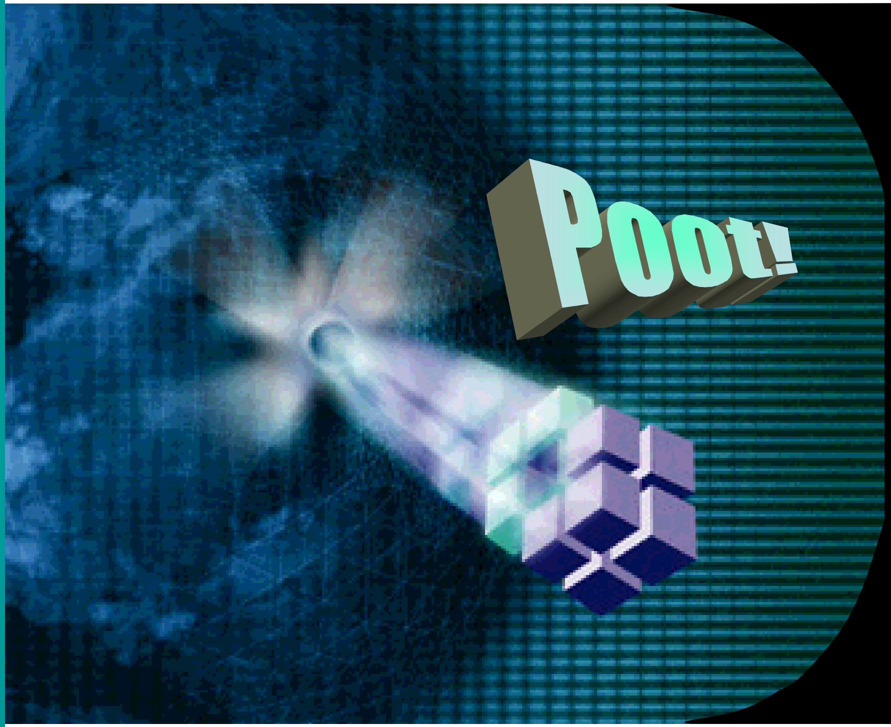
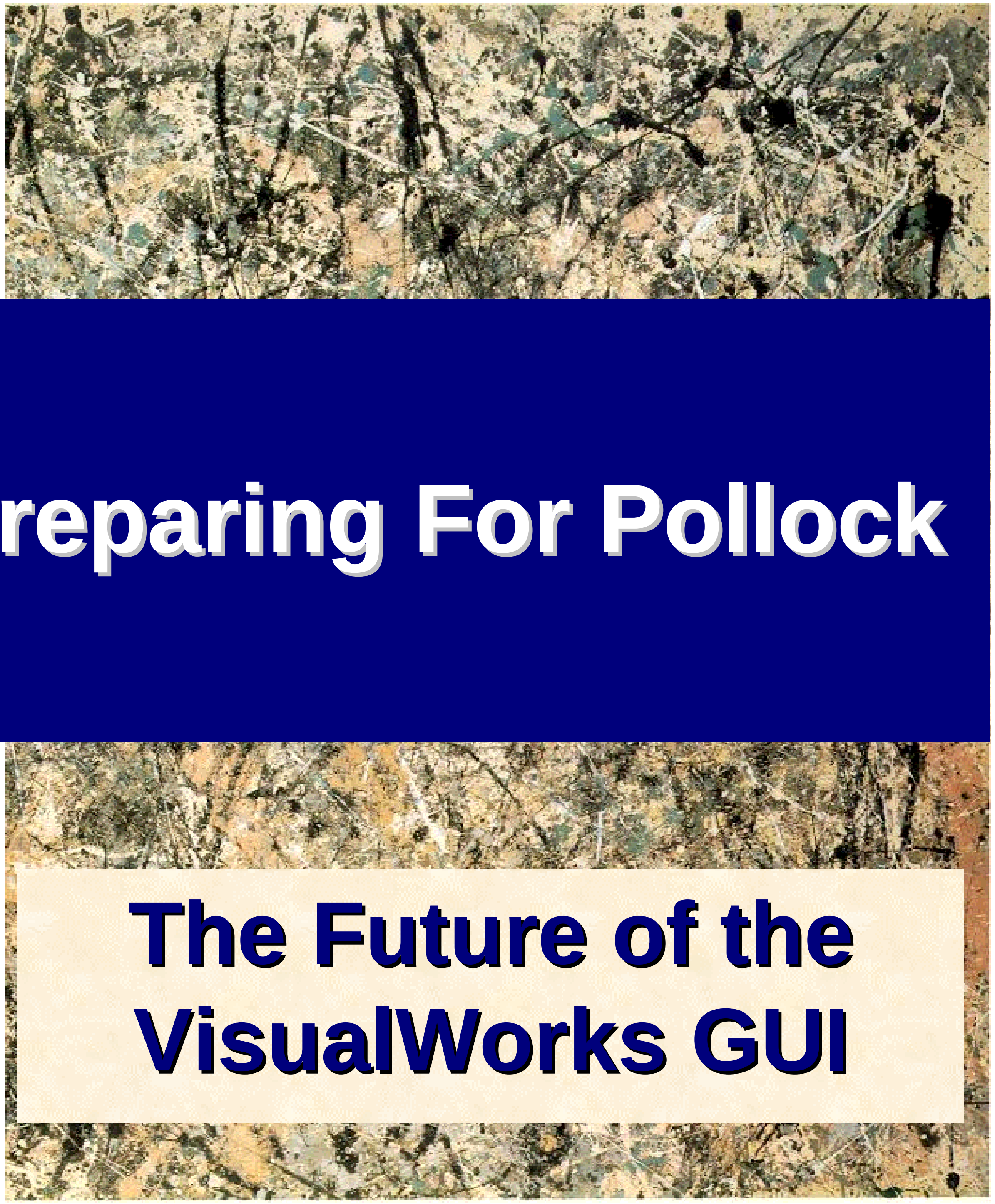


Preparing For Pollock

Number 1, 1950 (Lavender Mist)

Jackson Pollock 1912-1956



Preparing For Pollock

The Future of the VisualWorks GUI

Preparing For Pollock

- ☞Why a new GUI Framework
- ☞Pollock Philosophy and Goals
- ☞The Path
- ☞The Metaphor
- ☞The Basics
- ☞Pollock & The Trigger Events Framework
- ☞Models & ValueEvents

Preparing For Pollock

- ☞Pollock & DragDrop
- ☞Pollock & Edit Keys
- ☞Coding Today With The Future In Mind
- ☞Pollock Tools
- ☞Building A New Widget – An Example
- ☞Q&A

Why a new GUI Framework

- What needs to be obsolete
  - Wrappers
  - Look Specific Widgets
  - Ball Of Mud Controllers
  - Static Edit Keys
  - Fragile & Noisy Change/Updates in the Guts
  - Do Too Much Builder

