Software Engineering Group Project
Design Specification

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CONTENTS

1. INTRODUCTION

1.1 Purpose of this Document

This document shows a detailed design of our game, including in depth class analysis, class diagrams and mapping requirements. It is to adhere to the design requirements [1] and the design specification requirements [2] QA documents, and to allow coders to understand and map out the classes that will be used during the creation of Monster Mash. The descriptions and diagrams are included to aid in the development of game and also to help in the maintenance of the project once it is completed

1.2 Scope

This document gives access to the design information and class information. It will explain how these are linked together and which each class does. There is also discussion of the different applications in the project and the way in which the functionality of the project will be achieved.

1.3 Objectives

- To accurately describe the classes that will be used in the project
- To show the functionality of these classes and how this will be achieved
- To create a document that aid in the creation of the prototype software
- Allow for the implementation to be completed adhering to the user requirements and efficiently

2. DECOMPOSITION DESCRIPTION

2.1 Applications in the System

There are two distinct applications - the client program, which runs in a web browser on the player's computer, and the server program, which will run on a server in the University.

Our client program will be what the player will see in the web browser. With this application, the player will be able to send friend requests, fight requests and other interactions with the server to be passed along to another player or other places, depending on the action. They can sell their monsters, breed their monsters with other players, and have their monsters fight with other players' monsters.

The server will generate the pages that are handed to the client program (the web browser). It will also pass data from the database to the users when required - such as the data from the marketplace, the leader board and the breeding market. Actions in the client program, such as selling a monster, will be passed back to the database on the server via the PersistenceManager.

Servers will also interact with each other, by hosting cross-server fights between players, trades and friend requests.

2.2 Significant Classes

2.2.1 Player

This class contains information about a single player/account. Email address (userID) and password instance variables are required for signing in. Each email address (userID) will be unique on our server. We need also serverID and username instance variables to work with “server to server” API. To make the application more secure, the password will be encrypted. For each player we will store their wealth as an integer. Each player will also have a list of friends and we decided to store them in an ArrayList of Players, because friend list will not be fixed size. There is an ArrayList of Monsters, which holds all monsters attached to a single player. Each player has also ArrayList of Notifications.

Player class contains four constructors. First one creates an object of player, who is not on our server, so we know only userID, username and serverID, then this object can be stored in a friend list of some player. Second constructor creates player by just taking userID, username, password, amount of money and name of initial monster and it is used for creating new account (it generates first monster and notifications). Third constructor has parameters for each instance variable and it is used for creating object of data taken from database. Last constructor takes no parameter and creates object with all null instance variables. Besides constructors, setters and getters, Player class contains method called **sortByMoney()**, which takes an ArrayList of Players and sort them by amout of money, so player with most money will be at the first position in the ArrayList.

2.2.2 Monster

Monster is aclass containing information about a single monster.
Monster class contains following attributes:
-id:int - ID of the monster (randomly generated String)
-name:String - name of the monster
-dob:Date - monster's date of birth
-dod:Date - monster's date of death
-baseStength:double - strength of the monster, used during breeding
-currentStrength:double - strength of the monster, used during fighting
-baseHealth:double - health of the monster, used during breeding
-currentHealth:double - health of the monster, used during fighting
-fertility:float - fertility of the monster
-userID:String - ID of the owner
-saleOffer:int - if other than 0, the monster is offered for sale
-breedOffer:int - if other than 0, the monster is offered for breed
-serverID:int - ID of the server on which the monster exists
-MAX_CHILDREN:int - maximum number of monsters that can be result of breeding
Monster class contains following methods:
+fight(opponent:Monster):double - contains fighting algorithm. Takes the opponent monster as a parameter. Returns opponent's health.
+breeding(other:Monster):Monster[] - contains breeding algorithm. Takes the monster to breed with as a parameter. Returns array of new monsters that are the result of breeding.
+updateStats(strength:double, defence:double, health:double):void - updates statistics of the monster.

2.2.3 Persistence manager

This is the only class which interacts with database. It has five private final instance variables: **dbname**, **dbhost**, **dbport**, **dbusername**, **dbpassword** and also three private instance variables: **connection** (which holds database connection), **error** (error message if any occurred) and **remote** (holds object of RemoteTalker class). The **constructor** of this class, which has no parameters, opens a connection to the database and creates new object of RemoteTalker class. This class contains a plenty of methods which operate on objects from data package. To communicate with database it uses SQL queries with values taken from that objects. When some error occurred, while executing SQL query, error message can be read from **getErrorMessage()** method. There is also one private method which doesn't interact with database – it is **randomString()** method. It takes length and generates random string with that length. It is used for storing new records in database, which needs unique field like monsterID *(Note: we couldn't use auto increment field in database, because API specified that we have to use string instead of integer for fields like monsterID, playerID etc)*.

2.2.4 Other Persistence Manager

This class holds various methods used mainly by the cross server part of the application to communicate with the database. The class extends *PersistenceManager* so one will not need to have an instance of *PersistenceManager* and *OtherPersistenceManager* at the same scope.

2.3 Requirements mapping

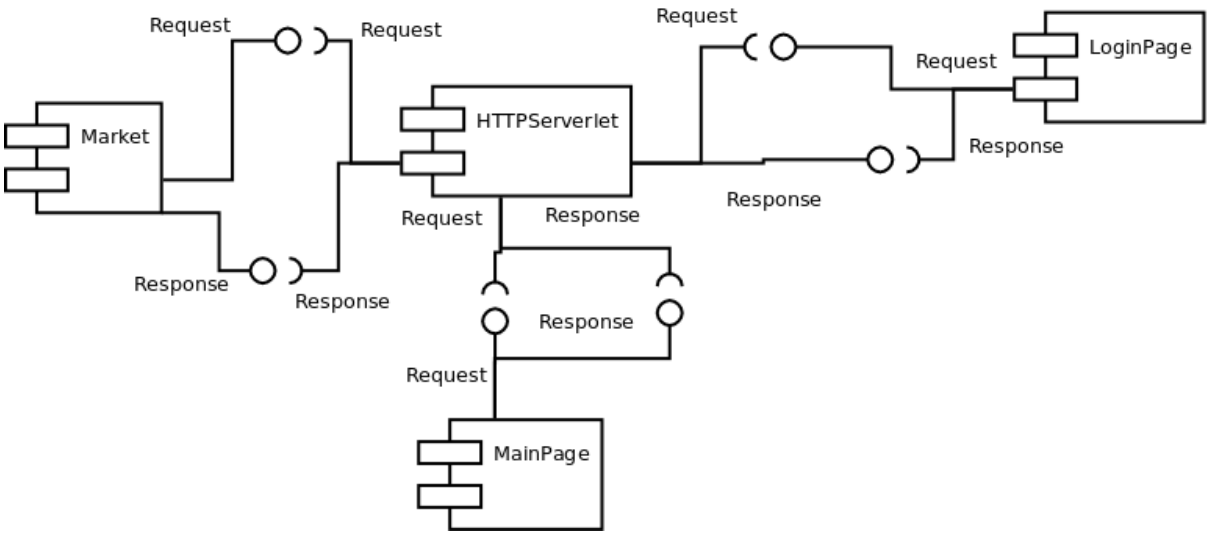
Functional Requirement	Classes Providing Requirement
FR1	Register, Player, Login, PersistenceManager
FR2	Player, PersistenceManager
FR3	Monster, Player, PersistenceManager
FR4	Monster, Player, FightRequest, PersistenceManager
FR5	
FR6	Register, Player, FriendRequest, Market, MarketOffer, BreedingMarket, BreedingOffer, *Monster*, MainPage, FightRequest,
FR7	Player, Register, Login, PersistenceManager, OtherPersistanceManager
FR8	Player, Monster, Notification, Market, FriendRequest, BreedingOffer, FightRequest, MarketOffer, PersistenceManager
FR9	Player, FriendRequest, PersistenceManager, OtherPersistanceManager
FR10	Notification, Player, Monster(Male), PersistenceManager
FR11	Player, PersistenceManager, OtherPersistanceManager

3. DEPENDENCY DESCRIPTION

3.1 Component Diagrams

3.1.1 Client

All the pages in the front-end use both the Persistence Manager and the HTTPServerlet. The PersistenceManager provides data for the webpages, and the HTTPServerlet serves the webpages to the web browser. This diagram describes the relationship between the different aspects of our project.



4. INTERFACE DESCRIPTION

4.1 Overview of Classes

4.1.1 BreedingOffer

This class holds the information concerning a breeding offer including the players and monsters involved, the money required for a player to accept the offer and the date upon which it was placed.

4.1.2 Monster

This is the class that models the monsters that user own and use, it holds all the genetic data of the monster such as strength and fertility rating as well as personal stats (name, date of birth, age, owner, age rate). It also contains the methods required to breed and fight with other monsters

4.1.3 Fight Request

This is the class that stores the fight requests given it will store links to the players and monsters involve

4.1.4 Friend Request

This is the class which models the sent requests and will store the players it is between and whether it has been accepted yet. It will also store the date that it was sent..

4.1.5 MarketOffer

This class models the current monster sale offers within our server, this will contain the relevant monster and player and also the price of the monster.

4.1.6 Notification

This Class is responsible for notification events. Players will get notifications if someone decides to fight them or buy their monster. There will also be notifications for breeding and adding the player as a friend.

4.1.7 Player

This holds all player's details that player enters at registration: username, password, email. Also it lists their friends and monsters, their money, notifications created by the Notification class. This class will be used to create player's very first initial monster. The monsters will be stored in here as a list of Monster objects.

4.1.8 Breeding Market

This class processes breed requests and actually sends or shows them.

4.1.9 Leader Board

This class models the leaderboard and will store the list of the wealthiest players and the amount of money they have.

4.1.10 Login

This class models the login data of a username/email address and password.

4.1.11 Main Page

This class models the main page shown to the user in their browser.

4.1.12 Market

This class is responsible for displaying the market which is a hash table of monsters for sale and also of those that you put for sale. It also processes buy and sell requests.

4.1.13 Persistence Manager

is a class that manages all persistent data and communicates with database. Its responsibility is object manipulation. It can get friends, monsters, players, notifications; as well as add these things.

4.1.14 Other Persistence Manager

4.1.15 Register

This class is for registration it will create a player with their attributes (username, password, email) which will be saved in a player class.

4.2 Class Skeletons

This sections shows some code skeletons automatically generated from our UML designs, these adhere to the Java coding specifications [3].

