal	Private IP DNS name (IPv4 only) <a href="#">ip-172-31-15-11.ap-southeast-2.compute.internal</a>	Elastic IP addresses <a href="#">3.106.33.61 [Public IP]</a>
Answer private resource DNS name -	Instance type t2.small	AWS Compute Optimizer finding <a href="#">Opt-in to AWS Compute Optimizer for recommendations.</a>   Learn more
Auto-assigned IP address -	VPC ID <a href="#">vpc-009af1c4df3b5a9da</a>	

5. Also, for the security group you can see that a new SG has been assigned to it.

**Instances (1/1) Info**

Instance state = running  Clear filters

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4 ...
i-04828eff52ba9640e	i-04828eff52ba9640e	Running	t2.small	Initializing	<a href="#">View alarms +</a>	ap-southeast-2a	ec2-3-106-33-61.ap-so...	3.106.33.61

**i-04828eff52ba9640e**

[Details](#) | [Status and alarms](#) | [Monitoring](#) | [Security](#) | [Networking](#) | [Storage](#) | [Tags](#)

**Security details**

IAM Role -	Owner ID <a href="#">878893308172</a>	Launch time Fri Jul 19 2024 18:09:47 GMT+0530 (India Standard Time)
Security groups <a href="#">sg-0d8a83e4c872a0382 (Stack-condition-SG-Prod-ProdEnvSecurityGroup-RW20wQRyOUEr)</a>		

**Inbound rules**

Name	Security group rule ID	Port range	Protocol	Source	Security groups	Description
-	srg-022b7b020b3ee92d7	22	TCP	0.0.0.0/0	Stack-condition-SG-Prod-ProdEnvSec...	-

6. Once you are done delete your stack.

## 😢 Intrinsic function Not

- Now we are going to add some more conditions. First, we are going to add a new environment QA, then we will add a condition that if we are selecting an environment other than prod then the dev security group will attach to the instance.
- Below in the code you can see the condition.

### Conditions:

```
CreateEIPForProd: !Equals [!Ref EnvironmentName, prod]
CreateProdSecurityGroup: !Equals [!Ref EnvironmentName, prod]
CreateDevSecurityGroup: !Not [{Condition: CreateProdSecurityGroup}]
```

3. Once you have seen the template now move to cloud formation and create your stack.
4. Then give your stack a name and choose environment as qa our new environment and move to create your stack.

Specify stack details

**Provide a stack name**

Stack name  
Stack-condition-SG  
Stack name must be 1 to 128 characters, start with a letter, and only contain alphanumeric characters. Character count: 18/128.