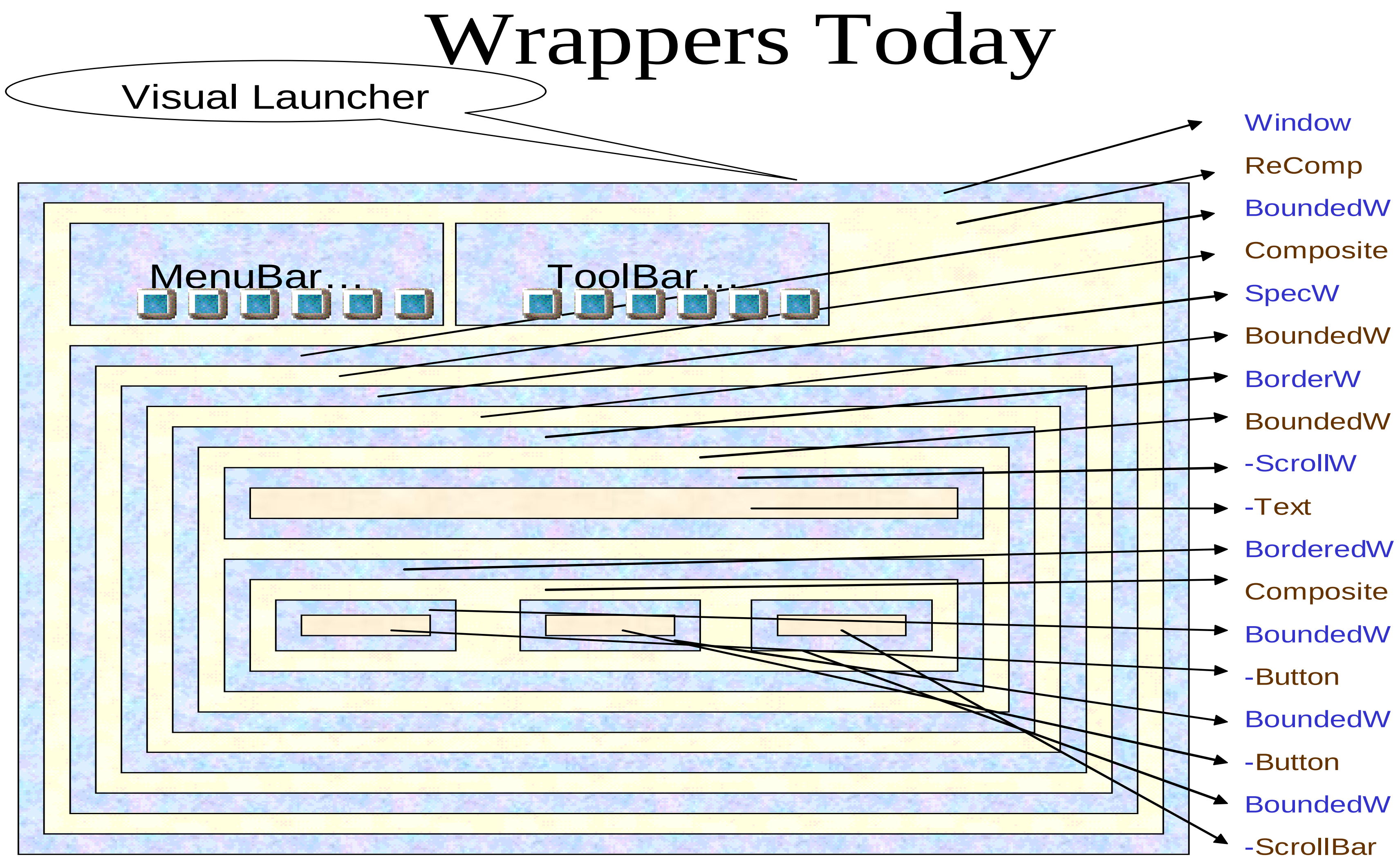
Why a new GUI Framework

- What needs to be added
  - Configurable Hotkeys
  - Dynamic Look Changing
  - Stupid Controllers
  - Full Use of the Trigger Event System
  - Separate Builder and Widget Inventory
  - E-Z Developer Widget Creation
  - E-Z Developer Widget Extension Capability

