A Framework for Context-Aware Adaptable Web Services

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The Context Framework

- Context: Information about clients and their environment that is used by Web services to provide clients with a customized and personalized behavior
- Separation of functional duties into external components: context plugins and context services
- Transparent and automatic usage of these components
- Generic solution, i.e., components are usable for a variety of Web services
- Implemented within the ServiceGlobe system, our open and distributed Web service platform

The Context Model

- Context consists of several context blocks
- A context block is associated to one context type
- A context type defines the type of context information in a context block, e.g., location, client device
- At most one context block is allowed for a context type within a context
- Context is transmitted as a SOAP header block

Context Processing Architecture

- Specify how and where context is processed:
  - Hosts to which context is transmitted
  - Hosts and components, i.e., context plugins and context services, that should process the context
  - Provided within a client’s context or the UDDI metadata of Web services, or determined automatically by the context framework

The Context Framework – Example Scenario

SOAP Request:
<Envelope>
  <Header>
    <Context>
      <Location>
        <address useType="Office">
          <addressLine keyName="Street">Innstraße 33</addressLine>
          <addressLine keyName="City">94032 Passau</addressLine>
          <addressLine keyName="Country">Germany</addressLine>
        </address>
      </Location>
      <Client>
        <DeviceDefaults>
          http://example.com/context/device/PDA
        </DeviceDefaults>
        <Hardware>
          <ScreenSize>320x320</ScreenSize>
          <IsColorCapable>Yes</IsColorCapable>
        </Hardware>
      </Client>
    </Context>
  </Header>
  <Body>
    <KeywordSearchRequest>
      <mode>books</mode>
      <keyword>John Grisham</keyword>
    </KeywordSearchRequest>
  </Body>
</Envelope>

SOAP Response:
<Envelope>
  <Header>
    <ResponseProperties>
      <Stylesheet>http://orioles/context/stylesheet-pda.xsl</Stylesheet>
    </ResponseProperties>
  </Header>
  <Body>
    <KeywordSearchResponse>
      <return>
        <TotalResults>264</TotalResults>
        <Details>
          <ProductName>The Last Juror</ProductName>
          <Authors>
            <Author>John Grisham</Author>
          </Authors>
          <ListPrice>EUR 16.77</ListPrice>
          <Reviews>
            <TotalCustomerReviews>100</TotalCustomerReviews>
            <CustomerReviews>
              <CustomerReview>
                <Comment>This book would have completely lacked any sort of suspense or sense of anticipation if ...</Comment>
              </CustomerReview>
            </CustomerReviews>
          </Reviews>
        </Details>
      </return>
    </KeywordSearchResponse>
  </Body>
</Envelope>