

Dimitri Gielis

Intro into Charts



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Agenda

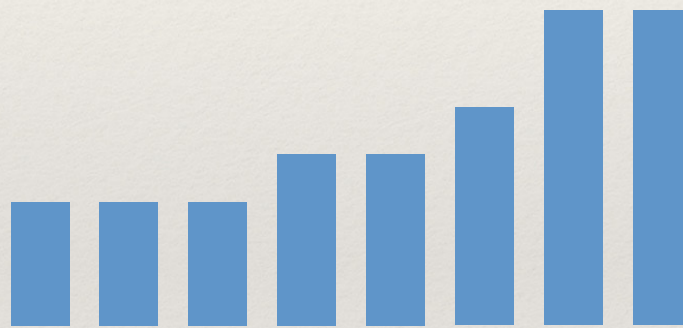
- ❖ Intro into visualisations
- ❖ Create a chart in APEX
- ❖ Customise the chart (based on Best Practices)
- ❖ Looking behind the scenes
- ❖ Q&A

Intro into visualisations

What's your message?

- ❖ Be careful how to show your data...

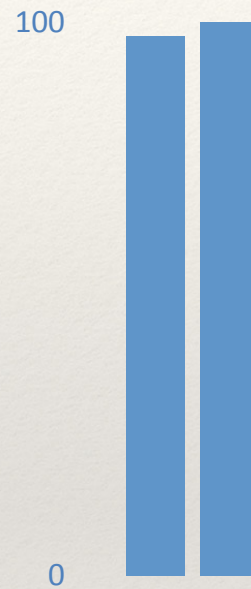
Visual Context (order)



Visual Context (order)



Largest effective difference (scale)

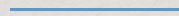


Largest effective difference (scale)

100

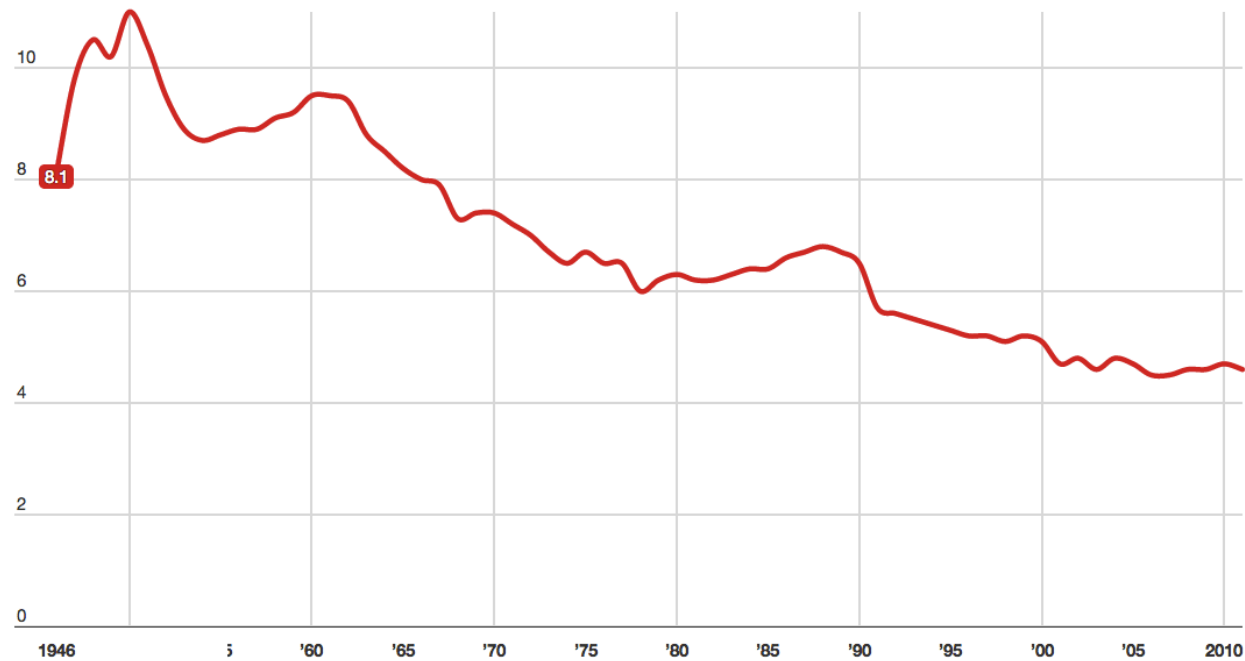


90



Largest effective difference (scale)

Line

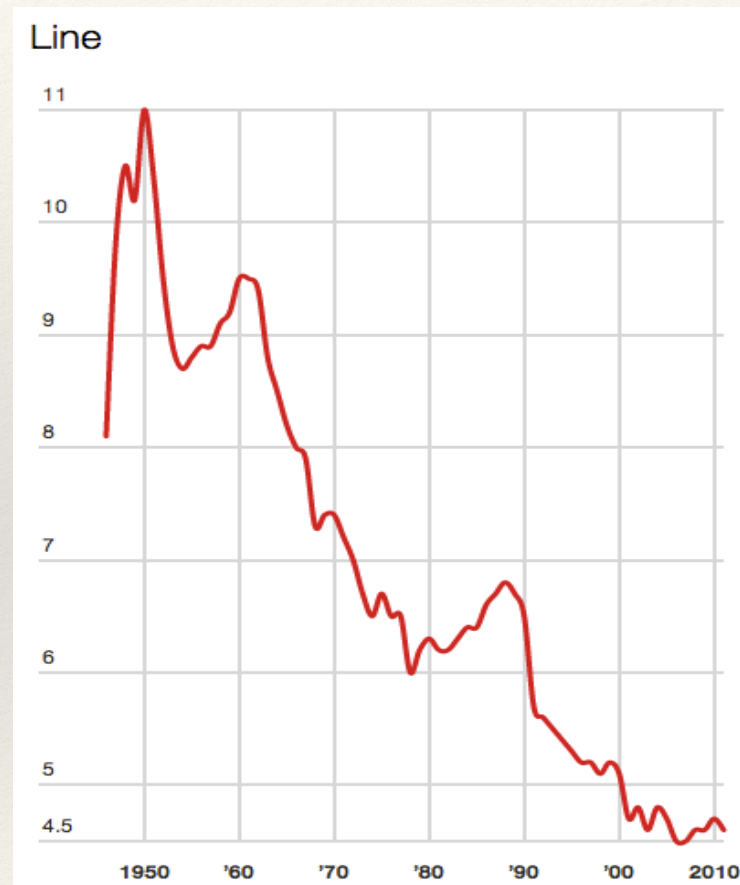


Largest effective difference (scale)

