Rich Web Applications in Server-side Java without Plug-ins or JavaScript

Joonas Lehtinen, PhD
IT Mill - CEO
joonas@vaadin.com

vaadin }>

Vaadin is a UI framework for desktop-like web apps

}

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New configs, taglibs and syntax!?!

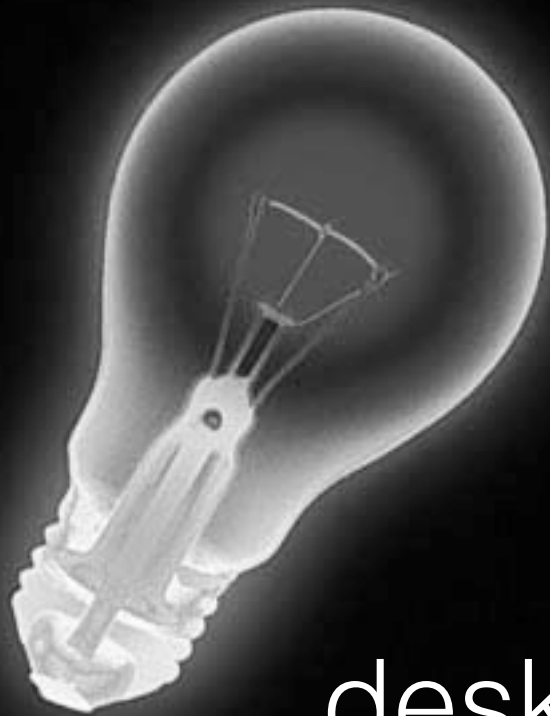**JavaScript, DOM, Applet, plugins?**

No!
This is Java.
Nothing else.

1998

healthcare portal, 100 kloc of perl, ..

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web 1.0, netscape, ie5, ie6, ...

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thinking of
object oriented design, desktop, Java, U and I ...
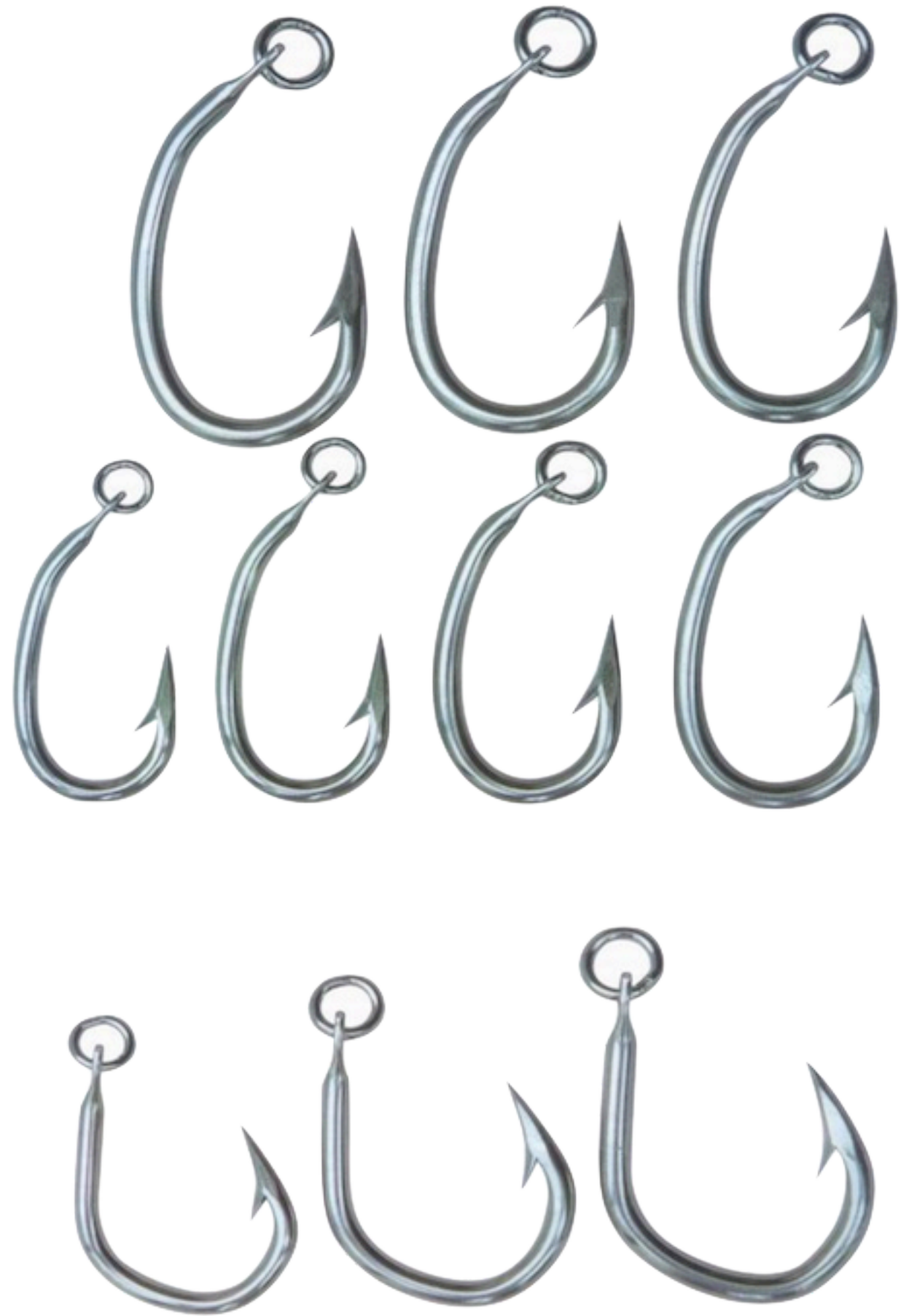
desktop programming paradigm for web!

found **IT MILL** millstone ajax google web toolkit

2000 2002 2005 2008

vaadin }>

re-released as

vaadin }>

2009

is there a ?

Apache License

Contents

Server-side RIA

What is it? Pros & cons?

In practice

Coding a Vaadin application step-by-step

Discussion

Vaadin

Big picture, Extending, Getting started

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Server-side RIA

}

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Rich Internet Application

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an application that makes developers **rich**

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if they bill by **hour**

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Architecture

"Web 1.0"

