JavaOne℠

TS-4506
Migrating Your Java™ Platform, Micro Edition MIDlets to JavaFX™ Mobile Technology

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Agenda

Introduction to MIDlets and JavaFX Mobile

Mobile RIA: Tapping Into Creativity

Model View Controller

Stage and Scene

Binding UI to the Controller

Using Mobile Samples

Adding Media

Demo

Summary

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Introduction to MIDlets

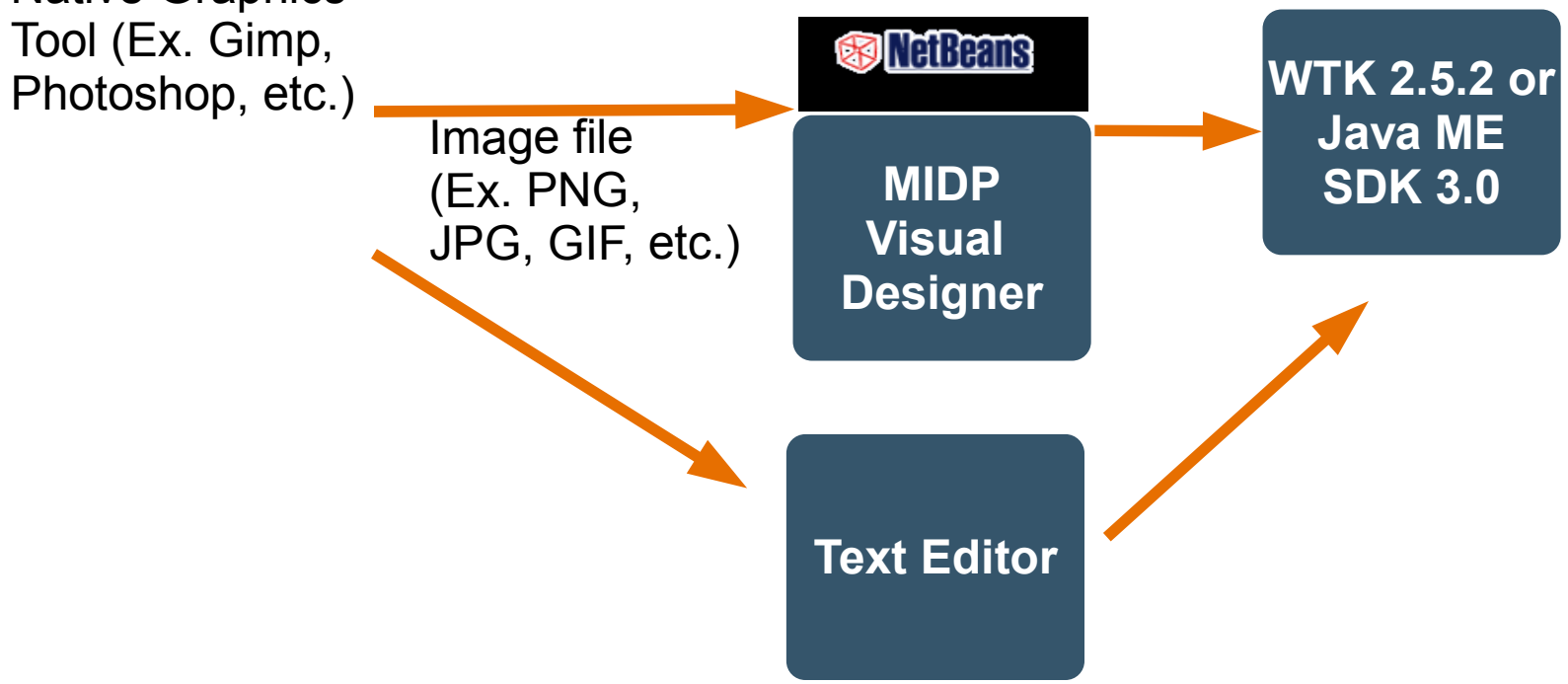
- Java Micro Edition
  - Resource-constrained devices
  - Mobile Information Device Profile (MIDP)
    - MIDP Applications: MIDlets
    - Tools: Wireless Toolkit (Java ME SDK)
    - Same core fundamental APIs: java.lang, java.io
    - New APIs: javax.microedition
  - Edit, compile, preverify, package, test/deploy
  - Tools:
    - Wireless Toolkit (WTK) 2.5.2/Java ME SDK 3.0
    - NetBeans (Visual Designer)

Introduction to MIDlets (Tool Chain)

Media Assets Created By:

Integrated into IDEs:

Emulated by (if reqd):