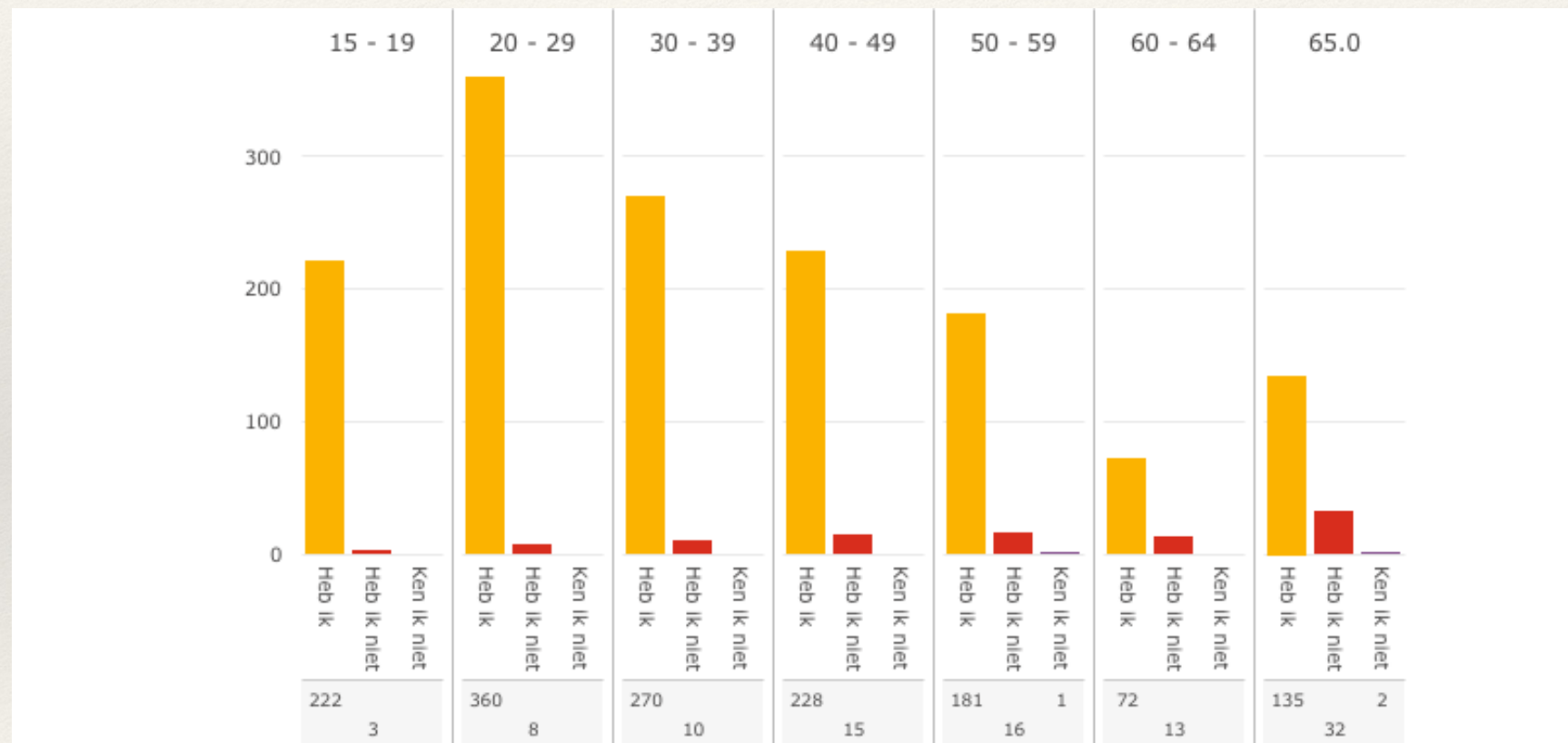
Line



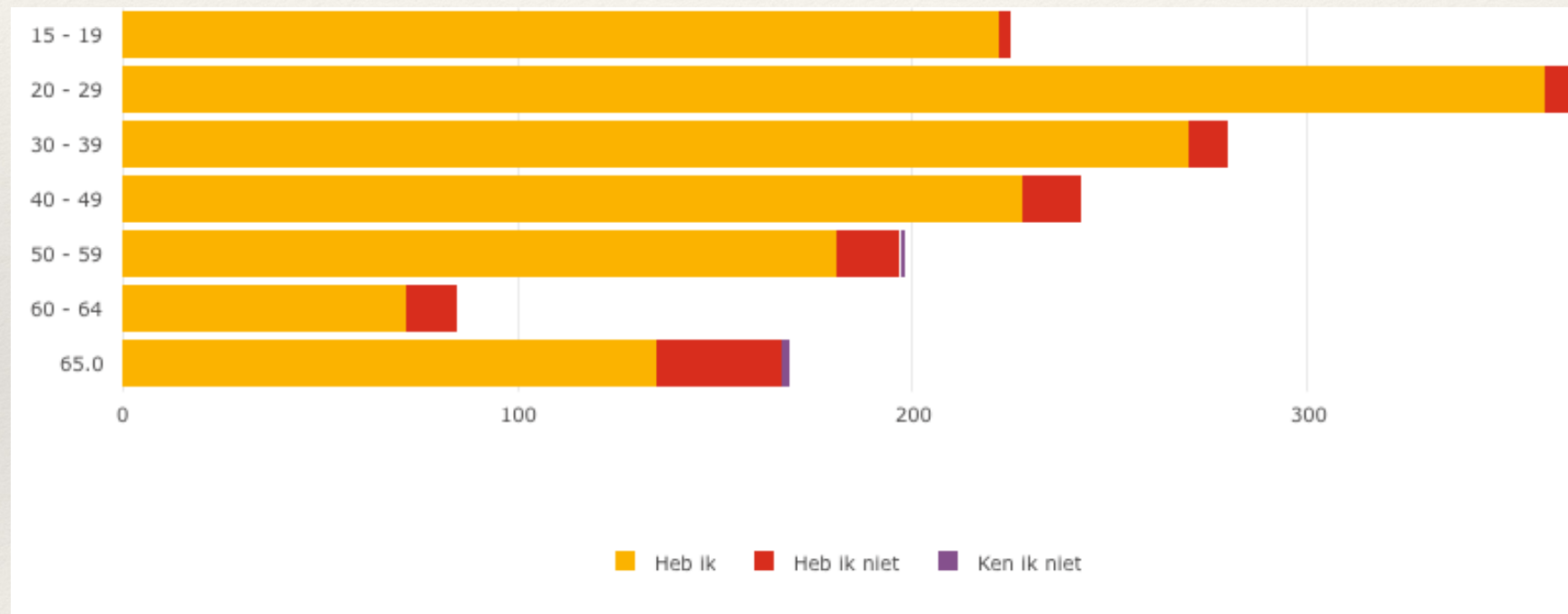
Largest effective difference (scale)



