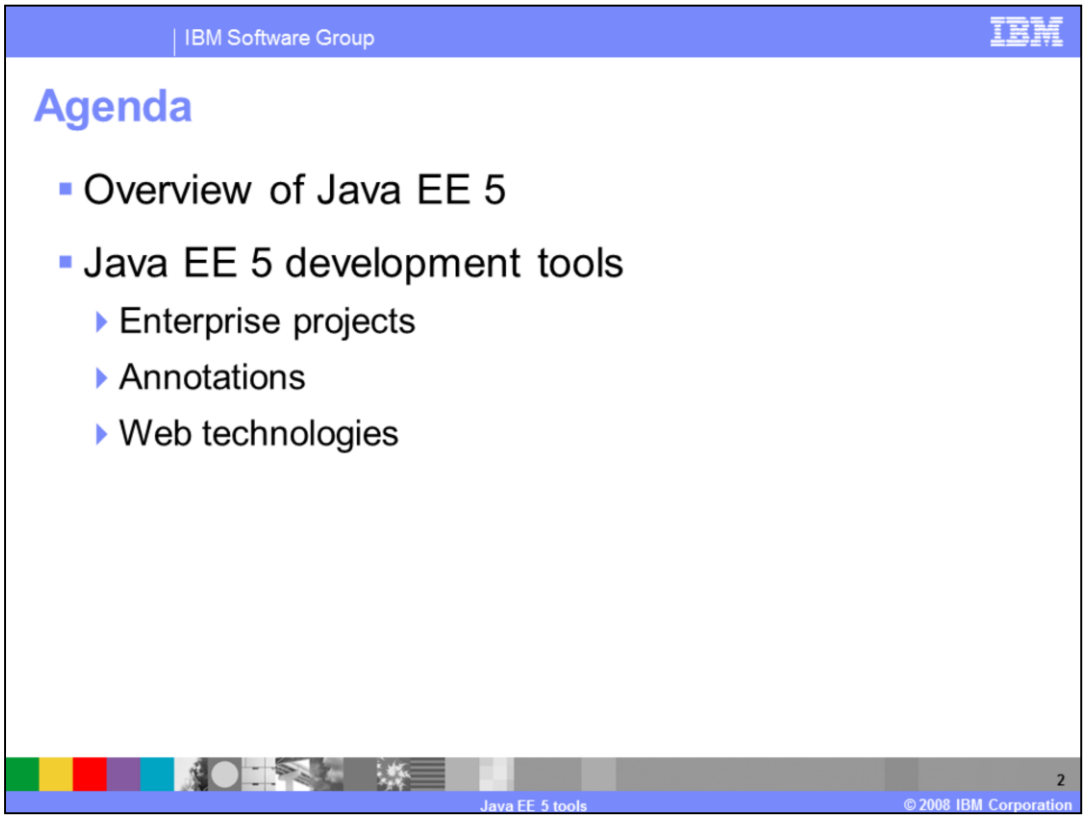
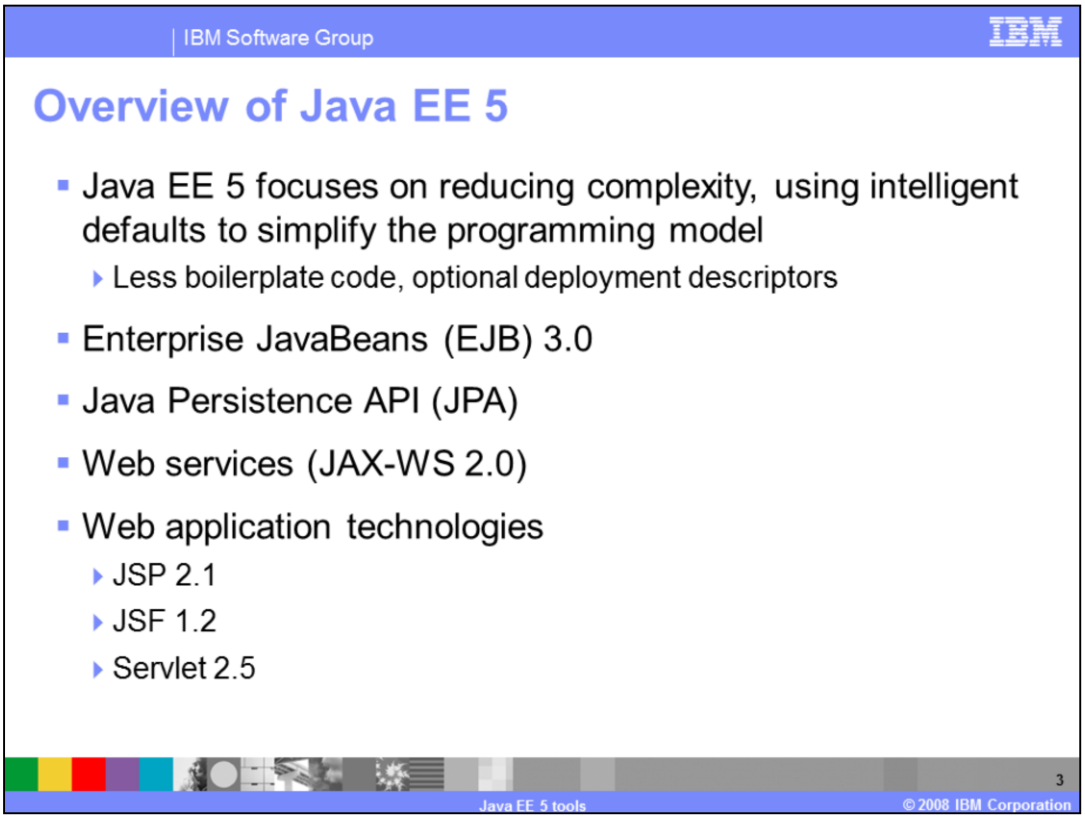
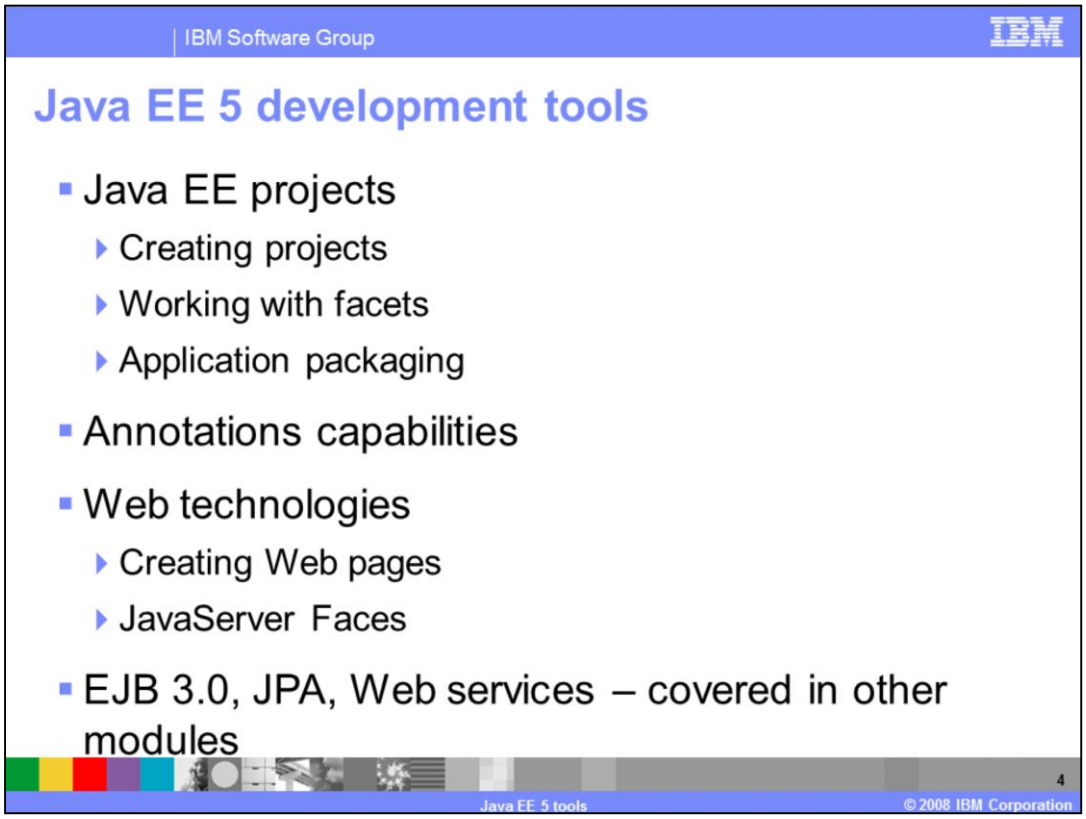