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

EnvironmentName  
Select the environment  
qa

MyKeyName  
Select Key name  
CFKeyPair

Cancel Previous Next

5. Below you can see that our stack has been created successfully. Now move to EC2.

Stack-condition-SG

Stack info	Events	Resources	Outputs	Parameters	Template	Change sets	Git sync - new	Stacks	Delete	Update	Stack actions ▾	Create stack ▾																																																																																								
<b>Events (10)</b>																																																																																																				
<table border="1"> <thead> <tr> <th colspan="2">Search events</th> <th colspan="2">Timestamp</th> <th>Logical ID</th> <th>Status</th> <th>Detailed status</th> <th>Status reason</th> </tr> </thead> <tbody> <tr> <td>2024-07-19 18:18:33 UTC+0530</td> <td>Stack-condition-SG</td> <td>CREATE_COMPLETE</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>2024-07-19 18:18:33 UTC+0530</td> <td>MyVMInstance</td> <td>CREATE_COMPLETE</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>2024-07-19 18:18:23 UTC+0530</td> <td>Stack-condition-SG</td> <td>CREATE_IN_PROGRESS</td> <td>CONFIGURATION_COMPLETE</td> <td>-</td> <td>Eventual consistency check initiated</td> <td>-</td> <td>-</td> </tr> <tr> <td>2024-07-19 18:18:23 UTC+0530</td> <td>MyVMInstance</td> <td>CREATE_IN_PROGRESS</td> <td>CONFIGURATION_COMPLETE</td> <td>-</td> <td>Eventual consistency check initiated</td> <td>-</td> <td>-</td> </tr> <tr> <td>2024-07-19 18:18:12 UTC+0530</td> <td>MyVMInstance</td> <td>CREATE_IN_PROGRESS</td> <td>-</td> <td>-</td> <td>Resource creation Initiated</td> <td>-</td> <td>-</td> </tr> <tr> <td>2024-07-19 18:18:10 UTC+0530</td> <td>MyVMInstance</td> <td>CREATE_IN_PROGRESS</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>2024-07-19 18:18:09 UTC+0530</td> <td>DevEnvSecurityGroup</td> <td>CREATE_COMPLETE</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>2024-07-19 18:18:09 UTC+0530</td> <td>DevEnvSecurityGroup</td> <td>CREATE_IN_PROGRESS</td> <td>-</td> <td>-</td> <td>Resource creation Initiated</td> <td>-</td> <td>-</td> </tr> <tr> <td>2024-07-19 18:18:06 UTC+0530</td> <td>DevEnvSecurityGroup</td> <td>CREATE_IN_PROGRESS</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>2024-07-19 18:18:04 UTC+0530</td> <td>Stack-condition-SG</td> <td>CREATE_IN_PROGRESS</td> <td>-</td> <td>-</td> <td>User Initiated</td> <td>-</td> <td>-</td> </tr> </tbody> </table>													Search events		Timestamp		Logical ID	Status	Detailed status	Status reason	2024-07-19 18:18:33 UTC+0530	Stack-condition-SG	CREATE_COMPLETE	-	-	-	-	-	2024-07-19 18:18:33 UTC+0530	MyVMInstance	CREATE_COMPLETE	-	-	-	-	-	2024-07-19 18:18:23 UTC+0530	Stack-condition-SG	CREATE_IN_PROGRESS	CONFIGURATION_COMPLETE	-	Eventual consistency check initiated	-	-	2024-07-19 18:18:23 UTC+0530	MyVMInstance	CREATE_IN_PROGRESS	CONFIGURATION_COMPLETE	-	Eventual consistency check initiated	-	-	2024-07-19 18:18:12 UTC+0530	MyVMInstance	CREATE_IN_PROGRESS	-	-	Resource creation Initiated	-	-	2024-07-19 18:18:10 UTC+0530	MyVMInstance	CREATE_IN_PROGRESS	-	-	-	-	-	2024-07-19 18:18:09 UTC+0530	DevEnvSecurityGroup	CREATE_COMPLETE	-	-	-	-	-	2024-07-19 18:18:09 UTC+0530	DevEnvSecurityGroup	CREATE_IN_PROGRESS	-	-	Resource creation Initiated	-	-	2024-07-19 18:18:06 UTC+0530	DevEnvSecurityGroup	CREATE_IN_PROGRESS	-	-	-	-	-	2024-07-19 18:18:04 UTC+0530	Stack-condition-SG	CREATE_IN_PROGRESS	-	-	User Initiated	-	-
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6. In your running instance you can see that the SG attached to is dev SG.

7. Once you are done delete your stack.

## 😊 Intrinsic function OR

1. Here we are using intrinsic function OR as our condition that if we are in the Singapore region then we will use this key pair or if we are in the Sydney region then we will use this key pair.
2. Now you should have the same key pairs in both of the regions. From below you can see that in Singapore I only have a single key pair and in Sydney also, I have 1 key pair which is same.

3. Below is the statement that we are going to use in our template.

```
Conditions:
CreateEIPForProd: !Equals [!Ref EnvironmentName, prod]
CreateProdSecurityGroup: !Equals [!Ref EnvironmentName, prod]
CreateDevSecurityGroup: !Not [{Condition: CreateProdSecurityGroup}]
IfRegionUseKeyName: !Or [!Equals [!Ref 'AWS::Region', ap-southeast-1:], !Equals [!Ref 'AWS::Region', ap-southeast-2:]]
```

4. Now open your cloud formation in both of the regions and create your stack one by one.
5. Give your stack a name and choose your environment.

