Using MapViewer Heatmap in OBIEE

Chris Hughes, Senior Sales Consultant, Oracle Public Sector

BIWA SIG
Better Information Better Results
www.oraclebiwa.org

Speaker Bio

- Chris Hughes is a Senior Sales Consultant for the Oracle Public Sector organization supporting clients and prospects in evaluating and deploying Oracle solutions.
- He has had multiple roles in Public Sector Sales and IT over the past 20 years and acts as a Spatial Technical Evangelist within the Oracle and Business Intelligence communities.
- He is a two time graduate of the Pennsylvania State University

Agenda

A. Review Existing Technology
   - Standard OBIEE Mapping component
   - Methodologies for integrating Javascript APIs in OBIEE
   - Newer analytical features in Oracle Maps HTML5 API

B. Step By Step: Heatmap in OBIEE
   - Build a working heatmap in OBIEE using Answers and Oracle Maps HTML5 API
   - Making Cupcakes!

Objectives

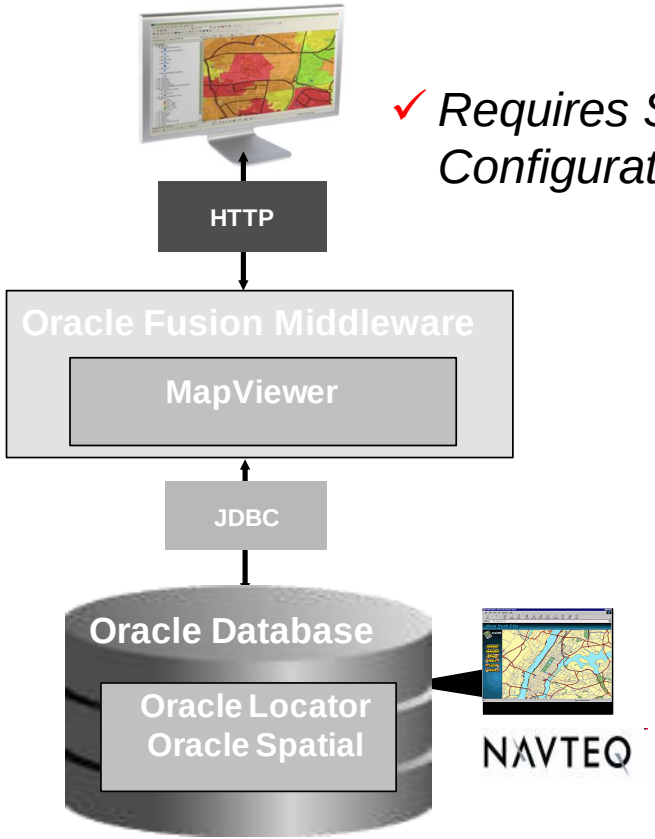
1. Understand Spatial Visualization in OBIEE
2. Learn the new features of Oracle Maps for analytics
3. Understand some of the integration points for OBIEE
4. Learn a Recipe

Using MapViewer Heatmap in OBIEE

A. REVIEW EXISTING TECHNOLOGY

Out of the Box OBIEE Map Component

- **Oracle Locator**: Feature of Oracle Database XE, SE, EE
- **Oracle Spatial**: Priced option to Oracle Database EE
- **MapViewer**: Java application and map rendering feature of Oracle Fusion Middleware
- **Workspace Manager**: Long transactions feature of Oracle Database SE, EE
- **Bundled Map Content**: Major roads, administrative boundaries (city, county, state, country) - worldwide coverage from Navteq

