Rooting & Custom Rom in Android

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Abstract: *The present paper attempts to look behind the rooting of android device and keeping a special focus on custom Read Only Memory and check security which could yield to device compromise. It focuses on things like what is custom ROM, how can it be installed, what are the pros and cons of installing the custom ROM, features of a custom ROM discuss with step by step. A method of installing a new custom ROM is provided that will help users to easily install and access. Root, Custom Recovery, and Custom ROMs are three of the customizations you should definitely make use of when you get an Android device. These are the things that make your experience with Android much smoother and faster. First off, you should know exactly what these things are and what they do, then you can move forward and get them on your device.*

Keywords: Rooting, Custom ROM, Stock ROM, Custom Recovery, Clockworkmod recovery

1. Introduction

Android is an open source based on the Linux kernel and designed primarily for touch screen mobile devices such as smartphones and tablets. It is the mobile operating system developed by Google, Android's user interface is mainly based on direct manipulation, using touch gestures that correspond to real-world actions to manipulate on-screen objects. Android provides a rich application framework that allows you to build innovative apps for mobile devices.

The stock ROM comes installed on the phone or tablet, while a Custom ROM comes from a third party. The Custom ROM provides better features, frequent updates, and bug fixes and also in cases of some device you can even upgrade to a new version of Android which you may not if you are running on the Stock ROM made by the manufacturer. There are two types of ROM's available for the android devices such as Stock ROM and Custom ROM described below:

Stock ROMs are the ones which come by default in Android phones or tablets. These are customized versions of Android done by mobile companies to make their devices unique in looks and features. The out-of-the-box smartphones are all shipped with stock ROM. Main Advantages of Stock ROMs are kept the warranty, pre-installed app, premium features and trust for security.

Custom ROM is an aftermarket firmware which is a standalone OS and includes everything as in the stock firmware, however, it's customized in some way. A Custom ROM breaks the barrier between the user and the amount of customizability that every Android device holds. It allows the user to be much more precise and specific while using an Android device.

Root refers to the administrative access to the system files on your Android device. In simple words, it means once you are rooted, you can access (and modify) those system files that are usually restricted by the OS. Well, there are various reasons for that, some of them being: You might want to change the appearance of your device. You might want to remove some apps that have come preloaded on your device. You might want to do some tricks with your phones. On the other hand, one of the main disadvantages of rooting a device is lacking the warranty. If you root your device, your warranty gets voided and the only way to get it back is to unroot your device. Unrooting refers to the process of removing root from your device and it is NOT possible to unroot all available devices.

Clockworkmod recovery is the original custom recovery that is developed by Koushik Dutta and is the most popular recovery of all (arguably).There are three several CWM recovery are available for the devices, such as Standard version which uses hardware keys for navigation and selection, Swipe version which uses basic up/down/left/right swipe gestures to navigate and select options and the Touch version which is entirely touch-driven.

Your first task is to power down your Android device and boot into the recovery mode which is different with different devices. You can either search for the hardware button combo in the Google or use any 3rd party apps (requires root) which do the some job.

2. Literature Survey

The First rooted android device is HTC Dream(G1) and first custom ROM develops JesusFreke aka. JF ROM.It was the most popular after the G1 device was rooted.

HTC Dream was the first commercially launched Android powered smartphone back in October 2008. Developers found an exploit that gained them super user access. It can be confirmed that HTC Dream or HTC G1 was the first rooted device on android. It's Wikipedia page under the modding section.

JF wasn't the first. I couldn't find any source stating it was the first. I am using Google search tools and set the time from October 2008 to Jan 2009. What I found is an Interview with JesusFreke developer of JF Rom. Where it's stated that it was most popular ROM after HTC Dream(G1) was rooted.

Some interesting facts while researching.
1) XDA-developers have started in January 2003 became popular after the first root successfully access.

Developer Koushik Dutta is Founder of ClockworkMod provided the first detailed guide to root HTC G1.

2) Developer JesusFreke stopped working on JF ROM in August 2009 and suggested users switch to an enhanced version of JF developed by user Cyanogen (Steve Kondik) called CyanogenMod.

3) After the first root access successful. Android became more popular among hackers and modders. Google took this opportunity and launched Android Phone which came pre-rooted.

