



# Build amazing HTML5 applications with Sencha GXT

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# A Java library for building rich applications with GWT



# Speaking of GWT...



670 at GWT.create 2015





- ▶ Google Inbox is written in GWT
- ▶ 70% code shared between Android, Web, and iOS
- ▶ And the new Sheets
- ▶ 100k+ developers world-wide
- ▶ Super dev mode > classic dev mode (demo)
- ▶ Continues to fill niche in enterprise apps
- ▶ Now governed by GWT Steering Committee  
(Vaadin, Sencha, ArcBees, Google)



# Sencha GXT

- ▶ Native GWT solution with no external JavaScript or 3rd party libraries
- ▶ High performance, customizable UI widgets
- ▶ Well designed, consistent and fully documented source
- ▶ Built-in support for RPC, RequestFactory, and JSON
- ▶ Full theming support with standard CSS
- ▶ Commercial licenses and support available





# GXT Widgets

Sencha GXT Explorer Demo

Navigation

Filter...

- Binding
- Button
- Charts
- Combos
- Drag and Drop
- Draw
- Forms
- Grid
  - Aggregation Grid
  - Basic Grid
  - Basic UIBinder Grid
  - Cell Grid
  - CheckBox Grid
  - Filter Grid
  - Grouping Grid
  - Inline Editable Grid
  - Json Grid
  - Live Grid
  - Live GroupSummary
  - LocalStorage Grid
  - Paging Grid
  - Paging UIBinder Grid
  - Remote Filter Grid
  - RequestFactory Grid
  - Row Editable Grid
  - RowExpander Grid
  - RowNumberer Grid
  - Xml Grid
- Layouts
- Misc
- Tabs
- Templates & Lists
- ToolBar & Menu
- Tree
- TreeGrid
- Windows

Overview

Basic Grid

Company	Sym
Apple Inc.	AAPL
Cisco Systems, Inc.	CSO
Canada Bar	CAF
China Eastcom, Inc.	CEI

Cell Grid

Name
Bloodroot

CheckBox Grid

Selection Mode: Multi

<input type="checkbox"/>	Company
<input type="checkbox"/>	Apple Inc.
<input type="checkbox"/>	China Eastcom, Inc.

Filter Grid

Company	Price	Adj
Shade	\$9.50	Apr
Hearty Shady	\$4.50	May
Sun or Shade	\$7.10	Apr
Hearty Sunny	\$9.00	Jul
Sunny	\$2.44	Mar

Grouping Grid

Industry: Automotive (3 Items)
General Motors Corporation

Inline Editable Grid

Sender	End
Middleton, Wendy V.	Mar
Stark, Olivia P.	May
Shannon, Rhia D.	July
Eric, August P.	April

Json Grid

Forum
Forum
User Extensions
Bus

Live Grid Example

Live Grid

Live GroupSummary

Forum	End
Forum	Forum
User Extensions	User Extensions
Bus	Bus

LocalStorage Grid Example

Title
Status bar error with
I skin XT template to a
LocalStorage Grid

Paging Grid Example

Forum
Bugs
User Extensions

Grid UIBinder Example

Forum
Help
Help

Remote Filter Grid

Forum
General Discussion
RequestFactory Grid

RequestFactory Grid

Forum
General Discussion
RequestFactory Grid

Row Editable Grid

Company
Apple Inc.
Cisco Systems, Inc.
Company: Cisco Systems, Inc.

RowExpander Grid

Company
1 Apple Inc.
2 Cisco Systems, Inc.
3 Google Inc.

RowNumberer Grid

Company
1 Apple Inc.
2 Cisco Systems, Inc.
3 Google Inc.

Xml Grid

Company
1 Apple Inc.
2 Cisco Systems, Inc.
3 Google Inc.

AccordionLayout

BorderLayout Example

BorderLayout

BorderLayout (UIBinder)

BorderLayout (UIBinder Dynamic Attribute)

BorderLayout (UIBinder)

CardLayout Example

CardLayout

CardLayout (UIBinder)

CenterLayout

CenterLayout (UIBinder)

HBoxLayout

HBoxLayout (UIBinder)

HorizontalLayout

HorizontalLayout (UIBinder)

HtmLayout

LayoutPanel Integration

PortLayout

PortLayout (UIBinder)

VBoxLayout

VBoxLayout (UIBinder)

VerticalLayout

VerticalLayout (UIBinder)

DatePicker

DatePicker (UIBinder)

Draggable

Draggable (UIBinder)

Fx

Fx (UIBinder)

Slider

Slider (UIBinder)

ToolTips

ToolTips (UIBinder)

Window State

Advanced Tabs

Basic Tabs

Basic Tabs (UIBinder)

Advanced ListView

DateCell ListView

Basic Template

Mix and match icon sizes

Button w/ Menu

Button w/ Menu

File Edit

File Edit

Demo Source



# GXT Charts

Sencha GXT Explorer Demo

Overview Area Chart

Select Company: Apple Inc  
Name: Apple Inc  
Symbol: AAPL  
Last: 123.43

Select Company: Apple Inc  
Name: Apple Inc  
Symbol: AAPL  
Last: 123.43

Date in UTC:  
2011 December 6 0  
Show

Basic Binding Basic Binding (UIBinder) Converter Example

Icon and Text (bottom)  
Add User Add User

Buttons

Area Chart Area Renderer Chart

Dynamic Line Chart Filter Chart Gauge Chart

Pie Chart Pie Renderer Chart Radar Chart

Google Inc. Google Inc.

Area Chart

Reload Data Animate

Number of Hits

Month of the Year

data1 data2 data3 data4 data5 data6 data7

The image displays the Sencha GXT Explorer Demo interface. On the left, the 'Overview' tab shows a grid of various GXT components and charts, including 'Basic Binding', 'Basic Binding (UIBinder)', 'Converter Example', 'Buttons', 'Area Chart', 'Area Renderer Chart', 'Dynamic Line Chart', 'Filter Chart', 'Gauge Chart', 'Pie Chart', 'Pie Renderer Chart', and 'Radar Chart'. On the right, the 'Area Chart' tab is active, showing a detailed area chart titled 'Area Chart'. The chart displays the 'Number of Hits' (Y-axis, 0 to 450) over the 'Month of the Year' (X-axis, January to December). The chart is a stacked area chart with seven data series: data1 (green), data2 (blue), data3 (red), data4 (orange), data5 (yellow), data6 (purple), and data7 (teal). The total number of hits peaks in May and November, reaching approximately 430. The chart includes a legend at the bottom and control buttons for 'Reload Data' and 'Animate'.