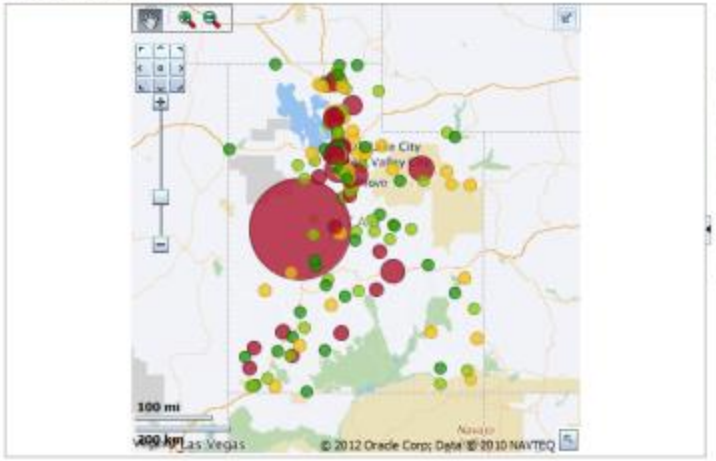


✓ *Requires Some Configuration*

OBIEE Map Component

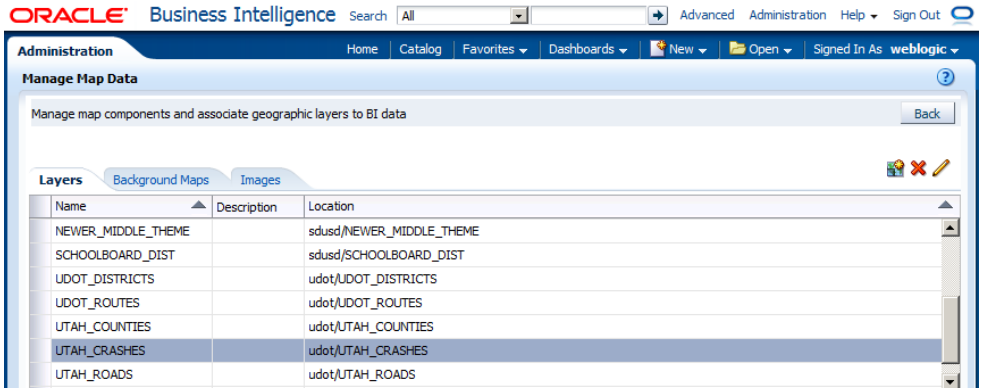
ORACLE Business Intelligence

Top 10 Fatal Crash Areas by Year
crossTab Crashes Points

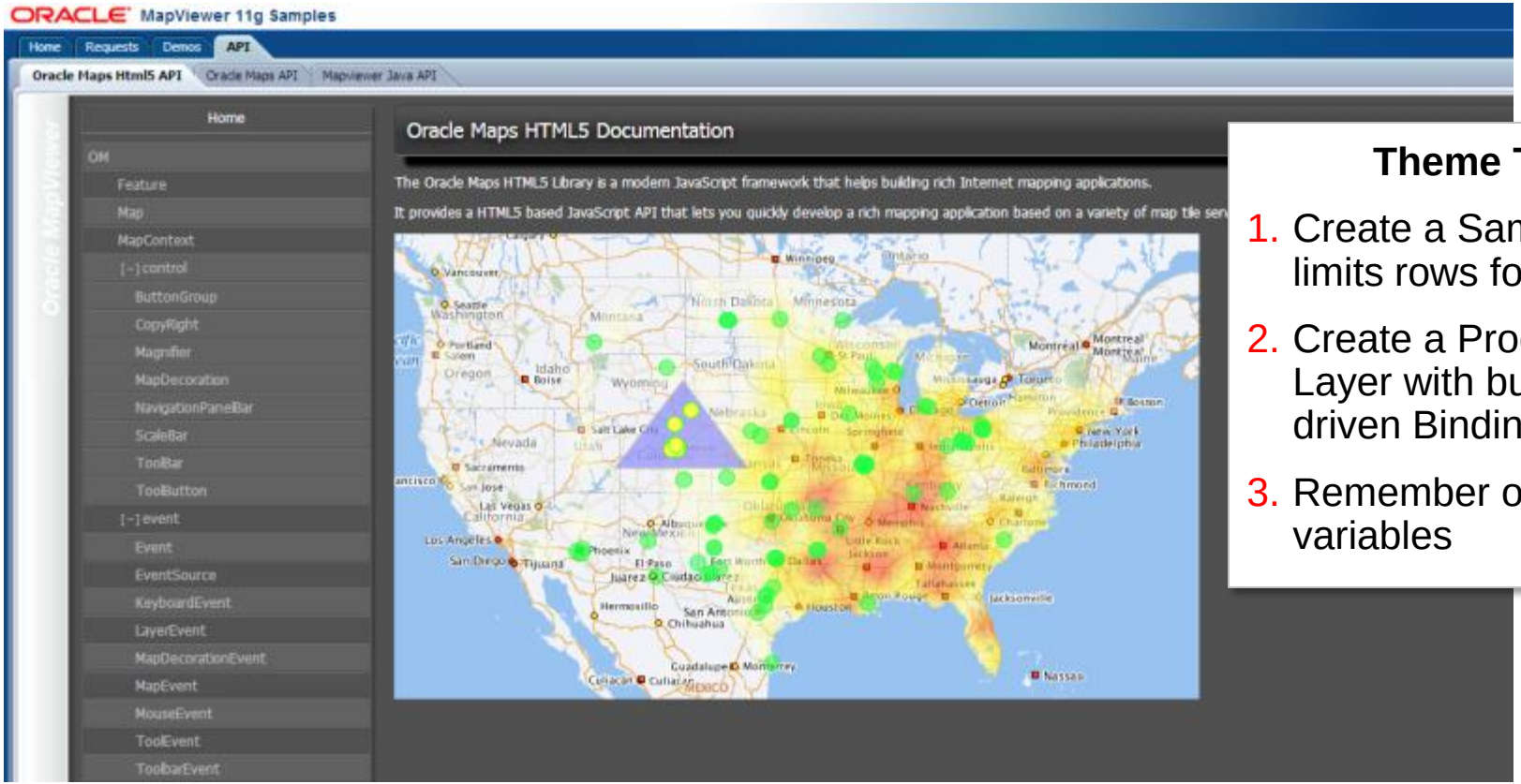


Refresh - Print - Export - Add to Briefing Book - Copy

Rt Dir Id	Route Fullname	2006 Num Crashes 4.00	2006 Num Crashes 5.00	2006 Total Num Crashes	2007 Num Crashes 4.00	2007 Num Crashes 5.00	2007 Total Num Crashes	2008 Num Crashes 4.00	2008 Num Crashes 5.00	2008 Total Num Crashes	2009 Num Crashes 4.00	2009 Num Crashes 5.00	2009 Total Num Crashes	2010 Num Crashes 4.00	2010 Num Crashes 5.00	2010 Total Num Crashes	2011 Num Crashes 4.00	2011 Num Crashes 5.00	2011 Total Num Crashes	Num Crashes
310.00	US 40	31	12	**43**	22	8	**30**	16	8	**24**	14	10	**24**	20	4	**24**	12	3	**15**	**160**
318.00	SR 71	29	3	**32**	34	2	**36**	23	1	**24**	8	2	**10**	18	3	**21**	12	3	**15**	**138**
321.00	I-80 EB	54	15	**69**	35	14	**49**	36	23	**59**	30	11	**41**	23	7	**30**	23	10	**33**	**281**
403.00	US 189	24	4	**28**	26	5	**31**	13	6	**19**	13	1	**14**	5	2	**7**	11	1	**12**	**111**
418.00	I-215 CW	27	8	**35**	23	3	**26**	17	5	**22**	10	3	**13**	12	2	**14**	7	5	**12**	**122**
1332.00	US 6	28	6	**34**	19	6	**25**	10	5	**15**	16	6	**22**	13	10	**23**	11	3	**14**	**133**
1333.00	I-15 NB	217	31	**248**	165	37	**202**	128	35	**163**	126	32	**158**	112	29	**141**	89	29	**118**	**1030**
1368.00	SR 68	25	4	**29**	29	4	**33**	26	6	**32**	22	2	**24**	19	4	**23**	24	7	**31**	**172**
1370.00	I-70 EB	27	5	**32**	21	6	**27**	18	7	**25**	5	8	**13**	15	9	**24**	16	6	**22**	**143**
1384.00	US 89	136	24	**160**	126	18	**144**	103	12	**115**	79	16	**95**	66	10	**76**	69	8	**77**	**667**



