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DroidBuilder

Saving time and money: Using DroidBuilder, an Android device provisioning tool

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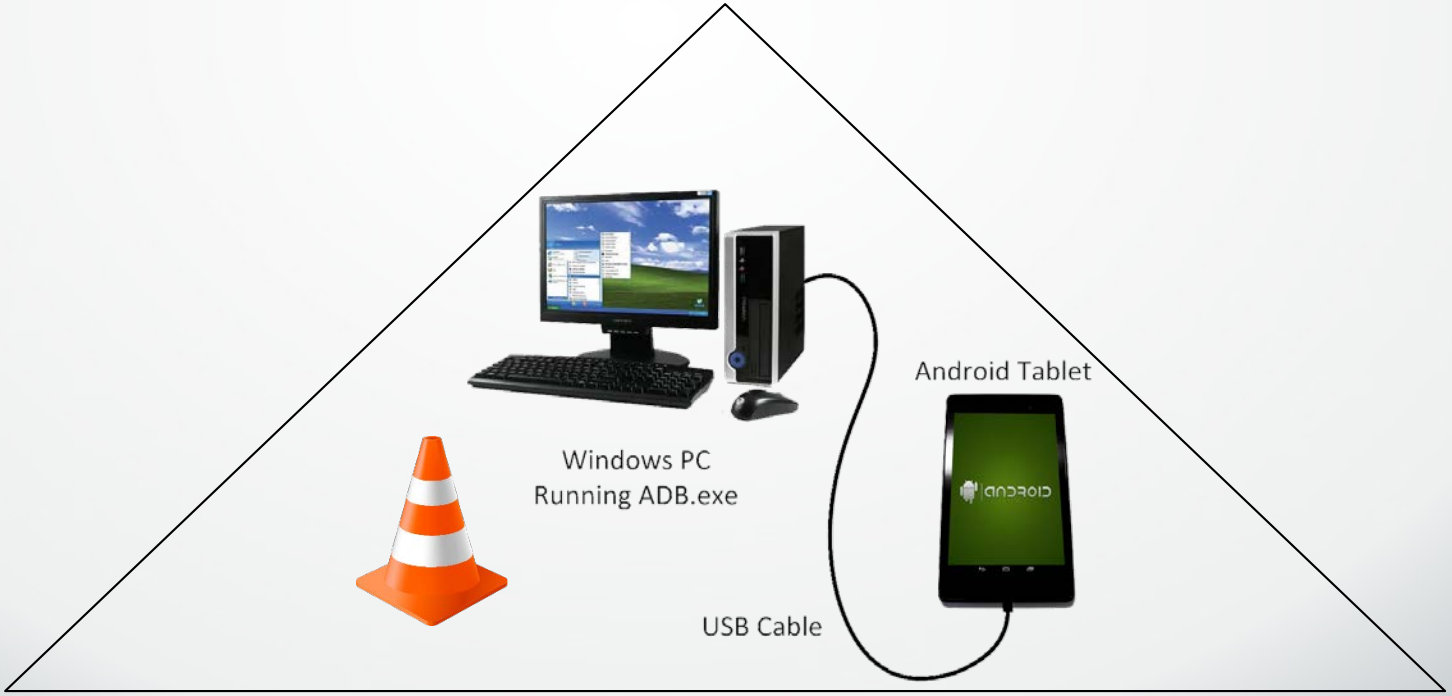