This presentation provides an overview of Java™ EE 5 development tools that are available in Rational® Application Developer V7.5.



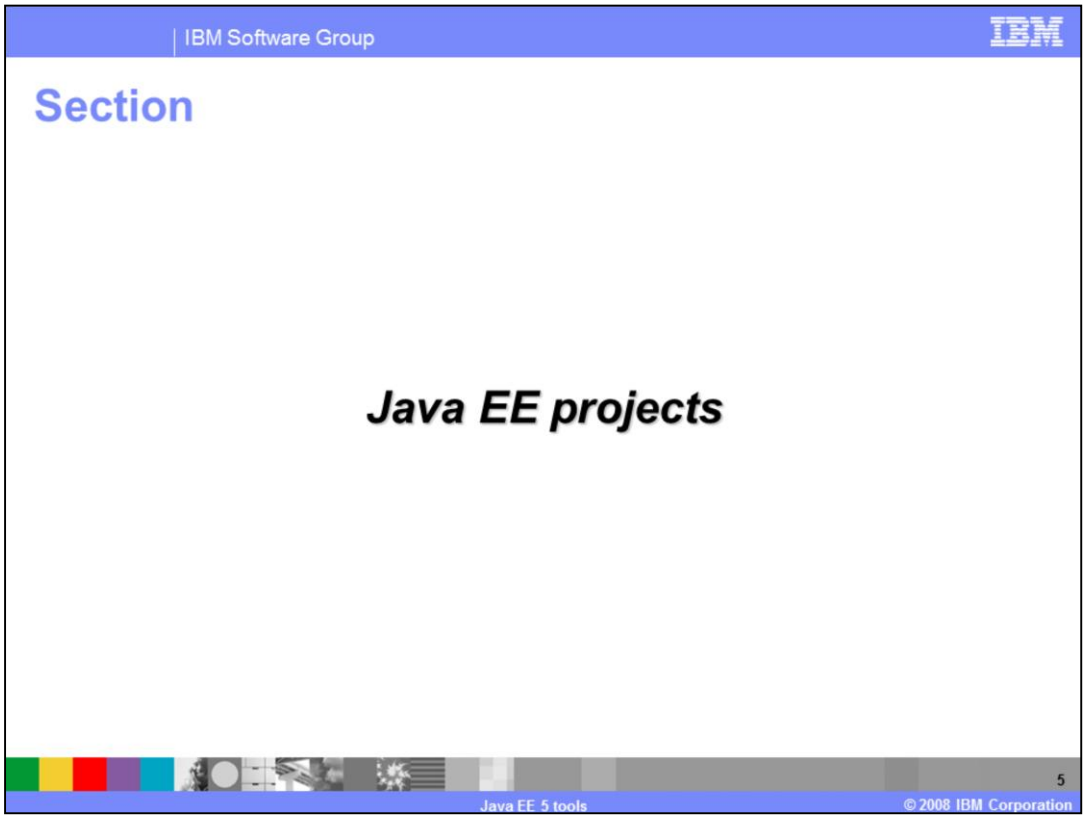

The first section of this presentation includes an overview of the Java EE 5 specification, which includes many important technology updates like EJB 3.0 and the Java Persistence API. The rest of the presentation discusses the tools that the Rational Application Developer workbench provides for building, compiling, and testing Java EE 5 applications. This includes creating projects, working with annotations, and using new Web development tools. Other tools for Web services, EJB, and JPA development are covered in separate modules.




The main goal of Java EE 5 is to simplify the programming model. The new specification aims to make it as easy as possible to implement simple things, while keeping complex things possible. In many cases this is accomplished by utilizing contextually appropriate default values, allowing you to override the defaults when needed. When it is possible for the container to figure something out, it will do so, rather than requiring a developer to provide unnecessary information. With this simplification, regular Java developers should be more able to make the transition to developing enterprise Java applications. The EJB specification has been heavily revised, and is now a plain-old Java object based programming model. This approach extends even to data persistence, with the introduction of JPA, the Java Persistence API. Java EE 5 also incorporates the latest Java Web services standards, such as JAX-WS, the Java API for XML Web services. Web application technologies, such as servlets, JavaServer Pages, and JavaServer Faces have also been revised in this specification.

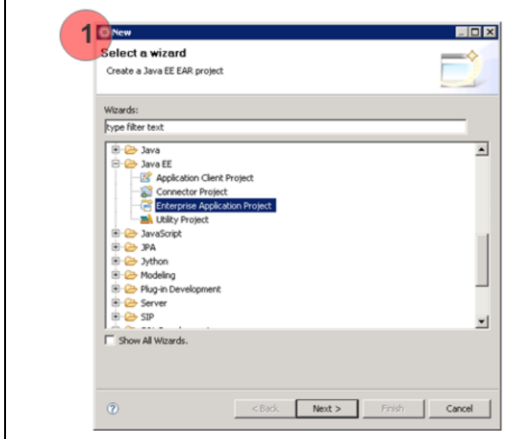



The rest of this presentation focuses on the tools in the Rational Application Developer V7.5 workbench that support Java EE 5 development. The first section describes how to create projects, how to work with project facets, and changes in the Java EE 5 application packaging model. The Java EE 5 programming model is heavily annotations-based, and tools for doing annotation-based development are covered in the next section of the presentation. Finally, the presentation covers new tools for Web development, including a graphical Web page designer and enhanced tools for developing JavaServer Faces. There are many other specialized tools in the workbench for working with EJB 3.0 artifacts, JPA constructs, and doing Web services development. These tools are covered in separate modules.