Introduction to JavaFX Mobile

- JavaFX: Create and deliver Rich Internet Apps across multiple screens (powered by Java)
- JavaFX Mobile: Addresses JavaFX on mobile devices
  - Create and deliver RIAs on cell phones
  - Powered by Sun Java Wireless Client
    - CLDC/MIDP/JSRs
  - Tools:
    - JavaFX SDK 1.2 (mobile emulator)
    - NetBeans 6.5.1 (JavaFX SDK 1.2 w/mobile emulator), Production Suite

Introduction to Java JavaFX Mobile (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

Integrated into IDEs:

NetBeans

Sun JavaFX Plug-in for IDEs

Sun JavaFX Compiler

eclipse

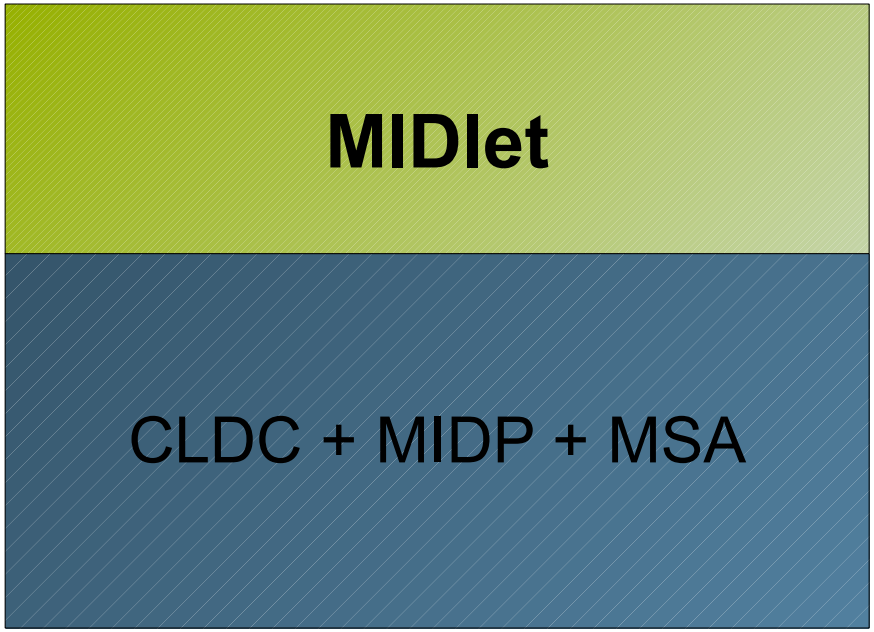
(JavaFX 1.5)

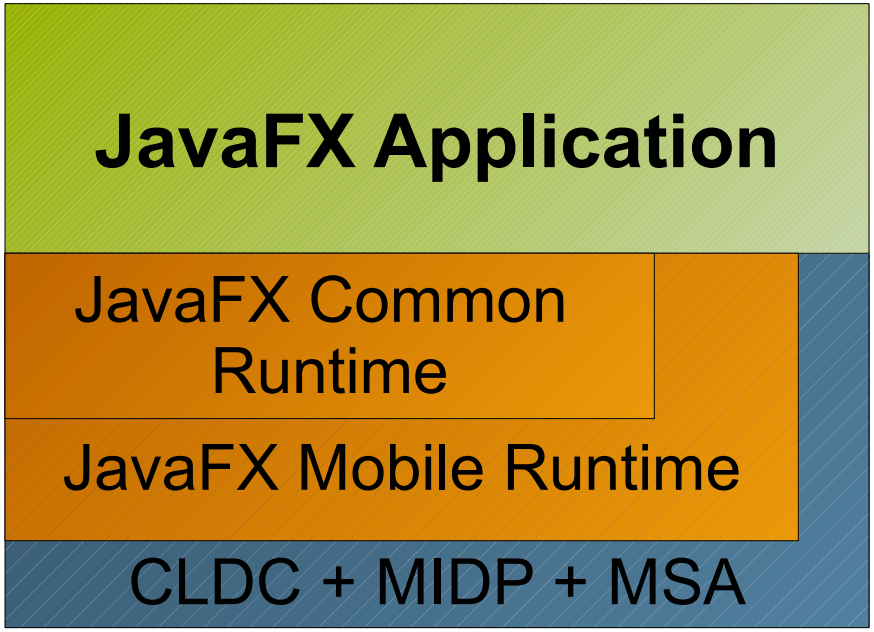
3rd Party RAD Tool

Emulated by (if reqd):

