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Communication for
Management Professionals

Welcome to Java.Next Track

Peter Pilgrim

JAVAWUG.com, Sun Java Champion, Lloyds TSB Corporate Markets

Today

- Enterprise JavaFX for the Web Platform
  - -Peter Pilgrim
- Java Modularity OSGi
  - – Neil Bartlett
- Groovy and Grails
  - – Graeme Rocher
- Spring Today and Tomorrow
  - – Rod Johnson
- Data Grid Design Pattern
  - – Brian Oliver

Enterprise JavaFX for the Web Platform

Peter Pilgrim

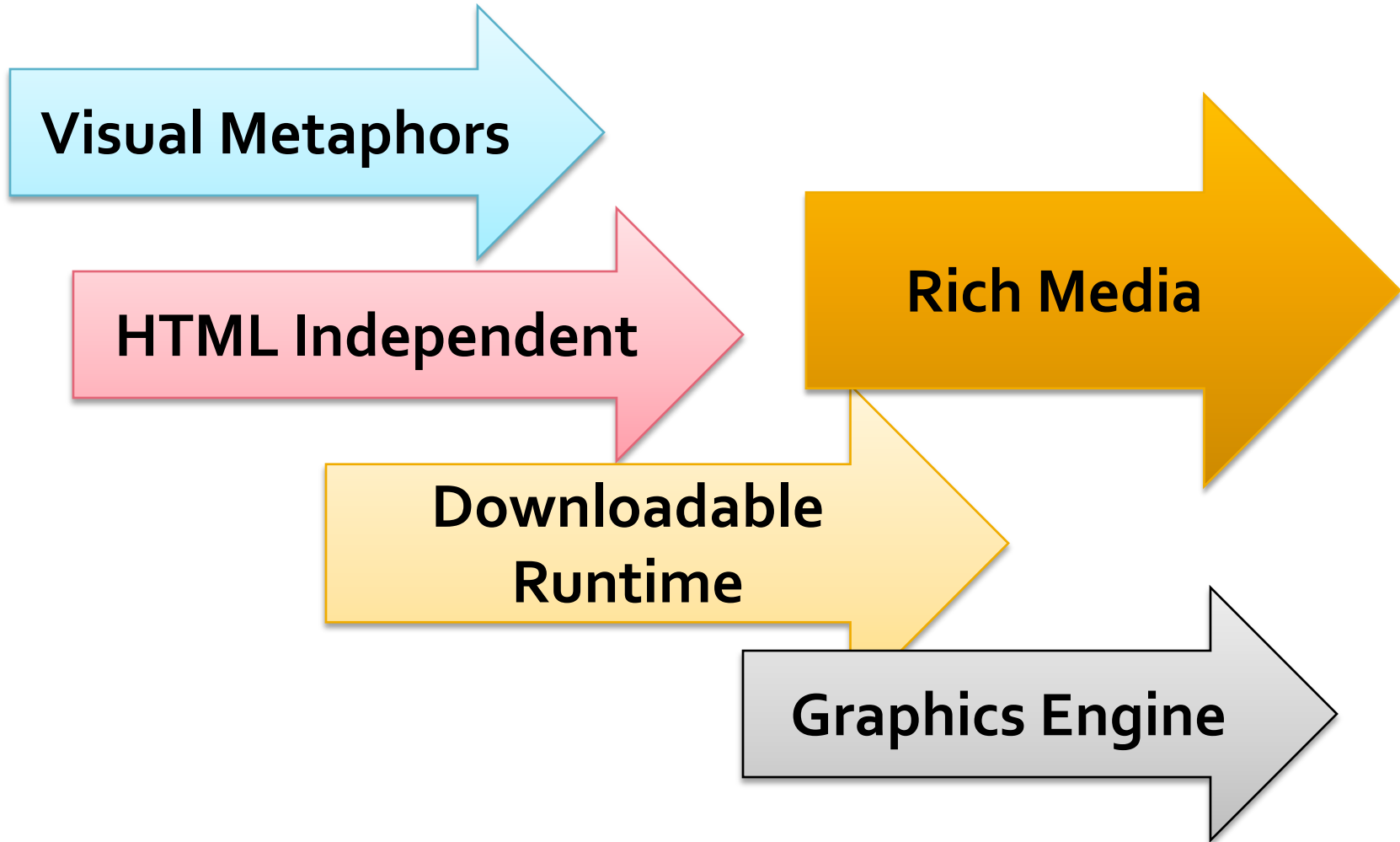JAVAWUG.com, Sun Java Champion, Lloyds TSB Corporate Markets
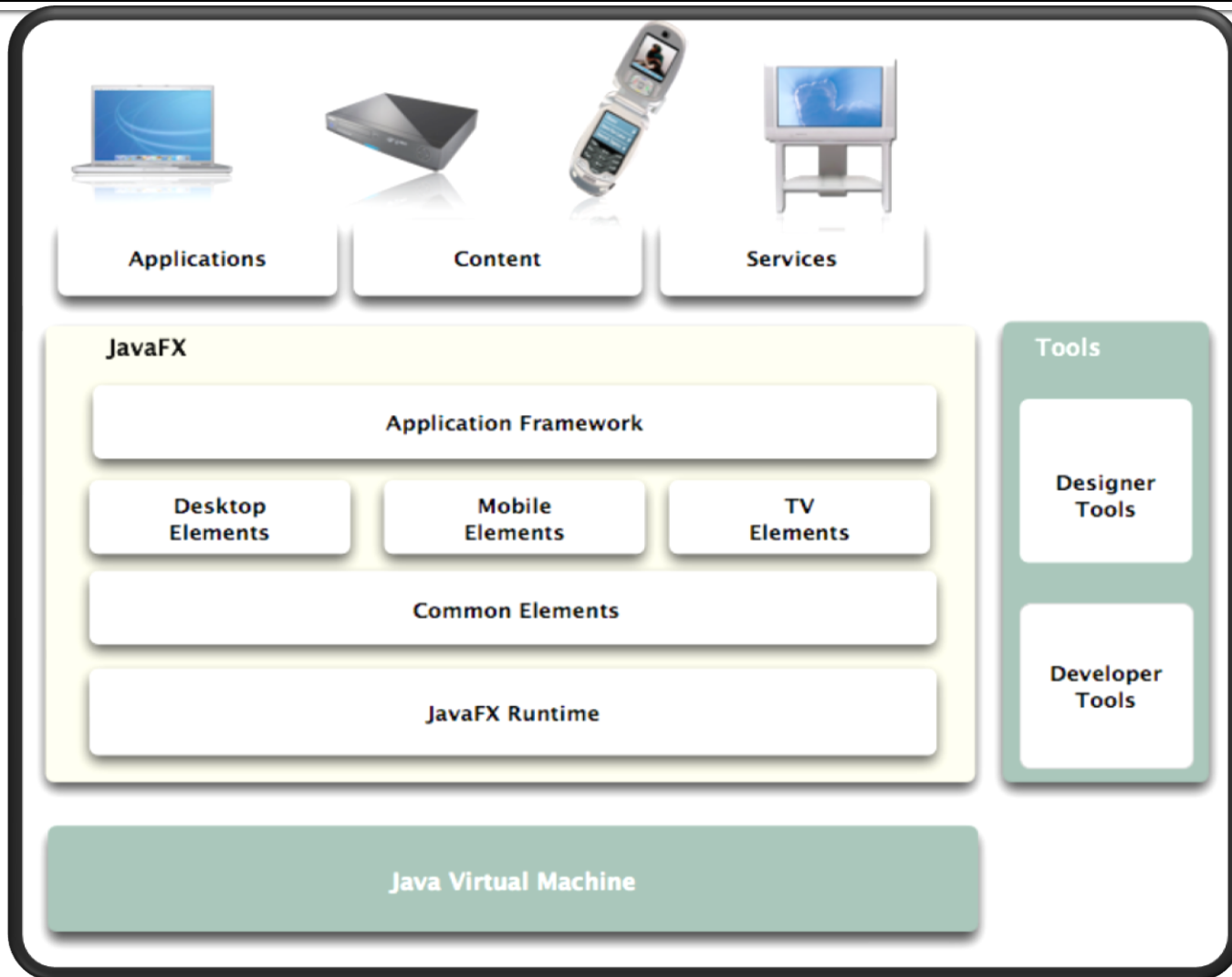
Introducing JavaFX 1.1