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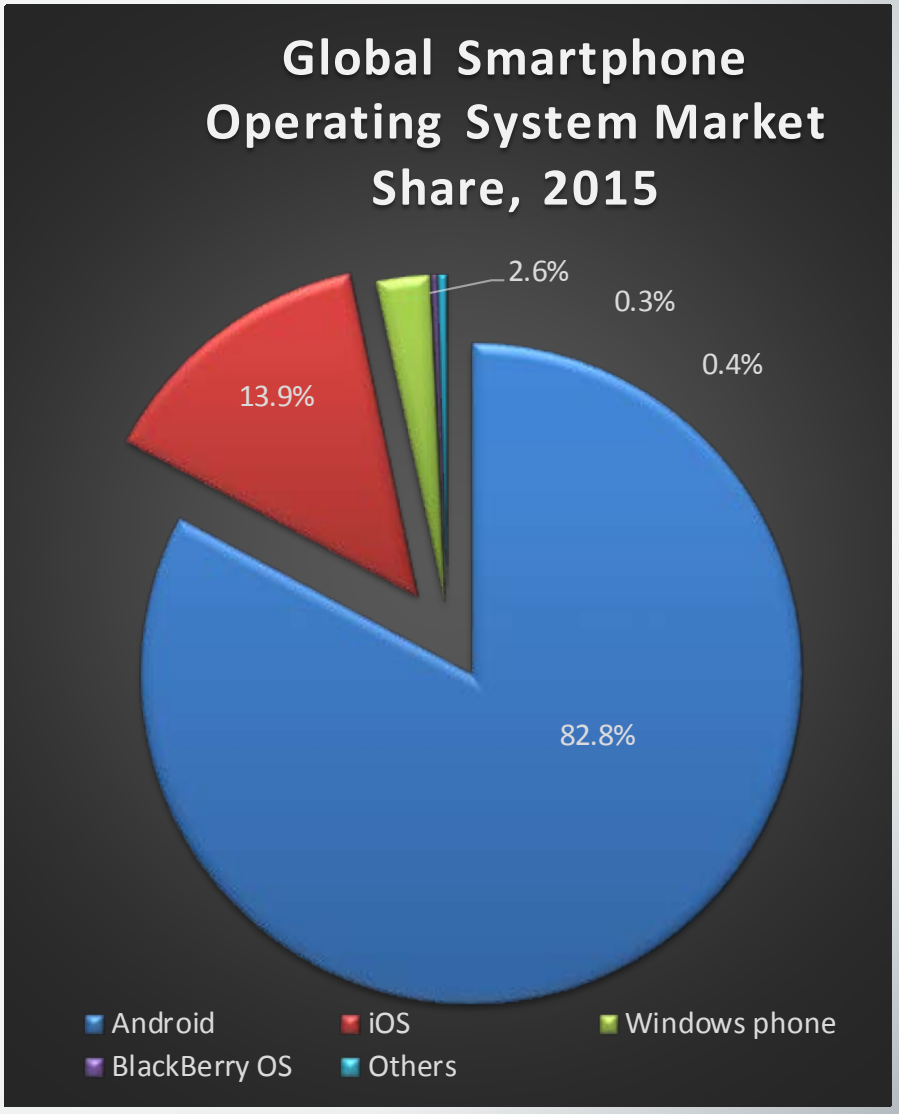
Overview

- Background
- Problem
- Existing Solutions
- Solution: DroidBuilder
- Numbers from the field
- Future Enhancements

Background

- Rise of mobile CAPI
- Android devices
  - Popular
  - Inexpensive
  - Adequate computing power
  - Sufficient storage
  - Various screen sizes



Sources: http://www.idc.com/prodserv/smartphone-os-market-share.jsp

Problem

- Fleet provisioning
- Common configuration
- No Root Access 
- Setup hundreds of devices

  {100, 200, 300, 400, 500, 600}

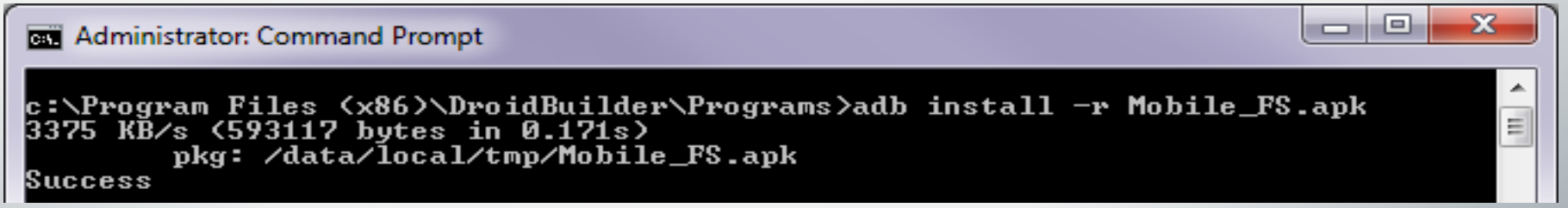
Existing Provisioning Solutions

- Google's Enterprise Mobility Management
- Tachyon (formerly Kaprica Security)
- Device manufacturer services
  - Samsung, etc.
  - Custom ROM
  - Minimum order requirements
  - Cost per device

