ONLINE JUDGE

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1 Introduction

1.1 Project aim

To further improve the existing online judge by using advanced technologies of PHP framework CODEIGNITOR,front end framework BOOTSTRAP and also strengthening the existing security of the website by using LXC Containers.

1.2 Prerequisites

- Codeignitor php framework for server side scripting
- Bootstrap front end framework for client side scripting.
- HTML,CSS and JAVASCRIPT for changing the existing themes of bootstrap.
- MYSQL library in C for connection to database using c coding.
- C++ and Unix shell for back end of online judge

1.3 Tools Required

For this we have used following tools:

- PHP 5.5
- APACHE 2.2
- MySQL 5.5
- LXC container for unix
- GNU GCC
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2. Design

2.1 Database

We have provided here 6 databases for the whole functioning of whole websites efficiently

- Problem
- Overall ranking
- Membership
- Questions
- Problem
- Status

2.2 Website

2.2.1 Theme used

Twitter Bootstrap is a free collection of tools for creating websites and web applications. It contains HTML and CSS-based design templates for typography, forms, buttons, charts, navigation and other interface components, as well as optional JavaScript extensions.

2.2.1 Readability of code

Using codeignitor as a php back end framework it becomes a lot easier for us to understand the codes of php behind the online judge website.

3. Back end

3.1 Codeignitor

Model: Basically data is represented by model and all its functions retrieve, insert and restructure the database information as model contains data logic and also represents classes, data structures etc.

View: is the information- in general a web page which is accessible to users. Just like a header or footer, we can say a page scrap in Code Igniter, which can either be RSS page or any page .

Controller: is just a name of a class file linked with a URI and it is loaded by Code Igniter. But, for loading purpose not only matching of controller's name with first segment of Url is necessary, but also first character of class name is required in upper case.

Advantages:

1. Easy to learn, adopt,deploy,customizing and handling.

2.Good collection of possessed libraries.

3. Offers flexibility and easy management With MVC based framework.

4. Free from complex structures and development

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3.2 Judge

Judge part of this website had been made by last year team of online judge project and we will be using it as it is available now with no changes.

3.3 LXC container

Linux Containers (LXC) allow running multiple isolated Linux instances (containers) on the same host.A container is a way to isolate a group of processes from the others on a running Linux system. By making use of existing functionality like the Linux kernel's new resource management and resource isolation features (Cgroups and name spaces), these processes can have their own private view of the operating system with its own process ID (PID) space, file system structure and network interfaces.

FEATURES:

- Light weight and resource friendly.
- Comprehensive process and resource isolation.
- Run multiple versions of an operating system on a single server.
- Rapid and easy deployment.

4. Source code

4.1 Index

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We have divided our codes into following view files:

- Account.php-It views the user about his or her

  profile data and trackrecord.
- Contest.php-It contains the data of running,past and future contests.
- login_form.php:It have the index page of the website.
- Problem.php-It gives you the various problems of different contests.
- Processfile.php- script which runs after a file is submitted to the judge.
- Status.php-The current status of the user is depicted here wether the problem is in pending mode or it has been accepted.
- Rank.php-The ranking of different users has been shown here with scores.
- Header.php-This file has been included in all the the view files.It contains the whole design of of our website.

4.2 Further Improvement

There has been a lot of challenges left for me to complete in near future.The most important one is to implement the multiplayer bot vs bot system based upon Hackerrank website and another one is to improve the security system of the whole website.