sharemycode.net

An Open Platform For Collaboration

Lachlan Archibald[1], Shane Bryzak[2]

1. Software Developer - Griffith University 2. Industry Supervisor - Red Hat Asia-Pacific Pty. Ltd.

sharemycode.net is an open source Java EE application that provides a free service allowing developers to share project source code and resources to collaborate and solve problems together in real-time.

The aim of this project is to develop the core web service for sharemycode.net using modern Java EE technologies and a Java client library to allow developers to quickly write their own client software to consume the service.

Project Background

Red Hat have identified a need for an open source system that will allow software developers to collaborate on projects and solve problems in real-time, that can be used with any number of clients and Integrated Development Environments (IDEs).

Existing products are restricted to online use only with a limited number of options for client applications.

This project will benefit the software development community by providing an open platform for developers to collaborate on projects and reduce the time it takes to solve problems.

Open source, Open API

Sharemycode.net addresses these issues by providing a free service with an open API based on modern technologies. Any developer may create a client application or IDE plugin to consume the service using its simple, well-documented RESTful API. A Java client library is provided to allow developers to write client applications quickly using simple methods to connect to the service.

The sharemycode.net service and client library are available to the community as an open source project, so that any developer or institution may deploy the service on their internal network if they would prefer to host it privately.

Modern Technologies

The sharemycode.net service provides a modern, enterprise solution through the use of a number of recent Java EE technologies including:

- Enterprise JavaBeans (JSR-220)
- Contexts and Dependency Injection (JSR-299)
- Java Persistence API (JSR-311)
- The Java API for RESTful Web Services (JSR-317)

The service is secured transparently using PicketLink, a modern Java EE security framework.

The webclient is developed using HTML and xwidgets, a JavaScript MVC framework currently in early development.

Implementation

The project was conducted using an agile software development methodology, with multiple iterations of requirements analysis, design, development and testing. The features of the service and client library were implemented concurrently, and tested using semi-automated unit testing with the JUnit testing framework. Figure 1 shows the output of a successful unit test, demonstrating the completion of a core feature of the service and client library.

The main problem encountered with the project was the dependence on immature in-house products PicketLink and xwidgets, which delayed development of several core features, and limited the completion of the optional webclient. Other features were developed while waiting for updates to dependent products.

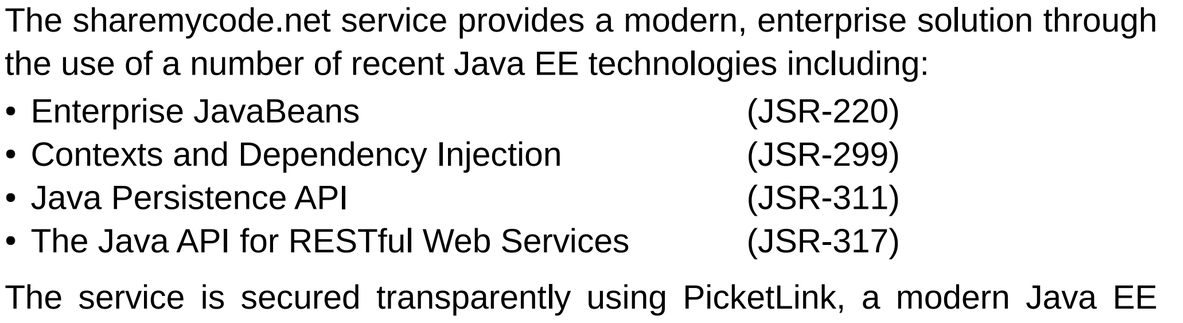

Figure 1: Successful unit test listing the resources of a project

Software Architecture

The sharemycode.net project uses a three-tier client/server architecture to separate the presentation, business logic and data layers as shown in Figure 2.

Client applications connect to the service and perform operations on web resources by submitting HTTP requests to the service's REST endpoints. The result of the request after processing is returned to the client as a HTTP response.

The service uses equivalent methods in the controller classes for performing logical operations on the server and object persistence operations with JPA queries which access the datastore via an Object-Relational Mapping framework.

Security of the service is provided transparently by the PicketLink security framework, handling user authentication, authorisation and identity management.

