Quality Appraisal of Product Deployment and Development of Server Configuration Tools

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Quality Appraisal of Product Deployment and Development of Server Configuration Tools

Major Project

Submitted in partial fulfillment of the requirements

for the degree of

Master of Technology in Computer Science and Engineering

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Certificate

This is to certify that the major project entitled **" Quality Appraisal of Product Deployment and Development of Server Configuration Tools"** submitted by **Astha Soni (Roll No: 13MCEC01)**, towards the partial fulfillment of the requirements for the award of degree of Master of Technology in Computer Science and Engineering of Institute of Technology, Nirma University, Ahmedabad, is the record of work carried out by her under my supervision and guidance. In my opinion, the submitted work has reached a level required for being accepted for examination. The results embodied in this project, to the best of my knowledge, haven't been submitted to any other university or institution for award of any degree or diploma.

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Statement of Originality

I, **Astha Soni**, Roll. No. **13MCEC01**, give undertaking that the Major Project entitled " **Quality Appraisal of Product Deployment and Development of Server Configuration Tools**" submitted by me, towards the partial fulfillment of the requirements for the degree of Master of Technology in **Computer Science & Engineering** of Institute of Technology, Nirma University, Ahmedabad, contains no material that has been awarded for any degree or diploma in any university or school in any territory to the best of my knowledge. It is the original work carried out by me and I give assurance that no attempt of plagiarism has been made. It contains no material that is previously published or written, except where reference has been made. I understand that in the event of any similarity found subsequently with any published work or any dissertation work elsewhere; it will result in severe disciplinary action.

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Place: Bangalore

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- Astha Soni

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Abstract

1. Quality Appraisal for product deployment: This project aims to conduct a few mock product deployments and implementations on specific environment and architectural platforms in a phased manner, covering each possible detail at every step, while strictly following the appropriate installation guide and provide feedback to make the entire process simple and hassle-free, even for customers and clients who are not very familiar with database and server technologies.

2. Development of Server configuration Tools: There are several definitions which are given to me to complete within the span of my internship program here. Some of them include:

   (a) Developing a tool for automatic recapitulation of servers in case of a breakdown: When due to some technical fault or accidental breakdown of servers, all the apps running on it are down, which are to be brought up one by one. So a tool needs to be developed such that it starts all the servers which were running on that host.

   (b) End to End Smoke test automation of the environments for formal testing of the retail products automatically without manual interruption and try login credentials to check whether those are correct or not.

Abbreviations

RMS	Retail Merchandising System.
RWMS	Retail Warehouse Management System.
RFM	Retail Fiscal Management System.
ALLOC	Allocation Management System.
ReIM	Retail Invoice Matching.
RA	Retail Analysis.
RPM	Retail Price Management System.
ReSA	Retail Sales Audit.
RFI	Retail Financial Integration.
SIM	Store Inventory Management.
OATS	Oracle Application Testing Suite.
OS	Openscript.
QTP	Quick Test Professional.
VBSCipt	Visual Basic Script.
GUI	Graphical User Interface.
CSS	Cascading Style Sheets.
JS	JavaScript.
JSP	Java Server Pages.
JSch	Java Secure Channel.
API	Application Program Interface.
SMTP	Simple Mail Transfer Protocol.
TCP/IP	Transmission Control Protocol/Internet Protocol.
POP	Post Office Protocol.
ISP	Internet Service Provider.
MTA	Message Transfer Agent.
EPL	Eclipse Public License.
	.

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Chapter 1

Introduction

1.1 Organization

Oracle has a revenue of over 35.6 billion dollars, more than 380,000 customers like Axiom telecom, Sainsburys, Family Dollar, Aldo, Gymboree, Nordstrom, Staples, Ikea, Aditya Birla, Hallmark, Dubai Duty Free, and many more, It offers an optimized and fully integrated stack of business systems that help organizations overcome complexity and ignite innovation and also empower retailers to optimize operations across traditional, mobile, and online commerce channels. Only Oracle provides a complete integrated combination of server and storage solutions.[1]

Some of the well known clients using Oracle Retail products include:

1. Dubai Duty Free
2. Starbucks Coffee
3. Staples
4. Best Buy
5. Hallmark, and many more worldwide

The Aditya Birla Group and Arvind Mills are prominent names among many clients that use Oracle Retail products in India.

1.2 Aim of the Internship

This internship is basically carried out in two parts where the first part deals with the quality assessment and appraisal of the product deployment and the second part deals with the development of some tools which are helpful for organization.

1.2.1 Part 1

Product deployment and implementation is a very important part of any business activity which is performed in order to expand the business, increase profits, consolidate, manage and utilize all the existing resources in an efficient manner. When a software product purchased from a particular company has to be deployed, possibly on a large variety of hardware and OS platforms, great care needs to be taken at each configuration step so that the process can be completed both safely and successfully. This project aims to

conduct a few mock product deployments and implementations on specific hardware and architectural platforms in a phased manner, covering each possible detail at every step, while strictly following the appropriate installation guide and provide feedback to make the entire process simple and hassle-free, even for customers and clients who are not very familiar with database and server technologies.

1.2.2 Part 2

This part consists of many tool development which are helpful for the team such as server configuration and end to end smoke testing.Server Configuration tool is the TRANSFORMATION APLLICATION which is helpful in managing domains and managed servers.
The other project is for smoke Testing.This basically involves the testing of the applications after an outage that whether all the apps came up and are logging in successfully.This project is carried out with OATS and Synergy.

Chapter 2

Literature Survey

2.1 Genre 1

2.1.1 SVN

Version Control System is a software that maintains complete history of the work of the software developers and helps them to work together.
Version Control System goals:

1. Has a facility that many developers can work simultaneously.
2. Even helps not to overwrite changes.
3. Maintains history of all the versions.

Version control system is of two categories:

1. Centralized version control system (CVCS)
2. Distributed/Decentralized version control system (DVCS)

Subversion falls under centralized version control system which means that it uses central server to store all the files.

1. The Repository: A repository is the base of any VCS. It is a central location where code developers save all their codes. This not only save files but also history of the code. It can be accessed over a configured network, with repository acts as a pool of resources and version control tool acts as a client, and then they can store/retrieve their changes within the code to this repository pool.After the client is done, he can make these changes available to other developers or users and by retrieving changes when changes are stored; a client can take other pupil's changes in code as a working copy.
2. Trunk: It is a directory where all the main development work takes place and developers usually, check out, to work on the project.
3. Tags: This is also a directory which is used to store named code snippets of the project. Tag operation allows to name the specific version in the repository which is far more explanatory.[15]

4. Branches : Branches are made to create another line of development and not disturb which is already going on. It is useful when the development process is to be forked off into two different versions or patch is to be prepared. For example, version 7.0 is released, you might want to create a branch so that development of 8.0 features can be kept separate from 7.0 patch or bug-fixes.

5. Working copy: It is a snapshot of the repository. The repository is shared by all the teams, but developers cannot modify it directly. They have to checkout the working copy. Then that working copy becomes a private workplace where coder can do any work isolated from the rest of the team and not disturbing the original working code.

6. Commit changes: This process helps in storing changes from private workbench to central repository. After doing this, changes can be made available to all the teams. If other developers want to have this code, they can update their working copies. Commit is an atomic operation. Either whole commit succeeds or is rolled back.There is no provision of half finished commit.[2]

2.1.2 Weblogic

Introduction:
WebLogic was a company (from 1995 to 1998) who created the first J2EE application server, the WebLogic Application Server. BEA Systems acquired WebLogic, Inc. in 1998 and Oracle Corporation acquired BEA Systems in 2008.
Weblogic's Console is used for:

1. Configure, start, and stop WebLogic Server instances.

2. Configure Servers and clusters.

3. Configure WebLogic Server services, such as database connectivity (JDBC), and messaging (JMS).

4. Configure security parameters, including managing users, groups, and roles.

5. Configure and deploy the applications.

6. Monitor server and application performance and working.

7. View server and domain log files.

8. Deployment descriptors.

9. Edit application deployment descriptor elements.[5]

Components

Server: It is a configured instance to host applications and resources like Web Apps, Enterprise Apps, Web Services, JMS, JDBC etc. There are two types of WebLogic servers Administrative and Managed Server.

Managed Server: It is a running instance that hosts applications and resources needed by those applications. It is actually the real work horse in a WebLogic Domain. Each managed server is independent of all other managed servers in the domain. We can

have as many managed servers in a domain as we need. Individual managed servers are typically added for capacity and application isolation.
Interaction between Administration Server and Managed Server:

1. The Administration Server stores the master copy of the domain configuration, including the same for all managed servers in the domain.
2. Each Managed Server stores a local copy of the configuration of that server.
3. When a Managed Server starts, it connects to the Administration Server to synchronize the configuration
4. The Administration Server sends changed configuration to Managed Servers when configuration is changed.

Node Manager: It is a process running on a physical server that enables us to start, stop, suspend and restart WebLogic server instances remotely. It must run on each physical server that hosts WebLogic server instances which we want to control. A Node Manager is independent of any domain. It can start any server instance that resides on the same physical server and is required to start/stop servers using the Administration Console. It is also required for some configurations of automatic server migration and for whole server migration.[4]

Machine: A machine is an independent, physical piece of hardware.It is used to associate a computer with the managed servers it hosts.It is used by the Node Manager in restarting a failed Managed Server.[4]

Additional Components

1. DB
2. Load Balancer
3. Security Services
4. Virtual Hosting
5. Client and backend tier Components
6. Cluster
7. Application Logic layers

