

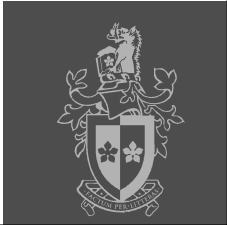
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W3bworld – Bringing L3DGE to HTML5

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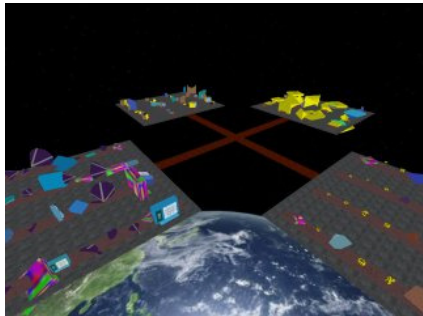
CAIA Seminar – Aug 8th 2012



L3DGEWorld



- Visualises the state of an environment through visual characteristics
- Each entity is represented by a single in-world object
- Requires the use of a sizeable dedicated client program



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CAIA Short Talk – Chris Holman <http://caia.swin.edu.au> 6963420@student.swin.edu.au 16th August 2012 2

HTML5 – Taking L3DGE to the cloud



- Can a modern browser replicate L3DGEWorld?
 - 2D animation and 3D rendering (WebGL) from within the browser, using Javascript
 - Move from AJAX polling to full duplex communication
 - Significantly faster JS engines

What is this “WebGL”?



- A 3D renderer inside the browser
- Provides an OpenGL-like interface.
- Plenty of third-party libraries to ease development



What is this “Websockets”?



- Socket-like functionality
- Operates over “upgraded” HTTP connections

```

Follow TCP Stream
Stream Content
GET / HTTP/1.1
Upgrade: websocket
Connection: Upgrade
Host: 192.168.1.6:8888
Origin: http://localhost
Sec-WebSocket-Key1: L270 [ 1'!d TL7o& .4k9U 1 92
Sec-WebSocket-Key2: 2 4 79859)8= 68

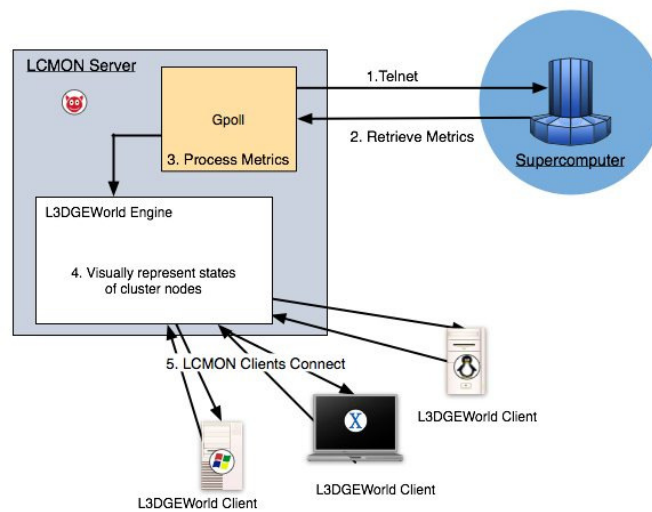
.k$.a...HTTP/1.1 101 websocket Protocol Handshake
Upgrade: websocket
Connection: Upgrade
Sec-WebSocket-Origin: http://localhost
Sec-WebSocket-Location: ws://192.168.1.6:8888/

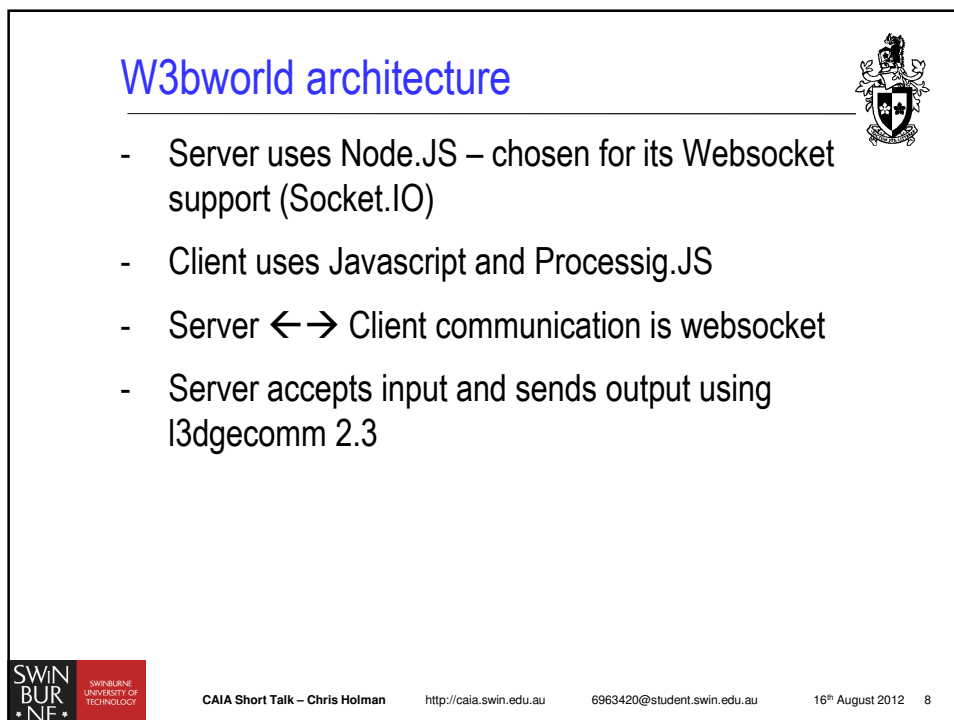
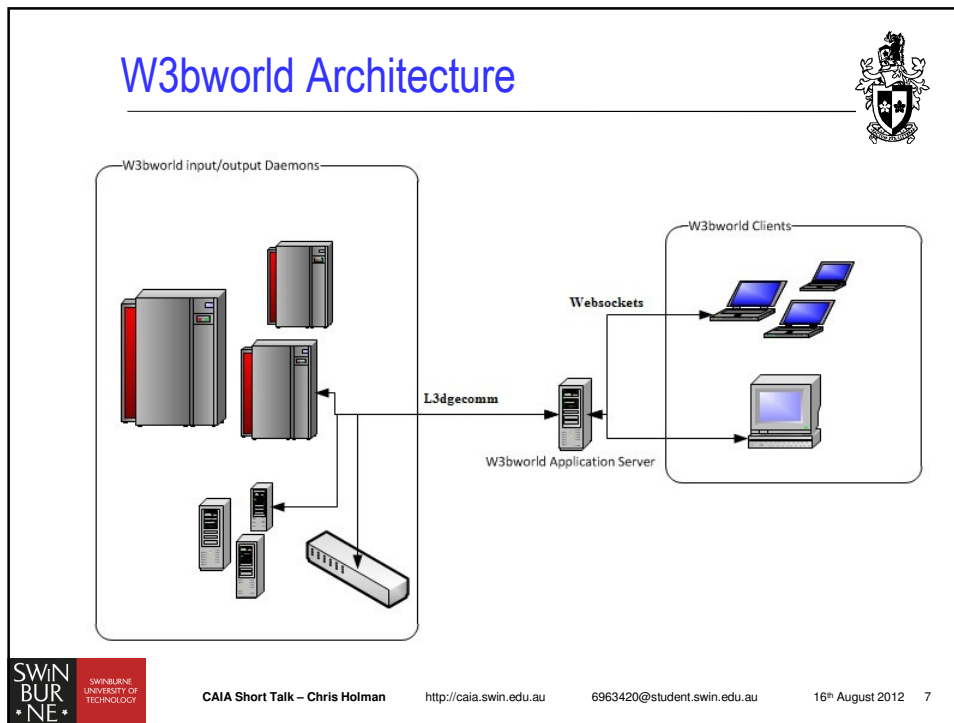
$.A2..5.%.;....{"Type":"NewParticipaint","Data":"wayne"}..{"Players":
["wayne"],"voteStatus":[]}.
    
```