## Specify stack details

**Provide a stack name**

Stack name  
Stack-condition-Key

Stack name must be 1 to 128 characters, start with a letter, and only contain alphanumeric characters. Character count: 19/128.

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

EnvironmentName  
Select the environment  
qa

Cancel Previous Next

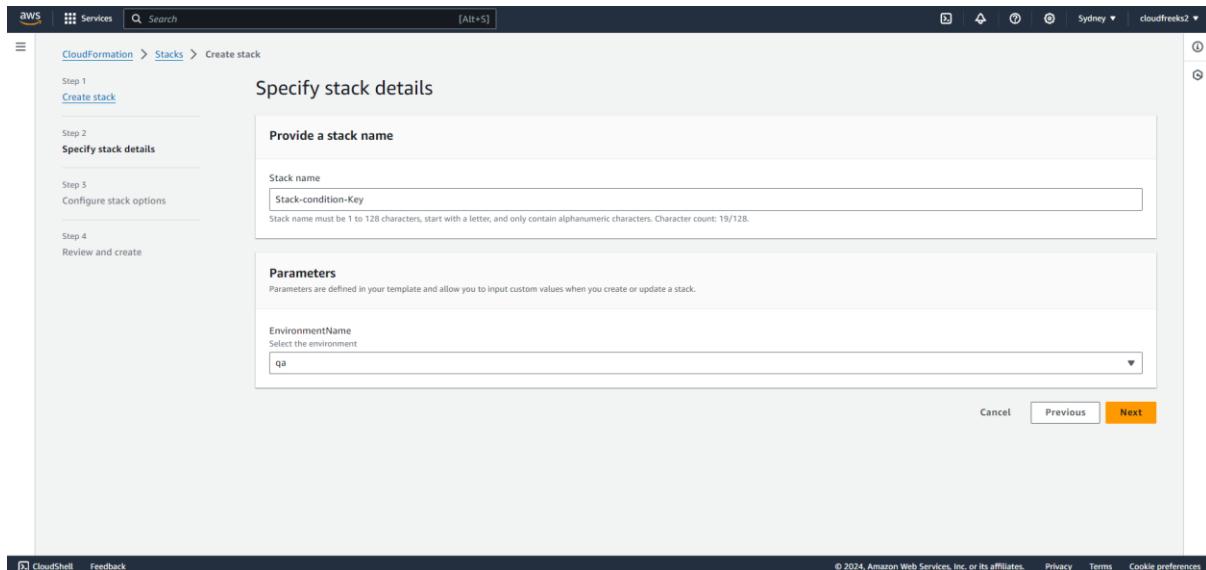
6. Below you can see that our stack has been created successfully.

CloudFormation > Stacks > Stack-condition-Key					
<a href="#">Stacks</a> <a href="#">Delete</a> <a href="#">Update</a> <a href="#">Stack actions</a> <a href="#">Create stack</a>					
<a href="#">Stack info</a> <a href="#">Events</a> <a href="#">Resources</a> <a href="#">Outputs</a> <a href="#">Parameters</a> <a href="#">Template</a> <a href="#">Change sets</a> <a href="#">Git sync - new</a>					
Events (10)					
<a href="#">Stack condition-Key</a>	<a href="#">CREATE_COMPLETE</a>	-	-	-	-
<a href="#">MyVMInstance</a>	<a href="#">CREATE_COMPLETE</a>	-	-	-	-
<a href="#">Stack condition-Key</a>	<a href="#">CREATE_IN_PROGRESS</a>	<a href="#">CONFIGURATION_COMPLETE</a>	Eventual consistency check initiated	-	-
<a href="#">MyVMInstance</a>	<a href="#">CREATE_IN_PROGRESS</a>	<a href="#">CONFIGURATION_COMPLETE</a>	Eventual consistency check initiated	-	-
<a href="#">MyVMInstance</a>	<a href="#">CREATE_IN_PROGRESS</a>	-	Resource creation Initiated	-	-
<a href="#">MyVMInstance</a>	<a href="#">CREATE_IN_PROGRESS</a>	-	-	-	-
<a href="#">DevEnvSecurityGroup</a>	<a href="#">CREATE_COMPLETE</a>	-	-	-	-
<a href="#">DevEnvSecurityGroup</a>	<a href="#">CREATE_IN_PROGRESS</a>	-	Resource creation Initiated	-	-
<a href="#">DevEnvSecurityGroup</a>	<a href="#">CREATE_IN_PROGRESS</a>	-	-	-	-
<a href="#">Stack condition-Key</a>	<a href="#">CREATE_IN_PROGRESS</a>	-	User Initiated	-	-

