Orientation in Objects

Nie mehr weltweites Warten

JSF Performance-Tuning

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Version:

Ihr Sprecher

Orientation in Objects

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Schwerpunkte
Frontend-Architektur,
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Web-Performance-Optimierung

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Fear, Uncertainty, Doubt

Orientation in Objects

Fear, Uncertainty, Doubt

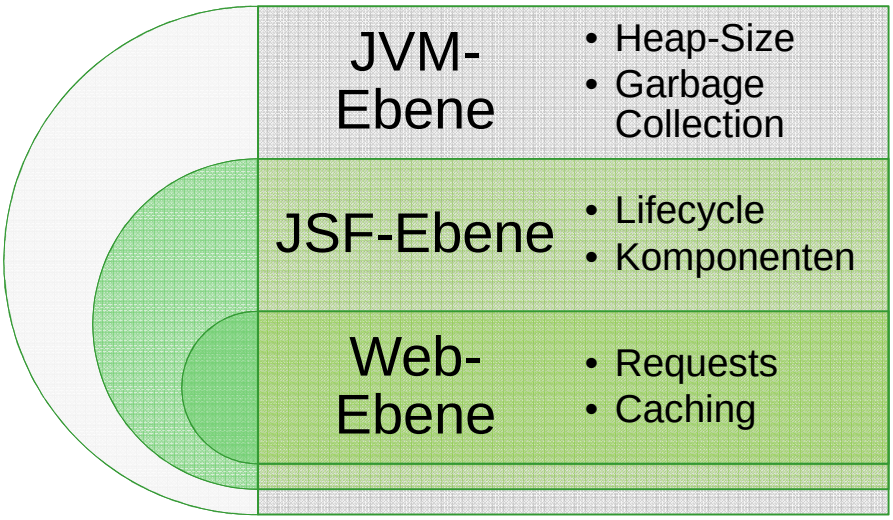
Orientation in Objects

JSF ist doch …

Langsam !!!

Performance optimieren – Auf welcher Ebene?

Orientation in Objects

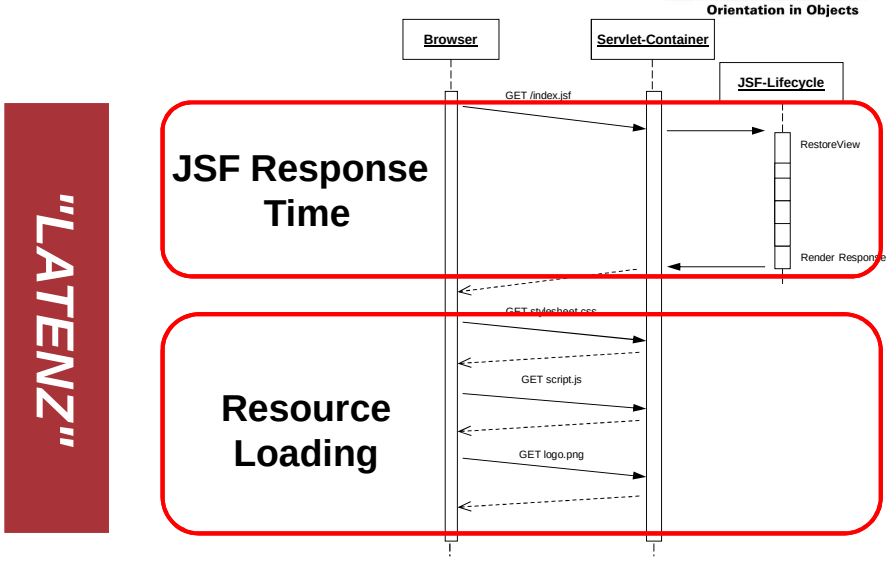


Orientation in Objects

Only 10%-20% of End-User Response-Time is spent donwloading the HTML document.

Steve Souders
- Web-Performance Guru, Yahoo

Welt-Weites-Warten



Optimierungsmassnahmen - Anforderungen

Orientation in Objects

- Postiver Effekt auf
  - JSF Response Time
  - Resource Loading
  - Netzwerk Latenzen
- Geringe Auswirkungen auf
  - Anwendungs-Architektur
  - Programmiermodell
  - Deployment
- Tooling:
  - Integration in bestehenden Toolstack
  - (JSF) – Bordmittel

Ansatzpunkte

Orientation in Objects

- JSF-spezifischen Overhead verringern
  - Komponentenbaum minimieren
  - Performante Implementierung wählen
- Anzahl der Requests verringern
  - Ressourcen zusammenfassen
  - Caching
  - Resourcen auslagern / CDN nutzen
  - Komprimierung

