Why CloudFormation?

Setting Up an Application

Series of API
Calls to AWS

AWS CLI & SDKs

Configure VPC

Launch ELB

Launch EC2 Instances

Launch RDS Instance

Define IAM Users

…

Setting Up an Application
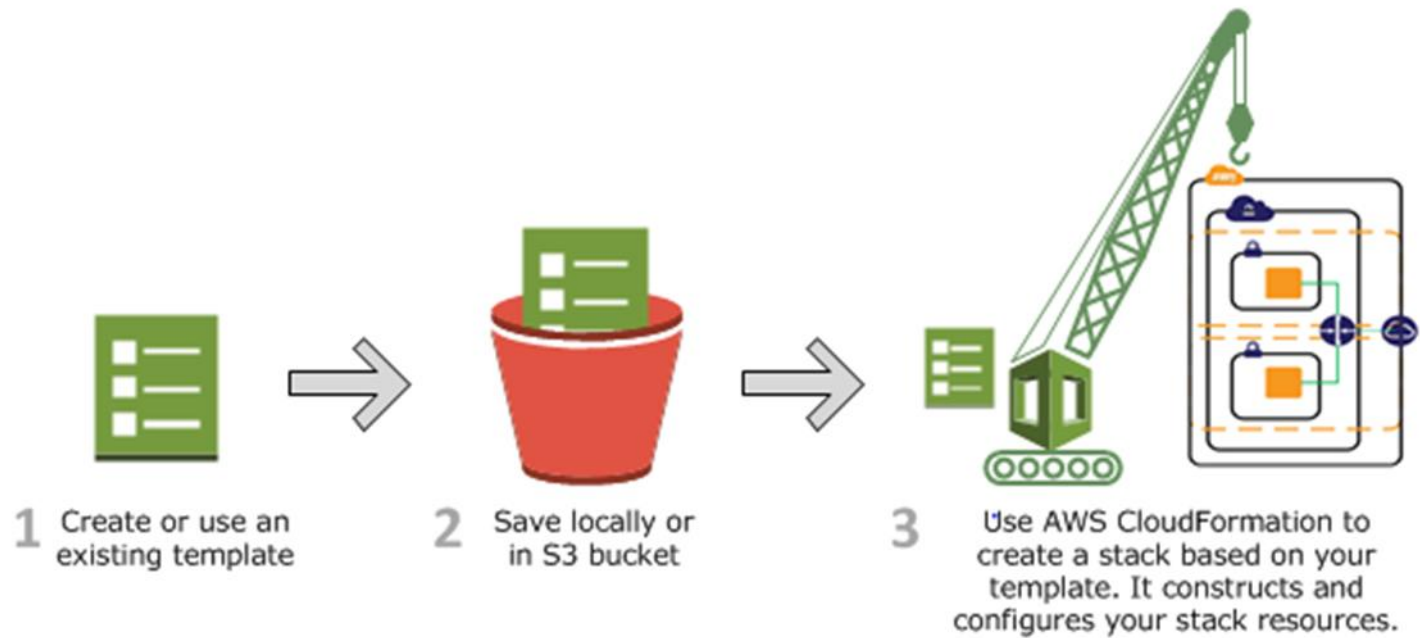

Template of Resources
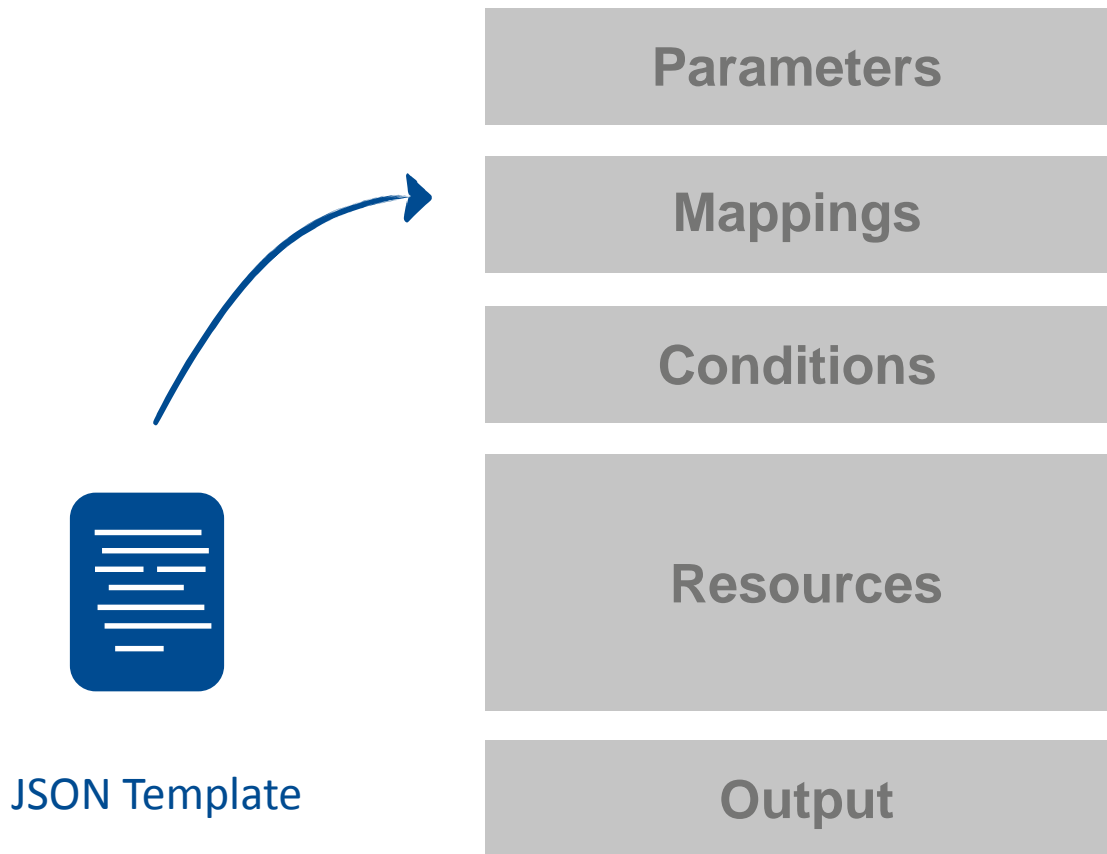
VPC

ELB

EC2 Instances

RDS Instance

IAM Users

…

How it works?