7. Then we come to EC2 and here we can see that our key pair.

EC2 Dashboard					
Instances (1/1) <a href="#">Info</a>					
<a href="#">Find Instance by attribute or tag (case-sensitive)</a> <a href="#">All states</a>					
<a href="#">Instance state = running</a> <a href="#">Clear filters</a>					
<input checked="" type="checkbox"/> <a href="#">Name</a>	<a href="#">Instance ID</a>	<a href="#">Instance state</a>	<a href="#">Instance type</a>	<a href="#">Status check</a>	<a href="#">Availability Zone</a>
<input checked="" type="checkbox"/> <a href="#">i-06486685ab833c59f</a>	<a href="#">Running</a>	t2.medium	<a href="#">Initializing</a>	<a href="#">View alarms +</a>	ap-southeast-1b
<a href="#">i-06486685ab833c59f</a>					
Instance auto-recovery	Lifecycle	Stop-hibernate behavior			
Default	normal	Disabled			
AMI Launch index	Key pair assigned at launch	State transition reason			
0	<a href="#">CFKeyPair</a>	-			
Credit specification	Kernel ID	State transition message			
standard	-	-			
Usage operation	RAM disk ID	Owner			
<a href="#">RunInstances</a>	-	878893308172			
Enclaves Support	Boot mode	Current instance boot mode			
-	uefi-preferred	legacy-bios			
Allow tags in instance metadata	Use RBN as guest OS hostname	Answer RBN DNS hostname IPv4			
Disabled	<a href="#">Disabled</a>	<a href="#">Disabled</a>			
<a href="#">Host and placement group</a> <a href="#">Info</a>					
Host ID	Affinity	Placement group			

8. Similarly, we will now create a stack in the Sydney region.



9. Below you can see that our stack has been created successfully.

Stack-condition-Key					
Stack info		Events	Resources	Outputs	Parameters
<b>Events (10)</b>					
Timestamp	Logical ID	Status	Detailed status	Status reason	
2024-07-19 18:54:40 UTC+0530	Stack-condition-Key	CREATE_COMPLETE	-	-	
2024-07-19 18:54:39 UTC+0530	MyVMInstance	CREATE_COMPLETE	-	-	
2024-07-19 18:54:30 UTC+0530	Stack-condition-Key	CREATE_IN_PROGRESS	CONFIGURATION_COMPLETE	Eventual consistency check initiated	
2024-07-19 18:54:30 UTC+0530	MyVMInstance	CREATE_IN_PROGRESS	CONFIGURATION_COMPLETE	Eventual consistency check initiated	
2024-07-19 18:54:18 UTC+0530	MyVMInstance	CREATE_IN_PROGRESS	-	Resource creation Initiated	
2024-07-19 18:54:16 UTC+0530	MyVMInstance	CREATE_IN_PROGRESS	-	-	
2024-07-19 18:54:16 UTC+0530	DevEnvSecurityGroup	CREATE_COMPLETE	-	-	
2024-07-19 18:54:16 UTC+0530	DevEnvSecurityGroup	CREATE_IN_PROGRESS	-	Resource creation Initiated	
2024-07-19 18:54:13 UTC+0530	DevEnvSecurityGroup	CREATE_IN_PROGRESS	-	-	
2024-07-19 18:54:11 UTC+0530	Stack-condition-Key	CREATE_IN_PROGRESS	-	User Initiated	

