Android Internals Training

Duration: **5 Day**

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Overview

This 5-day course, based on Jonathan Levin's *Android Internals* books, delves into the architecture and implementation of Android. Participants will explore Android's features, its relationship to Linux, and how it diverges with its own unique 'Android-isms.' The course covers Android subsystems like the Dalvik Virtual Machine, Android Runtime (ART), Binder IPC, Hardware Abstraction Layer (HAL), and more. It combines theory with hands-on exercises to provide a deep understanding of Android's architecture from both the user-mode and kernel-mode levels.

Prerequisites

- Strong knowledge of Android development or implementation.
- Experience in reverse engineering or security research.
- A rooted Android device (recommended Android 10 or higher) and a Linux host (VMs can be provided).
- Familiarity with Linux and Android systems.

Target Audience

- Experienced Android developers or implementers.
- Security researchers interested in the internals of the Android OS.

This course is not suitable for user-mode developers focused on Android GUI applications, but it serves as an excellent follow-up for those already familiar with the Android SDK.

What You Will Learn

- Describe the architecture of the Android operating system.
- Understand the similarities and differences between Linux and Android.
- Trace the core architectural changes from Android Froyo (2.2) to Android 13.0.
- Understand the functions and architecture of the Android kernel.
- Reverse engineer Android applications.
- Monitor, trace, and intercept inter-process communication (IPC) in Android.
- Gain a deep understanding of DEX, ART, and OAT formats.
- Learn to use free tools such as Dextra, bindump, and jtrace.
- Analyse Android security, its evolution, and weaknesses.