Becoming a Pro

IN Mobile Applications Testing

Overview: *Mobile APPS*

- Categories
- Types
- Distribution/Installation/Logs
- Mobile Test Industry Standards
- Remote Device Access (RDA)
- Emulators
- Simulators
- Troubleshooting Guide
- App Risk Analysis

Mobile APPS: Distribution/Installation: Android .APK

What is **TEST FAIRY ?**

TestFairy offers some great features for app developers. One of the stand out features is client side Video recording and not just screen shots.

TestFairy provides a video recording of the exact test from the client side, including CPU, Memory, GPS, Network monitoring, logs, crash reports and more.

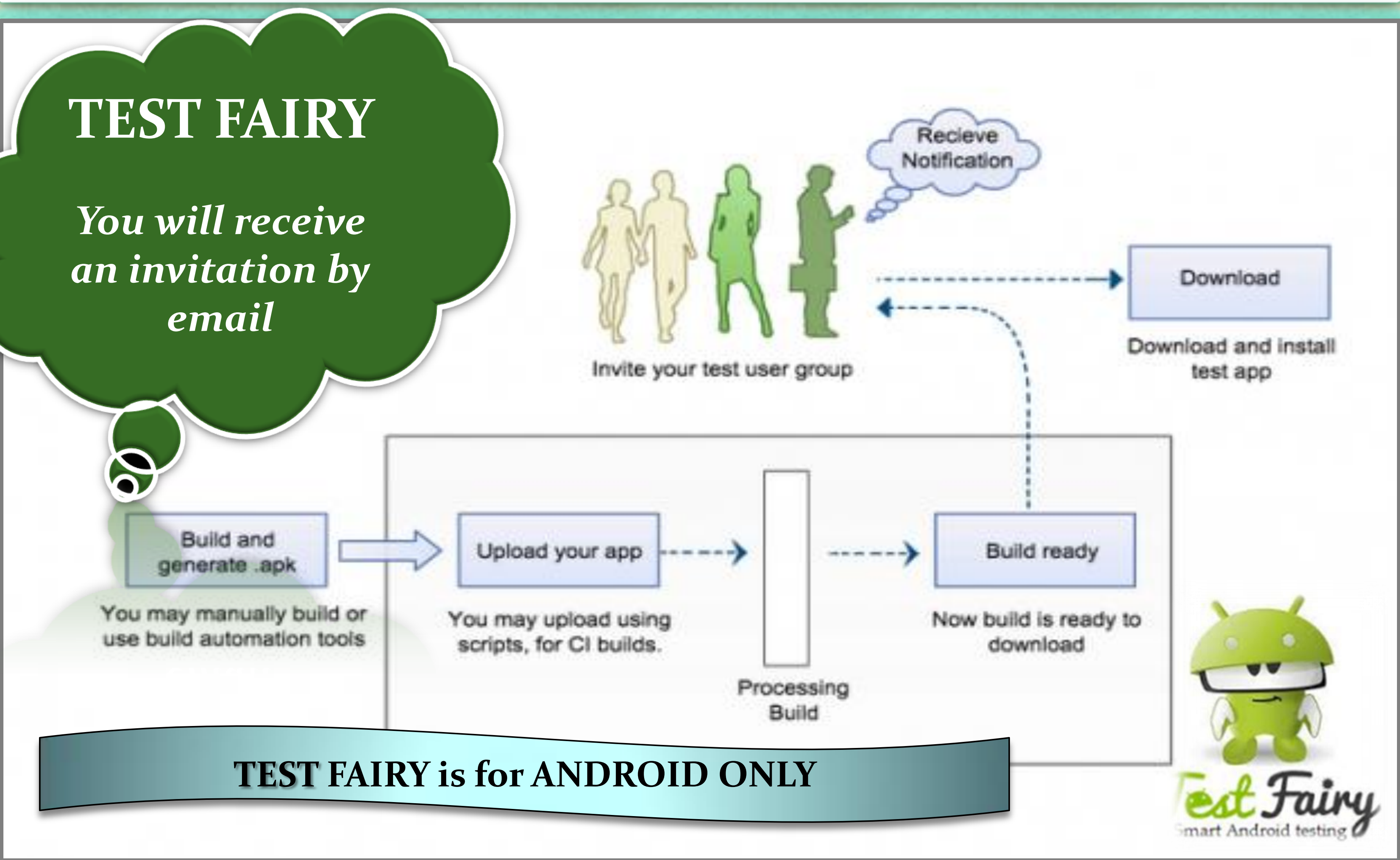
With Android apps you don't need to integrate any SDK or APIs into your app builds. You upload your APK (Android application file) to the TestFairy platform.

TEST FAIRY is for ANDROID ONLY

Mobile APPS: Distribution/Installation: Android .APK

TEST FAIRY

You will receive an invitation by email



Recieve Notification

Invite your test user group

Download

Download and install test app

Build and generate .apk

You may manually build or use build automation tools

Upload your app

You may upload using scripts, for CI builds.

