CS 5551 Second Increment Report

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Class ID: 9, Project Group ID: 1
CS 5591 – Spring 2015

I. Introduction

This is the summary report of the second iteration of work performed on the Terrapin Collection Manager system. This system proposes to implement a framework for organizing and managing a user's Board Game collection. The full background of this project can be found in the Project Proposal Document [1] submitted previously.

For this second iteration, my primary focus to begin the iteration was on the agent process and improving the process for fetching and then approving game content. While not complete, this process took longer than expected due to a high degree of variation and inconsistency in the data. Focus then shifted to the Services tier, where User and Collection services were implemented. Finally, the last few days involved finally performing some front end work and creating an initial set of web pages.

Since many of the details behind the architecture of this system were discussed previously in my Project Plan [2] and elaborated on during the First Iteration [3], I will not be repeating elements of those discussions here except to discuss changes or additions.

II. Objectives

The objectives of this iteration, given where last iteration ended, were to solidify the external data pull operations, prepare that data to be analyzed and converted into Game objects, then associated the other external sources via matching to the Game.

Roughly the first half of this iteration was devoted to this process, with most of the code changes coming in the Agent layer, supported by corresponding changes to the ac-games-pojos project as new issues were discovered. To put some numbers into perspective:

Total number of Games listed on BoardGameGeek I am tracking: 158536
Total number of Vendor entries I am tracking: 146429

Because of the scope, I spent a fair amount of time working on building some intelligence into the processing effort, determining which entries were invalid or incomplete, which items are capable of being ignored (for example, entries for game supplies instead of games), and attempting to automatically process and confirm as many entries as possible. This effort is still in flight, but so far I have been able to review more than 93% of BoardGameGeek entries and developed a means of categorizing Vendor data that should help during the automated matching work.

Since some of that work can only be done manually, I turned my attention to the UI, rather than try to do all that work by hand. However, prior to being able to work on that interface, I realized I needed to build out the services to support not just Game and GameReltn data, but

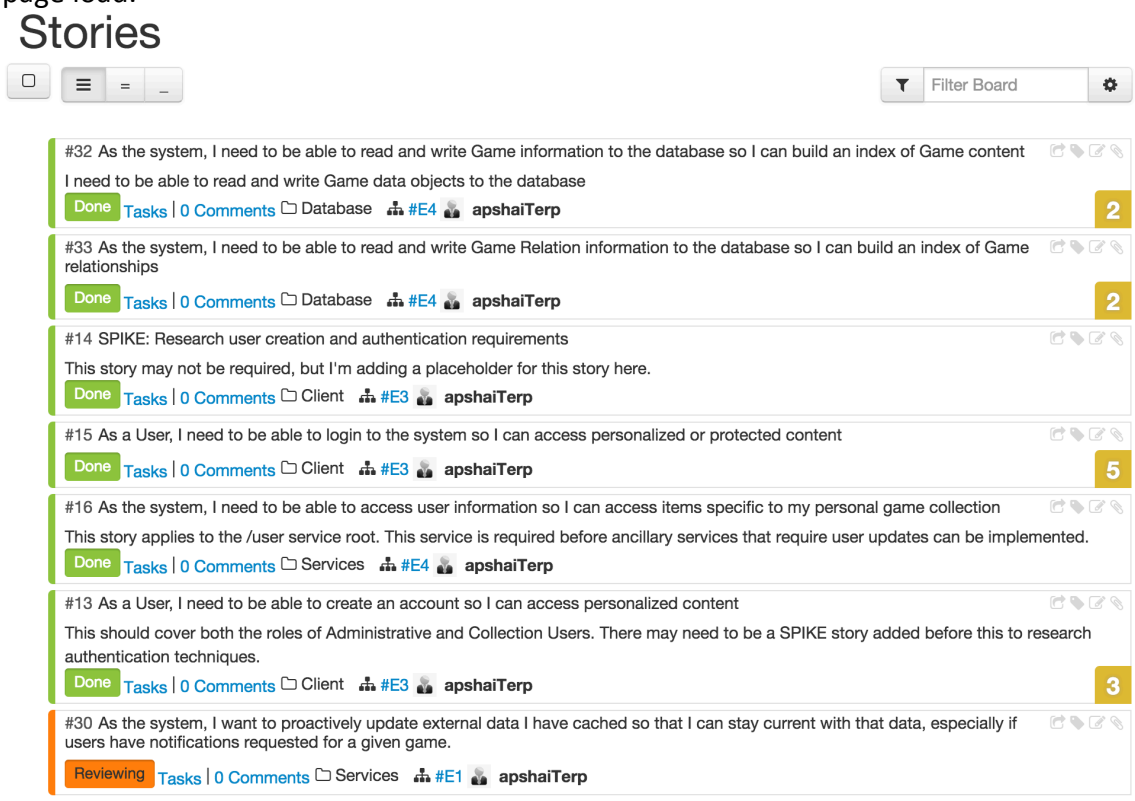
also Users to support login and permissions, which then led to the need to implement Collection data to complete the User object and it's child classes. Most of the second half of this iteration was spent building out the required REST service endpoints, which will be discussed later.

Finally, the last four days I have been finally diving into HTML5 and Bootstrap to work on developing a UI. I was able to create a home page, about page, and login and signup pages to move forward, but those pages allowed me to learn a lot more about HTML5 and Bootstrap in particular. This time will be very valuable moving forward in the remaining iterations.

