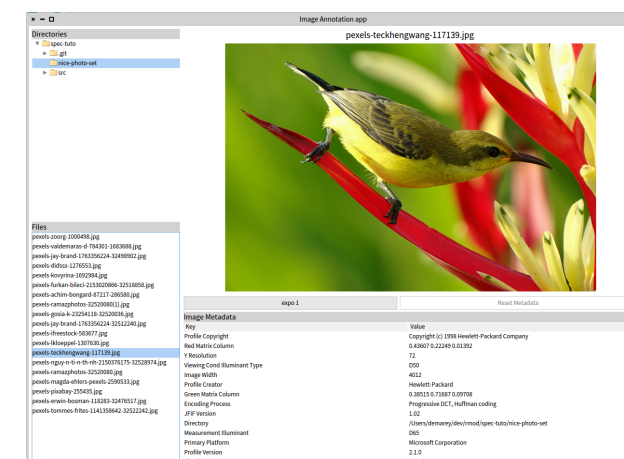


How to write an App with Spec?

Christophe Demarey

Inria Engineer



with the support of Esteban Lorenzano

What is Spec?



Spec is a framework in Pharo for describing user interfaces

✓ Fits for a wide range of User Interfaces

✓ Most Pharo tools are written in Spec

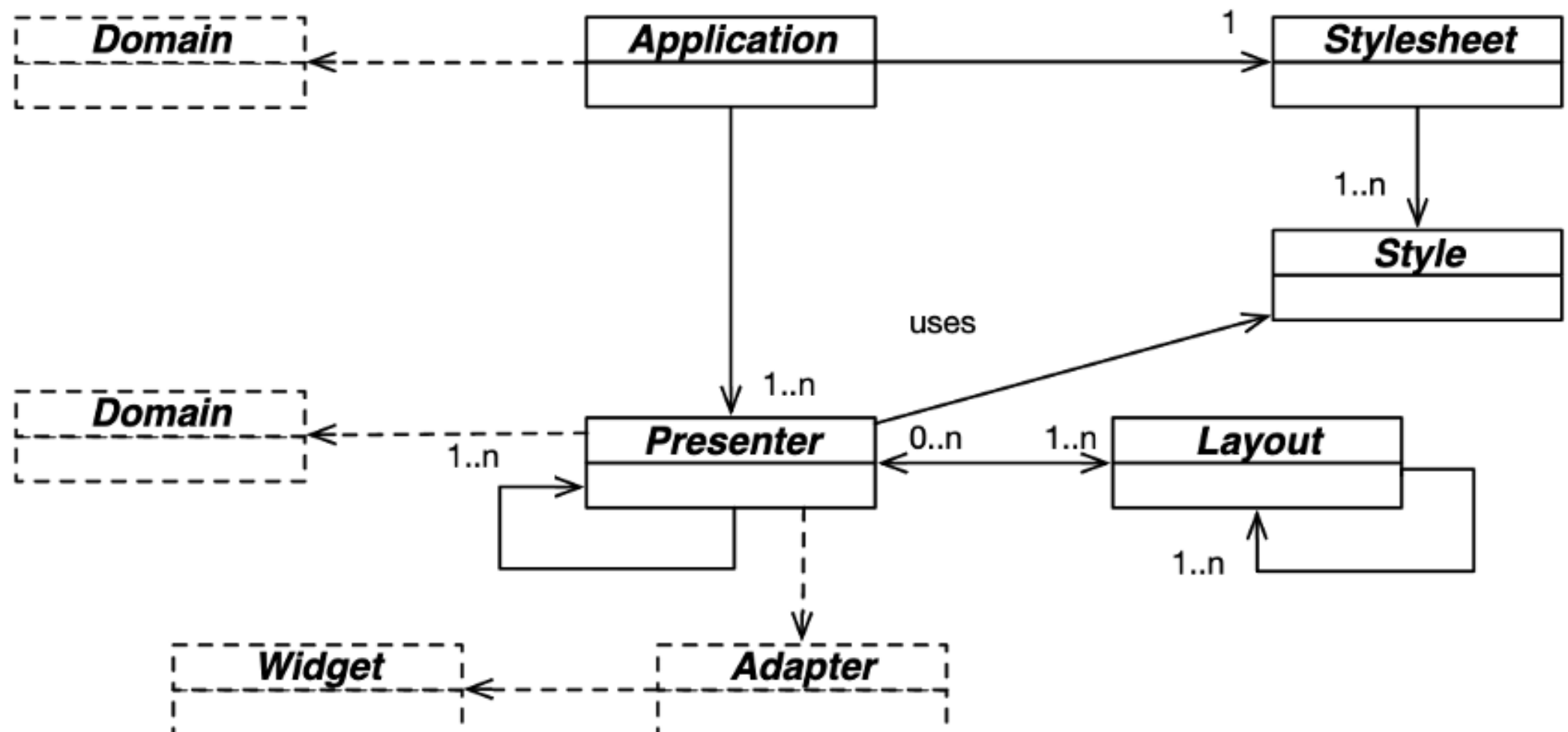
Fundamental principle behind Spec:

