

Cloud Formation Template (CFT)

Introduction

- It gives developers and systems administrators an easy way to create and manage a collection of related AWS resources, provisioning and updating them in an orderly and predictable fashion.
- Called as “**Infrastructure as Code**”

Objectives

- Create a standalone stack using the existing template.

Pre-Requisites

- AWS Account (Signup User) / IAM User Account
- Practical knowledge on AWS CLI / AWS Console
- Basic knowledge on AWS Resources and Cloud Formation Template
- Basic Understand on JSON
- Key Pair to access to login your instance (Assumed this document, you have already have the .pem key)

Template Components

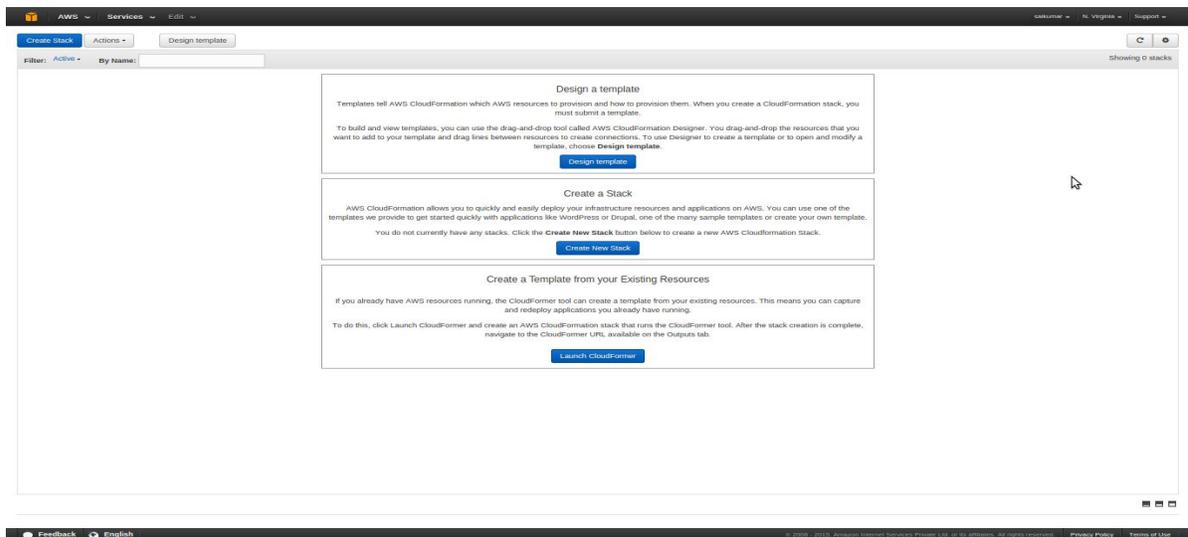
Key	Description
AWSTemplateFormatVersion	Specifies the AWS CloudFormation template version that the template conforms to. The template format version is not the same as the API or WSDL version.
Description	A text string that describes the template. This section must always follow the template format version section.
Parameters (optional)	Specifies values that you can pass in to your template at runtime (when you create or update a stack). You can refer to parameters in the Resources and Outputs sections of the template.
Mappings (optional)	A mapping of keys and associated values that you can use to specify conditional parameter values, similar to a lookup table. You can match a key to a corresponding value by using the Fn::FindInMap intrinsic function in the Resources and Outputs section.
Conditions	Defines conditions that control whether certain resources are created or whether certain resource properties are assigned a value during stack creation or update. For example, you could conditionally create a resource that depends on whether the stack is for a production or test environment.

Resources	Specifies the stack resources and their properties, such as an Amazon Elastic Compute Cloud instance or an Amazon Simple Storage Service bucket. You can refer to resources in the Resources and Outputs sections of the template.
Outputs (optional)	Describes the values that are returned whenever you view your stack's properties. For example, you can declare an output for an Amazon S3 bucket name and then call the <code>aws cloudformation describe-stacks</code> AWS CLI command to view the name.

Instructions

Creating Stack Using CloudFormation Template

1. Log in as Admin User/IAM User with the below URL
<https://aws.amazon.com/console/> [Admin User]
https://My_AWS_Account_ID.signin.aws.amazon.com/console/ [IAM User]
2. Select the Region which you want run the cloud Formation Template (eg: ap-northeast-1 / us-east-1)
3. Check the AMI in template exists in the selected region or not (Note: If not, copy the AMI from one region to another region)
4. Select Services -> **CloudFormation** from Management Tools
5. Click on **Create Stack** on top of Header



6. Pick a template (<name>.template) from the Local PC / Amazon S3 template URL

The screenshot shows the 'Select Template' page in the AWS CloudFormation console. The page has a dark header with 'AWS Services Edit' and user information 'saikumar N. Virginia Support'. On the left, a sidebar lists 'Select Template', 'Specify Details', 'Options', and 'Review'. The main content area is titled 'Select Template' and includes a sub-header 'Select the template that describes the stack that you want to create. A stack is a group of related resources that you manage as a single unit.' Below this, there are three sections: 'Design a template' with a 'Design template' button; 'Choose a template' with three radio buttons: 'Select a sample template' (selected), 'Upload a template to Amazon S3' (with a 'Choose File' button and 'No file chosen' text), and 'Specify an Amazon S3 template URL' (with an empty text input field). At the bottom right, there are 'Cancel' and 'Next' buttons.

