Becoming a Pro (II)

IN Mobile Applications Testing

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Overview: *Mobile APPS*

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

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REMOTE DEVICE ACCESS (RDA)

Manual application and website testing run on the company`s devices

Website testing on multiple devices with URL input

Fast screenshot export

PC keyboard text input

Application testing supported with outgoing and incoming text messages

Calls and messages exchange among several virtual devices

Scalable picture from device to PC

Control over audio/video quality (important for slow Internet connection)

Full control over the device operation process (physical and virtual keypad, touch and slide functions, g-sensor, device restart, battery disconnection)

Operation of an unlimited number of devices simultaneously (with an hourly fee)

Test case manager, business paper organizer

Automation script creation and processing upon several devices (enterprise package)

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REMOTE DEVICE ACCESS (RDA) Summary

Provides testing access to a huge variety of mobile devices.

The specialty of the service is that they actually make use of remote connection to real devices

it's the real thing you are testing against, and not just an emulator.

DA Service can be used for testing of mobile websites as well as HTML5 hybrid apps and native apps.

Works on: Windows, Linux, Mac OS X

Brief Comparison between DeviceAnywhere (DA) and PerfectoMobile(PM)

DA - has wider scope of devices covering multiple countries- covering US/UK/France/Europe etc.. and supports corresponding carriers when compared to PM.

DA has wide range of handsets when compared to PM.

Camera quality is really good in DA when compared to PM(for taking screenshots, capturing videos)

PM has advantage with regards to automation over DA.

PM is cheaper when compared to DA

PM supports Indian carriers where as DA does not.

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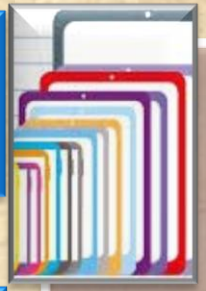
EMULATORS : MOBILE

- Generally provided by Device Manufacturers and simulate the actual device.
- An Emulator has the goal of taking the place of the real (in our case) mobile device.
- Emulator duplicates every aspect of the original device's behaviour, both hardware and software.
- Basically simulates all of the hardware the real device uses, allowing the exact same app to run on it unmodified, and all of the software.



DEVICE EMULATORS

Excellent for testing your site or application on a particular device or set of devices.

BROWSER EMULATORS

These simulate mobile browser environments. Whilst useful for determining the functionality available in a particular mobile browser, they are useless for device-specific testing.

Operating System Emulators

Microsoft provides emulators for Windows Mobile, and Google provides an emulator for Android. These run within a simulated mobile device environment and provide access to applications running within the operating system, e.g. a Web browser.

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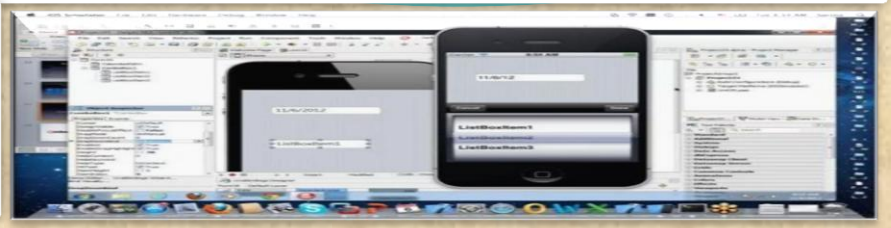
EMULATORS : MOST POPULAR

There are a large number of emulators available.
The following companies offer emulators for some or all of their mobile devices :



- Research in Motion (BlackBerry)
- Apple (iPhone)
- Samsung
- Palm
- LG
- Motorola

Browser Emulators

- Opera Mini
- Openwave

Operating system emulators are available from:

- Microsoft (Windows Mobile)
- Google (Android)
- Nokia (Series 40 and Series 60)

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EMULATORS :Android

Android Emulator comes as part of the android SDK commonly known as AVD – Android Virtual Device. It lets the user to prototype, develop, and test Android applications without using a physical device.

Android Emulators

The AVD's are OS version specific and provides the user the flexibility to customize OS version, resolution,skin, sd card size and various other hardware properties to be emulated.

There are many command line utilities and tools which comes as part of the sdk which makes it easy to debug and interact with emulator

Prerequisites for Android Emulator

- JRE – Java Runtime Environment
- Android SDK

Installing an application on Android Emulator

- If the application is available in Google Playstore it can be directly downloaded and installed on to the device.
- If the application is available in '.apk' format ,it can be installed using the command, 'adb install ' .

Adb is a command line utility which comes as part of the SDK.

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EMULATORS : iPhone

A note about terminology:

The terms '***Mobile Emulator***' and '***Simulator***' are sometimes used interchangeably.

It doesn't help that *Apple* considers its native emulator a 'simulator' whereas *Android* tools are called emulators.

In the case of *Apple*, you need ***Xcode***

- *Apple always harps on the importance of device testing because iPhone Simulator does not emulate an iPhone processor, disk drive, memory constraints and whatnot.*
- *You hardly ever get memory warnings unless your Mac is struggling to manage resources itself, unless you simulate (again) memory warnings from the Simulator's menu item.*

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EMULATORS : Blackberry

BlackBerry Simulators is different from the other emulators as this is Device model specific (rather than OS version) • Easy to use interface for installing and testing apps

Blackberry Emulators

• Model specific blackberry emulators are available from RIM as standalone window applications and also along with BB JDK.

• The BlackBerry MDS Simulator and the BlackBerry Email Simulator simulates internet and email services respectively.

Prerequisites for Blackberry Simulator

• JRE – Java Runtime Environment

• Blackberry simulator package • Blackberry email and MDS Simulator

Installing an application on Blackberry emulator

• If the application is in .cod format, it can be directly loaded in to the emulator from the menu options in emulator.

• If the simulator is being used with an IDE or Blackberry JDE it directly loads the application into the simulator and runs it.

• The blackberry device manager can also be used to for installing the applications on emulator and device

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EMULATORS : Windows Phone

Windows Phone 7 is a mobile operating system developed by Microsoft, and is the successor to its Windows Mobile platform.

The Windows Phone 7 emulator comes with SDK and Windows Developer Tool Kit.

Pre-requisites for the emulator

- Windows Vista and higher Desktop OS
- Microsoft Silverlight along with silver light toolkit for windows phone
- Visual Studio 2010
- Windows mobile 7 sdk

Installing applications in emulator

- Open the "Application Deployment" tool which is the part of "Windows Phone Developers Tool"
- Provide the path to the .xap file of the application in the tool
- The emulator opens showing the application that has been installed

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EMULATORS Pros and Cons

1. Freeware and easily downloadable for use

2. It is possible real time scenarios like out of network, Emergency calls etc

3. Since emulator integrates with the development IDE, it would be easy to debug the application for a developer.

1. The Real live interactions cannot be performed(Ex. scanning , capturing etc)

- It is not possible to test the applications on a live network connectivity.

2. It just mimics the mobile device from various platforms and hence testing on the emulator cannot guarantee the stability of the application.

3. Some of the interruption test scenarios may also not work properly as like in real handset to predict the actual behavior of the application.

4. Memory Leak issues and Performance issues cannot be detected.

5. Dependency on platform to launch the simulator (Ex. MAC Desktop)

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EMULATORS vs Real Devices

USER EXPERIENCE AND USABILITY

- User Interactions
- Real occurring events
- Overall performance
- Consistency in results

SPECTRUM OF DEVICE CONFIGURATIONS (HARDWARE)

- Chipset
- Display
- Memory
- Sensors

PLATFORM + CUSTOMIZATIONS (SOFTWARE)

- Platform/OS version
- OEM and Carrier customizations
- *Dependencies to other software/app*

INFRASTRUCTURE (NETWORK)

- Network/WiFi

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Simulators : MOBILE

- Mobile Simulator is a software application for a personal computer which creates a virtual machine version of a mobile device,such as a mobile phone, iPhone, other smartphone, or calculator, on the computer.
- The mobile simulator allows the user to use features and run applications on the virtual mobile on their computer as though it was the actual mobile device.
- A mobile simulator lets you test a website and determine how well it performs on various types of mobile devices.
- A good simulator tests mobile content quickly on multiple browsers and emulates several device profiles simultaneously.
- This allows analysis of mobile content in real-time, locate errors in code, view rendering in an environment that simulates the mobile browser, and optimize the site for performance.
- Mobile simulators may be developed using programming languages such as Java and .NET

A **SIMULATOR** sets up a similar environment to the original device's OS, but doesn't attempt to simulate the real device's hardware.

Some programs may run a little differently, and it may require other changes (like that the program be compiled for the computer's CPU instead of the device's), but it's a close enough match that you can do most of your development against the simulator.

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Simulators Pros and Cons

1. Study the behavior of a system without building it.
2. Results are accurate in general, compared to analytical model.
3. Help to find un-expected phenomenon, behavior of the system.
4. Easy to perform ``What-If'' analysis.

1. No support for placing or receiving actual phone calls.

   You can simulate phone calls through the emulator console, however.
2. No support for USB connections
3. No support for camera/video capture (input).
4. No support for determining connected state
5. No support for Bluetooth
6. No support for actual GPS
7. No support for Accelerometer feature used in Gaming applications

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Simulators : iPhone

iPhone and iPad are popular devices from Apple. Its has its own proprietary operating system, iOS. Its well known for its design and performance.

Prerequisites:

MAC Environment

Getting Started:

- **Deploy Native app into iPhone Simulator using Xcode.**

- **Xcode - an integrated development environment that manages your application projects and lets to edit, compile, run, and debug code**

- **Once the native app is deployed, the app icon appears on simulator, thus aids to access the app directly from simulator**

- **Testing in UIAutomation can be done by both developer and tester, it requires knowledge of iPhone development.**

- **UIAutomation is the automation technique for iPhone.**

It uses JavaScript as test script to perform automation. This can be done both in device and simulator

- **iPhone Simulator does not emulate an iPhone processor, disk drive, memory constraints**

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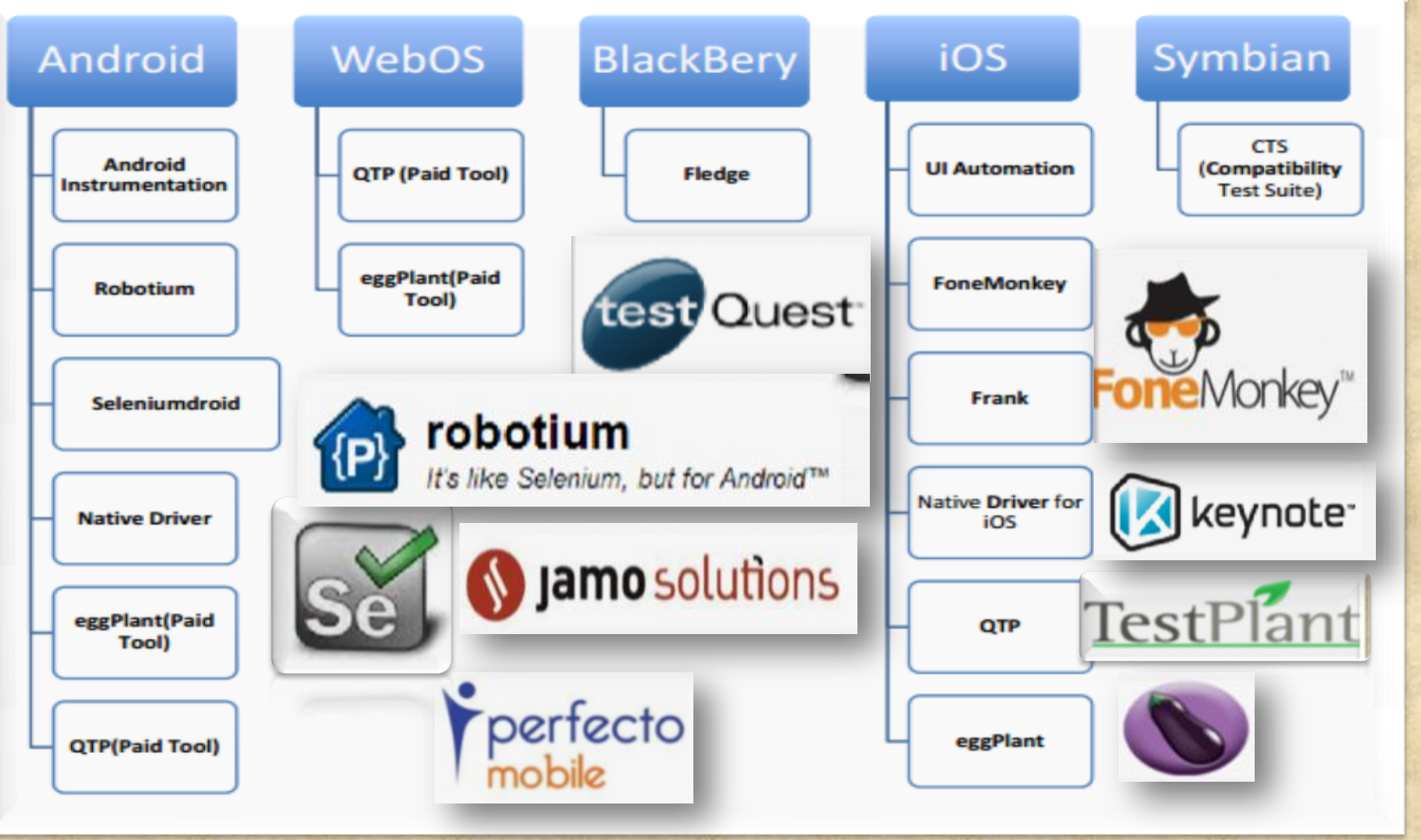
Most Popular Mobile App Testing Tools