4.2.1 BreedServlet

```
package ServerCom;

import data.Monster;
import data.Notification;
import data.Player;
import database.OtherPersistenceManager;
import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import org.owasp.esapi.Encoder;
import org.owasp.esapi.codecs.OracleCodec;
import org.owasp.esapi.reference.DefaultEncoder;

/**
 * This servlet handles the part of the API that allows a remote user to
breed with
 * a monster that is offered for breeding on our server.
 * @author sis13
```

```
 */
public class BreedServlet extends HttpServlet {
    Encoder encoder = new DefaultEncoder();
    /**
     * Processes requests for both HTTP
     * <code>GET</code> and
     * <code>POST</code> methods.
     *
     * @param request servlet request
     * @param response servlet response
     * @throws ServletException if a servlet-specific error occurs
     * @throws IOException if an I/O error occurs
     */
    protected void processRequest(HttpServletRequest request,
HttpServletResponse response)
            throws ServletException, IOException {
    }


    /**
     * Handles the HTTP
     * <code>GET</code> method.
     *
     * @param request servlet request
     * @param response servlet response
     * @throws ServletException if a servlet-specific error occurs
     * @throws IOException if an I/O error occurs
     */
    @Override
    protected void doGet(HttpServletRequest request, HttpServletResponse
response)
            throws ServletException, IOException {
    }

    /**
     * Handles the HTTP
     * <code>POST</code> method.
     *
     * @param request servlet request
     * @param response servlet response
     * @throws ServletException if a servlet-specific error occurs
     * @throws IOException if an I/O error occurs
     */
    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse
response)
            throws ServletException, IOException {
    }

    /**
     * Returns a short description of the servlet.
     *
     * @return a String containing servlet description
     */
    @Override
    public String getServletInfo() {
    }
}
```

4.2.2 BuyServlet

```
package ServerCom;

import data.Monster;
import data.NameGenerator;
import data.Notification;
import data.Player;
import database.OtherPersistenceManager;
import java.io.IOException;
import java.io.PrintWriter;
import java.util.ArrayList;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import org.owasp.esapi.Encoder;
import org.owasp.esapi.codecs.OracleCodec;
import org.owasp.esapi.reference.DefaultEncoder;

/**
 * This servlet handles our part of the API that allows a remote server to
buy
 * a monster that is offered for sale on our server.
 * @author sis13
 */
public class BuyServlet extends HttpServlet {
    Encoder encoder = new DefaultEncoder();
    /**
     * Processes requests for both HTTP
     * <code>GET</code> and
     * <code>POST</code> methods.
     *
     * @param request servlet request
     * @param response servlet response
     * @throws ServletException if a servlet-specific error occurs
     * @throws IOException if an I/O error occurs
     */
    protected void processRequest(HttpServletRequest request,
HttpServletResponse response)
            throws ServletException, IOException {
    }

    /**
     * Handles the HTTP
     * <code>GET</code> method.
     *
     * @param request servlet request
     * @param response servlet response
     * @throws ServletException if a servlet-specific error occurs
     * @throws IOException if an I/O error occurs
     */
    @Override
    protected void doGet(HttpServletRequest request, HttpServletResponse
response)
            throws ServletException, IOException {
    }

    /**
     * Handles the HTTP
     * <code>POST</code> method.
```

```
     *
     * @param request servlet request
     * @param response servlet response
     * @throws ServletException if a servlet-specific error occurs
     * @throws IOException if an I/O error occurs
     */
    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse
response)
            throws ServletException, IOException {
    }

    /**
     * Returns a short description of the servlet.
     *
     * @return a String containing servlet description
     */
    @Override
    public String getServletInfo() {
    }
}
```

4.2.3 CONFIG

```
package data;

/**
* Configuration file
*/
public class CONFIG
{
      /**
      * ID of the local server
      */
    public static final int OUR_SERVER;
}
```

4.2.4 CreateAccountPage

```
import data.*;
import database.PersistenceManager;
import java.io.IOException;
import javax.mail.internet.AddressException;
import javax.mail.internet.InternetAddress;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import org.owasp.esapi.Encoder;
import org.owasp.esapi.codecs.OracleCodec;
import org.owasp.esapi.reference.DefaultEncoder;

/**
* Servlet for creating a new account.
*/
public class CreateAccountPage extends HttpServlet {
    /** SET INITIAL MONEY AMOUNT **/
    private final int MONEY_AMOUNT = 10;

    /**
      * Check if email address is correct.
```

```
      * @param email user's email address
      * @return true when email address is correct
      */
    private boolean isValidEmailAddress(String email) {
    }

    /**
      * Encode password using MD5.
      * @param md5 password
      * @return encoded password
      */
    public String MD5(String md5) {
    }

    /**
      * Handles the HTTP
      * <code>GET</code> method.
      *
      * @param request servlet request
      * @param response servlet response
      * @throws ServletException if a servlet-specific error occurs
      * @throws IOException if an I/O error occurs
      */
    @Override
    protected void doGet(HttpServletRequest request, HttpServletResponse
response) throws ServletException, IOException {
    }

    /**
      * Handles the HTTP
      * <code>POST</code> method.
      *
      * @param request servlet request
      * @param response servlet response
      * @throws ServletException if a servlet-specific error occurs
      * @throws IOException if an I/O error occurs
      */
    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse
response) throws ServletException, IOException {
    }
}
```

4.2.5 FightAccept

```
import ServerCom.RemoteTalker;
import data.*;
import database.OtherPersistenceManager;
import database.PersistenceManager;
import java.io.IOException;
import java.util.logging.Level;
import java.util.logging.Logger;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import org.json.JSONException;

/**
* This servlet is called when a fight request is accepted, runs fight
* algorithm and determinates who won and who lost.
```

```
*/
public class FightAccept extends HttpServlet {

    /**
      * Processes requests for both HTTP
      * <code>GET</code> and
      * <code>POST</code> methods.
      *
      * @param request servlet request
      * @param response servlet response
      * @throws ServletException if a servlet-specific error occurs
      * @throws IOException if an I/O error occurs
      */
    protected void processRequest(HttpServletRequest request,
HttpServletResponse response)
            throws ServletException, IOException {
    }

    /**
      * Handles the HTTP
      * <code>GET</code> method.
      *
      * @param request servlet request
      * @param response servlet response
      * @throws ServletException if a servlet-specific error occurs
      * @throws IOException if an I/O error occurs
      */
    @Override
    protected void doGet(HttpServletRequest request, HttpServletResponse
response)
            throws ServletException, IOException {
    }

    /**
      * Handles the HTTP
      * <code>POST</code> method.
      *
      * @param request servlet request
      * @param response servlet response
      * @throws ServletException if a servlet-specific error occurs
      * @throws IOException if an I/O error occurs
      */
    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse
response)
            throws ServletException, IOException {
    }

    /**
      * Returns a short description of the servlet.
      * @return a String containing servlet description
      */
    @Override
    public String getServletInfo() {
    }
}
```

4.2.6 FightingPage

```
import ServerCom.RemoteTalker;
import data.CONFIG;
```

```
import data.FightRequest;
import data.Monster;
import data.Player;
import database.OtherPersistenceManager;
import database.PersistenceManager;
import java.io.IOException;
import java.io.PrintWriter;
import java.util.ArrayList;
import java.util.Date;
import java.util.logging.Level;
import java.util.logging.Logger;
import javax.servlet.ServletException;
import javax.servlet.annotation.WebServlet;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import javax.servlet.http.HttpSession;
import org.json.JSONException;
import org.owasp.esapi.Encoder;
import org.owasp.esapi.codecs.OracleCodec;
import org.owasp.esapi.reference.DefaultEncoder;

/**
* Servlet for displaying page that allows user to select to fight with
another
* user's monsters.
*
* @author $Author: fiz$
* @version $Id$
*/
@WebServlet(name = "FightingPage", urlPatterns = {"/fight"})
public class FightingPage extends HttpServlet {
      /** Encoder **/
    Encoder encoder = new DefaultEncoder();

    /**
      * Gets all data from DB, which will be displayed on fighting page.
      *
      * @param request servlet request
      * @param response servlet response
      * @throws ServletException if a servlet-specific error occurs
      * @throws IOException if an I/O error occurs
      */
    private void getDataFromDB(HttpServletRequest request,
HttpServletResponse response) throws ServletException, IOException {
    }

    /**
      * Handles the HTTP
      * <code>GET</code> method.
      *
      * @param request servlet request
      * @param response servlet response
      * @throws ServletException if a servlet-specific error occurs
      * @throws IOException if an I/O error occurs
      */
    @Override
    protected void doGet(HttpServletRequest request, HttpServletResponse
response) throws ServletException, IOException {
    }
```

```
    /**
      * Handles the HTTP
      * <code>POST</code> method.
      *
      * @param request servlet request
      * @param response servlet response
      * @throws ServletException if a servlet-specific error occurs
      * @throws IOException if an I/O error occurs
      */
    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse
response)
            throws ServletException, IOException {
    }

    public void doRemoteRequest(HttpServletRequest request,
HttpServletResponse response) throws IOException {
    }
}
```

4.2.7 FightLost

```
package ServerCom;

import data.FightRequest;
import data.Monster;
import data.NameGenerator;
import data.Notification;
import data.Player;
import database.OtherPersistenceManager;
import java.io.IOException;
import java.io.PrintWriter;
import java.util.ArrayList;
import java.util.logging.Level;
import java.util.logging.Logger;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import org.json.JSONException;
import org.owasp.esapi.Encoder;
import org.owasp.esapi.codecs.OracleCodec;
import org.owasp.esapi.reference.DefaultEncoder;

/**
 * This servlet handles our part of the API that allows remote servers to
notify
 * us when a fight request originating form our server has been fought and
lost.
 * @author sis13
 */
public class FightLost extends HttpServlet {
    Encoder encoder = new DefaultEncoder();
    /**
     * Processes requests for both HTTP
     * <code>GET</code> and
     * <code>POST</code> methods.
     *
     * @param request servlet request
     * @param response servlet response
     * @throws ServletException if a servlet-specific error occurs
```

```
     * @throws IOException if an I/O error occurs
     */
    protected void processRequest(HttpServletRequest request,
HttpServletResponse response)
            throws ServletException, IOException {
      }

    // <editor-fold defaultstate="collapsed" desc="HttpServlet methods.
Click on the + sign on the left to edit the code.">
    /**
     * Handles the HTTP
     * <code>GET</code> method.
     *
     * @param request servlet request
     * @param response servlet response
     * @throws ServletException if a servlet-specific error occurs
     * @throws IOException if an I/O error occurs
     */
    @Override
    protected void doGet(HttpServletRequest request, HttpServletResponse
response)
            throws ServletException, IOException {
    }

    /**
     * Handles the HTTP
     * <code>POST</code> method.
     *
     * @param request servlet request
     * @param response servlet response
     * @throws ServletException if a servlet-specific error occurs
     * @throws IOException if an I/O error occurs
     */
    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse
response)
            throws ServletException, IOException {
    }

    /**
     * Returns a short description of the servlet.
     *
     * @return a String containing servlet description
     */
    @Override
    public String getServletInfo() {
    }
}
```

4.2.8 FightReject

```
package ServerCom;

import data.FightRequest;
import data.Notification;
import data.Player;
import database.OtherPersistenceManager;
import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.annotation.WebServlet;
```

```
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import org.owasp.esapi.Encoder;
import org.owasp.esapi.codecs.OracleCodec;
import org.owasp.esapi.reference.DefaultEncoder;

/**
 * Servlet for handling incoming fight rejections.
 * @author FZajac
 */
@WebServlet(name = "FightReject", urlPatterns = {"/fight/reject"})
public class FightReject extends HttpServlet {
    Encoder encoder = new DefaultEncoder();
    /**
     * Processes requests for both HTTP
     * <code>GET</code> and
     * <code>POST</code> methods.
     *
     * @param request servlet request
     * @param response servlet response
     * @throws ServletException if a servlet-specific error occurs
     * @throws IOException if an I/O error occurs
     */
    protected void processRequest(HttpServletRequest request,
HttpServletResponse response)
            throws ServletException, IOException {
    }

    /**
     * Handles the HTTP
     * <code>GET</code> method.
     *
     * @param request servlet request
     * @param response servlet response
     * @throws ServletException if a servlet-specific error occurs
     * @throws IOException if an I/O error occurs
     */
    @Override
    protected void doGet(HttpServletRequest request, HttpServletResponse
response)
            throws ServletException, IOException {
    }

    /**
     * Handles the HTTP
     * <code>POST</code> method.
     *
     * @param request servlet request
     * @param response servlet response
     * @throws ServletException if a servlet-specific error occurs
     * @throws IOException if an I/O error occurs
     */
    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse
response)
            throws ServletException, IOException {
    }

    /**
     * Returns a short description of the servlet.
```

```
     *
     * @return a String containing servlet description
     */
    @Override
    public String getServletInfo() {
    }
}
```

4.2.9 FightRequestServlet

```
package ServerCom;

import data.*;
import database.OtherPersistenceManager;
import java.io.IOException;
import java.io.PrintWriter;
import java.util.logging.Level;
import java.util.logging.Logger;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import org.json.JSONException;
import org.owasp.esapi.Encoder;
import org.owasp.esapi.codecs.OracleCodec;
import org.owasp.esapi.reference.DefaultEncoder;

/**
 * This servlet handles incoming fight request from a remote server.
 * @author sis13
 */
public class FightRequestServlet extends HttpServlet {

    Encoder encoder = new DefaultEncoder();

    /**
     * Processes requests for both HTTP
     * <code>GET</code> and
     * <code>POST</code> methods.
     *
     * @param request servlet request
     * @param response servlet response
     * @throws ServletException if a servlet-specific error occurs
     * @throws IOException if an I/O error occurs
     */
    protected void processRequest(HttpServletRequest request,
HttpServletResponse response)
            throws ServletException, IOException, JSONException {
    }

    /**
     * Handles the HTTP
     * <code>GET</code> method.
     *
     * @param request servlet request
     * @param response servlet response
     * @throws ServletException if a servlet-specific error occurs
     * @throws IOException if an I/O error occurs
     */
    @Override
    protected void doGet(HttpServletRequest request, HttpServletResponse
response)
            throws ServletException, IOException {
    }

    /**
     * Handles the HTTP
```

```
     * <code>POST</code> method.
     *
     * @param request servlet request
     * @param response servlet response
     * @throws ServletException if a servlet-specific error occurs
     * @throws IOException if an I/O error occurs
     */
    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse
response)
            throws ServletException, IOException {
    }

    /**
     * Returns a short description of the servlet.
     *
     * @return a String containing servlet description
     */
    @Override
    public String getServletInfo() {
    }
}
```