Client

DOM

Server

View

Model

Controller

DB

⑤

④

③

②

①

HTML Page
over HttpResponse

Parameters over
HttpRequest
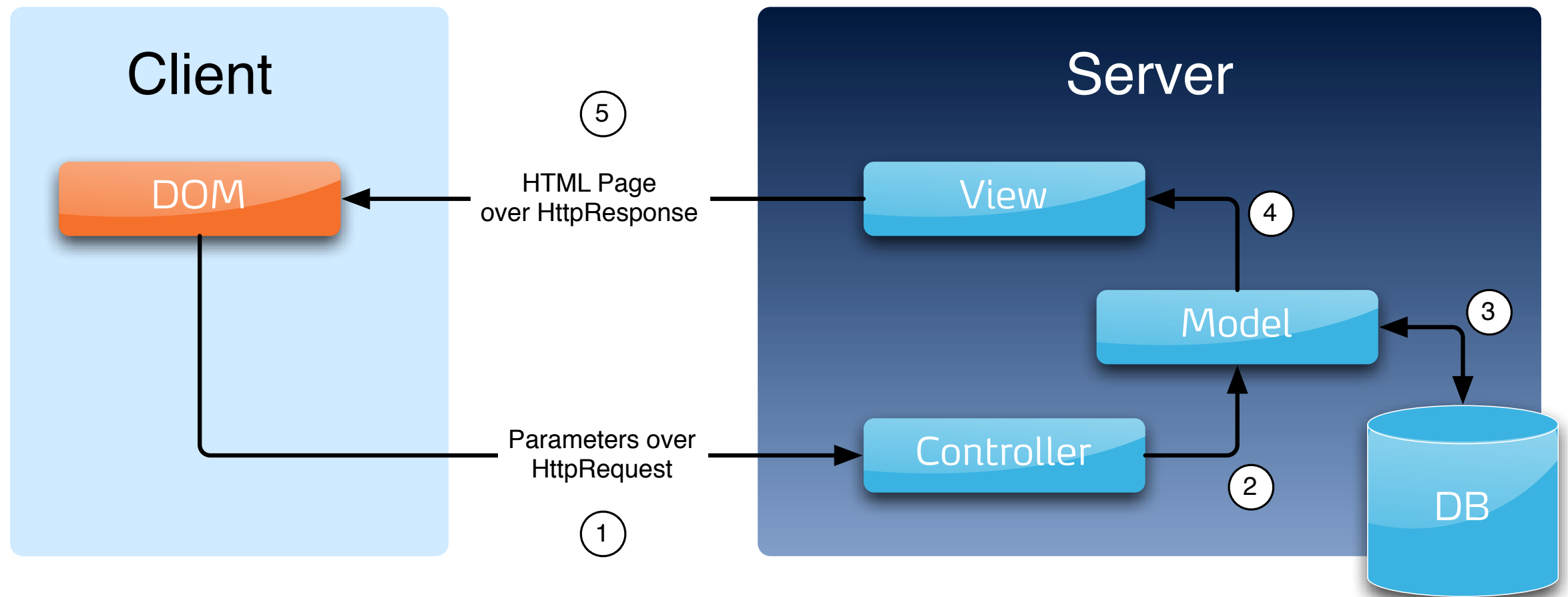
client-side ria

fat client

Client-side RIA

Client

View

5

DOM

1

Controller

Server

4

Requested data to view as XML / JSON

Model

3

Changes to model encoded as parameters

2

DB
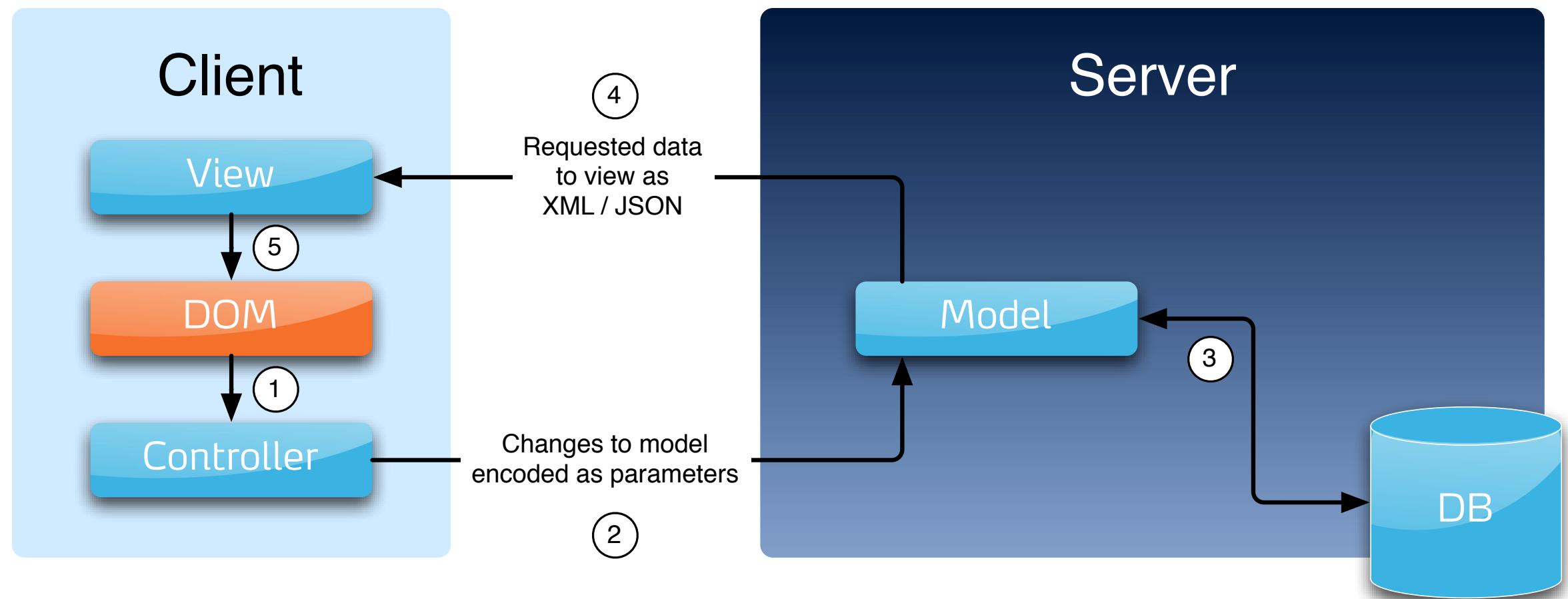
programming **web is** **not easy**

different
features
in different
browsers

different
performance
in different
browsers

vaadin }>
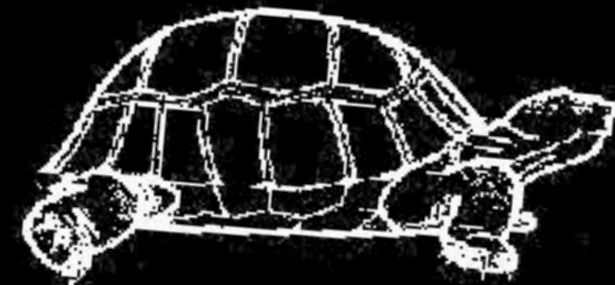
different
bugs
in different
browsers

