Module 9

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The architectural need

You need to start automating to keep growing. Your organization has many different architectures and needs a way to consistently deploy, manage, and update them.

Module Overview

- Why Automate?
- Automating Infrastructure
- Automating Deployment

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Why Should You Automate?

Without Automation

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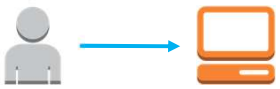
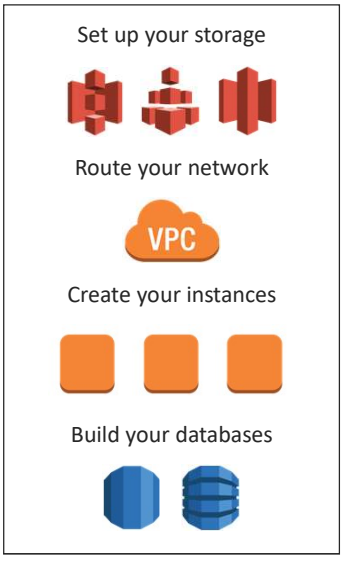
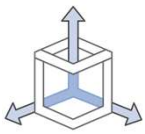
Long manual process to build an architecture

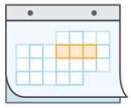




Risks From Manual Processes



Does not scale



No version control

Lack of audit trails

Inconsistent data management

In General

If you have to manually change something in your production environment,
you are putting yourself at risk.

Manual processes are risks without reward.

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Automating Your Infrastructure

Automation of Your Infrastructure

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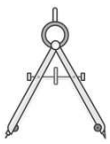
AWS CloudFormation

Provides a common language to describe your AWS infrastructure



Creates and builds those described resources in an automated manner

How Does it Work?

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AWS CloudFormation Templates

- JSON/YAML formatted file describing the resources to be created
- Treat it as source code: Put it in your repository

JSON

```
{
  "Resources" : {
    "HelloBucket" : {
      "Type" : "AWS::S3::Bucket"
    }
  }
}
```

YAML

```
Resources:
 HelloBucket:
  Type: AWS::S3::Bucket
```


Infrastructure as Code (IaC)

