

Overview of IBM
WebSphere Application Server
Feature Pack for Web 2.0



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Agenda

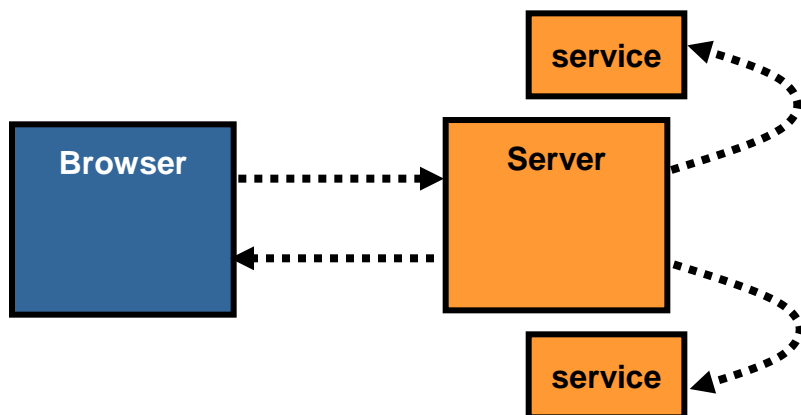
- Web 2.0 and SOA
- Overview of the Feature Pack for Web 2.0 features
 - Web 2.0 SOA Ajax connectivity
 - Java libraries
 - Ajax development toolkit
 - IBM sample applications
- Benefits of the Feature Pack for Web 2.0
- Summary
- References
- Questions & Answers

Web 2.0 and SOA

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Web Applications and SOA

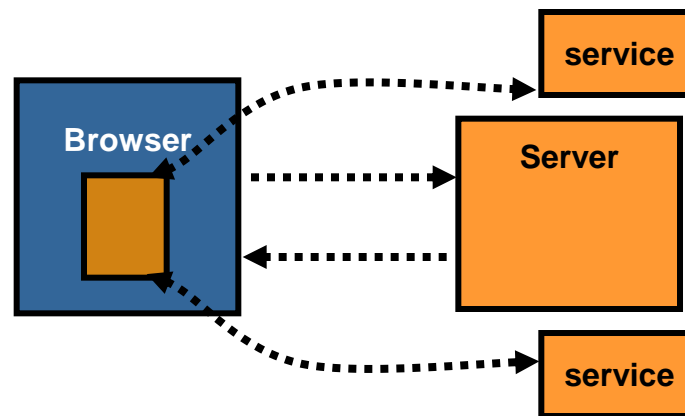
Classic web application patterns promoted server side service access



Existing web services standards (WS_*, WSDL, SOAP) are typically used in this model

Focus is on access from multiple programming languages using a variety of communication protocols

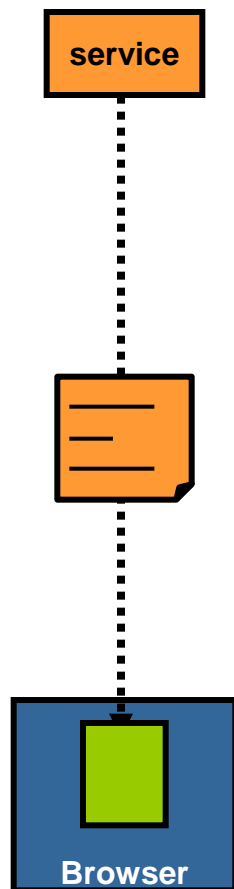
Web 2.0 application patterns promote client side (browser) access to services



Emerging web services approaches leveraging REST and JSON are typically used in this model

Optimized for *single language* (JavaScript), *single protocol* (HTTP) access via Ajax in a browser

Web 2.0 style services – key concepts



REST

- **RE**presentational **S**tate **T**ransfer
- Server side architectural style relying on HTTP semantics to access services or resources
- Easily invoked by browsers via Ajax

JSON

- **J**ava**S**cript **O**bject **N**otation
- Data format used to exchange information between browser and a service
- Directly consumable by JavaScript clients

Ajax

- **A**synchronous **J**ava**S**cript **A**nd **X**ML
- Browser based technology to provide highly interactive and responsive web pages
- Enables the browser to invoke services directly from the client

What is Ajax?

- Ajax is the acronym for **A**synchronous **J**avaScript **A**nd **X**ML
- A pattern for programming rich browser applications that uses open standards.
- Ajax can be mixed in with classic Web user interface
- Unlike previous rich Web user interface approaches, Ajax applications leverage standard browser features and does not require browser plug-ins
- AJAX involves existing technology & standards: JavaScript™ and XML

Basic technologies involved in Ajax

- HTML or XHTML and CSS
- JavaScript code
- DOM, the Document Object Model
- DHTML, or Dynamic HTML, updates forms dynamically
- Data interchange and manipulation using (JavaScript Object Notation) JSON or XML or both file formats.

