



### Agenda

- § Jazz Platform architectural goals and overview
- § Jazz Platform deep dive illustrated with an example
  - **4** From the client to the server



# Jazz Platform Value Proposition

- **§** Integrated collaboration improves team effectiveness
- **§** Designed for organizationally distributed development
- § Process integration for enhanced productivity, repeatability, and best practices
- **§** Seamless integration across the software development lifecycle
- **§** Traceability across the life cycle
- § Non-intrusive visibility into project status and health information
- **§** Lower Total Cost of Ownership
- **§** Scalability: process and team and project size
- § Extensible on the client and server
- § A growing Eclipse-based community





### Your Projects, Teams, and Items in Jazz ...

- § Project areas reify projects and team areas reify teams
- § Activities within a project are governed by the project's process
- § The project's process differs from team to team
- **§** Items belong to projects and are owned by teams
- § Items are persisted on the server
- § Items can be created, be updated, and be deleted
- § Items have history
- § Items have types
- **§** The set of item types is extensible



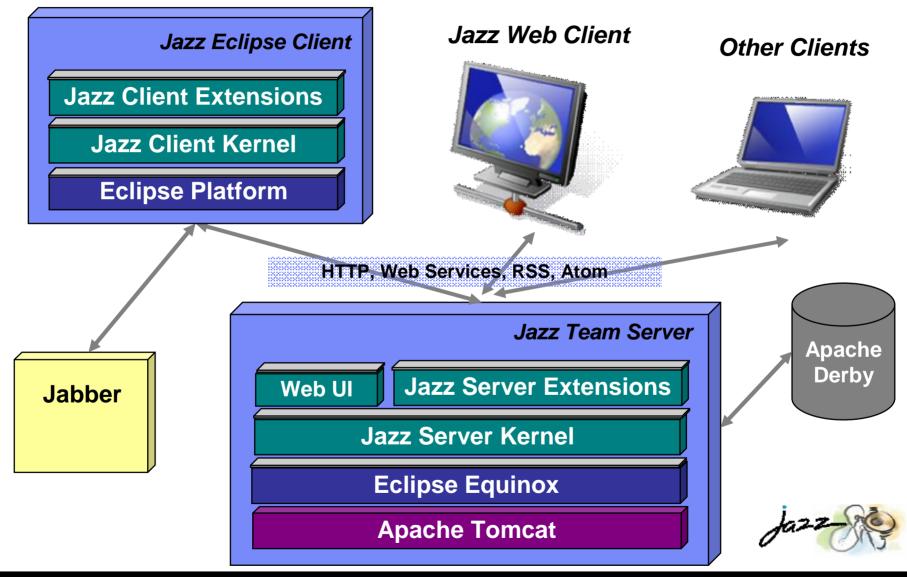
# Jazz Platform Architectural Goals

#### § Team first

- 4 Projects / teams / feeds
- 4 Continuous project health "for free"
- § Configurable through process
- § Easily extensible
- § Multi-client, WAN-friendly
- § Scalable
- § Secure
- § Standard middleware platform

