**Asteroids**

**TBD**

**Supplementary Specifications**

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**Revision History**

|  |  |  |  |
| --- | --- | --- | --- |
| **Version** | **Date** | **Description** | **Author** |
| Inception Draft | 9/20/2018 | First Draft | All |
| Elaboration revise | 10/30/2018 | Added Packaging and Standards sections. Added a title page and a table of contents. | Eric Guzman |
| Elaboration 2 | 12/11/18 | Added new nonfunctional requirements to Security, reliability, and performance. | Eric Guzman |

# Introduction

This document is the repository of all Asteroids requirements not captured in the use cases.

# Functionality

## Logging and Error Handling

Errors and game crashes are logged to the device’s storage. This log can be viewed to troubleshoot the game or sent to our servers for analysis.

## Security

All users must be authenticated before given access to the game. The team will fix and solve an vulnerabilities that can be found in the system during the routine maintenance.Since our system will keep credit and debit cards on file. We are going to encrypt all their payment details data. We will be Monitoring for any breaches in our servers.

# Usability

## Human Factor

Asteroids will have bright colors so that it can be easily seen on any display. There will also be different color modes specific to common types of colorblindness to ensure fairness. Sound will aid the user during gameplay. Font size will be able to be changed depending on the user. A tutorial of how to navigate and use the system will be played when you first boot the system and will be available at any time.

# Reliability

## Recoverability

Loss of connection to the system denies user authentication. This can result if the Asteroids servers are down, or the user loses an internet connection. Without authentication, the user cannot play Asteroids. Thus we should diversity our server geography, hardware, and other factors to ensure maximum uptime.

If there is failure to use external systems, such as the payment system, then purchases cannot be made. Thus we should include redundant payment connections, and multiple payment systems.

If connection is lost or the Asteroids client crashes during gameplay, that game is saved as a game in progress. When the user authenticates, the previous game can be resumed.

Servers should be running without any errors at 99.99999% of the time. Processing payments would also need to run at 99.99999% of the time with errors.

# Performance

Users want authorization and payments to be quick. Gameplay should be be smooth and responsive. Our goal is to have the game play at a minimum of 60 frames per second. The game will be optimized for all hardware and operating systems. We want to make sure the system is efficient with resources(RAM,CPU, ect).

# Supportability

Asteroids will be played on a limitless combination of hardware and operating systems. Patches must be released to ensure compatibility with old and new hardware.

# Implementation Constraints

Asteroids must be implemented in a way that is consistent across any platform. This allows players to have the same experience on any of their devices.

# Purchased Components

We will need computers that are at least using intel i7 processors with 16gb of ram and nvidia graphic cards in order to develop the game and future functionality. Other components that are needed are servers to be able to host the databases for user accounts.

# Free Open Source Components

Our system will use any Open source components as needed because there is no need to reinvent a piece of software if there is an open source one we can use. This helps us not waste time and money and many of the open source software has already been tested and proven to work. The repo that we are using is an open source repository as well as the operating system that we are using in an open source linux distribution..

# Interfaces

## Hardware Interfaces

* Monitor for display
* Keyboard for user input
* Touch screen on tablets or phones

## Software Interfaces

System must have interfaces for each classes that we will build in the system. They will be used to create the packages and classes that the system will need.

# Application-Specific Domain (Business) Rules

(see the separate Business Rules documents for general rules)

|  |  |  |  |
| --- | --- | --- | --- |
| **ID** | **Rule** | **Changeability** | **Source** |
| RULE1 | The game ends when the player’s last life has expired. | Low. | Game Rules |
| RULE2 | Objects have one hit point. When the player’s ship and alien ship is hit by any object, it is destroyed. Asteroids are broken down after hit by a projectile, and continue to do so until the smallest size asteroid object is destroyed. | Low. | Game Rules |
| RULE3 | Purchased PowerUps are consumables. | Low. | Game Rules |
| RULE4 | Player can only use one PowerUp per game and will have to choose the power up they would like to use in game | Med | Game Rules |
| RULE5 | Player only has 1 life in each game | Med | Game Rules |

# Legal Issues

Sales tax will be applied to purchases of in-game items according to the law. Asteroids does not contain microtransactions that resemble gambling in any way.

# Information in Domains of Interest

## Pricing

Asteroids is a free-to-play game that has microtransactions. Purchasing any in-game items is optional. PowerUps are 5 for $5. In-game items are sold cheaply, but the game and social aspect promote players to buy large quantities of them.

There are no discounts allowed for purchases.

## Sales Tax

Sales tax will be applied to all purchases. The amount of sales tax depends on current laws and can change frequently.

# Reports

Reports are very important to us and should be taken seriously. Reports should be handled correctly especially those that have to do with the functionality of the system.

# Packaging

The system will be composed of a 3 layer architecture where at the top level will have the UI packages and classes. The Middle layer will hold the main packages and components related to the game. The bottom layer will have all the technical services like the database and the financial packages that communicate with external banking systems.The system will be broken up in packages that can be indeporent of each other. The game side of the project will have its own package. The store, net and server packages will have their own packages. Technical Services and UI will also have their own packages. Keeping everything in packages makes things more manageable and understandable and also helps with any separation of concern.

# Standards

We have the highest quality standards when it comes to any product that we build. That is that the system will and shall always run with no errors at 99.9999 percent of the time. The user experience should always be at the highest priority and that is the reason why it is important to periodically maitane the infrastructure of the system to make sure it is running at its best. The technical standards are also important for the longevity of the system. All engineers working on this system will make sure they write clean and easy to read code accompanied with any documentation. Writing code that uses the GRASP principles is especially important.

# General Collaboration

The team will use Google Drive primarily to share and collaborate documents and general artifacts. There will be a shared folder named ***CPSC 462 (Software Engineering)*** into which all artifacts will be placed. There will be a subfolder for each main phase which is to be turned in to the *Client* (ie. Professor).

Code collaboration will take place on a private server hosting an instance of “GOGS”, a CMS similar to Github. Team members can use GOGS to track issues and features, inspect code, and synchronize the state of our system. GOGS also provides a back-end for cod management through git.

# Team Communication

The team will communicate primarily through three different means:

* Discord
  + The team will communicate in a Discord server named “CPSC 462”
* Email
* Face to Face