Concordia University
Department of Electrical and Computer Engineering
COEN424/COEN6313 Programming On Cloud
Fall 2017

Project Description

Overview

In this course, you will be working in groups of 2 or 3 (individuals or group of 4 needs approval from the lecturer) on a final project that runs on the **Cloud**. Your project should develop a service that has targeted users and with specific functions. Example scenarios are given below. If you own proposed scenarios are not approved, you need to choose one of the following scenarios.

A service is accessible on the Internet. Its design should follow RESTful architecture style that runs on a Cloud platform and meets the requirements below. Throughout the semester, you will work on your project and to present and discuss it with the class. During the final week of the semester you will present and demonstrate your project to the class and possibly some outside evaluators.

Scenario 1: Community-based Advertisement Distribution

Individuals, organizations, and companies have the needs of advertisement for their services, goods, products. Although there are many advertisements distribution methods over the internet to gain geographical exposure to the potential clients, some advertisement may need a more localized awareness with in a community. For example, the food delivery services or local shops normally put their brochures or printed promotions into mailbox. They are targeting residents nearby. The advertisement can have another form of distribution as remotely distributed to smart display of apartment elevators, community centers, shops, etc. Therefore an advertisement distribution system on cloud can be further designed and implemented.

Scenario 2: Big Data Analysis

There are many big data sets available publicly. The analytics can benefit from distributed parallel programming models such as MapReduce and Spark. A big data analysis project that is leveraging MapReduce, Machine Learning frameworks and deployed on Cloud is also an option, it still needs to address the requirements below.

Requirements

Mandatory

Your project must include the following:

1. Utilize a Cloud platform such as Amazon EC2, Google App Engine, Windows Azure, Joyent, Linode, Heroku, Rackspace, Eucalyptus etc or **setup a private cloud by yourself on your own computers.** Take advantage of a platform-specific feature. For instance, if you use Amazon EC2, you can take advantage of S3 or DynamoDB.
2. Design the data model of your services.
3. Use a NoSQL data store for managing the data of your application.
4. Utilize or mash up external web services as part of your application.

PLEASE BE CAREFUL, if you decide to use a public repository to host your source code, please DO NOT save your public cloud account keys to the repository, nor to put the plain text of your account keys and tokens into the source code. The leaking of your account information is the same as leaking your credit card information publicly. A possible fraud can incur with unexpected high cost in your billing of using the public cloud.

When you use a public cloud, you should be aware of the possible cost and you are responsible for the cost incurred by yourself.

Extra Feature

Your project must select **one** of the following features to implement:

1. Create a mobile application that takes advantage of your web service.
2. Provide a language binding for your web service.
3. Expose REST APIs for your web service.
4. Integrate the smartness (e.g. natural language processing, vision detection, image pattern recognition). [extra 5 bonus points to key technical members developing such feature]

Schedule

This project includes the following deliverables and time schedule.

D1 **Week 2 Friday 23:55** : Group information submitted

Find project partners and discuss your possible project ideas and what sort of platform you wish to use. The size of a group is 3 or 4. Please select your group leader.

The group leader should submit to Moodle site a single pdf or txt file with the file name

D1-[SID of Member]- [SID of Member]- [SID of Member].pdf or

D1-[SID of Member]- [SID of Member]- [SID of Member].txt

containing the following information

- For each group please indicate the following information of each member
  [SID] [First and Last Name] [Undergraduate or Graduate] [Project Leader Yes/No]

D2 Week 5 Thursday: Group Presentation [5 points]

D2.1 At the class time, each group will give a 3-minute presentation on their project. Be sure to address the following questions:

1. Title of your project
2. What is the problem your project is trying to solve?
3. Who would be the end users of your web service?
4. How would you meet the project requirements?
5. What would you want to do and what will you actually accomplish?

This group presentation is compulsory. Without the presentation, the project scope will not be approved by the lecturer. As a result, this may lead to a complete failure of the whole project.

One representative member of each group gives the talk. Others may be asked to answer questions.

D2.2 Week 5 Thursday 23:55, the presentation slides from each group should be uploaded to Moodle site, given the file name as

D2-[GroupID].pdf or D2-[GroupID].ppt

D3 Week 9 Thursday: Progress Report [5 points]

D3.1 At the class time, each group should give a 3-minute presentation to cover the following

- Title of your project
- Main function of your web service (or application)
- Architecture design (e.g. UML diagrams to represent the structure of the design, interaction and deployment)
- Technologies used and what have you accomplished so far?
- What issues have you faced and how have you overcome them?
- What do you have left to do?
- Are your goals still the same?

D3.2 Week 9 Thursday 23:55, the presentation slides from each group should be uploaded to Moodle site. The presentation slide should be submitted the following name convention

D3-[GroupID].pdf or D3-[GroupID].ppt

D4 Wee 13 Thursday: Final Presentation, Demo and Report (20 points)

D4.1 At the class time, each group will give a 15-minute presentation and demonstration of their project. Be sure to address the following questions:

1. What is your web service?
2. Your architecture design and use of cloud technologies (be sure to address the project's mandatory requirement)
   - Does your architecture follow the REST architecture style?
   - Please present our data model, storage and access to data.
   - Be sure to describe the architecture of your application and the various components.
3. What extra feature(s) have you achieved?
4. Techniques you applied for implementation
5. What works and what doesn't work?
6. Discussion on how your architecture can address one or more quality attributes of performance, scalability, availability, and security
7. Discussion on the strengths of the cloud technologies you applied and what limitation you have experienced so far.
8. Live demo (in case of failure, prepare a backup video demo)

Each member should perform one of the activities of presentation talk, live demo and Q&A.

D4.2 Week 13 Thursday 23:55, each group will submit
a) A single **report file** to contain the following

- Title of the project
- Abstract and Summary
- Context and Problem Statement
- Function of the web service
- The architecture design
- The technical implementation
- Discussion on the quality attribute that this project addressed by using cloud technologies
- Discussion on the experience and lessons learnt
- The role and technique contribution of each member (please be noted a person who only performs document writings will be considered as no technical contribution)
- The URL to access your project source code
- The URL to access your web service
- Reference to technical and academic articles

The report should be within 5 pages including all the figures and references, following the format of
http://www.ieee.org/conferences_events/conferences/publishing/templates.html

The file name should follow the following naming convention

D4-report-[GroupID].pdf

b) The presentation slides in ppt or pdf with the following naming convention
D4-presentation-[GroupID].pdf or D4-presentation-[GroupID].ppt

c) all the source code of your project in a single package.

D4-project-[GroupID].tar or D4-project-[GroupID].zip