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Developing JavaServerTM Faces Applications for Mobile Device Browsers

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 - (German) Java- and Eclipse-Magazine
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Agenda

- > Mobile Web Challenges and Opportunities
- > JavaServer Faces
 - Apache MyFaces Trinidad
- > Mobile Web with JSF/Trinidad
 - DEMO
- > Lessons Learned
- > Q&A

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Mobile Web Browser Evolution

- > Mobile web browser today is far cry from the WAP browsers that dominated market 5 years ago
 - But evolution varies greatly
- > Web access via mobile devices has begun to exceed access via desktop browsers
- > Smartphone browsers are approaching capabilities of desktop browsers
 - But still must contend with limited screen form factor
- > Consumer phone browsers can now handle HTML content

Challenges Presented by the Mobile Web Development

- > Wide variety of browser capabilities
 - JavaScript and AJAX
 - CSS
 - DOM
- > Uneven device performance
 - iPhone, BlackBerry Bold, and other smartphones
 - Consumer/Feature Phones
- > Different device interfaces and user interactions
 - Touch screen vs. non-touch screen
 - Finger vs. stylus navigation

Leading to Mobile Web Development Limitations

- > Developers currently have to choose one of the following approaches
 - “Lowest common denominator” approach
 - Mobile web application is targeted to run on basic mobile devices with plain HTML browsers
 - Develop several versions of the same application optimized for different devices
 - For example, one site for iPhone, one site for smartphone with JavaScript and CSS site, and one site for plain HTML browsers

What User Wants: Compelling Mobile Web Applications

- > Device-native application look and feel
 - Supports similar user experiences between mobile web application and native mobile application
 - Supports rich user interaction when device support is available
 - Works well for touch screen and non-touch screen devices
- > Performs well across various device types and connectivity
 - Leverage advanced AJAX capabilities in smartphone browsers to reduce network traffic
 - Reduce or eliminate JavaScript and Style sheets for less capable mobile devices with limited bandwidth

What User Wants: Compelling Mobile Web Applications

- > Designed with mobile user in mind
 - Information delivered as needed
 - Easy to navigate while “on-the-go”
 - Data formatted to fit on mobile device screen while remaining visible