1 Create or use an existing template

2 Save locally or in S3 bucket

3 Use AWS CloudFormation to create a stack based on your template. It constructs and configures your stack resources.

Anatomy of a CloudFormation Template

Parameters

Mappings

Conditions

Resources

Output

JSON Template

Key Benefits
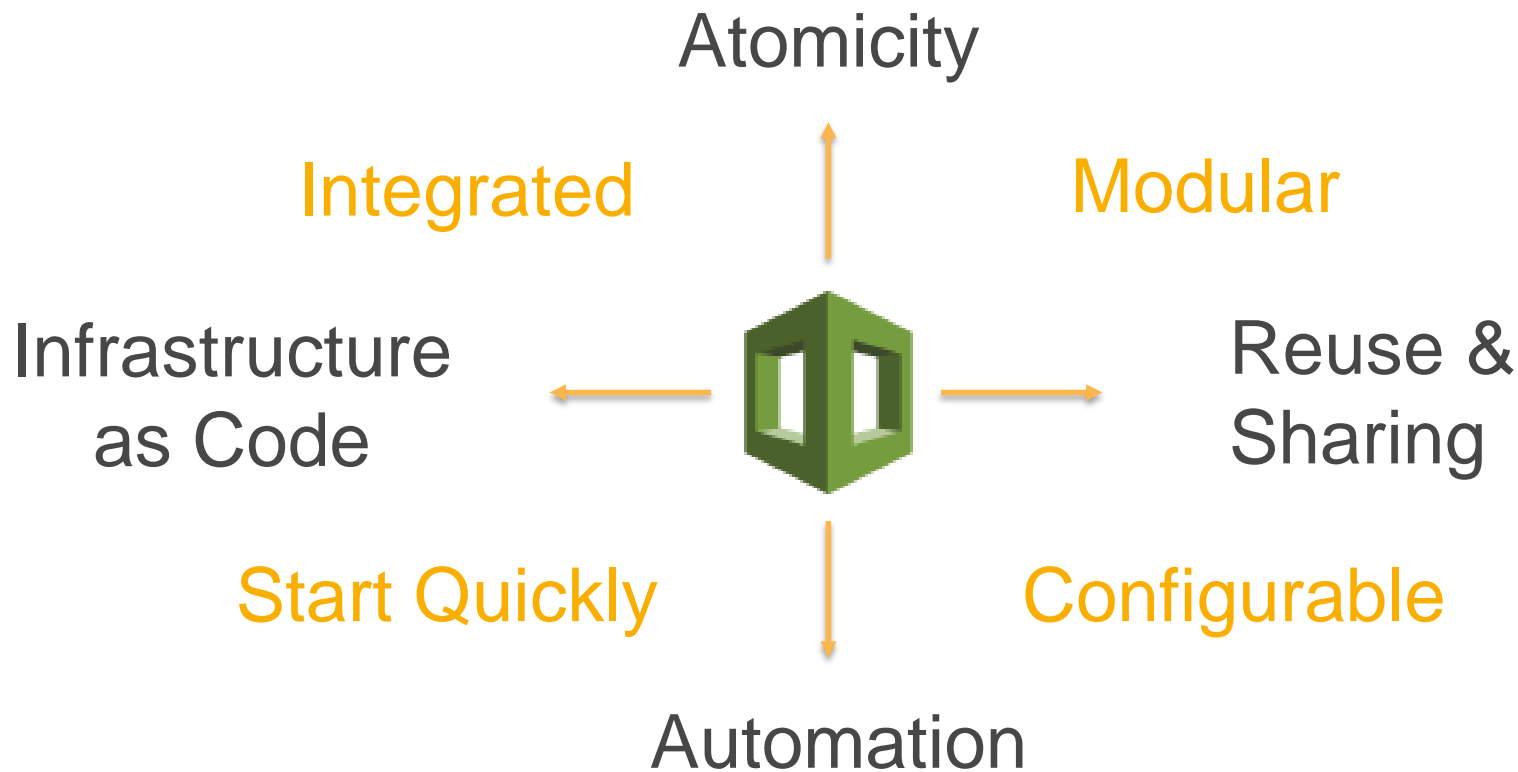
Usecases

Go Global

Continuous Delivery

Infrastructure as Code

Cost Allocation

Demos

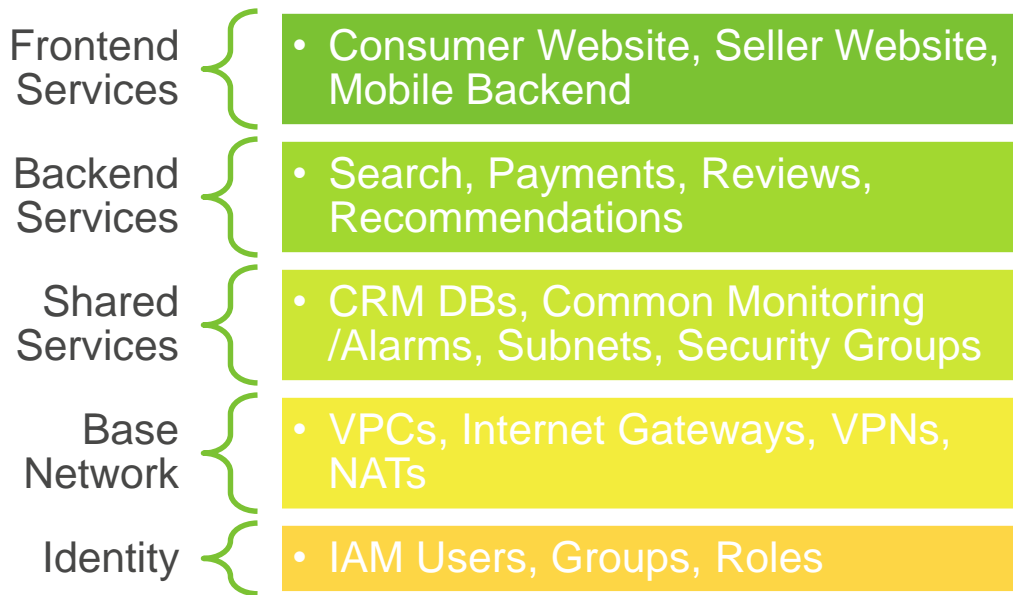Software Evaluation

Test Automation

Complex Enterprise SW

Trainings

Load Testing

VPC Configuration

How to plan my stacks?