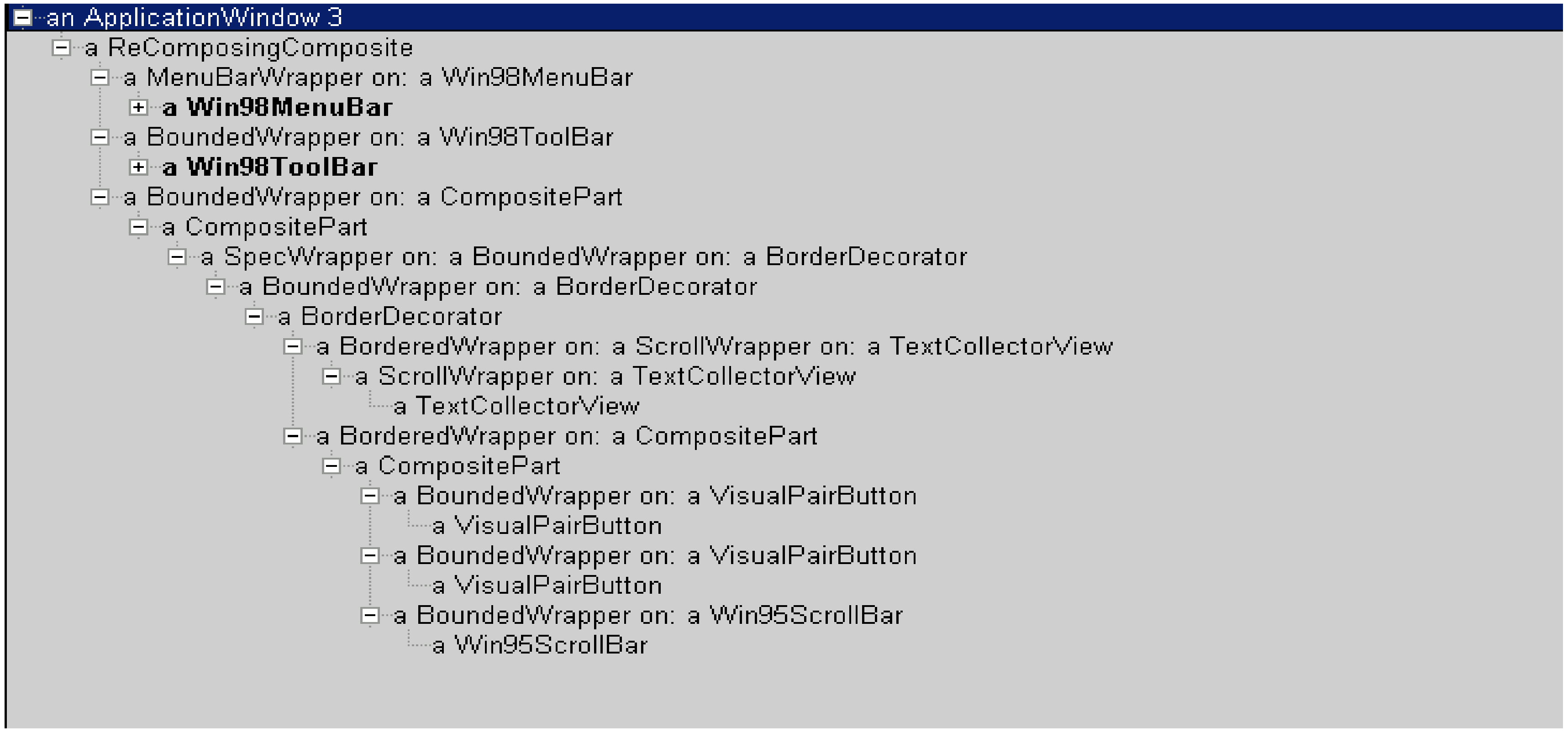
Why a new GUI Framework

- Widgets In General
  - Out of the box they need
    - To Do More
    - To Do It Faster
    - To Do It Better
    - Where Required: To Do It More Platform Faithfully
  - And if not:
    - E-Z To Make Them Do It

What needs to be obsolete:



What needs to be obsolete: Wrappers Today



```
⊟ an ApplicationWindow 3
  ⊟ a ReComposingComposite
    ⊟ a MenuBarWrapper on: a Win98MenuBar
      ⊞ a Win98MenuBar
    ⊟ a BoundedWrapper on: a Win98ToolBar
      ⊞ a Win98ToolBar
    ⊟ a BoundedWrapper on: a CompositePart
      ⊟ a CompositePart
        ⊟ a SpecWrapper on: a BoundedWrapper on: a BorderDecorator
          ⊟ a BoundedWrapper on: a BorderDecorator
            ⊟ a BorderDecorator
              ⊟ a BorderedWrapper on: a ScrollWrapper on: a TextCollectorView
                ⊟ a ScrollWrapper on: a TextCollectorView
                    a TextCollectorView
              ⊟ a BorderedWrapper on: a CompositePart
                ⊟ a CompositePart
                  ⊟ a BoundedWrapper on: a VisualPairButton
                      a VisualPairButton
                  ⊟ a BoundedWrapper on: a VisualPairButton
                      a VisualPairButton
                  ⊟ a BoundedWrapper on: a Win95ScrollBar
                      a Win95ScrollBar
```

What needs to be obsolete:

- ☞Wrappers
  - ☞SpecWrappers: Hold on to too much runtime information, waste space with the rest
  - ☞Bounded, Bounding, Bordered… Baloney!
  - ☞Scrollbars : The result of composition run rampant
  - ☞Menus : Not much better
  - ☞Bounds calculation : The progenitor of modern C obfuscation contests

What needs to be obsolete:

- Look Specific Widgets
  - Can’t change their look on the fly without rebuilding whole window
  - Complex build rules (<widget>:into:)
  - Forces duplicated build code
  - Commingled common and look specific code

What needs to be obsolete:

- Ball Of Mud Controllers
  - Controllers have lost their “MVC” meaning
  - They have become sophomoric
  - Because of wrappers are involved in downcasting & upcasting events
  - Knows too much about view

What needs to be obsolete:

- ☞Static Edit Keys
  - ☞Controllers do too much
  - ☞Controllers contain too much feel specific code
  - ☞Dispatch tables are code based
  - ☞The Developer knows best (i.e. least)

What needs to be obsolete:

- ☞Fragile & Noisy Change/Updates in the Guts
  - ☞All dependents get all update information, even when they don’t care (which in the guts of the GUI, is most of the time)
  - ☞Updates fling up and down the wrapper hierarchy
  - ☞Changing models and views is fraught with danger, making existing Widgets fragile
  - ☞Debugging is a nightmare

What needs to be obsolete:

- ☞Do Too Much Builder
  - ☞Builds then sticks around
  - ☞“self builder componentAt:” *(‘nuff said!)*
  - ☞Can’t properly get nested components (sub-canvases)
  - ☞Throws out important build time information

What needs to be added (redux):

- Configurable Hotkeys
- Dynamic Look Changing
- Stupid Controllers
- Full Use of the Trigger Event System
- Separate Builder and Widget Inventory
- E-Z Developer Widget Creation
- E-Z Developer Widget Extension Capability