Oracle Maps HTML5 API (QuickStart)

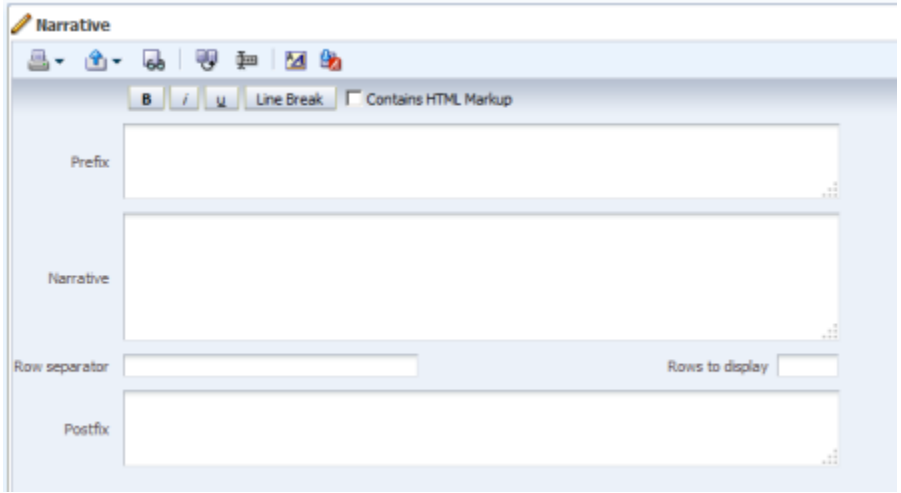


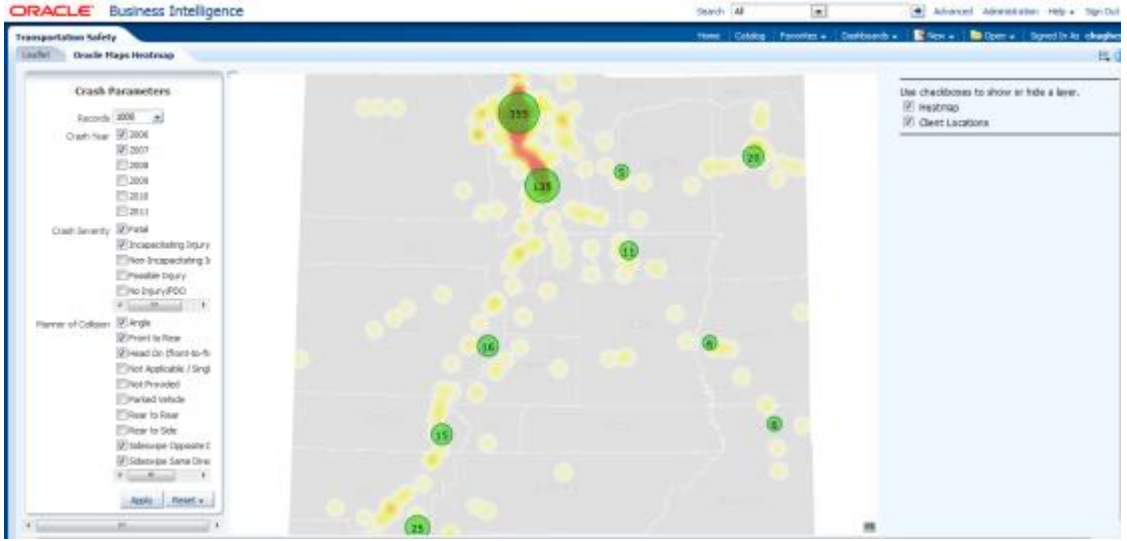
Theme Tips

1. Create a Sample that limits rows for Testing
2. Create a Production Layer with business driven Binding Variables
3. Remember order of variables

Easiest OBIEE JS Integration Points

- Narrative Component
- Dashboard Text Component
- Embedded (IFrame)
- Prefer Dashboard Text component
  - Pass in variables
  - easier to work with
  - can code in complete HTML and JS in an IDE





B. Step By Step: Heatmap in OBIEE

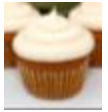
Problem Definition (why do this?)

