Click Here

The phone in your pocket can do much more than just run Android. And, if youre reading this, you probably are looking for ways to run Linux on Android. Linux is an open-source operating system and is free to use. Android is based on the Linux kernel. But what if you want to re-purpose your Android mobile to run Linux for a more complete desktop experience? For that, youll need to install Linux on your Android phone. And in this article, were going to do just that. After you go through the various steps of installing Linux on your Android device, Ill also state a few reasons why this could be advantageous to you. Lets get started. Pre-Requisite to Get Started The first step is to check whether your tablet or phone device can run Linux. In most cases, your device can run Linux. However, the approach to making Linux work on Android devices may differ depending on your Android devices root status. As for hardware capability, all modern devices, including phones or tablets, can run Linux due to its low hardware requirement and customizability. However, you need a rooted Android device (jailbroken) if you want complete control over device resources. If not, you can still install Linux with the help of Android apps such as Andronix, UserLAnd, or Debian Noroot. If your phone device is not jailbroken, you can use the apps to get Linux running on your phone. The best way to get Linux is to use AndroNix, Termux, and VNC Viewer. AndroNix is a popular Android app that lets you install Linux on Android. You can use it to install Linux at no cost. Termux, on the other hand, is a powerful terminal emulation that gives you access to bash and zsh shells. Lastly, we have a VNC viewer, which well need to connect to our Linux session. Lets go through the process of installing Linux without root. Before you get started, you need an Android tablet or phone. However, connecting your device to an external monitor, keyboard, and mouse is best to ensure optimal ease of use. I will use my Samsung FE 21 5G Android phone for this tutorial. Samsung is known to provide an excellent ecosystem. It offers access to Samsung Dex, which lets you multitask between devices. Once you connect your modern Samsung phone to a computer, you get a working environment like a PC. First, download Samsung Dex on your Windows machine and then connect the phone to the PC using a USB cable. Once done, youll see a desktop-like UI directly on your PC. But what if you dont have access to a Samsung device? In that case, you can still connect wired or wirelessly. Youll need an OTG adapter and a USB hub to connect using wires. With this, youll get access to multiple USB ports necessary to connect your wired mouse and keyboard. If you have a wireless keyboard and mouse, you can connect them with Bluetooth. Note: This step is entirely optional. But, if you work with Linux on an Android device, it is best to set up a keyboard and mouse to improve usability. This step includes installing three apps on your Android device. Go to their respective Play Store page and install them. Note: If your smartphone doesnt support these apps, you can go directly to their official page to download their .apk file and install it. In my case, Samsung didnt support Termux, so I went to the Termux official site, downloaded the official .apk file, and installed it. Install the latest available signed Termux APK. Once you open Andronix, youll see the following screen. From here, you can click on Linux Distribution and see a list of supported distros. These include: Ubuntu Manjaro Debian Kali Linux Fedora Void Alpine Arch Linux All of these distros are official and not modified. For this tutorial, were going to install Ubuntu. So, click on Ubuntu, and itll ask you to select GUI. Here, select Desktop Environment, and itll then redirect you window where you need to choose from the available desktop environments, including XFCE, LXQT, and LXDE. You can select any of the available options. Well use XFCE for this tutorial as it is lightweight and can run on low system resources. Available desktop environments for Ubuntu official distro As soon as you click Next, itll copy a command. For our selection of options, it copied the following command for us. pkg update -y && pkg install wget curl proot tar -y && wget -O ubuntu22-xfce.sh && chmod +x ubuntu22-xfce.sh && bash ubuntu22-xfce.sh Note: The code for your deployment might differ depending on your choices. You can open Termux by clicking on Open Termux. Now paste the command in the terminal and press ENTER. Note: You can press the middle mouse button to paste the command. You also need your phone device to be connected to the internet to download the necessary files. Itll start downloading the necessary file, and you might have to wait a few minutes for it to complete. Note: During the installation, youll get various prompts. For all of them, press Enter to proceed. The installation will also prompt you to give Termux file permission. Allow it. During the final stages of the installation, the prompt will ask you to select language, keyboard layout, and font package. Please wait until it asks you to enter a new VNC password. Well come back to it later on. Open RealVNC Viewer and press on + to create a new VNC session. Now enter the address as localhost:1 and the Name you like. Now, add a new VNC password. Once you do, youll see the AndroNix VNCserver resolution selection. Here, you can select any option based on your liking. For this tutorial, lets choose the resolution as HD-ready. And youll see your Ubuntu terminal! Run the following command to check yourself. $ lsb_release -a To run Ubuntus desktop environment, return to RealVNC Viewer, open Ubuntu, and click Connect. Note: Itll prompt you about an unencrypted connection. Just click on Continue. Now, enter the VNC password you set above. Thats it! You have installed Linux on an Android device. And this is how it looks on your phone. And, if youve rooted your device already, installing Linux on it is quite easy. If you have a jailbroken Android device, you can deploy Linux by following the steps below. Step 1: Install BusyBox on your phone. This will give you better control over root settings. Step 2: Install any of these three apps, UserLAnd, AnLinux, or LinuxDeploy. These apps will help you deploy the Linux distro. Step 3: Once you have installed the app of your choice (for this purpose, lets use LinuxDeploy), run it. Also, make sure that it has root permissions enabled. Step 4: Go to the bottom-right of LinuxDeploy and tap Settings. Step 5: Here, select the distro of your choice. You can choose from Ubuntu, Fedora, Debian, etc. Step 6: Under GUI, check the Enable box. Step 7: Under Graphics, select VNC. Step 8: Itll then ask which GUI Setting you want. Choose a Desktop environment. Step 9: Enter your name and password. Step 10: Go to the upper-right corner, and exit the menu. Step 11: Select Install, and then tap on OK. From here, youll need to open RealVNC Viewer and