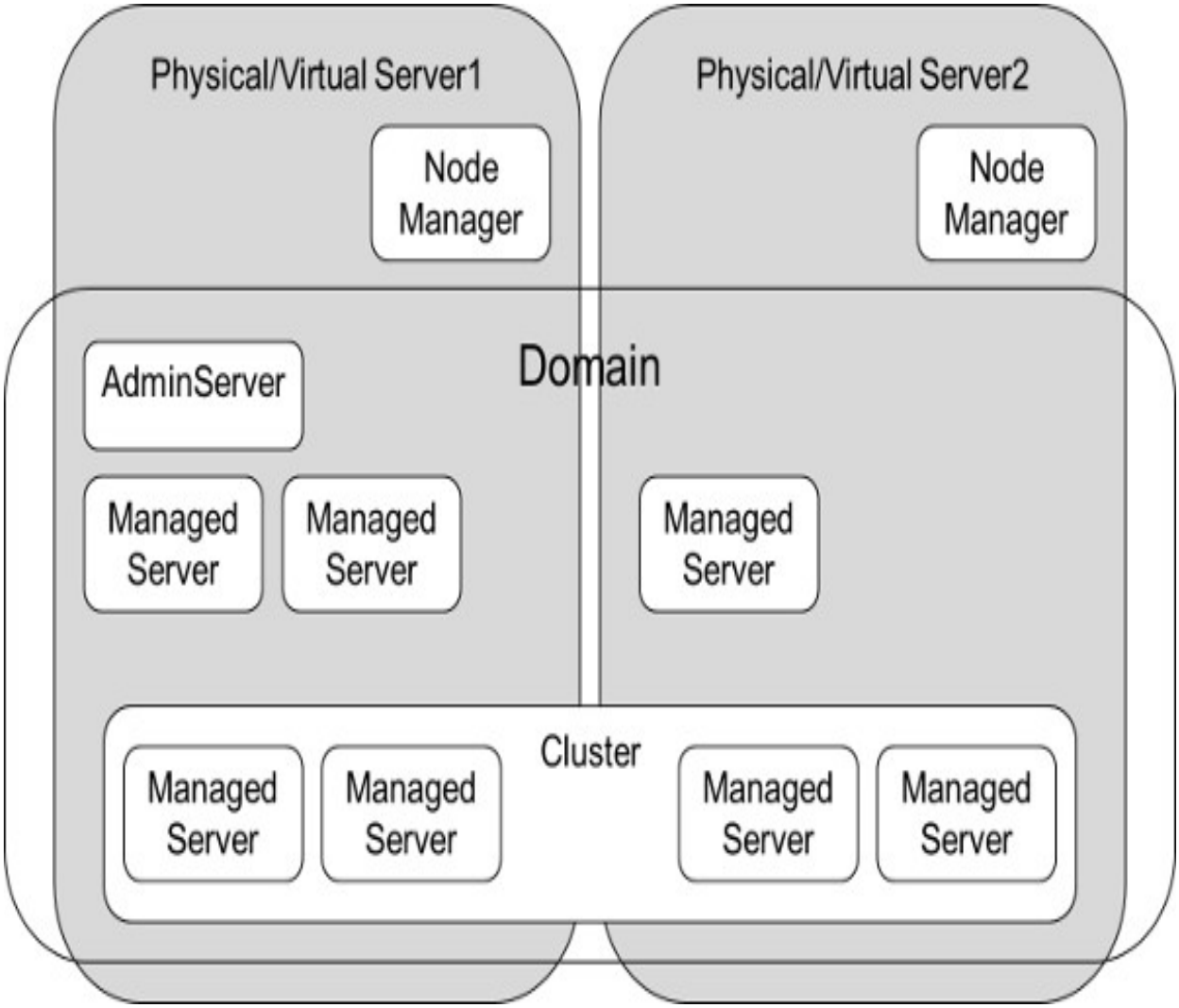


Figure 2.1: Weblogic Composite View

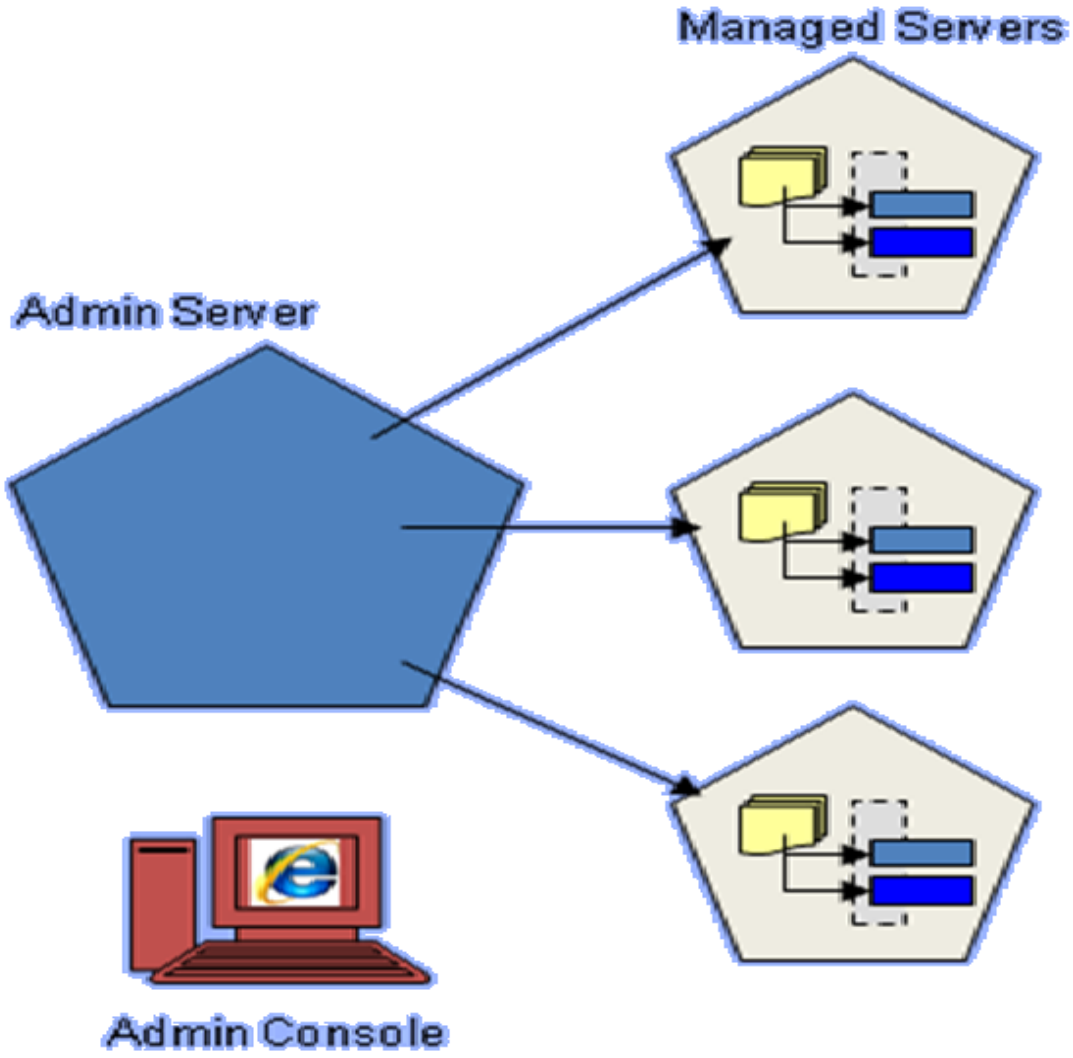


Figure 2.2: Admin Server

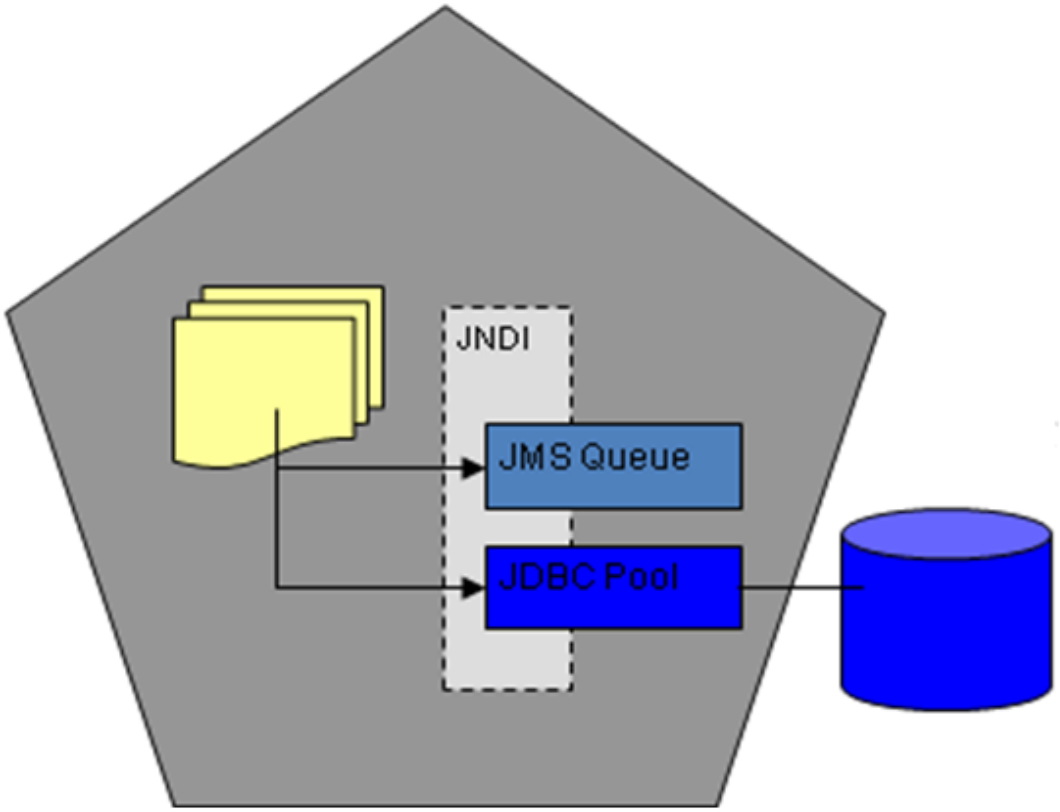


Figure 2.3: Managed Server

2.1.3 Life cycle of Product Deployment

Products deployed till date:
13.2.7 RMS
13.2.7 RFM
13.2.7 Alloc
13.2.8 RIB
13.2.8 RSB
13.2.8 REIM
14.1 RA
14.1 RPM
14.1 RSB
14.1 ReSA
14.1 RWMS
14.1 REIM
14.1 RFI
14.1 ALLOC
14.1 SIM.[2]

Brief Introduction on some of the apps:
Oracle Retail Warehouse Management System (RWMS) manages and optimizes essential supply chain processes for any Commerce Anywhere retailer.
Oracle Retail Invoice Matching (ReIM) supports verification of merchandise invoice costs and quantities prior to payment.