Data transferred



L3DGEWorld Architecture





Demo – W3bworld



- Fullscreen API
- Camera movement
- Inspecting objects

Demo – input daemon



- Using Gpoll + W3bmon, we can emulate the functionality of LCMon.
- Gpoll reads data from the Green Machine supercomputer, takes key datapoints for each node and turns them in to a visual metric. It was written for the original LCMon.

Demo – input daemon



- Environmental sensors
 - Light
 - Temperature
 - Open doors

Demo – output daemon



- L3dgecomm allows for data sources to be interacted with from within the w3bworld client
- In this demonstration, the entity ID that we shoot dictates the angle the servo moves too.
- Utilising multiple ‘tools’, we can perform different actions on a node (not implemented yet)

Real applications?



- W3bmon, as demonstrated
- Environmental monitoring using Arduino (or similar)
 - Temperature around a DC
- Network monitoring
 - Home networks
 - Server farms, etc
- Device monitoring
 - ITS' UPS monitor, LupsMon

Trivial to expand



- The application server is separated in to two parts: a l3dgecomm server and the w3bworld server.
- Replacing l3dgecomm with a custom input is trivial

```
var EventEmitter = require('events').EventEmitter;
module.exports = new EventEmitter();

function doThings() {
  var updateMessage = ["", entityID, metricID, messageType, Math.floor(
    Math.random() * 40 ).toString() ];
  module.exports.emit("update", updateMessage);
}
setInterval( function() { doThings(); }, 5000 );
```

Pros and cons?



- L3DGEWorld provides a much better looking experience (shaders, detailed levels, etc)
- W3bworld has no entity limits
- W3bworld client will work on any platform with a WebGL-enabled webbrowser – browser support is increasing

Browser support



- Firefox 4.0 and above, Firefox for Android
- Chrome 9.0 and above
- Safari (disabled by default)
- Opera 11 and 12, Opera Mobile for Android
- IE10

Where to?



- A new version of l3dgeom to expand the capabilities (eg, set absolute position/rotation)
- Find a better/faster Javascript 3D rendering library, for better looking worlds and more represented entities
- Enhance as HTML5 becomes more powerful (eg, the upcoming pointer-lock API)
- Interface with device consoles from within the webpage (eg, SSH to server or router)