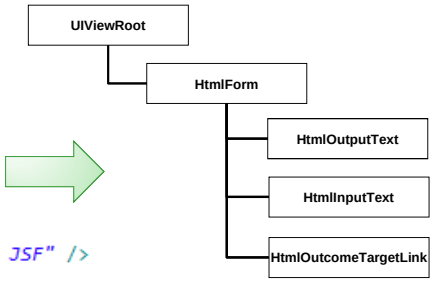
Orientation in Objects

Komponentenbaum

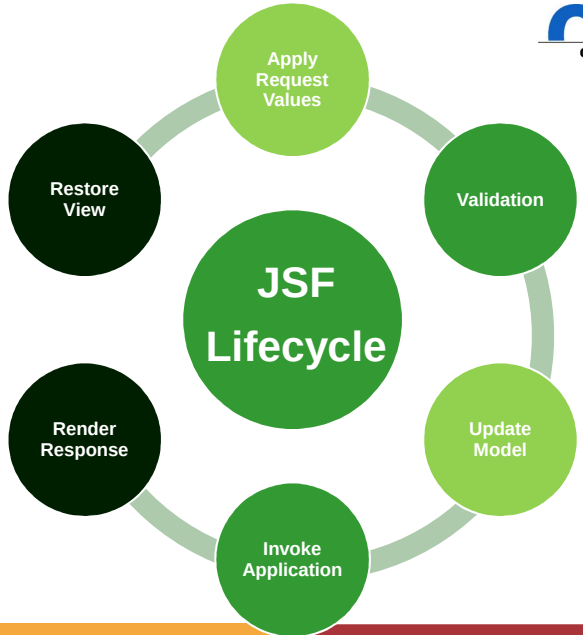
JSF - Komponentenbaum

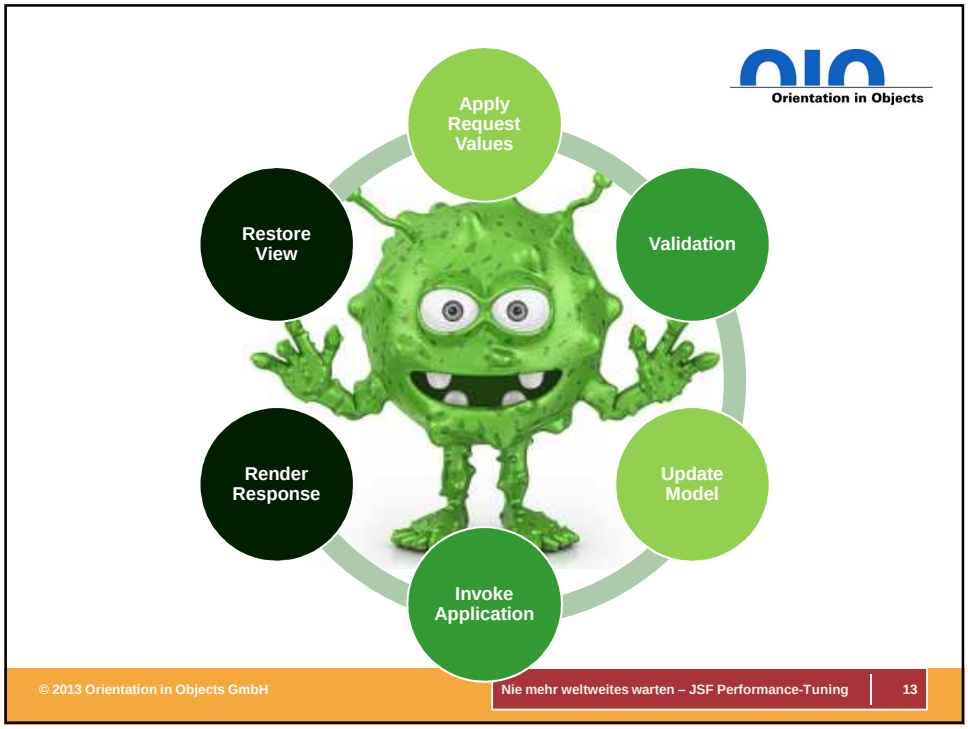
Orientation in Objects

```
<h:head>

</h:head>

<h:body>
    <h:form id="form">

        <h1>
            <h:outputText value="Hello JSF" />
        </h1>

        <h:inputText id="input" value="#{flash.input}" />
        <h:link outcome="page2.xhtml" value="Page 2" />

    </h:form>

</h:body>
```



Orientation in Objects




Apply Request Values
Validation
Update Model
Invoke Application
Render Response
Restore View
Orientation in Objects
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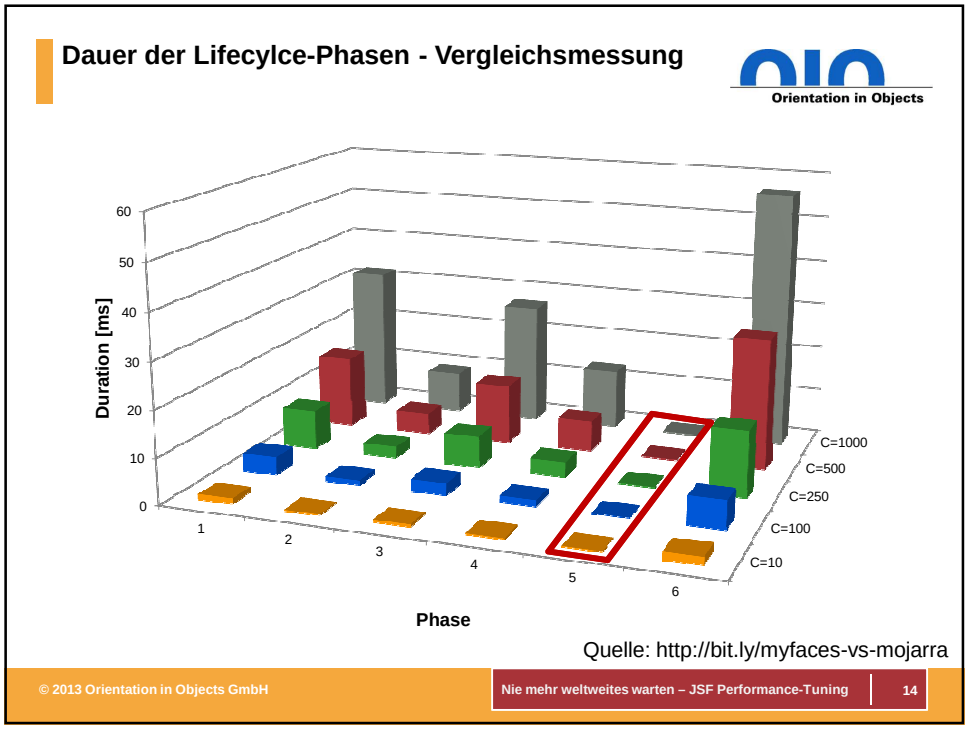
Nie mehr weltweites warten – JSF Performance-Tuning
13


