

Building real-life applications

with Spec and GTK

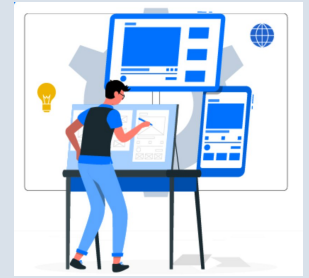
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pharo.org

What is Spec?

(Last time we talked about this was 2020, you may have forgotten about it ;)



Spec is a framework in Pharo for describing user interfaces

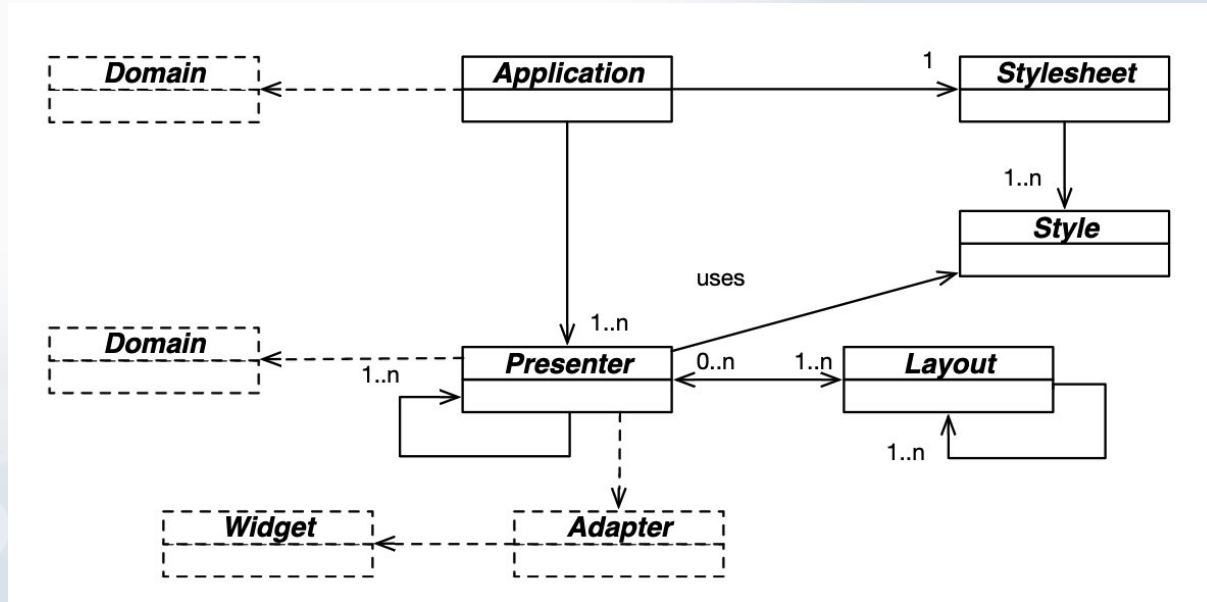
- Fits for a wide range of UIs
 - Most Pharo tools are written in Spec
- Fundamental principle behind Spec:
 - Reuse of UI logic and its visual composition

=> User interfaces are built by reusing and composing existing UIs, and configuring them as needed