Agenda

- Rich Internet Applications and JavaFX
- Deployment of JavaFX Clients
- Integration Client with Server
- The Way Forward

RIA Characteristics

Visual Metaphors

HTML Independent

Rich Media

Downloadable Runtime

Graphics Engine

JavaFX Platform

Demo: JavaFX Video Player

- Object oriented scripting language
- Stage
- Scene
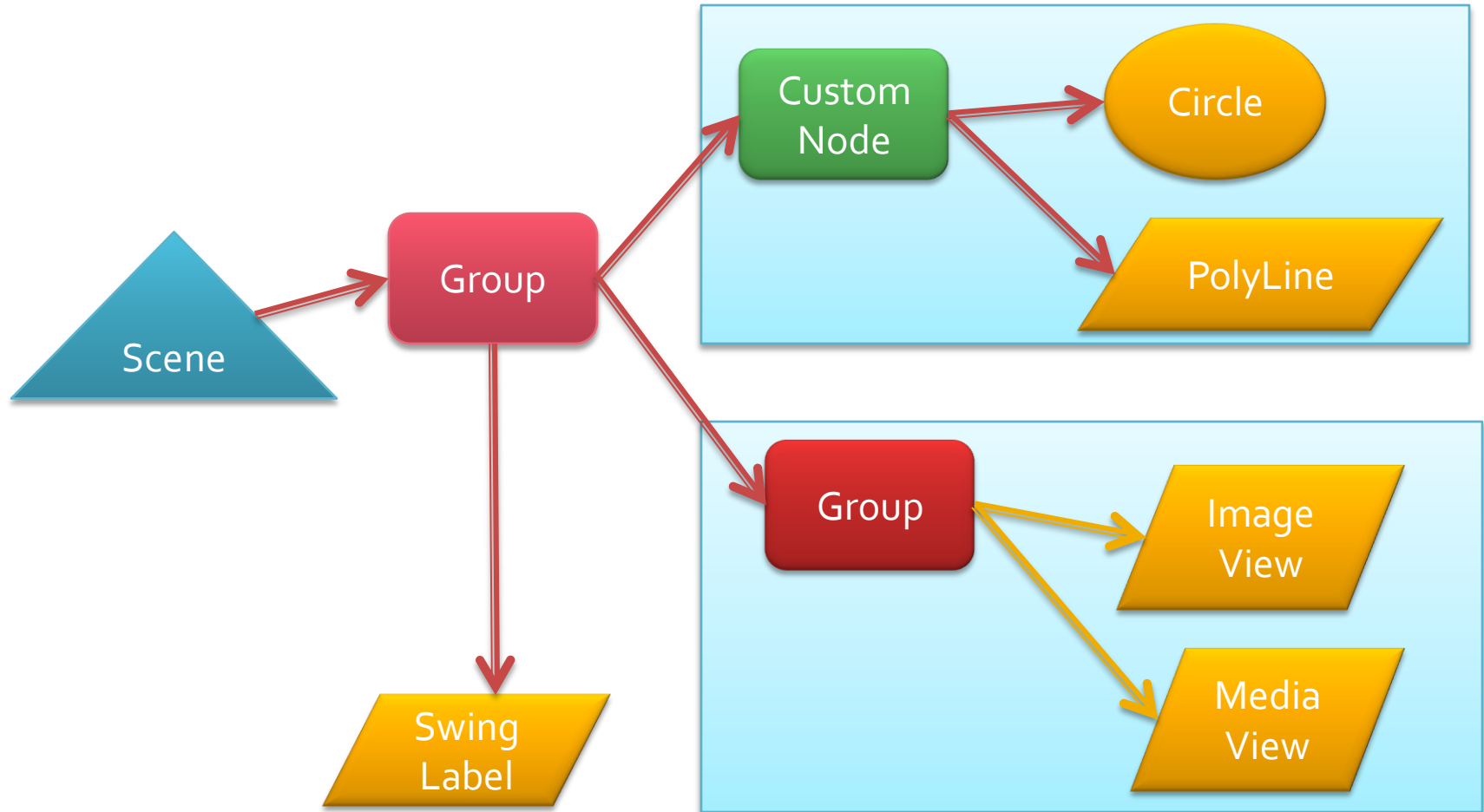- MediaView
- MediaPlayer
- Media