Processing Build

Build ready

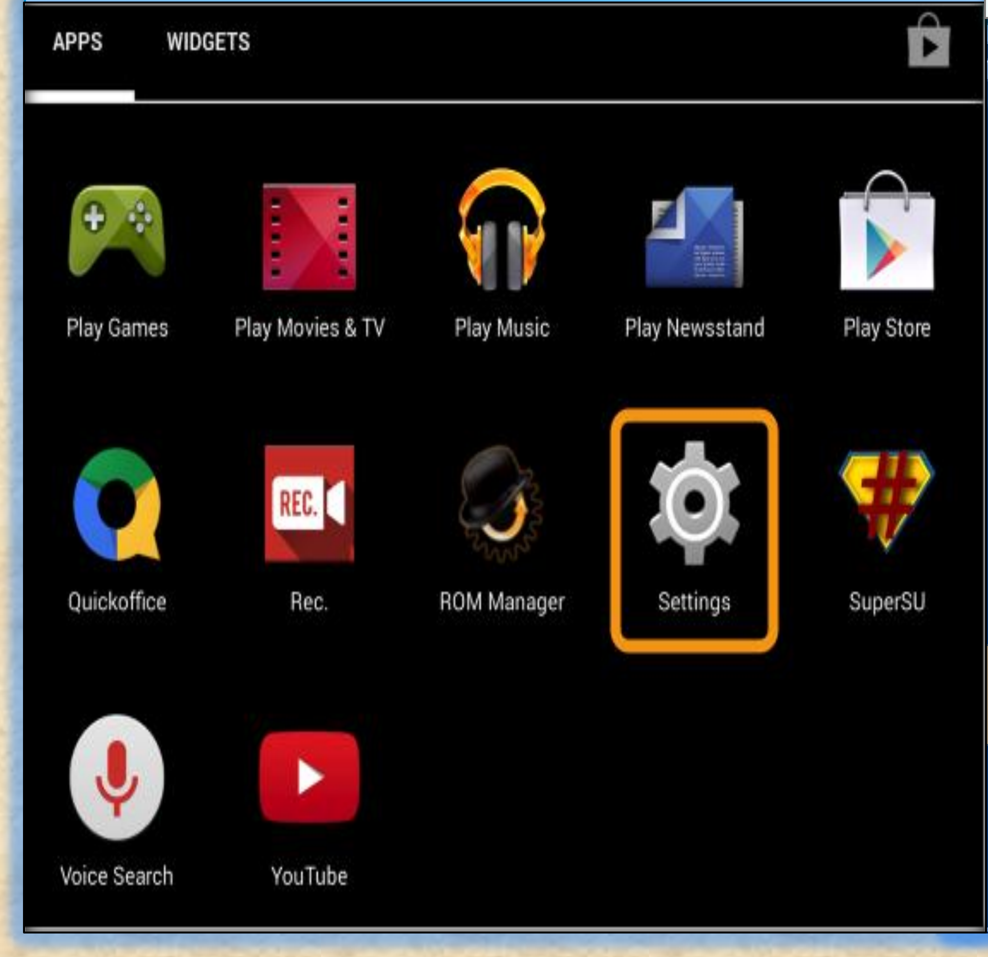
Now build is ready to download

TEST FAIRY is for ANDROID ONLY

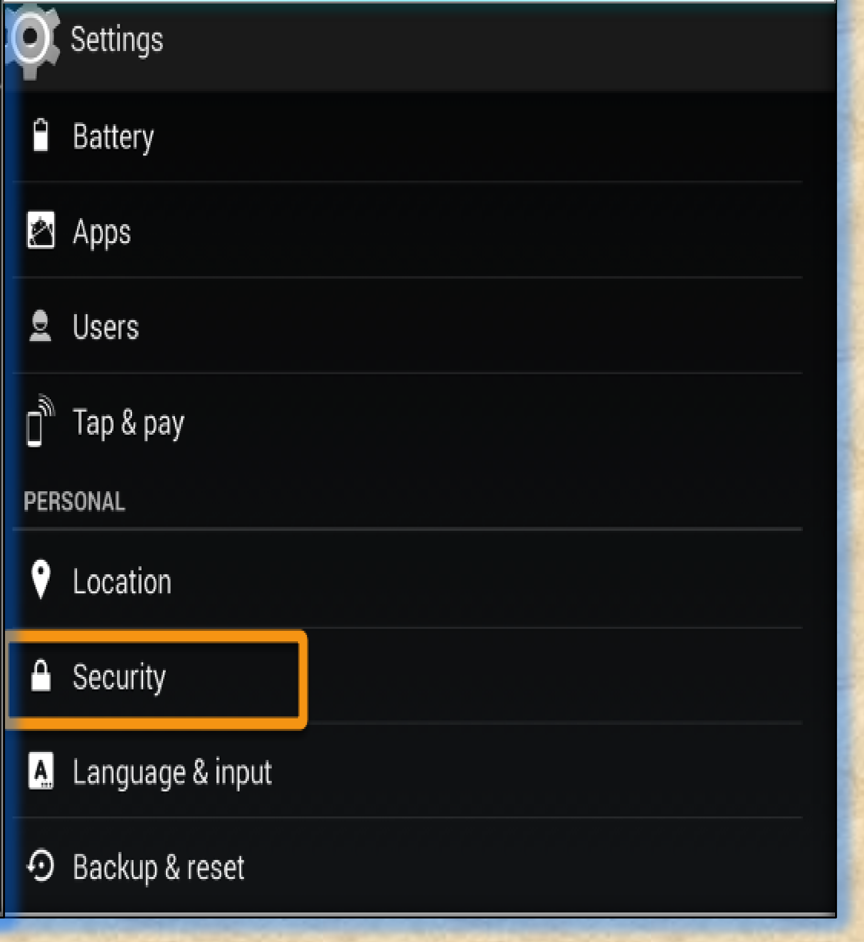
Mobile APPS: Distribution/Installation: Android .APK

Installing THIRD PARTY APK

1. Go to the "Settings" application on your Android device



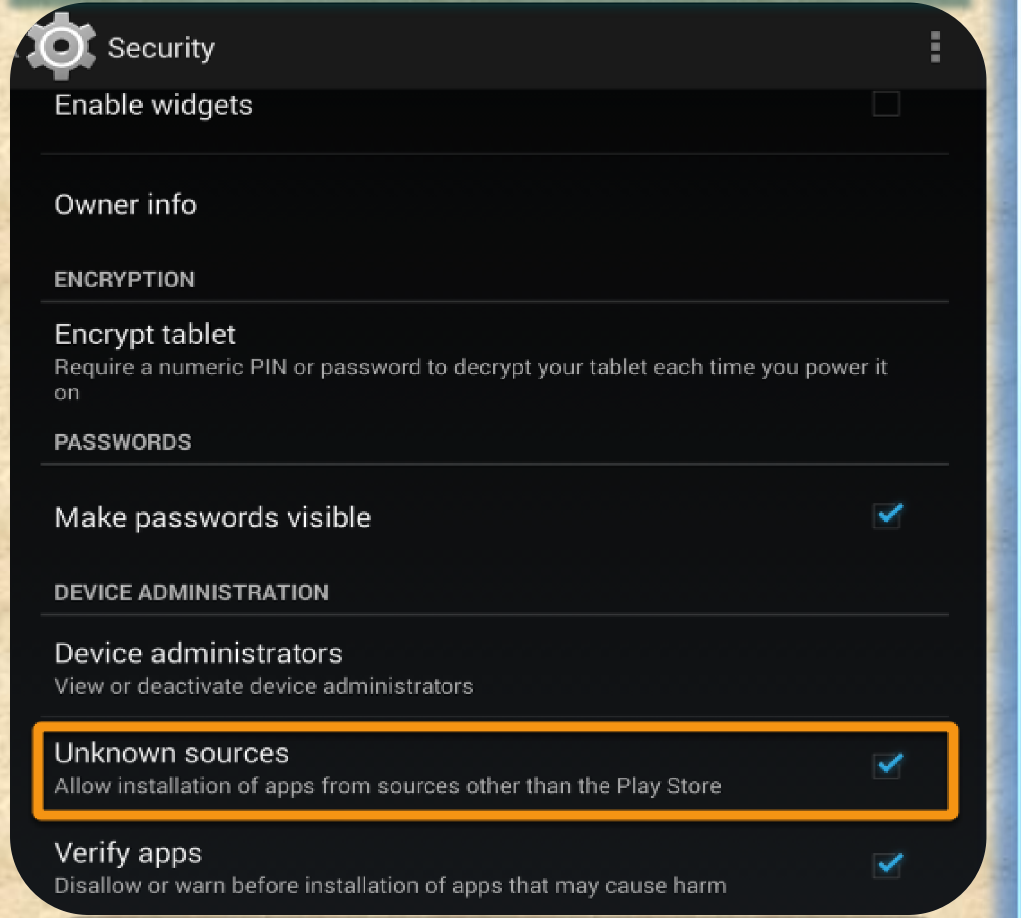
2. Choose the "Security" option located under the heading "Personal”



Mobile APPS: Distribution/Installation: Android .APK

Installing THIRD PARTY APK (OS 7 and lower)

3. Under "Device Administration" place a checkbox next to the option "Unknown Sources"



Security

Enable widgets ☐

Owner info

ENCRYPTION

Encrypt tablet
Require a numeric PIN or password to decrypt your tablet each time you power it on

PASSWORDS

Make passwords visible ☑

DEVICE ADMINISTRATION

Device administrators
View or deactivate device administrators

Unknown sources ☑
Allow installation of apps from sources other than the Play Store

Verify apps ☑
Disallow or warn before installation of apps that may cause harm

This allows you to install applications on your Android device that are not downloaded directly from the Google Play store