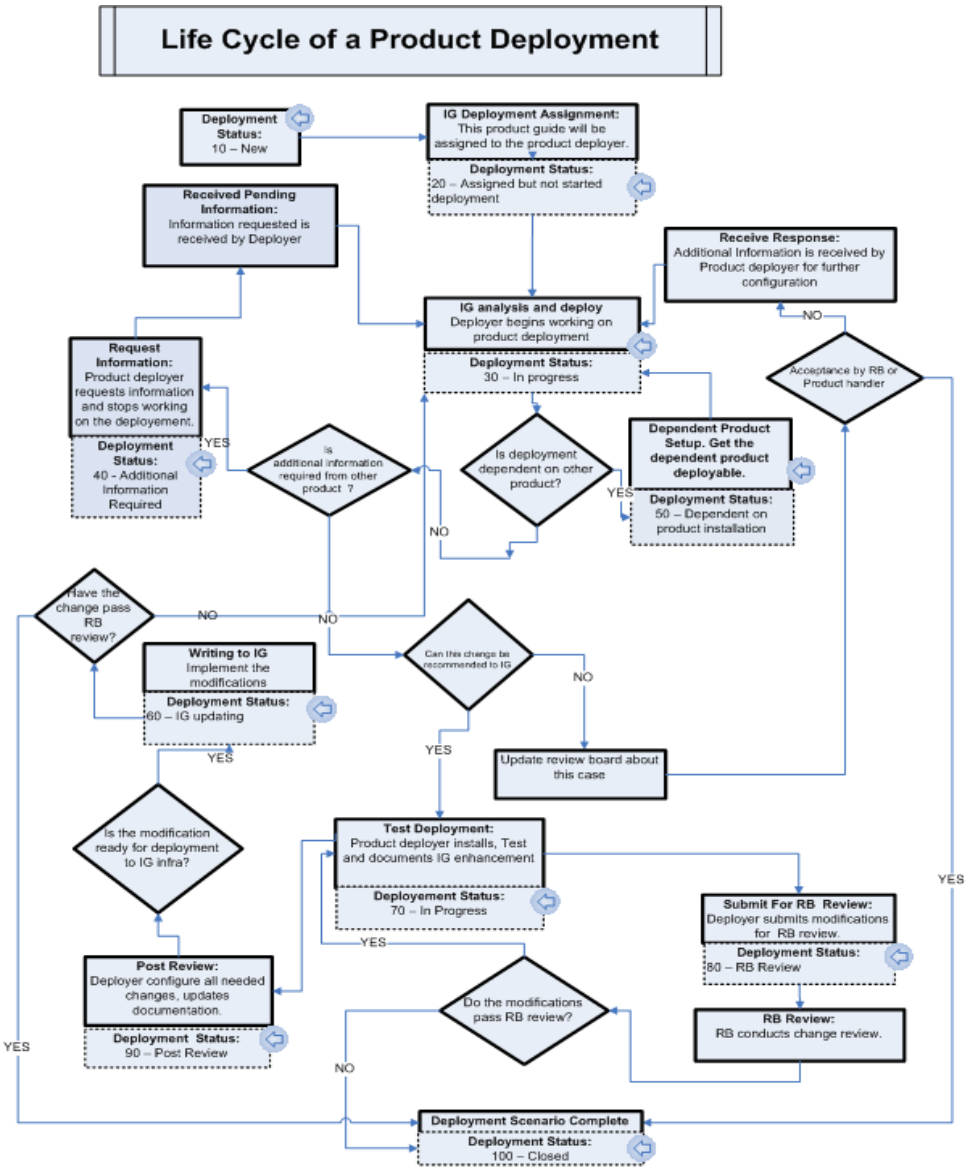


Figure 2.4: Product Life cycle

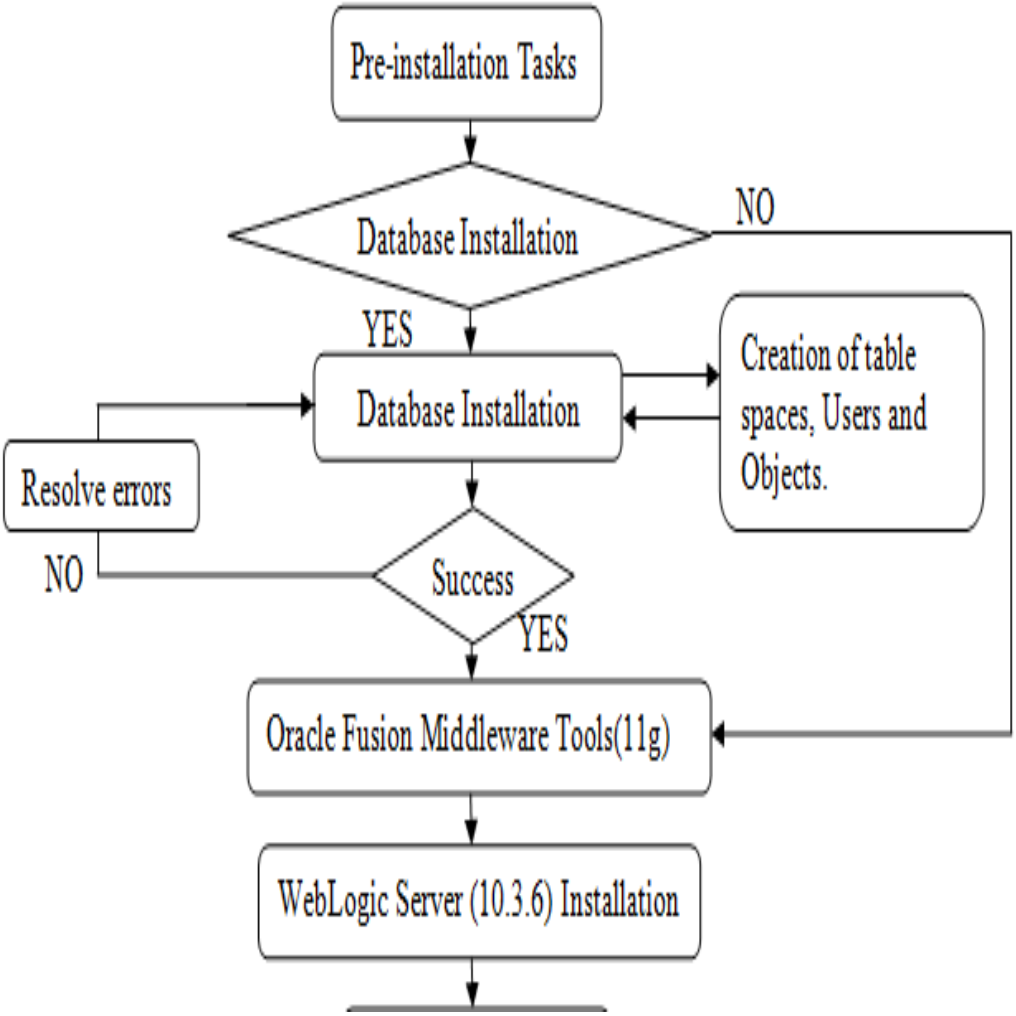


Figure 2.5: Flow Of Product Deployment : Part 1

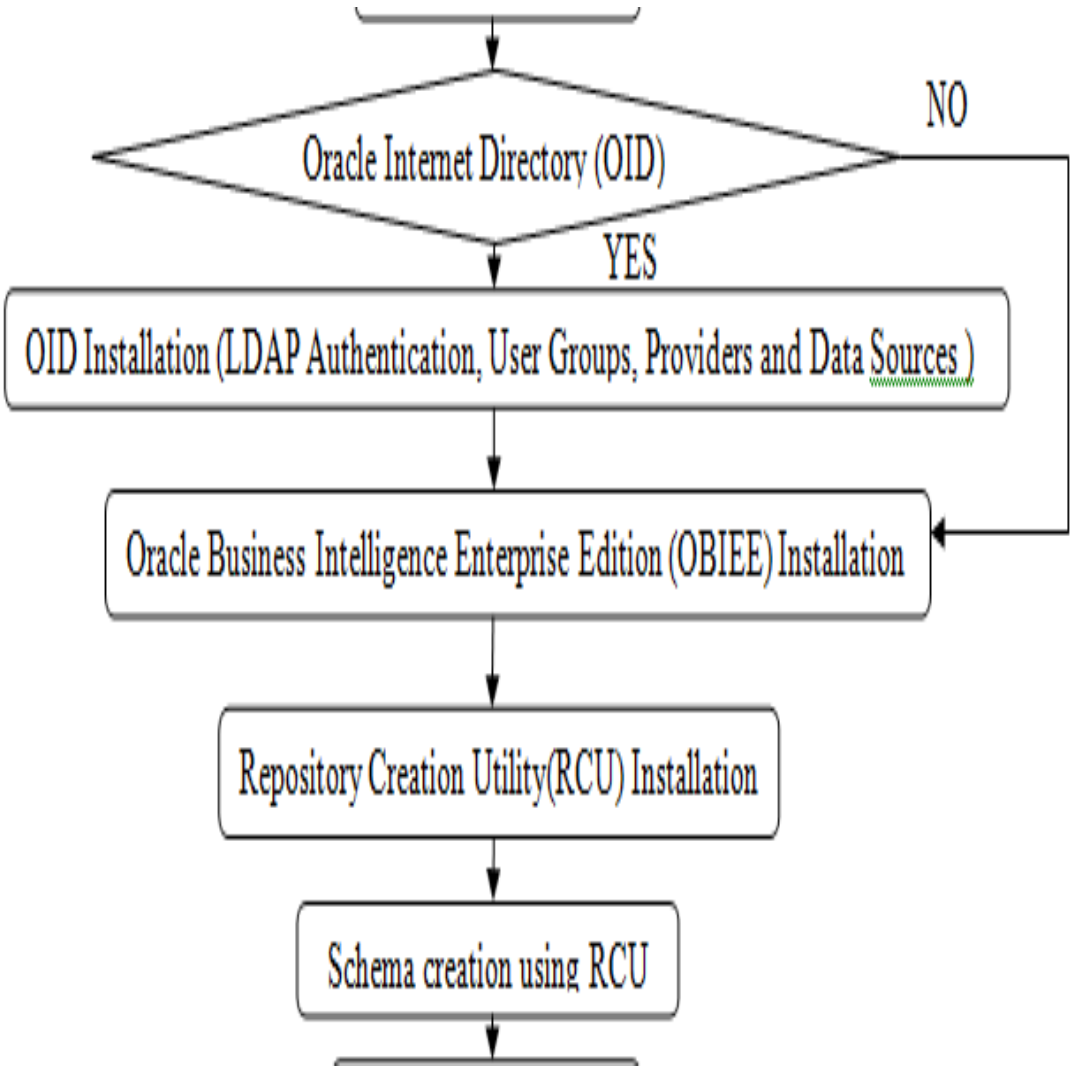


Figure 2.6: Flow Of Product Deployment : Part 2

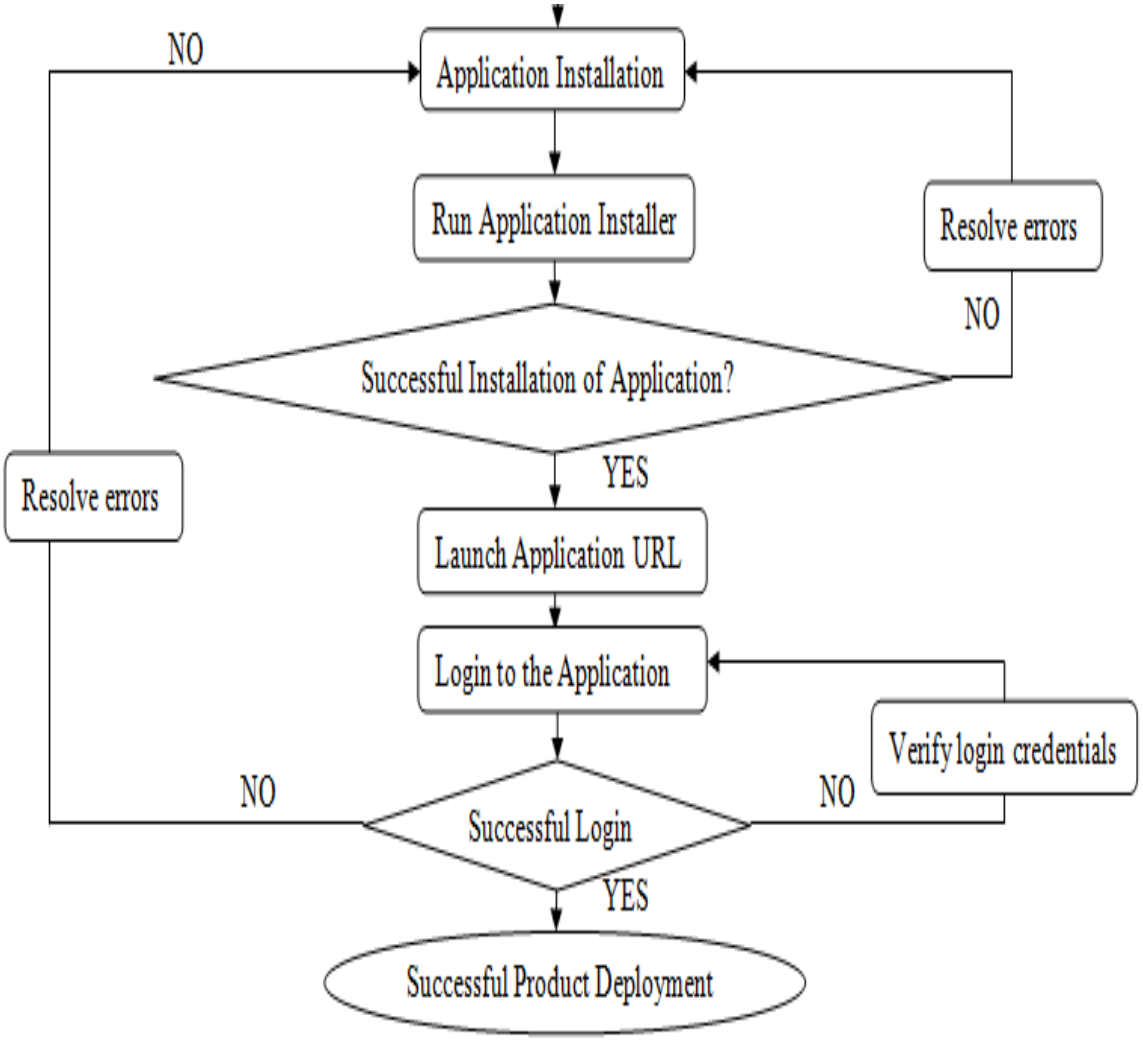


Figure 2.7: Flow Of Product Deployment : Part 3

Oracle Retail Store Inventory Management (SIM) can provide inventory position visibility, streamline in-activities, improve merchandise management and productivity, reduce labor costs, support remote store processes, and manage store-level profit and loss. Using a high-speed internet connection and portable handheld wireless devices, store managers and store personnel.
Oracle Retail Analytics (RA) is an analytical application that provides multiple modules for analysis and reporting on different areas of retail management and operations. It is a modular software product; customers can license modules separately to best fit their analytical and reporting needs.
Oracle Retail Merchandising System (RMS) is the market leading integrated merchandising solution for retailers. The solution enables retailers better manage, control and perform crucial day-to-day merchandising activities from new product introduction to automated replenishment to financial inventory valuation.[3]
Oracle Retail Price Management (RPM) provides retailers with a complete rules-based pricing execution engine that supports regular pricing, promotions and clearance across all selling locations and channels.
Oracle Retail Sales Audit (ReSA) processes and validates all sales transactions from all channels, ensuring clean and consistent sales information, while allowing users to manage discrepancies by exception.
Oracle Retail Service Backbone (RSB) is an uptake of Oracle Service Bus (OSB) for Retail domain. Oracle Retail Service Backbone (RSB) is a product comprising of a set of web services, ESB and security tools that standardize the deployment and runtime of web service flows within Oracle Retail Suite of applications. It can also be viewed as a set of pre-built web service integration API end points delivered by Oracle Retail. It is based on SOA architectural style and uses OSB as the infrastructure component to realize the architecture.[2]

2.2 Genre 2

2.2.1 Java Secure Channel

JSch is a pure Java implementation of SSH2. It connects to an sshd server and uses the concepts of port forwarding, X11 forwarding, file transfer, etc., and you can integrate its functionality into own created Java programs. JSch is licensed under BSD style license. SSH provides support for secure remote login, file transfer, and TCP/IP and X11 forwarding. It can automatically encrypt, compress and authenticate transmitted data. The SSH protocol is available in two varieties: SSH1 and SSH2. SSH2 was invented to avoid the patent issues regarding RSA (because RSA patent has expired), and to fix some data integrity problem that SSH1 had, and for a number of other technical reasons. [6]

2.2.2 Quick Test Professional

HP QuickTest Professional (QTP) is an automated testing tool for functionality of any application, that helps the testers to perform automated testing in order to identify any discrepencies with the actual or desired results of the application which is under test.
QTP means QuickTest Professional, a product of Hewlett Packard (HP). This tool helps testers to perform an automated functional testing without monitoring once correct and extensive script development is done.

Visual Basic Scripting (VBScript) ie used for automating the testing.Since Scripting

Engine is an available part of the Windows OS, it need not be installed exclusively as it . The Current version of VBScript is 5.8 which is available as part of Windows 7. VBScript is an object based language, NOT an object oriented language.
QTP is best suited for regression testing of apps. QTP is one of the most popular tool and is licensed/commercial owned by HP. It compares the actual and expected result and reports the results in the execution summary.[7]
Advantages:

1. Here writing automated tests using VBScript does not require any specific skills and relatively easy when compared other object oriented programming languages.
2. Easy to use, write the code, validation or results and generation or report.
3. Readily Integrated with Test Management Tool(Hp-Quality Center) which enables easy Monitoring and scheduling.
4. Full support is provided by HP and by its forums and groups for addressing technical issues since it is an HP product and is used world wide very much.

Disadvantages:

1. It works only in Windows operating systems.
2. It does not support all versions of Browsers and even if the support is available, the testers need to wait for the patch to be released for each one of the major versions.
3. Since it is a commercial tool, the licensing cost is very high.
4. Even if the script writing time is less, the execution time of the scripts is relatively more as it puts load on CPU and RAM.Hence increases total time for execution.

Record and Playback
Recording a test actually means recording the user actions of the application under test so that QTP automatically generates the scripts that can be played back to perform the same action automatically.

Significance of Record and Playback : It is used to create a test script to test the basic functionality of any application or features that does not require long-term maintenance or frequent changes and also It can be used for recording both keyboard inputs and mouse movements.

Object Repository
Object Repository is a collection of objects and properties along with their entire X-Paths with which QTP will be able to recognize that this objects is present on the page and act on it. When a user records a test, the objects and its properties are captured by default only if any object repository is attached with it. Without understanding objects and its properties, QTP will NOT be able to play back the scripts.[9]

2.2.3 Oracle Application Testing Suite

Oracle Application Testing Suite is a testing suite for testing web applications that provides us various tools needed to check the reliability and correctness of the business related and critical applications.

1. It is a platform for creating extensible test scripts in Java for automating any kind of testing procedure.
2. Oracle Load Testing for load, scalability and stress testing. It also has tools for server side reporting and monitoring.
3. Oracle Test Manager for organizing and managing your overall testing process.[10]

Oracle Openscript

Oracle OpenScript provides the base for the OpenScript units and APIs and is created on a platform which is based on standards.OpenScript is helpful in advanced QA automation coders to novice testers when combinined with an intuitive GUI with the robust characteristic of Java language.

Scripts are written in OpenScript APIs for testing Web application functionality. Its API consists of a set of predifined methods that can be used to modify or edit the scripts.[10]

OpenScript Feature Highlights

It is the environment for developing Oracle Application Testing Suite scripts for Web/forms/ADF application testing. OpenScript offers the following advantages for Web-based application testing:

1. **Script Workbench :** Here we have an Eclipse based Workspace where developer can run and create new automated test scripts. Users can use the Tree View interface for writing and editing scripts easily with the user interface. Users can anytime go to Java Code View interface and use it for creating and modifying their scripts.

   The main feature of OATS is that the test scripts created can be played back to check,validate and test the functioning of the application. Load the test scripts that are created for application load testing as well, and will allow to check and simulate when hundreds of users will be executing the scripts simultaneously.

2. **Test Modules :**The OpenScript Test Unit provides specially for an application, test automation facility. The Test Unit is coded in a manner to check a Particular application.

   OpenScript's Test Unit interface is entirely open. Users can use the Test Unit API to create new code snippet for testing particular application or can extend any existing pre-written code to add customized functions.[12]

3. **Tree/Graphical View Scripting Interface :**This interface shows the test script in graphical manner. Multiple script windows can be opened simultaneously. For each test script or library , the Tree View is categorized into three main modules:

   (a) Initialize : Used for the commands that are to be executed only once.

   (b) Run : This contains the main body of the script that is to be run on every (if any)iteration

   (c) Finish : Used for script commands that are to be executed only on the last iteration.

   Within each module, script flow and navigation flow will be created automatically while recording the script or manually by the Tree View UI. Various script commands are represented as nodes in Tree View including data for input, test script, files which are storing logs, etc. Each Tree View node has a corresponding representation/code snippet in the Java Code View also.

4. **Code/Programming View Scripting Interface :** This interface has the actual Java code representation of the test scripts. This view provides full look and feel of Eclipse IDE for writing, editing and debugging the scripts. Script commands in Java will be mapped to the corresponding representation in the Tree View. Users have the freedom of editing the scripts in any one - the code or tree view and it will automatically reflect in the other.

5. **Results View and Properties View :**This View give users the facility to view detailed properties for script selected in the Tree View tab. The Results View shows detailed results of script playback.There is a Console view that shows the playback command output and status information. Script log message also appear in the Console.

6. **Data Banks :** OpenScript allows users to parametrize the input to the script to perform testing which is data based using databanks. Users can attach any data that is to be used in their script and then substitute it in a variable form to extract it from any external file while playing back. Multiple Data Bank files can be attached to a single script and users can specify how OpenScript assigns data during script playback.[14]

7. **Correlation :**This interface helps users to make similar libraries to parametrize the on the spot requests during the time of playback automatically.

8. **OpenScript Preferences :**This interface is a place where users can specify the settings that are used to control the script recording, its playing-back and general settings for the Workbench in OpenScript.

9. **Multiple User Executions :**This will Launch more than one OpenScript instances under different user accounts and separate named Windows. Playback for multiple scripts is supported using any of the following:

   (a) OpenScript Playback button

   (b) Command-Line Interface[12]

OpenScript Feature Highlights

It shows the recorded scripts in two different tabs: Tree View and Java Code. The Tree View tab shows the steps and the Initialize, Run, and Finish modules of each step using a graphical tree view. The Java Code tab shows the underlying Java code used for the script.

The script view is where one can perform the majority of the script editing actions. The Script view has the following tab views:

1. **Tree View :**The Tree View shows the script hierarchy and data as nodes in a collapsible tree view.This gives a clear idea about what functionality is written in all the three modules(discussed below).

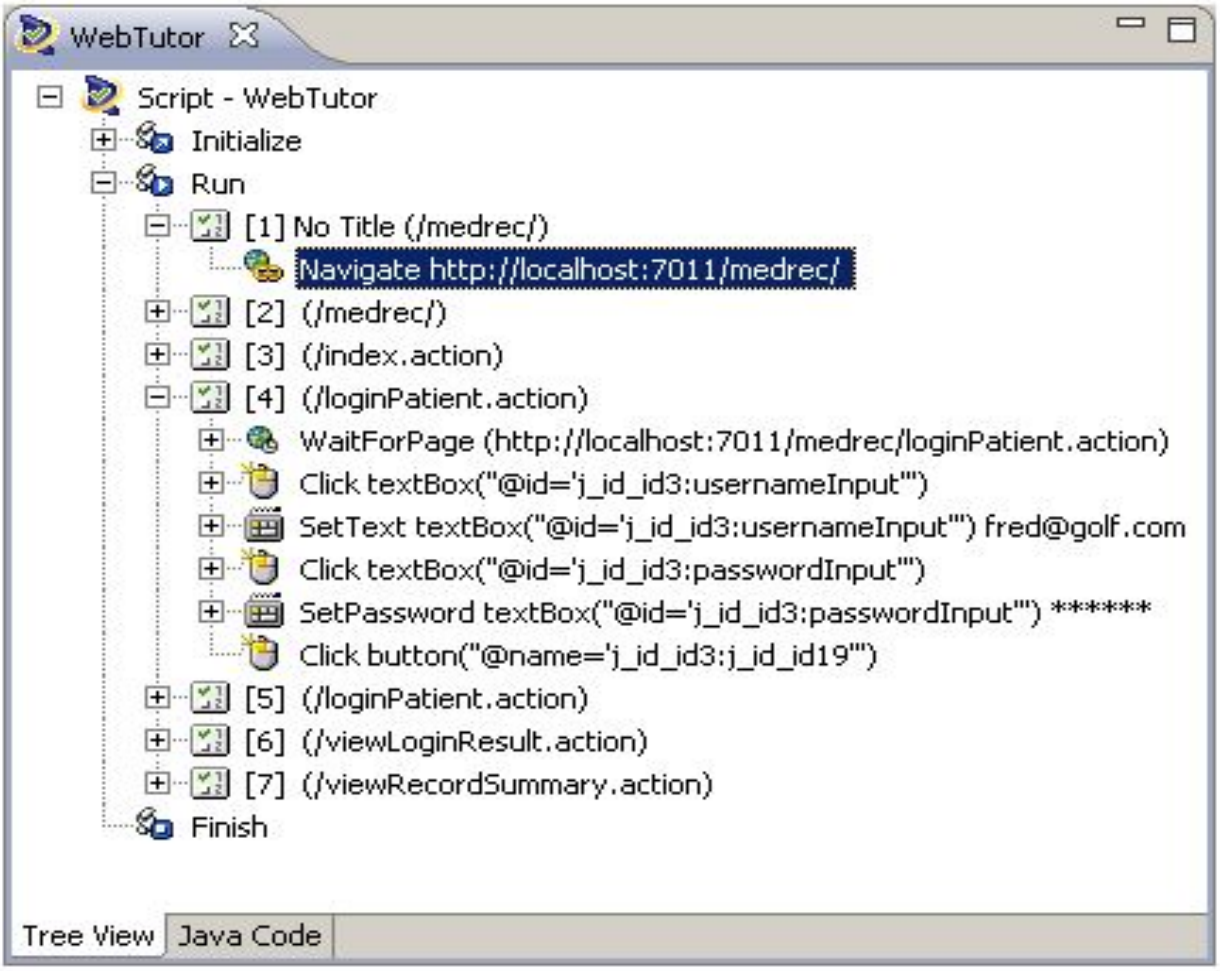


Figure 2.8: Tree View in OATS

The Tree View also has the following standard modules:

(a) Initialize - this module specifies the script actions to perform only once at the beginning of the script playback.Even if the body of the script has to iterate over and over again, this part won't be repeated.