# Getting started

```
mvn archetype:generate \  
-DarchetypeRepository=https://oss.sonatype.org/content/repositories/snapshots \  
-DarchetypeGroupId=com.sencha.gxt.archetypes \  
-DarchetypeArtifactId=gxt-basic-public-3x-archetype \  
-DarchetypeVersion=1.0.0-SNAPSHOT
```

[http://docs.sencha.com/gxt/3.1/getting\\_started/maven/Archetypes.html](http://docs.sencha.com/gxt/3.1/getting_started/maven/Archetypes.html)





# GXT Features

Cells & Widgets

Layouts & UIBinder

Stores & Loaders

Charts





# Cells & Widgets



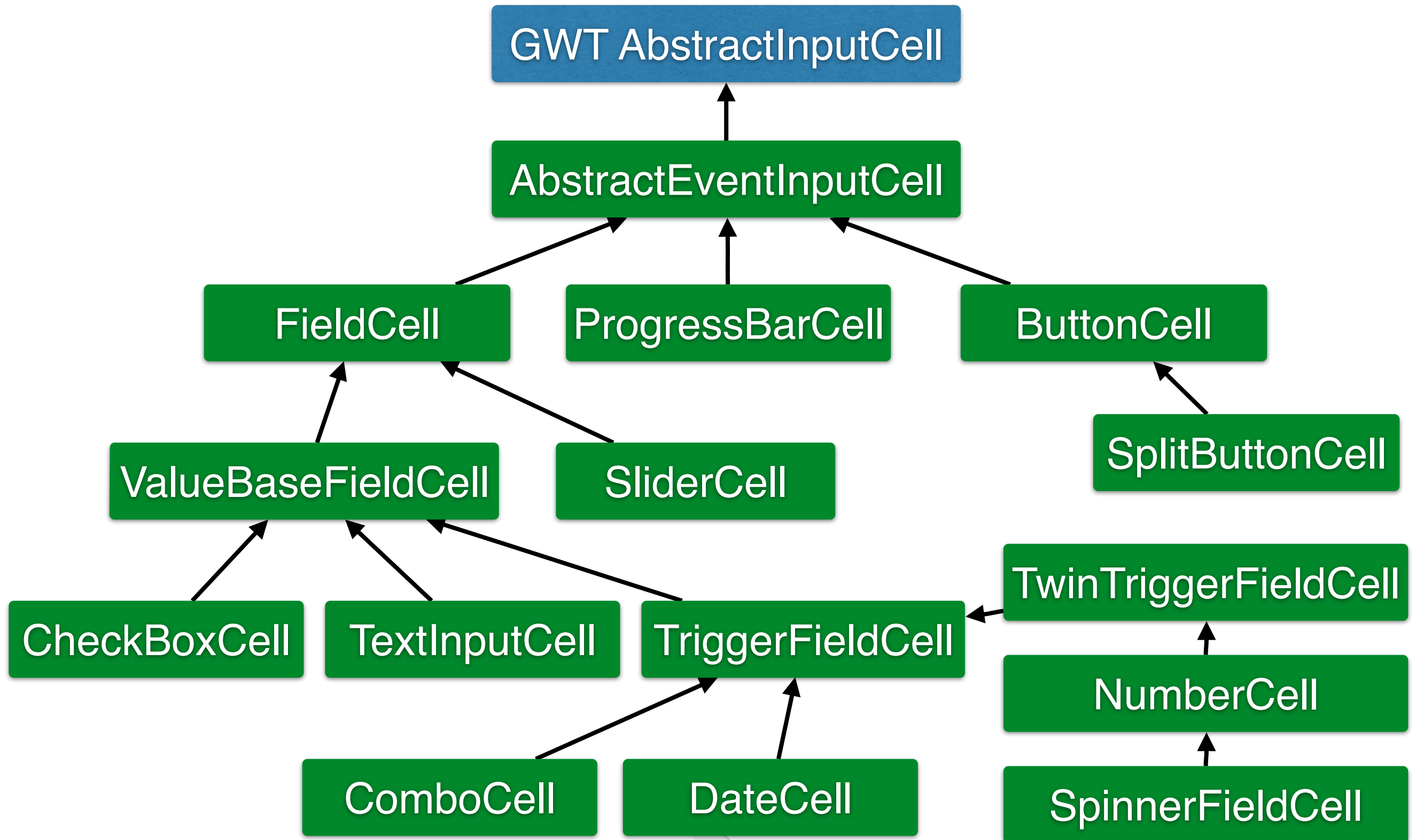


# Widgets

- ▶ Grids, trees, toolbars, menu buttons, ...
- ▶ See them all in the Explorer demo
- ▶ Customizable (Appearance pattern)
- ▶ Work with the GWT Editor framework
- ▶ Support asynchronous retrieval of data
- ▶ Auto state mgmt (LocalStorage, cookies, async...)
- ▶ Not on by default



# Cells



# Cell widgets

- ▶ Cell support in all data widgets
- ▶ Tree, ListView, Grid, TreeGrid
- ▶ Replaces Widget support in data widgets from 2.0
- ▶ High performance, interactive behavior

**Cell Grid**

Name	Date
Bloodroot	2006-03-15
Columbine	2006-03-15
Marsh Marigold	2006-05-17
Cowslip	
Dutchman's-Breeches	
Ginger, Wild	
Hepatica	
Liverleaf	
Jack-In-The-Pulpit	
Mayapple	
Phlox, Woodland	

**DataWidget Example**

First Name	Last Name	Email Address	Favorite Color	Height
Colin	Alworth	colin.alworth@sencha.com	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="range"/>
Sven	Brunken	sven@sencha.com	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="range"/>
Darrell	Meyer	darrell@sencha.com	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="range"/>
Wesley	Moy	wesley@sencha.com	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="range"/>
Brendan	Coughran	brendan@sencha.com	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	<input type="range"/>



# Cell example

```
ColumnConfig column = new ColumnConfig();
column.setRenderer(renderer);

cc1 = new ColumnConfig<Plant, String>(properties.name(), 100, "Name");

TextButtonCell button = new TextButtonCell();
button.addSelectHandler(new SelectHandler() {
    @Override
    public void onSelect(SelectEvent event) {
        Context c = event.getContext();
        int row = c.getIndex();
        Plant p = store.get(row);
        Info.display("Event", "The " + p.getName() + " was clicked.");
    }
});
cc1.setCell(button);
```





