

# Automating the Deployment and Testing the Benchmarks for Elba Project

## Project Proposal for Real Time Systems

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### Goal

The project goal is to create scripts to automate the process of deployment of 3-tier servers on remote Emulab cluster located in University of Utah.

### Motivation

Currently, the computer industry relies on manual testing and staging approach of enterprise systems before the code enters production level. This approach tends to be expensive due to its complexity, vulnerability to errors and large time-consumption. Also, the testing takes place on real hardware with random sets of workloads aimed at collecting metrics and using them for tuning to make the future designs more robust. To make this approach more efficient and streamlined, the Elba project at Georgia Tech is currently developing procedures to automate the management of large application systems with tools that cover design, deployment, monitoring and evaluation.

The Elba project aims to verify and test the system deployment plan in a specifically developed staging environment before committing it to a production environment. The vision is to change the current methods of manual testing and debugging during production phase to an automatic execution of benchmarks to validate the deployment during staging using lower cost hardware resources to achieve results that can be scaled to production level environment.

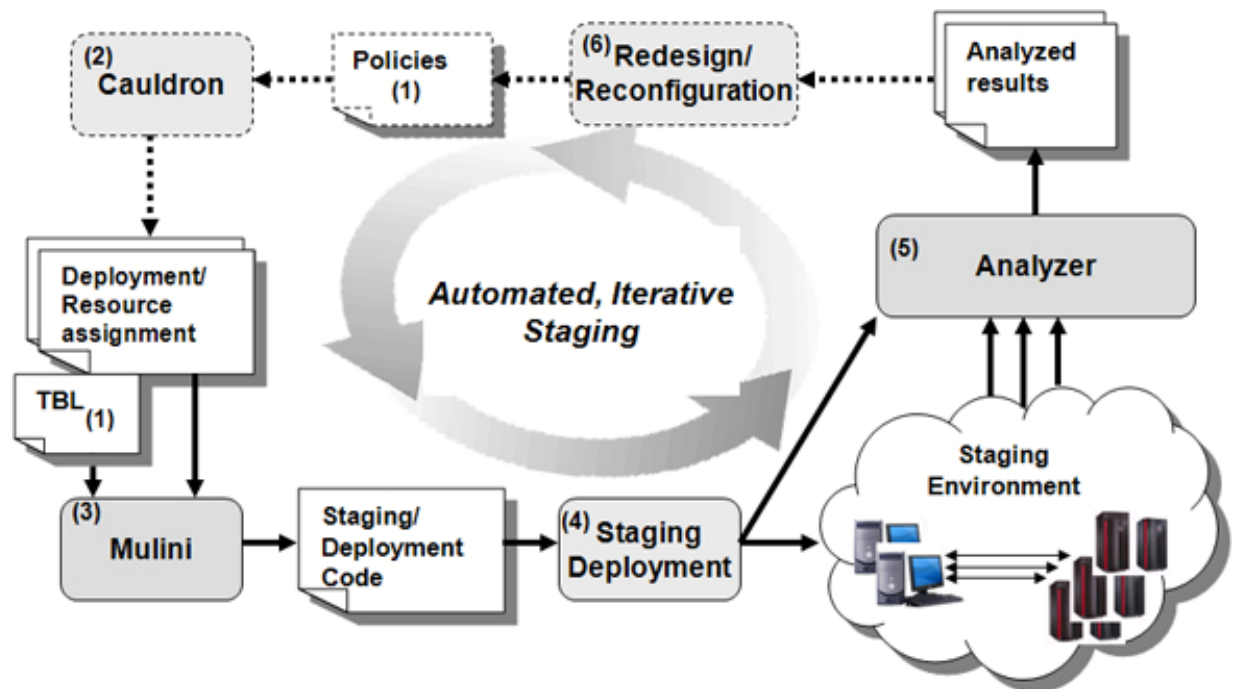


Fig. 1: Architecture of the Elba project for Automated System Deployment. The figure details the code generation tools that are used to link the different steps of deployment, evaluation, reconfiguration, and redesign. (Source: Elba Project, CC, Georgia Tech)

We plan to use Opentaps to export benchmarks into our web deployment module. Opentaps is a web based ERP and CRM for small to medium sized businesses. Opentaps has a web based UI (user interface). The server can be installed on a Windows 32-bit (2000/XP/2003) or any POSIX (Linux/BSD/UNIX-like OSes). More importantly, it is compatible with MySQL, Apache, Tomcat and is built on Built on JavaEE with a Service Oriented Architecture framework.