Organize by Layers

Frontend Services
- Consumer Website, Seller Website, Mobile Backend

Backend Services
- Search, Payments, Reviews, Recommendations

Shared Services
- CRM DBs, Common Monitoring /Alarms, Subnets, Security Groups

Base Network
- VPCs, Internet Gateways, VPNs, NATs

Identity
- IAM Users, Groups, Roles

Validate your Templates

- JSON Syntax
- Circular Dependencies
- Template Structure

validate-template

Description

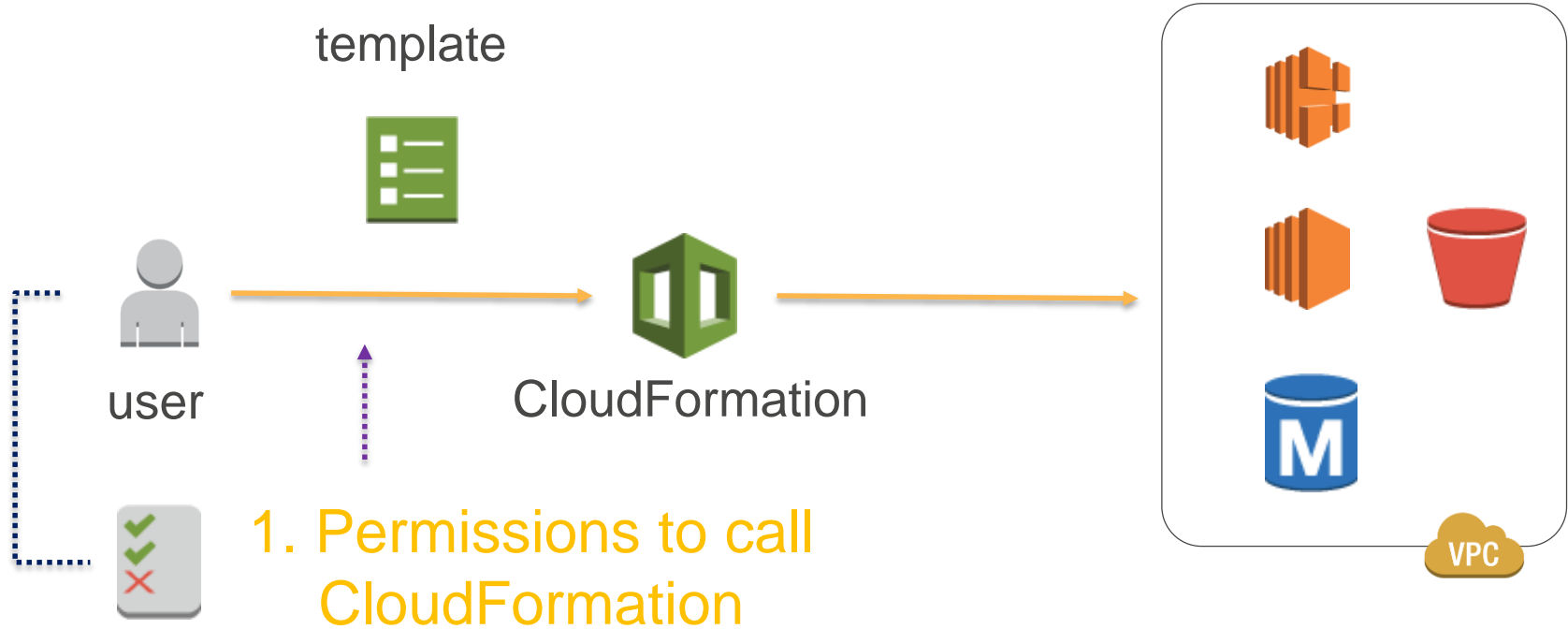Validates a specified template.

Synopsis

```
  validate-template
[--template-body <value>]
[--template-url <value>]
[--cli-input-json <value>]
[--generate-cli-skeleton]
```

