MICHIGAN STATE UNIVERSITY

Project Plan

Cloud Management Platform

The Capstone Experience

Team GE

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From Students…
…to Professionals

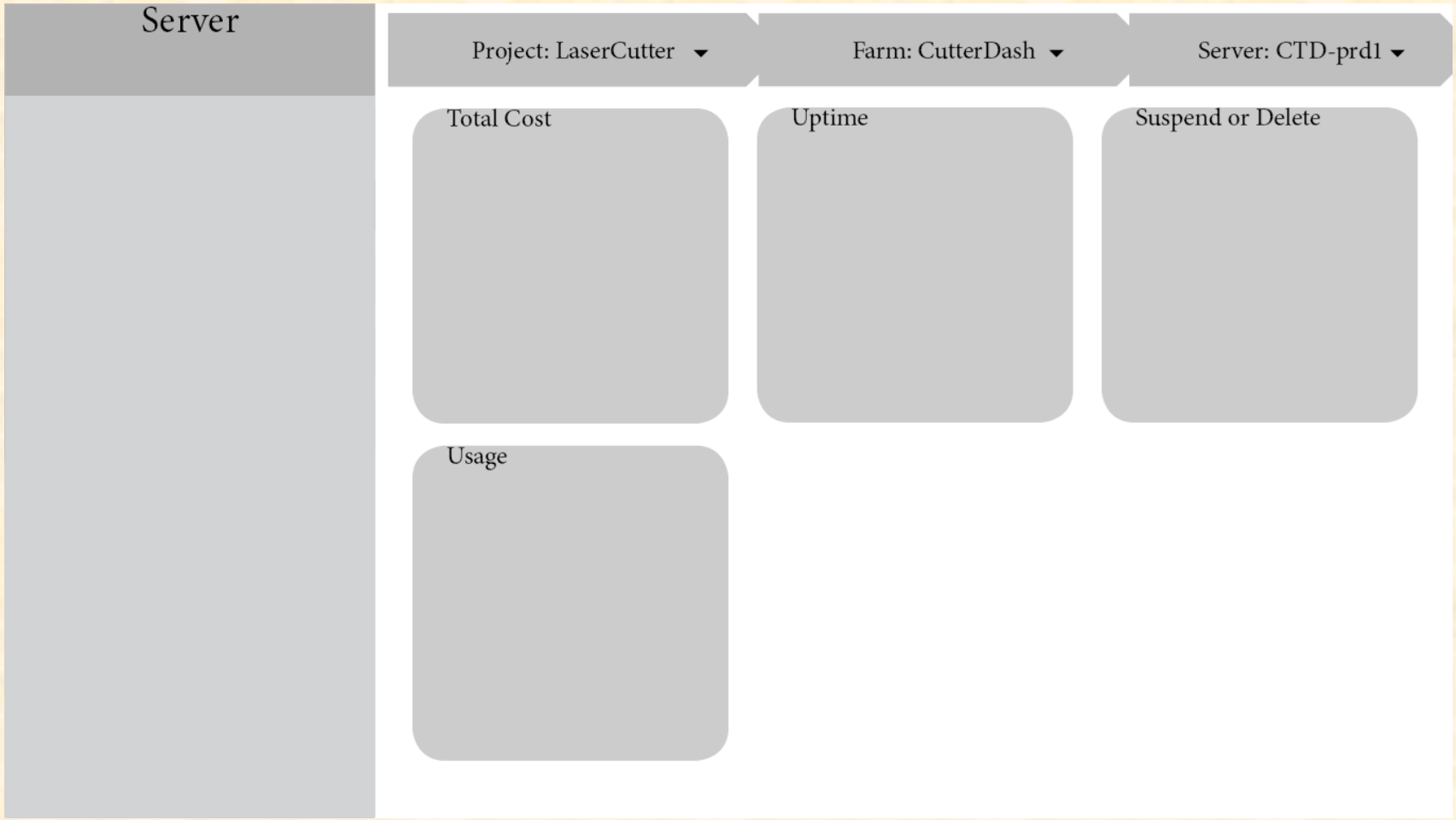
Functional Specifications

- Streamlines management of cloud resources
- Current cloud management system is too difficult and complex for day-to-day use
  - Wastes the time of IT professionals on simple tasks
- We propose a clean, easy to use webapp that will make the most commonly used features more accessible

Design Specifications

- Manage server “farms” on the cloud
  - Create/remove farms
  - Suspend/resume farms
  - Clone farms
  - View farm information
  - View costs associated with each project