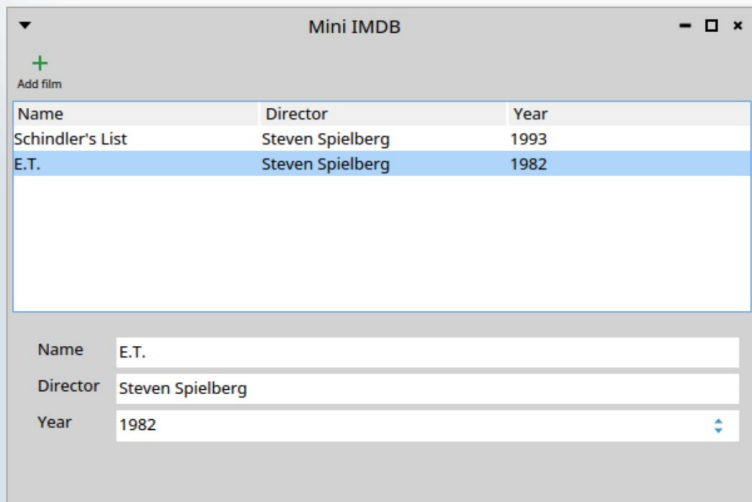
Spec overview

A framework in Pharo for describing User Interfaces



Write once in Spec, run on many backends

- Write your app once in Spec
- Will then be runnable on Morphic, GTK, *Toplo*



By the way, last screenshots were made like this:

```
items := {
  { 'Schindler''s List'. 'Steven Spielberg'. 1993 }.
  { 'E.T.'. 'Steven Spielberg'. 1982 }.
}.
presenter := SpPresenter new.
presenter application: (SpApplication new useBackend: #Gtk).

toolbar := presenter newToolbar.
toolbar add: (presenter newToolbarButton
  icon: (presenter iconNamed: 'add');
  label: 'Add film';
  yourself).

list := presenter newTable
  items: items;
  addColumn: (SpStringTableColumn title: 'Name' evaluated: #first);
  addColumn: (SpStringTableColumn title: 'Director' evaluated: #second);
  addColumn: (SpStringTableColumn title: 'Year' evaluated: #third);
  yourself.

nameText := presenter newTextInput.
directorText := presenter newTextInput.
yearNumber := presenter newNumberInput.
```

```
nameText := presenter newTextInput.
directorText := presenter newTextInput.
yearNumber := presenter newNumberInput.

list transmitDo: [ :anArray |
  nameText text: anArray first.
  directorText text: anArray second.
  yearNumber number: anArray third ].

presenter layout: (SpBoxLayout newVertical
  add: toolbar expand: false;
  add: list;
  add: (SpGridLayout build: [ :builder | builder
    beColumnNotHomogeneous;
    column: 2 withConstraints: [ :c | c beExpand ];
    add: 'Name'; add: nameText; nextRow;
    add: 'Director'; add: directorText; nextRow;
    add: 'Year'; add: yearNumber; nextRow ]);
  yourself).

presenter asWindow
  title: 'Mini IMDB';
  initialExtent: 600@400;
  open.
```

(I am not saying you have to do it in the same way, but is nice to see how scriptable Spec is)



What is GTK?