vaadin }>
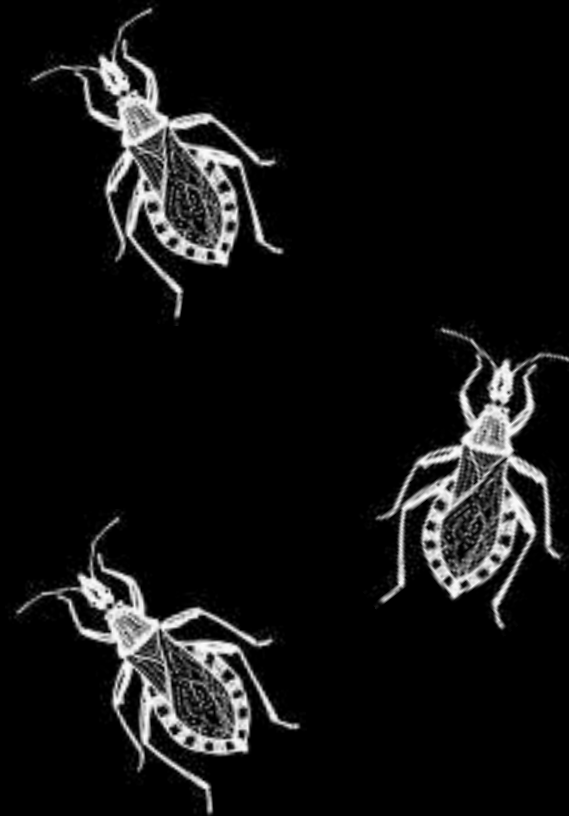
Google Web Toolkit
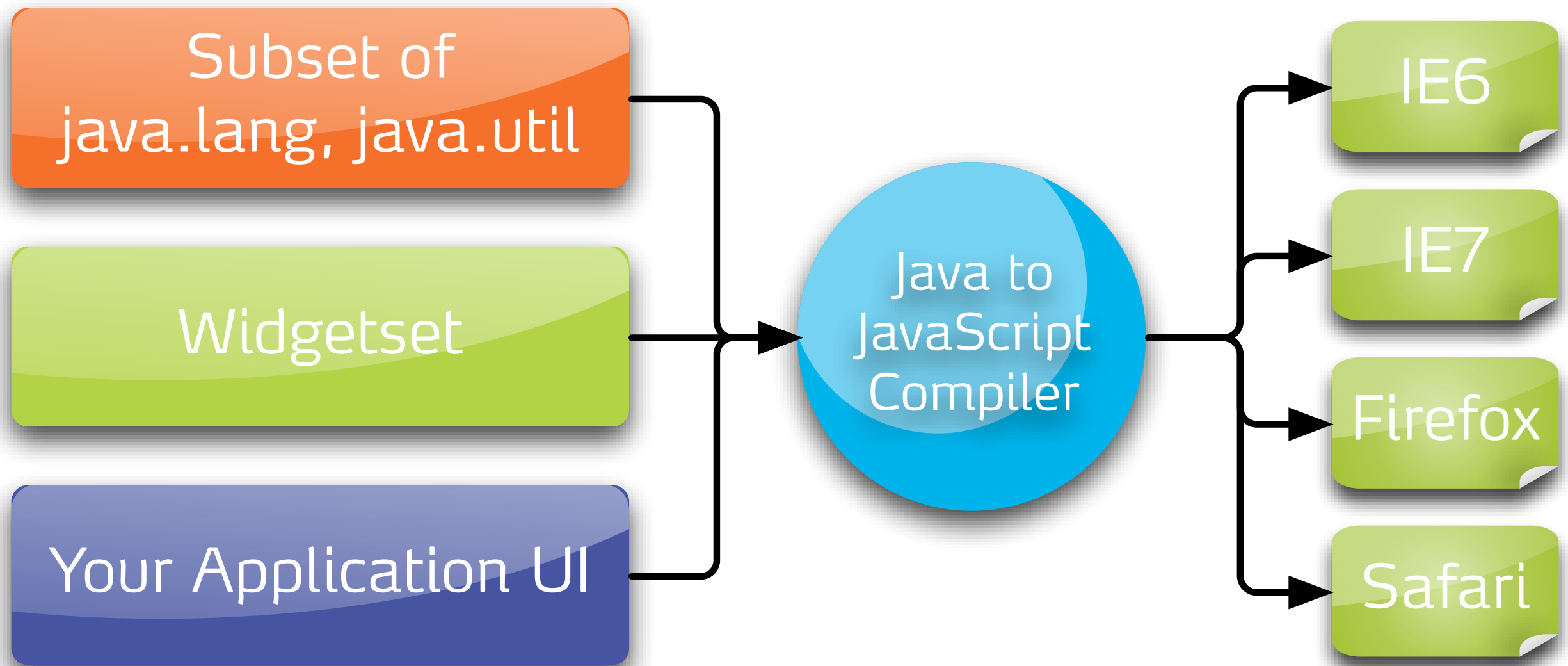
simpler

- Java only
- forget the web

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cost-effective
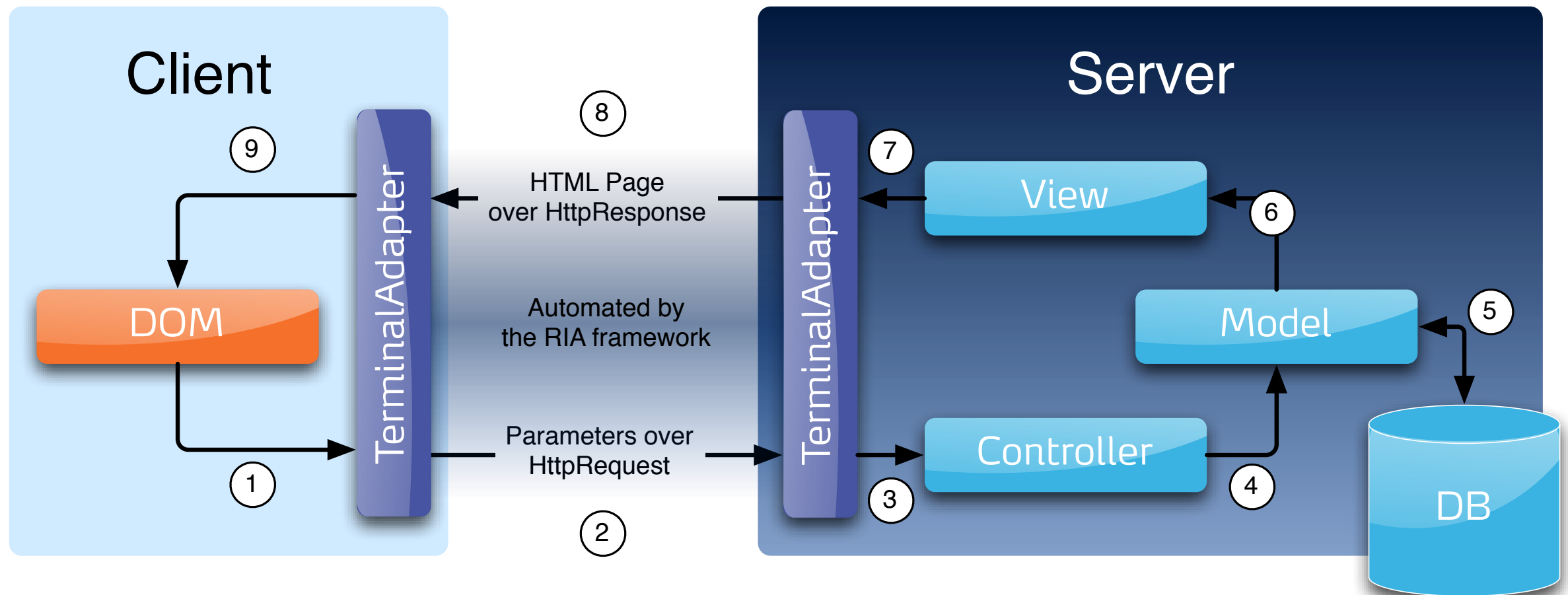# stop debugging JavaScript spaghetti