4.2.10 FightWon

```
package ServerCom;

import data.FightRequest;
import data.Monster;
import data.Notification;
import data.Player;
import database.OtherPersistenceManager;
import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import org.owasp.esapi.Encoder;
import org.owasp.esapi.codecs.OracleCodec;
import org.owasp.esapi.reference.DefaultEncoder;

/**
 * This servlet handles the part of the server to server API that allows a
remote
 * Server to say that a fight request that originated from our server has
been done
 * on the remote server, and that our user won the fight.
 * @author sis13
 */
public class FightWon extends HttpServlet {
    Encoder encoder = new DefaultEncoder();
    /**
     * Processes requests for both HTTP
     * <code>GET</code> and
     * <code>POST</code> methods.
     *
     * @param request servlet request
     * @param response servlet response
     * @throws ServletException if a servlet-specific error occurs
     * @throws IOException if an I/O error occurs
```

```
     */
    protected void processRequest(HttpServletRequest request,
HttpServletResponse response)
            throws ServletException, IOException {
    }

    /**
     * Handles the HTTP
     * <code>GET</code> method.
     *
     * @param request servlet request
     * @param response servlet response
     * @throws ServletException if a servlet-specific error occurs
     * @throws IOException if an I/O error occurs
     */
    @Override
    protected void doGet(HttpServletRequest request, HttpServletResponse
response)
            throws ServletException, IOException {
    }

    /**
     * Handles the HTTP
     * <code>POST</code> method.
     *
     * @param request servlet request
     * @param response servlet response
     * @throws ServletException if a servlet-specific error occurs
     * @throws IOException if an I/O error occurs
     */
    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse
response)
            throws ServletException, IOException {
    }

    /**
     * Returns a short description of the servlet.
     *
     * @return a String containing servlet description
     */
    @Override
    public String getServletInfo() {
    }
}
```

4.2.11 Friend

```
package data;

/**
 * The friend class represents a friendship between two players. It stores
data
 * needed to identify the players and the server they belong too.
 * @author sjk4
 */
public class Friend {
    private String friendshipID;
    private String remoteUserID, localUserID;
    private int localServerID, remoteServerID;
    private boolean friendshipConfirmed;
```

```
    /**
     * Friend constructor
     * @param friendshipID Unique friendship ID
     * @param remoteUserID The userID of the remote player (Sender)
     * @param localUserID The userID of the local player (Receiver)
     * @param localServerID The server ID of the local user.
     * @param remoteServerID The server ID of the remote user.
     * @param confirmed Boolean to decide if the friendship is confirmed.
     */
    public Friend(String friendshipID, String remoteUserID, String
localUserID, int localServerID, int remoteServerID, String confirmed){
    }
}
```

4.2.12 FriendAccept

```
package ServerCom;

import data.Friend;
import data.Notification;
import data.Player;
import database.OtherPersistenceManager;
import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import org.owasp.esapi.Encoder;
import org.owasp.esapi.codecs.OracleCodec;
import org.owasp.esapi.reference.DefaultEncoder;

/**
 * This servlet handles the API that allows a remote server to accept a
friend
 * request originally sent from our server.
 * @author sis13
 */
public class FriendAccept extends HttpServlet {
    Encoder encoder = new DefaultEncoder();
    /**
     * Processes requests for both HTTP
     * <code>GET</code> and
     * <code>POST</code> methods.
     *
     * @param request servlet request
     * @param response servlet response
     * @throws ServletException if a servlet-specific error occurs
     * @throws IOException if an I/O error occurs
     */
    protected void processRequest(HttpServletRequest request,
HttpServletResponse response)
            throws ServletException, IOException {
    }

    /**
     * Handles the HTTP
     * <code>GET</code> method.
     *
     * @param request servlet request
```

```
     * @param response servlet response
     * @throws ServletException if a servlet-specific error occurs
     * @throws IOException if an I/O error occurs
     */
    @Override
    protected void doGet(HttpServletRequest request, HttpServletResponse
response)
            throws ServletException, IOException {
    }

    /**
     * Handles the HTTP
     * <code>POST</code> method.
     *
     * @param request servlet request
     * @param response servlet response
     * @throws ServletException if a servlet-specific error occurs
     * @throws IOException if an I/O error occurs
     */
    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse
response)
            throws ServletException, IOException {
    }

    /**
     * Returns a short description of the servlet.
     *
     * @return a String containing servlet description
     */
    @Override
    public String getServletInfo() {
    }
}
```

4.2.13 FriendReject

```
package ServerCom;

import data.Friend;
import data.Notification;
import data.Player;
import database.OtherPersistenceManager;
import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.annotation.WebServlet;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import org.owasp.esapi.Encoder;
import org.owasp.esapi.codecs.OracleCodec;
import org.owasp.esapi.reference.DefaultEncoder;

/**
 * The part of the API that allows remote servers to reject a friend
request
 * originally sent from our server.
 * @author sis13
 */
@WebServlet(name = "FriendReject", urlPatterns = {"/friends/reject"})
```

```
public class FriendReject extends HttpServlet {
    Encoder encoder = new DefaultEncoder();
    /**
     * Processes requests for both HTTP
     * <code>GET</code> and
     * <code>POST</code> methods.
     *
     * @param request servlet request
     * @param response servlet response
     * @throws ServletException if a servlet-specific error occurs
     * @throws IOException if an I/O error occurs
     */
    protected void processRequest(HttpServletRequest request,
HttpServletResponse response)
            throws ServletException, IOException {
    }

    /**
     * Handles the HTTP
     * <code>GET</code> method.
     *
     * @param request servlet request
     * @param response servlet response
     * @throws ServletException if a servlet-specific error occurs
     * @throws IOException if an I/O error occurs
     */
    @Override
    protected void doGet(HttpServletRequest request, HttpServletResponse
response)
            throws ServletException, IOException {
    }

    /**
     * Handles the HTTP
     * <code>POST</code> method.
     *
     * @param request servlet request
     * @param response servlet response
     * @throws ServletException if a servlet-specific error occurs
     * @throws IOException if an I/O error occurs
     */
    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse
response)
            throws ServletException, IOException {
    }

    /**
     * Returns a short description of the servlet.
     *
     * @return a String containing servlet description
     */
    @Override
    public String getServletInfo() {
    }
}
```

4.2.14 FriendRequest

```
package ServerCom;
```

```
import data.CONFIG;
import data.Friend;
import data.Player;
import database.OtherPersistenceManager;
import database.PersistenceManager;
import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import org.owasp.esapi.Encoder;
import org.owasp.esapi.codecs.OracleCodec;
import org.owasp.esapi.reference.DefaultEncoder;

/**
 * This servlet handles our part of the API that receives friend requests
from
 * a remote server.
 *
 * @author sis13
 */
public class FriendRequest extends HttpServlet {
    Encoder encoder = new DefaultEncoder();
    /**
     * Processes requests for both HTTP
     * <code>GET</code> and
     * <code>POST</code> methods.
     *
     * @param request servlet request
     * @param response servlet response
     * @throws ServletException if a servlet-specific error occurs
     * @throws IOException if an I/O error occurs
     */
    protected void processRequest(HttpServletRequest request,
HttpServletResponse response)
            throws ServletException, IOException {
    }

    /**
     * Handles the HTTP
     * <code>GET</code> method.
     *
     * @param request servlet request
     * @param response servlet response
     * @throws ServletException if a servlet-specific error occurs
     * @throws IOException if an I/O error occurs
     */
    @Override
    protected void doGet(HttpServletRequest request, HttpServletResponse
response)
            throws ServletException, IOException {
    }

    /**
     * Handles the HTTP
     * <code>POST</code> method.
     *
     * @param request servlet request
     * @param response servlet response
     * @throws ServletException if a servlet-specific error occurs
```

```
     * @throws IOException if an I/O error occurs
     */
    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse
response)
            throws ServletException, IOException {
    }

    /**
     * Returns a short description of the servlet.
     *
     * @return a String containing servlet description
     */
    @Override
    public String getServletInfo() {
    }
}
```

4.2.15 HighscoresPage

```
import ServerCom.RemoteTalker;
import data.Player;
import database.PersistenceManager;
import java.io.IOException;
import java.util.ArrayList;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import javax.servlet.http.HttpSession;

/**
* Displays the highscores page.
*/
public class HighscoresPage extends HttpServlet {

    /**
      * Gets all data from DB, which will be displayed on highscores page.
      * @param request servlet request
      * @param response servlet response
      * @throws ServletException if a servlet-specific error occurs
      * @throws IOException if an I/O error occurs
      */
    private void getDataFromDB(HttpServletRequest request,
HttpServletResponse response) throws ServletException, IOException {
    }

    /**
      * Handles the HTTP
      * <code>GET</code> method.
      *
      * @param request servlet request
      * @param response servlet response
      * @throws ServletException if a servlet-specific error occurs
      * @throws IOException if an I/O error occurs
      */
    @Override
    protected void doGet(HttpServletRequest request, HttpServletResponse
response) throws ServletException, IOException {
    }
```

```
    /**
      * Handles the HTTP
      * <code>POST</code> method.
      *
      * @param request servlet request
      * @param response servlet response
      * @throws ServletException if a servlet-specific error occurs
      * @throws IOException if an I/O error occurs
      */
    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse
response) throws ServletException, IOException {
    }
}
```

4.2.16 JSONManager

```
package ServerCom;

import data.Monster;
import data.Player;
import java.util.ArrayList;
import java.util.logging.Level;
import java.util.logging.Logger;
import org.json.JSONArray;
import org.json.JSONException;
import org.json.JSONObject;

/**
 * The JSONManager turns data objects into JSON so they can be sent over
the wire.
 * @author sis13
 */
public class JSONManager {

    /**
     * Turns a player object into JSON.
     * @param player The layer object you want to turn into JSON.
     * @return Returns a JSONObject.
     */
    public static JSONObject jsonPlayer(Player player) {
    }

    /**
     * Turns a Monster into JSON, so it can be sent over the wire.
     *
     * @param monster The monster you want to turn to JSON.
     * @return Returns a JSONObject of the monster.
     */
    public static JSONObject jsonMonster(Monster monster) {
    }

    /**
     * Turns a ArrayList of monster into a JSON array of monsters.
     * @param monsters The monsters you want to turn into JSON.
     * @return A JSONArray of monsters.
     */
    public static JSONArray jsonMonsterList(ArrayList<Monster> monsters) {
    }

    /**
```

```
     * Turns a ArrayList of players into a JSON array of monsters.
     * @param players ArrayList of players you want to turn to JSON.
     * @return A JSONArray of players.
     */
    public static String jsonUsers(ArrayList<Player> players) {
      }
}
```

4.2.17 LoginPage

```
import data.Player;
import database.PersistenceManager;
import java.io.IOException;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import javax.servlet.http.HttpSession;
import org.owasp.esapi.Encoder;
import org.owasp.esapi.codecs.OracleCodec;
import org.owasp.esapi.reference.DefaultEncoder;

/**
* Servlet used for the login page.
*/
public class LoginPage extends HttpServlet {

    /**
      * Encode password using MD5.
      * @param md5 password
      * @return encoded password
      */
    public String MD5(String md5) {
    }

    /**
      * Handles the HTTP
      * <code>GET</code> method.
      *
      * @param request servlet request
      * @param response servlet response
      * @throws ServletException if a servlet-specific error occurs
      * @throws IOException if an I/O error occurs
      */
    @Override
    protected void doGet(HttpServletRequest request, HttpServletResponse
response) throws ServletException, IOException {
    }

    /**
      * Handles the HTTP
      * <code>POST</code> method.
      *
      * @param request servlet request
      * @param response servlet response
      * @throws ServletException if a servlet-specific error occurs
      * @throws IOException if an I/O error occurs
      */
    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse
response) throws ServletException, IOException {
```

```
    }
}
```