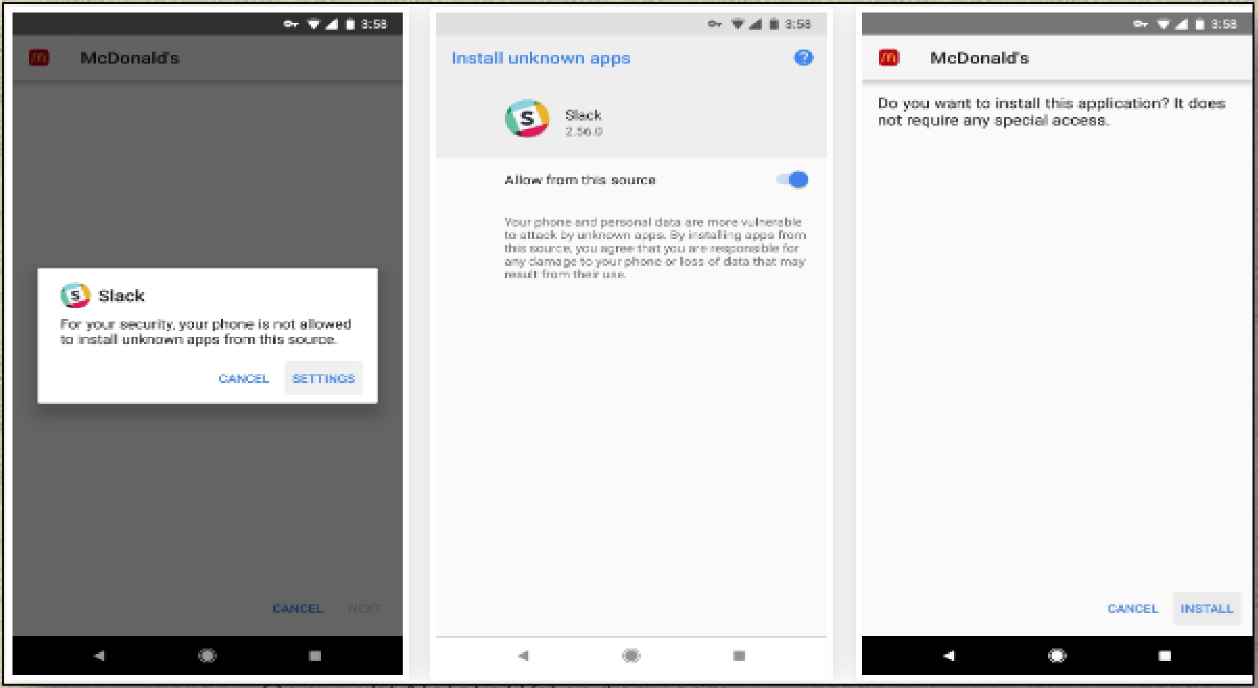
Mobile APPS: Distribution/Installation: Android .APK

Installing THIRD PARTY APK (OS 8 and higher)

Just download APKs as you normally would, but when you launch the APK, you'll be prompted to allow the permission.

1. Tap "**Settings**" on the prompt,
2. **Enable the switch** next to "Allow from this source" on the following screen.
3. Hit your back button, then you can resume installation.

- ❑ *Starting with **Android 8.0**, the process of side loading apps has changed*
- ❑ *No longer is there a system-wide "Unknown Sources" setting instead, it's now handled on a per-app basis.*



McDonald's

Slack

For your security, your phone is not allowed to install unknown apps from this source.

CANCEL SETTINGS

Install unknown apps

Slack 2.56.0

Allow from this source

Your phone and personal data are more vulnerable to attack by unknown apps. By installing apps from this source, you agree that you are responsible for any damage to your phone or loss of data that may result from their use.

McDonald's

Do you want to install this application? It does not require any special access.

CANCEL INSTALL

".

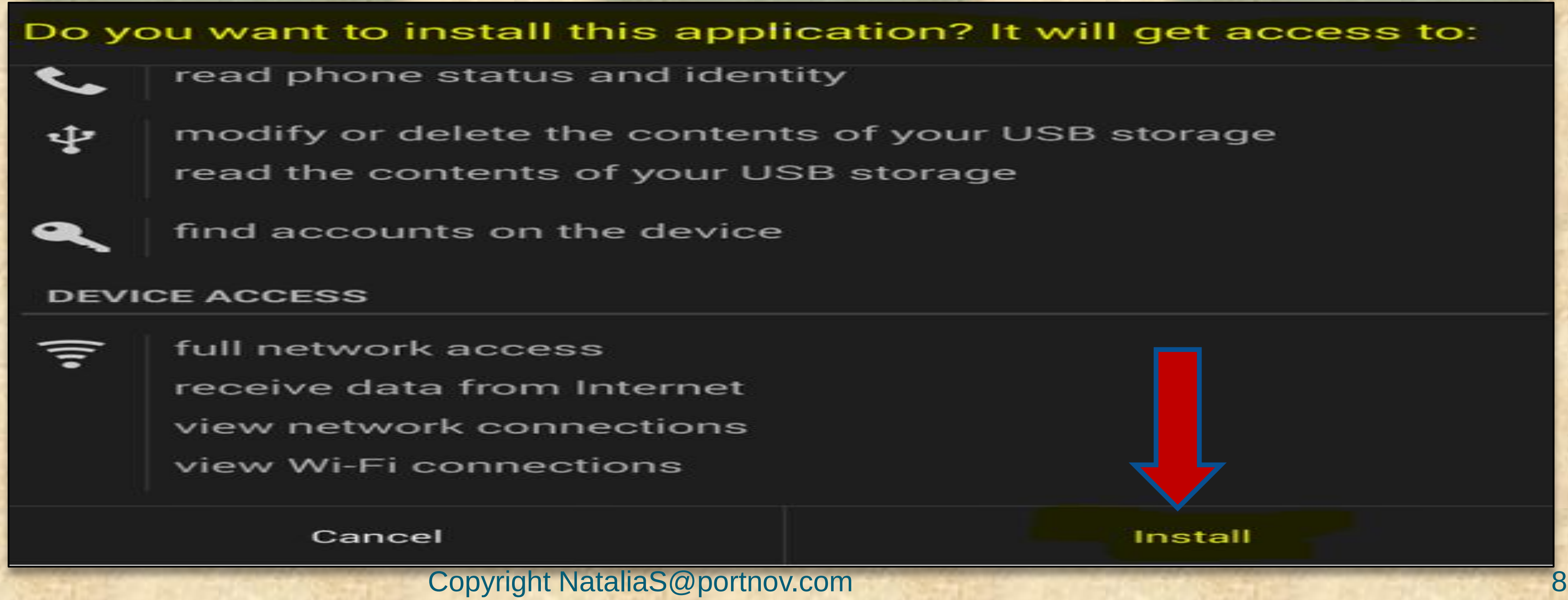
Mobile APPS: Distribution/Installation: Android .APK

Transferring APK to your Device

1. On your computer, attach the ".apk" file to an e-mail and send it to an account that you can access via your Android device.

2. On the Android device, click on the ".apk" attachment in the e-mail in order to download it.

3. Follow the on-screen instructions to install the application.



Do you want to install this application? It will get access to:

- read phone status and identity
- modify or delete the contents of your USB storage
- read the contents of your USB storage
- find accounts on the device

DEVICE ACCESS

- full network access
- receive data from Internet
- view network connections
- view Wi-Fi connections

".

