

Termux: What Went Wrong and an Implementation Guide

Summary

The initial idea of creating a terminal for an Android code editor using the Termux API faced several problems and insurmountable difficulties. Due to these limitations, it was decided that creating a custom terminal or fully integrating Termux into the application would require disproportionate effort. This document provides a full description of the issues encountered, offering a better understanding of the scenarios in which the Termux API can be effectively utilized.

Initial Concept

The original idea was to implement a terminal for our Android code editor project using Termux — an emulator of a full-fledged Linux terminal for Android. One of its advantages is that it does not require root permissions. The Termux team also developed the Termux API, which is installed as a separate application. Using this API, we planned to simulate a terminal by sending commands that Termux would execute and returning the results to the screen.

Installing Termux API

At the beginning of our implementation, we encountered several issues:

- **Difficulties with initial installation:** If we build a terminal relying on Termux, the user will be required to install both the Termux app and the Termux API. Additionally, both apps must be installed from the same source to have a matching digital signature. This adds extra manual work, as we cannot bundle multiple applications with our own due to [Android's restrictions](#).
- **Difficulties with configuration:** Beyond installation, additional steps are required to use intents with the Termux API. Since we need to receive a response from our command rather than just execute it, we must use an **intent**. This means our application must obtain special permission to send requests to Termux. Furthermore, inside the Termux app, the user must manually edit the `~/.termux/termux.properties` file to allow incoming requests ([more details in the documentation](#)). The Termux developers themselves consider this approach **highly insecure!**
Additionally, the user must allow Termux and Termux API to run in the background in their smartphone settings; otherwise, Android may terminate them at any time. If file access is required, explicit permission must be granted to access storage.

Key Issue

However, the main problem turned out to be a misunderstanding of **RUN_COMMAND**. Initially, based on the documentation and responses, we assumed the following was possible: we would have a command string, send it to a Termux session using **RUN_COMMAND**, and receive its execution result. This would allow us to fully simulate a terminal, such as displaying the current working directory as a prompt at the beginning of each input line.

However, upon deeper investigation, it turned out that this intent does not accept any command as an argument. Instead, it requires a mandatory argument with the misleading name **RUN_COMMAND_SERVICE.EXTRA_COMMAND_PATH**, which actually specifies the path to an executable that the intent will run. This means that we cannot directly send commands to be executed within a single terminal session, as is common in any code editor. Instead, it allows us to run specific scripts or executables with arguments, which can be passed via the request. As a result, fully emulating a Termux terminal through requests is practically impossible.

A possible solution to this problem would be to either write an entire terminal from scratch or integrate all of Termux into our application. However, both of these options would require significantly more work than our main project itself.

Appropriate Use Cases

The Termux API could be useful if we were developing, for example, a dedicated Python compiler or any other predefined shell command. In such cases, we could easily specify all necessary arguments through an intent and even receive a response.

This could be helpful in some scenarios, but we believe that the difficulties with installing and configuring Termux make alternative, more direct methods much more practical.