JavaFX 1.1
Technical Introduction

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JavaFX Highlights

- Expressive rich client platform bringing together web, scripting, media, and Java

- Targets **desktop**, **browser**, **mobile**, and **entertainment** with a unified development and deployment model

- For (web) developers, designers, and creators

- Adds new dimensions to the Java platform
  - > Do **cool stuff easily** that was traditionally hard in Java
  - > **Leverage** the power and pervasiveness of Java
  - > **Break from** from the browser

Demos
- Effects Playground
- Photo Flockr
- Video Box

RIA Development: Web RIA or Java?

RIA
- Rich User Experience
- Secure sandbox
- Ubiquity if player is available
- Limited access to system/network capabilities
- Proprietary

Web App
- Desktop focused, growing in Mobile
- Moderate User Experience, improving
- Very limited access to system/network capabilities (unless tied to specific browser)
- Trending to fragmentation (browsers, APIs)

Java App
- Multiple screens/platforms
- Proven security architecture
- Access to system & network capabilities, deep integration
- Difficult to create rich User Experience
- Fragmented (e.g. media support)

RIA Development: Web RIA or Java?

Leverage Strengths, Address Limitations

RIA

Web Application

JavaFX, built on Java

- Ubiquity (desktop, web, mobile, TV)
- Proven security architecture
- Access to system & network capabilities
- Rich user experience and media
- Scripting, declarative UI
- Full browser integration, if desired
- "Break Free" from browser