7. Click on Next

8. Give the Stack Name and Choose the appropriate Parameters

The screenshot shows the 'Specify Details' page in the AWS CloudFormation console. The page has the same dark header and sidebar as the previous screenshot. The main content area is titled 'Specify Details' and includes a sub-header 'Specify a stack name and parameter values. You can use or change the default parameter values, which are defined in the AWS CloudFormation template. Learn more.' Below this, there are three sections: 'Stack name' with a text input field containing 'my-test'; 'Parameters' with three fields: 'InstanceType' (dropdown menu with 't2.micro' selected and 'WebServer EC2 instance type' as a hint), 'KeyName' (dropdown menu with 'test-sai-us-north' selected and 'Name of an existing EC2 KeyPair to enable SSH access to the instance' as a hint), and 'SSHLocation' (text input field with '0.0.0.0/0' and 'The IP address range that can be used to SSH to the EC2 instances' as a hint). At the bottom right, there are 'Cancel', 'Previous', and 'Next' buttons.

9. Click on Next

10. Create Tags, if you want (Help you identify and categorize those resources.)

The screenshot shows the 'Options' step in the AWS CloudFormation console. On the left, a navigation menu includes 'Select Template', 'Specify Details', 'Options' (highlighted), and 'Review'. The main content area is titled 'Options' and contains a 'Tags' section. Below the title, a text box explains: 'You can specify tags (key-value pairs) for resources in your stack. You can add up to 10 unique key-value pairs for each stack. [Learn more.](#)' Below this is a table with two columns: 'Key (127 characters maximum)' and 'Value (255 characters maximum)'. The first row has '1' in the first column, 'Name' in the second, and 'test-stack' in the third. A blue '+' button is to the right of the table. Below the table is an 'Advanced' section with a title and a text box: 'You can set additional options for your stack, like notification options and a stack policy. [Learn more.](#)' At the bottom right, there are three buttons: 'Cancel', 'Previous', and 'Next'.

11. Click on Next

12. Review Created template, stack details before starting / Create the Stack

The screenshot shows the 'Review' step in the AWS CloudFormation console. On the left, the navigation menu includes 'Select Template', 'Specify Details', 'Options', and 'Review' (highlighted). The main content area is titled 'Review' and contains several sections: 'Template' with 'Template URL' and 'Description', 'Estimate cost' with 'Cost', 'Stack details' with 'Stack name', 'InstanceType', 'KeyName', 'SSHLocation', and 'Create IAM resources', 'Options' with 'Tags' and 'Advanced' (containing 'Notification', 'Timeout', and 'Rollback on failure'). At the bottom right, there are three buttons: 'Cancel', 'Previous', and 'Create'.

13. Click On Create and wait until completion

14. Check the Resources, OutPuts, Parameters, Tags ... from the bottom section once after CREATE_COMPLETE

The screenshot shows the AWS CloudFormation console for a stack named 'my-test'. The stack is in the 'CREATE_COMPLETE' state. The 'Events' tab is active, showing a list of events:

Time	Status	Type	Logical ID	Status Reason
12:57:35 UTC+0550	CREATE_COMPLETE	AWS::CloudFormation::Stack	my-test	
12:57:33 UTC+0550	CREATE_COMPLETE	AWS::EC2::Instance	EC2Instance	
12:56:43 UTC+0550	CREATE_IN_PROGRESS	AWS::EC2::Instance	EC2Instance	Resource creation Initiated
12:56:42 UTC+0550	CREATE_IN_PROGRESS	AWS::EC2::Instance	EC2Instance	
12:56:35 UTC+0550	CREATE_COMPLETE	AWS::EC2::SecurityGroup	InstanceSecurityGroup	
12:56:33 UTC+0550	CREATE_IN_PROGRESS	AWS::EC2::SecurityGroup	InstanceSecurityGroup	Resource creation Initiated
12:56:17 UTC+0550	CREATE_IN_PROGRESS	AWS::EC2::SecurityGroup	InstanceSecurityGroup	
12:55:59 UTC+0550	CREATE_IN_PROGRESS	AWS::CloudFormation::Stack	my-test	User Initiated

15. Check the Resources and go to relevant services and verify as per template, resources are created or not

The screenshot shows the AWS Management Console for an EC2 instance named 'test-stack'. The instance is in a 'running' state. The instance details are as follows:

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS	Public IP
test-stack	i-831ded32	t2.micro	us-east-1c	running	2/2 checks ...	None	ec2-54-85-108-86.com...	54.85.108.86

The instance details section shows:

- Instance ID: i-831ded32
- Public DNS: ec2-54-85-108-86.compute-1.amazonaws.com
- Instance state: running
- Public IP: 54.85.108.86

Connecting to EC2 (Webserver) instance using SSH

- Open the Terminal
- Locating to Path and give the permission to the .pem key
chmod 400 /path/my-key-pair.pem
- Login to ec2 using the below command
ssh -i /path/my-key-pair.pem <user_name>@<instance_url>
- Verify that the fingerprint in the security alert matches the fingerprint
ssh -i /path/my-key-pair.pem <user_name>@<instance_url>
- Install apache2 / httpd and test the server

```
[ec2-user@ip-172-31-57-100 ~]$ sudo service httpd restart
Stopping httpd:                               [ OK ]
Starting httpd:                                [ OK ]
[ec2-user@ip-172-31-57-100 ~]$
```

Note : We can download the sample cloudformation templates by below URL:

<http://docs.aws.amazon.com/AWSCloudFormation/latest/UserGuide/sample-templates-services-us-west-2.html>

Copying Files

scp -ri <keyname.pem> <file path> <username>@<server-name/server-ip address>:<path>

To Download

scp -i </path/my-key-pair.pem> <user_name>@<instance_url>

******* Thank You *******

Sivaram
