ZEBRA

AMERICAS

APPFORUM 2017

INNOVATE. ENGAGE. TRANSFORM.

ANDROID ALPHABET SOUP

Darryn Campbell

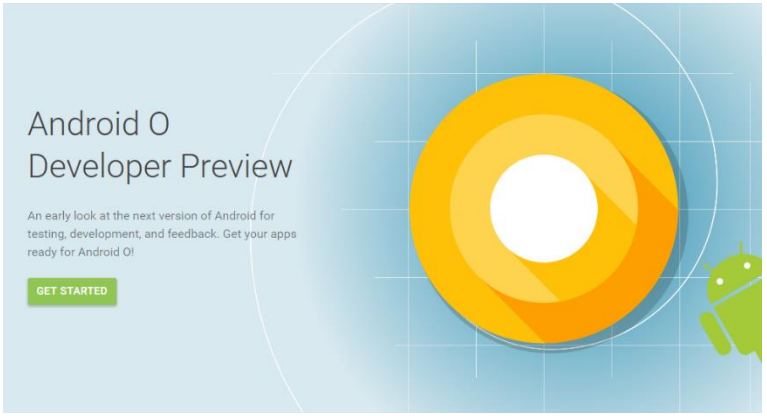
Senior Software Architect

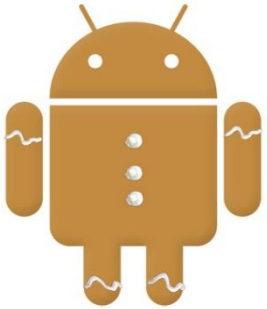
Developer Session

Agenda

Android Alphabet Soup

- How the enterprise got here
- Where we're going
- Android Marshmallow & demos
- Android Nougat
- Android 'O'





ZEBRA


ZEBRA
APPFORUM 2017
INNOVATE. ENGAGE. TRANSFORM.
HISTORY & FUTURE

History & Future

How the enterprise got here

- First generation of Zebra Android devices ran Gingerbread with limited SDK and management options
- Defined and spearheaded the Enterprise market for Android:
  - Security enhancements
  - Zero-touch device staging
  - Enterprise focused utilities such as Enterprise Home Screen
  - Options for migration from WM/CE to Android with Xamarin support, ATTE, Enterprise Browser, offering the same hardware with an Android SKUs and services.

- Proliferation of Zebra device portfolio as the enterprise embraced Android

ZEBRA

History & Future

Where we're heading

- Devices lifespan always exceeds the latest version of Android therefore multiple-flavors upgrades are often offered:
  - E.g. TC55: JB, KK; MC40: JB, KK, L
  - New devices are built from the ground up with this in mind.
- Proliferation of GMS SKUs in our portfolio
  - Ties to Google's increased focus on Enterprise use cases
  - Often the latest & greatest Google features are GMS-only
- Customers may find themselves with a variety of devices running different Android versions and both GMS and non GMS
  - This is **challenging for both developers and administrators**

ZEBRA

History & Future

GMS vs. Non GMS

- Reasons a developer or administrator might choose GMS over Non-GMS:
  - Enhanced security:
    - Find device, remote wipe, reset protection out of the box
    - Google security services scanning applications both in the Play Store and side loaded on your device
  - A cloud messaging API that ‘just works’. Alternatives have to work around doze mode (M/N) and background execution limitations (O)
  - Enhanced locationing APIs, with access to Google’s crowd sourced WiFi AP and Bluetooth database, can provide better location than network / GPS alone, even on a WiFi only device
  - Google Maps to enhance your application with a free mapping solution and associated API
  - Chrome, with the latest features and security enhancements, now showing a disparity from its WebView counterpart on AOSP which receives security updates only.
  - Support for Google’s enterprise APIs and ability to manage devices

Many more… there’s a whole talk on it.

ZEBRA

History & Future

EMDK OS support over time

- Options for deployments mixing JB & M:
  - Separate product flavours in gradle to pull in different library versions & build two apks
  - Use DataWedge
- This is a single SDK only.