Mobile APPS: Android LOGS : EXTRA

Installing LOGCAT APP to your Device

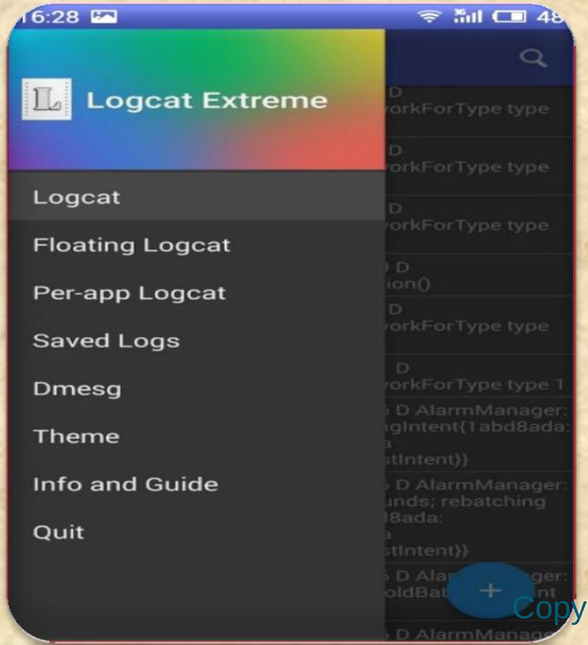
Download

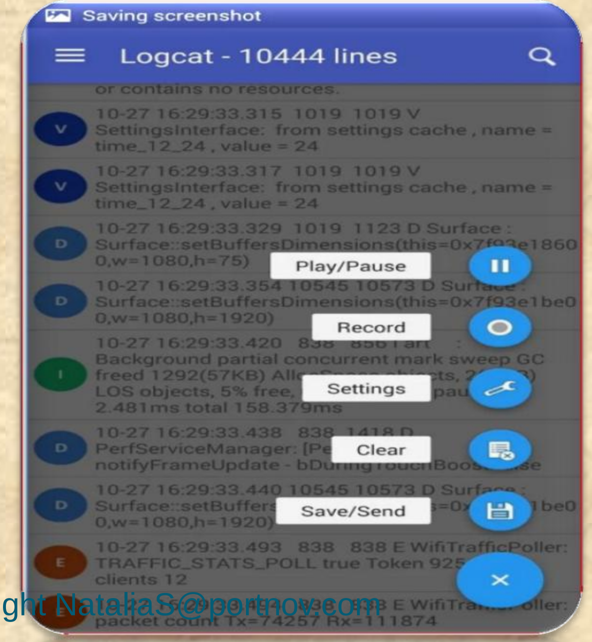
LOGCAT EXTREME

from PlayStore to your Device directly *(this is only an example, there are many other similar apps)*

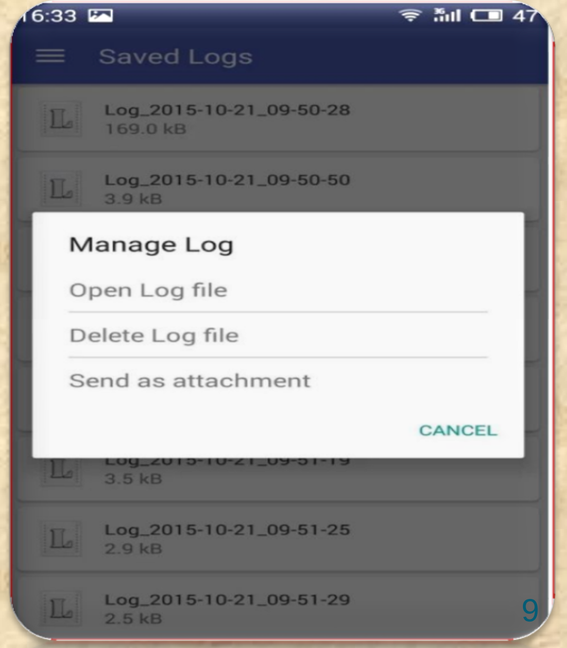
LOGCAT EXTREME is an enhanced Logcat reader and Logcat recorder which comes with a rich set of features and handy user interface.

Please note: From Android 4.1 onwards ANY logcat app needs root access in order to show logs properly.





```
or contains no resources.
V 10-27 16:29:33.315  1019  1019 V
SettingsInterface:  from settings cache , name =
time_12_24 , value = 24
V 10-27 16:29:33.317  1019  1019 V
SettingsInterface:  from settings cache , name =
time_12_24 , value = 24
D 10-27 16:29:33.329  1019  1123 D Surface :
Surface::setBuffersDimensions(this=0x7f93e1860
0,w=1080,h=75)
D 10-27 16:29:33.354 10545 10573 D Surface :
Surface::setBuffersDimensions(this=0x7f93e1be0
0,w=1080,h=1920)
I 10-27 16:29:33.420   838   856 I art      :
Background partial concurrent mark sweep GC
freed 1292(57KB) All
LOS objects, 5% free,
2.481ms total 158.379ms
D 10-27 16:29:33.438   838  1418 D
PerfServiceManager: [Pe
notifyFrameUpdate - bDuring
D 10-27 16:29:33.440 10545 10573 D Surface :
Surface::setBuffers
0,w=1080,h=1920)
E 10-27 16:29:33.493   838   838 E WifiTrafficPoller:
TRAFFIC_STATS_POLL true Token 925
clients 12
E                                 838 E WifiTra
packet count Tx=74257 Rx=111874
```



Log_2015-10-21_09-50-28
169.0 kB

Log_2015-10-21_09-50-50
3.9 kB

Log_2015-10-21_09-51-19
3.5 kB

Log_2015-10-21_09-51-25
2.9 kB

Log_2015-10-21_09-51-29
2.5 kB

Mobile APPS: Distribution/Installation: iOS .IPA

- Through an App Marketplace (APP STORE)
- XCODE
- ITUNES
- TEST FLIGHT

Mobile APPS: Distribution/Installation: .IPA

What is XCode?

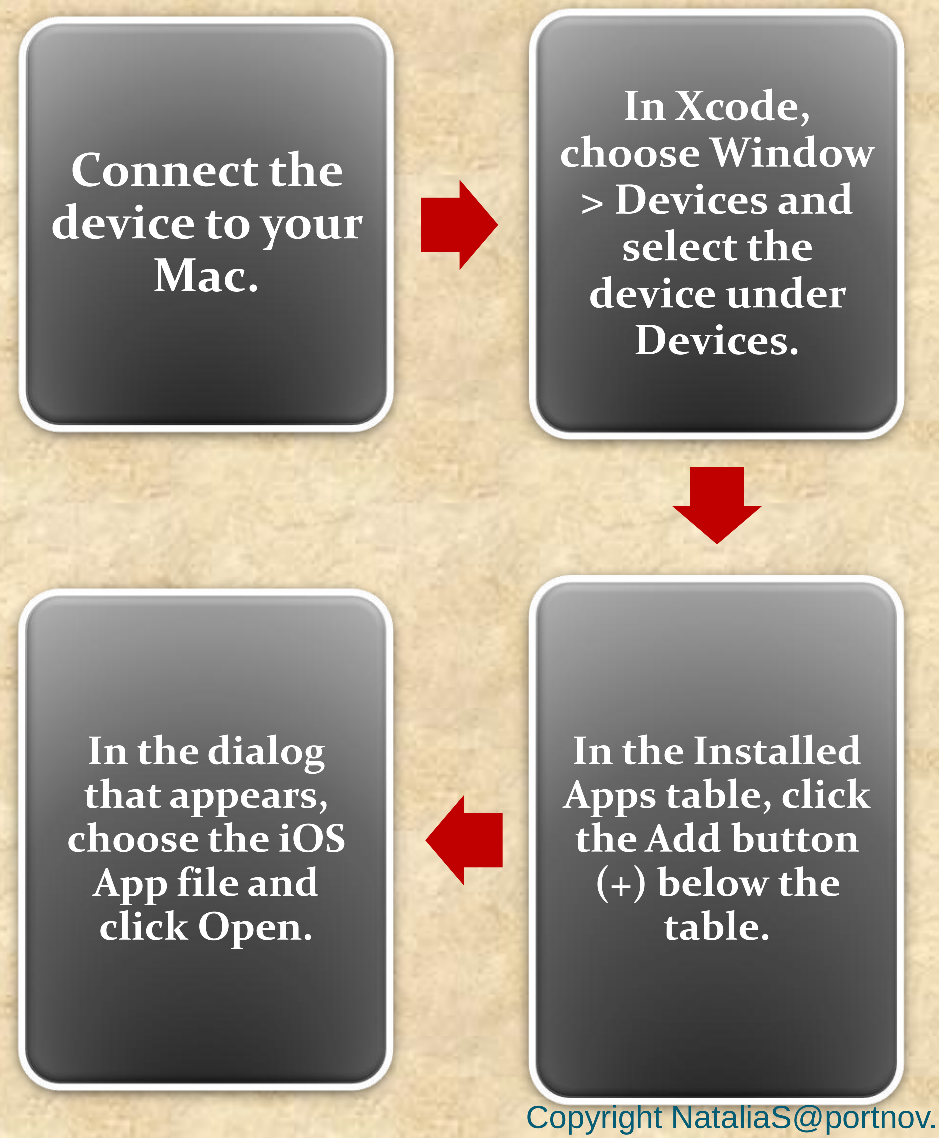
Xcode is an Intergrated Development Environment by Apple containing a suite of software Development Tools for macOS, iOS, WatchOS and tvOS

Xcode supports source code for programing languages C, C++, Objective-C, Objective-C++, Java, AppleScript, Python, Ruby, ResEdit (Rez), and Swift

Also supports variety of programming models, including but not limited to Cocoa, Carbon, and Java

Mobile APPS: Distribution/Installation: .IPA

Distributing .IPA through XCode ?