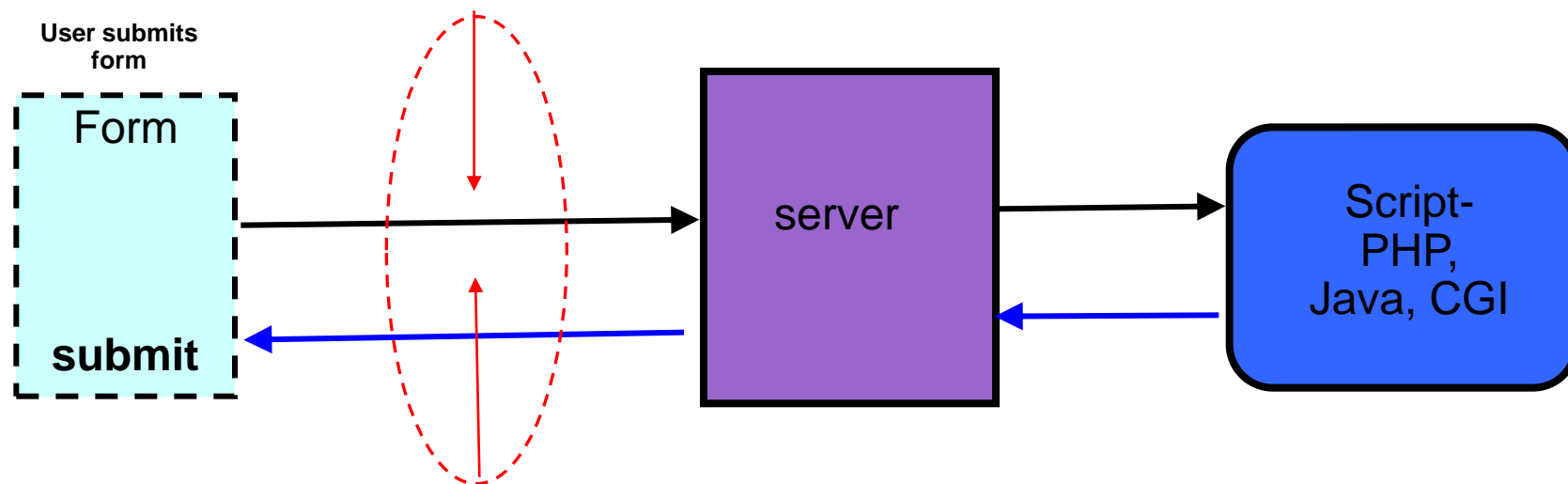
The XMLHttpRequest (XHR) object

- XMLHttpRequest
 - Enables the retrieval of data from Web resources as a background activity
- XMLHttpRequest object that talks to the server

```
<script type="text/javascript">  
var xmlhttp = new XMLHttpRequest();  
</script>
```
- The result is a dynamic, responsive, highly-interactive experience like a desktop application, but with all the power of the Internet behind it

Example

- Request sent asynchronously behind the scenes



JavaScript/XMLHttpRequest –
sends requests behind the
scenes

Benefits of Ajax

- Attempts to bridge the gap between the interactivity and functionality of a desktop application and the always updated Web application
- Creates more dynamic and responsive Web pages
- Ajax applications leverage standard browser features and do not require user to install browser plug-ins.
- Builds Web clients in a Service Oriented Architecture that can connect to any kind of server: PHP, ASP.Net, Ruby on Rails, and so on
- Enables major improvements in responsiveness and performance of Web applications, for example used at Yahoo! Mail, Google Maps, live.com, and others

Overview of the Feature Pack for Web 2.0 features

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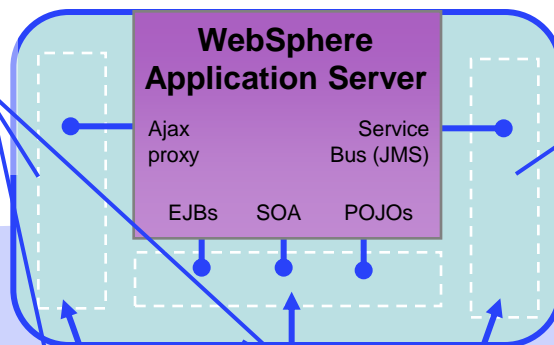
IBM Feature Pack for Web 2.0 highlights

Web 2.0 to SOA connectivity

For enabling connectivity from Ajax clients to SOA services and other JEE assets. Extends enterprise data to customers and partners through Web feeds.

Ajax messaging

For connecting Ajax clients to real-time updated data like stock quotes or instant messaging.



External Web Services



Event-Driven Data

IBM \$125.25 +\$2.50... MSFT \$43.75 -\$1.50 ...



Web Feeds

Ajax development toolkit

Best-in-class Ajax development toolkit for WebSphere Application Server based on Dojo, an Open Source JavaScript runtime.



