

Design and Implementation of an extensible, modular, web-based class-room supplement 2008-2009

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Abstract

Blackboard, Fairfax County's current Academic Suite and one of the most commonly used Class-room supplements in education, is disliked by many students and teachers as well as containing many security vulnerabilities. The Goal of this project is to develop an extensible, modular, web-based replacement for Blackboard which will incorporate Blackboard's functionality as well as additional features. By building an extensible and modular replacement what will run on a standard LAMP (Linux, Apache, MySQL, and PHP) Server, this project will hopefully be much easier to maintain, secure, and add additional functions to.

Keywords: software design, software engineering, application, web-based

1 Introduction

For many people today, the Internet is the first place they go for information and many school systems are trying to make as much information available online as possible. However many of the commercial course management systems available today suffer from lack of standardization and extensibility. An ideal course management system would be easy and intuitive to use,

3 Preliminary Testing and Analysis

Currently I have Apache2 with mod_ssl and mod_rewrite, PHP5, and MySQL5 running on a Debian Linux server in the lab. This is all that my project requires to run. The currently working version of my code presents a login page and denies access to the site without a valid login. Once a user logs in, their IP and browser agent are recorded for security, and they are given a PHP session which is used throughout the site. Before allowing them to access each page, the kernel module checks that their IP and browser agent are the same (to protect against session hijacking) and that they have not been idle for a long time (to protect users who forget to logout). All of these features work with multiple accounts and the main page currently uses information from the database to display the user's name and "rank" (teacher, student, or administrator).

4 2nd Quarter Improvements

Second quarter, the focus of my project changed from a script blackboard replacement towards a more general and versatile web development framework. The focused goal of this framework is to run the TJ Cubesat website which will take text submissions, hold them for review, and then upload them via radio link to an orbiting satellite. As a result of the radio link, I have had to use a python wrapper script to interface with the radio because PHP (a web-oriented language) has no built-in serial functionality. Building this script and making it work properly using PHP's `exec()` command was the primary difficulty I have had with making this alternative functionality work.