4.2.18 LogoutPage

```
import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import javax.servlet.http.HttpSession;

/**
* Servlet used for logging out.
*/
public class LogoutPage extends HttpServlet {
    /**
      * Handles the HTTP
      * <code>GET</code> method.
      *
      * @param request servlet request
      * @param response servlet response
      * @throws ServletException if a servlet-specific error occurs
      * @throws IOException if an I/O error occurs
      */
    @Override
    protected void doGet(HttpServletRequest request, HttpServletResponse
response)
            throws ServletException, IOException {
    }

    /**
      * Handles the HTTP
      * <code>POST</code> method.
      *
      * @param request servlet request
      * @param response servlet response
      * @throws ServletException if a servlet-specific error occurs
      * @throws IOException if an I/O error occurs
      */
    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse
response)
            throws ServletException, IOException {
    }
}
```

4.2.19 MainPage

```
import ServerCom.RemoteTalker;
import database.PersistenceManager;
import java.io.IOException;
import java.util.ArrayList;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import javax.servlet.http.HttpSession;
import data.*;
import database.OtherPersistenceManager;
```

```
import java.util.Collections;
import org.owasp.esapi.Encoder;
import org.owasp.esapi.codecs.OracleCodec;
import org.owasp.esapi.reference.DefaultEncoder;

/**
* Servlet used for displaying the main page after logging in.
*/
public class MainPage extends HttpServlet {

    /**
      * Gets all data from DB, which will be displayed on main screen (list
of
      * friends, monsters and notifications).
      *
      * @param request servlet request
      * @param response servlet response
      * @throws ServletException if a servlet-specific error occurs
      * @throws IOException if an I/O error occurs
      */
    private void getDataFromDB(HttpServletRequest request,
HttpServletResponse response) throws ServletException, IOException {
    }

    /**
      * Handles the HTTP
      * <code>GET</code> method.
      *
      * @param request servlet request
      * @param response servlet response
      * @throws ServletException if a servlet-specific error occurs
      * @throws IOException if an I/O error occurs
      */
    @Override
    protected void doGet(HttpServletRequest request, HttpServletResponse
response) throws ServletException, IOException {
    }

    /**
      * Handles the HTTP
      * <code>POST</code> method.
      *
      * @param request servlet request
      * @param response servlet response
      * @throws ServletException if a servlet-specific error occurs
      * @throws IOException if an I/O error occurs
      */
    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse
response) throws ServletException, IOException {
    }

    /**
      * Check if user sent form with new friend request if so process it
and send
      * friend request with proper notifications.
      *
      * @param request servlet request
      * @param response servlet response
      * @throws ServletException if a servlet-specific error occurs
      * @throws IOException if an I/O error occurs
```

```
      */
    private void sendFriendRequest(HttpServletRequest request,
HttpServletResponse response) throws ServletException, IOException {
    }

    /**
      * Accept or cancel friend request.
      *
      * @param request servlet request
      * @param response servlet response
      * @throws ServletException if a servlet-specific error occurs
      * @throws IOException if an I/O error occurs
      */
    private void respondToFriendRequest(HttpServletRequest request,
HttpServletResponse response) throws ServletException, IOException {
    }
}
```

4.2.20 MarketPage

```
import ServerCom.RemoteTalker;
import data.CONFIG;
import data.Monster;
import data.Notification;
import data.Player;
import database.PersistenceManager;
import java.io.IOException;
import java.util.ArrayList;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import javax.servlet.http.HttpSession;

/**
* Servlet used for displaying the market page.
*/
public class MarketPage extends HttpServlet {
    /**
      * Gets all data from DB, which will be displayed on market page.
      *
      * @param request servlet request
      * @param response servlet response
      * @throws ServletException if a servlet-specific error occurs
      * @throws IOException if an I/O error occurs
      */
    private void getDataFromDB(HttpServletRequest request,
HttpServletResponse response) throws ServletException, IOException {
    }

    /**
      * Handles the HTTP
      * <code>GET</code> method.
      *
      * @param request servlet request
      * @param response servlet response
      * @throws ServletException if a servlet-specific error occurs
      * @throws IOException if an I/O error occurs
      */
    @Override
```

```
    protected void doGet(HttpServletRequest request, HttpServletResponse
response) throws ServletException, IOException {
    }

      /**
       * After a user has offered a monster for sell, he can cancel the
offer.
       * @param request servlet request
       * @param response servlet response
       * @param pm persistence manager
       * @param current object of current player
       * @throws ServletException
       * @throws IOException
       */
    private void cancelOffer(HttpServletRequest request,
HttpServletResponse response, PersistenceManager pm, Player current) throws
ServletException, IOException {
    }

    /**
       * Enables player to buy a monster available on the market.
       * @param request servlet request
       * @param response servlet response
       * @param pm persistence manager
       * @param current object of current player
       * @throws ServletException
       * @throws IOException
       */
    private void buyMonster(HttpServletRequest request, HttpServletResponse
response, PersistenceManager pm, Player current) throws ServletException,
IOException {
    }

    /**
       * Handles the HTTP
       * <code>POST</code> method.
       *
       * @param request servlet request
       * @param response servlet response
       * @throws ServletException if a servlet-specific error occurs
       * @throws IOException if an I/O error occurs
       */
    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse
response) throws ServletException, IOException {
    }

    /**
       * Checks if the offered money is valid (an integer larger than 0)
       * @param offerAmount
       * @return
       */
    private boolean validOffer(String offerAmount){
    }
}
```

4.2.21 MatingPage

```
import ServerCom.RemoteTalker;
import data.*;
import database.PersistenceManager;
```

```
import java.io.IOException;
import java.util.ArrayList;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import javax.servlet.http.HttpSession;

/**
* Servlet used for displaying the mating page.
*/
public class MatingPage extends HttpServlet {

    /**
      * Gets all data from DB, which will be displayed on mating page.
      *
      * @param request servlet request
      * @param response servlet response
      * @throws ServletException if a servlet-specific error occurs
      * @throws IOException if an I/O error occurs
      */
    private void getDataFromDB(HttpServletRequest request,
HttpServletResponse response) throws ServletException, IOException {
    }

    /**
      * Handles the HTTP
      * <code>GET</code> method.
      *
      * @param request servlet request
      * @param response servlet response
      * @throws ServletException if a servlet-specific error occurs
      * @throws IOException if an I/O error occurs
      */
    @Override
    protected void doGet(HttpServletRequest request, HttpServletResponse
response) throws ServletException, IOException {
    }

    /**
      * After a user has offered a monster for breeding, he can cancel the
offer.
      * @param request servlet request
      * @param response servlet response
      * @param pm persistence manager
      * @param current object of current player
      * @throws ServletException
      * @throws IOException
      */
    private void cancelOffer(HttpServletRequest request,
HttpServletResponse response, PersistenceManager pm, Player current) throws
ServletException, IOException {
    }

    /**
      * Enables player to breed with a monster available for breeding.
      * @param request servlet request
      * @param response servlet response
      * @param pm persistence manager
      * @param current object of current player
      * @throws ServletException
```

```
      * @throws IOException
      */
    private void breedMonster(HttpServletRequest request,
HttpServletResponse response, PersistenceManager pm, Player current) throws
ServletException, IOException {
    }

    /**
      * Handles the HTTP
      * <code>POST</code> method.
      *
      * @param request servlet request
      * @param response servlet response
      * @throws ServletException if a servlet-specific error occurs
      * @throws IOException if an I/O error occurs
      */
    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse
response) throws ServletException, IOException {
    }

    /**
      * Checks if the offered money is valid (an integer larger than 0)
      * @param offerAmount
      * @return
      */
    private boolean validOffer(String offerAmount)
    {
    }
}
```

4.2.22 Monster

```
package data;

import java.util.Date;
import java.util.Random;

/**
* Encapsulation of the Monster data. The data is stored in the database and
* represents one of the the player's Monster.
*/
public class Monster {
    private final int START_HEALTH = 100;

      /** lifespan of a monster **/
    public static final int LIFESPAN = 1000*60*60*60*24*7;

    private String id;
    private String name;
    private Date dob;
    private Date dod;
    private double baseStrength;
    private double currentStrength;
    private double baseDefence;
    private double currentDefence;
    private double baseHealth;
    private double currentHealth;
    private float fertility;
    private String userID;
    private int saleOffer;
```

```
    private int breedOffer;

    private int serverID;

    private final int MAX_CHILDREN = 10;

    /**
      * Constructor taking parameters. This constructor is used for
creating
      * Monster objects about remote Monsters before we get all the data.
      *
      * @param id The Monsters ID.
      * @param name The Monster's name.
      * @param userID The ID of the owner of the Monster.
      *
      * @see Player
      */
    public Monster(String id, String name, String userID){
        this.id = id;
        this.name = name;
        this.userID = userID;
    }

    /**
      * Constructor setting all the Monsters fields, the stats are random.
      * @param name
      * @param userID
      */
    public Monster(String name, String userID){
    }

    public Monster(String id, String name, Date dob, Date dod, Double
baseStrength, Double currentStrength, Double baseDefence, Double
currentDefence, Double baseHealth, Double currentHealth, float fertility,
String userID, int saleOffer, int breedOffer) {
    }

    /**
      * Breeding class to breed new monsters
      *
      * @param other Monster that is being bred with
      * @return Monster[] and array of the children
      */
    public Monster[] breeding(Monster other) {
    }

      /**
      * Updates statistics of the mosnter
      * @param strength monster's updated strength
      * @param defence monster's updated defence
      * @param health monster's updated health
      */
    public void updateStats(Double strength, Double defence, Double health)
{
    }

      /**
      * Enrolls two Monsters in an epic battle.
      * @param opponent The Monster this monster will fight versus.
      * @return The opponent is returned with new stats..
      */
```

```
    public double fight(Monster opponent){
    }
}
```

4.2.23 Monsters

```
package ServerCom;

import data.Monster;
import database.OtherPersistenceManager;
import database.PersistenceManager;
import java.io.IOException;
import java.io.PrintWriter;
import java.util.ArrayList;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import org.json.JSONObject;
import org.owasp.esapi.Encoder;
import org.owasp.esapi.codecs.OracleCodec;
import org.owasp.esapi.reference.DefaultEncoder;

/**
 * Monster servlet handling our part of the API handling request used to
retrieve
 * monster information from our database.
 * @author sis13
 */
public class Monsters extends HttpServlet {

    Encoder encoder = new DefaultEncoder();

    /**
     * Processes requests for both HTTP
     * <code>GET</code> and
     * <code>POST</code> methods.
     *
     * @param request servlet request
     * @param response servlet response
     * @throws ServletException if a servlet-specific error occurs
     * @throws IOException if an I/O error occurs
     */
    protected void processRequest(HttpServletRequest request,
HttpServletResponse response)
            throws ServletException, IOException {
    }

    /**
     * Handles the HTTP
     * <code>GET</code> method.
     *
     * @param request servlet request
     * @param response servlet response
     * @throws ServletException if a servlet-specific error occurs
     * @throws IOException if an I/O error occurs
     */
    @Override
    protected void doGet(HttpServletRequest request, HttpServletResponse
response)
            throws ServletException, IOException {
```

```
      }

    /**
     * Handles the HTTP
     * <code>POST</code> method.
     *
     * @param request servlet request
     * @param response servlet response
     * @throws ServletException if a servlet-specific error occurs
     * @throws IOException if an I/O error occurs
     */
    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse
response)
            throws ServletException, IOException {
    }

    /**
     * Returns a short description of the servlet.
     *
     * @return a String containing servlet description
     */
    @Override
    public String getServletInfo() {
    }

    /**
     * Get the information about all the monsters of a user.
     * @param userID The ID of the user you want to retrieve.
     * @param response Response object for error handling.
     * @return Returns null if it fails, if successful it returns a JSON
string
     * of all the monsters belonging to the user.
     * @throws IOException
     */
    public String usersMonsters(String userID, HttpServletResponse
response) throws IOException {
    }

    /**
     * This method looks up a single monster from the database and returns
     * JSONed monster.
     * @param monsterID The ID of the monster the remote client wants.
     * @param response Response object for error handling.
     * @return Returns null if the method fails, and a JSON string of the
monster
     * if successful.
     * @throws IOException
     */
    public String singleMonster(String monsterID, HttpServletResponse
response) throws IOException {
      }
}
```

