AnDevCon SF 2014

Notifications: Front to Back

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Order of Battle

- Basic Notifications
- Foreground Services
- Notifications and Android Wear
- Notifications and Lollipop
- Design Notes

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Basic Notification Recipe

- Create a `NotificationCompat.Builder`
  - Yes, you want the Compat one...
- Configure the `Builder`
- Get `Notification` from `Builder`, pass to `NotificationManager` via `notify()`
  - Or `NotificationManagerCompat`, particularly when needed

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Typical Configuration Items

- Status/System Bar Contents
  - `setSmallIcon()`
  - `setTicker()`
    - Deprecated on Android 5.0
- Notification Drawer Contents
  - `setContentTitle()`
  - `setContentText()`
  - `setContentIntent()`
- Hardware Options
  - `setDefaults()`

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Notification Lifespan

- Typical: Displayed Until Tapped
  - Use `setAutoCancel(true)`
- Optional: Displayed Until You Clear
  - Use `setOngoing(true)`
  - Call `cancel()` or `cancelAll()` on `NotificationManager` later to dismiss

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Who Decided on “Push Notifications?”

- `Notification`
  - Thingy in the status bar
- Push Notification
  - GCM and other ecosystem equivalents
- Not Really Related
  - You can display a `Notification` as a result of an incoming GCM message, but is not the default, let alone required

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Who Decided on “Push Notifications?”

- User Notification
  - GCM construct for sending notifications to all the user's devices, not a single device
  - Supports an upstream “dismissal” operation, forwarded to all the other devices for that user
  - Pattern
    - Display a `Notification` upon receipt of user notification
    - Send dismissal when you/user clears `Notification`
    - Cancel the `Notification` if you get dismissal message

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startForeground()

- Called by `Service` on itself
- Raises priority of process
- Trade-off: Must Supply `Notification`
  - Raised priority only while notification is visible
- Use Cases
  - True everlasting services
  - Greater guarantees on longer transactional work
    - E.g., email downloads

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Size Matters

- Regular View
  - Default when not the top-most based on priority
- Expanded View
  - Default when the top-most based on priority, if you supply an expanded view
  - User can use two-finger swipe to toggle between views

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Size Matters

- Expanded View = Style Objects
  - InboxStyle
  - BigTextStyle
  - BigPictureStyle
  - MediaStyle
    - Note: not available in Android Support backport, native-only for Android 5.0+

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Notifications Wear On You

- Android Wear
  - Automatically “CC'd” on all notifications
  - User Responses
    - Triggering actions, affecting the primary device
    - Dismissing the notification, also clearing it from the primary device
  - Problems
    - Not everything belongs on Wear
    - May need to tailor for Wear, so what shows on Wear is useful and actionable

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Stacking Notifications

- Scenario: Several Events Worthy of Notification
  - Example: multiple unread emails over time
- Desired UX
  - Mobile device: summary
  - Wearable: individual “stacked” notifications
    - Provide more context without the user having to open up mobile device
    - Only good to a point – dozens of stacked notifications will likely be bad

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Stacking Notifications

- Implementation
  - Associate a group ID with all relevant notifications
    - `setGroup()` on your `Builder`
  - Set up a group summary that will appear on the mobile device
    - `setGroupSummary()` on your `Builder`
    - Not forwarded to the Wear device

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Pages and Pages

- Scenario: One Event, But User Needs Detail
  - Example: calendar event reminder
- Desired UX
  - Mobile device: notification leading to activity
  - Wearable: multi-page notification
    - Provide more detail directly on the wearable
    - Objective: decent % of notifications do not require pulling out the mobile device

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Pages and Pages

- Implementation
  - Use a WearableExtender
  - Add additional pages to extender
    - Page = another notification!
  - Extend the main notification using the extender
  - Use a NotificationManagerCompat to raise the notification
    - Android Support package wrapper around system NotificationManager

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Wear-Only Actions

- Scenario: You Want Extra Actions on Wear
  - Stuff that the user might ordinarily do from the activity and, for whatever reason, do not make sense to offer in the mobile device's notification
- Implementation
  - Use a WearableExtender
  - Define an action via an NotificationCompat.Action.Builder
  - Call addAction() on the WearableExtender

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“KITT!!!” “On My Way, Michael!”

- Scenario: You Need More Input from Wear
  - Example: message to use to reply to incoming SMS
- Implementation
  - Set up a RemoteInput with prompt, optional canned replies
  - Attach RemoteInput to a Wear-only action
  - Use RemoteInput and `getResultsFromIntent()` to get the response from user (canned or speech recognition)

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Running Away from Wear

- Scenario: Notification Only Relevant on Device
  - Example: Temporary foreground service
- Implementation
  - `setLocalOnly(true)` called on Builder

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Oh, L... Heads Up, People!

- Scenario: Want to Be More “In Your Face”
  - Not just an icon showing up in status bar
  - Example: Appointment reminder
- Implementation: Heads-Up Notification
  - High-priority notification
  - Full-screen Intent notification

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L is for Lockscreen (And Lollipop)

- Scenario: You Want More Control Over Lockscreen Edition of Notifications
  - Hide super-secret stuff
  - Display more for public stuff
- Implementation: Visibility
  - Public, private (default), and secret
  - `setVisibility()` on the Builder

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Disabled Notifications

- Result: Notifications Suppressed
  - Not shown, no hardware effects
- Android 4.x
  - CheckBox in app's page in Settings
- Android 5.0+
  - “Sound & notifications” → “App notifications” in Settings
  - Toggle “Block” Switch to on

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Interruption Control

- Android 5.0+ Choices
  - Always interrupt
  - Interrupt for “priority notifications” only
  - Never interrupt
- “Interrupt” = hardware effects
- “Priority notifications” = those flagged in “App notifications”
  - NOTE: not tied to `setPriority()`

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It's One L of a Design Mess

- Changes in Lollipop for Notification Design
  - Yet Another Icon Design
    - Android 1.0-2.2
    - Android 2.3
    - Android 3.x
    - Android 4.0-4.3
    - Android 4.4
    - Android 5.0 (close to Android 4.4, pure alpha channel used as mask)

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It's One L of a Design Mess

- Changes in Lollipop for Notification Design
  - Accent color, used for circle behind icon
  - Small icon as badge on large icon
  - Dark text/light background

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IM IN UR NOTIFICASHUNS

- `NotificationListenerService`
  - Near-total control over notifications
  - Requires double-opt-in (install, enable in Settings)
  - Features
    - Find out when notifications are posted, removed
    - Read notifications
    - Cancel notifications
    - Attempt to control notification filtering

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And There's More!

- Progress Bars
- Full-Screen `PendingIntent`
- Number Badges
- Sort Keys
- Chronometer Mode
- Custom Ringtones, Vibration Patterns, LED Flashes
- ...

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