VR Installation & Build Instructions — RealityLabs (.abk/.apk)

Overview & Assumptions

This document provides step-by-step instructions to build, install, and run a Unity-based VR project (RealityLabs) on common VR headsets (Android-based such as Meta/Quest family, and PC-VR via Link/SteamVR). You asked about an `.abk` file — this guide assumes `.abk` is an Android package similar to `.apk`. If `.abk` is a different format, please let me know and I will adapt the instructions.

Prerequisites

- PC or laptop (Windows recommended for wide support) with USB-C or USB-A and a good USB cable.
- Unity Editor (2020.3 LTS or newer recommended) with Android Build Support if targeting Quest/Android.
- XR Plugins: XR Plugin Management, OpenXR, and/or Oculus XR Plugin (via Unity Package Manager).
- Android Platform Tools (adb) installed (part of Android SDK Platform-Tools) and available in PATH.
- Oculus/Meta Quest headset (Quest 2/3) or other Android-based standalone VR headset OR a PC-VR headset (HTC Vive, Valve Index) for PC builds.
- Oculus mobile app + developer account to enable Developer Mode (for Quest devices).
- Optional: SideQuest (makes sideloading .apk easier) and an internet connection for downloads.

Unity: Prepare & Build (Android / Quest)

1. Open your project in Unity.
2. Install required packages via Window > Package Manager: XR Plugin Management, OpenXR Plugin, Oculus XR Plugin, XR Interaction Toolkit (if used).
3. Edit > Project Settings > XR Plug-in Management: on the 'Android' tab, enable OpenXR or Oculus (follow plugin guidance).
4. Player Settings (Edit > Project Settings > Player) → Other Settings:
5. - Set 'Package Name' (e.g., com.yourname.realitylabs).
6. - Scripting Backend: IL2CPP.
7. - Target Architectures: ARM64 (Quest requires 64-bit builds).
8. - Minimum API Level: prefer Android 7.0+ (API 24+) — modern headsets work best with API 24 or higher.
9. Add the scenes you want to include via File > Build Settings > Scenes In Build.
10. File > Build Settings: select Android, click 'Switch Platform' if needed.
11. Configure 'Publishing Settings' and keystore for a signed build (Player Settings → Publishing Settings).

12. Click 'Build' or 'Build And Run' and export an `.apk` (or `.aab`) file. For Quest, `.apk` is fine for sideloading.

Unity: Prepare & Build (PC VR via Link/SteamVR)

1. In Build Settings choose 'PC, Mac & Linux Standalone' and set target to Windows (x86_64).
2. Ensure VR SDK support is configured (OpenXR + appropriate runtime like SteamVR).
3. Add scenes and build the Windows executable (.exe) and data folder.
4. To run, start SteamVR / Oculus PC app, connect headset via Link/Air Link/USB, then run the built .exe.

Enable Developer Mode on Meta/Quest (required for adb)

- Install the Oculus mobile app on your phone and sign in with the same Oculus account.
- Pair your Quest headset with the app (if not already paired).
- In the app: Menu → Devices → select your headset → Developer Mode → toggle ON.
- If you don't have a developer account, register at developer.oculus.com and follow the steps to enable developer mode.

Install ADB (Android Debug Bridge)

1. Download Android SDK Platform-Tools from the official Android developer website and extract them.
2. Add the platform-tools folder to your system PATH or use the full path to adb in the terminal/command prompt.
3. Verify installation: open terminal and run `adb version` and `adb devices`.

Sideloading the app (USB) — Typical Workflow

1. Connect your headset to the PC using a USB cable. In the headset, accept the 'Allow USB debugging' prompt when it appears.
2. On PC, confirm the device is visible: `adb devices` → you should see a device id listed.
3. Install the APK: `adb install -r path/to/your_app.apk` (use `-r` to replace existing installation).
4. If you have an `.obb` expansion file, push it to the correct folder: `adb push your.obb /sdcard/Android/obb//`.
5. After install, find the app in 'Unknown Sources' inside the headset (usually under Apps → Unknown Sources) and launch it.