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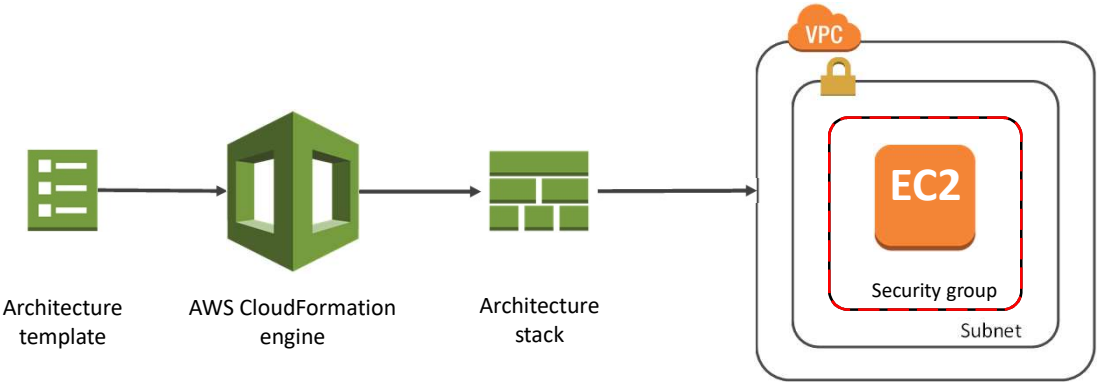
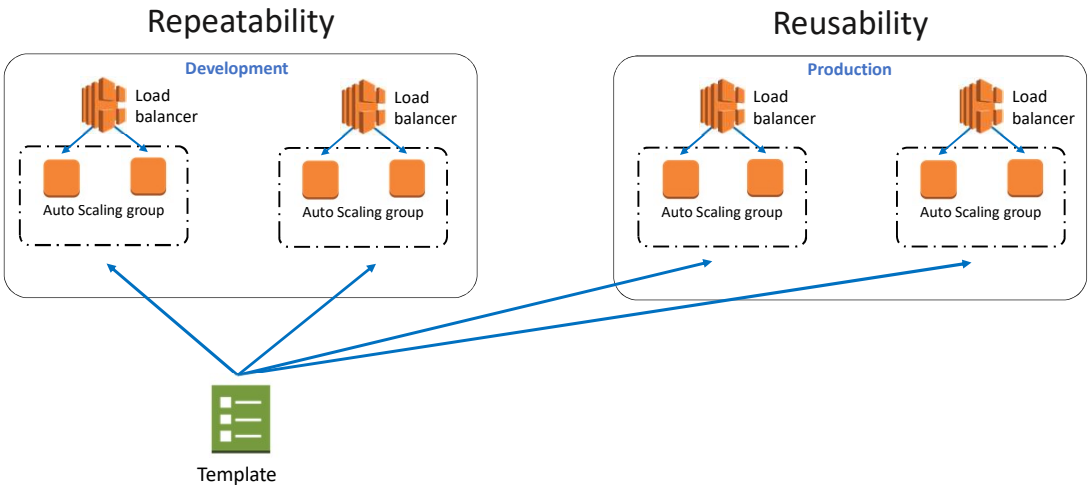
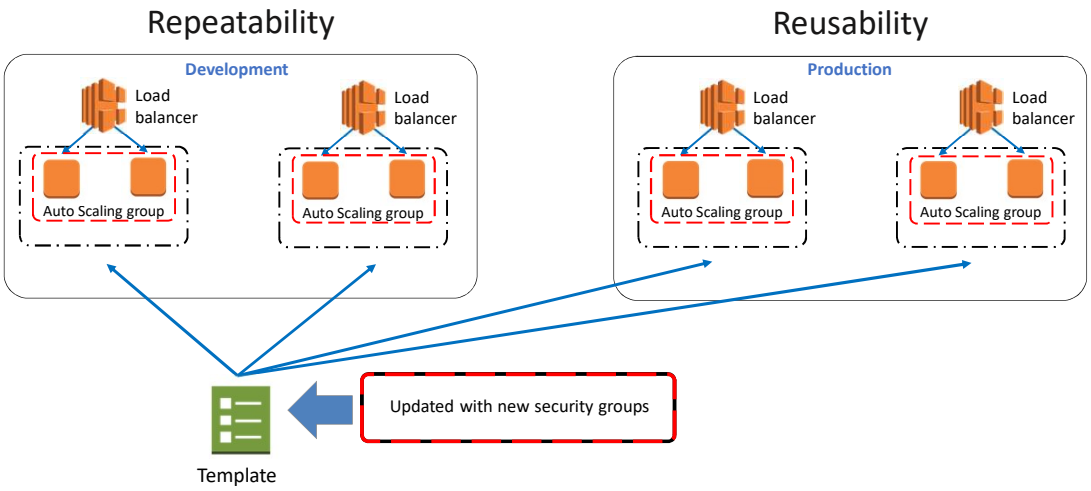