Existing Mobile Platforms And Available Test Automation Tools



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EXTRA<WHAT'S NEW ?>EXTRA

Mobile Applications Testing

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Overview

iOS

Android

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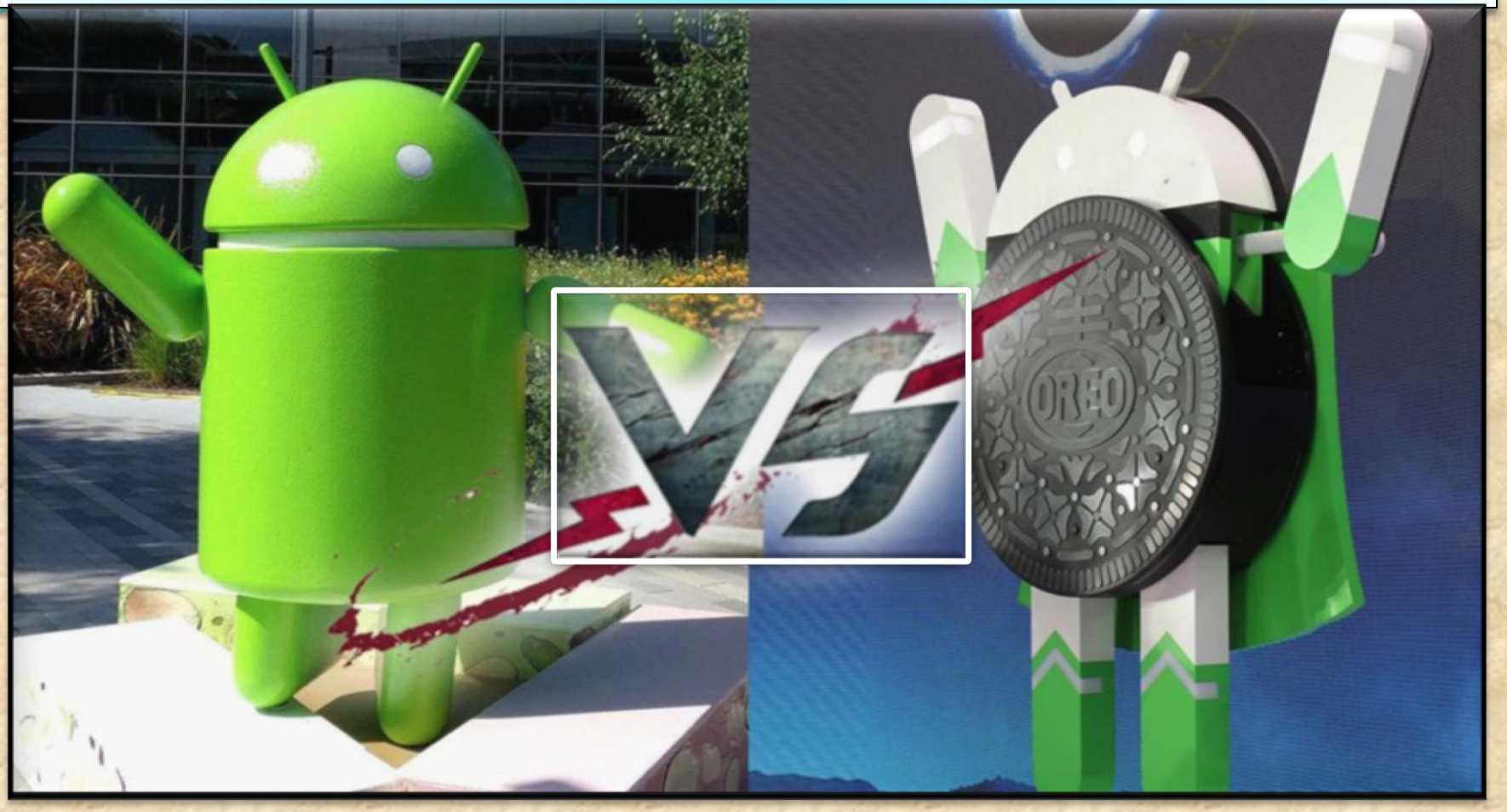
ANDROID



WHAT'S NEW in Oreo 8.0 (released Aug 21, 2017)

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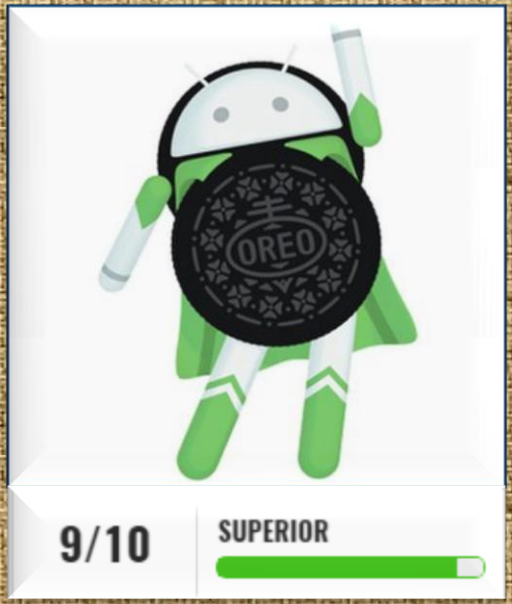
ANDROID OREO 8.0

- Zippy performance
- Picture-in-picture is a great add-on
- Smarter notifications
- Cleaner settings menu
- Performance improvements : much faster



- Notification dots are annoying
- Fragmentation remains an issue

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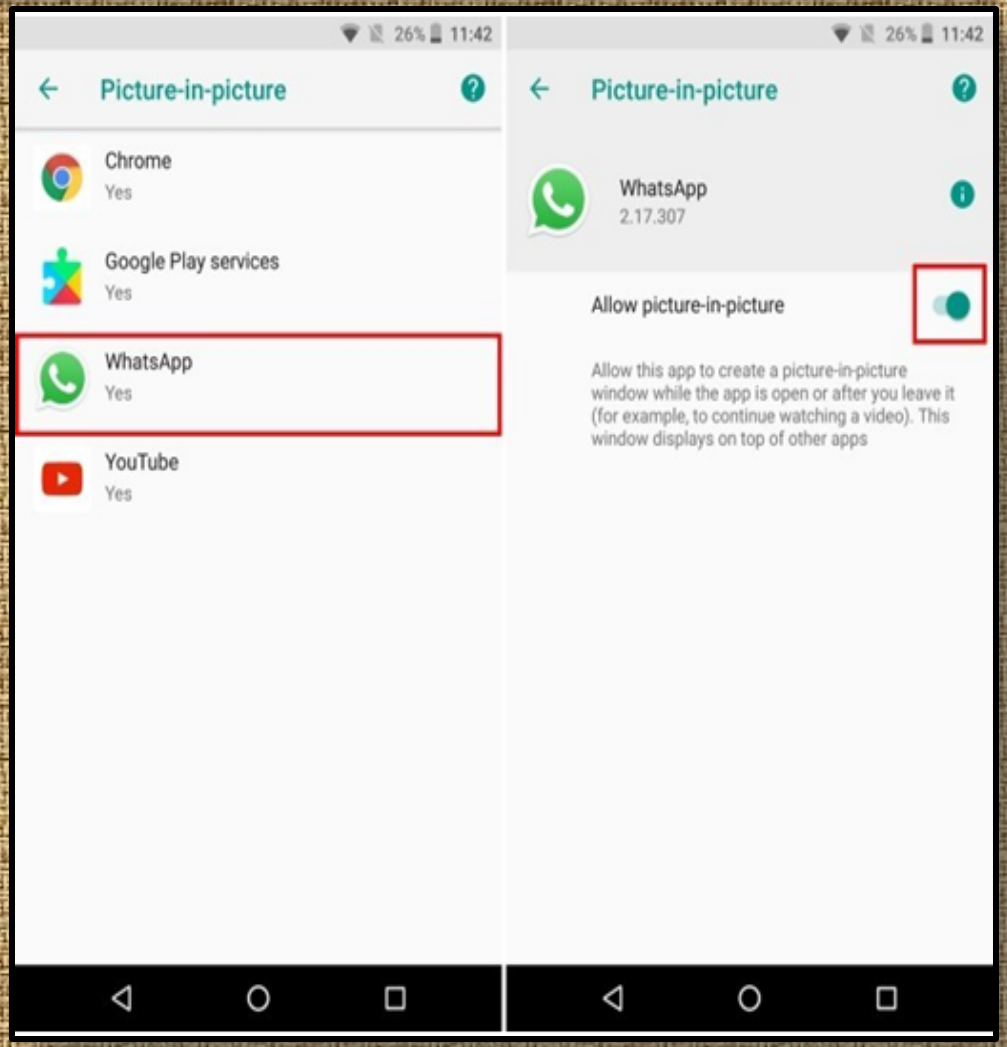
ANDROID OREO 8.0

1. Picture in picture

You can move the video around the screen as you wish and then send the video away by pushing it to the bottom of the screen.

This feature will be especially welcome on tablets, so you can better use that extra screen real estate.

You can now use the **Picture-in-Picture** mode for the apps that you wish to



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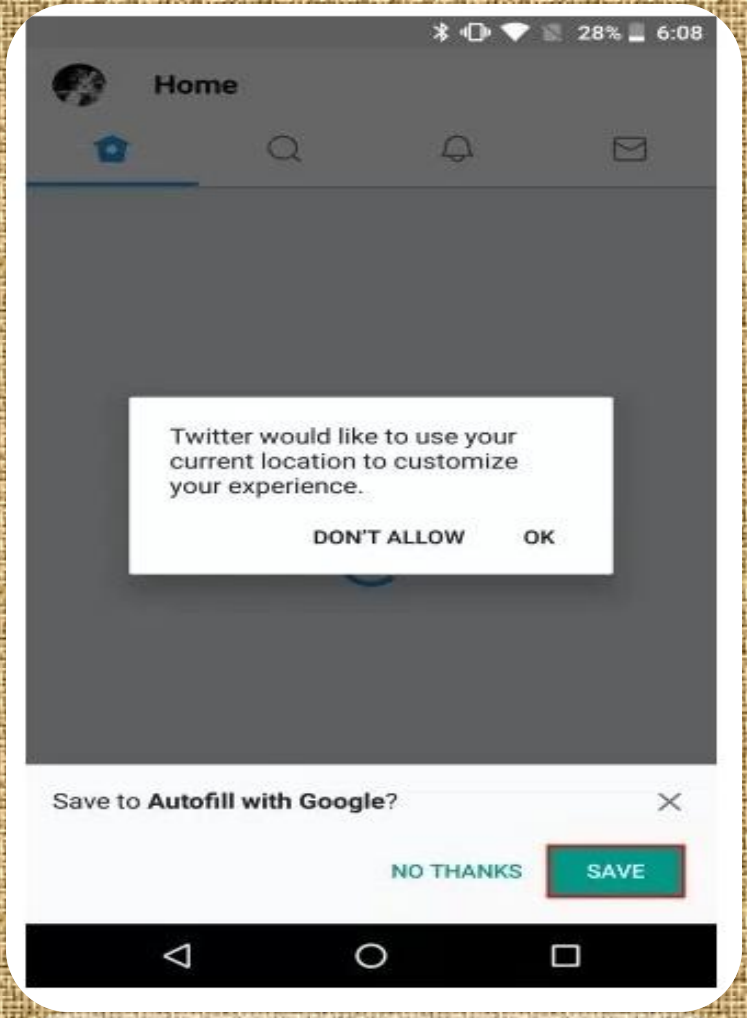
ANDROID OREO 8.0

2. AutoFill Inside Apps

You may be familiar with Google Smart Lock, which saves your passwords when you log-in for the first time into a website.

It then presents the same credentials to you the next time that you wish to log-in to the website. This feature has been extended to work within apps as well.

Google will basically save your passwords and offer to easily input them directly the next time you try to log into an app.



