

# Run Ubuntu Linux on Android – Version 2.0

Running a full Linux distro on your Android tablet isn't as dopey as it sounds – but the best technique for doing so has changed. Darren Yates explains what you do.

**A**ndroid tablets have fallen out of favour a bit these days, what with all the big screen phones hitting the market. Yet, they can still be incredibly powerful devices – even the occasional \$99 budget 7-inch model. Last year, we showed you how to install and run a full Linux desktop distro as an app on Android. Since then, the GNUroot app that made it possible hasn't kept up with Android changes, but there's a more recent alternative we think is better. This month, we're showing you this new technique for running Ubuntu 18.04.1 LTS Linux on your Android device – and you don't need root access.

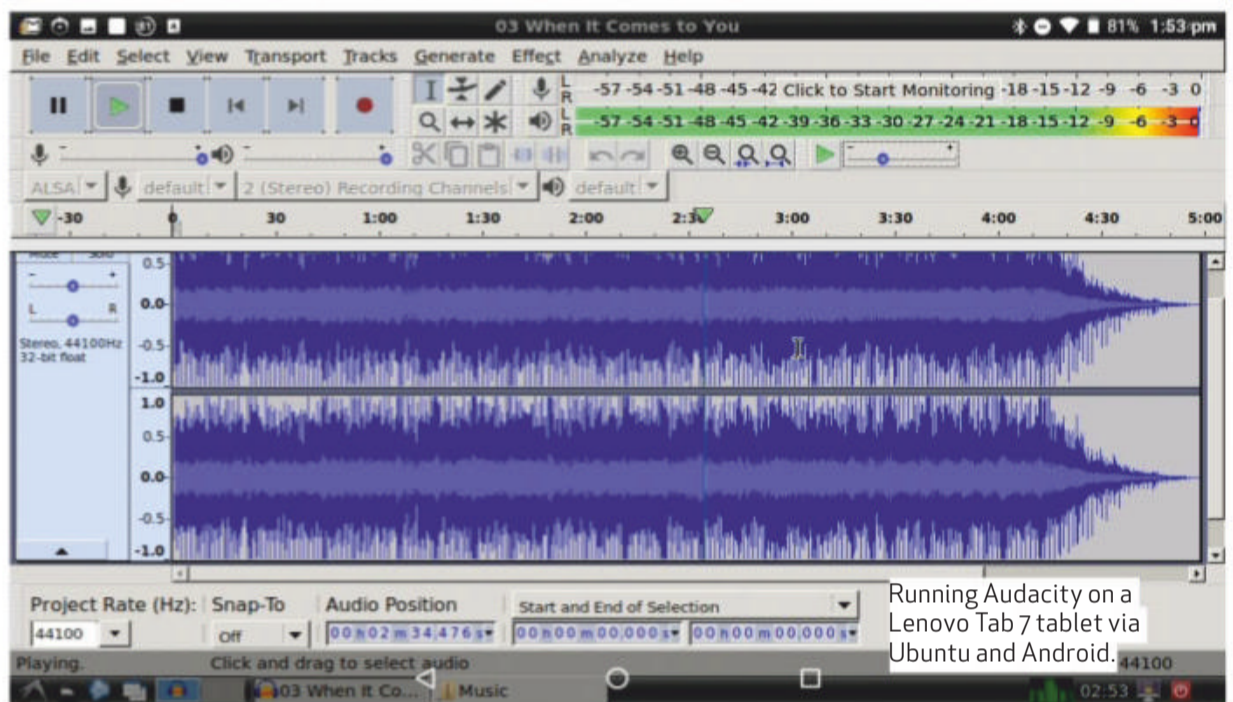
## SURPRISINGLY USEABLE

Now I can hear you lot in the back seats calling out that Android-grade hardware is too slow to run Linux as a virtual machine on Android. And you're right. But we're not running it as a virtual machine – not in the 'VirtualBox' sense, anyway. Instead, we're using a lower-spec chroot environment (actually, a user-space version called 'proot'). That's why we can run an LXDE-based Ubuntu desktop on a \$99 Lenovo Tab 7 Essentials tablet with Android 7.0, a budget quad-core Cortex A35 CPU and have it not be terrible. Sure, it's not PC-fast, but it's certainly useable.