Screen Mockup: Server Management



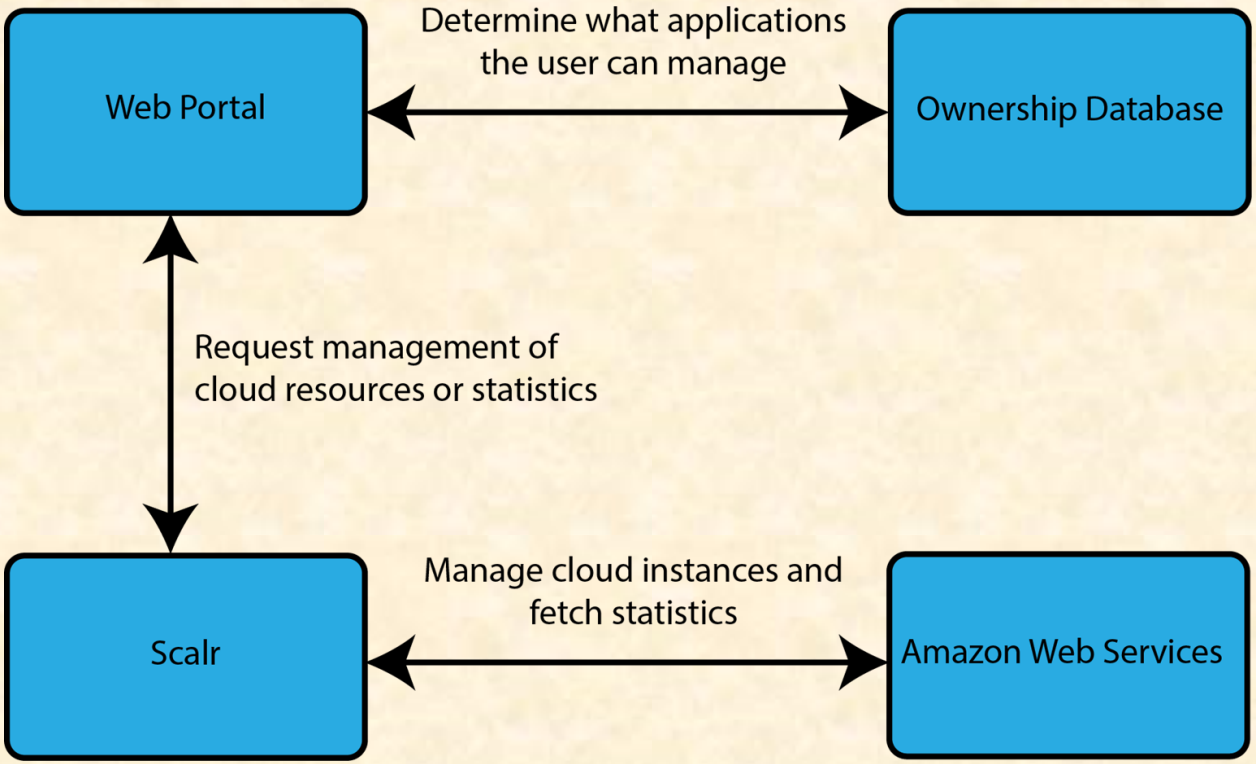
Screen Mockup: New Farm Modal

Screen Mockup: Farm Information Modal

Technical Specifications

- Web Portal
  - Django-based server, Python interface to Scalr API
- Ownership Database
  - PostgreSQL database on AWS
- Scalr
  - Platform-agnostic cloud management server
- Amazon Web Services
  - Cloud services provider managed by Scalr

System Architecture



System Architecture

Web Portal - Django-based server that renders the user interface. Uses a wrapper around the Scalr API for python to execute user commands and queries against the ownership database to determine what Scalr Projects a user can control.

Ownership Database - PostgreSQL database server that maintains the relationship between users and what Scalr projects they have access to.

Scalr - Cloud Management Server, exposes a frontend and API for managing cloud resources. Scalr is platform agnostic which enables us to interact with cloud resources from different platforms using 1 interface. In the prototype Scalr will only be managing AWS instances

Amazon Web Services - Cloud Provider that provides scalable application and database servers as well as load balancing tools.

System Components

- Hardware Platforms
  - Amazon Web Service
- Software Platforms / Technologies
  - Scalr: Existing webapp, manages server “farms” on the cloud
  - Python/Django: Back-end, interaction with Scalr API
  - CHEF: Automation of server setup
  - AngularJS or JQuery: Front-end
  - PX: GE proprietary front-end framework

Testing

- Manual Testing
  - Most testing will be manual
  - Emphasis on access policies and error checking
- Unit Testing
  - Leverage Django's unit testing features
  - Identify high-traffic areas and prioritize them in the testing

Risks

- Lack of access to GE internal network
  - No access due to HR and internal IP policy
  - Mitigation: Creation of a similar external
  - Status: Using resources available outside of GE
- Ambiguity of Requirements
  - No clear feature requirement at the beginning of the project
  - Mitigation: Continuing communications with GE
  - Status: First mockup has been sent
- Scalr configuration and Mismatch APIs
  - GE internal version of APIs is different from the external version
  - Mitigation: Communication with GE personnel familiar with role definition in Scalr will help mitigate that concern
  - Status: Issues are not yet resolved but communication is ongoing.

Risks

- AWS free account limitations
  - current AWS accounts are limited in the amount of servers/space/time
  - Mitigation: Communication with GE has led to the promise of additional resources to move beyond a free AWS account.
  - Status: Resources have been requested from GE and the project team is currently awaiting on the disbursement of these resources.
- High number of systems interacting
  - GE's current system uses vary of technologies
  - Mitigation: Team has been focused on learning the new technologies. Communication with knowledgeable GE personnel and online documentation
  - Status: Team is currently involved in learning technologies. 70% to 80% of required technologies have been suitably mastered.