

# **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

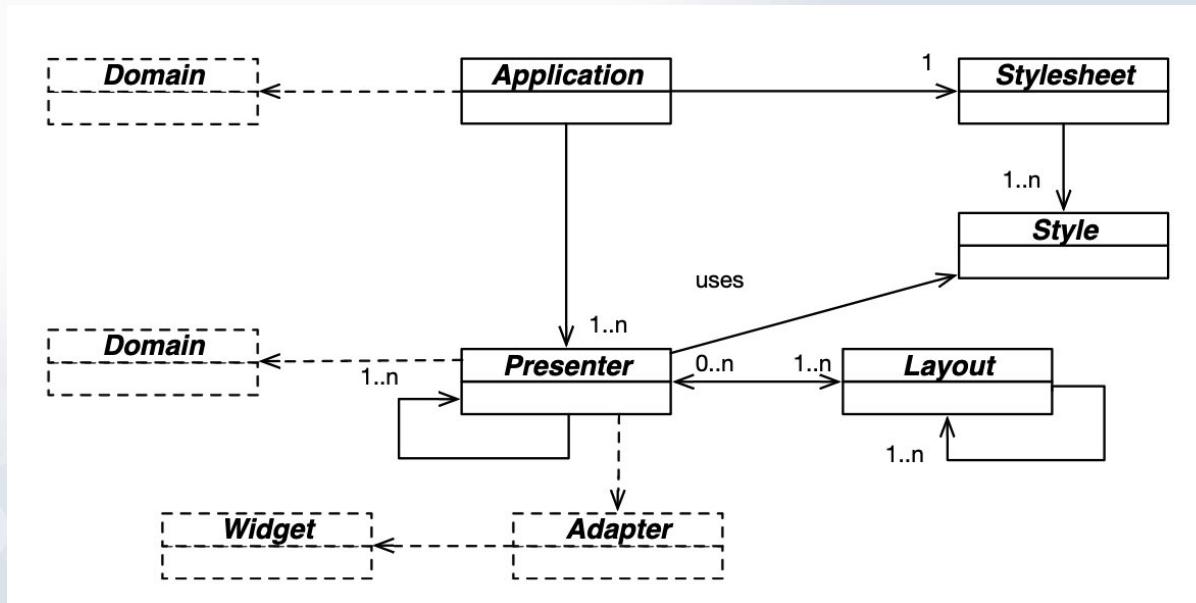
- Fits for a wide range of UIs
  - Most Pharo tools are written in Spec
- Fundamental principle behind Spec:
  - Reuse of UI logic and its visual composition