4.2.24 NameGenerator

```
package data;

import java.util.*;

/**
```

```
* NameGenerator to generate random name for monsters. The name is a
combination
* of a front name and last name.
*/
public class NameGenerator {
    private static List startWords = new ArrayList();
    private static List endWords = new ArrayList();

    /**
      * Get a random name, the random name is of a for name and last name.
      * @return The name.
      */
    public static String getName() {
    }

    /**
      * Private function to get a random int between a range.
      * @param min Min
      * @param max Max
      * @return A random number between min and max.
      */
    private static int randomInt(int min, int max) {
    }

    /**
      * Private method to get the a random element from a list.
      * @param v The list of strings
      * @return a random element.
      */
    private static String getRandomElementFrom(List<String> v) {
    }
}
```

4.2.25 Notification

```
package data;
import java.util.Date;

/**
* Encapsulation of data used to send notifications to Players who has
gotten
* request like friend/fight request, or has sold or breed a monster.
*
* $Author sis13 $
*
* @see Player
* @see ServerCom.RemoteTalker
* @see database.PersistenceManager
*/
public class Notification{
    /** Attributes */
    private int id;
    private String shortText;
    private String longText;
    private Player player;
    private Date timeSent;

    /**
      *
      * @param shortText Short title.
      * @param longText Longer description.
```

```
     * @param player Player to receive the notification.
     */
    public Notification(String shortText, String longText, Player player){
        this.id = 0;
        this.shortText = shortText;
        this.longText = longText;
        this.player = player;
        this.timeSent = new Date();
    }

    /**
     *
     * @param shortText Short title.
     * @param longText Longer description.
     * @param player Player to receive the notification.
     * @param timeSent Date object of the time when the notification was
sent.
     */
    public Notification(int id, String shortText, String longText, Date
timeSent){
        this.id = id;
        this.shortText = shortText;
        this.longText = longText;
        this.player = null;
        this.timeSent = timeSent;
    }
}
```

4.2.26 OtherPersistenceManager

```
package database;

import data.FightRequest;
import data.Friend;
import data.Monster;
import data.Player;
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.ResultSet;
import java.sql.SQLException;
import java.sql.Statement;
import java.util.ArrayList;
import java.util.Date;
import java.util.logging.Level;

/**
* @see PersistanceManager
* @author sis13
*/
public class OtherPersistenceManager extends PersistenceManager {

    private final String dbname = "MonsterMash";
    private final String dbuser = "root";
    private final String dbpassword = "root";
    private final String dbhost = "localhost";
    private final String dbport = "1527";
    private Connection connection;
    private String error;

    public OtherPersistenceManager() {
        String driver = "org.apache.derby.jdbc.EmbeddedDriver";
```

```
        String connectionURL = "jdbc:derby://" + dbhost + ":" + dbport +
"/" + dbname + ";create=true;user=" + dbuser + ";password=" + dbpassword;
        try {
            Class.forName(driver);
        } catch (java.lang.ClassNotFoundException e) {
            e.printStackTrace();
        }
        try {
            connection = DriverManager.getConnection(connectionURL);
        } catch (Exception e) {
            e.printStackTrace();
        }
    }

      /**
      * Accepts friend request
      * @param friend
      */
    public void acceptFriendRequest(Friend friend) {
    }

      /**
      * Gets Friend object
      * @pram friendID id of the friend
      * @return Friend object
      */
    public Friend getFriend(String friendID) {
    }

      /**
      * Rejects friend request
      * @param friend
      */
    public void rejectFriend(Friend friend) {
    }

      /**
      * Adds a friend
      * @param friend
      */
    public void addFriend(Friend friend) {
    }

      /**
      * Gets list of players
      * @return list of players
      */
    public ArrayList<Player> getPlayers() {
    }

      /**
      * Gets a list of monsters owned by this player
      * @param playerID id of player
      * @return list of monsters owned
      */
    @Override
    public ArrayList<Monster> getMonsterList(String playerID){
    }

      /**
      * Stores fight request in the database
```

```
    * @param fr fight request
    */
  public void storeFightRequest(FightRequest fr) {
    }

    /**
    * Gets monster
    * @param monsterID id of the monster
    * @return Monster object
    */
  public Monster getMonster(String monsterID) {
  }

    /**
    * Gets fight request
    * @param fightID id of the fight
    * @return fight request
    */
  public FightRequest getFightRequest(String fightID) {
  }

    /**
    * Updates monster's statistics
    * @param monster
    */
  public void updateMonster(Monster monster) {
  }

    /**
    * Removes fight request
    * @param fr fight request
    */
  public void removeFightRequest(FightRequest fr) {
  }

    /**
    * Updates player's money
    * @param player
    */
  public void updateMoney(Player player) {
  }

    /**
    * Removes monster from the database
    * @param senderMonsterID id of the monster
    */
  public void removeMonster(String senderMonsterID) {
    }

    /**
    * Gets friends of given player
    * @param player
    * @return list of friends
    */
  public ArrayList<Friend> getFriends(Player player) {
    }

    /**
    * Removes user from the database
    * @param userID id of the user
    */
```

```
    public void removeUser(String userID) {
    }

      /**
      * Gets player from another server
      * @param userID id of the player
      * @return Player object
      */
    public Player getPlayerSafe(String userID) {
    }
}
```

4.2.27 PersistenceManager

```
package database;

import ServerCom.RemoteTalker;
import data.Monster;
import data.*;
import java.security.SecureRandom;
import java.sql.*;
import java.util.ArrayList;
import java.util.Random;
import java.util.logging.Level;
import java.util.logging.Logger;
import org.json.JSONException;
import org.owasp.esapi.Encoder;
import org.owasp.esapi.codecs.OracleCodec;
import org.owasp.esapi.reference.DefaultEncoder;

/**
* Manages persistent data.
*/
public class PersistenceManager {
    private final String dbname = "MonsterMash";
    private final String dbuser = "root";
    private final String dbpassword = "root";
    private final String dbhost = "localhost";
    private final String dbport = "1527";

    private Connection connection;
    private String error;
    private RemoteTalker remote;

    public PersistenceManager(){
    }

    /**
      * Generates random string, which will be used as IDs for
monsters/players etc.
      * @param length length of a string
      * @return random string with specified length
      */
    private String randomString(int length){
    }

    /**
      * Checks if there is an account with specified email address.
      * @param email user's email address
      * @return true if account exists
      */
```

```
    public boolean accountExists(String userID){
    }

    /**
      * Store player with monsters and notifications in DB.
      * @param email user's email address
      * @param password encrypted password (md5)
      * @param money start amount of money
      * @return true when account created successfully
      */
    public void storePlayer(Player p){
    }

    /**
      * Stores all notifications with ID = 0 (which haven't been saved in
DB)
      * @param p object of Player class
      */
    public void storeNotifications(Player p){
    }

    /**
      * Stores all monsters with ID = 0 (which haven't been saved in DB)
      * @param p object of Player class
      */
    public void storeMonsters(Player p){
    }

    /**
      * Gets player object of DB, returns null when user doesn't exist
      * @param email user's email address
      * @param password encrypted password using MD5
      * @return object of player class with all monsters, notifications and
friends
      */
    public Player doLogin(String email, String password){
    }

    /**
      * Gets all friends from DB of specified player
      * @param playerID ID of player
      * @return list of friends and friend requests
      */
    public ArrayList<Player> getFriendList(String playerID){
    }

    /**
      * Gets all fight requests from DB.
      * @param playerID id of player
      * @return list of fight requests
      */
    public ArrayList<FightRequest> getFightRequests(String playerID){
    }

    /**
      * Gets all notifications from DB ordered by date.
      * @param playerID id of player
      * @return list of notifications
      */
    public ArrayList<Notification> getNotificationList(String playerID){
    }
```

```
    /**
      * Gets a list of monsters owned by this player
      * @param playerID id of player
      * @return list of monsters owned
      */
    public ArrayList<Monster> getMonsterList(String playerID){
    }

    /**
      * Gets player from DB with all monsters, notifications, friends.
      * @param id id of player
      * @return object of Player class, null when player doesn't exist
      */
    public Player getPlayer(String userID){
    }

    /**
      * Returns player id at index 0 and player server id at index 1
      * @param userID player's userID
      * @return player name (index 0) player server id (index 1)
      */
    public int getPlayerServerID(String userID){
    }

    /**
      * Checks if friend request has been already sent.
      * @param playerOne userID of first player
      * @param playerTwo userID of second player
      * @return true when such a request was sent
      */
    public boolean isFriendRequestSent(String playerOne, String playerTwo){
    }

    /**
      * Adds new record to "Friendship" table and if user is on different
server, sends JSON object.
      * @param senderID userID of sender (always our server)
      * @param receiverID userID of reciver
      * @param receiverServerID server ID of receiver
      */
    public void sendFriendRequest(String senderID, String receiverID, int
receiverServerID){
    }

    /**
      * Confirms friendship between players (senderID and receiverID)
      * @param senderID id of player who sent request
      * @param senderServer address of sender's server
      * @param receiverID id of player who accepted request
      * @param receiverServer address of receivers's server
      */
    public void confirmFriendship(String senderID, int senderServer, String
receiverID, int receiverServer){
    }

    /**
      * Cancel friendship request between players (senderID and receiverID)
      * @param senderID id of player who sent request
      * @param senderServer address of sender's server
      * @param receiverID id of player who accepted request
```

```
      * @param receiverServer address of receivers's server
      */
    public void rejectFriendship(String senderID, int senderServer, String
receiverID, int receiverServer){
    }

    /**
      * Remove friendship request between players (playerOne and playerTwo)
      * @param playerOne user id of first player
      * @param playerTwo user id of second player
      */
    public void removeFriendship(String playerOne, String playerTwo){
    }

    /**
      * Get highscores for logged player, ordered by amount of money
      * @param playerID id of logged player
      * @return ArrayList of HTML table rows
      */
    public ArrayList<String> getHighscores(String playerID){
    }

    /**
      * Gets player username by player id and server id.
      * @param playerID id of selected player
      * @param serverID id of player's sever
      * @return player's username
      */
    public String getPlayerUsername(String playerID, int serverID){
    }


    /**
      * Gets all friend requests from DB.
      * @param playerID id of player
      * @return list of friend requests
      */
    public ArrayList<String> getFriendRequestList(String userID){
    }

    /**
      * Accepts a firend request
      * @param requestID id of the request
      * @param receiverID id of the receiver
      */
    public void acceptFriendRequest(String requestID, String receiverID){
    }

    /**
      * Cancels a friend request
      * @param requestID id of the request
      * @param receiverID id of the receiver
      */
    public void cancelFriendRequest(String requestID, String receiverID){
    }

    /**
      * Gets monsters for sale from the database.
      * @param playerID id of the player
      * @return list of monsters for sale
      */
```

```
    public ArrayList<Monster> getMonstersForSale(String playerID){
    }

    /**
      * Gets monsters for breeding from the database.
      * @param playerID id of the player
      * @return list of monsters for breeding
      */
    public ArrayList<Monster> getMonstersForBreeding(String playerID){
    }

    /**
      * Creates new market offer
      * @param userID id of the user
      * @param monsterID id of the monster
      * @param offerAmount amount of money paid for monster
      * @return whether the monster has been offered for sale
      */
    public boolean makeNewMarketOffer(String userID, String monsterID, int
offerAmount){
    }

    /**
      * Creates new breeding offer
      * @param userID id of the user
      * @param monsterID id of the monster
      * @param offerAmount amount of money paid for breeding with the
monster
      * @return whether the monster has been offered for breeding
      */
    public boolean makeNewBreedOffer(String userID, String monsterID, int
offerAmount){
    }

    /**
      * Cancels monster sale offer
      * @param userID id of the user
      * @param monsterID id of the monster
      * @return whether the monster offer has been canceled
      */
    public boolean cancelMonsterOffer(String userID, String monsterID){
    }

    /**
      * Cancels monster breeding offer
      * @param userID id of the user
      * @param monsterID id of the monster
      * @return whether the monster offer has been canceled
      */
    public boolean cancelBreedingOffer(String userID, String monsterID){
    }

    /**
      * Gets monster's name
      * @param monsterID id of the monster
      * @return monster's name
      */
    public String getMonsterName(String monsterID){
    }

    /**
```

```
      * Buys a monster from the market.
      * @param userID id of the user
      * @param monsterID id of the monster
      * @param serverID id of the server
      * @return new id of the bought monster
      */
    public String buyMonster(String userID, String monsterID, int
serverID){
    }

    /**
      * Gets a monster
      * @param monsterID id of the monster
      * @param serverID id of the server
      * @return Monster object
      */
    public Monster getMonster(String monsterID, int serverID){
    }

    /**
      * Updates money of given player
      * @param player player object
      */
    public void updateMoney(Player player) {
    }

      /**
      * Checks if any monster dies
      */
    public void checkIfAnyMonsterDies(){
    }

      /**
      * Executes given query
      * @param query query to execute
      */
    public boolean insert(String query){
    }

      /**
      * Counts number of records for a given query
      * @param query
      * @return number of records
      */
    public int count(String query){
    }

      /**
      * Gets error message
      * @return error message
      */
    public String getErrorMessage(){
    }
}
```

