Odds and Ends

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Android 310

Google I/O

Android M

- New version of Android available in preview.
  - Nexus 5, 6, and 9
  - Emulator
- Version 1 out now
- Version 2 out late June/July
- Version 3 out late July
- Production: Q3 sometime

Android Studio 1.3

- New release coming. Preview 2 seems more stable, but may want to stay at 1.2.
- Will add NDK (C++) support
- Will add new visual editor
- New heap dump/allocation tracker
- Required if working with M preview
- What's new in android dev tools

Doze Mode

- New mode where untouched device becomes “inactive”.
- Exists when plugged in, moved, or used.
  - Scheduled jobs, alarms, wake locks, network access disabled, and wifi scans disabled.
  - Shouldn’t require app changes, but should test as background processing will be suspended.
  - Power optimizations

App Standby

- Similar to doze mode, but for apps.
- If app not used for period of days, will enter “doze” like mode for apps.
- App will get one shot a day to update on battery, or while plugged in.
- Again new test modes via adb to test your app behavior when resumed.

Auto Backup

- M will do a full data backup of all apps nightly, excluding caches, and files explicitly marked as to not be backed up.
- Devs may want to ensure data is marked appropriately.
- New adb commands to test backup/restore
- Auto Backup

Binding

- New compile time support for binding a POJO (aka simple java object) to a view similar to cursor.
- Backwards compatible to 2.2.
- Potentially useful when showing data that doesn’t exist in a database.
- Likely pitfall is doing too much logic in new layout xml.
- Still in beta. Need to try before recommending.
- Data Binding

Now On Tap

- New support for Google Now which present information while in app.
- Developers can help provide “context” to Google Now to help ensure the data presented to the user is related to what is on screen.
- Probably killer feature in M

Permissions

- M introduces new runtime permission API
- Runtime Permissions
- If compiled against M, must ask user for permission for “critical” permissions.
  - Location, camera, sms, phone, sensors, calendar, contacts and microphone at moment.
  - First ask is free. However, if permission is implicit (ie no obvious UI), may need to explain first.

Permissions

- Apps targeting M+ will install without pre-approval for permissions on install or update.
- Apps targeting API 22 or earlier, will still present user with permissions on install or update (if new).
    - User still able to disable permission. App will be presented “empty” set, etc. App unable to re-enable.

Design Library

- Adds official floating action button, snackbar, text input, tabs, nav drawer and motion per material design.
- Motion includes optionally collapsing/hiding action bar during scroll.
- Design Library

Your requests

Quick Hitting

Learning more about Android

- On Google+ follow:
  - Android Developers
  - Me (Joe Rogers)
  - From there follow who you like.
- Android YouTube Playlists
  - Especially like Performance Patterns
- Google I/O 2015
  - Other years still have good info… If you are looking for something on a topic it is a place to start.

Including Libraries

- Best to include directly in gradle
  - compile ‘com.squareup.picasso:picasso:2.5.2’
  - Always fully specify version vs using +
- If no gradle support and is “jar” just drop in the app/libs
  - Drawback replace jars to update version.
- May get “aar”. Android archive. Need to “import” as module. (ideally instructions).
- Review any library before using. Many libraries are not properly optimized for Android impacting performance.

How to design without designer

- Visit Material Design
- Find the concept you are looking for. Lists, grids, etc.
- Focus on big picture. Ie the look and feel first, and skip animations initially.
- After getting basics in place, go back and implement “motion” per the spec.

View Pager

- Typically used with fragment state pager adapter.
- Usually a static list of fragments.
- If fragments may change dynamically should override getItemPosition()
  - POSITION_UNCHANGED if item in same position
  - POSITION_NONE if item no longer exists
  - new position if item moved.

Fragment Set Retain Instance

- Useful to “keep” a fragment around due to a “configuration change” either to keep a background operation active, or avoid reloading certain data.
- Usually used with fragments with no UI.
- Skips onCreate/onDestroy during configuration change.
- onDestroy will be called when activity is “finished” ie app calls “finish()” or user hit “back”, or when OS needs to destroy the activity to free memory.

