JavaScript in Apex

Aljaž Mali

Abakus
As na disku.

20. JUBILARNA KONFERENCIJA

13. - 16. 10. 2015. ROVINJ

BOLJA
VEĆA
STRUČNIJA
VESELIJA

Quick introduction

- IT Solutions Architect at Abakus plus, d.o.o

- SIOUG - Member of Executive Committee

- Oracle Certified Professional 9i, 11g

- Oracle Application Express Developer Certified Expert

- My first Apex (HtmlDB) presentation: HTMLDB – just a toy?, SIOUG, Portorož 2004

- Apex Meetups

Public appearances

- **HTMLDB – just a toy?, SIOUG, Portorož 2004**
- It's good to know your own backyard (Trace Analyzer, dbms_profiler), SIOUG, Portorož 2005
- Oracle Database Standard Edition, SIOUG, Portorož 2008
- Create table, SIOUG, Portorož 2009
- With Oracle Forms to future, SIOUG, Portorož 2010
- Oracle Listener, SIOUG, Portorož 2011
- Apex Plugins, SIOUG, Ljubljana 2012
- Apex Workshop: All you need to start working with Apex, Ljubljana 2012
- Apex Listener, SIOUG, Mengeš 2013
- Apex and jQuery, SIOUG, Mengeš 2013
- Apex Dynamic Actions, SIOUG, Mengeš 2013
- JavaScript in Apex, SIOUG, Ljubljana 2014
- JavaScript in Apex, SROUG, Zlatibor, Serbia, 2015
- Apex Meetups, Ljubljana, Kranj, 2015
- Apex Shared Components, SIOUG, Portorož, 2015
- JavaScript in Apex, HROUG, Rovinj, Croatia, 2015

Abakus plus, d.o.o.

History

    from 1992, ~20 employees

Applications:

    special (DB – Newspaper Distribution, FIS – Flight Information System)

    ARBITER – the ultimate tool in audit trailing

    APPM – Abakus Plus Performance and Monitoring Tool

Services:

    DBA, OS administration, programming (MediaWiki, Oracle)

    networks (services, VPN, QoS, security)

    open source, monitoring (Nagios, OCS, Wiki)

Hardware:

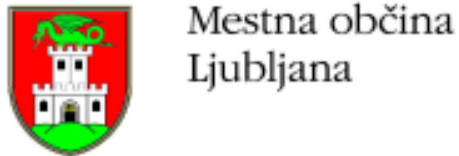   servers, **backup server**, **SAN storage**, firewalls

Infrastructure:

    from 1995 GNU/Linux *(20 years of experience!)*

    Oracle on GNU/Linux: since RDBMS 7.1.5 & Forms 3.0 *(before Oracle!)*

    >20 years of experience with High-Availability!

GENERALI Zavarovalnica

Aerodrom Ljubljana

BANKA SLOVENIJE
BANK OF SLOVENIA
EUROSYSTEM

DELO PRODAJA

KONTROLA ZRAČNEGA PROMETA SLOVENIJE

Gorenjska Banka
Vse, kar šteje.

GOODYEAR

HRANILNICA LON
Bančništvo na Ljubezniv Oseben Način

Mestna občina Ljubljana

Mercator

NLB Vita
Življenjska zavarovalnica

MESTNA OBČINA KOPER
COMUNE CITTA DI CAPODISTRIA

Sava

Agenda

• What is JavaScript?

• JavaScript and Apex

• JavaScript API

  namespaces
  confirm, submit
  apex.item
  apex.server
  apex.lang
  apex.debug

• Asynchronous Ajax

• HighCharts

JavaScript

http://en.wikipedia.org/wiki/JavaScript

 ˈ ʒɑː ə,   ɪ

JavaScript (/ d   v skr pt/; ***JS***) *is a dynamic computer programming language[5]. It is most commonly used as part of web browsers, whose implementations allow client-side scripts to interact with the user, control the browser, communicate asynchronously, and alter the document content that is displayed.[5] It is also being used in server-side network programming (with Node.js), game development and the creation of desktop and mobile applications.*

JavaScript

- JavaScript and Java are unrelated

- is actually derived from C

- Originally developed by Brendan Eich (Netscape)
  http://brendaneich.com/

- Officially managed by Mozilla Fundations
  https://developer.mozilla.org/en-US/docs/Web/JavaScript

- JavaScript is based on ECMAScript standard

JavaScript

http://tsdr.uspto.gov/#caseNumber=75026640&caseType=SERIAL_NO&searchType=statusSearch