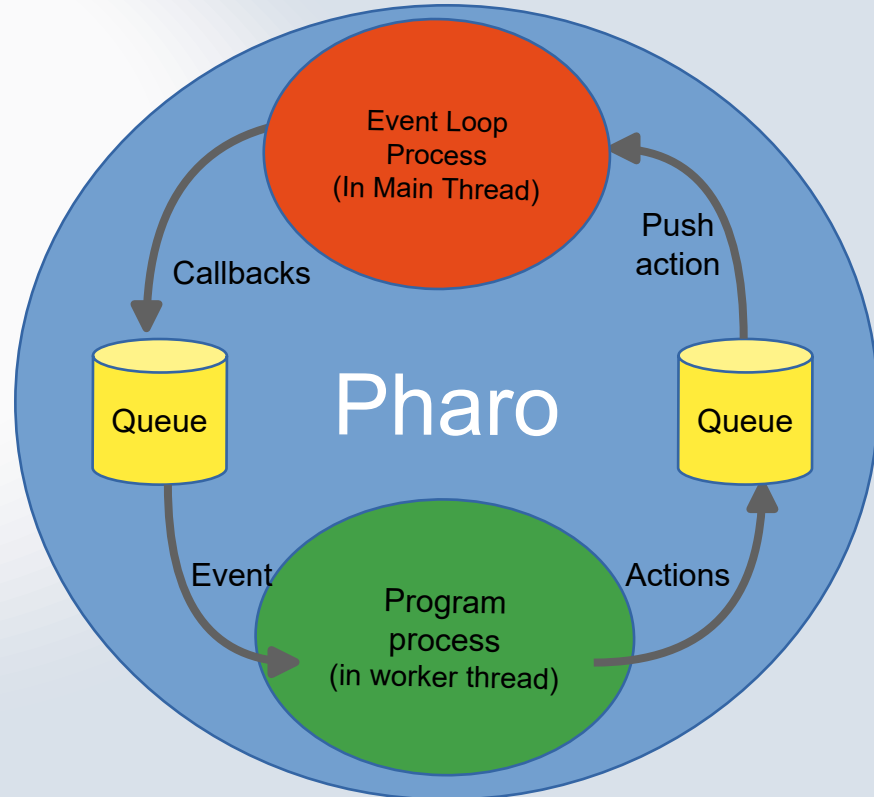
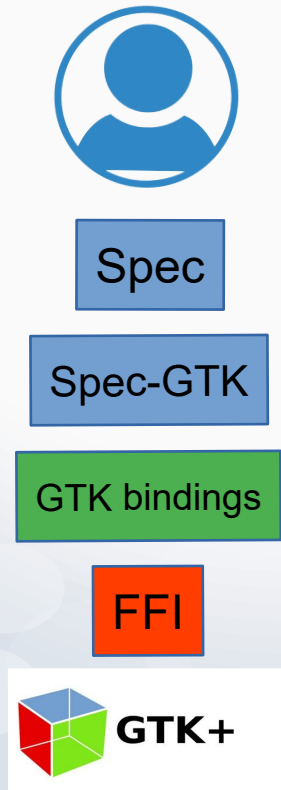
<https://www.gtk.org/>



- **Rich set of Widgets**
- **Cross-Platform:** Linux, Windows, and macOS
- **FOSS:** Free Open Source Software
- **Written in C:** Easy FFI integration
- **Trivia:** It means “GIMP Toolkit” (not “Gnome Toolkit”)

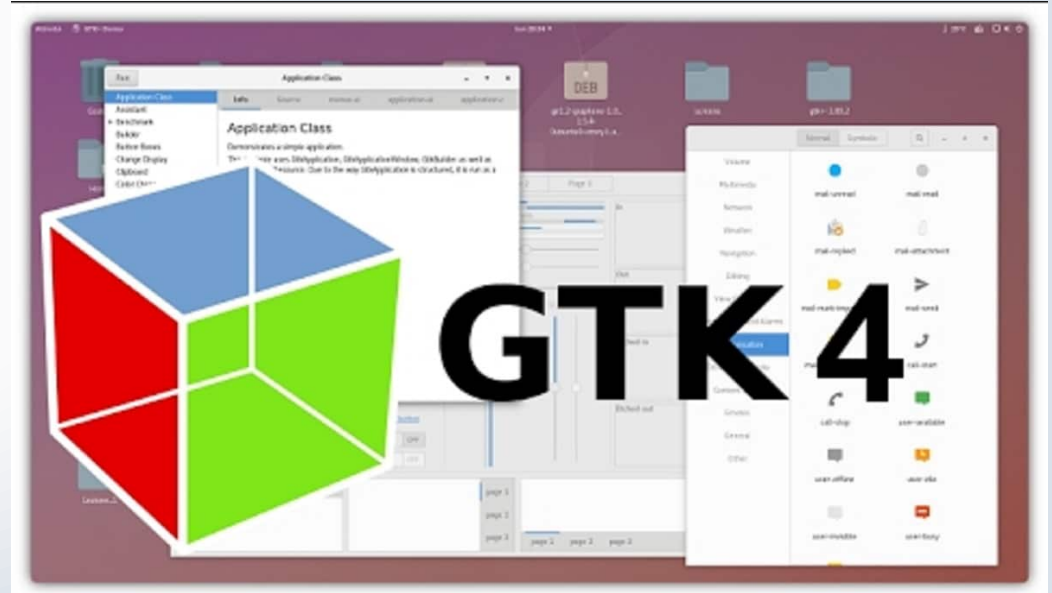


GTK support overview



Why GTK4?