JavaFX

- Leverages the Java Platform
- Statically Compiled DSL for the JVM (SDK)
- Runtime for Desktop & Mobile RIA
- Java Media Component API
- Java 6 update 12 JDK / JRE

Stage & Scene

- Stage – container for scene (JFrame, JApplet)
  - Desktop profile supports translucency
  - Mobile profile specialised UI container
- Scene – container for the UI scenegraph

SceneGraph

JavaFX The Language

Language Fundamentals

- Expression based scripting language
- Declarative and Object Oriented
- Based on Chris Oliver ideas from JavaScript, Miranda, SQL and Lisp
- However, integrates with Java

JavaFX 1.1 Reserved Words

abstract after and as assert at attribute before bind bound break catch class continue def delete else exclusive extends false finally first for from function if import indexof in init insert instanceof into inverse last lazy mod new not null on or override package postinit private protected public-init public public-read replace return reverse sizeof static step super then this throw trigger true try tween typeof var where while with

Standard Types

- No primitives allowed. Wrapped Primitives.
- Boolean, Character, Byte, Short, Integer, Long, Number, Float and Double
  - Number defaults to a Float (for performance)
- String, Duration
- Sequences `element[index]`
- Void

Declarative Syntax

```
var red = Rectangle { fill:Color.RED
    x: 50; y: 50; width: 320 height: 240
    arcWidth: 24 arcHeight: 24}

var text = Text { x: 100 y: 100
    font: Font { size: 64 }
    content: "The Red\nDevils" }

var stage = Stage { width: 400 height: 300
    scene: Scene {  content: [ red, text ] }
    style: StageStyle.TRANSPARENT
}
```

Demo: Lets Play Red Devil

- Live coding Example
- NetBeans 6.5
- Transparency

Sequence Types

```
// A sequence of Strings
[ "red", "green", "gold" ]
// A sequence of Integer
[ 21, 31, 44, 65, 95 ]

// Range of Integers from 0, 1, 2 to 100
[0 .. 100]
// Range of Integers from 0, 1, 2 to 99
[0 .. <100]
```

Sequence Types #2

```
var fruits[] = { "Apple", "Pear", "Orange" };

// Prints "First element is Apple
FX.println( "First element is {fruits[0]}" );

// Prints 3
FX.println( sizeof fruits )

var empty[];
// Prints 0
FX.println( sizeof empty );
```

Sequences #3

- Nested sequences are automatically flattened

```
var seq = [ [ 1,2,3, [4,5,6] ], [7, 8, 9] ];
for ( e in seq ) {
    FX.println( "{indexof e}-{e}" );
}
// Prints 0-1 1-2 2-3 3-4 4-5 5-6 6-7 7-8 8-9
```