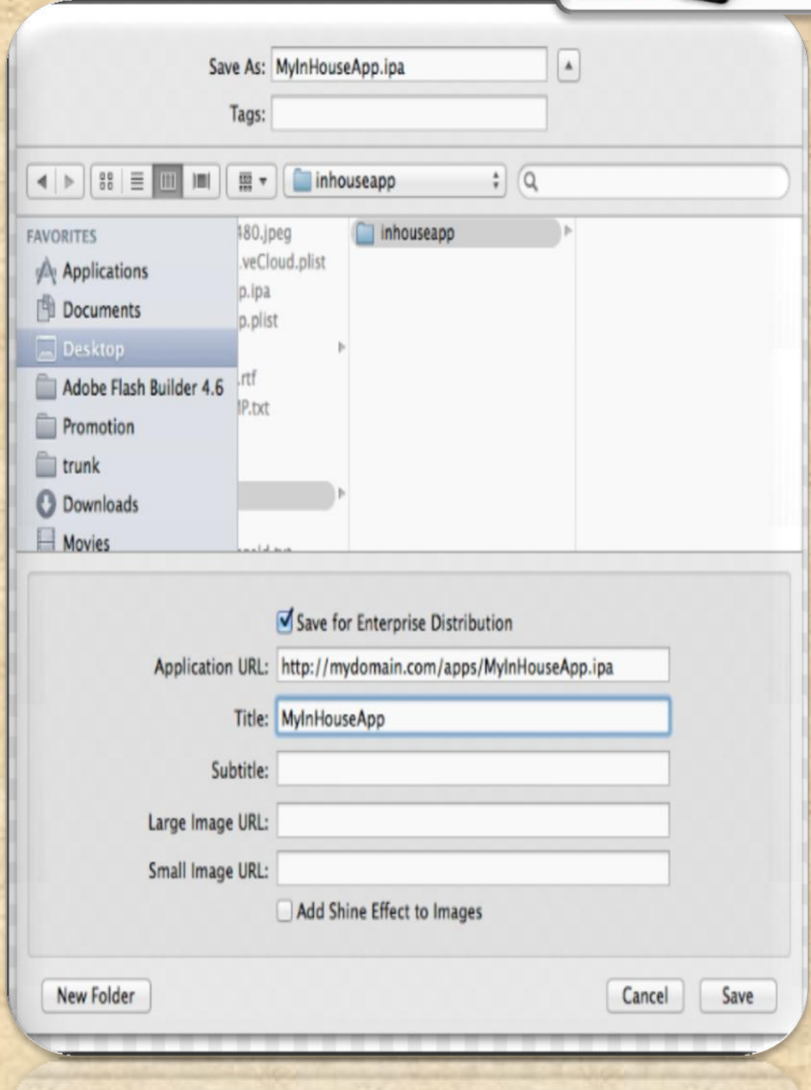


Connect the device to your Mac.

In Xcode, choose Window > Devices and select the device under Devices.

In the Installed Apps table, click the Add button (+) below the table.

In the dialog that appears, choose the iOS App file and click Open.



Save As: MyInHouseApp.ipa

Tags:

inhouseapp

☑ Save for Enterprise Distribution

Application URL: http://mydomain.com/apps/MyInHouseApp.ipa

Title: MyInHouseApp

Subtitle:

Large Image URL:

Small Image URL:

□ Add Shine Effect to Images

Mobile APPS: Collecting LOGS: .IPA

How to do it through Xcode on MAC ?

1. Install XCode

2. Connect your iPhone to the Mac

3. Select Trust this computer on the iPhone pop-up request

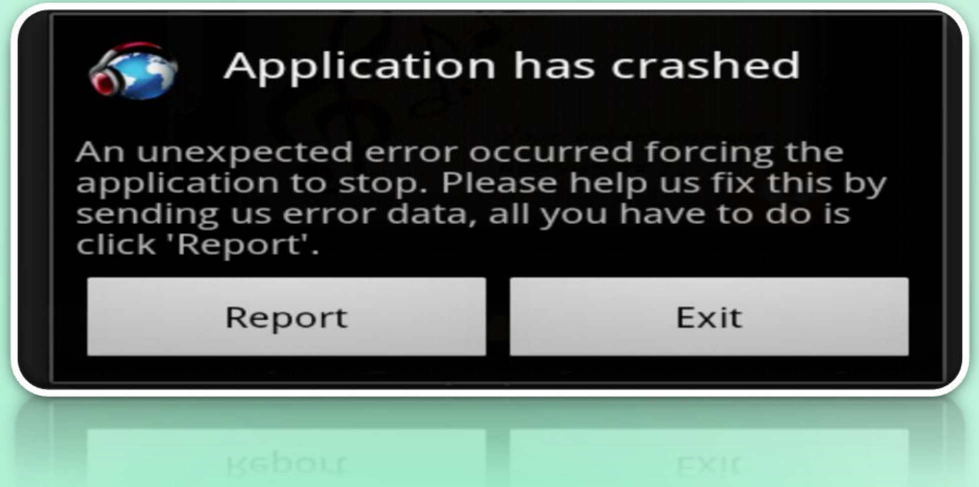
4. Start xCode (Menu) →Window → Devices (Select your iPhone and press the arrow button in the bottom right

5. Reproduce the problem

6. Press the arrow button and download the logs

How can I debug a deployed app without Xcode debugger ?

- A: Once you have deployed your app, either through the *App Store* or as an *Ad Hoc* or *Enterprise* build, you won't be able to attach *Xcode's* debugger to it.
- To debug problems, you need to analyze *Crash Logs and Console* output from the device.



Application has crashed

An unexpected error occurred forcing the application to stop. Please help us fix this by sending us error data, all you have to do is click 'Report'.

Mobile APPS: Distribution/Installation: .IPA

What is iTunes?

iTunes is a media player, media library, online radio broadcaster, and mobile device management application developed by Apple Inc.

It is used to play, download, and organize digital downloads of music and video (as well as other types of media available on the iTunes Store) on personal computers running the macOS and Microsoft Windows operating systems.

Mobile APPS: Distribution/Installation: .IPA

Drag-and-drop IPA file into '*Apps*' tab of iTunes BEFORE you connect the device

Connect your device

Select *your device* on iTunes

Select '*Apps*' tab

Search app that you want to install

Click on '*Install*' button. This will change to '*Will Install*'

Click on '*Apply*' button on right corner

LOGS: Collecting from iTunes

- Sync your device with iTunes on your desktop.
- After syncing, look for crash logs in the correct directory.

The Following few slides will give an instructions . Lets start !

LOGS: Collecting from iTunes

- **Mac OS X:**

- Open Finder (found in the Dock)
- Click on the 'Go' menu at the top of your screen, and select 'Go to Folder'
- Type (or paste): ***~/Library/Logs/CrashReporter/MobileDevice/<DEVICE_NAME>***
- Open the folder with the same 'name' as your device.

  (Note: your device name appears in iTunes on the left side, under 'Devices').
- Open the folder called 'Retired'
- You will see at least one item starting with 'ReadItLaterPro'.

