

JFace Databinding Frank Gerhardt Michael Scharf

Boris Bokowski



Data Binding

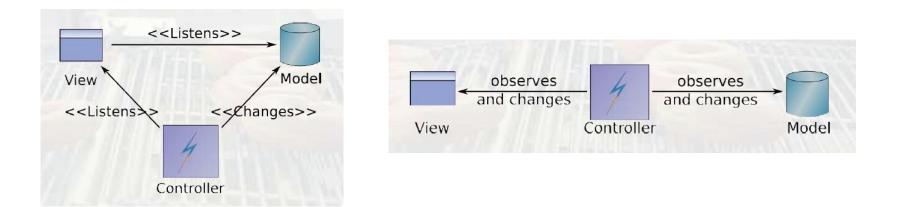


Vision: Get rid of listeners in UI code. Why?

- Hard to write, hard to maintain
- For every aspect:
 - Copy initial state into widget
 - Hook listener (to widget, to model)
 - Write code that sync's state incrementally
 - Validation, conversion typically not separated
 - threading

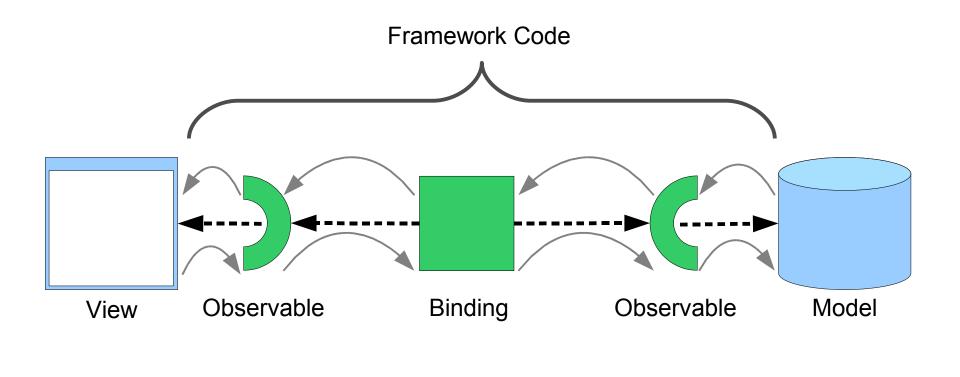
Triangle -> Straight Line

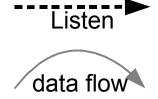
 From model-view-controller (MVC) triangle to more independence



From David Orme, Introducing JFace Data Binding, EclipseCon 2006, made available under EPL 1.0

Concepts





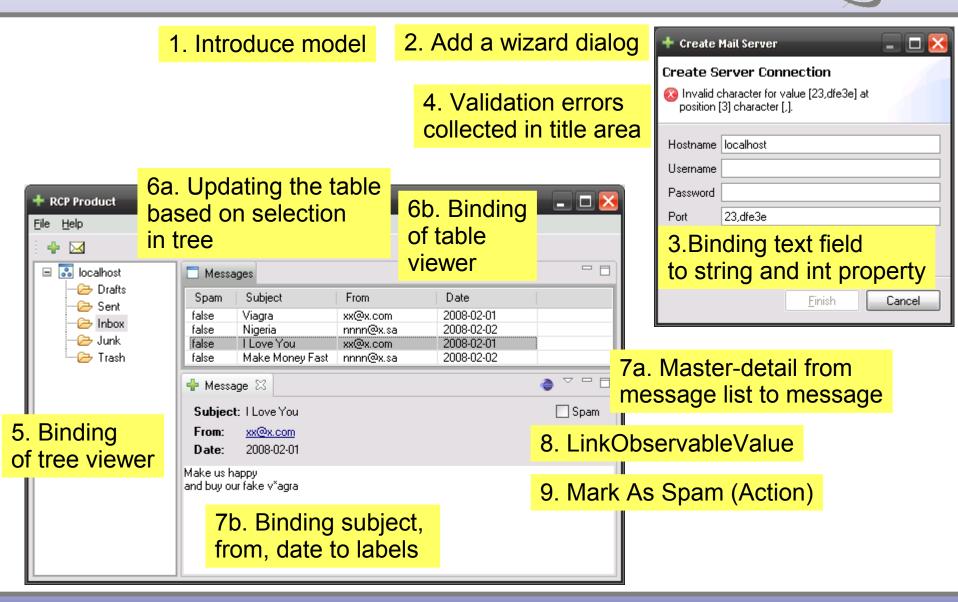
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INFORMA

Running Example: RCP

- RCP Mail is the base of our data binding example
- We added some GUI elements to show various bindings