Dauer der Lifecylce-Phasen - Vergleichsmessung
Orientation in Objects
Duration [ms]
60
50
40
30
20
10
0
1
2
3
4
5
6
Phase
C=1000
C=500
C=250
C=100
C=10
Quelle: http://bit.ly/myfaces-vs-mojarra
© 2013 Orientation in Objects GmbH
Nie mehr weltweites warten – JSF Performance-Tuning
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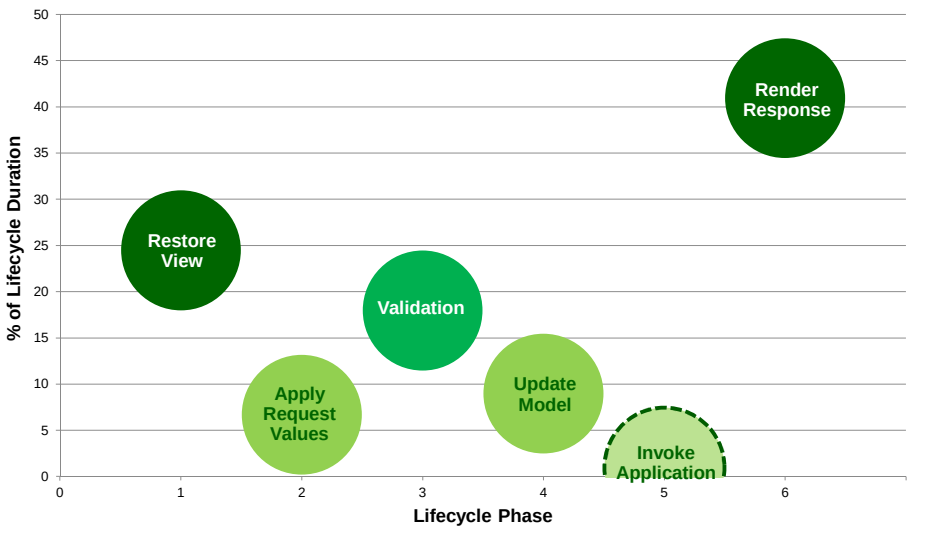
Dauer der Lifecylce-Phasen – Anteilig



Anzahl Components / View

- Erfahrungswerte:
  - < 50 eher selten
  - Mittelwert ca. 250
  - Ausnahmefälle > 3000

54 Components!

- Ursache:
  - Unnötiger Gebrauch von JSF-Komponenten
    - **Falscher Gebrauch von Composite Components**
  - "Dead Code": rendered="false"
    - **Trotzdem Teil des Komponentenbaumes**
  - Komplexität
    - **z.B.: verschachtelte Tabbed Panes**

Brauchen wir dafür JSF – Komponenten?

Orientation in Objects

1. Chrysler, 1965
2. Opel, 1999
3. Renault, 1972
4. Chrysler, 1988
5. Mercedes, 1971
6. Opel, 1996
7. Renault, 1986
8. Opel, 1991
9. Volkswagen, 1971

```
<ol id="ordered_list" class="ui-datalist-data">
    <li class="ui-datalist-item">
        Chrysler, 1965
    </li>
    ...
<ol>
```


Lösung: Es müssen nicht immer Composites sein …

Orientation in Objects

- Custom-Tags

```
<my:spacer height="100" />
```

- Decorator

```
<my:infoBox type="warning" >
  <h:message for="selection" />
</my:infoBox>
```

- Includes

```
<ui:include src="footer.xhtml" />
```

- Composite-Components

```
<my:orderForm value="#{order}" showAll="true">
    <f:validateRequired for="address" />
</my:orderForm>
```

Implementierungs-Unterschiede

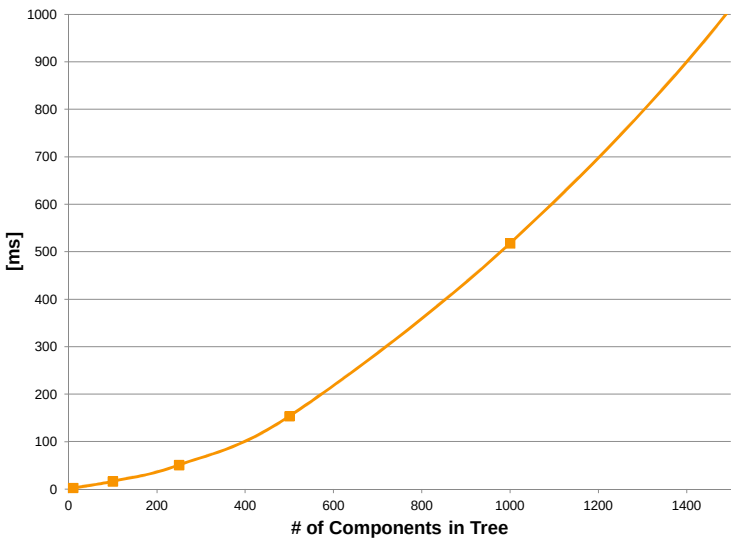
JSF - Implementierungen

- 2 Implementierungen:
  - Oracle Mojarra (Referenzimplementierung)
  - Apache MyFaces
  - ⇨ Prinzipiell Austauschbar