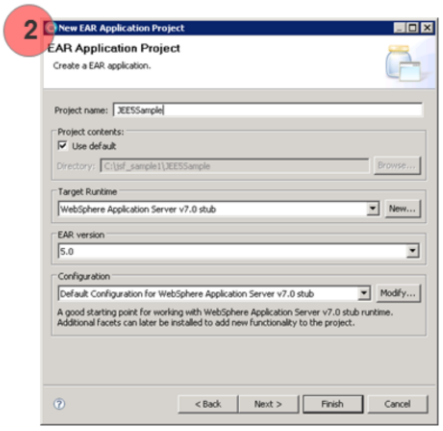



This section describes how to create Java EE projects, how to manipulate project facets, and discusses changes in application packaging that are a part of the Java EE 5 specification.

# Creating an enterprise project



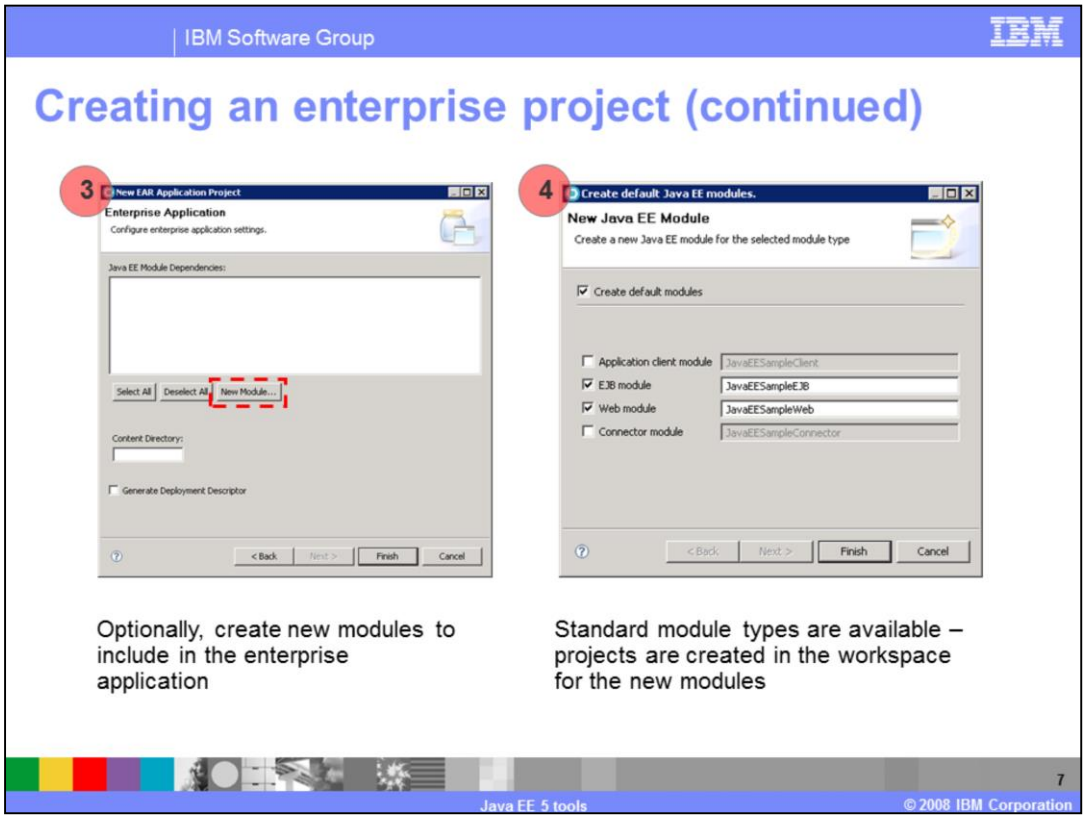

Start the EAR Application Project wizard by selecting **File > New > Project > Java EE > Enterprise Application Project**



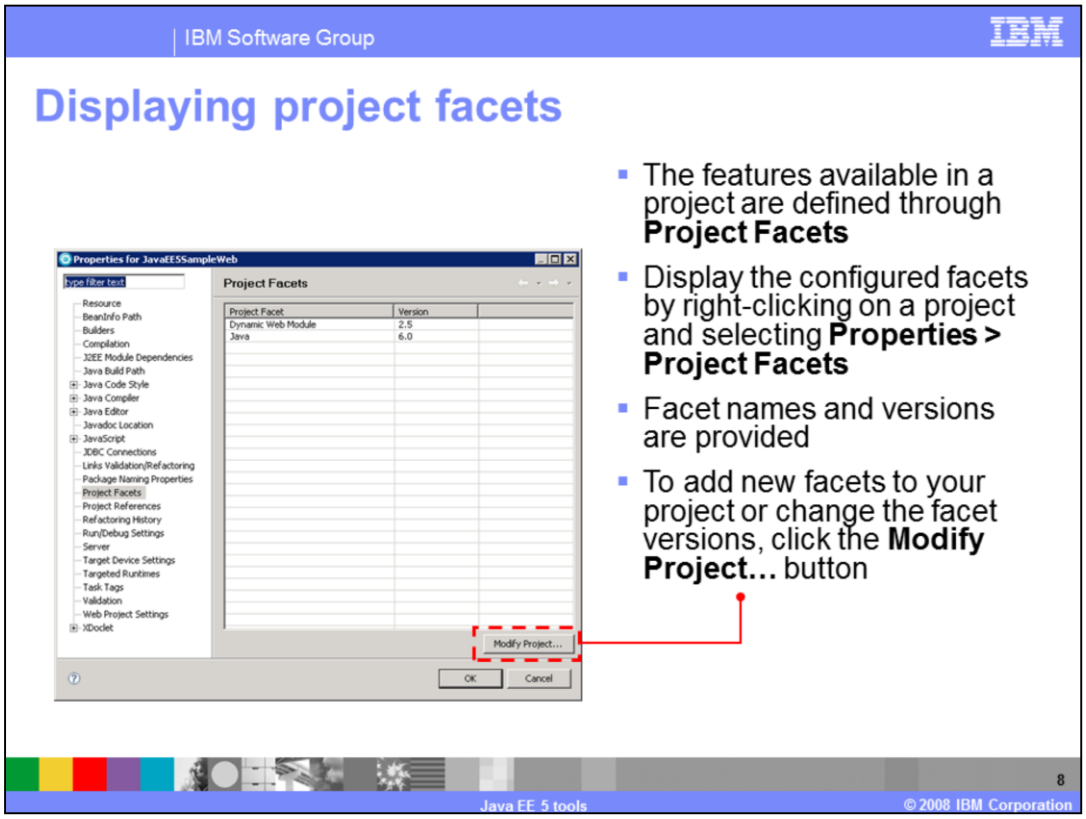

Choose a target runtime and EAR version – the default for WebSphere® Application Server V7 is Java EE 5




There is a wizard to walk you through creating a Java EE project. First, launch the EAR Application Project wizard using the product menus. On the second panel of the wizard, provide a name for the project and select other runtime configuration options. The target runtime that you associate with the project is the runtime that you are going to use to test your application. If you choose WebSphere Application Server V7, then the default EAR version is 5.0 for Java EE 5. You can select a different Java EE level for the project using the dropdown menu. The configuration profile that you choose determines which facets are associated with your project. Either choose a configuration profile from the dropdown menu or use the Modify button to manually configure the facets for your project.