4.2.28 Player

```
package data;

import java.util.ArrayList;
import java.util.Date;
```

```
import java.util.Random;

/**
* The Player class is the representation of the Player's i our database.
* @author $Author sis13 $
*/
public class Player {
    /** Attributes */
    private String userID;
    private String password;
    private String username;
    private int money;
    private int serverID;
    private ArrayList<Player> friends;
    private ArrayList<Notification> notifications;
    private ArrayList<Monster> monsters;

    /**
      * Creates object of a new "friend".
      * @param email username (email address)
      * @param password encrypted password
      * @param money default amount of money
      * @param initialMonsterName name of random initial monster
      */
    public Player(String userID, String username, int serverID){
    }

    /**
      * Creates object of a new player.
      * @param email username (email address)
      * @param password encrypted password
      * @param money default amount of money
      * @param initialMonsterName name of random initial monster
      */
    public Player(String userID, String username, String password, int
money, String initialMonsterName){
    }

    /**
      * Creates object of a player selected from DB
      * @param id player's id from DB
      * @param email player's email address
      * @param password encrypted password
      * @param money current amount of money
      * @param friends list of player's friends
      * @param notifications list of player's notifications
      * @param monsters list of player's monsters
      */
    public Player(String userID, String username, String password, int
money, ArrayList<Player> friends, ArrayList<Notification> notifications,
ArrayList<Monster> monsters, int serverID){
    }

    public Player() {
    }

    /**
      * Sorts a ArrayList of players by the amount of money. The Player
with
      * the most money should appear in the front of the list.
      * @param players List of Players you want to sort.
```

```
      * @return Returns a list of sorted Players.
      */
    public ArrayList<Player> sortByMoney(ArrayList<Player> players) {
    }

    /**
      * Adds a friend
      * @param friend
      */
    public void addFriend(Player friend){
    }

    /**
      * Removes given friend
      * @param friend
      */
    public void removeFriend(Friend friend){
    }

    /**
      * Adds a monster
      * @param monster
      */
    public void addMonster ( Monster monster ){
    }

    /**
      * Removes given monster
      * @param monster monster to remove
      */
    public void removeMonster ( Monster monster ){
    }

    /**
      * Adds a notification
      * @param notefication
      */
    public void addNotification ( Notification notification ){
    }
}
```

4.2.29 RemoteTalker

```
package ServerCom;

import com.sun.jersey.api.client.Client;
import com.sun.jersey.api.client.WebResource;
import com.sun.jersey.api.client.config.ClientConfig;
import com.sun.jersey.api.client.config.DefaultClientConfig;
import com.sun.jersey.core.util.MultivaluedMapImpl;
import data.*;
import database.OtherPersistenceManager;
import database.PersistenceManager;
import java.util.ArrayList;
import java.util.Date;
import java.util.Random;
import java.util.logging.Level;
import java.util.logging.Logger;
import javax.ws.rs.core.MultivaluedMap;
import org.json.JSONArray;
import org.json.JSONException;
```

```
import org.json.JSONObject;

/**
 * RemoteTalker holds all the methods needed for the client part of the
 * server to server communication. It has methods to access all of the
 * request specified by the standards which the groups agreed on.
 *
 * @author $Author sis13 $
 */
public class RemoteTalker {
    private Client client;
    private WebResource resource;

    public RemoteTalker() {
        ClientConfig config = new DefaultClientConfig();
        client = Client.create(config);
        client.setConnectTimeout(2000);
        client.setReadTimeout(5000);

    }

    /**
     * Get a Player from a remote server.
     * @param userID userID of the player you want to request.
     * @param remoteAddress The address to the remote server.
     *
     * @return A Player object.
     *
     * @see data.Player
     */
    public Player getRemotePlayer(String userID, String remoteAddress) {
    }

    /**
     * Gets a Monster from a remote server.
     *
     * @param monsterID Id of the monster you want.
     * @param remoteAddress The address of the server you want to look up
the
     * monster at.
     * @return Monster object if found, returns null elswise.
     * @throws JSONException
     *
     * @see data.Monster
     */
    public Monster getRemoteMonster(String monsterID, String remoteAddress)
throws JSONException {
    }

    /**
     * Get all the monsters of a user from a remote server.
     *
     * @param userID The userID of the user you want monsters off.
     * @param remoteAddress Address of the server.
     *
     * @return returns a list if successful and null if something goes
wrong.
     * @throws JSONException
     *
     * @see data.Monster
     */
```

```
    public ArrayList<Monster> getRemoteUsersMonsters(String userID, String
remoteAddress) throws JSONException {
    }

    /**
     * Convert a server number to a remote address.
     * @param serverNumber
     * @return The remote address.
     */
    public String getRemoteAddress(int serverNumber) {
    }

    /**
     * Send a friend request to a user on a remote server.
     *
     * @param localUser The user you want to add as friend.
     * @param remoteUserID Your local userID.
     * @param serverNumber Your server number
     *
     * @return returns true if the function is successful, false otherwise.
     *
     * @see data.Player
     */
    public Boolean remoteFriendRequest(Player localUser, String
remoteUserID, int serverNumber) {
    }


    /**
     * Accept a friend request gotten from another server.
     *
     * @param friend Friend ship data bout the friend ship.
     *
     * @return Returns true if successful, false otherwise.
     */
    public Boolean acceptRemoteFriendRequest(Friend friend) {
    }

    /**
     * Reject a remote friend request.
     * @param friend Friendship object holding data bout the friendship.
     * @return true if successful false otherwise.
     */
    public Boolean rejectRemoteFriendRequest(Friend friend) {
    }

    /**
     * Send a remote fight request to a remote server given by the server
number.
     *
     * @param fightRequest Fight request object with the data about the
fight.
     * @param serverNumber Server number the request is going too.
     *
     * @return true if successful false otherwise.
     *
     * @see data.FightRequest
     */
    public Boolean remoteFightRequest(FightRequest fightRequest, int
serverNumber) {
    }
```

```
    /**
     * Send a request that a fight has been won.
     * @param fightRequest
     * @param serverNumber
     * @param monster
     * @return
     */
    public Boolean wonRemoteFight(FightRequest fightRequest, int
serverNumber, Monster monster) {
    }

    /**
     * Sends a request to a remote server indicating our local user lost a
fight
     * versus one of their's users.
     * @param fightRequest Fight request object of the lost fight.
     * @param serverNumber The server number of the remote user.
     * @return Returns true if the request was sent successfully.
     */
    public Boolean lostRemoteFight(FightRequest fightRequest, int
serverNumber) {
    }

    /**
     * Reject a fight sent from a remote server.
     * @param fightRequest The fight request object for this fight.
     * @param serverNumber The server number of the remote server.
     *
     * @return Returns true if the request was sent successfully.
     */
    public Boolean rejectRemoteFight(FightRequest fightRequest, int
serverNumber) {
    }

    /**
     * Method to send a breed request to a remote server.
     *
     * @param monsterID The ID of the monster you want to breed with.
     * @param serverNumber Remote server ID.
     * @return
     */
    public Boolean sendBreedRequest(String monsterID, int serverNumber) {
    }

    /**
     * Sends a buy request for a monster on a remote server.
     * @param monsterID The ID of the monster you want to buy.
     * @param serverNumber The ID of the remote server.
     *
     * @return Returns true if the request was sent successfully.
     */
    public Boolean sendBuyRequest(String monsterID, int serverNumber) {
    }

    /**
     * Finds a user. The method will first search locally for the user, and
if
     * the user is not found the method will search for the user on a
remote
     * server.
```

```
     *
     * @param userID The ID of the user you want to find.
     *
     * @return Returns true if the request was successful.
     */
    public Player findUser(String userID) {
    }

    /**
     * Will generate the highscore list for a player. It will fetch any
friends
     * that are on remote server as well.
     *
     * @param player Player object of the player you want to generate a
high score list for.
     * @return Returns a HTML list of the Players in sorted order.
     */
    public ArrayList<String> getHighScores(Player player) {
    }
}
```

4.2.30 Unregister

```
import data.Player;
import database.OtherPersistenceManager;
import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import javax.servlet.http.HttpSession;

/**
* Allows user to unregister his account, deleting his monsters, etc.
*/
public class Unregister extends HttpServlet {

    /**
      * Processes requests for both HTTP
      * <code>GET</code> and
      * <code>POST</code> methods.
      *
      * @param request servlet request
      * @param response servlet response
      * @throws ServletException if a servlet-specific error occurs
      * @throws IOException if an I/O error occurs
      */
    protected void processRequest(HttpServletRequest request,
HttpServletResponse response)
            throws ServletException, IOException {
      }

    /**
      * Handles the HTTP
      * <code>GET</code> method.
      *
      * @param request servlet request
      * @param response servlet response
      * @throws ServletException if a servlet-specific error occurs
      * @throws IOException if an I/O error occurs
```

```
      */
    @Override
    protected void doGet(HttpServletRequest request, HttpServletResponse
response)
            throws ServletException, IOException {
    }

    /**
      * Handles the HTTP
      * <code>POST</code> method.
      *
      * @param request servlet request
      * @param response servlet response
      * @throws ServletException if a servlet-specific error occurs
      * @throws IOException if an I/O error occurs
      */
    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse
response)
            throws ServletException, IOException {
    }

    /**
      * Returns a short description of the servlet.
      *
      * @return a String containing servlet description
      */
    @Override
    public String getServletInfo() {
    }
}
```

4.2.31 User

```
package ServerCom;

import data.Player;
import database.OtherPersistenceManager;
import database.PersistenceManager;
import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.annotation.WebServlet;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import org.owasp.esapi.Encoder;
import org.owasp.esapi.codecs.OracleCodec;
import org.owasp.esapi.reference.DefaultEncoder;

/**
* Servlet implementing the API used to get users from this server.
* If the url /users is requested from our server server the servlet will
return
* a json array containing all the users registerd on the server. If the
client
* wants a specific user only it can be requested by sending a request to
* /users?userID=xxx where xxx is the ID of the user.
*
* @author $Author sis13 $
*
```

