CS 6314, Fall 2017
Dr. Mithun Balakrishna
Homework 1
Due September 10th, 2017 11:59 pm

A. Submission Instructions:

- Submit your solutions via eLearning.
- Please submit a single PDF/Doc/PS/Image file with the solutions.
- Late Submission Penalty:
    - up to 2 hours late — 10% deduction
    - 2 - 4 hours late — 20% deduction
    - 4 - 12 hours late — 35% deduction
    - 12 - 24 hours late — 50% deduction
    - 24 - 48 hours late — 75% deduction
    - more than 48 hours late — 100% deduction (zero credit)

B. Problems:

1. (20 Points)

Your customer requires a web application that will support four (4) different operations. All these operations have similar requirements for system resources and have the same load on the server. Will you design your customer's web application using Service-Oriented Architecture (SOA)? Please explain your answer using a real-world example.

Yes. Because SOA could solve problems independently of one another. SOA works well when each service has its own endpoints. For example, it we upload a dog image and also make a request for dog image, it is better to have two service, one of which is image write service, anther of which is image retrieval service. They work independently and improve availability if one of the server is down.

2. (20 Points)

Describe Shared-Nothing architecture using a real-world web application as an example.

With Shared-Nothing architecture, each node is able to operate independently of one another and there is no central "brain". It is a distributed computing architecture. One of the good examples of using the Shared-Nothing architecture is a MySQL cluster. It features a Network Database (NDB) storage engine that automatically distributes MySQL data across multiple storage nodes and provides great performance in write-heavy applications. It allows for almost infinite scaling of MySQL-based website or application, which can be done horizontally, i.e. with very inexpensive machines.

3. (40 Points)

Your client requires a website for the following services:

a. Very fast flight searches

b. Highly available travel booking request

c. Reliable travel itinerary access

Draw a diagram showing your design of a scalable, service-oriented architecture to meet your client's requirements.
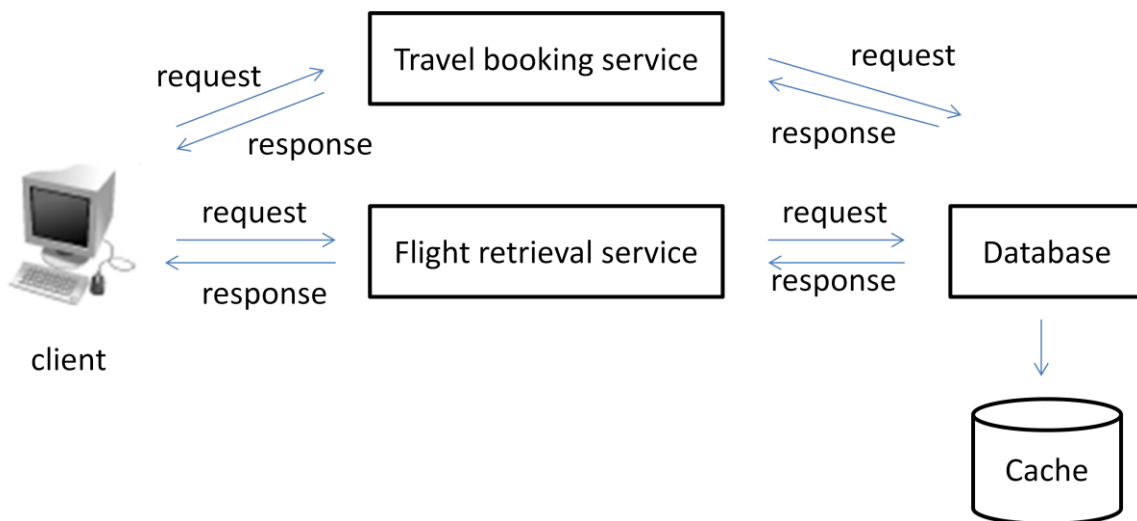
I designed two server, one of which is booking service, another one is flight retrieval service, based on SOA principle. For very "fast flight searching", we can use cache to store some history or based on some business requirement. For the "reliability travel itinerary access", we can make the replicate of data to store flight information in case of system down.

4. (20 Points)

Define in your own words the following HTTP Request Methods with one or more examples:

    a. HTTP GET

       Request to get the url (specified resource). For example, when searching in google, write in the google browser, a new url page will appear.

    b. HTTP HEAD

       Similar to GET, request to get the response body only. For example, when requesting resource which just contains meta-information written in response headers, without the entire content.

    c. HTTP PUT

       Requests that the enclosed entity be stored under the supplied URL. If the URL refers to an already existing resource, it is modified, while if the URL does not point to an existing resource, then the server can create the resource with that URL. That is, to put and store data into a url that is not existing. At a same time, create this new url. For example, when change password in one url, PUT can create or modify a url and store data into that.

    d. HTTP POST

       Put data into an existing url. For example, when change password in one url, no other url will be created, nor does that url be modified, just store data.