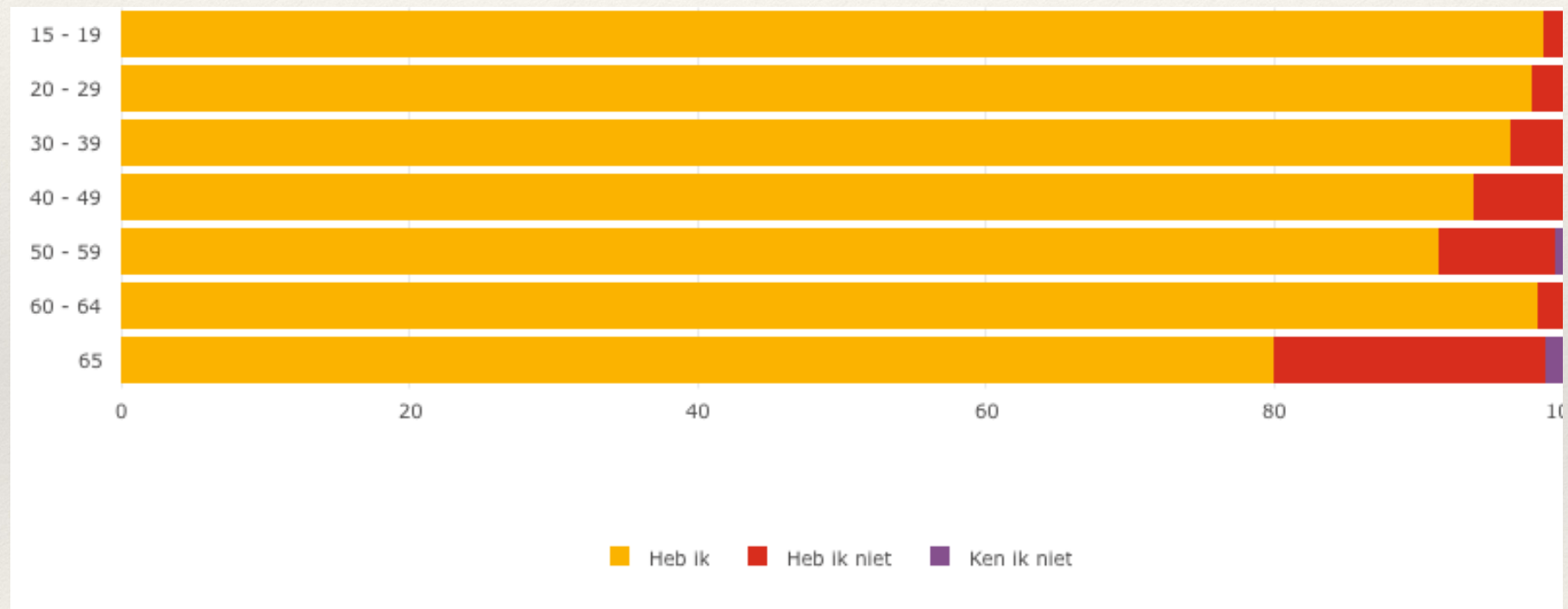
Graph Type



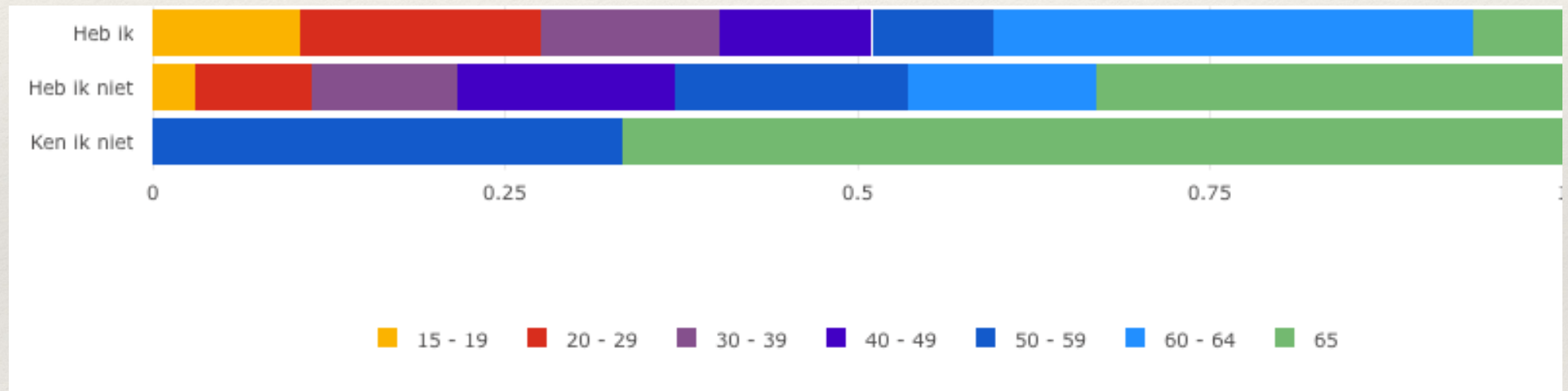
Graph Type



Graph Type

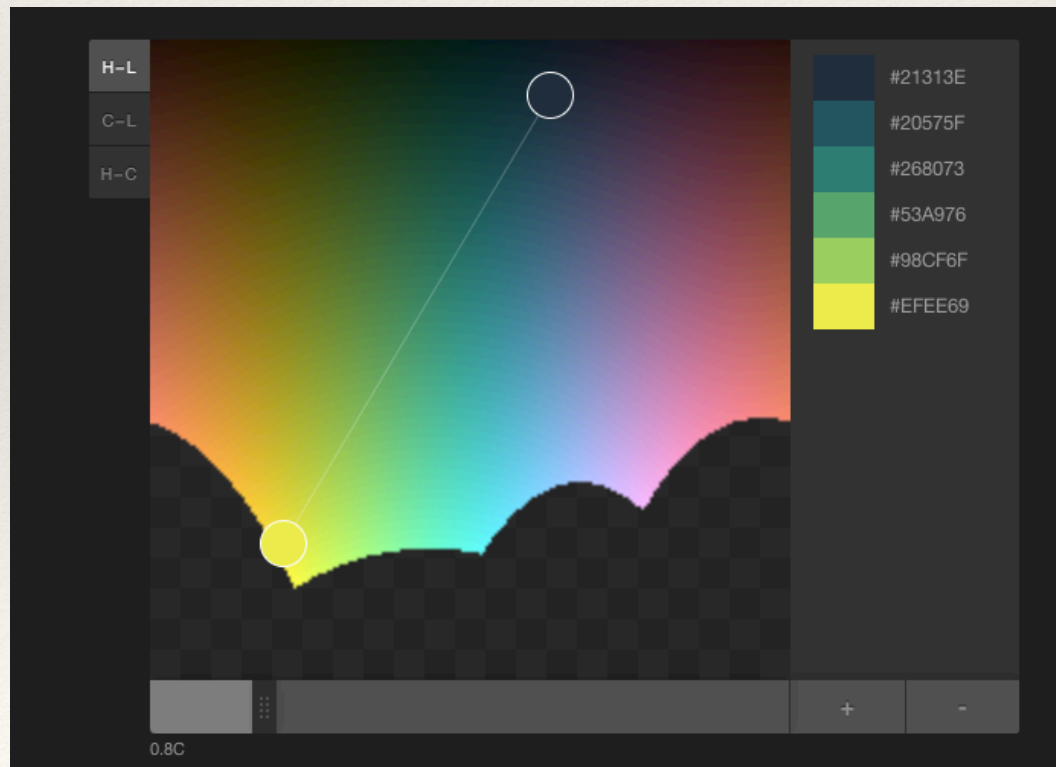


Graph Type



Color Selection

- ❖ Kuler
- ❖ <http://tristen.ca/hcl-picker>



Create a chart in APEX

Create Chart - Step 1

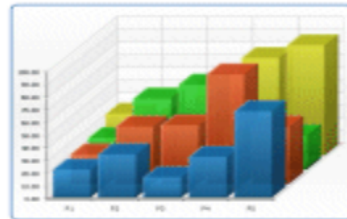
- ❖ Select rendering engine and main chart type