Ajax Application

IBM Feature Pack for Web 2.0 features (1)

- Web 2.0 SOA Ajax connectivity
 - Remote Procedure Call (RPC) adapter
 - Ajax proxy
 - Abdera based feed libraries (FeedSphere)

- Java libraries
 - JSON4J libraries
 - Ajax messaging

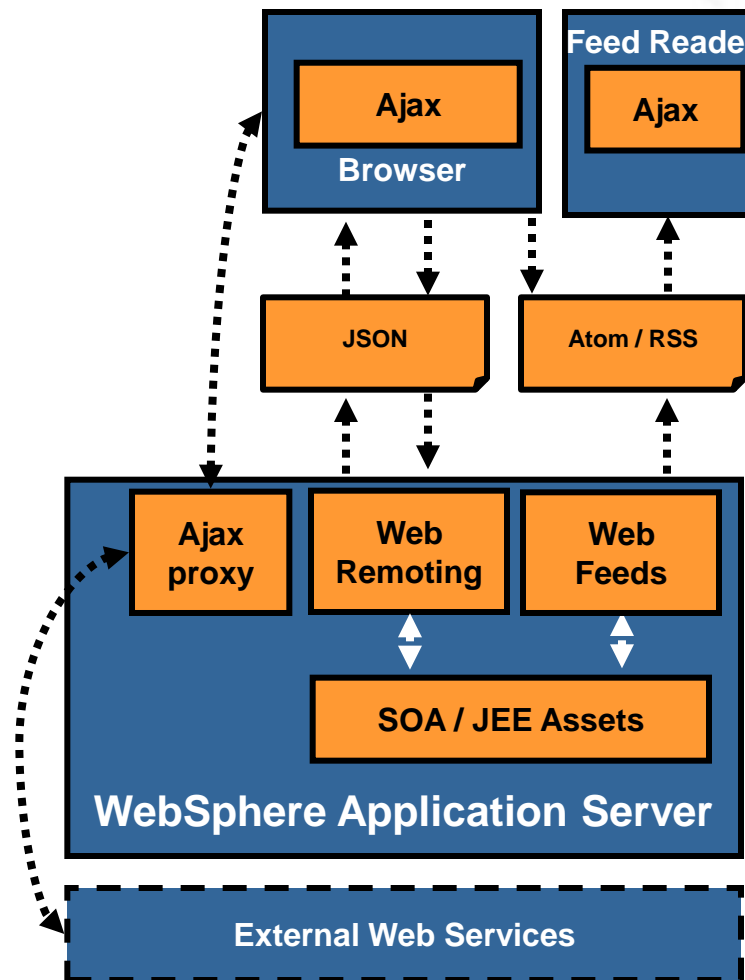
- Ajax developer's guide

IBM Feature Pack for Web 2.0 features (2)

- Ajax development toolkit (Ajax client runtime)
 - Dojo Toolkit
 - IBM extensions to the Dojo Toolkit
 - Soap library
 - Atom library
 - Gauge widgets
 - OpenSearch library
- IBM sample applications
 - QuoteStreamer
 - PlantsByWebSphere (Ajax edition)
 - CourierApp (RPC adapter sample)
 - FeedSphere samples

Web 2.0 to SOA connectivity overview

- For enabling connectivity from Ajax clients and mashup to external Web services, internal SOA services, and other JEE assets.
- Extends enterprise data to customers and partners through Web feeds.



RPC adapter (Web Remoting)

- Provides a lightweight Web endpoint which can expose methods of Java EE assets (EJB, PoJo, Web service proxies)
- Can be easily invoked from Ajax applications using JSON or XML formats
- Supports HTTP GET/POST mapping for methods
- Enabled through simple configuration options without rewriting the original Java objects, EJB or Web services

RPC adapter example

Input

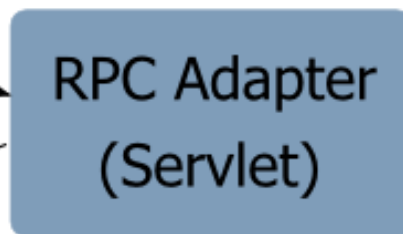
URL
/EmployeeService/getEmployeeById?id=7A3716

Output

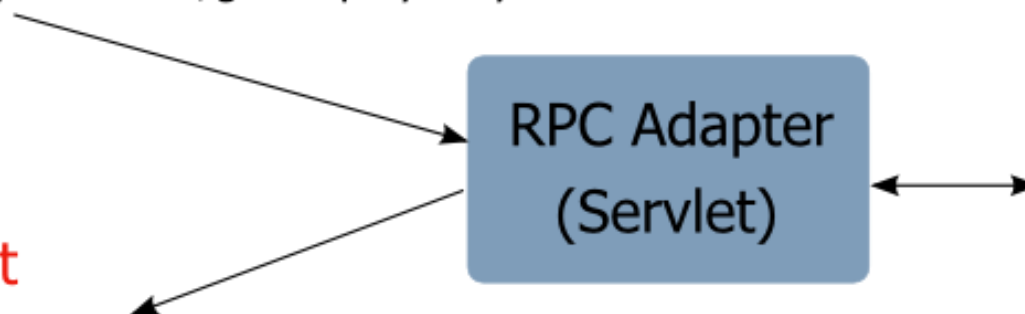
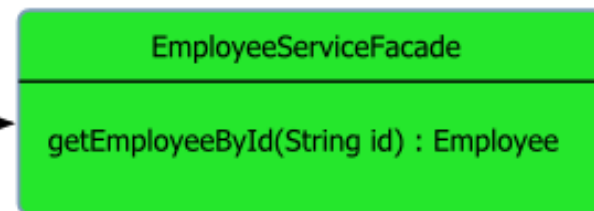
JSON or XML

```
{
  "id": "7A3716"
}
```

```
<Employee
  id="7A3716">
</Employee>
```

