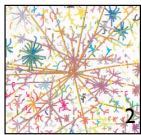


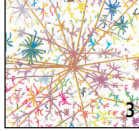
Google Web Toolkit



Webtechnológia I

GWT

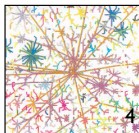
-
- Java fejlesztő környezet AJAX alkalmazások kliens oldali komponensének fejlesztésére
 - felhasználói felület (widgetek)
 - aszinkron RPC
 - history menedzsment, bookmarking



Webtechnológia I

GWT

- GWT compiler
 - Java -> JavaScript
 - Hosted mode – embedded browser window, JVM
 - Web mode – JavaScript, html – normál browser
 - GWT runtime library – Java runtime library emuláció



Webtechnológia I

Fejlesztési folyamat

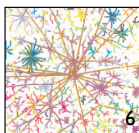
- Java kód editálás pl. Eclipse
- Java kód debuggolás
- Hosted mode vizuális debuggolás
- Fordítás JavaScriptre
 - tesztelés browserben



Webtechnológia I

Java támogatás

- byte, char, short, int, long (float), float, double, Object, String
- try, catch, finally
- JavaScript interpreterek egyszálúak
- java.lang, java.utils



Webtechnológia I

Packages

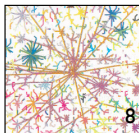
com.google.gwt.core.client	Fundamental classes used in client-side GWT code.
com.google.gwt.core.ext	Classes used to extend the GWT compiler.
com.google.gwt.core.ext.typeinfo	Type-introspection support classes used by generators.
com.google.gwt.http.client	Provides the client-side classes and interfaces for making HTTP requests and processing the associated responses.
com.google.gwt.i18n.client	Internationalization support for GWT applications.
com.google.gwt.json.client	Classes for parsing and creating JSON encoded values.
com.google.gwt.junit.client	Classes and modules used in building JUnit tests.
com.google.gwt.user.client	Fundamental user-interface classes used in client-side GWT code.
com.google.gwt.user.client.rpc	Classes used in client-side implementation of remote procedure calls.
com.google.gwt.user.client.ui	Widgets, Panels, and other user-interface classes.
com.google.gwt.user.server.rpc	Classes used in server-side implementation of remote procedure calls.
com.google.gwt.xml.client	Basic classes used in XML DOM parsing and XML document generation.



Webtechnológia I

com.google.gwt.core.client

- EntryPoint interfész
 - public void onModuleLoad()
 - modul belépési pont



Webtechnológia I

com.google.gwt.http.client

- Kliens oldali http kérések és válasz feldolgozás
 - Request
 - cancel(), isPending()
 - RequestBuilder
 - RequestBuilder(RequestBuilder.Method httpMethod, String url)
 - public Request sendRequest(String requestData, RequestCallback callback)
 - RequestCallback
 - onError(Request, Throwable)
 - onResponseReceived(Request, Response)
 - Response
 - getHeaders()
 - getStatusCode()
 - getText()



Webtechnológia I

GET példa

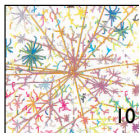
```
public class GetExample implements EntryPoint {
    public static final int STATUS_CODE_OK = 200;

    public static void doGet(String url) {
        RequestBuilder builder = new RequestBuilder(RequestBuilder.GET, url);

        try {
            Request response = builder.sendRequest(null, new RequestCallback() {
                public void onError(Request request, Throwable exception) {
                    // Code omitted for clarity
                }

                public void onResponseReceived(Request request, Response response) {
                    // Code omitted for clarity
                }
            });
        } catch (RequestException e) {
            // Code omitted for clarity
        }
    }

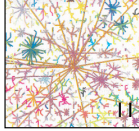
    public void onModuleLoad() {
        doGet("/");
    }
}
```



Webtechnológia I

com.google.gwt.json.client

- JSONParser
- JSONValue
 - JSONArray, JSONBoolean, JSONNull, JSONNumber, JSONObject, JSONString



