ANDROID STATIC ANALYSIS REPORT

Chess (8.9.5)

File Name:	installer3768.apk
Package Name:	jwtc.android.chess
Scan Date:	May 31, 2022, 6:20 p.m.
App Security Score:	50/100 (MEDIUM RISK)
Grade:	B

FINDINGS SEVERITY

HIGH	MEDIUM	INFO	SECURE	HOTSPOT
1	19	1	1	1

FILE INFORMATION

File Name: installer3768.apk
Size: 3.19MB
MD5: 4b6dc75295a65e9ea4d89649dd823005
SHA1: ad029b3a2d6d7a5aa58fcb0d7a54b45f95b40e33
SHA256: c7329d6031b20bfe2e9159a97749eb6473b818d72599cd45f70f0e14699b514e

APP INFORMATION

App Name: Chess
Package Name: jwtc.android.chess
Main Activity: jwtc.android.chess.start
Target SDK: 28
Min SDK: 14
Max SDK:
Android Version Name: 8.9.5
Android Version Code: 156

APP COMPONENTS

Activities: 17
Services: 0
Receivers: 0
Providers: 2
Exported Activities: 14
Exported Services: 0
Exported Receivers: 0
Exported Providers: 0

CERTIFICATE INFORMATION

APK is signed
v1 signature: True
v2 signature: False
v3 signature: False
Found 1 unique certificates
Subject: C=UK, ST=ORG, L=ORG, O=fdroid.org, OU=FDroid, CN=FDroid
Signature Algorithm: rsassa_pkcs1v15
Valid From: 2014-08-31 04:46:05+00:00
Valid To: 2042-01-16 04:46:05+00:00
Issuer: C=UK, ST=ORG, L=ORG, O=fdroid.org, OU=FDroid, CN=FDroid
Serial Number: 0xb9cf784
Hash Algorithm: sha256
md5: 7ab2718c19bc8dc1e427405b5299978b
sha1: 69d01756c91e64687bf8787216d330823dab0b2b
sha256: e0c0cbdeebe74a7bb65a409c509d248b875b84cad3bd59c1debf013f30037fba
sha512: 635cbcfab3f8c7b15e17401e94d9d2fe8e25302069f839ac611dd731fd408cc7731acefea7676a1318b443f4919af530baf73f4d697322dd841d8a0b575c58d6

TITLE	SEVERITY	DESCRIPTION
Signed Application	info	Application is signed with a code signing certificate

TITLE	SEVERITY	DESCRIPTION
Application vulnerable to Janus Vulnerability	high	Application is signed with v1 signature scheme, making it vulnerable to Janus vulnerability on Android 5.0-8.0, if signed only with v1 signature scheme. Applications running on Android 5.0-7.0 signed with v1, and v2/v3 scheme is also vulnerable.

APPLICATION PERMISSIONS

PERMISSION	STATUS	INFO	DESCRIPTION
android.permission.WAKE_LOCK	normal	prevent phone from sleeping	Allows an application to prevent the phone from going to sleep.
android.permission.FULLSCREEN	unknown	Unknown permission	Unknown permission from android reference
android.permission.WRITE_EXTERNAL_STORAGE	dangerous	read/modify/delete external storage contents	Allows an application to write to external storage.
android.permission.INTERNET	normal	full Internet access	Allows an application to create network sockets.
android.permission.ACCESS_NETWORK_STATE	normal	view network status	Allows an application to view the status of all networks.
android.permission.VIBRATE	normal	control vibrator	Allows the application to control the vibrator.

