

Lotus



con 2001

TS113: The Architecture of the New Web Programming Model in Rnext

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Agenda

- What is "Garnet"?
- Intro to Servlets and JSPs
- High Level Architecture
- Details of each piece
- Architecture in action



What is "Garnet"?

- An umbrella code name for a group of new technologies that support a new, standards based, web programming model in the next release of Domino (itself code named Rnext)
- Garnet consists of:
 - An updated Servlet container with JSP support
 - JSP custom tag libraries
 - "Template" applications
 - Third Party Development Tool integration



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Servlets

- Standard Java server extension
 - like CGI
- Loaded once
- Can handle Gets and/or Posts
- Complete control over the HTTP response



Java Server Pages

- Combine HTML and server side code
 - usually Java
- Translated into a Servlet
- Like Microsoft Active Server Pages
- Supports custom tag libraries



JSP Syntax

- Standard HTML
- Directives - Command the JSP parser
`<%@ page language="java" %>`
- Expression - Emit strings into your HTML
`<%= name.toUpperCase() %>`
- Scriptlets - Blocks of code
`<% %>`

HelloWorld.jsp

```
<%@ page language="java"%>  
<html>  
<body>  
<h1>Hello World</h1>  
<h1><%=request.getParameter("name")%></h1>  
</body>  
</html>
```



JSP Custom Tag Libraries

- XML style tags wrap common behavior
- Implemented via Java
- Described via Tag Library Definition file (.TLD)
- Access via taglib directive

```
<%@ taglib uri="domino.tld" prefix="domino" %>
```

```
<%@ taglib uri="test.tld" prefix="test" %>
```

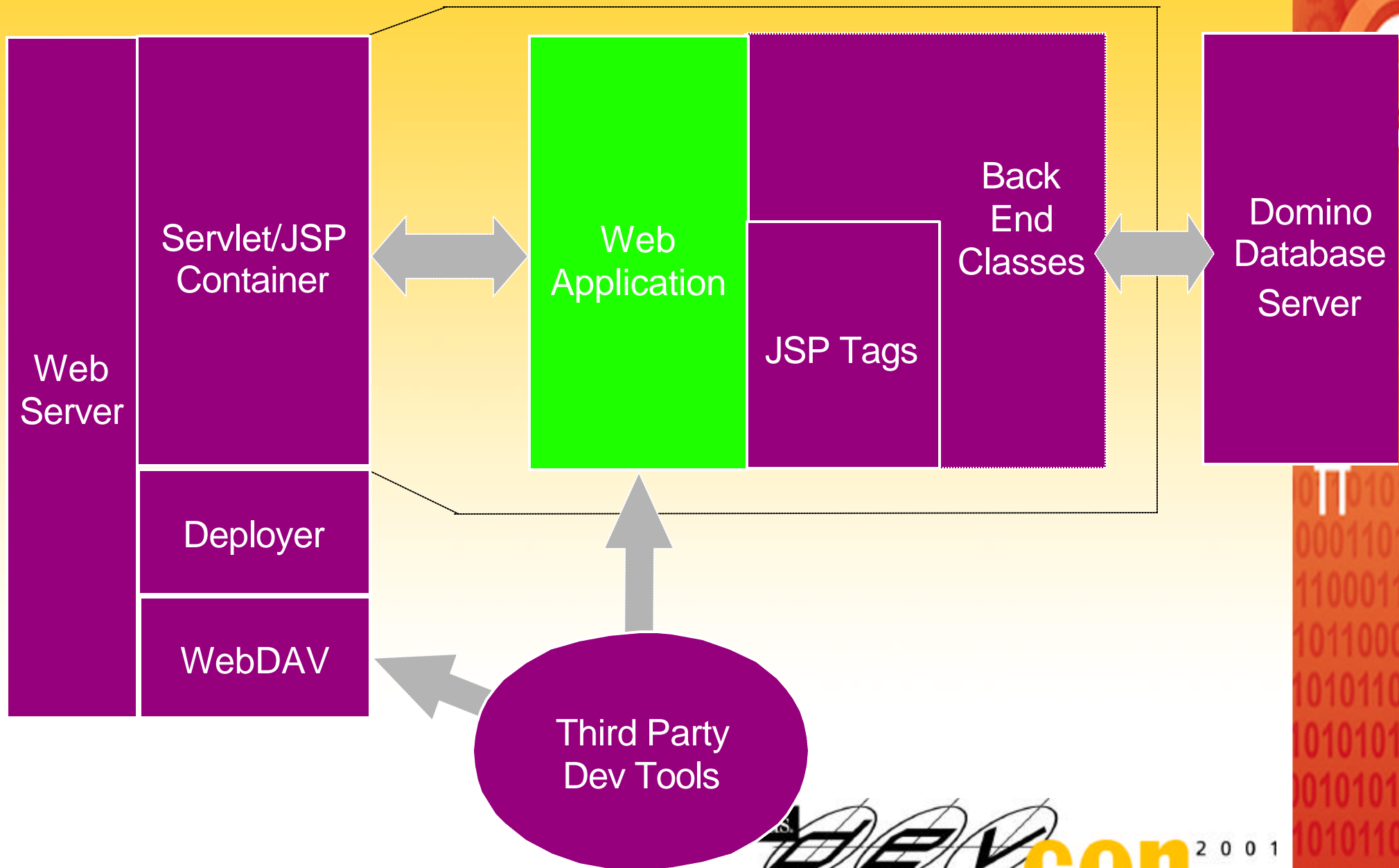
Tag Basics

- Tags use XML style names
`<namespace:tagname>`
- Tags must be terminated
`<demo:tag></demo:tag>`
`<demo:tag/>`
- Tags can be nested inside other tags