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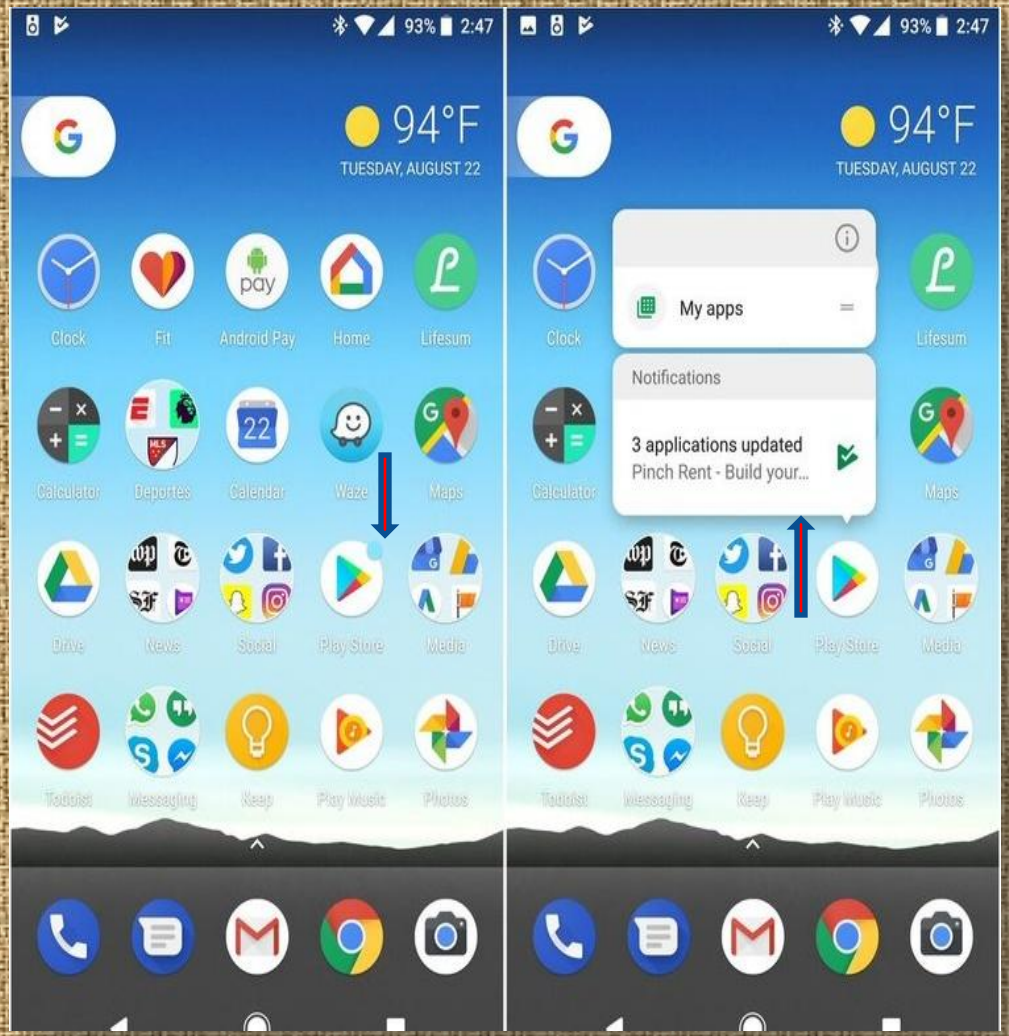
ANDROID OREO 8.0

3. Notification Badges

When you have an app with a notification, you'll now see a colored dot at the top of the icon.

When you touch and hold the icon, you'll see the contents of the notification and be able to swipe it away.



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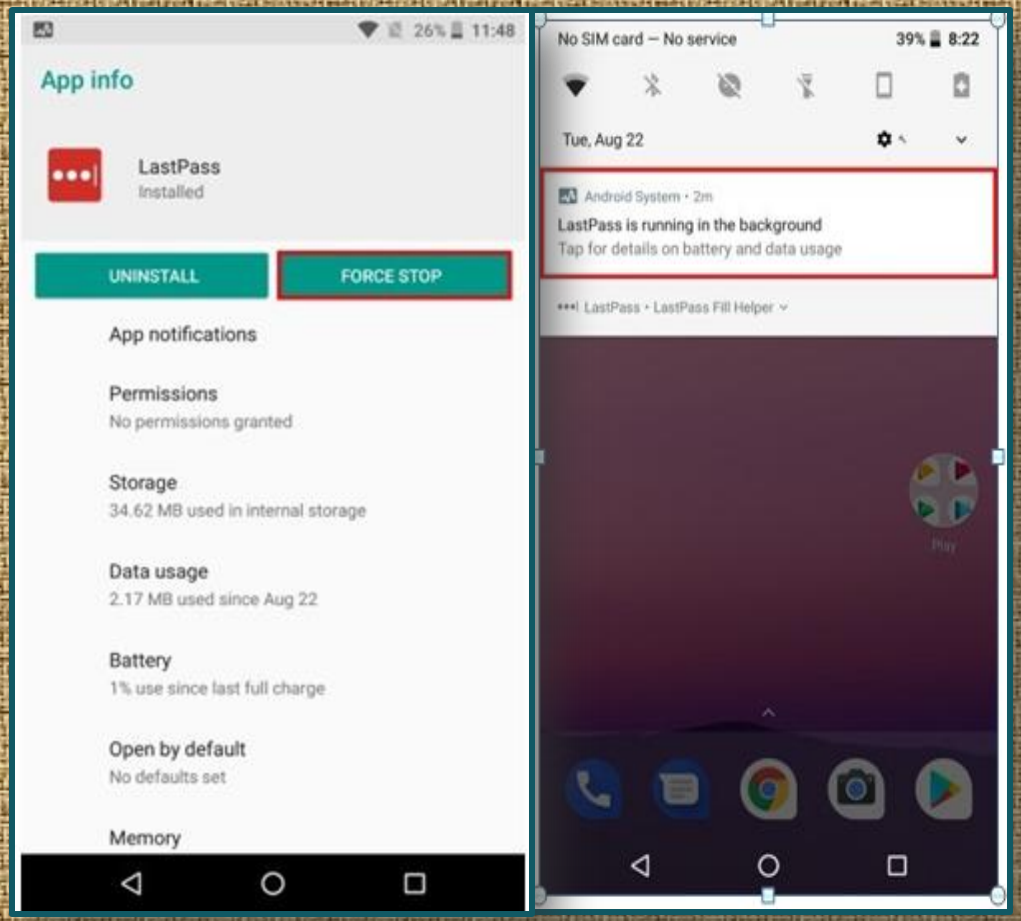
ANDROID OREO 8.0

4. Control of APPs running in Background

While Android Oreo features tons of battery optimizations, it also gives the user control over what apps should one allow to run in the background.

Android Oreo shows the user what apps are currently running in the background, and allows force close them.



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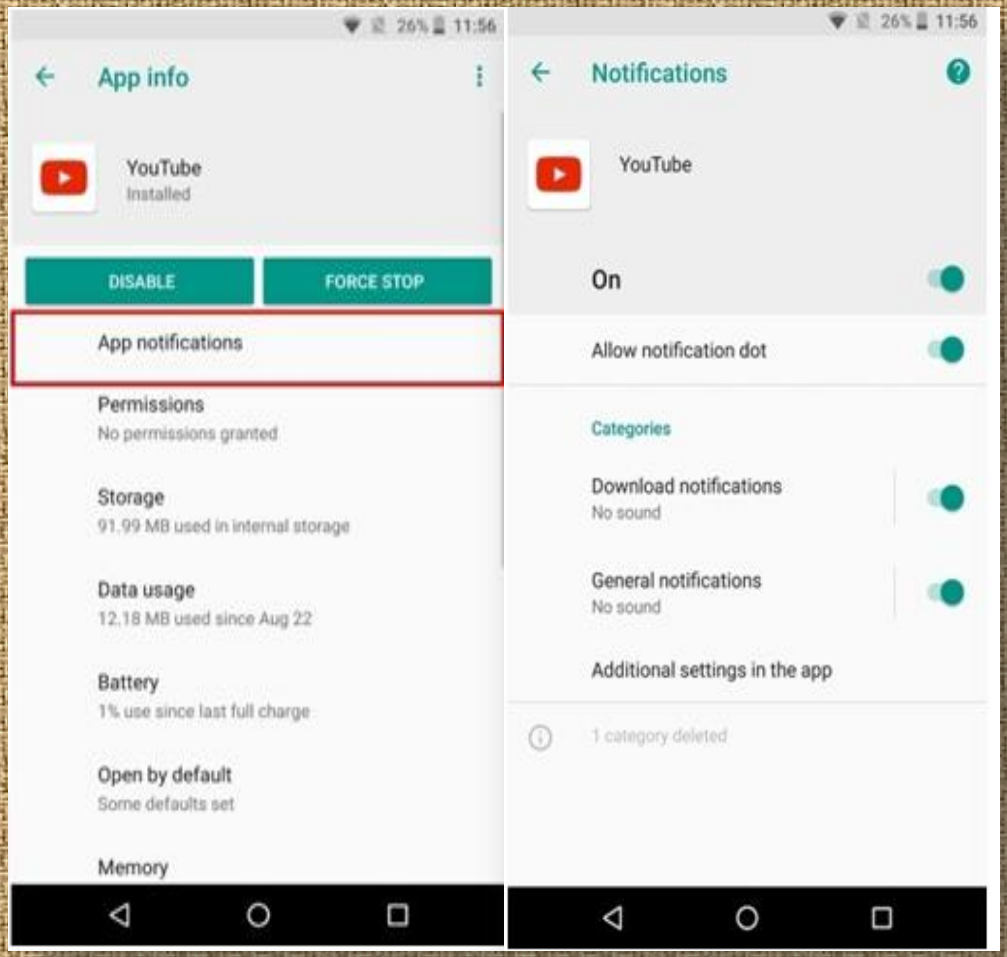
ANDROID OREO 8.0

5. Filter Notifications

New feature, that is Notification Channels. Prior , notifications were set as one collective set, and the user had the option to either disable them entirely or bear them altogether.

In Oreo, the notifications are now divided into categories, based on their priority or functioning.

User can now easily disable one category of app notifications while keeping the other one enabled.



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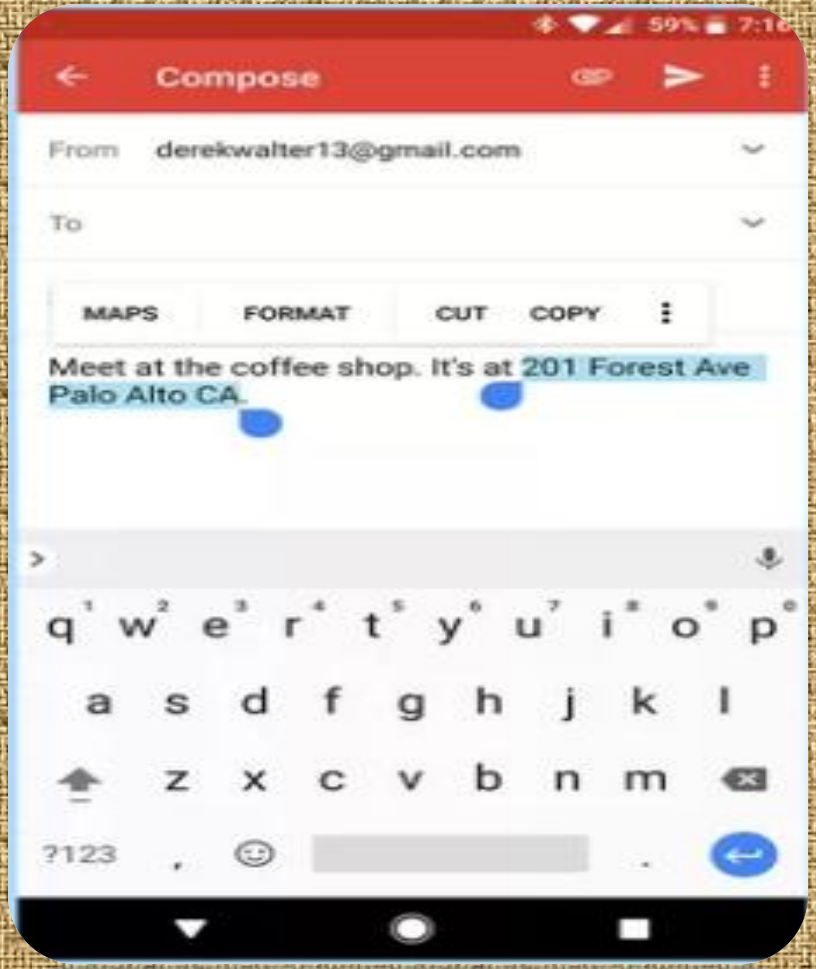
ANDROID OREO 8.o

6. Smart Text Selection

When you highlight a piece of text, the device will offer specific actions based on the content.