- New stable, lot of improvements.
- Improved List, Table and Tree widgets.
- Many available libraries: WebKitGTK, Vte, etc.



Worker mode

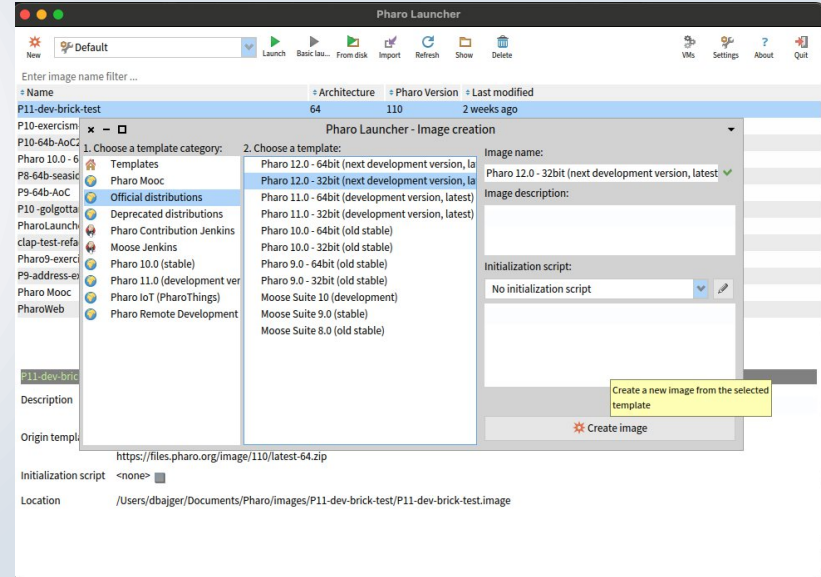
- The VM need to run in “worker mode”
- Forced separated UI thread and logic thread
- Allow real *idle* process



Demo - Pharo Launcher on GTK

Same app as Pharo Launcher on Morphic

- Already written in Spec
- It requires L&F enhancements (available for both backends)
- Specific styling for GTK



Pharo Launcher now



Pharo Launcher

New

Launch
Basic lau...
From disk
Import
Refresh
Show
Delete

VMs
Settings
About
Quit

Enter image name filter ...

Name	Architecture	Pharo Version	Last modified
pharo12	64	100	3 weeks ago
pharo-test-cmd	64	100	5 months ago
Moose Suite 10 (development)	64	100	more than a year ago

pharo12 image, last edited 2024-06-12T22:26:57+02:00

Description There is no description

Origin template unknown

 unknown

Initialization script <none>

Location /home/esteban/Pharo/images/pharo12/pharo12.image

Pharo Launcher

New Launch Basic lau... From disk Import Refresh Show Delete VMs Settings About Quit

Enter image name filter ...

Name	Architecture	Pharo Version	Last modified
pharo12	64	100	3 weeks ago
pharo-test-cmd	64	100	5 months ago
Moose Suite 10 (development)	64	100	more than a year ago

pharo12 image, last edited 2024-06-12T22:26:57+02:00

Description: There is no description

Origin template: unknown

Initialization script: <none>

Location: /home/esteban/Pharo/images/pharo12/pharo12.image



This happened after running Pharo Launcher in
Spec-GTK the first time...

Pharo Launcher

New **Default** Launch Basic lau... From disk Import Refresh Show Delete VMs Settings About Quit

Enter image name filter ...