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LOGS: Collecting from iTunes

- **Windows Vista or 7:**

- Open any Windows Explorer Window (My Computer, My Documents, etc.)
- Enter %appdata%, and press enter →Navigate to Roaming *C:\Users\<USERNAME>\AppData\Roaming\Apple*
- *Computer\Logs\CrashReporter\MobileDevice\<DEVICE_NAME>*
- (Note: your device name appears in iTunes on the left side, under 'Devices')
- You will see at least one item starting with 'ReadItLaterPro'.

LOGS: Syncing your device with iTunes

- **Windows XP:**

- Locate your Application Data folder.
- Navigate to Apple computer ***C:\Documents and Settings\<USERNAME>\Application Data\Apple***
- ***Computer\Logs\CrashReporter\MobileDevice\<DEVICE_NAME>***
- (Note: your device name appears in iTunes on the left side, under 'Devices')
- You will see at least one item starting with 'ReadItLaterPro'.

LOGS: *Collecting from your Device*

- To obtain iOS crash logs, please select your device and go to:

- **Settings>Privacy>Analytics>Analytics Data (iOS 10 and higher)**
- ***Settings > Privacy > Diagnostics & Usage (for iOS 8 and iOS 9))***
- ***Settings > General > About > Diagnostics & Usage (for iOS 7 or older)***

- Select a ***Chrome*** crash from the list.

  This will start with ***"Chrome_"*** and contain the timestamp of the crash.
- Tap on the crash and you will see a text field with a crash log.

  Long press to *Select All* and then *Copy* the crash text.
- Paste it into something you can get off of your device (for example, an email to yourself).

Mobile APPS: Distribution/Installation: .IPA

What is TestFlight?

TestFlight is an online service for over-the-air installation and testing of mobile applications, currently owned by Apple Inc and only offered to developers within the iOSDeveloper Program

Developers signed up with the service to distribute applications to internal or external beta testers, who could subsequently send feedback about the application to developers

The TestFlight SDK additionally allowes developers to receive remote logs, crash reports and tester feedback.

HOMEWORK : READ AN ENTIRE ARTICLE ABOUT TestFLIGHT https://www.raywenderlich.com/48750/testflight-sdk-tutorial

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- App Risk Analysis

Mobile Test Industry Standards :

Testing Strategies for Mobile Apps

Challenges

- Device fragmentation
- In-house vs. outsourced testing
- Availability of mobile testing tools
- Application Lifecycle Testing

- Like any desktop or web application testing, mobile application testing is also focused on the quality and performance of the final product.
- However, mobile app testing becomes far more challenging because of the following key factors

Mobile Test Industry Standards :

Testing Strategies for Mobile Apps

- Device Model
- OS Version
- Screen Resolution
- Form Factor
- Emulators vs. Physical Devices

Mobile Test Industry Standards :

Testing Strategies for Mobile Apps

Network density

How the app behaves on specific devices

How real-world users interact with the app

Different battery states on the devices

Multiple networks (Wi-Fi, 4G, 3G, etc.)

Beta Testing of your Mobile App

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Mobile Test Industry Standards :

Testing Strategies for Mobile Apps

applications can be deployed, tested, and managed

saves businesses from setting up on-premise test environments

capability to support complex apps

provides real-time testing results

Mobile App Testing on Cloud

Mobile Test Industry Standards :

Testing Strategies for Mobile Apps

testing mobile apps in real network environments

network simulation tools are available

test mobile apps in various network speeds, bandwidths variations

testing the app in a full internet connectivity scenario and other factors

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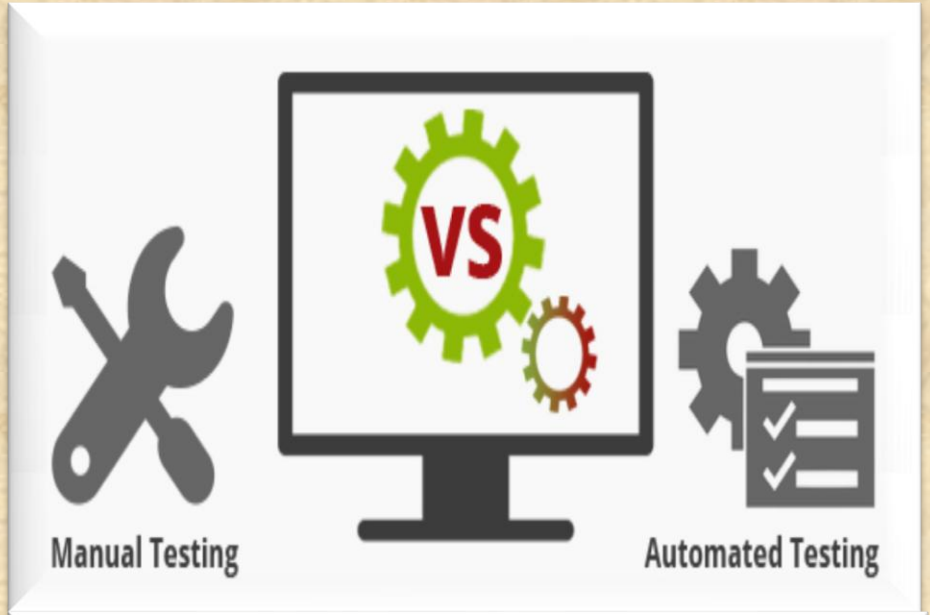
Mobile Test Industry Standards :

Testing Strategies for Mobile Apps

Automated testing is highly effective in consistently repeating a test procedure in regression testing as well as testing during the development stages.

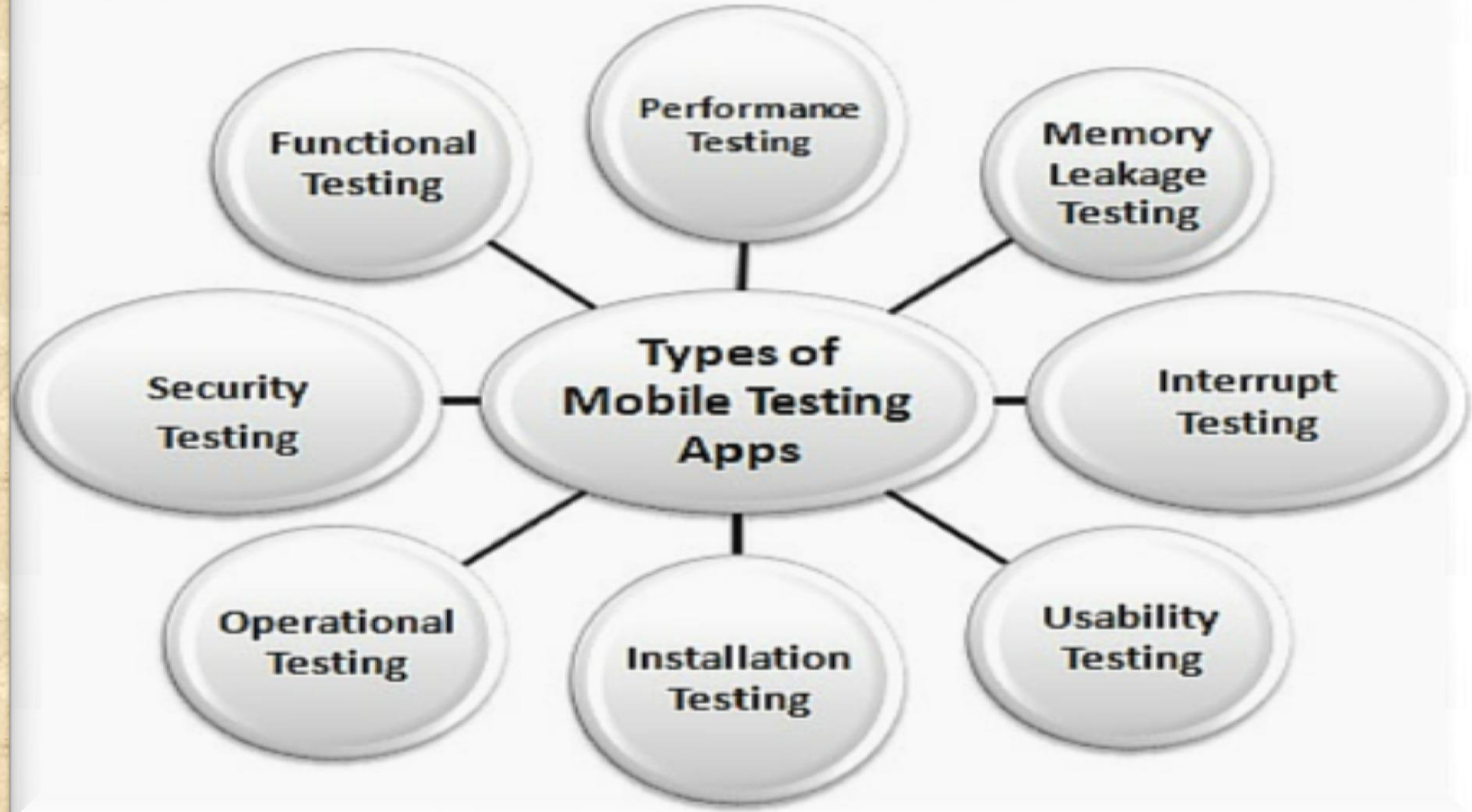
However, test automation requires significant amount of initial investment.