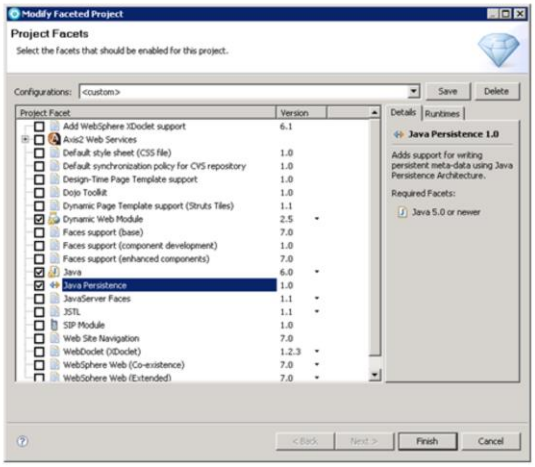

After choosing the runtime and workspace configuration options for your project, you have the option of creating modules for your enterprise. If you do not want to create any modules, you can exit the wizard by clicking Finish on the Enterprise Application settings panel – this creates an empty EAR project that you can later customize with application modules. Alternatively, if you want to create application modules at project creation time, click the New Module button to choose which modules to create. On the new Java EE module page, you have the option of creating an application client, EJB, Web, or connector module. Choose the options you want and click Finish to create the enterprise application.




Java EE projects typically have facets, which describe the functions that are contained in the project. When you add a facet to a project, the project is configured to perform a certain task, fulfill certain requirements, or have certain characteristics. For example, the EAR facet sets up a project to function as an enterprise application by adding necessary metadata and setting up the classpath for a project. Using product tools, you can easily add EJB 3.0 or JPA facets to a plain Java project, which converts the project to a Java EE project.

# Changing project facets

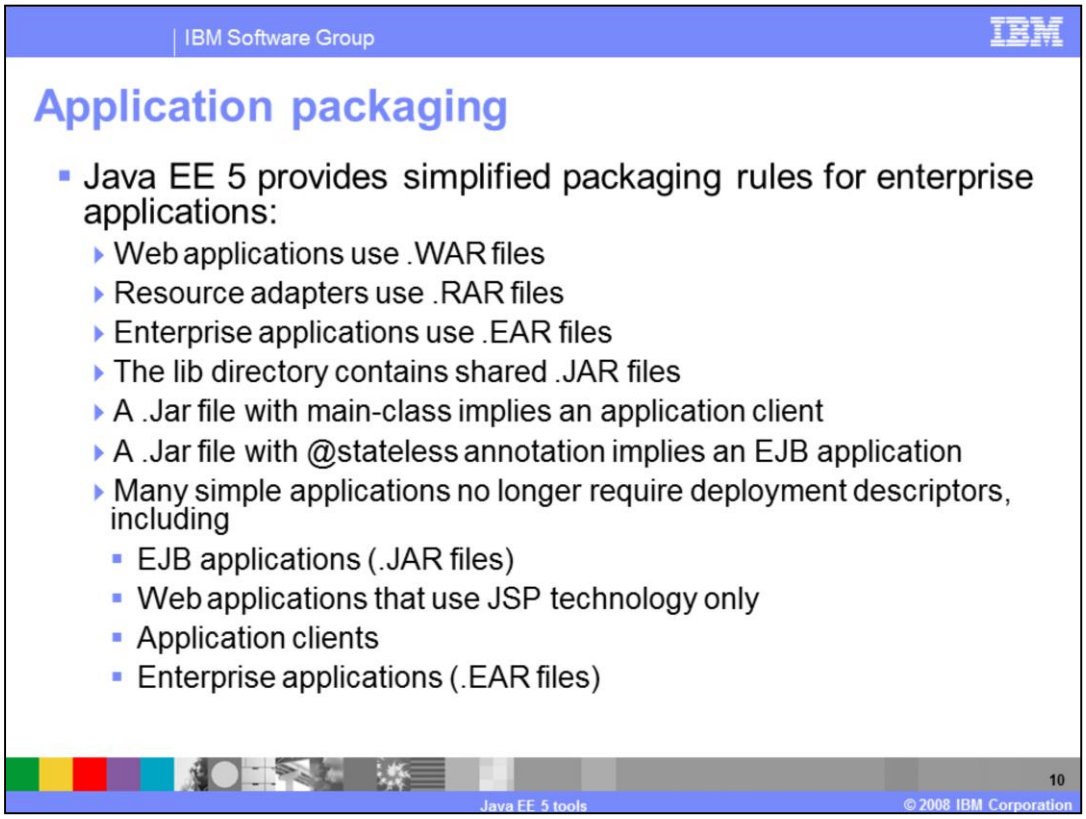
- Configure facets on the **Modify Faceted Project** panel
  - Add or remove facets
  - Change the version of a facet
- **Example:**
  - To use the Java Persistence API in a Web project, select the check box next to Java Persistence
- **Example:**
  - To change the targeted JDK level for a project, click the arrow in the Version column next to Java and choose the appropriate JDK level



