ATHENS

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ATHENS IS..

- a "new old" vector graphics framework for Pharo

- started around a year ago (April 2011)

GOALS

- modern graphics engine for Pharo

- make it simple

- make it object oriented (smalltalk oriented)

- one API, multiple backends

WHY ATHENS?

PHARO MUST BE *SEXY*!

AND SMART, OF COURSE

WHY WE NEED ATHENS

• Bitblt – lacks of abstraction

• We living in pixelated world

• Balloon engine is built "on top" of BitBlt, not-so-nice integration. As result – existing Canvas & Morphic code is cumbersome and overloaded

• hard to maintain & improve (VM plugins written in slang)

• rendering quality

WHY WE NEED ATHENS

- Canvas

  - methodDict size = 88

  - coordinate system is fixed

  - many places assuming canvas have direct access to pixels

- AthensCanvas

  - methodDict size = 21

  - free transformation of coordinate system

  - no assumptions about output media

ATHENS DESIGN

User application

Athens API

Backends

Balloon

Cairo

SVG
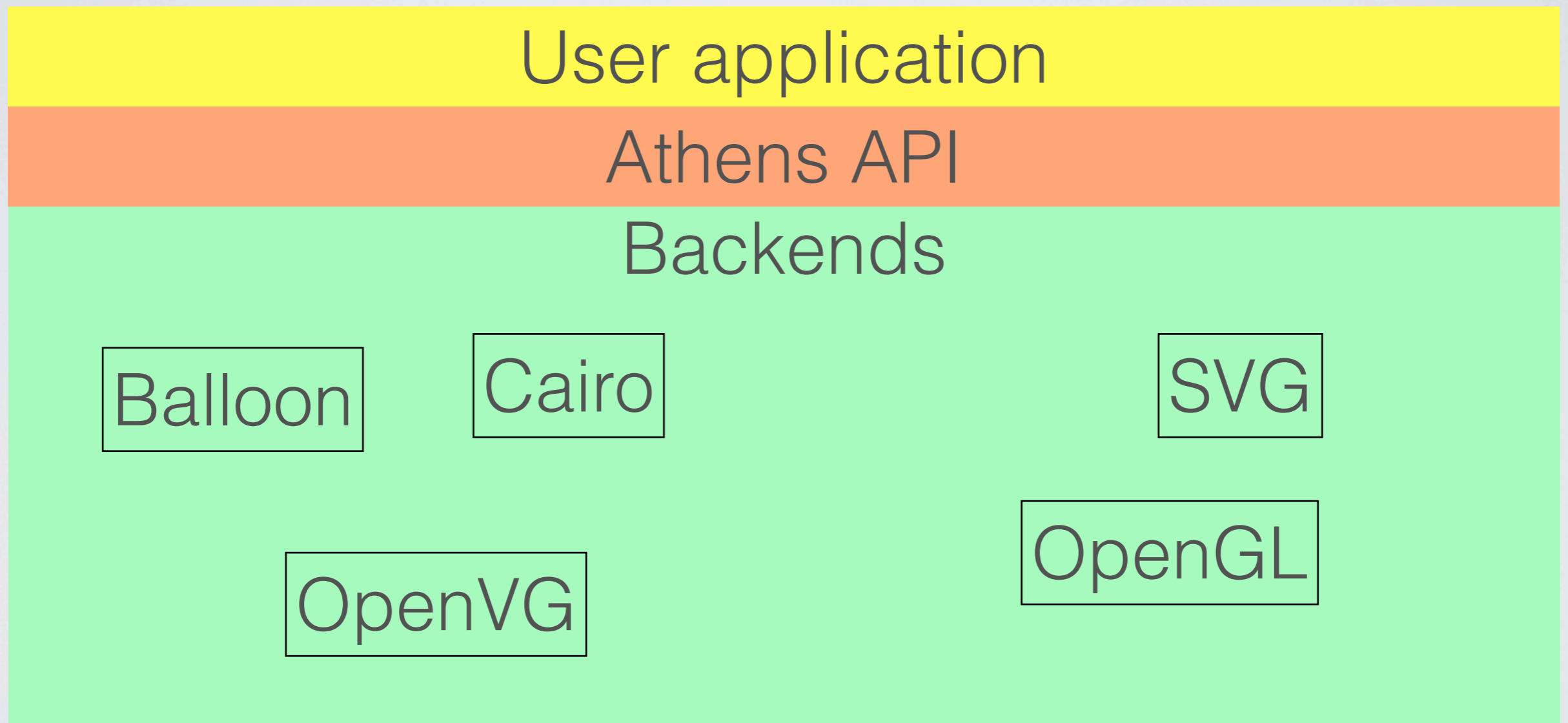
OpenVG

OpenGL

INSPIRED BY

- BitBlt & Morphic

- OpenVG

- Cairo

- OpenGL

- SVG

- and of course .... SMALLTALK

API MAJOR POINT

- Implementation is based on ROLES and their protocols, NOT classes

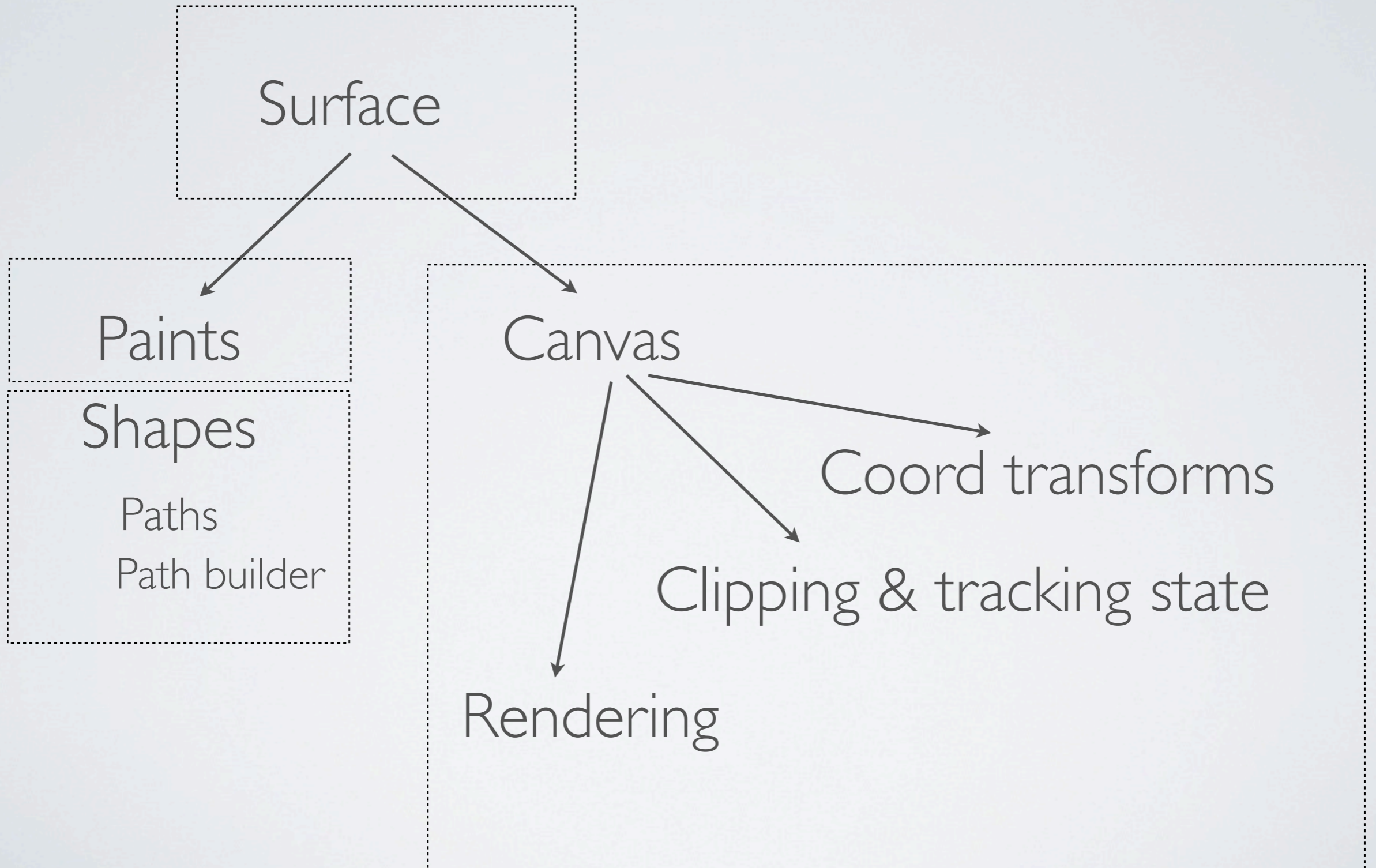canvas setColor: Color red.
canvas drawRectangle: (0@0
corner: 100@100).

canvas setGradient: mygradient.
canvas drawLine: pt1 to pt2.

canvas setPaint: Color red.
canvas drawShape: (0@0
corner: 100@100).

canvas setPaint: mygradient.
canvas drawShape: myLine.

drawShape: anObject
        self setShape: anObject.
        self draw.

ROLES

Surface

Paints

Shapes

Paths
Path builder

Canvas

Coord transforms

Clipping & tracking state

Rendering

SURFACE

- represents an output media & defines backend which you will be using.

- acts as a factory for creating paints, paths, canvas & other involved objects

- access to its canvas

- surfaces is ALWAYS backend-specific

CANVAS

- one, single drawing operation: canvas draw.