## WHAT YOU NEED

First up, you need an Android tablet (although a phone will work at a pinch), but it should have a quad-core CPU and must have Android 5.0/Lollipop or newer OS. Next, you need to install three apps from Google Play – all of them are free and none of them require root access.

Start with UserLAnd ([tinyurl.com/y8sq23tr](http://tinyurl.com/y8sq23tr)), followed by bVNC ([tinyurl.com/q5staybm](http://tinyurl.com/q5staybm)) and XServer XSDL ([tinyurl.com/mbyjjcx](http://tinyurl.com/mbyjjcx)). When you're ready, launch bVNC, don't make any changes (just let it setup), then launch UserLAnd. When UserLAnd fires up, look over the 'Distribution' List and select 'Ubuntu'. Approve access to your device storage. You'll also be asked to



set a username and password and select a connection type between SSH and VNC. Select VNC, then press 'Continue'. This will now setup the root filesystem and install a core of Linux utilities. When it's complete, bVNC will launch automatically with a small but functional terminal.

## INSTALLING A DESKTOP

Before you do anything else, you should ensure you have the up-to-date distro repository file listings. You do that by running the following in the bVNC terminal:

```
sudo apt-get update
```

Now you're ready to install a desktop environment and the one we recommend

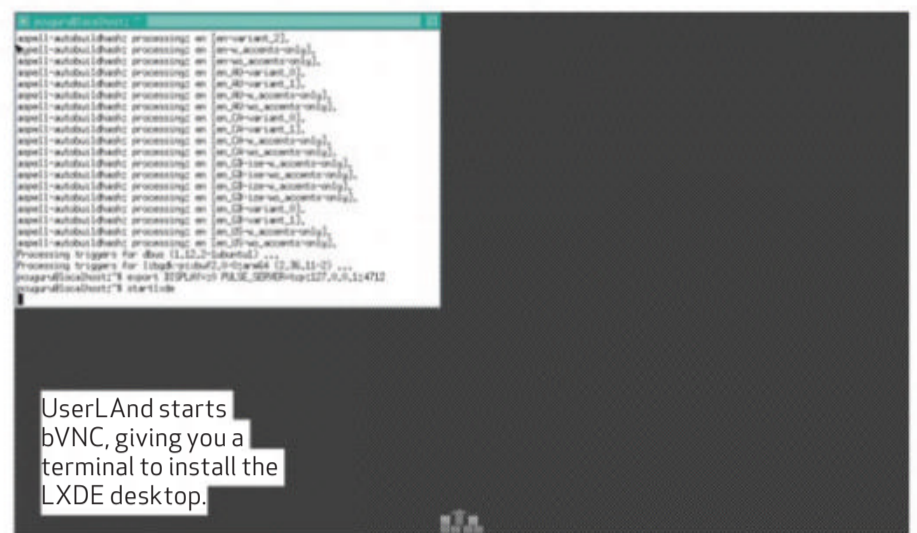
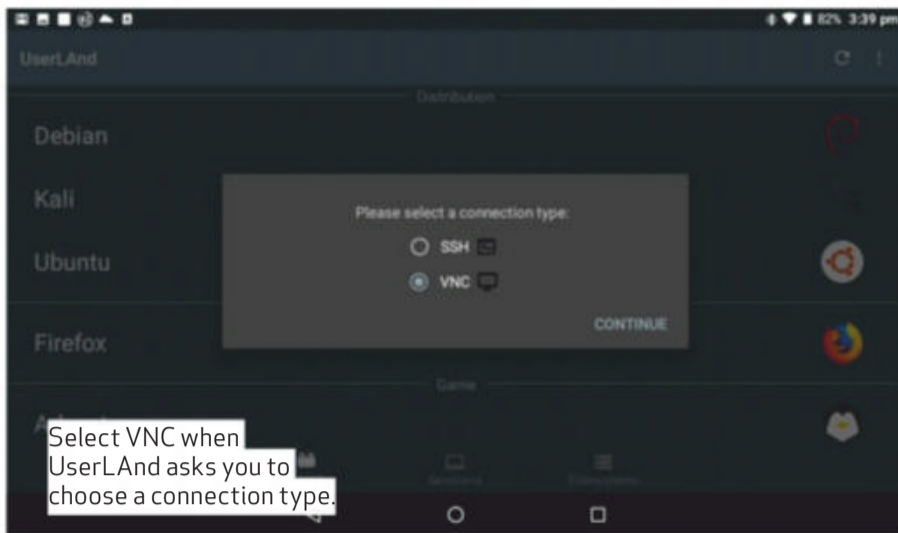
is LXDE. It's a lean, lightweight environment that has a GTK+ look about it like Xfce and GNOME 2, but is ideal for Android tablets. Install the core components using the command:

```
sudo apt-get install lxde-core lxterminal
```

