Web-based Control Application Using WebSocket

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Introduction

- Web-based application has many advantages
  - Platform independent
  - Easy to develop and many developers
  - Easy to keep running application newest
- Question is “Are control applications able to be written as web-based applications?”
- Answer before HTML5 is “Partially Yes”.
  - Periodically Polling type application can be realized such as alarm display.

What is WebSocket?

- WebSocket a part of HTML5 and it brings asynchronous and full-duplex communication with server and client.
- WebSocket protocol is built-in most modern web-browsers and you can easy to open in a javascript, like
  `ws = WebSocket("ws://<host>[:port]");`
  `ws.send("<message>");`
  `ws.onmessage() = function(event){...};`
- Web applications are written in Javascript most cases and it brings asynchronous communication.
- What is lacks in web application?
  - Notification from server side to the client.
  - To solve this situation, long polling method, called “Comet” is introduced but there were many limitations.
  - Require open/close session for every message exchange.
  - Cannot send another message from client during waiting for returned message.

WebSocket to MADODA gateway

Available Platforms and Clients

Examples

Stepper Motor Control

BL26B2 Monochromator Control

Diffractometer Control

Note on WebSocket Version

The WebSocket protocol is under development. Latest version is “hybi-10” which is opened to the World in this July and expected to be a final version. My WebSocket server is not based on hybi-10 but on hybi-00 because currently most browser’s implementations are based on the hybi-00 (Latest Google Chrome and Firefox’s WebSocket implementations are based on newer version). There are reported that the hybi-00 contains a security issue, so the Opera browser and Firefox’s WebSocket are turned off by default. You have to turn on the WebSocket using “about:config” dialog.

Note PC, PDA

Table of Available Platforms and Clients

<table>
<thead>
<tr>
<th>Platform</th>
<th>Windows</th>
<th>MacOSX</th>
<th>Linux (Ubuntu)</th>
<th>iOS</th>
<th>Android (OS 3.5)</th>
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<tbody>
<tr>
<td>Google Chrome</td>
<td>○</td>
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<tr>
<td>Opera (10,+)</td>
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Not only PC or Workstation OS but mobile device OSs are available for the platform of the WebSocket support web-browsers. WebSocket based control applications can be applicable for the applications running in the central control room and applications for the handy terminal which is useful for tuning, testing and trouble shooting of equipment.

WebSocket is also applicable for the wide-area remote experiment system (please reffer the presentation THBHAUST05 on Thursday morning) because it is easy to maintain the application on the remote user latest.

Conclusion

- Anser for the question “Are control applications able to be written as web-based application?” become now “YES” with the WebSocket.
- WebSocket based application will be used widely on control applications.