reuse of user interface logic and its visual composition

User interfaces are built by reusing and composing existing user interfaces, and configuring them as needed

Spec overview

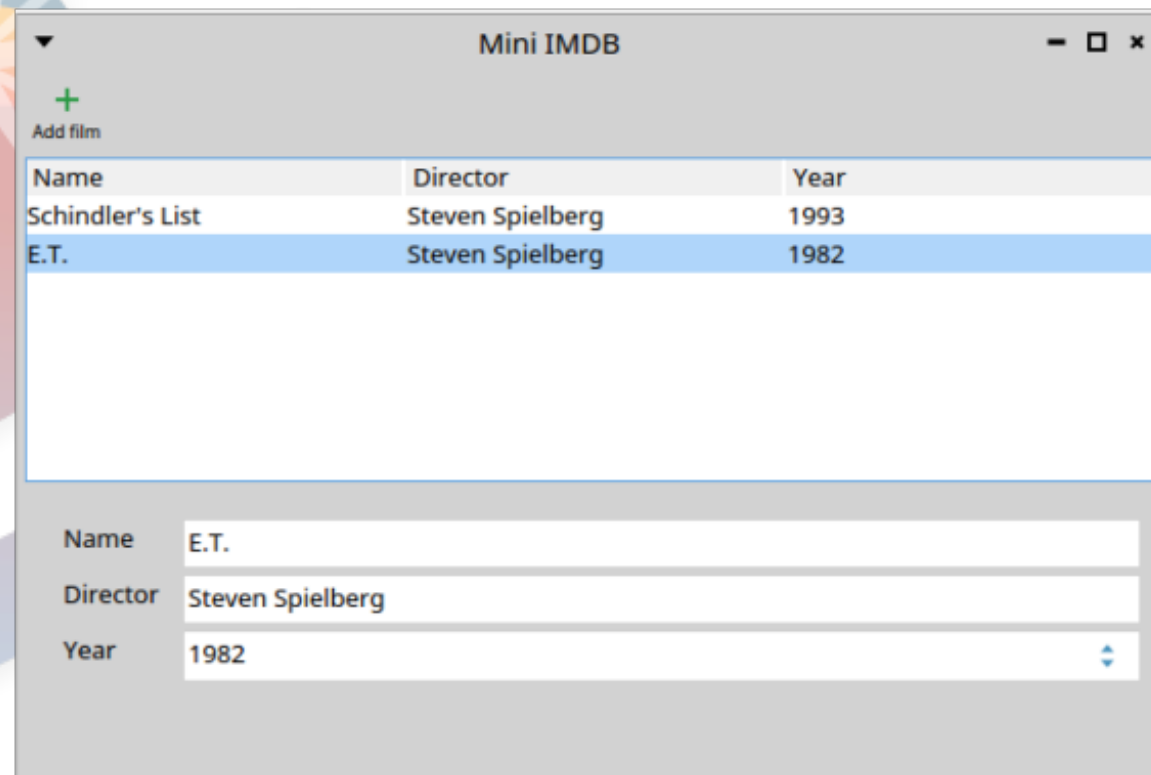
A presenter manages the UI logic and the link between widgets and domain objects.



