Java Comes Home to the Consumer
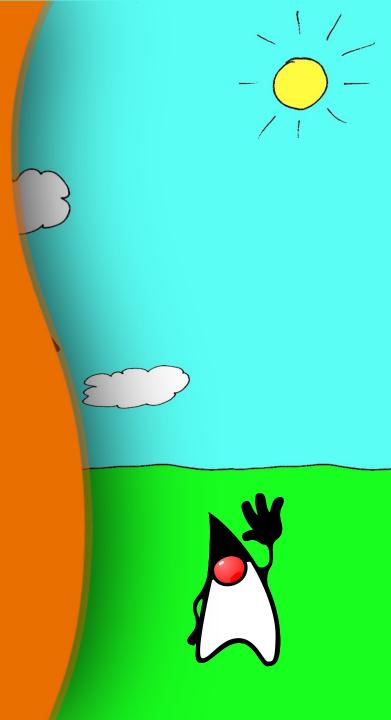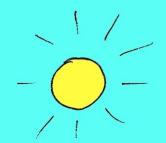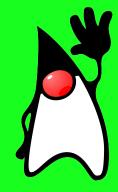
Chet Haase
Java SE Client Architect

Agenda

- Java SE 6
- Update N
- Java FX
- JDK7

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Java SE 6:
Awesome Desktop Release

Desktop API

TrayIcon

Improved native look & feel

New OS support (Vista)

SwingWorker

Project Matisse and Group Layout

Gray Rect fix

JTable Sorting and Filtering

LCD Text

Single-Threaded Rendering

Desktop AA Text Properties

Better Curved Primitives

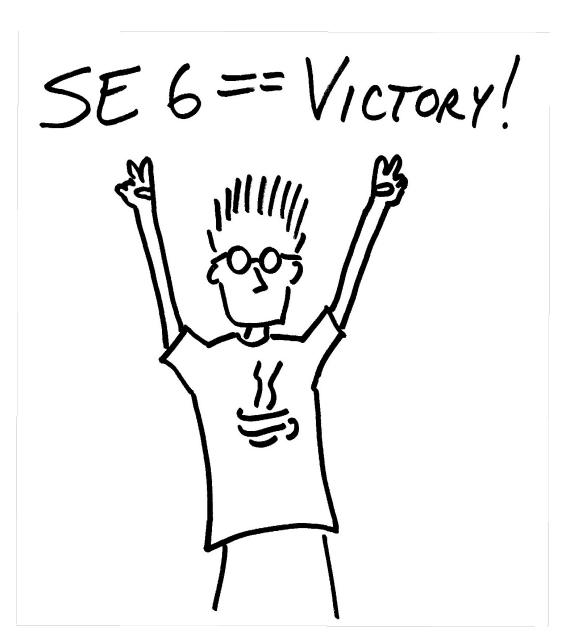Splash Screen

Better Security Dialogs

Graphics Acceleration Improvements

Is anyone still reading this?

Agenda

- Java SE 6
- Update N
- Java FX
- JDK7

Consumer JRE

~~Consumer JRE~~

Project Hamburg

~~Consumer JRE~~

~~Project Hamburg~~

Java SE 6, Update X

Consumer JRE

Project Hamburg

Java SE 6, Update X

Java SE 6, Update N

Outstanding Problems

- Startup Time

- Install Time

- JRE Detection

- Applet support

Startup Time

QuickStarter

- "Coldstart" vs. "Warmstart"
- Root problem:
  - > Large files + Disk access speed
- Solution: QuickStarter
  - > Pre-warm the disk cache
- Note: QuickStarter != running VM
  - > Smaller footprint, more targeted disk pages
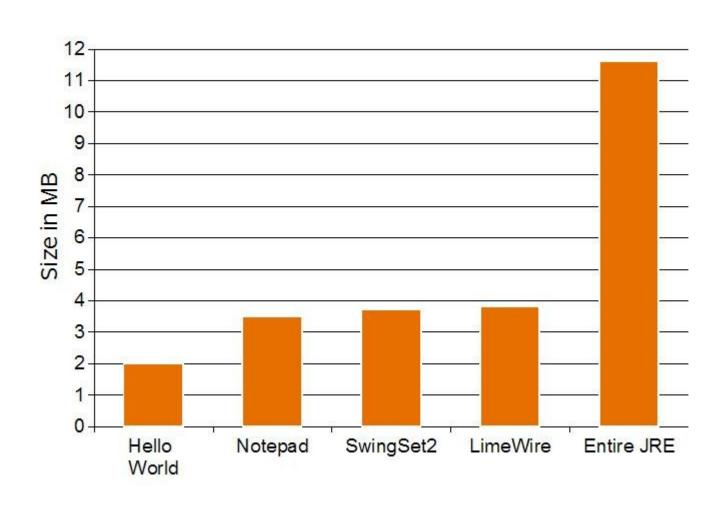
Install Time