- Servlet-Container:
  - Implementierung typischerweise Teil der Anwendung
  - ⇨ Freie Wahl der Implementierung

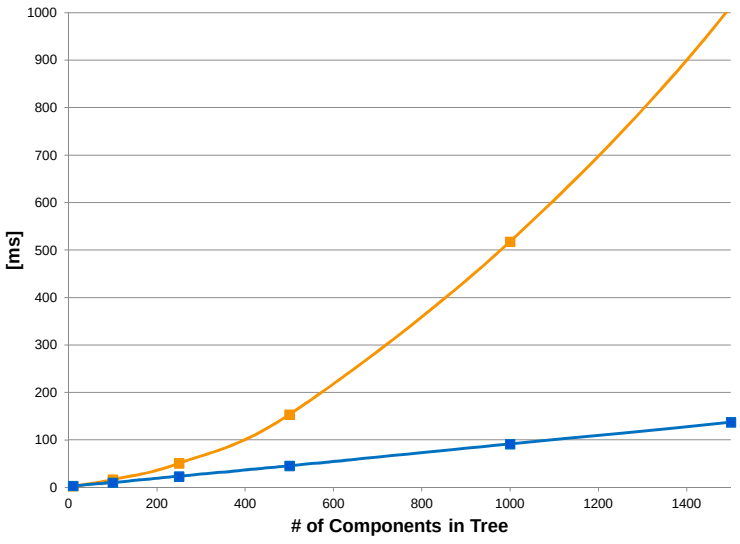
- Java EE - Application-Server: "Full-Stack-Falle"
  - Implementierung zwingend Teil des Auslieferumfangs
  - Dadurch Festlegung auf
    - Implementierung
    - Version
  - Änderung der JSF-Implementierung möglich
    - **Konfiguration notwendig**
    - **Ggf. Auswirkung auf Garantie/Support**

Vergleich: MyFaces vs Mojarra



2.1.14

Vergleich: MyFaces vs Mojarra

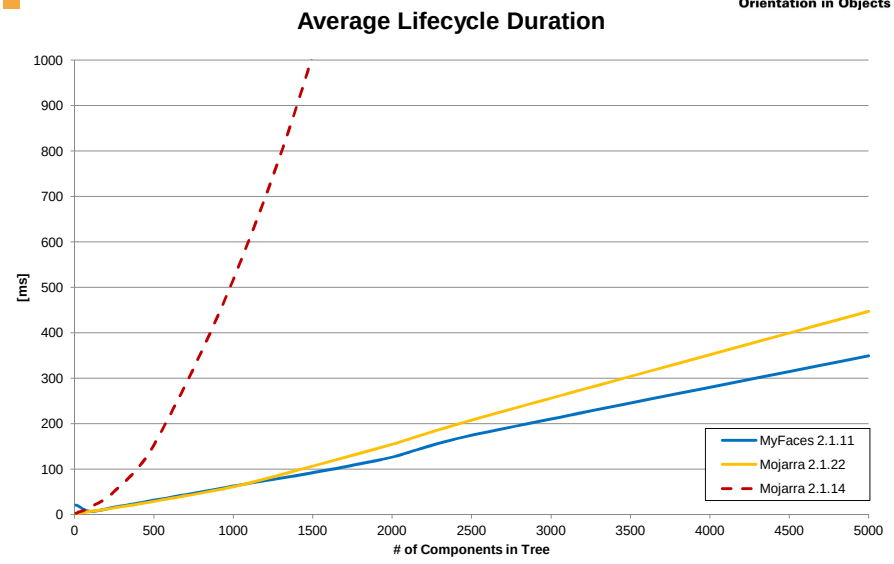


2.1.14

2.1.9

MyFaces vs Mojarra – Aktueller Stand

Orientation in Objects



Components	
javax.faces.component.UIPanel (3)	form:foo:j_idfoo__f_cc_facet form:foo:greeting:j_idgreeting__f_cc_facet form:greeting:j_idgreeting__f_cc_facet
javax.faces.component.UIViewRoot (1)	j_id0
org.apache.myfaces.component.ComponentResourceContainer (2)	javax_faces_location_body javax_faces_location_head
javax.faces.component.UIOutput (3)	j_id1 jsfinspector-resource-jquery jsfinspector-resource-css
javax.faces.component.html.HtmlHead (1)	j_id_3
javax.faces.component.html.HtmlBody (1)	j_id_4
javax.faces.component.html.HtmlForm (1)	form
javax.faces.component.html.HtmlOutputText (2)	form:hello form:output
javax.faces.component.html.HtmlInputText (1)	form:input
javax.faces.component.html.HtmlCommandButton (1)	form:submitButton
javax.faces.component.html.HtmlPanelGrid (2)	form:grid form:grid2
javax.faces.component.html.HtmlOutputLabel (1)	form:outputLabel
de.thomasasel.jsf.inspector.components.JSFInspector (1)	form:inspector
Total number of components:	**20**

Composite Components	
greeting.xhtml (2)	form:foo:greeting form:greeting
foo.xhtml (1)	form:foo
Total number of components:	3