3. Methodology

a) Custom ROM

A Custom ROM provides better features, frequent updates, and bug fixes and also in cases of some device you can even upgrade to a new version of Android which you may not if you are running on the Stock ROM made by the manufacturer. You can find out custom ROMs available for the own device by just simply Googling up or you can check on XDA Developers forum if any ROM is available for the own device or not.

Some Precautions: - Here are some precautions that you must take care before installing Custom ROM.
1) Backup your apps, contacts etc
2) Ensure a decent battery level
3) Enable USB Debugging
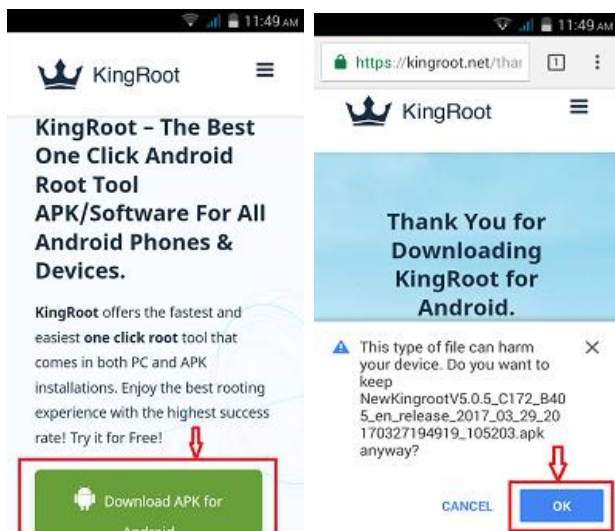
b) Install a Custom ROM on Android Mobile

Get Root access:
First you need Root access. Root access is necessary to provide up your device with all the required permissions that you need to perform the required change.

So if you have not rooted until yet, search up google to find the Root procedure for your own device and follow it and Root your device and get back here then.
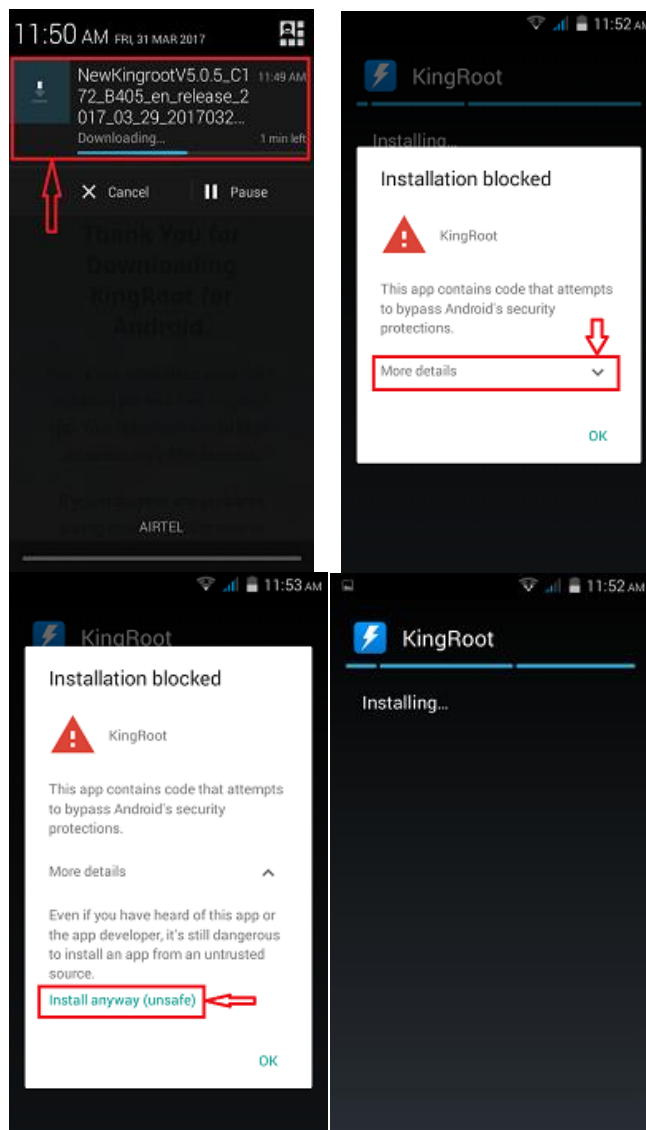
Step 1: You can download KingRoot app on official website www.kingroot.net on your own device