Cloud formation supports drift detection

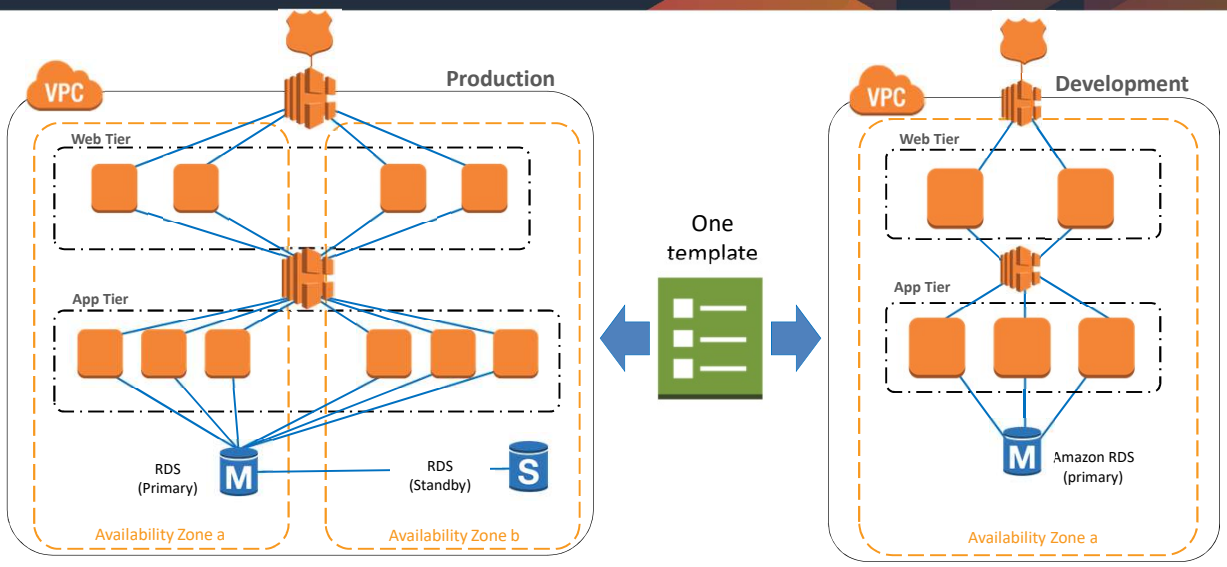
Benefits of IaC



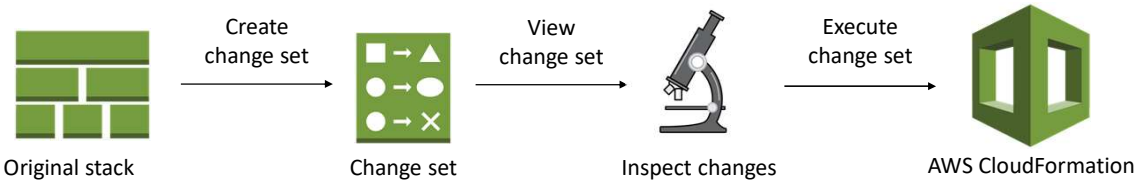
Benefits of IaC



AWS CloudFormation Conditions



How Do I Update My Stacks?



Design Example

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A layered architecture

Front end	CRM web interface, admin interface, analytics dashboard
Backend	Customers, campaigns, products, marketing collateral, analytics
Shared	CRM DBs, common monitoring/alarms, subnets, security groups
Base network	VPCs, internet gateways, VPNs, NATs
Identity	IAM users, groups, roles

AWS Quick Starts

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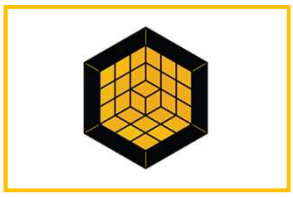
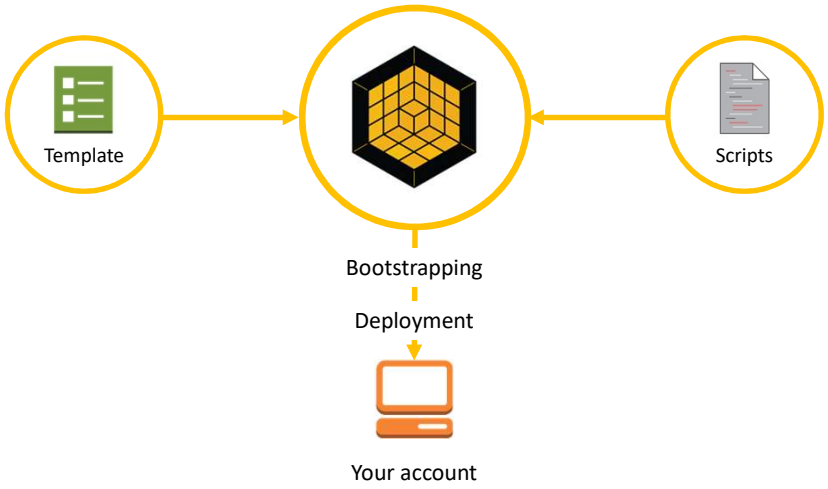
Standardized templates