- Roll your own

Solution: DroidBuilder

- Developed in Microsoft Visual Studio .NET
- Driven by XML input
- Android Debug Bridge (ADB)
  - Free, built into Android OS
  - Send keystrokes, text, touch, swipe inputs
  - Programmatically un/install apps



DroidBuilder Common Actions

- Uninstall/install apps
- Create folders
- Push/pull files (i.e., database, data files)
- Set screen timeout
- Set lock screen password
- Create/remove app shortcuts
- Remove extra home screens
- Prompt Date/Time/Timezone
- Mute sound
- Set screen brightness
- Set wall paper

Useful ADB Commands (Basic)

- adb wait-for-device
- adb devices
- adb shell input keyevent 4
- adb shell input tap 294 211
- adb shell input text “Hello”
- adb reboot
- adb uninstall org.rti.FI_Assistant
- adb install -r “myapp.apk”
- adb pull /sdcard/myfile.pdf c:\myfile.pdf
- adb push c:\myfile.pdf /sdcard/myfile.pdf

Useful ADB Commands (Medium)

- adb shell screencap /sdcard/screenshot.png
- adb shell screenrecord /sdcard/movie.mp4
- adb shell am start -n com.android.settings/.DateTimeSettingsSetupWizard
- adb shell settings put global wifi_on 0

Useful ADB Commands (Large)

Start, create email account

- adb shell am start -a com.android.email.CREATE_ACCOUNT;sleep 2;input text “email.rti.org”

Turn off auto-rotate, force portrait

- adb shell content insert --uri content://settings/system --bind name:s:user_rotation --bind value:i:0;content insert --uri content://settings/system --bindname:s:accelerometer_rotation --bind value:i:0;

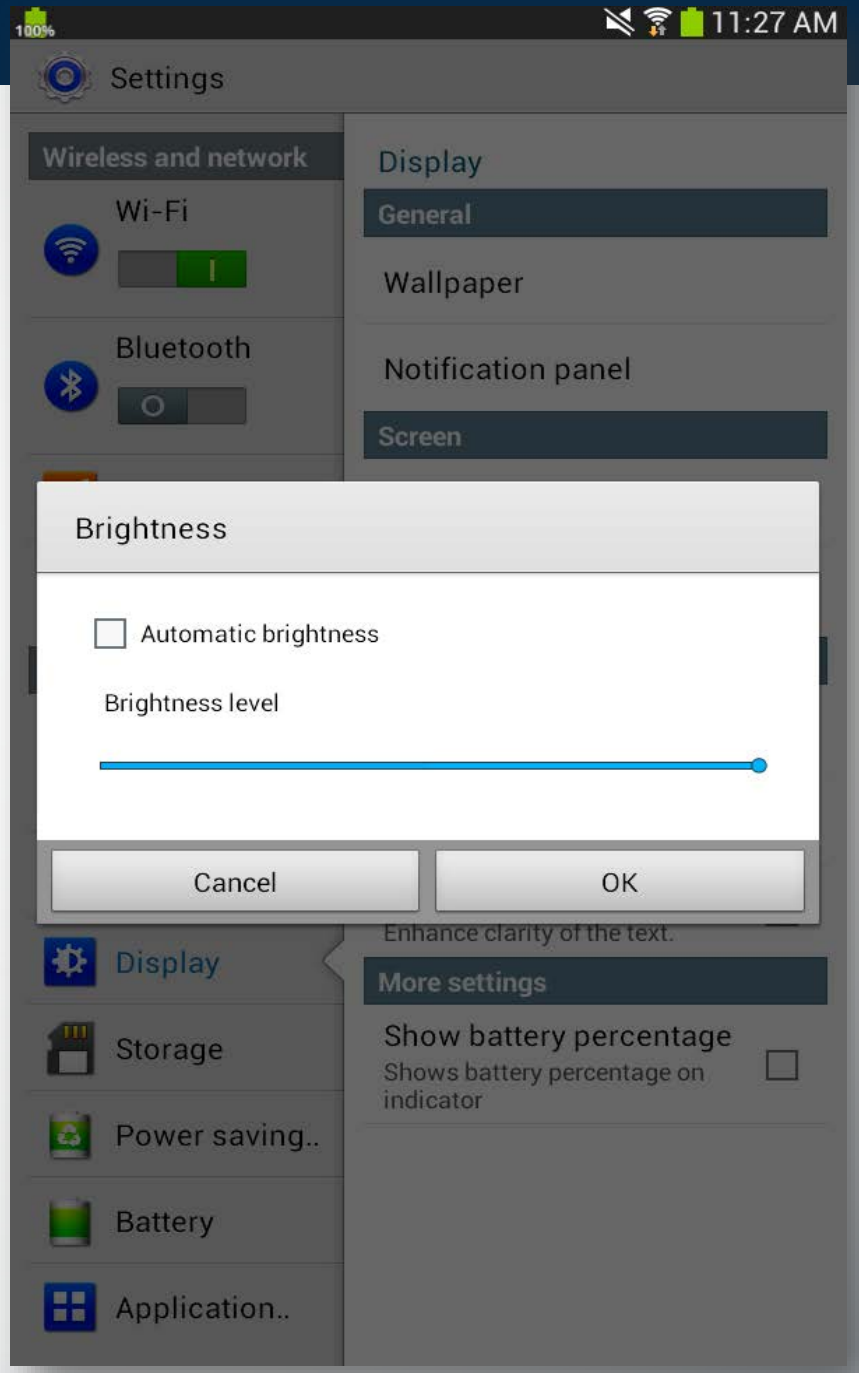
Simulate swipe downward (show notifications)