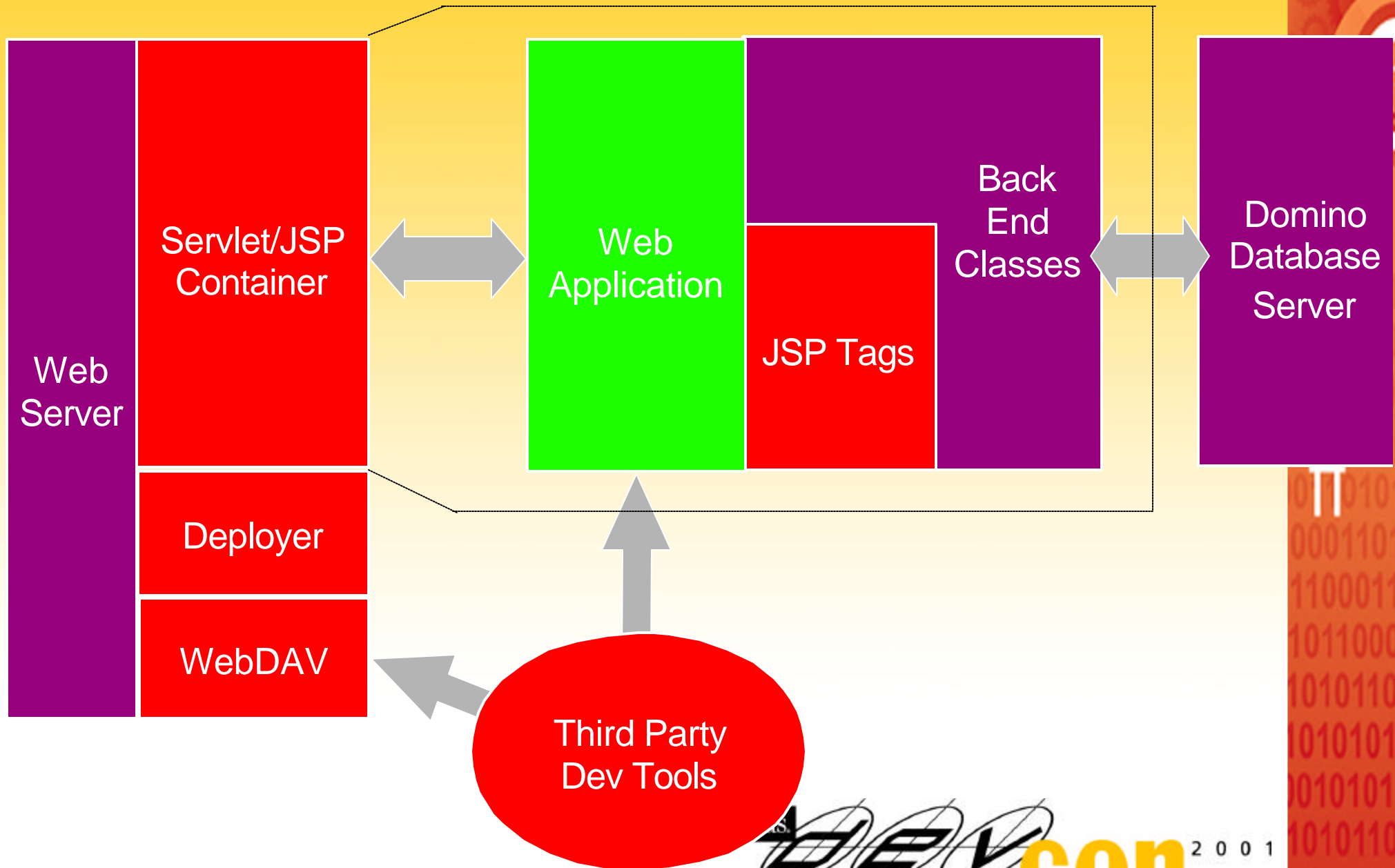
HelloWorld.jsp with tags

```
<%@ page language="java" >
<%@ taglib uri="demo.tld" prefix="demo" %>
<html>
<body>
<h1>Hello World</h1>
<h1><demo:name/></h1>
</body>
</html>
```