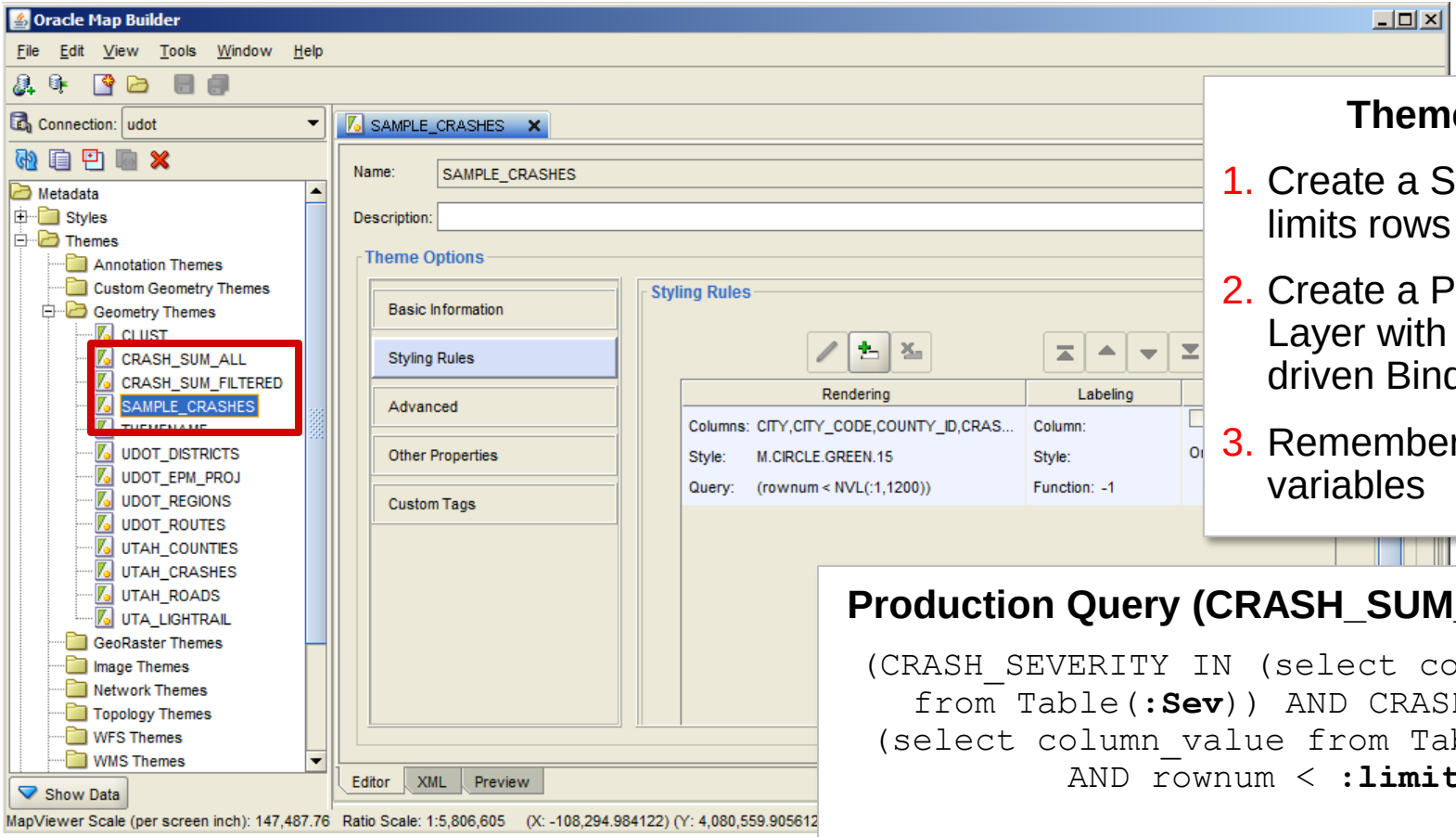
1. Client wants to build a record detail map visualization
2. OBIEE works in aggregates (mainly)
3. MapViewer Oracle Maps v1 FOI system requires some babysitting in OBIEE (embedded in OBIEE widget)
4. MapViewer Oracle Maps v1 FOI system has a practical limit of 100-200 objects

Steps in Building a Heatmap in OBIEE

1. Define Your Geometry Themes (one test, one prod, use parameters)
2. Configure the MapViewer 11.1.1.7 JSON dataservice
3. Troubleshooting the dataservice
4. Deploy analyticsRes add libraries and HTML test apps
5. Test using Leaflet consuming the Mapviewer data
6. Build the HTML/JS Framework as Text in Dashboard
7. Build Dashboard Prompt in OBIEE
8. Add parameters to the JS code (matching geometry theme)
9. The cupcakes are done!
   - Add OBIEE Content as Desired (sprinkles)

1) Use Map Builder to Define Your Geometry Themes





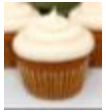
Theme Tips

1. Create a Sample that limits rows for Testing
2. Create a Production Layer with business driven Binding Variables
3. Remember order of variables

Production Query (CRASH_SUM_FILTERED)

```
(CRASH_SEVERITY IN (select column_value
  from Table(:Sev)) AND CRASH_YEAR IN
(select column_value from Table(:Year))
  AND rownum < :limit)
```

2) Configure the Mapviewer Instance for dataserver



1

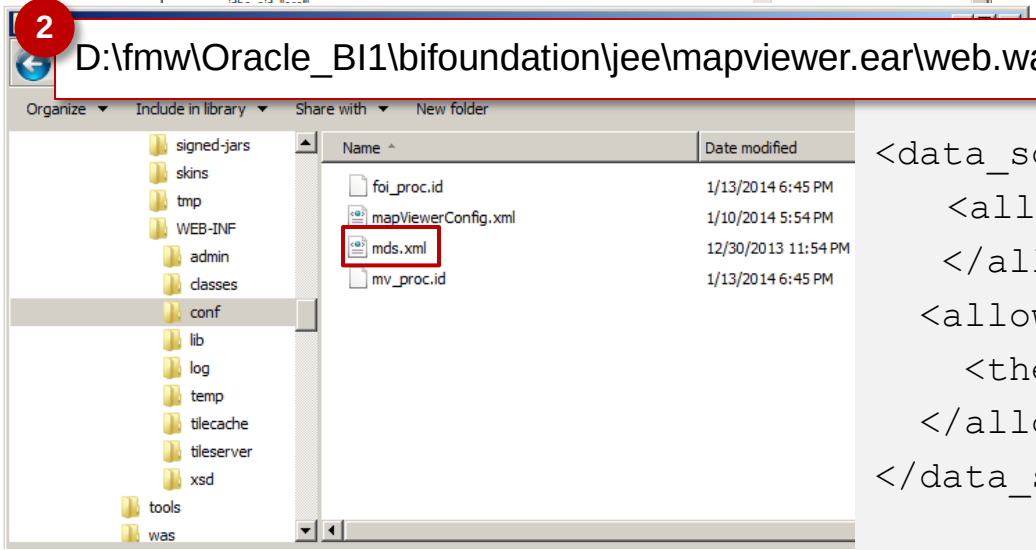
http://localhost:9704/mapviewer/faces/admin/admin.jspx

Steps

1. Set the data source in MV configuration
2. Ensure data streaming is enabled in mds.xml

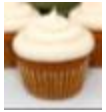
2

D:\fmw\Oracle_BI1\bifoundation\jee\mapviewer.ear\web.war\WEB-INF\conf\mds.xml




```
<data_source name="udot">
    <allow_predefined_themes>true
    </allow_predefined_themes>
  <allow>
    <theme>*</theme>
  </allow>
</data_source>
```