Phase Results					
221,22 ms	0,00 ms	0,00 ms	0,00 ms	0,00 ms	464,45 ms

JSFInspector

Orientation in Objects

- Keine Klassischen UI-Komponenten
- Unterstützt Developer bei der JSF-Anwendungs-Entwicklung
- inspect:tree
  - Wieviele Komponenten stecken in meinem Komponentenbaum?
  - Welche Komponenten wurden wie oft verwendet?
- Inspect:lifecycle
  - Welche Phase dauert wie lange?
  - Welche Phasen wurden durchlaufen?
  - Welche Komponenten weisen Validierungsfehler auf?
- http://tasel.github.io/jsfinspector

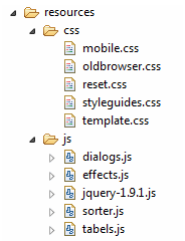
Orientation in Objects

Ressourcen zusammenfassen

JSF - Resource Handling

Orientation in Objects

- Organisation in WebContent/resources:



- Deklaration:

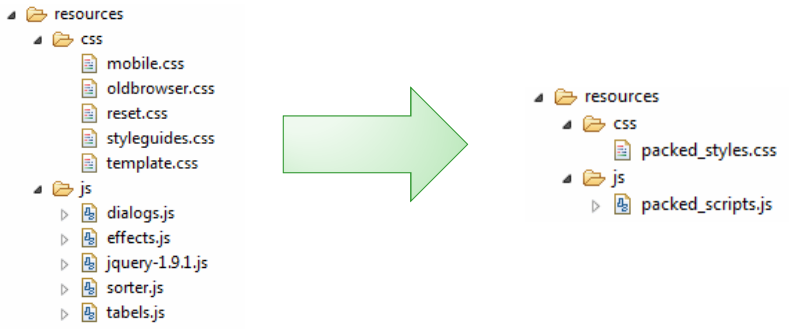
```
<h:outputStylesheet
   library="css"
   name="styleB.css" />

<h:outputScript
   library="js"
   name="scriptC.js"
   target="head" />
```

- Rendering:

```
<link rel="stylesheet"
href="/myapp/javax.faces.resource/styleB.css.jsf?ln=css">
<script src="/myapp/javax.faces.resource/scriptC.js.jsf?ln=js">
</script>
```


Combined Resources

Orientation in Objects



Combined Resources: Anforderungen

Orientation in Objects

- Umsetzungsvarianten
  - Build-Prozess/Deployment
    - **Maven**
    - **Ant**
    - **Jawr**
  - JSF
    - **Eigenimplementierung / Erweiterung**
    - **Bibliothek**
- Programmiermodell:
  - Ressourcen zur Entwicklungszeit nicht kombinieren
  - ⇨ Staging-Konzept berücksichtigen
- Rendering:
  - Nur ein Verweis pro Typ
  - Gerenderte Links müssen kombinierte Ressource referenzieren

Combined Resources: Rendering

Orientation in Objects

```
<link rel="stylesheet"
href="/myapp/javax.faces.resource/styleA.css.jsf?ln=css">
<link rel="stylesheet"
href="/myapp/javax.faces.resource/styleB.css.jsf?ln=css">
<script src="/myapp/javax.faces.resource/scriptA.js.jsf?ln=js"></script>
<script src="/myapp/javax.faces.resource/scriptB.js.jsf?ln=js"></script>
<script src="/myapp/javax.faces.resource/jquery-
1.9.1.min.js.jsf?ln=js"></script>
```

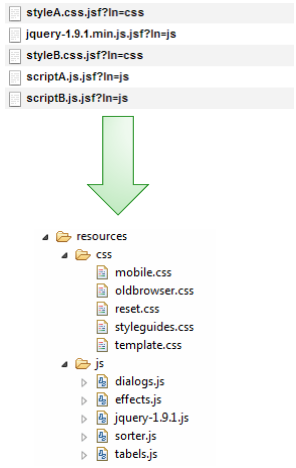
```
<link rel="stylesheet" href="/myapp/resources/packed.css">
<script src="/myapp/resources/packed.js"></script>
```

JSF - Resource Handler

Orientation in Objects

ResourceHandler

+ResourceHandler()
+createResource(parameter : String) : Resource
+createResource(parameter : String, parameter2 : String) : Resource
+createResource(parameter : String, parameter2 : String, parameter3 : String) : Resource
+libraryExists(parameter : String) : boolean
+handleResourceRequest(parameter : FacesContext) : void
+isResourceRequest(parameter : FacesContext) : boolean
+getRendererTypeForResourceName(parameter : String) : String
+handleResourceRequest(parameter : FacesContext) : void
+isResourceRequest(parameter : FacesContext) : boolean



- Verantwortlich für De/Encoding von Resourcen
- Liefert Ressource anhand Library und Resourcename
- Behandelt Resource Requests