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JavaServer Faces

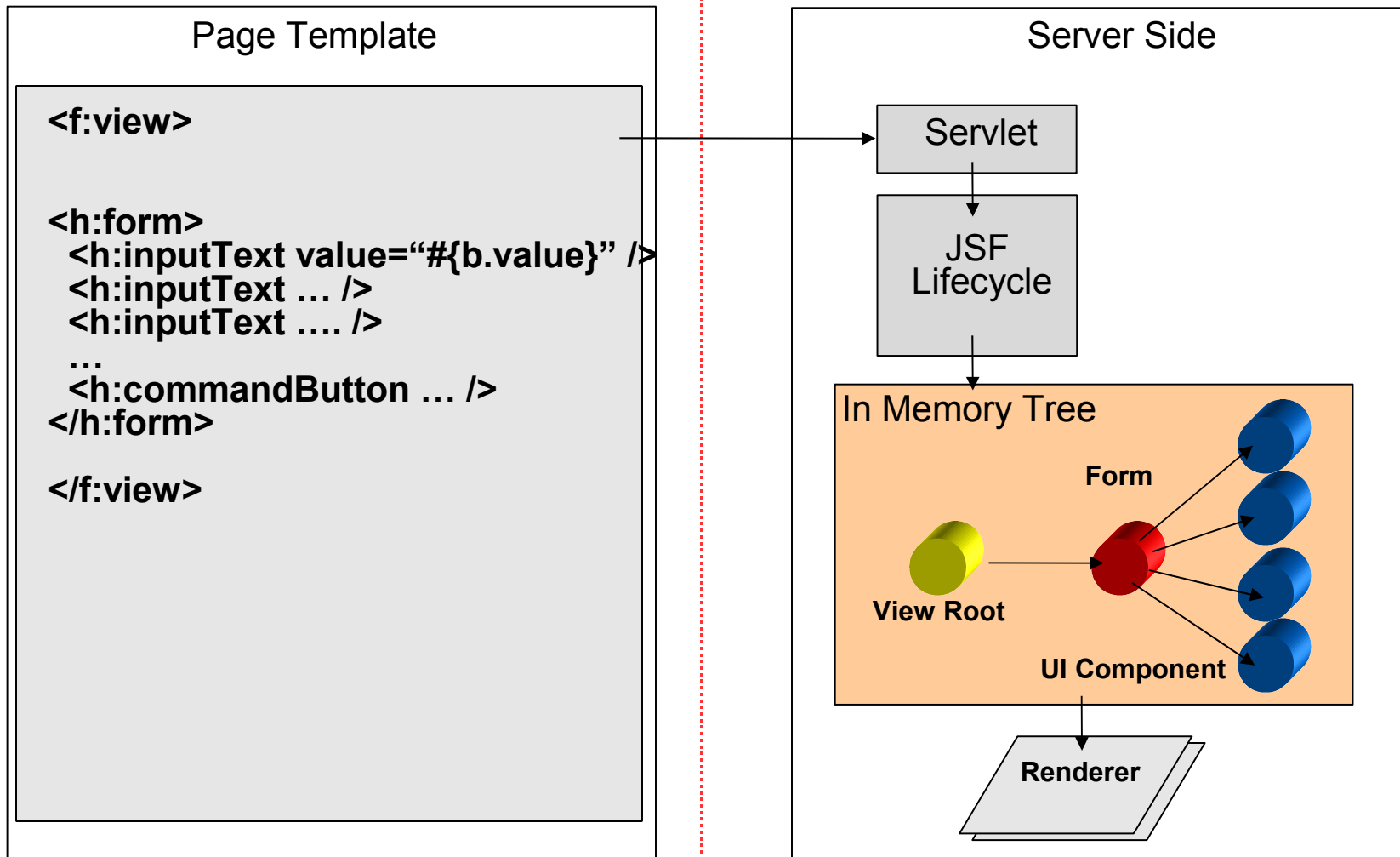
- > Java on the Web:
 - Servlets
 - JavaServer Pages (JSP)
 - JavaServer Pages Standard Tag Library (JSTL)
- > Emerging Frameworks
 - Apache Struts
 - other „Model 2“ Frameworks (Cocoon, Stripes,...)
- > Problems:
 - No „component-based“ approach
- > One Industrial Standard → JavaServer Faces (JSF)
 - Backed by JCP
 - JSR 127 → JSF 1.1 (May 2004)
 - JSR 252 → JSF 1.2 [Java EE 5] (May 2006)
 - JSR 314 → JSF 2.0 [Java EE 6] (2009)

JavaServer Faces

What is it really ?

- > Lightweight and extensible Web-Framework
 - POJO, replace the bits (navigation, view-technology,...)
- > API for UI Component Development
 - Several 3rd party component suites available
- > Goals
 - Make Java-Web-Development simple
 - Tooling (JDeveloper, Netbeans, Eclipse, ...)
- > Implementations
 - Sun Project Mojarra, hosted on java.net
 - Apache MyFaces
 - Caucho Resin
 - OperaMasks.org

JavaServer™ Faces



Apache MyFaces Trinidad



- > Contains more than 100 JSF components
 - Ajax-enabled JSF components
 - Tree-Navigation
 - Helpers (e.g. Extra converters and validators)
- > Ajax is first class citizens
 - Mother of PPR (Partial Page Rendering) ☺
 - Ajax support since UIX days !
- > Ajax-API
 - Client (JavaScript)
 - Server (Java)
- > Donated to Apache by Oracle in 2006