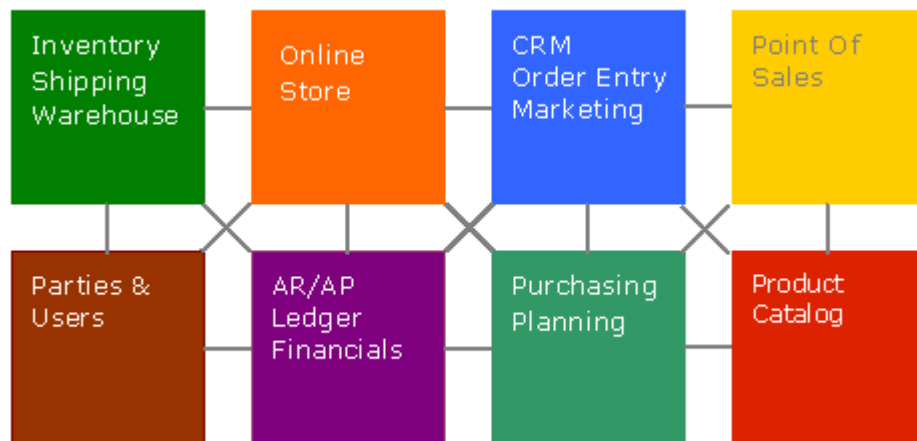


Fig. 2: Key features of Opentaps Open Source ERP + CRM

## Proposed Work

The entire process of setting up the configuration environment for Openlaps that consists of database engines, application servers, web servers etc is a very tedious task when done manually. The deployment of benchmarks becomes more cumbersome and complex when done on Emulab clusters since the clusters are stateless. So we plan to develop some scripts that can automate the tasks of deployment and setting up of configuration environment for Openlaps. With the help of these scripts, there won't be any need to manually configure the configuration environment each time when we log into Emulab.

*The project will be a part of the ongoing research at Elba project. We will be working with Simon Malkowski, Qingyang and Danesh Irani – the graduate students currently involved with Elba project. Even though our project plan has been approved by these students, this close relationship with the research may necessitate changing our project path.*

We plan to proceed with our project work by dividing the entire work into following milestones:

**Milestone 1:** Understanding the benchmarks and configuration files of the aforementioned Openlaps.

**Milestone 2:** Creating the scripts for achieving the desired task.

**Milestone 3:** Deploying the benchmarks using the scripts in one or two of the Emulab nodes.

**Milestone 4:** Develop a workload generator to simulate client requests.

**Milestone 5:** Testing the benchmarks and coming up with some performance evaluation charts or graphs.

## Technology

Python & Bash for writing scripts, Java for writing test cases, Tomcat, Apache Server, MySQL.

## Tentative Schedule

Sep 15<sup>th</sup> to Sep 30<sup>th</sup> ----- Understanding the benchmarks and finalizing the plan for writing the script.

Oct 1<sup>st</sup> to Oct 15<sup>th</sup> ----- Installing the necessary components on our systems and start writing scripts in python.

Oct 15<sup>th</sup> to Oct 31<sup>st</sup> ----- Continuing the task of writing script.

Nov 1<sup>st</sup> to Nov 15<sup>th</sup> -----Testing the script on our systems and also start the deployment and testing phase on Emula clusters.

Nov 15<sup>th</sup> onwards-----Continuing testing and start writing the final report.

## Metrics for Success

The project would be considered successful if we could successfully write the scripts in python for automating the task of deploying the benchmarks and configuring the environment where the benchmarks will get deployed. The scripts should give desired results not only on our personal systems, but also on distributed environment like Emulab.

## References

1. Opentaps, <http://www.opentaps.org>, September 12, 2008
2. Elba Project, Georgia Tech, <http://www.cc.gatech.edu/systems/projects/Elba/>, September 12, 2008
3. Emulab, University of Utah, <http://www.emulab.net/>.