Fragment Set Retain Instance cont.

- If it is a long running op, it should be running on a background thread in some way.
- Ensure you setup during onCreate and stop during onDestroy. May require other changes as some objects such as Activity may not be available at times.
- NOTE: if user can navigate to other activities, you may need to rely on onStart/onStop to shut down…
- A standard service using startService/stopService may be more flexible as it can live across activities.

Saving passwords in DB

- First avoid saving sensitive data like passwords in app.
- If you must store it follow the best practices, have your app audited by someone who is an expert in security. One mistake can be costly to your company or yourself.
- Best do authentication on server and store token locally.
- Security Blog post
- Security Tips
- Account Manager
- Google Identity Solutions

Cross Platform Tools

- Opinion: Fool’s Gold of Mobile development
  - Most use webviews (security risk) and javascript.
  - Build once, but run everywhere is selling point.
  - Usually do not follow platform best practices.
  - Typically much slower, crash, and very hard to debug which increases costs.
  - Usually favors one mobile OS platform for look/feel.
  - Self defeating if adjusting UI per platform.
  - Go all in native or do a mobile website instead.

WebViews

- This is the one view subject to security issues especially with javascript active.
- Prior to KitKat not updatable. Lollipop updated via store
- Should restrict only to pages you trust.
- Better to send to external browser, or use new Chrome Custom Tab which is a hybrid of sorts.
- WebView
- Chrome Custom Tab
- Browser Intent

Dependency Injection

- Called out on as something to avoid for performance and memory usage as most will slow your app down.
- Usually added by devs coming from Java server world and used to things like Spring.
- New Android data binding api may be compromise
- If must use, Dagger2 may be best bet as it is compile time and easy to debug. However still new and not developed strictly for Android.
- Likely will increase code paths.

Android Wear

- Notifications to wear. Easy add on to app.
- Is version of android, so may build a dedicated app, but special UI and data transfer considerations.
  - Wear app included in main app APK.
- Also build watchface again, special guide.
- Android Wear

Localization

- Essentially updating strings to be represented in another language.
- May affect layouts as text might be longer
- Essentially, it is a strings.xml in a values-xx folder where xx is the language code.
  - For example strings.xml in values-es will be used to represent strings in spanish.
  - Localization

How are ads Turned on/off

- Usually ads disabled when user makes in-app purchase or pays for app in store.
- The app will get a “license” and if the license is valid, disable the “ad” views and network access dynamically.
- Paid app, typically has the ads disabled as part of build variant.
- Licencing
- In-App billing
- Gradle Build Varients

Photo Gallery

- Essentially photos on device (or in cloud) are accessed via ContentProviders that are external to your app.
- You likely will need to scale the images smaller to be able to display more than one.
- Use an LRU cache to avoid refetching images again.
- Picasso is able to load images from these providers.
- Displaying Bitmaps Efficiently
- Document Provider (access cloud files)
- Media Store (local access)

Camera

- If not core to app, best to use intent to take picture and avoids the permission problem.
- If secondary feature, but app runs without it, make sure uses-feature is false to allow app to install.
    - Note in this case, camera may not exist and app should handle.
- Camera Guide
- Camera Training

Bluetooth

- Requires physical device. (no emulator)
- Standard Bluetooth relatively mature api.
  - Connect to car, headset, etc.
- Bluetooth Low Energy (LE)
  - Used in wearables, FitBit, Nike Bands, etc.
  - Stable in Kitkat 4.4.4 for scanning (but will run earlier, but some bugs nasty).
  - Advertising available on 5.0+
  - Compat Lib bringing 5.0 scan niceties back to 4.3+

Google Cloud Messaging

- A way for app to get data from server without polling. Essentially server pushes messages to client.
- Two types of messages:
  - Notification - visible to the user about a new event.
  - Data - Internal message indicating app should “update” data.
- **New**: App can register for specific topics vs all.
- Requires a server to function.
- Cloud Messaging

Analytics

- Android Studio 1.3 is introducing new feature to add various tools like ads, analytics to your project.
- Open via File->Project Structure
- You may need to sign-in/sign-up to use the services.