Software Requirements Specification

Cloud based E-commerce Web Application

Version 2.0

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Revision History

Name	Date	Reason For Changes	Version
Priyesh & Sudeep	09/18/2014	First draft	1.0
Priyesh & Sudeep	10/08/2014	Modification in Functional and Non-Functional requirements, rectification of typos.	2.0

1. Introduction

1.1 Purpose

In a traditional e-commerce application, the most prevalent issue is that of serving an unexpectedly large number of user requests. If the application is not equipped to handle it, then eventually the organization ends up losing customers.

Cloud provides infrastructure that enables scalability and fault tolerance mechanism for any given application. The purpose of this project is to demonstrate performance benefits in an ecommerce application using this cloud infrastructure.

1.2 Document Conventions

Standard used for Software Requirement Specification: IEEE

1.3 Intended Audience and Reading Suggestions

Participants of the course: *Cloud Computing* (*COP 6087)* at University of Central Florida.
Reading Suggestions:

1] About Amazon Elastic Compute Cloud:
http://docs.aws.amazon.com/AWSEC2/latest/UserGuide/concepts.html 2]
About JMeter: http://jmeter.apache.org

1.4 Product Scope

The cloud based e-commerce application will enable a large number of users to browse/buy items from the given list of products. Since, the application is being deployed on the cloud, it will have the capability to scale up or scale down dynamically depending upon the number of active users. The end product will benefit both the end user as well as the organization adopting it. The end user will not face any issue in using the application even during peak time. At the same time the organization need not invest in infrastructure to handle such situations that occur infrequently.

1.5 References

- EC2 Load balancer http://aws.amazon.com/documentation/elastic-load-balancing/
- EC2 http://aws.amazon.com/documentation/ec2
- Benefits of Cloud Computing to E-Commerce industry http://www.vi.net/blog/2010/11/the-benefits-of-cloud-computing-to-the-e-commerce-industry/

2. Overall Description

2.1 Product Perspective

The application is self-contained. There are no dependencies on external products. However, it will be utilizing the resources available on AWS cloud infrastructure. The application as a whole will be deployed on AWS EC2 instance. End-users will be interacting with the application over HTTP requests and response. The major components of the system comprise of SQL Server, Application server and load balancer. The load balancer component used will provide business logic implementation for distributing the load of user requests.

2.2 Product Functions

The system will enable user to register online and create an account or continue to browse as a guest user. The application will display a gallery of different arts and artifacts along with its price. The user will be able to browse the item individually and add it to a cart. Further, user will have an option to proceed to check out the items added to cart. The application will navigate the user to payment gateway asking for credit card credentials in order to confirm the order. The order will be registered in the system and invoice for order confirmation stating the date of delivery will be displayed. The application will contain database for holding User information, Order info and Product Info, which will be deployed on Amazon EC2 SQL Server.

2.3 User Classes and Characteristics

The intended users of this application are essential commodity buyers and commodity seller. The commodity seller should have sound understanding of the e-commerce platform.

Users	Intend
Buyers	Browse/ buy the products among the list published.
Seller	Upload the product catalogue along with its information and pricing.

2.4 Operating Environment

Supported operating system: All flavors of Windows, Linux and Macintosh.
Platforms: Web browsers like Chrome, Firefox and Safari.
Compatible devices: Desktops, laptops and smart phones.

2.5 Design and Implementation Constraints

- There shall be consistency in variables names within the system. The graphical user interface shall have consistent look and feel.
- The application implemented should make use of cloud infrastructure.

2.6 User Documentation

NA

2.7 Assumptions and Dependencies

The system relies on following dependencies.

1. AWS will provide the necessary infrastructure to develop and deploy the application
2. AWS will provide platform to host the e-commerce application.
3. AWS will provide load balancing feature and performance monitoring tools

3. External Interface Requirements

3.1 User Interfaces

- From User Perspective:

  In this system, the user will be navigated to home page initially. The home page will display the list of products with its description and pricing. The user will have an option to proceed as guest or login to account. If the user does not already have a registered account, he will have an option of creating one. The user will be able to select items and add them to shopping cart. Once the user will click on proceed to checkout, he will be navigated to payment information page where one can provide payment information and confirm the order. Post confirmation the user will be redirected to order summary page displaying the order details.

