Chapter 1

Athens

Athens in 4 points: Athens is a modern graphics engine for Pharo Athens is an object-oriented (smalltalk oriented) vector graphics library. It is not a wrapper of a C-library. Athens offers one API and multiple backends (Cairo, openGl).

1.1 Why a new canvas?

- 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 and Morphic code is cumbersome and overloaded

- hard to maintain and improve (VM plugins written in slang)

- rendering quality

Canvas (the pre-Athens canvas)

- methodDict size returns 88

- coordinate system is fixed

- many places assuming canvas have direct access to pixels

AthensCanvas

- methodDict size returns 21

- free transformation of coordinate system

- no assumptions about output media
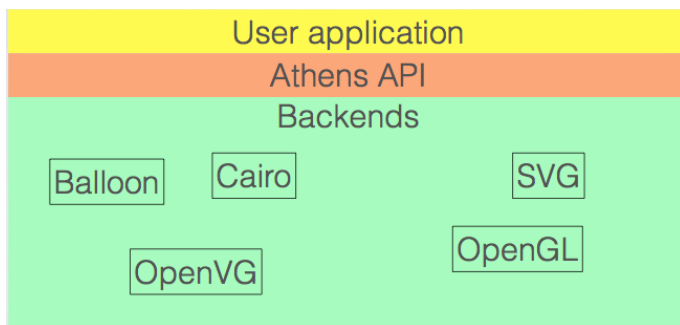
1.2   Athens Design

Figure 1.1:   Athens is the API that applications and infrastructure should use.

1.3   Main Architecture Players

Surface

Surface is an abstract class which represents an output media and defines backend which you will be using.

A surface acts as a factory for creating paints, paths, canvas and other involved objects. It provides access to its canvas. Surfaces are ALWAYS backend-specific.

Canvas

A canvas is associated to a surface. Canvas implements one, single drawing operation: canvas draw **Stéf** ▶*is it the real method name?*◀ The canvas maintains current coordinate system transformations: canvas pathTransform
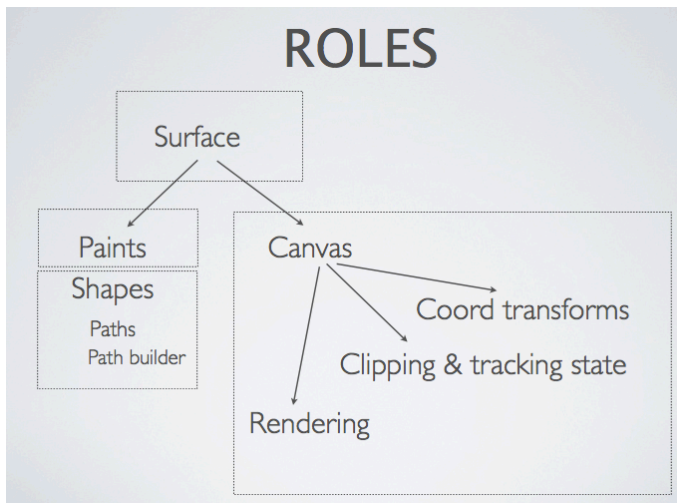
Figure 1.2:

canvas paintTransform maintains currently selected shape (selected using canvas setShape: ..., and maintains currently selected paint (selected using canvas setPaint: and the paint mode (not fully implemented).

Paint

A paint is used to fill the shape. It can be composed of

- solid color
- gradients
- stroke paints
- bitmap (form) paints

In addition you can define own paint.

Shape

A shape defines an enclosing region of drawing operation. This region can be a rectangle or paths.

A path delineates a contour consisting of a sequence of connected segments. Segments are line, quadric Bezier curve, cubic Bezier curve, circular arcs, and elliptical arcs. In addition you can define your own shape.

1.4 Athens examples

Studying a first example

```
| surf |
surf :=  AthensCairoSurface extent: 100@100.

surf drawDuring: [:canvas |
     surf clear.
     canvas setPaint: (Color red).
     canvas setShape: (0@ 0 corner: 40@ 40).
     canvas draw.
   ].
Display getCanvas drawImage: surf asForm at: 0@0
```