Note:-Before Downloading KingRoot for Android.You receive a alert message " file can harm your decice".Click on OK button.
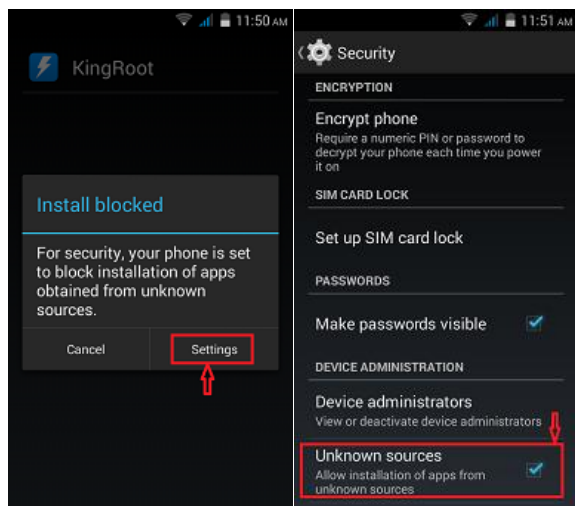

Step 2:- Now click on the dropdown notification bar to see installation. Once KingRoot download is completed

Note:-you should receive this popup "Installation blocked message", click on install anyway and press OK
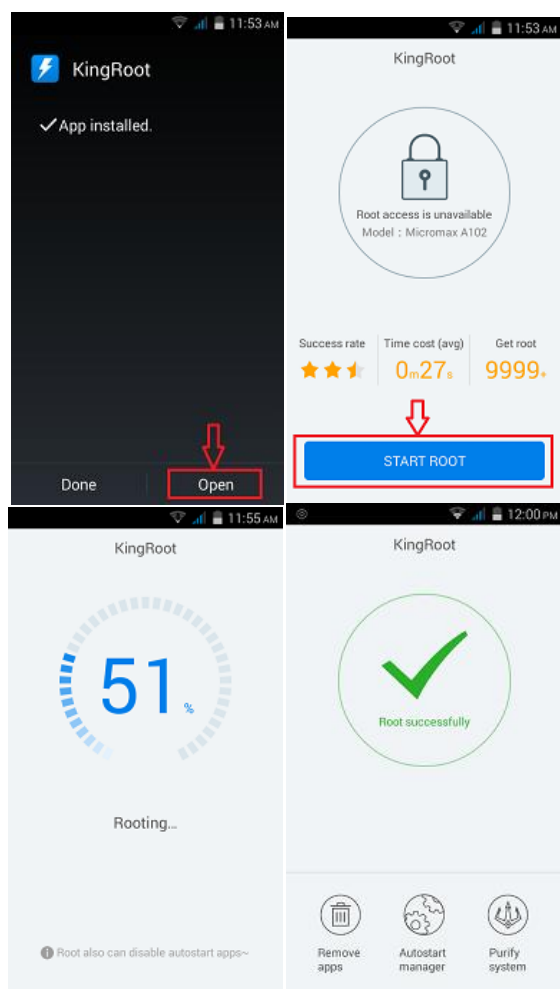

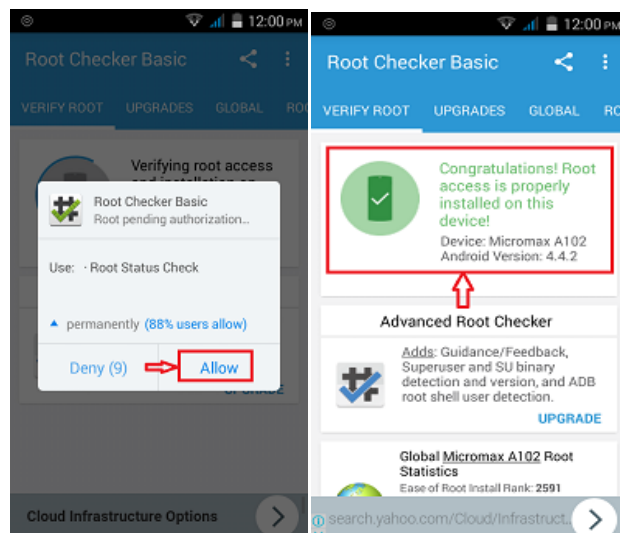**Step 3:-** if you have set already,skip this step,directly go to step 4.