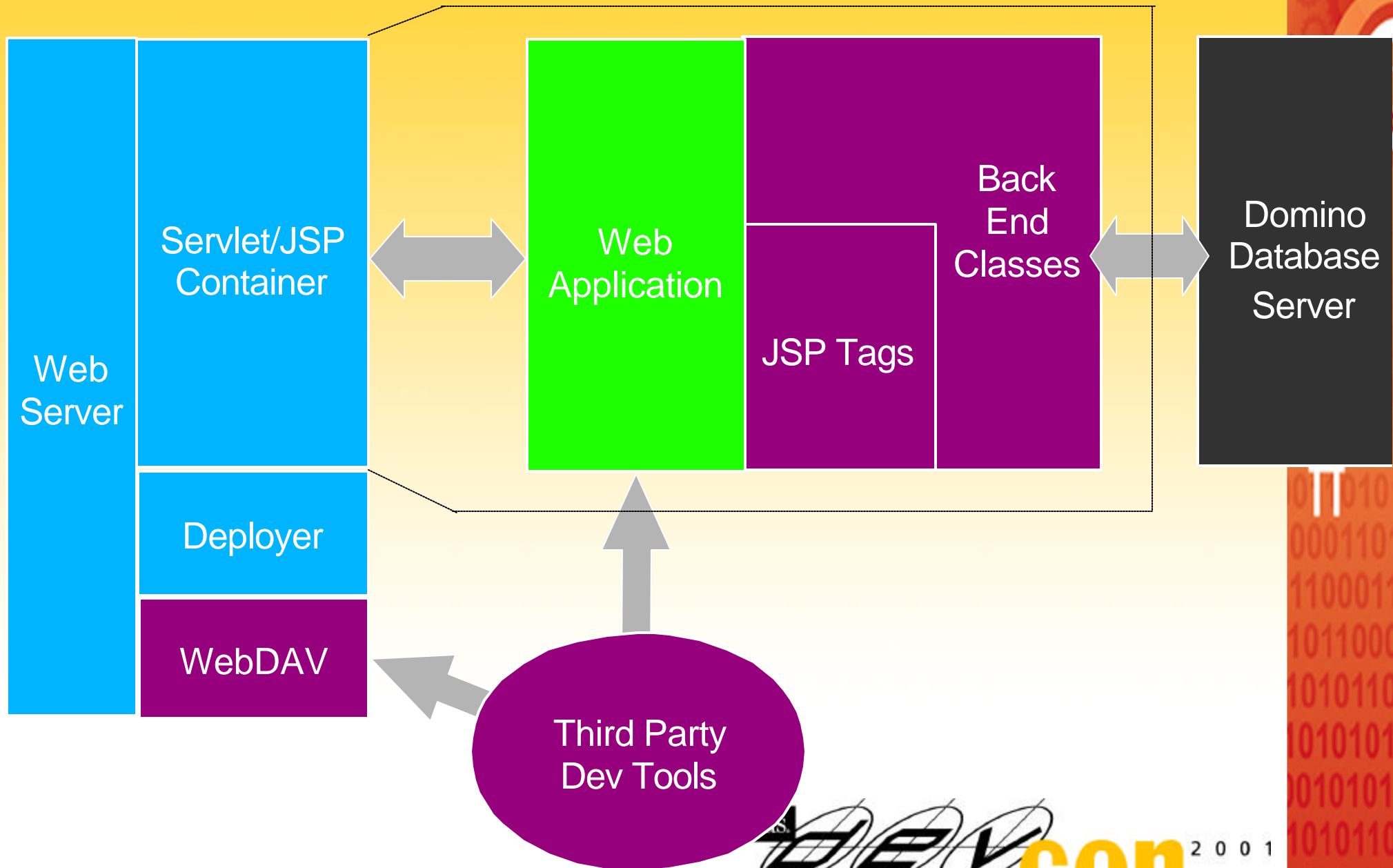
High Level Architecture



Garnet

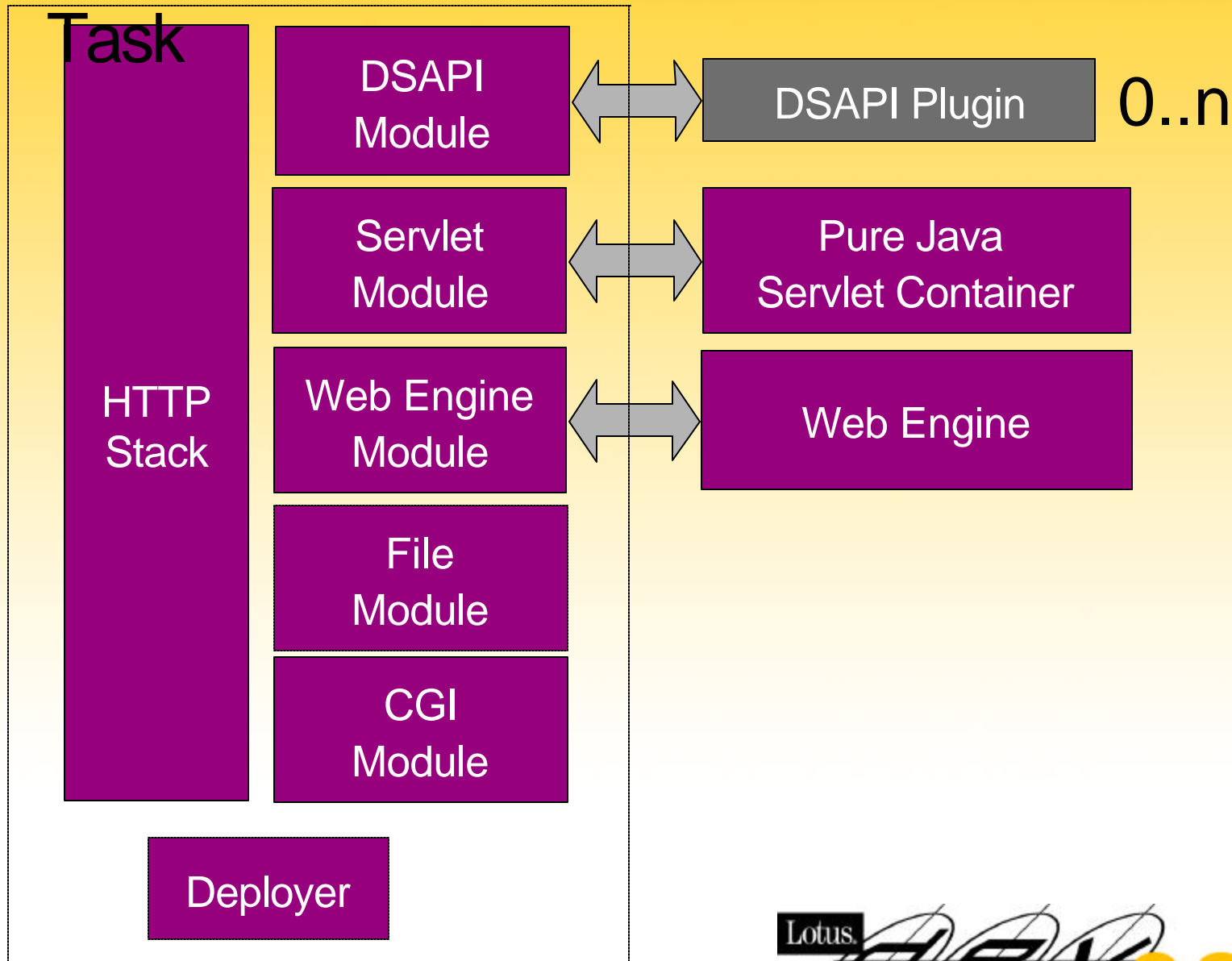


Garnet Architecture



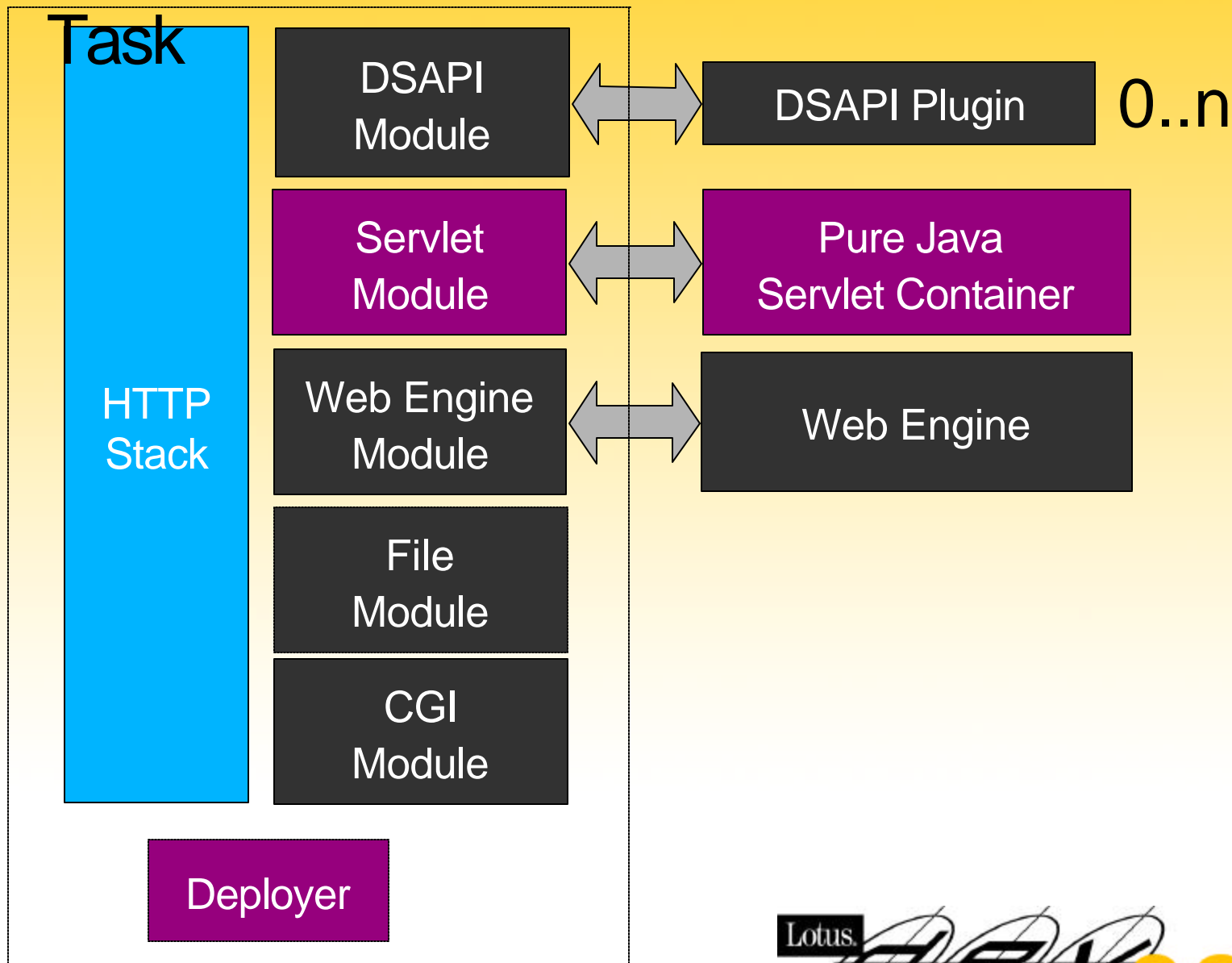
Web Server Architecture

HTTP Server



Web Server Architecture

HTTP Server



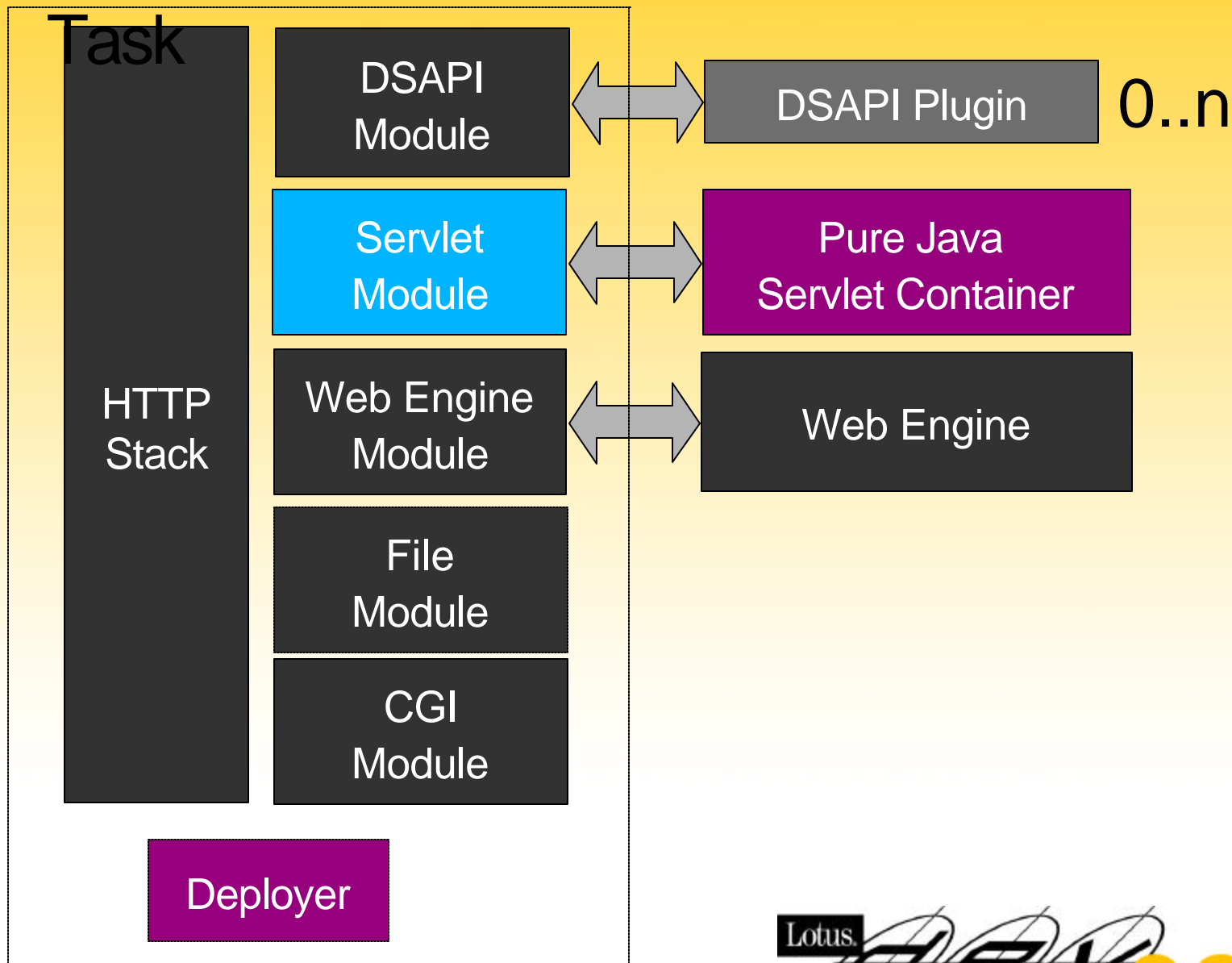
HTTP Stack

- Handles all HTTP connection handling and communication
- Allows for HTTP 1.1 persistent connections