Mobile Test Industry Standards :

Testing Strategies for Mobile Apps

Types of Mobile App Testing



Types of Mobile Testing Apps

Functional Testing

Performance Testing

Memory Leakage Testing

Security Testing

Interrupt Testing

Operational Testing

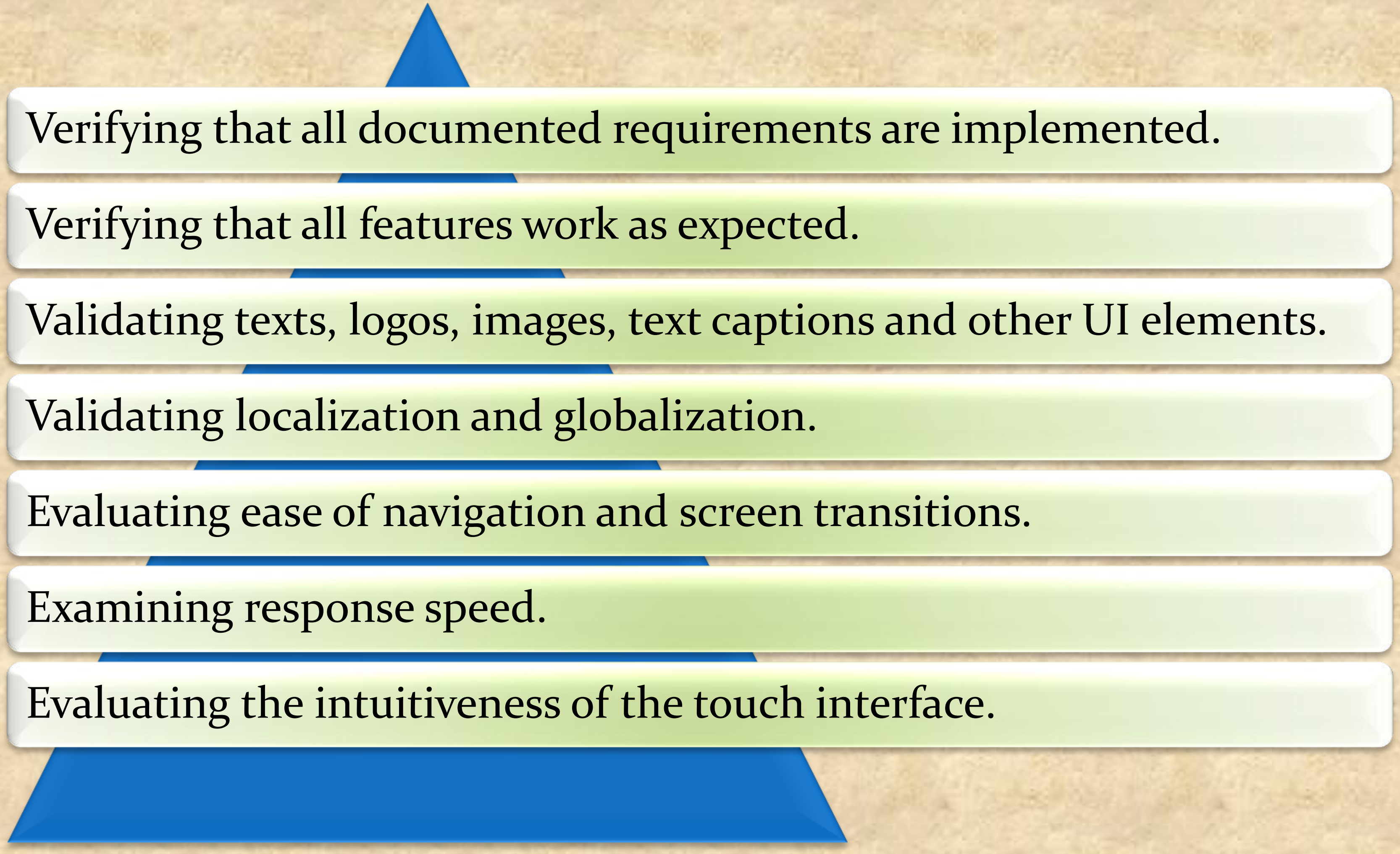
Installation Testing

Usability Testing

Mobile Test Industry Standards :

