

Literary Worlds Javascript Client

John Lewis, Owen Watson, Tim Cunningham

November 10, 2014

Table of contents

Background

Introduction

Design Decisions

Stories

Implementation

Testing

Security

Background

- ▶ Literary Worlds is an multiuser text based game used for English education at WMU.
- ▶ These games are known as MOOs (Multiuser Object Oriented), or MUDs (Multi User Domains)
- ▶ Most of these games provide a telnet interface for playing, Literary Worlds uses enCore with MOOtcn, a Java applet.
- ▶ The aim of this project is to provide a drop-in replacement user interface in Javascript.

enCore Xpress interface

Fall
Apart</i>, [SL] to Shakespeare Learning Library, [1984
(Thoughtcrimes)] to
<i>1984</i>, [PP] to Pied Piper Courtyard Entrance, [BN] to
<i>Native Son</i>
- Bigger's World, [MM] to Midsummer Madness, [TOS] to Taming of the
Shrew,
[DL] to Mrs. Dalloway's London, [D] to <i>Democracy</i> - The
Inmutable Hill,
[ILY] to <i>An Island Like You</i>, [F451] to <i>Fahrenheit
451</i>, [GM] to
"Glass Menagerie" The Wingfield Apartment, [ASP] to Middangeard
Anglo-Saxon
Mead-Hall, [AIA] to Angels in America, [WIG] to Wild Irish Girl,
[GG] to
<i>The Great Gatsby</i>, [SB] to Shelter Bay, [CD] to Charles
Dickens -
London Bridge, [T] to Virtual Teapest, [MM] to <i>Of Mice and
Men</i>, [LOTF]
to <i>Lord of the Flies</i>, [#62] to General Prologue--Tabard Inn
Cheapside,
[#62] to <i>Number the Stars</i>, [#62] to Moll's World, [#62] to
La Mancha

MESSAGE OF THE DAY: Lord, what fools these mortals be!

##ncp version: 2.1 to: 2.1
Johnson the Literary Worlds Security Guard says, "Hi Dickens_Guest!
Name Connected Idle time Location

Dickens_Guest (#169) 29 seconds 0 seconds Literary Worlds
Welcome Center
DrHaughey (#713) an hour an hour Dr. Haughey's
Office
MrsHaughey (#5526) a day a day Mrs. Haughey's
Fourth-Grade CL

Total: 3 persons, 1 of whom has been active recently.
You say, "hello"

say
normal
say
emote

me to Literary Worlds. Enjoy your visit! **Welcome** to Literary Worlds. E

Literary Worlds Welcome Center

Follow the links below to virtual museums and interactive worlds!

You see:

- [Literary Worlds Newspaper](#)
- [Coffee bar](#)
- [Johnson the Literary Worlds Security Guard](#)
- [Dickens Guest](#)

Links:

- [Teaching to Exceed Virtual School](#)
- [Campus](#)
- [Brave New World](#)
- [Things Fall Apart](#)
- [Shakespeare Learning Library](#)
- [1984](#)
- [Pied Piper Courtyard Entrance](#)
- [Native Son - Bigger's World](#)
- [Midsummer Madness](#)
- [Taming of the Shrew](#)

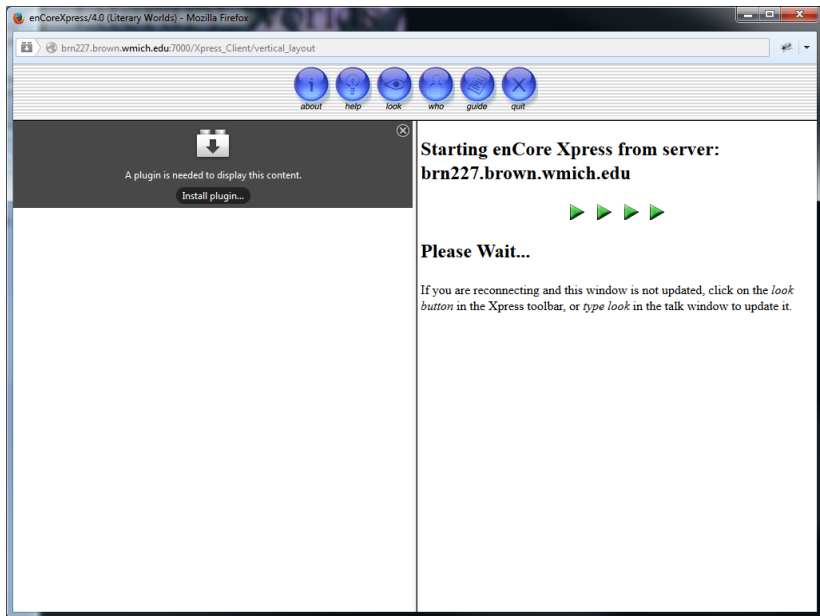
Client

- ▶ Client: Allen Webb
- ▶ Professor of Comparative Literature and Postcolonial Studies at Western Michigan University's Department of English
- ▶ In 2003, Robert Rozema, a PhD student under Allen Webb created the prototype Literary World.
- ▶ Several virtual worlds were created that form the Literary Worlds project.
- ▶ The Literary Worlds project was one of seven projects to receive funding from the Western Michigan University President's Innovation Fund.

Technical Introduction

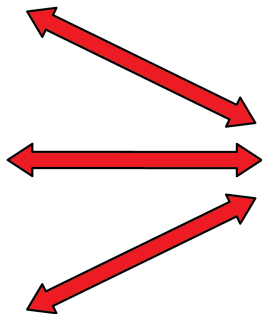
- ▶ LambdaMOO is a MUD server software package(as well as a particular MUD), Literary Worlds uses the server software.
- ▶ enCore Xpress is an graphical interface and MUD database package that works with the LambdaMOO server to provide a browser based text client using a Java applet as well as a graphical, mouse driven interface.
- ▶ Literary Worlds uses version 4 of enCore, there is a version 5 of enCore that attempts to provide a web interface without a Java applet, however it is beta software and hasn't been actively developed since 2006.