Chart Rendering

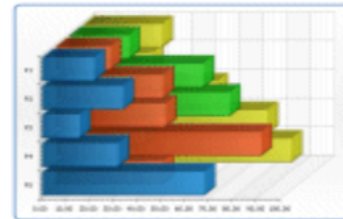
☒ Flash Chart
☐ HTML5 Chart

Chart Type:

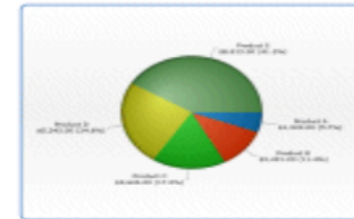
☒ Column



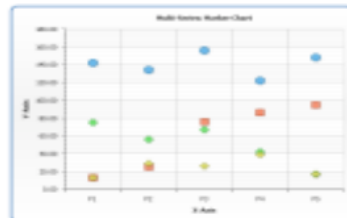
☐ Horizontal Bar



☐ Pie & Doughnut



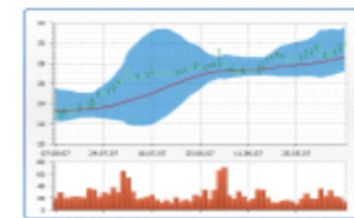
☐ Scatter



☐ Line



☐ Candlestick



☐ Gauges



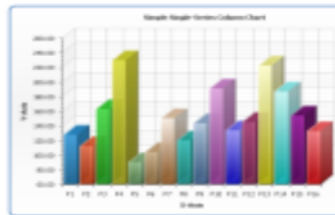
☐ Gantt



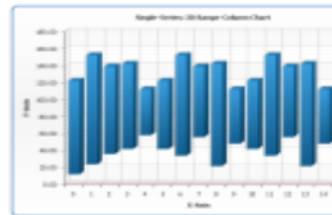
Create Chart - Step 2

- ❖ Depending main type, select sub type

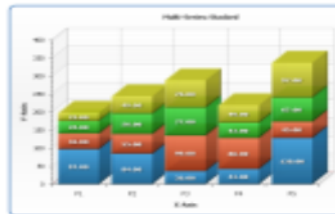
☒ 3D Column



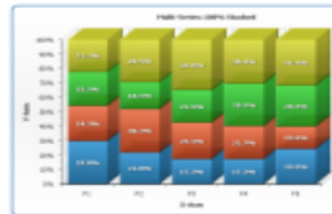
☐ 3D Range Column



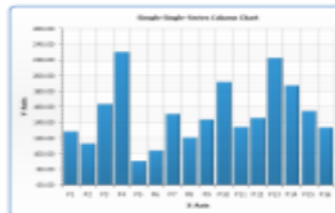
☐ 3D Stacked Column



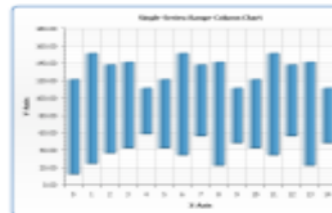
☐ 3D Stacked Column (Percent)



☐ 2D Column



☐ 2D Range Column



Create Chart - Step 3

- ❖ Specify look and feel through chart attributes

Chart Type:	2D Column		
Chart Title			
Chart Animation	None ▾		
Background Type:	☒ Transparent	☐ Solid Color	☐ Gradient
Background Color 1	#eeeeee		
Background Color 2	#eeeeee		
Gradient Angle			
Y Axis Title			
Color Scheme	Look 6 ▾		
X Axis Title			
Show Hints	☒		
Show Labels	☒		

Create Chart - Step 4

❖ Define the source for the data of the chart

Enter the query that will return the data to display the chart. Depending on the chart type, the required query format is different. To see an example, click **Chart Query Example**.

* Enter SQL Query or PL/SQL function returning a SQL Query:

```
SELECT NULL LINK,  
       ENAME LABEL,  
       SAL VALUE  
FROM   EMP  
ORDER  BY ENAME|
```

Build Query

Page Items to Submit



* Maximum Rows

15

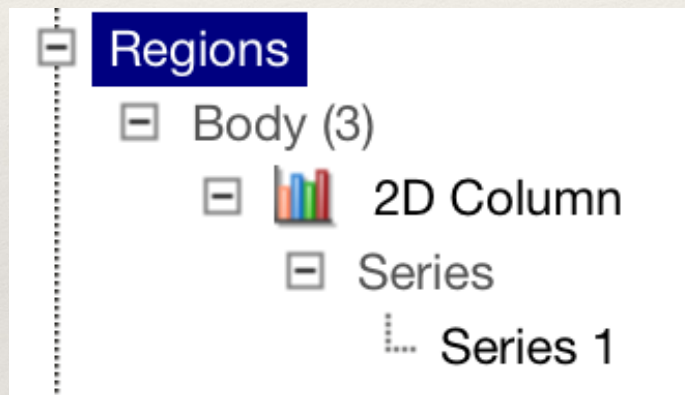
When No Data Found Message

No data found.