APKID ANALYSIS

<table>
<tr><th>FILE</th><th>DETAILS</th></tr>
<tr><td>classes.dex</td><td><table><tr><th>FINDINGS</th><th>DETAILS</th></tr><tr><td>Compiler</td><td>r8</td></tr></table></td></tr>
</table>

NETWORK SECURITY

NO	SCOPE	SEVERITY	DESCRIPTION

MANIFEST ANALYSIS

NO	ISSUE	SEVERITY	DESCRIPTION
1	Application Data can be Backed up [android:allowBackup] flag is missing.	warning	The flag [android:allowBackup] should be set to false. By default it is set to true and allows anyone to backup your application data via adb. It allows users who have enabled USB debugging to copy application data off of the device.
2	Activity (jwtc.android.chess.main) is not Protected. An intent-filter exists.	warning	An Activity is found to be shared with other apps on the device therefore leaving it accessible to any other application on the device. The presence of intent-filter indicates that the Activity is explicitly exported.
3	Activity (jwtc.android.chess.options) is not Protected. An intent-filter exists.	warning	An Activity is found to be shared with other apps on the device therefore leaving it accessible to any other application on the device. The presence of intent-filter indicates that the Activity is explicitly exported.

NO	ISSUE	SEVERITY	DESCRIPTION
4	Activity (jwtc.android.chess.mainPrefs) is not Protected. An intent-filter exists.	warning	An Activity is found to be shared with other apps on the device therefore leaving it accessible to any other application on the device. The presence of intent-filter indicates that the Activity is explicitly exported.
5	Activity (jwtc.android.chess.setup) is not Protected. An intent-filter exists.	warning	An Activity is found to be shared with other apps on the device therefore leaving it accessible to any other application on the device. The presence of intent-filter indicates that the Activity is explicitly exported.
6	Activity (jwtc.android.chess.GamesListView) is not Protected. An intent-filter exists.	warning	An Activity is found to be shared with other apps on the device therefore leaving it accessible to any other application on the device. The presence of intent-filter indicates that the Activity is explicitly exported.
7	Activity (jwtc.android.chess.puzzle.puzzle) is not Protected. An intent-filter exists.	warning	An Activity is found to be shared with other apps on the device therefore leaving it accessible to any other application on the device. The presence of intent-filter indicates that the Activity is explicitly exported.
8	Activity (jwtc.android.chess.puzzle.puzzlePrefs) is not Protected. An intent-filter exists.	warning	An Activity is found to be shared with other apps on the device therefore leaving it accessible to any other application on the device. The presence of intent-filter indicates that the Activity is explicitly exported.
9	Activity (jwtc.android.chess.puzzle.practice) is not Protected. An intent-filter exists.	warning	An Activity is found to be shared with other apps on the device therefore leaving it accessible to any other application on the device. The presence of intent-filter indicates that the Activity is explicitly exported.
10	Activity (jwtc.android.chess.ics.ICSClient) is not Protected. An intent-filter exists.	warning	An Activity is found to be shared with other apps on the device therefore leaving it accessible to any other application on the device. The presence of intent-filter indicates that the Activity is explicitly exported.

NO	ISSUE	SEVERITY	DESCRIPTION
11	Activity (jwtc.android.chess.ics.ICSPrefs) is not Protected. An intent-filter exists.	warning	An Activity is found to be shared with other apps on the device therefore leaving it accessible to any other application on the device. The presence of intent-filter indicates that the Activity is explicitly exported.
12	Activity (jwtc.android.chess.ics.CustomCommands) is not Protected. An intent-filter exists.	warning	An Activity is found to be shared with other apps on the device therefore leaving it accessible to any other application on the device. The presence of intent-filter indicates that the Activity is explicitly exported.
13	Activity (jwtc.android.chess.tools.pgntool) is not Protected. An intent-filter exists.	warning	An Activity is found to be shared with other apps on the device therefore leaving it accessible to any other application on the device. The presence of intent-filter indicates that the Activity is explicitly exported.
14	Activity (jwtc.android.chess.tools.FileListView) is not Protected. An intent-filter exists.	warning	An Activity is found to be shared with other apps on the device therefore leaving it accessible to any other application on the device. The presence of intent-filter indicates that the Activity is explicitly exported.
15	Activity (jwtc.android.chess.tools.importactivity) is not Protected. An intent-filter exists.	warning	An Activity is found to be shared with other apps on the device therefore leaving it accessible to any other application on the device. The presence of intent-filter indicates that the Activity is explicitly exported.