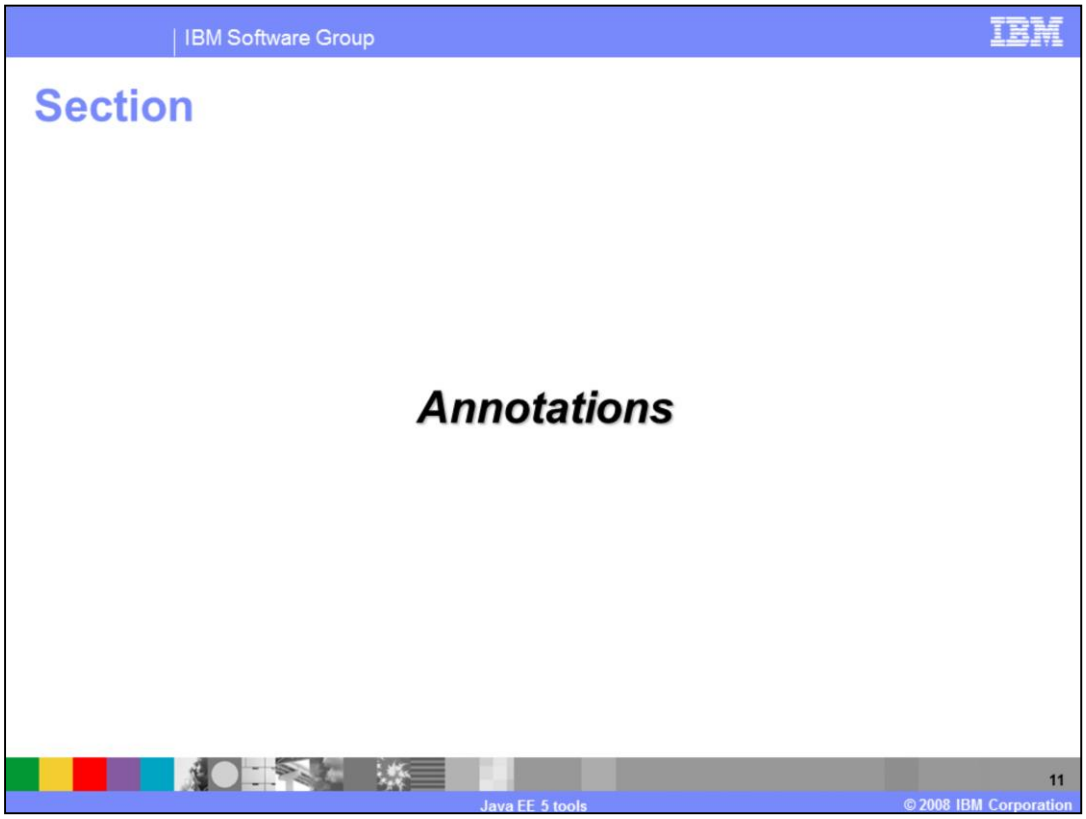




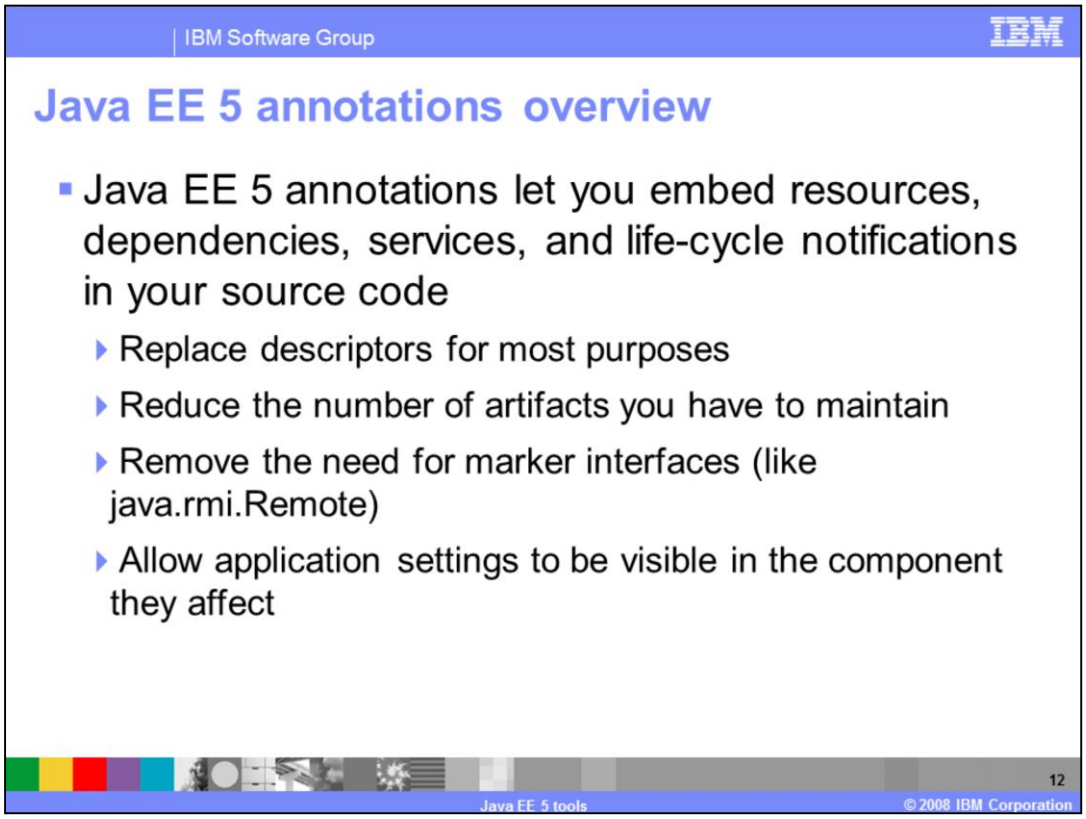
By modifying the project facets, you control the technologies that are available to the application that you are developing in that project. You can add and remove facets to your project and change the version of a facet. For example, to use the Java Persistence API in a Web project, select the check box next to Java Persistence to add that facet to the project. If you want to change the target JDK level for a project, click the arrow in the version column next to Java and choose the appropriate JDK level.