- Interfaces with various "Modules" to handle the HTTP request



Web Server Architecture

HTTP Server



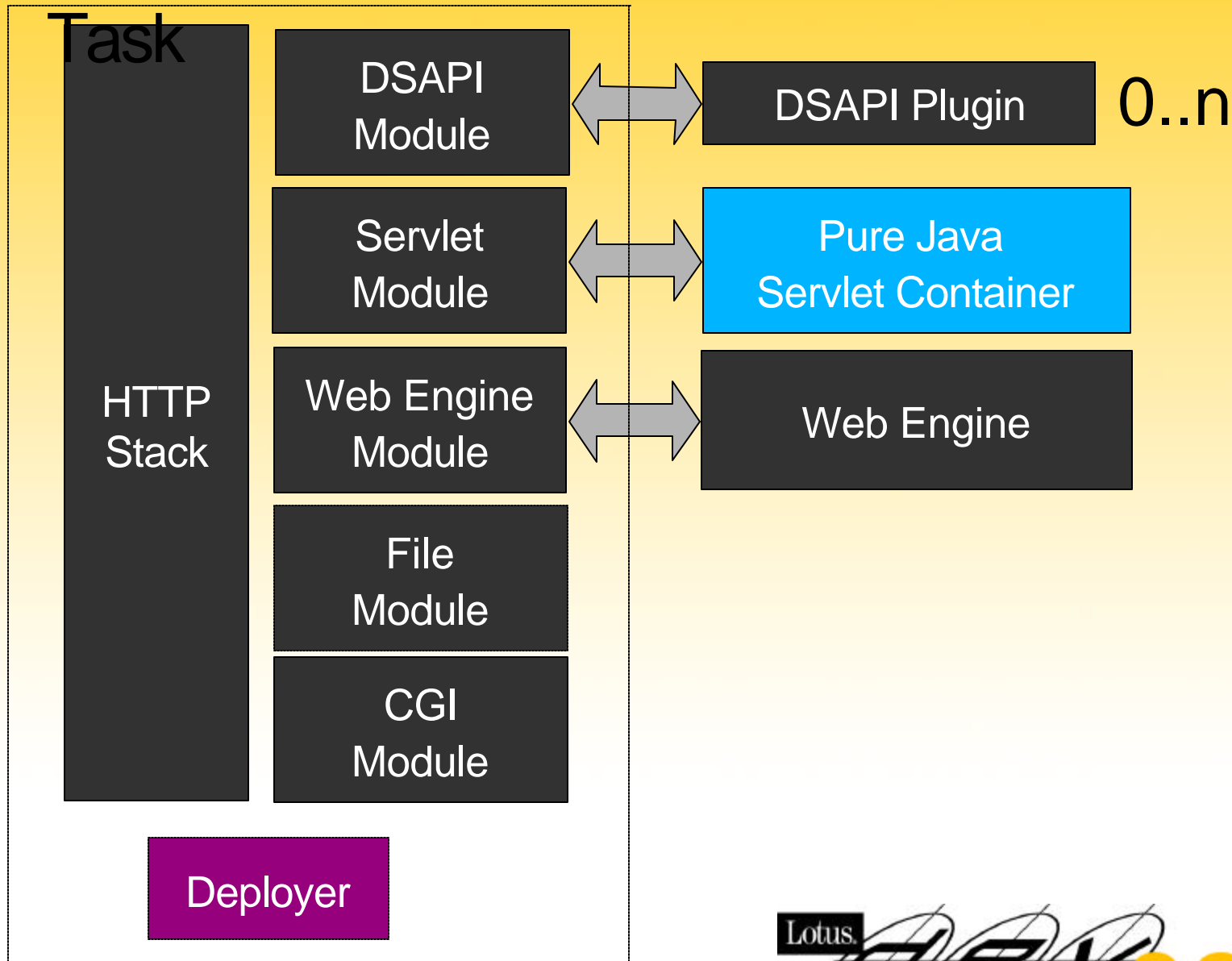
Servlet Module

- Connects to the pure Java Servlet container
- Automatically generates configuration
- Servlet container can be run in the HTTP process as well as in separate processes
 - Each application is configured as to where it will run
 - Separate process are managed automatically by the app space