vaadin }>
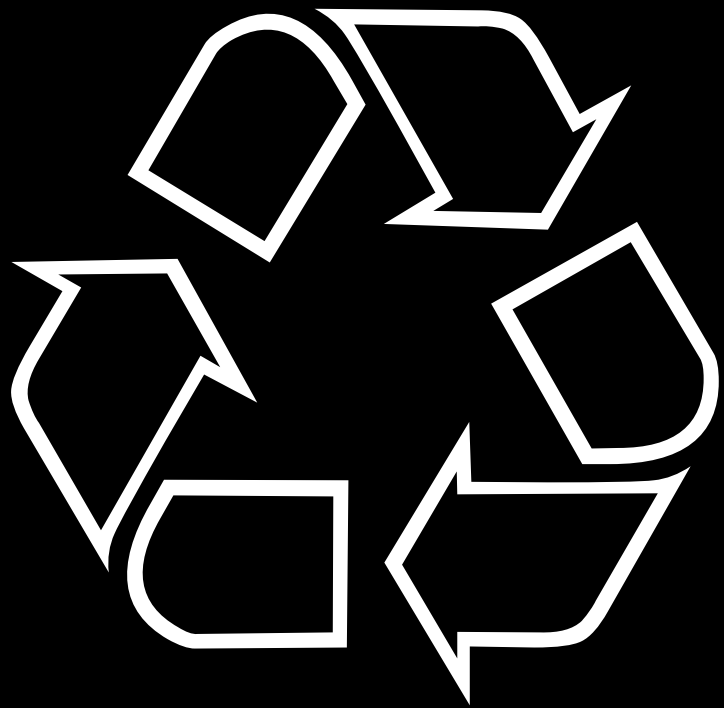
modular
extensible

Building wonderful apps doesn't require writing **fat** web clients.

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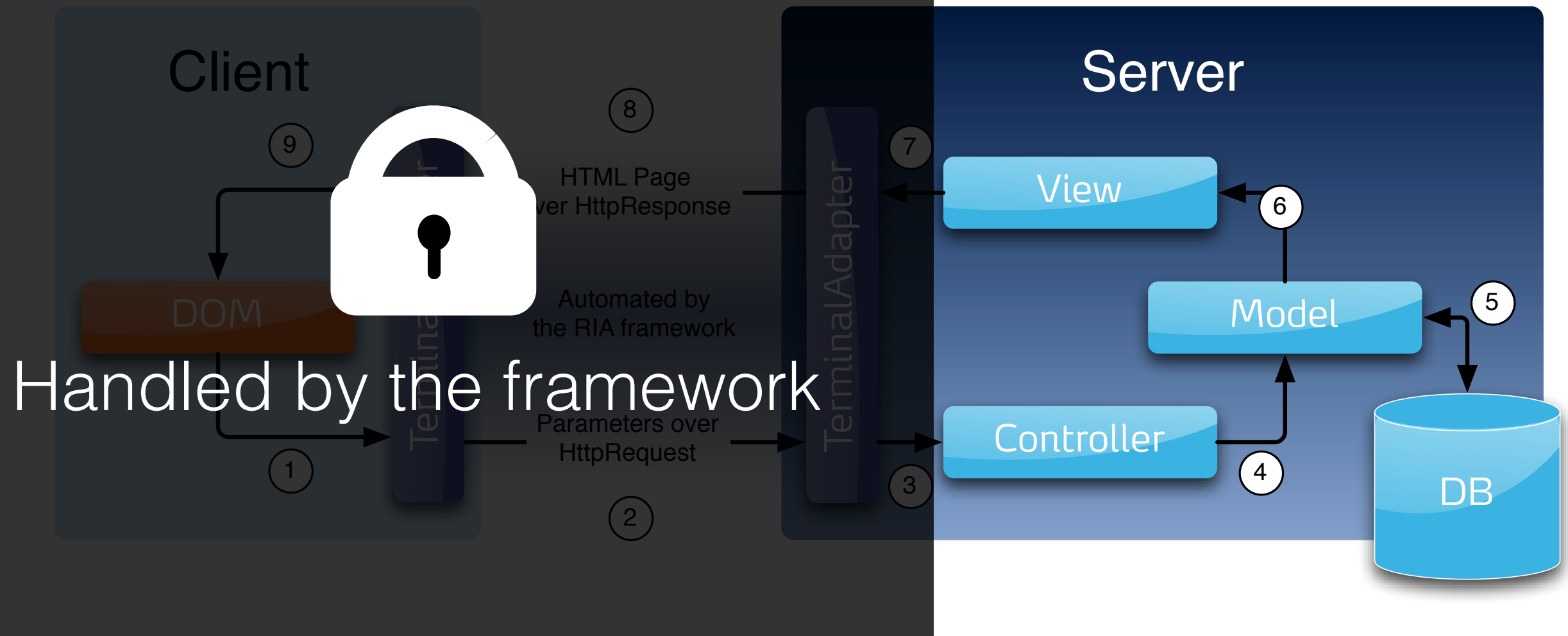
server-side ria

thin client

Server-side RIA

Client

Server

DOM

TerminalAdapter

HTML Page over HttpResponse

Automated by the RIA framework

Parameters over HttpRequest

TerminalAdapter

View

Model

Controller

DB

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

Server-side RIA

Client

⑨

DOM

Handled by the framework

①

Server

⑧

⑦ View ⑥

HTML Page
over HttpResponse

Automated by
the RIA framework

TerminalAdapter

Model ⑤

Parameters over
HttpRequest

Controller ④

DB

③

②

Sunday, March 7, 2010

the benefits of Java
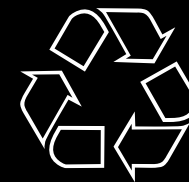
Java

simpler
forget the web

cost-effective
no JavaScript debugging

modular extensible

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even simpler

- forget the client-side
- synchronous
- server resources

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more flexible

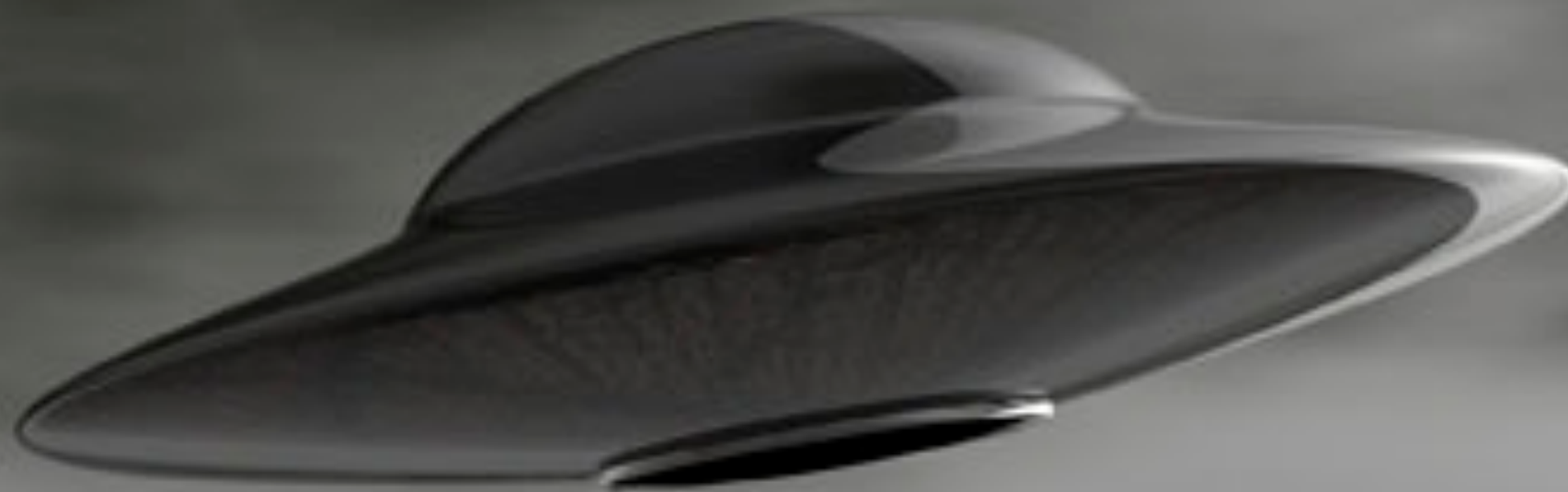- all Java tools and libraries
- any JVM language