Sun JavaFX Mobile Emulator

Introduction: MIDlet vs. JavaFX App





Introduction to JavaFX Mobile

- MIDP JSRs can be accessed by JavaFX Mobile Apps
  - Example:
  - MSA JSRs for Bluetooth, PIM, Location, SMS/MMS, Sensors, etc.
- Make calls to JSRs in JavaFX Script code
  - One-way access from JavaFX to MIDP JSRs

Introduction to JavaFX Mobile

JavaFX App Using MIDP JSR 256 (Sensor API)

```
Stage {
 scene: Scene {
        content: [
            ImageView {
                x: bind X
                y: bind Y
                image: bind image
                }
...
// Timeline update function
public function update(): Void {
        X = channelXRange.getLargestValue();
        Y = channelYRange.getLargestValue();
}
```

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Mobile RIA: Tapping Into Creativity

Mobile RIA: Rich Internet Application - user experience, networking, secure sandbox, player on today's cell phones

Break free of Mobile Web Browser

Developers and Designers

- Designers create rich assets
- Developers re-use Java
- Heavy use of Mobile Media
- Mash-up of RESTful Web services

Mobile RIA: Tapping Into Creativity

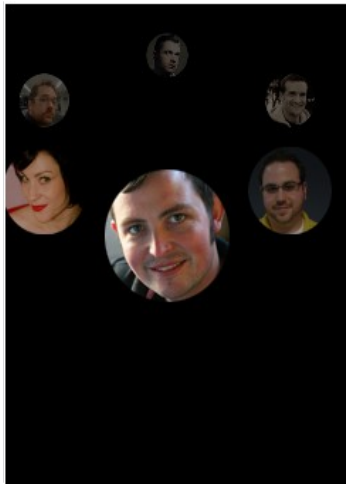
- JavaFX Mobile as a way for Mobile RIA
- JavaFX Common APIs
  - Same Functionality on Mobile as on Desktop
  - Same UI Controls (widgets)
  - Same documentation
  - Cross-platform use

Mobile RIA: Tapping Into Creativity

Before: MIDlet

Figure 1: Address Book Contacts in a MIDlet

After: JavaFX Mobile



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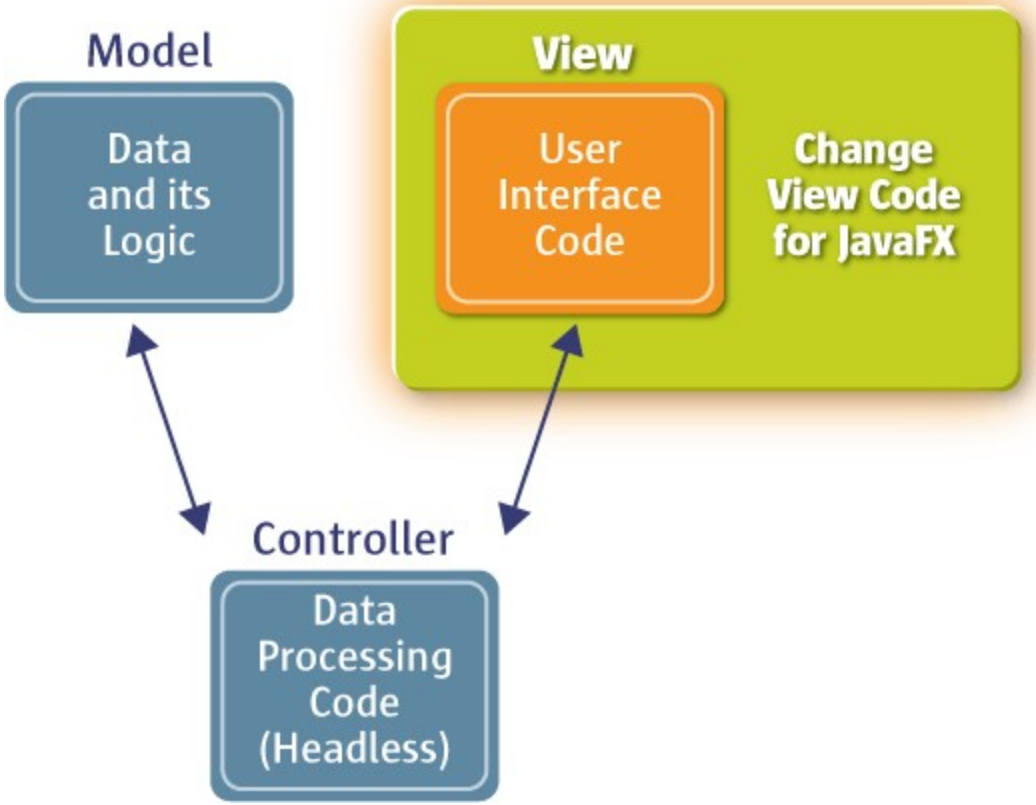
Model View Controller (MVC)