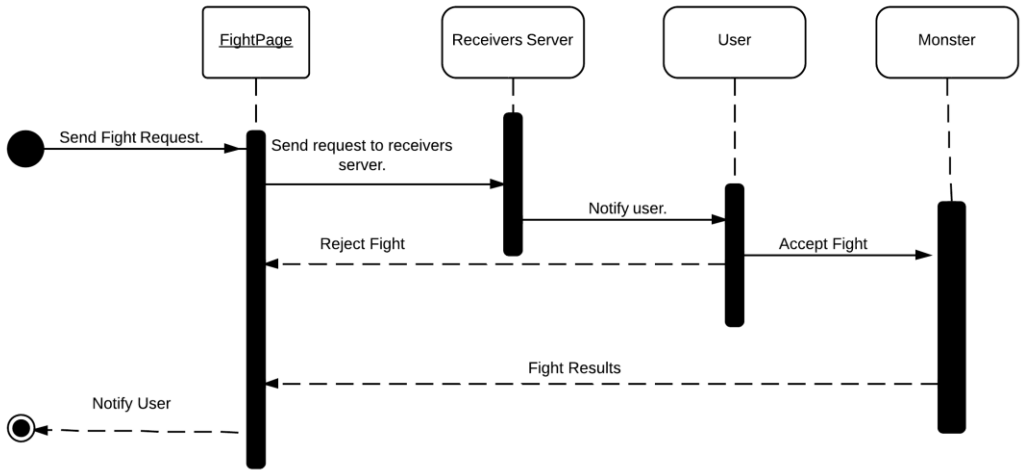
```
* @see data.Player
*/
@WebServlet(name = "users", urlPatterns = {"/users"})
public class User extends HttpServlet {
      /** encoder **/
    Encoder encoder = new DefaultEncoder();

    /**
      * Processes requests for both HTTP
      * <code>GET</code> and
      * <code>POST</code> methods.
      *
      * @param request servlet request
      * @param response servlet response
      * @throws ServletException if a servlet-specific error occurs
      * @throws IOException if an I/O error occurs
      */
    protected void processRequest(HttpServletRequest request,
HttpServletResponse response)
            throws ServletException, IOException {
    }

    /**
      * Handles the HTTP
      * <code>GET</code> method.
      *
      * @param request servlet request
      * @param response servlet response
      * @throws ServletException if a servlet-specific error occurs
      * @throws IOException if an I/O error occurs
      */
    @Override
    protected void doGet(HttpServletRequest request, HttpServletResponse
response)
            throws ServletException, IOException {
    }

    /**
      * Handles the HTTP
      * <code>POST</code> method.
      *
      * @param request servlet request
      * @param response servlet response
      * @throws ServletException if a servlet-specific error occurs
      * @throws IOException if an I/O error occurs
      */
    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse
response)
            throws ServletException, IOException {
    }

    /**
      * Returns a short description of the servlet.
      *
      * @return a String containing servlet description
      */
    @Override
    public String getServletInfo() {
    }
}
```

5. DETAILED DESIGNS

5.1 Sequence Diagrams

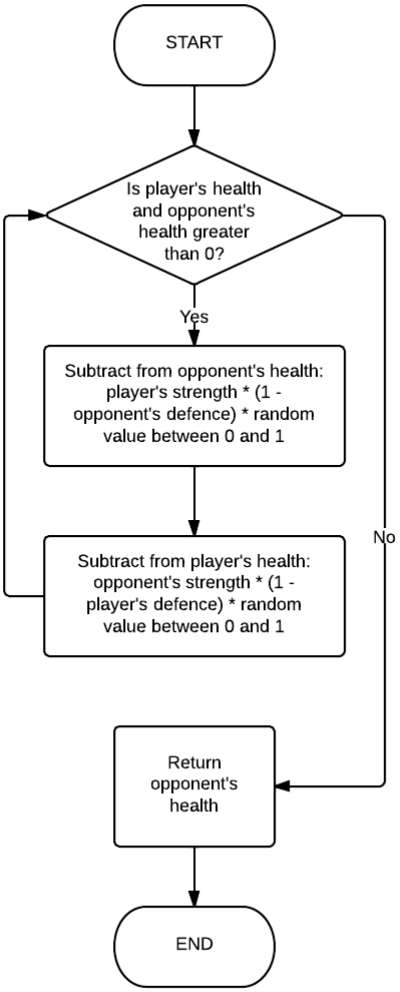
5.1.1 Fighting

This shows how the fight would take place at a slightly higher level than the actual algorithm. The dead monster would be passed back to the player (owner) who would send it off to get removed from the server.



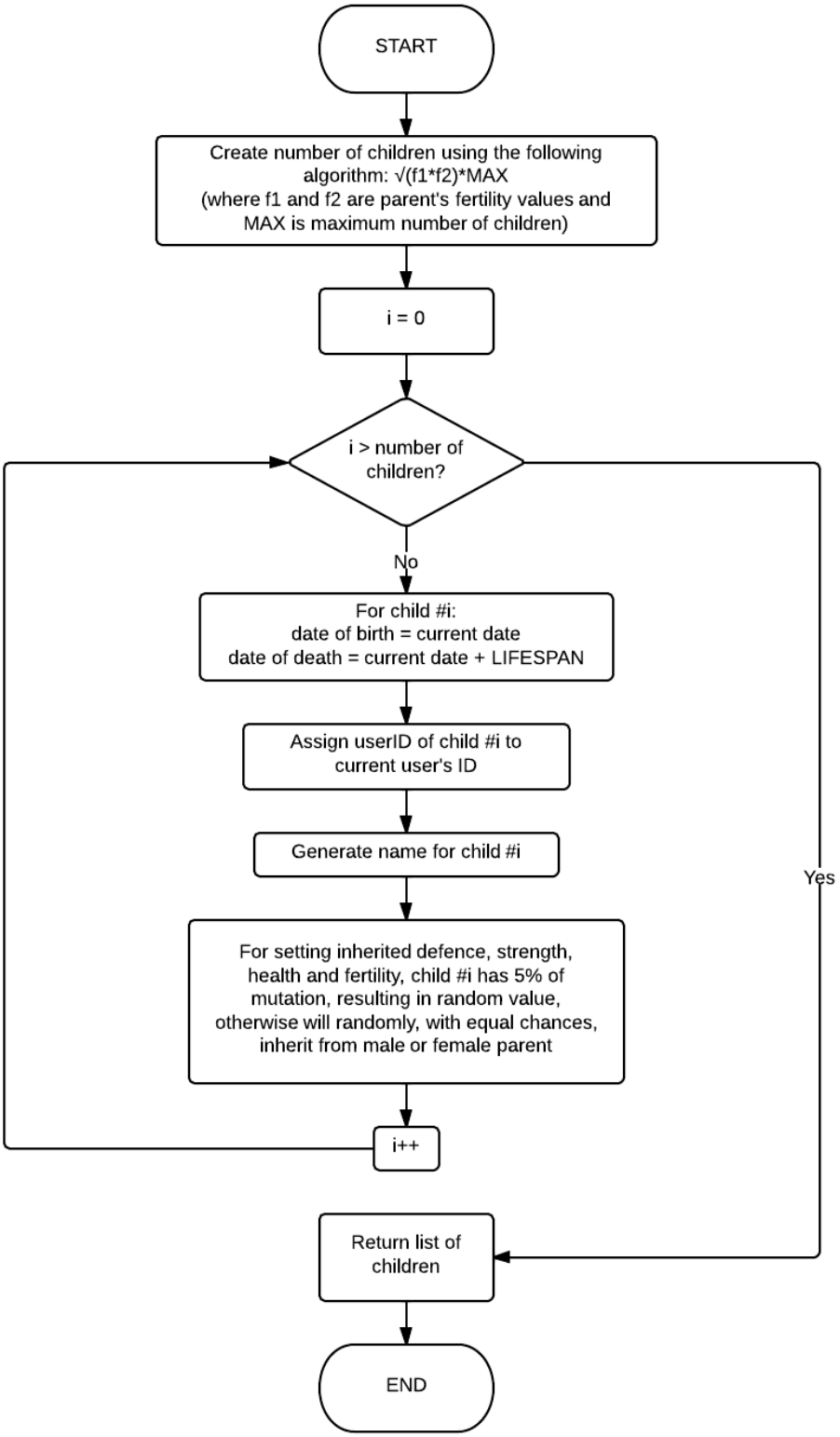
5.2 Significant Algorithms

5.2.1 Battling




```
public double fight(Monster opponent)
{
	Random randomGenerator = new Random();
	double random = randomGenerator.nextDouble();

	while(this.currentHealth > 0 && opponent.currentHealth > 0) {
		opponent.currentHealth -= this.currentStrength * (1-
			opponent.currentDefence) * random;
		this.currentHealth -= opponent.currentStrength * (1-
			this.currentDefence) * random;
	}

	return opponent.currentHealth;
}
```

5.2.2 Breeding

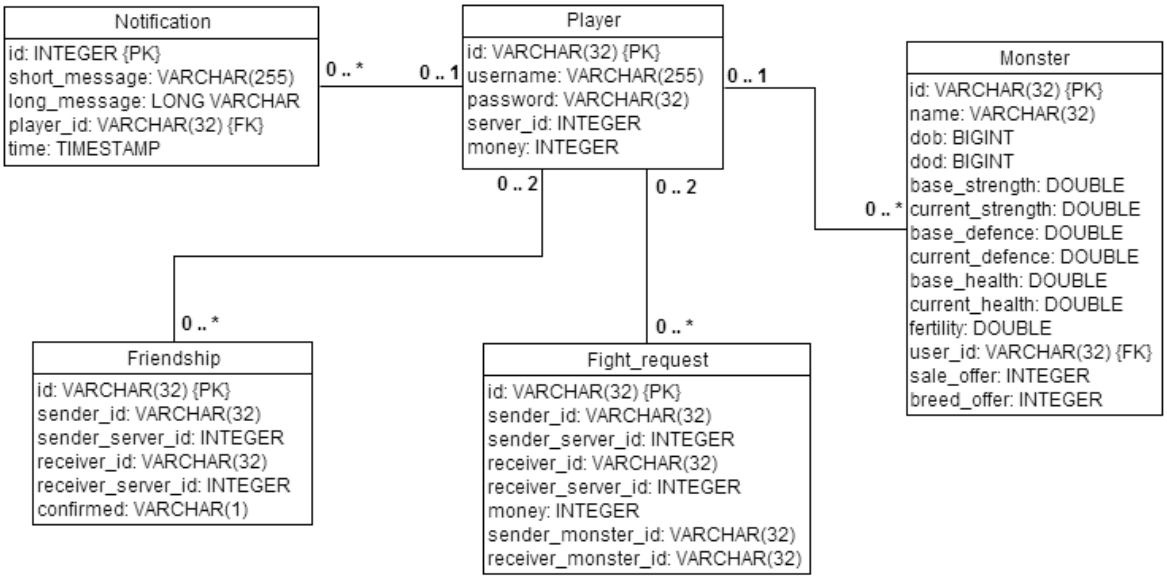


```
public Monster[] breeding(Monster other) {
	Random r = new Random();
	int numberofchildren = (int) (Math.sqrt(fertility * other.fertility) *
MAX_CHILDREN);
	Monster[] children = new Monster[numberofchildren + 1];
	for (int i = 0; i<= numberofchildren; i++){
		children[i]=new Monster();
		children[i].id = "0";
		children[i].dob=new Date();
		children[i].dod = new Date(children[i].dob.getTime()+LIFESPAN);
		children[i].userID = this.userID;
		children[i].name = NameGenerator.getName();
		//generating inherited defense
		if(r.nextInt(100)<5){
			children[i].baseDefence=r.nextDouble();
		} else if(r.nextInt(100)<50){
			children[i].baseDefence=baseDefence;
		} else {
			children[i].baseDefence=other.baseDefence;
		}
		children[i].currentDefence = children[i].baseDefence;
		//generating inherited strength
		if(r.nextInt(100)<5){
			children[i].baseStrength=r.nextDouble();
		}
		else if(r.nextInt(100)<50){
			children[i].baseStrength=baseStrength;
		} else {
			children[i].baseStrength=other.baseStrength;
		}
		children[i].currentStrength = children[i].baseStrength;
		//generating inherited health
		if(r.nextInt(100)<5){
			children[i].baseHealth=r.nextDouble();
		}else if(r.nextInt(100)<50){
			children[i].baseHealth=baseHealth;
		} else {
			children[i].baseHealth=other.baseHealth;
		}
		children[i].currentHealth = children[i].baseHealth;
		//generating inherited fertility
		if(r.nextInt(100)<5){
			children[i].fertility=r.nextFloat();
		} else if(r.nextInt(100)<50){
			children[i].fertility=fertility;
		} else {
		       children[i].fertility=other.fertility;
		}
	}
	return children;
}
```

