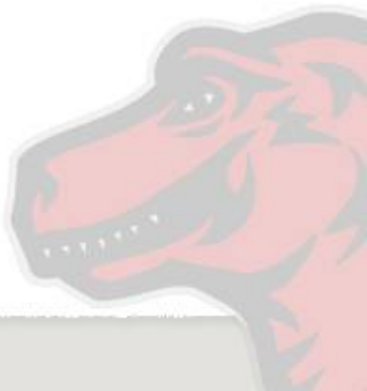
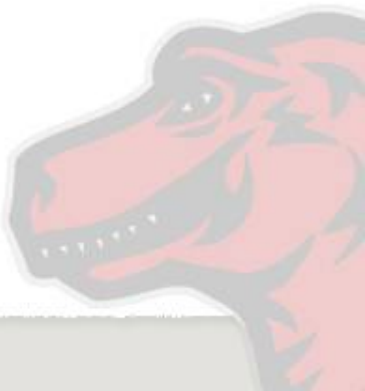
Firefox on Android

after the reboot

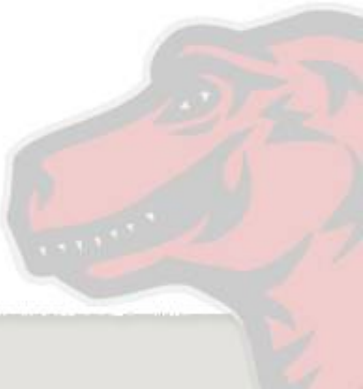


Current Status



Firefox 10 for Mobile

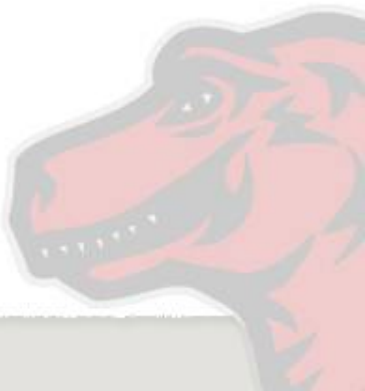
- XUL based UI; runs on Android, Maemo/Meego, WinCE, and desktop platforms
- Multi-process architecture
- CSS styling to create a native look & feel on each platform



Firefox 11 on Android

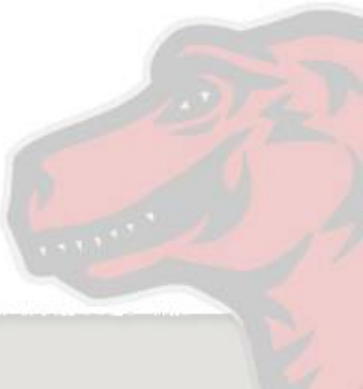
- Native Android widget based UI; runs only on Android
- Single process architecture
- Android widgets handle all look & feel capabilities in the chrome UI

NOTE: XUL based UI will be used for Tablets



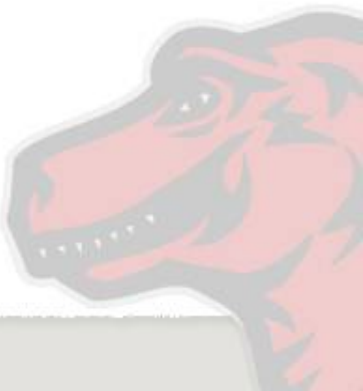
Positive Feedback

- Great HTML5 support
- Fast Javascript performance
- Innovative UI design
- Built-in support for Sync
- Quick security updates

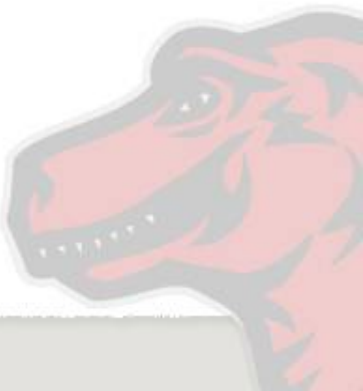


Negative Feedback

- Slow startup time
- No Flash support
- Uses too much memory/ Killed in background
- Poor alternate keyboard support (Swype / Swiftkey)
- Poor video support



Rewrite the UI!



