CSE 485 Project Initialization

Connor Alfheim   Ryan Dougherty   David Ganey   Dylan Lusi

Joseph North   Ben Roos

September 30, 2014

1   Table of Contents

1. Overview

2. Requirements

3. First Semester Plan

4. Conclusion

2 Overview

2.1 Introduction

NOTE: this is stolen from the Bowman document. We should rewrite this a bit

New radio telescopes, including the upcoming Hydrogen Epoch of Reionization Array (HERA; reionization.org), are the next generation of observational cosmology telescopes. In many engineering terms these are not the most complicated telescopes ever built, but they do involve the integration of dozens of independent computer systems and generate petabytes of highly complex data every year a situation that is very new to astronomy projects. Hence, the new telescopes present unique operational and data analysis challenges, many of which stem from the volume of data and the complexity of processing the data. Commanding the telescopes and data processing are much more automatic than with traditional telescopes, but the operational model and user interfaces for controlling and monitoring the telescopes has yet to be well-implemented. The top level user interfaces need to be developed so that users can easily monitor data flow, search meta-data, and initiate pre-defined processing steps on subsets of the data archive. Partial solutions have been developed to allow more efficient and routine observing command and analysis, however they still lack a unified interface – leaving much of the data hidden. When completed, this project will be a foundation that enables international teams of astrophysicists and cosmologists to make important cosmological observations for many years to come.

2.2 Description

How does this differ from the introduction?

2.3 Assumptions

No significant assumptions will be required for this project. Because the project involves improving an existing system, we are able to know how the system will be used and tailor the performance to those situations.

3 Requirements

The web system has the following requirements:

1. The web application should display the current status of the Murchison Widefield Array

   (a) The application should display the status of the array in a visual format

2. The application will support user accounts

   (a) Signing in will be required to act on the website, but not to read it

   (b) Users should be able to customize their experience by subscribing to various feeds, modules, etc.

   (c) Users can create accounts only with permission from a site admin

3. The application should support some data processing

   (a) Data contained in periods during which the MWA had malfunctioning nodes should be flagged

4. The team should generate an API which allows astronomers with limited knowledge of software development to add, extend, and modify the application functionality.

3.1 Deliverables

The team will deliver a functional website running on an EC2 instance. The team will be agile, so as the requirements change, so will the specifics of the delivered website. Accompanying the web platform will be documentation, to maintain extensibility in the future after the conclusion of the project.

3.2 Use-case diagram

LETS MAKE A DIAGRAM

3.3 User stories

3.3.1 User not signed in

A user who is not signed in will navigate to the website and see....

3.3.2 User signed in

Users who are signed in can...

3.4 Non-functional requirements

The primary goal of the project is *extensibility*. The API developed by the team should allow individuals who are not software developers to modify and add functionality to the website. As a result, scalability and longterm maintainability are significant nonfunctional requirements. Additionally, standard constraints on security and efficiency apply. The website should not be vulnerable to standard exploits (e.g. no passwords stored in plaintext), and should scale appropriately to deliver a pleasant experience to all users.

4 First semester plan

During the first semester, roles will be assigned to the team. All members should be functional in all areas, but the sponsors and the team agree that some team members will specialize in specific areas (e.g. the database). After dividing roles, the database team will meet with the sponsors to discuss the database schema. Due to the complexity of the database, a small portion of it will be copied to our test instance to be used in testing.

Once the EC2 instance is up and running with the database, the team will clone the existing code repository to use it as a base. Whether any of the current code remains in the website is a decision the team will make after reviewing the source code itself. The team can then begin to build features. It is likely that the basic login/logout functionality will be built first, followed by the primary visualization dashboards.

4.1 Initial scope

WHAT IS THIS?

4.2 Milestones

4.2.1 Table 1

Date	Goal
10/3/2014	Project Initialization form sent to sponsors
10/11/2014	Project Initialization form complete
10/20/2014	Database copy completed
11/1/2014	Begin work
12/6/2014	When does class end?