Version	JellyBean	KitKat	Lollipop	Marsh
EMDK 6.3		●	●	●
EMDK 6.0		●	●	●
EMDK 5	●	●	●	
EMDK 4.2	●	●	●	
EMDK 4	●	●		
EMDK 3.1.1	●	●		
EMDK 3.1	●	●		
EMDK 2.1	●			
EMDK 2	●			

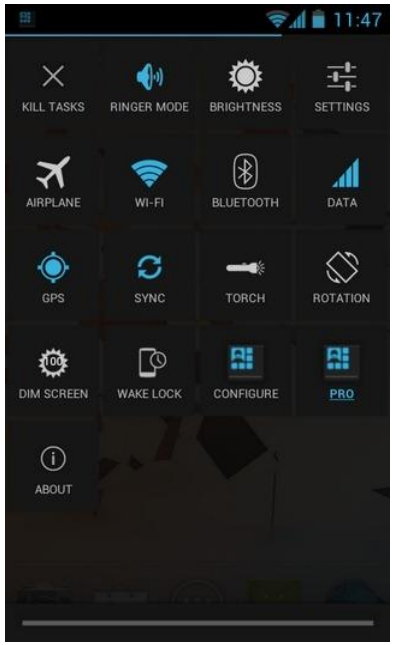
ZEBRA


ZEBRA
APPFORUM 2017
INNOVATE. ENGAGE. TRANSFORM.
COMMON PATTERNS

Common Patterns

Controlling device access

There are some interesting patterns emerging as Android evolves:



- Notifications have undergone major (or at least noteworthy) changes in every release from KitKat to ‘O’.
  - Notifications feature heavily in enterprise use cases it becomes increasingly complex to lock down what the user is able to control
- Pushes towards power saving, taking flexibility away from developers with consumer end user battery life in mind
- Locking down your device becomes increasingly complex.
  - More system apps to prohibit
  - Key components (e.g. notification shade) are reworked frequently making it difficult to provide granular access to specific features.

ZEBRA


ZEBRA
APPFORUM 2017
INNOVATE. ENGAGE. TRANSFORM.
ANDROID
MARSHMALLOW

Android Marshmallow

Behaviour changes affecting Enterprise

- Dynamic runtime permissions
- Doze mode
- Encryption & Adoptable storage
- Trusted & untrusted resets
- Enterprise Android: COSU support (Corporate-owned single-use)