▼ Chart Query Example for 2DColumn

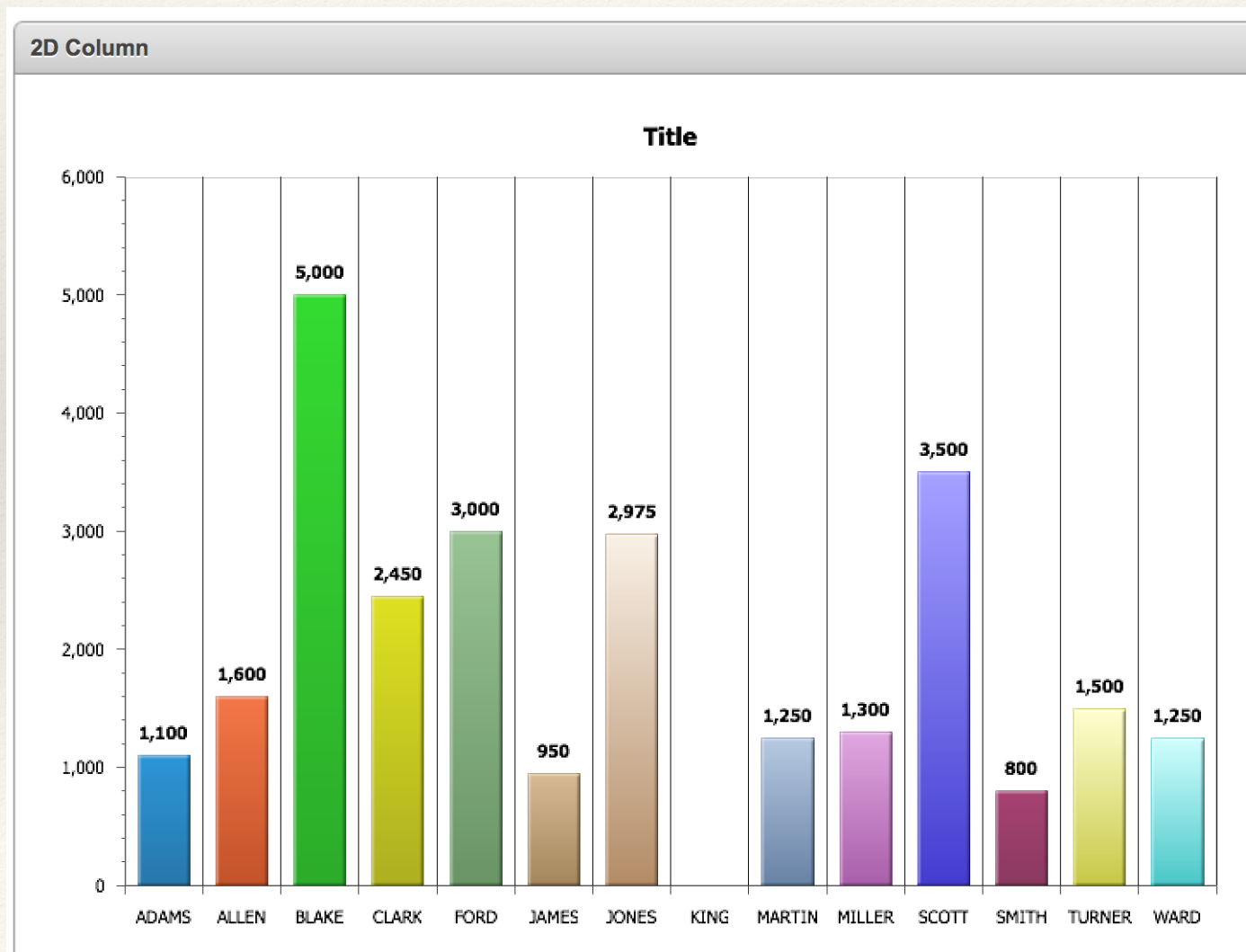
Create Chart - Result

- ❖ A chart region is created (Page Definition)



Create Chart - Result

- ❖ Chart is shown when the page is ran



Customise the chart
(based on Best Practices)

Customise a chart - Part 1

Region Definition		Chart Attributes					
Region: 1 of 1 Name: 2D Column							
Show All	Identification	User Interface	Grid Layout	Attributes	Header and Footer	Conditions	Read Only
Identification							
Page:	30 Test 123						
* Title	2D Column			☐ exclu			
Type	Chart						
User Interface							
* Sequence	10						
Parent Region	- Select a Parent -						

Customise a chart - Part 2

Region Definition

Chart Attributes

Region Name: 2D Column

Show All

Chart Settings

Chart Series

Display Settings

Axes Settings

Legend Settings

Font Settings

Chart XML

Refresh

Chart Settings

Chart Rendering

Flash Chart

HTML5 Chart

Chart Type

2D Column

Chart Title

Title

* Chart Width

700

* Chart Height

500

Formula 16/9

Chart Margin: Top

Bottom

Left

Right

Color Scheme

Look 7

Set Color Level:

☒ Series

☐ Point

Custom Colors

Hatch Pattern

No

Custom Colors

Customise a chart - Part 2

Region Definition	Chart Attributes
-------------------	-------------------------

Region Name: 2D Column

Show All	Chart Settings	Chart Series	Display Settings	Axes Settings	Legend Settings	Font Settings	Chart XML	Refresh
----------	----------------	---------------------	------------------	---------------	-----------------	---------------	-----------	---------

Chart Series

	Series Name	Query
	Series 1	SELECT NULL LINK, ENAME LABEL, SAL VALUE FROM EMP ORDER BY ENAME

Customise a chart - Part 2

Region Definition

Chart Attributes

Region Name: 2D Column

Show All

Chart Settings

Chart Series

Display Settings

Axes Settings

Legend Settings

Font Settings

Chart XML

Refresh

Display Settings

Animation

None

Style

Default

Background Type:

☒ Transparent ☐ Solid Color ☐ Gradient

Background Color 1

Background Color 2

Include on Chart:

☒ Hints

☒ Values

☒ Labels

☐ Group By Series

☐ Major Ticks

☐ Minor Ticks

☐ Tick Labels

☐ Multiple Y-Axis

☐ Invert X-Axis Scale

☐ Invert Y-Axis Scale

☐ Invert Scale

☐ Overlay Y-Axis

☐ Sorted Overlay Y-Axis

Customise a chart - Part 2

Region Definition	Chart Attributes
-------------------	-------------------------

Region Name: 2D Column

Show All	Chart Settings	Chart Series	Display Settings	Axes Settings	Legend Settings	Font Settings	Chart XML	Refresh
----------	----------------	--------------	------------------	----------------------	-----------------	---------------	-----------	---------

Axes Settings

X Axis Title			
Y Axis Title			
Y Axis: Min		Max	
X Axis: Prefix		X Axis: Postfix	
Y Axis: Prefix		Y Axis: Postfix	
X-Axis: Major Interval		Minor Interval	
Y-Axis: Major Interval		Minor Interval	
Decimal Places			

Customise a chart - Part 2

Region Definition

Chart Attributes

Region Name: 2D Column

Show All

Chart Settings

Chart Series

Display Settings

Axes Settings

Legend Settings

Font Settings

Chart XML

Refresh

Legend Settings

Show Legend:

☒ None ☐ Left ☐ Right ☐ Top ☐ Bottom ☐ Float

Legend Title

Legend Element Layout:

☒ Vertical ☐ Horizontal

Show Legend Background

☒

Customise a chart - Part 2

Region Definition

Chart Attributes

Region Name: 2D Column

Show All

Chart Settings

Chart Series

Display Settings

Axes Settings

Legend Settings

Font Settings

Chart XML

Refresh

Font Settings

	Font Face	Font Size	Font Color
X Axis Labels	Tahoma ▾	10 ▾	#000000  
Y-Axis Labels	Tahoma ▾	10 ▾	#000000  
Values	Tahoma ▾	10 ▾	#000000  
Hints	Tahoma ▾	10 ▾	#000000  
Legend	Tahoma ▾	10 ▾	#000000  
Chart Title	Tahoma ▾	14 ▾	#000000  
X Axis Title	Tahoma ▾	14 ▾	#000000  