***Example*:** if you highlight an address you'll see a choice to open that location in Google Maps.



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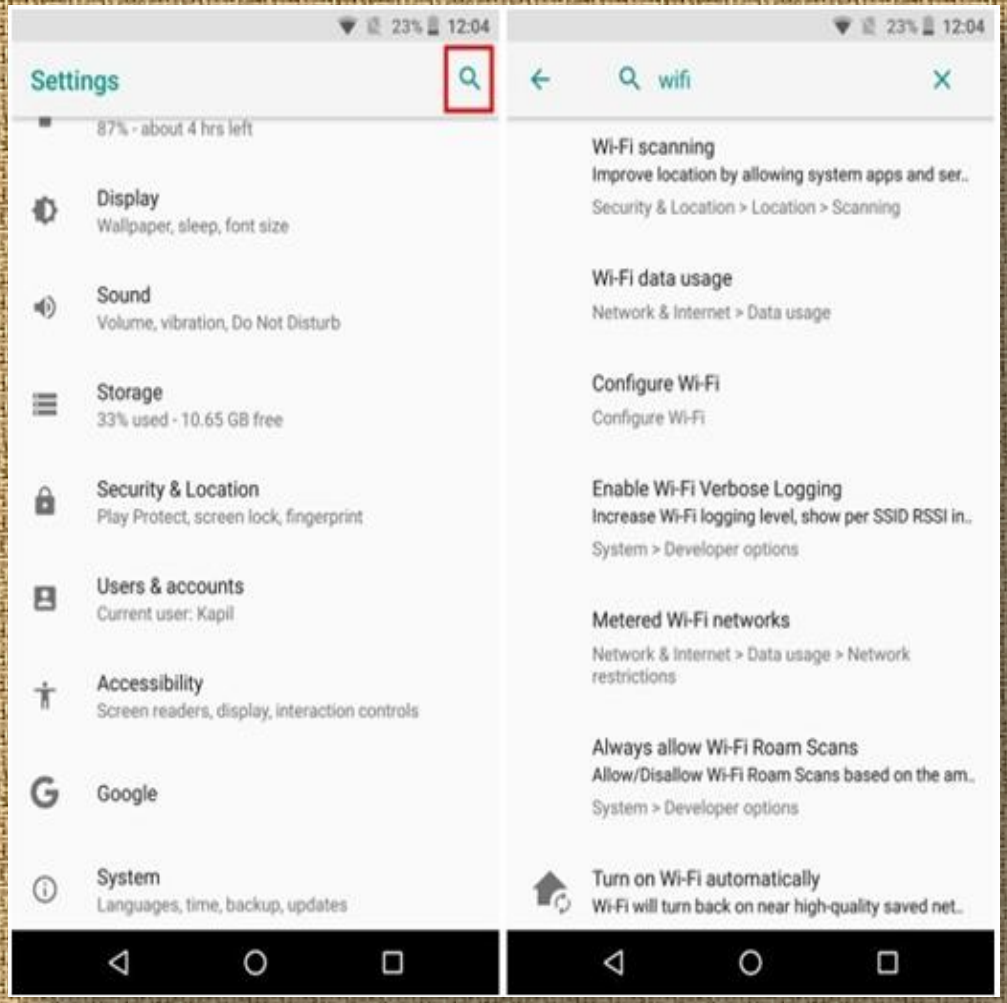
ANDROID OREO 8.0

7. Settings Navigation

When Android Nougat debuted last year, it brought a redesigned settings menu that made it much easier to find your way around.

Different sections are categorized in a more straightforward manner.

There's also a search feature, which is often the best way to find what you need.



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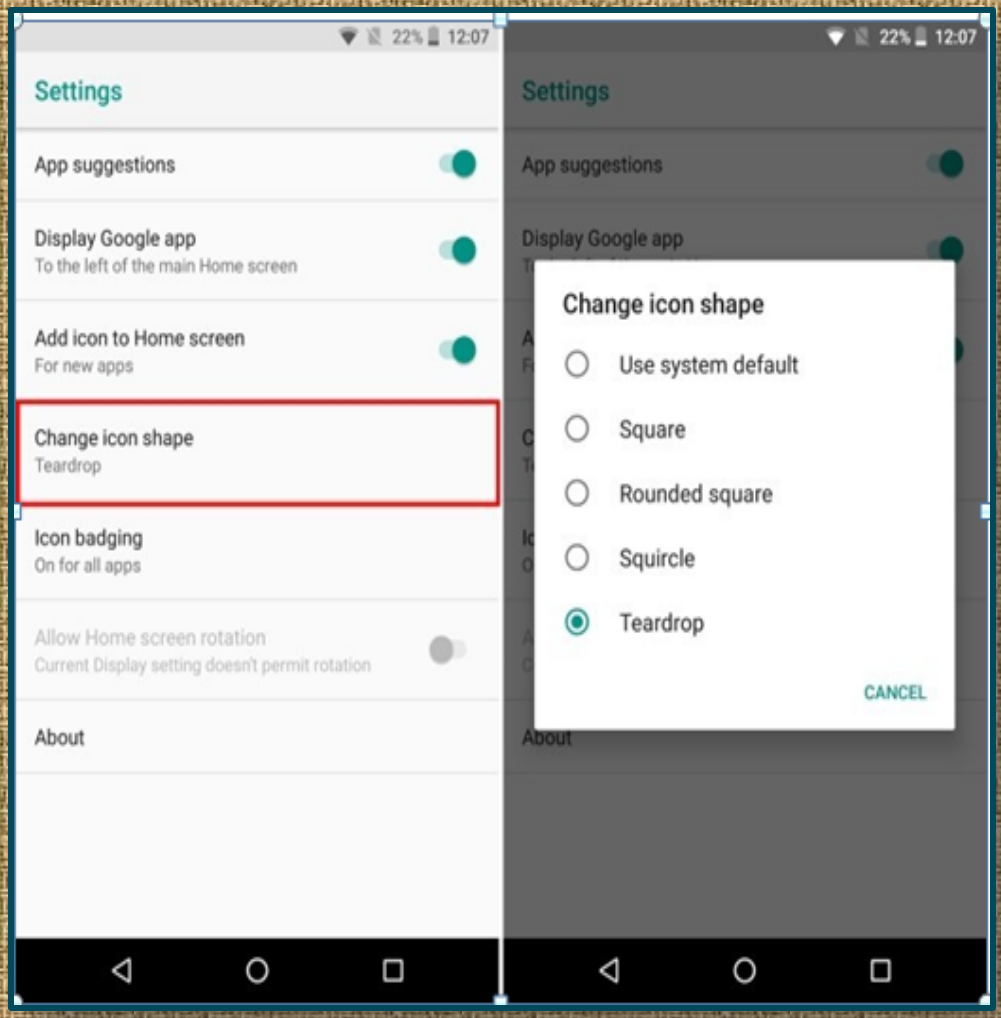
ANDROID OREO 8.o

8. Icons Shape

While the Pixel Launcher is highly regarded as the stock and basic Android Launcher, when coupled with Android Oreo, it also allows the user to change the overall look of the app icons.

Tap on **"Change icon shape"** to continue.

Choose from **System default**, **Square**, **Rounded square**, **Squircle**, **and Teardrop**.



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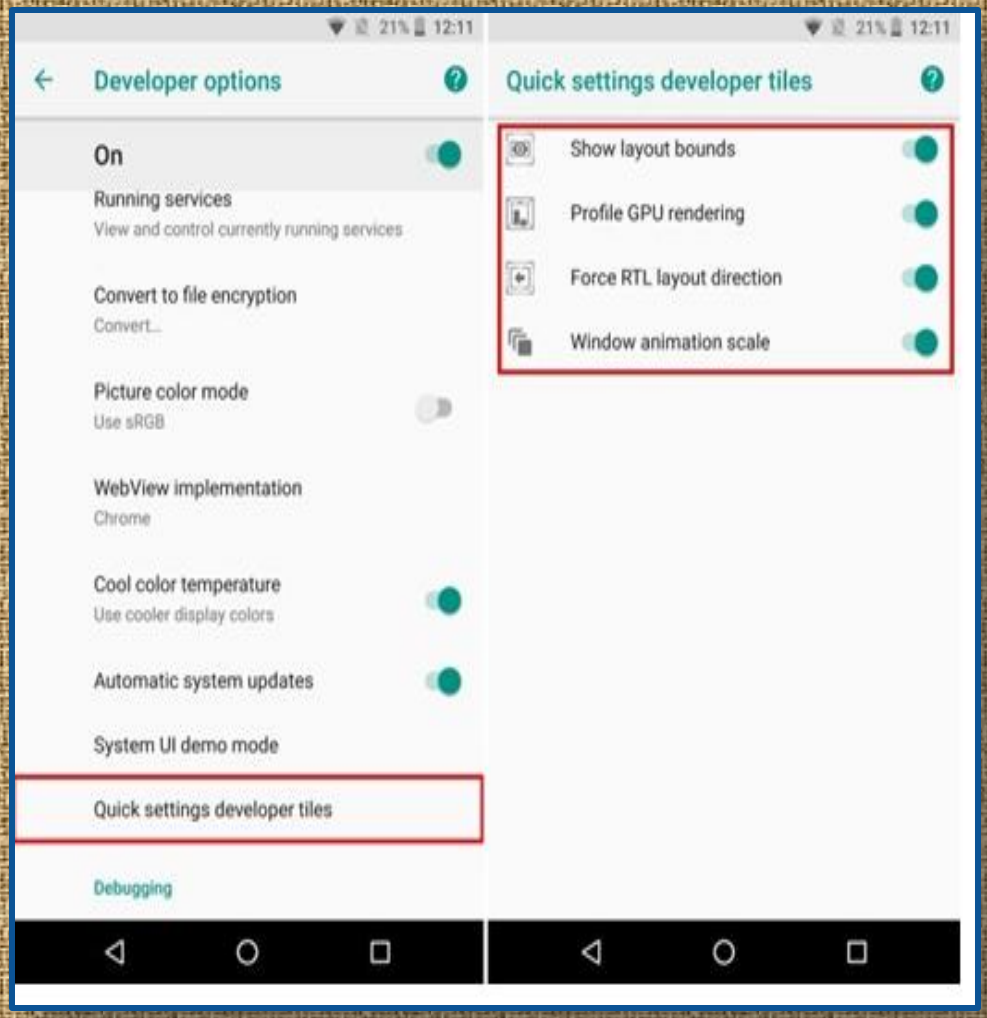
ANDROID OREO 8.0

9. Developer Quick Settings

Quick Settings on Android allow for easy toggling and/or access to various functions of the system.

Previously it was disabled by default but now you may enjoy it.

Now, you can enable or disable various developer related tiles such as "**Show layout bounds**, **Profile GPU Rendering**, **Force RTL layout direction**, **and Window animation scale**".



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ANDROID OREO 8.0

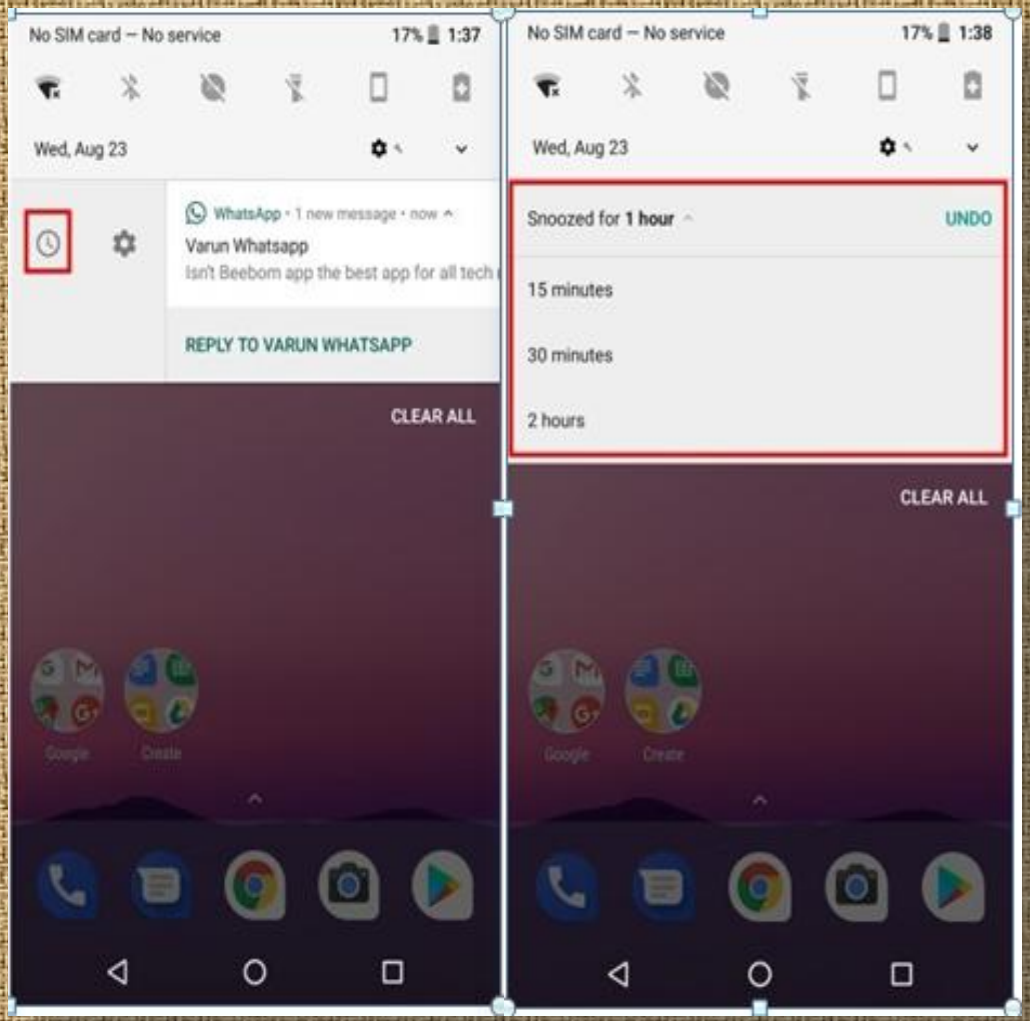
10. Snooze Notifications

Android notifications are great but there are times that it might come in the way of what you're currently doing.

You can simply snooze your notifications continue doing your work.

Once the timer runs out, you'll be presented with the same notification again.

Set it up to **15 min**, **30 min**, **1 hour** or **don't snooze**.



