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JAVA BEANS



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CONSTRAINED PROPERTIES

- ▶ A Bean that has a *constrained* property generates an event when an attempt is made to change its value.
- ▶ The event is of type **PropertyChangeEvent**. It is sent to objects that previously registered an interest in receiving such notifications.
- ▶ These other objects have the ability to veto the proposed change.

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event
and it is sent

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beam
and uh that is the

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PERSISTENCE

- ▶ *Persistence* is the ability to save a Bean to non-volatile storage and retrieve it at a later time. The information that is particularly important are the configuration settings.
- ▶ In the example of both the Colors and TickTock Beans, The rectangular property of the Colors Bean was changed to true, and the interval property of the TickTock Bean was changed to one second. These changes can be saved.

of the property interval property
and it has changed its

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and its configuration parameters
and we have to supply that file

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PERSISTENCE

- ▶ Start the BDK again. To restore the application, go to the menu bar of the BeanBox and select File | Load.
- ▶ A dialog box should appear, allowing to specify the name of the file from which an application should be restored.
- ▶ Supply the name of the file in which the application was saved, and click the OK button.

specify the name of the file in which the application should be

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- ▶ Supply the name of the file in which the application was saved, and click the OK button.
- ▶ The application should now be functioning.

of the colors beam is true and the interval

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JAVA BEANS



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PERSISTENCE

- ▶ Confirm that the rectangular property of the **Colors Bean** is **true** and that the interval property for the **TickTock Bean** is equal to one second.
- ▶ The object serialization capabilities provided by the Java class libraries are used to provide persistence for Beans.
- ▶ If a Bean inherits directly or indirectly from java.awt.Component, it is automatically serializable, or if it implements the java.io.Serializable interface.

awt dot component uh
it is automatically serializable

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JAVA BEANS



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configuration of the
parameters configuration

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on the next customizers

must be followed to use the component in a

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CUSTOMIZERS

- ▶ The Properties window of the BDK allows a developer to modify the properties of a Bean.
- ▶ This may not be the best user interface for a complex component with many interrelated properties.
- ▶ Therefore, a Bean developer can provide a *customizer* that helps another developer configure this software.

these complex components contains the interrelated

A customizer can provide a step-by-step guide through the process that must be followed to use the component in a specific context. Online documentation can also be provided.

10 seconds

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CUSTOMIZERS

- ▶ Since builder tools recognize any customizer that implements the Customizer interface, it can be launched from any builder tool that has the bean installed.
- ▶ **Customizer Interface :** The Customizer interface is simple and has only three methods.
- ▶ **setObject(Object bean):** The builder tool calls this method to pass the target bean instance to the customizer. It is called only once, which is before the builder tool launches the customizer.

and next application builder tool
can recognize

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CUSTOMIZERS

► *addPropertyChangeListener(PropertyChangeListener*

listener): This method adds a propertyChange event listener.

By registering as a listener, the target object(s) can receive notification and the modified value of the property. When the

target object receives a propertyChange event, it retrieves the

setter Method object and the property value from the

propertyChangeEvent object. Using this Method object and

property value, the target object then invokes the setter

method in the bean to modify the property.

those objects are already registered to
receive

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set the property

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CUSTOMIZERS

- ▶ *removePropertyChangeListener* (*PropertyChangeListener listener*): This removes a property change event listener.
- ▶ A customizer class has to meet the following requirements to enable builder tools to launch it:
- ▶ *It must implement the Customizer interface*: This is to enable the builder tool to recognize the customizer and to obtain the bean instance, which can be passed on to the customizer. Using this bean instance, the customizer can fetch and modify a bean's properties.

remove remove property change listener
is to be

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CUSTOMIZERS

- ▶ It has to be a subclass (direct or derived) of the `java.awt.Component` class. This is to enable builder tools to embed the customizer in a dialog box.
- ▶ It must have a constructor with no arguments. This is to enable the builder tool to launch it. If constructors with arguments are allowed, builder tools wouldn't know which constructor to call (in case there are many) or what values to pass as parameters.

builder tool
to launch the customizer

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interfaces first one is
applet initializer

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THE JAVA BEANS API

- The Java Beans provides a set of classes and interfaces in the java.beans package.

INTERFACE	DESCRIPTION
AppletInitializer	Methods in this interface are used to initialize beans that are also applets.
BeanInfo	This interface allows a designer to specify information about the properties, events and methods of a bean.
Customizer	This interface allows a designer to provide a graphical interface through which a bean may be configured.
DesignMode	Methods in this interface determine if a bean is executing in design mode.

uh which allows to provide a graphical user interface

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change listener are invoked

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INTERFACE	DESCRIPTION
ExceptionListener	A method in this interface is invoked when an exception has occurred.
PropertyChangeListener	A method in this interface is invoked when a bound property is changed.
PropertyEditor	Objects that implement this interface allow designers to change and display property values.
VetoableChangeListener	A method in this interface is invoked when a constraint property is changed. Methods in this interface allow a bean to execute vetoable operations where a GUI is not available.

will change listener
so with change

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PropertyEditor	Objects that implement this interface allow designers to change and display property values.
VetoableChangeListener	A method in this interface is invoked when a constraint property is changed.
Validity	Methods in this interface allow a bean to execute validations where a GUI is not available.

class provides the information about the bean and

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THE JAVA BEANS API

► The following table lists the classes in **java.beans**.

CLASS	DESCRIPTION
EventHandler	Supports dynamic event listener creation.
EventSetDescriptor	Instances of this class describe an event that can be generated by a Bean.
Expression	Encapsulates a call to a method that returns a result.

handler which supports the
dynamic

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descriptor classes

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CLASS	DESCRIPTION
Introspector	This class analyses a bean and constructs a BeanInfo object that describes the component.
PropertyDescriptor	Instances of this class describe a method of a Bean.
ParameterDescriptor	Instances of this class describe a method parameter
PropertyChangeListener	Handles the state information of an object.

of a java bean
and a parameter

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JAVA BEANS

THE JAVA BEANS API

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CLASS	DESCRIPTION
PropertyEditorSupport	This class provides functionality that can be used when writing property editors.
PropertyVetoException	An exception of this type is generated if a change to a constrained property is vetoed.
BeanInfo	This class provides functionality that can be used when writing BeanInfo classes.

property is
next simple being

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