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more secure

- code stays in server
- less web services

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not as scalable
more processing kept on server

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no offline mode
server is always required

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In practice }

© National Geographic Channel 2010

Seeing is believing

vaadin

What can it do in 20 minutes?

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http://localhost:8080/DocMgr/

javaforum joonas

NAME	ICON	SIZE	LAST MODIFIED
Application.WindowDetachEvent.html	icon/files/file.gif	7691	Tue Nov 24 13:36:39 EET 2009
Application.WindowDetachListener.html	icon/files/file.gif	8324	Tue Nov 24 13:36:39 EET 2009
Application.html	icon/files/file.gif	40555	Tue Nov 24 13:36:39 EET 2009
ApplicationContext.TransactionListener.html	icon/files/file.gif	12628	Tue Nov 24 13:36:47 EET 2009
ApplicationContext.html	icon/files/file.gif	12289	Tue Nov 24 13:36:47 EET 2009
ApplicationResource.html	icon/files/file.gif	11406	Tue Nov 24 13:36:47 EET 2009

Methods in com.vaadin that return Application

Application	Application.UserChangeEvent.getApplication()
	Gets the application where the user change occurred.
Application	Application.WindowDetachEvent.getApplication()
	Gets the application from which the window was detached.
Application	Application.WindowAttachEvent.getApplication()
	Gets the application to which the window was attached.

Constructors in com.vaadin with parameters of type Application

Application.UserChangeEvent(Application source, Object newUser, Object prevUser)
    Constructor for user change event.

Uses of Application in com.vaadin.service

Methods in com.vaadin.service with parameters of type Application

void	ApplicationContext.TransactionListener.transactionEnd(Application application, Object transactionData)
	Invoked at the end of every transaction.
void	ApplicationContext.TransactionListener.transactionStart(Application application, Object transactionData)
	Invoked at the beginning of every transaction.

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http://localhost:8080/DocMgr/

javaforum joonas

NAME | ICON | SIZE | LAST MODIFIED

Application.v
Application.V
Application.h
ApplicationC
ApplicationC
ApplicationR

edit

Overview Pa

PREV NEXT

Edit document ✕

B *I* <u>U</u> X₂ X² ≡ ≡ ≡ S ⇥ ⇤ — ≣ ☰ 🖼 🔗 🔗 *T*ₓ

Background ⬍ | Foreground ⬍ | Font ⬍ | Size ⬍

Overview Package Class Use **Tree Deprecated Index Help**

PREV NEXT   FRAMES   NO FRAMES

WYSIWYG Editor for HTML documents

Uses of Class
com.vaadin.Application

Packages that use **Application**

| com.vaadin | This package is the base of Vaadin. |
| com.vaadin.service | |

save

Packa

com.vaadin
com.vaadin.
com.vaadin.
com.vaadin.
com.vaadin.

Uses

Methods in c

Application Application.UserChangeEvent.getApplication()
            Gets the application where the user change occurred.

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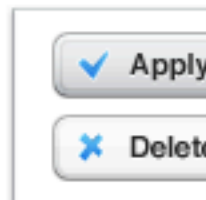vaadin }>

Demo as video

http://www.youtube.com/watch?v=u-a3VQF90kw

vaadin }>

Vaadin
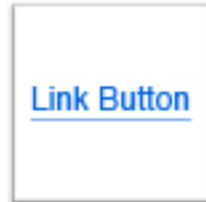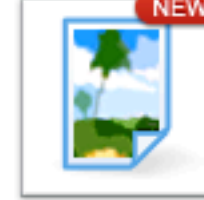
all benefits of
- server-side ria
- gwt

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ui components

Vaadin Sampler

http://demo.vaadin.com/sampler/

Google

Vaadin Sampler

Home

All Samples
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  Runo theme icons NEW
  Error indicator
  Progress indication NEW
  JavaScript API NEW
  ▼ Buttons
    Push button
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    Checkbox
  ▼ Links
    Link
    Link, configure window
    Link, sized window
  ▼ Texts
    Label, plain text
    Label, preformatted
    Label, rich text
  ▼ Embedding
    Image NEW
    Flash NEW
    Web content NEW
▼ Value Input Components
  ▼ Dates
    Pop-up date selection

UI Basics

18 SAMPLES

| Tooltips | Icons | Runo theme icons | Error indicator | Progress indication | JavaScript API |

Click Edit

Apply   Delete

60 %

JS

| Push button | Link button | Checkbox | Link | Link, configure window | Link, sized window |

Button   Link Button   Link   Link   Link

| Label, plain text | Label, preformatted | Label, rich text | Image | Flash | Web content |

Text   Text   Text   Fl   WWW HTML JSP PHP

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http://demo.vaadin.com/sampler/#ProgressIndicators

Google

Vaadin Sampler

Progress indication New   Reset View Source

Normal mode Runs for 20 seconds

Start normal

Indeterminate mode Runs for 10 seconds

Start indeterminate

Description and Resources

The ProgressIndicator component can be used to inform the user of actions that take a long time to finish, such as file uploads or search queries.

Updates to the indicator happen via polling, and the default polling interval is 1 second.

API Documentation

ProgressIndicator

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Progress indication }> Vaadin Sampler

http://demo.vaadin.com/sampler/#ProgressIndicators

All Samples

▼ UI Basics
  Tooltips
  Icons
  Runo theme icons NEW
  Error indicator
  Progress indication NEW

Progress indication New   Reset   View Source

Normal mode Runs for 20 seconds

Start normal

Description and Resources

The ProgressIndicator component can be used to inform the user of actions that take a long time to finish, such as file uploads or search queries.

Updates to the indicator happen via polling, and the default polling interval is 1 second.

