Service Enabler

Accessing Web Sites as Web Services

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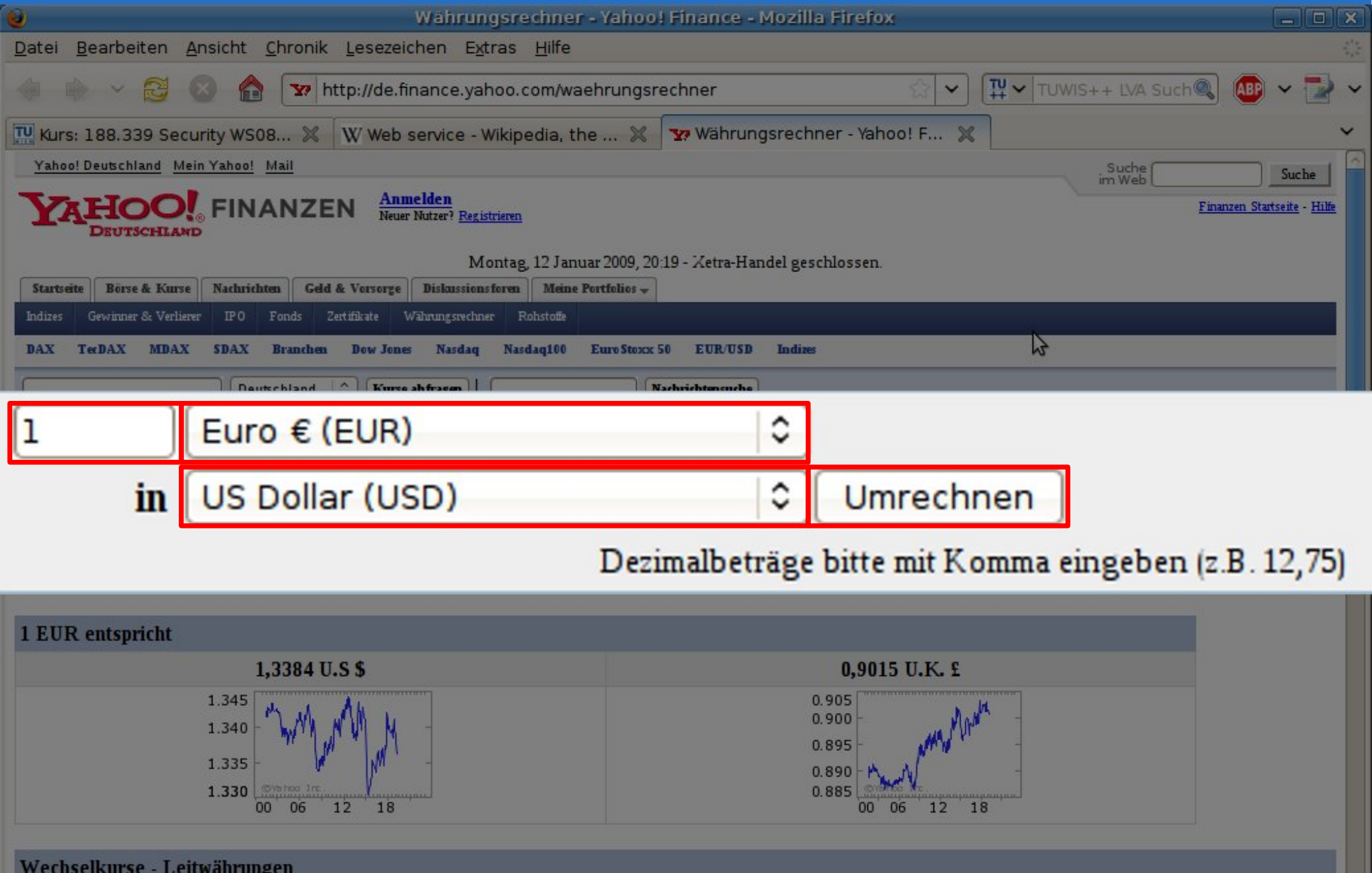
Definition: Web Services

- “A software system designed to support interoperable machine-to-machine interaction over a network.”
- Successor of network technologies like CORBA
- XML
- SOAP
- WSDL

Motivation

- Web services provide interoperable machine-to-machine interaction over a network
- Many legacy web applications are only exposed as html pages and not easily usable by computer programs
- Service Enabler connects these two worlds and provides an infrastructure to access legacy web applications as web services