Customise a chart - Part 2

Region Definition

Chart Attributes

Region Name: 2D Column

Show All

Chart Settings

Chart Series

Display Settings

Axes Settings

Legend Settings

Font Settings

Chart XML

Refresh

Chart XML

Use Custom XML

No

Custom XML

```
<?xml version = "1.0" encoding="utf-8" standalone = "yes"?>
<anychart>
  <settings>
    <animation enabled="false"/>
    <no_data show_waiting_animation="False">
      <label>
        <text>#NO_DATA_MESSAGE#</text>
        <font family="Verdana" bold="yes" size="10"/>
      </label>
    </no_data>
  </settings>
</anychart>
```

Reset

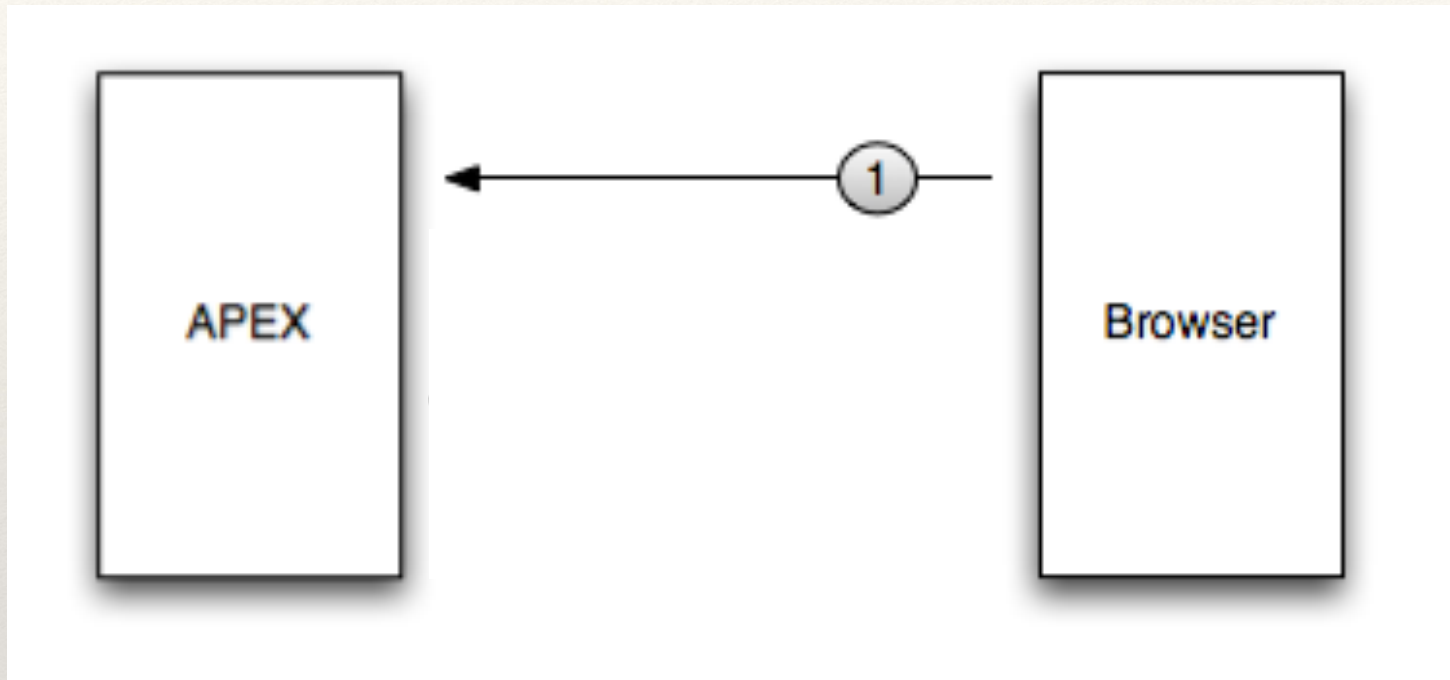
Customise a chart - Part 2

Region Definition	Chart Attributes
Region Name: 2D Column	
Show All Chart Settings Chart Series Display Settings Axes Settings Legend Settings Font Settings Chart XML Refresh	
Refresh	
Asynchronous Update	No ▾ Update Interval (Seconds) 10