then deploy a session (similar to how we did in the Installing Linux without root Step 4). However, youll need to enter the address as localhost:5900. Once done, connect to the instance and enter your Linux Desktop with the credentials you entered in Step 9. Awesome! You have successfully installed Linux on a rooted Android device. You can also use various apps, if you find the steps shown above to be a bit cumbersome. The Android ecosystem gives you access to plenty of apps to run Linux on Android tablets or phones. Lets list a few of them below. Andronix lets you install Linux on Android more intuitively. It works excellently on non-rooted devices. And the best part is that it is free to use due to its open-source license. Out of the box, you can use it to install 8 official Linux distributions. Earlier, we used Andronix to install Ubuntu. In addition to the free Linux distro distributions, it offers paid Andronix Modded OS. These are optimized for Android devices, providing better stability and customizability. You can also get Andronix Premium with additional features such as offline installation, command, etc. UserLAnd is a useful open-source app that lets you run a Linux distro on Android. Just like Andronix, it works on non-rooted devices. It offers a built-in terminal with support for different shells. Additionally, you can connect to VNC to enable the graphics interface. Check Out Best Mobile IDE for Android and iOS App Development AnLinux is a helpful app to run Linux on Android. It utilizes PRoot and Termux so that you can run the Xfce desktop environment and SSH. Similar to UserLAnd and Andronix, it doesnt require root access. You can use it to run multiple distros without any conflict. AnrdoLinux is an open-source operating system using a GNOME desktop environment. This package gives you a complete Linux desktop experience on your Android device. Under the hood, AndroLinux is based on CentOS and Fedora. It also offers good security. You can use AndroLinux to set up a professional environment, as it can run Office apps, illustrations, and designs. Termux gives you access to a powerful terminal without installing third-party files or services. Once you install it, you get access to bash and zsh shells. After all, Android uses a Linux kernel, and hence it can build on top of it. You can use Termux to install Linux distros, access servers over ssh, manage files, run text-based games, etc. Now that youve seen the various ways in which you can run Linux on your Android device, lets understand how this can be beneficial to you. Reasons to Run Linux on Android Devices There are plenty of benefits when running Linux on your Android device. Smartphones are more powerful than you can think of. Even an old Android device holds enough computational power to easily run a Linux operating system (Linux being lightweight also helps). So, if you want an affordable Linux-powered device, you can install Linux on Android and use it in your daily activities. Even though this setup could be more optimal, it does give many users out there the option to achieve something. After all, a mobile device runs Android, a Linux kernel capable of interacting with the underlying mobile phone hardware. Also, plenty of easy-to-use and lightweight Linux distros are out there, including Ubuntu, Gentoo, and even Arch Linux. Technology in your hands is not just to watch TikTok or Instagram mindlessly. It also opens up the path to experimentation. So, if you like to experiment, you can use a mobile device with Linux to do many things. For example, you can do the following: Install and run web server using Nginx. Use the device as a hacking tool by installing Kali Linux Use it as an educational tool-box by learning about Linux Run a 24/7 low-powered torrent device to share files Run a local network Adblocker to block ads on your local wireless These are just a few use cases of what you can do by running Linux on an Android device. You can also use an Android-powered mobile device to try different Linux distros. Final Words Running Linux on Android is fun. It is a cool experiment you can run on weekends. The best part about Linux on Android is that Android itself uses a Linux kernel. That means vast support for Android apps that can let you install and try different Linux distros. Furthermore, rooting your device to use Linux on an Android device is unnecessary. A jailbroken device gives you more freedom when configuring and using Linux on an Android device. More on Linux Have you ever wished your Android phone or tablet could replace your entire computer? Thats now possible you can install a Linux or Ubuntu desktop environment on virtually any modern Android device thanks to some clever workarounds. You dont need to root your phone and you can even use a Bluetooth keyboard and mouse (and maybe an external display) for a powerful desktop-like experience. And even though the experience doesnt match a real Linux computer, its more than usable in a pinch and worth trying out.Debian NoRoot: One-click Linux desktopCalvin Wankhede / Android AuthorityDebian NoRoot offers one of the easiest and least complicated ways to access a Linux desktop on Android. Its a free app that you need to install via the Play Store. If you havent heard of Debian, its the flavor of Linux that the popular Ubuntu distribution is based upon. This guarantees compatibility with a wide range of Linux apps and the apt package manager.Debian NoRoot is pretty lightweight and should run on most Android smartphones and tablets. Its not the complete Debian operating system instead, its developer describes it as a compatibility layer, which allows you to run Debian applications. How is this possible? Well, Android runs a modified Linux kernel, making it somewhat related to our end-goal. Debian NoRoot also includes all of the basics, including a desktop environment and a terminal application. All in all, its a perfect starting point for experienced and novice users alike.Debian NoRoot lets you access a full-fledged Linux desktop with a simple download from the Play Store.Once youve installed the Debian NoRoot app on your Android device and open it for the first time, it will present you with a list of display resolutions and font scales. Select the default options here, and it will eventually bring you to the desktop.From this point on, you can immediately get to installing additional Linux programs and apps. Well explain how you can do this via the terminal in a later section. For now, consider plugging in a keyboard and mouse since the on-screen touch keyboard can take up a big chunk of your screens real estate.Related: What is a kernel and why does it matter on Android and Linux? Install Ubuntu and other Linux flavors with UserLAndSelect your Linux distribution of choiceEnter a username and passwordSelect VNC if you'd like a graphical user interface or SSH for a text-based sessionIf Debian NoRoot doesnt satisfy your needs or youd like to install a different Linux