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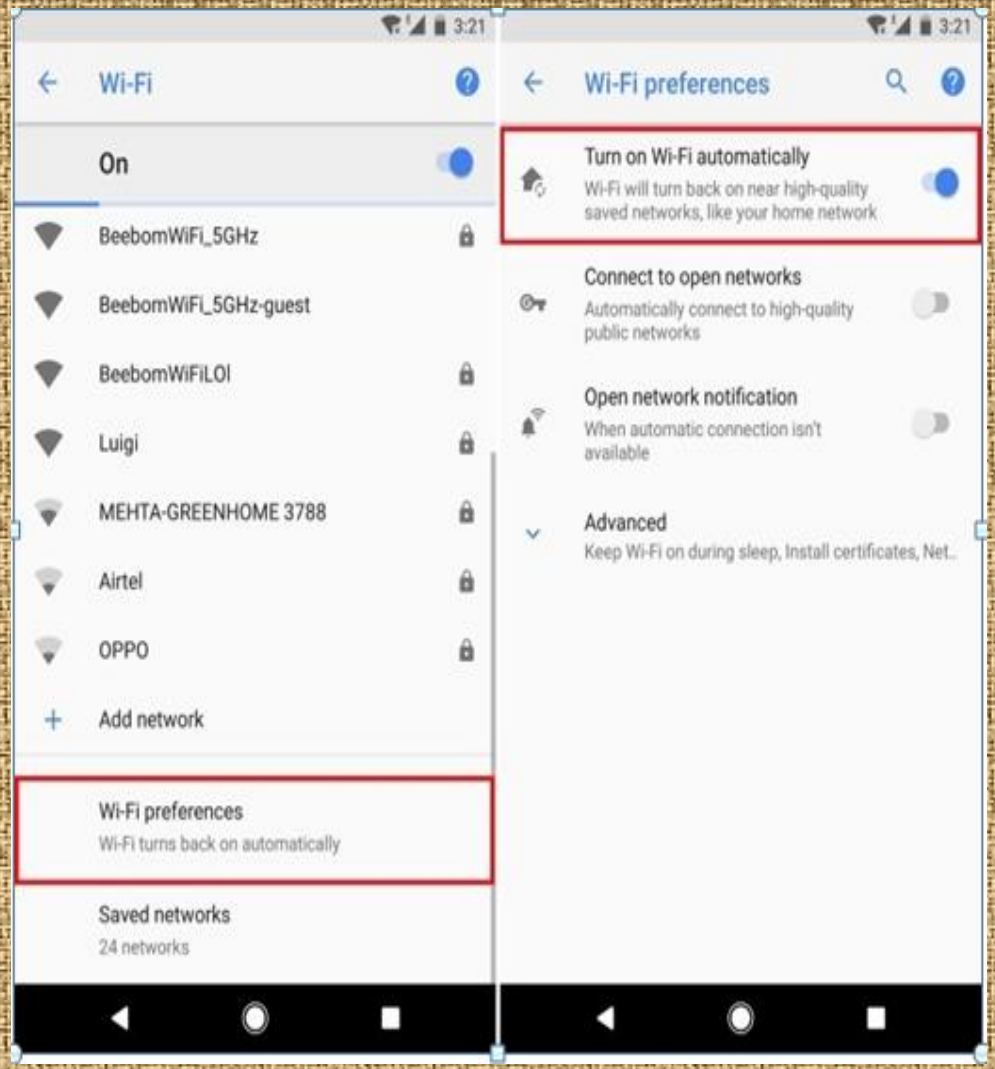
ANDROID OREO 8.0

11. Smarter Wi-Fi

Android Oreo comes with the ability to automatically turn on **Wi-Fi** when you're in home or office, where there is a high-quality network available.

It comes as a nifty little feature that while conserving battery, also allows you to automatically switch to **high-speed networks**.

This is a smart feature that should save you some battery life and keep you from having to constantly turn on and off **Wi-Fi** on your phone.



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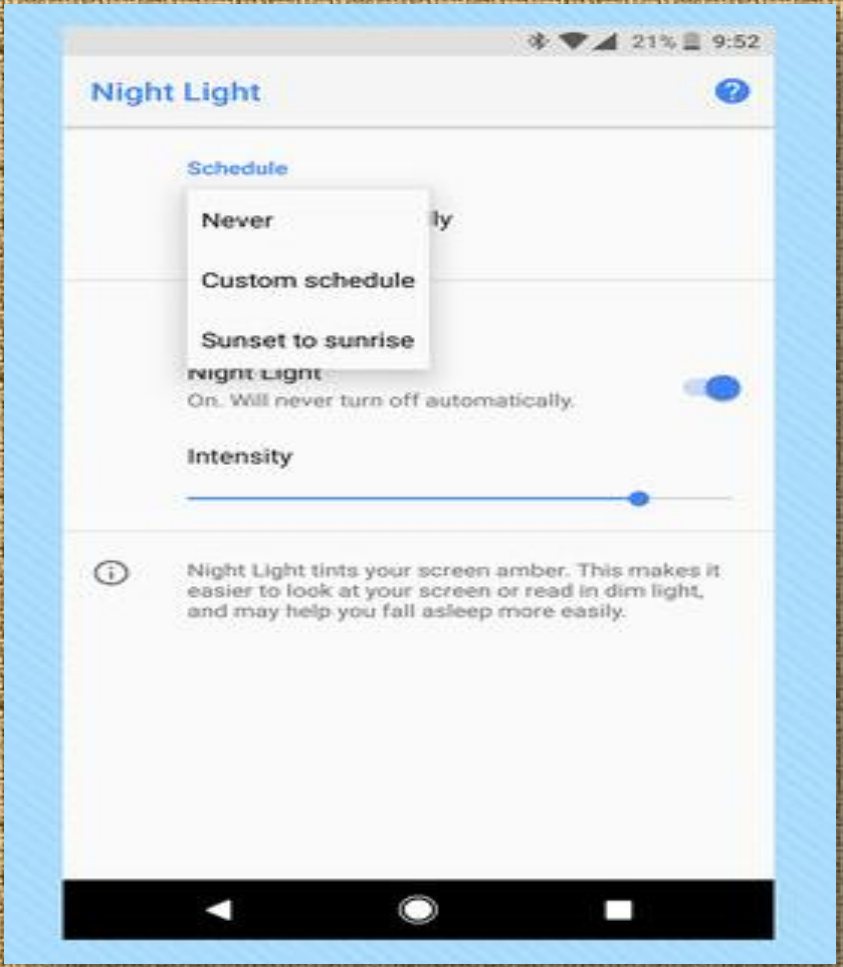
ANDROID OREO 8.0

12.Nighttime Mode

The Night Light mode debuted in Nougat, but now it's better in Oreo, with a slider bar so you can change the hue of the light.

Just as with Nougat, you can schedule times for the Night Light to pop up so you don't keep yourself up for all hours of the night.



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iOS 11 Released 9/19/2017

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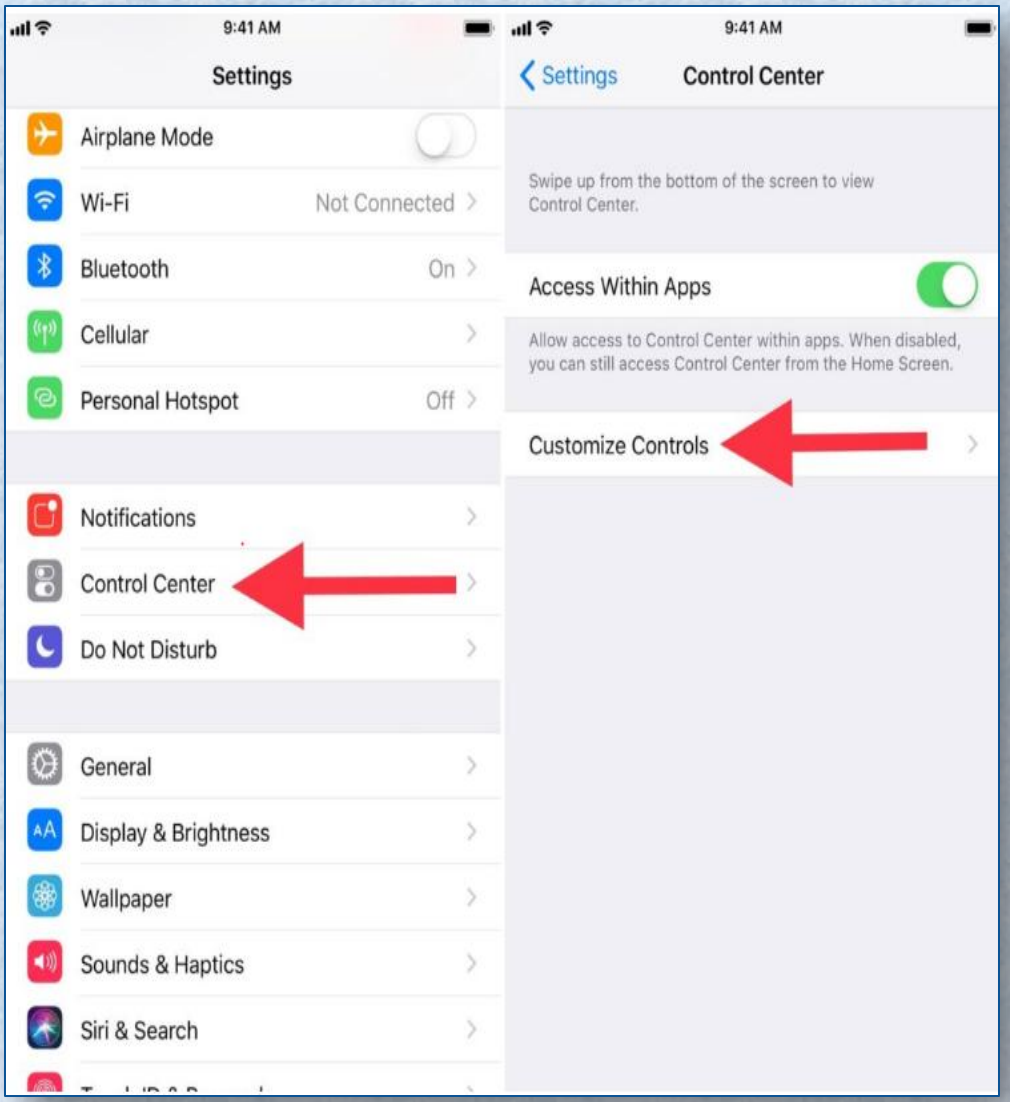
iOS 11 — 1. Customizing Control Center

- Flashlight
- Timer
- Calculator
- Camera
- Low Power Mode
- Alarm
- Notes
- Screen Recording
- Do Not Disturb While Driving
- Stopwatch
- Wallet
- Voice Memos
- Apple TV Remote
- Accessibility Shortcuts
- Guided Access
- Magnifier
- Text Sizes



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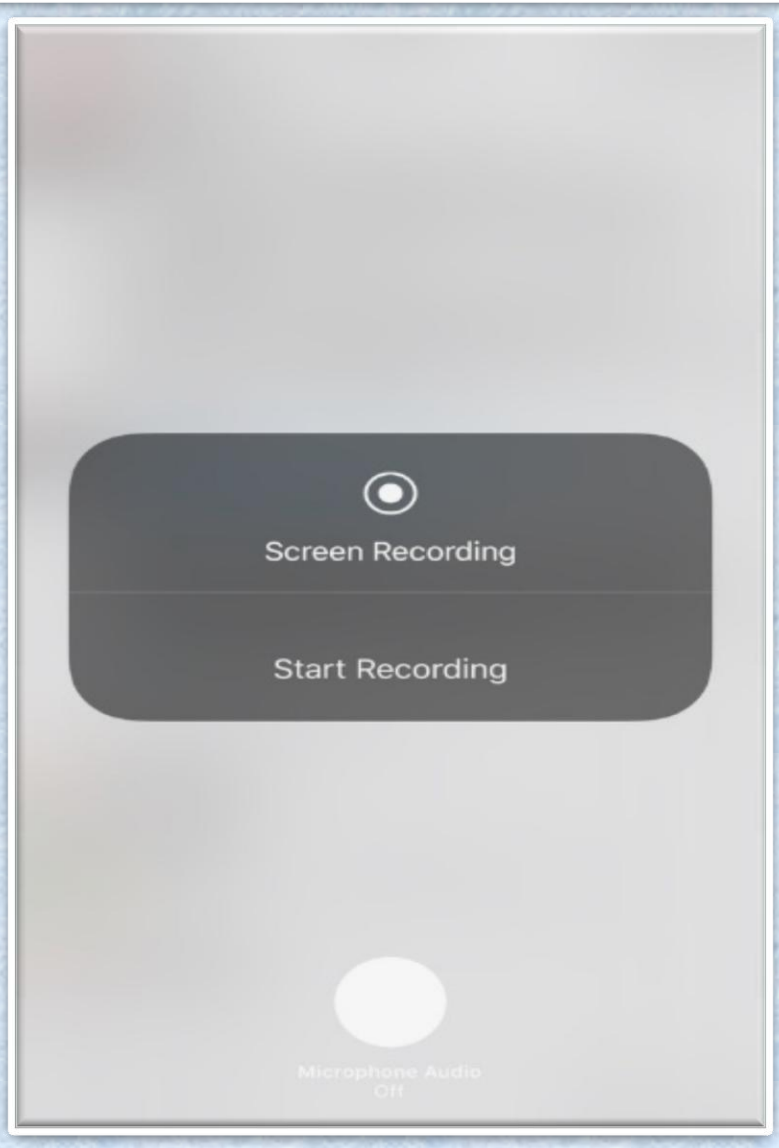
2. On Device Screen Recording

OS 11 allows you to record your display from the device itself with just the tap of a button from Control Center.