Live Demo

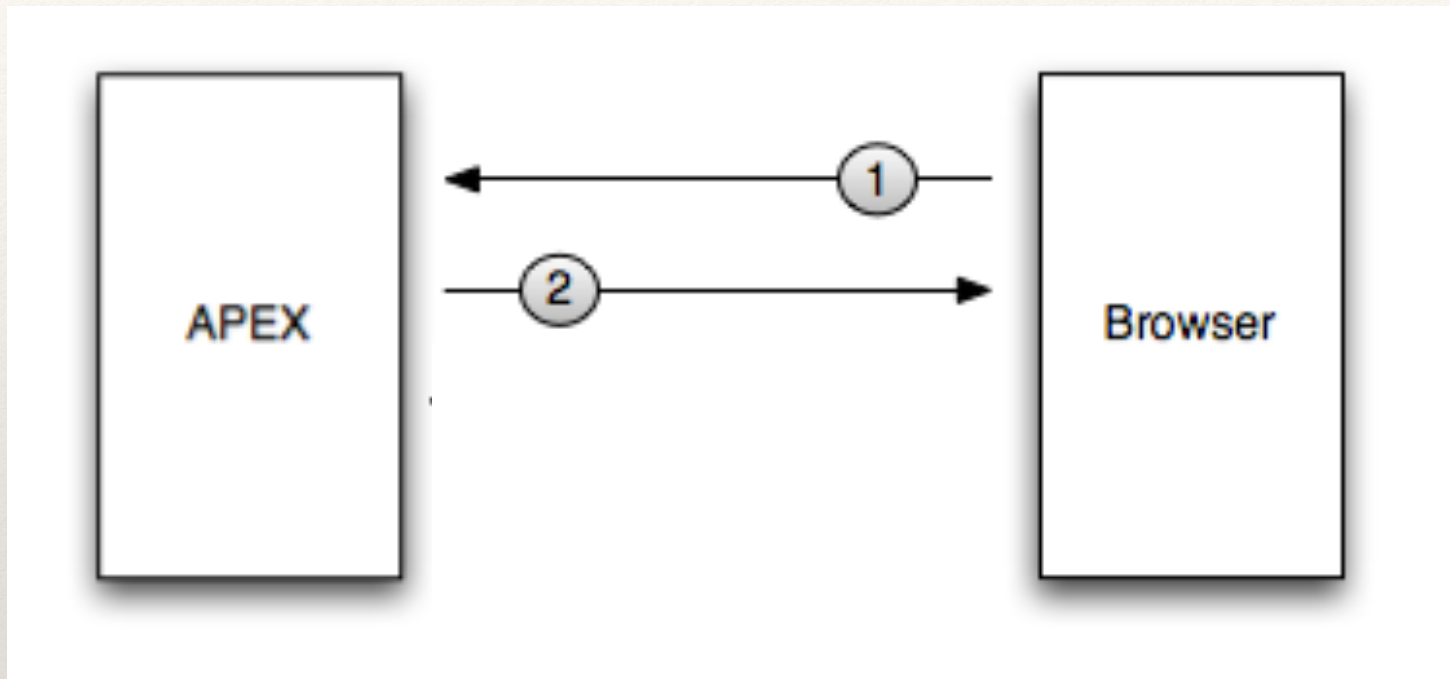
Looking behind the scenes

Process of Running a Chart



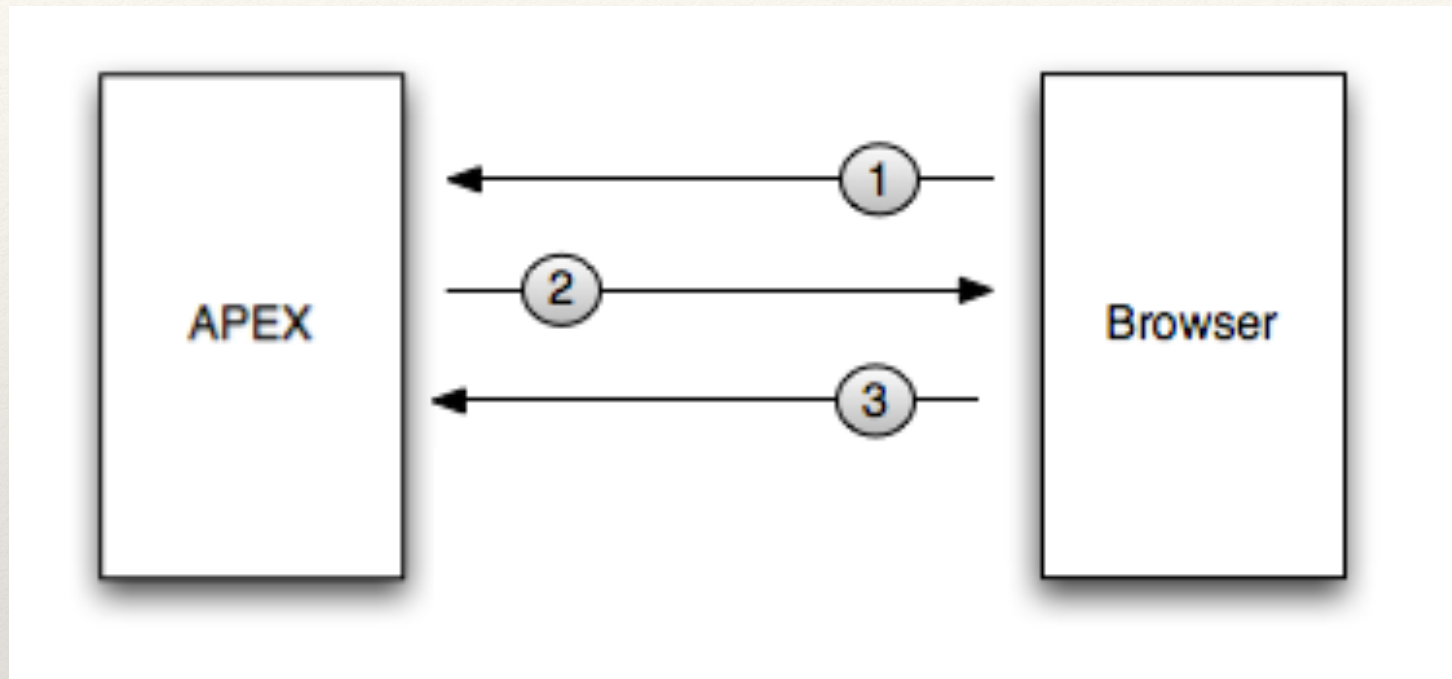
1. Page request with chart

Process of Running Flash Chart



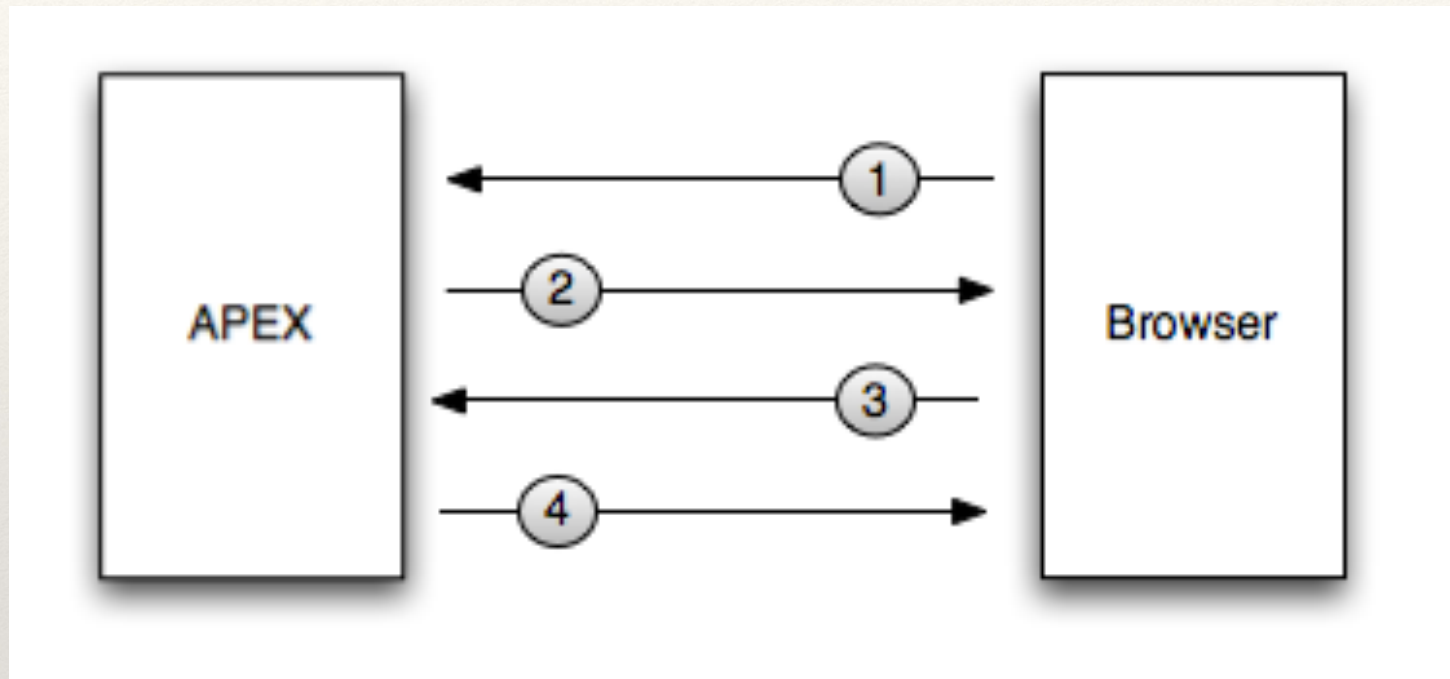
1. Page request with chart
2. APEX sends back HTML/Javascript