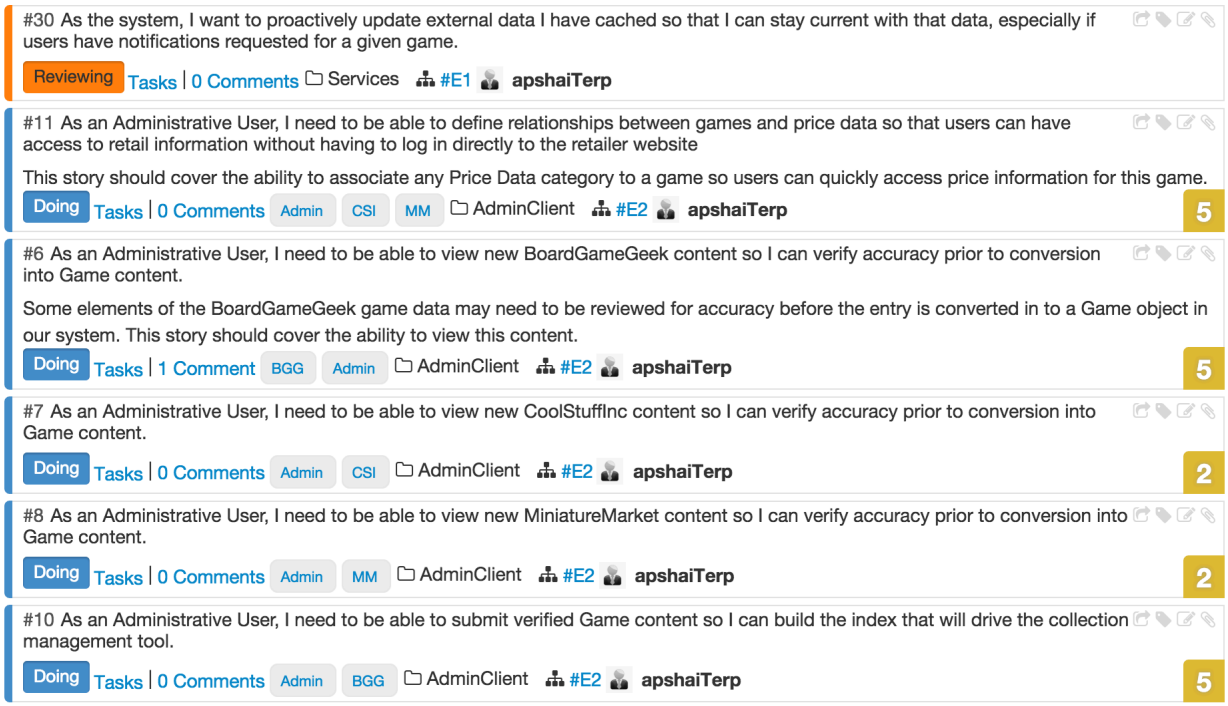
III. Design Overview

Fundamentally, there have been no significant changes to the overall architecture of the system. This iteration was really more about expanding capabilities than exploring design issues, with the exception perhaps of the web pages. Much of the planning on how new services should be implemented has been done previously.

One change I did make was to change the structure of my web pages to move away from a single page model where multiple pages are specified as page content in the HTML body and instead created separate HTML pages for each required page. There were issues I encountered related to how the page separation was being handled (or not handled). This forced me to consolidate libraries, generating a single common .css file for all related pages, and has resulted in some level of duplicated code, but has the tradeoff of being cleaner to manage events and reduced page load times due to javascript tasks that are required in some instances to run at page load.



From a story perspective, 6 stories were completed, with one close to completion, and another 5 stories were begun, but not completed, which will be rolled into the third iteration.



The backlog currently contains another 15 items. Many of those stories are related to the front-end HTML pages that will need to be developed that could not even be attempted without the services implementation I have been working on thus far, and I expect many of those tasks to be accomplished reasonably quickly, so at this point, I still feel confident I will be able to deliver on all the stories planned.

Finally, on the topic of design for the HTML pages, I have settled on some common elements, that I intend to use to bind the Look and Feel of my site together. There will be a navbar element at the top of the page, followed by a large visual component referred to by Bootstrap as a Jumbotron. There are also common themes of Terrapin images and a background image that all pages share that is defined in the common .css file to be shared by my HTML pages. Examples of this will be shown later in the Implementation discussion.

IV. Implementation Details

To begin presenting what has been implemented during this iteration, I want to present some quick statistics that were generated to give an idea of progress made. Eclipse has a number of plugins that can generate code statistics driving off any number of criteria. For clarity, I will be presenting statistics in the following 4 categories: Number of Classes, Number of Tests, Total Lines of Code (TLOC), and Meaningful Lines of Code (MLOC – A measurement that ignores whitespace and commented lines).

Project	Classes	Tests	TLOC	MLOC
ac-games-pojos - iteration 1	22	28	1777	1086
ac-games-pojos - iteration 2	38	42	2713	1568
Increase during second iteration	16	14	936	482
ac-games-db - iteration 1	3	0	54	39
ac-games-db - iteration 2	3	0	103	117
Increase during second iteration	0	0	49	78
ac-games-db-mongo - iteration 1	7	3	2841	2419
ac-games-db-mongo - iteration 2	13	9	3200	2753
Increase during second iteration	6	6	359	334
ac-games-restservice-spring - iteration 1	7	4	900	725
ac-games-restservice-spring - iteration 2	22	9	2927	2321
Increase during second iteration	15	5	2027	1596
ac-games-agent - iteration 1	6	0	640	463
ac-games-agent - iteration 2	13	0	1718	1409
Increase during second iteration	7	0	1078	946
Overall System Numbers - iteration 1	45	35	6212	4732
Overall System Numbers - iteration 2	89	60	10661	8168
Increase during second iteration	44	25	4449	3436

This data summary illustrates clearer than a lengthy discussion how progress has been made in all major project components. There was more work done in the Mongo space than is truly reflected in the line counts, since I was able to simplify a handful of operations by refactoring and genericizing a handful of calls.

The REST service grew the most from a raw amount of code perspective. During this iteration I implemented the following new REST service endpoints with full CRUD support (GET, PUT, POST, DELETE) unless otherwise indicated.