CODE ANALYSIS

NO	ISSUE	SEVERITY	STANDARDS	FILES
				jwtc/android/chess/ChessViewBase.java jwtc/android/chess/ChessPreferences.java

NO	ISSUE	SEVERITY	STANDARDS	FILES
1	The App logs information. Sensitive information should never be logged.	info	CWE: CWE-532: Insertion of Sensitive Information into Log File OWASP MASVS: MSTG-STORAGE-3	jwtc/android/chess/puzzle/ChessViewPractice.java jwtc/android/chess/tools/PGNProcessor.java jwtc/chess/algorithm/UCIWrapper.java jwtc/android/chess/tools/importactivity.java jwtc/android/chess/ChessImageView.java jwtc/android/chess/setup.java jwtc/chess/GameControl.java jwtc/android/chess/ics/ICSGameOverDlg.java jwtc/android/chess/ChessView.java jwtc/android/chess/ics/ICSChessView.java jwtc/android/timeseal/TimesealingSocket.java com/kalab/chess/enginesupport/ChessEngine.java jwtc/chess/ChessPuzzleProvider.java jwtc/android/chess/ics/TelnetSocket.java jwtc/android/chess/GamesListView.java jwtc/android/chess/ics/ICSMatchDlg.java jwtc/android/chess/main.java com/kalab/chess/enginesupport/ChessEngineResolver.java jwtc/android/chess/puzzle/ChessViewPuzzle.java jwtc/android/chess/MyBaseActivity.java jwtc/android/chess/puzzle/puzzle.java jwtc/android/chess/tools/pgntool.java

NO	ISSUE	SEVERITY	STANDARDS	FILES
				jwtc/chess/JNI.java jwtc/android/chess/ics/ICSClient.java jwtc/android/chess/start.java jwtc/chess/PGNProvider.java com/kalab/chess/enginesupport/ChessEngineProvider.java
2	[App can read/write to External Storage. Any App can read data written to External Storage.]	warning	CWE: CWE-276: Incorrect Default Permissions OWASP Top 10: M2: Insecure Data Storage OWASP MASVS: MSTG-STORAGE-2	jwtc/android/chess/tools/FileListView.java jwtc/android/chess/main.java jwtc/android/chess/tools/pgntool.java jwtc/android/chess/ics/ICSClient.java
3	App uses SQLite Database and execute raw SQL query. Untrusted user input in raw SQL queries can cause SQL Injection. Also sensitive information should be encrypted and written to the database.	warning	CWE: CWE-89: Improper Neutralization of Special Elements used in an SQL Command ('SQL Injection') OWASP Top 10: M7: Client Code Quality	jwtc/chess/ChessPuzzleProvider.java jwtc/chess/PGNProvider.java
4	Files may contain hardcoded sensitive information like usernames, passwords, keys etc.	warning	CWE: CWE-312: Cleartext Storage of Sensitive Information OWASP Top 10: M9: Reverse Engineering OWASP MASVS: MSTG-STORAGE-14	jwtc/android/chess/ics/TimesealingSocket.java

SHARED LIBRARY BINARY ANALYSIS

NO	SHARED OBJECT	NX	STACK CANARY	RELRO	RPATH	RUNPATH	FORTIFY	SYMBOLS STRIPPED

NO	SHARED OBJECT	NX	STACK CANARY	RELRO	RPATH	RUNPATH	FORTIFY	SYMBOLS STRIPPED
1	lib/armeabi-v7a/libchess-jni.so	True info The shared object has NX bit set. This marks a memory page non-executable making attacker injected shellcode non-executable.	True info This shared object has a stack canary value added to the stack so that it will be overwritten by a stack buffer that overflows the return address. This allows detection of overflows by verifying the integrity of the canary before function return.	Full RELRO info This shared object has full RELRO enabled. RELRO ensures that the GOT cannot be overwritten in vulnerable ELF binaries. In Full RELRO, the entire GOT (.got and .got.plt both) is marked as read-only.	None info The shared object does not have run-time search path or RPATH set.	None info The shared object does not have RUNPATH set.	False warning The shared object does not have any fortified functions. Fortified functions provides buffer overflow checks against glibc's commons insecure functions like strcpy, gets etc. Use the compiler option -D_FORTIFY_SOURCE=2 to fortify functions.	True info Symbols are stripped.