=> 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*

Mini IMDB

Add film

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

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

Mini IMDB

Add film

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

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



# 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/>

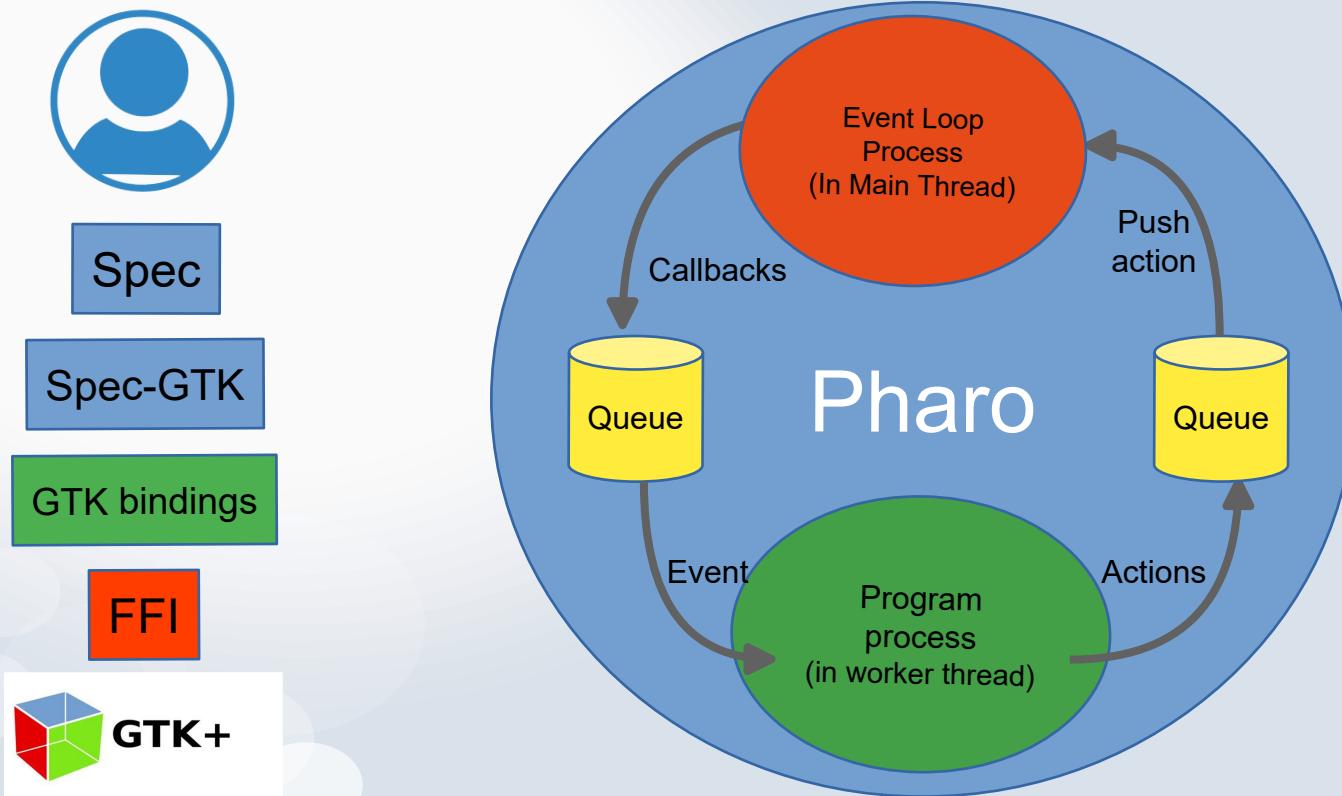


- **Rich set of Widgets**
- **Cross-Platform:** Linux, Windows, and macOS
- **FOSS:** Free Open Source Software
- Written in **C**: Easy FFI integration
- Trivia: It means “GIMP Toolkit” (not “Gnome Toolkit”)