- adb shell input keyevent 4; input keyevent 4; input keyevent 4; input swipe 10 10 10 1000;

ADB Send Keys

Setting Maximum Screen Brightness

```
adb shell sleep 15;input keyevent
  4;am start -a
  android.settings.DISPLAY_SETTING
  S;input keyevent 122;input keyevent
  22;input keyevent 20;input keyevent
  123;input keyevent 19;input keyevent
  19;input keyevent 19;input keyevent
  19;input keyevent 19;sleep 2;input
  keyevent 66;input keyevent 66;sleep
  2;input keyevent 20;input keyevent
  66;input keyevent 122;input keyevent
  22;input keyevent 19;sleep 1;input
  keyevent 22;input keyevent 22;input
  keyevent 22;input keyevent 22;input
  keyevent 22;input keyevent 22;input
  keyevent 22;input keyevent 22;input
  keyevent 22;input keyevent 22;input
  keyevent 22;input keyevent 22;input
  keyevent 22;input keyevent 22;input
  keyevent 20;sleep 2;input keyevent
  66;
```



World Survey Android Builder (4.3.0.0)

Tablet Connected

I. Tablet Pre-Build Manual Steps

1. The tablet screen needs to be ON.
2. The tablet needs to be disconnected.
3. Tap a check next to the 'USB Debugging', check documentation for details.
4. Connect the tablet via the USB cable.

II. Configure

FIID:	000999	First Name:	Joe	Username:	NA
GovID:	123456	Last Name:	Techsup	Password:	NA

Configure Tablet Cancel

III. Status

Stage 2: Don't touch the tablet, the system is auto setting the screen timeout.

Action Duration: 00h:00m:03s

Stage: 1 of 34 Completed

Total Duration: 00h:00m:12s

IV. Results

Successfully completed: Stage 1: Waiting for the tablet USB connection... Check the tablet. Make sure the screen is ON and unlocked.