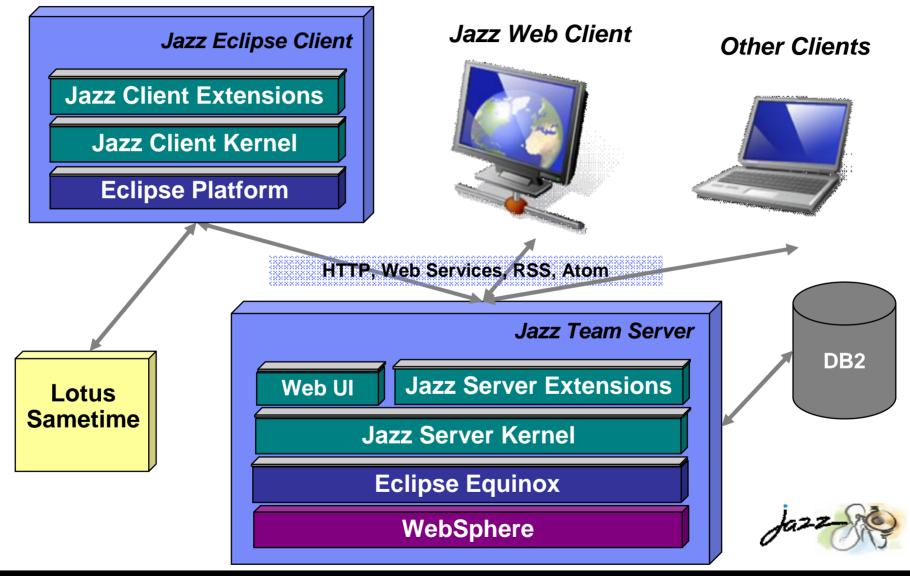


#### Jazz Platform Architecture – Open Source middleware



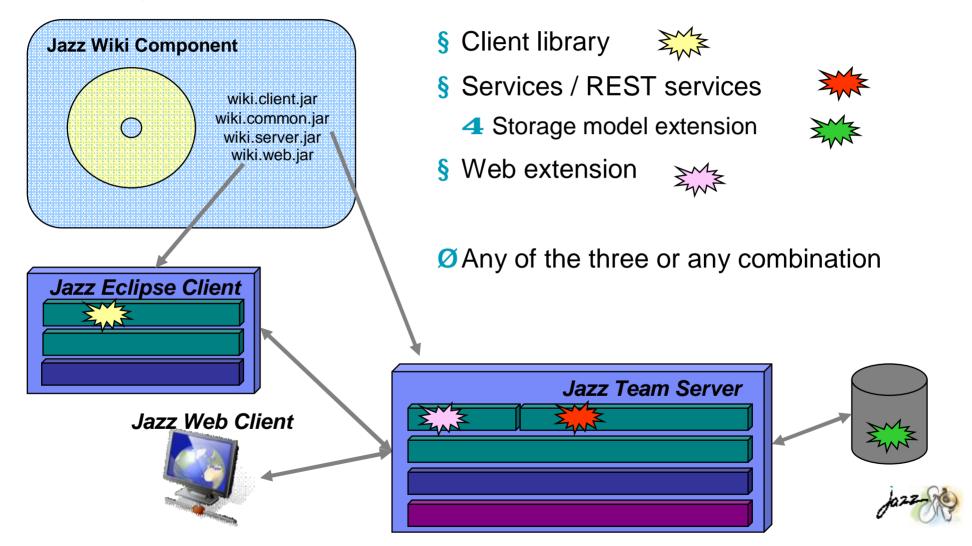


#### Jazz Platform Architecture – IBM middleware





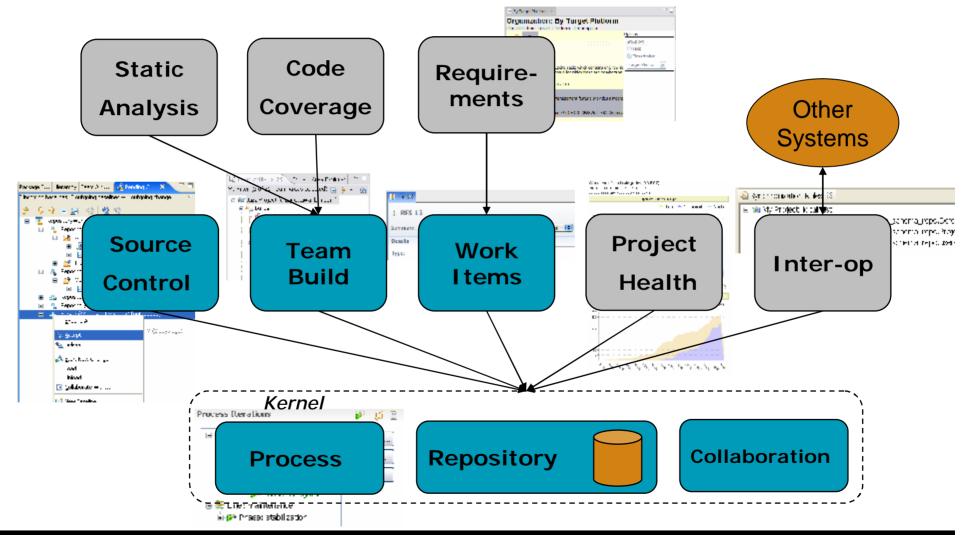
#### Anatomy of a Jazz Component



9



#### Jazz Platform Components Overview





# No Exceptions

§ All components are following the same pattern.

- § There are no exception.
  - 4 Not even for Jazz.