`/game`
`/gamereltn`
`/user`
`/collection`
`/collectionitem`
`/login` (Only supports POST for performing login operation, and PUT for updating sensitive user data)

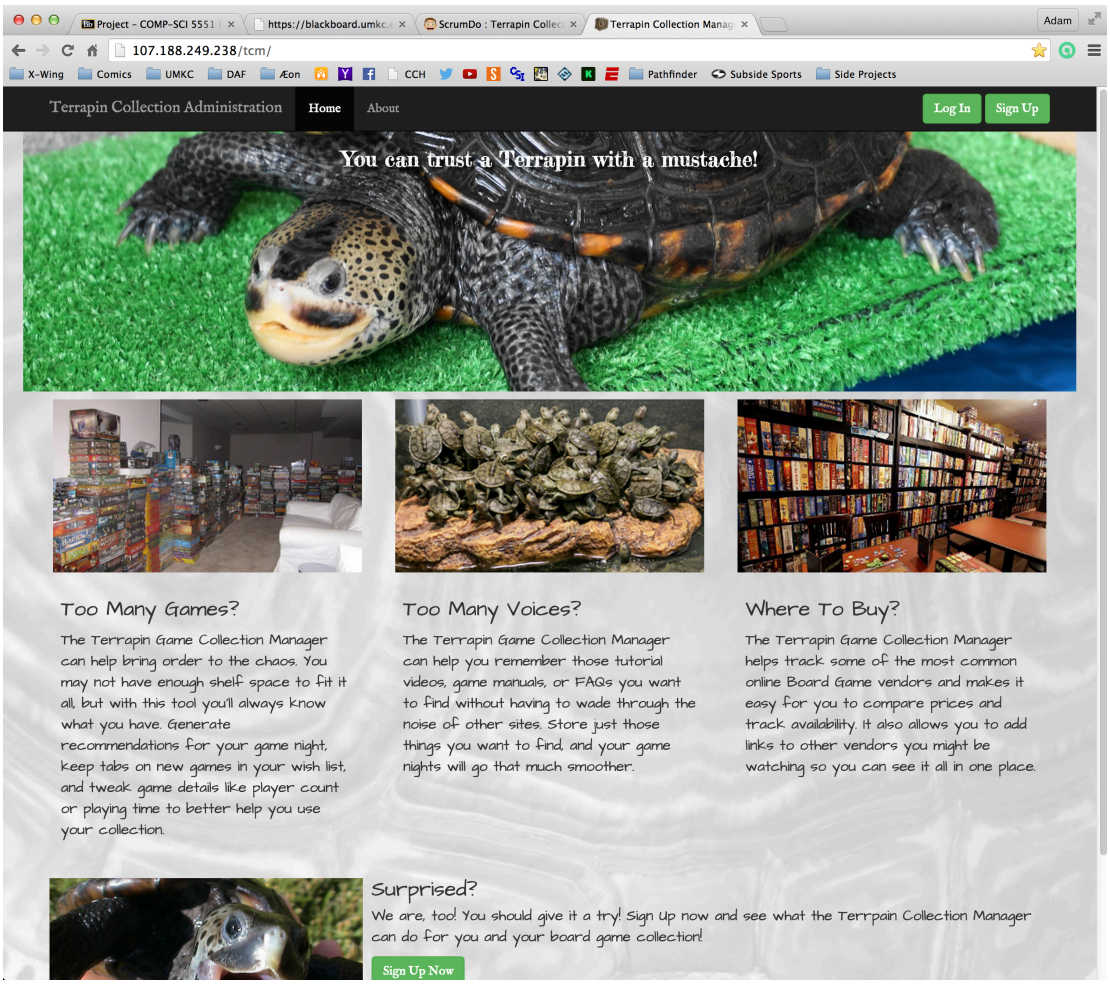
All 6 of these new services, with their corresponding data objects and validation requirements were done this iteration.

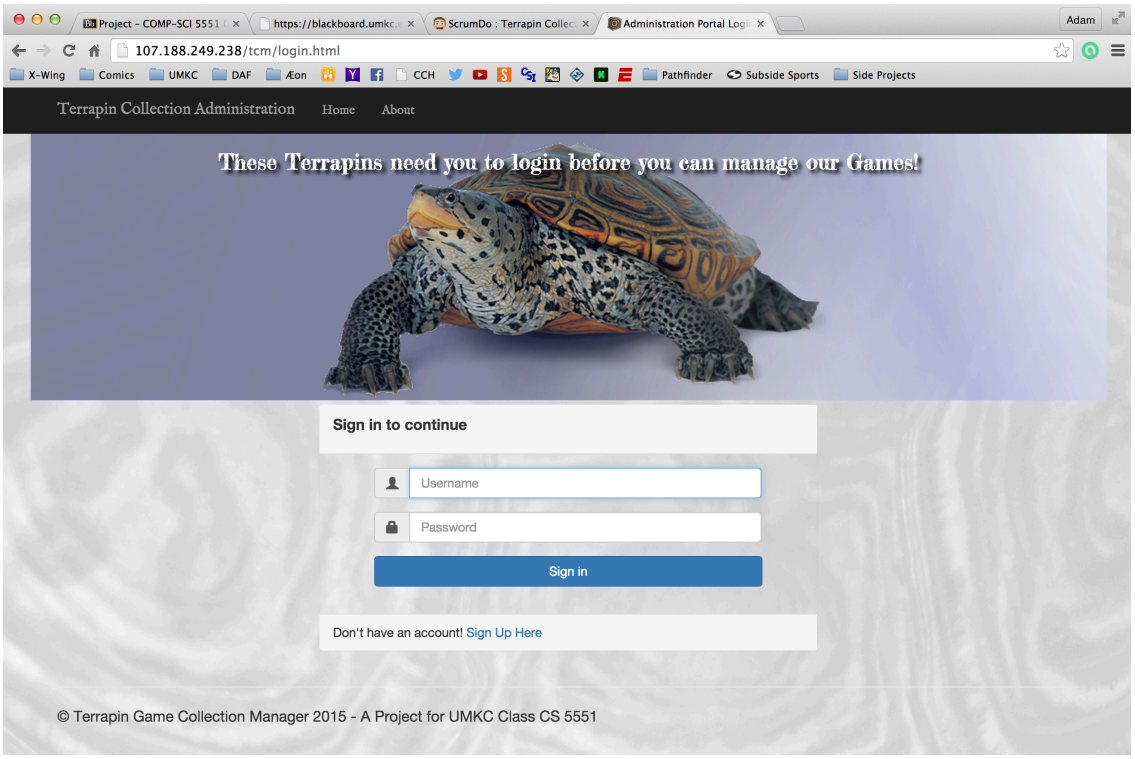
The only major implementation detail that differs from earlier implemented services is that in some cases there are cascading effects of some data changes, for example, if I remove a User from the system, I must also remove his collection and every item in his collection from the system as well.