Process of Running Flash Chart



1. Page request with chart
2. APEX sends back HTML/Javascript
3. Javascript call to request data for chart

Process of Running Flash Chart



1. Page request with chart
2. APEX sends back HTML/Javascript
3. Javascript call to request data for chart
4. APEX sends back XML (data of chart)

Requests behind the scenes

URL	Status	Domain	Size	Remote IP	Timeline
▶ GET f?p=106:30:6156531779817:::31ms	200 OK	oel.apexrnd.be:8888	11,5 KB	172.16.68.148:8888	31ms
▶ GET apex.min.css?v=4.2.2.00.11	304 Not Modified	oel.apexrnd.be:8888	34,7 KB	172.16.68.148:8888	9ms
▶ GET jquery-ui.min.css	304 Not Modified	oel.apexrnd.be:8888	24,2 KB	172.16.68.148:8888	8ms
▶ GET desktop_all.min.js?v=4.2.2.00.	304 Not Modified	oel.apexrnd.be:8888	264,4 KB	172.16.68.148:8888	8ms
▶ GET legacy.min.js?v=4.2.2.00.11	304 Not Modified	oel.apexrnd.be:8888	17,8 KB	172.16.68.148:8888	8ms
▶ GET theme_4_0.css	304 Not Modified	oel.apexrnd.be:8888	122,4 KB	172.16.68.148:8888	8ms
▶ GET widget.chart.min.js?v=4.2.2.00	304 Not Modified	oel.apexrnd.be:8888	1,2 KB	172.16.68.148:8888	9ms
▶ GET AnyChart.js	304 Not Modified	oel.apexrnd.be:8888	80,6 KB	172.16.68.148:8888	9ms
▶ GET AnyChartHTML5.js	304 Not Modified	oel.apexrnd.be:8888	575,0 KB	172.16.68.148:8888	10ms
▶ GET e.gif	304 Not Modified	oel.apexrnd.be:8888	870 B	172.16.68.148:8888	1ms
▶ GET rHeader.png	304 Not Modified	oel.apexrnd.be:8888	2,4 KB	172.16.68.148:8888	1ms
▶ GET sRegion.png	304 Not Modified	oel.apexrnd.be:8888	1,4 KB	172.16.68.148:8888	1ms
▶ GET sRegion-Body.png	304 Not Modified	oel.apexrnd.be:8888	318 B	172.16.68.148:8888	1ms
▶ GET sRegion-Bottom.png	304 Not Modified	oel.apexrnd.be:8888	1,3 KB	172.16.68.148:8888	1ms
▶ GET sRegion-Blank-White.png	304 Not Modified	oel.apexrnd.be:8888	1,3 KB	172.16.68.148:8888	1ms
▶ GET right_arrow_bullet.gif	304 Not Modified	oel.apexrnd.be:8888	179 B	172.16.68.148:8888	1ms
▶ GET dev-bar.png	304 Not Modified	oel.apexrnd.be:8888	188 B	172.16.68.148:8888	1ms
▶ GET Preloader.swf	304 Not Modified	oel.apexrnd.be:8888	6,8 KB	172.16.68.148:8888	2ms
▶ POST www_flow.show	200 OK	oel.apexrnd.be:8888	3,7 KB	172.16.68.148:8888	24ms
19 requests			1,1 MB	(1,1 MB from cache)	1,06s (onload: 1,13s)

Only when Flash chart

Javascript logic

❖ investigate `/i/libraries/apex/widget.chart.js`

```
/**
1  /**
2  * @fileOverview
3  * The {@link apex.widget}.chart is used to store all chart related functions of Oracle Application Express.
4  */
5
6  ( function( widget, $, util ) {
7
8  /**
9  * @param {String} pRegionId
10 * @param {Object} [pOptions]
11 *
12 * @function chart
13 * @memberOf apex.widget
14 * */
15 widget.chart = function( pRegionId, pOptions ) {
16
17     var lRegion$ = $( '#' + util.escapeCSS( pRegionId ), apex.gPageContext$ ),
18         lChart$ = $( "#" + util.escapeCSS( pRegionId + "_chart" ), apex.gPageContext$),
19         lOptions = pOptions || {},
20         lChart,
21         lUseBrowserResize = true;
22
23     if ( pOptions.swfFile && pOptions.swfFile.match( /anygantt.*/ ) ) {
24         lChart = new AnyGantt( pOptions.swfFile, pOptions.preloaderFile );
25     } else {
26         AnyChart.useBrowserResize = true;
27     }
28 }
```

APEX Charts behind the scenes

- ❖ Based on AnyChart 6.x (special version)

Native in the APEX Wizard

	Column chart
	Line Chart
	Bar Chart
	Range-Bar Chart
	Range-Column Chart
	Stacked Bar Chart
	Stacked Column chart
	100% Stacked Column Chart
	Candlestick Chart
	100% Stacked Bar Chart
	Pie Chart
	Doughnut Chart
	Circular Gauge
	Scatter Chart

Not in APEX, but in full version AnyChart

	Stock(HLOC) Chart		Step-Line Chart
	Spline Chart		Spline-Area Chart
	Area Chart		Funnel Chart
	Step-Line-Area Chart		Pyramid Chart
	Range-Area Chart		Tree-Map
	Range-Spline-Area Chart		Indicator Gauge
	Stacked Area Chart		Vertical Gauge
	Stacked Spline-Area Chart		Heat-Map
	Stacked Step-Line-Area Chart		Interactive Gauges
	100% Stacked Area Chart		Interactive Dashboards
	100% Stacked Step-Line-Area Chart		Horizontal Gauge
	Bubble Chart		Image Gauge
	100% Stacked Spline-Area Chart		Thermometer Gauge
	Dot/Marker Chart		Tank Gauge

Anychart XML Reference

- ❖ XML is fully documented on the AnyChart website



AnyChart

Flash Charting Component - XML Reference

Version 5.1.2

```
<anychart>
├── <charts>
│   └── <chart>
│       ├── <data_plot_settings>
│       ├── <chart_settings>
│       ├── <data>
│       ├── <styles>
│       ├── <palettes>
│       └── <thresholds>
├── <margin>
├── <settings>
├── <templates>
├── <dashboard>
├── <gauges>
└── <data_sets>
```

<chart> node

Description

Chart node contain settings and data for a single chart.

Attributes

Attribute Name	Description	Type	Possible Values	Default Value
plot_type	Plot type	Enum	CategorizedVertical CategorizedHorizontal CategorizedBySeriesVertical CategorizedBySeriesHorizontal Scatter Pie Doughnut Map HeatMap TreeMap Funnel	CategorizedVertical
template	Template name	String	n/a	n/a
name	Chart name used in dashboard mode.	String	n/a	n/a
	Enables/Disables animation for the given		True	

Live Demo

We covered

- ❖ Intro into visualisations
- ❖ Create a chart in APEX
- ❖ Customise the chart (based on Best Practices)
- ❖ Looking behind the scenes

Q&A

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