

# Cloud Computing Class Project 3 Final Report

CSCI 4450/6400 Cloud Computing Spring 2020

## Group – 9

### 1. Introduce the AWS services that you used.

We have hosted our web app on the AWS Elastic Beanstalk. We have chosen Elastic Beanstalk because of the following reasons:

- a. This service can easily set up development environments to work with which saves a lot of time. In our project, we were easily able to set up the node environment on AWS Elastic Beanstalk just with few clicks and do the same with installing MySQL on this environment. This way, we have saved a lot of time to deploy the app.
- b. The tools provided by this service helps to monitor the health of the deployed web app in the form of Amazon CloudWatch. In our project, we were able to see the health of deployed app through different stages which helped us to understand the current status of the web app.
- c. AWS Elastic Beanstalk makes it easy to scale and manage web applications by increasing or decreasing the allocated resources to the web app.

Along with these, there are many more advantages of using AWS Elastic Beanstalk which makes it an easy and reliable cloud computing service.

### 2. Describe how you connect those services (system architecture or dataflow).

We have used Node JS environment on AWS Elastic Beanstalk along with RDS Database to store the application data. Express JS framework is used on top of the Node JS to create routes to the web application and web services. We have defined routes to two web services (/createApplication and /getAllStudents) which connect to the database either to read or save the GA/TA application data. And a third web service (/uploadResume) to receive the file uploads using Multer library. Other than these three, all the other routes will be redirected to the web application's index.html file. When the application runs, Express JS spins a web server on port 8081 and listens for any HTTP requests and routes to different parts of the application. The system architecture is shown in Fig 1 below.

**Dataflow:** When application is deployed on Elastic Beanstalk, it spins a server on port 8081 which will be listening for the incoming requests. When a user hits the URL <http://aum-mathsandsciences.us-east-1.elasticbeanstalk.com> it will be routed to the index.html we have inside 'project3-ui' folder since it's not one of the defined web service paths and loads the static web pages. Any subsequent routes will load the internal static web pages. Within these static web pages, we have defined a dynamic web page where

the user can submit a GA/TA application and is located at <http://aum-mathsandsciences.us-east-1.elasticbeanstalk.com/application.html>. This page contains a form where the user can fill the details and submit. We have also added the logic to check for the filled in data to make sure it's valid. All of this logic is defined within the application.html file. When the user submits the form, the validation logic makes sure that the data is valid. After the data validation, we wrap the data in a JSON and make a POST XMLHttpRequest to the web service we have defined at <http://aum-mathsandsciences.us-east-1.elasticbeanstalk.com/createApplication>. The web service receives the data, unwraps it and inserts it into the database. Along with the user info, we also make another POST call to <http://aum-mathsandsciences.us-east-1.elasticbeanstalk.com/uploadResume> to upload the resume to the backend. The attached file is sent as formData through the XMLHttpRequest. The attached form data is received by the web service and is submitted to the Multer library which saves the file at path 'project3-ui/resumes/'.

The applicant's data can be retrieved by going to <http://aum-mathsandsciences.us-east-1.elasticbeanstalk.com/getAllStudents> where the webservice would return all the student's data by making a 'Select' query on the database table.

This is the way the data flows in our web application.

