

UNIVERSITY of WASHINGTON

# Group 2: Amazon Elastic Beanstalk



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## About

- > **PAAS to deploy and manage web apps & services**
- > **Supported environments:**
  - Java, .NET, PHP, Node.js, Python, Ruby, Go, Docker.
  - Servers: Apache HTTP, Tomcat, Nginx, Passenger and IIS.
- > **Handles:**
  - Deployment, capacity provisioning, load balancing, auto-scaling, application health monitoring.
- > **Maintain full control of resources powering app.**

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## History

- > **Amazon Web Services**
  - AEB introduced in 2011.
- > **For deploying infrastructure which uses many AWS services**
  - EC2, S3, CloudWatch, Simple Notification Service, Elastic Load Balancing, Auto Scaling.

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## Motivation

- > **Free developers from deployment oriented tasks**
  - Provisioning servers, setting up load balancing, managing scaling.
- > **Allow focus on implementation aspect of project(s)**
  - Time spent re-architecting infrastructure.
  - Scaling of servers to support more users.

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## Features

### > Wide selection of application platforms

- Supports web apps written in many popular languages & frameworks.
- Available platforms to deploy:
  - > Java, .NET, Node.js, PHP, Ruby, Python, Go, and Docker.

### > Variety of application deployment options

- AWS Management Console, Elastic Beanstalk CLI, Visual Studio, Eclipse.
- Pick from multiple deployment policy choices to choose between speed and safety of deployment

### > Monitoring

- App health: 40+ metrics (latency, CPU utilization, response codes, etc.)
- Logging, tracing
  - > Customized metrics via CloudWatch, AWS X-Ray



## Features

### > Management and updates

- Automatic update of latest version of your environment
  - > **Immutable deployment** mechanism minimizes end user impact.

### > Scaling

- Scales in and out based on specific needs.

### > Customization

- Selection of resources optimal for your application.

### > Compliance

- Meets criteria for ISO, PCI, SOC 1, SOC 2, and SOC 3, HIPAA eligibility.
- Process regulated financial data or protected health information (PHI)



## **Use cases**

- > **Online e-commerce application:**
  - User base across countries, continents.
- > **Game server**
- > **State voting web app**

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## **Advantages**

- > **Fast configuration & Automation**
- > **Customization**
- > **Price**
- > **Flexibility**

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## Disadvantages

- > **Unreliable deployment**
  - Feedback/Logs not always intuitive after environment creation.
- > **Deployment speed**
  - Can take up to 15 minutes depending on specifics of configuration.
- > **Upgrades**
  - Availability of changes made to latest versions.



## Usability

- ❑ Minimal intervention and fast configuration
  - ❑ Automated configuring log file rotations, linux package installation, load balancer configuration and database setup
  - ❑ Supports various platforms (PHP, Java, Python, Ruby, etc) and multiple environments (Linux & Windows Server based)
  - ❑ Managed security groups and policies
  - ❑ Flexibility in adding additional resources



## Usability (contd.)

- ❑ Dynamic customization
  - ❑ Everything is an AWS Service!
  - ❑ More low level access and control
  - ❑ Easier update to config files
  - ❑ Autoscaling based on the threshold



## Usability (contd.)

### API References

- ❑ Several actions are supported (Request parameters, errors, sample request and response)
  - ❑ AbortEnvironmentUpdate, CheckDNSAvailability, DescribeApplications, RebuildEnvironment, RestartAppServer, UpdateApplication, etc



## Example

### Sample Request

```
https://elasticbeanstalk.us-west-2.amazonaws.com/?
ApplicationNames.member.1=SampleApplication
&Operation=DescribeApplications
&AuthParams
```

### Sample Response

```
<DescribeApplicationsResponse xmlns="https://elasticbeanstalk.amazonaws.com/
docs/2010-12-01/">
  <DescribeApplicationsResult>
    <Applications>
      <member>
        <Versions/>

```



## Pricing Model

- ❑ AWS Free Usage Tier (12 months limited usage per month)
- ❑ AWS Elastic Beanstalk comes at **NO-COST!**
- ❑ Cost varies on several factors (EC2 instances, bandwidth, database)
- ❑ Usually determined by Amazon EC2 instance(s) and Load Balancer Capacity Units (LCUs)
  - ❑ New connections, active connections, Bandwidth, Rule evaluations
- ❑ CloudWatch Alarms to manage costs



## Pricing Model (Use case)

- ❑ Instance : Amazon EC2 m4.xlarge 4 vCPU 16GB Memory
- ❑ Usage : 100% utilized/month
- ❑ Duration : 30 days
- ❑ EBS Volume : 100 GB
- ❑ Region : US East (N. Virginia)
- ❑ Load Balancer : 2 (200GB/month)

➔ \$181.37

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## Alternatives

- ❑ Heroku
- ❑ Google App Engine
- ❑ Microsoft Azure
- ❑ OpenShift

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## Alternatives (contd.)

- Focus on product, not deployment
- PAAS, Pay-as-you-go
- Low learning curve
- Well documented (API references)
- Vertical & horizontal scalability (“dynos”) based on thresholds
- Supports multiple platforms (Java, PHP, Go, Scala, etc)
- Free tiers

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## Alternatives (contd.)

### Which is the right fit?

- Heroku is hosted on **AWS!**
- Geographic availability
- Business needs & Flexibility
- Cost

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## Elastic Beanstalk (In a nutshell)

- ❑ Easy to use service (PAAS) for deploying & scaling web applications
- ❑ Analogy (Simply upload the code and the rest is taken care of)
- ❑ Wide selection of Application Platforms
- ❑ Fast and simple to deploy applications
- ❑ Dynamic and complete Resource control/Monitoring
- ❑ Security compliance
- ❑ Low Learning curve
- ❑ Customers (Zillow, GeoNet, CrowdChat, Samsung)



## Demonstration

### GUI:

- Walkthrough Amazon Elastic Beanstalk UI
- Create and deploy application and environment with GUI

### CLI:

- Install Elastic Beanstalk
- Create and Deploy application and environment with CLI