API Documentation

ProgressIndicator

Java™ source   ×

```java
    // Add a normal progress indicator
    pi1 = new ProgressIndicator();
    pi1.setIndeterminate(false);
    pi1.setEnabled(false);
    hl.addComponent(pi1);
    hl.setComponentAlignment(pi1, "middle");

    startButton1 = new Button("Start normal", new Button.ClickListener() {
        public void buttonClick(ClickEvent event) {
            worker1 = new Worker1();
            worker1.start();
            pi1.setEnabled(true);
            pi1.setValue(0f);
            startButton1.setEnabled(false);
        }
    });
```

▼ Dates
  Pop-up date selection

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Vaadin UI component architecture

"UI Component"
- Button, Table, Tree, ...
- Server-side data
- Full Java API

HTTP(S)

"Widget"
- Client-side peer for the component
- Runs on JavaScript

Java
- Compiled with JDK

Java
- Google Web Toolkit
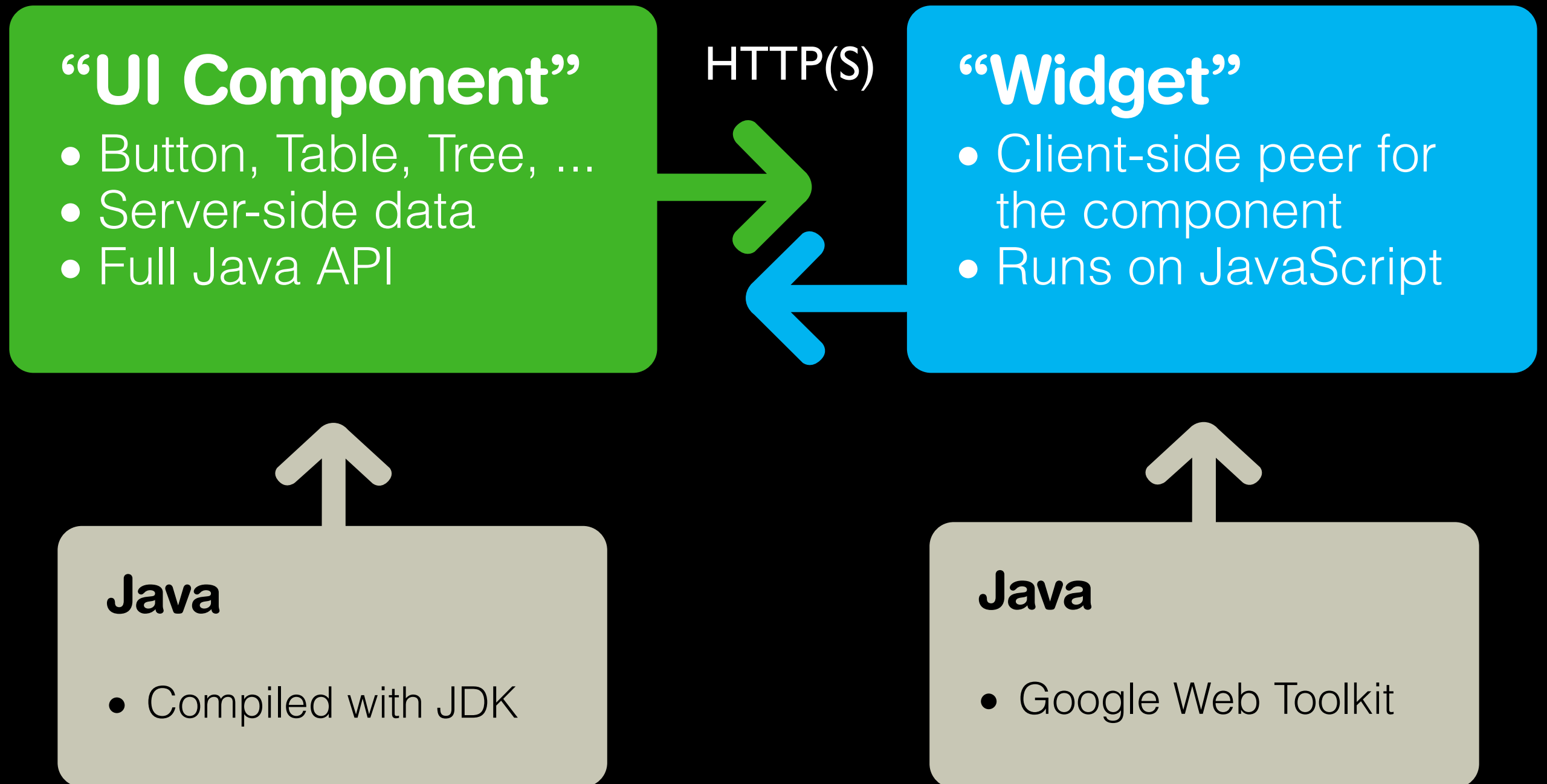
vaadin }>

thanks to GWT, creating new ui components is really easy

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directory

channel for distributing Vaadin add-ons

vaadin }>

ui components, data sources, themes, tools, ...
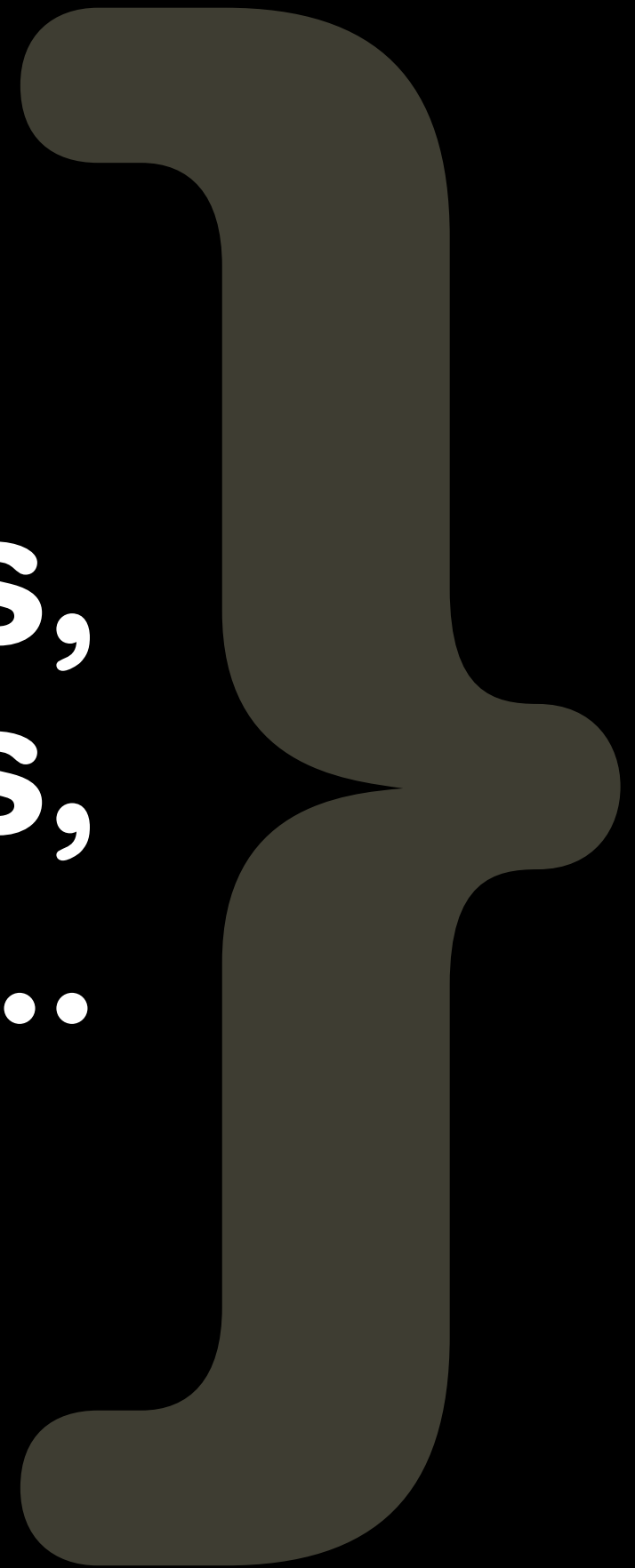
}

vaadin }>

http://vaadin.com/directory/

Google

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Demo   Download   Learn   Discuss   Contribute   Pro