Name	Architecture	Pharo Version	Last modified
pharo-test-cmd	64	100	4 months ago
pharo12	64	100	4 months ago
Moose Suite 10 (development)	64	100	more than a year ago

pharo-test-cmd image, last edited 2024-01-23T12:10:01+02:00

Description There is no description

Origin template Pharo 10.0 - 64bit (stable)
<https://files.pharo.org/image/100/latest-64.zip>

Initialization script <none>

Location /home/esteban/Pharo/images/pharo-test-cmd/pharo-test-cmd.image



And this is how it looks now

Pharo Launcher

New Import From disk Refresh VMs Settings About Quit

Enter image name filter ...

Name	Architecture	Pharo Version	Last modified
pharo12	64	100	2 weeks ago
pharo-test-cmd	64	100	5 months ago
Moose Suite 10 (development)	64	100	more than a year ago

pharo12

Description: There is no description

Configuration: Test

Initialization script: No initialization script




Origin template: Pharo 10.0 - 64bit (stable)






Location: /home/esteban/Pharo/images/pharo12

Last modified: 2 weeks ago





Pharo Launcher

 New  Import  From disk


 Refresh  VMs  Settings  About  Quit

Enter image name filter ...



Name	Architecture	Pharo Version	Last modified
pharo12	64	100	2 weeks ago
pharo-test-cmd	64	100	5 months ago
Moose Suite 10 (development)	64	100	more than a year ago



 

pharo12



Description

Configuration **Test**  

Initialization script **No initialization script**  

Origin template [Pharo 10.0 - 64bit \(stable\)](#)

Location [/home/esteban/Pharo/images/pharo12](#)

Last modified: 2 weeks ago

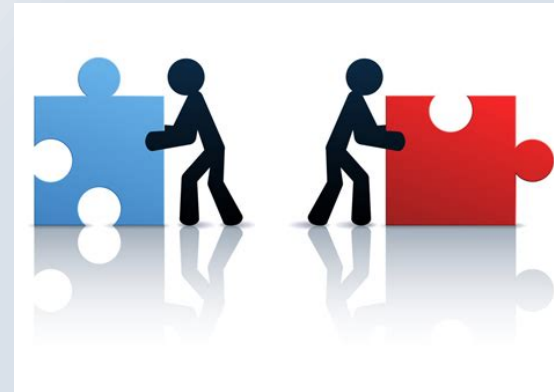
The importance of design

UX is important
Blocking processes are dangerous!



Separation between UI and program logic

- Forced separation between UI and program logic helps, but you still can do a mess
- e.g. executing heavy processes inside a callback
- like filling a list that needs to be downloaded from the internet



Packaging of a Spec-GTK application



How to distribute my application written in Spec with GTK backend?

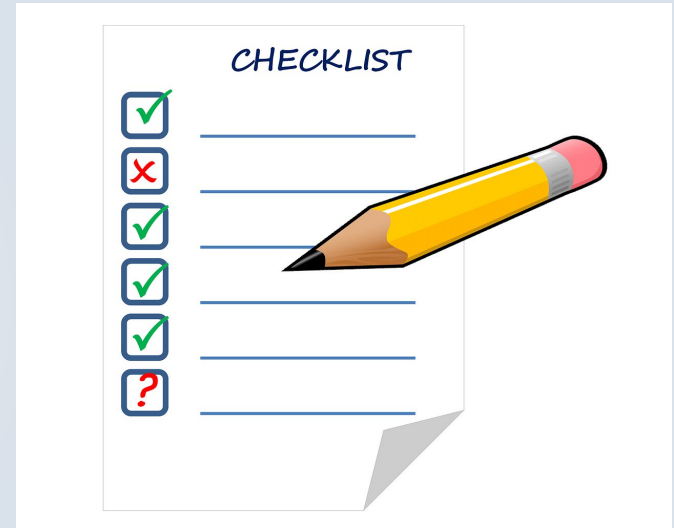
- reuse guidelines presented at ESUG'23:
<https://youtu.be/iYGnb1oVosU>