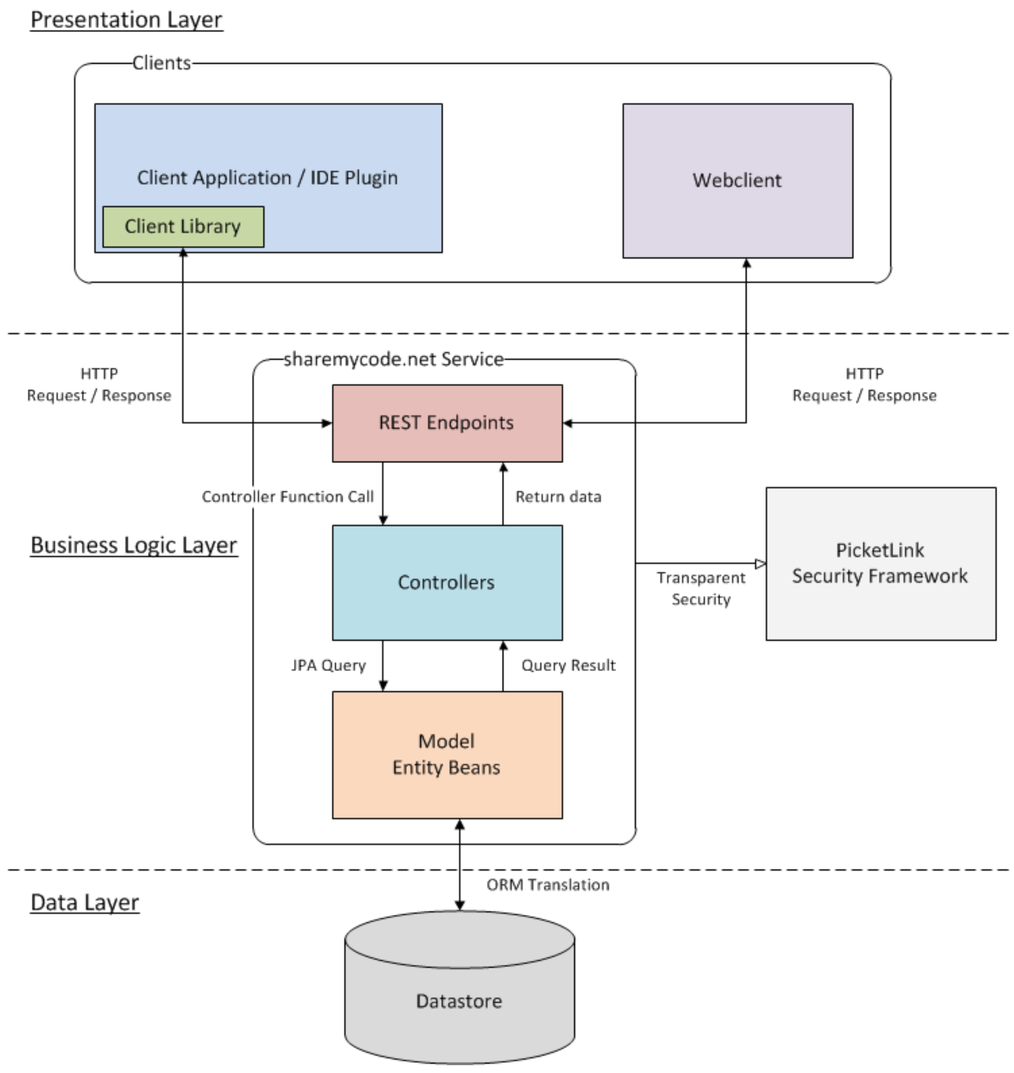

Figure 2: Three-tier client/server architecture of the sharemycode.net system

Outcomes

The outcomes of this project include the completed sharemycode.net core web service, a Java client library to allow developers to create new client applications, and a partially implemented dynamic webclient for demonstration of the service using a modern web browser.

The acceptance criteria of the project consists of the completion of the core web service and client library, defined as a set of 18 base requirements. 100% of these features were implemented and tested successfully, resulting in the acceptance of the project.

Future Work

Future versions of the service will utilise WebSockets to allow clients to subscribe to resource updates, and use Operational Transformation techniques to provide simultaneous editing of resources and ensure that all clients have the same resource content at all times.

FOR FURTHER INFORMATION

Shane Bryzak

E sbryzak@redhat.com

W www.redhat.com

CONTRIBUTE TO THE PROJECT

https://github.com/sharemycode

STUDENT INFORMATION

Name: Lachlan Archibald

Degree: Bachelor of Software Engineering

Industry Partner: Red Hat Asia-Pacific Pty. Ltd.