

# XWhy Permission-Gaps Occur in Android Applications, their Effects, and How they can be Prevented.X

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## ABSTRACT

Abstract

## 1. INTRODUCTION

## 2. RESEARCH QUESTIONS

**RQX:** *What are the most pervasive overprivileges?*

Blah

**RQX:** *What is the variation of risks across genres?*

Blah

**RQX:** *How does code quality ?*

Blah

**RQX:** *What causes apps to be under prived? ?*

Blah

**RQX:** *Why do over privs occur and what can be done to prevent them?*

Blah

**RQX:** *How does code quality, and the vulnerability of apps compare over time ?*

Blah

**RQX:** *Do developers ever remove permissions?*

Look at commit histories and app histories to see if developers ever add permissions to apps and then remove them.

**RQX:** *What functionality additions cause over privs?*

## 3. ANDROID APPLICATIONS

blah

## 4. APP COLLECTION & STATIC ANALYSIS

## 5. EVALUATION

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Table 1: Rate of Over Privs for 3 versions

Version Group	Over Privs	Permissions	Oprivs/Perm
1	193	1559	1.238
2	199	1623	1.226
3	220	1655	1.329

### 5.1 OverPriv Rate

We next sought to determine if applications have more permissions added throughout the development process. In order to evaluate this, we looked at the commit histories for AndroidManifest.xml files and counted the number of permissions in each commit of the file. We then looked at commits 1-X of the files in increments of X. We found that..

Our findings are shown in Figure X:

- looked at X apps to provide enough detail - Looked at the same X apps for X versions

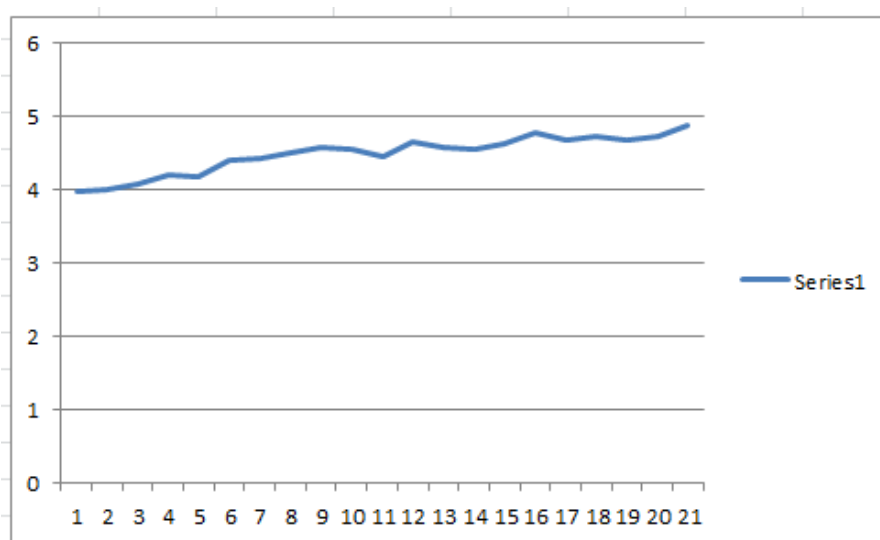
Table 2: Applications With Overprivileges

$\geq$ OverPrivs	%Apps		
	$\geq$ 10K	< 10K	F-Droid
1	X	X	X
2	X	X	X
3	X	X	X
4	X	X	X
5	X	X	X
6	X	X	X
7	X	X	X
8	X	X	X
9	X	X	X
10	X	X	X
10+	X	X	X

[Version\_order is not correct in the queries and needs to be fixed.]

