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Partitioning the Impact of Mobile Applications on Big Data Cloud

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Abstract

Inception of mobile devices and applications have seen an exponential growth of data. Bandwidth limitation for cloud-hosted applications is the "Elephant in the room". This research has designed an algorithm to address the bandwidth limitations by data prioritizing and partitioning. Saudi Arabia is developing a financial district in Riyadh that could serve as financial hub for the region and could help Saudi Arabia to enter the domain of developed countries. Inception of cloud technology could play a key role for financial institutions for resource gathering and allocation. The research has formulated a priority sequence queuing model that filters the incoming cloud bundles based on their priority defined by the business logic. The research has designed a novel and secure E-Banking solution that is already been implemented for Canadian Imperial Bank of Commerce (CIBC) and if adapted for the oil rich nation i.e. Saudi Arabia, can foster the growing consumer market for changing global priorities. User access through both desktop/laptop and mobile applications present a challenging scenario for the cloud server hosting multiple sessions. The Transaction per Second (TPS) and multiple sessions hit ratio can create a system overhead which is hard to predict and calculate, and can run the cloud server down. In addition to queuing algorithm the research has also implemented a session Time to Live (TTL), cross session check and kill algorithm, which is also based on business logic. It is assumed that a single customer could hold multiple logins on a database cloud server utilizing a single push and multiple pull mechanism for online, Automated Business Machine and mobile devices.

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Keywords: Big Data Cloud, Transaction per Second, Mobile Application

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1. Introduction

Cloud hosted banking applications require communication channel through service provider and key authentication and encryption via Integrated Service Development PKI RSA key for every session id. Online banking applications are commonly used throughout the world. Interfacing the mobile banking module introduces n session times and predicting the use of time for multiple federated logins can introduce exponential login ratios that can bring the cloud-hosting server down. The research has introduced a concept of push pull replication creating a virtual session id on XML parser and mobile application module. Data partitioning based on business logics and production policies and applications was implemented on two servers integrated with commercial integrated data warehouse. This production partitioning is for online application while business application is accessed by mobile module through virtual application server. The business policies are stored in the virtual server in the cloud. The replication on the cloud is supported by AutoSys and is a daily 2-tier fixed time triggered replication including batch and live replication between application/database server and the cloud. The offers presented to clients need to satisfy the business logic and any variation from business logic would induce an offer kill. This cross kill is based on multiple accounts transaction history such as savings, chequing, brokerage, credit cards and dependent accounts, and the credit history of the client. Any account presenting a conflict for the business policy generates the kill token otherwise a session token is generated after Information Services Director (ISD) authentication. Figure 1 shows the basic architecture of the online and mobile application.

The client logs in through the Oracle-Sun Microsystems iPLANET web services providing the third party secured key authentication. The application has n-tier architecture, comprising presentation layer (session façade layer), logic layer, Application (workflow) layer, common services layer and the data layer. Presentation layer provides user interface for input and output. The presentation layer comprises stateless session bean EJB service for the business rules containing POJO classes embedded in the logic layer. Application layer divides complex tasks into independent granular tasks which are configured and executed in sequence. This layer is implemented using Spring Core (dependent injection methodology). Common services layer deals with messaging, XML configuration support and for resource look up. The data layer is also called DAO (Data Access Object).

Online Banking (OLB) presentation layer is built on struts-Model view controller (MVC) framework. There is an addition of the wrapper class for the mobile banking to develop an interface for device specific users such as iOS, Android, IPAD and IPod. In OLB business logics are contained within EJB class and stored in back end database providing a view to client via JSP. The working of struts is based on user request and response in the sequence of Pre-Processing, Processing, building plug-in, Post-Processing.

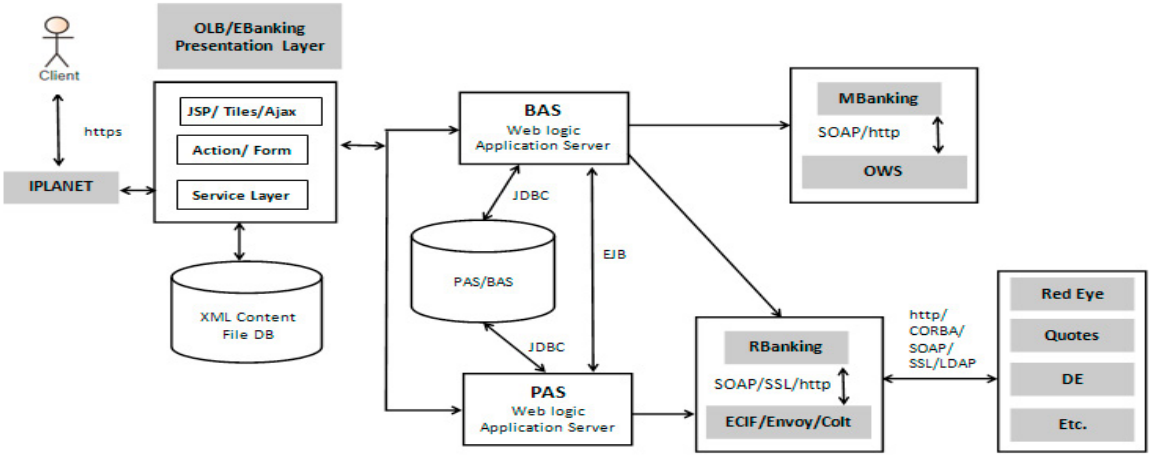

Fig 1 Cloud based Mobile and Online Banking Application Architecture