Write once in Spec, Run on many backends

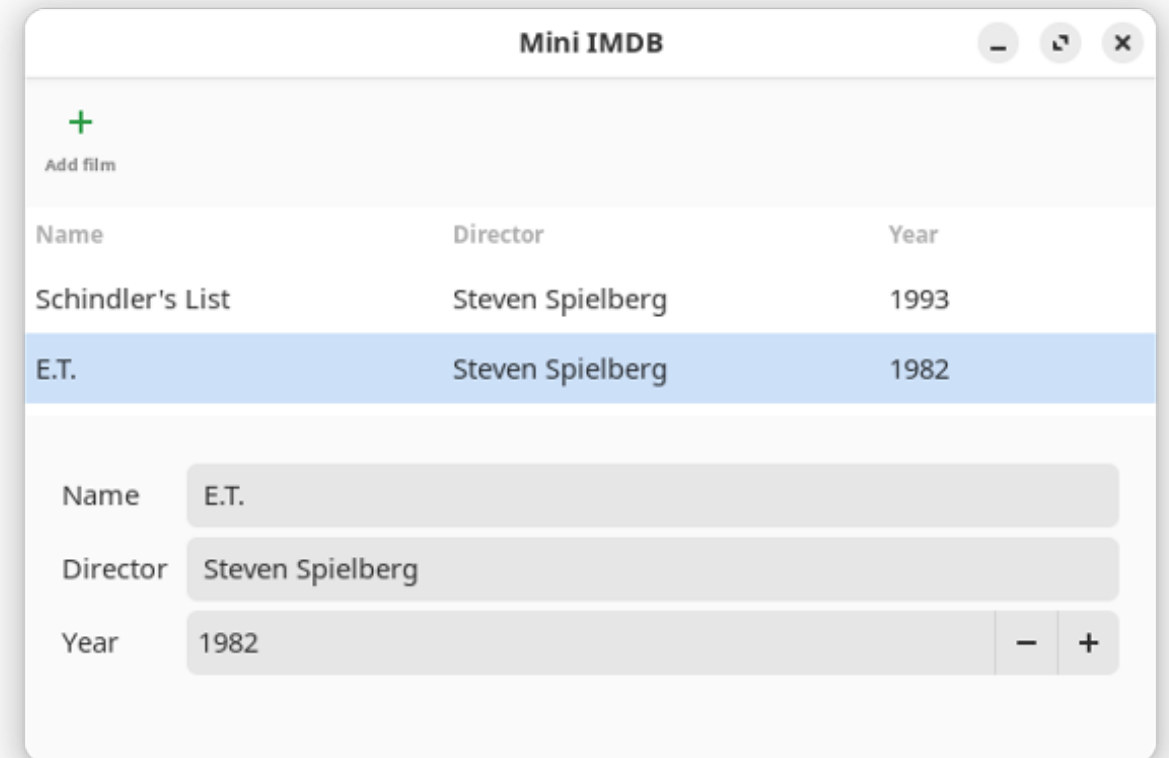
Morphic backend

GTK backend

A screenshot of the 'Mini IMDB' application running on the Morphic backend. The window has a grey title bar with the text 'Mini IMDB' and standard window controls. Below the title bar is a green '+' icon and the text 'Add film'. The main content area contains a table with three columns: 'Name', 'Director', and 'Year'. The table has two rows: 'Schindler's List' by 'Steven Spielberg' in '1993', and 'E.T.' by 'Steven Spielberg' in '1982'. The 'E.T.' row is highlighted in blue. Below the table is a form with three input fields: 'Name' with the value 'E.T.', 'Director' with the value 'Steven Spielberg', and 'Year' with the value '1982' and a small blue double-headed arrow icon to its right.