5.3 Significant Data structures

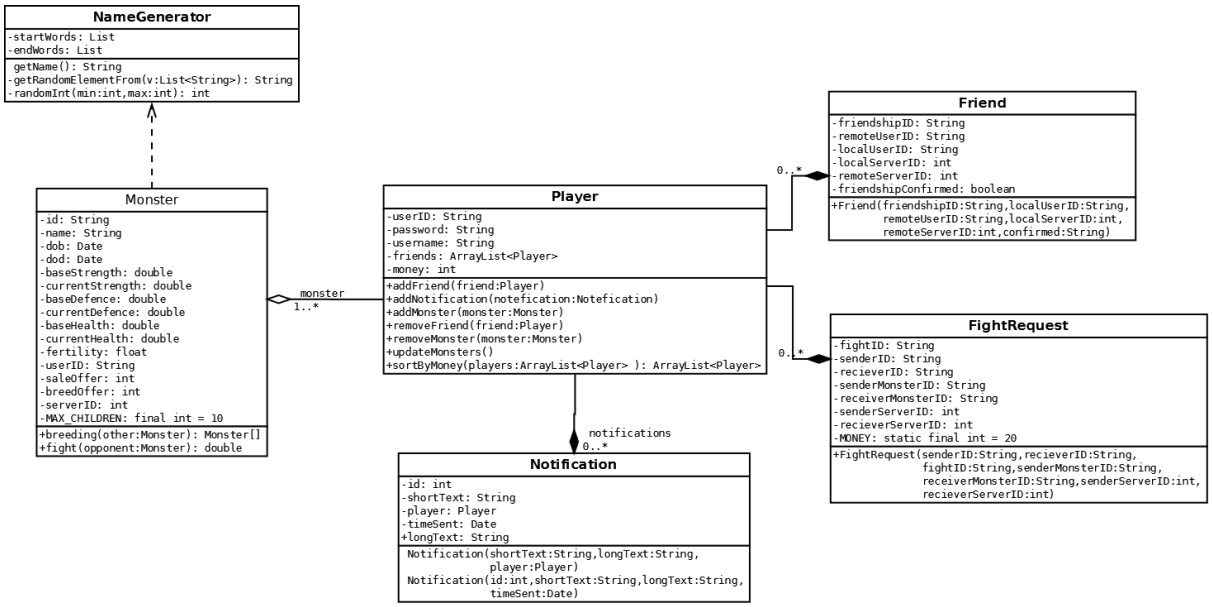
5.3.1 Database Description

The database is used to store all data, so that data is not lost when the server is down. The instance variables of the java objects are saved so that they can re-instantiated. In the diagram below the *Fight_request* and *Friendship* tables do not have ForeignKeys for monster and player because not all players and monsters are stored in our database.

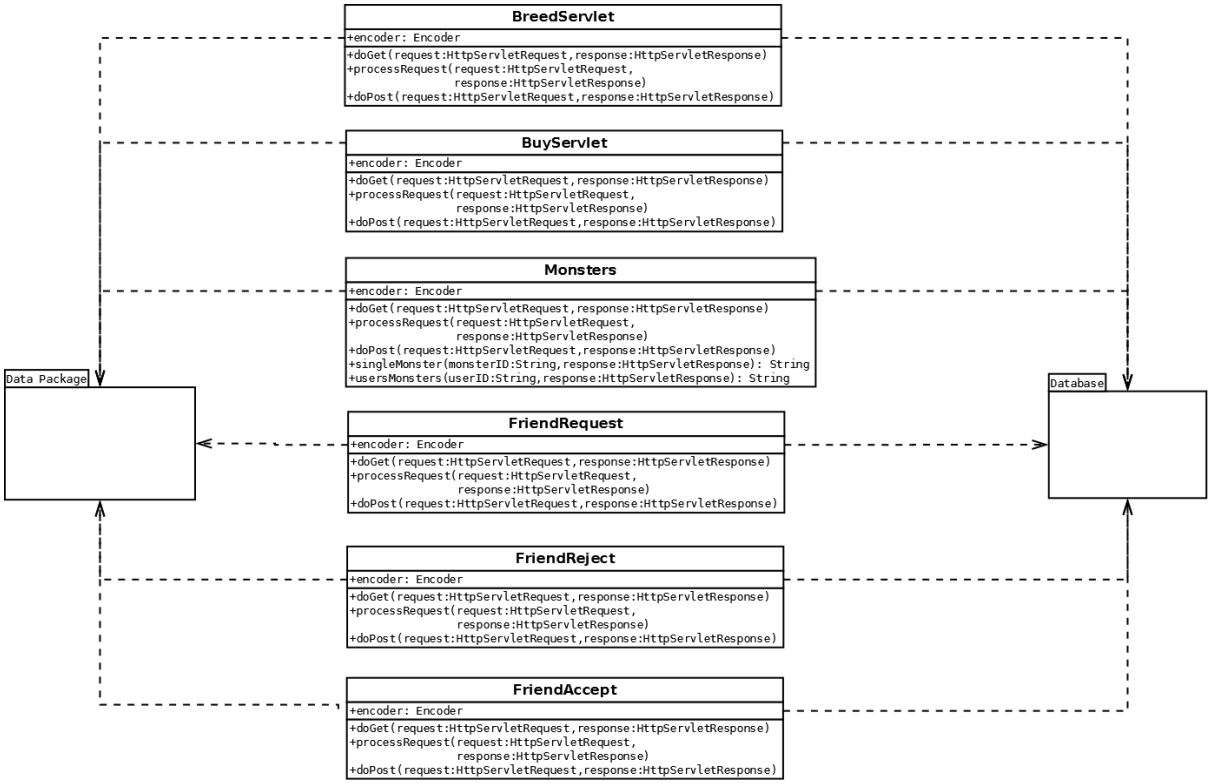


5.4 Class Diagrams

5.4.1 Data Classes Package

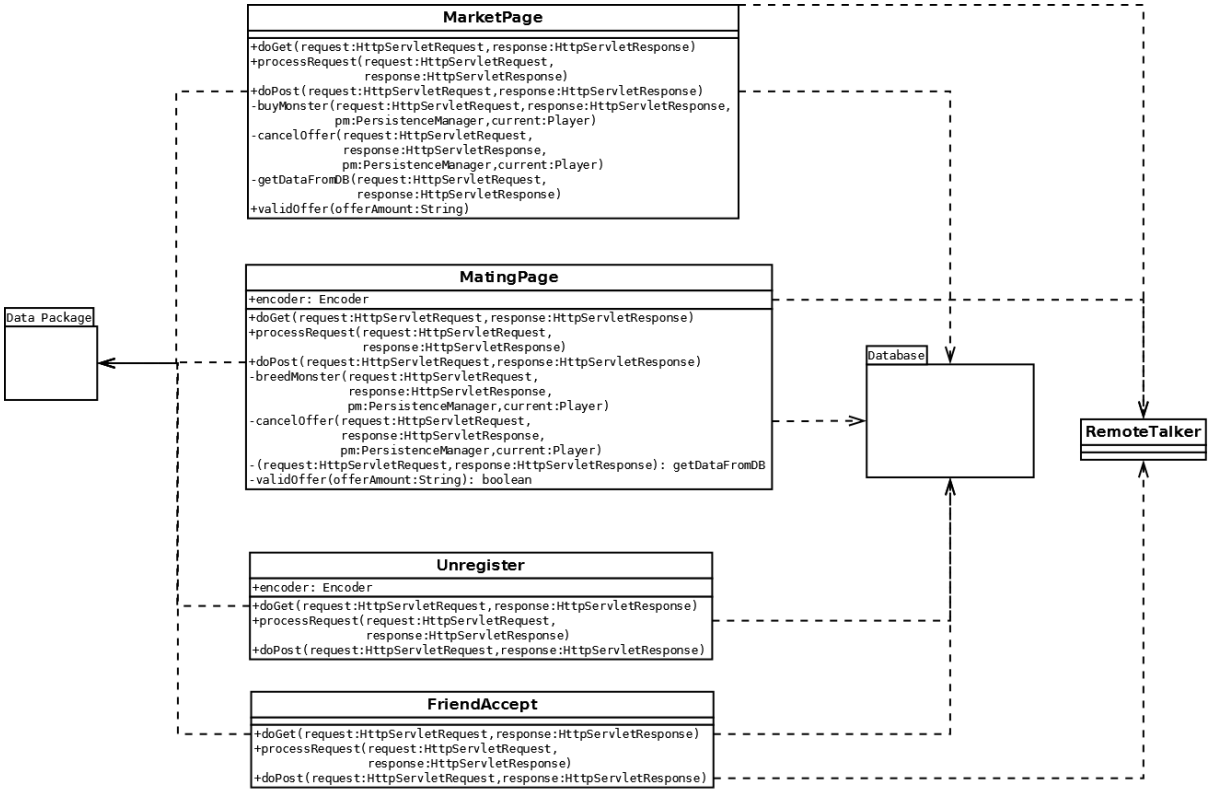


5.4.2 Servlet Class Packages

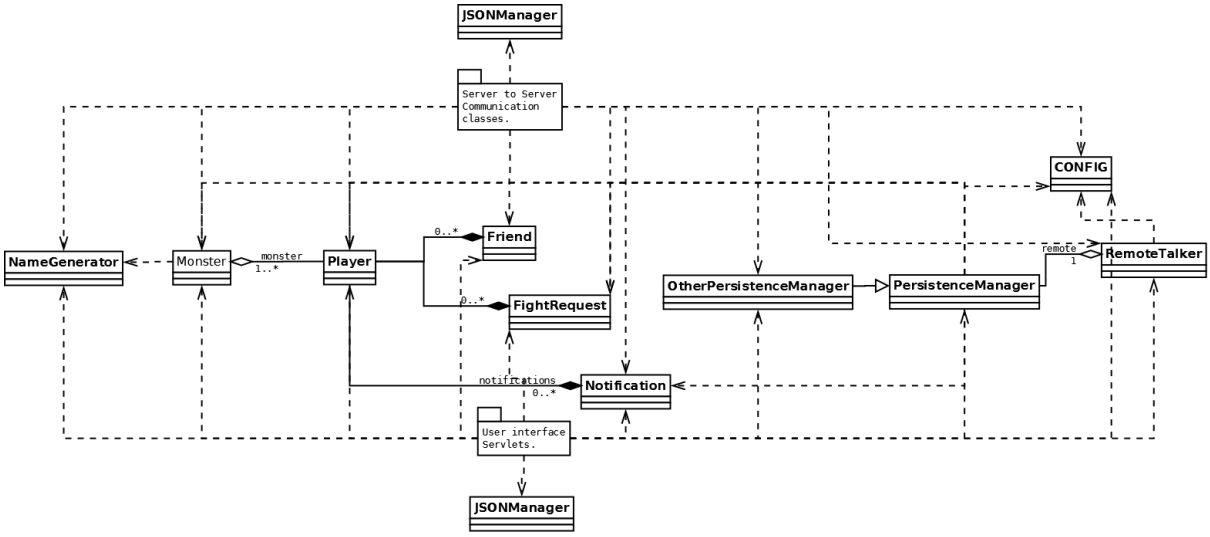


5.4.3 Server Communications 1

5.4.4 Server Communications 2



5.4.5 Overall Class Diagram



REFERENCES

[1] **Software Engineering Group Projects Monster Mash Game Requirements Specification**
Config Ref: SE.CS.RS

[2] **Software Engineering Group Projects Design Specification Standards**
Config Ref: SE.QA.05A

[3] **Software Engineering Group Projects Java Coding Standards**
Config Ref**:** SE.QA.09

DOCUMENT HISTORY

Version	*CCF No.*	*Date*	*Changes made to document*	*Changed by*
1.0	N/A	05/12/12	Creation of document, all major elements added	G12
1.1	N/A	06/12/12	Overhaul of many documentation and format elements	jau1
1.2	N/A	15/02/13	Refactoring of many elements so they conform to the changes made to the design	G12