🔍 **Trademark Status & Document Retrieval (TSDR)** ❓

SEARCH	MULTI-SEARCH	❓

US Serial No ▼	75026640	Status	Documents

Mark:	JAVASCRIPT	No Image exists for this case.
US Serial Number:	75026640	**Application Filing Date:** Dec. 01, 1995
US Registration Number:	2416017	**Registration Date:** Dec. 26, 2000

▾ Current Owner(s) Information

Owner Name:	ORACLE AMERICA, INC.
Owner Address:	500 ORACLE PARKWAY REDWOOD SHORES, CALIFORNIA 94065 UNITED STATES
Legal Entity Type:	CORPORATION
State or Country Where Organized:	DELAWARE

JavaScript API

https://docs.oracle.com/cd/E59726_01/doc.50/e39149/javascript_api.htm#AEAPI266

- apex.da namespace
- apex.debug namespace
- apex.event namespace
- apex.item
- apex.lang namespace
- apex.navigation namespace
- apex.server namespace
- apex.storage namespace
- apex.util namespace
- apex.widget namespace
- non-namespace Javascript APIs

Legacy JavaScript APIs

https://docs.oracle.com/cd/E59726_01/doc.50/e39149/javascript_api.htm#AEAPI30227

Work has commenced to reduce the overall size of JavaScript that is loaded by Oracle Application Express when rendering a page. JavaScript functions that are no longer served on every page are gradually being moved to a legacy JavaScript file, which can be found in */i/libraries/apex/legacy.js*

```
/**
 * @fileOverview
 * This file holds for legacy purpose all the old non-namespaced JavaScript functions of APEX.
 *
 * */


/**
 * @deprecated Use apex.submit, or Dynamic Action "Submit Page"
 * @function
 * */
function doSubmit(pOptions){
  apex.submit(pOptions);
}
/**
 * @deprecated Use apex.confirm, or Dynamic Action "Confirm"
 * @function
 * */
function confirmDelete(pMessage,pOptions){
      apex.confirm(pMessage,pOptions);
}
```

submit, confirm

```
//legacy.js
function doSubmit(pOptions){
  apex.submit(pOptions);
}

apex.submit( 'DELETE' );

apex.submit({
    request:"CONFIRM",
    set:{"P1_CONF_X1":654, "P1_CONF_X2":321},
    showWait:true
    });

apex.confirm("Set values and submit?", {
    request:"CONFIRM",
    set:{"P1_CONF_X1":123, "P1_CONF_X2":456},
    showWait:true
    });
```

getElementById

// Get element by id = "demo"
var x = document.getElementById("demo");
x.style.color = "red";

// Set value
document.getElementById("myText").value = "Johnny Bravo";

//Set value – ReadOnly
$("#myROText ").text("To display");

$x, $v, $s

//Read value – same for edit or display only item
x = $v("P1_TEXT");
y = $v("P1_DISPLAY");

//Set value - edit item and display only item
$x("P1_TEXT").value = "Some text";
$("#P1_DISPLAY").text("To display"); // I still need jQuery

//Set value – same for edit or display only item
$s("P1_TEXT","New text");
$s("P1_DISPLAY","Also new");

apex.item

apex.item(pNd).getValue()

- taking into account the current item type (same as $v)

- Returns array of string values if the item supports multiple values

- $v2 = apex.item(pNd).getValue // shortcut

apex.item

apex.item(pNd).setValue(pValue,
                              pDisplayValue,
                              pSuppressChangeEvent)

- pDisplayValue: in case of Popup LOV display value
- SuppressChangeEvent
- $s = apex.item (pNd).setValue //shortcut

apex.item("P1_ITEM").setValue("10");
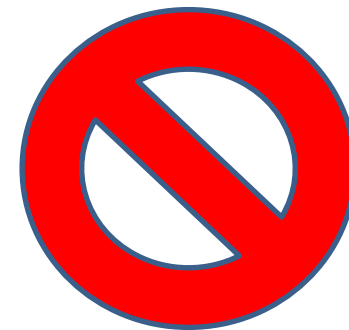apex.item("P1_ITEM").setValue("10", "SALES", true);

apex.server namespace - AJAX

Application Process:DO_SOMETHING1

```
htp.p('Parameter 1: ' || APEX_APPLICATION.g_x01);
htp.p('Parameter 2: ' || APEX_APPLICATION.g_x02);
```