# Layouts & UiBinder

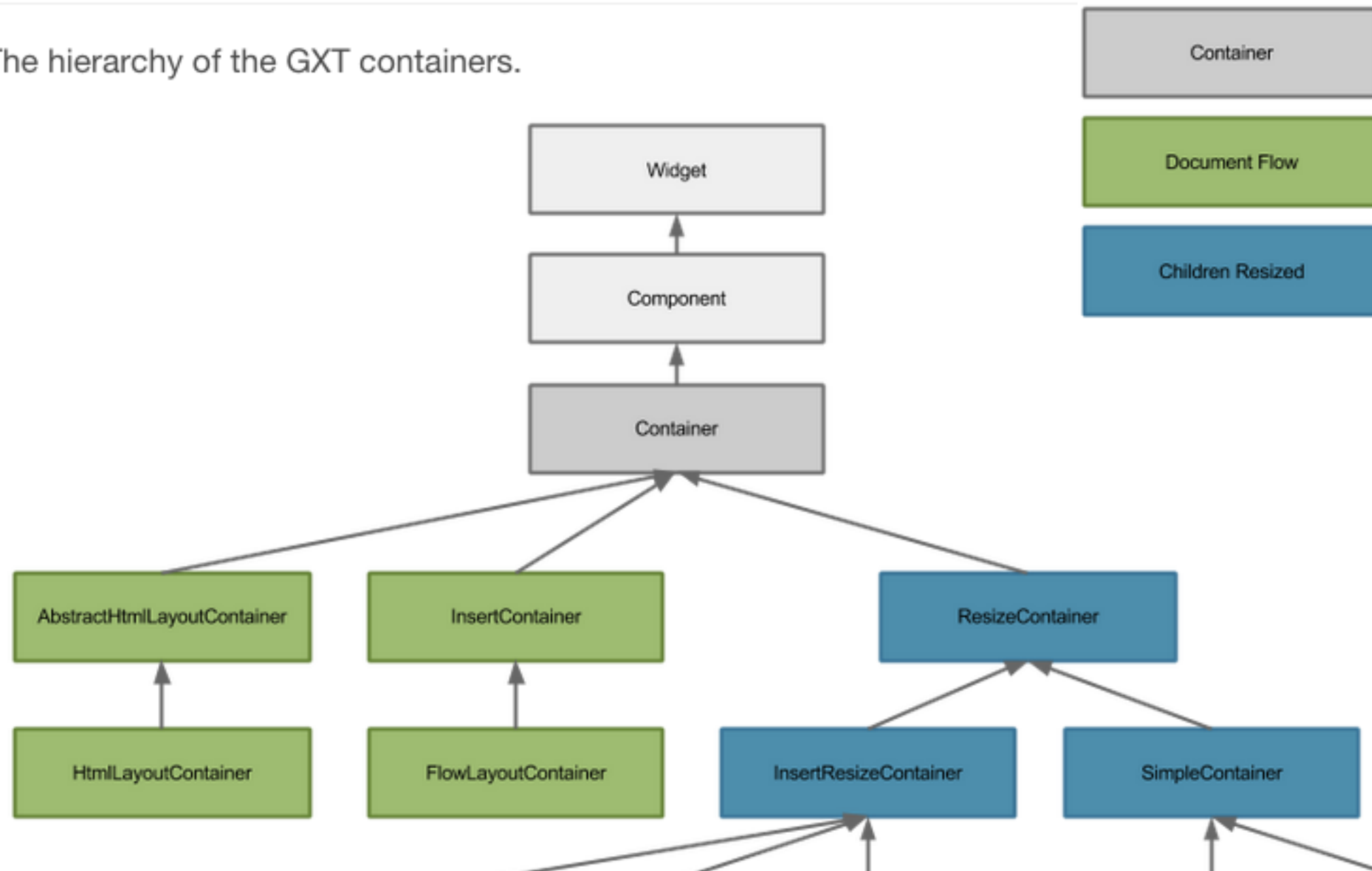




# Layouts

## Container hierarchy

The hierarchy of the GXT containers.



# UiBinder

- ▶ Declarative user interfaces via Xml
- ▶ Separations of duties Java developers and designers
- ▶ Supports both widgets and HTML markup
- ▶ Supports CSS (soon GSS)

```
<ui:UiBinder xmlns:ui='urn:ui:com.google.gwt.uibinder' ...>
```

```
  <container:CenterLayoutContainer>
```

```
    <gxt:ContentPanel bodyStyle="padding: 6px" headingText="CenterLayout" width="200">
```

```
      <g:Label text="I should be centered" />
```

```
    </gxt:ContentPanel>
```

```
  </container:CenterLayoutContainer>
```

```
</ui:UiBinder>
```



# XTemplate

- ▶ Provides compile time templating
- ▶ Retrieves data from any Java bean
- ▶ Produces SafeHtml

**Advanced Template**

Apply Template

**Name:** Darrell Meyer  
**Company:** Sencha Inc  
**Location:** Washington, DC  
**Salary:** US\$1,000,000,000.00  
**Kids:**  
1. Darrell Meyer's kid - Alec - 2/1/2004  
2. Darrell Meyer's kid - Lia - 2/1/2005  
3. Darrell Meyer's kid - Andrew - 2/1/2007

**Simple ListView (1 items selected)**



alec\_4th\_july.jpg   alec\_lia\_beach.jpg   alec\_lia\_beach2...   alec\_lia\_playin...   alec\_lia\_readin...

alec\_lia\_toscho...   alec\_snow.jpg   all\_beach.gif   all\_kids.jpg   andrew.jpg

lia\_4th\_july.jpg   lia\_beach.jpg   lia\_birthday.jpg   lia\_dress.jpg   lia\_snow.jpg

playing.jpg   playing\_beach.jpg



# XTemplate

```
<p><b>Name:</b> {data.name}</p>
<p><b>Salary</b>: {data.income:currency}</p>
<p><b>Kids:</b></p>
<tpl for="data.kids">
  <tpl if="age < 100">
    <p>{#}. {parent.name}'s kid - {name} - {bday:date("M/d/yyyy")}</p>
  </tpl>
</tpl>
```