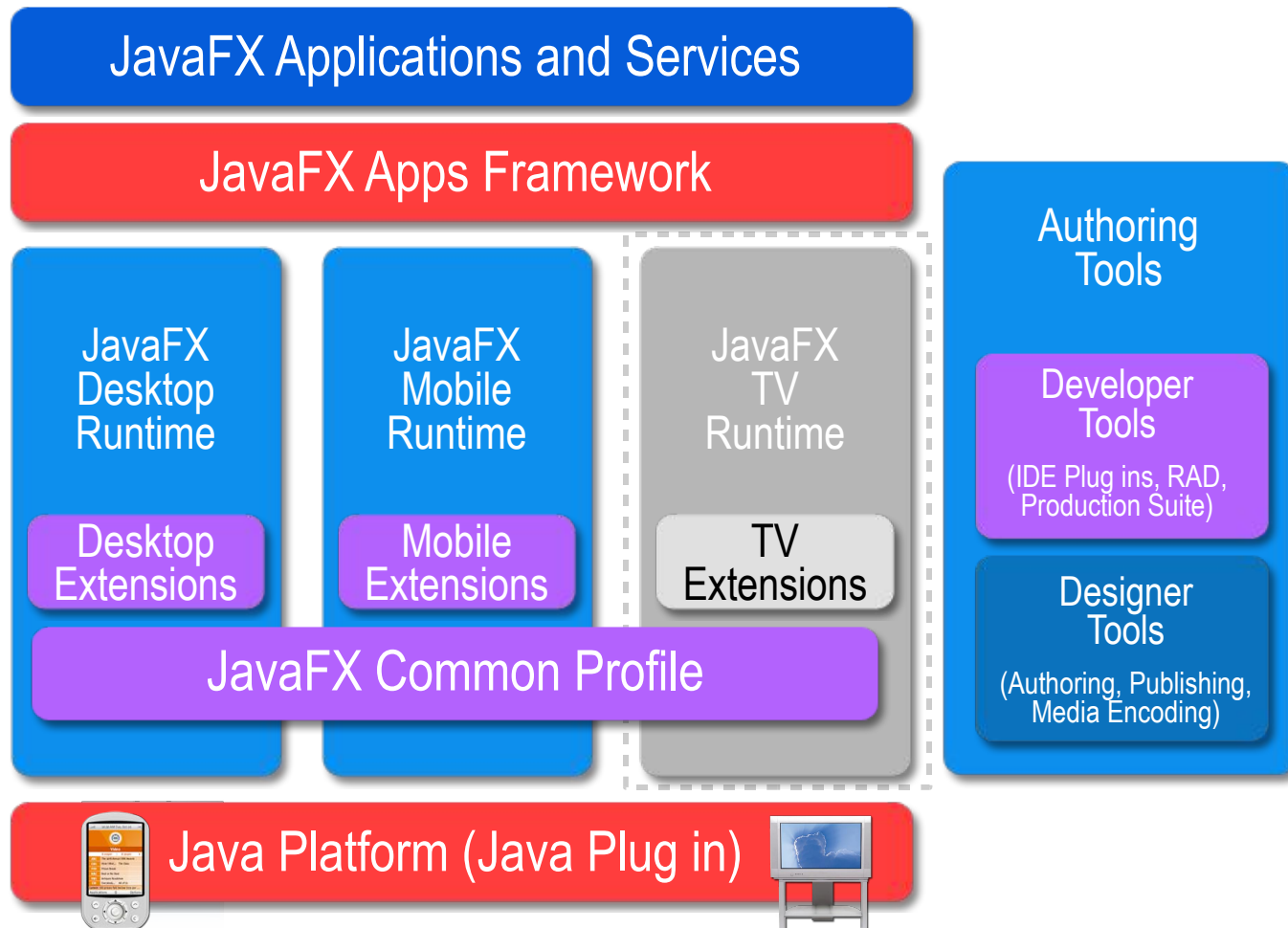# What Can You Build with JavaFX 1.1

- Cross-Browser Video playback

- Interactive and immersive business applications

- Mash-ups with REST based web services

- Applications that run across the browser, desktop, mobile and more!

JavaFX 1.1
Architecture, Tools,
and Components

JavaFX 1.1 + Java Marketecture

JavaFX Applications and Services

JavaFX Apps Framework

JavaFX Desktop Runtime	JavaFX Mobile Runtime	JavaFX TV Runtime	Authoring Tools
Desktop Extensions	Mobile Extensions	TV Extensions	Developer Tools (IDE Plug ins, RAD, Production Suite)
JavaFX Common Profile			Designer Tools (Authoring, Publishing, Media Encoding)

Java Platform (Java Plug in)

JavaFX Components

- JavaFX Script - The Language

- JavaFX Runtimes: Desktop/Web, Mobile, TV (in 2010)
  - > 1.5 MB jar (700 KB packed), dynamically downloaded, cached, and updated as necessary (i.e. "no-hassle deployment")

- JavaFX Applications
  - > In jar file(s), loaded via class loader
  - > Standalone, via Java Web Start, as Applet, or mobile app

- JavaFX Tools
  - > FX Script compiler and runtime tools
  - > IDE plug-in, designer tools
  - > Graphics-, media-, web services-, and rich text libraries

Java 6 Update 10 - "Applets reloaded"

- New Java "Kernel"
  - > Componentized runtime – small modules loaded upon demand
  - > Faster download and install of modules
  - > Java QuickStarter: Faster cold-start, near-instant warm-start

- New Browser Plug-In
  - > Rewritten from scratch, new architecture (mostly in Java)
  - > Applets run in separate process - independent of the browser
    - – More control and reliability
  - > Rewrite of "LiveConnect" JavaScript bridge
    - – Interaction between browser (JavaScript) and Applet (Java) much improved

Demos
- Photo Effects
- Draggable MP3 Player
- Video Box

JavaFX 1.1 Developer Tool Chain

Media Assets Created By

Adobe Illustrator

Adobe Photoshop

On2 Flix Encoders
(JavaFX File Format, VP6 and MP3)

Adobe CS3
(Flash and Flash Video, JavaFX 1.5)