Sequences #4 (SQL Influence)

var names=["Khan", "Bush Jr"];

insert "Obama" into names;
// ["Khan", "Bush Jr", "Obama"]

insert ["Reagan", "Bush Sr"] before names[0];
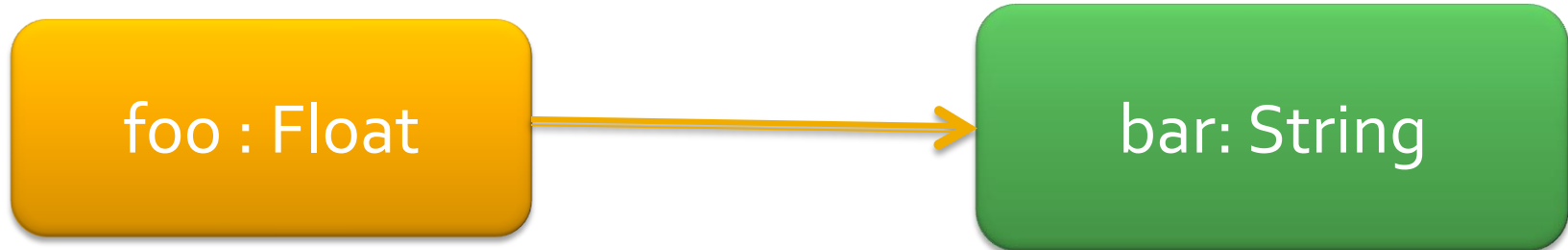// ["Reagan", "Bush Sr", "Khan", "Bush Jr", "Obama"]

delete names[2]; delete "Khan" from names;
// ["Reagan", "Bush Sr", "Bush Jr", "Obama"]

insert "Clinton" after names[1];

Binding


```
var foo: Float = 3.14596527;
var bar: String = bind "bar={foo}";
FX.println(bar); // bar=3.141596527
foo = 27.471;
FX.println(bar); // bar=27.471
```

Triggers with Objects

```
var x = 7 on replace oldValue {
    FX.println("x was {oldValue} and is now: {x}")
};

// Prints x was 7 and is now: 12
x = 12;
```

Triggers with Sequences

```
var data: Float[] = {10.2, 74.4, 82.7 }
on replace oldValue[firstIdx .. lastIdx] = newElements {
    println("replaced {oldValue}[{firstIdx}..{lastIdx}] by
    {newElements} yielding {data}")
};

// Prints "replaced [10.2, 74.4, 82.7]{4..3} by 3.14
    yielding [10.2, 74.4, 82.7, 3.14 ]
insert 3.14 into data;
// Prints "replaced [10.2, 74.4, 82.7, 3.14]{2..2} by null
    yielding [10.2, 74.4, 3.14 ]
delete data[2];
```

Classes and Literals

```
public class Dimension2D {
    public var width: Float; public var height: Float;
    public function override toString() {
        return "Dimension2D( width={width},
                height={height} )";
}

// Object literal syntax
var prefSize = Dimension2D{ width: 640 height: 480 };
prefSize.width = 1920;
prefSize.height  = 1200;
```
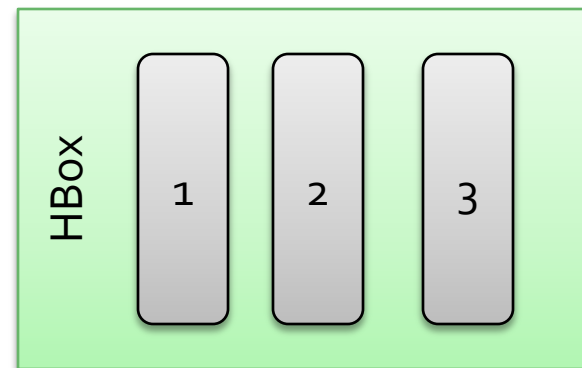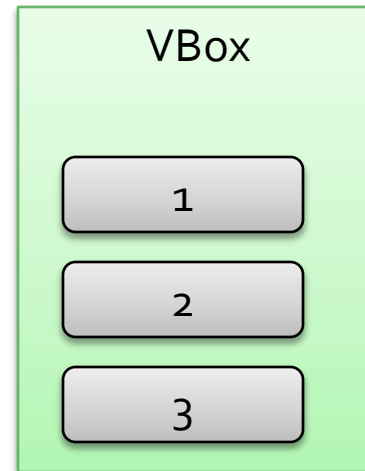
Demo: Binding User Interfaces