Example: Currency Converter



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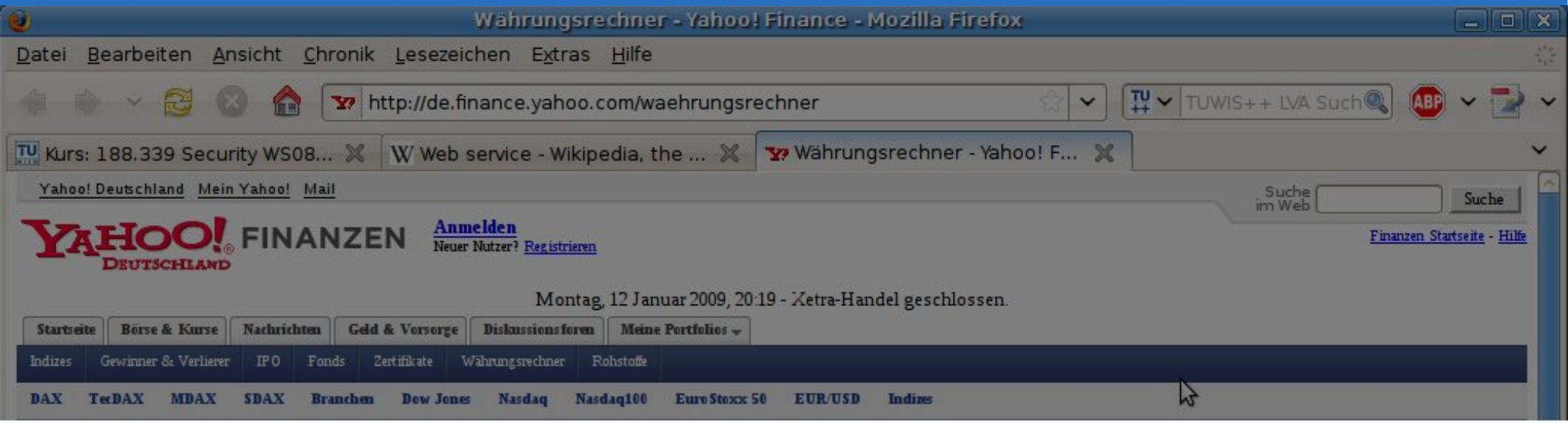
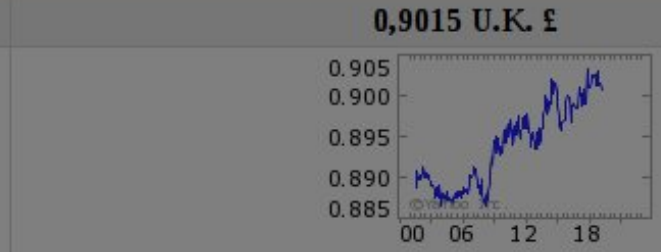


mrechnung

ol	Euro €	Wechselkurs		US Dollar
D=X	1	12 Jan	1,3375	1,3375

Zum Portfolio hinzufügen Daten herunterladen



Wechselkurse - Leitwährungen

Basics

Service Enabler ...

- behaves like a web browser
- simulates a user and his actions
- retrieves values of web pages
- exposes functionality as web service (SOAP)

- needs description of the web applications

Definitions

- Action: a task like typing, clicking or reading text
- Method: a sequence of actions
- Service: groups methods of one web site
- Login: Starting point of all methods of a service

Actions

- PutText: enters text into input field or textarea
- Select: dropdown lists, check boxes and radio buttons
- Click: simulates a click on a clickable element
- GetValue: retrieves a single value
- GetTable: retrieves multiple records of values
- Repeat: repeats a list of actions
- Verify: allows to verify the content of an HTML element

Actions (2)

- Actions operate on the DOM of an HTML page
- XPath is used to determine HTML elements
  - `/html/body/center/form/table/tbody/tr[1]/td[2]/input[2]`
  - `//input[@name="amount"]`
- Constant and variable values possible

XML Configuration

```
<service name="CurrencyConverter">
 <login startUrl="http://...waehrungsrechner" validTime="604800">
 </login>

 <method name="convert">
    <actions>
      <puttext>
        <xpath>//input[@name="amt"]</xpath>
        <argname>amount</argname>
      </puttext>
      <select>
        <xpath>//select[@name="from"]</xpath>
        <argname>from</argname>
      </select>
        ..............
    <actions>
  </method>

</service>
```