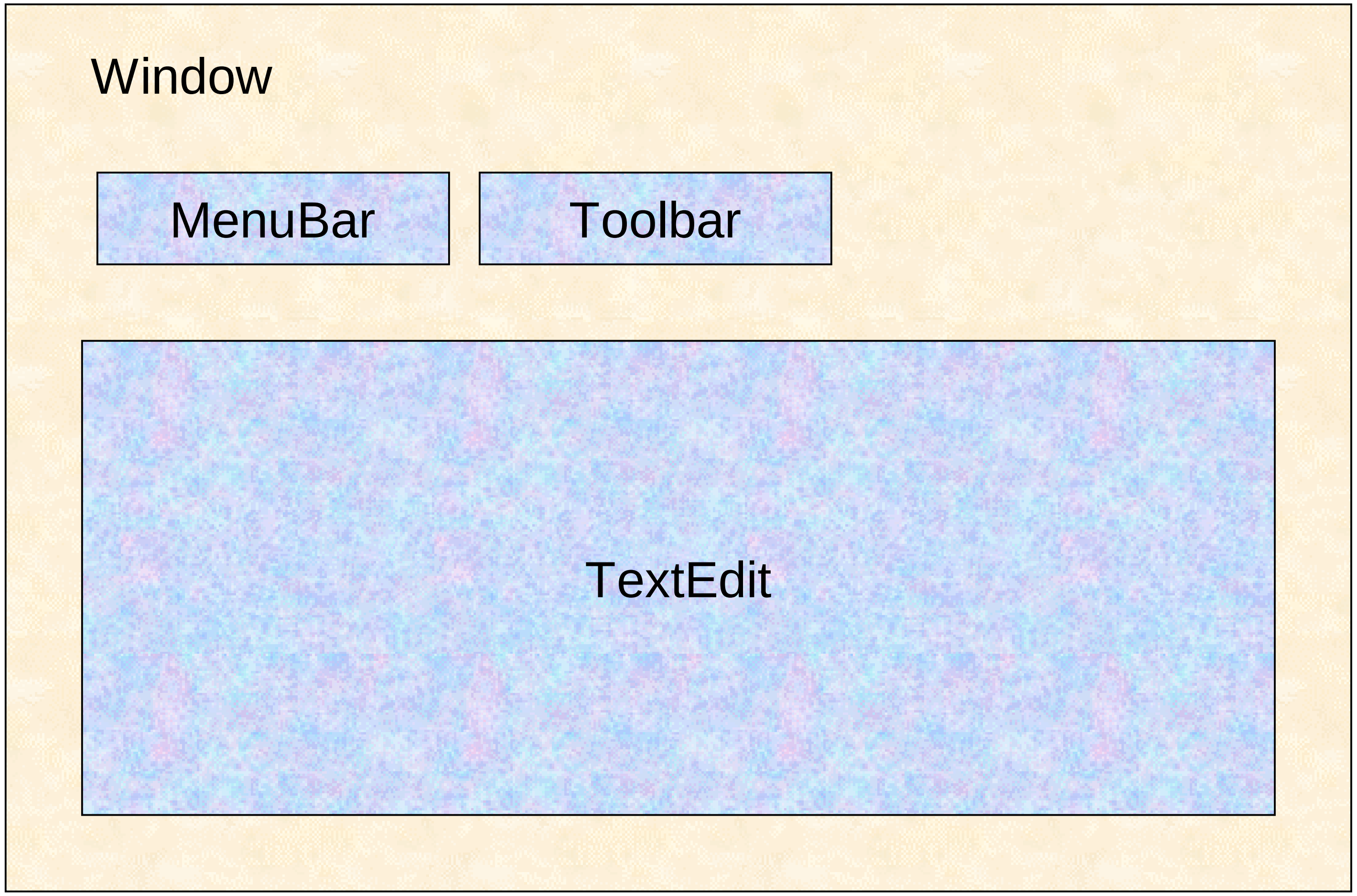
Pollock Philosophy and Goals

- ☞Goals
  - ☞Must be more accessible to both novice and expert developers
  - ☞Must be more modular
  - ☞Must be more adaptable to new looks and feels
  - ☞Must have tools to migrate from old framework
  - ☞Must have comprehensive unit tests
  - ☞Must be developed “Out In The Open”

Pollock Philosophy and Goals

- Philosophy : XP (as much as possible)
  - Make it work,
    Make it right,
    Make it fast
    (in that order)
  - You aren't going to need it
  - The simplest thing that can possibly work
  - Let the code tell me what to do
  - Test first
  - Continuous integration

Visual Launcher under Pollock



The Path

- Beta 1: VW 7
  - ApplicationWindow, Button, Label & Image
  - Simple layouts (OriginExtent, Alignment)
  - Win9x, MacOSX & Motif looks
  - Build, Read & Write from XML and Array
  - DTD for XML
  - Window opening styles
  - Full Trigger Event usage
  - Builder, UserInterface, WidgetInventory

The Path

- ☞ Beta 2 : VW 7.1
  - ☞ CheckBox
  - ☞ Radio
  - ☞ InputField
  - ☞ List
  - ☞ TextEdit

The Path

- Beta 3 : VW 7.2
  - Menu, DropDown (list and menu), Grid (Table & Dataset combined), Dialog, Toolbar & Toolbar panes, TreeView, TabControl, GroupBox
  - DragDrop
  - Fractional Layouts
  - UIPainter written in Pollock

The Path

- Production 1 : VW 7.3
  - SubpaneHolder, Resizer, SpinButton, Divider, ClickWidget, Region, Progress, Slider
  - UIPainter, MenuEditor, ToolbarEditor
  - Translation & Conversion tools
  - Co-exist in image with existing framework
  - Existing framework default user interface creation tool
  - Last changes to existing framework
  - All widgets have at least basic functionality

The Path

- Production 2 : VW “7.4”
  - All widgets have full capability
  - WinXP Look & Feel
  - Some internal tools use Pollock
  - Co-exist in image with existing framework
  - Pollock default new user interface creation tool
  - Existing framework “Soft” obsolete

The Path

- ☞Production 3 : VW “7.5” or “11”
  - ☞All tools use Pollock
  - ☞Existing framework “Hard” obsolete
  - ☞Only Pollock in image
  - ☞Existing framework fully loadable from Obsolete parcel

The Metaphor

- Panes & Frames, Agents & Artists
  - Pane
    - Like a VisualComponent
    - Some Panes have Subpanes
    - Window is a Pane
    - Screen is a Pane
    - All subclass from AbstractPane

The Metaphor

- Panes & Frames, Agents & Artists (cont.)
  - Frame
    - Like a Layout
    - visible bounds
    - displayable bounds
    - origin
    - [alignment]
    - [fractional positions]
    - [relation positions]
    - [viewport]

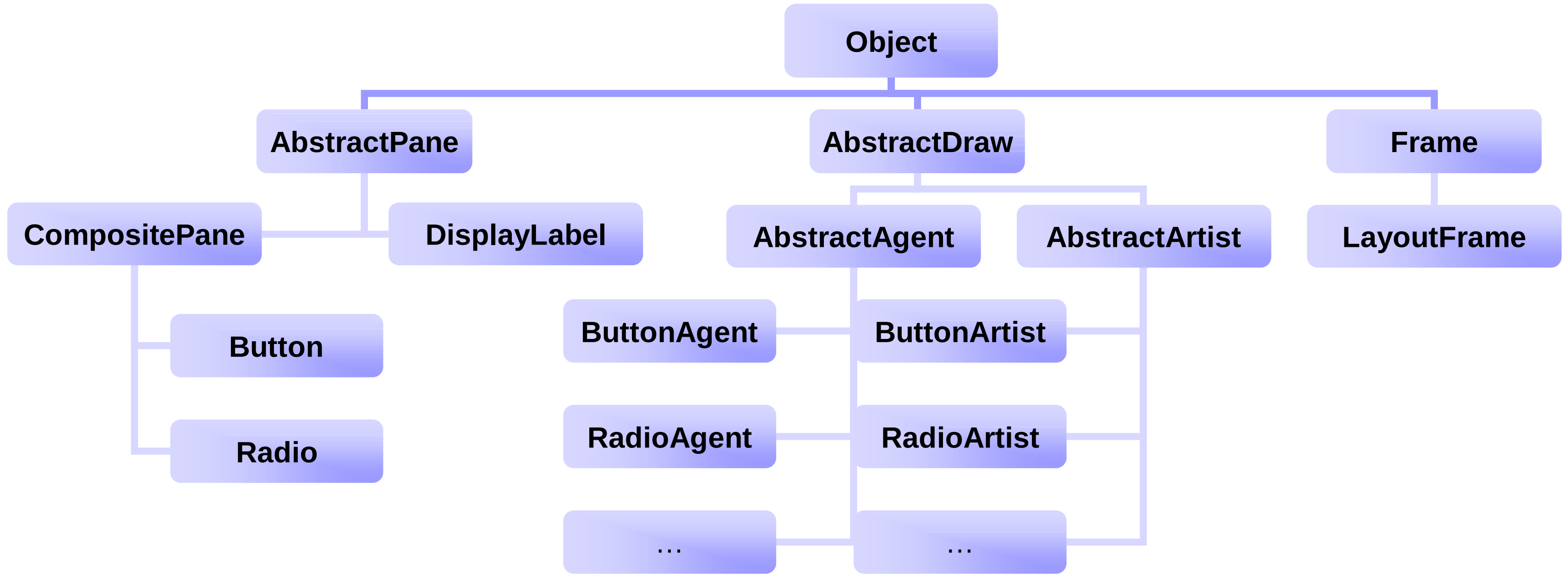
The Metaphor

- ☞Panes & Frames, Agents & Artists
  - ☞Agent
    - ☞Offload behavior from controller
    - ☞Tell the artist when to draw
    - ☞Maintain most state (visibility, enablement, selected, pushedness, cursor position)
    - ☞Behavior for mouse and keyboard (keyboard processor, focus, “handler for mouse event”)