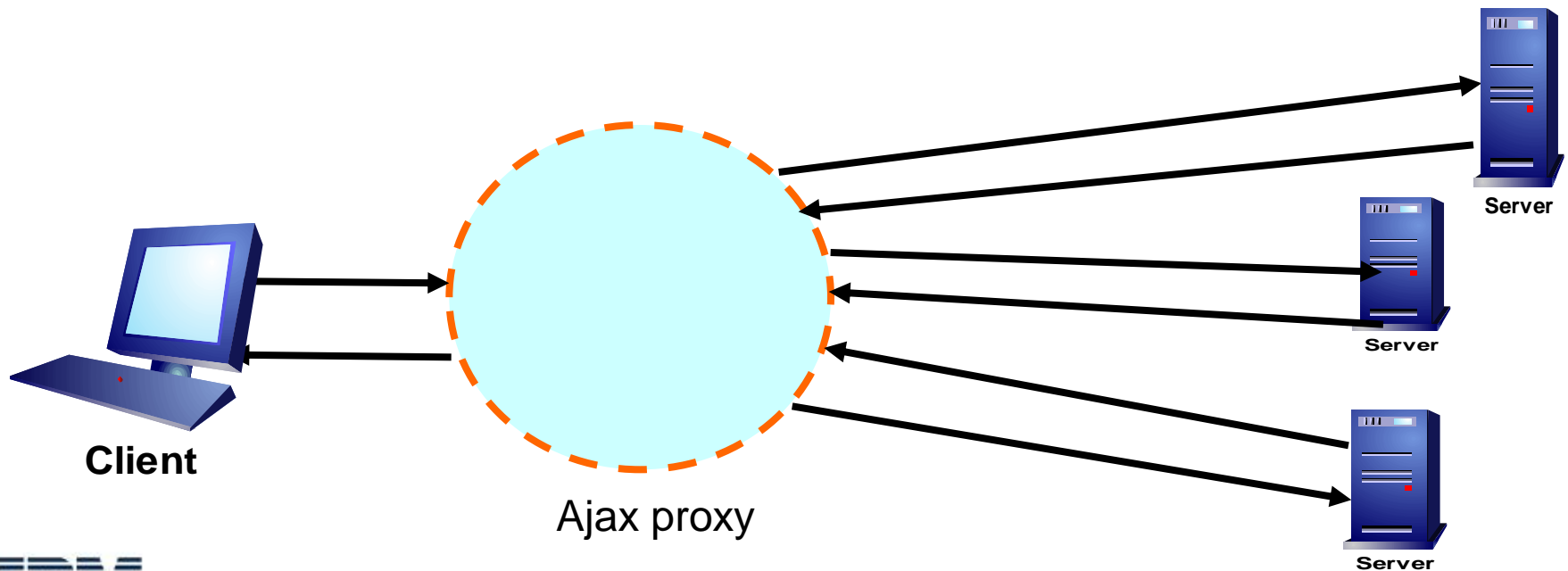


Server Side JavaBean

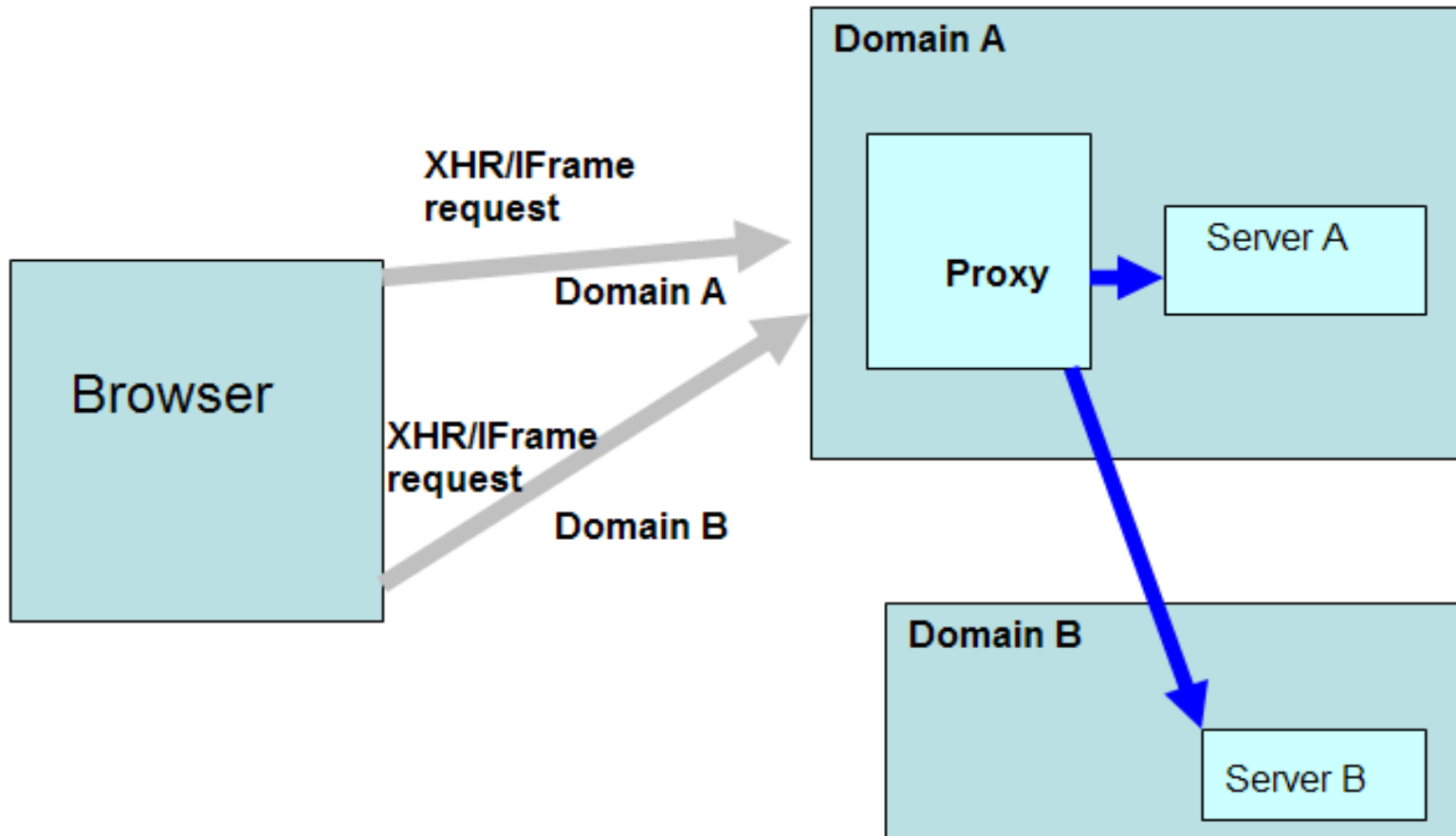


Ajax proxy

- A lightweight proxy to enable browser based access to cross-site services in a Web 2.0 fashion
- Proxy can run embedded within a application or stand-alone
- Support for white-listing policies for filtering on criteria of incoming requests such as: Cookies, MIME types, HTTP Headers, HTTP Verbs (GET, POST, PUT, and so on)



Ajax proxy



Web feeds

- The Atom and RSS libraries will expose JEE resources as Web 2.0 style “data feeds”
 - pushing updates to clients when data changes
- Support for feeds, using the Apache Abdera libraries.
 - Apache Abdera is an open-source project providing feeds support.