Sideloading the app (WiFi) — Optional

1. Connect headset and PC to the same WiFi network (or use the headset's hotspot).
2. Get headset IP address (Headset Settings → About → look for IP address).
3. On PC: `adb tcpip 5555` then `adb connect :5555`.
4. Confirm with `adb devices`, then `adb install -r path/to/your_app.apk`.

Alternative: Use SideQuest (easier for many users)

- Install SideQuest (sidequestvr.com) on your PC and connect the headset via USB.
- Use SideQuest's 'Install APK' button and select your .apk to sideload quickly.
- SideQuest also supports WiFi installs and provides device logs for debugging.

If you have an `.abk` file (non-standard):

- Try to confirm with the file provider whether `.abk` is an APK/Android package or a custom bundle.
- If it's actually an `.apk` renamed to `.abk`, make a copy and rename `filename.abk` → `filename.apk` and attempt install via adb/SideQuest.
- If rename fails or installer rejects the file, request the proper `.apk` or installation instructions from the vendor.

Build & Run from Unity Editor (quick)

1 In Unity: File → Build Settings → select target platform (Android) → ensure scenes are added → click 'Build And Run'.

2 Unity will build the APK and attempt to install it on any connected device (requires adb available and headset in developer mode).

Command-line Unity build (example)

```
/path/to/Unity -quit -batchmode -projectPath "/path/to/Project" -executeMethod
BuildScript.PerformBuild -buildTarget Android -logFile build.log
```

Troubleshooting (common issues & fixes)

• `adb` shows 'unauthorized' or no devices

→ Accept the USB debugging prompt inside the headset or reinstall adb drivers on Windows. Revoke USB debugging in headset Developer Options and reconnect.

• Installation fails due to signing conflicts

→ Uninstall previous app version or use `adb install -r --allow-downgrade your_app.apk`. Ensure keystore signing is consistent.

• Build fails: 'ARM64 required' or 'Missing IL2CPP'

→ Enable ARM64 in Player Settings and set Scripting Backend to IL2CPP. Install Android NDK if required by Unity.

• App crashes on launch

→ Check device logs with `adb logcat` or SideQuest's log viewer. Look for missing permissions or plugin errors.

• Network issues in hostel

→ If hostel WiFi blocks device-to-device connections, use a phone hotspot or USB connection for adb installs.

Hostel-specific tips & deployment checklist

- Check hostel/network policies before using shared WiFi. Use a mobile hotspot if required.
- Bring a long USB cable and a power strip/extension; charging points may be limited.
- Schedule demonstration when the area is quiet; sanitize headsets between users.
- Keep a backup power bank and a PC with prepared builds to avoid delays.
- Prepare a short demo script and sample inputs so testing is consistent.

Safety, Privacy & Legal

This project is for research/demo purposes only. If the app collects or processes personal data (images), ensure informed consent and follow local privacy laws. This tool is NOT a substitute for clinical diagnosis. Add medical disclaimer in-app and in your README.

Quick Command Reference

- `adb devices` — list connected devices
- `adb install -r path/to/app.apk` — install or replace APK
- `adb uninstall ` — remove existing app
- `adb logcat` — view device logs for debugging
- `adb push file /sdcard/...` — copy files to headset storage
- `adb connect :5555` — connect to device over WiFi

Appendix: Example workflow (summary)

1 1) Build APK from Unity (Android, ARM64, IL2CPP).

2 2) Enable Developer Mode on Quest via mobile app.

3 3) Connect headset to PC via USB and accept debugging prompt.

4 4) `adb install -r path/to/app.apk` and launch app from 'Unknown Sources'.

5 5) If desired, set up WiFi adb for future installs `adb tcpip 5555` → `adb connect `.

Contact & Next Steps

If you'd like, I can: (a) customize this guide for a specific headset model (Quest 2, Quest Pro, Vive, Index), (b) generate a step-by-step script for automated adb installs, or (c) produce a short one-page quick-start cheat sheet for distribution in the hostel.

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