- GTK-specific:
➔ Need to embed GTK libs with the Pharo VM (Windows, Mac Os)

Application check list

- Spec-GTK is there to help
- DO NOT block the UI thread
- Think about UX

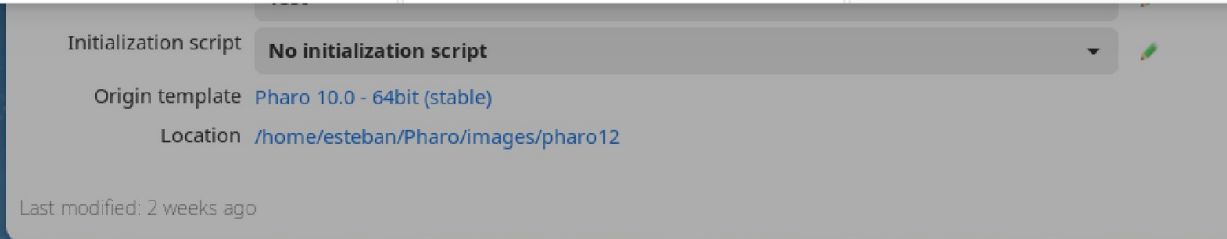
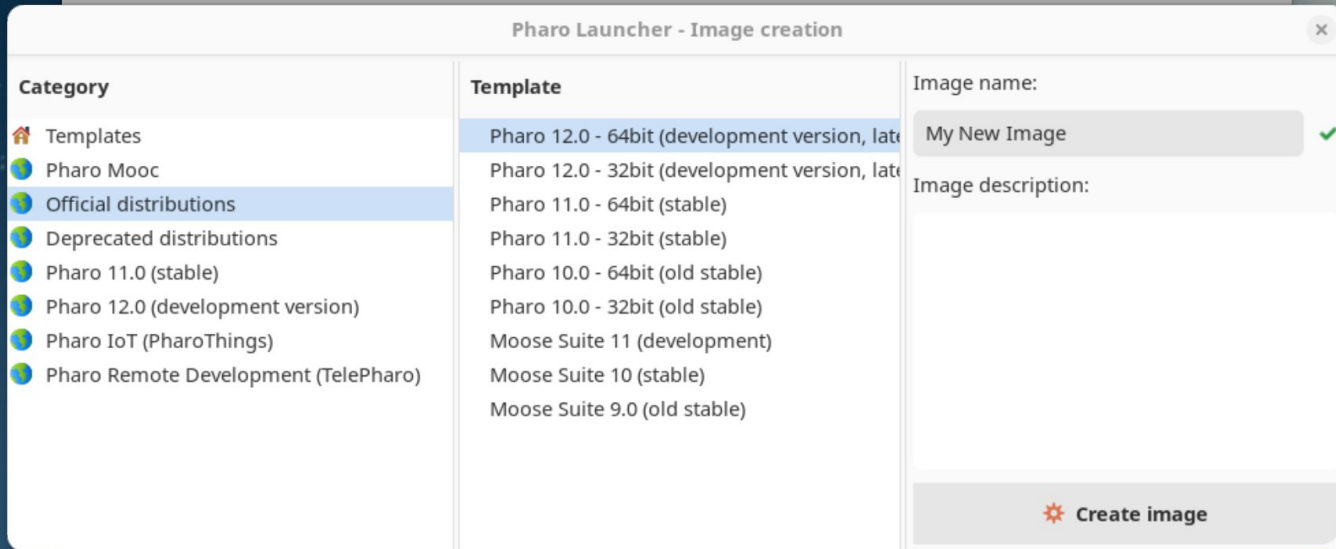
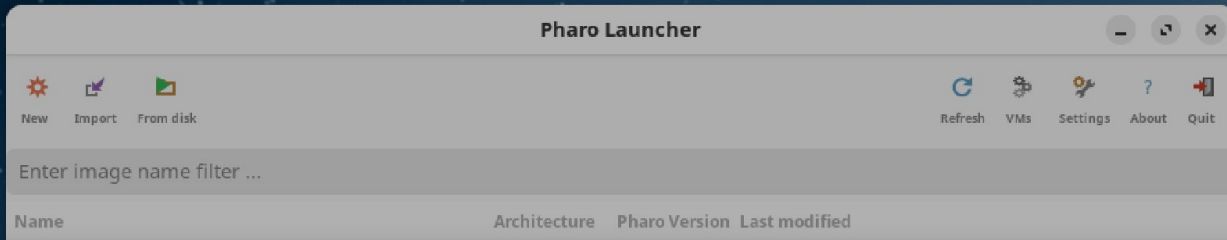