- Split of components
  - Model
    - Information (data)
  - View
    - UI elements
  - Controller
    - Manages communication

Model View Controller



Model View Controller

- Model View Controller in Mobile
  - MIDlet data (RMS, GCF, etc.)
  - LCDUI/GameCanvas
  - MIDlet headless code
- Re-implementing View of MIDlets
  - Use JavaFX Stage and Scene
  - SceneGraph: UI Controls

Model View Controller Example: MIDlet View

LCDUI List

```
List listOfAddr = new List("Adresses",
  List.IMPLICIT, elements, null);
...
private void listView() {
  listOfAddr.deleteAll();
  int n = addressList.size();
  for(int i = 0; i < n; i++) {

  listOfAddr.append(
    addressList.elementAt(i).toString(),
      null);
  }
}
```

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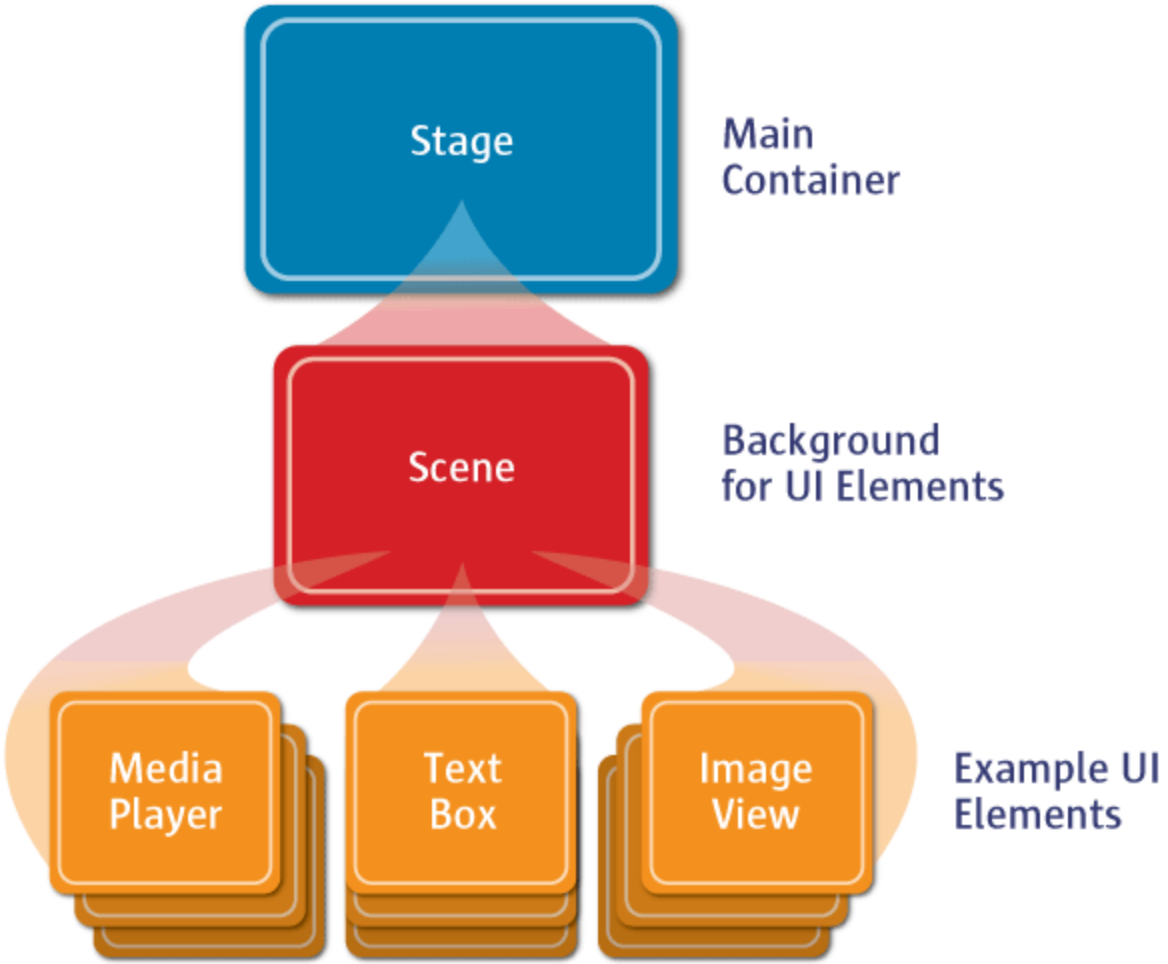