It's a 200MB download and requires 812MB of storage, which actually isn't too bad given what else is available. Download time depends on your network connection.

## SETTING UP THE X WINDOW SERVER

The bVNC app is useful for the basic terminal setup, but we recommend an X



Windows Server. This is the method most Linux desktops use and for Android, XServer XSDL is our choice. Once the above apt-get installs are complete, launch XServer XSDL, just allow it to setup itself and eventually you'll get a blue screen with some code details. The code you need is:

```
export DISPLAY=:0 PULSE_SERVER=tcp:127.0.0.1:4712
```

Type this codeline into the bVNC terminal and press Enter, followed by:

```
startlxde
```

and press Enter again. This launches the LXDE desktop session. However, you won't see any change on-screen until you go back and launch the XServer XSDL app again. After a few seconds, it should begin showing the makings of the LXDE desktop environment.

### BLUETOOTH KEYBOARD/MOUSE

If you haven't already, setting up a Bluetooth keyboard and mouse would be a great idea right about now. Even the Lenovo Tab 7 Essentials tablet happily pairs both devices at once, so you shouldn't have any trouble. Just use Android's Bluetooth device setup procedure and device control will automatically pipe through to Ubuntu.

### ACCESSING ANDROID STORAGE

Another nice feature (although it'll likely raise eyebrows from a security viewpoint) is the fact that the two systems are not totally isolated. You can access your Android storage and files via Ubuntu using the PCManFM file manager. From the LXDE menu, select 'System Tools', 'File Manager PCManFM' and it'll launch to your /home/<username> folder. At top-left, click the green up-level arrow until you get back to the root '/' folder. Open up the '/sdcard' folder and there are your Android folders.

### WHAT YOU GET AND DON'T GET

Now in terms of apps, what you've got at this point is an ultra-lean Ubuntu 18.04.1 LTS desktop setup, with just a

handful of peripheral-function apps installed. However, fire up lxterminal and you have access to the full Ubuntu ARM-class app repository, thanks to the 'apt' command-line tool. You'll find LibreOffice works well, as do lighter options such as GNUMeric (spreadsheet) and Abiword (word processor). You can code using Python 3.6 and IDLE, even run Audacity, giving you a full digital audio workstation.

However, as good as this technique is, what you don't get is access to the device's 3D graphics hardware. Unfortunately, that means no 3D gaming, but more significantly, no web browser. That said, you still have access to your Android device's web browser, so it's not exactly a game-breaker. Download files using the Android web browser and access them in Ubuntu using the file manager in the /sdcard folder.

### DELETING UBUNTU

If you decide to get rid of Ubuntu at some point, uninstall those three initial apps from your Android device – UserLAnd, bVNC and XServer XSDL – and it's all gone. The Linux root filesystem itself is stored by UserLAnd, so uninstalling UserLAnd may take a bit longer, but doing so returns your device to its original pre-Ubuntu setup.

### LINUX ON ANDROID? ABSOLUTELY!

Running a Linux desktop on an Android device might sound daft, but I've already found it extremely useful. Even on a budget tablet, the performance is surprisingly good and although you don't get a web browser or 3D gaming, there are plenty of productivity apps available on the Ubuntu repository to make it worth the effort. And, the whole thing runs as an Android app, so your Android OS remains intact. Great! ■