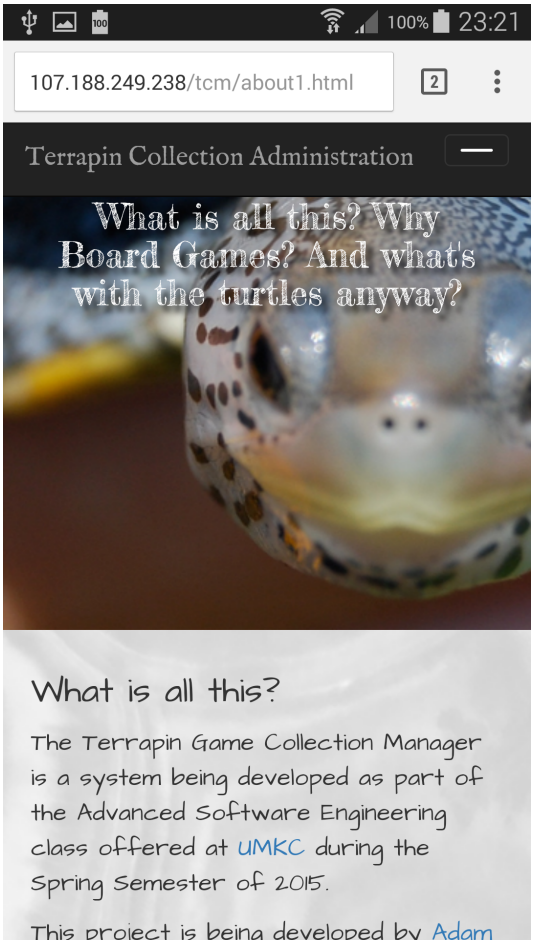
For reference, the code repositories for each project are listed below. All code for this release has been checked in to the Master branch of each project. Because class diagrams at this point are a little large to make inclusion in this document meaningful, they have been uploaded as part of the github project under the src/model folders.

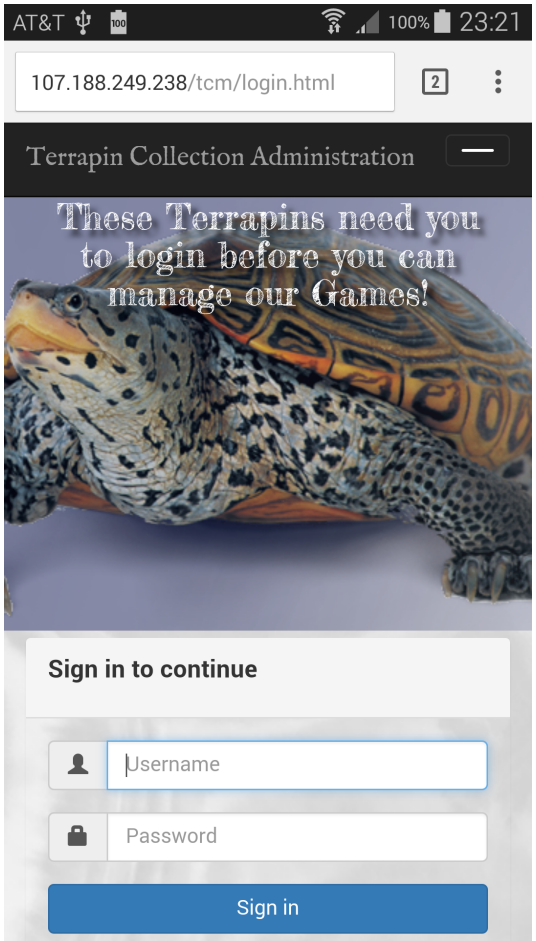
- **ac-games-pojos** – https://github.com/apshaiTerp/ac-games-pojos
- **ac-games-db** – https://github.com/apshaiTerp/ac-games-db
- **ac-games-db-mongo** – https://github.com/apshaiTerp/ac-games-db-mongo
- **ac-games-restservice-spring** – https://github.com/apshaiTerp/ac-games-restservice-spring
- **ac-games-agent** – https://github.com/apshaiTerp/ac-games-agent

Finally, the last element I want to discuss is the HTML development. All development for this project is being checked in to https://github.com/apshaiTerp/agent-site. Included below are some screen shots from both the Standard Web view, as well as Mobile.




Project - COMP-SCI 5551
https://blackboard.umkc.
ScrumDo : Terrapin Collec
Administration Portal Logi
Adam
107.188.249.238/tcm/login.html
X-Wing
Comics
UMKC
DAF
Æon
CCH
Pathfinder
Subside Sports
Side Projects
Terrapin Collection Administration
Home
About
These Terrapins need you to login before you can manage our Games!
Sign in to continue
Username
Password
Sign in
Don't have an account! Sign Up Here
© Terrapin Game Collection Manager 2015 - A Project for UMKC Class CS 5551


100%
23:21
107.188.249.238/tcm/about1.html
2
Terrapin Collection Administration
What is all this? Why Board Games? And what's with the turtles anyway?
What is all this?
The Terrapin Game Collection Manager is a system being developed as part of the Advanced Software Engineering class offered at UMKC during the Spring Semester of 2015.
This project is being developed by Adam


AT&T
100%
23:21
107.188.249.238/tcm/login.html
2
Terrapin Collection Administration
These Terrapins need you to login before you can manage our Games!
Sign in to continue
Username
Password
Sign in

As the screen shots show, by using Bootstrap I was able to implement a responsive design that if not always as clean as the full browser version, is functional and scales all the elements appropriately.

V. Testing

Unit testing was expanded quite a bit with this iteration, though the ac-games-agent process is still without Unit Test.

The important tests I focused on were ensuring that objects behaved correctly, that the REST calls were processed correctly, and that the database operations processed data correctly. All of those tests have been implemented. As with the last iteration, I am including the surefire and clover reports, which have also been uploaded to my documentation site for this iteration. The Code Coverage percentages are lower than the true test coverage numbers because the tests aren't all running through a single source. It is possible to do it this way, but the maven configuration necessary has not been a priority.

- **ac-games-pojos**

Surefire Report

Summary

[Summary] [Package List] [Test Cases]

Tests	Errors	Failures	Skipped	Success Rate	Time
42	0	0	0	100%	0.542

Note: failures are anticipated and checked for with assertions while errors are unanticipated.

