E-Compiler for Java with Security Editor

Prof.T. R. Muhibur Rahman[1], Suma .M[2], Beeralinga .K[3], Bramhaiah .P[4], Vinayak[5]
Associate Professor[1], BE Student[2, 3, 4, 5]
Department of Computer Science and Engineering
Ballari institute of   Technology and Management, Karnataka, India

Abstract:
Java compilers are used translate the java program into the eqvailanent intermediates codes (Byte code). Java virtual machine (JVM) interprets and executes these byte codes. Therefore to compile and execute a java file, we need to install Java Development Kit (JDK) consisting of java compiler and interpreter in every system. We can avoid the burden of installations by installing JDK in only the server. JDK need not be installed in the client machines of network. Compile and interpret a java program through online. There is need of mechanism which allows online compilation of java program. This paper provides a mechanism for online compilation of java program .The mechanism also provides security to the source file. The server executes the java code and produces the error message to the appropriate client machine. The security editor module will perform Encryption and decryption of a file using RSA Algorithms. There are several security algorithms that exist but RSA algorithm is efficient to encrypt and decrypt the file. The system allows the user to view all type of java API functions. The mechanism is useful for java programmers since they need not install JDK in their system.

Keywords: RSA Algorithm, encrypt, decryption, E-compiling

1. INTRODUCTION

The Online Java Compiler is used to write, debug and compile a java program online without installing the Java Development Kit (JDK) in the client machine. The Client is connected to the server through the URL where the JDK is installed. The server compiles the java program and gives the appropriate output to the client. Cloud computing builds on decades of research in virtualization, distributed computing, utility computing, and more recently networking, web and software services. Cloud Computing describes a new supplement, consumption and delivery model for IT services based on Internet protocols and it typically involves provisioning of dynamically scalable and often virtualized resources. It is a by-product and consequence of the ease-of-access to remote computing sites provided by the Internet according to their own needs. It implies a service oriented architecture, reduced information technology overhead for the end-user, great flexibility, reduced total cost of ownership and on demand services among other advantages. The National Institute of Standards and Technology (NIST) defines „Cloud Computing‟ as „a model for enabling easy, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. "It does not require the end-user to know the physical location and configuration of the system that provides the services to the end-user. The main disadvantage of Cloud computing is the loss of control over the infrastructure used by the users. However, this disadvantage is eclipsed by many an advantages that cloud computing offers. Some of them are lower costs, better computing, location in dependence, better security. This project is developed for compiling the java programs on-line. The Online-Compiler for Java with Security Editor is a web based application that can be accessed throughout the world.

Scope
This system can be used for compiling java programs on- line,

also save that file on the web, we can access the java API classes and we can also perform encryption and decryption operations.

Overview
Here user sign up into the application, once he is registered then he can directly log into the application with proper user id and password.

2. SYSTEM ANALYSIS

System analysis focuses on specifying for what the system or the application is required to do. It allows the individuals to see the logical elements (what the system should do) apart from the physical components it uses (computers, terminals and storage system). It is the process of gathering and interpreting facts, diagnosing problems and using the information to recommend improvements to the system.

Existing system and its disadvantages
In the existing system, the compilation of the java programs is not through online. It is an offline process where the client or user has to install the Java Development Kit (JDK) in the host machine. One has to choose the software that is compatible with hardware specification of the system. The user has to give the command in the command prompt for the compilation of the java program. There should be enough memory space in the memory devices in the host machine for the installation of the JDK. The Existing System has many disadvantages. The following are the disadvantages of using the existing system:
✓ The software should be compatible with the hardware specification of the host machine.
✓ More memory is utilized in the host machine as the Java Development Kit needs to be installed in the host machine.

Proposed system and its advantages
In the proposed system, the compilation is performed online where a editor is provided for the user to create the java

program. This created Java Program is saved in the server with the name provided in the directory with the host address having the subdirectory as the username. This saved java program is then compiled with the help of JDK which is installed in the server machine. Hence the server compiles the java program. Thus the compilation is carried out online. The editor in E-Compiler is a security editor which helps in encrypting the code. In the encryption process the code is converted to the cipher text which is not understandable. The cipher text must be decrypted in order to make it readable. In the decryption process the cipher text is converted back to the plain text that can be understandable. The process of encryption and decryption is carried out using the RSA algorithm. Hence the proposed system provides security to the data of the user. The following are the advantages of using the proposed system:

✓ Compilation is through online.
✓ Software need not be installed in the client machine.
✓ Memory can be saved for the client machine
✓ The client machine need not be compatible with the JDK software but should be able to run a browser in it.
✓ It provides security to the client information.