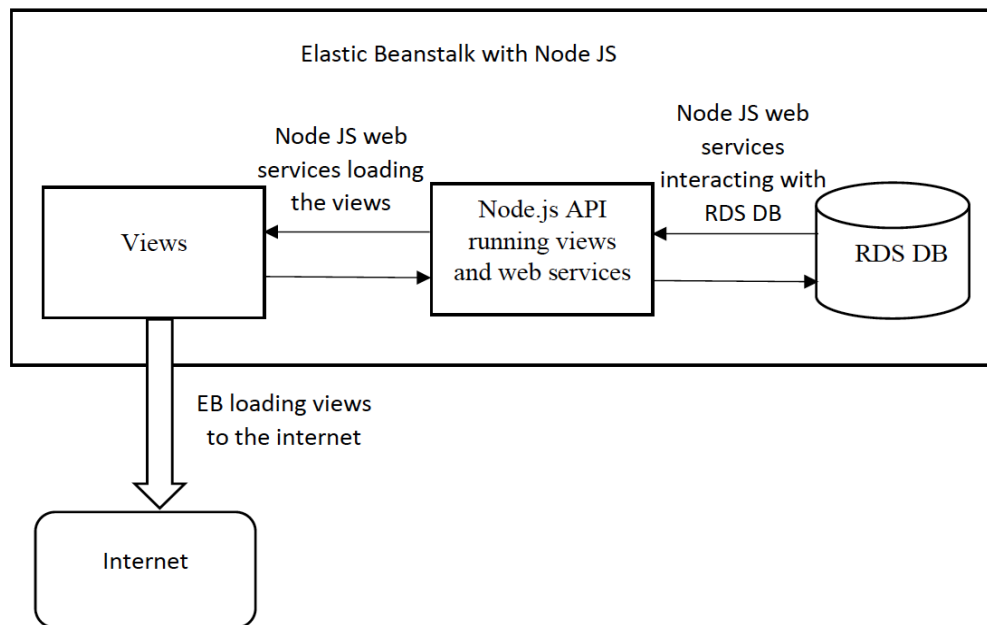


Fig 1: System Architecture

### 3. List any technology that is not mentioned in the project description for getting bonus.

We have used HTML, CSS, JavaScript, Node Js, Express JS, RDS DB with MySQL, and Multer technologies. Express JS and Multer are the technologies we have used which are not mentioned in project description.

- a. **Express** JS is a framework which is built on top of Node JS to build web application and web services.
- b. **Multer** is a Node JS middleware for handling multipart/form-data which is used for uploading files.

### 4. Please attach your codes (application) or a GitHub link to your project along with this report.

We have worked on the project locally and pushed all the code to the GitHub which is available here <https://github.com/sowmyaakula96/Project3>. We have added a **Read Me** page which gives the instructions to set up the project and run it.

### 5. Individual tasks

Student Name	Major tasks
Sowmya Yadav Akula	<ul style="list-style-type: none"><li>• Made Phase1 design diagram and designed the entire data flow of the project</li><li>• Worked on system architecture of the project.</li><li>• Worked on Express JS to spin a web server on port 8081.</li><li>• Defined routes to the web services and the entire website.</li><li>• Configured RDS MySQL database on the AWS Elastic Beanstalk and created a student table with required columns.</li><li>• Worked on MySQL and NodeJS connections and created a connection file, worked on MySQL queries to insert and select the student information from the database.</li><li>• Worked on Multer library to manage the resume file uploads, worked on dynamic form for the GA/TA application.</li><li>• Worked on making XMLHttpRequests to the web services when the form is submitted along with the resume from the website.</li><li>• Worked on adding validations to the form elements of the GA/TA application.</li><li>• Responsible for deploying the web app on AWS Elastic Beanstalk.</li><li>• Worked on making the power point presentation and pushed the code to GitHub repository.</li><li>• Worked on writing the final report.</li></ul>

<p>Kundhana Reddy Aavula Bala</p>	<ul style="list-style-type: none"> <li>• Helped in designing system architecture of phase 1 in project</li> <li>• Redesigned locally static pages of AUM website “Academic Programs and Student Resources” which again include various pages inside them with modifications as per requirements.</li> <li>• Helped on MySQL and NodeJS connections as per requirements</li> <li>• Helped in deploying the website to AWS cloud</li> <li>• Helped in power point for final project presentation</li> <li>• Helped in writing the Final report</li> </ul>
<p>Nagarjuna Sriramaneni</p>	<ul style="list-style-type: none"> <li>• I have redesigned the existing static pages of Academic departments and Community resources of the given URL which is of our own AUM website.</li> <li>• The redesign includes of serval changes from the given URL which includes changes in HTML according to the necessary for the project.</li> </ul>
<p>Gutlapalli Venkata Ganesh</p>	<ul style="list-style-type: none"> <li>• I designed the static pages of About and Auburn Montgomery resources of our AUM website.</li> <li>• By using HTML, I have made changes in URL as required to project</li> </ul>

## 6. Input/Output (take screenshots from your apps)

### a. AWS Service 1:

Screenshot of input and output:

teach (TA) or carry out other relevant tasks that contribute to the student's professional development (GA). The number of positions available is based on funding from the university and grants awarded to faculty. Please apply here for a GA/TA position.