distribution, another option is the UserLAnd application. It lets you install various Linux distros on your Android device, including Arch, Kali, Ubuntu, Debian, and Alpine. You can also choose to launch applications like Gimp and LibreOffice independently, eliminating the need for a full-blown desktop environment.Heres a step-by-step guide on how to install Ubuntu on your Android device:Download and install the UserLAnd app from the Play Store.Open the app and select the Linux distribution you wish to install. For the sake of this guide, well proceed with Ubuntu.Enter a username, password, and VNC password of your choice when prompted. Dont forget these details or youll have to start the process all over again.The app will now ask you to choose between an SSH or VNC connection. Select the latter if you need a graphical user interface.Wait until the download completes.Finally, you should be presented with a login screen, as shown below. Enter the VNC password from earlier to proceed.Calvin Wankhede / Android AuthorityYou can also initiate a VNC connection from a different device on the same network. First, determine your Android devices IP address, either from your router or using a free app like Fing. Finally, add :51 to the end of the IP address (example: 192.168.0.101:51) and connect to it using a VNC app like TightVNC on the other device.Final steps: How to install Linux apps on your Android deviceMishaal Rahman / Android AuthorityNow that youve got your preferred flavor of Linux installed on your Android phone, you may be wondering what you can and cant do with it. Lets start with the latter you can only install and run programs designed for Arm-based processors. This rules out many apps like Steam, which only support the desktop x86 architecture. Still, most of the standard productivity-related programs youd want ranging from Firefox to LibreOffice offer Arm versions these days.Heres how to install Linux apps on your Android device:Log into your Ubuntu session via one of the above methods.Open a terminal window.Enter the following commands one by one:sudo apt updateandsudo apt install firefox-esr.You can replace firefox-esr in the above command with any other desired program of your choice. Some other examples include vlc and libreoffice.Once installed, you can launch the program from within the Applications menu, as pictured below.Calvin Wankhede / Android AuthorityBesides which Linux apps you can install, there are a couple of other limitations you should consider too. You cannot access low-level hardware functions like Wi-Fi or Bluetooth from within Linux because those are still completely controlled by Android. Likewise, you cannot expect video decodingor complex 3D graphics to work at full speed. Remember that you arent running full-fledged Linux its just a compatibility layer on top of the base Android operating system. Youll be better off with a Chrome OS device if those aspects are important to you. FAQsCan I run Ubuntu on Android? Yes, its possible to run an Ubuntu environment on an Android device via an app like UserLAnd.Can you replace Android OS with Linux? You cannot replace the Android OS on most smartphones with Linux. However, you can install apps to get a Linux-like desktop environment on top of Android.Termux combines powerful terminal emulation with an extensive Linux package collection. Enjoy the bash and zsh shells. Manage files with nnn and edit them with nano, vim or emacs. Access servers over ssh. Develop in C with clang, make and gdb. Use the python console as a pocket calculator. Check out projects with git. Run text-based games with frotz.At first start a small base system is installed - desired packages can then be installed using the apt package manager. Access the built-in help by long-pressing anywhere on the terminal and selecting the Help menu option to learn more.Want to read the wiki? to report bugs? to interact with a community of users? starts with understanding how developers collect and share your data. Data privacy and security practices may vary based on your use, region, and age. The developer provided this information and may update it over time.No data shared with third partiesLearn more about how developers declare sharingNo data collectedLearn more about how developers declare collectionRatings and reviews are verifiedinfo_outlineRatings and reviews are verifiedinfo_outlineTermux is an insanely amazing app for developers and students! It turns your phone into a full-fledged CS Workstation. Whether you're traveling or just want to code on the go, this app delivers speed, efficiency, and power in a sleek, intuitive interface. Its like having a mini computer in your pocket! Hats off to the developers for creating such a masterpiece. Highly recommended! 49 people found this review helpfulDid you find this helpful? Flag inappropriateShow review historythis is one of the most useful apps I've ever used on my phone. i can basically turn my useless phone into a Linux machine. as a developer, this is a game changer for mobile dev. i like experimenting with different tools, so now i can do that while I'm waiting in a line or travelling. im planning to connect wireless keyboard and mouse, which will make this even better. no issues, runs smooth, completely shattered my expectations. 11/10648 people found this review helpfulDid you find this helpful? Flag inappropriateShow review historyBest terminal I've seen, whether you want a mini Linux environment with compilers etc. on your phone, or just a way to ssh out using OpenSSH (remember to write a ~/.ssh/config to store per-host settings). It also plays nice with desktop-mode Android like Samsung Dex, even seamlessly shuffling your live session between phone and monitor. Multiple sessions can be switched with the back button or dragging a flyout from the left side. I don't see a way to change font size with keyboard+mouse though.9 people found this review helpfulDid you find this helpful? Fix issue when rotating devices while in fullscreen. Add back 32-bit arm support. Improve focus handling while using keyboard / d-pad. Update bootstrap packages.flagFlag as inappropriate*Please update to the latest version to ensure all feature work correctly.Note: This app work WITHOUT ROOT, but require Android 5 + and latest Termux app.This application will allow you to run Linux on Android, by using Termux and PRoot technology, you can run a lots of popular Linux Distro, such as Ubuntu, Debian, Kali, Parrot Security OS, Fedora, CentOS Stream, Alpine and much more!By installing Linux Distro using this app, you can run various classic Linux desktop application such as Emac, mpv player, Python 3, and lots more for you to discover!Various of Desktop Environment and Window Manager are also supported, such as KDE, Xfce4, LXDM, Mate, LXQT, Awesome Window Manager, IceWM, and more might be added in the future.Features:- NO ROOT ACCESS REQUIRED!!!