 - Abdera addresses both the Atom syndication format and the Atom publishing protocol.
 - In addition, Abdera currently supports reading RSS content.
- The IBM support for feeds, using Apache Abdera libraries, is referred to as FeedSphere

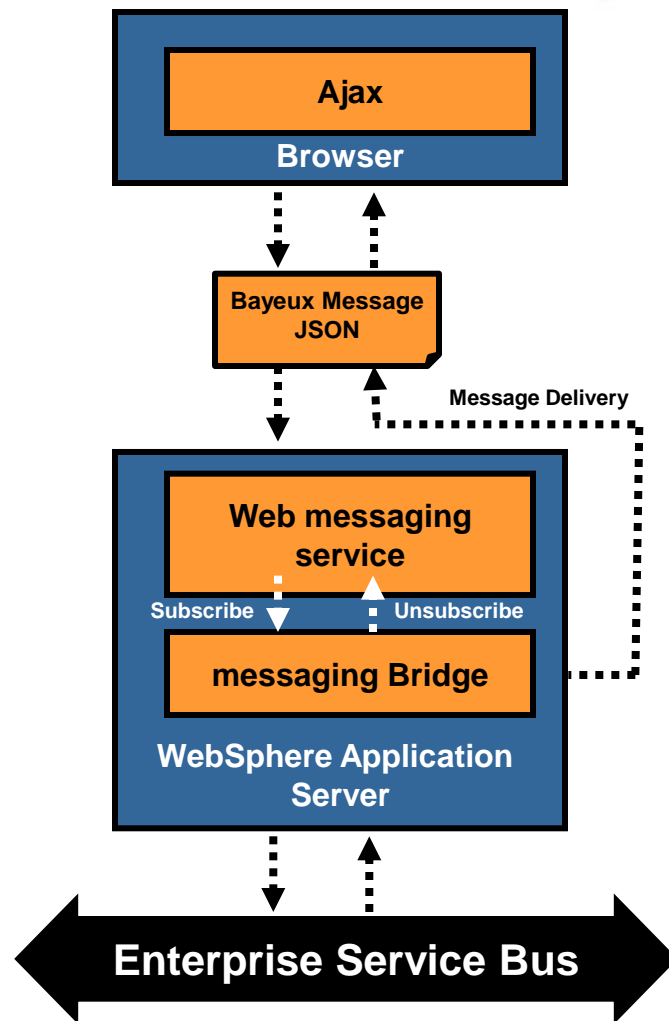
JSON4J

- JavaScript™ Object Notation (JSON) has gained much popularity within Ajax applications as a lightweight data interchange format (defined at <http://www.json.org>)
- JSON consumes a little less bandwidth than XML and works well with all browsers
- JSON is built up from a collection of name-value pairs and ordered lists of values
- JSON4J library is an implementation of JSON for use within Java environments
- JSON4J provides a fast transform for XML->JSON conversion