(b) Run - this specifies the script actions to perform one or more times during script playback depending upon the databanks or other custom code.

(c) Finish - specifies script actions to perform once at the end of the script playback and this is similar to the initialize part which is executed only once.

Use the Record options and right-click shortcut menu to add options to the script modules or modify the properties of them in the Tree View.[14]

2. **Java Code :** The Java Code view shows the script hierarchy and data as Java programming code. The Java Code view corresponds to the Tree View. Any changes in the Code View will be automatically updated in the Tree View.

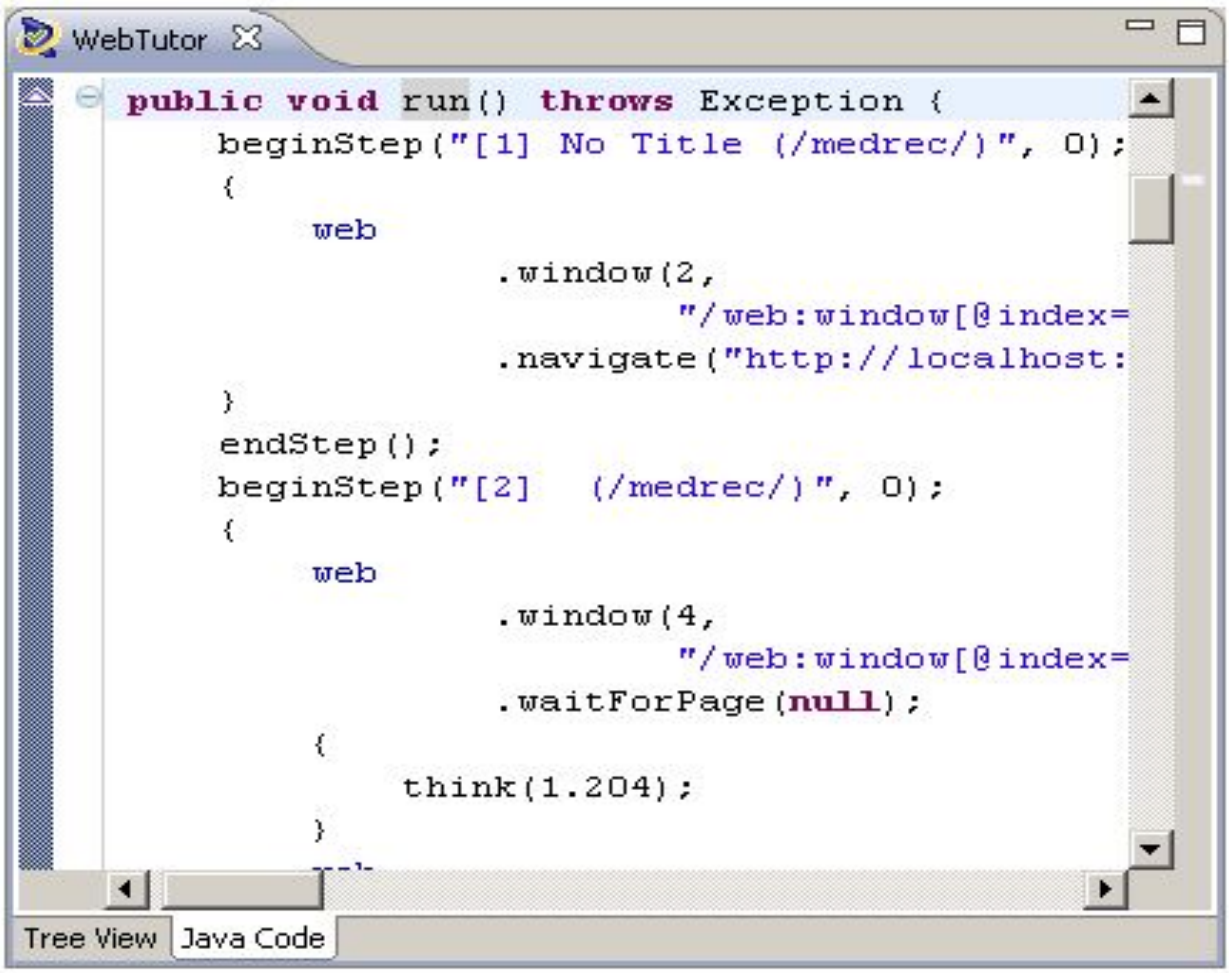


Figure 2.9: Java Code View

The Java Code view also has the following standard methods:

(a) initialize() - this method states the Initialize node of the Tree View and executes a custom program added at the starting of the script playback.

(b) run() - this method corresponds to the Run node of the Tree View and executes recorded and custom program one or more times during the script playback depending upon the databanks.

(c) finish() - this method states the Finish node of the Tree View and executes any custom program added once at the ending of the script playback.

2.2.4 Jericho HTML Parser

It is a java library that allows analysis and manipulation of parts of any HTML document, including tags on the server-side, while reproducing word by word (if any) unrecognized or invalid HTML. It also provides high-level HTML form manipulation methods.

It is an open source library available under the Eclipse Public License (EPL).

Feature Highlights

1. The presence of badly formatted HTML does not interfere or affects the parsing of the remaining document, which makes the library get for use with "real-world" HTML that sometimes choke other parsers.

2. Built-in functionality to extract all text from HTML markup, suitable for feeding into a text search engine.

This library has been used to create the input which is to be given to Synergy.The synergy input should be of a kind that it takes the application host, username, password, login and run the batch profiles such that profiles are set. After that run any one of the batch files to see if it goes fine.Hence the input should be in an excel sheet which is actually present in a WIKI page(organizational internal web page) currently. This short input processing project made us of this library for data analysis.

Here the text is parsed in two parts:

1. The text which is in <td> </td> tags which will give the batch paths.

2. The href links which will give the host names.

2.2.5 Configuration of SMTP Server

SMTP means Simple Mail Transfer Protocol. It standardizes how computers exchange electronic mail and is based on TCP/IP. It works on the principle of post office protocol (POP).

It basically uploads mail directly from a client host to an intermediate host, but only those computers which are always connected with the ISP to the Internet can use this protocol to receive mail. The ISP servers then send the mail to the users to whom they provide the Internet service.

Port number 25 is used by SMTP for his service. Therefore source machine established a TCP connection to port 25 and the e-mail is delivered from source to destination. A system must have a client MTA to send a mail, and to receive a mail, a system must have a server MTA.

Alloc	
Alloc 14.0 URL	http://msp52379.us.oracle.com:18003/AllocPortal-Portal-context-root/faces/pages_home
Alloc App Login	buyer/welcome1
Alloc 14.0 schema user	rms01app/retail@qaols65
ALLOC 14.0 Hudson Build Project	Alloc_14.0.1_QA2
ALLOC 14.0 Hudson Build Envname	alloc14seqa2
ALLOC 14.0 Batch profile	msp52379:/home/alcbatch/profiles/alloc140qa2
ALLOC 14.0 Batch directory	msp52379:/home/alcbatch/alloc140qa2
ReIM	
ReIM 14.0 URL	http://msp52408:17009/reim140qalin2/
REIMDomain Admin URL	http://msp52408.us.oracle.com:19001/console
REIMDomain Home	/u00/webadmin/product/wls_retail/user_projects/domains/REIMDomain
ReIM 14.0 Application login	retail.user/welcome1
ReIM 14.0 schema user	rms01app/retail@qaols65
ReIM 14.0 Hudson Build Project	REIM_14.0X
ReIM 14.0 Hudson Build Envname	reim14seqa2
ReIM 14.0 Batch profile	/home/reimbat/profiles/reim14seqa2
ReIM 14.0 Batch directory	/home/reimbat/reim14seqa2

Figure 2.10: Sample WIKI Page

It is a client-server based ASCII protocol. After establishing the TCP connection,the client machine that is sending messages, waits for the receiving machine that is operating as the server, to send the message first. The process starts by sending first message by server side which gives its identity and telling whether or not it is prepared to receive the mail. If in case it is not then the client machine releases the connection with the server for that moment and tries again after some time.

If the server accepts e-mail, the client will tell who is the sender of the e-mail along with the destination, The server allows the client to send the mail or message. Then the server acknowledges client sent messages .[13]

Mail Transfer Phases

1. Setup of connection:

   The sender when has a message to send it set ups a TCP connection with the target.The following action flow occurs during connection setup operation:

   (a) A TCP connection is openned from the sender to the receiver.
   (b) The receiver identifies itself with 'Service Ready" after the connection is made.
   (c) A "HELLO" command is sent by the sender to identify itself.
   (d) An "OK" message is sent by receiver to show that it has accepted sender's message.
   (e) If in case the mail service on the receiver's side is unavailable, it will send a a "Service Not Available" reply and the process is terminated there only.

2. Mail transfer:

   After the connection has been made, the SMTP receiver can get one or more messages from the sender.

   Following are the phases for transferring a message :

   (a) A "MAIL" message is used to identify the creator of the message.
   (b) In return "RCPT" command identifies the one who will receive the message.
   (c) The message is then transferred by the "DATA" command.

3. Termination of Connection:

   The connection is closed in the following way by the SMTP server:

   (a) A "QUIT" command is sent by the sender and then waits for a reply.
   (b) Therefore the sender initiates the close operation.
   (c) And then receiver carry on with its TCP close after sending it's answer to the QUIT command.[13]

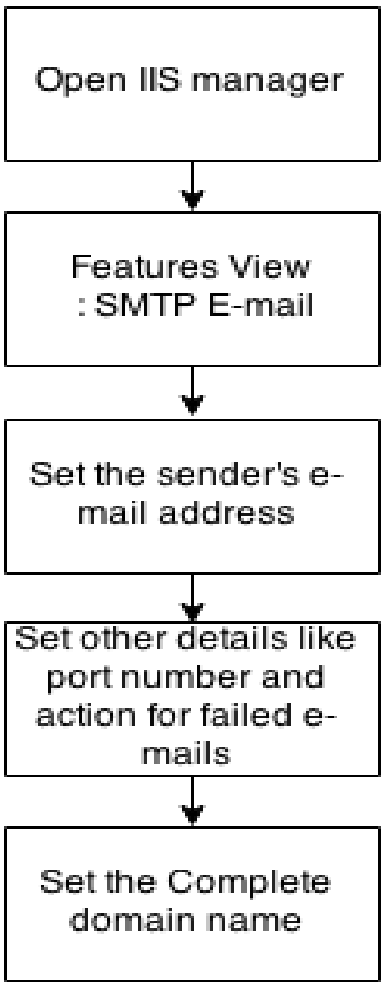


Figure 2.11: SMTP Configuration

Chapter 3

Implementation

Includes many Sub-projects/Tool development for host analysis.

3.1 Tool 1

Application for Host Monitoring:
The Host Monitoring Implementation tool developed is based on monitoring different domains created within the WebLogic server by the various applications deployed. In order to understand the working of the application lets first have an overview and flow of the application.

This application gives an easy GUI for :

1. Listing all the Domains without logging in.
2. Listing all the managed servers of any Domain.
3. Starting and Stoping all/some/one Managed Servers in any domain.
4. Starting Admin Server, if it not up. .
5. Checking the Log of servers as well as Domain and Host.
6. Modifying the properties.

In the Host monitoring application as mentioned before we perform various operations with respect to the domains. The working of the application goes as shown in the above implementation diagram. We have used multiple jsp pages to display the different functioning. Since jsp uses Http session to transfer data between the different pages, we have used Jsch for secured session for executing the scripts in the Unix server and for secured transfer of data from jsp page to java functions and transmit back the processed data to the jsp function call. The application project is developed in java net beans. The project folder consist of 3 main folders namely WebPages which consist of all the jsp pages of the current application, CSS folder which consist of the style sheets for the different jsp pages and Source Package folder consist of the java files specifying the functions for the various operation carried out by the jsp pages an every event that occurs. Steps to be carried out are as follows:

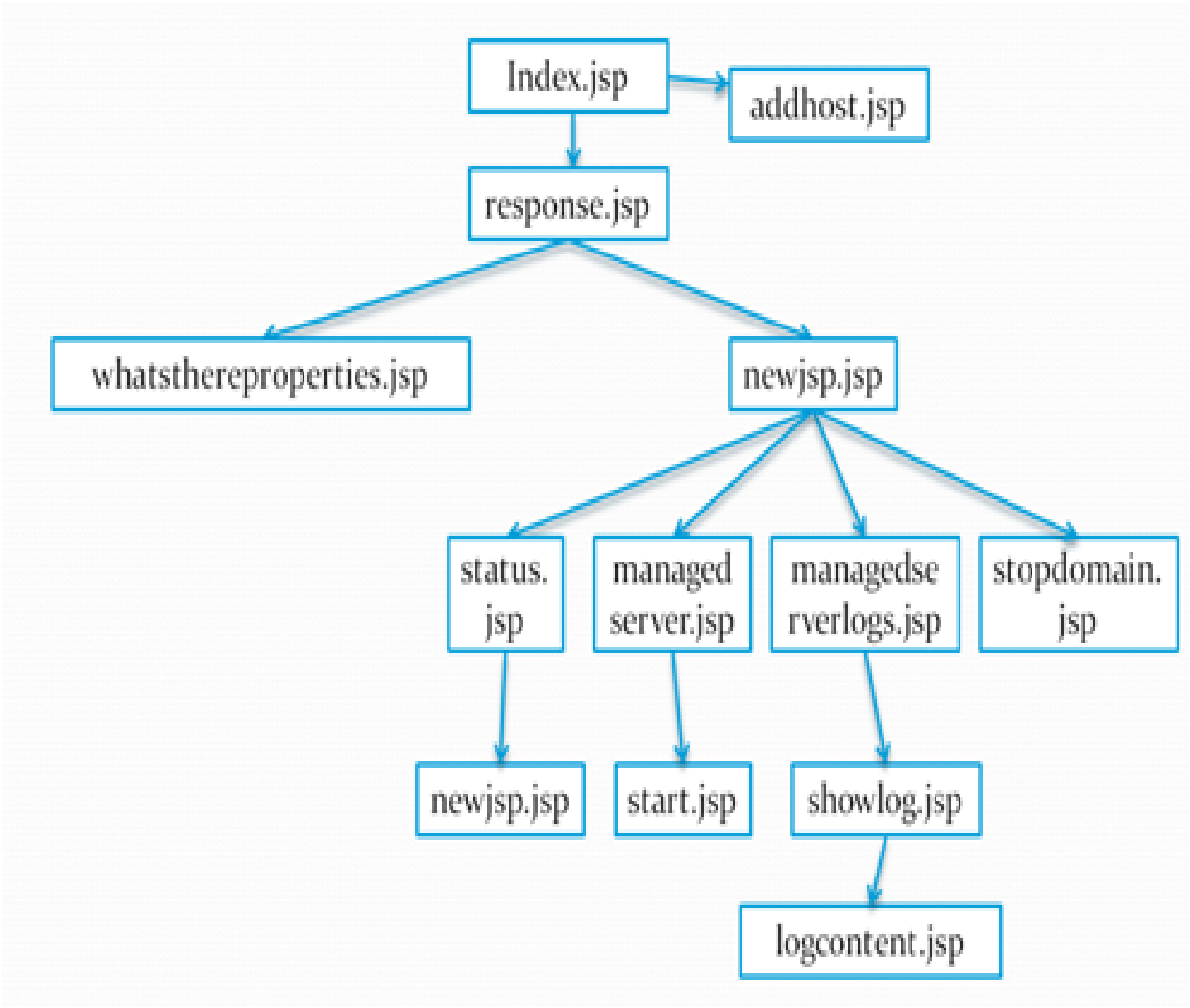


Figure 3.1: Transformation Application GUI Flow Chart

1. **Run the index.jsp file:** which in turn displays the index.jsp page within the login credentials to be entered into it. Here we enter the host name of the Application server into which we want to log in, in order to monitor the domains present in it.