Rewriting Code can be Harmful

When you rewrite, you are:

- Not adding new functionality
- Not fixing existing bugs
- Adding all new bugs & untested code

Stay focused on why you are rewriting:

- Create clear goals
- Create clear milestones
- Use history; You have done this before

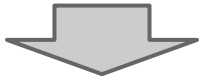
Goal: Start-up Time

- XUL based UI is limited by how fast we can load the Gecko shared libraries
- Android's Java process starts very fast: less than 300ms even on older devices

- Build the chrome UI using Android (Java) widgets
  - Very fast start-up
  - Decouple as many other systems from Gecko as possible (bookmarks & history storage)

Goal: Use Single-Process

- Multi-process helped keep UI responsive
- Many issues with multi-process
  - Increased memory usage
  - Hurt video playback performance
  - Hurt IME support

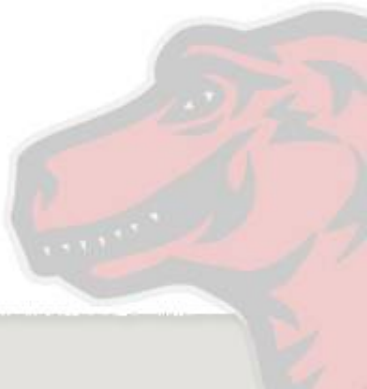


- Use multi-threaded architecture to maintain a non-blocking UI
  - Gecko platform and Android UI in separate threads
  - Use a message API to communicate

Goal: Flash Support

- No NPAPI support
  - Undocumented API
  - Different on Gingerbread, Honeycomb and ICS
- Not designed for multi-process
- Closely tied to Java

- Reverse-engineer the core API
- Implement for single-process
- Implement using Java APIs