---

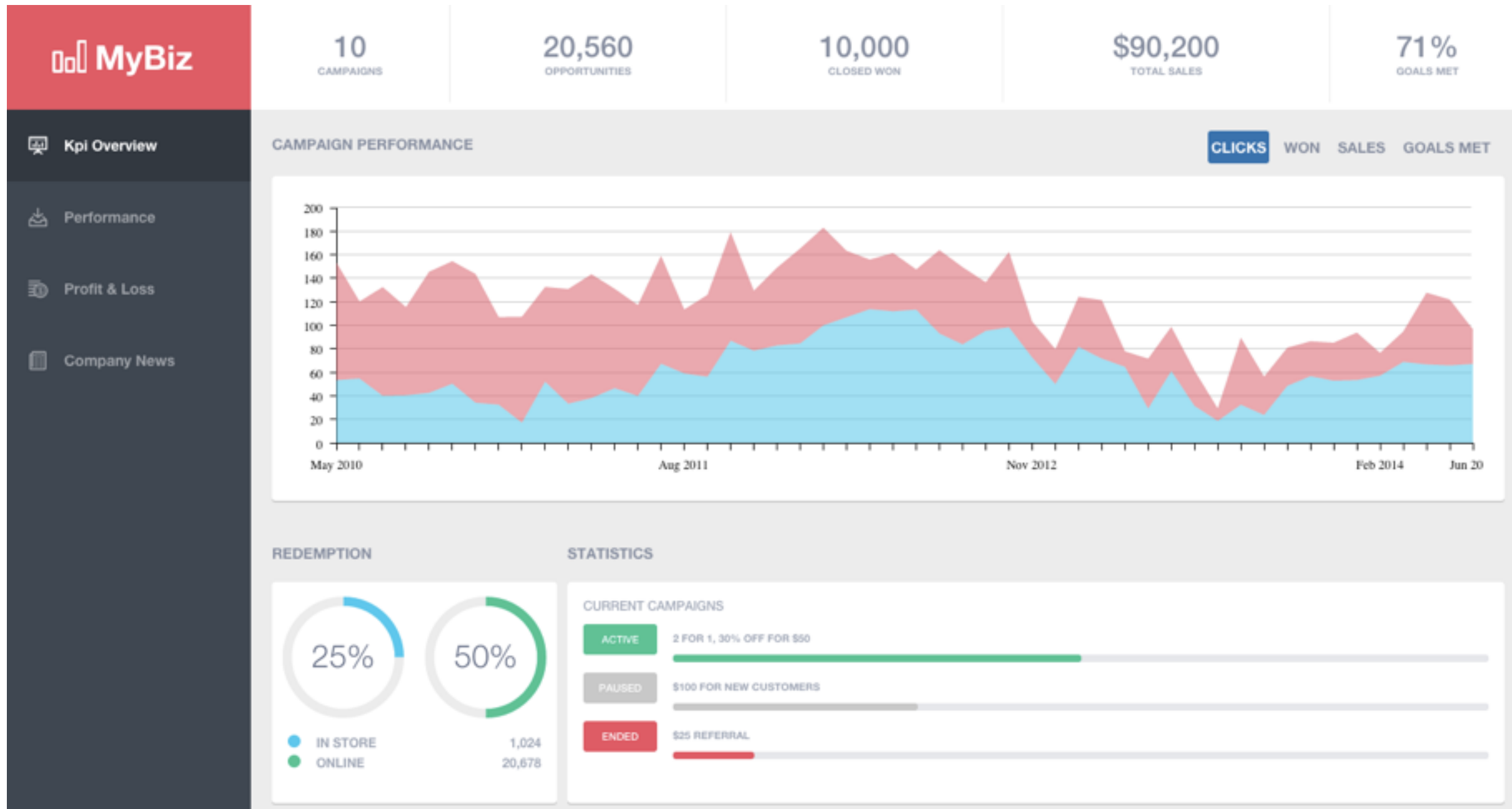
```
public interface DataRenderer extends XTemplates {
    @XTemplate(source = "template.html")
    public SafeHtml renderTemplate(Person data);
}
DataRenderer renderer = GWT.create(DataRenderer.class);
HTML text = new HTML(renderer.renderTemplate(person));
```

---

```
interface ExampleStyle extends CssResource {
    String searchItem();
}
interface ExampleTemplate extends XTemplates {
    @XTemplate("<div class='{style.searchItem}'>{post}</div>")
    SafeHtml render(Forum post, ExampleStyle style);
}
```