File Help Image: Metrix com Image: Metrix com Image: Inbox Image: Metrix com Image: Image	+ RCP Product	- D 🔀
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This RCP Application was generated from the PDE Plug-in Project wizard. This sample shows how to: add a top-level menu and toolbar with actions add a top-level menu and toolbar with actions create views that can't be closed and multiple instances of the same view perspectives with placeholders for new views use the default about dialog	1 🕂 🖂	
	□ Inbox □ Drafts □ Inbox □ Inbox	Message 23 Subject: This is a message about the cool Eclipse RCP! From: nicole@mail.org Date: 10:34 am This RCP Application was generated from the PDE Plug-in Project wizard. This sample shows how to: - add a top-level menu and toolbar with actions - add a top-level menu and toolbar with actions - add a top-level menu and toolbar with actions - create views that can't be closed and multiple instances of the same view - perspectives with placeholders for new views - use the default about dialog



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INFORMATICS

1. Introduce model

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	false false	T Love You Make Money Fast	xx@x.com nnnn@x.sa	2008-02-01 2008-02-02	
	🕂 Messa	ige 🛛			● ▽ □ □
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	From:	xx@x.com			
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Create S	erver Connection							
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Username]						
Password]						
Port	23,dfe3e]						
	<u>F</u> inish Cancel]						

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PropertyChange Support

No other requirements

```
import java.beans.PropertyChangeListener;
import java.beans.PropertyChangeSupport;
```

```
private final PropertyChangeSupport propertyChangeSupport = new PropertyChangeSupport(this);
```

```
public void addPropertyChangeListener(PropertyChangeListener listener) {
    propertyChangeSupport.addPropertyChangeListener(listener);
}
```

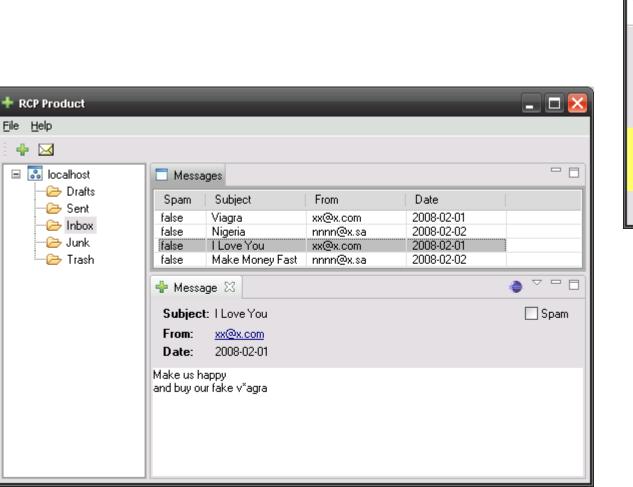
```
public void addPropertyChangeListener(String propertyName, PropertyChangeListener listener) {
    propertyChangeSupport.addPropertyChangeListener(propertyName, listener);
}
```

```
public void removePropertyChangeListener(PropertyChangeListener listener) {
    propertyChangeSupport.removePropertyChangeListener(listener);
}
```

public void removePropertyChangeListener(String propertyName, PropertyChangeListener listener) {
 propertyChangeSupport.removePropertyChangeListener(propertyName, listener);
}

```
protected void firePropertyChange(String propertyName, Object oldValue, Object newValue) {
     propertyChangeSupport.firePropertyChange(propertyName, oldValue, newValue);
}
```