Name	Director	Year
Schindler's List	Steven Spielberg	1993
E.T.	Steven Spielberg	1982

Name: E.T.
Director: Steven Spielberg
Year: 1982

A screenshot of the 'Mini IMDB' application running on the GTK backend. The window has a white title bar with the text 'Mini IMDB' and standard window controls. Below the title bar is a green '+' icon and the text 'Add film'. The main content area contains a table with three columns: 'Name', 'Director', and 'Year'. The table has two rows: 'Schindler's List' by 'Steven Spielberg' in '1993', and 'E.T.' by 'Steven Spielberg' in '1982'. The 'E.T.' row is highlighted in blue. Below the table is a form with three input fields: 'Name' with the value 'E.T.', 'Director' with the value 'Steven Spielberg', and 'Year' with the value '1982' and a small blue double-headed arrow icon to its right.

Name	Director	Year
Schindler's List	Steven Spielberg	1993
E.T.	Steven Spielberg	1982

Name: E.T.
Director: Steven Spielberg
Year: 1982

Let's write a small Spec app!



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Image Annotation App



VectorStock® VectorStock.com/46646872



Image Annotation app

Directories

spec-tuto

.git

nice-photo-set

src

Files

pexels-zoorg-1000498.jpg

pexels-valdemaras-d-784301-1683688.jpg

pexels-jay-brand-1763356224-32498902.jpg

pexels-didsss-1276553.jpg

pexels-kovyrina-1692984.jpg

pexels-furkan-bileci-2153020866-32518858.jpg

pexels-achim-bongard-87217-286580.jpg

pexels-ramazphotos-32520080(1).jpg

pexels-gosia-k-23254118-32520036.jpg

pexels-jay-brand-1763356224-32512240.jpg

pexels-ifreestock-583677.jpg

pexels-lkloepfel-1307630.jpg

pexels-teckhengwang-117139.jpg

pexels-nguy-n-ti-n-th-nh-2150376175-32528974.jpg

pexels-ramazphotos-32520080.jpg

pexels-magda-ehlers-pexels-2590533.jpg

pexels-pixabay-255435.jpg

pexels-erwin-bosman-118283-32476517.jpg

pexels-tommes-frites-1141358642-32522242.jpg

pexels-teckhengwang-117139.jpg

expo 1

Reset Metadata

Image Metadata

Key	Value
Profile Copyright	Copyright (c) 1998 Hewlett-Packard Company
Red Matrix Column	0.43607 0.22249 0.01392
Y Resolution	72
Viewing Cond Illuminant Type	D50
Image Width	4012
Profile Creator	Hewlett-Packard
Green Matrix Column	0.38515 0.71687 0.09708
Encoding Process	Progressive DCT, Huffman coding
JFIF Version	1.02
Directory	/Users/demarey/dev/rmod/spec-tuto/nice-photo-set
Measurement Illuminant	D65
Primary Platform	Microsoft Corporation
Profile Version	2.1.0
File Size	1163 kB

Image Annotation App

Simple application that allows the user to

- Browse images from the filesystem
- Display the selected image
- Display the selected image metadata
- Tag or reset the image description metadata



Presenter definition


A Spec presenter commonly has:

- sub-presenters,
- a layout

▲ `defaultLayout`
▲ `initializePresenters`

You need to define them and then connect presenters

Presenter definition example



```
SpPresenter << #SpColorCodePresenter
  slots: { #rCodeInput . #gCodeInput . #bCodeInput .
           #hexaCode . #colorBox . #alphaColorBox };
  package: 'ColorPicker'
```

SpPresenter Vs SpPresenterWithModel

Use SpPresenterWithModel when you want to react to changes of the model.