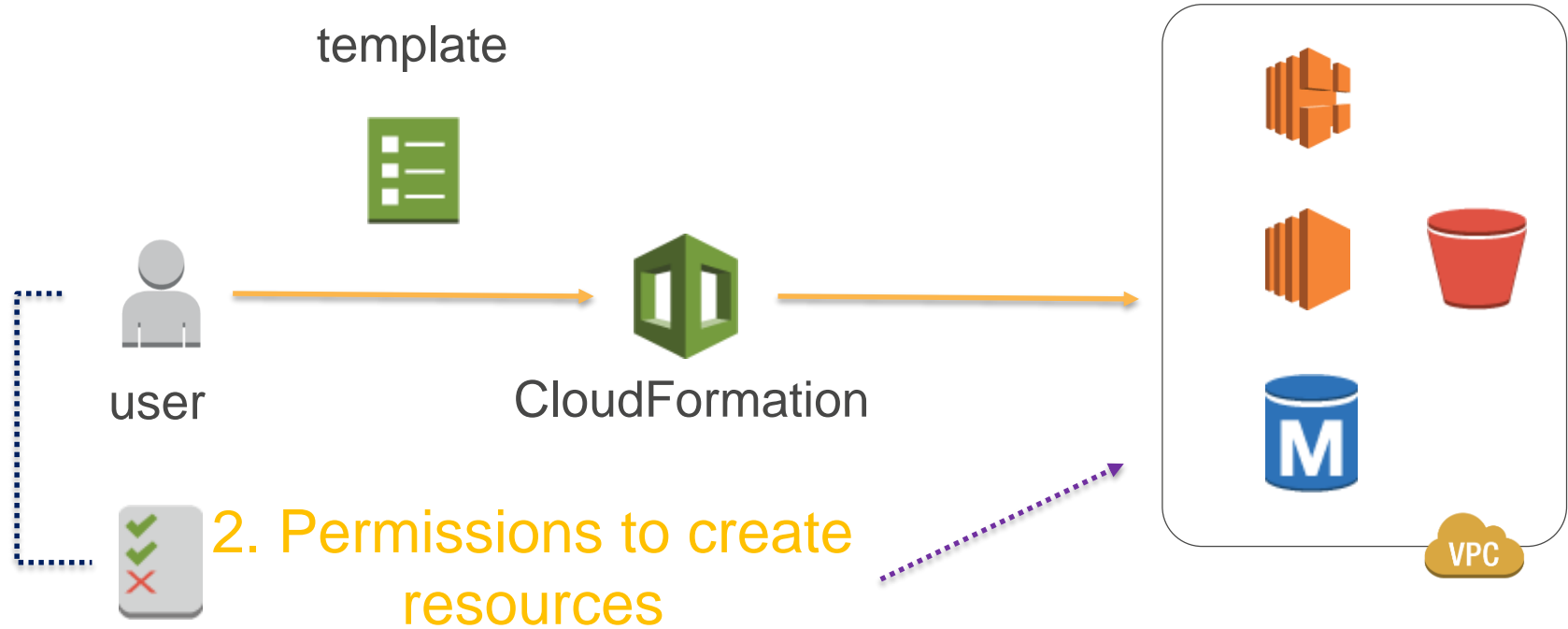# Use Parameter Types

```
"Parameters" : {
    "aVpcId" : {
        "Type" : "AWS::EC2::VPC::Id"
    },
    "bSubnetIds" : {
        "Type" : "List<AWS::EC2::Subnet::Id>"
    },
    "cSecurityGroups" : {
        "Type" : "List<AWS::EC2::SecurityGroup::Id>"
    }
}
```

Check IAM Permissions

template

user

CloudFormation

1. Permissions to call
CloudFormation

VPC

Check IAM Permissions

How to debug?

View Events

Overview	Outputs
2015-04-28	
▸ 10:44:28 UTC+1000	
▸ 10:44:25 UTC+1000	
▸ 10:43:39 UTC+1000	
10:43:37 UTC+1000	
▸ 10:43:36 UTC+1000	
▸ 10:43:35 UTC+1000	
10:43:19 UTC+1000	
▸ 10:42:57 UTC+1000	

```
PROMPT> aws cloudformation describe-stack-events --stack-name myteststack
{
    "StackEvents": [
        {
            "StackId": "arn:aws:cloudformation:us-east-1:123456789012:stack/myteststack/466
            "EventId": "af67ef60-0b8f-11e3-8b8a-500150b352e0",
            "ResourceStatus": "CREATE_COMPLETE",
            "ResourceType": "AWS::CloudFormation::Stack",
            "Timestamp": "2013-08-23T01:02:30.070Z",
            "StackName": "myteststack",
            "PhysicalResourceId": "arn:aws:cloudformation:us-east-1:123456789012:stack/mytes
            "LogicalResourceId": "myteststack"
        },
```

How to protect running stacks?