- Live Coding Example
- RGB Color Mixer

JavaFX Layouts

- HBox – Horizontal layout container
- VBox – Vertical layout container
- Custom layouts
  - Write your own
  - See JFXtras Project for Grid and MigLayout
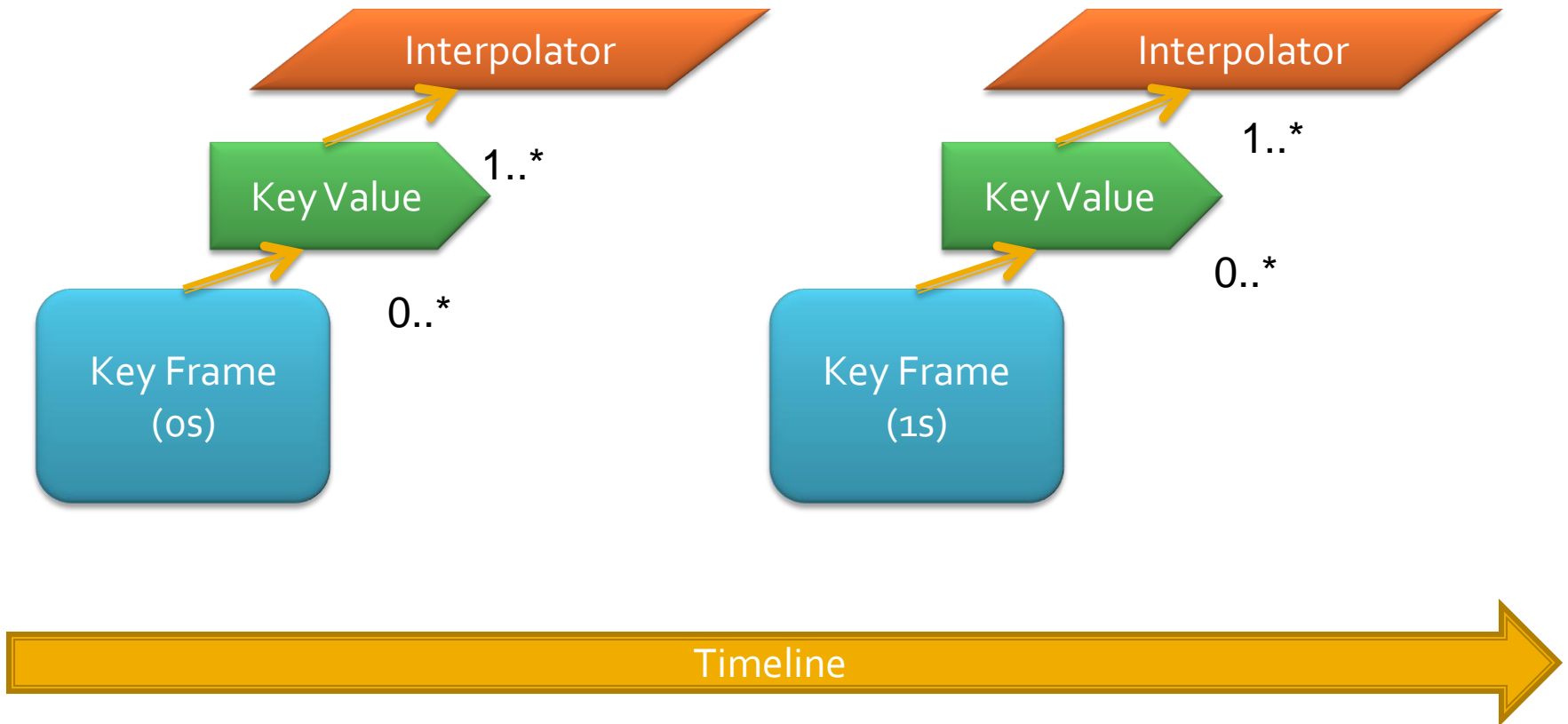
VBox