2. **Login button event:** This is present in the index.jsp page to launch the response.jsp page. The action event in the Login button at the backend invokes the call() function in the SSH.java, which internally calls the dbconn.java file in order to establish connection to the remote database server for example msp52647.us.oracle.com by using the database details in the connectionstringcopy.txt file which consist of the database url, application host user and the application user password. Once the connection with database host is successful we fetch the username and password from the transformationappuser table space for the specified application host name given by the user at the index.jsp page. If the user has given the valid host name, then the sql query is executed successfully and the response.jsp page is displayed.

3. **In the response.jsp page:** user has been given 2 buttons namely DOMAINS and CHANGE APPLICATION PROPERTIES.
   DOMAINS: When we click on this button newjsp.jsp page is loaded with the list of all the available domains in the host.
   CHANGE APPLICATION PROPERTIES: On click of this button whatsthere propchange.jsp page is loaded which consist of all the details from the whatsthere.properties file. If we want to change any of the details in the file we have to enter the values in the specified text areas and click on the change button in order to update the file. At the action event of the change button automatic backup of the current whatsthere.properties file is taken and maintained in the wlsctrl folder.

4. **In newjsp.jsp page:** It displays the list of the different domains present in the server and few operations that can be carried out on those domains. But on the selection of the more than one domains few of the options are disabled like the Status, Managed Server and Managed Server Logs The operations are as follows:
   Status: It loads the status.jsp page which consists of the status of the selected domain from the list of domains in the newjsp.jsp page. This page displays the servers in the domain, status and port number on which it is running.
   Managed Server: It loads the managedserver.jsp page with options like start, stop, startall, stopall and back buttons. On the click of these buttons we can either stop/start the managed servers within that domain.
   Managed Server Logs: It loads the managedserverlogs.jsp page which consists of the list of the servers in the domain and the show options which displays the showlog.jsp page.
   Stop/Start Domain and Stop All Domains: Both of them load the stopdomain.jsp page and alerts the user that the selected server has been shutdown as per the request generated by the stop event.

5. **In showlog.jsp page:** On the load of this page it displays 2 options of the selected server namely <servername>.out and <servername>.log.On the click of the SHOWLOGS button it loads the logcontent.jsp page.

6. **In logcontent.jsp page:** Here the recorded log contents of the server in the Domain of the weblogic installation path are displayed. It consists the status of the

server at every instance of the time after the creation, like actions performed on the server, whether nodemanager is reachable, deployments, users and groups available , security etc.

Screenshots :