# Deep Dive Roadmap

#### § Clients

- 4 Eclipse RCP & plain Java clients
- 4 Web UI

#### § Server

- 4 Server extensibility deep dive
- 4 Storage model
- **4** Service programming model
- § Process enablement
  - 4 Customization
  - **4** Participation

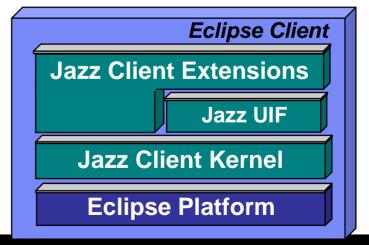


# **Client Applications**

§ Jazz Client Kernel



- **4** Provides access to and manages repository connections
- 4 Provides the basics for querying, fetching, and caching repository data
- 4 Provides access to and manages feed subscriptions and feed data
- **4** Provided access to and manages client libraries
- **4** Provides the notions of projects, teams, and process
- 4 Runs in OSGI environments such as eclipse RCP and in plain java clients
- § Jazz UI Foundation
  - 4 Basic UI building blocks for Jazz
- § Jazz client extensions
  - 4 Client libraries
  - **4** UI or UI extensions





#### Plain Java



- § It is a normal plain Java application
- § Establishes one or more connections to Jazz repositories
- § Uses (and provides) client libraries

```
TeamPlatform.startup();
ITeamRepositoryService srv = TeamPlatform.getTeamRepositoryService();
ITeamRepository repo = srv.getTeamRepository(myRepositoryURL);
repo.login(progressMonitor);
IQueryClient qryClnt = repository.getClientLibrary(IQueryClient.class);
IQueryResult result= qryClnt.findAll(myQueryExpression);
processWorkItems(result);
```



## What are Client Libraries?

- **§** Provides a sophisticated façade for a component's functionality
- **§** Instantiated only once per repository connection
  - **4** may have state and allow for listeners
- § Talks to Jazz platform and component specific services on the server
  - **4** Can leverage smart, optimized communication patterns
- § Manages the caching of the component's repository data
- § Can depend on and talk to other client libraries

Interesting client side applications are possible by using the Jazz Client Kernel and existing client libraries



# Example: The Wiki Client Library

§ Registered as extensions with a Jazz Client Kernel extension point

```
<extension point="com.ibm.team.repository.client.clientLibraryFactory">
    <factory
    factoryClass="com.ibm.team.wiki.internal.WikiClientLibraryFactory"
    interfaceClass="com.ibm.team.wiki.client.IWikiManager"
    name="Foundation Wiki Client Factory"/>
  </extension>
```



### Example: The Wiki Client Library

```
public interface IWikiManager {
    IWikiPage createPageUsingOwner(
        IItemHandle owner, String pageId, IProgressMonitor monitor)
    throws TeamRepositoryException;
    IWikiPage findPageUsingOwner(
        IItemHandle owner, String pageId, IProgressMonitor monitor)
        throws TeamRepositoryException;
    IWikiPage createPageUsingPath(
        WikiPath wikiPath, IProgressMonitor monitor)
        throws TeamRepositoryException;
    IWikiPage findPageUsingPath(
        WikiPath wikiPath, IProgressMonitor monitor)
        throws TeamRepositoryException;
    IWikiPage findPageUsingPath(
        WikiPath wikiPath, IProgressMonitor monitor)
    }
}
```

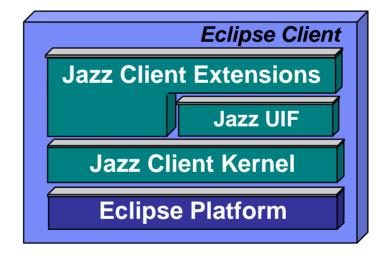
```
throws TeamRepositoryException;
```

```
IWikiPage savePage(
    IWikiPage page, XMLString content, IProgressMonitor monitor)
    throws TeamRepositoryException, IOException;
```