Install Time

- Java's not small
  - > J2SE 5.0: 7.1 MB
  - > Java SE 6: 10+ MB
  - > rt.jar: 40+ MB on disk
- Lots of bits being moved around
  - > Download, Unzip, Unpack200, Copying
- Solution: Java Kernel
  - > Download only core dependencies first
  - > Launch application
  - > Download and install in the background

Kernel: Most Apps Need Only a Small Portion of the Full JRE

JRE Detection

Deployment Toolkit

- Detecting Java from a web page is hard
  - > Does the user have Java?
  - > What version?
  - > How to get user to install and return?
- Result: Most applets use old (1.1) APIs
  - > Allows them to run compatibly on old versions
    - > e.g., MS VM
- Solution: Deployment Toolkit
  - > JavaScript hosted at Sun for general detection
  - > Plugins (ActiveX and Mozilla) for more specific detection
  - > Detect, start installation if necessary, launch

Applets

New Plugin Architecture

- Out-of-process
  - > Small core process for overall plugin
  - > Separate process(es) for applets
  - > Faster startup
  - > Better signed applet behavior on Vista
- Increased robustness
- Better JavaScript/Java communication support
- Different JVM options per-applet
- Different applets can run different JRE versions
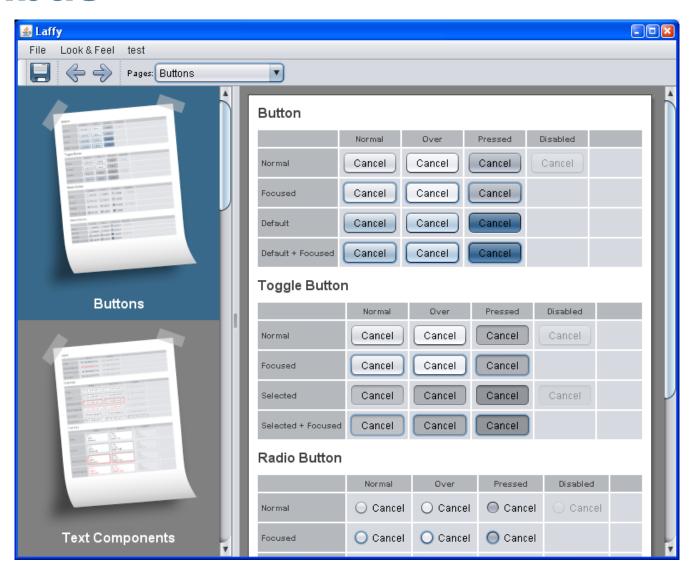
But Wait, There's More

Graphics Goodies

- Better Windows graphics performance
  - > GPU-accelerated, using Direct3D
  - > On by default
- Nimbus:
  - > Cross-platform look & feel
  - > More modern than current Metal look & feel
  - > Opt-in: Not the default look & feel
    - > Preserves backwards compatibility
  - > Design tool for creating new skins

Nimbus

Update [whe]N?

- Early Access available now
  - > https://jdk6.dev.java.net/6uNea.html
  - > Everything seen here except:
    - > Java Kernel should be added in the next couple of weeks (b07)
    - > New plugin should be added in the following build (b08)
- Beta planned for February
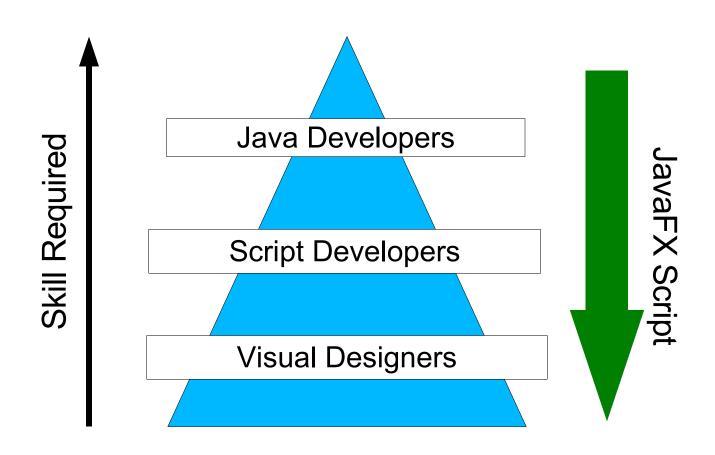- GA planned for early second half of 2008

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Java FX:
Expanding the Developer Base

Java FX:
Expanding the Developer Base

Skill Required

Java Developers

Script Developers

Visual Designers

JavaFX Script

Java FX

- Java FX Script
  - > Making consumer application development easier
  - > Runs on the Java platform
  - > Media-intensive
  - > Built-in animation
  - > Fast prototyping of GUIs and graphics
- Early access version available now
  - > http://openjfx.dev.java.net