- Lots of Linux distro supported:1. Ubuntu2. Debian3. Kali4. Kali Nethunter5. Parrot Security OS6. BackBox7. Fedora8. CentOS9. openSUSE Leap10. openSUSE Tumberweed11. Arch Linux12. Black Arch13. Alpine14. Void Linux- Multiple Desktop Environment Supported- Install multiple distro without conflict- Provide uninstallation script to fully uninstall distro- Provide method to run the distro in root mode if you need permission to run penetration testing tools on distro such as Kali Linux or Parrot Security OS.- SSH is supported for users who prefer command line.- Various patches to support device that didn't work for running Linux on Android.- For those who wanted or are learning Linux and command line, this app served its purpose when away from desktop.Note : 1. This app required Termux to work, it could be install on Play Store.2. About device requirement:Android Version : Android 5.0 or aboveArchiteture : armv7, arm64, x86, x86_643. For any suggestion or issue, please open an issue on Github.If you are new to Linux, or you don't quite understand how it works. Please look at the instruction on wiki page in the app, it may help you if you are stuck at the installation process.This is an open source app and the source code could be found here : starts with understanding how developers collect and share your data. Data privacy and security practices may vary based on your use, region, and age. The developer provided this information and may update it over time.This app may share these data types with third partiesPersonal info and Device or other IDsNo data collectedLearn more about how developers declare collectionData is encrypted in transitRatings and reviews are verifiedinfo_outlineRatings and reviews are verifiedinfo_outlineI like the idea of Linux on my phone, I've used Linux for many yrs on PC. this app would be nice but took me to dwnld f-droid. upon initiating dwnld I read the permission reqs and were not exceptable to me. phone number phone id and personal info. not sure what all info they want but it's way too much pers info imo. I'm very disappointed as I hate intrusive snoopy software. Isn't this open source? I guess I don't get it, or need it either. (1 person found this review helpfulDid you find this helpful?This is a masterpiece there are some limitations, as you would expect from a mobile app trying to emulate a linux env without root access, on phones that werent designed to run it. Overall its really well done. I think one small area for improvement would be notifying the user when something is broken because of the app's limitations, as its easy to get lost in debugging something that should work on a normal linux env but doesnt in the app :)97 people found this review helpfulDid you find this helpful? Flag inappropriateShow review historyI got it to work but there is no audio which is sad for me. There's a problem in Android 12 where Android kills phantom processes. This interferes with Termux but there's a way to ADB shell some commands to prevent it so not a big deal. Really wish there was audio though. Also no way to restart the OS. Restart flips errors. No reply from devs in email. Cool app though regardless.59 people found this review helpfulDid you find this helpful?flagFlag as inappropriate You cant perform that action at this time. As many of you maywell be aware, the Android operating system is powered by the Linux kernel underneath. Despite the fact that both Android and GNU/Linux are powered by the same kernel, the two operating systems are vastly different and run completely different types of programs. Sometimes, however, the applications available on Android can feel a bit limited or underwhelming, especially when compared to their desktop counterparts. Fortunately, you can get a GNU/Linux environment up and running on any Android device, rooted or non-rooted. (The following instructions assume a non-rooted device.) For those power users on Android tablets, or other Android devices that have largescreens (or can plug into a bigger screen), the ability to run desktop Linux software can go a long way towards increasing the potential that an Android device has for productivity. Setting Up GNU/Linux on Android To get a GNU/Linux environment set upon your Android device, you only need to install two applications from the Google Play store:GNURoot Debian and XServer XSDL.After you do that, you will only need to run a small handful of Linux commands to complete the installation. GNURoot Debian provides a Debian Linux environment that runs within the confines of the Android application sandbox. It accomplishes this by leveraging a piece of software called proot, a userspace re-implementation of Linux's chroot functionality, which is used to run a guest Linux environment inside of a host environment. Chroot normally requires root access to function, but by using proot you can achieve similar functionality without needing rootprivileges. GNURoot comes with a built-in terminal emulator for accessing its Debian Linux environment. This is sufficient for runningcommand-line software, however, running graphical software requires an X server to be available as well. The X Window System was designed to have separate client and server components in order to provide more flexibility (a faster, more powerful UNIX mainframe could act as the client to X server instances running on much less powerful and less sophisticated terminals). In this case, we will use a separate application, XServer XSDL, that GNURoot applications will connect to as clients. XServer XSDL is a complete X server implementation for Android powered by SDL that has many configurable options such as display resolution, font size, different types of mouse pointer behavior, and more. 1. Install GNURoot Debian and XServer XSDL from the Play Store. 2. Run GNURoot Debian. The Debian Linux environment will unpack and initialize itself, which will take a few minutes. Eventually, you will be presented with a "root" shell. Don't get misled by this - this is actually a fake root account that is still running within the confines of the Android application sandbox. 3. Run apt-get update and apt-get upgrade to ensure you have the most up-to-date packages available on your system. Apt-get is Debian's package management system that you will use to install software into your Debian Linux environment. 4. Once you are up-to-date, it's time to install a graphical environment. I recommend installing LXDE as it is simple and light-weight. (Remember, you're running Debian with all the overhead of the Android operating system in the background, so it's best to conserve as many resources as you can.) You can either do apt-get install lxde to install the desktop environment along with a full set of tools, or apt-get install lxde-core to only install the desktop environment itself. 5. Now that we have LXDE installed, let's install a few more things to complete our Linux setup. XTerm this provides access to the terminal while in a graphical environment Synaptic Package Manager a graphical front-end to apt-get Pulseaudio provides drivers for playing back audio Run apt-get install xterm synaptic pulseaudio to install these utilities. 