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Browse

All

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Themes

Data Components

Tools

Miscellaneous

Joonas Lehtinen

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Showing   CERTIFIED   STABLE   BETA   EXPERIMENTAL

« Previous   Next »   **1**   2   3   4   5   6   7   8   9   89 Results

Blackboard
In **Tools** by **Henrik Paul**

A generic blackboard system for listening to and firing events.

Version 1.1.0   STABLE   No ratings yet   ⬇ 3

Color Picker
In **UI Components** by **John Ahlroos**

Pick your color in style!

Version 0.9.5   BETA   ★★★½★ 2   ⬇ 3

GoogleAnalyticsTracker
In **UI Components** by **Sami Ekblad**

Track Vaadin application use with Google Analytics

Version 1.1.1   BETA   No ratings yet   ⬇ 3

VaadinAppFoundation
In **Miscellaneous** by **Kim Leppänen**

Application foundation provides commonly used features to your Vaadin applications, such as persistence, authentication, i18n and view helpers.

Version 1.0.2   BETA   ★★★★★ 1   ⬇ 5

PaintTheme
In **Themes** by **Jouni Koivuviita**

A general purpose theme with customization possibilities using a WYSIWYG editor.

Version 1.0   BETA   ★★★★★ 3   ⬇ 2

Timeline
In **UI Components** by **John Ahlroos**

Make beautiful interactive timelines with the Timeline component.

Version 0.9.1   BETA   No ratings yet   ⬇ 3

SearchField

Drawer

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http://vaadin.com/directory/#addon/47

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RotaryKnob

In **UI Components** by **Mikael Vappula**   ★★★★½ 2   ⬇ 0

Report this add-on

Version	0.3 (latest)

Maturity	BETA	
License	Apache License 2.0	
Vaadin	6.2 upwards	

Browser Compatibility

Internet Explorer 6, Internet Explorer 7, Internet Explorer 8, Safari 4, Firefox 3, Opera 10, Safari 3

Download Now
Version 0.3 (43 kB)

Related Links

→ Discussion Forum
→ Source Code
→ Online Demo

Rate this Add-on

★★★★★

Overview

RotaryKnob component emulates its real-world counterpart and is simply used for selecting numeric value within a range. Knob can be rotated by dragging mouse along y-axis, using mouse scroll wheel or pressing up/down keys.
Component also supports browser focus events.

Highlights

Please rotate

36
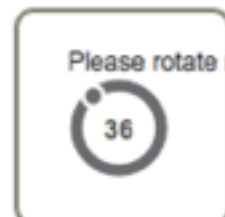
Screenshot

```
1  package org.vaa
2
3  import com.vaad
4  import com.vaad
5
6  public class MyA
```

Code example

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Java EE   Resource   SVN Reposit...   <SVN Reposi...

Projec   Naviga

An outline is not available.

Outli

▶ 📁 Servers
▼ 🏛 StudioTable
    ▶ 📄 Deployment Descriptor: Stu
    ▼ 🏛 Java Resources: src
        ▼ 📦 com.example.studiotabl
            ▼ 📄 StudiotableApplicatio
                ▶ 📄 StudiotableApplica
        ▶ 📚 Libraries
    ▶ 📚 JavaScript Resources
    ▶ 📁 Web Resources : WebConter
    ▶ 📁 build
    ▼ 📁 WebContent
        ▶ 📁 META-INF
        ▼ 📁 WEB-INF
            ▼ 📁 lib
                📄 rotaryknob-0.3.jar
                📄 vaadin-6.2.5.jar
            X web.xml

Compile widgetset

⚠ Your client side code in the project StudioTable might need a recompilation. Compile widgetset now?

☐ Suspend automatic recompilation

No   Yes

Prob   Task   Prop   Serv   Data   Snip   Prog   Sear   SQL   SVN   Cons   JUni

SVN

com.example.studiotable.Studiotab...pplication.java – StudioTable/src

*StudiotableApplication.java

```java
1 package com.example.studiotable;
2
3 import org.vaadin.mikael.rotaryknob.RotaryKnob;
8
9 @SuppressWarnings("serial")
10 public class StudiotableApplication extends Application {
11     @Override
12     public void init() {
13         Window mainWindow = new Window("Studio", new GridLayout(4, 3));
14         for (int i = 0; i < 12; i++) {
15             mainWindow.addComponent(new RotaryKnob());
16         }
17         setMainWindow(mainWindow);
18     }
19
20 }
21
```

Writable   Smart Insert   21 : 1

Sunday, March 7, 2010

Java EE – http://localhost:8080/StudioTable/ – Eclipse – /Users/Shared/phoenix/workspace

Projec   Naviga   StudiotableApplication.java   Studio   Outli

http://localhost:8080/StudioTable/

An outline is not available.

- Servers
- StudioTable
  - Deployment Descriptor: Stu
  - Java Resources: src
    - com.example.studiotabl
      - StudiotableApplicatio
        - StudiotableApplica
    - com.example.studiotabl
    - Libraries
  - JavaScript Resources
  - Web Resources : WebConte
  - build
  - WebContent
    - META-INF
    - VAADIN
    - WEB-INF
      - lib
        - rotaryknob-0.3.jar
        - vaadin-6.2.5.jar
      - web.xml

90

Prob   Task   Prop   Serv   Data   Snip   Prog   Sear   SQL   SVN   Cons   JUni

Tomcat v6.0 Server at localhost [Apache Tomcat] /System/Library/Frameworks/JavaVM.f

```
=================================================================
Vaadin is running in DEBUG MODE.
Add productionMode=true to web.xml to disable debug features.
To show debug window, add ?debug to your application URL.
=================================================================
```

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Vaadin Directory
open to public by
the end of this month

vaadin }>

# Eclipse
# Maven
# Netbeans
}

vaadin }>

Servlet
Portlet
GAE

getting started

vaadin }>

vaadin }> thinking of U and I

Vaadin is a Java framework for building **modern web applications** that look great, perform well and make you and your users happy.