If you have not been set before then you will see alert message"install blocked",click on setting and make sure unknown sources is check ,as the steps in the following figure,

Step 4:- Click on install to start the installation process ,when the installation process is finish then click on open to start using KingRoot. Now you can see main interface of KingRoot and click "start root" button to start rooting.Once the rooting process is completed, after that you will be return to the main KingRoot app screen and see the Root successfully.

Step 5:-Open Google Play App Store.Click on search and Download RootChecker App.Allow the app permission to Check the Root is successful
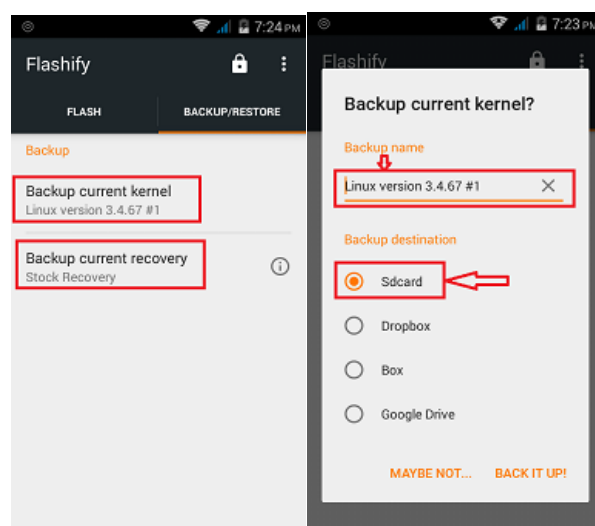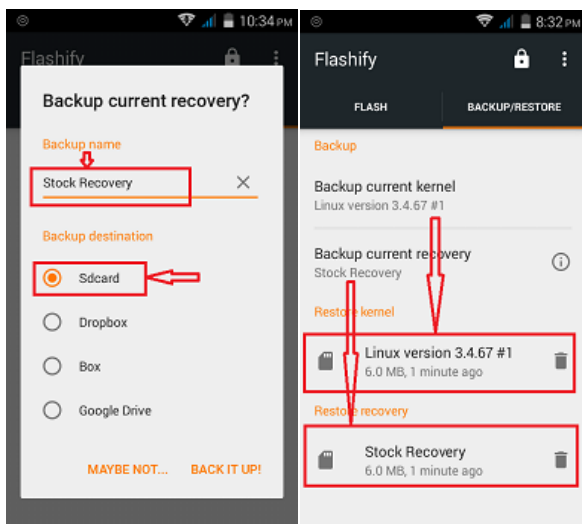

4. Install a Custom Recovery

Next thing you require after Rooting your device is a custom recovery image. So you need to install a custom recovery because the default recovery is not capable of flashing a ROM. There are many recoveries like CWM, TWRP etc. SO search up recovery for your device and install it.
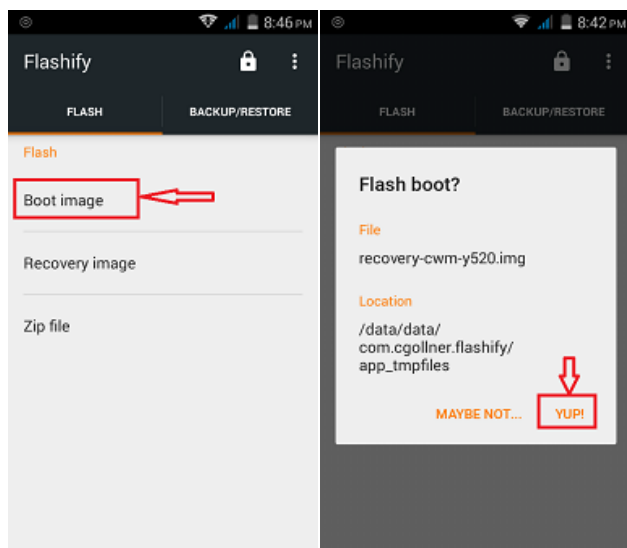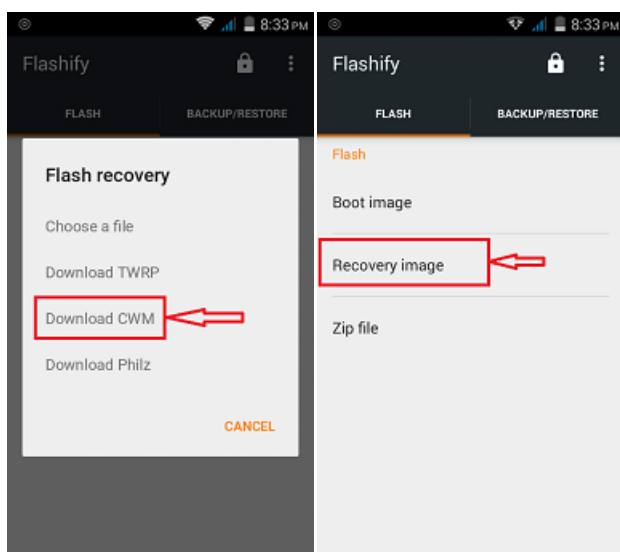
It is actually depends on your phone.Some phones support CWM & other supports TWRP(in my micromax A102 supports CWM).Do google for compatibility
1) Do google and download CWM.img file for your android version
2) After download make sure it is in your SD card without folder
3) Go to play store and install Flashify App(for root users only)
4) Click to open app and take backup of stock recovery.