=> while the presenter is open, an event changes the model that was used to build the UI

=> the method `modelChanged` will be called at each change of the model. You can define how to update the presenter accordingly

SptMetadataPresenter

```
SpPresenterWithModel << #SptMetadataPresenter  
  slots: { #table };  
  tag: 'Presenters';  
  package: 'Spec2-Tutorial'
```


Image metadata

Key	Value
File Type Extension	jpg
JFIF Version	1.01
File Modification Date/Time	2024
File Name	IMG_6642.jpg
File Size	1502 kB
File Access Date/Time	2024
Directory	/Users/me/Pictures
Exif Byte Order	Big-endian (Motorola, MM)
Make	Apple
File Inode Change Date/Time	2024
ExifTool Version Number	13.30
File Permissions	-rwx-----
File Type	JPEG
MIME Type	image/jpeg
Camera Model Name	iPhone 15 Pro Max

SptMetadataPresenter subpresenters

`initializePresenters`

```
table := self newTable
    addColumn: (SpStringTableColumn
        title: 'Key'
        evaluated: [ :association | association key ]);
    addColumn: (SpStringTableColumn
        title: 'Value'
        evaluated: [ :association | association value ]);
yourself
```



Key	Value
File Type Extension	jpg
JFIF Version	1.01
File Modification Date/Time	2024
File Name	IMG_6642.jpg
File Size	1502 kB
File Access Date/Time	2024
Directory	/Users/me/Pictures
Exif Byte Order	Big-endian (Motorola, MM)
Make	Apple
File Inode Change Date/Time	2024
ExifTool Version Number	13.30
File Permissions	-rwx-----
File Type	JPEG
MIME Type	image/jpeg
Camera Model Name	iPhone 15 Pro Max

SptMetadataPresenter layout

defaultLayout

```
^ SpBoxLayout newTopToBottom  
  add: 'Image metadata' expand: false;  
  add: table;  
  yourself
```



Image metadata	
key	value
File Type Extension	jpg
JFIF Version	1.01
File Modification Date/Time	2024
File Name	IMG_6642.jpg
File Size	1502 kB
File Access Date/Time	2024
Directory	/Users/me/Pictures
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Make	Apple
File Inode Change Date/Time	2024
ExifTool Version Number	13.30
File Permissions	-rwx-----
File Type	JPEG
MIME Type	image/jpeg
Camera Model Name	iPhone 15 Pro Max

Presenter update

- Why? My data changed
- What? Set data used by presenters / widgets
- `updatePresenter` and `modelChanged` methods



SpPresenter

SpPresenterWithModel

SptMetadataPresenter update

modelChanged

```
table items: (self model  
  ifNotNil: [ :aModel | aModel metadata associations ]  
  ifNil: [ #() ])
```

SptMetadataPresenter class

example

<script>

```
(self on: SptImageMetadata example) open
```



VectorStock

VectorStock.com/46646872

Improving Window

```
initializeWindow: aWindowPresenter
```

```
super initializeWindow: aWindowPresenter.  
aWindowPresenter title: 'Image Annotation app'
```

