# E-Compile Lab

## Background

In software development, developers and software architectures are playing major roles in aspect of identifying better and suitable technologies for their end products. It is not an easy task since modern day technology is growing faster and huge number of similar products, tools and software components being introduced every day. So the developers facing difficulties identifying better solution as long as they have to download, install and configure each and every similar technologies/products. Also some software components / libraries are highly expensive, so it’s making almost impossible to research on those software components and libraries. As a result, individual and freelance developers’ ends up using pirated software components and hard /useless solutions.

Developer and architectures could be able to analyze and identity correct techniques, components or libraries in order to come up with the best product .In addition, it needs to be extremely specific and detailed about what the output needs to look like, and how it needs to operate. The overall cost of the project can change substantially based on seemingly minor requirements that end up making some existing platform a bad choice. With a stack of different requirements, and unknown length of time to implement, it is difficult to schedule out projects.

## Problems

* Developers need to install and configure compilers and runtime environments for each and every technology that they do on research.
* Installing and configuring take consider amount of time so that time to implement on research would be less and scheduled projects could be delayed
* Wrong configuration may provide inaccurate results and that cause to eliminate potentially good software component to use their products.
* Developers may not know about all available solutions and software components for their specific problem. So they fail to notice possible accurate components.
* Some software components and technologies are not free at cost so they may not be able to make an effort. So this lead some small scale software developers to avoid these components only for research purposes because and this may or may not be a useful in long term purposes
* Even the people who able to buy such expensive software components, they may not need to use them after researches or a after a specific project.

## Solution and benefits

This research proposes probable solutions to eliminate difficulties of installing and configuring each technologies or software components by introducing pre-defined / pre-configured platforms. Moreover, this platform provides ability to introduce new pre-defined/ pre-configured environment (platform) for new software technology vendors. Furthermore, this platform provides set of 3rd party software components /libraries via cloud computing technique. Within this platform, users will be able to use those for reasonable price for a period of time

* Developers will be able to do their research in short period of time for prepare environments.
* Developers able to try out more available similar solutions to compare and apply the most suitable solution. (Ex :- Apache components , sourceforge projects, etc..)
* New software platform vendors able to provide pre-define environment and create a large market share for their product. (Ex: - java, Ruby, Python... etc...)
* Also people who develop 3rd party components and libraries, they can publish software cloud and make money.
* For just one research, developers will be able to buy some expensive software components for a certain time period by paying less. (Basically same idea/concept behind clouded ERPs)

## Proposed system

There are three main components of the system

* Client code snippet manager.
* Web service to provide service to developers.
* Application server which host all environments and software component cloud.

### Client code snippet manager

* Simple downloadable client (or probably browser base client), which basically run as a snippet manager.
* This client always connected to web service to enable compiler service and run the code snippet. This makes web service work as an online compiler.
* Client shows all available software platforms that developer can write code snippets.
* Client shows all available 3rd party software components and libraries that available with selected platforms
* Users can simply add those libraries into code contexts and that enables using those library features in code snippet area.
* Since all compilation and execution happens in server end, users no need to worry about environment installations and configurations.
* Users able to use expensive libraries for certain amount of time, without buying the whole library and for a less amount of money
* Client show all APIs, Docs related to added libraries and also code assistance which helps for the development

### Web Service

Web service uses as a middle tier because in future it may possible to plug next level code snippet tool or an entire IDE (Integrated development environment). And this web service provides several services that help to work client snippet manager.

* Compiler service: - Through this service, client will be able to compile their code phrase against defined platform with added libraries.
* Runtime management services: - This service provides results of executed code phrase.
* Access to software component cloud service: – This is software cloud that contains software libraries. Using client software, those libraries can be used for researches with code snippets. Also paid libraries can use via this service for a lesser amount of money.
* Build new pre-define platform services: - Service that enables to add new development platform. This is for software vendors who built new software platforms. (Adding whole different new platform may not able to work via this service. Some may need manual configuration in Application server area). But adding an adapter between client and newly create platform is possible.

### Application Server

* All pre-define environments, platforms contains in this application server area.
* All available compilers for all available platforms are configured here.
* All information related to users, and also user sessions maintain in this application server.
* User sessions hold user profiles, previous research details and information of any 3rd party software libraries that bought for certain amount of time.

## Compared to Existing applications

* Online compiler concept is a newly introduced existing concept. But it’s still not advanced to facilitate large scale projects and those only compatible with static core platforms like java, ruby, python etc... In this proposed system enables to research and develop on those core platforms with other 3rd party libraries.
* Also proposed systems provide details about similar products, so users can research on more products even without knowing a product.
* Code assistance also provide via client tool for 3rd party libraries.
* In these days one of the newest and most demanding concepts is the Cloud computing. For example a cloud ERP system enables to get those ERP for a certain amount of time. So without the buying whole ERP system users can apply ERP solution in their specific work. This motivates users to make use of correct software without investing huge amount of money. In this proposed system this concept used to provide expensive software libraries for developers on research purposes for a certain amount of time and less amount of money

## Deliverables

* Client snippet manage for windows platform (or may web base client for cross platform)
* Web service as a middle tier layer
* Application server to facilitate all business needs

## Technologies Used

* Java 7 with spring for client development
* JAX-WS 2.2/ Metro 2.0 for web service development (or may use axis 2)
* Jboss 7 for hosting web service and application server.
* As a user management and storing session data small database (probable open source NOSQL database )
* Platforms like java, ruby, python...etc are use for demonstration
* Software libraries like apache commons, yaml for python..Etc are use for demonstration.