Future

- Release of Pharo Launcher GTK
- Application Builder (automate packaging)
- Enhance tools for better experience when working on GTK
- better debug when inside a callback (not easy)

but you should not be in a callback!





pharo12 image launch configurations

Configuration name	Test
VM	100-x64
VM arguments	<ul style="list-style-type: none">--worker
Image arguments	<ul style="list-style-type: none">--interactive

Location </home/esteban/Pharo/images/pharo12>

Last modified: 2 weeks ago

Buttons: Apply, Save & select

Pharo Launcher

New Import From disk

Refresh VMs Settings About Quit

Enter image name filter ...

Name

ph

ph

Mc

Locally available Virtual Machines

Update Show Delete

Name	Last update	Download URL
120-x64	2024-07-02 14:24:13	https://files.pharo.org/get-files/120/pharo-vm-Linux-x86_64-stable.zip
110-x64	2024-06-28 10:49:19	https://files.pharo.org/get-files/110/pharo-vm-Linux-x86_64-stable.zip
100-x64	2023-03-30 13:06:45	https://files.pharo.org/get-files/100/pharo-vm-Linux-x86_64-stable.zip
90-x64	2023-03-30 13:06:45	https://files.pharo.org/get-files/90/pharo-vm-Linux-x86_64-stable.zip
90-x64-headless	2023-03-30 13:06:45	https://files.pharo.org/get-files/90/pharo-vm-Linux-x86_64-stable.zip
80-x64	2020-02-12 06:07:16	https://files.pharo.org/get-files/80/pharo64-linux-stable.zip
80-x64-headless	2019-01-21 04:17:50	https://files.pharo.org/get-files/80/pharo-linux-stable.zip

Initialization script **No initialization script**

Origin template [Pharo 10.0 - 64bit \(stable\)](#)

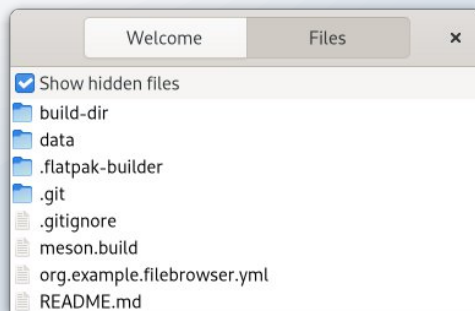
Location [/home/esteban/Pharo/images/pharo-test-cmd](#)

Last modified: 5 months ago

Important changes in Spec-Gtk

From user point of view: You have nothing to do.

- List / Table / Tree
- New GTK widgets (GtkListView, GtkColumnView) use a more efficient pattern (same as morphic Fast Table, in fact).
Important for Pharo because it reduces the amount of Thread jumps.
- New SpListViewPresenter and SpColumnViewPresenter can receive **any** presenter as content (not a subset of column types as before).



Contextual menus

- The old way to declare context menus and shortcut bindings was not satisfactory at all (a lot of duplicated code)
- Blocks for doing better were already there (commander)

Spec UI example (Morphic backend)

Mini IMDB

+
Add film

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

Name

Director

Year