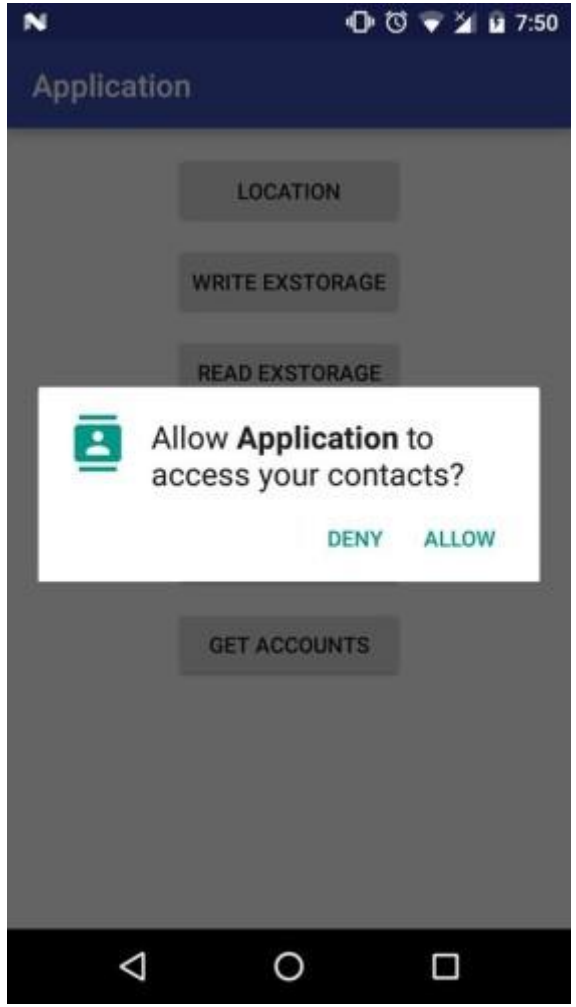
ZEBRA

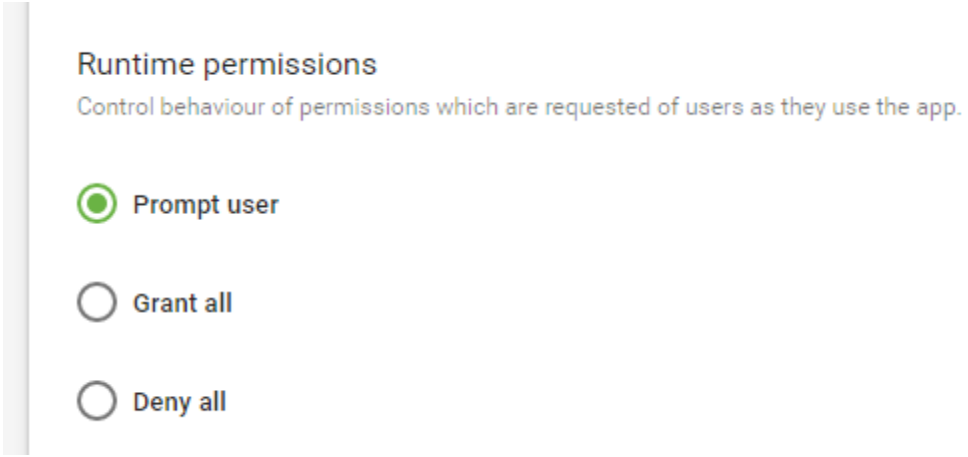
Android Marshmallow

Dynamic runtime permissions

What are your options:

1. Continue to target API 22 (Lollipop)
2. Implement Google's runtime model
3. Use an MX AppManager profile to install the application
4. Use an EMM that supports managed Android devices

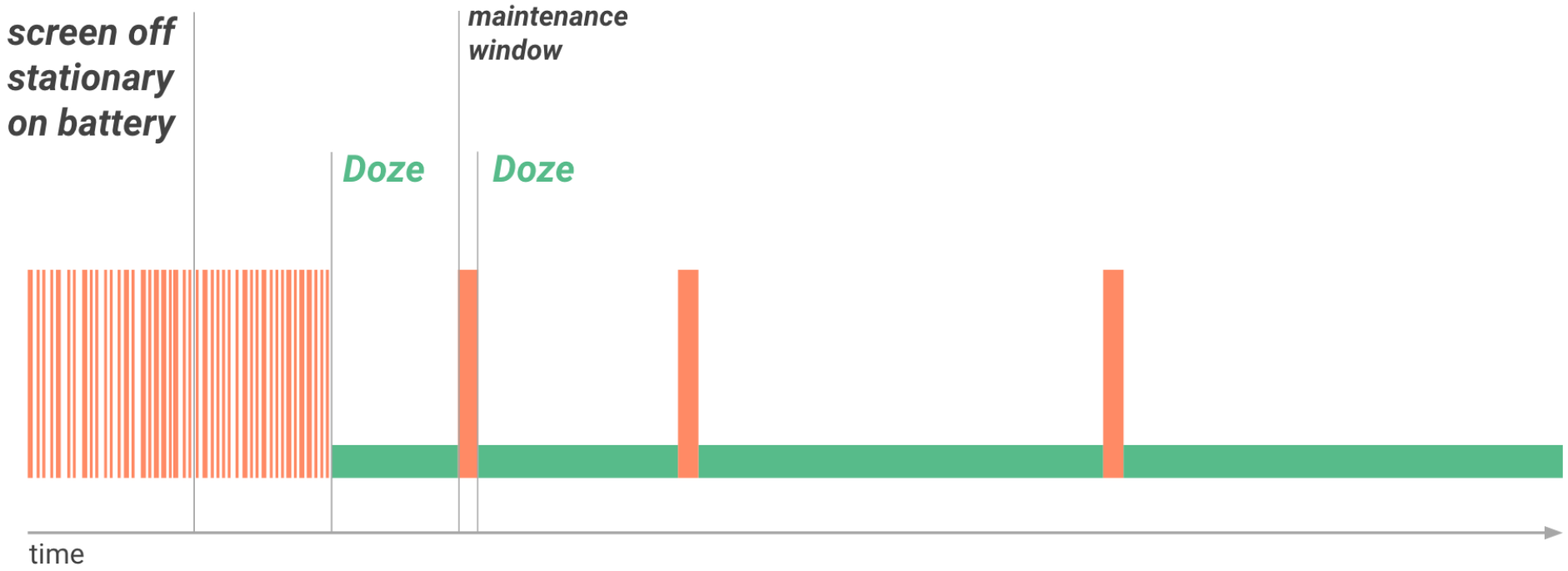




Android Marshmallow

Doze mode

- Doze mode



ZEBRA

Android Marshmallow

Doze mode

Impacted:

- GMS devices only. AOSP devices are unaffected.
- Push solutions that do not depend on GCM / FCM
- Applications using Alarms to schedule jobs

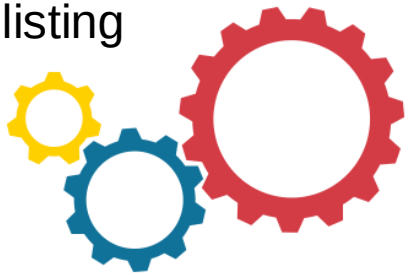
How can I test?

- https://developer.android.com/training/monitoring-device-state/doze-standby.html#testing_doze_and_app_standby

What can I do?

- Transition to GCM / FCM (GMS only)
- Whitelist applications (Network & wake locks only):
  - adb shell dumpsys deviceidle whitelist +com.yourcompany.yourapp
  - Usually a manual process, Play store may reject your app if it is not suitable for Whitelisting (https://developer.android.com/training/monitoring-device-state/doze-standby.html#whitelisting-cases)

ZEBRA



Android Marshmallow

Encryption & Adoptable storage – Interaction with Encrypt Manager

Two modes:

1. Full Storage Card Encryption Mode
   - Matches what Adoptable Storage is with the same limitations
   - Can be provisioned via StageNow
   - Duplicates Android functionality so potential for future deprecation
2. Folder Encryption Mode
   - Supports encryption in /data and on the Storage Card
   - Allows a common encrypted implementation in common with non-Marshmallow devices in your deployment

ZEBRA

Android Marshmallow

Encryption & Adoptable storage

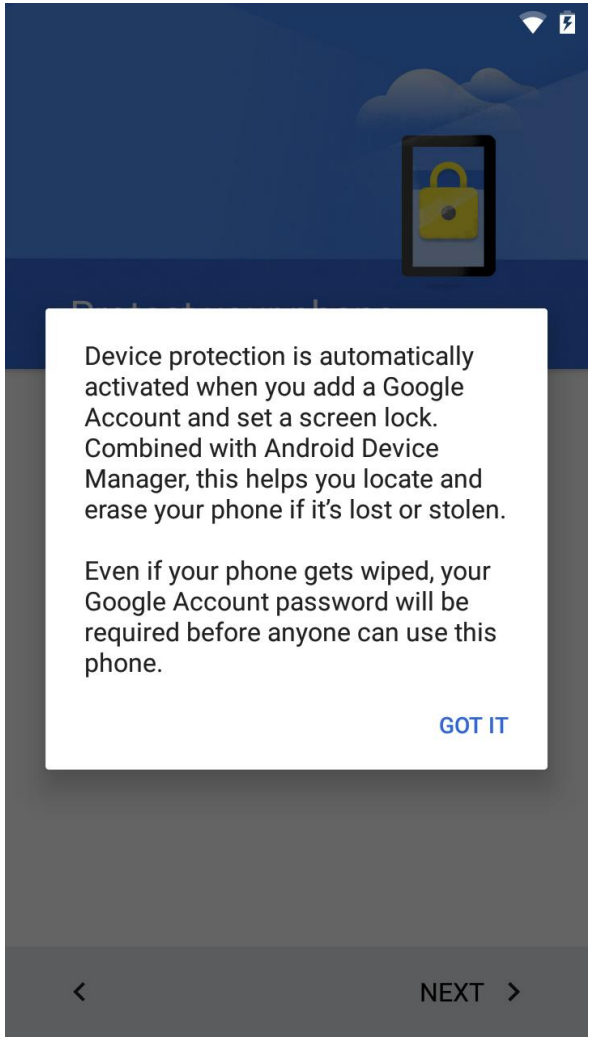
Reset Action	Emulated storage cards	Physical storage cards	Adopted storage cards	Enterprise partition
Reboot	Retained	Retained	Retained	Retained
Full Device Wipe	Wiped	Wiped	Wiped	Wiped
Factory Reset	Wiped	Retained	Wiped	Wiped
Enterprise Reset	Wiped	Retained	Wiped	Retained