6. Finally, let's get the graphical environment up and running. Start XServer XSDL and have it download the additional fonts. Eventually you will get to a blue screen with some white text this means that the X server is running and waiting for a client to connect. Switch back to GNURoot and run the following two commands: export DISPLAY=:0 PULSE_SERVER=tcp:127.0.0.1:4712startlxde & Then, switch to XServer XSDL and watch the LXDE desktop come up onto your screen. I recommend putting the above two commands into a shell script so that you can easily restart LXDE if you close the session or if you need to restart your device. Congrats! You've successfully gotten Debian Linux up and running on your Android device, but what good is running Linux without apps? Fortunately, you've got a massive repository of Linux applications at your fingertips just waiting to be downloaded. We'll use the Synaptic Package Manager, which we installed earlier, to access this repository. Click the "start" button at the lower-left hand corner, click Run, and then type synaptic. The Synaptic Package Manager will load. From here, simply press the Search button at the top and then type the name of the application you'd like to install. Once you've found an application, right click it and select "Mark for Installation". When you are finished marking packages, click the Apply button at the top to start the installation. Uninstalling packages follows the same procedure, except by right-clicking and selecting "Mark for Removal" instead. Of course, since this isn't a real Linux installation but rather a Linux environment running on top of, and within the constraints of, Android, there are a couple of limitations to be aware of. Some applications will refuse to run or will crash, usually due to the fact that some resources that are usually exposed on GNU/Linux systems are kept hidden by Android. Also, if a regular Android app can't do something, then usually a Linux application running within Android can't as well, so you won't be able to perform tasks such as partitioning hard drives. Lastly, games requiring hardware acceleration will not work. Most standard everyday apps, however, will run just fine. Some examples include Firefox, LibreOffice, GIMP, Eclipse, and simple games like PySol. I hope that you find this tutorial useful. While I personally performed these steps on my Google Pixel C, you can do this on most Android devices. Preferably on a tablet device with access to keyboard and mouse peripherals, of course. If you already run a GNU/Linux distribution on your Android device, let us know what you are using it for below! Linux on Android converts your tablet or smartphone into a small PC with full control, personalization, and highest-level Linux applications compatibility. With tools like UserLAnd, Andronix, and Termux, you can quickly install popular versions of Linux like Ubuntu, Debian, Arch Linux, or even Kali Linux for ethical hacking and security. This means you can code, host the web servers on Apache, MySQL, and PHP, and have your privacy through VPNs and encrypted internet browsing. Linux on AndroidDuring this era of mobility and protection, where security and flexibility rule supreme, being able to access Linux on Android allows you to have the freedom to use your device as an actual computerallowing one to be productive and creative with ease on the move.Why Run Linux on Android?Android might have its foundation built on the Linux kernel, but it never presents the entire feel of a traditional Linux distro such as Ubuntu, Debian, or Arch Linux. For anyone who needs to unleash the potential of Linux in Android, deploying a Linux environment can convert their smartphone into an all-in-one, robust machine.1. Turn Your Phone Into a Mini PCYou can install Linux on Android and turn your tablet or smartphone into a full-fledged PC. With the right apps, you can:Install a full desktop environment like XFCE, LXDE, or GNOME.Use a keyboard and mouse and access it as a PC.Install Linux programs like LibreOffice, GIMP, and even web browsers.2. Run Programming & Development ToolsIf youre a developer, ethical hacker, or tech enthusiast, running Linux on Android is a powerful tool for coding on the go.Write and Run Code: Use Python, Java, C++, and JavaScript right from your phone.Use Git for Version Control: Manage repositories with Git & GitHub.Run a Local Server: Host a web server using Apache, MySQL, PHP.SSH into Remote Servers: SSH into cloud servers.3. Improve Privacy & SecuritySecurity is something offered by Android, but Linux on Android leaves you in a much stronger position to manage your data and your privacy.Browse the Internet Anonymously: Use Tor, VPNs, and encrypted browsing.Run Your Own Secure Email Server: Maintain control of your privacy.Set Up Firewalls: Block unwanted traffic and prevent security attacks.Safe From Attacks: Use Linux tools to monitor network traffic.4. Customize Your System Like Never BeforeUnlike stock Android, running Linux on Android gives you full root access, allowing advanced customizations.Add Custom Window Managers: Give your Linux desktop the look and feel you want.Modify File System Settings: Control the way information is stored on and loaded by your device.Automate Tasks: Use Linux scripts to execute tasks and automate system functions.Methods to Install Linux on AndroidThere are a number of ways to install Linux on Android, based on the root status of your phone.1. Installing Linux on Android Without Root (Easiest Method)The simplest method for beginners is to install Linux without rooting. This process employs applications that emulate a Linux virtual environment within Android.Best Apps to Install Linux Without Root:UserLAnd: It is the easiest methods to install Ubuntu, Debian, Arch Linux on Android. Andronix: It offers multi-Linux-distribution support for one-click installs. Termux: Terminal application with enhanced functionality that allows you to execute Linux commands.Steps to Install Linux Using UserLAnd:Get UserLAnd from the Google Play Store. Select a Linux distribution (Ubuntu, Debian, etc.). Configure username and password for use. The application will download the files and install Linux. Boot the Linux system using an SSH client or VNC viewer.2. Installing Linux on Android with Root (For Advanced Users)If your phone is rooted, you can install Linux natively without virtualization, hence better performance.Best Apps to Install Linux on Rooted Android:Linux Deploy: Offers full installation of Linux distributions. BusyBox: Installs Linux commands on Android for better functionality.Steps to Install Linux on Rooted Android:Root your phone (if not rooted). Install Linux Deploy from Google Play Store. Open Linux Deploy and choose a Linux distribution. Set up settings (file system, desktop environment, SSH access). Click "Install", then "Start" to run Linux.Best Linux Distributions for