Testing Strategies for Mobile Apps

FUNCTIONAL TEST

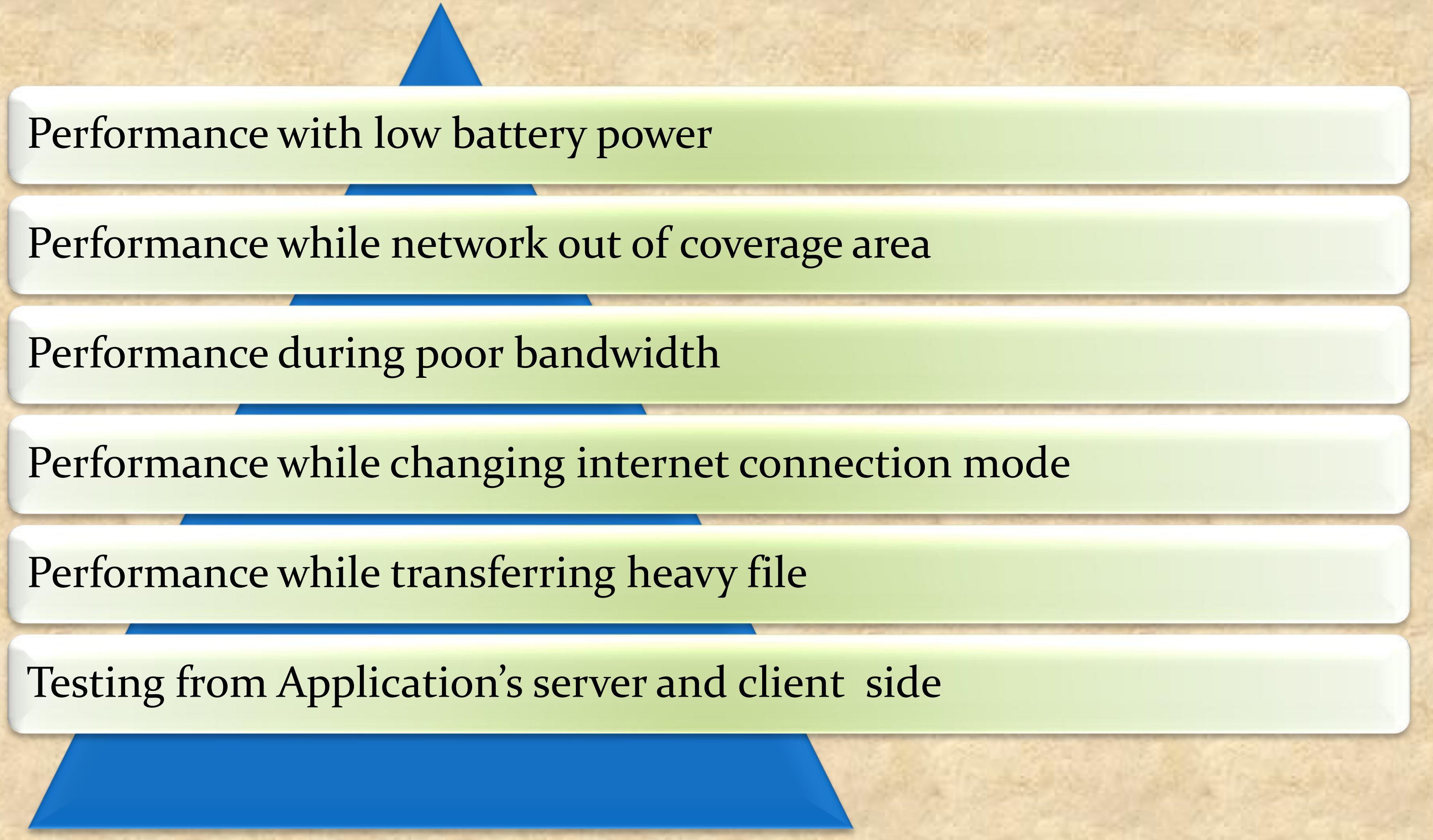


- Verifying that all documented requirements are implemented.
- Verifying that all features work as expected.
- Validating texts, logos, images, text captions and other UI elements.
- Validating localization and globalization.
- Evaluating ease of navigation and screen transitions.
- Examining response speed.
- Evaluating the intuitiveness of the touch interface.

Mobile Test Industry Standards :

Testing Strategies for Mobile Apps

PERFORMANCE TEST

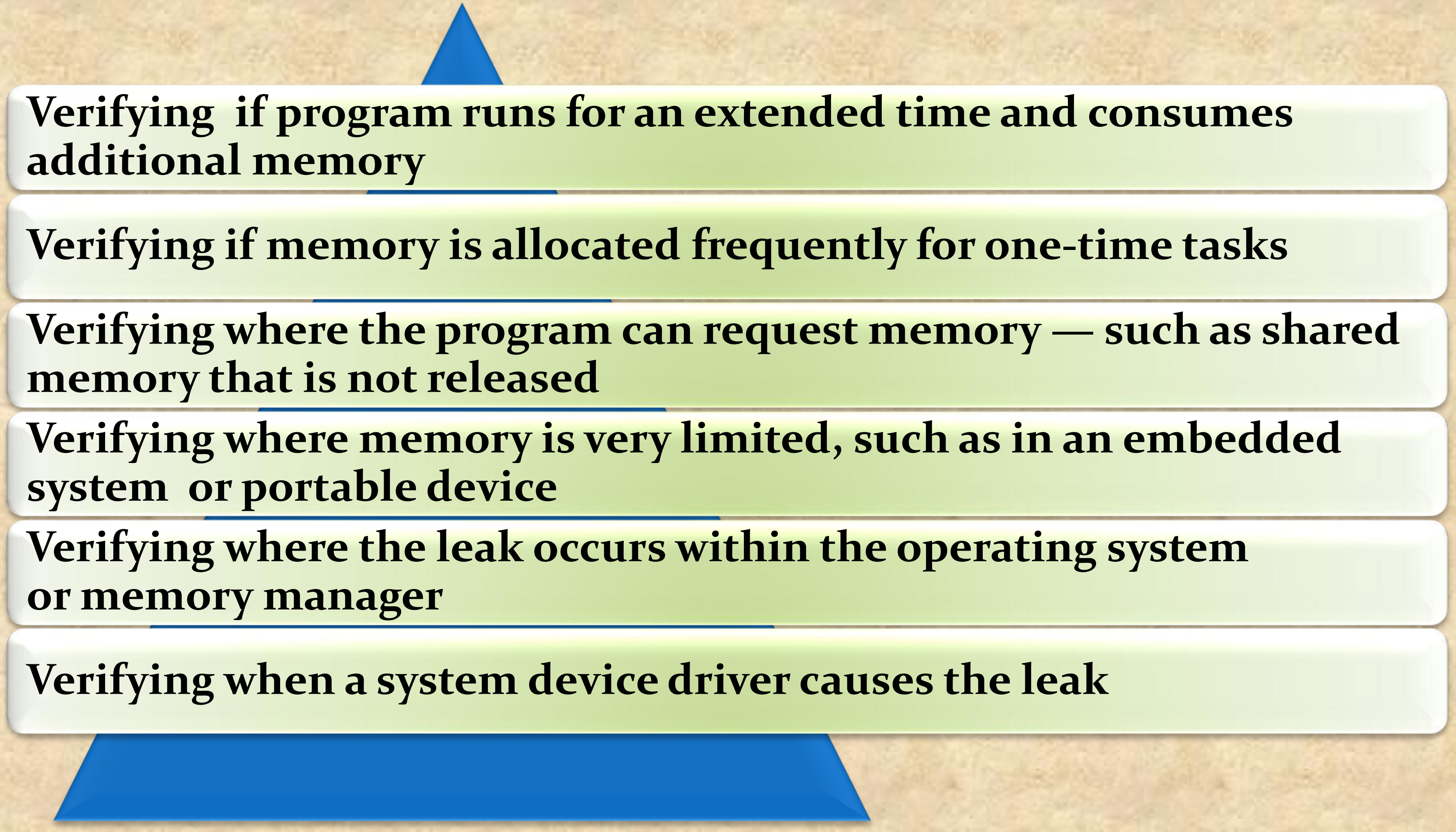


- Performance with low battery power
- Performance while network out of coverage area
- Performance during poor bandwidth
- Performance while changing internet connection mode
- Performance while transferring heavy file
- Testing from Application’s server and client side

Mobile Test Industry Standards :

Testing Strategies for Mobile Apps

Memory Leakage TEST



Verifying if program runs for an extended time and consumes additional memory

Verifying if memory is allocated frequently for one-time tasks

Verifying where the program can request memory — such as shared memory that is not released

Verifying where memory is very limited, such as in an embedded system or portable device

Verifying where the leak occurs within the operating system or memory manager

Verifying when a system device driver causes the leak

Mobile Test Industry Standards :

Testing Strategies for Mobile Apps

INTERRUPT TEST

- Battery low
- Battery full- when charging
- Incoming phone call
- Incoming SMS
- Incoming Alert from another mobile application
- Plugged in for charging
- Plugged out from charging
- Device shut off
- Application Update reminders
- Alarm
- Network connection loss
- Network connection restoration

Mobile Test Industry Standards :

Testing Strategies for Mobile Apps

USABILITY TEST

- To ensure that the buttons should have the required size and be suitable to big fingers.
- To ensure that the buttons are placed in the same section of the screen to avoid confusion to the end users.
- To ensure that the icons are natural and consistent with the application.
- To ensure that the buttons, which have the same function should also have the same color.
- To ensure that the validation for the tapping zoom-in and zoom-out facilities should be enabled.
- To ensure that the keyboard input can be minimized in an appropriate manner.
- To ensure that the application provides a method for going back or undoing an action, on touching the wrong item, within an acceptable duration.
- To ensure that the contextual menus are not overloaded because it has to be used quickly.

Mobile Test Industry Standards :

Testing Strategies for Mobile Apps

INSTALLATION TEST

Verify application gets installed properly

Verify user can uninstall application successfully

Verify app updates are properly installed

Verify aborting installation does not affect other features

Check app behavior on trying to install it on non-supported version/device.

Verify app is installed properly from app store and from side loading