WSDL mapping

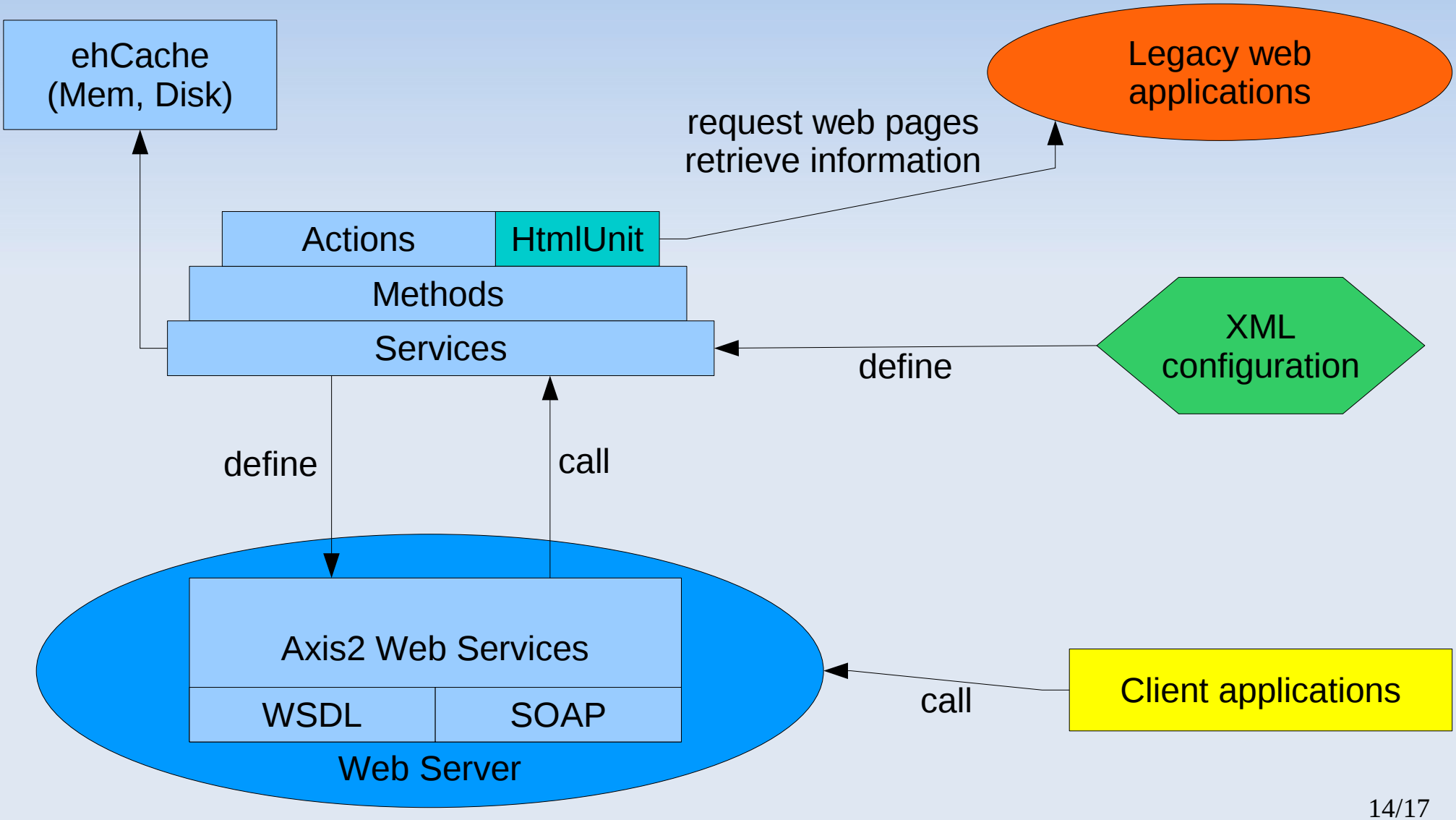
- Service → WSDL service
- Method → SOAP operation
- Action with variable argument → operation parameter
- GetValue, GetTable → Part of result message

Further Features

- Can handle incorrect HTML
- Session management: cached login method
- Caching of method results
- JavaScript is supported

Live Demo

Architecture



Used Tools

- Apache Axis2
- ehCache
- HtmlUnit
  - `List<?> nodes = page.getByXPath(xpath);`
  - `nodes.get(0).click();`
- XStream: XML (De-)Serialization
  - InputStream in = new BufferedInputStream(new FileInputStream(xmlFile));
  - Object o = xstream.fromXML(in);

Outlook

- Tool to create configurations
- Integration into servlet container
- Type checking
- Template engine, scripting support

Service Enabler

Thank you!

Any questions?