AWS CloudFormation templates built by AWS Solutions Architects

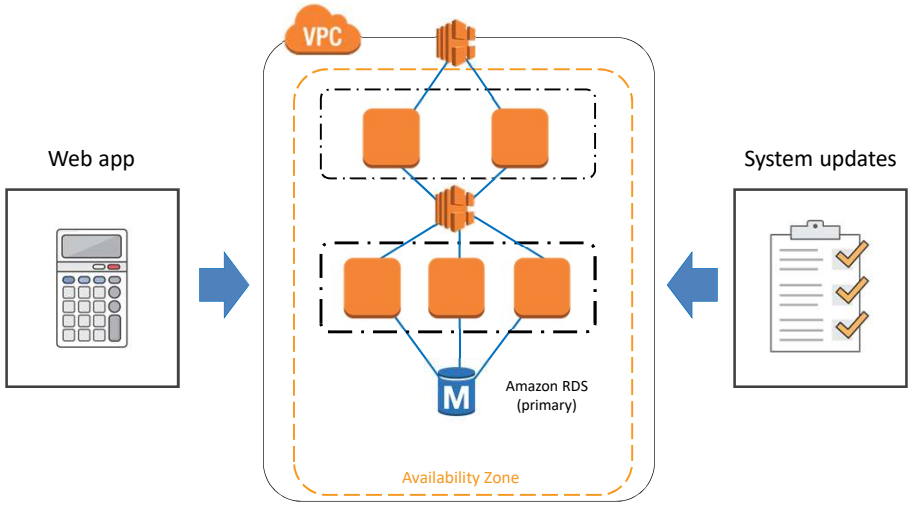
- Gold-standard deployments in the AWS Cloud
- Based on AWS best practices for security and high availability
- Create entire architectures with one click in less than an hour
- Great for experimentation and building off

What Is a Quick Start?



Automating Deployments

How Do You Modify Your Fleet?



Systems Manager

AWS Systems Manager

A set of capabilities that enable **automated configuration** and **ongoing management of systems at scale**

- Across all of your Windows and Linux workload
- Runs in Amazon EC2 or on-premises

What Can It Do?

Run Command

Maintenance Windows

Patch Management

State Manager

AWS OpsWorks for Infrastructure and Deployment Automation

AWS OpsWorks

Configuration management services

- AWS OpsWorks Stacks
- AWS OpsWorks for Chef Automate
- AWS OpsWorks for Puppet Enterprise

OpsWorks Stacks has Lifecycle Events

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Allows you to run scripts on these triggers:

Setup occurs on a new instance after it successfully boots.

Configure occurs on all of the stack's instances when an instance enters or leaves the online state.

Deploy occurs when you deploy an app.

Undeploy occurs when you delete an app.

Shutdown occurs when you stop an instance.

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A Little More Hands Off

General Challenges

- Managing infrastructure around deploying an app can be difficult
- It can take a lot of time to manage and configure servers
- Lack of consistency across multiple projects or applications

AWS Elastic Beanstalk

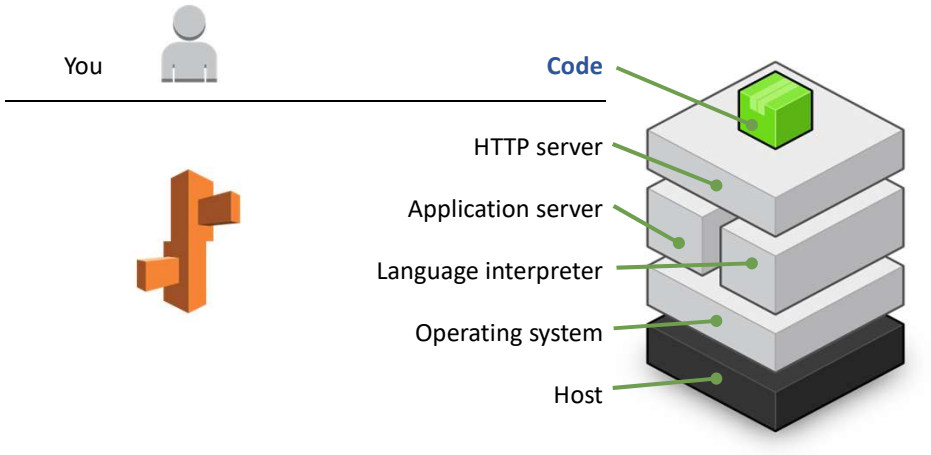
AWS Elastic Beanstalk

Provisions and operates the infrastructure and **manages the application stack for you**

Completely transparent—you can see everything that is created

Impossible to outgrow; **automatically scales your application** up and down

What Do You Control?