Java FX Features

- Java FX Script
- Scene graph
- Media
- HTML
- Multiple Device

Java FX Script

Java FX Script

- Language
  - > Simple data binding
  - > Fast prototyping
  - > Declarative GUIs and graphics
  - > Easily programmed animations
- Compiler
  - > Interpreter (now): okay for demos
  - > Compiler (soon): necessary for real applications

Scene Graph

Scene Graph

- "Retained mode" graphics
  - > Versus immediate-mode 2D API
- More declarative model for:
  - > Graphics
  - > GUI
  - > Media
- Also:
  - > Animation

Media

Old TODO List

- [ ] Performance
- [ ] Data Binding
- [ ] Swing Framework
- [ ] Ease of Development
- [ ] More Hardware Acceleration
- [ ] World Peace
- [ ] Video
- [ ] Shaped Windows
- [ ] Mixed Heavyweight/Lightweight
- [ ] Animation
- [ ] Rasterization Fixes
- [ ] Drag and Drop Work
- [ ] New Look & Feel

Recent TODO List

Media

- Media player component
  - > Video
  - > Audio
  - > Simple player component creation
- Modern codecs
  - > native
  - > cross-platform

<HTML>

HTML

- Swing HTML support intentionally basic
- Need new component for "street HTML" rendering
- Will allow integrated Swing, graphics, and HTML applications

Mobile

FX Mobile

- Java FX Script isn't just for desktop
  - > Java FX Mobile platform
- Development skills that carry between platforms
  - > Not *mobile developers*
  - > Developers with skills that are *mobile*
- Easier authoring of applications for multiple devices

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JDK 7: More Client Goodness

- Some internal FX capabilities may become real Java APIs
  - > e.g., scene graph, animation
- Continued emphasis on client
  - > But other important platform work continues
    - > VM, GC, OS-related features
- Availability
  - > Sometime after FX release

Java SE 7: Sampling of Features

- Still in the planning stages
  - > These represent important features that we would like to see in the release
  - > ... but whether they make it depends on resources
- Remember, this is software
  - > Some of these will *not* happen
  - > Other features, not mentioned here, *will* happen

JDK7 Feature Samples: Client

- FX features carry-over
  - > Media
  - > Animation
  - > Scene graph
  - > HTML component
- JSR 295: Data binding
- JSR 296: Swing application framework
- Transparent/shaped windows
- Heavyweight/lightweight mixing
- GetJava executable

JDK7 Feature Samples: Core

- Startup performance

- Hotspot performance

- JSR 277: Java Modules

- JSR 294: Super packages

- Improved DTrace/Java integration

- JSR 203: More NIO

- Garbage-First (G1)

- Attach-on-demand debugging

- JSR 255 and 262: JMX

- Tiered Compilation

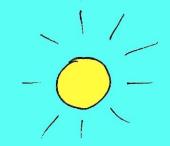# JDK7 Feature Samples: Language

- Invoke-dynamic bytecode

- Closures

- Shorthand for JavaBean properties

- Smaller proposals
  - > Declaring and constructing a variable instance
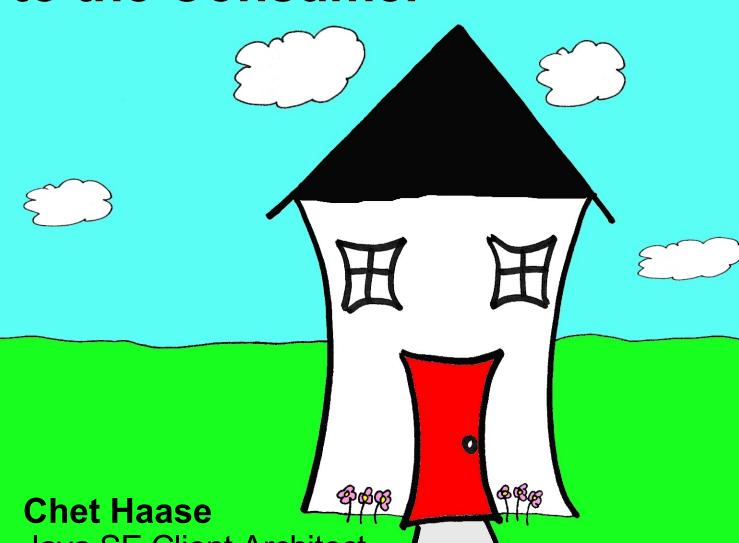 - > Strings in switch statements

For More Information

- Java SE 6 Update N
  - > https://jdk6.dev.java.net/6uNea.html
- JavaFX
  - > https://openjfx.dev.java.net/