OmniFaces - CombinedResourceHandler

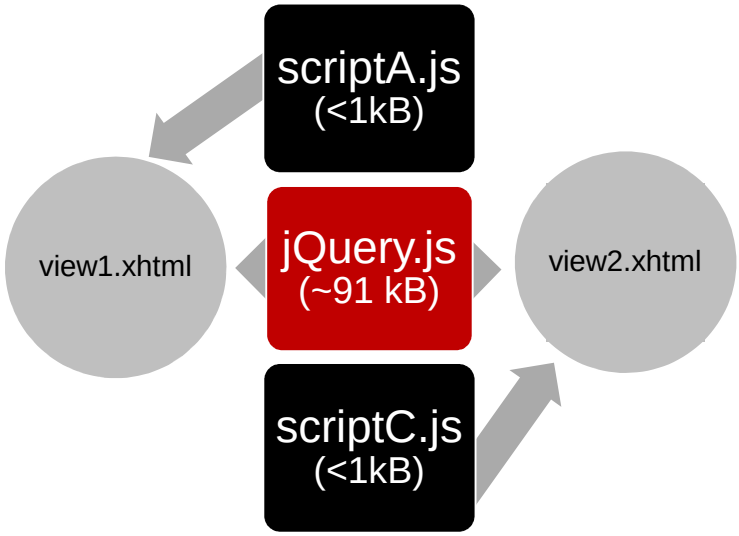
omnifaces
OmniFaces - to make JSF life easier

faces-config.xml:

```
<application>
  <resource-handler>
    org.omnifaces.resourcehandler.CombinedResourceHandler
  </resource-handler>
</application>
```

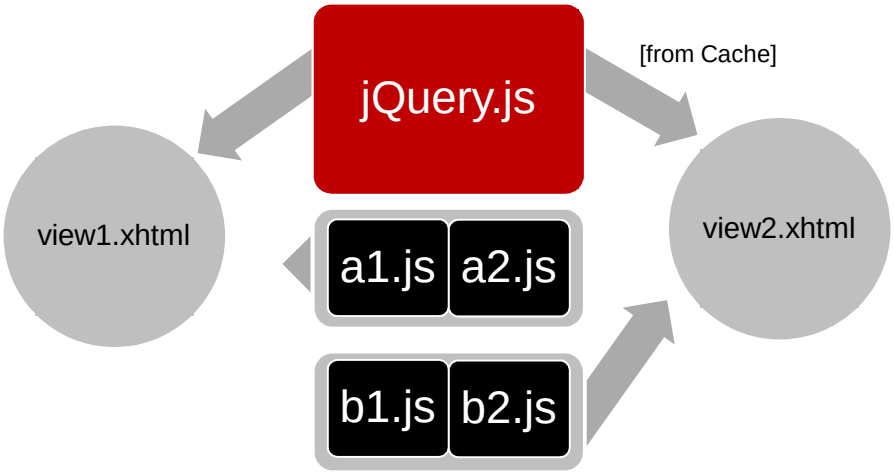
Combined Resources: Problem

Orientation in Objects



Combined Resources – Ausnahmen

Orientation in Objects



OmniFaces - CombinedResourceHandler

Ausschluß seitenweise konfigurieren:

view.xhtml:

```
<!-- Packed Ressources -->
<h:outputScript library="js" name="scriptB.js"
  target="head" />
<h:outputScript library="js" name="scriptC.js"
  target="head" />

<!-- Excluded from packing -->
<h:outputScript library="js" name="jquery-1.9.1.min.js"/>
```


OmniFaces - CombinedResourceHandler

Ausschluß global konfigurieren:

- web.xml:

```
<context-param>
  <param-name>
  org.omnifaces.COMBINED_RESOURCE_HANDLER_EXCLUDED_RESOURCES
  </param-name>
  <param-value>
    javax.faces:jsf.js
  </param-value>
</context-param>
```

OmniFaces: CombinedResourceHandler

Auslieferung vollständig unterdrücken:

- web.xml:

```
<context-param>
  <param-name>
  org.omnifaces.COMBINED_RESOURCE_HANDLER_SUPPRESSED_RESOURCES
  </param-name>
  <param-value>
    primefaces:primefaces.css
   </param-value>
</context-param>
```


Combined Resources - Bibliotheken

Omnifaces
"Combined ResourceHandler"

ICEfaces 3.3
"Resource Coalescing"

RichFaces 4
"Resource Optimization"

Orientation in Objects

Caching

Standardverhalten: Caching- Response Header

Orientation in Objects

- Production-Stage:

```
HTTP/1.1 200 OK
Server: Apache-Coyote/1.1
Expires: Thu, 11 Apr 2013 13:51:12 GMT
Last-Modified: Wed, 03 Apr 2013 08:52:01 GMT
Content-Type: application/javascript
Content-Length: 176
Date: Thu, 04 Apr 2013 13:51:12 GMT
```

Expires Header

Orientation in Objects

"The Expires entity-header field gives the date/time after which the response is considered stale."

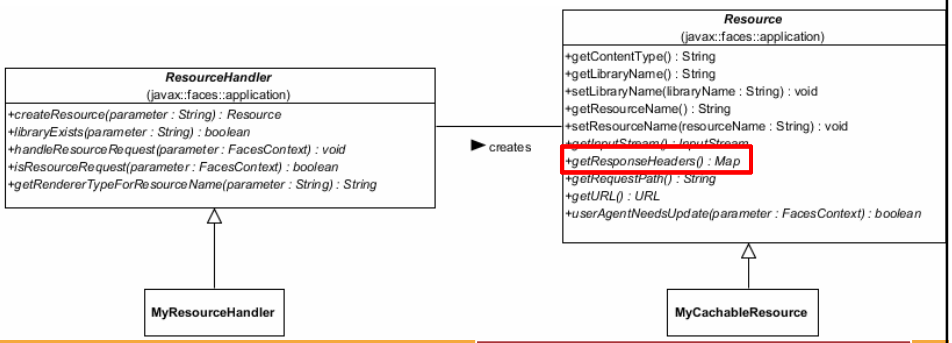
RFC 2616 - Hypertext Transfer Protocol -- HTTP/1.1