1) Click on Flash Tab.If your phone supports TWRP then go to "Recovery image" option
2) Click on "download TWRP" and find TWRP for your device.
3) Here My device supports CWM so I am showing you how to install CWM.Now Click on Boot Image and navigate to your CWM.img file and click on yup button.Now Flash is completed.

Important note:-You can flash only three times in 24 Hours by using this app
Just Click on Reboot.Now it will start recovery mode which is your new CWM Recovery mode.

5. Installing a Custom ROM:

Once you have rooted your own device and installed a custom recovery, you can flash a Custom ROM on your device. The developers that we have a variety of Custom ROMs to choose from your device so select a ROM you want to flash.
1) Download and copy the ROM file as it is to your phone that is if it is a .zip file, copy the whole file and don't extract it.
2) Boot into recovery, usually there are different key-combinations for different devices so follow the one for your device and boot up. (Volume up+Volume down+Power key).
3) When you have booted into recovery, you can use the volume buttons to navigate and power button to select.
4) You have a see at many options. You have first wipe of your current system partition to make your new ROM.
5) Select the option 'Wipe Data/Factory Reset', and then select 'Yes' to confirm.
6) Note: If you're just updating an existing ROM, you can just wipe the cache and dalvik cache. So, you can have your data after the update.
7) Head over back to the main screen, and now select 'Install ZIP', then select 'Install ZIP from SD Card'. CWM now displays all of your folders and sub-folders.We need only the ROM file.

Now Select the ROM file that you have downloaded to your device, and select 'Yes' to confirm the flash.Now flash process is completed.

6. Advantages of Rooting

1) **Remove the Preinstalled applications**
   Manufacturer would not allow you to uninstall those preinstalled apps on your device.Once you Rooting a device can make them removed easily, which ensures a high running quality.
2) **Install Incompatible Apps**
   Some apps need the root access if you install them on your device. Root your phone, enjoy more apps

3) **Upgrade Latest Android OS-**
   A rooted Android can get the new OS months before the carrier releases the update, often along with a few bonus features
4) **Boost your Android Device with better Speed and Battery Life**
   Some powerful apps like Greenify can close the useless applications automatically, which can effectively improve your device's performance. Of course, Greenify needs root access.
5) **Complete Backups of Your Android Phone**
   An manufacturer Android mobile can only backup some settings and apps of your device. Titanium can be used on rooted device to give you a complete backup.

7. Disadvantages of Rooting

1) **Security**
   You won't be able to use any Internet banking apps.. Since after rooting, you will use make rooted apps and tha may not provide you safe security.
2) **Phone's Warranty**
   Once you root your phone, the manufacturer's warranty becomes void.
3) **Higher vulnerability to Viruses**
   By now you should know your smartphone is a target of viruses, malware, adware and all sorts of crapware, just like your PC. When you root your phone, you can also flash the device's ROM using custom programs. Making such changes to the code of a software increases the likelihood of introducing a virus.
4) **Hardbrick**
   While flashing some ROMs, recovery or even while rooting there is chance that you phone can get bricked.

8. Conclusion

Rooting your Android Phone can be very powerful as it gives you the best of user friendly experience and total control on your device. Remember to always be careful when rooting and custom ROM on your device. However, the step of rooting and custom ROM on your Android Phone should not be rushed into and it should be carefully done, the service of an expert should be considered if you lack the experience of similar tasks. Look for steps that are specific to your Android phone or tablet and follow them to the letter and to give a shot to all of these customizations and let us know how it worked for you!.

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