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AWS Certified Solutions Architect

OFFICIAL STUDY GUIDE

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After all of the resources have been deleted, AWS CloudFormation signals that your stack has been successfully deleted. If AWS CloudFormation cannot delete a resource, the stack will not be deleted. Any resources that haven't been deleted will remain until you can successfully delete the stack.

Use Case

By allowing you to replicate your entire infrastructure stack easily and quickly, AWS CloudFormation enables a variety of use cases, including, but not limited to:

Quickly Launch New Test Environments AWS CloudFormation lets testing teams quickly create a clean environment to run tests without disturbing ongoing efforts in other environments.

Reliably Replicate Configuration Between Environments Because AWS CloudFormation scripts the entire environment, human error is eliminated when creating new stacks.

Launch Applications in New AWS Regions A single script can be used across multiple regions to launch stacks reliably in different markets.

AWS Elastic Beanstalk

AWS Elastic Beanstalk is the fastest and simplest way to get an application up and running on AWS. Developers can simply upload their application code, and the service automatically handles all of the details, such as resource provisioning, load balancing, Auto Scaling, and monitoring.

Overview

AWS comprises dozens of building block services, each of which exposes an area of functionality. While the variety of services offers flexibility for how organizations want to manage their AWS infrastructure, it can be challenging to figure out which services to use and how to provision them. With AWS Elastic Beanstalk, you can quickly deploy and manage applications on the AWS cloud without worrying about the infrastructure that runs those applications. AWS Elastic Beanstalk reduces management complexity without restricting choice or control.

There are key components that comprise AWS Elastic Beanstalk and work together to provide the necessary services to deploy and manage applications easily in the cloud. An *AWS Elastic Beanstalk application* is the logical collection of these AWS Elastic Beanstalk components, which includes environments, versions, and environment configurations. In AWS Elastic Beanstalk, an application is conceptually similar to a folder.

An *application version* refers to a specific, labeled iteration of deployable code for a web application. An application version points to an Amazon S3 object that contains the deployable code. Applications can have many versions and each application version is unique. In a running environment, organizations can deploy any application version they already uploaded to the application, or they can upload and immediately deploy a new application version. Organizations might upload multiple application versions to test differences between one version of their web application and another.

An *environment* is an application version that is deployed onto AWS resources. Each environment runs only a single application version at a time; however, the same version or different versions can run in as many environments at the same time as needed. When an environment is created, AWS Elastic Beanstalk provisions the resources needed to run the application version that is specified.

An *environment configuration* identifies a collection of parameters and settings that define how an environment and its associated resources behave. When an environment's configuration settings are updated, AWS Elastic Beanstalk automatically applies the changes to existing resources or deletes and deploys new resources depending on the type of change.

When an AWS Elastic Beanstalk environment is launched, the environment tier, platform, and environment type are specified. The environment tier that is chosen determines whether AWS Elastic Beanstalk provisions resources to support a web application that handles HTTP(S) requests or an application that handles background-processing tasks. An environment tier whose web application processes web requests is known as a *web server tier*. An environment tier whose application runs background jobs is known as a *worker tier*.

At the time of this writing, AWS Elastic Beanstalk provides platform support for the programming languages Java, Node.js, PHP, Python, Ruby, and Go with support for the web containers Tomcat, Passenger, Puma, and Docker.

Use Cases

A company provides a website for prospective home buyers, sellers, and renters to browse home and apartment listings for more than 110 million homes. The website processes more than three million new images daily. It receives more than 17,000 image requests per second on its website during peak traffic from both desktop and mobile clients.

The company was looking for ways to be more agile with deployments and empower its developers to focus more on writing code instead of spending time managing and configuring servers, databases, load balancers, firewalls, and networks. It began using AWS Elastic Beanstalk as the service for deploying and scaling the web applications and services. Developers were empowered to upload code to AWS Elastic Beanstalk, which then automatically handled the deployment, from capacity provisioning, load balancing, and Auto Scaling, to application health monitoring.

Because the company ingests data in a haphazard way, running feeds that dump a ton of work into the image processing system all at once, it needs to scale up its image converter fleet to meet peak demand. The company determined that an AWS Elastic Beanstalk worker fleet to run a Python Imaging Library with custom code was the simplest way to meet the requirement. This eliminated the need to have a number of static instances or, worse, trying to write their own Auto Scaling configuration.

By making the move to AWS Elastic Beanstalk, the company was able to reduce operating costs while increasing agility and scalability for its image processing and delivery system.

Key Features

AWS Elastic Beanstalk provides several management features that ease deployment and management of applications on AWS. Organizations have access to built-in Amazon CloudWatch monitoring metrics such as average CPU utilization, request count, and average

latency. They can receive email notifications through Amazon SNS when application health changes or application servers are added or removed. Server logs for the application servers can be accessed without needing to log in. Organizations can even elect to have updates applied automatically to the underlying platform running the application such as the AMI, operating system, language and framework, and application or proxy server.

Additionally, developers retain full control over the AWS resources powering their application and can perform a variety of functions by simply adjusting the configuration settings. These include settings such as:

- Selecting the most appropriate Amazon EC2 instance type that matches the CPU and memory requirements of their application
- Choosing the right database and storage options such as Amazon RDS, Amazon DynamoDB, Microsoft SQL Server, and Oracle
- Enabling login access to Amazon EC2 instances for immediate and direct troubleshooting
- Enhancing application security by enabling HTTPS protocol on the load balancer
- Adjusting application server settings (for example, JVM settings) and passing environment variables
- Adjust Auto Scaling settings to control the metrics and thresholds used to determine when to add or remove instances from an environment

With AWS Elastic Beanstalk, organizations can deploy an application quickly while retaining as much control as they want to have over the underlying infrastructure.

AWS Trusted Advisor

AWS Trusted Advisor draws upon best practices learned from the aggregated operational history of serving over a million AWS customers. AWS Trusted Advisor inspects your AWS environment and makes recommendations when opportunities exist to save money, improve system availability and performance, or help close security gaps. You can view the overall status of your AWS resources and savings estimations on the AWS Trusted Advisor dashboard.



AWS Trusted Advisor is accessed in the AWS Management Console. Additionally, programmatic access to AWS Trusted Advisor is available with the AWS Support API.

AWS Trusted Advisor provides best practices in four categories: cost optimization, security, fault tolerance, and performance improvement. The status of the check is shown by using color coding on the dashboard page, as depicted in [Figure 11.10](#).