Web Server Architecture

HTTP Server



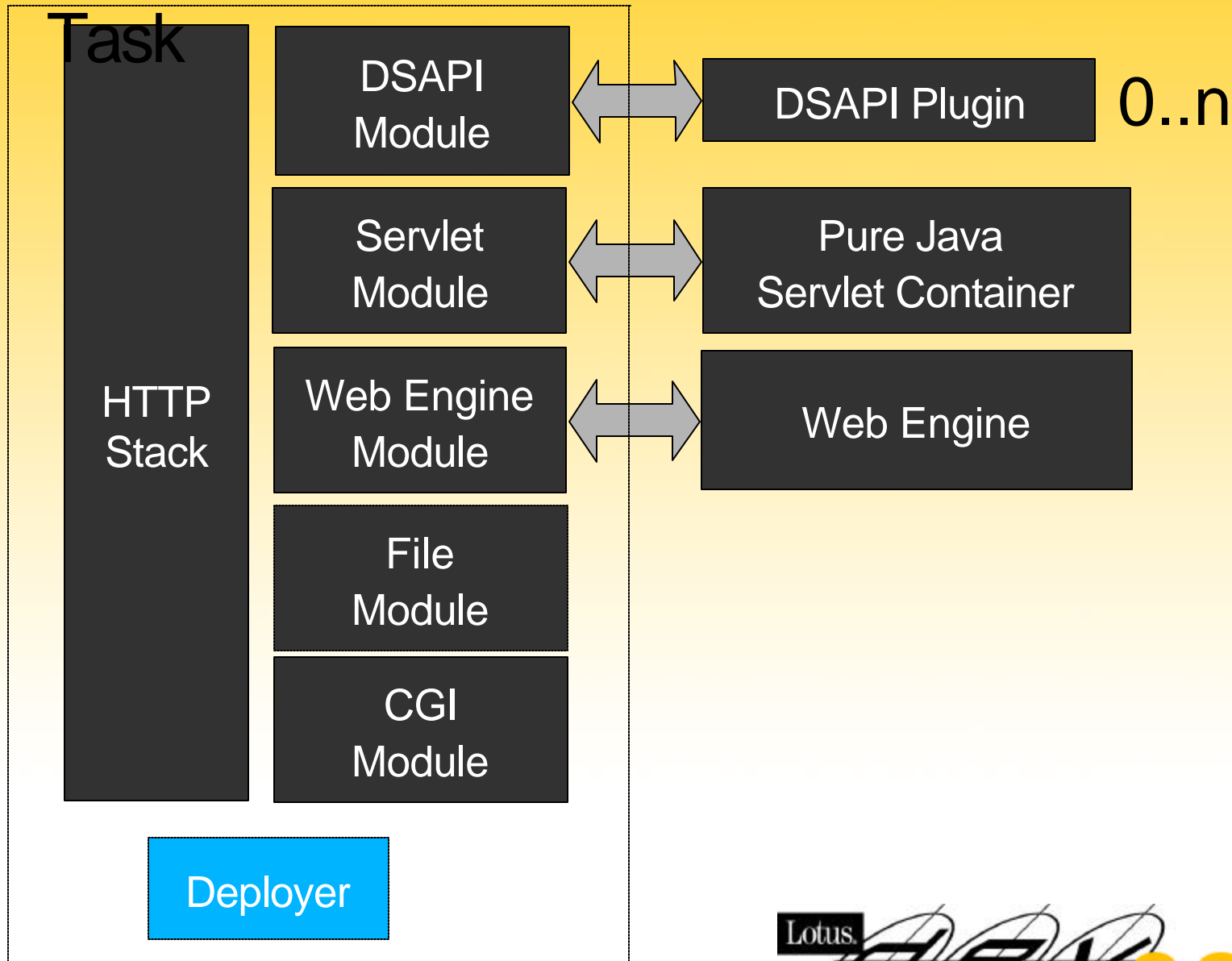
Servlet and JSP Container

- Pure Java container acts as the runtime host of standard web applications
- Servlet 2.2 and JSP 1.1
- Existing R5 servlets will run within the new container



Web Server Architecture

HTTP Server

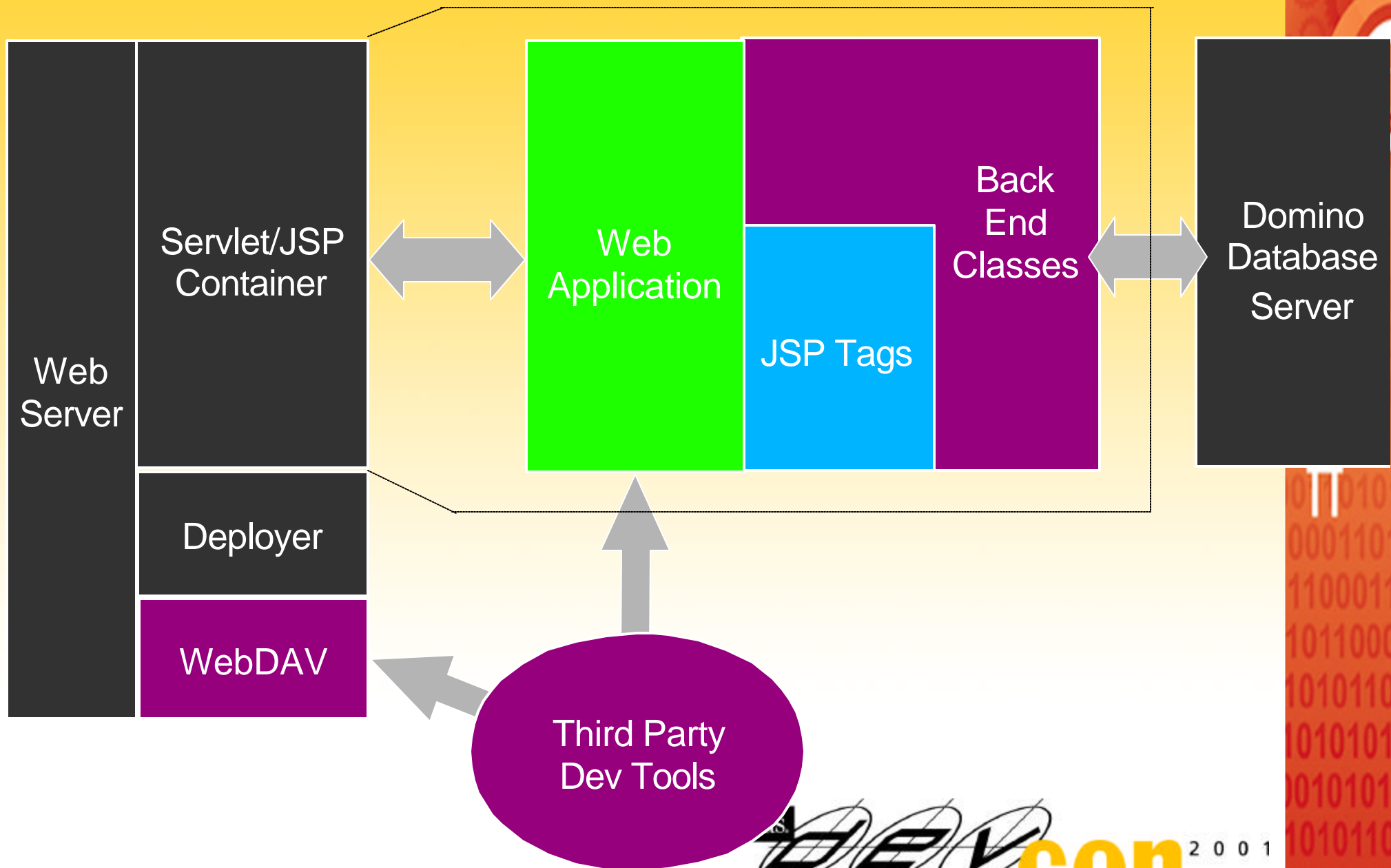


Deployer

- Web Applications can be stored in NSF files and replicated using standard replication
- Specially marked NSF files have their contents automatically exported
 - based on entries in the Domino Directory
- Each application can have own entry