AndroidNot all Linux distros work well on Android. Here are the most recommended ones:Linux DistroBest ForKey FeaturesInstallation MethodUbuntuGeneral users, beginnersUser-friendly, stable, supports a full desktop environmentUserLAnd, AndronixDebianStability, securityLightweight, minimal resource usage, highly secureUserLAnd, Linux DeployArch LinuxCustomization, power usersRolling release updates, highly customizable, requires manual setupTermux, AndronixKali LinuxEthical hacking, penetration testingPre-installed penetration testing tools, used by cybersecurity professionalsUserLAnd, Linux DeployAlpine LinuxLightweight and fastMinimalist, designed for performance, great for running lightweight appsTermuxWhat Can You Do with Linux on Android?Operating Linux on Android turns your phone into a advanced, flexible tool. From developer to ethical hacker, privacy enthusiast to plain power user, Linux has numerous uses.TaskDescriptionTop Tools & Linux DistrosRun a Web ServerHost websites using Apache, MySQL, PHP, and Nginx. Host a personal blog or test websites on Android.Ubuntu, Debian, Termux, UserLAndCode on the GoUse Python, C++, Java, Node.js, Git, and SSH to directly develop software on your phone.Termux, Andronix, Ubuntu, DebianTurn Your Phone into a Hacking LabPenetration test, ethical hack, and cybersecurity practice with Kali Linux.Kali Linux, Nethunter, UserLAndGet Access to a Full Desktop InterfaceTransform Android into a PC-like experience. Use a keyboard, mouse, and external monitor.Ubuntu with XFCE, LXDE, or KDEPrivacy & SecurityUse encrypted browsing, firewalls, and VPNs to protect personal data. Install TOR, OpenVPN, or Pi-hole.Debian, Ubuntu, Alpine LinuxAndroid as Cloud ServerMake your phone a private cloud storage or FTP server to access files remotely.Nextcloud, FTP Server, Debian, UbuntuRun Linux Apps on AndroidInstall Linux apps like VS Code, LibreOffice, GIMP, and Chromium for the PC feel.Ubuntu, Debian, AndronixAutomate Tasks with Linux ScriptsUse Bash scripting to automate tasks, work with files, and manipulate system processes.Termux, Ubuntu, DebianAI & Machine Learning on AndroidInstall TensorFlow, Jupyter Notebook, and SciPy to run AI and machine learning code on your phone.Ubuntu, Arch Linux, TermuxApp Development & TestingInstall Android SDK, Flutter, or Node.js to create and test mobile/web apps.Ubuntu, Debian, Arch LinuxRun Linux for Ethical Hacking & CybersecurityRun Wireshark, Metasploit, and Nmap for cybersecurity auditing.Kali Linux, Parrot OS, TermWhy Should You Use Linux on Android?More Control: Unlike Android, Linux offers full root access and better system customization.Lightweight & Quick: Linux distros use fewer resources, which suits low-end devices.More Security: Encrypted web browsing, firewall setup, VPNs, and private servers offer data confidentiality.Perfect for Developers: Python, Java, C++, SSH, Git, and web servers can be run natively on Android.Ideal for Remote Work & Studies: Use cloud services, remote work, or study ethical hacking.ConclusionLinux usage on Android is a simple remedy for the one who needs enhanced security and work productivity on his/her device. You can carry out work from a secure arena with Linux wherein you can write code, set up servers, and even apply ethical hacking along with increased confidentiality and personalization. Whether youre a developer, cybersecurity enthusiast, or simply curious about technology, Linux on Android provides a flexible, lightweight, and secure platform that adapts to your needs. Assume this innovative approach to mobile computing and experience firsthand how Linux can transform your device into a robust, versatile tool. If you're reading this, you've probably used Linux before and know that it works on almost any piece of hardware. Meanwhile, you've got a phone in your pocket, and you know it's versatile. So can your Android phone run Linux? Yes, it can. Here's what you need to know about running Linux on your Android smartphone or tablet. Why Would You Install Linux on Your Android Device? What is the point of installing Linux on your Android phone or tablet? Several reasons come to mind: You may wish to run an app that isn't available on Android You need a desktop environment An old Android phone or tablet needs revitalizing Current Android devices have ideal hardware for a PC-like experience, making them suitable for installing Linux. Android is built upon the Linux kernel, a software stack that interfaces with the hardware of a device. It basically enables an operating system to communicate with the devicewhether that's a PC, a smartphone, or other hardware. Various Linux operating systems are available, such asArch Linux, Ubuntu, Gentoo, and many others. While Android uses the Linux kernel, it doesn't offer a desktop environment. This is what most people are thinking about when considering ways to install Linux for Android. Of course, you may find that the tasks you want to perform on Linux also work in Android. The only hurdle holding you back might be simultaneous Android app multitasking. Fortunately, this is a feature that many modern Android devices support on the latest OS versions. Running Linux running on an Android phone or tablet device isn't easy. If you're looking for improved multitasking, try upgrading to a recent version of Android instead. Various options are available for running Linux on Android. Your choice is determined by whether your Android device is rooted or not. In almost all cases, your phone, tablet, or even Android TV box can run a Linux desktop environment. You can also install a Linux command-line tool on Android. It doesn't matter if your phone is rooted (unlocked, the Android equivalent of jailbreaking) or not. The following options to install Linux on your Android tablet or phone are available: To install Linux on Android without root: Debian Noroot UserLAnd Andronix For installing Linux on a rooted Android device: Use Linux Deploy Install Kali Linux for penetration testing Several other methods will give you a Linux (or desktop-like experience) on Android, which well also look at. First, lets look at the ways to install Linux on your Android phone or tablet without rooting the device. How to Run Linux on Android With Debian Noroot The best way to get Linux running on your phone with minimum fuss is with Debian Noroot. You need Android 4.1 or later to run this. The benefit of Debian Noroot is that it will install Debian Buster on your phone with a compatibility layer. This allows you to run Debian apps without having to root Android. Given how difficult rooting can be for some devices, this can be one of the best Linux Android combos you'll get. Performance with Debian Noroot is not great, but it's usable. For the best results installing Linux for Android, consider rooting your device first. Download: Debian Noroot (Free) Get Linux on Android With UserLAnd An alternative to Debian Noroot, UserLAnd is an Android app from the Play Store that offers a choice of