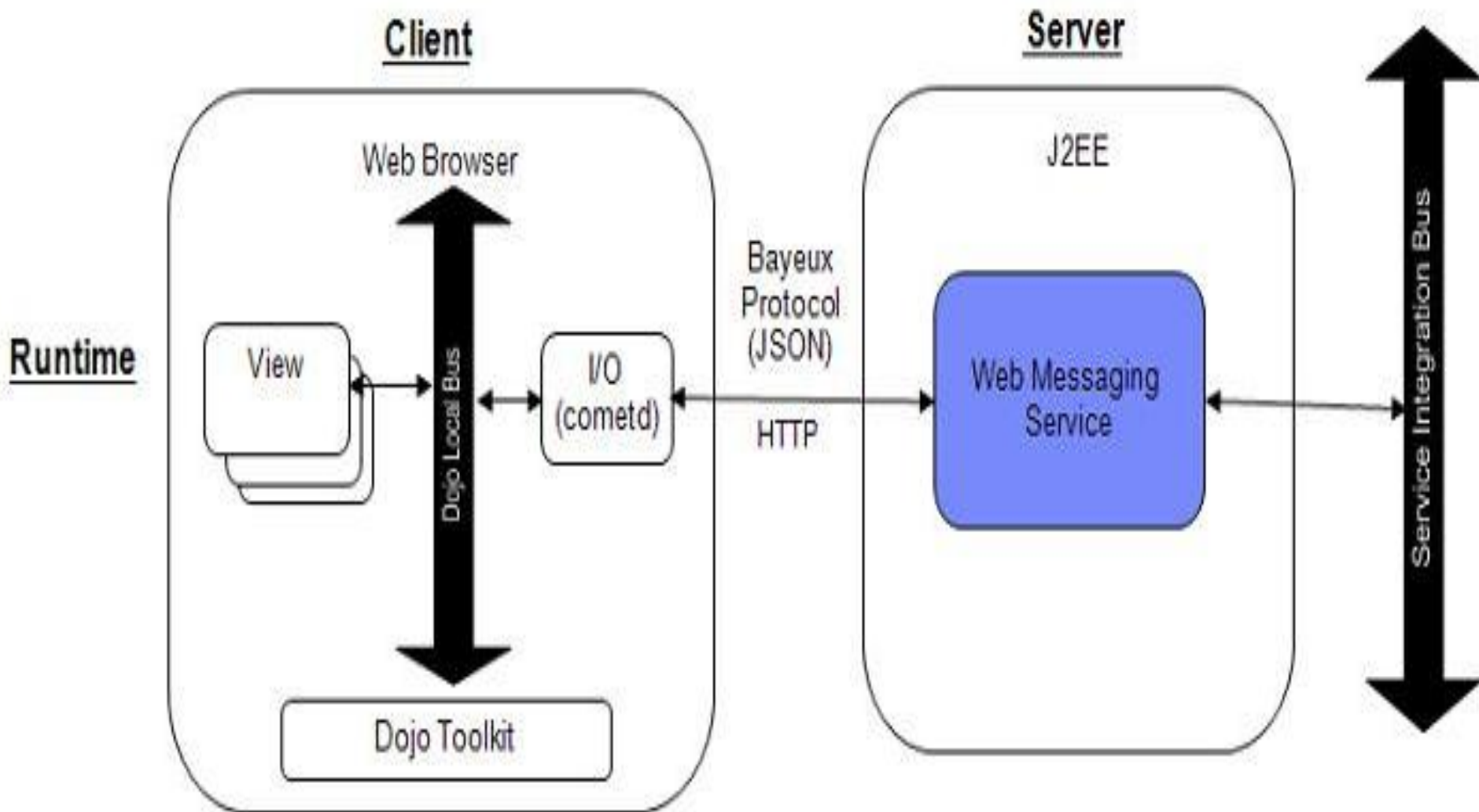
```
{ "customer" : {  
    "name" : "Jane Doe",  
    "company" : "Acme Enterprises"  
  }  
}
```

Ajax messaging - overview

- For connecting Ajax clients to near-real-time updated data like stock quotes or instant messaging.
- A publish/subscribe messaging implementation which connects the browser to the WebSphere Application Server service integration bus for pushing server-side events to the browser
- Client/server communication is achieved through the Bayeux protocol
- Client side support is provided by the Dojo Toolkit.



Web messaging service – overall architecture



Scalability

- Bayeux protocol communicates through a long-lived HTTP connection
 - server typically holds a connection open for a certain time to wait for the server to push an event to the browser.
 - Web container cannot scale as each waiting client consumes a thread waiting for an event.