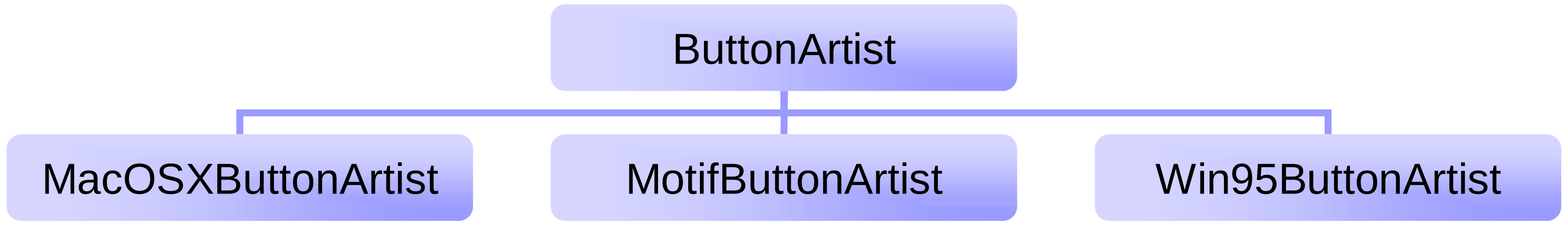
The Metaphor

- Panes & Frames, Agents & Artists
  - Artist
    - Does all drawing
    - Interacts with Agent and Pane to get information about what to draw, and when

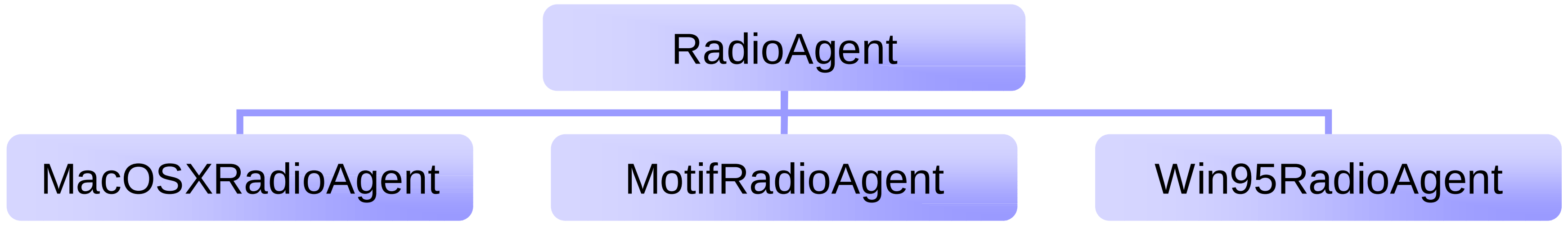
The Basics


Object
AbstractPane
AbstractDraw
Frame
CompositePane
DisplayLabel
AbstractAgent
AbstractArtist
LayoutFrame
Button
Radio
ButtonAgent
ButtonArtist
RadioAgent
RadioArtist
…
…

The Basics : Looks



The Basics : Feels



The Basics

- Creating, configuring and opening a window

```
| window |
window := Pollock.ScheduledWindow new.
window frame: ((WindowFrame new)
            maximumSize: 400 @ 400;
            openingPosition: 100 @ 100;
            yourself).
window border: #etched.
window open
```

The Basics

☞Creating, configuring and adding a Pane

```
| window radio |
window := self openWindow.
radio := Radio new.
radio frame: (OriginExtentFrame origin: 10 @ 10 extent: 30 @ 30).
window addComponent: radio.
```

The Basics

- ☞Labels are NOT part of panes, but can be subpanes

```
| window radio displayLabel labelModel |
window := self openWindow.
radio := self createRadio.
displayLabel := Pollock.DisplayLabel new.
labelModel := Pollock.Label string: 'Hi&Ho'.
displayLabel label: labelModel.
displayLabel frame origin: 0 @ 0.
radio addComponent: displayLabel.
window addComponent: radio
```

The Basics

- CompositePanes
  - Any subclass can have subpanes
  - Can have any number of subpanes
  - Can have any kind of subpanes
- Common subpanes
  - Buttons : Labels and DisplayImages
  - Radios : Labels

The Basics

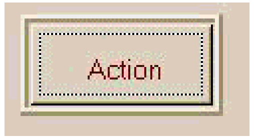
- Controllers are much more dumb
  - Controllers and Trackers still exist
  - New hierarchy
  - Forward all events to the Agent
- The Agent holds the Keyboard Processor
  - Because of compatibility, controller passes it to the Agent

The Basics

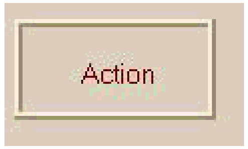
- ☞Decorations and Borders
  - ☞Decorations : Things inside a pane
    - ☞Scrollbars in an Advanced Text pane
    - ☞The “3D Look / Raised” portion of a Button
    - ☞Clip the drawable bounds
  - ☞Borders : Things that surround a pane
    - ☞Effectively clip the visible bounds
  - ☞Most panes have borders
  - ☞Some panes have decorations
  - ☞Borders and Decorations have Artists

The Basics

- ☞ A Button with a Border (ridged) and a decoration:

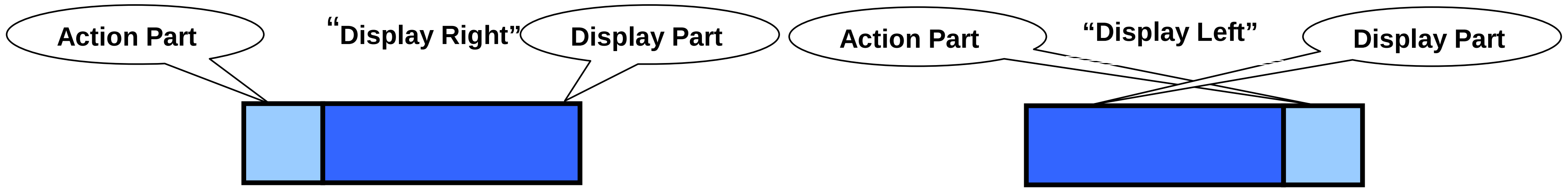


- ☞ A Button with a Border (ridged) – No decoration:

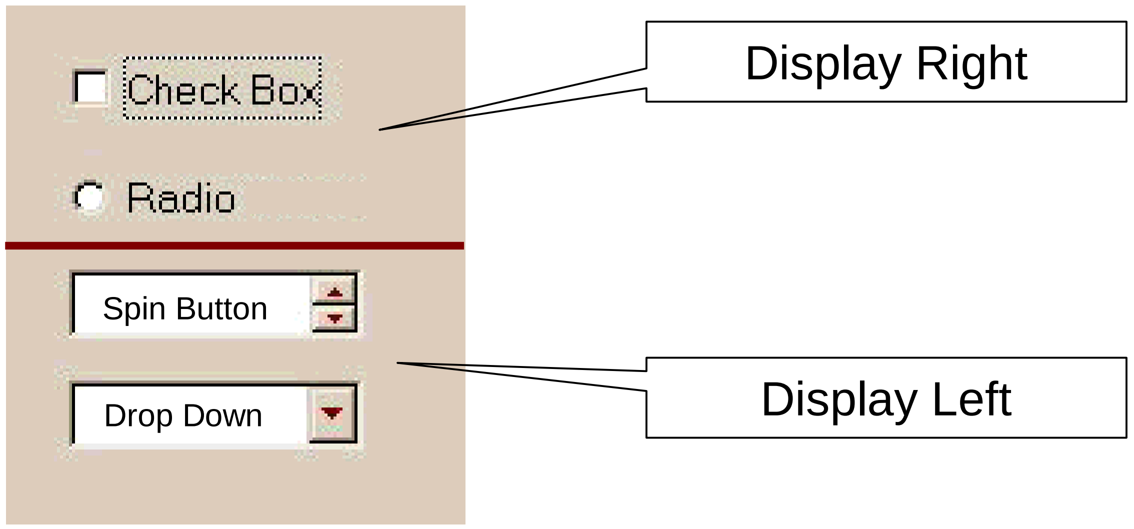


The Basics

- ActionDisplay pane



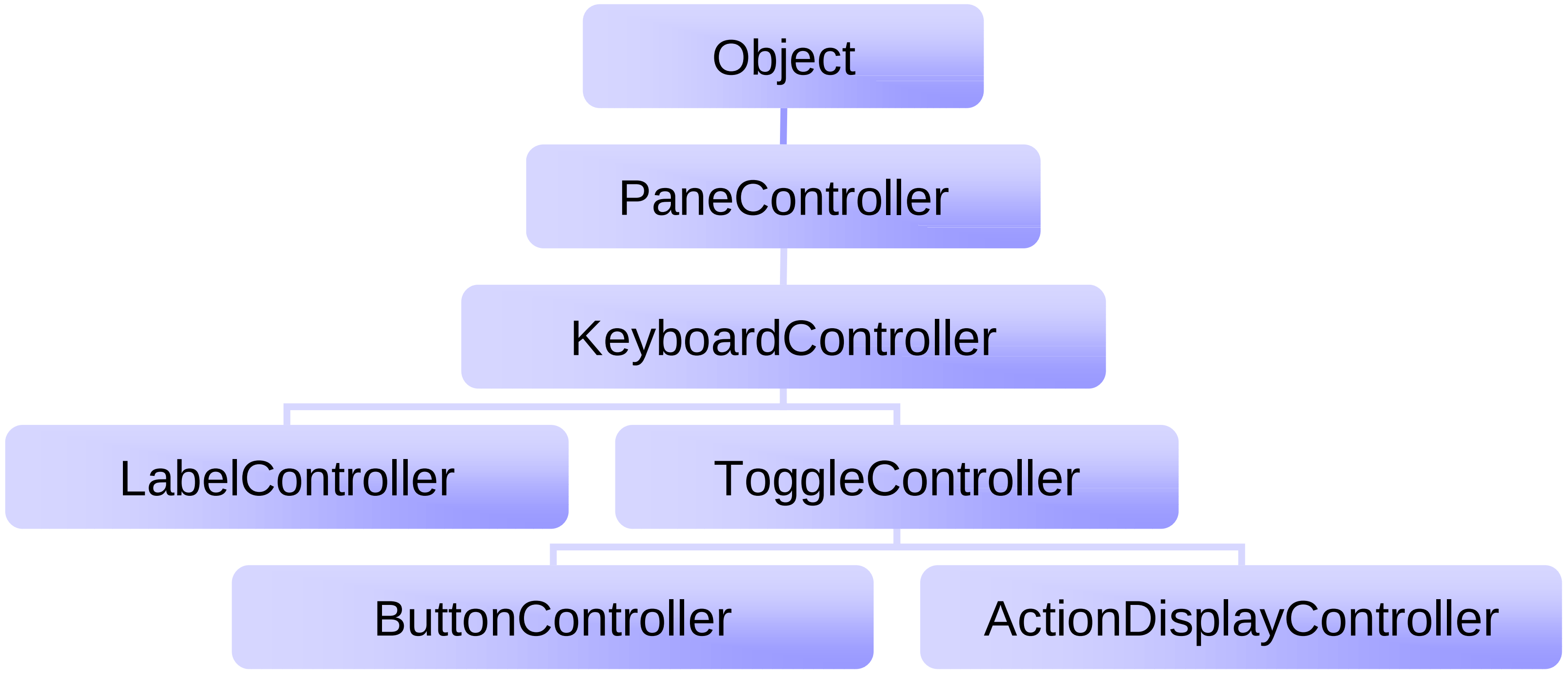
- Examples:



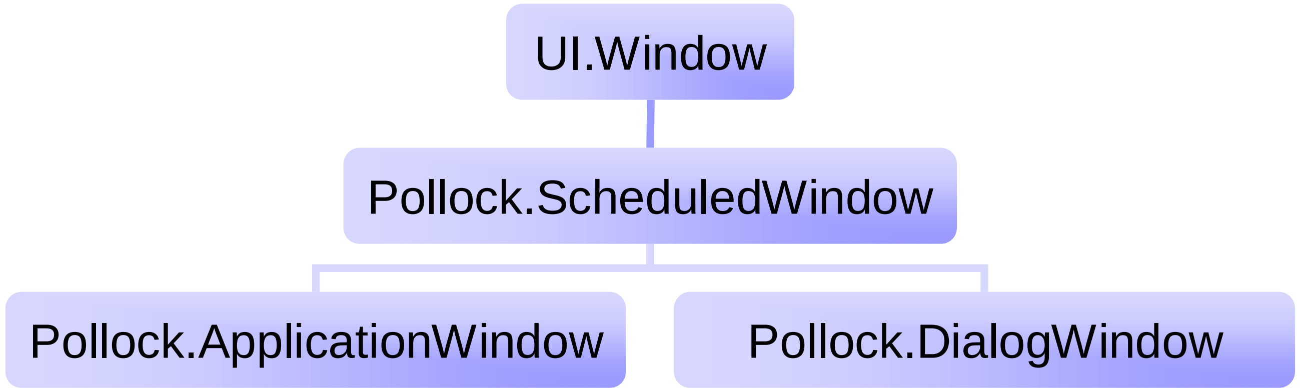
The Basics

- Agents, Artists and Frames are pluggable at runtime
- Update/Change behavior is banned from the Pollock internals
- WidgetPolicy, BorderPolicy, LookPolicy
- FeelPolicy replaced by KeyboardPolicy
- New Controller hierarchy
- New ScheduledWindow hierarchy

New Controller Hierarchy



New ScheduledWindow hierarchy



The Basics – Widget Changes

- Grid
  - Combines Dataset & Table
  - Will support Dataset models, as well as Table models
  - Will provide Multi-Column list mode

The Basics – Widget Changes

- DropDown
  - Combines DropDown, Combo and MenuButton
  - Will support Lists as well as Menus as models

The Basics – Unsure Future

- TabControl
  - Will exist
  - Should it add “Minor” tabs (right and/or bottom)?
  - Should it add “Stacked” tabs?
- Notebook
  - Not scheduled to exist (should it?)