Assets Transformed By

JavaFX Production Suite

3rd Party RAD Tool

Integrated Into IDEs

NetBeans.ORG

JavaFX Plug-in for IDEs

JavaFX Compiler

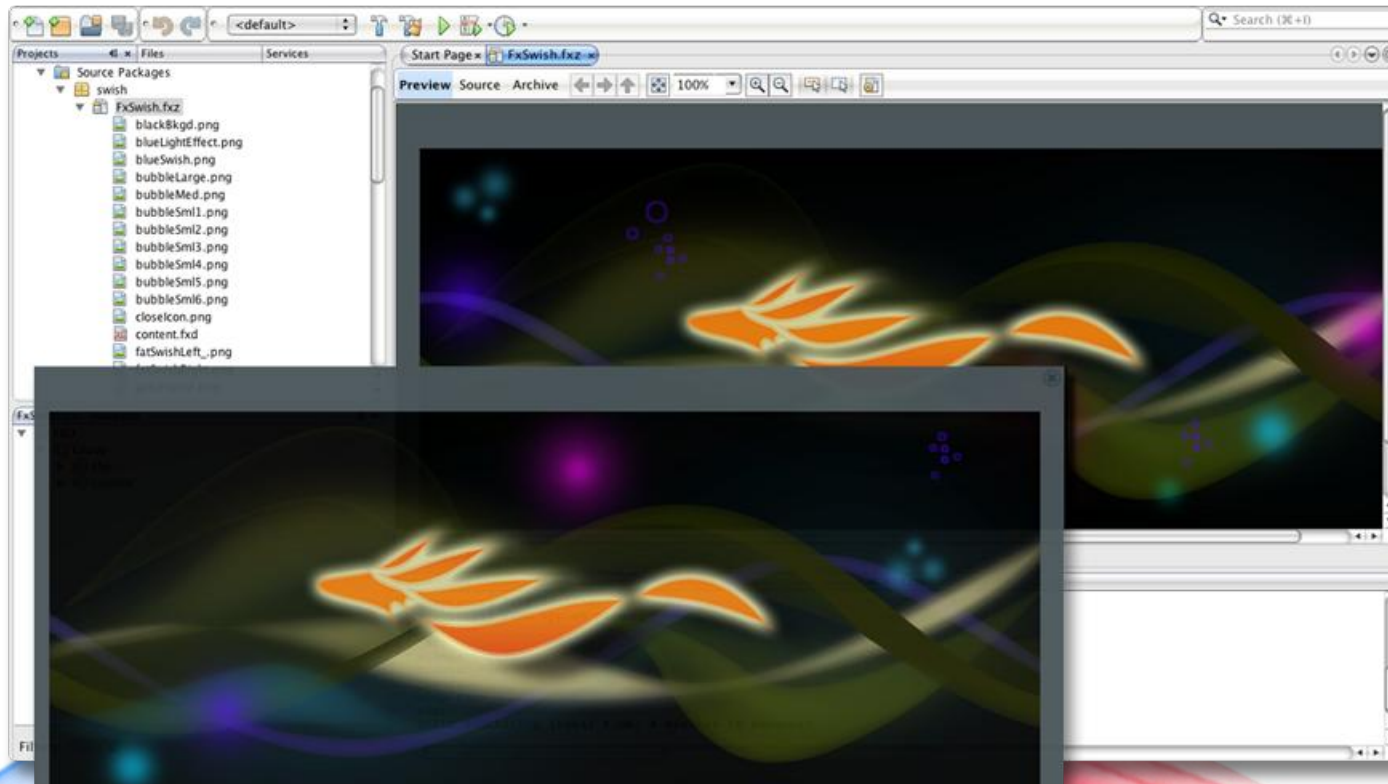eclipse

(Open Source)

Emulated By (If Required)