Apache MyFaces Trinidad



- > Trinidad is a framework
 - Several framework bits
 - Skinning
 - Ajax API
 - Maven2 Plugins
 - ...
- > Used as base for:
 - ADF Faces Rich Client Framework
 - ADF mobile
- > Stable library
 - JSF 1.2 support
 - JSF 1.1 support

Apache MyFaces Trinidad



The component show...

with all the widgets

is online available:

➔ **<http://www.irian.at>** ➔

Building Compelling Mobile Application with JSF and Trinidad Components

- Device-native application look-and-feel
 - JSF applications can be easily skinned to achieve device native look-and-feel
 - Two levels of rendering support:
 - Trinidad render kit renders UI component based on browser capabilities
 - Platform specific style sheets controlled by the developer



Building Compelling Mobile Application with JSF and Trinidad Components

- Performs well across various device types and connectivity
 - AJAX Support reduces data and network round trips for smartphone browsers
 - Trinidad components automatically switch to plain HTML when targeting basic mobile devices
 - Better performance for devices with less powerful processors
 - Less data to download over slower network connections



Building Compelling Mobile Application with JSF and Trinidad Components

- > Designed with mobile user in mind
 - Controls re-size dynamically based on screen size
 - Allows developer focus on application logic and view layout for mobile use
 - UI Developer thinks in terms of components instead of tags
 - *No need to write multiple versions of the same application*



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Mobile Web with JSF

➔ DEMO ➔

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UI Component Rendering Based on Browser Capabilities and User Agent

- > Difficult to decipher browser capabilities simply from User Agent
- > Our Current Approach:
 - Group browsers into major categories in terms of capabilities, and render UI and layout components based on these categories
 - AJAX, CSS, JavaScript, HTML version, DOM, Screen Size, Performance level, etc.
- > Another approach is to use device capabilities repository such as WURFL (<http://wurfl.sourceforge.net/>)
 - Accuracy depends on quality of contributor's information

Handling of AJAX responses due to different browser implementation

> Our Approach:

- JavaScript handler from Trinidad components needs to be customized to the different “AJAX-enabled” browsers

> Each of the following browsers handles AJAX responses differently:

- iPhone Safari
- Nokia S60 Browser
- Windows Mobile 5
- Windows Mobile 6
- BlackBerry Bold/Storm
- Android
- Etc.

Support for Mobile Browsers without JavaScript

- > Necessary for consumer/feature phone browsers
- > Our Approach:
 - Replace JavaScript based navigation control with Plain HTML controls
- > Auto-submit would not work without JavaScript support
 - For example, table navigation controls are changed
 - Show a picture
- > Page navigation link (tr:commandLink) is rendered as buttons
 - Page navigation in Trinidad is implemented as form submit (HTTP POST)
 - In HTML, HTTP POST request is typically rendered as buttons

Narrow Screen Support

- > Defined as screen width < 240 pixels
- > Challenges:
 - Label and Text cannot be displayed side-by-side
 - Text is likely to wrap
- > Our approach:
 - Re-arrange controls vertically
 - Label and Text arranged vertically instead of side-by-side
 - Still work in progress
 - Suggestions and contributions welcome

Performance Optimizations

- > Network download optimizations
 - CSS Optimization
 - JavaScript Optimization
- > Deliver CSS and JavaScript to devices that can perform well
 - Processing performance and capabilities varies greatly for CSS and JavaScript between different devices and operating system

Links and Resources

- > Apache MyFaces Trinidad
 - <http://myfaces.apache.org/trinidad>
- > Trinidad in Action
 - <http://jsfcentral.com>
- > Oracle ADF mobile
 - http://www.oracle.com/technology/tech/wireless/adf_mobile.html
- > Oracle ADF Faces
 - <http://www.oracle.com/technology/products/adf/adffaces/index.htm>
|
 - <http://tinyurl.com/adf-faces-live>
- > Contact us:
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New Contributors and
Developers are
Welcome!!

Questions and (Hopefully) Answers



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Thank You

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