Package List

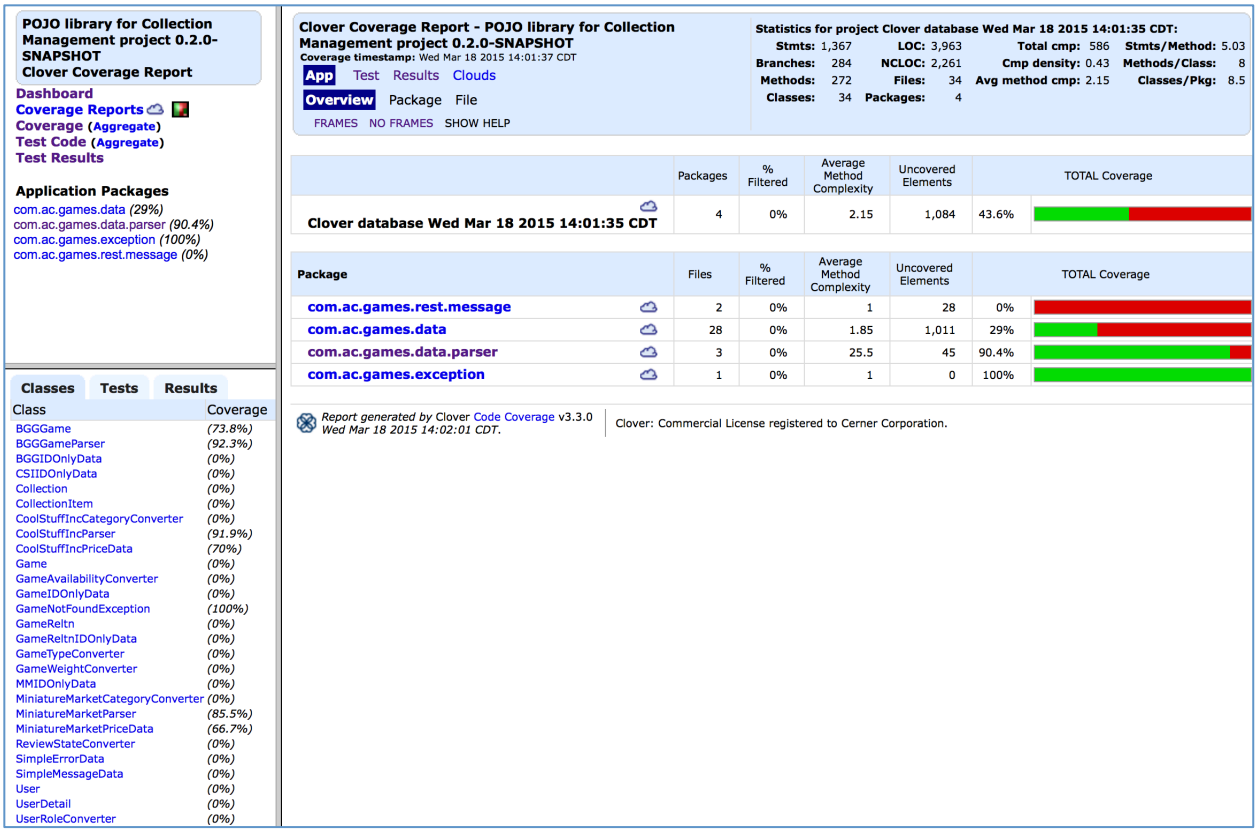
[Summary] [Package List] [Test Cases]

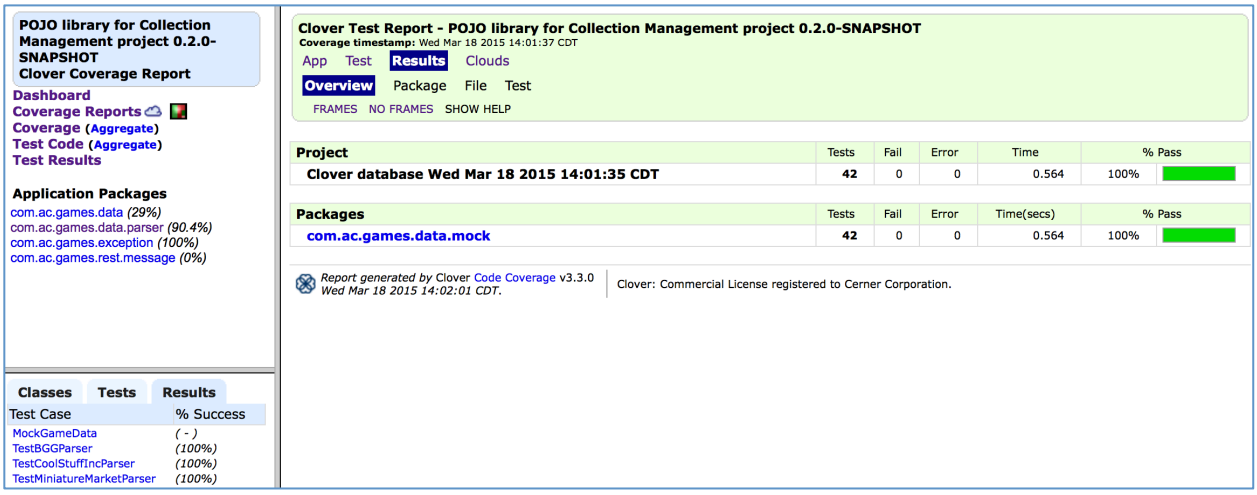
Package	Tests	Errors	Failures	Skipped	Success Rate	Time
com.ac.games.data.mock	42	0	0	0	100%	0.542

Note: package statistics are not computed recursively, they only sum up all of its testsuites numbers.

com.ac.games.data.mock

	Class	Tests	Errors	Failures	Skipped	Success Rate	Time
	TestBGGParser	14	0	0	0	100%	0.45
	TestCoolStuffIncParser	14	0	0	0	100%	0.035
	TestMiniatureMarketParser	14	0	0	0	100%	0.057





Surefire and Clover reports for this project are stored under https://github.com/apshaiTerp/cs-5551-documentation/tree/master/maven%20sites/ac-games-pojos/ac-games-pojos-0.2.0-SNAPSHOT%20site.

- **ac-games-db-mongo**

For this package, the same basic testing strategy was used as was done in the first iteration: Create a series of 3 objects, run a set of inserts and updates, verify that the correct results were obtained for all operations as anticipated. This was done for all new database objects.