JavaFX Mobile Emulator

JavaFX 1.1 Plugin for NetBeans
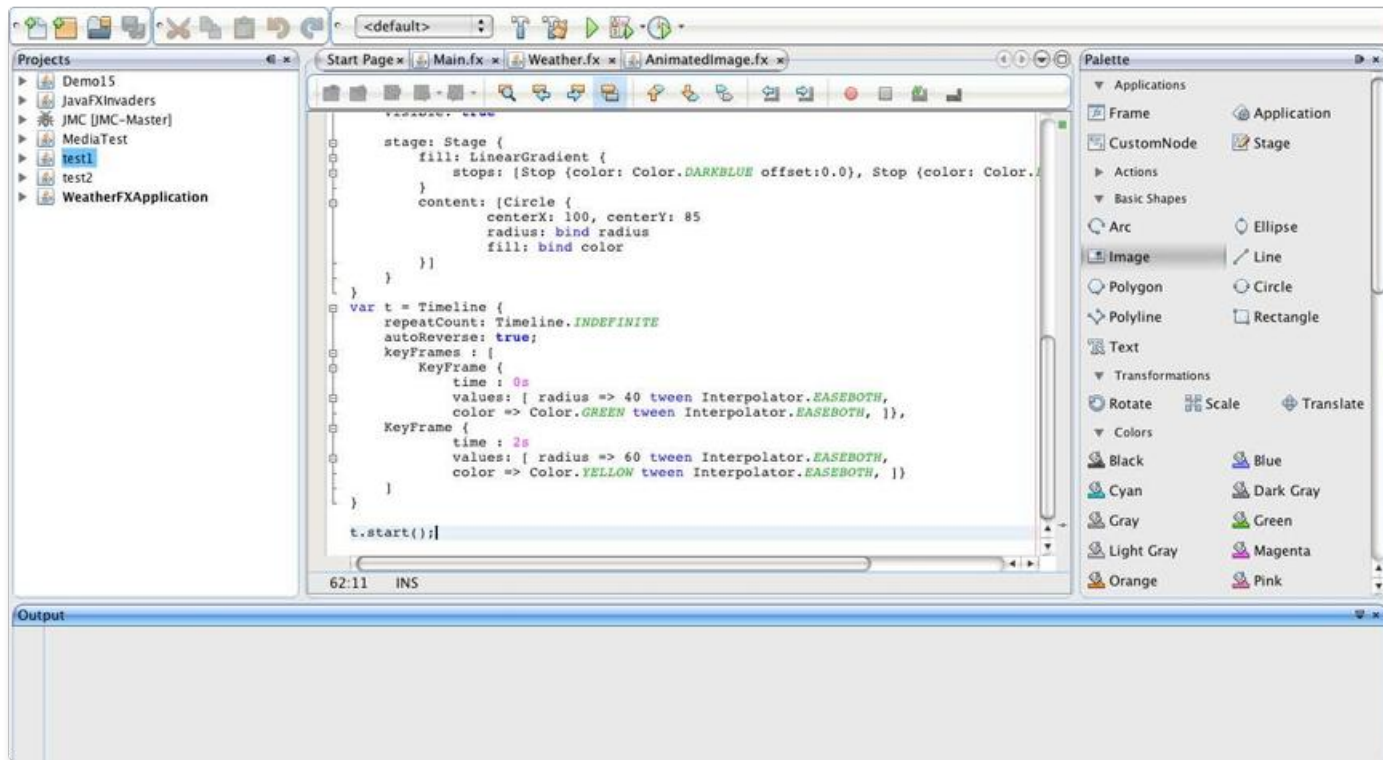
Incorporate Existing Visual Assets with the JavaFX Production Suite

JavaFX 1.1 Features
and Language

JavaFX Common Profile Features

Components	Features	
Compiler and Languages	>SE 5 and CLDC Target	
Graphics	>Geometric shapes, lines, curves, arc >Transparency >Gradient, color fill, texture >Stroke styles	>Clip with arbitrary geometric shapes >Image masks >Fullscreen support >transforms (rotate, scale, skew)
Text	>True Type font rendering >Transforms (rotate, scale, skew) >Content embedded font	

JavaFX Common Profile Features

| Components	Features	
Animation	>Key frame animation with tweening >Path-based animation	>Standard animations (rotate, zoom, slide)
Media	>Cross platform audio (mp3) and video (On2) >Codec native media framework support (DirectShow and Core Video), play, pause, seek, volume, balance, speed controls	>Volume and audio balance control >Http streaming with buffering fxm file format (FLV subset)
Other	>Web services (JSON/XML parser, RESTful APIs) >Common text input control (CSS skinning) >Input handling (keyboard, mouse, touch)	

JavaFX Scenegraph

- Tree-like structure of graphical nodes
- Easy, platform-neutral way of vector graphics representation

```
Scene {
    Group {
        Rectangle,
        Circle
    }
}
```
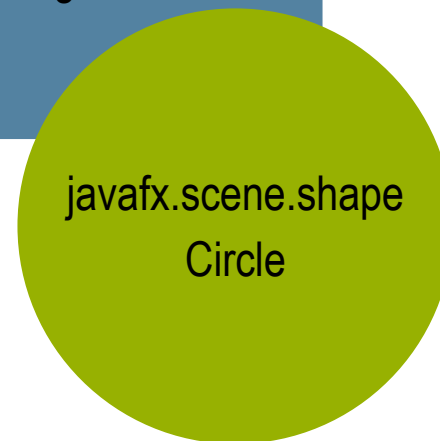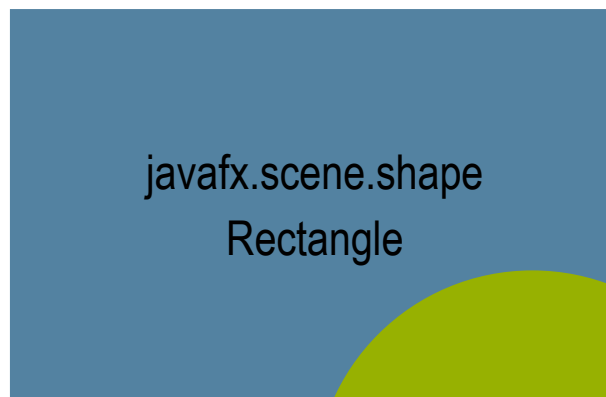
- Swing components can be embedded (on Desktop profile)