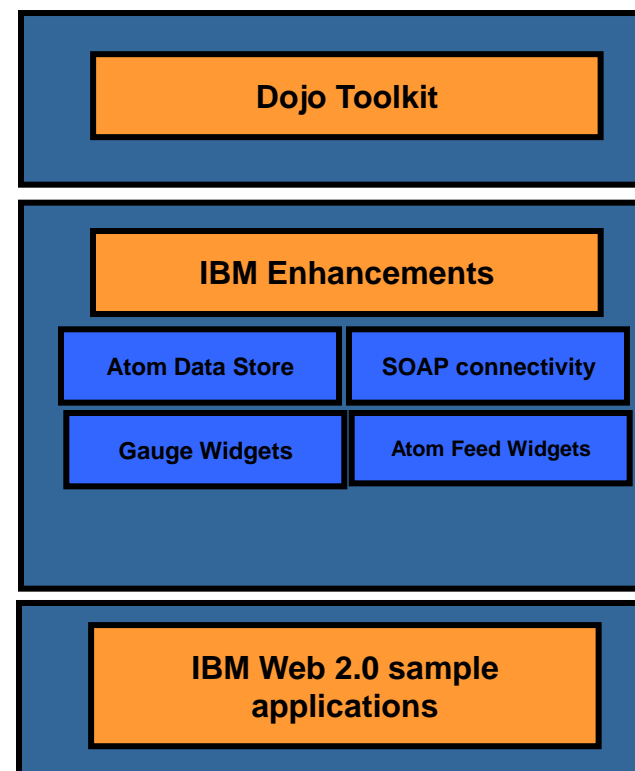
- WebMsg channels used to meet the scalability needs of Web messaging service
 - Channel framework extends the HTTP channel to bridge incoming Bayeux requests to the service integration bus.

Ajax developer's guide

- Includes more detail information on:
 - The importance of the proxy for Ajax
 - Using MVC Patterns with the Dojo Toolkit
 - Publishing and Subscribing to Server Events from Ajax Clients
 - Ajax and traditional J2EE Web applications
 - Debugging Ajax

Ajax development toolkit

- Best-in-class Ajax development toolkit for WebSphere Application Server based on the Open Source Dojo Toolkit (dojotoolkit.org) with IBM extensions.
- IBM is a committed member of the Dojo Foundation and the OpenAjax Alliance (openajax.org)



SOAP Library

- SOAP connectivity makes it easier to invoke public SOAP-based Web services from Ajax applications
 - The SOAP service - This library extends the `dojo.rpc.RpcService` class and provides an easier way to create the SOAP envelope around a request
 - The SOAP widget - This widget uses the SOAP Service and enables a convenient way to connect to external SOAP services and invoke their methods in a simple way.

Atom

- Atom Data Access provides client-side support of Atom feeds in the browser allowing for two-way communication with those feeds using the Atom Publishing Protocol (APP)
- Atom Data Access is split into 3 categories:
 - Atom library
 - The AppStore
 - The Atom Widgets
- Makes it easy to invoke any Atom APP 1.0-compliant service, and use Atom feeds as data source which are bound to widgets, within your Ajax application

Gauge widgets

- Gauge widgets are a way to display numerical data graphically
- There are 2 gauge widgets
 - Analog Gauge widget
 - Bar Graph widget
- Support real-time updates (for example, when used with Ajax messaging Service)

OpenSearch library

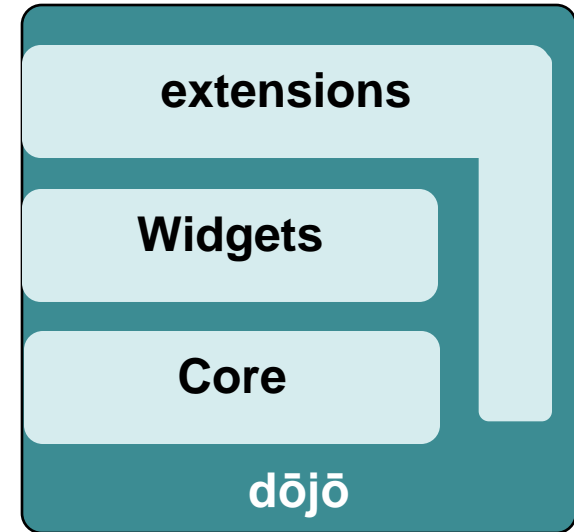
- OpenSearch library makes it easy to invoke any OpenSearch-compliant service, and bind search results to widgets within your Ajax application.
- Typically, server-side support consists of hosting an open search description document that defines the URLs used to query the server
- When the store is instantiated, it parses the description document, determines the best URL element to use.
 - The types, in order, are Atom, RSS, HTML.
- The store queries the server to retrieve the results.

Dojo Toolkit version 1.0

- A JavaScript toolkit for developing Ajax applications with rich user interfaces
- Key capabilities
 - Works well across most modern browsers
 - Small footprint, high function
- Dojo provides a lot of power and attempts to make it digestible in three major layers: Dojo Core, Dijit, and DojoX.
- www.dojotoolkit.org

Dojo Toolkit version 1.0 features included

- OpenAjax Hub 1.0
- Dojo Core
 - Utility routines
 - Event handling system
 - Ajax support
 - Drag and Drop
 - Language utilities & support for localization
 - Data access
- Dojo Widgets
 - Accessible
 - High-quality, neutral default theme (replaceable)
 - Extensive layout & form capabilities
 - Data bound widgets
 - Grid and Charts
- Many community provided “extension” modules



QuoteStreamer & Plants by WebSphere

- QuoteStreamer
 - Sample application uses the Web messaging service to simulate stock quotes to a Dojo-enabled client application.

- Ajax-enabled PlantsbyWebSphere
 - Sample application is intended to be representative of a Web application that contains model, presentation, and control layers.

Fictitious Market Report

2:20 pm : **Tech Stock #1** (TS1: 80.2, +0.2, +0.3) continues to gain in heavy trading which drives small gains for the **Tech Index** (TEC: 3021.0, +21.0, +0.7). Investors continue to like the results for the third quarter of Tech Stock #1. In addition, a report was just released showing important gains in the marketshare of the best selling product of Tech Stock #1.