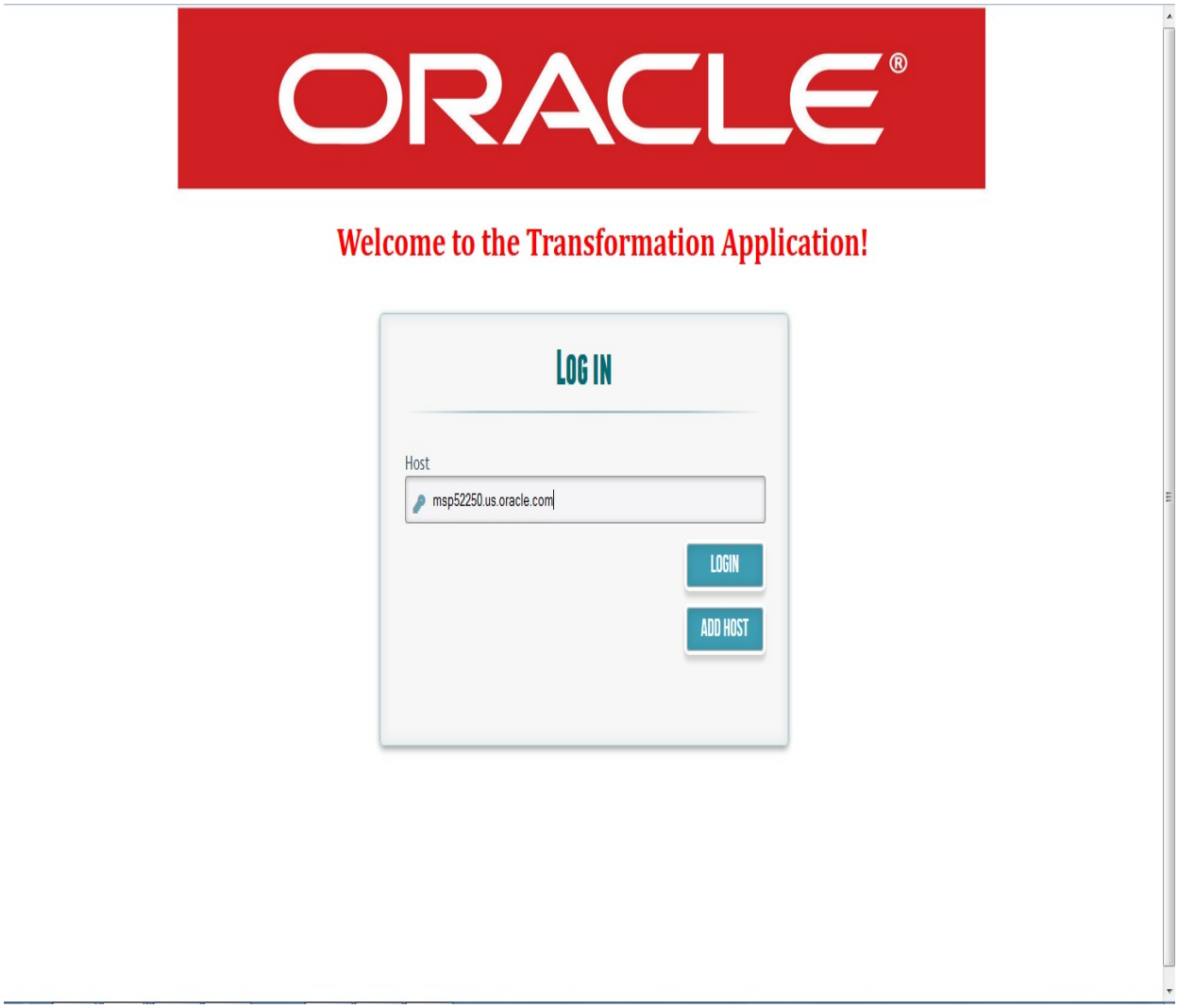


Figure 3.2: Transformation Application : Login Page

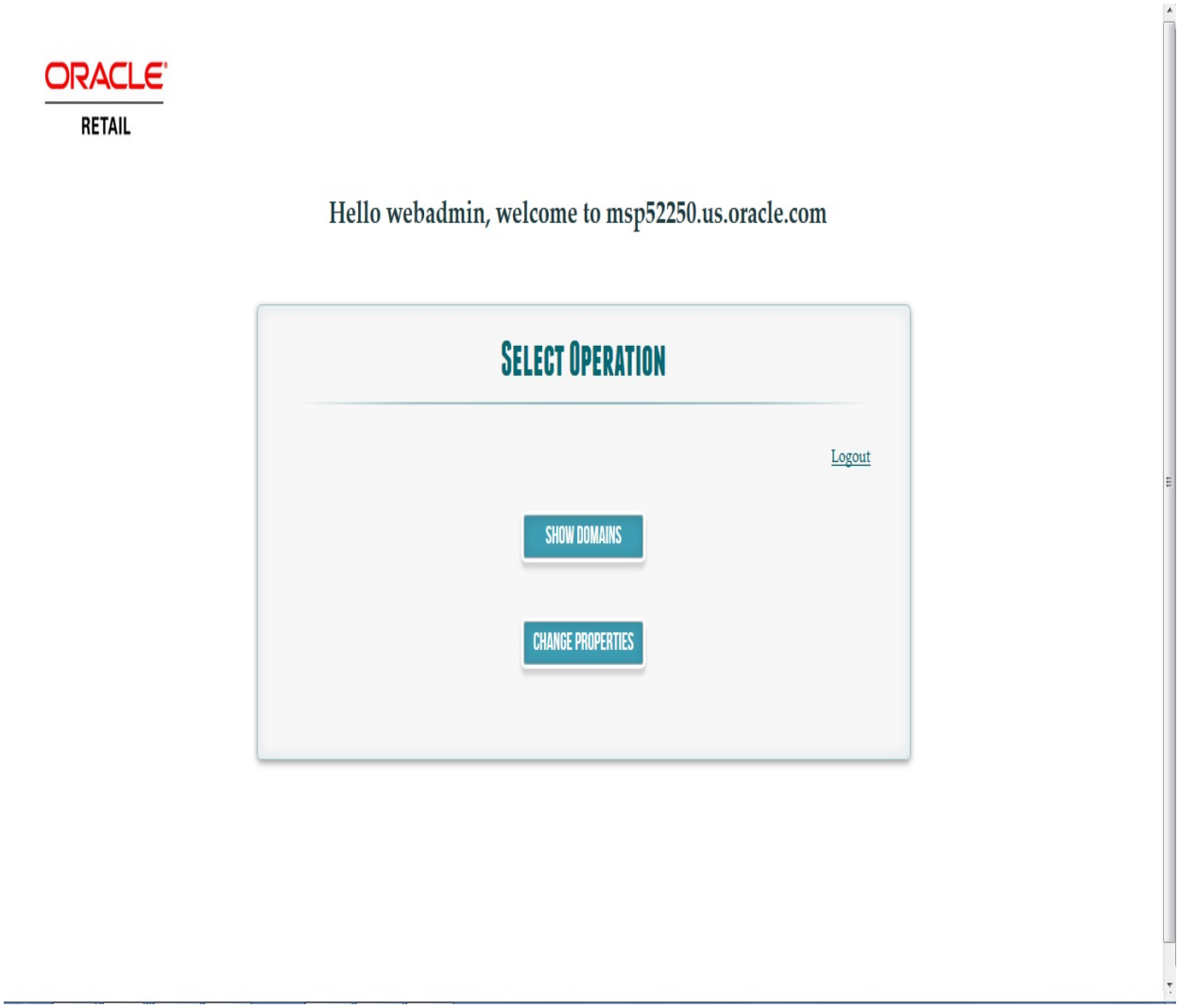


Figure 3.3: Home Page

Figure 3.4: SHOW DOMAIN Page

Figure 3.5: MANAGED SERVER LOG Page

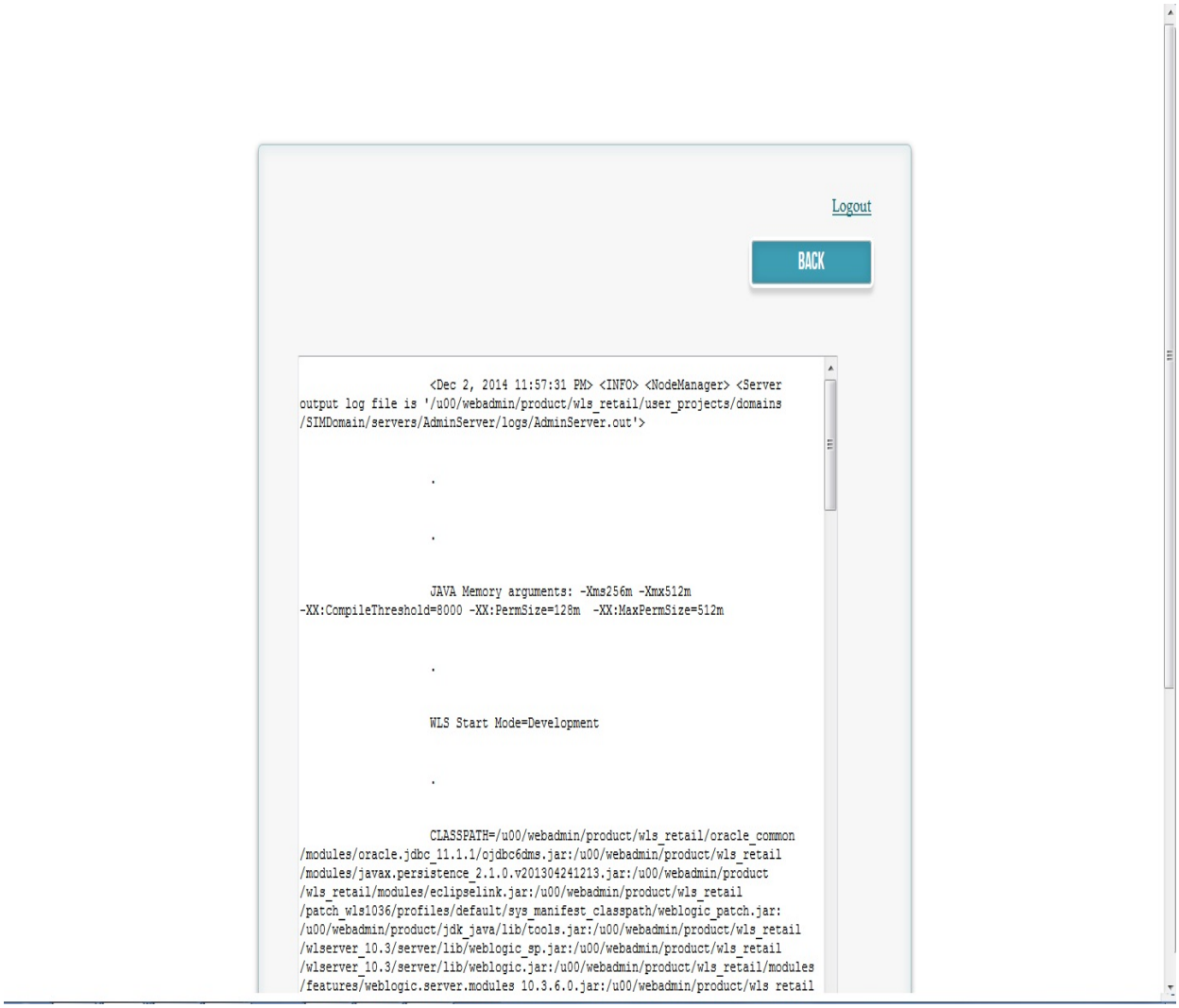


Figure 3.6: Server Log

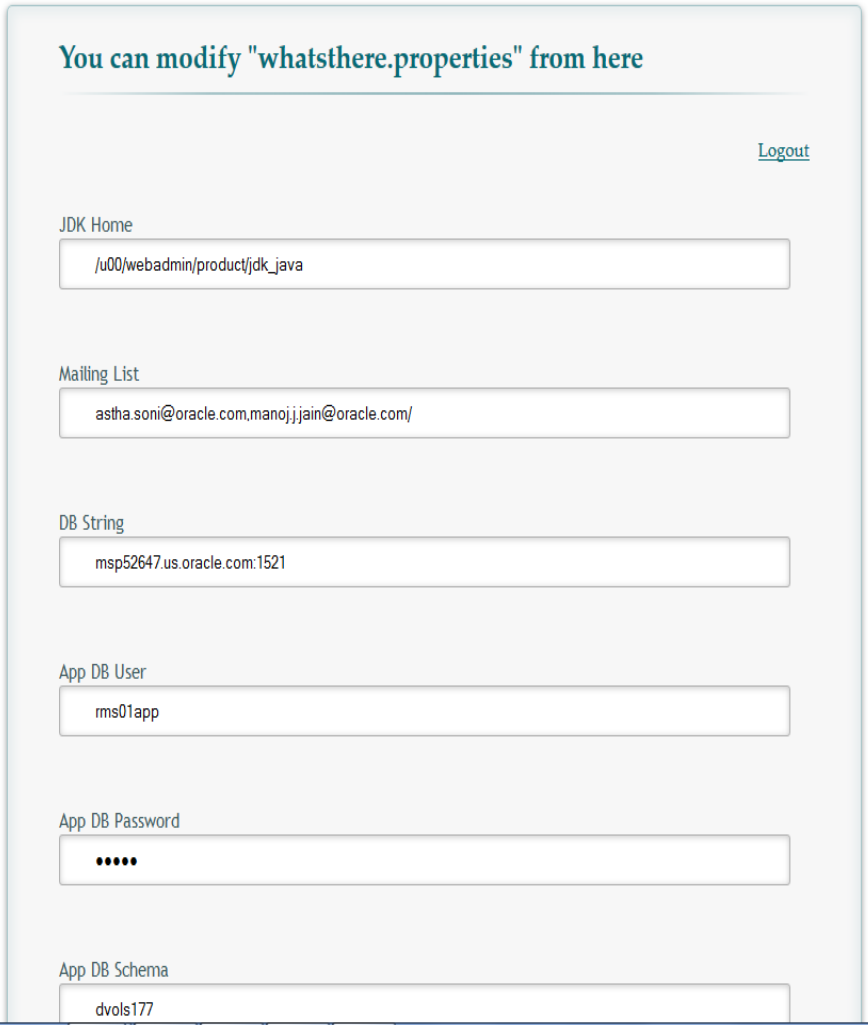


Figure 3.7: CHANGE PROPERTIES Page

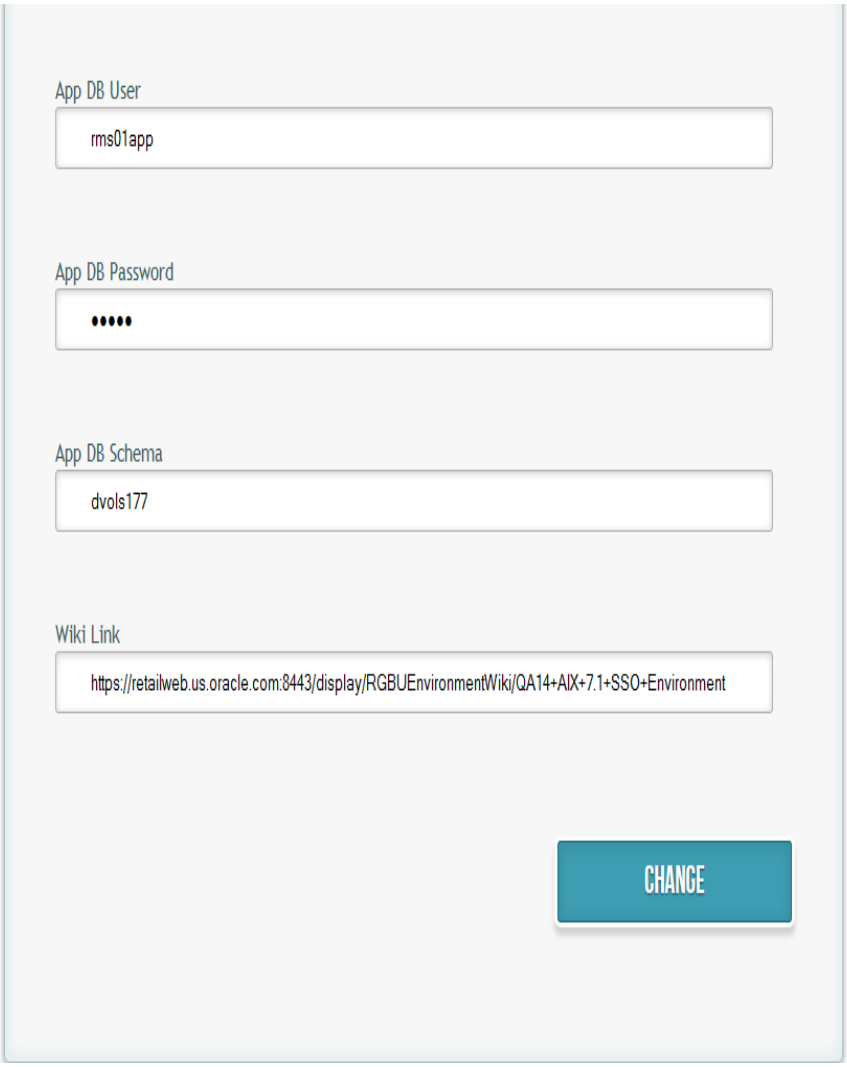


Figure 3.8: CHANGE PROPERTIES Page 2

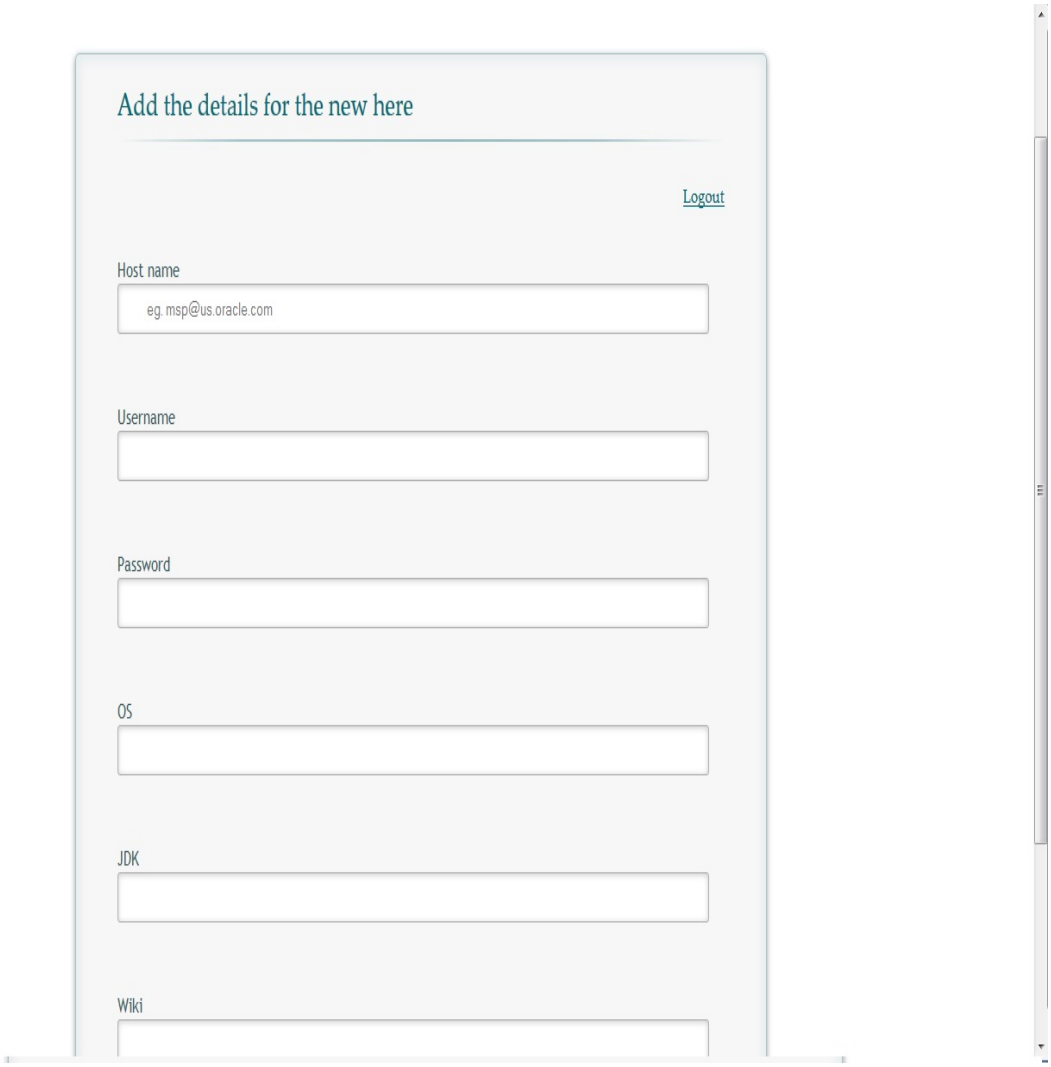


Figure 3.9: ADD HOST Page

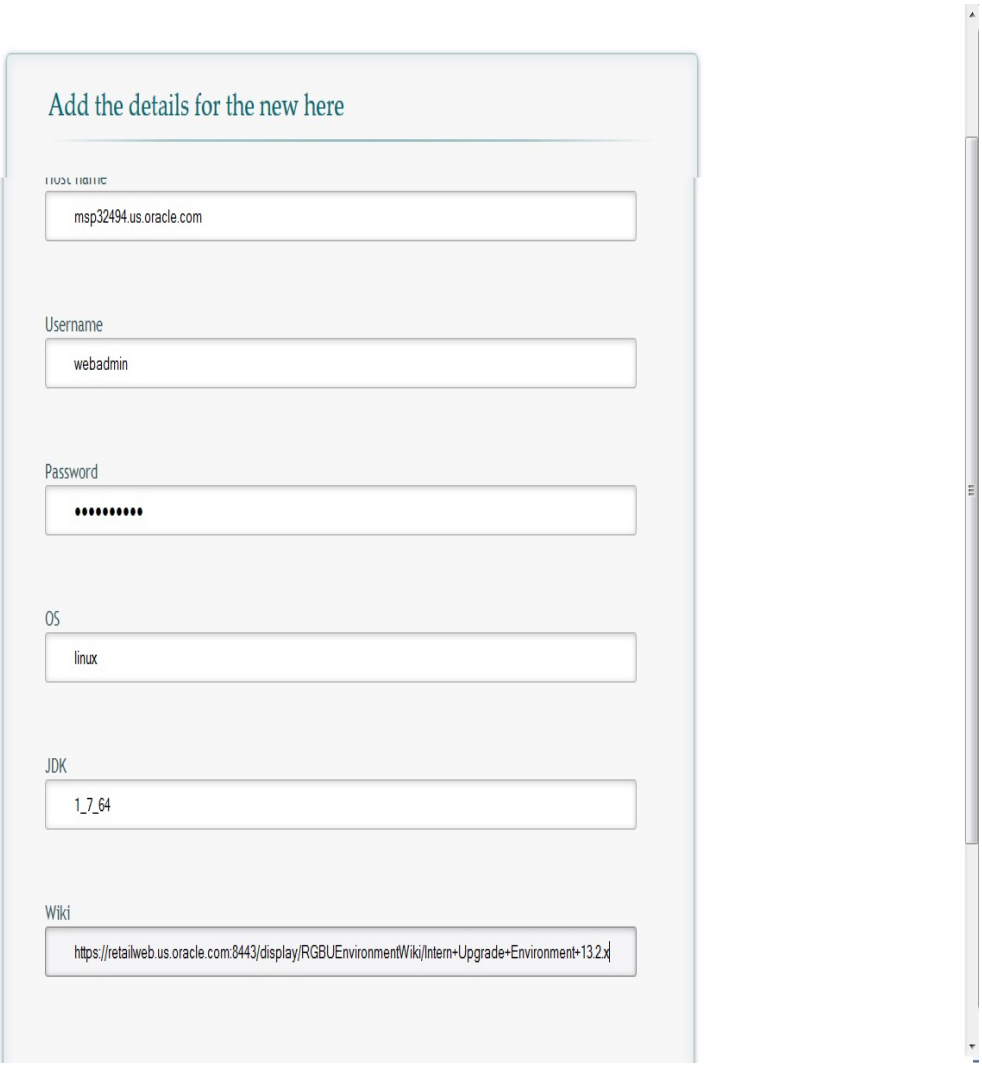


Figure 3.10: ADD HOST Page 2

3.2 Tool 2

In this project we first recorded all the apps by manually launching the URL and logging into the application so as to create an extensive object repository so that there is less chance of an error like unidentified obejcts.Hence, created different functions for different applications.
After that input was prepared in an excel sheet which consistes of Application name(which helps in identifying which function to call for which application), URL, login ID and password(to login).Also the result in generated in the same kind of excel sheet where a new column result is added in this excel whcih tells the status of the app.
Specifically the app turns out to give 4 possibility in result:

1. Pass : The App is up and login credentials are correct.
2. Authentication Error : The App is up but login credentials are wrong.
3. App is down : App not launching/Fail(Server Issues)
4. Unknown error : App/Object not recorded/tested

There may be a possibility that result may be blank because when application is checked for different versions with the same object repository, there may be possible that the object may be different and hence not recorded.

3.3 Tool 3

3.3.1 OATS

This project is a recreation of Tool 2, but with entirely different technology called OATS. OATS is an Oracle product explained extensively in Literature Survey.Similar to QTP, OATS also uses record and playback technology for recording human acts and then reproducing them later.

The application that were to be tested were of two different versions : 13 and 14.

Version 13 had two types of applications : Web and Forms.

Version 14 had three types of applications : Web, Forms and ADF.