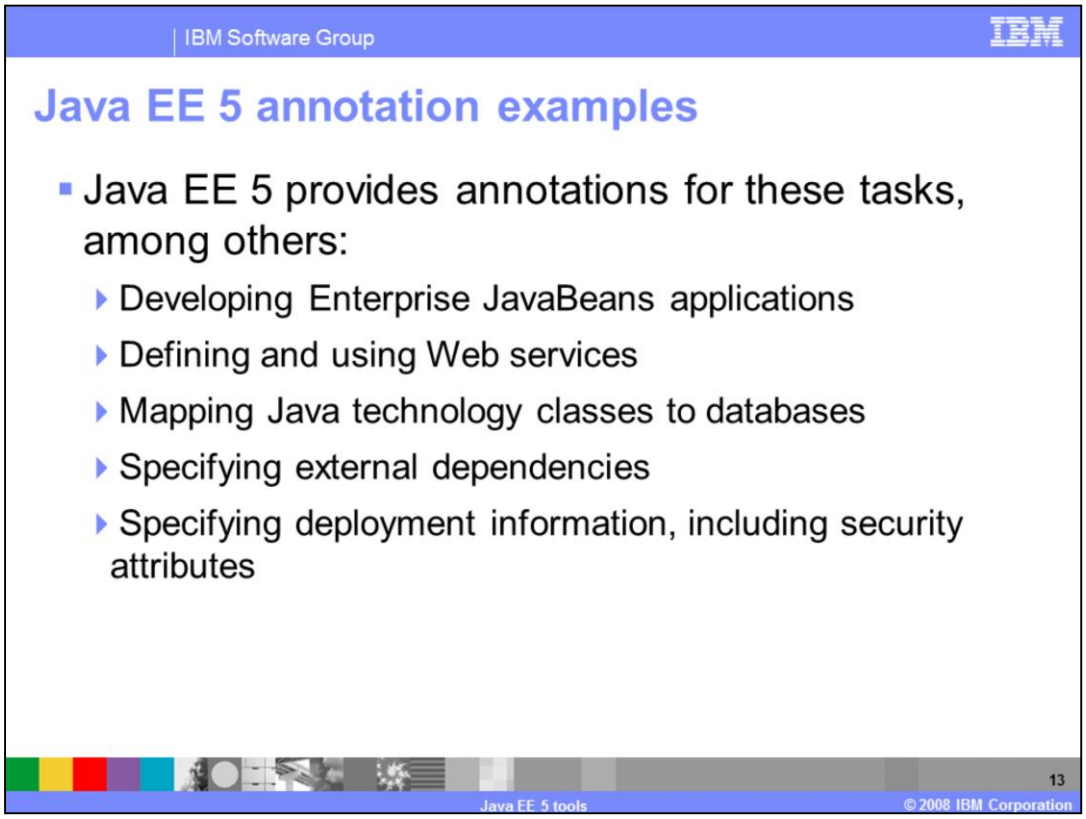

Java EE 5 provides a simplified packaging model for enterprise applications. In most cases, deployment descriptors are optional, so the specification relies on file name extensions and package contents to identify application components. For example, a WAR file is a Web application, a RAR file is a resource adapter, and an EAR file is an enterprise application. Since JAR file packages can contain different types of application components, the packaging model relies on the contents of the archive to identify the package type. For example, a JAR file with a main-class is an application client, and a JAR file with EJB annotations like the @Stateless annotation is an EJB module. Most applications no longer require deployment descriptors; include EJB applications, enterprise applications, and some Web applications. If a Web application contains technologies other than JavaServer Pages – for example, if the application contains Servlets – then a deployment descriptor is still required. You can still include a deployment descriptor in your application package, even if it is not required. In that case, the information in the deployment descriptor overrides information in the annotations in the application content.




This section describes how annotations are used in Java EE 5 applications and some of the annotation tools available in the Rational Application Developer workbench.



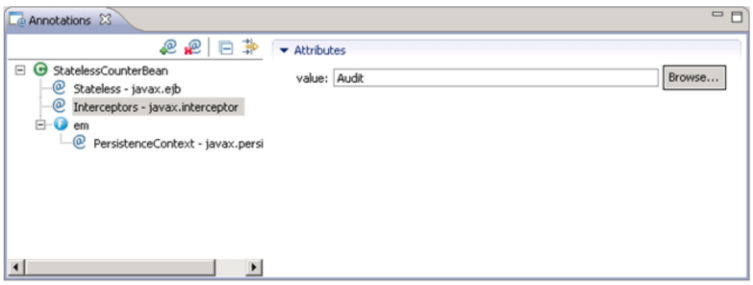

Java EE 5 supports the injection of annotations into your source code, so that you can embed resources, dependencies, services, and life-cycle notifications in your source code, without having to maintain these artifacts elsewhere. An annotation is a modifier or Metadata tag that provides additional data to Java classes, interfaces, constructors, methods, fields, parameters, and local variables. Annotations replace boilerplate code, common code that is required by certain applications. For example, an annotation can replace the paired interface and implementation required for a Web service. Annotations can also replace additional files that programs require, which are maintained separately. By using an annotation, this separate file is no longer required. For example, annotations can replace the need for a separately maintained deployment descriptor for JavaBeans.




Java EE 5 defines several annotations that can be injected into your source code. To declare an annotation, you precede the keyword with an "at" sign (@). There are special annotations defined for doing EJB development, Web services development, and using the Java Persistence API to map Java objects to databases. Annotations also allow you to inject resources directly into your application. For example, rather than having to do a complex lookup and cast an EJB as an appropriate object type to be able to access its data in an application, you can use a simplified annotation-based programming model to create an instance of an EJB in your application. In Java EE 5, you can create an instance of an EJB in your application using the @EJB annotation, the name of the EJB you want to use, and the name of the variable that will contain the EJB. The line “@EJB ShoppingCart myCart”, for example, injects a callable instance of the EJB ShoppingCart into a Java program.

# Annotations view

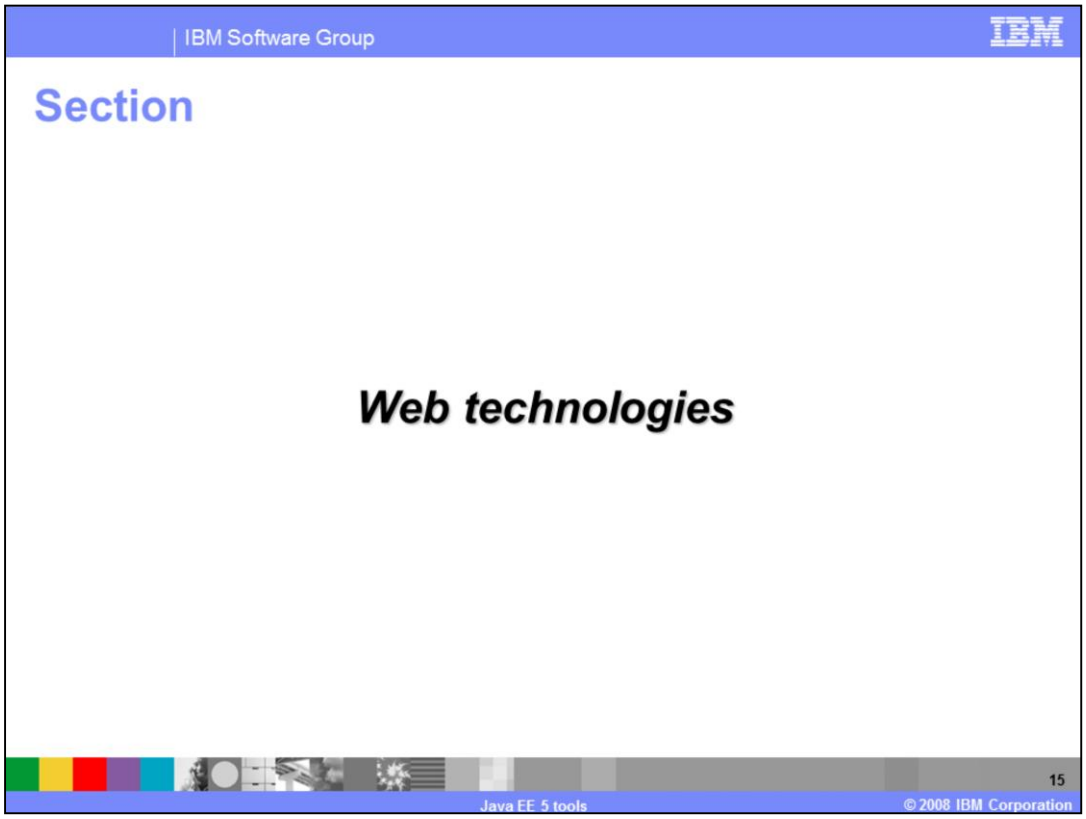
- Will display in your workspace in the Java EE Perspective
  - If needed, open the Annotations view explicitly under **Window > Show View > Other > Annotations > Annotations**
- Annotations view provides
  - Tree view of the annotations in a class
  - Ability to add, edit, or delete annotations
  - Menus for defining annotation attributes