# Custom theming

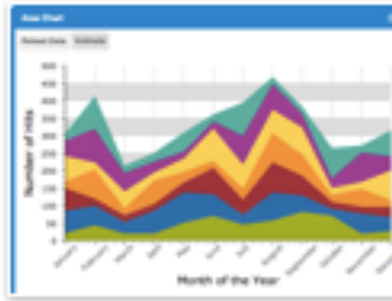




# Charts

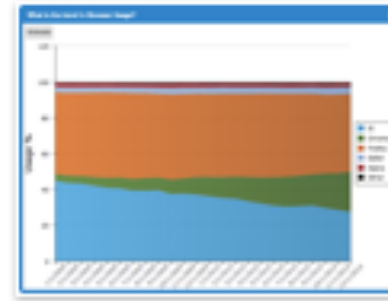






### Area Chart

A chart describing the continuous composition of a value



### Area Renderer Chart

An area chart with custom rendering logic



### Bar Chart

A chart describing categorical data



### Bar Renderer Chart

A bar chart with custom rendering logic



### Blue Chart

A chart with a blue-colored theme



### Column Chart

A chart describing categorical data



### Column Renderer Chart

A column chart with custom rendering logic



### Dashboard

Dashboard example

<http://docs.sencha.com/gxt/3.1/ui/charts/GettingStartedCharts.html>





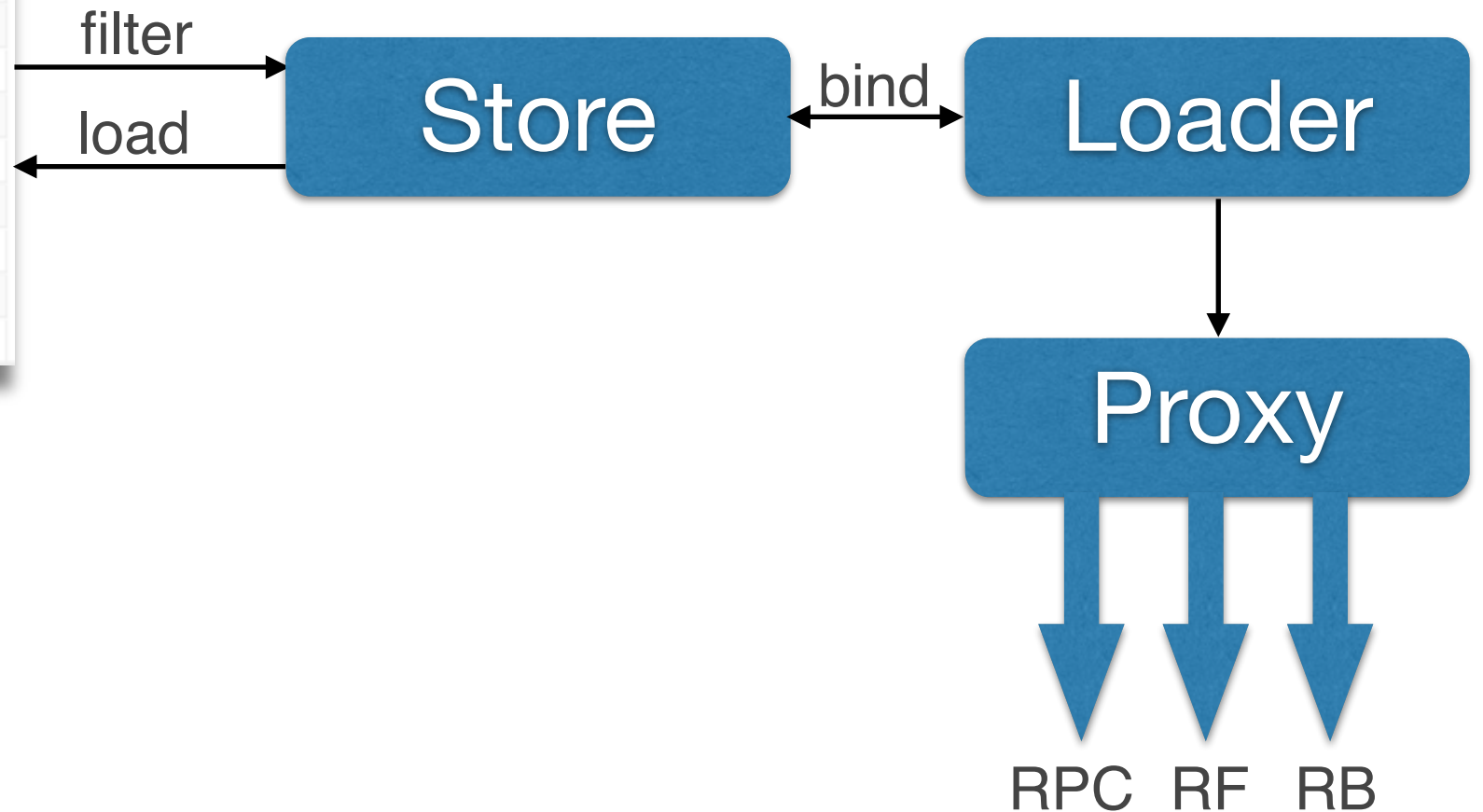
# Stores & Loaders





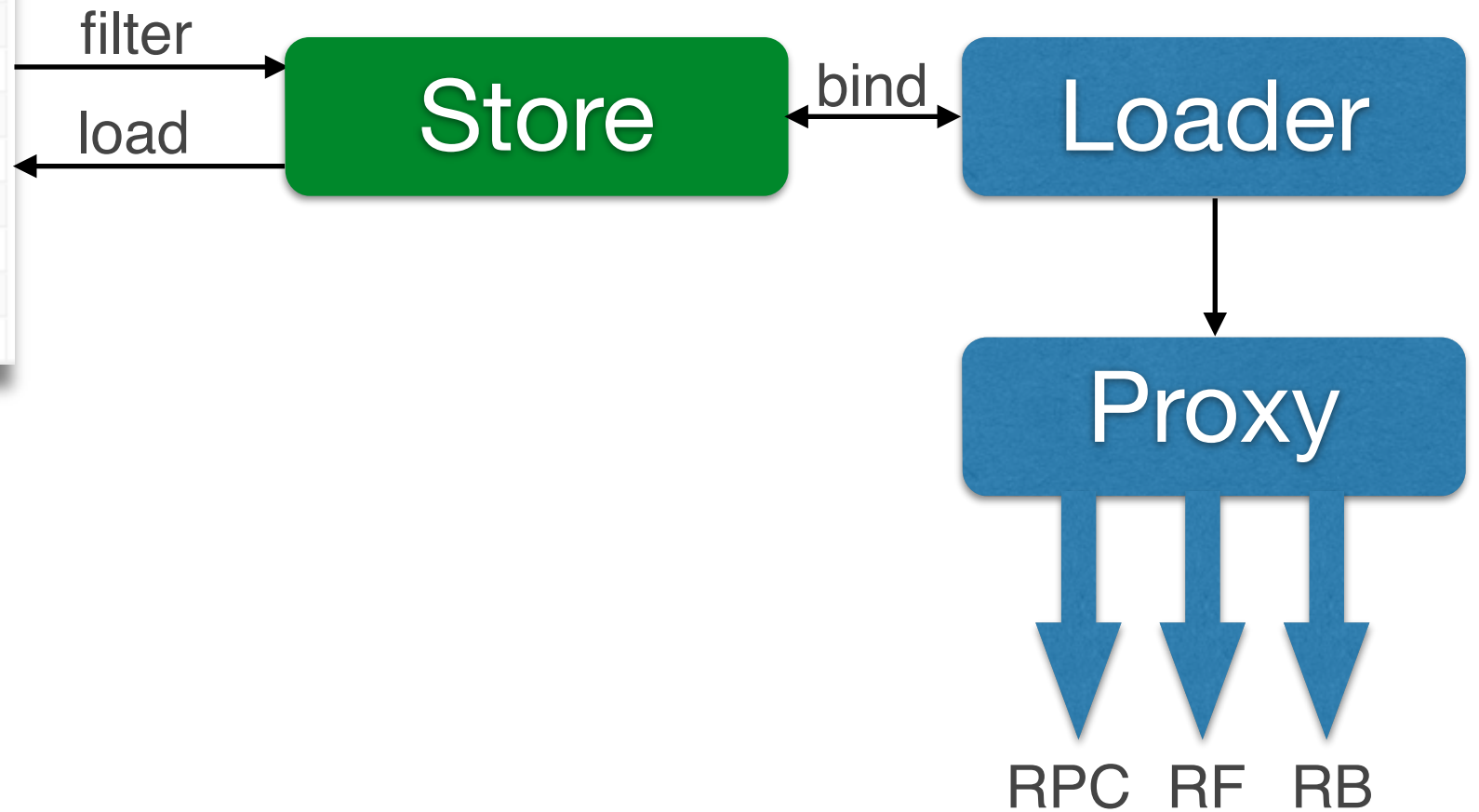
# The Big Picture

Filter Grid			
Company ↓	Symbol	Last	Change
eBay Inc.	EBAY	31.21	0.78
Yahoo! Inc.	YHOO	27.29	0.32
Verizon Communications Inc.	VZ	42.61	0.11
Valero Energy Corporation	VLO	72.6	0.14
Tyco International Ltd.	TYC	33.26	-0.22
Time Warner Inc.	TWX	20.45	0.15
The Home Depot, Inc.	HD	37.79	0.13
Texas Instruments Incorporated	TXN	35.7	0.68
Tellabs, Inc.	TLAB	10.75	0.11