Pollock & The Trigger Events Framework

- The Trigger Events Framework
  - Fully fleshed out in VW 7
  - All events ultimately triggered by “views”
- Event Checking
  - Ambivalent vs. Strict
  - Object – Default is Ambivalent
  - Views & Panes – Default is Strict
- Using it now
  - In General
  - ApplicationModel

Trigger Events – Using it now

- General
  - eventTable
  - canTriggerEvent: anEventNameSymbol
  - hasActionForEvent: anEventNameSymbol
  - actionListForEvent: anEventNameSymbol

Trigger Events – Using it now

- General
  - when: anEventNameSymbol do: aBlock
  - when: anEventNameSymbol evaluate: anAction
  - when: anEventNameSymbol send: aSelectorSymbol to: anObject
  - when: anEventNameSymbol send: aSelectorSymbol to: anObject with: anArgumentObject
  - when: anEventNameSymbol send: aSelectorSymbol to: anObject with: firstArgumentObject with: secondArgumentObject
  - when: anEventNameSymbol send: aSelectorSymbol to: anObject withArguments: anArgumentCollection
  - whenAny:…

Trigger Events – Using it now

- General
  - removeAction: anAction forEvent: anEventNameSymbol
  - removeActionsForEvent: anEventNameSymbol

Trigger Events – Using it now

- ApplicationModel
  - widget: aWidgetIDSymbol when: anEventSymbol do: aBlock
  - widget: aWidgetIDSymbol when: anEventSymbol evaluate: anAction
  - widget: aWidgetIDSymbol when: anEventSymbol send: anAction to: anObject
  - widget: aWidgetIDSymbol when: anEventSymbol send: anAction to: anObject with: anArgument
  - widget: aWidgetIDSymbol when: anEventSymbol send: anAction to: anObject with: firstArgument with: secondArgument
  - widget: aWidgetIDSymbol when: anEventSymbol send: anAction to: anObject withArguments: aCollection

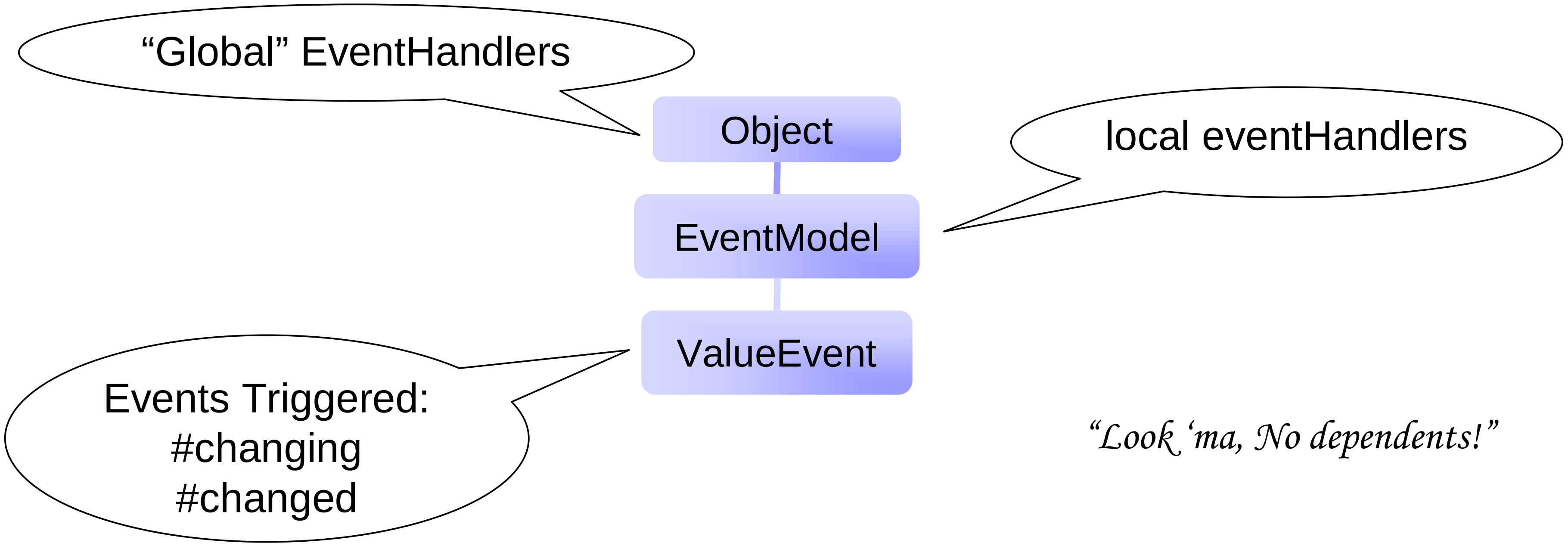
Trigger Events – Using it now

☞New behavior in Object>>changed:with:

```
changed: anAspectSymbol with: aParameter

		"The receiver changed.  The change is denoted by the argument
anAspectSymbol.  Usually the argument is a Symbol that is part of the dependent's
change protocol, that is, some aspect of the object's behavior, and aParameter is
additional information.  Inform all of the dependents."


		self myDependents update: anAspectSymbol with: aParameter from: self.

		anAspectSymbol isSymbol ifTrue: [self triggerEvent: anAspectSymbol]
```

Models & ValueEvents

- The Model Hierarchy will not be used
- Replaced by the EventModel Hierarchy



"Look 'ma, No dependents!"

Pollock – New DragDrop System

- ☞ State driven engine

For single select lists, the following are the rule states.

1) If you click on an unselected item, and you do NOT move the mouse more than 2@2 while you have the mouse down, nothing happens until you release the mouse, at which time the target item is selected.

2) If you click on an unselected item, and you DO move the mouse more than 2@2, the target item is selected, and you are put into Drag mode for that item if it is turned on, if not, the selection changes as you drag the mouse over successive unselected items.

3) If you click on a selected item and do NOT move the mouse more than 2@2, nothing happens until you release the mouse, at which time the target item is unselected.

4) If you click on a selected item and DO move the mouse more than 2@2, you are put into Drag mode for that item if it is turned on, if not, the selection changes as you drag the mouse over successive unselected items (as in rule #2)

Pollock – New DragDrop System

☞State driven engine (continued)

For multi select lists, the following are the rule states.

1) If you click on an unselected item, and you do NOT move the mouse more than 2@2 while you have the mouse down, nothing happens until you release the mouse, at which time the target item is selected. (Rules of Shift & Ctrl apply to "items" selected)

2) If you click on an unselected item, and you DO move the mouse more than 2@2, the current item is selected and any additional items you drag the mouse over get added to the current selections. (Rules of Shift & Ctrl apply to "items“ selected).