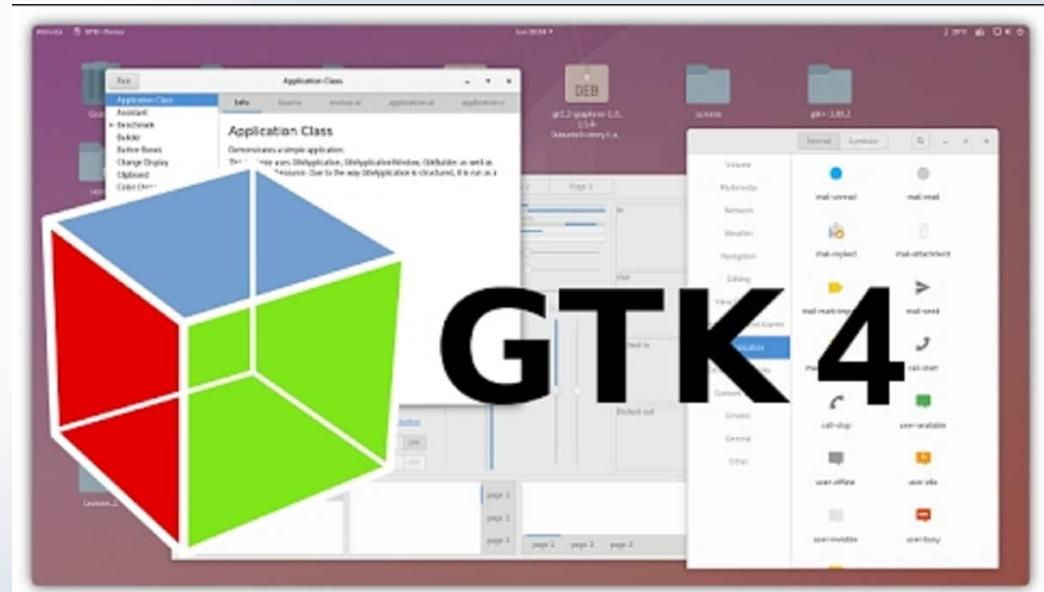
pharo.org

# GTK support overview



# Why GTK4?

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



# Worker mode

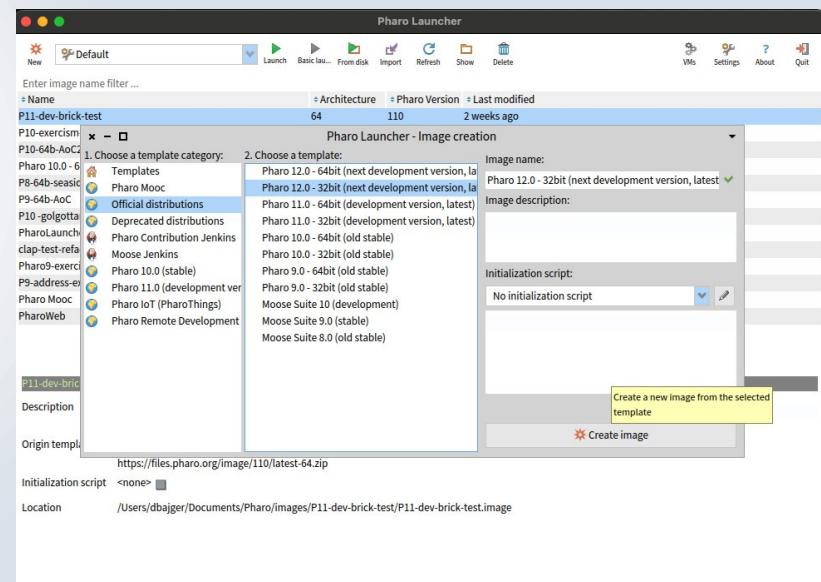
- The VM need to run in “worker mode”
- Forced separated UI thread and logic thread
- Allow real *idle* process