Webtechnológia I

JSON példa

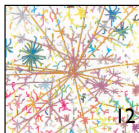
```
private class JSONResponseTextHandler implements ResponseTextHandler {
    public void onCompletion(String responseText) {
        try {
            JSONValue jsonValue = JSONParser.parse(responseText);
            displayJSONObject(jsonValue);
        } catch (JSONException e) {
            displayError(responseText);
        }
        searchButton.setText(SEARCH_BUTTON_DEFAULT_TEXT);
    }
}

...
private void displayJSONObject(JSONValue jsonValue) {
    jsonTree.removeItem();
    jsonTree.setVisible(true);
    TreeItem treeItem = jsonTree.addItem("JSON Response");
    addChildren(treeItem, jsonValue);
    treeItem.setStyleName("JSON-JSONResponseObject");
    treeItem.setState(true);
}

...

private void addChildren(TreeItem treeItem, JSONValue jsonValue) {
    JSONArray jsonArray;
    JSONObject jsonObject;
    JSONString jsonString;

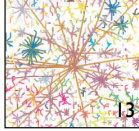
    if ((jsonArray = jsonValue.isArray()) != null) {
        for (int i = 0; i < jsonArray.size(); ++i) {
            TreeItem child = treeItem.addItem(getChildText("[["
                + Integer.toString(i) + "]]"));
            addChildren(child, jsonArray.get(i));
        }
    } else if ((jsonObject = jsonValue.isObject()) != null) {
        Set keys = jsonObject.keySet();
        for (Iterator iter = keys.iterator(); iter.hasNext(); ) {
            String key = (String) iter.next();
            TreeItem child = treeItem.addItem(getChildText(key));
            addChildren(child, jsonObject.get(key));
        }
    } else if ((jsonString = jsonValue.isString()) != null) {
        // Use stringValue instead of toString() because we don't
        want escaping
        treeItem.addItem(jsonString.stringValue());
    } else {
        // JSONBoolean, JSONNumber, and JSONNull work well with
        toString().
        treeItem.addItem(getChildText(jsonValue.toString()));
    }
}
```



Webtechnológia I

com.google.gwt.user.client osztályok

CommandCanceledException	Exception reported to the current UncaughtExceptionHandler when a deferred Command is canceled as a result of a slow script warning.
Cookies	Provides access to browser cookies stored on the client.
DeferredCommand	This class allows you to execute code after all currently pending event handlers have completed, using the addCommand(Command) or addCommand(IncrementalCommand) methods.
DOM	This class provides a set of static methods that allow you to manipulate the browser's Document Object Model (DOM).
Element	An opaque handle to a native DOM Element.
Event	An opaque handle to a native DOM Event.
History	This class allows you to interact with the browser's history stack.
HTTPRequest	This class allows you to make asynchronous HTTP requests to the originating server.
IncrementalCommandCanceledException	Exception reported to the current UncaughtExceptionHandler when a deferred IncrementalCommand is canceled as a result of a slow script
Random	This class can be used as a substitute for Random.
Timer	A simplified, browser-safe timer class.
Window	This class provides access to the browser window's methods, properties, and events.



Webtechnológia I

History példa

```
public class HistoryExample implements EntryPoint, HistoryListener {

    private Label lbl = new Label();

    public void onModuleLoad() {
        // Create three hyperlinks that change the application's history.
        Hyperlink link0 = new Hyperlink("link to foo", "foo");
        Hyperlink link1 = new Hyperlink("link to bar", "bar");
        Hyperlink link2 = new Hyperlink("link to baz", "baz");

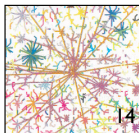
        // If the application starts with no history token, start it off in the
        // 'baz' state.
        String initToken = History.getToken();
        if (initToken.length() == 0)
            initToken = "baz";

        // onHistoryChanged() is not called when the application first runs. Call
        // it now in order to reflect the initial state.
        onHistoryChanged(initToken);

        // Add widgets to the root panel.
        VerticalPanel panel = new VerticalPanel();
        panel.add(lbl);
        panel.add(link0);
        panel.add(link1);
        panel.add(link2);
        RootPanel.get().add(panel);

        // Add history listener
        History.addHistoryListener(this);
    }

    public void onHistoryChanged(String historyToken) {
        // This method is called whenever the application's history changes. Set
        // the label to reflect the current history token.
        lbl.setText("The current history token is: " + historyToken);
    }
}
```



Webtechnológia I

Timer példa

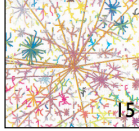
```
public class TimerExample implements EntryPoint, ClickListener {

    public void onModuleLoad() {
        Button b = new Button("Click and wait 5 seconds");
        b.addClickListener(this);

        RootPanel.get().add(b);
    }

    public void onClick(Widget sender) {
        // Create a new timer that calls Window.alert().
        Timer t = new Timer() {
            public void run() {
                Window.alert("Nifty, eh?");
            }
        };

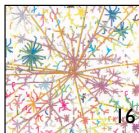
        // Schedule the timer to run once in 5 seconds.
        t.schedule(5000);
    }
}
```