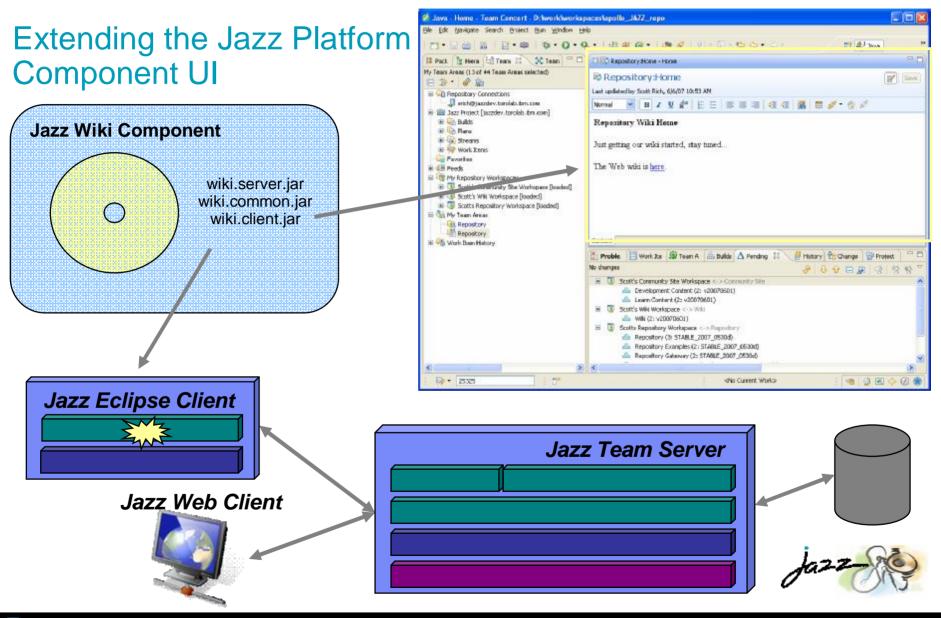


# Inside a Jazz RCP Client Application

- § It is a normal Eclipse RCP application
  - 4 Plug-ins defining extensions for available Eclipse RCP extension points such as views, editors, wizards, actions, etc. ...
- § Uses the Jazz client kernel
- § Uses (and provides) client libraries
- § Extends the Jazz UI Foundation
- § Extends the UI provided by other Jazz components









#### Jazz UI Foundation

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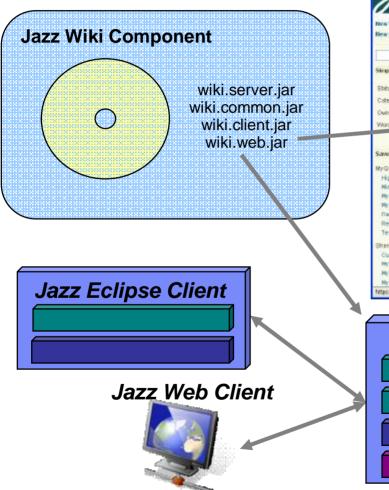


# Jazz UI Foundation

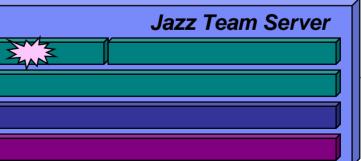
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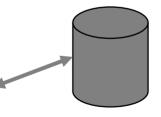


#### Extending Jazz – Component Web UI



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#### Value-add The Jazz Web UI Stack I want to provide some custom user experience. Contributed **Examples:** 'Perspective' • Work Item web UI, Agile Planning web UI A developer-defined top-level page (e.g. the Jazz.net web UI) that provides a consistent L&F and APIs. Web Workbench **Problems Solved:** • Common look and feel, normal web controls (back, forward, bookmarking), common APIs "Above the glass" - L&F Specific "Below the glass" - L&F Agnostic Mechanism to transparently optimize (compress/concatenate/cache) Ajax resources based on dependency structure and UI entry point. **Runtime Problems Solved:** Optimization •I want my Ajax UI to load fast (especially over a WAN) •I want platform extenders to focus on developing UIs, not analyzing, parsing, and generating compressed Javascript Mechanism to structure Ajax code as server-side OSGi bundles. OSGi plug-in / Problems solved: extensibility model •I want to build Ajax applications following the open-closed principle (open for extension, closed for modification) for Ajax code •I want open-ended extensibility so that framework code can call 3rd party code without having to know about the actual 3<sup>rd</sup> party implementations in advance



## Extending Jazz – Web UI (plugin.xml)

<!-- work item web UI bundle registration -->
<extension point="com.ibm.team.repository.web.webBundles"/>

<!-- work item web UI page definition -->

<extension point="com.ibm.team.repository.web.basicPerspectives">

<basicPerspective</pre>

id="com.ibm.team.workitem.web.WorkItemPage"

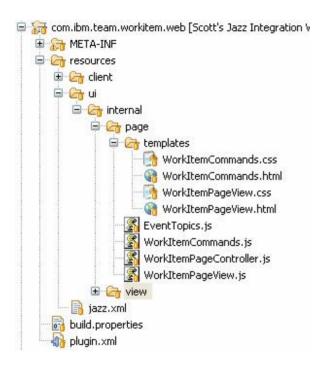
widget="com.ibm.team.workitem.web.ui..WorkItemPageView"

name="Work Items"/>

</extension>



# Extending Jazz – Web UI (JavaScript)



#### WorkItemPageView.js:

\* The main view for the work item web UI. Responsible for displaying left-nav \* content and for managing the main content area.