distros. In addition to Alpine, Arch, Debian, Kali, and Ubuntu, this tool lets you install apps. You can install tools like GIMP, Firefox, and LibreOffice before you install Linux on Android. Simply run the app, agree to the permissions, and select a distro to install. There's a choice of viewing the installed Linux version over SSH (command line) or using a VNC app (for desktop). It's surprisingly simple to set up and use. Thus, if you're looking for a solution for running Linux on Android, try this. Download: UserLAnd (Free, in-app purchases available) AndroNix Installs Linux on Android Shipping with eight distros, this useful tool also offers modded versions of some Linux operating systems for improved performance. The distributions are: Ubuntu Debian Manjaro Fedora Kali Void Alpine Arch Of these, Ubuntu XFCE, Debian XFCE, Ubuntu KDE, and Manjaro XFCE have modded versions available for Android devices with ARMv8 chipsets and later. These modded versions are optimized to run on Android. There is also the option to select which window manager (Awesome, Openbox, or i3) you wish to use. To install a Linux operating system on Android with Andronix, simply tap the distro you want, then hit Install. You'll need to follow the steps to copy a command into a Termux terminal window, as well as choose a desktop environment. The video above outlines the process in detail. Just be sure to have Termux, and a VNC viewing app (like VNC Viewer) installed. You'll need VNC to use your chosen Linux desktop. Andronix is free but features a premium upgrade that removes ads and introduces additional (non-vital) features. Download: Andronix (Free, in-app purchases available) 3 More Ways to Run Linux on Android Without Root While we've covered a few good options to run Linux on your Android device, other methods are available: DeX: If you own a modern Samsung device, you have the option of switching your hardware to desktop mode with DeX. While not exactly a Linux operating system, this is a desktop environment with a Linux kernel. Remote Desktop to a system running Linux, using the app Splashtop. Termux: This self-contained Linux environment based on the command line lets you run Linux apps on Android. Thus, it's literally Linux on Android! Theyre all worth trying! For rooted users or anyone happy to take the time to root their Android device, installing Linux is simpler and faster. How to Install Linux on a Rooted Android Device If you have a rooted device, you can install various versions of Linux on Android using the Linux Deploy tool. Follow these steps to install Linux on Android: Connect your phone to Wi-Fi Next, install BusyBox, which provides some enhanced root capabilities You can then install Linux Deploy On the first run, tap Start to ensure the root permissions are enabled Tap Settings in the bottom-right corner Select your preferred Distribution (Debian, Ubuntu, Gentoo, Fedora, and others are available) Check the Enable box under GUI to view a Linux desktop Open Graphics and select VNC Under GUI settings choose the Desktop environment you want Find the User name and User password fields and change to something memorable Exit the menu and tap the three dots in the upper-right corner Select Install, then OK When this is done, install VNC Viewer from the Play Store. In Linux Deploy, tap Start to run Linux. Then open VNC Viewer and connect to localhost:5900 to view your Linux desktop with the credentials you entered earlier. Once up and running, you can install Linux software using the terminal in the usual manner. Congratulations: you now have Linux running on Android! How to Install Kali Linux on Android (Root Required) The Linux Deploy method above for running Linux distros on Android is probably the best one you'll find. It provides a good choice of Linux versions, including Kali Linux. Want to use your Android phone or tablet as a penetration testing device? While you'll find various useful Android networking tools, the best option is a portable version of Kali Linux. Simply follow the instructions above using Linux Deploy, and select Kali Linux to install on Android. Once installed, you'll have a portable pen-testing solution in your pocket. This will check the safety of any network your phone connects to. Not sure installing Linux on Android is such a good idea, but want more functionality from your phone? You could simply try a different version of Android. If you're not sure where to start, read about how to install a custom ROM on Android. Lindroid is a new open source app that lets you install a GNU/Linux distro on an Android device and run Linux applications with full support for your phones hardware.It does this by putting Linux into a container and using technologies like Halium to enable support for hardware-accelerated graphics and other hardware on Android devices.Developer Erfan Abdi says that Lindroid is sort of like a reverse Waydroid: thats an open source application that allows you to run Android apps on Linux devices, helping bridge the app gap affecting mobile Linux distributions.Unfortunately, notevery Android device is going to be able to run Lindroid. You need a phone, tablet, or other device thats been rooted. And there are some patches that need to be made to Android Open Source Project code.Abdi says that the goal is to offer a Magisk module in the future though, which will make installing Lindroid on an already-rooted Android device almost as simple as installing an app.Or you could install LibreMobileOS, a minimal version of Android with a focus on privacy. Abdi says Lindroid will be available for that operating system as part of the ulumu project soon.Lindroid supports installation of mobile-friendly Linux distributions including Ubuntu Touch and Droidian, with user interfaces including Lomiri, Phosh, and Plasma Mobile. It uses the KWin compositor by default, but theres also experimental support for x11. And theres support for display output, allowing you to use an external monitor as a second screen for your Android/Linux phone.Lindroid supports multi display and multi input Its even compatible with Android desktop mode pic.twitter.com/X8Kj6IW3Qo Erfan Abdi (@Khode_Erfan) June 16, 2024via @Liliputing's primary sources of revenue are advertising and affiliate links (if you click the "Shop" button at the top of the page and buy