Inputs to the System:
In E-Compiler for Java With Security Editor, a form which has inputs in the system is discussed below.
1. User login
2. New user registration
3. Creating Java file and saving
4. View Java AP
5. Compile file
6. Encrypt file
7. Decrypt file
8. My Account
9. Forgot Password

User login
The user clicks and can logon to the home page. If the user name does not exists then the user has to create a new registration.

New user registration
Using this link user can create his new registration. For new account creation user has to give his personal details like name, password, e-mail id, etc.

Creating Java file and saving
In this form we can create a java file and save it in our local file system. Any client can create a java file using this web page. The client can create as many java files and save it. The web page also used as an editor for the clients to create java files. Using this client can easily create a java file. It is also user friendly for the clients. User can type the file in the given text area and can submit it. After submitting it it will go to the server and it will be stored under the client host named directory.

View Java API:
In this module, we can know the information of all the API (Application programming Interface) available in java. Using this module we can know all the methods that are available in a class or an interface. The application programming interface is a collection of classes and interfaces available in a package. It is not possible for a programmer to remember all the methods available in a class or an interface available in a package so at that time the programmer can make use of these JAVA API To

view the api information the user have to type the class name with full package name. if the user entered the server will show all the api from the api classes in the java api package using servlets that will be running in the server side.

Compile file
In this input form we can compile any java application that we are creating. The client machine is not required to have the JDK installed on their machines. The client can use this web application and he can compile the java file. The client machines java application is compiled with the help of the JDK installed in the server machine. The JDK installed in the server machine does the compilation for all the java programs available in the server machines To compile the file the user have to select the file name. After that the server will check the file names to the path in which the original file is stored. if it maches then the server will take the file and will compile it with the help of servlet the web helper application (web component).

Encrypt file
In this module, we are doing encryption using RSA (Ron Rivest, Adi Shamir and Len Adleman) Algorithm. We are encrypting the file with the help of RSA Algorithm. For encrypting a file, we need to get two prime number from the user. With the help of these prime numbers we are encrypting the file. Now the actual text of the file is converted to a cipher text. So it will not be visible for the user. It will not be in the known format.

Decrypt file
In this module, we are doing decryption using RSA (Ron Rivest, Adi Shamir and Len Adleman) Algorithm. We are decrypting the file with the help of RSA Algorithm. For decrypting a file, we need to decrypt it by giving the private keys. With the help of these private keys we are decrypting the file. Now the cipher text of the file is converted to the actual text. So it will visible for the user. It will be in a known format.

My Account
In this module, the user can see his details like username, password, email id, security question and the security answer to the question. The user will not have any access to modify or delete the created user.

Forgot password
In this section, the user can retrieve back the password incase if the user forgets his password. He has to remember the security question in order to obtain the password.

3.FEASIBILITY STUDY

Preliminary investigation examines project feasibility, the likelihood the system will be useful to the organization. The main objective of the feasibility study is to test the Technical, Operational and Economical feasibility for adding new modules and debugging old running system. All systems are feasible if they are given unlimited resources and infinite time. There are aspects in the feasibility study portion of the preliminary investigation:

• Technical Feasibility
• Operation Feasibility
• Economical Feasibility

Technical feasibility:

The technical issue usually raised during the feasibility stage of the investigation includes the following:

• Does the necessary technology exist to do what is suggested?

• Do the proposed equipments have the technical capacity to hold the data required to use the new system?

• Will the proposed system provide adequate response to inquiries, regardless of the number or location of users?

• Can the system be upgraded if developed? Are there technical guarantees of accuracy, reliability, ease of access and data security?

Operational feasibility:

User-friendly

Customer will use the forms for their various transactions i.e. for adding new routes, viewing the routes details. Also the Customer wants the reports to view the various transactions based on the constraints. These forms and reports are generated as user-friendly to the Client.

Reliability

The package wills pick-up current transactions on line. Regarding the old transactions, User will enter them in to the system.

Security

The web server and database server should be protected from hacking, virus etc

Portability

The application will be developed using standard open source software (Except Oracle) like Java, tomcat web server, Internet Explorer Browser etc these software will work both on Windows and Linux o/s. Hence portability problems will not arise.