\*/

dojo.widget.defineWidget(

"com.ibm.team.workitem.web.ui.internal.page.WorkItemPageView", dojo.widget.HtmlWidget,

```
{
```

// Other work item code may call these properties and methods.
//

```
/*
```

\* Returns the internal id of the widget currently displayed in the

\* page's content area.

```
*/
```

getCurrentWidgetId: function() {

return this.\_currentMainWidgetId;

```
},
```

\* Returns the work item object currently displayed in the page's

\* content area.

```
*/
```

. . .

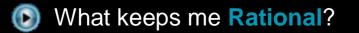
getCurrentWorkItem: function() {

return this.\_multipaneContentWidget.getCurrentWidget().\_workItem;



# Example of extending the server

- § Introduce higher-level and transactional behavior
- **§** Teach the repository about a new item type
- § Enable clients and other server extensions to use it

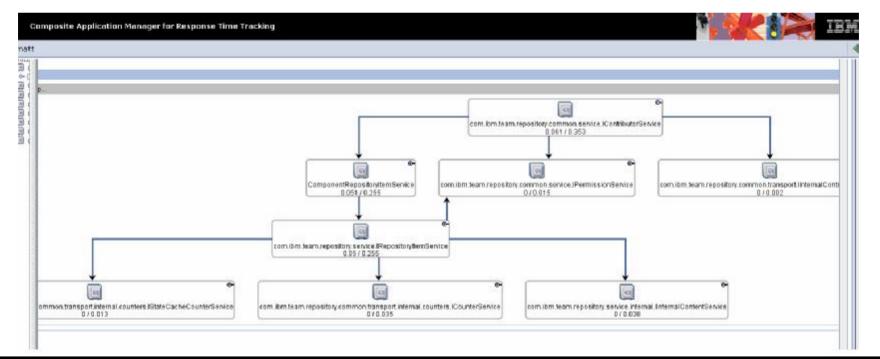




#### Extending the platform - Service programming model

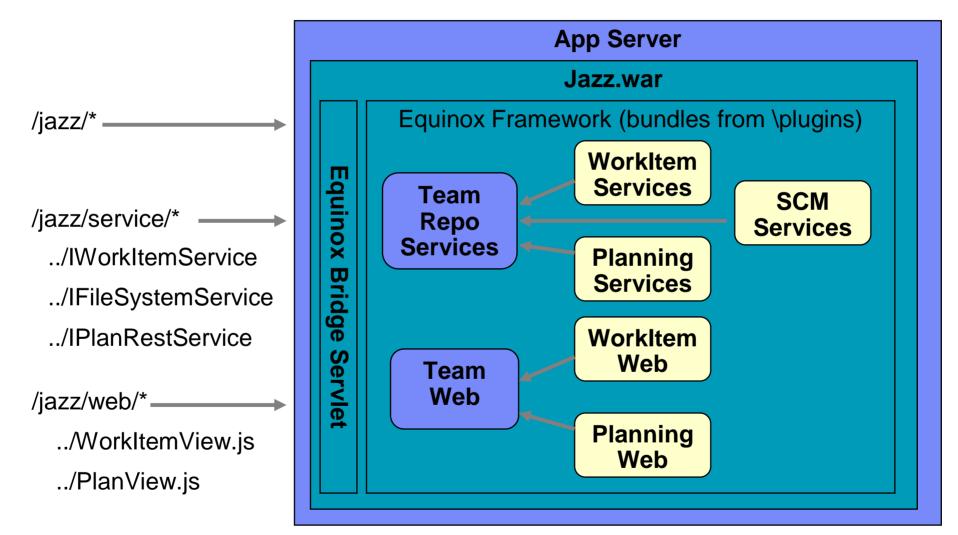
- § It's stateless services all the way down...
- § Services are contributed by bundles