- maintains current coordinate system transformations:

  - canvas pathTransform

  - canvas paintTransform

- maintains currently selected shape:

  - canvas setShape: ...

- maintains currently selected paint:

  - canvas setPaint:

- paint mode (not fully realized)

PAINT

- a "paint" which is used to fill the shape

  - solid color

  - gradients

  - stroke paints

  - bitmap (form) paints

  - you can define own

SHAPE

- defines an enclosing region of drawing operation

    - rectangle

    - paths

        - a contours consisting of connected segments:

            - line

            - quadric Bezier curve

            - cubic Bezier curve

            - circular arcs

            - elliptical arcs

    - you can define own

DEMO

SVG
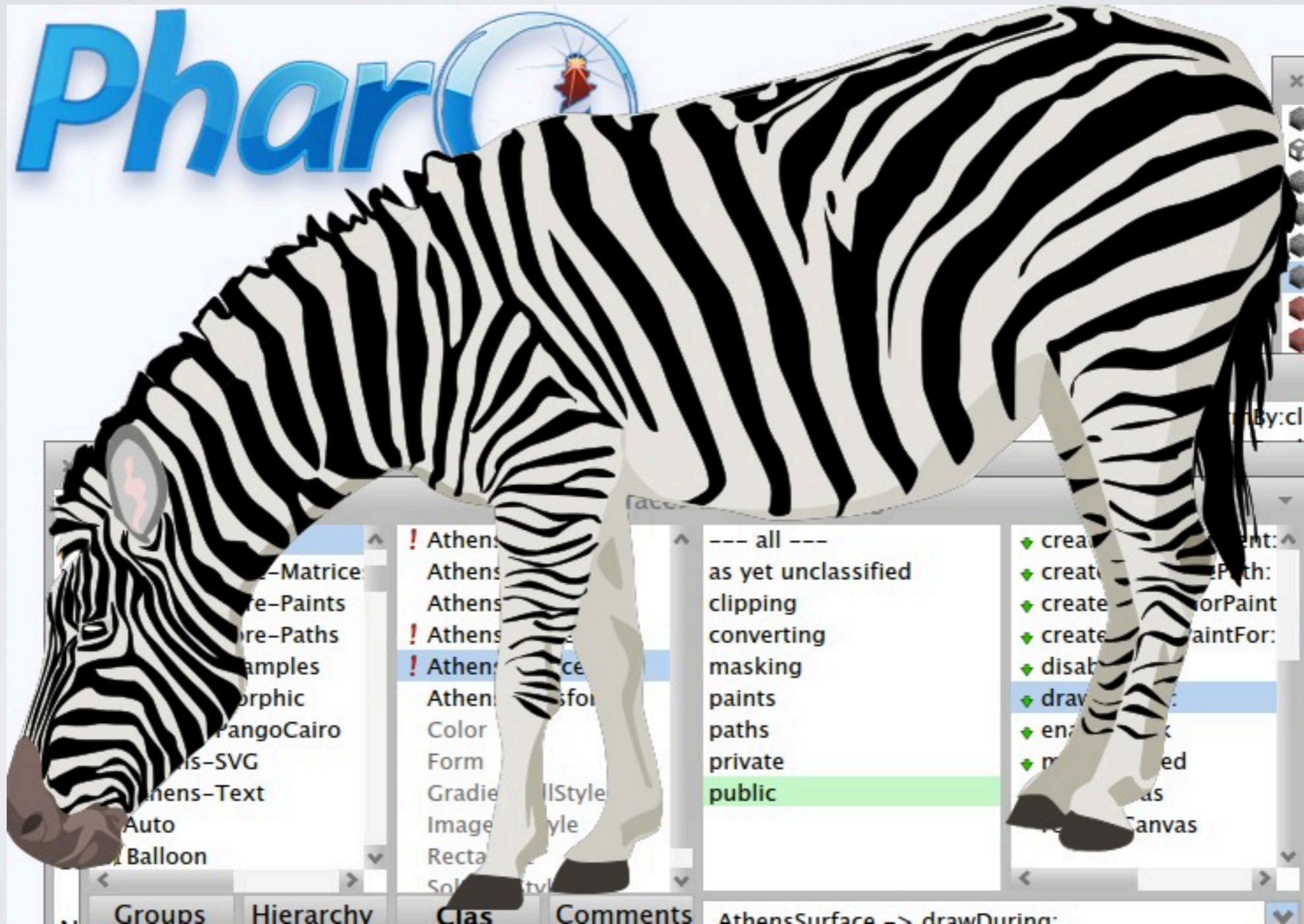
THINGS TO DO

- masking

- SVG export/import

- paint modes (overlay, screen , blend etc)

- OpenGL backend

- elliptical arcs

- DOCS!!!!

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QUESTIONS?

THANKS

- Fernando Olivero for helping with implementation

- RMoD team for discussions & design decisions

- Pharo & its fans :)