3) Test and troubleshoot Mapviewer dataserver



Access the JSON Data Server here:

http://localhost:9704/mapviewer/dataserver/*<datasource>*?help=y

t: theme name (mandatory)

bbox: bounding box, such as bbox=-122.0,24.6,-100,45

bbox_srid: srid of the bounding box, if different fr
(optional)

to_srid: data should be tranformed into this SRID be
(optional)

dadp: all coordinates should have this number of dig
default is 5 (optional)

include_style_info: if set to false, then no styling
response (optional)

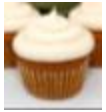
sql: (only used when requesting dynamic query-based
complete SQL query. (mandatory)

asis: (only used when requesting dynamic query-based
query should be executed as-is by the server. (optio

```
{"mds_error":
  {"message":"Data server
  streaming request
  validation error. Root
  cause: This data source
  does not allow streaming
  access.",
  "details":"Check server
  log for details."} }
```

If you receive this message you have not set the tags needed in mds.xml and restarted mapviewer

3a) Additional Mapviewer dataserver options



paramnum: specifies the number of binding variables (to be used for a pre-defined theme that has binding variables in its query cond) included in the request.

For each binding variable, you must supply the following with n starting from 1 through 'paramnum':

param<n>: the value of the binding variable. (mandatory)

paramtype<n>: used to specify an array type or a geometry type: narray (numeric array), sarray (string array), or geometry. (optional)

sqltype<n>: the sql type for the corresponding narray or sarray params, such as MV_NUMBERLIST or MV_STRINGLIST; not needed for any other param types. (optional)

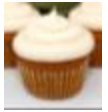
workspace: specifies the workspace to use when retrieving data

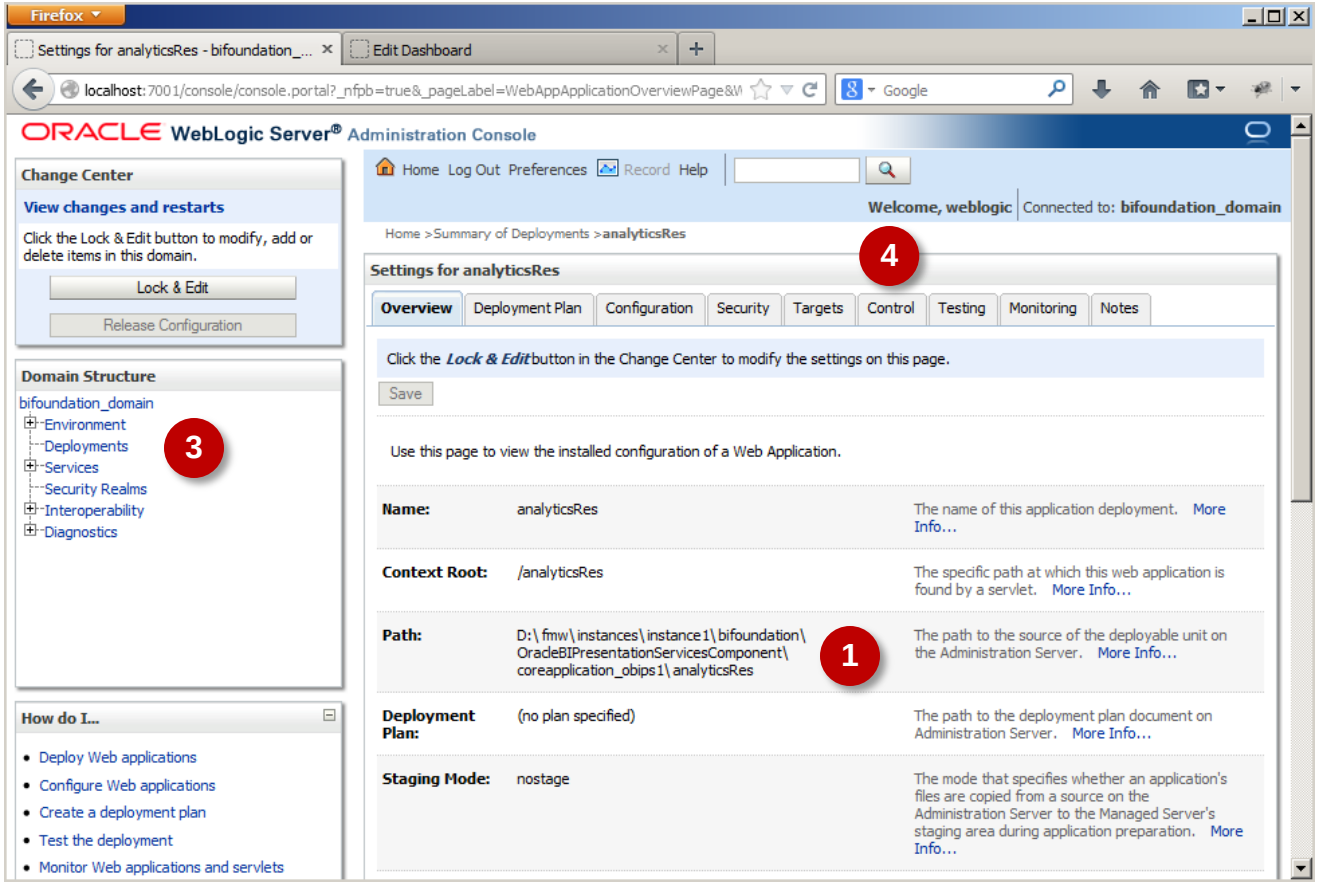
For 12c (planned for this calendar year):

simplify: indicates whether geometry should be simplified

threshold: if simplify is true, this value specifies the reduction percentage (value must be 1 through 99).