At one point, display recording was a jailbreak-only feature until Apple finally enabled the feature via macOS's QuickTime app.

Even so, this required having a Mac to capture your iPhone or iPad's screen via video, and it wasn't convenient for everyone.



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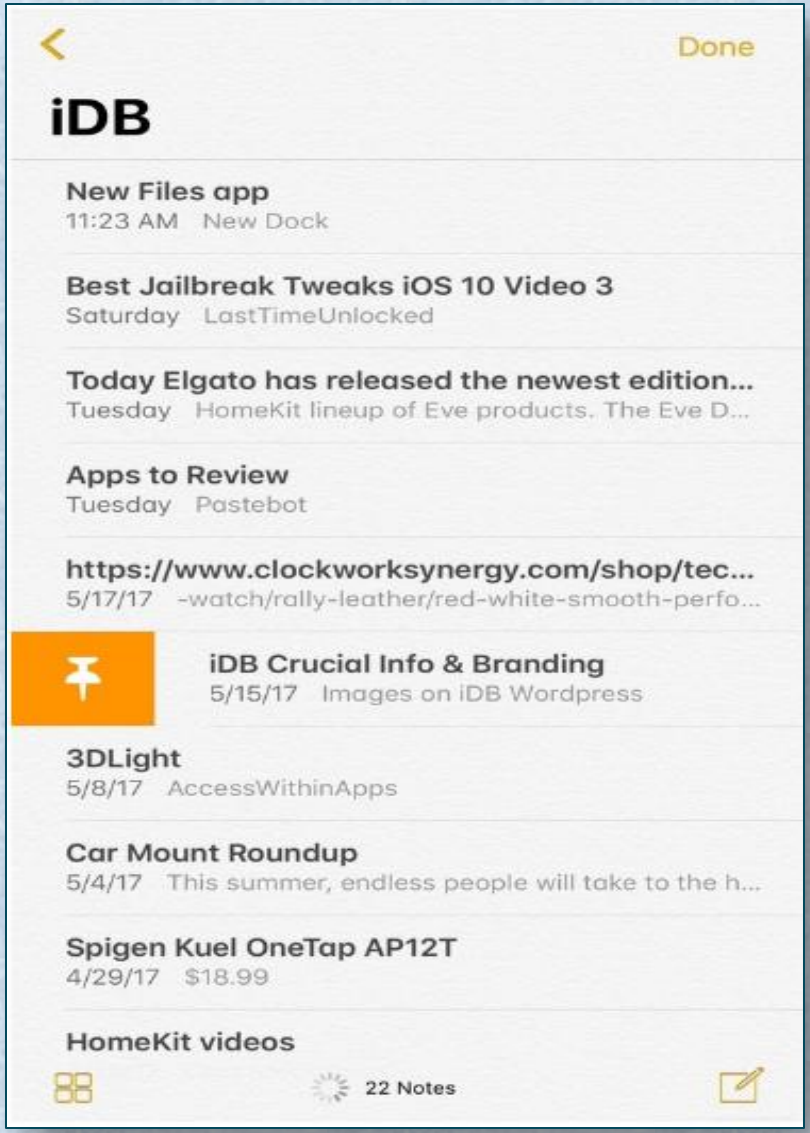
iOS 11 — 3. Pinning Important Notes

- You Can Add Inline Drawings
- There Are Improved Formatting Options
- You Can Scan Documents Using Your Camera
- You Can Pin Notes to the Top
- Locking Notes Is Easier
- You can now add Tables



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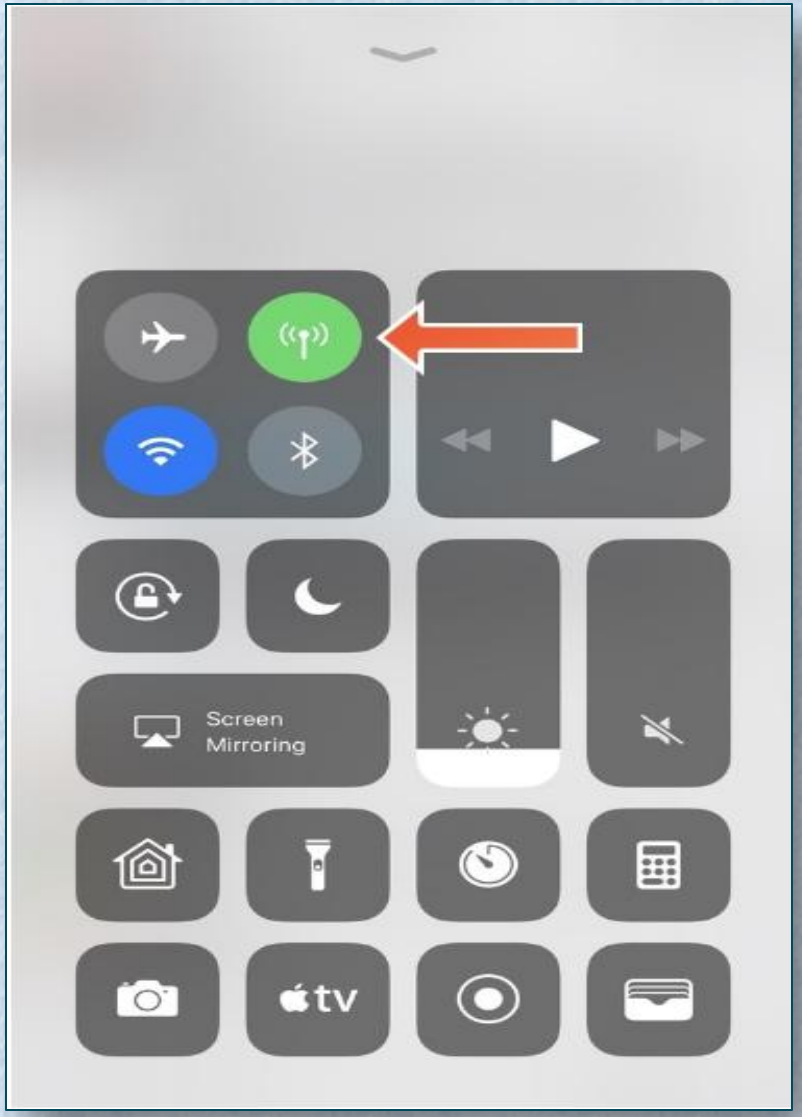
iOS 11 — 4. Cellular Data Control Center Toggle

Apple is bringing a dedicated cellular data toggle to Control Center.

It lets you shut off all cellular radios without having to use Airplane Mode or go into the Settings app to switch everything off.

Perfect for saving additional battery when you don't need cellular access or for saving cellular data when you're close to your monthly allotment.



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5. Translating Languages with Siri

Apple made tons of improvements to Siri .

These include new fluent voices, music-driven commands, and wittier jokes and personality.

Another feature Apple is giving Siri for the first time is language translation.

Without the need to use third-party apps this feature is now embedded in a stock function of the device

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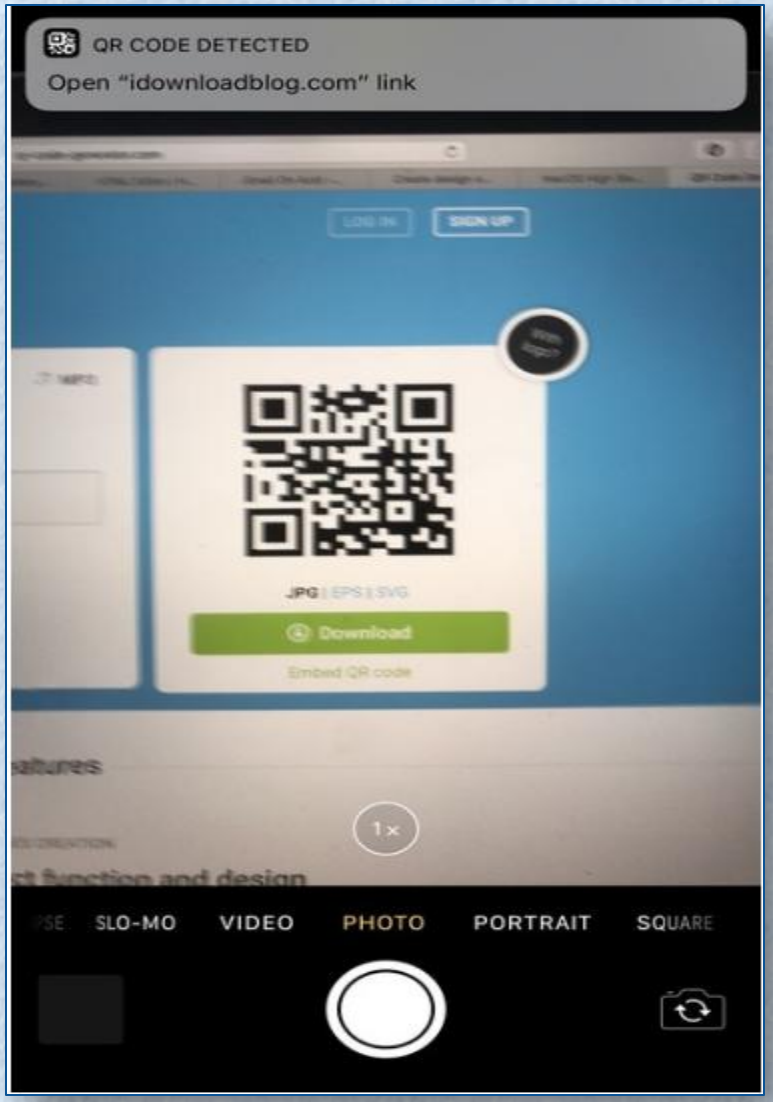
6. Scanning QR Codes

Android devices have supported it forever, but one thing all stock iPhones have lacked since day one is the ability to scan QR codes.

It's integrated right into the Camera app for your convenience.



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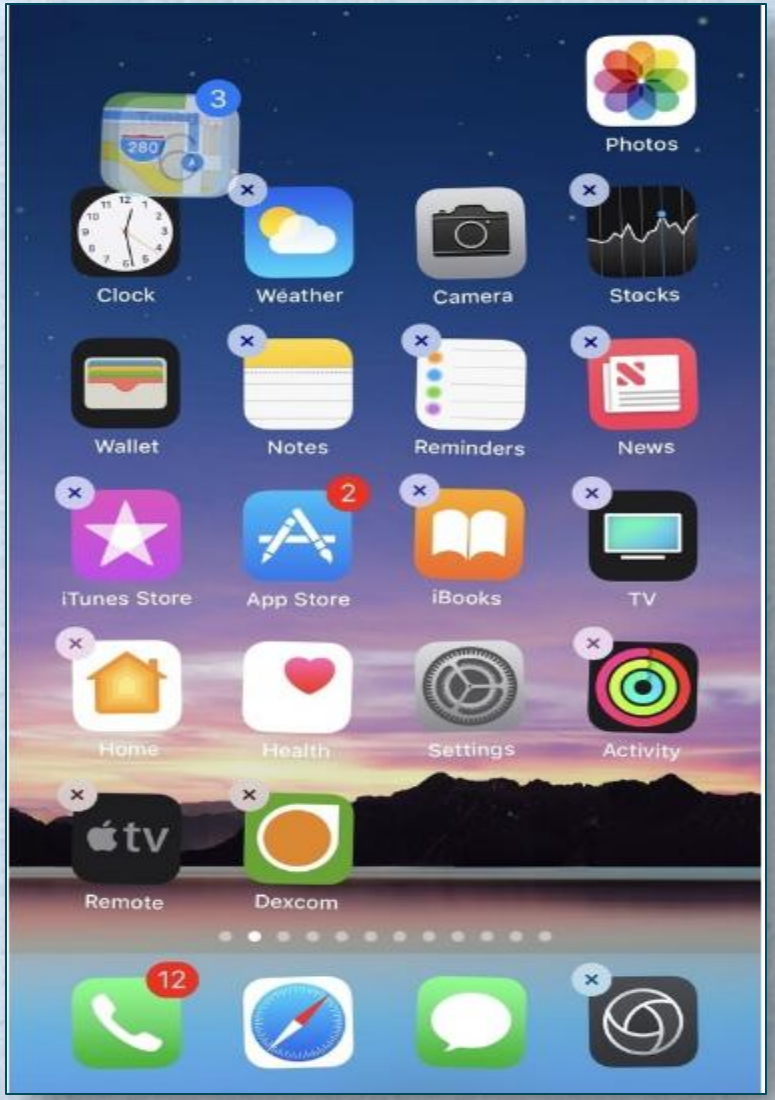
iOS 11

7. Moving many Home Screen icons simultaneously

Previously anyone who wanted to edit their iPhone's Home Screen had to enter 'jiggle' mode and individually move each app icon one-by-one .

Not only do you not have to go into 'jiggle' mode anymore, but you can now move multiple app icons from one page to another simultaneously.