About Auburn Montgomery

### Application Form

First Name: test  
Last Name: test1  
Student Id: 123456  
Email: test1@gmail.com  
Choose File: Akula\_Resum...m.docx.pdf  
Submit Form

Academic Programs  
Student Resources  
Academic Departments  
About  
Home

Dean's Office  
Alumni & Giving  
Giving to the College of Business  
Apply Now

Academic Advising  
News

7400 East Drive  
Montgomery, AL 36117  
Local: 334-244-3000  
Toll-Free: 800-227-2649

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Visit [www.aum.edu](http://www.aum.edu)

```
[[{"id":1,"firstname":"test","lastname":"test1","email":"test1@gmail.com","suid":"361278"}, {"id":2,"firstname":"test","lastname":"test1","email":"test1@gmail.com","suid":"361278"}, {"id":3,"firstname":"test","lastname":"test1","email":"test1@gmail.com","suid":"360375"}, {"id":4,"firstname":"Soumya Yadav","lastname":"Abhila","email":"abhila@aum.edu","suid":"360375"}, {"id":5,"firstname":"loknath","lastname":"pillai","email":"loknath@gmail.com","suid":"360375"}, {"id":6,"firstname":"shiva","lastname":"reddy","email":"shiva@gmail.com","suid":"123456"}, {"id":7,"firstname":"Soumya Yadav","lastname":"Abhila","email":"abhila@aum.edu","suid":"360375"}, {"id":8,"firstname":"test","lastname":"test1","email":"test1@gmail.com","suid":"123456"}]]
```

Environment name	Health	Application name	Date created	Last modified	URL	Running versions	Platform	Platform state
Project3-env	Ok	project3	2020-04-09 23:04:33 UTC-0500	2020-04-25 22:06:02 UTC-0500	aum-mathsandsciences.us-east-1.elasticbeanstalk.com	project3-source-13	Node.js running on 64bit Amazon Linux	Support

console.aws.amazon.com/elasticbeanstalk/home?region=us-east-1#/environment/configuration/applicationName=project3&environmentId=e-jff3qk3udv

aws Services Resource Groups

Environment: project3

Configuration

Load balancer: This configuration does not contain a load balancer.

Rolling updates and deployments: Command timeout: 600, Deployment policy: All at once, Healthy threshold: Single Instance, Ignore health check: disabled, Rolling updates: disabled. [Edit]

Security: EC2 key pair: --, IAM instance profile: aws-elasticbeanstalk-ec2-role, Service role: arn:aws:iam::074521725239:role/aws-elasticbeanstalk-service-role. [Edit]

Monitoring: CloudWatch Custom Metrics-Environment: --, CloudWatch Custom Metrics-Instance: --, Health event log streaming: disabled, Ignore HTTP 4xx: disabled, Ignore load balancer 4xx: disabled, System: Enhanced. [Edit]

Managed updates: Managed updates: disabled. [Edit]

Notifications: Email: --. [Edit]

Network: This environment is not part of a VPC.