- **§** Statelessness is key to scalability
  - All state is in the DB, all client interactions are atomic
  - 4 Clusterable and restartable
  - **4** No session state (clients are stateful)





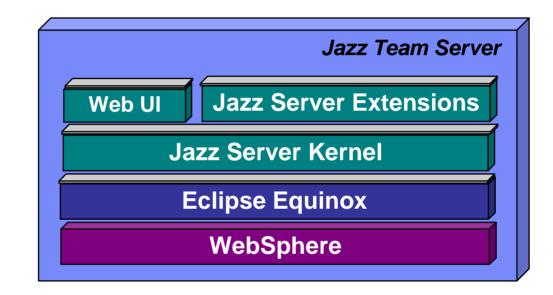
#### Extending the Jazz Platform – Understanding jazz.war





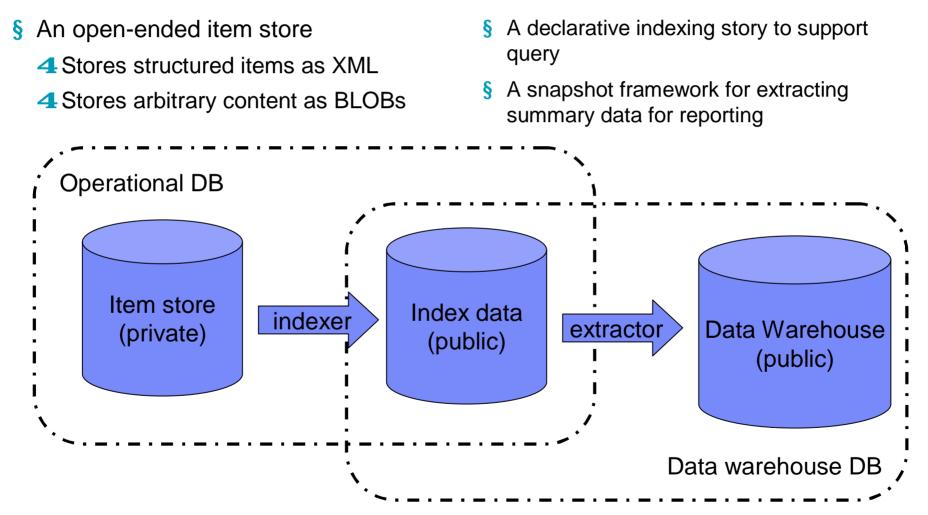
# Jazz Server Kernel

- § Team Repository Services
  - Provides the basics for querying, fetching, and updating repository data
  - 4 Provides support for change events
  - 4 Provides support to generate feeds



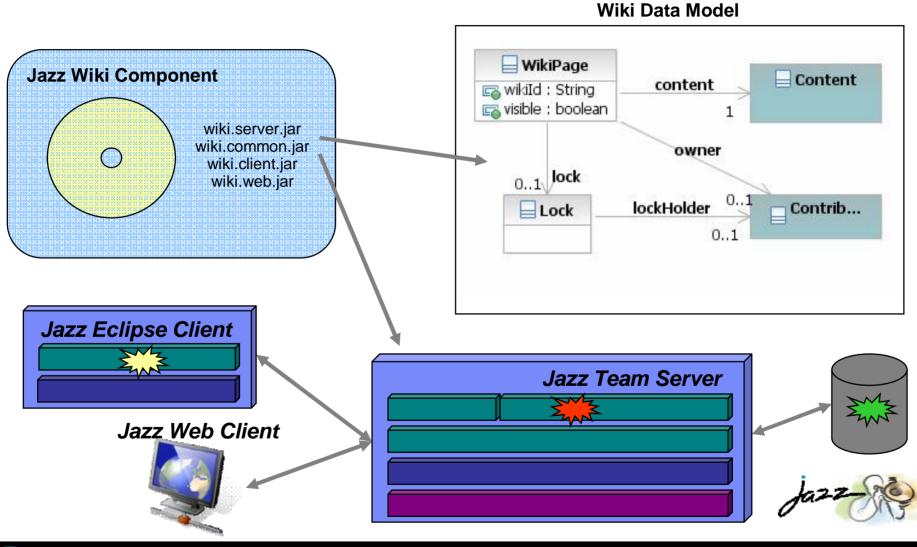
- **4** Provided access to and manages component services
- **4** Provides the notions of projects, teams, and process
- **4** Runs in OSGI environments