Surefire Report

Summary

[Summary] [Package List] [Test Cases]

Tests	Errors	Failures	Skipped	Success Rate	Time
9	0	0	0	100%	3.012

Note: failures are anticipated and checked for with assertions while errors are unanticipated.

Package List

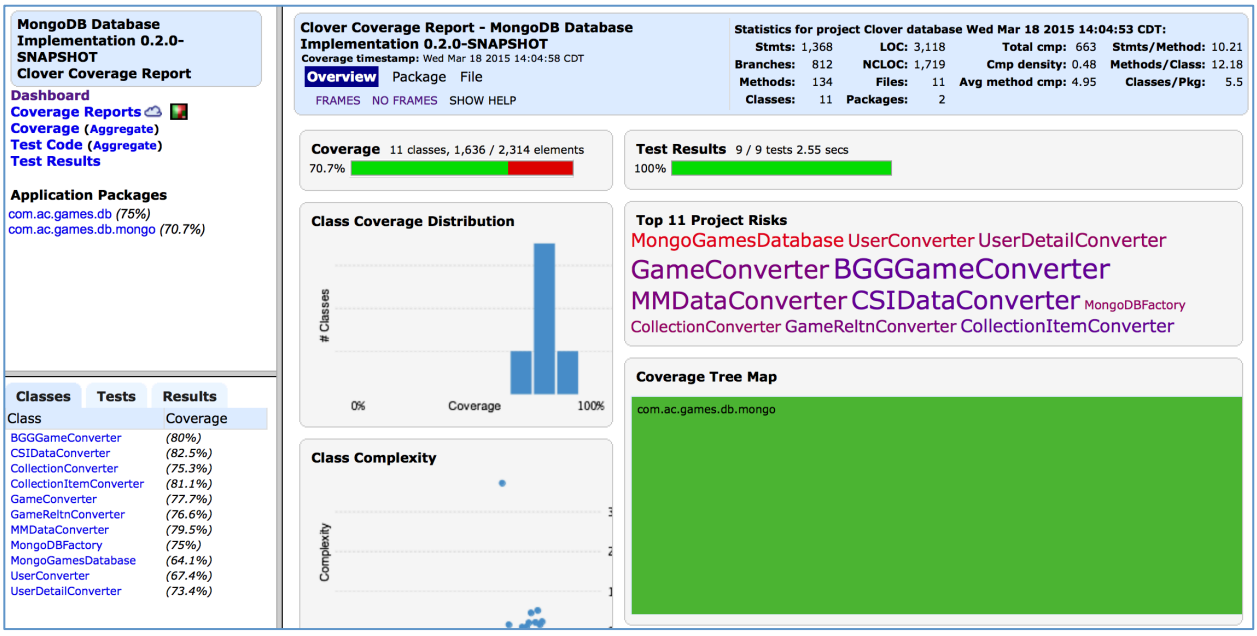
[Summary] [Package List] [Test Cases]

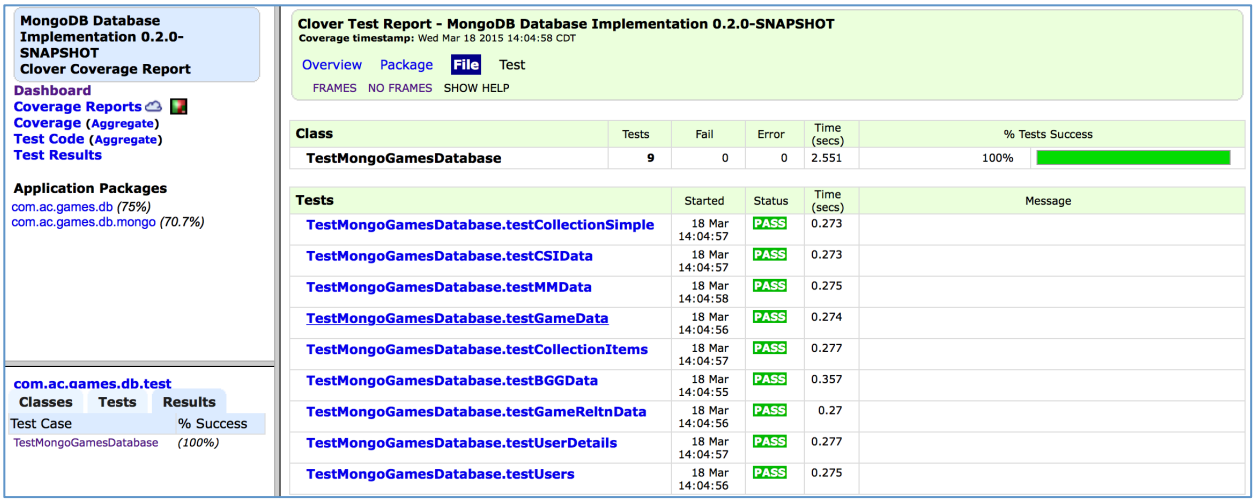
Package	Tests	Errors	Failures	Skipped	Success Rate	Time
com.ac.games.db.test	9	0	0	0	100%	3.012

Note: package statistics are not computed recursively, they only sum up all of its testsuites numbers.

com.ac.games.db.test

	Class	Tests	Errors	Failures	Skipped	Success Rate	Time
	TestMongoGamesDatabase	9	0	0	0	100%	3.012





MongoDB Database Implementation 0.2.0-SNAPSHOT
Clover Coverage Report

Dashboard
Coverage Reports
Coverage (Aggregate)
Test Code (Aggregate)
Test Results

Application Packages
com.ac.games.db (75%)
com.ac.games.db.mongo (70.7%)

com.ac.games.db.test
Classes | Tests | Results

Test Case	% Success
TestMongoGamesDatabase	(100%)

Clover Test Report - MongoDB Database Implementation 0.2.0-SNAPSHOT
Coverage timestamp: Wed Mar 18 2015 14:04:58 CDT

Overview | Package | File | Test
FRAMES NO FRAMES SHOW HELP

Class	Tests	Fail	Error	Time (secs)	% Tests Success
TestMongoGamesDatabase	9	0	0	2.551	100%