ZEBRA

Android Marshmallow

Trusted & untrusted factory resets

- Designed to reduce the value of stolen (consumer) devices
- Trusted factory resets:
  - Do NOT mandate reentry any previously associated Google creds
  - Invoked from device settings UI
- Untrusted factory resets:
  - GMS Only
  - DO mandate reentry of any previously associated Google creds
  - Factory resets invoked from MX Power manager
  - Factory reset packages available from Zebra support
  - Note: If you forget your previously associated Google creds contact Zebra support



ZEBRA

Android Marshmallow

Android in the Enterprise: Recap

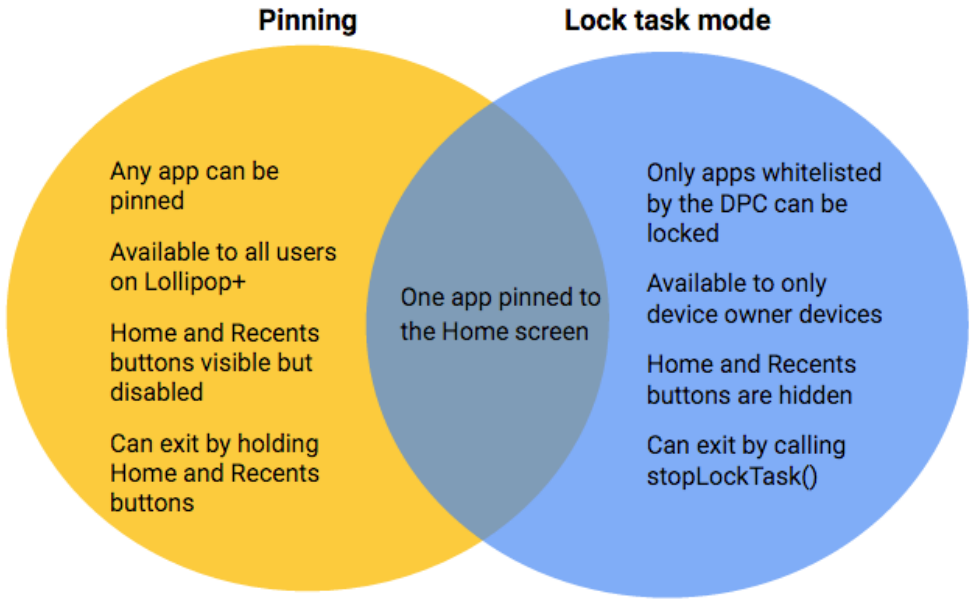
- Android for Work started with 5.0 (lollipop). Announced at Google I/O 2014
- Initially targeted BYOD (Bring your own device) use cases
  - Separation of 'Work' mode from personal applications
  - 'Work profile' owned by a "Profile Owner" which would be a device policy controller (DPC)
- Enhancements for COPE (Corporate owned, personally enabled)
  - Expectation that device or profile will owned by a DPC
  - DPC is acting as device owner (DO) or profile owner (PO)
- Enhancements for COSU (Corporate owned, single use) [6.0+]
  - Expectation that these devices will only have a device owner (DO)
  - Typical Zebra device use cases
  - Non-Zebra single use Android devices could be a payment terminal or airport check-in.
- DO provisioning via NFC prioritized by Google (also possible via adb)

ZEBRA

Android Marshmallow

Android in the Enterprise: COSU support in Marshmallow

- COSU support (Corporate Owned – Single Use)
  - Managed configurations via bundle data types
  - Lock Task Mode in additional to lollipop's consumer oriented 'Pinning'



DEMO

ZEBRA


ZEBRA
APPFORUM 2017
INNOVATE. ENGAGE. TRANSFORM.
ANDROID NOUGAT

Android Nougat (7.0)

Behaviour changes affecting Enterprise

- Multi-Window Support
- Notification Enhancements
- Doze on the Go
- Data Saver
- Tile API
- Number Blocking
- New Emojis ☺