javafx.scene.shape
Rectangle

javafx.scene.shape
Circle

JavaFX Script - The Basics

- A powerful script programming language
  - > OO, statically typed, type inference, binding, sequences, timelines, ...
  - > Functions are first-class objects
  - > Domain-specific: Designed for creating rich user interfaces
  - > Declarative syntax makes UI better organized
  - > Seamless interoperation with Java (shares same runtime)

- Built-in support for compelling graphics and media
  - > Adds compositional behavior on top of Java2D
  - > Easy and rich cross-platform graphics, animation, video & audio

- Compiles to run on high-performance Java runtimes

"Hello World" - Swing version

```java
import javax.swing.*;


public class HelloWorldSwing {
    public static void main(String[] args) {
        JFrame frame = new JFrame("HelloWorld Swing");
        final JLabel label = new JLabel("Hello, World");
        frame.getContentPane().add(label);
        frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        frame.pack();
        frame.setVisible(true);
    }
}
```
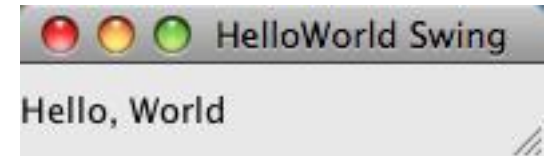
"Hello World" - JavaFX version

```
import javafx.stage.*;
import javafx.scene.*;
import javafx.scene.text.*;


Stage {
    title: "HelloWorld JavaFX"
    scene: Scene {
        width: 200
        height: 50
        content: Text {
            x: 50, y: 20
            content: "Hello, World"
        }
    }
}
```
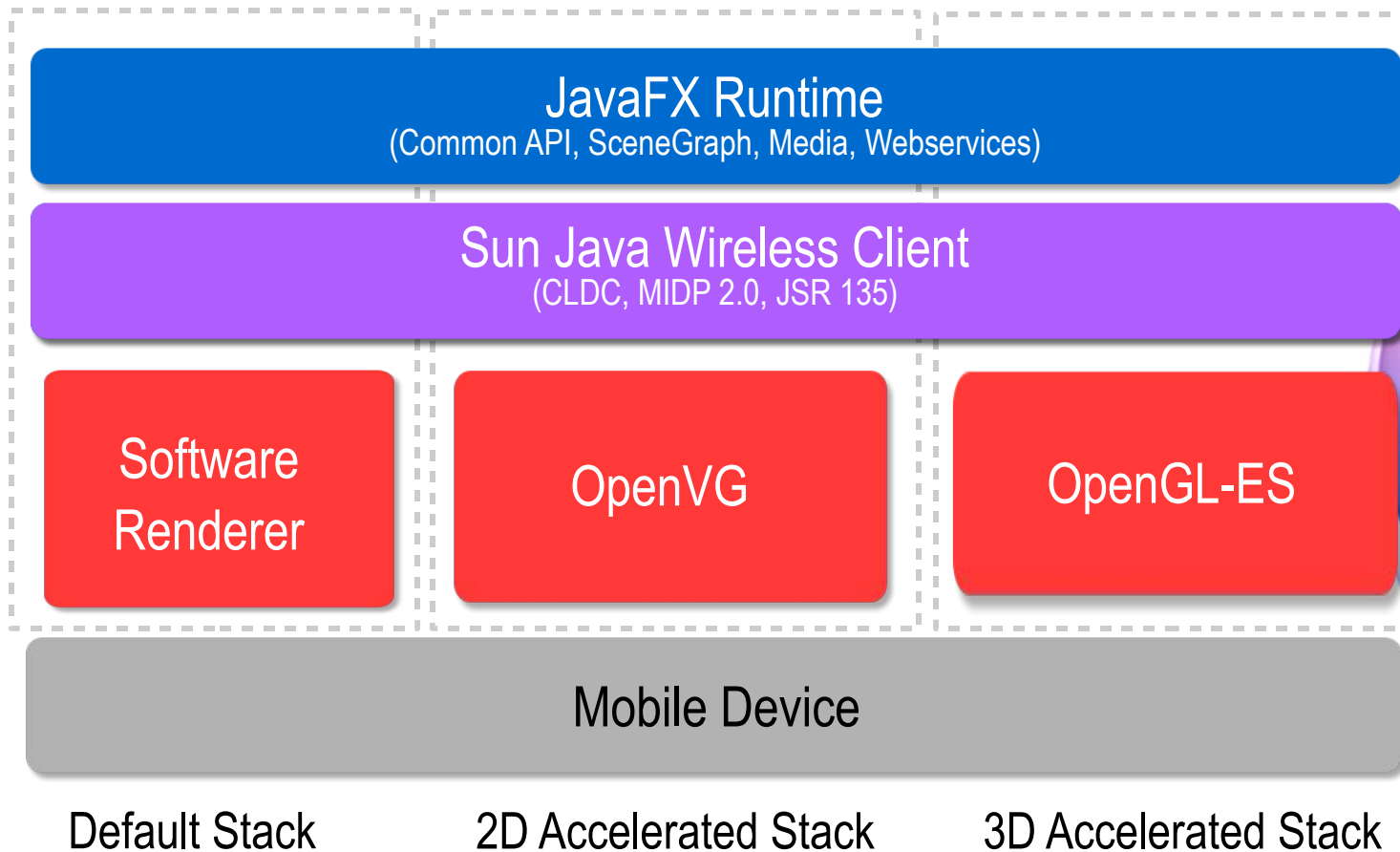
Appetizer - Some JavaFX Script Language Features