1. Introduce model 2. Add a wizard dialog

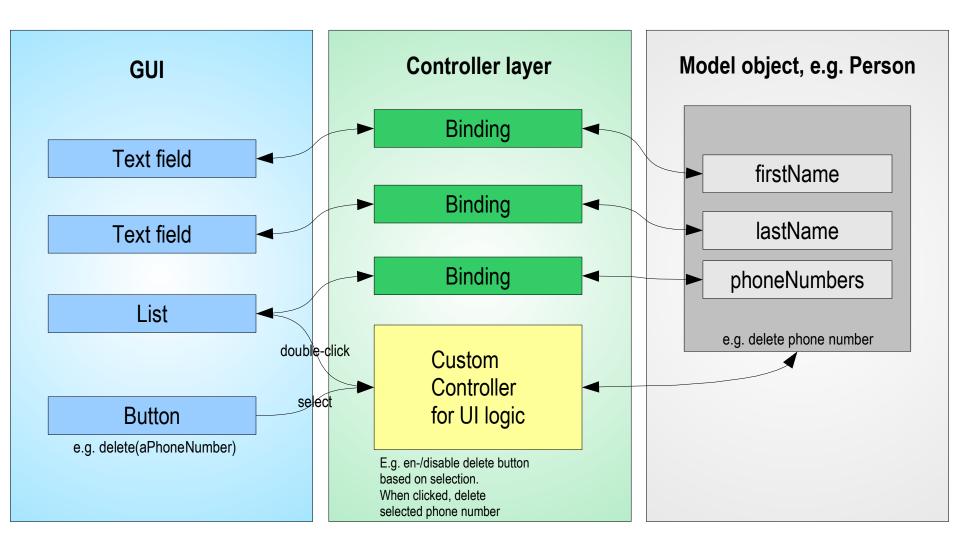


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3.Bin	ding text field							
to str	ing and int property							
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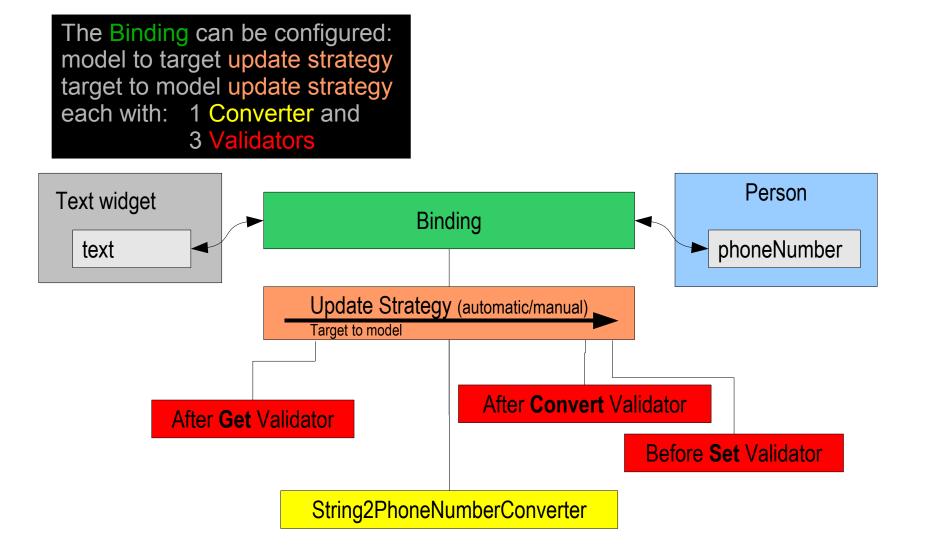
Architecture with DB



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+ RCP Product File Help					🔀	Port	23,dfe3e	
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Converters & Validators



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Drafts	Spam	Subject	From	Date	
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Trash	false false	T Love You Make Money Fast	xx@x.com nnnn@x.sa	2008-02-01 2008-02-02	
	🔶 Messa	ige 🛛			● ▽ □ □
	Subject	t: I Love You			🗌 Spam
5. Binding of tree viewer	From: Date:	<u>xx@x.com</u> 2008-02-01			
	Make us h and buy ou	appy Ir fake v [×] agra			

Note: non-API in 3.3

- TreeViewer support will be in 3.4
- Internal/provisional as of 3.3

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Hostname	localhost							
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From

xx@x.com

nnnn@x.sa

xx@x.com

nnnn@x.sa

Date

2008-02-01

2008-02-02

2008-02-01

2008-02-02

RCP Product

🖃 🔝 localhost

- 🧀 Drafts

- 🧀 Sent

🕞 Inbox

- 🗁 Junk

🕞 Trash

🗖 Messages

🕂 Message 🖾

Subject: I Love You

Spam

false

false

false

false

From:

Date: Make us happy and buy our fake v*agra

Subject

Viagra

Nigeria

Love You

xx@x.com

2008-02-01

7b. Binding subject, from, date to labels

Make Money Fast

<u>File</u><u>H</u>elp ÷

	🕂 Create I	Mail Server 📃 🗖 🔀
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7a.	Maste	er-detail from

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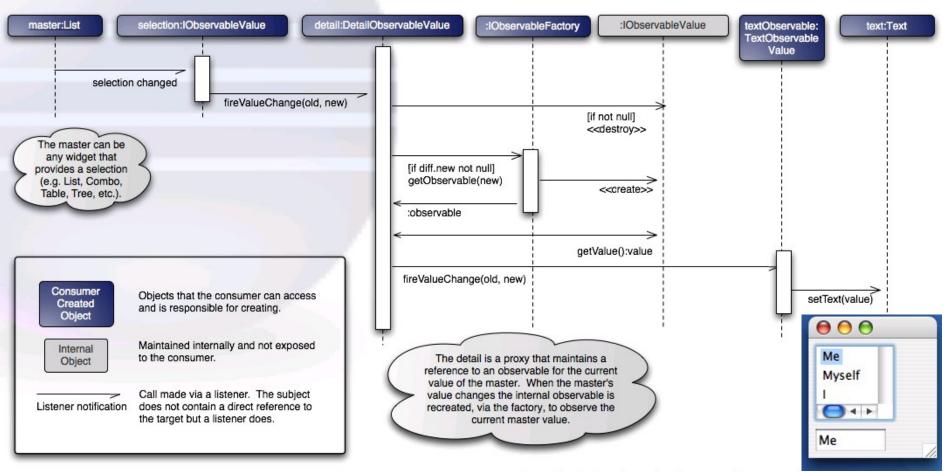
Spam