4) Deploy analyticsRes and any libraries or apps you might want

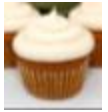




Steps

1. Create a folder or war file with WEB-INF and proper deployment descriptors
2. Create a sample html for testing
3. Create a deployment in WLS console
4. Add libraries as needed (ensure you stop / start after adding files)

5) Test using Leaflet consuming the Mapviewer data

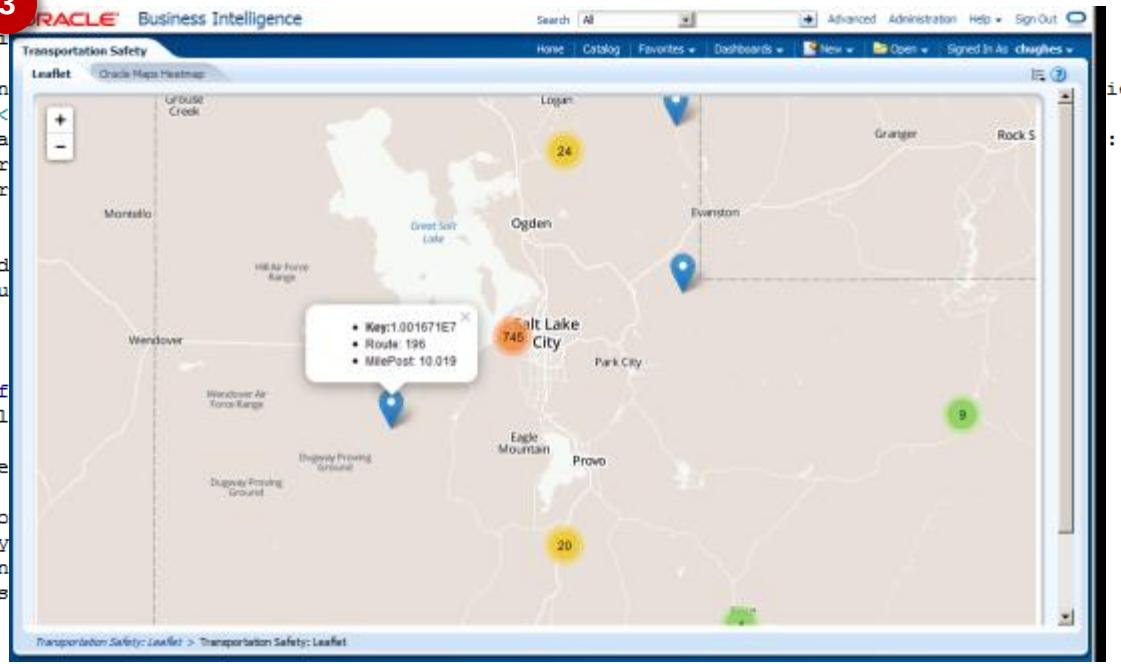


1. http://localhost:9704/mapviewer/dataserver/udot?t=SAMPLE_CRASHES&to_srid=8307&paramnum=1&param1=12

```
//handle json response
function han      son(data) {
    for (var i
        var a
        var in
            "<
        var ma
        marker
        marker
        }

    markers.ad
    map.fitBou
}


//sample URL f
var omvJsonUrl

//make ajax re
$.ajax({
        url: o
        dataTy
        conten
        succes
});
</script>
```

2

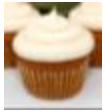
3



Steps

1. Test your layer URL
2. Write Simple HTML file
3. Deploy in a Dashboard as a Text Component

6) Build the MapView HTML/JS Framework as Text in Dashboard



```
var tilelayer = null;
var heatlayer = null;

var center = new OM.geometry.Point(-122,38,8307);
var utcenter = new OM.geometry.Point(452962,4347062,26912);

var zoomLevel = 3;
$(document).ready(function()
{
    limitPrm = @{variables.pv_limit}{5};
    var map = new OM.Map(document.getElementById('map'),{mapviewerURL: baseURL}) ;
    tilelayer = new OM.layer.OSMTileLayer("tilelayer");
    //local tile if needed
    //tilelayer = new OM.layer.TileLayer("udotbase", {Source:"udot", tileLayer:"LOCALTILELAYER", tileServerUrl: baseURL
    map.addLayer(tilelayer) ;

    vectorlayer1 = new OM.layer.VectorLayer("vectorlayer
    vectorlayer1.setLabelsVisible(false);
    vectorlayer1.enableClustering(true,{clusterStyle:cir                                    90});
    vectorlayer1.setQueryParameters(sevPrms, yearPrms ,
    map.addLayer(vectorlayer1) ;

    heatlayer = new OM.layer.VectorLayer("heatlayer",
    { def: layerdef, renderingStyle: new OM.style.HeatMa
            spotlightRadius:12,
            colorStops:["#ffffff","#ffff00", "#ff8800",
            opacity:0.5
        })
    });
    heatlayer.setQueryParameters(sevPrms, yearPrms, limi

    map.addLayer(heatlayer) ;
    map.setMapCenter(utcenter);
    map.setMapZoomLevel(zoomLevel) ;
    map.init()
})

</script>
```

4

5

6

Text Properties

Enter text and formatting tags below to include on your Dashboard.

B | I | U | Line Break | Contains HTML Markup

```
<script src="http://ajax.googleapis.com/ajax/libs/jquery/1.8.1/jquery.min.js">
</script>
<script type='text/javascript' src='/mapviewer/jslib/v2/oraclemapsv2.js'></script>

<style type= 'text/css '>body {cursor:default;}</style>

<script language="JavaScript" type="text/javascript">
  var map;
  var baseURL = '/mapviewer';
```

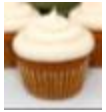
Preview

OK Cancel

Steps

1. Use IDE of your Choice
2. Follow existing MVDemo samples
3. Start with your test Theme
4. Add your parameters as OBIEE substitution strings
5. Add Two layers
6. Copy and paste into Dashboard Text

7) Add Presentation Variables to Your Dashboard Prompt



ORACLE Business Intelligence

Search All Advanced Administration Help Sign Out

Crash Prompt

Home Catalog Favorites Dashboards New Open Signed In As chugh

Definition

Add prompts for users when they run this analysis.