3) If you click on a selected item, and you do NOT move the mouse more than 2@2 while you have the mouse down, nothing happens until you release the mouse, at which time the item is unselected. (Rules of Shift & Ctrl apply to "items“ selected/unselected)

4) If you click on a selected item, and you DO move the mouse more than 2@2, you are now in Drag mode if it is turned on (Rules of Ctrl & Shift apply to move/copy mode of Drag, and not to selection modes), if not, rule #2 kicks in.

Pollock – New DragDrop System

- Trigger Event communication (based on VSE design)
- “Select When Down” dies a miserable death
- Configurable
  - Default – Right Button
  - Options : Left Button. Modifier Key

Pollock – Edit Keys

- “FeelPolicy” and the dispatch table as we know it, goes the way of the dodo
- KeyboardPolicy
  - Based on MagicKeys from Roel Wuyts (Thank You!)
  - Assignable by “Application”:
    - Transcript – EditPolicy
    - Refactoring Brrowser – CodePolicy
    - MyApplication – MyApplicationPolicy
  - Can have “Platform” versions
    - WindowsEditPolicy, WindowsCodePolicy
    - MacEditPolicy, MacMyApplicationPolicy

Coding with the future in mind

- ApplicationModel
  - Don’t write “self builder componentAt:”
  - Use new (VW 7) protocols
    - #mainWindow
    - #windowMenuBar
    - #controllerAt: aWidgetIDSymbol
    - #widgetAt: aWidgetIDSymbol
    - #wrapperAt: aWidgetIDSymbol

Coding with the future in mind

- ☞Use the Trigger Event system instead of update/change
- ☞Stay away from the Smalltalk (“Default”) look
- ☞Stay away from the GUI guts, but if you must: SUBCLASS!

Pollock Tools

- ApplicationModel conversion tool
- WindowSpec conversion tool
- Enhanced MenuEditor
- CoolImage replaces ImageEditor (Thank You Travis Griggs!)
- Toolbar Editor

Pollock Tools

☞Enhanced UIPainter

What is gone:

-More than 3 tabs

-Special tabs for color

-Special tabs for layout

-Apply & Cancel buttons

What is added:

-Event configuring in Painter

-Event coding in Painter

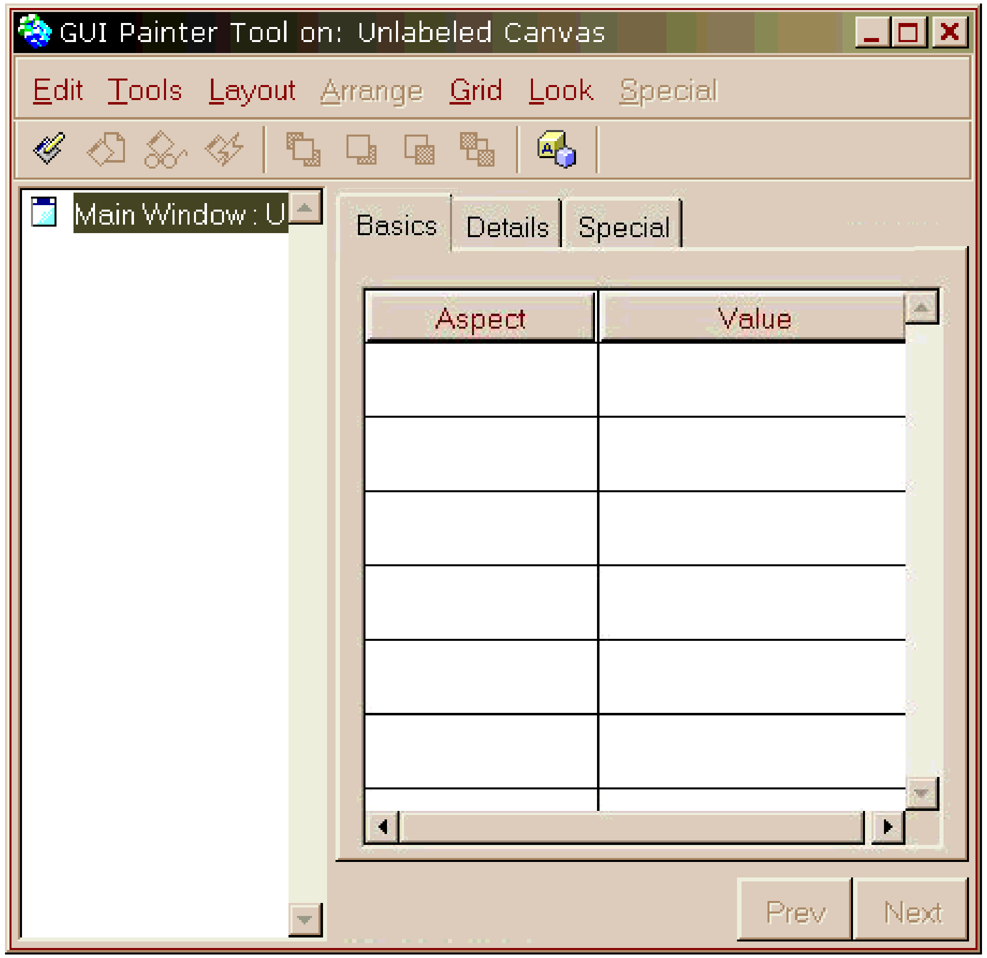
-Save to XML external file

-”Unlimited” Undo/Redo

-Undo/Redo list

-Widget Morphing

-The Kitchen Sink


GUI Painter Tool on: Unlabeled Canvas
Edit Tools Layout Arrange Grid Look Special
Main Window : U
Basics Details Special
Aspect Value
Prev Next

Building A New Widget

- Our Example : The Region Pane
- What we have to do

1. Write a Test
2. Create the Pane subclass
3. Write a Test
4. Create the Agent subclass
5. Write a Test
6. Create the Artist subclass

Pane – Required Methods

- agentClass
- artistClass
- defaultControllerClass
- frameClass
- getController

  (because defaultControllerClass is nil)
- outerExtentChanged: aPoint

First Uses

```
openWindowWithRegion
        self openWindow.
        region := Region new.
        region frame: (OriginExtentFrame origin: 10 @ 10 extent: 100 @ 100).
        window addComponent: region
```

```
openWindowWithRegionWithBorder
        self openWindow.
        region := Region new.
        region frame: (OriginExtentFrame origin: 10 @ 10 extent: 100 @ 100).
        region border: #ridged.
        window addComponent: region
```

Fleshing It Out

- rectangle instance variable (Pane)
- drawOn: (Artist)
- background (Artist & Pane)
- lineSize, lineColor, fillColor (Aritist & Pane)
- visible, beVisible: (Agent & Pane)

On your own

- ☞ Platform looks (if any)
- ☞ Additional shapes

Q & A

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