# Extending the Jazz Platform – repository data model ...three DBs in one





#### Extending Jazz – adding a component data model





# Extending the Jazz Platform – Adding a component data model (plugin.xml)

<extension point="com.ibm.team.repository.common.components">

<component

id= "com.ibm.team.foundation.wiki"

name= "Wiki"

packageURI= "com.ibm.team.foundation.wiki">

<service

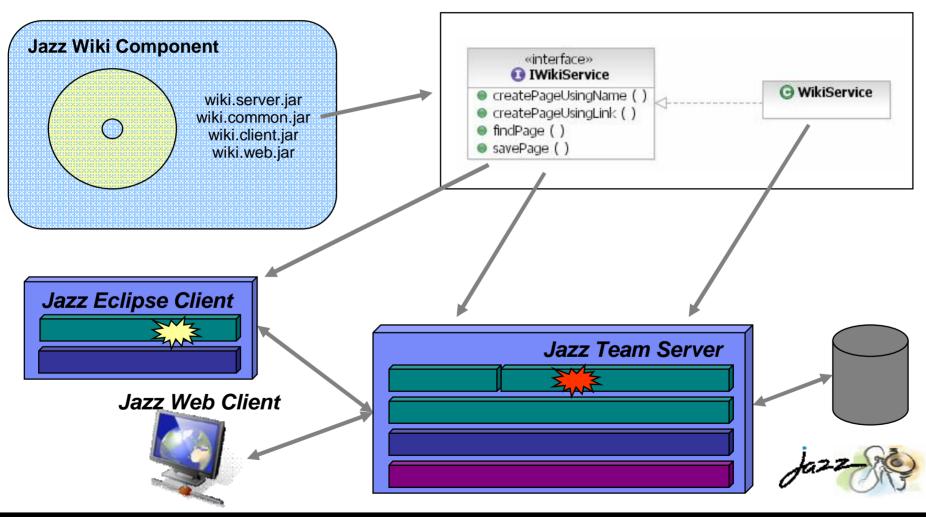
```
name="Wiki RCP Service"
interfaceClass="com.ibm.team.wiki.IWikiService"/>
```

</component>

</extension>



#### Extending the Jazz Platform – Adding a service





#### Extending the Jazz Platform – Adding a service (plugin.xml)

</extension>

#### Extending the Jazz Platform – Adding a service (Java code)

Interface:

```
public interface IWikiService {
```

```
public IWikiPage createPageUsingName(String name, IItemHandle
defaultOwner) throws TeamRepositoryException;
```

```
public IWikiPage createPageUsingLink(String wikiLink) throws
TeamRepositoryException;
```

```
public IWikiPage findPage(String wikiLink, IItemHandle
defaultOwner) throws TeamRepositoryException;
```

```
public IWikiPage savePage(IWikiPage page) throws
TeamRepositoryException;
```

```
Implementation:
```

...

```
public class WikiService extends AbstractService implements
    IWikiService {
```



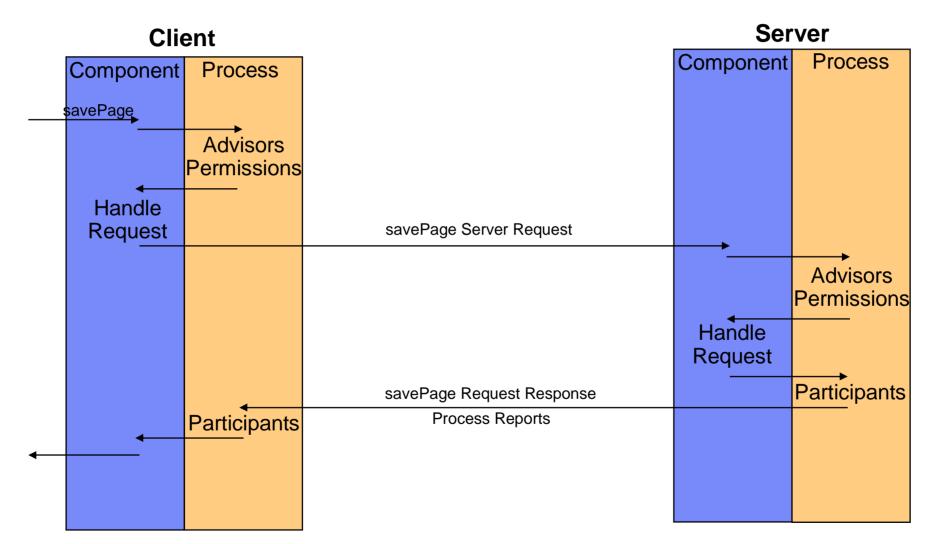
# Configurability through Process

- § Allows team specific work products and behavior
- § Allows team specific conditions under which client-side and server-side operations are allowed to proceed
- § Allows team specific participants for client-side and server-side operations
- § Allows team specific reactions to server-side change events