# 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.org](http://pharo.org)

# 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
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

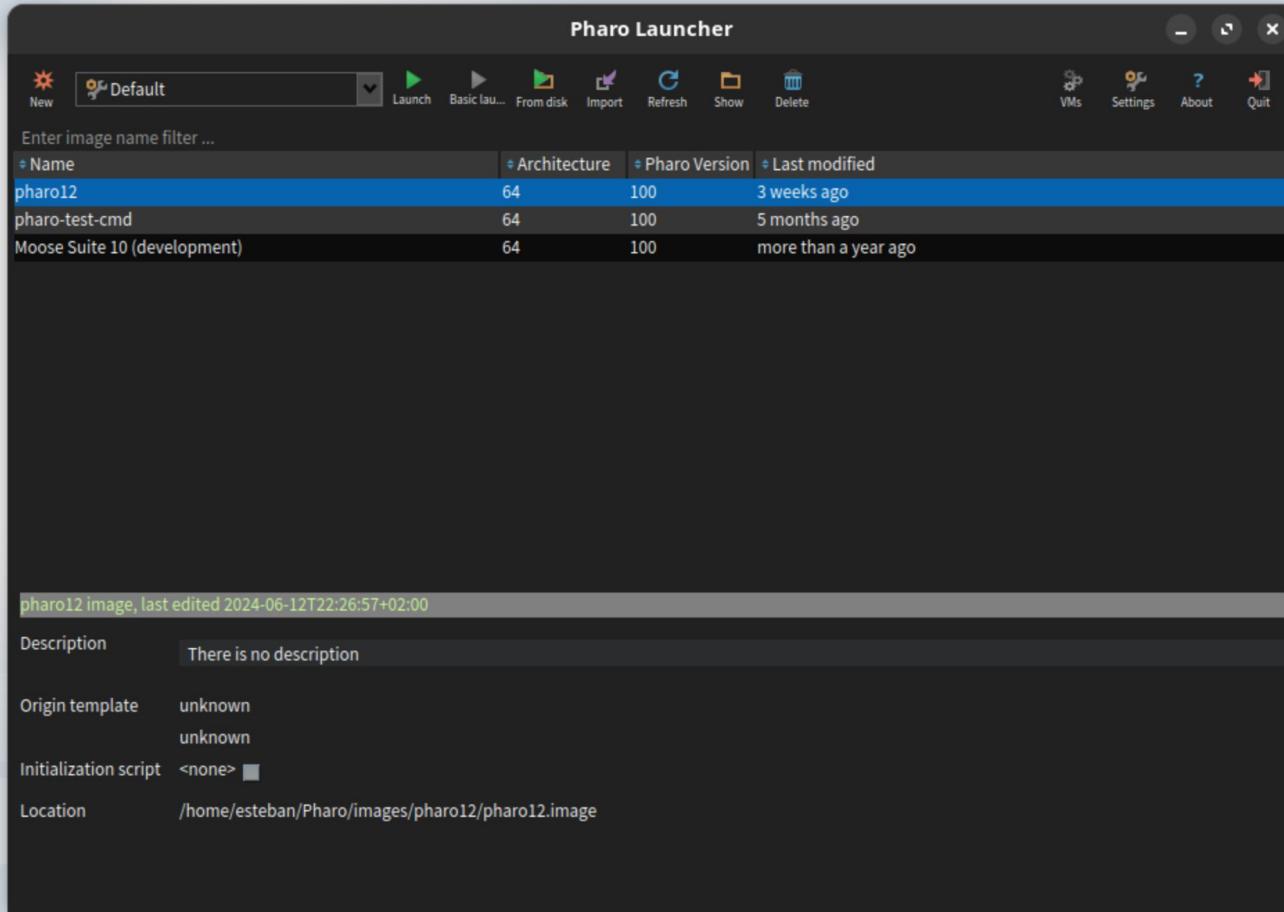
Description There is no description

Origin template unknown  
unknown

Initialization script <none>

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





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 There is no description

Configuration Test

Initialization script No initialization script

Origin template Pharo 10.0 - 64bit (stable)

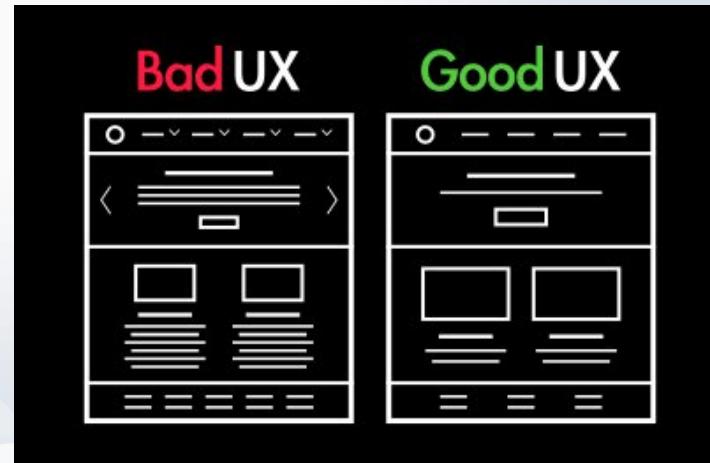
Location /home/esteban/Pharo/images/pharo12

Last modified: 2 weeks ago



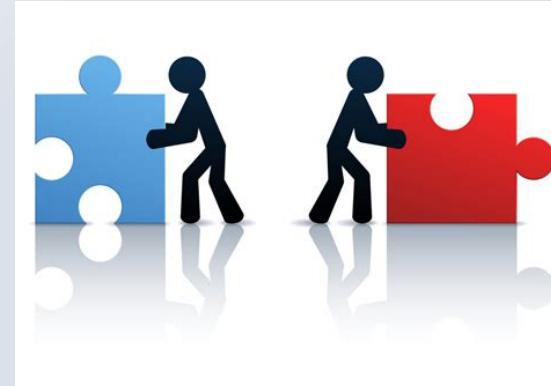
# The importance of design

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>



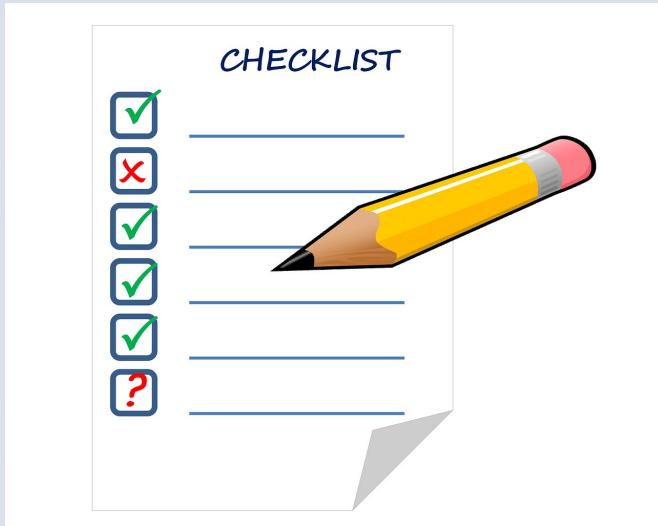
- GTK-specific:  
→ Need to embed GTK libs with the Pharo VM (Windows, Mac Os)