Plugin Missing



Client-Server Diagram

PCs with Java installed
in their browsers



LambdaMOO server with
enCore database

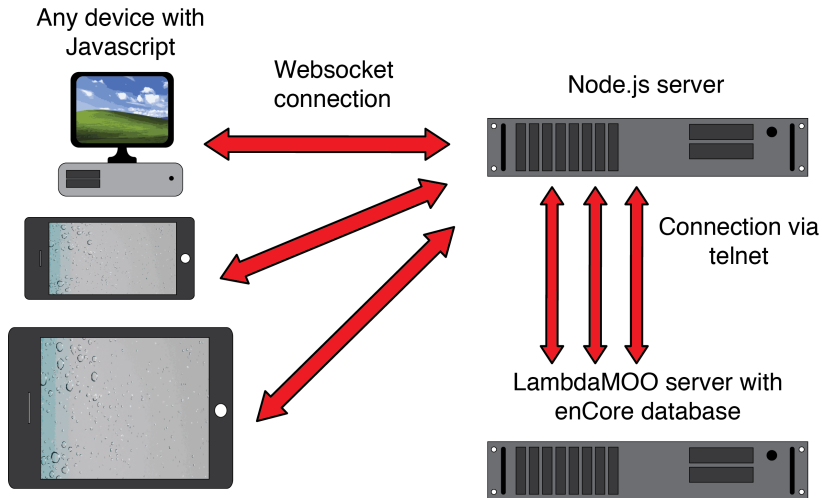


Connection via telnet
and HTTP

Client-Server Design

- ▶ It is not possible to initiate a raw TCP connection in clientside Javascript, unlike Java applets.
- ▶ Therefore, we need an intermediary server to connect over TCP, as well as to the browser client, and send data back and forth between the two.
- ▶ This server must also support multiple concurrent users and handle asynchronous tasks and events.

Client-Server Diagram



Client Technology

- ▶ Socket.io
 - ▶ Allows realtime communication between a server program and browser clients.
- ▶ Backbone
 - ▶ Backbone is a templating library for Javascript web applications
- ▶ Bootstrap
 - ▶ Bootstrap is a frontend layout toolkit
- ▶ Coffeescript
 - ▶ Coffeescript is a simple language that translates to Javascript

Basic Text Interface

Literary Worlds

Disconnect Login Options

confusing and frustrating, and the best way to deal with it is to use the
enCore Xpress client. There are also many other MUD clients available, see
for example <http://web.nwe.ufl.edu/~tarl/connections/client-info.html>.

To log out type: @quit (or click on the QUIT button in Xpress)

Finally, remember that one of the most useful help commands in MUD is this
one: say Hi, I'm new here. Do you have a minute for a question?

Good luck and happy MUDing.
Cynthia Haynes and Jan Rune Holmevik

No wizards currently logged in.
Wizard has connected.
jack has connected.

Name	Connected	Idle time	Location
----	-----	-----	-----
guest_Guest (#166)	a minute	0 seconds	EnCore Starting Point
jack (#170)	7 seconds	7 seconds	EnCore Starting Point
Wizard (#2)	31 seconds	28 seconds	EnCore Starting Point

Total: 3 persons, all of whom have been active recently.
testuser has connected.

Enter text here

Server Technology

- ▶ Node.js
 - ▶ Node.js is a server side runtime that uses the asynchronous features of Javascript to build web application servers. It provides a rich set of networking libraries, and uses the Google Chrome Javascript engine, V8.
 - ▶ It is the first class citizen for socket.io, so it was natural to choose it for the server.
- ▶ Express
 - ▶ Express is a web app framework for Node.js
 - ▶ It provides tools such as easy interfaces for REST, URL routing, cookies, etc. similar to what Ruby on Rails does for the Ruby language.
- ▶ Socket.io

Stories

- ▶ Text Mode
 - ▶ Client side Javascript MUD client
 - ▶ This is reason an intermediary server is needed, to handle the telnet connection on behalf of each client.
- ▶ Graphical Mode
 - ▶ This work is already done in enCore Xpress, there is no need to reinvent it.
 - ▶ The new web application will simply need to serve the existing enCore Xpress interface in a coherent way.

Continuous Integration

- ▶ Purpose

- ▶ Continuous integration aims to merge code from a developer's working copy many times a day into a shared mainline.
- ▶ Before any code is merged a, build server runs unit tests on the code, and if passed will be merged into the mainline.f
- ▶ This helps to improve the quality of the software and reduce the time to deliver it.
- ▶ The end goal of this process is to be able to automatically build and deploy the software whenever all of the tests are passing

- ▶ Possible Tools

- ▶ Jenkins
- ▶ CIRCLE
- ▶ TeamCity
- ▶ Hudson

Jenkins

- ▶ Pros:

- ▶ Widely used and documented
- ▶ open sourced
- ▶ Wide range of support for different systems
- ▶ Can be extended with plugins
- ▶ Github integration

- ▶ Cons:

- ▶ Manual setup required
- ▶ Have to get a server to run Jenkins

Unit Testing

- ▶ Framework
- ▶ Matching Tools

Security

- ▶ Telnet is plain text in transport, so it is inherently vulnerable to eavesdropping.
- ▶ For the initial work on the project, security is not a main concern.
- ▶ In the future, the telnet server can be protected from external network connections using containerization such as docker
- ▶ This way only the Node.js server can connect via telnet, and user data can be protected with SSL in transport.
- ▶ This strategy would disable the legacy enCore Xpress interface