Elsewhere in technology news, **Tech Stock #2** (TS2: 55.2, +0.2, +0.3) continues to fall for the day. Delays in shipping major new software with an earlier outlook downgrade, appear to be weighing heavily on investors' minds. As a result, **Stock Index** (IND: 10110.5, +110.5, +1.1) is down for the day. Elsewhere, the **Alternative Index** (ALT: 5040.1, -40.1, -0.8) is even in moderate trading.

11:23 am : **Spotlight Drug stores** A lot of activity on occurring the drug store front. United States based **Drug Store #1** (DS1: 10.0, 0.0, 0.2) has gained 10% in heavy activity after a positive third quarter result. This news is good for the previously troubled drug store, who has slowly been closing and remodeling stores in an effort to improve their image. With the strong third quarter, Drug Store #1 can concentrate even more on improving the image of their stores. As a result of this news, Drug Store #1 has been upgraded from hold to buy.

In other drug store news, **Drug Store #2** (DS2: 40.0, 0.0, 0.0) has continued their strong earnings as evidenced by their third quarter statement. With the addition of 20 new stores, earnings for the company should continue to grow. In other market news, the **Stock Index** (IND: 10110.5, +110.5, +1.1) continues to gain since the opening bell.






Stock Ind (IND: 10110.5, +110.5, +1.1)

Tech Ind (TEC: 3021.0, +21.0, +0.7)


Alt Ind (ALT: 5040.1, -40.1, -0.8)

Home Flowers Trees Vegetables Accessories

items 1-6 of 6 <back page 1 of 1 next>

Ornamental Gourd  \$1.5	Grapes  \$49.0	Onion  \$9.0	Pineapple  \$87.0	Strawberries  \$3.5
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Strawberries



Our brand is known for producing plump, sweet strawberries by the mid-June bucketful. Now you can grow them easily, with relatively little care, due to our patented version. Dental floss not included.

ITEM#	DESCRIPTION	PRICE	QUANTITY
V0006		\$3.5	1

1 Items in Shopping Cart

NAME	QTY	PRICE
Pineapple	1	87.0
Total Price:		\$87

Feed samples

- CourierApp
 - Demonstrates auto population of address details on selecting a zip/postal code. Address lookup service is invoked using the RPC adapter to get the detailed address. The response can be either JSON or XML format.
- FeedSphere samples
 - These samples demonstrate the Atom and RSS support in Abdera. In addition, it also demonstrates Atom Publishing Protocol support.

Benefits of Feature Pack for Web 2.0



Benefits of the Feature Pack for Web 2.0

- Enables more interactive, dynamic Web applications
- Fully leverages existing SOA and J2EE assets by making them easily accessible to Web 2.0 and Ajax applications
- Uses WebSphere Application Server to manage cross-site access to Web 2.0 style services from browser based Ajax applications
- Adds value to existing or new J2EE applications by adding Ajax features to enterprise Web applications

Benefits

- IBM WebSphere Application Server Feature Pack for Web 2.0 provides customers with the ability to:
 - Build Web 2.0 Applications with IBM SOA
 - Deliver Rich Internet Applications
 - Mash-up External Services
 - Reduce Development Costs and Time to Market
 - Reduce Technology Choices: Standard Ajax Library for the Enterprise

Summary

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SOA

Summary of Contents

- **Web 2.0 to SOA connectivity** – For enabling connectivity from Ajax clients and mash-ups to external Web services, internal SOA services, and JEE assets. Extends enterprise data to customers and partners through Web feeds.
- **Ajax messaging** – For connecting Ajax clients to real-time updated data like stock quotes or instant messaging.
- **Ajax development toolkit** – Best-in-class Ajax development toolkit for WebSphere Application Server based on Dojo (dojotoolkit.org) with IBM extensions.
- **Samples** – PlantsByWebSphere and QuoteStreamer

Summary

- Supported Platforms
 - WebSphere Application Server Version 6.1 (prerequisite of 6.1.0.13)
 - WebSphere Application Server Version 6.0.2 (prerequisite of 6.0.2.23)
 - WebSphere Application Server Community Edition Version 2.0
- The installer installs all the features and an eclipse-update-site.zip for easy import into Eclipse.
- Integrated Development Environments (IDEs):
 - Rational Application Developer Version 7 with fix pack level 3 (7.0.0.3).
 - Eclipse 3.2.2 with Web tools platform (WTP) 1.5.
- The WebSphere Application Server Version 6.1 Feature Packs service page:
 - <http://www-306.ibm.com/software/webservers/appserv/was/featurepacks/>

References

- JSON: <http://www.json.org>
- Dojo Toolkit (<http://dojotoolkit.org>)
- OpenAjax Alliance (<http://openajax.org>)
- Cometd (<http://www.cometd.com>)
- Eclipse Ajax Toolkit (<http://www.eclipse.org/atf>)
- Ajax Technical library
http://www.ibm.com/developerworks/views/web/libraryview.jsp?search_by=Mastering+Ajax
- The WebSphere Application Server Version 6.1 Feature Packs service page: <http://www-306.ibm.com/software/webservers/appserv/was/featurepacks/>

Questions & Answers

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