High Level Architecture

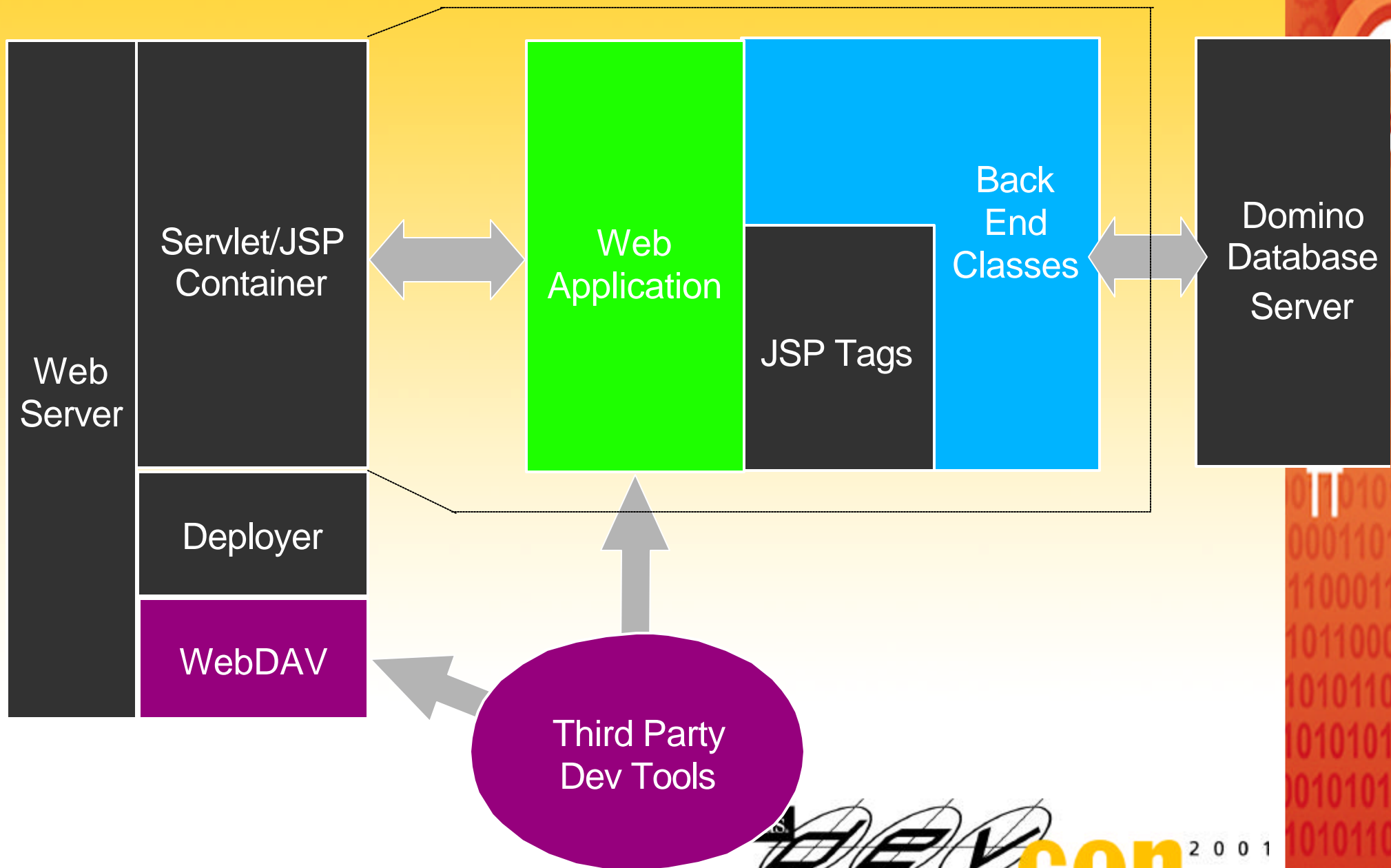


JSP Tag Libraries

- Allows for declarative access to Domino data
 - Sessions, Databases, Full Text searches, Views and Documents
- Some give access to back end classes
- Also paging, data entry and validation
- Rich Text editing using
 - IE5 HTML editing control
 - Domino Java applet
- Utility tags for conditional evaluation and internationalization