- "HelloWorld", animated
  - > Add timeline for animation
  - > Use binding to animate text position
  - > Add button and mouse event handler to turn animation on and off
  - > Use NetBeans "Realtime Preview" feature

JavaFX 1.1 Mobile

JavaFX Mobile Architecture

JavaFX Runtime
(Common API, SceneGraph, Media, Webservices)

Sun Java Wireless Client
(CLDC, MIDP 2.0, JSR 135)

Software Renderer

OpenVG

OpenGL-ES

Mobile Device

Default Stack   2D Accelerated Stack   3D Accelerated Stack

JavaFX Mobile Overview

- JavaFX 1.1 SDK
  - > Includes final version of JavaFX Mobile and mobile emulator

- Choice of platform targets
  - > Create cross-platform applications using JavaFX Common Platform
  - > Leverage mobile-specific features using JavaFX Common Platform
    - – and/or JavaFX Mobile Elements
    - – and/or mobile-specific JSR APIs (e.g. location, sensor, ...)

- Delivery and deployment of JavaFX applications to devices

Cross-Platform Development and Deployment

- Unified development
  - > Common tools
  - > Common code base
  - > Common programming paradigm

- Create, deploy, and run at the touch of a button
  - > Desktop app
  - > Web Start
  - > Applet in Browser
  - > Mobile app on emulator (and phone)

Demos
- Media Factory
- CloudDVR

JavaFX Road Map & Wrap-Up

JavaFX Road Map

- JavaFX 1.1 is out now
  - > Windows (XP, Vista), Mac OS X
  - > Runtimes: Desktop, Web, and Mobile
  - > Full Linux support coming soon

- "Marina" (JavaFX 1.2) release in May/June 2009
  - > RAD Designer Tool preview
  - > Cross-platform UI toolkit
  - > Ongoing improvements in performance, media support, etc.
  - > Developer devices (planned)

- 2nd Half of 2009
  - > JavaFX 2.0 + RAD Designer Tool release

Wrapping Up

- Now, Java has it all

Volume of devices **and** platforms	✔
Large base of developers **and** content authors	✔
Expressiveness, compelling UI, **and** power	✔
Rapid application development	✔
Accessibility and wide range of tools	✔
Cross-platform ubiquity	✔

- See **http://javafx.com** for samples, videos, tools, docs, and tutorials

Thank You.

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