### 5.2 Overpriv Analysis

[Look at some specific apps here and do more of an in depth analysis] In order to better understand why over privileges & vulnerabilities occur in Android applications, we selected several open source Android apps from the F-Droid data set and analyzed their development process by examining both their Git histories, application version his-



# of permissions/commit (temp data)

	Count	VersionGroup	avgOPriv	avgPermCount	avgFRisk	OPrivRatio	NCLOC	Functions	Violations	BlockerViolations	CriticalViolations	MajorViolations	MinorViolations
1	392	1	0.49	3.98	3.18	1.2	8815.7	674.7	1510.6	8.5	10.0	999.9	478.6
2	392	2	0.51	4.14	3.14	1.2	9023.1	694.2	1501.7	8.9	9.8	981.5	487.3
3	392	3	0.56	4.22	3.22	1.3	9010.4	684.9	1494.2	8.8	9.9	979.8	481.4

Figure 1: Average Results for each group

tories, and the source code of each app. We chose apps that were reasonably popular and.... We will discuss the X selected apps below

<https://github.com/AndroSec/VersionControlExtractor.git>  
2048

## 6. SECURITY & USER RATINGS

## 7. RECOMMENDATIONS

## 8. PUBLICLY AVAILABLE DATASET

## 9. LIMITATIONS

## 10. RELATED WORK

## 11. CONCLUSION

## References

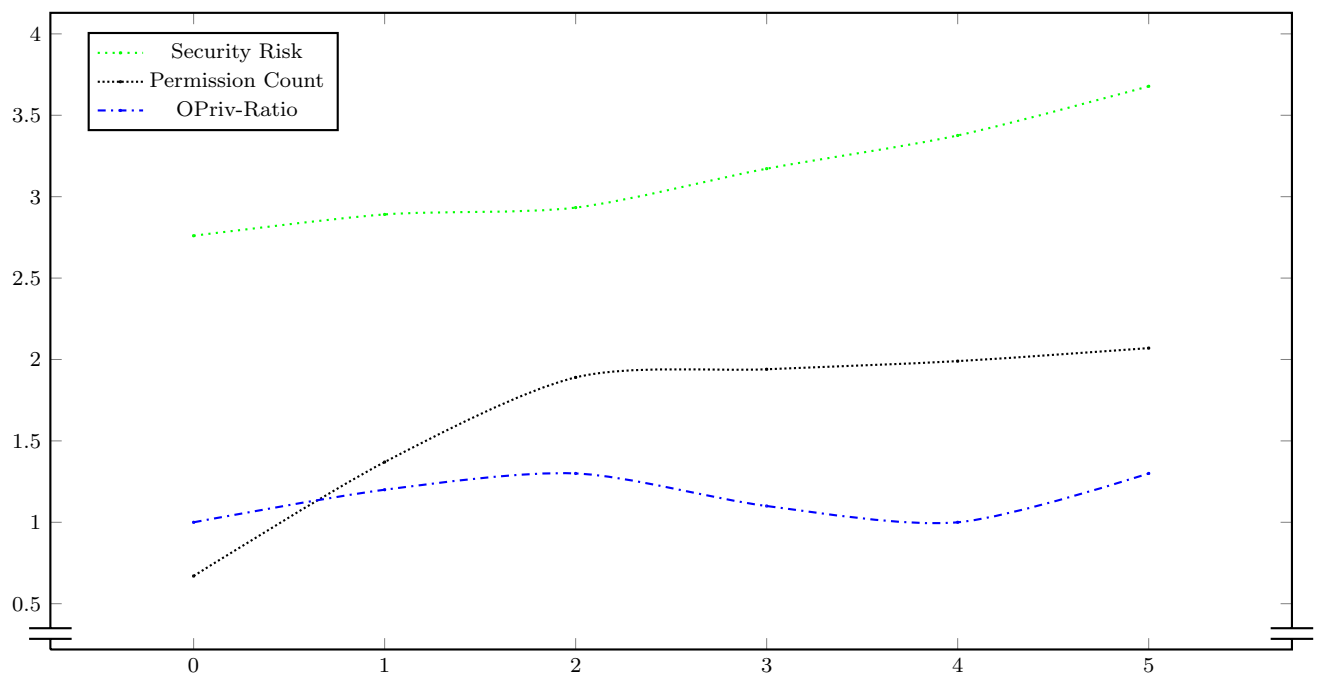


Figure 2: Maturity and Metrics (RQX) - Needs to be updated