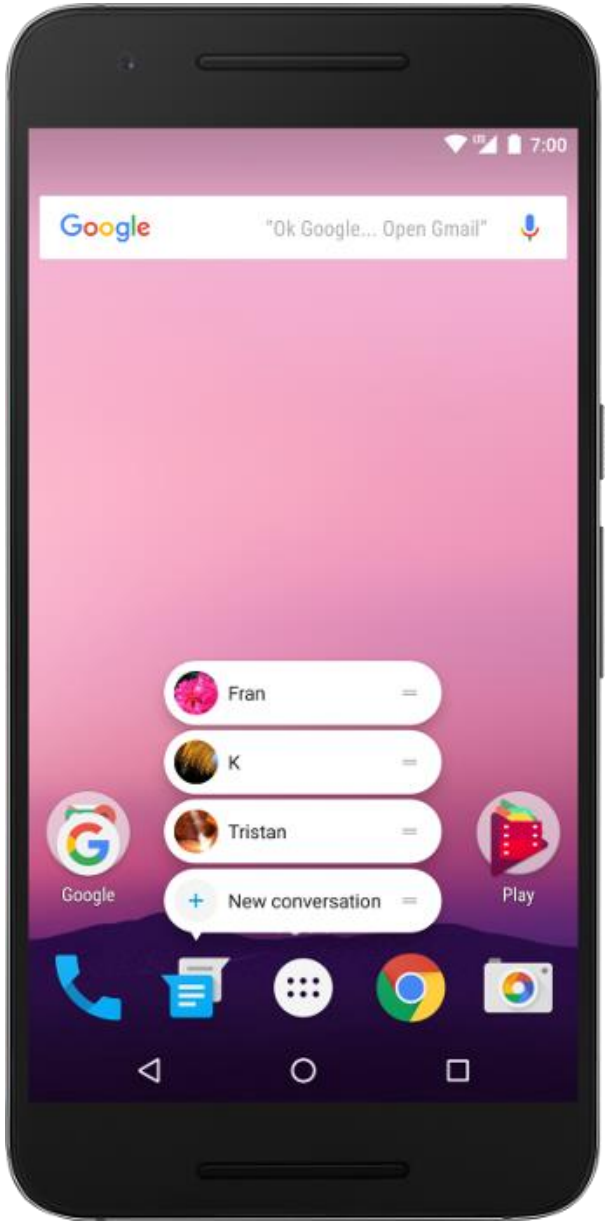
- WebView enhancements, now using Chrome (on GMS)
- Enterprise updates (incremental)
- Hardware back keystore

ZEBRA

Android Nougat (7.1)

Behaviour changes affecting Enterprise

- App Shortcuts
- Image Keyboard Support
- “Professional” Emoji ☺ ☺ ☺
- Storage Manager Intent



ZEBRA


ZEBRA
APPFORUM 2017
INNOVATE. ENGAGE. TRANSFORM.
ANDROID ‘O’

Android O PREVIEW

Behaviour changes affecting Enterprise

- Background execution limits
  - Background service limitations
  - Broadcast reception limitations
- Android background location limits
- Notification enhancements for ‘Channels’ giving users more granular control of notification importance & how they should be notified.
- Launcher shortcut pinning
- Enterprise updates:
  - COMP (Corporate owned, managed profile) devices
  - Incremental improvements to DPC APIs (new & existing).
    - E.g. inter profile application communication.
- Autofill Framework
- Google Safe Browsing API in WebViews

ZEBRA


ZEBRA
APPFORUM 2017
INNOVATE. ENGAGE. TRANSFORM.
Questions?