JavaScript

```
var ajaxRequest =
  new htmldb_Get(null,
          $v('pFlowId'),
          'APPLICATION_PROCESS=DO_SOMETHING1',
                     $v('pFlowStepId'));
ajaxRequest.addParam('x01', 'Value 1');
ajaxRequest.addParam('x02', 'Value 2');
var ajaxResult = ajaxRequest.get();
```

apex.server namespace - AJAX

Application Process:DO_SOMETHING1

htp.p('Parameter 1: ' || APEX_APPLICATION.g_x01);
htp.p('Parameter 2: ' || APEX_APPLICATION.g_x02);

JavaScript

```
apex.server.process (
  "DO_SOMETHING1",
        { x01: 'Value 1'
  ,x02: 'Value 2'
  }
  ,{ dataType: 'text',
        success: function(pData){alert(pData)}
  }
);
```

apex.server namespace - AJAX

Application Process:DO_SOMETHING2

```
htp.p('Parameter 1: ' || APEX_APPLICATION.g_x01);
htp.p('Parameter 2: ' || APEX_APPLICATION.g_x02);
htp.p('Page item P1_AJAX: ' || :P1_AJAX );
```

JavaScript

```
apex.server.process (
  "DO_SOMETHING2",
        { x01: 'Value 1'
   ,x02: $v('P1_AJAX')
        ,pageItems: "P1_AJAX"
  }
  ,{ dataType: 'text',
        success: function(pData){alert(pData)}
  }
);
```

apex.server namespace - AJAX

Application Process:DO_SOMETHING3

```
declare
  l_max number;
begin
  l_max := nvl(l_max,5);

  if APEX_APPLICATION.g_x01 > 10 then
    l_max :=  10;
  else
    l_max := APEX_APPLICATION.g_x01;
  end if;

  wwv_flow_utilities.pause(l_max);
end;
```

apex.server namespace - AJAX

JavaScript (DO_SOMETHING3)

```
function Ajax3() {
  if ($v('P1_AJAX')==''){
    alert('Please enter a value!');
    apex.item( "P1_AJAX" ).setFocus();
  }
  else{
    apex.server.process (
      "DO_SOMETHING3",
      { x01: $v('P1_AJAX')},
      { dataType: 'text'
      ,success: function(pData){alert('Done')}
      ,loadingIndicator: '#P1_AJAX'
      }
    );
  }
}
```

apex.server namespace - AJAX

Application Process:DO_SOMETHING4

```
update hroug2015
  set datum = sysdate;
```

JavaScript

```
function Ajax4() {
  apex.server.process (
    "DO_SOMETHING4",
    {},
          { dataType: 'text'
    ,success: function(pData){
                  apex.event.trigger(document,
                  "refresh_date_report");
                  }
          ,loadingIndicator: '#P1_AJAX'
          }
  );
}
```

apex.server namespace - AJAX

▼ Identification	
Name	Refresh date report
▶ Execution Options	
▼ When	
Event	Custom
Custom Event	refresh_date_report
Selection Type	JavaScript Expression
JavaScript Expression	document
Condition	- Select -

▼ Identification	
Action	Refresh
▼ Affected Elements	
Selection Type	Region
Region	..Date Report

Asynchronous Ajax

- Dynamic Actions, Wait For Result equal to yes
   - synchronous ajax request

- This will change in future release

   - Requests will be asynchronous
   - Apex 5.0 Release Notes
   - https://docs.oracle.com/cd/E59726_01/doc.50/e39143/toc.htm#HTMRN270

- Applications must not rely on the currently synchronous behavior

- Wait For Result will still work

- http://hardlikesoftware.com/weblog/2015/04/15/apex-and-asynchronous-ajax/

- https://community.oracle.com/thread/3675812

Dynamic Actions - asynchronous

- Move Pl/SQL code from dynamic action to application process

- Do the rest in "Execute JavaScript code"

- apex.server.process - by default in async mode

```
   ▼  ⚡ DA_ASYNC
      ▼  ▷ True
            Execute JavaScript Code
         ▢ False
```

```
spinner = apex.util.showSpinner($("#filter"));

apex.server.process (
   "AP_ASYNC_DEMO",
   { pageItems:["P2_COUNT"]
   }
   ,{
      dataType: 'text',
      success: function(pData){$s('P2_COUNT_NEW',pData);
                                $('#ir_report').trigger('apexrefresh');
                                spinner.remove();}
   }
);
```

apex.debug

- debug.error – always
- debug.info
- debug.log
- debug.trace – only on level APP_TRACE
- debug.warn
- debug.message(pLevel,)
- debug.setlevel(pLevel)
- debug.getlevel()
- debug.LOG_LEVEL =
   {OFF:0, ERROR:1, WARN:2, INFO:4, APP_TRACE:6, ENGINE_TRACE:9}