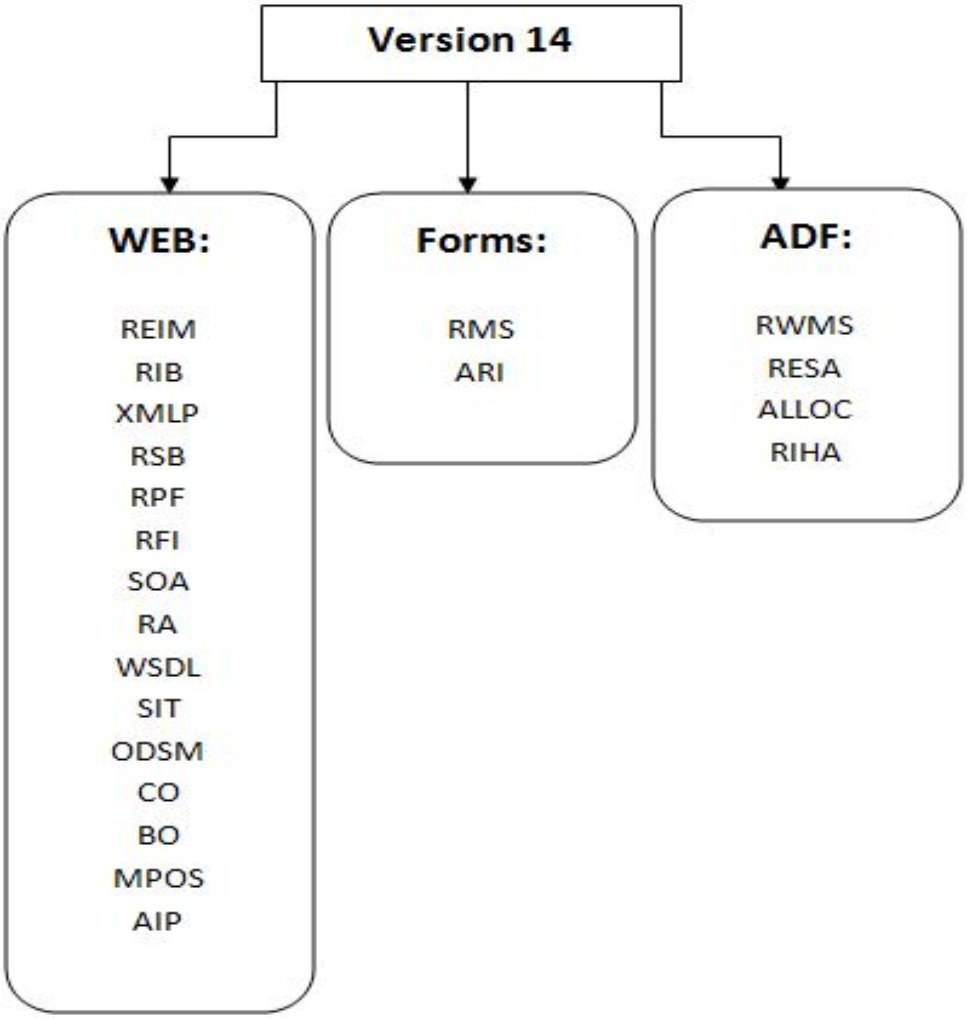


Figure 3.11: Version 14 Products

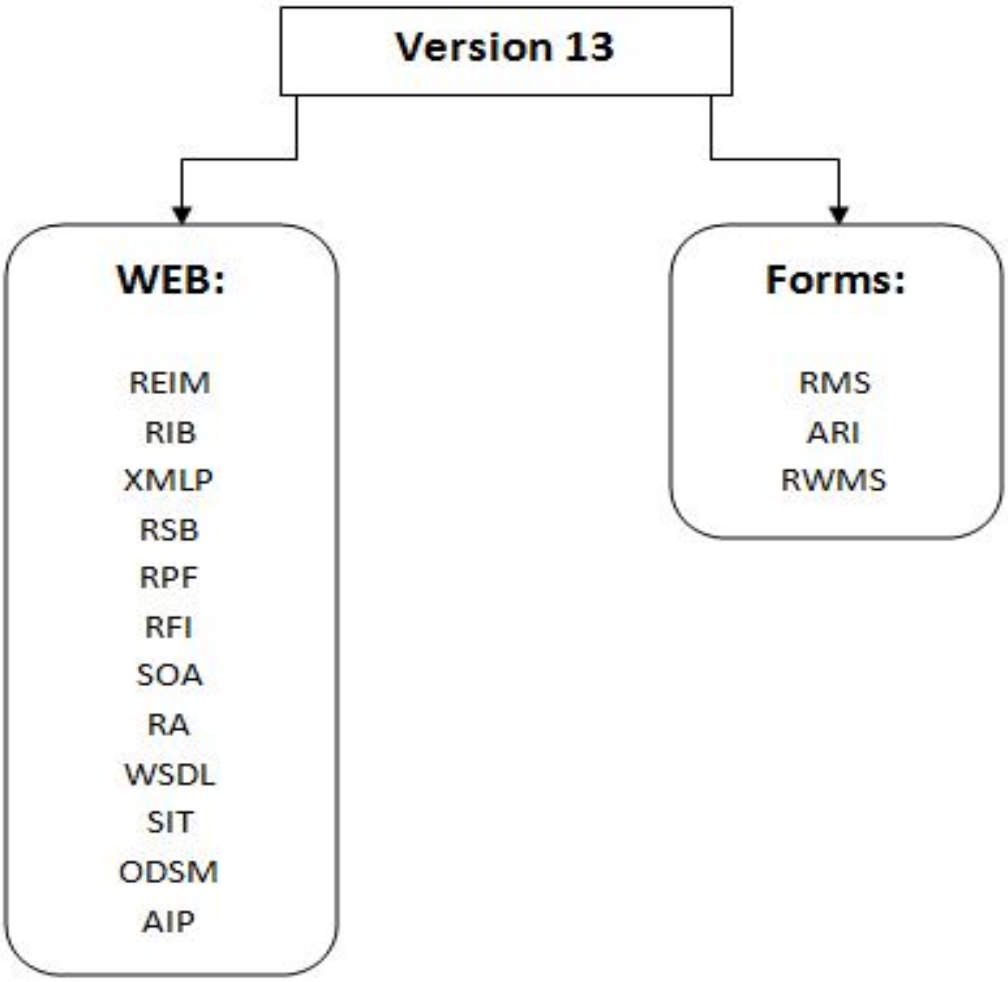


Figure 3.12: Version 13 Products

The objects are recorded in the following manner :

```
web.textBox(9,
1   "/web:window[@title='Single Sign On - Login']" +
2   "/web:document[@index='0'] " +
3   "/web:form[@name='LoginForm' '] " +
4   "/web:input_text[@name='ssousername'  or @ index='0']")
5   .setText("yutaka.takatsu@oracle.com" )
```

Figure 3.13: Recorded Object

When executing this command, OpenScript will :

1. Find a window with an attribute title=Single Sign On - Login
2. Within the window, find a document index= 0 ,
3. Within the document, find a form that has an attribute name= LoginForm
4. Within the form, find a an object Input type text ,
5. That has an attribute either name = ssousername or index='0'
6. Enter text yutaka.takatsu@oracle.com into the text box object

Optionally, object paths can be stored in an Object Library File that associates object paths to simple names.Allows users to store object paths used in multiple scripts in a single location (and make updates to multiple scripts at once)

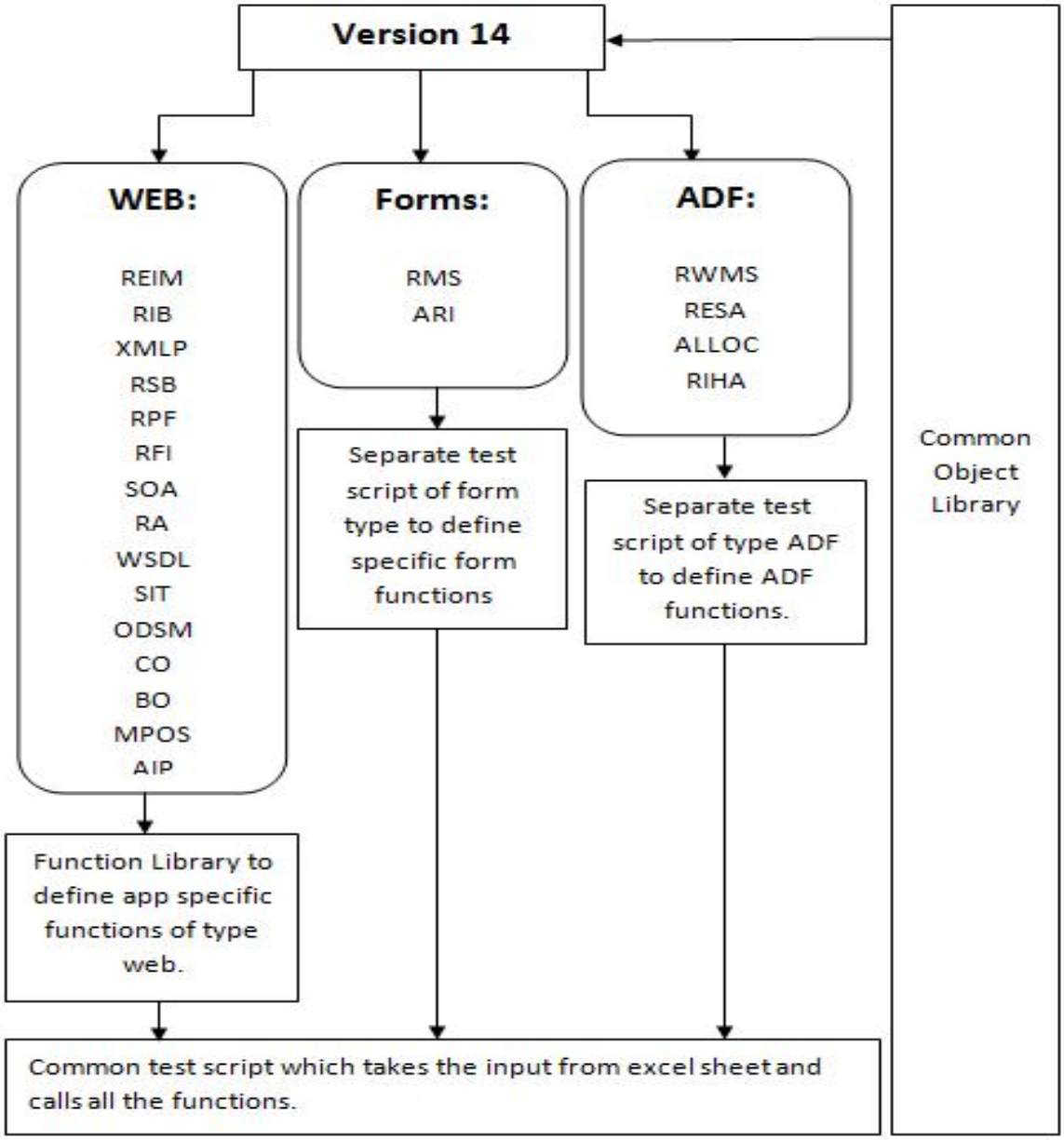


Figure 3.14: Script Structure

Also the result in generated in the same kind of excel sheet where a new column result is added in this excel whcih tells the status of the app.
Specifically the app turns out to give 7 possibility in result:

1. Passed : Here the URL is loaded and the user is able to login to the application successfully with the given credentials without any glitch. The user is also able to find the respective objects within the application login page.

2. Authentication Error : Here the URL is launched successfully. But the credentials given are invalid as a result they are not able to login to the application.

3. App is Down : This error occurs when the application URL is not launched because the application may not be up.

4. App is up but Unknown Error : Here the URL is launched and the objects in the login page are also present. But when the credentials are inputted to the input objects and tried to login,

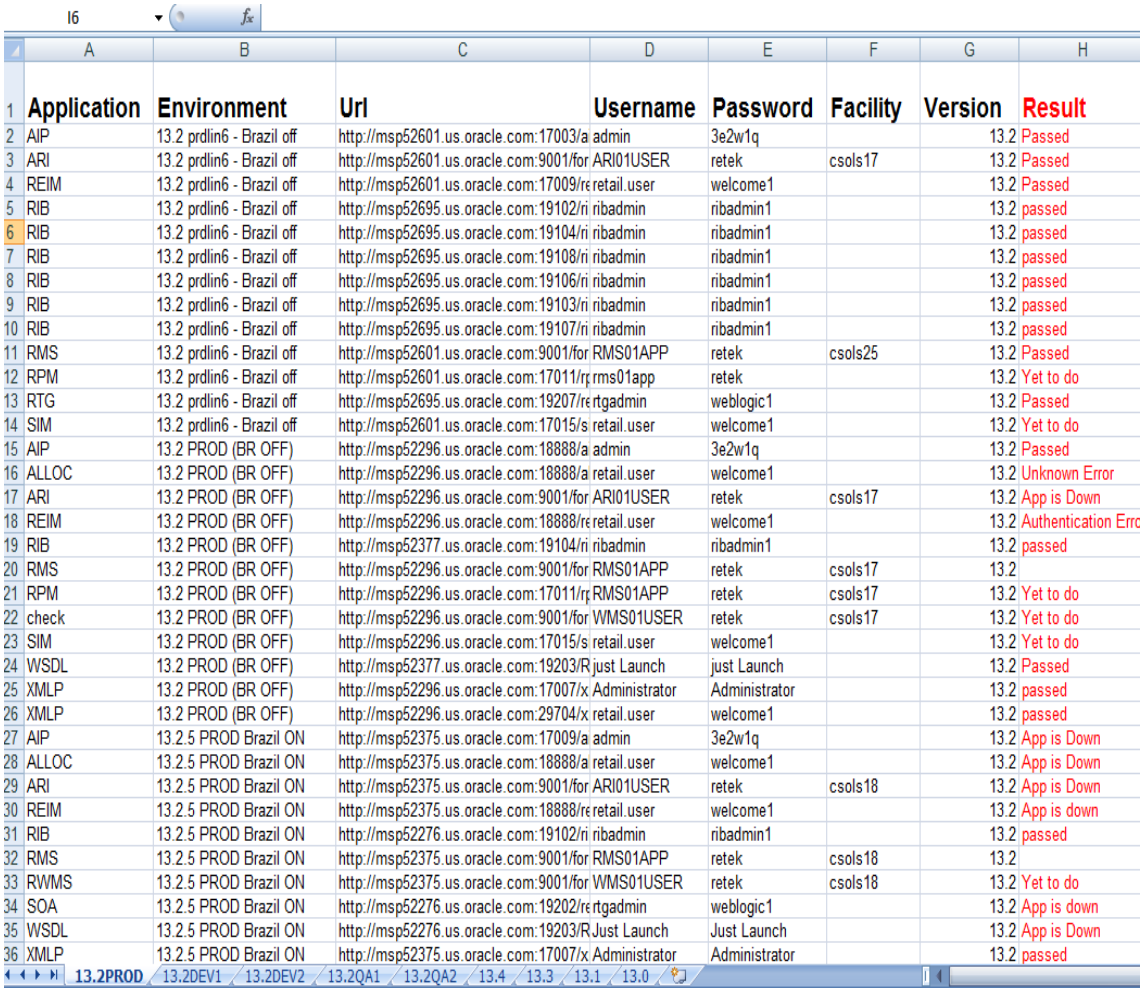
   (a) the application takes very long to load the index page

   (b) Application gets hanged without displaying any error.

5. Invalid Inputs: Here the URL is launched successfully. But the input credentials inputted by the input sheet is null.

6. Java Version not up to Date: Here the application is up but due to the incompatible java version the application URL is not launched.