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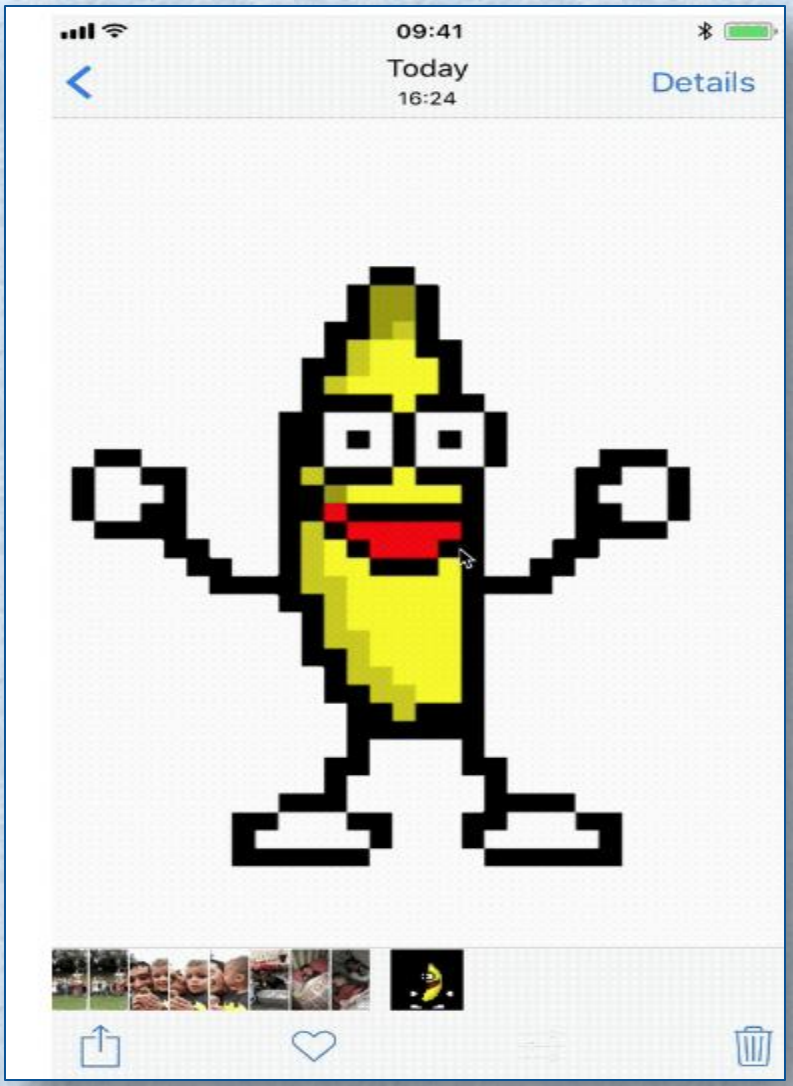
8. Viewing Animated GIFs in the Photo APP

Apple's Photos app never supported animated GIFs out of the box;

Rather they always looked like still images any time you viewed them.

Although it was quite a buzzkill for GIF-lovers, Apple seems to be taking a liking to animated GIFs in iOS 11 with native support.



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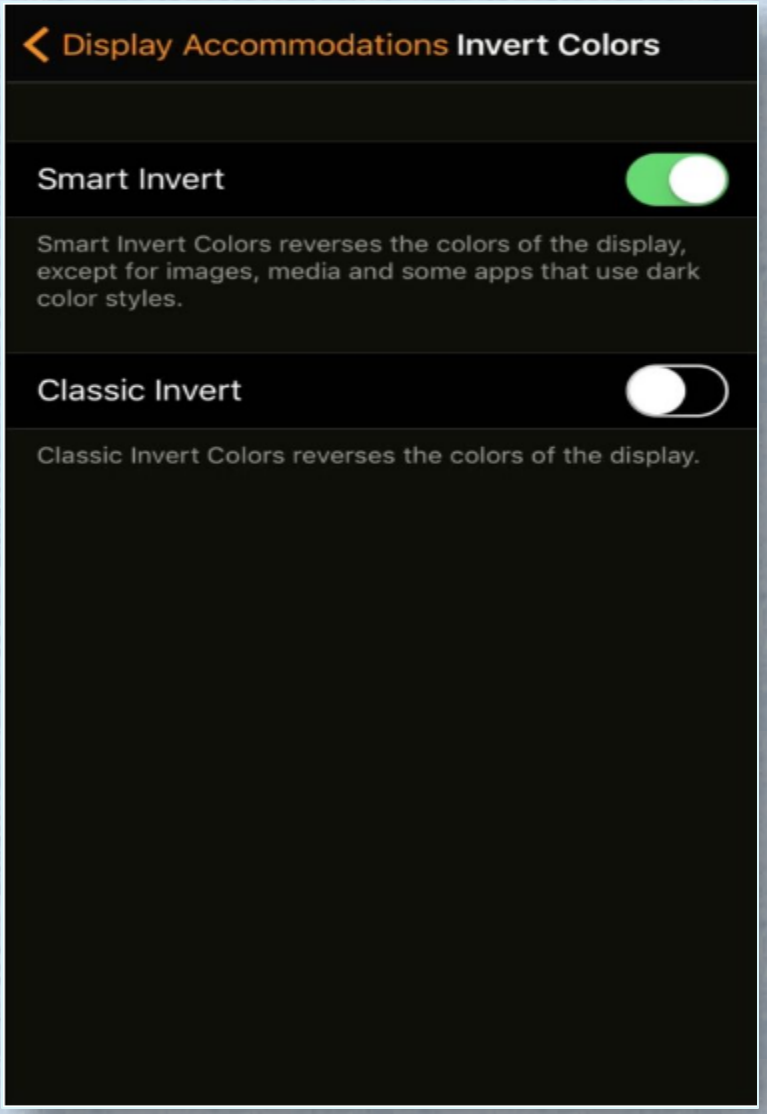
iOS 11

9. Applying a system-wide "Dark Mode"

With Smart Invert enabled, you'll immediately see that the background for the Settings app turns black but the toggle switch background color remains green instead of turning purple like it does with Classic Invert.

The app icons also remain unchanged. Open the Photos app and you'll see a similar effect -- the background is black but the photos are left alone so they don't look like photo negatives.



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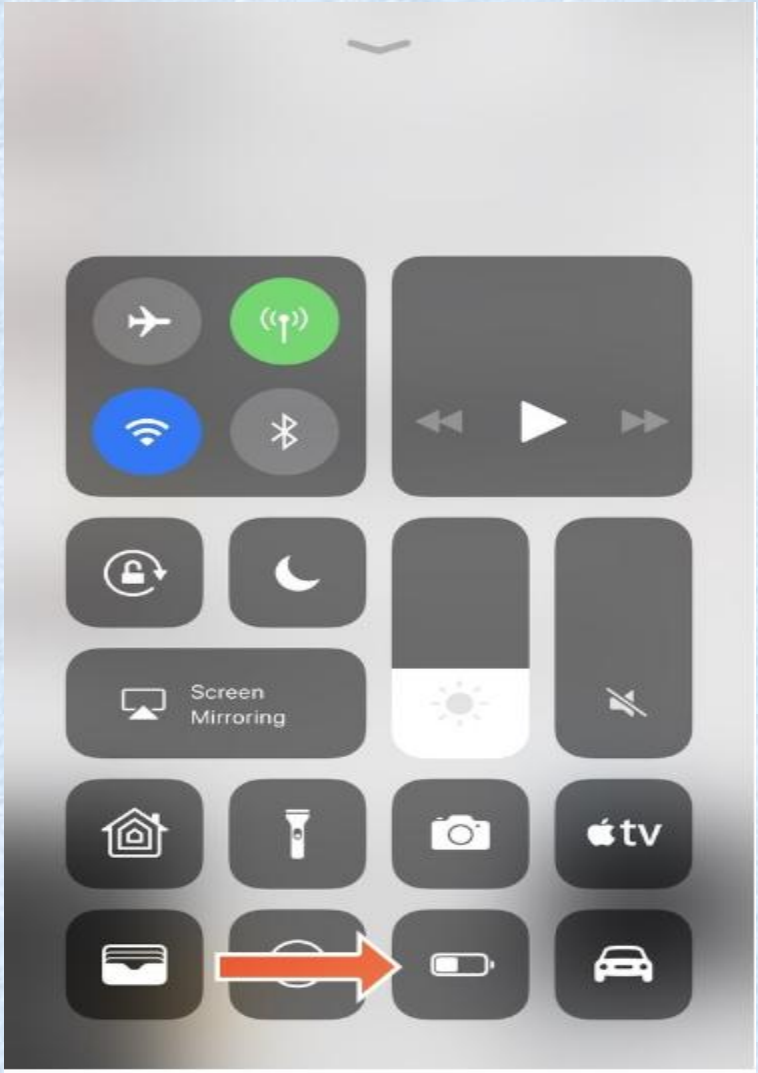
iOS 11

10. Low Power Mode Control Center Toggle

Low Power Mode is so useful for when you want to conserve power, but it has always been a cumbersome process to turn the feature on manually, as the toggle switch is buried deep within the iPhone's Settings.

New in iOS 11 is a toggle button for Control Center that makes it easier to conserve power when you're running low or expecting to be away from the power outlet for a while.



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Overview: *Mobile APPS*

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

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Troubleshooting Guide

Media File Formats: Audio

- .aif Audio Interchange File Format
- .iff Interchange File Format
- .m3u Media Playlist File
- .m4a MPEG-4 Audio File
- .mid MIDI File
- .mp3 MP3 Audio File
- .mpa MPEG-2 Audio File
- .ra Real Audio File
- .wav WAVE Audio File
- .wma Windows Media Audio File

Troubleshooting Guide

Media File Formats: Video

- .3g2 3GPP2 Multimedia File
- .3gp 3GPP Multimedia File
- .asf Advanced Systems Format File
- .asx Microsoft ASF Redirector File
- .avi Audio Video Interleave File
- .flv Flash Video File
- .mov Apple QuickTime Movie
- .mp4 MPEG-4 Video File
- .mpg MPEG Video File
- .rm Real Media File
- .srt SubRip Subtitle File
- .swf Shockwave Flash Movie
- .vob DVD Video Object File
- .wmv Windows Media Video File

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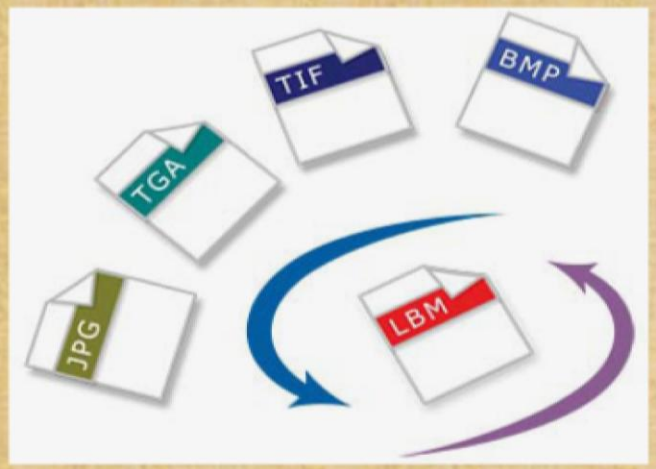
Troubleshooting Guide

Media File Formats: Image

3-D Images

- .3dm Rhino 3D Model
- .3ds 3D Studio Scene
- .max 3ds Max Scene File
- .obj Wavefront 3D Object File



Raster Image Files

- .bmp Bitmap Image File
- .dds DirectDraw Surface
- .gif Graphical Interchange Format File
- .jpg JPEG Image
- .png Portable Network Graphic
- .psd Adobe Photoshop Document
- .pspimage PaintShop Pro Image
- .tga Targa Graphic
- .thm Thumbnail Image File
- .tif Tagged Image File
- .tiff Tagged Image File Format
- .yuv YUV Encoded Image File

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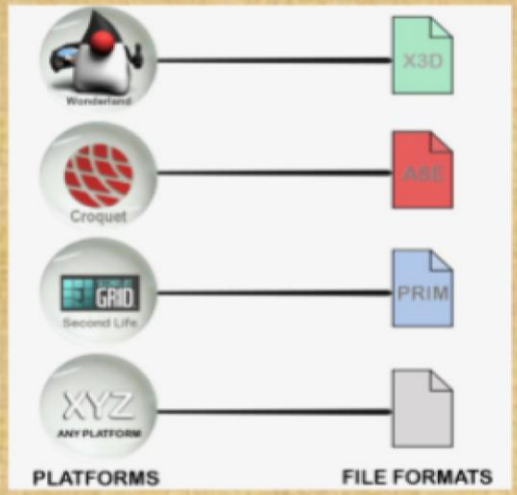
Troubleshooting Guide

Media File Formats: Game

.dem Video Game Demo File
.gam Saved Game File
.nes Nintendo (NES) ROM File
.rom N64 Game ROM File
.sav Saved Game



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Troubleshooting Guide

Media File Formats: Executable Files

- .apk Android Package File
- .app Application file
- .bat DOS Batch File
- .cgi Common Gateway Interface Script
- .com DOS Command File
- .exe Windows Executable File
- .gadget Windows Gadget
- .ipa iPhone archive File
- .jar Java Archive File
- .pif Program Information File
- .vb VBScript File
- .wsf Windows Script File

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Troubleshooting Guide

Media File Formats: Web Files

- .asp Active Server Page
- .aspx Active Server Page Extended File
- .cer Internet Security Certificate
- .cfm ColdFusion Markup File
- .csr Certificate Signing Request File
- .css Cascading Style Sheet
- .htm Hypertext Markup Language File
- .html Hypertext Markup Language File
- .js JavaScript File
- .jsp Java Server Page
- .php PHP Source Code File
- .rss Rich Site Summary
- .xhtml Extensible Hypertext Markup Language File