Prompt Label	Type	Prompt For	Description	Required	New Column
Page 1: Crash Parameters	Page				
Records	Variable value		Filter number of records for map layout		
Crash Year	Variable value		Filter Data by Year		
Crash Severity	Variable value	"Crash"."Severity"	Filter By Crash Severity		
Manner of Collision	Variable value	"Crash"."Collision Type"			

Edit Prompt

Prompt for: Presentation Variable — pv_severity

Label: Crash Severity

Description: Filter By Crash Severity

User Input: Check Boxes

Check Boxes Values: Specific Column Values

Column: "Crash"."Severity" — Select Column

Fatal
Incapacitating Injury
Non-Incapacitating Injury
Possible Injury
No Injury/PDO

▽ Options

Variable Data Type: Default (Text)

Limit values by: All Prompts

Require user input

Default selection: Specific Values

Fatal
Incapacitating Injury

Check Boxes Width: Dynamic 120 Pixels

OK Cancel

Display

Page 1

Crash Parameters

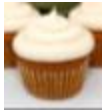
Records 1000

Crash Year 2006 2007 2008 2009 2010 2011

Parameters Desired

1. Crash Severity
2. Crash Year
3. Limit of Num Recs

8) Add Parameters to JS Code on Dashboard

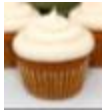


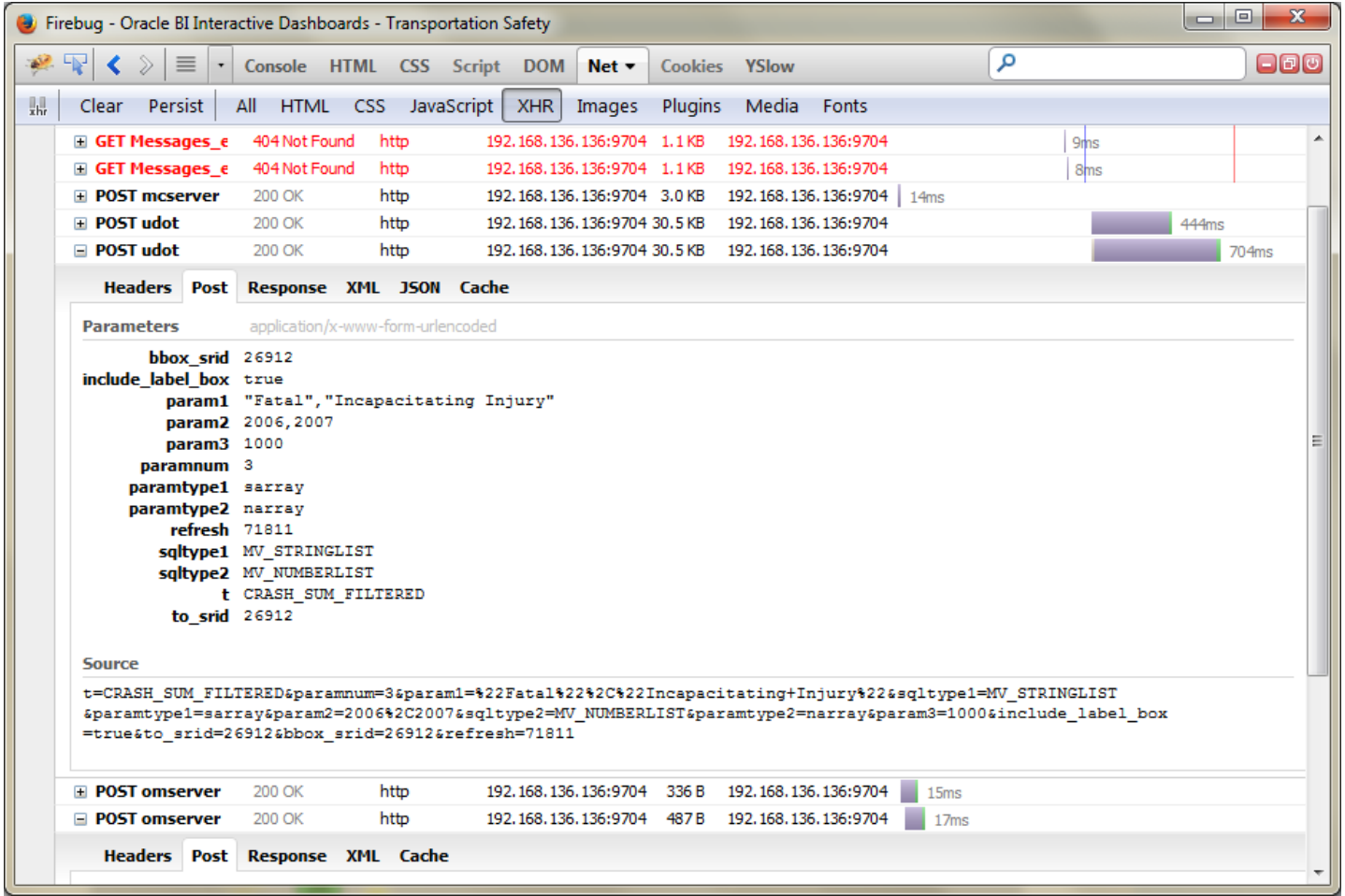
```
//parameter objects for calling mapviewer
var sevPrms = {value:["Fatal","Non-Incapacitating Injury"], type:"sarray", sqlType:"MV_STRINGLIST"};
var yearPrms = {value:[2007,2008], type:"narray", sqlType:"MV_NUMBERLIST"};
var manPrms = {value:["Head On","Angle"], type:"sarray", sqlType:"MV_STRINGLIST"};
var limitPrm = 1200;

var sevText, yearTxt, mannerTxt

var center = new OM.geometry.Point(-122,38,8307);
var utcenter = new OM.geometry.Point(452962,4347062,26912);

var zoomLevel = 3;
$(document).ready(function()
{
    limitPrm = @{variables.pv_limit}{5};
    sevText = "@{variables.pv_severity}{Fatal}";
    yearTxt = "@{variables.pv_year}{2006,2007}";
    mannerTxt = "@{variables.pv_manner}{RearEnd}";

    yearPrms.value = yearTxt.split(',');
    sevPrms.value = sevText.split(',');
    manPrms.value = mannerTxt.split(',');

    var map = new OM.Map(document.getElementById('map'),{mapviewerURL: baseURL}) ;
    tilelayer = new OM.layer.OSMTileLayer("tilelayer");
            //tilelayer = new OM.layer.TileLayer("udotbase", {dataSource:"udot", tileLayer:"LOCALTILELAYER", tileServerUrl: baseURL -

    map.addLayer(tilelayer) ;
    vectorlayer1 = new OM.layer.VectorLayer("vectorlayer1", { def:layerdef, renderingStyle: circleMarker});
    vectorlayer1.setLabelsVisible(false);
    vectorlayer1.enableClustering(true,{clusterStyle:circleMarker, minPointCount:5, maxClusteringLevel:8, threshold:90});
    vectorlayer1.setQueryParameters(sevPrms, yearPrms, limitPrm);
    map.addLayer(vectorlayer1) ;
```