7. SSO Required: Here the application is up but the SSO credentials are not available in the input sheet provided.



	A	B	C	D	E	F	G	H
1	Application	Environment	Url	Username	Password	Facility	Version	Result
2	AIP	13.2 prdlin6 - Brazil off	http://msp52601.us.oracle.com:17003/a	admin	3e2w1q		13.2	Passed
3	ARI	13.2 prdlin6 - Brazil off	http://msp52601.us.oracle.com:9001/for	ARI01USER	retek	csols17	13.2	Passed
4	REIM	13.2 prdlin6 - Brazil off	http://msp52601.us.oracle.com:17009/re	retail.user	welcome1		13.2	Passed
5	RIB	13.2 prdlin6 - Brazil off	http://msp52695.us.oracle.com:19102/ri	ribadmin	ribadmin1		13.2	passed
6	RIB	13.2 prdlin6 - Brazil off	http://msp52695.us.oracle.com:19104/ri	ribadmin	ribadmin1		13.2	passed
7	RIB	13.2 prdlin6 - Brazil off	http://msp52695.us.oracle.com:19108/ri	ribadmin	ribadmin1		13.2	passed
8	RIB	13.2 prdlin6 - Brazil off	http://msp52695.us.oracle.com:19106/ri	ribadmin	ribadmin1		13.2	passed
9	RIB	13.2 prdlin6 - Brazil off	http://msp52695.us.oracle.com:19103/ri	ribadmin	ribadmin1		13.2	passed
10	RIB	13.2 prdlin6 - Brazil off	http://msp52695.us.oracle.com:19107/ri	ribadmin	ribadmin1		13.2	passed
11	RMS	13.2 prdlin6 - Brazil off	http://msp52601.us.oracle.com:9001/for	RMS01APP	retek	csols25	13.2	Passed
12	RPM	13.2 prdlin6 - Brazil off	http://msp52601.us.oracle.com:17011/rp	rms01app	retek		13.2	Yet to do
13	RTG	13.2 prdlin6 - Brazil off	http://msp52695.us.oracle.com:19207/re	rtgadmin	weblogic1		13.2	Passed
14	SIM	13.2 prdlin6 - Brazil off	http://msp52601.us.oracle.com:17015/s	retail.user	welcome1		13.2	Yet to do
15	AIP	13.2 PROD (BR OFF)	http://msp52296.us.oracle.com:18888/a	admin	3e2w1q		13.2	Passed
16	ALLOC	13.2 PROD (BR OFF)	http://msp52296.us.oracle.com:18888/a	retail.user	welcome1		13.2	Unknown Error
17	ARI	13.2 PROD (BR OFF)	http://msp52296.us.oracle.com:9001/for	ARI01USER	retek	csols17	13.2	App is Down
18	REIM	13.2 PROD (BR OFF)	http://msp52296.us.oracle.com:18888/re	retail.user	welcome1		13.2	Authentication Erro
19	RIB	13.2 PROD (BR OFF)	http://msp52377.us.oracle.com:19104/ri	ribadmin	ribadmin1		13.2	passed
20	RMS	13.2 PROD (BR OFF)	http://msp52296.us.oracle.com:9001/for	RMS01APP	retek	csols17	13.2	
21	RPM	13.2 PROD (BR OFF)	http://msp52296.us.oracle.com:17011/rp	RMS01APP	retek	csols17	13.2	Yet to do
22	check	13.2 PROD (BR OFF)	http://msp52296.us.oracle.com:9001/for	WMS01USER	retek	csols17	13.2	Yet to do
23	SIM	13.2 PROD (BR OFF)	http://msp52296.us.oracle.com:17015/s	retail.user	welcome1		13.2	Yet to do
24	WSDL	13.2 PROD (BR OFF)	http://msp52377.us.oracle.com:19203/R	just Launch	just Launch		13.2	Passed
25	XMLP	13.2 PROD (BR OFF)	http://msp52296.us.oracle.com:17007/x	Administrator	Administrator		13.2	passed
26	XMLP	13.2 PROD (BR OFF)	http://msp52296.us.oracle.com:29704/x	retail.user	welcome1		13.2	passed
27	AIP	13.2.5 PROD Brazil ON	http://msp52375.us.oracle.com:17009/a	admin	3e2w1q		13.2	App is Down
28	ALLOC	13.2.5 PROD Brazil ON	http://msp52375.us.oracle.com:18888/a	retail.user	welcome1		13.2	App is Down
29	ARI	13.2.5 PROD Brazil ON	http://msp52375.us.oracle.com:9001/for	ARI01USER	retek	csols18	13.2	App is Down
30	REIM	13.2.5 PROD Brazil ON	http://msp52375.us.oracle.com:18888/re	retail.user	welcome1		13.2	App is down
31	RIB	13.2.5 PROD Brazil ON	http://msp52276.us.oracle.com:19102/ri	ribadmin	ribadmin1		13.2	passed
32	RMS	13.2.5 PROD Brazil ON	http://msp52375.us.oracle.com:9001/for	RMS01APP	retek	csols18	13.2	
33	RWMS	13.2.5 PROD Brazil ON	http://msp52375.us.oracle.com:9001/for	WMS01USER	retek	csols18	13.2	Yet to do
34	SOA	13.2.5 PROD Brazil ON	http://msp52276.us.oracle.com:19202/re	rtgadmin	weblogic1		13.2	App is down
35	WSDL	13.2.5 PROD Brazil ON	http://msp52276.us.oracle.com:19203/R	Just Launch	Just Launch		13.2	App is Down
36	XMLP	13.2.5 PROD Brazil ON	http://msp52375.us.oracle.com:17007/x	Administrator	Administrator		13.2	passed

Figure 3.15: Output Excel file from OATS

3.3.2 Synergy

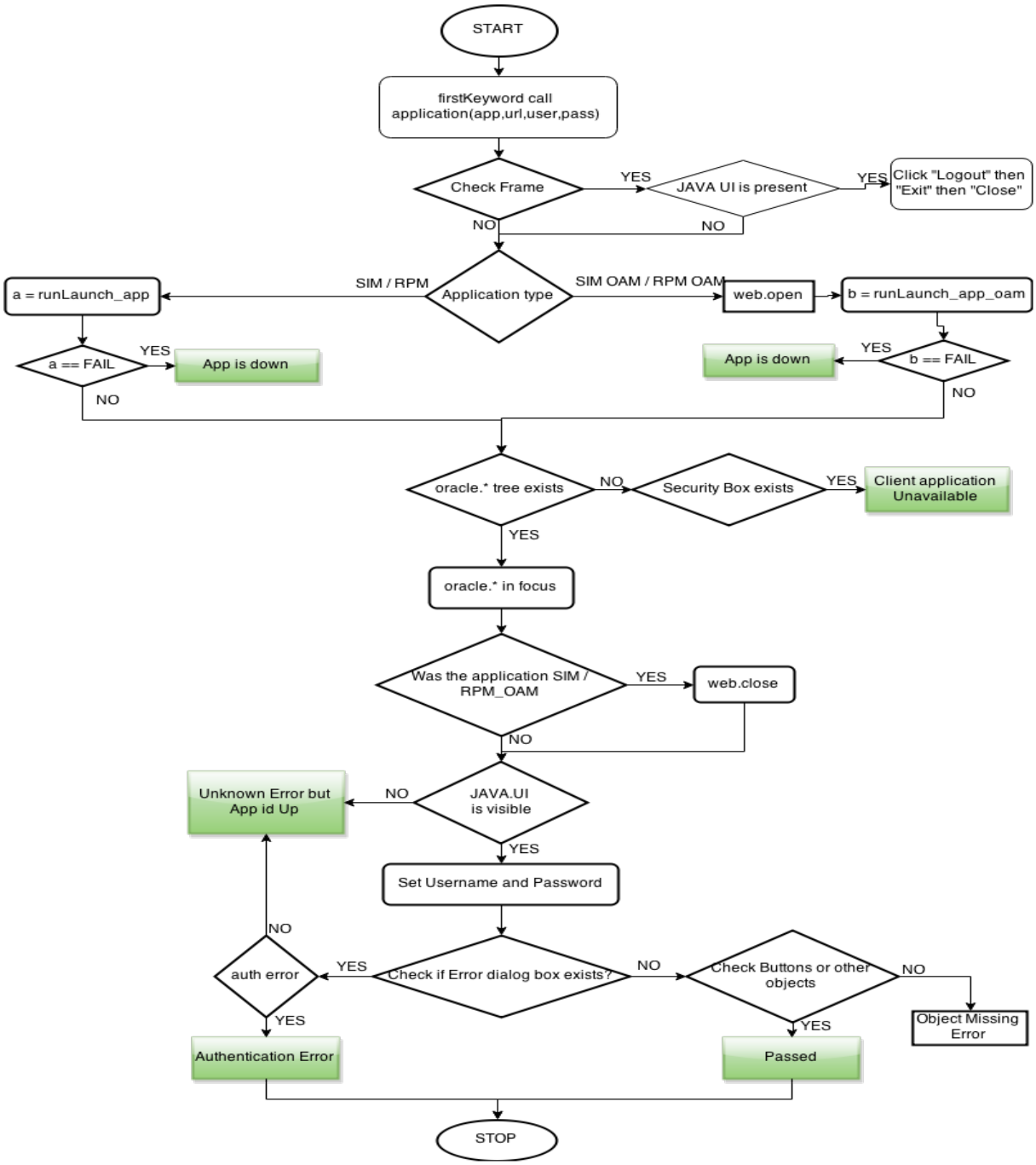


Figure 3.16: Synergy Application Logic

Why using Synergy?

1. Frustration with the performance and stability of QTP.
2. Too much time being spent on automation infrastructure instead of product automation.
3. Lack of good and stable support of emerging technologies (Adobe Flex, ADF).
4. We wanted to move towards test case creation using a keyword-driven methodology.

5. We wanted a very flexible automation platform (support for languages such as Java, JavaScript, Python, Scala).

Synergy is:

1. Unified Automation Platform that provides:
2. Easy and fast way of adding new automation plug-ins for new technologies (4-8 weeks average).
3. Common test execution and recording architecture across all automation plug-ins.
4. Common automation integrated development environment (IDE) across all automation plug-ins.

Synergy follows Tabular Scripting:

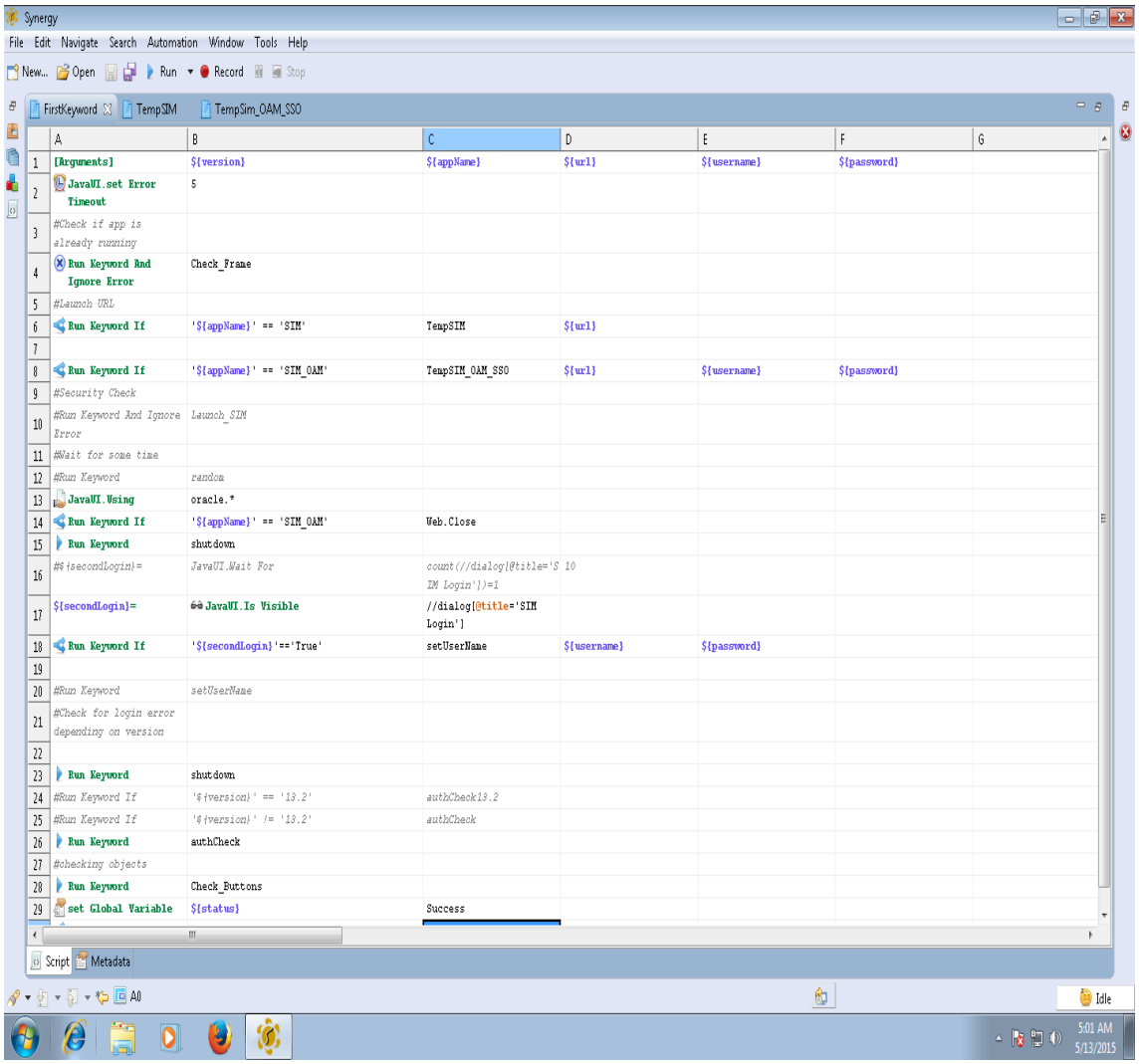


Figure 3.17: Synergy Script in Tabular Format

Chapter 4

Conclusion and Future Scope

4.1 Conclusion

Transformation Application

The quality appraisal work has been carried out for twelve products for the version 14.1.

The transformation app has been completed with all the features, like:

1. Listing all the domains in a host.
2. Viewing Server Logs.
3. Changing whatsthere.properties details.
4. Handling multiple managed servers simultaneously.

Synergy

The Synergy script for automated testing has been done for both the versions 13 and 14 for the java applications that is RPM and SIM.The accuracy achieved here is around 65% - 70 %.

OATS

The entire QTP project has been converted into Openscript where the script is able to :

1. Launch the URL of the application from the input sheet.
2. Identify the home page.
3. Put login credentials from the input sheet.
4. Identify whether the application was logged in successfully.
5. Accordingly specify result in excel sheet.
6. As soon as one worksheet is processed send the sheet as an attachment to the email IDs specified.

The accuracy achieved by OATS is around 80% - 90%.

Chapter 5

References

[1] www.oracle.com/in/industries/retail/overview/index.html

[2] http://www.oracle.com/technetwork/documentation/13xdoc520375.html

[3] docs.oracle.com/cd/E1244801/rms/pdf/1327/rms1327ig03.pdf

[4] www.oracle.com/us/products/middleware/application-server/family066521.html

[5] www.oracle.com/tech/middleware/weblogic/documentation

[6] www.jcraft.com/jsch

[7] www.tutorialspoint.com/qtp/

[8] www8.hp.com/in/en/softwaresolutions/unifiedfunctionaltestingautomation

[9] www.guru99.com/quicktestprofessionalqtp-tutorial.html

[10] www.smartbridge.com/use-oracle-application-testing-suite-oats-oracle-jd-edwards

[11] www.sudhirnimmagadda.blogspot.in/2013/08/about-oats-and-comparsion-with-qtp.html

[12]docs.oracle.com/cd/E25294-01/doc.920/e15487/chap3-os-fm.htm

[13]www.ecomputernotes.com/services-and-applications/smtp-simple-mail-transfer-protocol

[14]www.chadthompson.me/2012/08/first-steps-with-oats-recording-a-test-with-openscript

[15] Internal documents from SVN