- From Admin user perspective:

  If the user logged in is an admin user, he will be redirected to a view which will allow him to add/modify product details

3.2 Software Interfaces

The software components that would be involved in this system would be SQL Server 2008 R2, Amazon EC2 instances, AWS Load Balancer, ASP.Net framework. The HTTP request sent by the user while interacting with the web application will be redirected to the AWS load balancer. The load balancer will redirect the request to one of the EC2 instance in healthy state. The application hosted on EC2 instance will process the request and respond accordingly. All the user information will be stored on the database server on SQL Server 2008 R2. The application will interface with the database server for processing the transaction.

3.3 Communications Interfaces

The traffic between the client and server will be exchanged in the form of HTTP requests. The user credentials sent over the network to the cloud will be in an encrypted format (MD5 encryption). The communication between application server and database server will be routed using TCP/IP.

4. System Features

4.1 User login and Registration

4.1.1 Description and Priority

The system will allow the user to create an account on the e-commerce application to keep track of his orders. This feature is at high priority as it helps maintaining the record of customers.

4.1.2 Stimulus/Response Sequences

Once the user clicks on login page, he will be navigated to create account page if that particular user doesn't have any account associated. User will be entering all the credential like username, password and payment information. On clicking on create account, user will be prompted for successful creation of an account and will be redirected to home page for browsing the products.

4.1.3 Functional Requirements

For the login feature following requirements have to be satisfied:

REQ 01: The system should be able to look up for existing user. If there exist an account for returning user, it should not prompt for registration.

REQ 02: The system should make sure the user fill up the mandatory fields during registration.

REQ 03: Post registration, the system should prompt for success or failure of registration process.

4.2 Purchase items

4.2.1 Description and Priority:

The application will provide a feature of selecting items from the catalogue provided and add them to cart and finally proceed to checkout. The order will be placed once it is confirmed by entering the payment information.

4.2.2 Stimulus/Response:

The system will enable user to browse the catalogue of products and add them to cart. On selecting the items, user can proceed to checkout. The application will prompt for user credentials for confirming the order. Towards the end of transaction, user will be provided with invoice for the order placed.

4.2.3 Function Requirement:

The functional requirements for this feature are as follows:

REQ 01: The system shall allow user to select multiple items from the catalogue

REQ 02: The system should prompt for user credentials once he opts to checkout.

4.3 Demonstrate the performance improvisation

4.3.1 Description and Priority:

The system will have the capability of re-routing requests dynamically based on the load on various EC2 instances in the cloud cluster

4.3.2 Stimulus/Response:

The user will be able to perform the actions seamlessly even in hours of peak load. The admin user will be able to monitor the load distribution among different EC2 instances and make an informed decision of scaling up or scaling down the EC2 instances.

4.3.3 Functional Requirement:

AWS shall provide EC2 instance health monitoring tool which will allow system admin to observe the load distribution over various instances.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

The main purpose of this application is to demonstrate the performance improvisation benefiting from cloud infrastructure. The cloud environment will provide an ability to distribute the load of large requests to multiple EC2 instances on cloud depending upon the health status of the instance.

This will not hamper the performance of processing the requests from end user's perspective. The system should be able to resist large amount of virtual load generated at any given point of time.

To demonstrate if the above mentioned performance requirements are met, JMeter will be used to flood the system with large number of requests. The results obtained from AWS cloud monitor will illustrate if the load is distributed efficiently.

5.4 Software Quality Attributes

High Availability: The deployment of application over cloud environment will guarantee high availability of service as compared to availability of service in case of local infrastructure.

5.5 Business Rules

The admin user who manages the catalogue of products will be responsible for managing the products list, description and pricing.