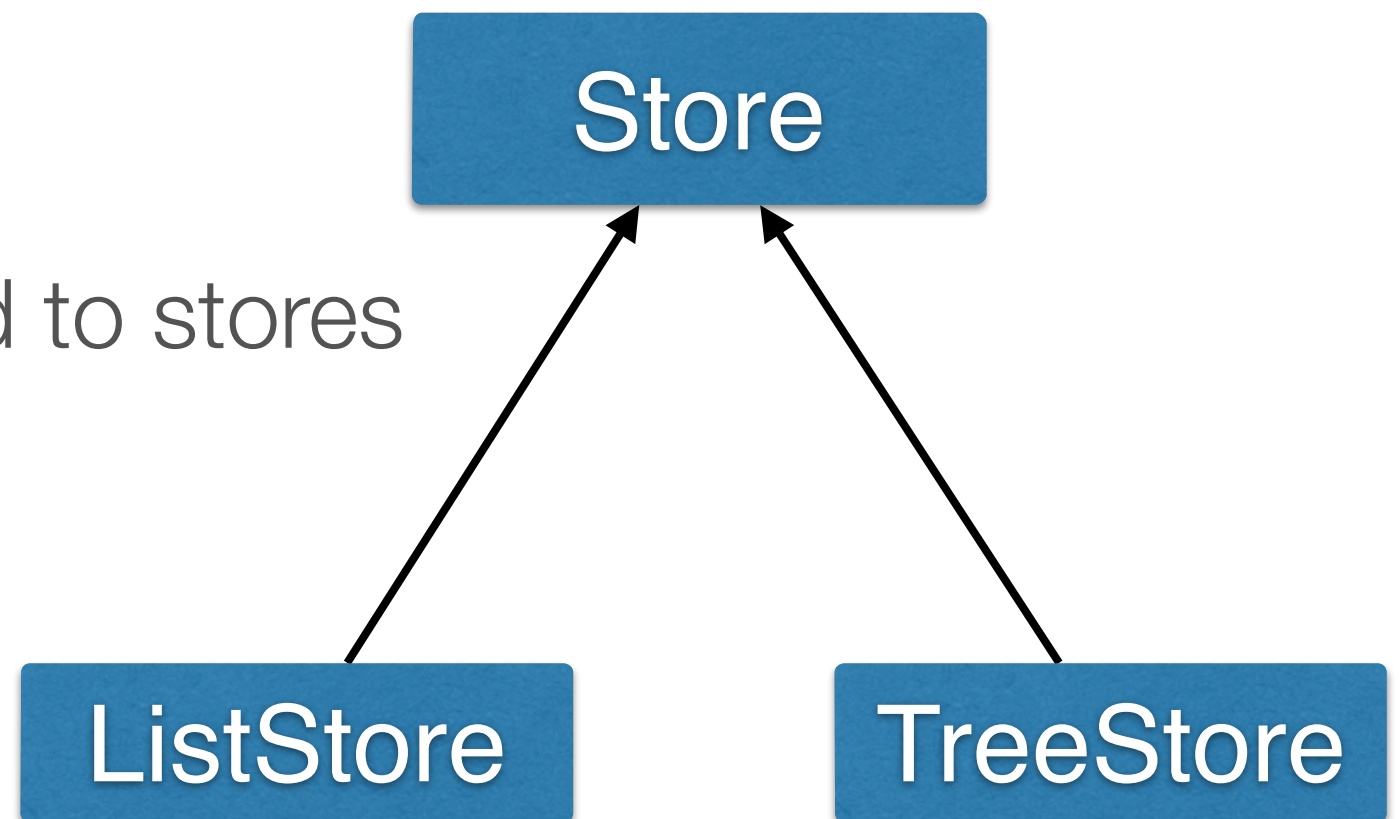
# The Big Picture

Filter Grid			
Company ↓	Symbol	Last	Change
eBay Inc.	EBAY	31.21	0.78
Yahoo! Inc.	YHOO	27.29	0.32
Verizon Communications Inc.	VZ	42.61	0.11
Valero Energy Corporation	VLO	72.6	0.14
Tyco International Ltd.	TYC	33.26	-0.22
Time Warner Inc.	TWX	20.45	0.15
The Home Depot, Inc.	HD	37.79	0.13
Texas Instruments Incorporated	TXN	35.7	0.68
Tellabs, Inc.	TLAB	10.75	0.11