Webtechnológia I

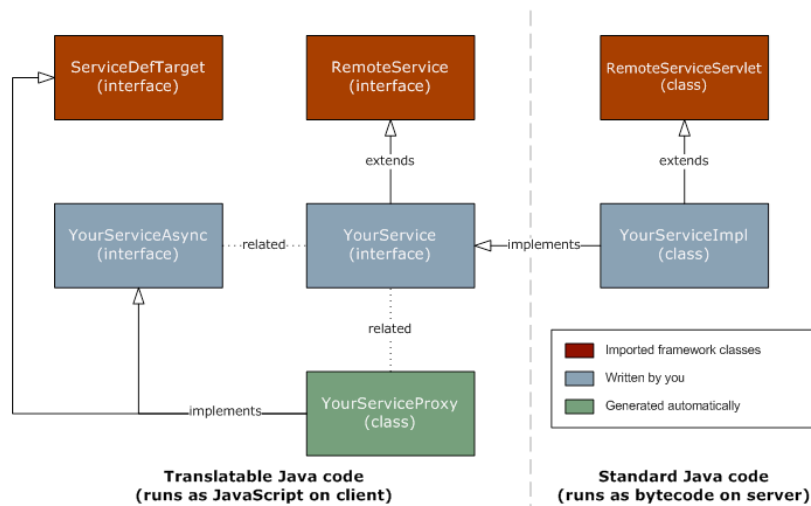
com.google.gwt.user.client interfészek

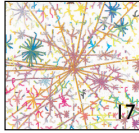
Command	Encapsulates an action for later execution, often from a different context.
EventListener	Receives low-level browser events.
EventPreview	A listener interface for previewing browser events.
HistoryListener	Implement this interface to receive notification of changes to the browser history state.
IncrementalCommand	An IncrementalCommand is a command that is broken into one or more substeps, each substep brings the whole command nearer to completion.
ResponseTextHandler	Implement this interface to receive HTTP completion events.
WindowCloseListener	Implement this interface to receive closing events from the browser window.
WindowResizeListener	Implement this interface to receive resize events from the browser window.



Webtechnológia I

GWT RPC

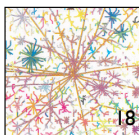




Webtechnológia I

com.google.gwt.user.server.rpc és com.google.gwt.user.client.rpc

- Szerver oldali RPC szolgáltatások implementálására szolgáló osztályok
- Kliens oldali RPC implementáció
- aszinkron callback interfész



Webtechnológia I

RPC implementáció

Kliens oldal

```
public interface MyService extends RemoteService {
    public String myMethod(String s);
}

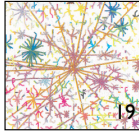
interface MyServiceAsync {
    public void myMethod(String s, AsyncCallback callback);
}

MyService.myMethod(s, new AsyncCallback() {
    public void onSuccess(Object result) {
        // It's always safe to downcast to the known return type.
    }
    public void onFailure(Throwable caught) {
        // Convenient way to find out which exception was thrown.
        try {
            throw caught;
        } catch (IncompatibleRemoteServiceException e) {
            // this client is not compatible with the server; cleanup and refresh the
            // browser
        } catch (InvocationException e) {
            // the call didn't complete cleanly
        } catch (Throwable e) {
            // last resort -- a very unexpected exception
        }
    }
});
```

Szerver oldal

```
public interface MyService extends RemoteService {
    public String myMethod(String s);
}

public class MyServiceImpl extends RemoteServiceServlet implements
    MyService {
    public String myMethod(String s) {
        // Do something interesting with 's' here on the server.
        return s;
    }
}
```



Webtechnológia I

com.google.gwt.user.client.ui

- Felhasználói felület–elem osztályok és interfészek

Normal Button Disabled Button Choice 1 Choice 2 (Disabled) Normal Check Disabled Check

Push Button Disabled up down disabled

text box... .. This is a big text area...