Parameters Matched

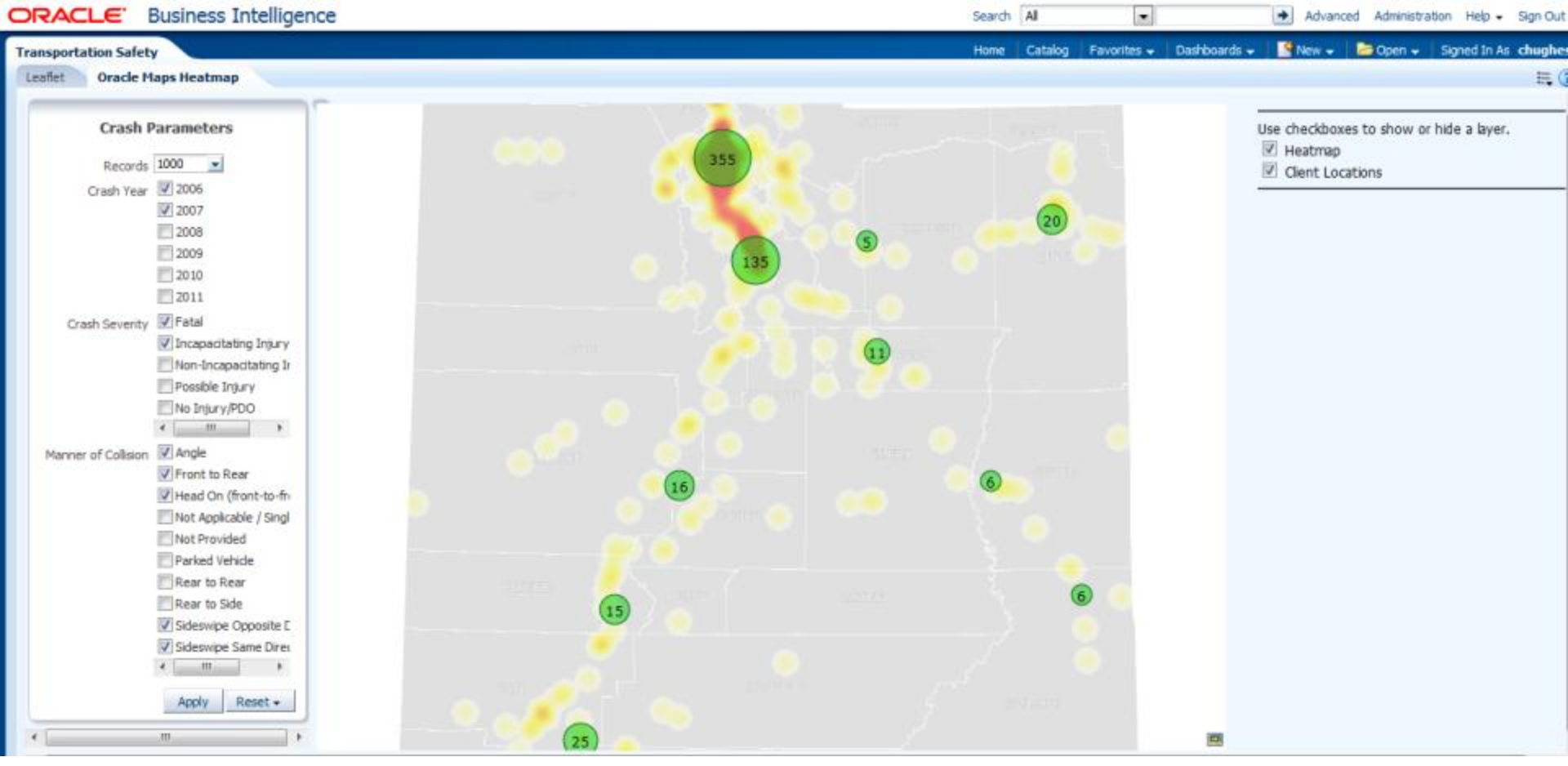
1. Crash Severity
2. Crash Year
3. Limit of Num Recs

8a) Review Parameters posted from the Oracle Maps js client





9) End Result with Heatmap and Clustered Symbols



Demonstrations

- Review prompts/parameters in JavaScript
- Firebug the XMLHTTP
- Lets Try and break the Demo!

Key Takeaways

- New Oracle Maps HTML5 API allows better and faster spatial data retrieval and manipulation
- Embedding other APIs in OBIEE is a good way to meet needs when OOTB OBIEE wont cut it
- Develop HTML/JS separately and then bring into OBIEE
- As always: Firebug (or Chrome Dev Tools) is your friend

CONCLUSION