10. In the Sydney region too you can see that we have our desired key pair.

Instances (1/1) Info	
<input type="text" value="Find Instance by attribute or tag (case-sensitive)"/> All states	
Instance state = running <input type="button" value="Clear filters"/>	
Name	Instance ID
i-06c6bd5fb839d9ddc	Running
AMI Launch index	t2.medium
0	Initializing
Credit specification	RAM disk ID
standard	Kernel ID
Usage operation	Boot mode
RunInstances	uefi-preferred
Enclaves Support	Use RBN as guest OS hostname
-	Disabled
Allow tags in instance metadata	Stop-hibernate behavior
Disabled	Disabled
Host and placement group	State transition reason
Host ID	-
Affinity	State transition message
	Owner
	878893308172
	Current instance boot mode
	legacy-bios
	Answer RBN DNS hostname IPv4
	Disabled

11. Once you are done delete your stack.

## 😊 Intrinsic function AND

1. Now we are going to use intrinsic function AND. By using this condition, we will say that if we are choosing a dev environment then we will use CFKeyPair key pair. And if the environment is prod or qa then the key pair will be CFKeyPair1.
2. Below we have given name to our stack and choose the environment as dev.

The screenshot shows the 'Specify stack details' step of the CloudFormation 'Create stack' wizard. On the left, a sidebar lists steps: Step 1 (Create stack), Step 2 (Specify stack details, currently selected), Step 3 (Configure stack options), and Step 4 (Review and create). The main area is titled 'Provide a stack name' and contains a 'Stack name' input field with the value 'Stack-condition'. Below it is a 'Parameters' section with a dropdown menu set to 'dev'. At the bottom right are 'Cancel', 'Previous', and 'Next' buttons.

3. From the events tab we can say that our stack has been created successfully.

The screenshot shows the 'Events' tab for the 'Stack-condition' stack. The table displays 10 events:

Timestamp	Logical ID	Status	Detailed status	Status reason
2024-07-19 19:22:49 UTC+0530	Stack-condition	CREATE_COMPLETE	-	-
2024-07-19 19:22:48 UTC+0530	MyVInstance	CREATE_COMPLETE	-	-
2024-07-19 19:22:38 UTC+0530	Stack-condition	CREATE_IN_PROGRESS	CONFIGURATION_COMPLETE	Eventual consistency check initiated
2024-07-19 19:22:38 UTC+0530	MyVInstance	CREATE_IN_PROGRESS	CONFIGURATION_COMPLETE	Eventual consistency check initiated
2024-07-19 19:22:27 UTC+0530	MyVInstance	CREATE_IN_PROGRESS	-	Resource creation Initiated
2024-07-19 19:22:25 UTC+0530	MyVInstance	CREATE_IN_PROGRESS	-	-
2024-07-19 19:22:25 UTC+0530	DevEnvSecurityGroup	CREATE_COMPLETE	-	-
2024-07-19 19:22:24 UTC+0530	DevEnvSecurityGroup	CREATE_IN_PROGRESS	-	Resource creation Initiated
2024-07-19 19:22:21 UTC+0530	DevEnvSecurityGroup	CREATE_IN_PROGRESS	-	-
2024-07-19 19:22:19 UTC+0530	Stack-condition	CREATE_IN_PROGRESS	-	User Initiated

4. In our instance you can see the key pair as we have expected.

The screenshot shows the AWS EC2 Instances page. On the left, there's a navigation sidebar with links like EC2 Dashboard, EC2 Global View, Events, Instances, Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Capacity Reservations, Images, AMIs, AMI Catalog, Elastic Block Store, Volumes, Snapshots, Lifecycle Manager, Network & Security, Security Groups, Elastic IPs, Placement Groups, and cloudShell/Feedback. The main area displays a table titled 'Instances (1/1) Info' with one row for 'i-01d7869c88a4156fe'. The instance is listed as 'Running' with an 't2.micro' type, 'Status check' as 'Initializing', and located in 'ap-southeast-1a'. Below the table, a detailed view for the instance 'i-01d7869c88a4156fe' is shown, including fields like Instance auto-recovery (Default), Lifecycle (normal), Stop-hibernate behavior (Disabled), Key pair assigned at launch (CFKeyPair), State transition reason (-), Credit specification (standard), Kernel ID (-), State transition message (-), Usage operation (RunInstances), RAM disk ID (-), Owner (878893508172), Enclaves Support (-), Boot mode (uefi-preferred), Current instance boot mode (legacy-bios), Allow tags in instance metadata (Disabled), Use RBN as guest OS hostname (Disabled), Answer RBN DNS hostname IPv4 (Disabled), Host ID (-), Affinity (-), Placement group (-), and Host and placement group (Info).