Model View Controller Example: JavaFX View

JavaFX Mobile List

```
Stage {
 scene: Scene {
        content: [
            ImageView {
                x: bind X
                y: bind Y
                scaleX: bind scale
                scaleY: bind scale
                opacity: bind opacityVal
                image: bind imageFromFile
                }
// *** NOTE: Use bind carefully because of
//          performance issues
```

Model View Controller Example: JavaFX View

JavaFX Mobile List

```
public function update(i:Number,angle:
  Number): Void {
          Z=Math.sin(angle + i*image_gap +
  shift) * radius + zcenter ;
          scale = fl / (fl + Z);
          X= Math.cos(angle + i*image_gap +
  shift) * radius + xcenter;
          Y= -Math.sin(angle + i*image_gap +
  shift) * radius_y + ycenter ;
      }

...
```

Stage and Scene

- JavaFX Stage: Root area for scene content
  - Common background
  - Equivalent to Frame
- JavaFX Scene: Multiple groups of UI elements, which can be switched
  - Groupings of Nodes
  - Content holds the elements

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Binding UI to the Controller

- MIDlet has existing Controller event code
- Use of Bind in JavaFX
  - Link attributes, so when a value changes in MIDP automatic changes happen in JavaFX
- Triggering from input events
  - Bind UI events to call MIDP code
- Using data from MIDP
  - JavaFX objects hold onto MIDP data to pass to MIDP when bind events occur

Binding UI to the Controller

Transparencies

Animations

Swooping motions (transitions)

Binding UI to the Controller

Example of Bind from JavaFX to MIDP:

```
Label {
   text: bind data.value.toString( )
}

function getCountFromMIDP( ) {
   ...
   // Use MIDP Java ME calls to get data
   data = MIDPClass.getCount();
}
```

Binding UI to the Controller

Ex. of Bind from JavaFX to MIDP Animation:

```
def track = Path { elements: [ MoveTo {
    x: bind X
    y: bind Y },
...
};
def anim = PathTransition {
   node: sprite
   path: AnimationPath.createFromPath(track)
...
function getPositionFromMIDP( ) {
   // Use MIDP Java ME calls to get X,Y data
}
```

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Using Mobile Samples

Samples at:

- **http://javafx.com/samples**

TextBox

- LocalSearch

ImageView

- Carousel

MediaComponent

- SimpleVideoPlayer

Using Mobile Samples

TextBox

```
var zipCodeText: TextBox = TextBox {
    blocksMouse: true
    columns: 7
    selectOnFocus: false

    text: "95054"

    onKeyPressed:function(e:KeyEvent) {
    if(e.code == KeyCode.VK_UP) {
      //...
    }
}
```

Using Mobile Samples

ImageView

```
content: [
   ImageView {
   x: bind X
   y: bind Y
   scaleX: bind scale
   scaleY: bind scale
   opacity: bind scale
   image: bind imageFromFile
   }
]
```

Using Mobile Samples

MediaComponent

```
def mediaUrl:String
  ="http://sun.com/samplemovie.flv";

var fullWidth = 640;
var fullHeight = 360;

var mediaBox:MediaComponent = MediaComponent
  {
     // set media and make the comp visible
     mediaSourceURL : mediaUrl
     visible:true
...
```

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Adding Media

MediaPlayer vs. MediaComponent

- MediaPlayer: APIs to play audio or video
- MediaComponent: UI Control player for convenience

Use MediaPlayer for programmatic control of media

- Play songs and videos

Use MediaComponent to give a Window with controls to play media

Adding Media Using MediaPlayer

```
var player = MediaPlayer {
  autoPlay: false
  media : Media {
    source : "{__DIR__}song.mp3";
  }
}
var view:MediaView = MediaView {
    visible: true
    mediaPlayer: bind player
}
```

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DEMO

MIDP MIDlet running on actual device

Same MIDlet converted to JavaFX Mobile app

Browse sample source code

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JavaFX new Rich User Experience

Existing MIDlets for cell phones

Migrating your MIDlets with MVC

Using techniques such as transparency, animations, and swooping motions

Leverage JavaFX Rich Internet App programming for mobile devices

More information

Download demo code and latest slides:
https://phoneme.dev.java.net/servlets/ProjectDocumentList?folderID=11315

Other JavaOne 2009 sessions:

- TS-5488, The Mobile Evolution: Java ME to JavaFX
- TS-4069, JavaFX in Action
- TS-5226, Hardware Accelerated Graphics
- TS-4529, A Closer Look at the Java ME SDK 3.0
- TS-4861, Pro JavaFX
- TS-3789, Getting Started with WidgetFX

Questions and Answers

Q & A

JavaOne℠

Thank You

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