OComponents explicitly design the configuration scope for process



#### **Process Execution: Operations**





### Example: Server side process-enabled operation

§ Declare process-enabled save operation on the server

```
<extension
    point="com.ibm.team.process.service.configurationPoints">
    <operation
        id="com.ibm.team.wiki.server.savePage"
            name="Save Wiki Page">
        </operation>
    </extension>
```

### Example: Server side process-enabled operation

§ When saving a page, wrap the save in an operation and pass the operation to the governing process for execution:

```
public IItemsResponse savePage(IWikiPage page) throws TRE {
  ITeamArea area = getTeamArea(page);
  IServerProcess serverProcess = getServerProcess(area);
  IDevelopmentLine line = serverProcess.getDevelopmentLine(area);
  WikiSaveOperation op = new WikiSaveOperation(page, area, line);
  IOperationReport report = serverProcess.adviseAndExecute(op);
  IItemsResponse response = ProcessCommon.createItemsResponse();
  response.setOperationReport(report);
  response.setClientItems(new IWikiPage[] { op.savedPage });
  return response;
}
```



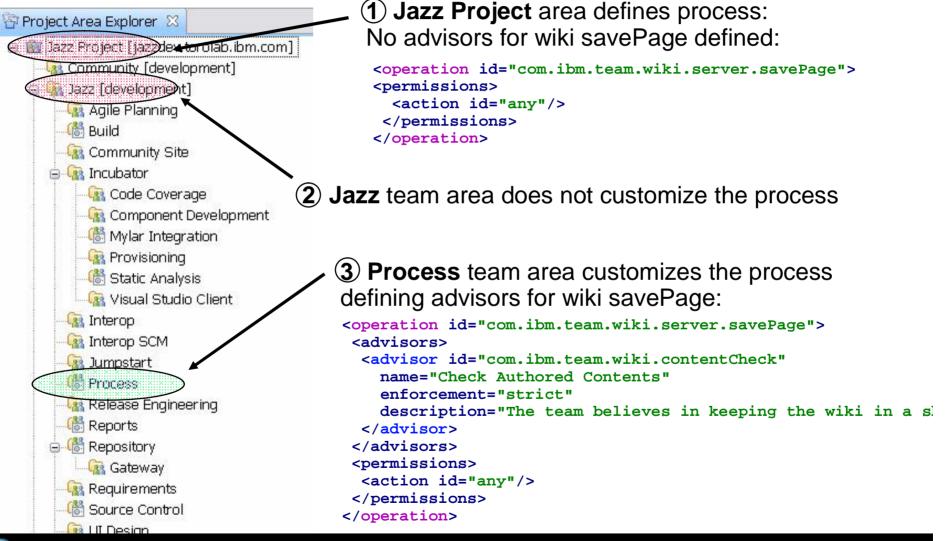
#### Example: Server side process-enabled operation

**§** The save operation defined inside the service looks like:

```
class WikiSaveOperation extends AdvisableOperation {
public IWikiPage savedPage;
public WikiSaveOperation(
    IWikiPage page, ITeamArea area, IDevelopmentLine line) {
 super("com.ibm.team.wiki.server.savePage", page, area, line);
public IOperationReport run(
    IProcessConfiguration conf, IProgressMonitor m)
    throws TeamOperationCanceledException {
 savedPage = transactionalSave((IWikiPage) getOperationData(), m);
 return null;
```



#### **Finding the Right Process**



What keeps me Rational?



# Programming Model Recap

- § Client APIs and RCP integration
  - **4** Lots of interesting extensions are possible with existing services and data
- § Services
  - 4 You own item saves, provide good validation and process enablement
  - **4** REST services to support Web client and forward compatibility
    - § Avoid exposing data directly
- § Storage model
  - **4** Think about migration
  - **4** Use Content for open-ended text and unstructured content