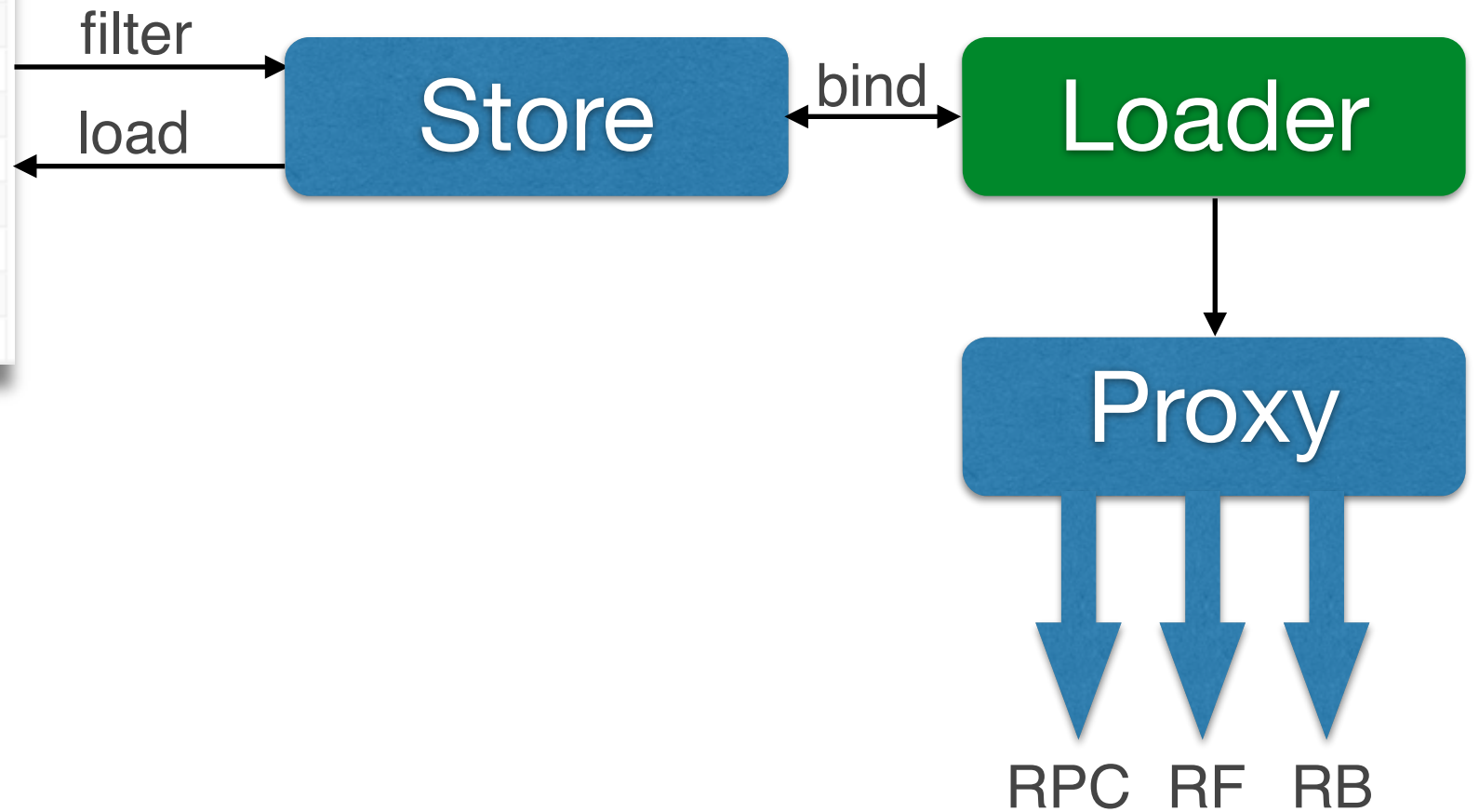
# Stores

- ▶ Client-side collections of data
- ▶ Filtering and sorting
- ▶ Trigger change events
- ▶ Accept any object type
- ▶ Data widgets are bound to stores



# The Big Picture

Filter Grid			
Company ↓	Symbol	Last	Change
eBay Inc.	EBAY	31.21	0.78
Yahoo! Inc.	YHOO	27.29	0.32
Verizon Communications Inc.	VZ	42.61	0.11
Valero Energy Corporation	VLO	72.6	0.14
Tyco International Ltd.	TYC	33.26	-0.22
Time Warner Inc.	TWX	20.45	0.15
The Home Depot, Inc.	HD	37.79	0.13
Texas Instruments Incorporated	TXN	35.7	0.68
Tellabs, Inc.	TLAB	10.75	0.11



# Loaders

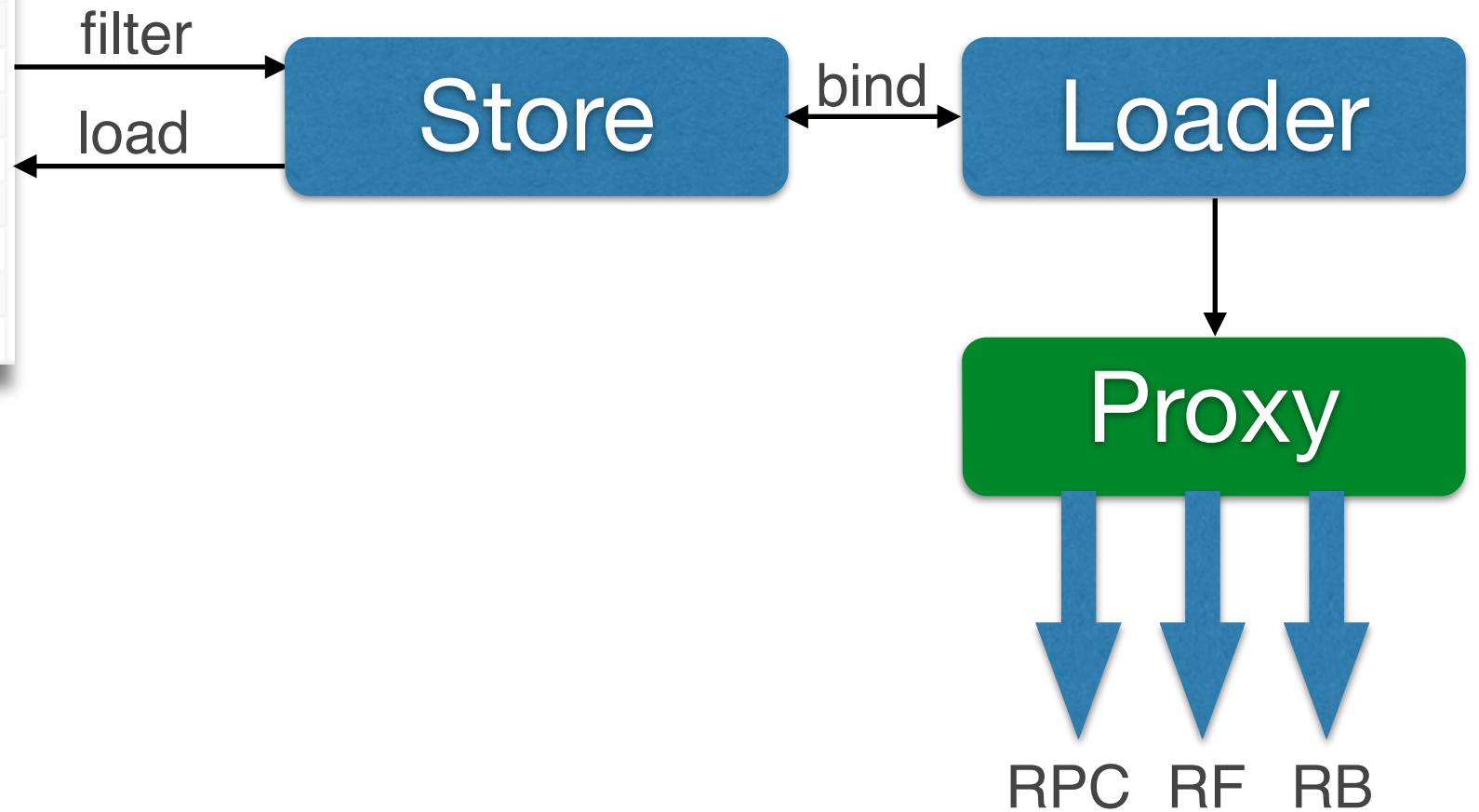
- ▶ Bound to Store, sends requests to DataProxy
- ▶ Send / receive any POJO
- ▶ Supports RPC, RequestFactory, AutoBeans, custom