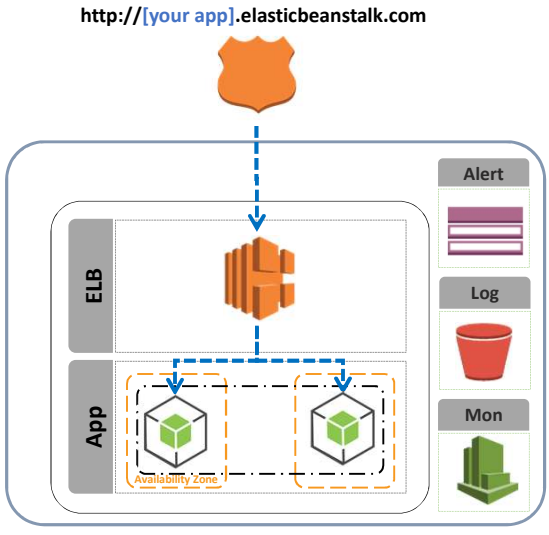


Elastic Beanstalk – Environment

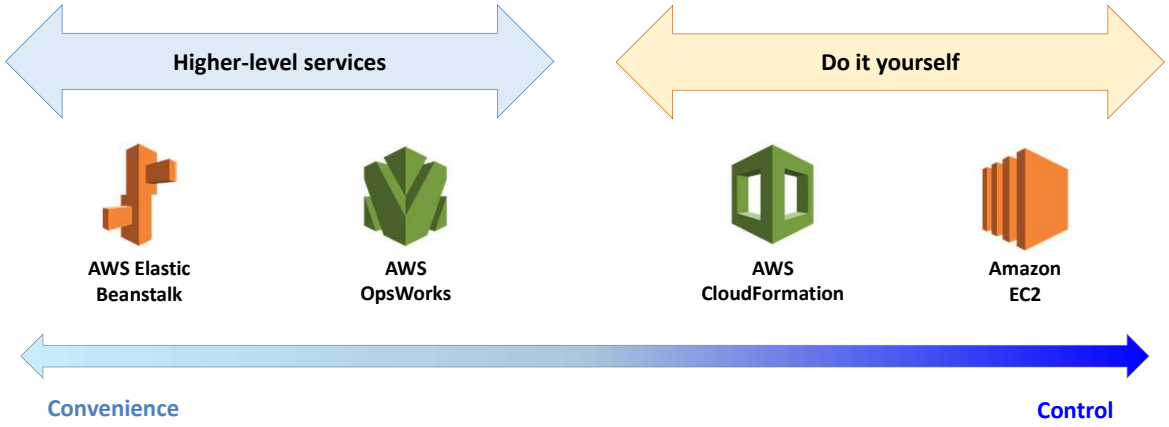
Elastic Beanstalk provisions necessary infrastructure resources

Elastic Beanstalk provides you with a unique domain name for your application environment (e.g., yourapp.elasticbeanstalk.com).

- You can resolve your own domain name to this domain name with Route 53



Choosing The Right Solution



Lab M09-01: Automating Infrastructure Deployment with AWS CloudFormation

Lab M09-01: Automating Infrastructure Deployment

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"I want to deploy infrastructure in a consistent, repeatable manner."

Technologies used:

- AWS CloudFormation

Lab M09-01: Automating Infrastructure Deployment

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You will deploy infrastructure in **layers**:

- Network layer
- Application layer

You will also:

- Update a stack
- Delete a stack that has a *deletion policy*

Duration: 30m

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