Database: Availability: Low (one AZ), Endpoint: aaww0s5x0nenux.cneubngenkoq.us-east-1.rds.amazonaws.com:3306, Engine: mysql, Instance class: db.t2.micro, Retention: Create snapshot, Storage: 5, Username: root. [Edit]

console.aws.amazon.com/elasticbeanstalk/home?region=us-east-1#/environment/logs/applicationName=project3&environmentId=e-jff3qk3udv

aws Services Resource Groups

Environment: project3

Logs

Click Request Logs to retrieve the last 100 lines of logs or the entire set of logs from each EC2 instance. [Learn more] [Request Logs] [Refresh]

Log file	Time	EC2 instance	Type
<a href="#">Download</a>	2020-04-29T22:16:41-05:00	i-07287e987603e5112	Last 100 Lines

```
node-caracal {
  id: 8,
  firstname: 'test',
  lastname: 'test1',
  email: 'test1@gmail.com',
  suid: 123456
}
}
Querying in db.js
req {
  firstname: 'test',
  lastname: 'test1',
  suid: '123456',
  email: 'test1@gmail.com'
}
The solution is: OkPacket {
  fieldCount: 0,
  affectedRows: 1,
  insertId: 9,
  serverStatus: 2,
  warningCount: 0,
  message: '',
  protocol41: true,
  changedRows: 0
}
file uploaded {
  filename: 'resume',
  originalname: 'Akula_Resume_Intern.docx.pdf',
  encoding: '7bit',
  mimetype: 'application/pdf'
}
newFileName: resume-1588216731217.pdf
Done

/var/log/nginx/error.log
-----

/var/log/eb-activity.log
-----
[2020-04-25T14:30:56.458Z] INFO [16415] - [CMD-TailLogs/AddonsBefore] : Starting activity...
[2020-04-25T14:30:56.458Z] INFO [16415] - [CMD-TailLogs/AddonsBefore] : Completed activity.
[2020-04-25T14:30:56.458Z] INFO [16415] - [CMD-TailLogs/TailLogs] : Starting activity... [Outlook]
```

## SOWMYA YADAV AKULA

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### CAREER OBJECTIVE

Seeking for a summer internship to develop my skills and gain hands-on experience in the area of cybersecurity.

### EDUCATION

Master's in Computer Science and Cybersecurity (Pursuing)	<b>4.0 GPA</b>	Aug 2018 - Present
Auburn University, Montgomery, Alabama		
Bachelor's in Computer Science	<b>70%</b>	Sep 2013 - May 2017
Jawaharlal Technological University, Hyderabad, Telangana, India		

### TECHNICAL SKILLS

Tools	:	Eclipse Helios, Selenium, MS Office, Apache POI
Cybersecurity tools	:	John the Ripper, Nmap, Netcat, Wireshark, Snort, Nikto, Burp Suite
Databases	:	SQL, Microsoft SQL Server
Computer Languages	:	C, Java, JavaScript, P/SQL, Php, Python
Operating Systems	:	Windows, Linux
VMs	:	Metasploitable VM, Kali Linux

### MASTERS COURSE WORK

- |                               |                             |                                     |
|-------------------------------|-----------------------------|-------------------------------------|
| 1. Intro to Computer Security | 3. Security Policy Seminars | 5. Data Communication and Networks  |
| 2. Cryptography               | 4. Software Engineering     | 6. Network Security and Reliability |

### KEY PROJECTS

- |   |                      |                               |
|---|----------------------|-------------------------------|
| <b>Privacy Protection for Web Search Engine</b>   | <b>Major Project</b> | <b>(Dec 2016 - May 2017)</b>  |
| <ul style="list-style-type: none"><li>Designed a privacy-preserving personalized web search framework UPS, which can generalize profiles according to user-specified privacy requirements.</li><li>Developed GreedyDP and GreedyDL algorithms to support runtime profiling.</li><li>Presented the experimental results to show the effectiveness and efficiency of UPS network.</li></ul> |                      |                               |
| <b>Digital Time Master</b>  | <b>Mini Project</b>  | <b>(June 2016 - Nov 2016)</b> |
| <ul style="list-style-type: none"><li>Designed an application which will help the students and teachers to view their schedules from anywhere.</li><li>Designed the architecture of flow of the data between the application and the database.</li><li>Used HTML, CSS, and Javascript to develop the application.</li></ul>   |                      |                               |

### WORK EXPERIENCE

Teaching Assistant	Auburn University, Montgomery, Alabama	(Aug 2018-Present)
<ul style="list-style-type: none"><li>Working as a teaching assistant for Maths Lab at Outlook</li></ul>		