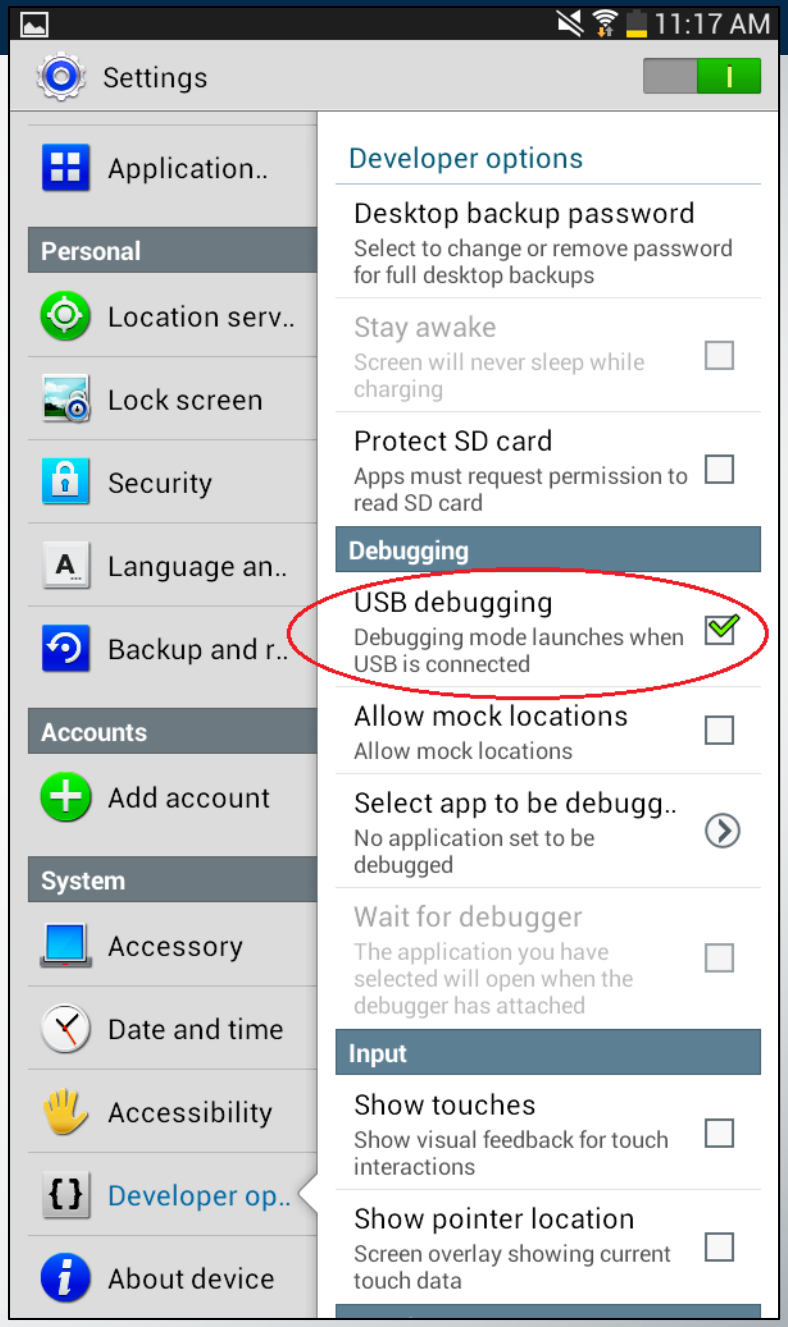
DroidBuilder Results

- ~5,100 Android devices (nine projects)
- 3x setup time efficiency

Average Operation Steps	Average Manual Setup Time (Minutes)	Average DroidBuilder Setup Time (Minutes)
39	17	*5

DroidBuilder Limitations

- Manually enable USB debugging
- Assumed device state
- Screen on & unlocked
- Order of operations matter
- Single USB device



Future Enhancements

- Use ADB setting put commands
- Image system setting validation check
- Automate creation of XML input
- Field Interviewer lookup web service
- Multiple connected USB tablets

  adb devices and adb –s <serial number>

Conclusion

- Standardizes Android device provisioning
- Built on freely tools (ADB)
- Customizable input (XML input file)
- Reduces
  - Human error
  - Configuration time
- Cost savings

Questions?

ADB Resources

- ADB Introduction
  https://developer.android.com/studio/command-line/adb.html

- Android System Settings
  https://developer.android.com/reference/android/provider/Settings.System.html

- Key Events
  https://developer.android.com/reference/android/view/KeyEvent.html

More Information

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