Debug log level is synchronized with the hidden item #pdebug
that comes from the server

apex.debug

```
console.log('Current log level: ' + apex.debug.getLevel());

apex.debug.info('Info message');
apex.debug.warn('Warning message');
apex.debug.error('Error message');

apex.debug.setLevel(apex.debug.LOG_LEVEL.APP_TRACE);
apex.debug.trace("Events: ", event);
```

apex.lang

- apex.lang.addMessages
- apex.lang.clearMessages
- apex.lang.format
- apex.lang.formatMessage
- apex.lang.formatMessageNoEscape
- apex.lang.formatNoEscape
- apex.lang.getMessage

Globalization

Globalization Attributes

Text Messages

Translate Application

Create/Edit Text Message

Messages are designed to provide translation services for use in PL/SQL.

* Name	TEST
Language	English (en)
Used in JavaScript	Yes
* Text (Example: Tax: %0 Total amount %1)	This is test %0

HighCharts

•http://www.highcharts.com/

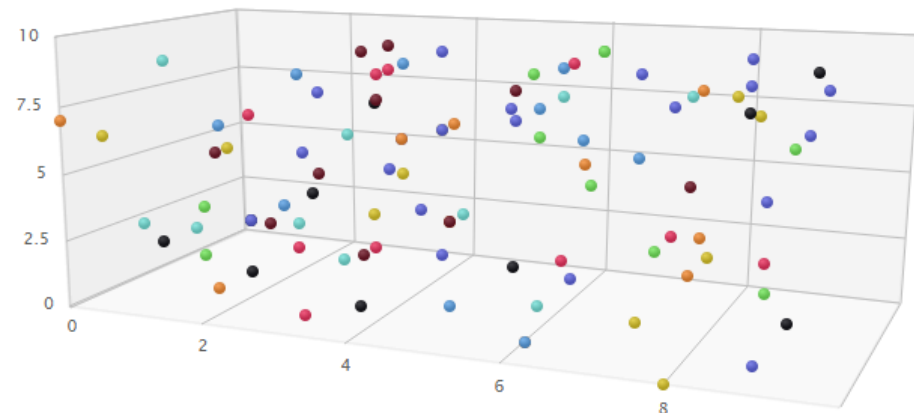•JavaScript library

•Free for Non-commercial

•More options

 HighStock
 HighMaps

```
<script src="/i/highstock.js"></script>
<script src="/i/exporting.js"></script>
```

HighCharts

Application Process:REFRESH_REPORT

```
--{ "name":"Tokyo" ,"data":[ 7, 6.9, 9.5,… ] }

apex_json.open_object;
  apex_json.write('name', APEX_APPLICATION.g_x01);
  apex_json.open_array('data');
  --
  for cur in (select val
           from hc_temperatures
           where city = upper(APEX_APPLICATION.g_x01))
  loop
    apex_json.write(cur.val);
  end loop;
  --
  apex_json.close_array;
apex_json.close_object;
```

HighCharts

JavaScript

```
function Refresh_Report() {
  apex.server.process (
    "REFRESH_REPORT",
    { x01: $v('P6_CITY')},
    {
      dataType: 'json',
      success: function(pData){draw_chart(pData)},
      loadingIndicator: '#P6_CITY'
    }
  );
};
```

HighCharts

```
function draw_chart(pData){
  $(function () {
    $('#container').highcharts({
      title: {text: 'Monthly Average Temperature', x: -20 //center },
      subtitle: {text: 'Source: WorldClimate.com', x: -20
      },
      xAxis: {
        categories: ['Jan', 'Feb', 'Mar', 'Apr', 'May', 'Jun','Jul', 'Aug', 'Sep', 'Oct', 'Nov', 'Dec']
      },
      yAxis: {
        title: {text: 'Temperature (°C)'},
        plotLines: [{ value: 0, width: 1, color: '#808080' }]
      },
      tooltip: { valueSuffix: '°C'  },
      legend: {
        layout:'vertical', align:'right',verticalAlign:'middle', borderWidth:0},
        series: [pData]
    });
  });
}
```

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