High Level Architecture

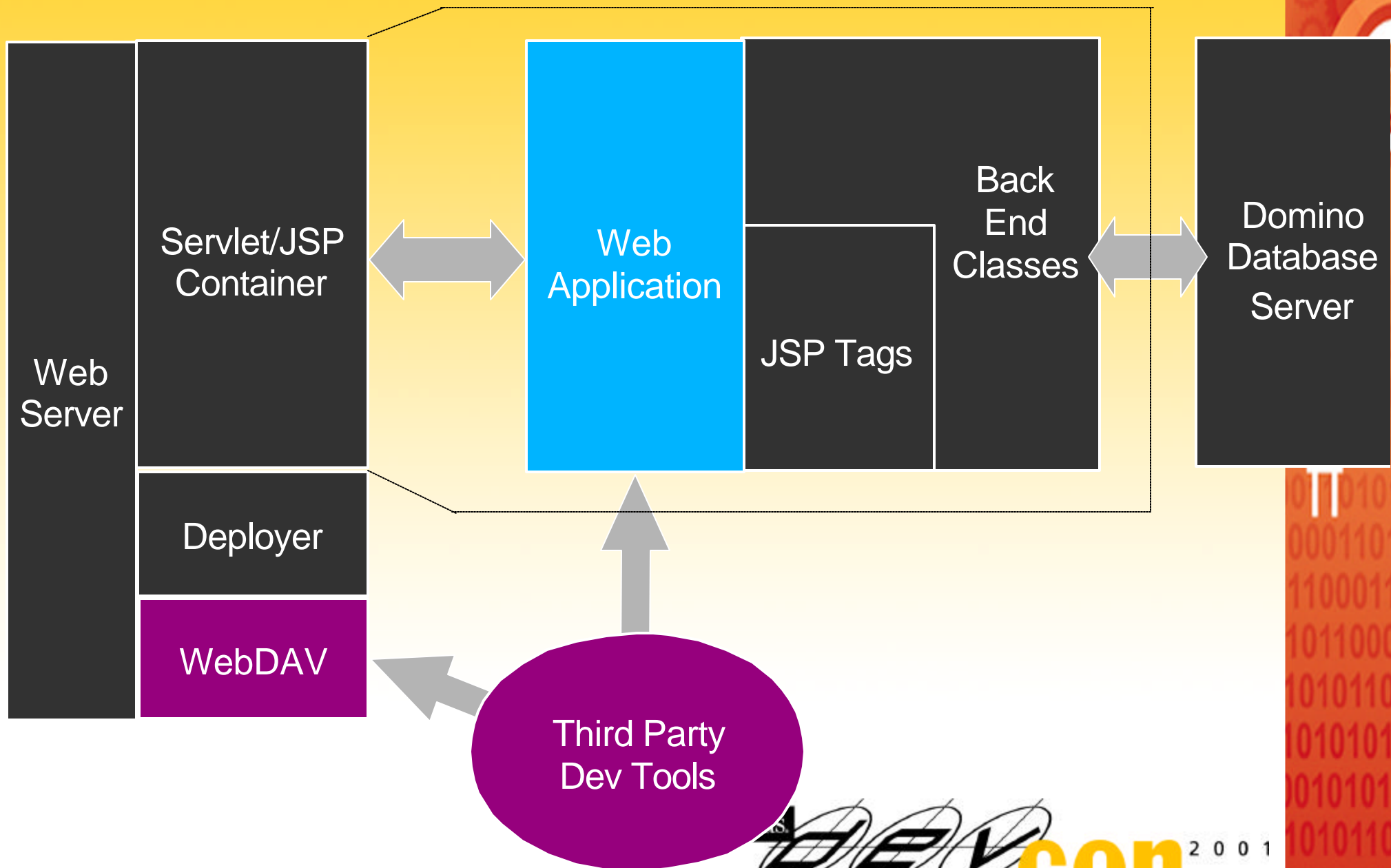


Java Back End Classes

- Low level access to Domino objects
- Specialized processing on a JSP page written with the tag library
- Without the tag library for custom JSP processing or in Servlets
- Enhanced to facilitate the caching of objects across request boundaries



High Level Architecture

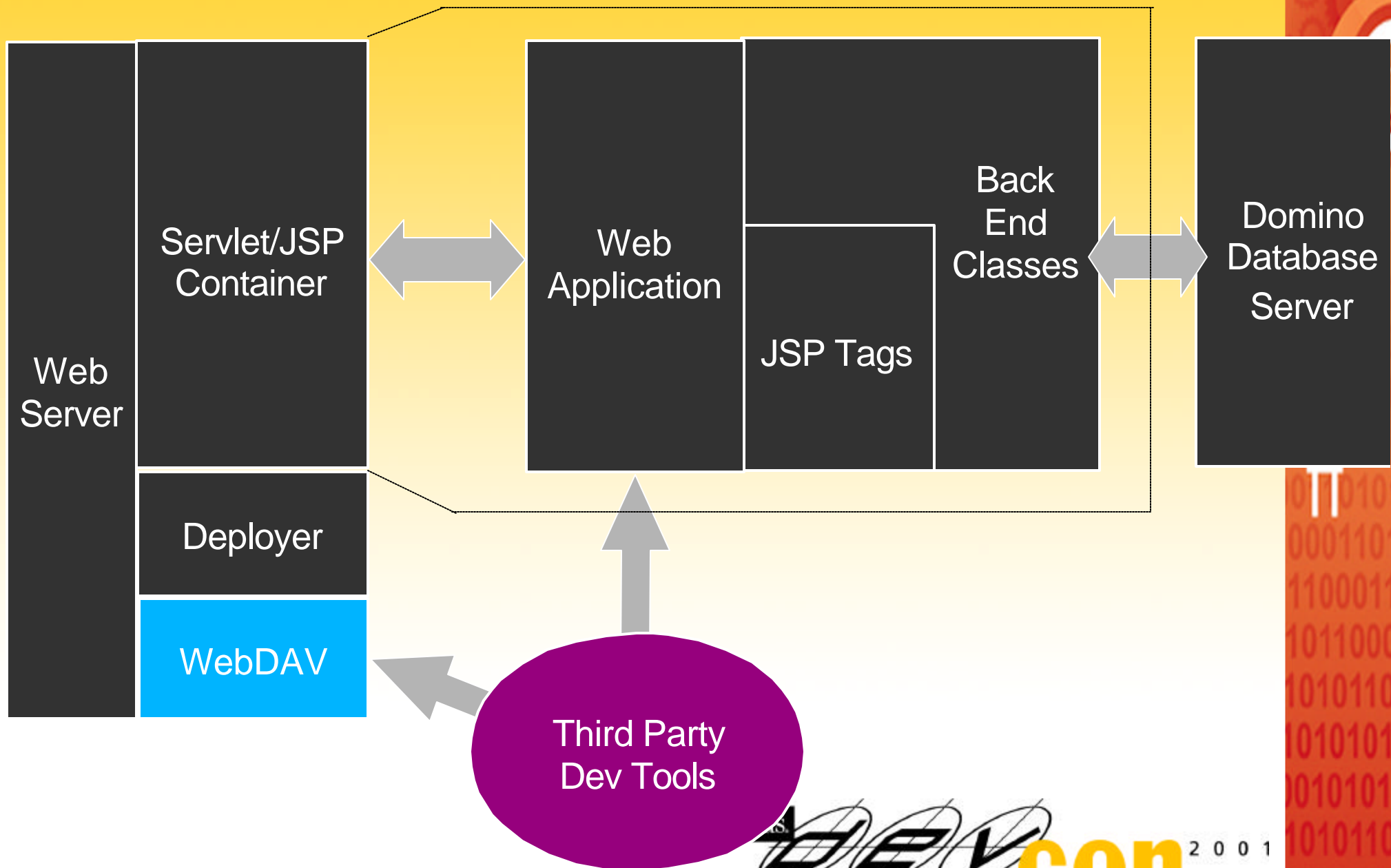


Java Web Application

- Consists of JSP pages, Servlets, class libraries and configuration files
- Can be created by Domino Designer or using third party development tools
- A properly constructed web application can be moved between web containers
 - As long as it doesn't take advantage of any proprietary services
 - Domino tag libraries will work in other containers