Info Buttons Menus Images Layouts

List0 List1 List2 List3 List4

foo0 bar0 baz0 toto0 tintin0

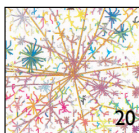
Style Fruit Term

Bold Italicized More » Code Strikethrough Underlined

foo@example.com

Inbox Drafts Templates

B I U X₂ X² Background Foreground Font



Webtechnológia I

com.google.gwt.user.client.ui (folyt.)

sender email

markboland05	mark@example.com
Hollie Voss	hollie@example.com
boticario	boticario@example.com
Emerson Milton	emerson@example.com
Healy Colette	healy@example.com
Brigitte Cobb	brigitte@example.com
Elba Lockhart	elba@example.com

1634 1640 1642 1662

About the Mail Sample

Google This sample app construction of a GWT's built-in w see how easy it

Close

Mail

Tasks

Get groceries

Walk the dog

Contacts

twig von Beethoven

Richard Feynman

nchard@example.com

0 1 2

0 1 2

north (0)

west (1) west (2) center (5) east (3)

south (4)

A B C

1 ↑ 2 ↓

1 ← → 2

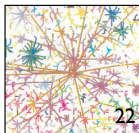


Webtechnológia I

com.google.gwt.xml.client

- XML DOM parszolás és XML dokumentum generálás
- browser XML támogatásának használata

Attr	Attr objects represent key-value pairs of attributes on Element objects.
CDATASection	This node represents escaped character sequences.
CharacterData	This interface describes CharacterData XML nodes.
Comment	This interface describes comment XML nodes.
Document	Document objects represent XML documents.
DocumentFragment	A DocumentFragment is a basket into which one may place other Node objects for future processing.
Element	This interface represents XML DOM elements, which are the basic building block of XML.
EntityReference	This interface represents entity references, such as &foo;.
NamedNodeMap	Represents a string-to-node map, used in getAttributes.
Node	This is the base interface for DOM nodes, as obtained from using XMLParser methods.
NodeList	This interface represents an immutable ordered collection of nodes.
ProcessingInstruction	This interface documents the ProcessingInstruction node type.
Text	This interface describes text nodes, as might occur between tags.



Webtechnológia I

Hello World

- HTML dok.

```
<html>
  <head>
    <title>Hello</title>
  </head>
  <body bgcolor="white">
    <script language="javascript" src="com.google.gwt.sample.hello.Hello.nocache.js"></script>
  </body>
</html>
```



Webtechnológia I

Hello World (folyt.)

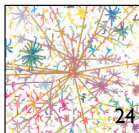
- Java kód

```
package com.google.gwt.sample.hello.client;

import com.google.gwt.core.client.EntryPoint;
import com.google.gwt.user.client.Window;
import com.google.gwt.user.client.ui.Button;
import com.google.gwt.user.client.ui.ClickListener;
import com.google.gwt.user.client.ui.RootPanel;
import com.google.gwt.user.client.ui.Widget;

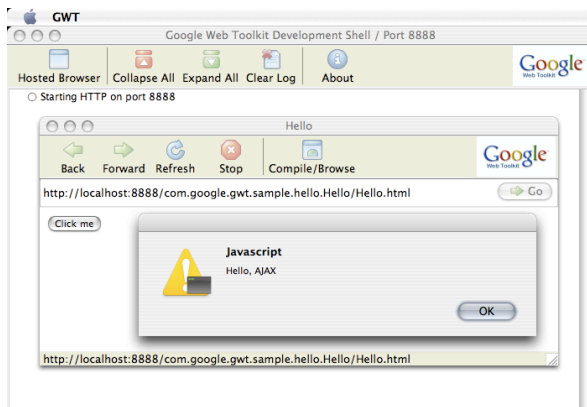
/**
 * HelloWorld application.
 */
public class Hello implements EntryPoint {

    public void onModuleLoad() {
        Button b = new Button("Click me", new ClickListener() {
            public void onClick(Widget sender) {
                Window.alert("Hello, AJAX");
            }
        });
        RootPanel.get().add(b);
    }
}
```

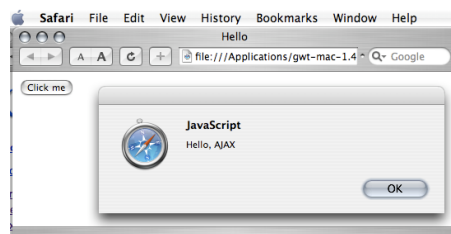


Webtechnológia I

Hello World (folyt.)



Hosted mode



Browser mode



Webtechnológia I

Szerszámok

projectCreator	Generate an Ant buildfile and/or Eclipse project.
applicationCreator	Generate a starter application, including launch scripts.
junitCreator	Generate a JUnit test for an existing project.
i18nCreator	Generate an i18n properties file and synchronization script for an existing project.
benchmarkViewer	Displays benchmark results.
<modulename>-compile	Compile the Java code in the named module into JavaScript. This script is created by applicationCreator.
<modulename>-shell	Run the named module in Hosted Mode. This script is created by applicationCreator.