5. Now let's create our stack using prod as our environment.

The screenshot shows the AWS CloudFormation 'Create stack' wizard. It's on Step 2, 'Specify stack details'. The left sidebar shows steps: Step 1 (Create stack), Step 2 (Specify stack details), Step 3 (Configure stack options), and Step 4 (Review and create). The main area has two sections: 'Provide a stack name' (Stack name: Stack-condition) and 'Parameters' (EnvironmentName: prod). At the bottom right are 'Cancel', 'Previous', and 'Next' buttons.

6. Here you can see that our stack has been created.

The screenshot shows the AWS CloudFormation 'Events' tab for the 'Stack-condition' stack. The table lists 12 events:

Timestamp	Logical ID	Status	Detailed status	Status reason
2024-07-19 19:24:38 UTC+0530	Stack-condition	CREATE_COMPLETE	-	-
2024-07-19 19:24:37 UTC+0530	MyVMInstance	CREATE_COMPLETE	-	-
2024-07-19 19:24:35 UTC+0530	MyProdEIP	CREATE_COMPLETE	-	-
2024-07-19 19:24:18 UTC+0530	MyProdEIP	CREATE_IN_PROGRESS	-	Resource creation Initiated
2024-07-19 19:24:17 UTC+0530	MyProdEIP	CREATE_IN_PROGRESS	-	-
2024-07-19 19:24:17 UTC+0530	MyVMInstance	CREATE_IN_PROGRESS	CONFIGURATION_COMPLETE	Eventual consistency check initiated
2024-07-19 19:24:06 UTC+0530	MyVMInstance	CREATE_IN_PROGRESS	-	Resource creation Initiated
2024-07-19 19:24:04 UTC+0530	MyVMInstance	CREATE_IN_PROGRESS	-	-
2024-07-19 19:24:03 UTC+0530	ProdEnvSecurityGroup	CREATE_COMPLETE	-	-
2024-07-19 19:24:03 UTC+0530	ProdEnvSecurityGroup	CREATE_IN_PROGRESS	-	Resource creation Initiated
2024-07-19 19:24:00 UTC+0530	ProdEnvSecurityGroup	CREATE_IN_PROGRESS	-	-
2024-07-19 19:23:58 UTC+0530	Stack-condition	CREATE_IN_PROGRESS	-	User Initiated

7. Here you can see in the instance the key pair is what we have desired.

The screenshot shows the AWS EC2 Instances page. On the left, there's a navigation sidebar with sections like EC2 Dashboard, Services, Events, Instances (selected), Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Capacity Reservations, Images, AMIs, AMI Catalog, Elastic Block Store, Volumes, Snapshots, Lifecycle Manager, Network & Security, Security Groups, Elastic IPs, Placement Groups, CloudShell, and Feedback. The main area has a search bar at the top with filters for 'Instance state = running' and 'All states'. Below it is a table with one row for an instance named 'i-0cf8545afa39ed6b8'. The table columns include Name, Instance ID, Instance state, Instance type, Status check, Alarm status, Availability Zone, Public IPv4 DNS, and Public IP. The instance details pane below shows settings like 'Key pair assigned at launch' set to 'CFKeyPair1', 'RAM disk ID', 'Boot mode' set to 'uefi-preferred', and 'Use RBN as guest OS hostname' set to 'Disabled'. The bottom right of the screen shows a footer with copyright information and links to Privacy, Terms, and Cookie preferences.

8. Once you are done just delete your stacks.