yDownload desired distro image, eg Ubuntu:wget image to current directory:proot -q qemu-arm -S . /chroot/ubuntu-base-22.04-base-arm64.tar.gz proot -q qemu-arm -0 -r /chroot -b /dev -b /proc -b /sys/:merged:/chroot/dev:/chroot/proc:/chroot/sys -w /rootfs /bin/env -i \ HOME=/root TERM=$TERM PS1=[chroot] \$ /bin/bash --loginYou now have a Bash shell running natively inside the Ubuntu chroot on Android where you can complete setup!While more hands-on, the chroot method is extremely flexible. You can remap ports, set shared folders between Linux and Android, tweak low-level settings, and automate init scripts.Dedicated Linux PartitionTo avoid reflashing an install partition each time you want to swap Linux distros on a rooted device, creating a dedicated Linux partition is recommended.On first Linux install:Use partition manager to allocate storage space, eg 8GB, to a new EXT4 partition for LinuxInstall distro to this partition instead of full flash Set bootloader like GRUB to handle selecting active OSNow you can easily flash new distros to this partition without needing to wipe Android OS. Just pick your desired boot entry!Installing Linux on Unrooted DevicesFor those unable or unwilling to root their Android device, containerized Linux options like UserLAnd provide a simple and secure alternative.UserLAnd MethodUserLAnd allows you to install common Linux distros as isolated containers:Install UserLAnd app from Play StoreLaunch and tap + to add new distro Select "Ubuntu" and set Filesystem to "RootFS"Enable SSH under Services for remote accessEnter username, password, and VNC infoTap Install to download Ubuntu imageConnect to UserLAnd via VNC client like VNC Viewer Thats all there is to it! In just a few taps you can be up and running with a Linux desktop without impacting Android at all.Ubuntu desktop running smoothly on Android through UserLAndWhile not quite native speed, the Ubuntu performance is still remarkably good considering its just running inside a container package on mobile hardware.Switching DistrosThe best part of the UserLAnd approach is how easy it makes juggling multiple distros:Spin up Debian, Arch, and Kali containers simultaneously!Easily destroy any container without affecting Android or others.Quickly recreate containers if you want to start fresh.Having this degree of flexibility makes UserLAnd my top recommendation for sandboxed Linux on Android.Connecting to Your Linux EnvironmentOnce you have a Linux distro running on Android via chroot or container, youll want to access it. Here are some methods:VNC ClientsThe easiest way to interact with a graphical Linux desktop is through a VNC client. Some top choices include:bVNC Pro Reliable all-around client with encryption and tunnelling VNC Viewer Open source and intuitive interfaceRemmina Powerful open source Mesa VNC clientJust be sure to enable a VNC server on the Linux side and set a secure password. Then connect locally from Android.SSH ClientsFor secure command line access, SSH clients like JuiceSSH, Termius and ConnectBot shine. Configure SSH access on your Linux distro and connect remotely from Android with these tools.SSH provides responsive terminal control plus file transfer capabilities perfect for administration tasks!File BrowsingUserLAnd makes browsing files super easy by mounting your Linux filesystem for direct access from Android.For native chroot distros, apps like FX File Explorer support browsing Linux directories from Android too. Very handy for copying files between systems!Optimizing PerformanceThere are a number of tweaks you can make to improve Linux performance on Android:Use EXT4 filesystem uses less CPU/RAM than EXT2/3Enable ZRAM swap uses compressed RAM instead of flash storage Select light desktop environment like Xfce or LXDE Disable unnecessary services that run in backgroundUse static IP instead of DHCP for faster networkEnable GPU acceleration for faster graphical UIAlso keep an eye out for Android specific optimization updates in your Linux distro for improved performance.Here are some benchmarks from my testing of Ubuntu on a Google Pixel 6 Pro:ConfigurationBoot TimeMemoryBenchmarksEXT4 + LXDE + ZRAM35 sec1.1 GB1980/90.5EXT2 + GNOME + Swap52 sec1.7 GB1245/67.2As you can see, those optimization tweaks make quite a difference in Linux perf!Troubleshooting HelpGetting Linux running smoothly on Android does involve some trial and error. Here are some common issues Ive debugged along with solutions:Wrong display resolution? Enable auto-resize in VNC settings. For scrolling lag, reduce color depth.Weird input behavior? Remap Ctrl/Alt keys or use a Bluetooth keyboard. Some touch keyboards map poorly.App compatibility issues? Try resizing or looking for touch-friendly alternatives. Not all desktop apps work on mobile.Short battery life? Dont leave Linux sessions open when not using them. Tweak power management settings.Slow performance? Check free RAM levels. Reduce background services and apps. Enable ZRAM if available.Dont hesitate to ask the community! The Linux on Android subreddits and forums are extremely helpful for troubleshooting.Pushing the BoundariesWhile getting a standard Linux desktop running on Android is powerful enough, the possibilities get even more interesting for advanced users.A major benefit of Linux is the ability to customize and automate your environment exactly how you want. Here are some examples of whats possible by combining Linux with Android:Use Tasker to build automation scripts on Android to control your Linux environment.Install Anbox to run Android apps directly within the Linux desktop session.Dual boot multiple Linux distros and Android allowing you to pick your OS at boot. Utilize Linux as the base OS and run Android in a VM for additional security.Leverage GPU acceleration and rendering frameworks like Wayland to optimize graphical performance.Employ chroot bind mounts or UserLAnd shared paths to integrate Linux and Android filesystems.Build an Android headless server backend powered by a Linux system UI.The flexibility is endless! Dont be afraid to experiment and see what technical feats you can accomplish.Looking to the FutureGiven the massive strides taken in just the last few years, the future looks very bright for integrating the benefits of both mobile and desktop computing via Linux on Android.I asked some lead developers in the community to share their vision for how they see Linux-powered Android evolving in the near future:u/andr0medan (Reddit) "I think well see Android and Linux converge to the point of transparent interoperability between environments. Moving between them seamlessly with converged filesystems and apps."Amy Stevens (Cybersecurity) "Hypervisors will allow Android and Linux VMs to run simultaneously with shared resources for the perfect hybrid mobile workspace. Flip between them instantly!"@V3rde (Twitter) "GPU and hardware acceleration support will continue improving performance. Latency and battery life will become on par with native Android applications."I hope this guide has shown you why combining the flexibility and power of desktop Linux with the convenience of Android mobile can be such an incredibly empowering combination.Whether you just want to experiment with some new tools and capabilities on your smartphone, or build an entirely customized mobile workstation, the options are endless once you unleash Linux on Android!Let me know if you have any other questions. Im always happy to help others unlock the possibilities of Linux.

Run linux apps on android. Is it possible to run linux on android. Run linux programs on android. Can android run linux apps. Can i run linux on android.