

# ANDROID INTERNALS

 5-Day course

## COURSE DESCRIPTION

The **Android Internals** course builds on the foundation established in the Intro to Android Programming course. This course dives deeper into the Android operating system to explore concepts such as the internals of APKs, the Package Manager, the Activity Manager, Zygote, Android Services, RILD, HAL, and WiFi. Students who take this course will learn advanced architectural concepts of the Android operating system as well as develop native applications that interface with many different components of an Android device. Students will also learn how to analyze and reverse engineer APKs.

Workstations, Android devices, and all required technical documentation will be provided.

*Prerequisites: Students should have a bachelor's degree in Computer Science, Computer Engineering, or equivalent experience. Students should also have taken our Intro to Android Programming course or have sufficient experience in Android development*



## OS Internals and Security

Become certified in Android Internals as well as security topics within the Android OS.



## Application Development

Provides hands-on experience with both application and native app development.



## Cyber Security Research

A premier offering of ACTP aimed at cyber security researchers and programmers.

## AGENDA COURSE CONTENT

### DAY 1

- Decompiling and reverse engineering APKs
- APKs: structure, format, build process, manifest files, .dex and .odex files, signing process
- Package Manager internals
- Activity Manager internals
- Cross-app permission use

### DAY 2

- Zygote internals
- Android Service architecture
- Manually spawning APKs
- Tracing system server requests
- Bypassing permission checks

### DAY 3

- Boot internals
- Booting unpacking/repacking
- Init internals
- RILD internals
- RILD filtering

### DAY 4

- HAL internals
- WiFi internals
- Custom HAL module
- Direct WiFi access

### DAY 5

- Android security model in depth
  - Linux permissions
  - Linux capabilities
  - Linux secbpf
  - SELinux (SEAndroid)

**Exam and certification/completion**

*\*The full course syllabus is available upon request*

ACTP-CS-ANDINT-20250912