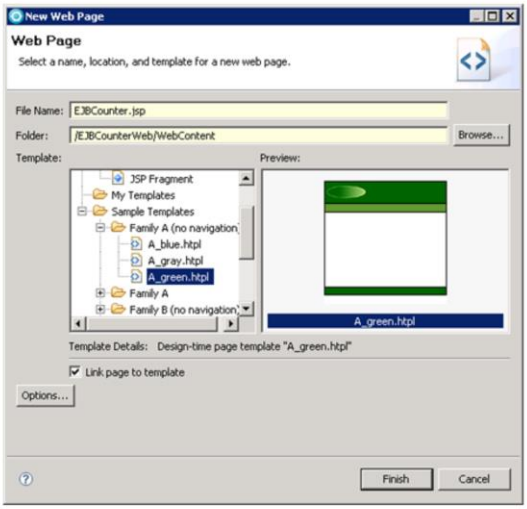
The Annotations view provides a way for you to create, edit, browse, and generally keep track of the annotations that you use in your applications. This view detects annotation types from the metadata in the annotation tag implementation class to provide rich editing capability, including the ability to indicate what attributes can be defined for an annotation and which attributes are required and to provide default validation and user assistance for each annotation. This view also displays in an easy-to-navigate tree structure all of your annotations in your Java classes. You can add and remove annotations using the toolbar icons above the tree. You can filter the tree by typing a filter value in the type filter text field. The view displays implied attributes, default values for attributes that are not required, and annotation values that are being overridden by deployment descriptors.




The last section of this presentation describes new tools in Rational Application Developer for developing Web applications.

# Creating Web pages

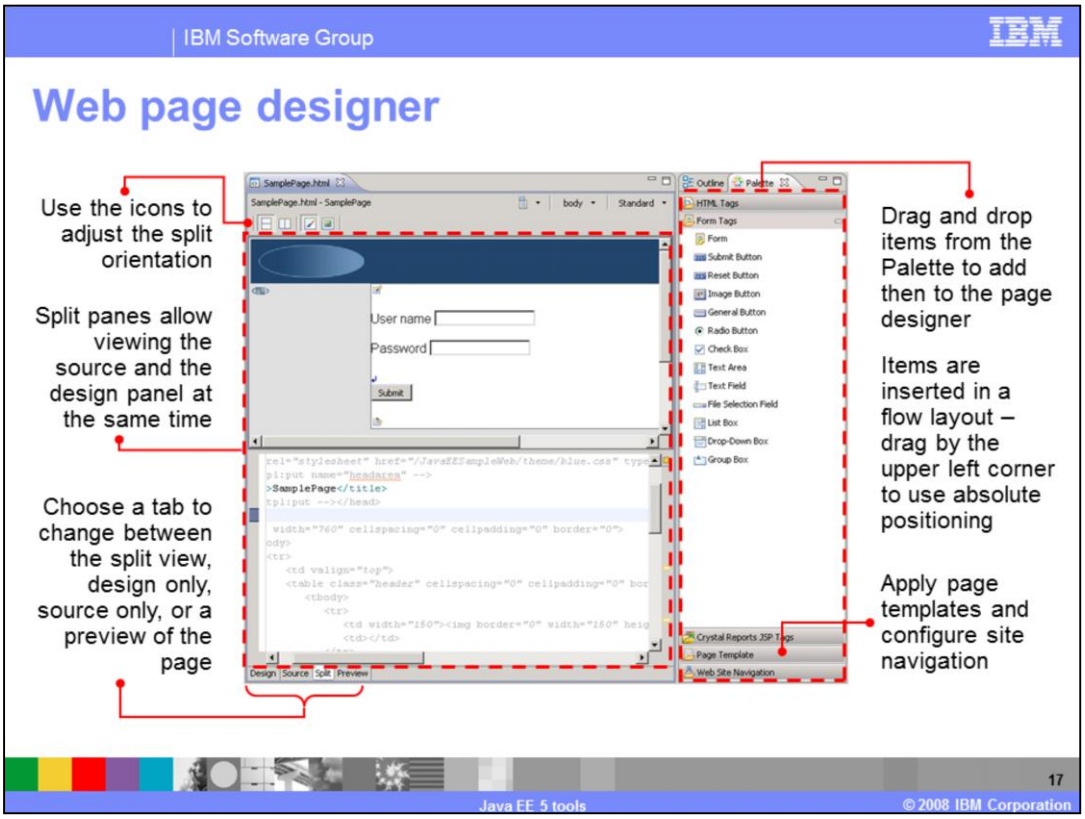
- Create a Web page by right-clicking on a project in the Project Explorer and selecting **New > Web Page**
- Pages can be created based on existing templates
  - Basic templates for HTML/XHTML, JSP, JSP fragments
  - Graphical templates with optional navigation components





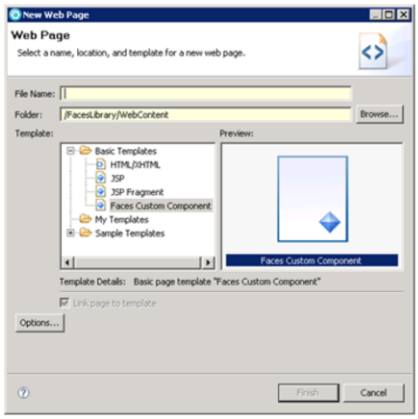


The development workbench contains a simple wizard for creating a new Web page. It allows you to create artifacts for HTML, XHTML, JSP, and JSP fragments. Open the new Web page panel, provide a name for the page, and indicate what type of page you are creating. You can also choose from one of several pre-defined page templates. Many of the templates offer optional navigation components.




The Web page designer is a multi-tabbed editor that makes it easy to edit HTML, XHTML, page template files, JavaServer Pages, Faces JavaServer Pages, and embedded JavaScript code. By clicking on a Page Designer tab, you can display multiple representations of each page: Design, Source, Split, and Preview. The Design page is the WYSIWYG environment that enables you to create and work with a file while viewing its elements on the page. For example, you can see the graphics that you have inserted into the file and continually check the visual presentation of the Web page as you design it. You can drag page components from the Palette to the Design panel. The Source page enables you to view and work with a file's source code directly. The Outline and Properties views both have features that supplement the Source page. They combine the Source page and either the Design page or the Preview page in a split screen view. Changes that you make in one part of the split screen can immediately be seen in the other part of the split screen. You can split the screen horizontally or vertically. The Preview page shows you how the current page is likely to look when viewed in an external Web browser. To preview any dynamic content (such as JSP tags), you use the Run on Server option from the page's pop-up menu in the Enterprise Explorer view.