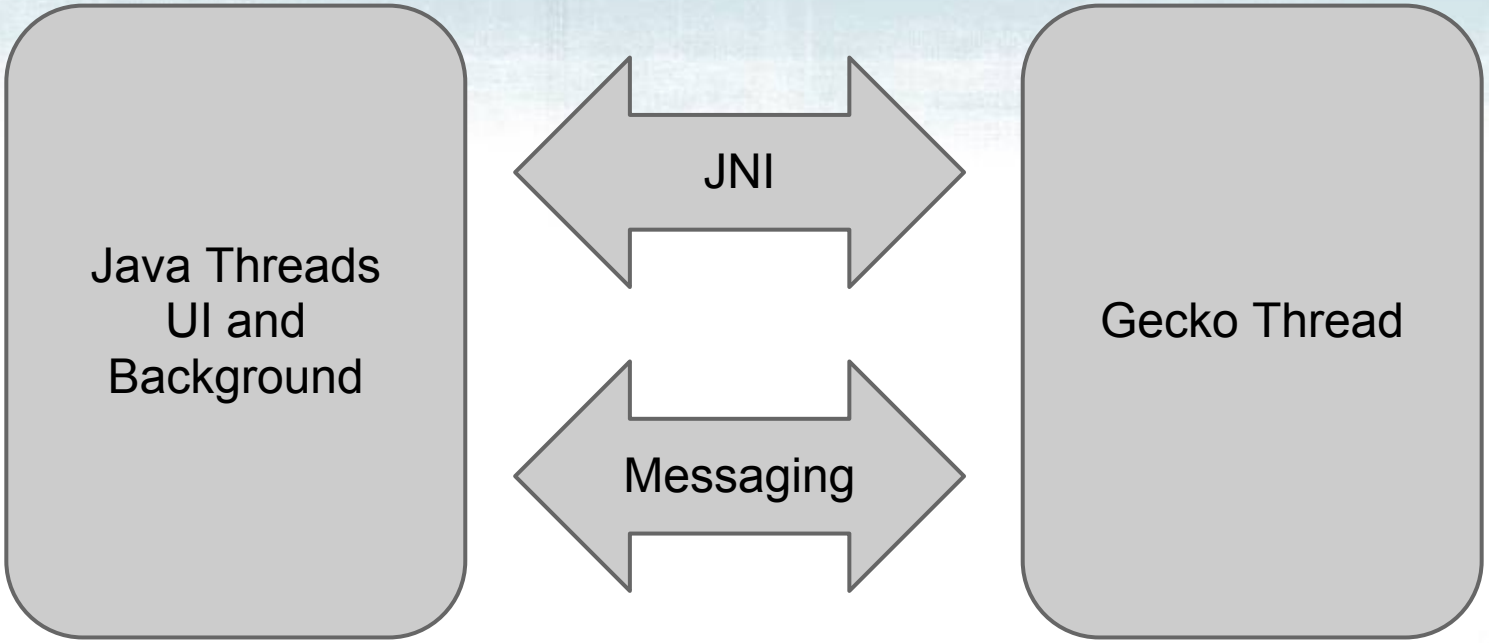


How Hard Could It Be?

Well...

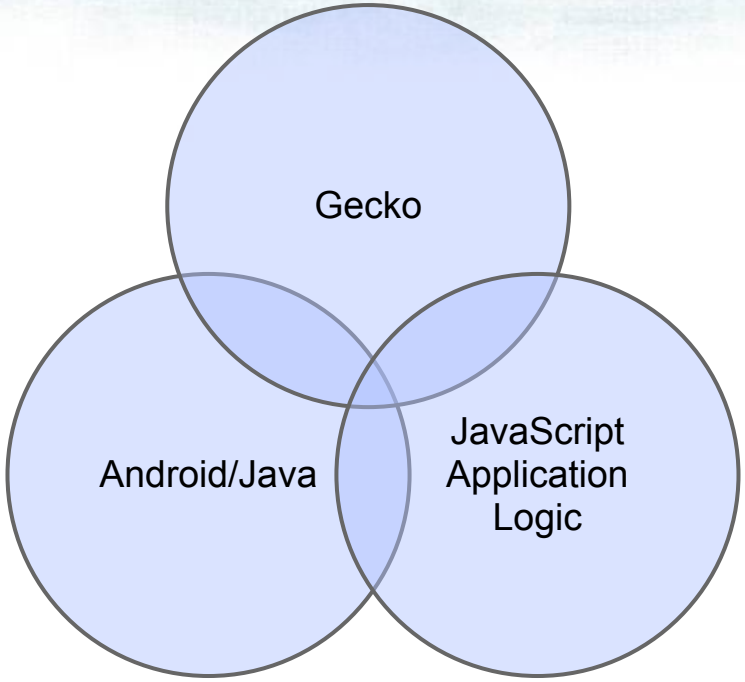
- Add-ons depend on XUL/JS system. Moving to a native UI would break them.
- Existing panning/zooming system was built in Gecko. Moving to Java means we need to re-impement.
- Existing touch-events are implemented in JS. Moving to Java means we need to re-implement.

Multi-Threaded System



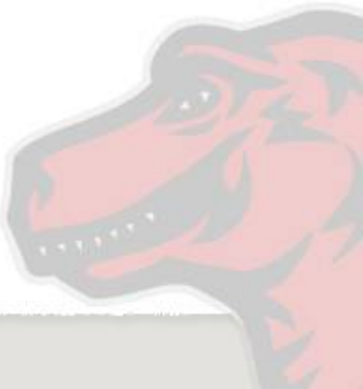
Java, Gecko and JavaScript

JavaScript is the perfect binding language into the Gecko platform. It's used for many tasks.



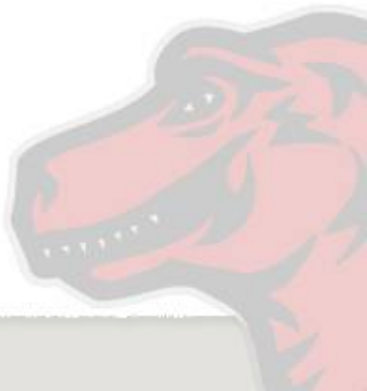
JavaScript is the intermediary between Gecko and Java.