- Wird von JSF automatisch gesetzt
  - Production-Stage: 7 Tage
  - Development-Stage: 0
- Probleme:
  - Zu kurzer Zeitraum:
    - **Ressource wird redundant ausgeliefert**
  - Zu langer Zeitraum
    - **Client verpasst Update**

Response Header anpassen

Orientation in Objects

- Servlet-Filter
  - geht immer, unabhängig von JSF
  - Nachteil: Kein Zugriff auf FacesContext, Scopes, etc…
- JSF:



Orientation in Objects

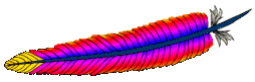
Resourcen auslagern

Statische Ressourcen auslagern

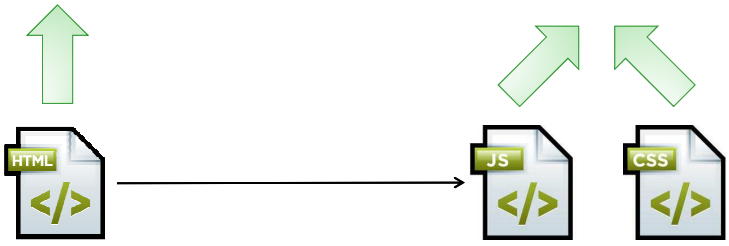
Orientation in Objects

`http://www.oio.de`

`http://static.oio.de`

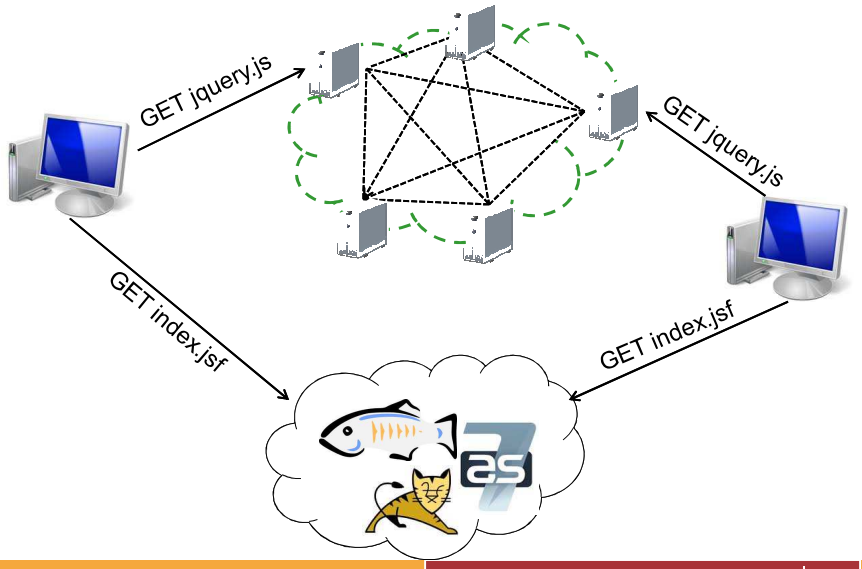


Apache httpd



CDN – Content Delivery Network

Orientation in Objects



CDN - Vorteile

Orientation in Objects

- Transfer von statischen Ressourcen
  - schont
    - **Application Server**
    - **Unternehmensnetzwerk**
  - Erzeugt (vermutlich) geringere Kosten

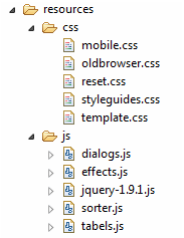
Beispiel amazon cloudfront **ab 0,12 $ / GB und $0,0090 / 10.000 Requests**

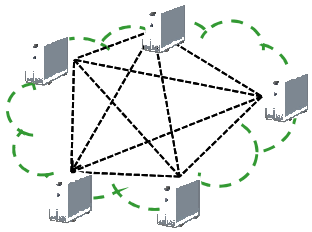
- CDN übernimmt
  - Auslieferung
  - Load-Balancing
  - Skalierung

JSF und CDN

Orientation in Objects

- Deployment
  - Extra-Step
    - **Maven**
    - **Ant**
    - **…**





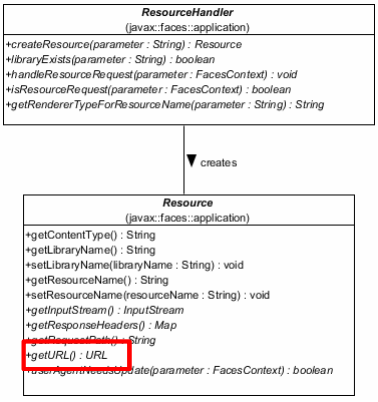
- JSF

```
<link rel="stylesheet"
href="/myapp/javax.faces.resource/styleA.css.jsf?ln=css">
```

```
<link rel="stylesheet" href="http://mycdn.com/oio/myapp/styleA.css">
```


JSF Resource Handler

Orientation in Objects



OmniFaces: CDNResourceHandler

omnifaces
OmniFaces - to make JSF life easier

- faces-config.xml:

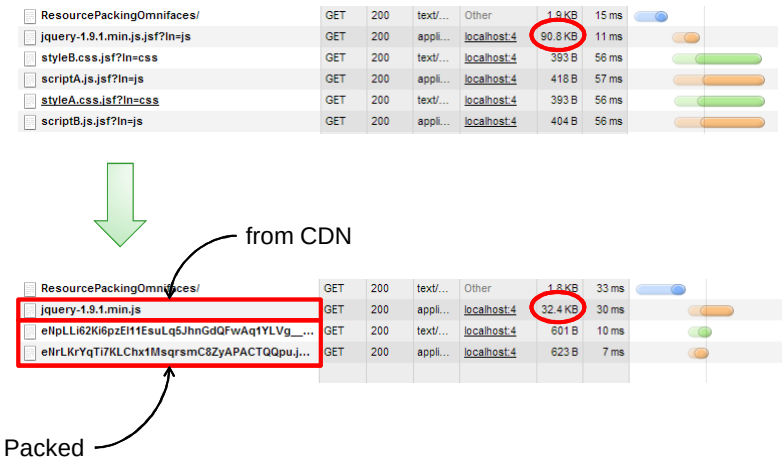
```
<application>
  <resource-handler>
    org.omnifaces.resourcehandler.CDNResourceHandler
  </resource-handler>
</application>
```

- web.xml:

```
<context-param>
  <param-name>
    org.omnifaces.CDN_RESOURCE_HANDLER_URLS
  </param-name>
  <param-value>
    js:jquery.js=http://code.jquery.com/jquery.js
  </param-value>
</context-param>
```


OmniFaces: CDNResourceHandler

omnifaces
OmniFaces - to make JSF life easier



CDN und Caching

Orientation in Objects

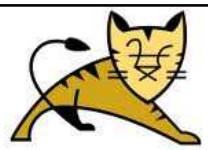
- Response Header:

```
Access-Control-Allow-Origin:*
Content-Encoding:gzip
Content-Length:32819
Content-Type:application/x-javascript; charset=utf-8
Date:Fri, 05 Apr 2013 14:02:24 GMT
Cache-Control:max-age=2592000
Expires:Sun, 05 May 2013 14:02:24 GMT
Last-Modified:Tue, 05 Feb 2013 00:56:40 GMT
Vary:Accept-Encoding
X-Cache:HIT
Server:ECS (fcn/41B6)
```


Orientation in Objects

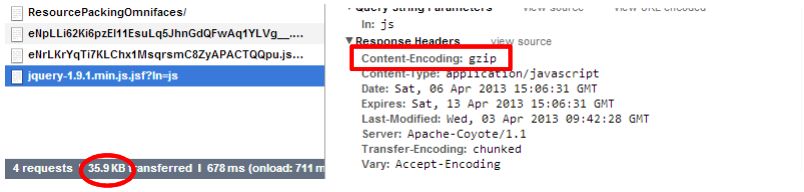
Komprimierung

Konfiguration - Tomcat



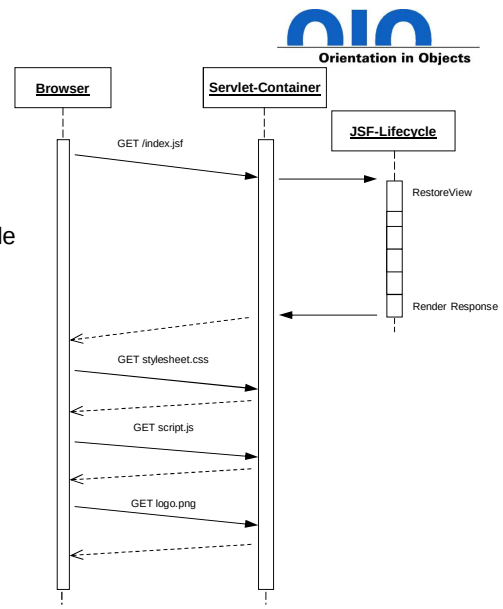
- Server.xml

```
<Connector port="8080" protocol="HTTP/1.1"
   connectionTimeout="20000"
   redirectPort="8443"
   compression="on"
   compressionMinSize="1024"
   compressableMimeType="text/css,application/javascript"
/>
```



Zusammenfassung

- JSF Response Time
  - Kompontenbaum
  - Implementierungsunterschiede
- Resource-Loading
  - Combined Resources
  - Caching
  - Ressourcen auslagern
  - Komprimierung



Fazit

Orientation in Objects

- Einfluss auf JSF-Performance:
  - Größe des Komponentenbaumes
  - Wahl der Implementierung
  - Mojarra: Update auf aktuelle Version dringend empfohlen
- # Requests statischer Resourcen verringern:
  - Combined Resources
  - Resource Caching
  - Auslagern (CDN / dedicated Webserver)
- Netzwerk-Latenz verringern:
  - GZip Kompression nutzen
    - **Der Browser kann das schon lange …**

⇨ Alle vorgestellten Massnahmen lassen sich mit JSF umsetzen
- Es existieren außerdem hilfreiche Bibliotheken

Mehr von OIO zum Thema…

Orientation in Objects

- Schulung: JavaServer Faces
  - http://www.oio.de/java-server-faces.htm
- Schulung: JSF Komponenten selbst entwickeln
  - http://www.oio.de/seminar/java/kurs-jsf-schulung-komponenten-java-server-faces-seminar-entwicklung-components.htm
- Vergleichsstudie der Implementierungen Oracle Mojarra und Apache MyFaces
  - http://www.oio.de/public/java/studie-jsf-mojarra-myfaces-performance-vergleich.htm
- Artikel: JSF Best Practices (englischer Artikel)
  - http://www.oio.de/public/java/jsf-best-practices-javaserver-faces-session-tips.htm



Orientation in Objects

Vielen Dank für ihre Aufmerksamkeit !

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