High Level Architecture

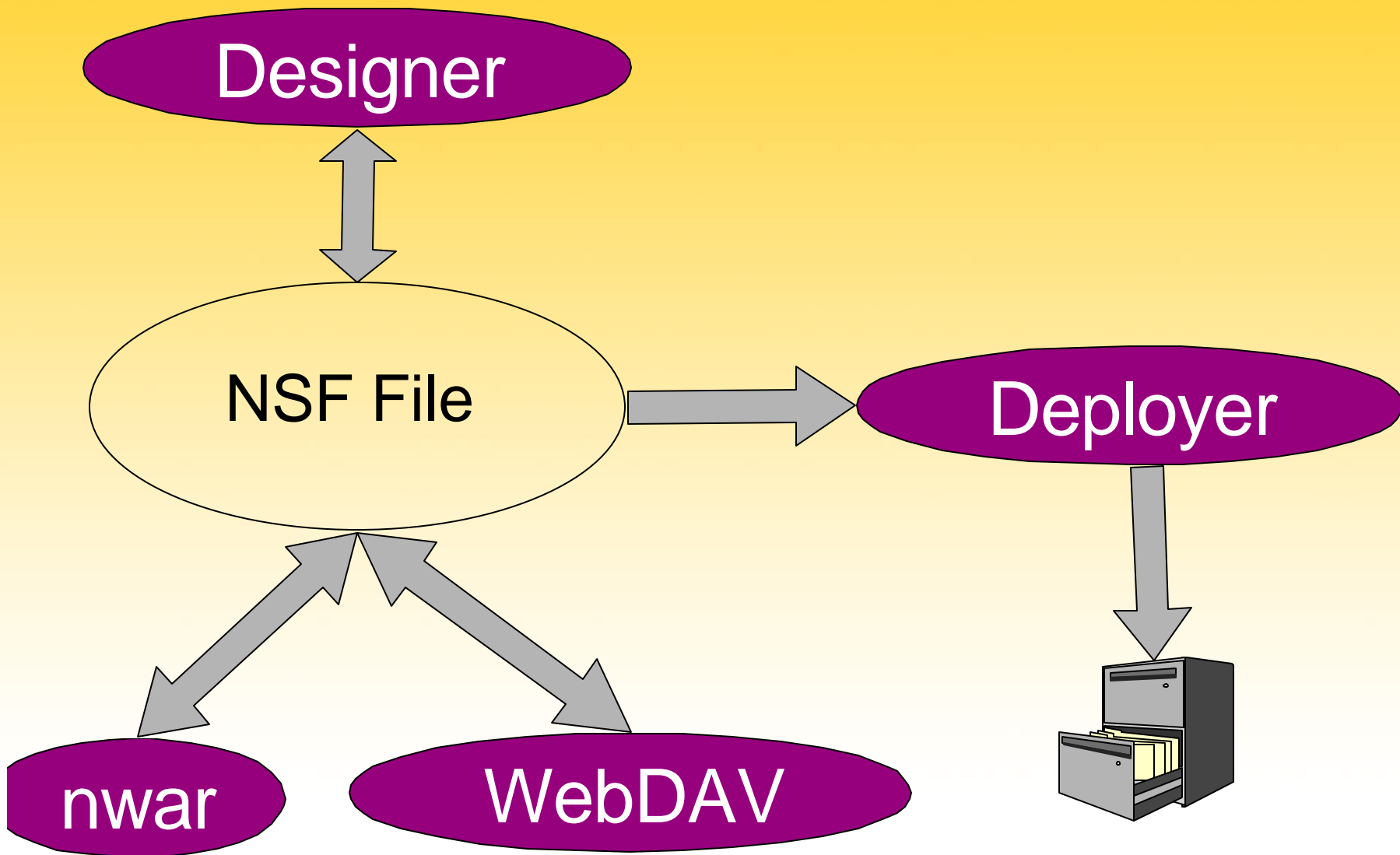


WebDAV

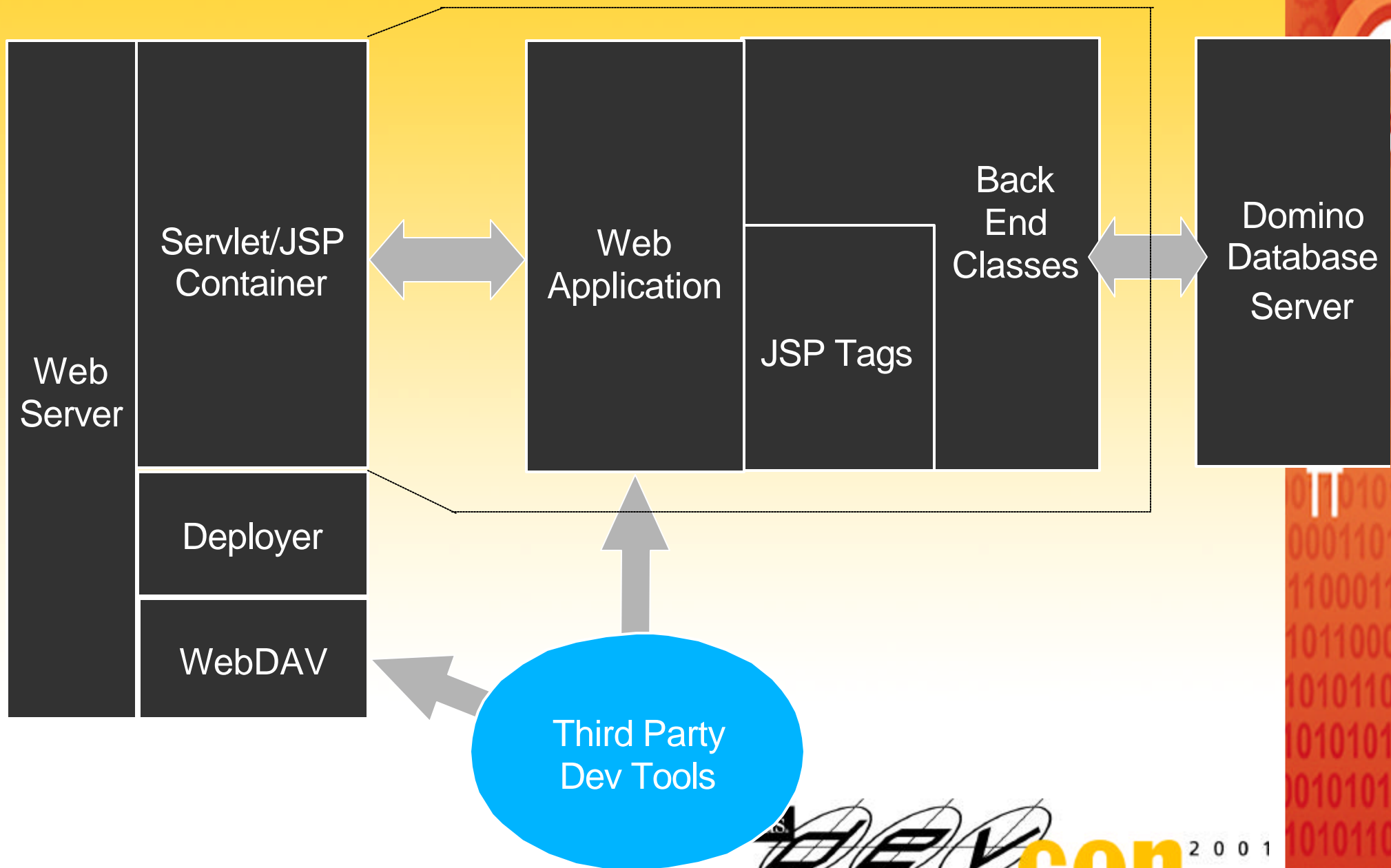
- An IETF standard
 - Web-based Distributed Authoring and Versioning
- Integrated with the Domino HTTP server
 - the files are stored in an NSF
 - presented as a hierarchical file system
- Interoperates with the deployer



NSF For Central Storage



High Level Architecture



Third Party Tool Integration

- nwar (Notes war) utility is provided to create an NSF from file system or existing WAR file
- Servlet container can use a WAR file or file system directly
 - Must configure web site in Directory
 - no replication
- If a tool supports WebDAV
 - it can deploy to an NSF
 - can use NSF as a "source control system"
- Other tools can still use WebDAV via Microsoft "Web Folders"



MacroMedia UltraDev

- UltraDev 4.0 supports WebDAV today
 - as deployment target
 - as source control system
- We are also developing an UltraDev extension
 - Enhanced editing with our tag libraries
 - Beta mid Q3
- For more info, "**HC114** - Tools and Tips for Working with the Rnext JSP tag library"
- Check out <http://www.lotus.com/webauthor>



Benefits

- Standards based web application platform provides fine level control over the returned HTML
- High efficiency, easy to use, document oriented data store
- Off-line web applications (not in Beta 2)
- Security
- Replication



Architecture in Action

Demo



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For more information

- **TS102** - Building and Deploying Java Web Applications on a Domino Server (Tues 1:30)
- **AS115** - Web Applications That Sizzle with Domino Rnext and Custom JSP Tags (Tues 4:30)
- **HC109** - Implementing the Domino Rnext JSP Tag Library (Wed 9:30)
- **HC114** - Tools and Tips for Working with the Rnext JSP tag library (Wed 1:30)
- **HC103** - Building R5 Web Applications using Java Server Pages and WebSphere (Wed 11:00)