Useful Links

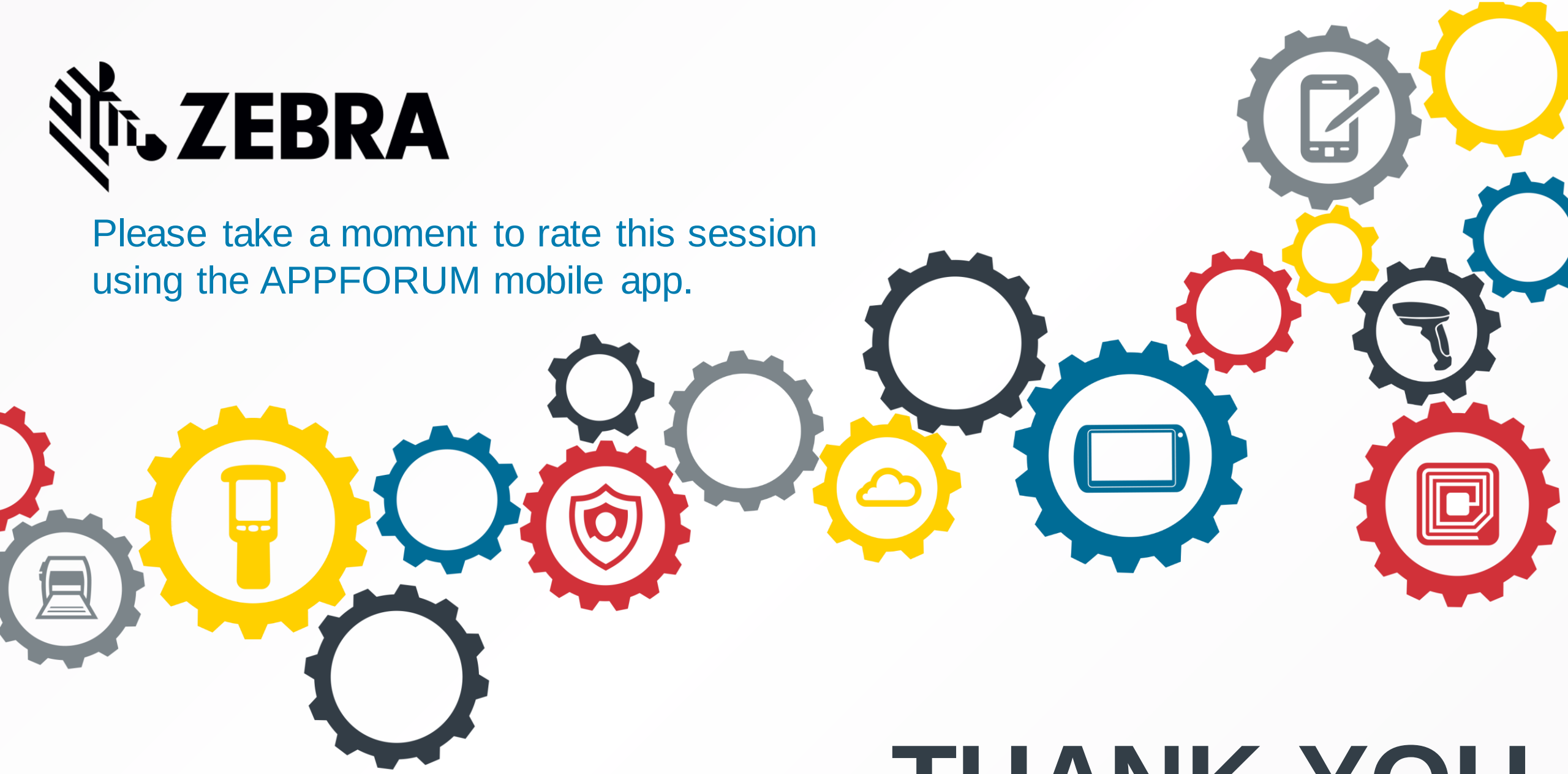
Android Alphabet Soup

- Android M developer impact: https://developer.zebra.com/community/android/android-forums/android-blogs/blog/2017/01/20/what-s-new-for-android-m-and-the-impact-on-zebra-developers
- Deploying applications on Zebra devices from JellyBean to Marshmallow & beyond: https://developer.zebra.com/community/android/android-forums/android-blogs/blog/2017/02/08/deploying-an-application-to-zebra-android-devices-ranging-from-jellybean-to-marshmallow-and-beyond
- Google official docs for:
  - Lollipop: https://developer.android.com/about/versions/lollipop.html
  - Marshmallow: https://developer.android.com/about/versions/marshmallow/android-6.0-changes.html
  - Nougat: https://developer.android.com/about/versions/nougat/android-7.0-changes.html
  - O: https://developer.android.com/preview/behavior-changes.html

ZEBRA

ZEBRA

Please take a moment to rate this session using the APPFORUM mobile app.



THANK YOU

Content Slide Title Goes Here

Sub title goes here

- Bullet text