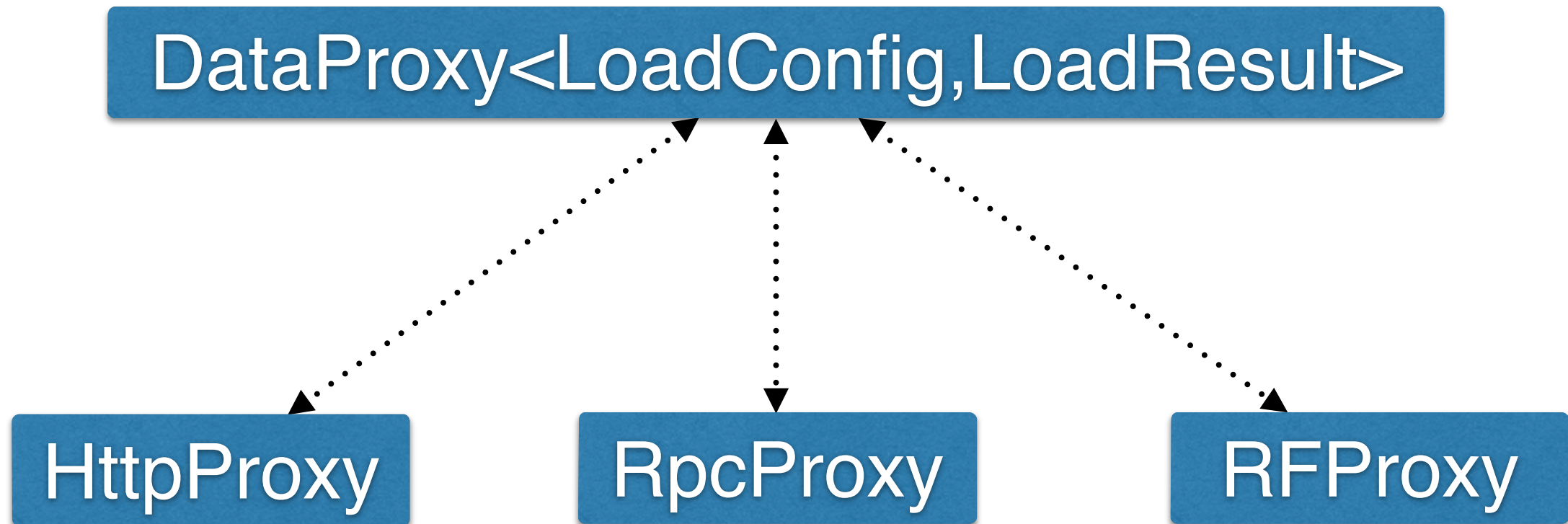


# The Big Picture

Filter Grid			
Company ↓	Symbol	Last	Change
eBay Inc.	EBAY	31.21	0.78
Yahoo! Inc.	YHOO	27.29	0.32
Verizon Communications Inc.	VZ	42.61	0.11
Valero Energy Corporation	VLO	72.6	0.14
Tyco International Ltd.	TYC	33.26	-0.22
Time Warner Inc.	TWX	20.45	0.15
The Home Depot, Inc.	HD	37.79	0.13
Texas Instruments Incorporated	TXN	35.7	0.68
Tellabs, Inc.	TLAB	10.75	0.11



# DataProxy<In,Out>



```
String path = "data/data.xml";
```

```
RequestBuilder builder = new RequestBuilder(RequestBuilder.GET, path);
```

```
HttpProxy<ListLoadConfig> proxy = new HttpProxy<ListLoadConfig>(builder);
```



# ValueProvider

- ▶ Describes the model to widgets
- ▶ Supports string based path, nested properties
- ▶ Can be created directly or by generator (PropertyAccess)

```
public interface QuoteProperties extends PropertyAccess<Quote> {  
  
    @Editor.Path("symbol")  
    ModelKeyProvider<Quote> key();  
  
    @Editor.Path("Bid")  
    ValueProvider<Quote, String> bid();  
  
}
```



# Wiring

```
interface PostProperties extends PropertyAccess<Post> {  
    ValueProvider<Post, String> username();  
    ValueProvider<Post, String> forum();  
    ValueProvider<Post, Date> date();  
}  
  
// create properties instance via deferred binding  
PostProperties props = GWT.create(PostProperties.class);  
  
// use value providers  
new ColumnConfig<Post, String>(props.forum(), 150, "Forum");
```



# RestyGWT Proxy demo

Tip: for faster initial compilation, put this in gwt.xml:

```
<collapse-all-properties />
```





# GXT 4.0

(In The Making - Q2 2015)

**PREVIEW**



# Tablet support

swipe      longpress  
rotate      doubletap  
drag      singletap  
**tap**  
tapcancel      pinch  
touchstart/end      pinchstart/end  
touchmove      rotatestart/end





# Theme builder

Before

Simple Form

Name: Enter your name...

Email:

Password:

Age:

Company:

Birthday:

Time:

Size:

Music:  Classical  Rock  Blues

Color:  Red  Blue

Description:

Duration(s):

Save

After

Simple Form

Name: Enter your name...

Email:

Password:

Age:

Company:

Birthday:

Time:

Size:

Music:  Classical  Rock  Blues

Color:  Red  Blue

Description:

Duration(s):

Save Cancel

```
panel {  
  font {  
    color = "#ffffff"  
    family = "Tahoma, Arial"  
    size = "14px"  
    weight = "bold"  
  }  
  borderStyle = "solid"  
  borderColor = "#157FCC"  
}
```

# Charts upgrades

- ▶ New chart types
- ▶ Optimized for Desktop & Tablets
- ▶ Mouse & touch inputs
- ▶ Gestures for zoom & pan





Why use GXT?





# The widgets, of course

- ▶ 113,370 LOC just in UI package
- ▶ 20+ man-years of keeping the browsers happy
- ▶ Implemented using GWT patterns and best practices
- ▶ We track GWT closely
- ▶ And contribute to it
- ▶ **Top-notch support**







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