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Troubleshooting Guide

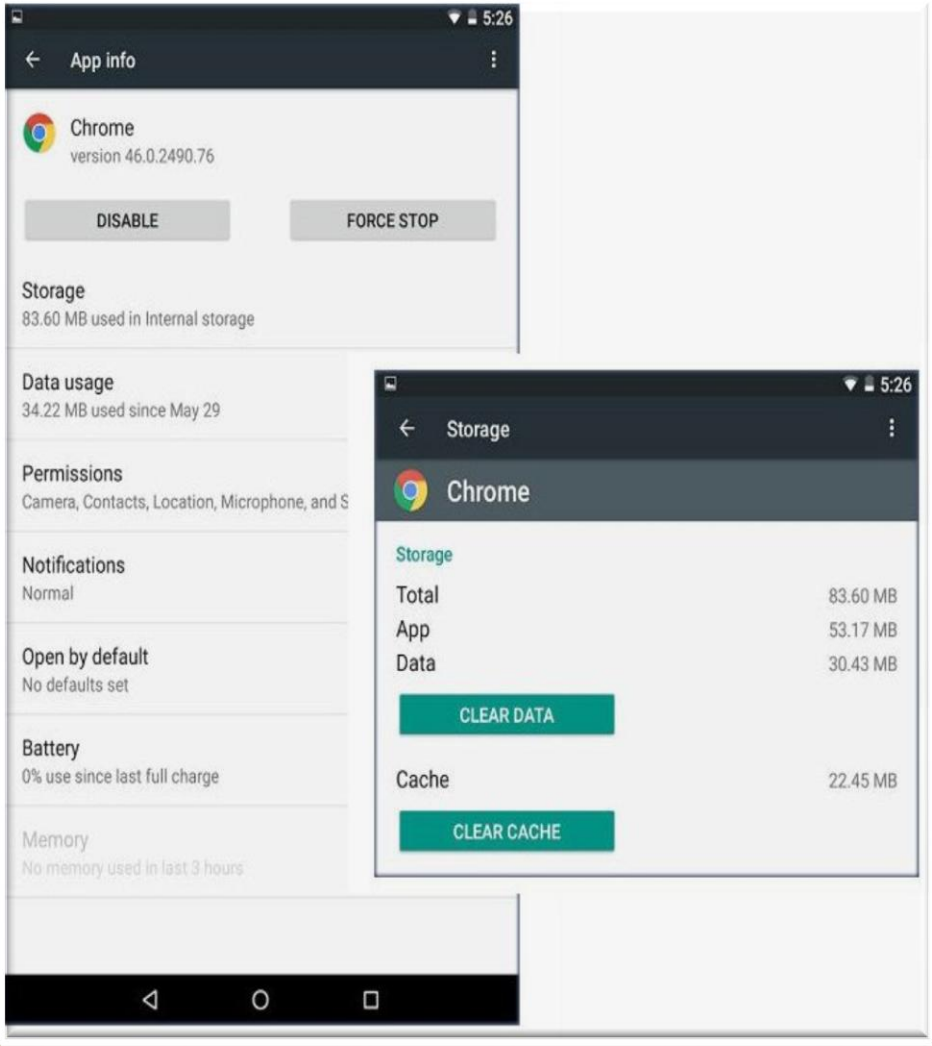
Clear App Cache And App Data : ANDROID

Among the changes that happened between Android 5.0 and 6.0 is the placement of the buttons for clearing the app caches and data.

Step 1: Head to the Settings menu. This can be done by tapping the cog icon in your notification shade.

Step 2: Find Apps (or Applications, depending on your device) in the menu, then locate the app that you want to clear the cache or data for.

Step 3: Tap on Storage and the buttons for clearing the cache and app data will become available (See Right→).



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Troubleshooting Guide

Clear App Cache And App Data : iOS

Delete Safari Cache :

1. Press Settings > Safari
2. Scroll down and tap Clear History and Website Data.
3. Tap Clear History and Data.

How to clean out your iPhone's memory:

Remove file data

1. Tap Settings > General > Storage & iCloud Usage
2. Tap Manage Storage.

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Troubleshooting Guide

Clear App Cache And App Data : WinPhone

Internet Explorer (Windows Phone) - Clearing Cache and Cookies

1. Tap the Internet Explorer live tile on the home screen.

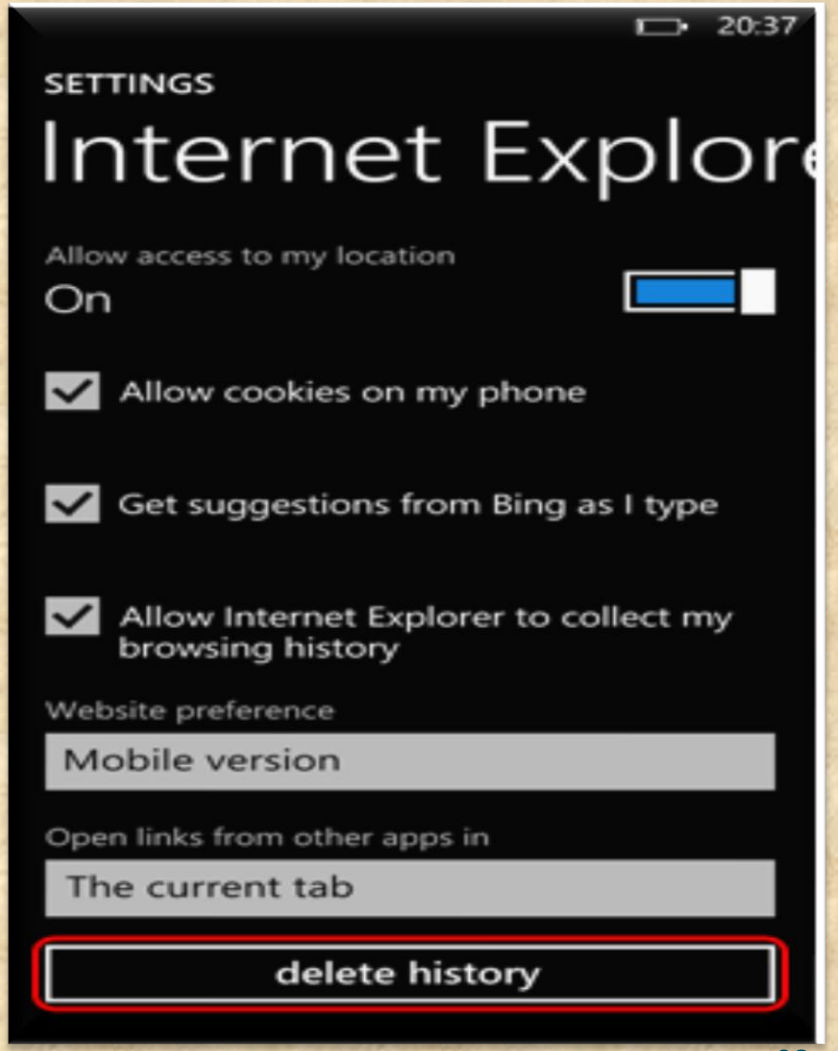
2. Tap on the ellipses (...) at the bottom right.

3. Scroll down and tap settings.

4. Scroll down and tap delete history.

5. Tap delete to confirm.

Wait a few seconds for the cache and cookies to clear.



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Troubleshooting Guide

Clear App Cache And App Data : BlackBerry

1. On the Home screen of the **BlackBerry** smartphone TAP BROWSER.

2. Tap Menu key

3. Tap Options.

4. Scroll to the very bottom of the options list where there will be a section called **Clear** Browsing Data.

5. Select the desired options and choose **Clear**

For more options

http://support.blackberry.com/kb/articleDetail?articleNumber=000003865

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APP RISK ANALYSIS

Setting Up a Mobile Test Lab

What mobile devices wi ll you use to test?	What devices are officially supported?	Make a decision based on user statistics	How will you source the devices?
When will you use an emulator or a real device?	What software will be maintained on the mobile devices?	How will the devices be managed and stored?	How can you be effective with the device power consumption? Do the devices really need to be charging all the time?
How will you load apps onto multiple devices?	Is there a need for a booking system for test devices?	How will you label devices with useful information? (OS, screen resolution, pixel density)	Can you use a background image to communicate information to the user of the device? For example, device information or a reminder of guidelines.

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APP RISK ANALYSIS

What Makes a Mobile App or Website…ACCESSABLE?

- Does audio and voiceover function and make sense?
- Can you zoom in and out effectively?
- Does the app accommodate all sizes of text?
- Does the full list of touch device options work?
- How large can on-screen buttons and navigation be?
- Is there voice activation or control?
- Is color contrast at a sufficient accessible level?
- Is it worth considering audible, visible and vibrating alerts?
- How does the app look inverted in colors? For example, white on black.
- Have you explored the accessibility features of the app and mobile device you are using?
- What types of gesture controls are available

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APP RISK ANALYSYS

What Makes a Mobile App or Website...Social?

Can you register as a user via the app?

Can you login via the app?

Do you remain logged in when the app is not in use? If not, how does that affect the user experience?

Does the app or website support social authentication methods?

How easy is it to share media content, links, or files as well as comments and notes?

How easy is it to disconnect updates and communications via the app?

Can notifications be switched off or changed?

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APP RISK ANALYSYS

What Makes a Mobile App or Website...Secure?

- Can the app be decompiled?
- How secure is the connection to the cloud server, if used?
- Can the data in transit be intercepted and decoded?
- Is any data or temporary data that the app uses stored securely on the device?
- Is all app data removed when the app is uninstalled?
- Is the app obfuscated using ProGuard/Dex Guard (Android only)
- Does the app authenticate? How?
- After an update, is my data still safe?
- Should the user automatically log out after a period of time?
- Can security be changed from other devices or websites?
- What happens if the user gets locked out?

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APP RISK ANALYSIS

What about … – The Product – What Are The Basics?

Can I download the app?

Can I download an update?

Can I update the app when there are multiple updates available? What happens if I don't update?

What happens when the OS is updated?

With what systems should it be compatible? For example, OS, platforms and browsers.

Can I uninstall the app?

Can I re-install the app?

Can I downgrade? Should I be able to downgrade?

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APP RISK ANALYSIS

What about … – Functional Testing – What Does it do?

Does the app perform the designed tasks?	Does the app perform non-designed tasks?	Is prevention of actions adequate?
Does the app ask me to turn on services? For example, location specific, Wi-Fi, and social media.	Is the user redirected? If so, where? From app to Web or visa versa? What do errors look like?	Does the user interface (UI) and design work as intended? Is there room for misunderstanding or error?
Is the UI appropriate for the form factor? For example, phone versus tablet, screen size, resolution, and existence of hardware buttons or keyboard.	Does it comply with any standards, good practice and guidelines?	Is the mobile app consistent with the desktop version, if it exists?

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APP RISK ANALYSIS

What about … – Data – Testing What It Processes?

How time applied to the app? For example phone time and server time? What about time zones?

What does it track and update? For example, reward points, friends, purchases, check-ins, social updates and user activity.

Does it sync and update?

What happens when it can't sync or update because the

Connecting through a paywall and haven't yet authenticated (Wi-Fi in Starbucks, an airport, or a local pub)

Disconnected because Web filtering rejected the request

Is there consistency between Web and mobile?

What clues can analytics provide?

How are things like user details and data saved?

What about data input and output? What type of data is accepted? For example, locations, preferences, friends, contacts, languages, files, size, media and audio

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APP RISK ANALYSIS

What about : Platform – What Does it depend on?

Change the device settings around. What do you notice?	What permissions does the app need?	What tablet device is being used? What version of hardware or software?
Review app store submission requirements	Test content. For example, text size, content adjustment and responsive design.	Test the UI and touchscreen gestures. For example, swipe, zoom, pinch, multi-touch, shake and orientation.
Test peripherals. For example, keyboards, Mi-fi devices, BT peripherals, iBeacon, and syncing peripherals.	Test Camera, if applicable. For example, taking photos, using stored photos and photo data.	How does the app run when the device is locked?

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APP RISK ANALYSIS

Operations – How Is It Used?

Wi-Fi	3G	4G
Intermittent	Airplane mode	NFC
Through a proxy	Testing under no, low and partial connectivity	

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APP RISK ANALYSIS

How Is Data Saved?

- Does the app write to the SD card?
- What happens if the SD card is full? What happens if it is removed?
- Is data saved online (in the cloud)?
- If the data is saved online, can it be retrieved after reinstalling the app, or will it be available on the app on a different device with the same user account?
- If the cloud is used, how does lack of connectivity affect the user experience?
- Is the data saved securely? (See “Security” section)
- What if data is lost? Are there backups?

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APP RISK ANALYSIS

Interruptions?

Phone calls	Text messages	App notifications	Battery Warning
Forced updates	Voicemail	Switching between apps	Locking and unlocking the screen
Music playing while using the app	MAM/MDM solution running on the device	Out of memory (general performance interruptions)	Data app interruptions (WhatsApp, Viber, Tango)

Audio interrupts from multiple sources (iPod, Media player, Other audio apps)

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APP RISK ANALYSIS

Customer Feedback

What are customers saying about app?

App reviews

App ratings / comments

Comments, forum posts and articles on the (social) web

Complaints and support request

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GOOD LUCK!!!

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