- Set window title
- Set window size

Ex: `aWindowPresenter` `initialExtent: 1000@600`



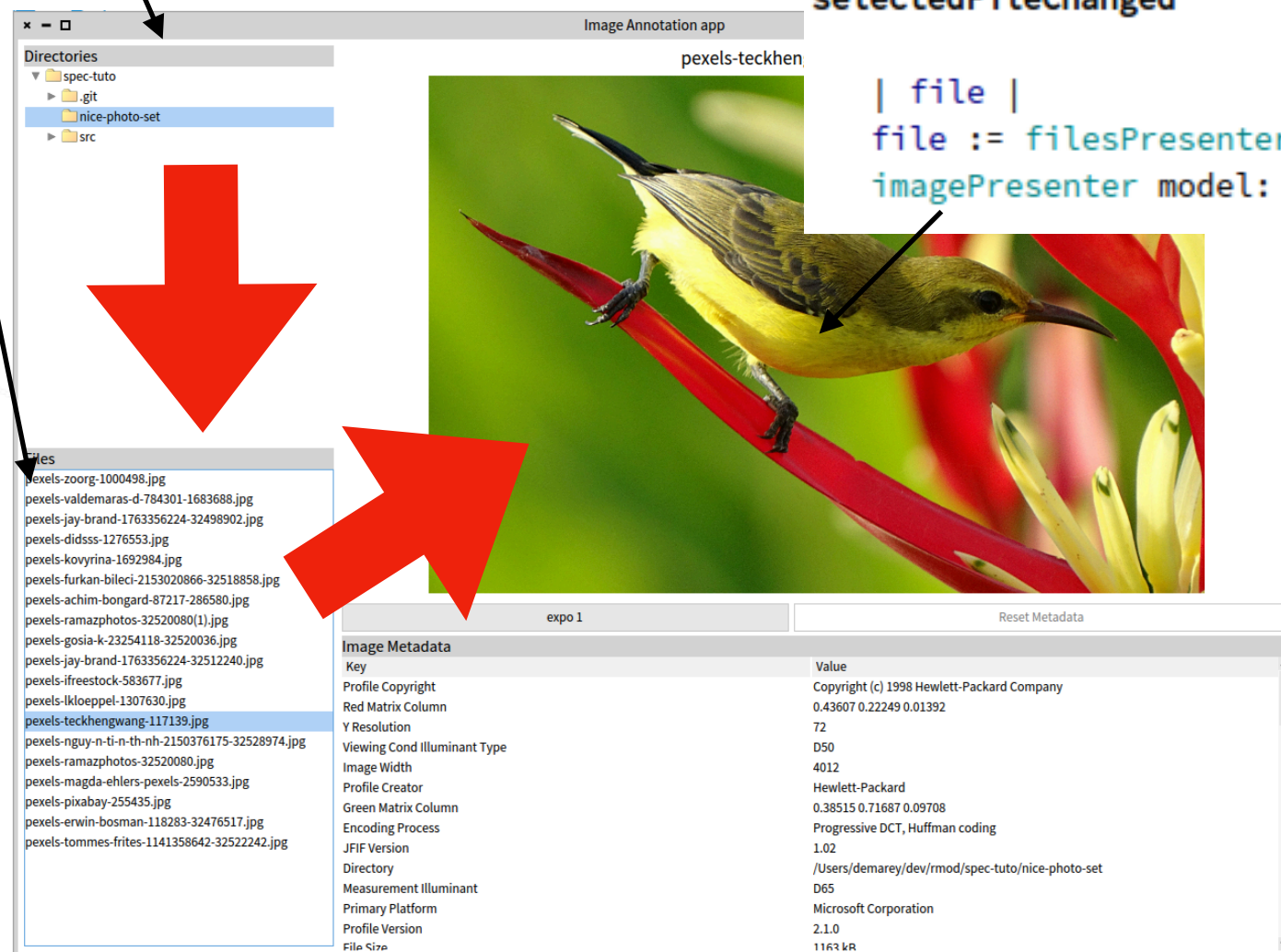
Communication between components

connectPresenters

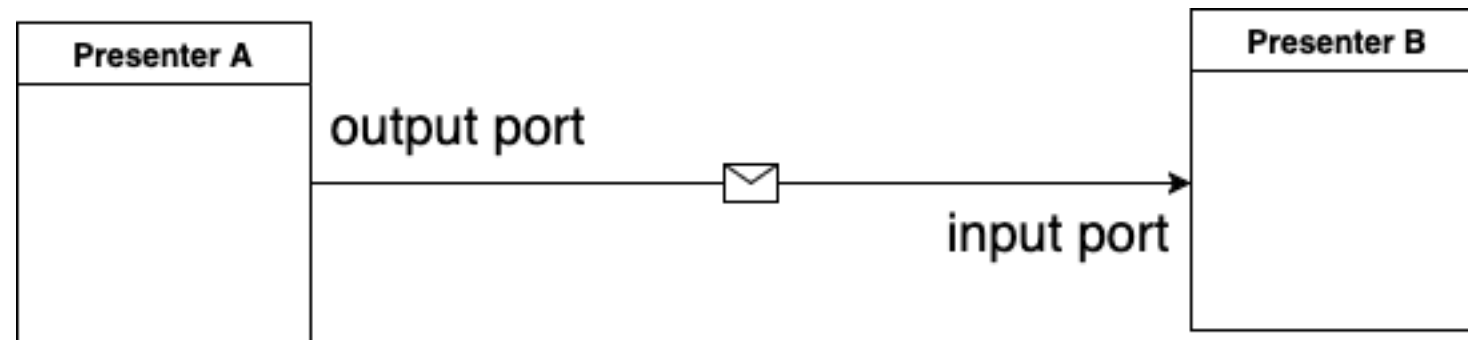
```
directoryPresenter whenSelectedItemChangedDo: [ self selectedDirectoryChanged ].  
filesPresenter whenSelectedItemChangedDo: [ self selectedFileChanged ]
```

selectedFileChanged

```
| file |  
file := filesPresenter selectedItem.  
imagePresenter model: (SptImageMetadata forImage: file)
```