Availability

This software will be available always.

Maintainability

The system called the ewheelz uses the 2-tier architecture. The 1st tier is the GUI, which is said to be front-end and the 2nd tier is the database, which uses My-Sql, which is the back-end. The front-end can be run on different systems (clients). The database will be running at the server. Users access these forms by using the user-ids and the passwords.

Economic feasility:

The computerized system takes care of the present existing system's data flow and procedures completely and should generate all the reports of the manual system besides a host of other management reports. It should be built as a web based application with separate web server and database server. This is required as the activities are spread throughout the organization customer wants a centralized database. Further some of the linked transactions take place in different locations. Open source software like TOMCAT, JAVA, Mysql and Linux is used to minimize the cost for the Customer.

4. HARDWARE AND SOFTWARE SPECIFICATIONS

The development of this project deals with the following environment

• Hardware requirements

• Software requirements

Hardware Requirements:

The selection of hardware is very important in the existence and proper working of any software. In the selection of hardware, the size and the capacity requirements are also important. The Web Based Manufacturing System can be efficiently run on Pentium system with at least 128 MB RAM and Hard disk drive having 20 GB. Floppy disk drive of 1.44 MB and 14 inch Samsung color monitor suits the information system operation.(A Printer is required for hard copy output).

✓ Pentium processor -------- 233 MHZ or above
✓ RAM Capacity -------- 128MB
✓ Hard Disk ------- 20GB
✓ Floppy disk -------- 1.44 MB
✓ CD-ROM Drive -------- 32 HZ
✓ KEYBOARD -------- 108 Standard

Software Requirements:

One of the most difficult tasks is that, the selection of the software, once system requirement is known is determining whether a particular software package fits the requirements. After initial selection further security is needed to determine the desirability of particular software compared with other candidates. This section first summarizes the application requirement question and then suggests more detailed comparisons.

✓ Operating System -- Windows95/98/NT/2000
✓ Browser -- IE
✓ Web/Application Server -- Tomcat Server
✓ Database -- Oracle
✓ Database Connectivity -- JDBC
✓ Java Technologies -- Java (Servlets, jsp)
✓ Scripting Technology -- Java Script, Jquery

5.SYSTEM DESIGN

Systems design is the process or art of defining the architecture, components, modules, interfaces, and data for a system to satisfy specified requirements. One could see it as the application of systems theory to product development. There is some overlap and synergy with the disciplines of systems analysis, systems architecture and systems engineering.
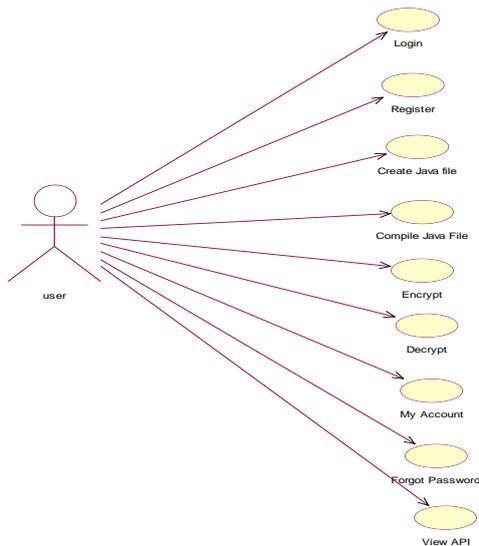
UML DIAGRAMS

Unified Modeling Language:

The Unified Modeling Language allows the software engineer to express an analysis model using the modeling notation that is governed by a set of syntactic semantic and pragmatic rules.
A UML system is represented using five different views that describe the system from distinctly different perspective. Each view is defined by a set of diagram, which is as follows.

• User Model View

▪ This view represents the system from the users perspective.

▪ The analysis representation describes a usage scenario from the end-users perspective.

• Structural model view

▪ In this model the data and functionality are arrived from inside the system.

▪ This model view models the static structures.

- Behavioral Model View
- It represents the dynamic of behavioral as parts of the system, depicting the interactions of collection between various structural elements described in the user model and structural model view.
- Implementation Model View
- In this the structural and behavioral as parts of the system are represented as they are to be built.
- Environmental Model View
- In this the structural and behavioral aspects of the environment in which the system is to be implemented are represented.