Tests	Started	Status	Time (secs)	Message
TestMongoGamesDatabase.testCollectionSimple	18 Mar 14:04:57	PASS	0.273	
TestMongoGamesDatabase.testCSIData	18 Mar 14:04:57	PASS	0.273	
TestMongoGamesDatabase.testMMData	18 Mar 14:04:58	PASS	0.275	
TestMongoGamesDatabase.testGameData	18 Mar 14:04:56	PASS	0.274	
TestMongoGamesDatabase.testCollectionItems	18 Mar 14:04:57	PASS	0.277	
TestMongoGamesDatabase.testBGGData	18 Mar 14:04:55	PASS	0.357	
TestMongoGamesDatabase.testGameReltnData	18 Mar 14:04:56	PASS	0.27	
TestMongoGamesDatabase.testUserDetails	18 Mar 14:04:57	PASS	0.277	
TestMongoGamesDatabase.testUsers	18 Mar 14:04:56	PASS	0.275	

Surefire and Clover Reports for this project are stored under https://github.com/apshaiTerp/cs-5551-documentation/tree/master/maven%20sites/ac-games-db-mongo/ac-games-db-mongo-0.2.0-SNAPSHOT%20site.

- **ac-games-restservice-spring**

As with the first iteration, testing was implemented using the Spring Framework and the Rest Assured Mock API. Like with the first iteration, I attempted to take a single object through all the calls for that REST endpoint. This includes in more complicated cases like new user creation checking all objects created by that process.

I discovered during this process that there are some limitations to the Mock framework, especially when it comes to data validation. For example, the Rest Assured framework does not correctly process Date values. Instead of actually converting the value to a Date, it displays the millisecond value represented by that Date. This is a limitation only of the test harness, as I can verify through non-mock usage that actual Date values are being passed through the call. Another limitation is the lack of Enum handling. Several of my report objects use Enum values. The framework is automatically casting Enum values into the toString() literal value, which made initially testing some objects difficult.

Finally, a shortcoming in current test is that most of my tests demonstrate the Happy path use case, even though there is robust parameter validation and error handing in the REST controllers. It was not deemed a prudent investment of time to implement all the edge case executions as tests at this time, since I have the virtue of being the only user and developer of this system. Had this not been the case, these would have been given a higher priority. That said, the tests as implemented still are sufficient to ensure all REST-accessible methods execute as expected.

Surefire Report

Summary

[Summary] [Package List] [Test Cases]

Tests	Errors	Failures	Skipped	Success Rate	Time
9	0	0	0	100%	10.796

Note: failures are anticipated and checked for with assertions while errors are unanticipated.

Package List

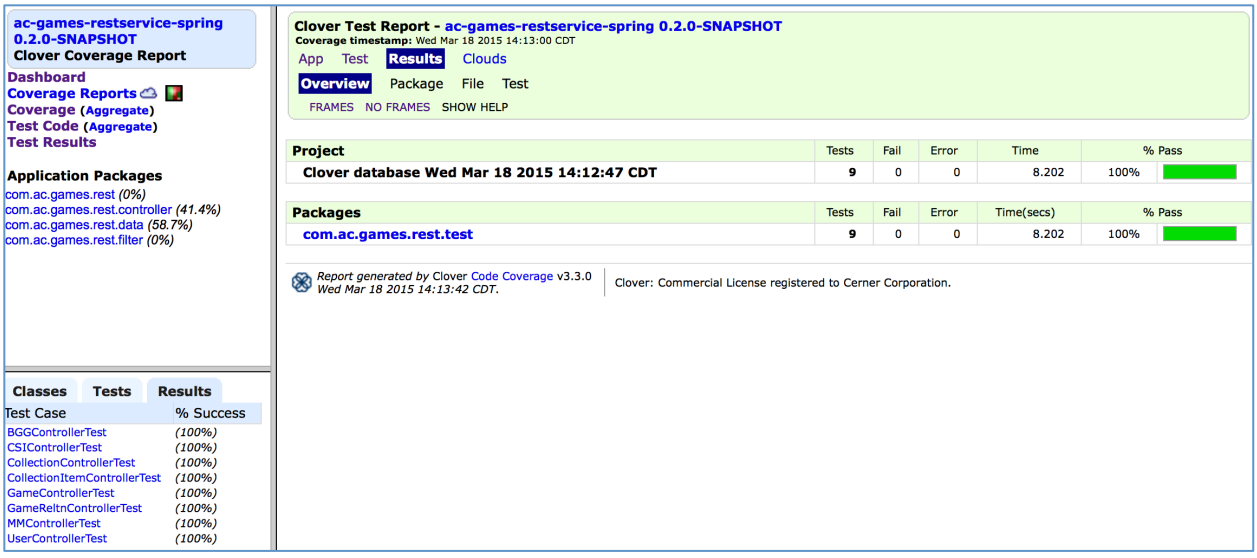
[Summary] [Package List] [Test Cases]

Package	Tests	Errors	Failures	Skipped	Success Rate	Time
com.ac.games.rest.test	9	0	0	0	100%	10.796

Note: package statistics are not computed recursively, they only sum up all of its testsuites numbers.

com.ac.games.rest.test

	Class	Tests	Errors	Failures	Skipped	Success Rate	Time
	BGGControllerTest	2	0	0	0	100%	3.834
	CollectionControllerTest	1	0	0	0	100%	0.731
	CollectionItemControllerTest	1	0	0	0	100%	0.623
	CSIControllerTest	1	0	0	0	100%	1.058
	GameControllerTest	1	0	0	0	100%	0.789
	GameReltnControllerTest	1	0	0	0	100%	0.274
	MMControllerTest	1	0	0	0	100%	2.829
	UserControllerTest	1	0	0	0	100%	0.658



ac-games-restservice-spring 0.2.0-SNAPSHOT
Clover Coverage Report
Dashboard
Coverage Reports
Coverage (Aggregate)
Test Code (Aggregate)
Test Results

Application Packages
com.ac.games.rest (0%)
com.ac.games.rest.controller (41.4%)
com.ac.games.rest.data (58.7%)
com.ac.games.rest.filter (0%)