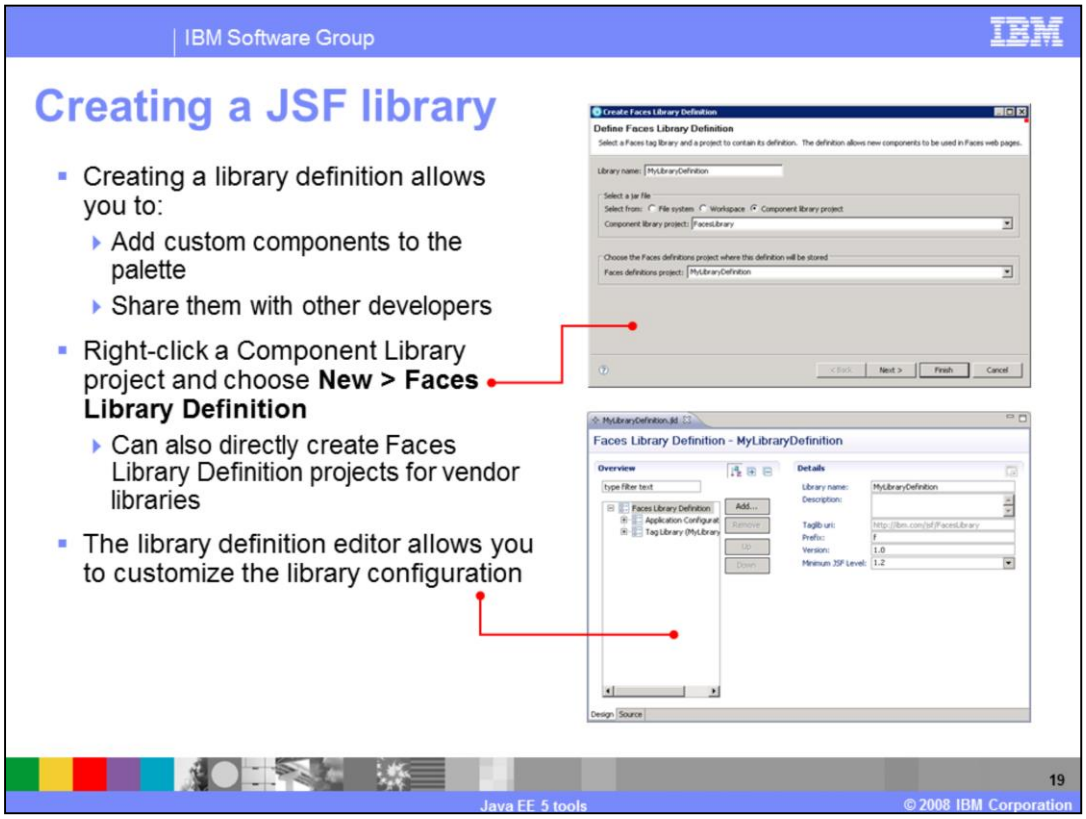
# JavaServer Faces custom components



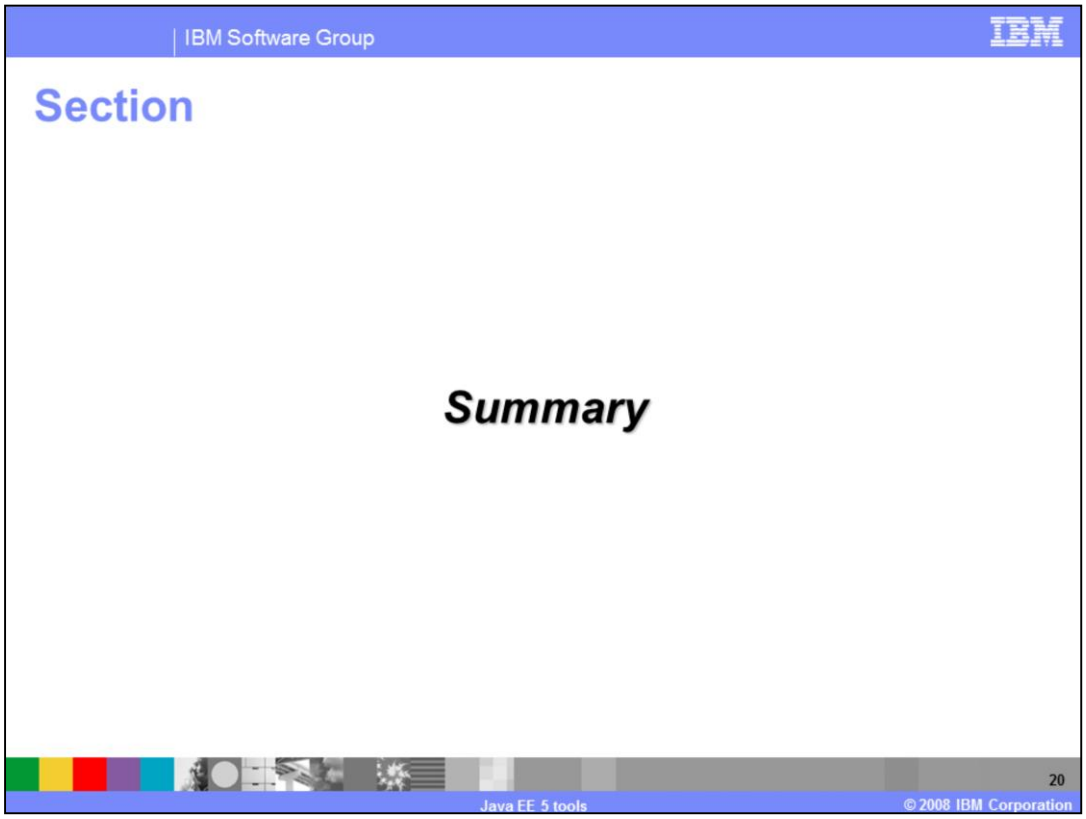

- Build libraries of customized JSF components
  - Combine existing JSF components to build a customized library
  - New components can be made available in the designer palette, used like any other JSF control
- Start with a component library project
  - **New > Project > Web > Faces Component Library Project**
- Generate components using the standard Web page wizard
  - Edit components in the standard Web page editor
  - Tool will automatically generate JSF classes and configuration files




A custom component library contains new and modified JSF components that you can use in your Web applications and distribute the libraries to your development team. A custom component library is a Faces-enabled Web project with the Faces component development facet selected. Each custom component is created in a separate JSP. After one or more JavaServer Pages are created, the project is built and a new custom tag library is generated automatically. The custom JSF components can be added to Web pages.




A Faces Library Definition contains project resources needed for a component library and the metatdata necessary for the interpretation of JSF tags. To configure the Faces Library Definition, double-click your Faces Library Definition to open the library definition file in the editor. Your library definition file has a JLD extension. Once you have configured your library definition, save the file. The definition is updated. To update the file, click Update Library Definition then click Perform update. The update process finds new tags and attributes in the tag library and adds them to the library definition.




This section provides a summary of this presentation.


Rational Application Developer V7.5 provides rich tools for Java EE 5 application development. There are specialized tools available for creating and working with enterprise application projects. The workbench includes an annotations view that allows you to visually browse through and edit the annotations in your application. Web application development tools have been enhanced with a drag-and-drop page designer tool and the ability to create customized JSF libraries.

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