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message	list to	message
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Master-Detail Binding

JFace Data Binding: Master Detail Selection Change



© 2006 Brad Reynolds and others | http://fire-change-event.blogspot.com | made available under EPL v1.0

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	Password	
	Port	23,dfe3e
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Spam		
LinkOb	servabl	eValue

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+ RCP Product					_ 🗆 🔀	Password	
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	false	Viagra	xx@x.com	2008-02-01			
- 🥭 Junk	false false	Nigeria T Love You	nnnn@x.sa xx@x.com	2008-02-02 2008-02-01			
🖳 🗁 Trash	false	Make Money Fast		2008-02-02			
	🕂 Messa	age 🛛			● ▽ □ □		
	Subjec	Spam 🗌					
	From: Date:	<u>xx@x.com</u> 2008-02-01			8. LinkOb	servab	leValue
	Make us h and buy ou	appy ur fake v [*] agra					

Factories



- Observables
- BeansObservables
- SWTObservables
- ViewersObservables
- MasterDetailObservables
- ...add your own!

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	Create Server Connection									
	Number 23, 200 [23, dfe38] at position [3] character [,].									
	Hostname localhost									
	Username									
	Password									
	Port 23,dfe3e									
- 8										
	<u>F</u> inish Cancel									
]Spam										
Mark	As Spam (Action)									

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Eile	+ 🖂	🗖 Messa	ages				Pass Port
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н.	🗁 Junk	false	I Love You	xx@x.com	2008-02-01		
Ш.	🎰 🗁 Trash	false	Make Money Fast	nnnn@x.sa	2008-02-02		
		🕂 Messa	age 🛛	● ▽ □ □			
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Ш.		From:	xx@x.com				
		Date:	2008-02-01				
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Benefits



- Provides structure
- Makes it easy to create multiple views onto the same model objects
- Setting up bi-directional bindings as easy as the uni-directional case
- If your model is changed from a non-Ul thread
- Master-detail just try coding it by hand
- Makes it easy to reuse validation code

Disadvantages

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- Learning curve
- Generic implementation makes it complex (create your own helper classes!)
- Overhead (space and time)
- Requires model that fires change events
- Hard to debug when things go wrong

Recap: Features (1)



- IObservable and Binding
 - Source and target are wrapped
- No superclasses or interfaces required
 - Standard Java beans, with PropertyChangeEvents
 - Other models possible (e.g. EMF, ...)
 - Even other UI toolkits (e.g. GWT, Swing, ...)
- Bindings are set up once
 - Careful design can avoid rebinding (master-detail)
- Validators: context collects validation errors
- Converters : model-to-UI, UI-to-model
- Pluggable update strategies (immediately, when validation is ok, manual, custom)

Recap: Features (2)

- Binding of
 - Values (String, Boolean, Integer...), 1:1
 - Lists, n:n
 - Master-Detail
- Can bind to UI state
 - Model.locked to Text.enabled
 - Color, visibility, many more
- Can bind to UI state, selection of list or table
 - Zero additional UI logic required
- Can bind to validation errors

Non-Features



- Can only bind to one level of properties
 - Not a.b.c directly
 - need to bind a-b and b-c
 - Workaround only for values (1:1), not for lists (n:n)
- Trees are not supported well
 - Internal, provisional
- Little documentation, only examples

How-to



- Decide which type to use
 - Value (1:1), list (n:n), master detail
- For values
 - Wrap model into Observable using BeansObservables Factory
 - Wrap UI into Observable using
 SWTObservables or ViewerObservables
- For lists
 - Use supplied ContentProvider and setInput

Examples





Steve Northover Grant Gayed

Veronika Irvine Mike Wilson

From CVS

reset collection

:pserver:anonymous@dev.eclipse.org:/cvsroot/eclipse/org.eclipse.jface.examples.databindi

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HelloWorld

Resources



- JFace Databinding Wiki page
 - http://wiki.eclipse.org/index.php/JFace_Data_Binding
- Newsgroup
 - eclipse.platform with [DataBinding] in subject
- Bugzilla
 - Product=Platform, Component=UI, Summary with [DataBinding]
- Examples from CVS

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