Protect Stacks from Unintended Changes

Frontend Services
- Consumer Website, Seller Website, Mobile Backend

Backend Services
- Search, Payments, Reviews, Recommendations

Shared Services
- CRM DBs, Common Monitoring /Alarms, Subnets, Security Groups

Base Network
- VPCs, Internet Gateways, VPNs, NATs

Identity
- IAM Users, Groups, Roles

Protect Stacks from Unintended Changes

```
{
    "Effect" : "Deny",
    "Action" : [ "cloudformation:*" ],
    "Resource" :
        "arn:aws:cloudformation:us-west-2:123456789:stack/BaseNet*"
}
{

    "Effect" : "Allow",
    "Action" : [ "cloudformation:*" ],
    "Resource" :
        "arn:aws:cloudformation:us-west-2:123456789:stack/FrontEnd*"
}
```

Stack Policies Against Unwanted Updates

"Do not update the databases"

```
"Effect" : "Deny",
"Principal" : "*",
"Action" : "Update:*",
"Resource" : "*",
"Condition" : {
    "StringEquals" : {
        "ResourceType" :

["AWS::RDS::DBInstance",
   "AWS::Redshift::Cluster"]
    }
```

"Okay to update, unless the
update requires replacement"

```
"Effect" : "Deny",
"Principal": "*",
"Action" : "Update:Replace",
"Resource" :
"LogicalResourceId/MyInstance"
```

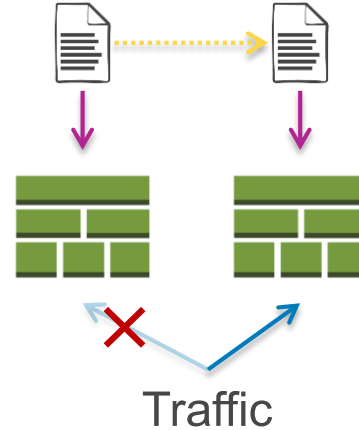# How to safely update stacks?

Choose an Update Style

In-place

Blue-Green

Templates

Stacks

Traffic

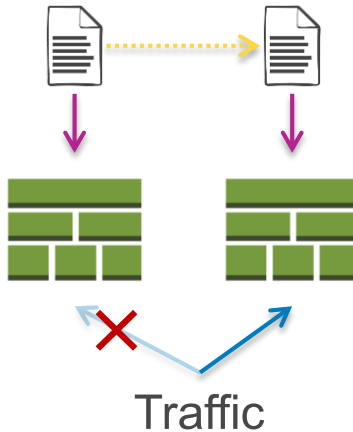# Choose an Update Style

In-place

Blue-Green

Templates

Stacks

Traffic

Fast, Simple &
Cost Efficient

Robust

Review Updates

What is going to be updated?

- Run Textual Diffs
- Pay attention to impact on Related Resources
  - Ref and Get:Att
- Check for Update Mode
  - No Interruption
  - Some Interruption
  - Replacement
- Check for Drift

Review Updates

What is going to be updated?

- Preview Feature with Change Sets *New*

- Pay attention to impact on Related Resources

  - Ref and Get:Att

- Check for Update Mode

  - No Interruption

  - Some Interruption

  - Replacement

- Check for Drift

Review Impact via Change Sets

Create Stack

Filter: Active ▾

Stack Name

☑ LAMP-Stack-3

AWS ▾   Services ▾   Edit ▾   Jeff Barr ▾   N. Virginia ▾   Support ▾

CloudFormation > Stack: LAMP-Stack-3 > Change set detail: BigChanges

BigChanges   Other Actions ▾   Execute

Overview

ID   arn:aws:cloudformation:us-east-1:348414629041:changeSet/BigChanges/be420e82-85ae-4bca-ad76-60b8d34c290a

Description Big changs for my stack

Created time 2016-03-23 19:09:39 UTC-0700

Status   CREATE_COMPLETE

Stack name   LAMP-Stack-3

▸ Change set input

▾ Changes

The changes CloudFormation will make if you execute this change set.

🔻 Filter

Action	Logical ID	Physical ID
Add	WebServerAutoScalingGroup	
Remove	WebServerInstance	i-d47ac24f
Add	WebServerLaunchConfig	
Add	WebSiteLoadBalancer	

Execute change set   ✕

Are you sure you want to execute the **BigChanges** change set to update the
LAMP-Stack-3 stack?

Cancel   Execute