Native UI Overview



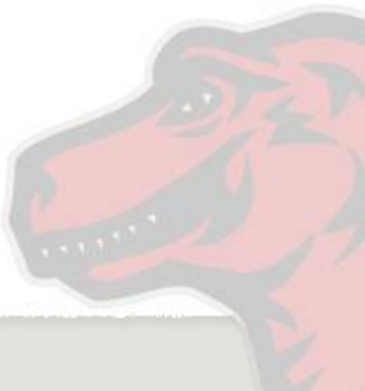
Progress on Goals (Fx11 vs Fx10)

- Startup time is several times faster
  - Application UI is open and ready almost instantly
- Panning is much smoother
- Memory usage has reduced X percent
  - Much less OOM background kills
- Flash is supported on Froyo and Gingerbread

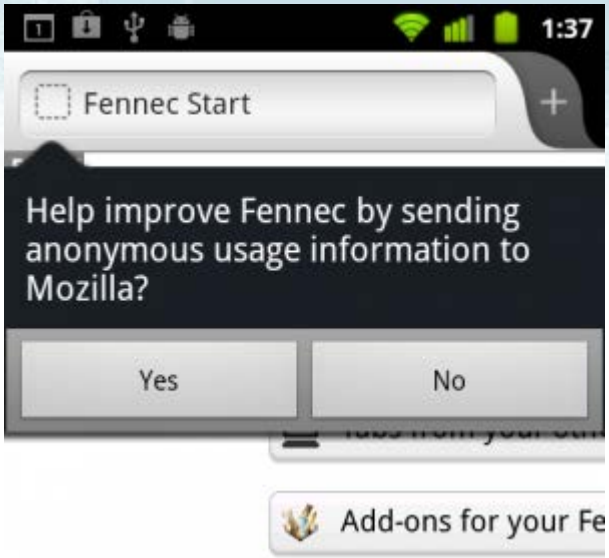


Add-ons: Fitting into Native UI

- Using JavaScript for application logic means add-ons are viable again
- XUL overlays are not possible
- A JavaScript API allows add-ons to integrate into the native UI
- Restartless add-ons are preferred



Add-on UI Examples



Popup Notifications

Context Menus

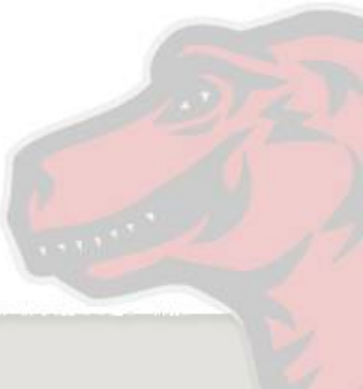
Add-on UI Examples

Menu items

Popup Alerts

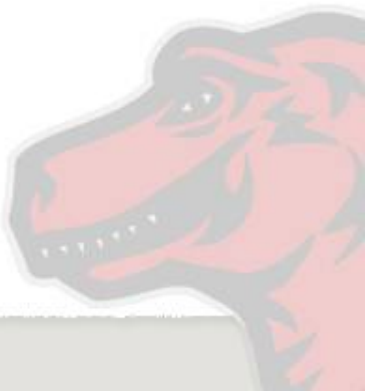
Add-on UI Examples

- Dialog boxes via nsIPromptService
- System notifications via nsIAlertService



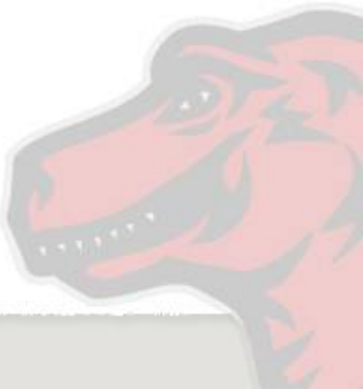
Sync: Going Native

- Ported to Java
- Integrated into Android "Accounts & Sync" system
- Can sync data in the background, even if Firefox is not running



Roadmap for Future

- Native UI optimized for Tablets
- Home screen widgets
- Special reading mode



Resources

- Articles & Blogs
  - https://wiki.mozilla.org/Fennec/NativeUI/Architecture_Overview
  - http://starkravingfinkle.org/blog/2011/11/firefox-for-android-native-android-ui/
  - http://starkravingfinkle.org/blog/2011/12/firefox-for-android-wheres-the-error-console/
  - http://starkravingfinkle.org/blog/2011/11/firefox-android-add-ons-in-a-native-world/

- IRC irc.mozilla.org
  - #mobile

- Newsgroups
  - http://www.mozilla.org/about/forums/#dev-platforms-mobile