pharo.org

# Application check list

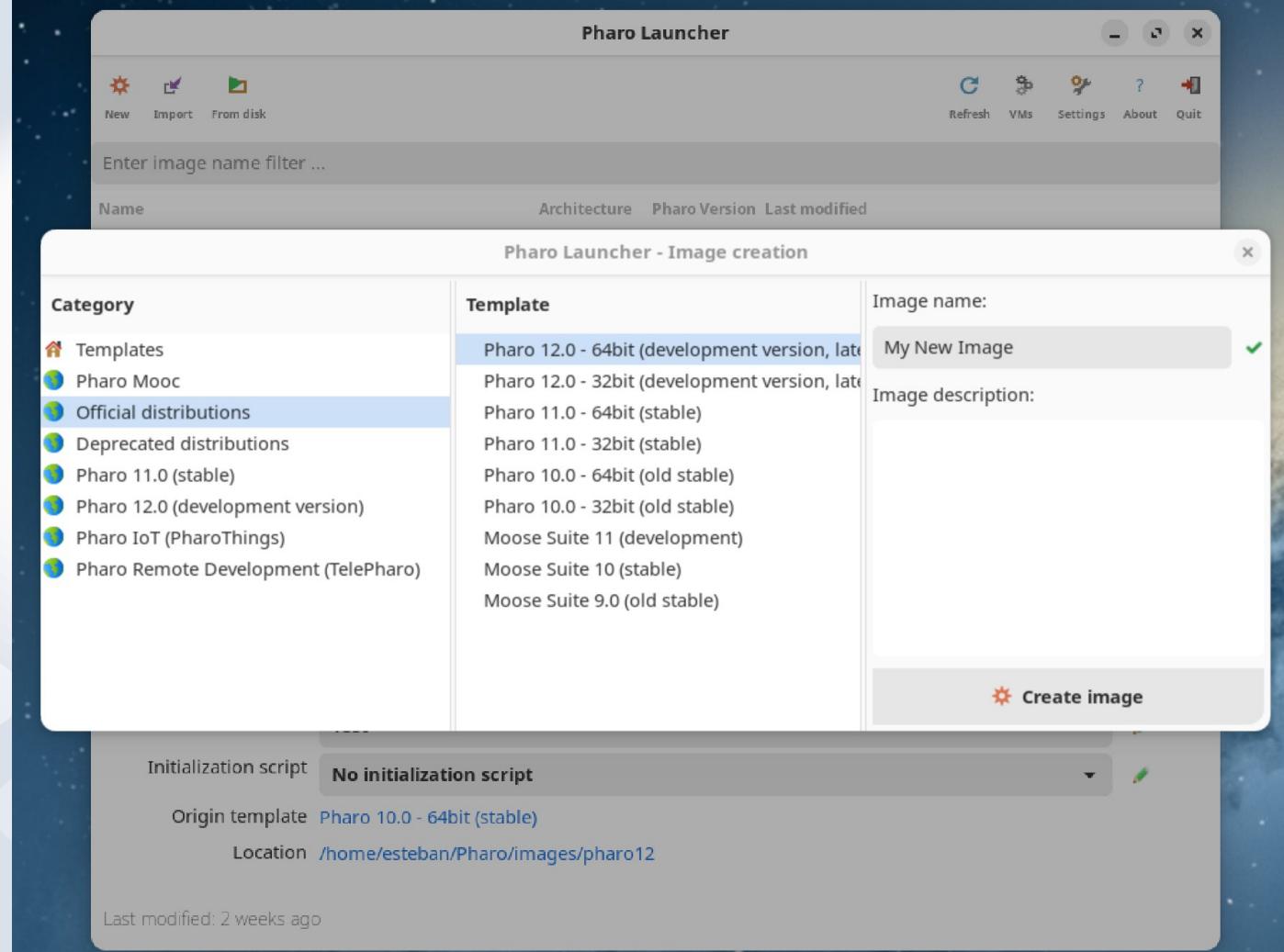
- Spec-GTK is there to help
- DO NOT block the UI thread
- Think about UX



# 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!





# Pharo Launcher

New Import From disk

Refresh VMs Settings About Quit

Enter

## pharo12 image launch configurations

Name  

Configuration name

Test

pharo Default

VM

100-x64

pharo Test

VM arguments

--worker

Moose



Image arguments  

--interactive



 Apply

 Save & select

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 ...

N

Locally available Virtual Machines

Update Show Delete

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

Initialization script No initialization script

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

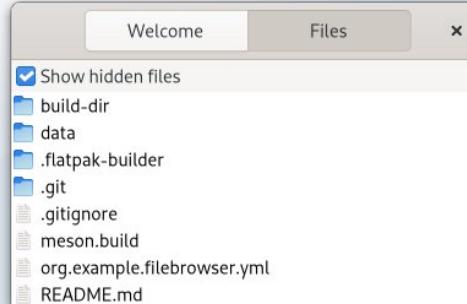
Location </home/esteban/Pharo/images/pharo-test-cmd>

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 E.T.

Director Steven Spielberg

Year 1982