Classes Tests Results

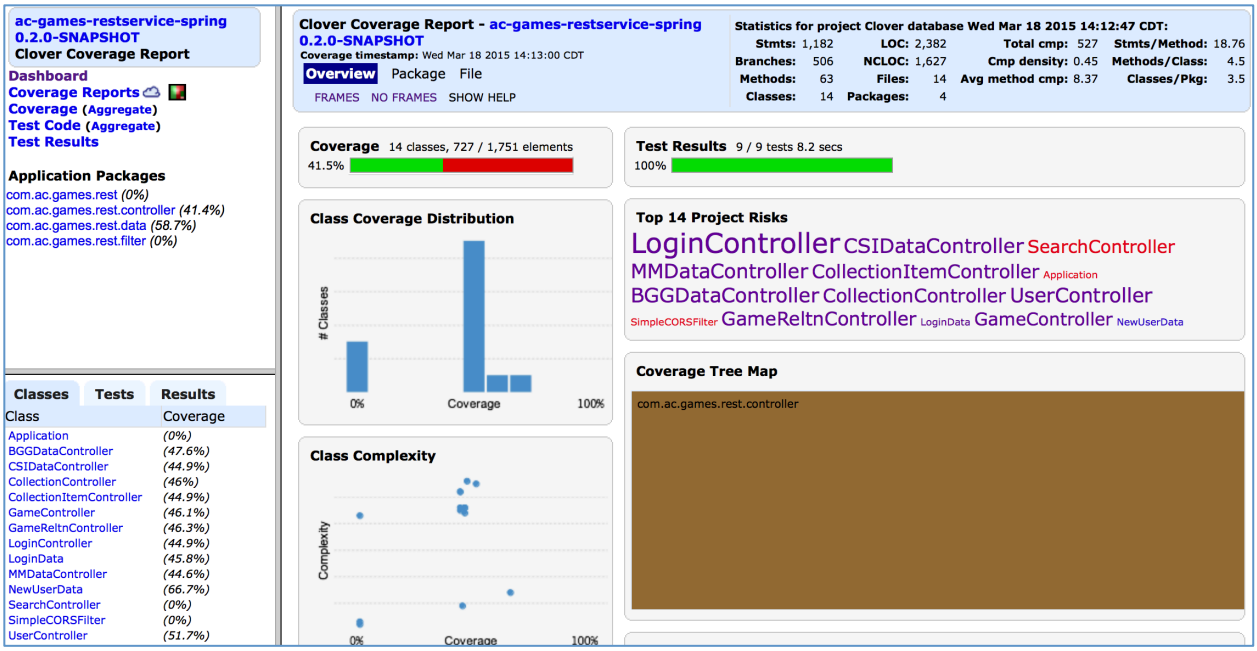
Test Case	% Success
BGGControllerTest	(100%)
CSIControllerTest	(100%)
CollectionControllerTest	(100%)
CollectionItemControllerTest	(100%)
GameControllerTest	(100%)
GameReltnControllerTest	(100%)
MMControllerTest	(100%)
UserControllerTest	(100%)

Clover Test Report - ac-games-restservice-spring 0.2.0-SNAPSHOT
Coverage timestamp: Wed Mar 18 2015 14:13:00 CDT
App Test Results Clouds
Overview Package File Test
FRAMES NO FRAMES SHOW HELP

Project	Tests	Fail	Error	Time	% Pass
Clover database Wed Mar 18 2015 14:12:47 CDT	9	0	0	8.202	100%

Packages	Tests	Fail	Error	Time(secs)	% Pass
com.ac.games.rest.test	9	0	0	8.202	100%

Report generated by Clover Code Coverage v3.3.0
Wed Mar 18 2015 14:13:42 CDT.
Clover: Commercial License registered to Cerner Corporation.



Surefire and Clover Reports for this project are stored under https://github.com/apshaiTerp/cs-5551-documentation/tree/master/maven%20sites/ac-games-restservice-spring/ac-games-restservice-spring-0.2.0-SNAPSHOT%20site.

VI. Deployment

The ScrumDo link to this iteration can be found here:
https://www.scrumdo.com/projects/project/terrapin-collection-manager/iteration/121582

As discussed previously, there are 6 stories that were completed this iteration, and 6 more that are in-flight that will be rolled into the next iteration.

The final end-states for my projects has been included in the GitHub documentation site, but this is the list of the final java project end-states:

```
ac-games-pojos-0.2.0-SNAPSHOT.jar
ac-games-db-0.2.0-SNAPSHOT.jar
ac-games-db-mongo-0.2.0-SNAPSHOT.jar
ac-games-restservice-spring-0.2.0-SNAPSHOT.jar
ac-games-agent-0.2.0-SNAPSHOT.jar
```

Because I have chosen to implement my project in Java, I needed to find an alternate form of deploying my REST service and other application elements so they can be publically accessible. To this end, I used a spare computer at home to install an Ubuntu desktop, from which I am running my own MongoDB Instance and Tomcat Server. The Tomcat server hosts both my REST service as well as the web site being developed for this project.

The root URL for my service is http://107.188.249.238/ac-games-restservice-spring-0.2.0-SNAPSHOT/.

The URL for my site is http://107.188.249.238/tcm/

All screen caps for the website generated above were taken using the live site deployment.

VII. Project Management

Because I am a team of one, I can attest that all work completed on this project is my own. While keeping track of the time spent has been difficult (I don't track time spent, especially now that I can't track it in ScrumDo), I would estimate that I spend about 20-25 hours weekly working on this project. I believe my code output is indicative of the time commitment I have made to work on this project.

While I remain optimistic at this point that I will complete all of the desired features and stories by the end of this project, I have had concerns that I might have overreached in my ambition. I will admit it is proving difficult to maintain this level of effort while working full time and having a second class. Part of this fear is largely due to the fact that until the last week, I have been working exclusively on framework components. This is an effort I believe will be valuable in the long run, but has at times made it difficult to gauge how much progress I was making on the application as a whole.

I believe the end of the third iteration should give a better measurement of how close I will be towards satisfying my primary goals with this application, as I hope to devote much more time to the client-side development work.

VIII. References

[1] – https://github.com/apshaiTerp/cs-5551-documentation/blob/master/CS551-Project-Proposal.pdf
[2] – https://github.com/apshaiTerp/cs-5551-documentation/blob/master/CS%205551%20Project%20Plan.pdf
[3] – https://github.com/apshaiTerp/cs-5551-documentation/blob/master/CS%205551%20First%20Increment%20Report.pdf