UML is specifically constructed through two different domains they are:

✓ UML Analysis modeling, this focuses on the user model and structural model views of the system.

✓ UML design modeling, which focuses on the behavioral modeling, implementation modeling and environmental model views.

Use case Diagrams represent the functionality of the system from a user's point of view. Use cases are used during requirements elicitation and analysis to represent the functionality of the system. Use cases focus on the behavior of the system from external point of view.
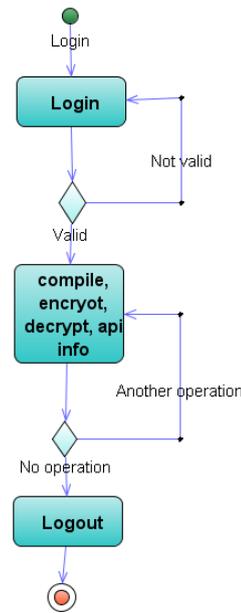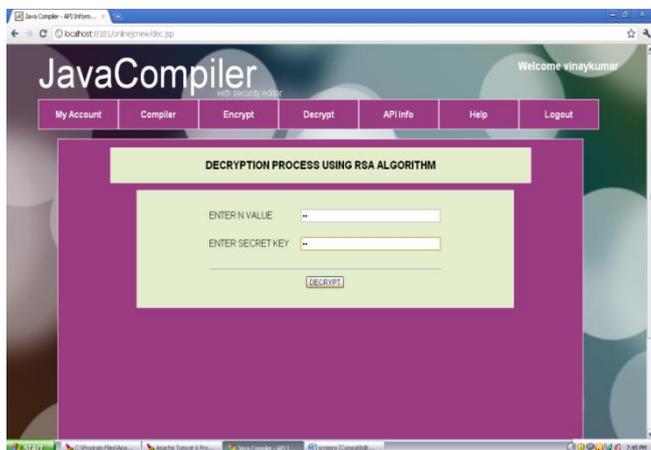
Use Case Diagram:

Activity Diagram for Registration:
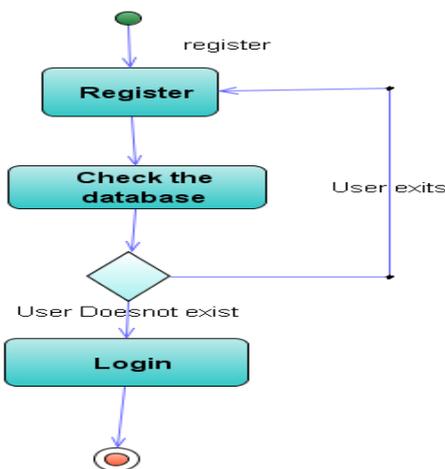
Activity Diagram for Registered User:

6.SNAPSHOTS

7.CONCLUSION

This project "**E-COMPILER FOR JAVA WITH SECURITY EDITOR**" is a web application which is used to write, debug and compile the java programs online. One can compile the java programs at an instant without installing the Java Development Kit (JDK). This reduces the usage of memory space in the client machine as the JDK is installed in the server. The server compiles the saved java programs and gives the appropriate output to the client machine. This project also provides security editor which encrypts and decrypts the files using RSA algorithm. Using API information module we can search all types of Java API for writing the code.

8.REFERENCES

[1]. Shufen Zhang Shuai Zhang Xuebin Chen Shangzhuo , ―Analysis and Research of Cloud Computing System Instance‖, Future Networks, 2010.ICFN '10. Second Internation execute the program and its instructions.

[2]. Grobauer, B. Walloschek, T. Stocker, E., "Understanding Cloud Computing Vulnerabilities", Security & Privacy, IEEE March-April 2011.

[3]. Chunye Gong Jie Liu Qiang Zhang Haitao Chen Zhenghu Gong, "The Characteristics of Cloud Computing", Parallel Processing Workshops (ICPPW), 2010 39th International Conference.

[4]. JunjiePengXuejun Zhang Zhou Lei Bofeng Zhang Wu Zhang Qing Li, "Comparison of Several Cloud Computing Platforms", Information Science and Engineering (ISISE), 2009 Second International Symposium.

[5]. Shufen Zhang Shuai Zhang Xuebin Chen Shangzhuo , "Analysis and Research of Cloud Computing System Instance", Future Networks, 2010. ICFN '10. Second International Conference.