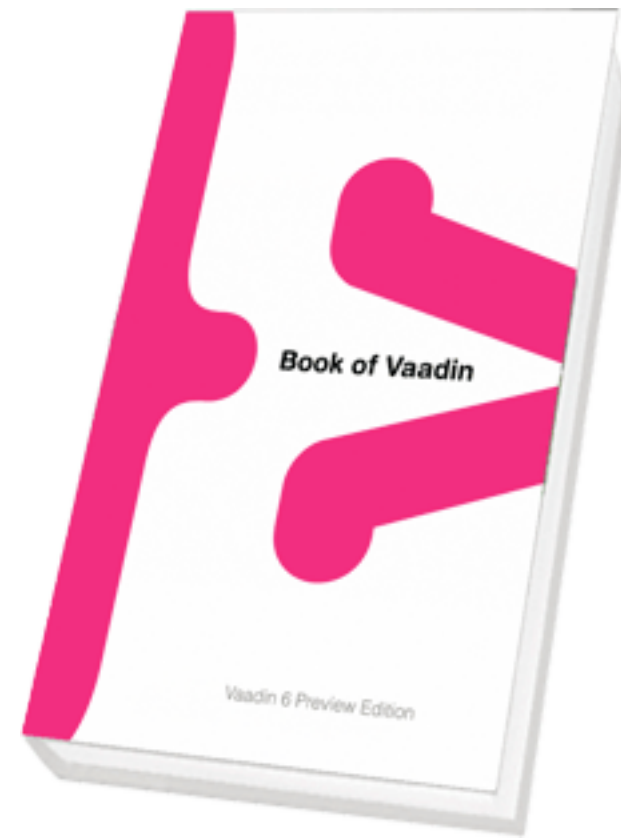## Demo

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+ Eclipse plugin 1.1

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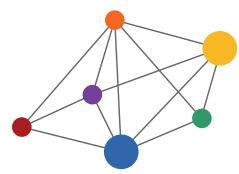30 Seconds to Vaadin »
Book of Vaadin - Tutorial »
FAQ - Forum - Recent posts »

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vaadin }>

CONTENTS INCLUDE:

Getting Started with Vaadin

By Marko Grönroos

ABOUT VAADIN

Vaadin is a server-side Ajax web application development framework that allows you to build web applications just like with traditional desktop frameworks, such as AWT or Swing. An application is built from user interface components contained hierarchically in layout components.

In the server-driven model, the application code runs on a server, while the actual user interaction is handled by a client-side engine running in the browser. The client-server communications and any client-side technologies, such as HTML and JavaScript, are invisible to the developer. As the client-side engine runs as JavaScript in the browser, there is no need to install plug-ins. Vaadin is released under the Apache License 2.0.
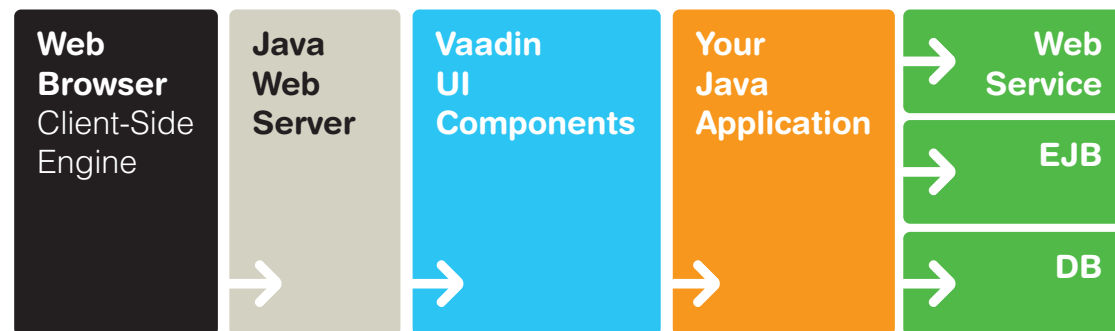

Figure 1: Vaadin Client-Server Architecture

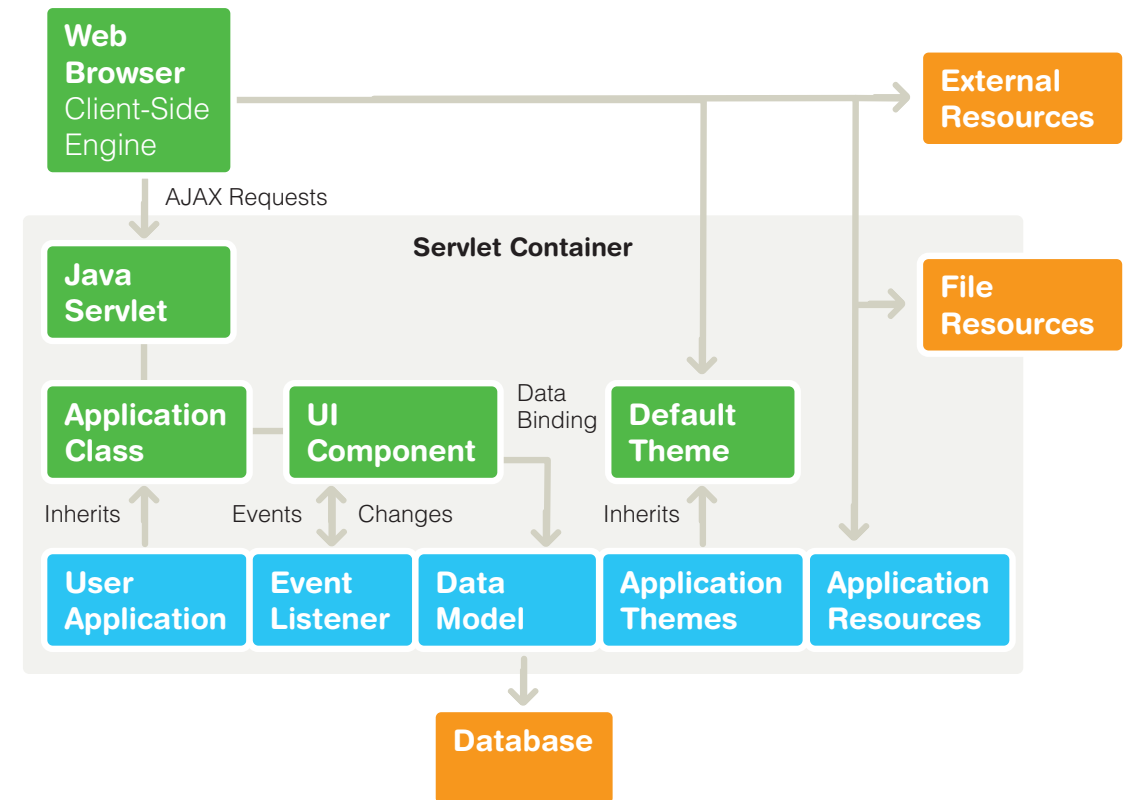If the built-in selection of components is not enough, you can

Figure 2: Architecture for Vaadin Applications
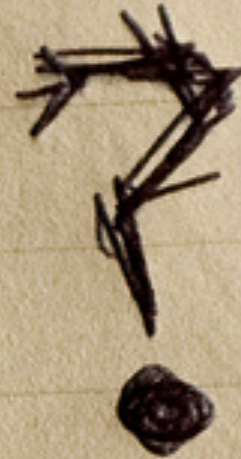
Hot Tip — You can get a reference to the application object from any component attached to the application with `getApplication()`

Event Listeners

In the event-driven model, user interaction with user interface components triggers server-side events, which you can handle

Questions
Comments

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skype://joonaslehtinen