Communication between components using transmissions



connectPresenters

```
directoryPresenter transmitTo: filesPresenter transform: [ :dirWrapper |
    dirWrapper
    ifNil: [ #() ]
    ifNotNil: [ dirWrapper fileReference files ] ].
filesPresenter
transmitTo: imagePresenter
transform: [ :file | SptImageMetadata forImage: file ]
```



Spec application

```
SpApplication << #SptImageAnnotationApplication  
  slots: {};  
  tag: 'Presenters';  
  package: 'Spec2-Tutorial'
```

Application entry point

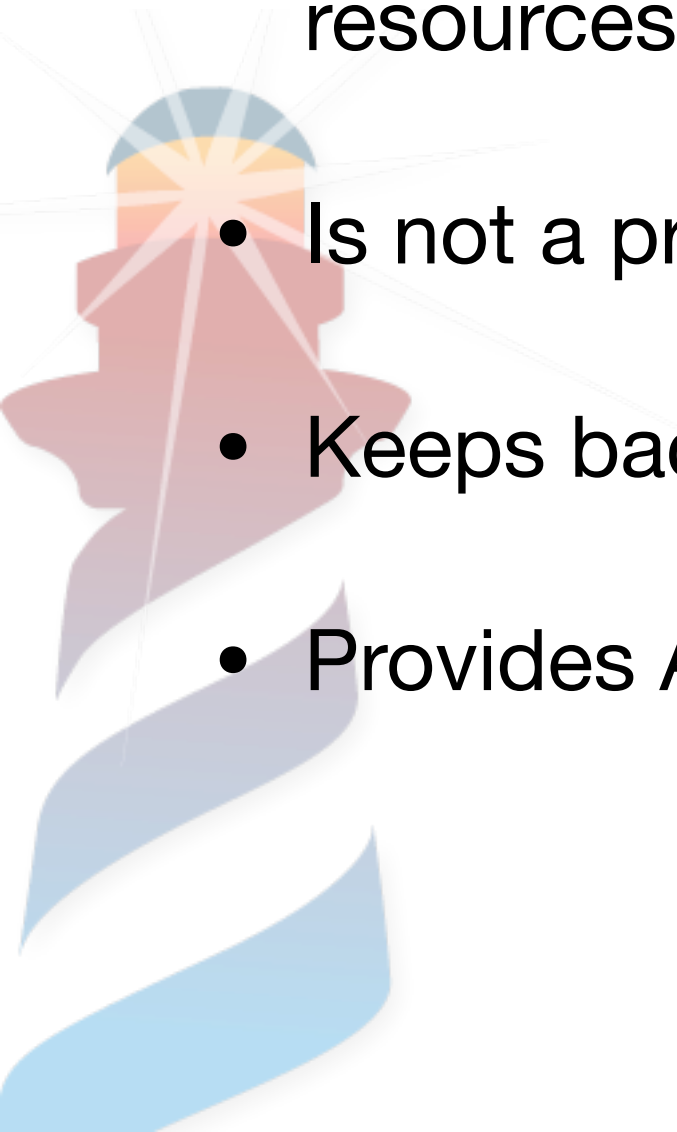
start

```
(SptImageAnnotationPresenter newApplication: self) open
```



Spec application

- Handles your application initialization, configuration, and resources
- Is not a presenter
- Keeps backend, theme, icons
- Provides API for UI interactions (inform, confirm, ...)



Thanks!



pharo-spec/spec-tuto



**Will come soon:
step by step
instructions for the
tutorial**