| 1 |
| 2 |
| 3 |

HBox

| 1 | 2 | 3 |

Demo: Custom Layouts

- ## My Personal Layouts
  - Perspective Tabbed Pane
  - Animated Tabbed Pane
  - MigLayout Example

Timeline Support in JavaFX

Interpolator

Interpolator

Key Value

1..*

Key Value

1..*

0..*

0..*

Key Frame
(0s)

Key Frame
(1s)

Timeline

Timeline Example

```
var t1 = Timeline {
      repeatCount: Timeline.INDEFINITE
      keyFrames: [
        KeyFrame {
          time: 0s
          values: [ angle => 180, xpos => 0  ]
        },
        KeyFrame {
          time: 4s
          values: [ angle => -180, xpos => 400
                  tween Interpolator.EASEBOTH ]
        }
      ]
    };
t1.play();
```

Demo: Simple Timeline Animation

Here is one I partially
   prepared earlier.
JavaFX Timeline

Transitions - Canned Animations

- Animations for a single purpose
  - Translation/Scale/Rotation/Fade
  - Animation along a path
  - Containers for complex animation
    - SequentialTransition
    - ParallelTransition
    - PauseTransition

Demo: Transition Animations

Transitions
Fade
Translate
Rotate
Scale
Parallel
Sequence

Deploying JavaFX

How to Deploy FX Applications

- **Javafxpackager** to generate a JAR
- Write a Java Network Launching Protocol (JNLP) file
- Upload the JARS and JNLP file
- On the client side, theJavaFX Runtime will download the appropriate JRE runtime e.g. "Consumer JRE"

"Consumer JRE" Java 6 Update 10+

- Java Kernel

  - Sun Microsystems modularised JRE

- Java Quickstarter
- Deployment Kit
- Accelerated Graphics
- Draggable Applets

RIA Communications

Client and Server

- FX Libraries support XML / JSON Parsers
- Asynchronous HTTP requests
- Invoke RESTful Web Services

HttpRequest Object

```
def request = HttpRequest {
    location: "http://api.flick.com/.../rest/?method=..."
    method: HttpRequest.GET

    onInput: function( is: InputStream ) {
        try {
                    // parse the content
        } finally {
                    is.close();
        }
    }
}

// Start the request, executes on the EDT
request.enqueue();
```

Pull Parser or XStream

- Use the javafx.data.PullParser to parse XML into data objects
- Or how about using Codehaus XStream in JavaFX? Yes we can!

The Way Forward

Hybrid Application

- HTML Web Pages
- Applets
- JavaScript / DOM

Enterprise Store

- Corporate packagement of RIA (JavaFX) application
- See WidgetFX (BSD license)

RIA Portal

- Lack of traction on the JSR 186 and 286 portal servers
- Lack of successful models may drive RIA portals based on Flex and/or JavaFX

End Game

Summary

- Easy and Accessible Rich Media
- Bindings, Triggers and Sequences
- Write YOUR JavaFX applications today! Deploy to desktop, target mobile phones
- In the Summer 2009 expect **JavaFX 1.5**

Thanks for your attention!

- My Email **peter.pilgrim at gmail dot com**
- My Blog roll http://jroller.com/peter_pilgrim
- JavaFX main site **http://javafx.com/**
- NetBeans 6.5 IDE
  http://www.netbeans.org/features/javafx/index.html
- JFXtras Project http://code.google.com/p/jfxtras/
- JavaFX Language Reference Docs
  http://openjfx.java.sun.com/current-
  build/doc/reference/JavaFXReference.html
- JAVAWUG http://jroller.com/javawug