NO	SHARED OBJECT	NX	STACK CANARY	RELRO	RPATH	RUNPATH	FORTIFY	SYMBOLS STRIPPED
2	lib/x86/libchess-jni.so	True info The shared object has NX bit set. This marks a memory page non-executable making attacker injected shellcode non-executable.	True info This shared object has a stack canary value added to the stack so that it will be overwritten by a stack buffer that overflows the return address. This allows detection of overflows by verifying the integrity of the canary before function return.	Full RELRO info This shared object has full RELRO enabled. RELRO ensures that the GOT cannot be overwritten in vulnerable ELF binaries. In Full RELRO, the entire GOT (.got and .got.plt both) is marked as read-only.	None info The shared object does not have run-time search path or RPATH set.	None info The shared object does not have RUNPATH set.	False warning The shared object does not have any fortified functions. Fortified functions provides buffer overflow checks against glibc's commons insecure functions like strcpy, gets etc. Use the compiler option -D_FORTIFY_SOURCE=2 to fortify functions.	True info Symbols are stripped.

NO	SHARED OBJECT	NX	STACK CANARY	RELRO	RPATH	RUNPATH	FORTIFY	SYMBOLS STRIPPED
3	lib/arm64-v8a/libchess-jni.so	True info The shared object has NX bit set. This marks a memory page non-executable making attacker injected shellcode non-executable.	True info This shared object has a stack canary value added to the stack so that it will be overwritten by a stack buffer that overflows the return address. This allows detection of overflows by verifying the integrity of the canary before function return.	Partial RELRO warning This shared object has partial RELRO enabled. RELRO ensures that the GOT cannot be overwritten in vulnerable ELF binaries. In partial RELRO, the non-PLT part of the GOT section is read only but .got.plt is still writeable. Use the option -z,relro,-z,now to enable full RELRO.	None info The shared object does not have run-time search path or RPATH set.	None info The shared object does not have RUNPATH set.	False warning The shared object does not have any fortified functions. Fortified functions provides buffer overflow checks against glibc's commons insecure functions like strcpy, gets etc. Use the compiler option -D_FORTIFY_SOURCE=2 to fortify functions.	True info Symbols are stripped.

NO	SHARED OBJECT	NX	STACK CANARY	RELRO	RPATH	RUNPATH	FORTIFY	SYMBOLS STRIPPED
4	lib/x86_64/libchess-jni.so	True info The shared object has NX bit set. This marks a memory page non-executable making attacker injected shellcode non-executable.	True info This shared object has a stack canary value added to the stack so that it will be overwritten by a stack buffer that overflows the return address. This allows detection of overflows by verifying the integrity of the canary before function return.	Full RELRO info This shared object has full RELRO enabled. RELRO ensures that the GOT cannot be overwritten in vulnerable ELF binaries. In Full RELRO, the entire GOT (.got and .got.plt both) is marked as read-only.	None info The shared object does not have run-time search path or RPATH set.	None info The shared object does not have RUNPATH set.	False warning The shared object does not have any fortified functions. Fortified functions provides buffer overflow checks against glibc's commons insecure functions like strcpy, gets etc. Use the compiler option -D_FORTIFY_SOURCE=2 to fortify functions.	True info Symbols are stripped.

NIAP ANALYSIS v1.3

NO	IDENTIFIER	REQUIREMENT	FEATURE	DESCRIPTION

NO	IDENTIFIER	REQUIREMENT	FEATURE	DESCRIPTION
1	FCS_STO_EXT.1.1	Security Functional Requirements	Storage of Credentials	The application does not store any credentials to non-volatile memory.
2	FCS_CKM_EXT.1.1	Security Functional Requirements	Cryptographic Key Generation Services	The application generate no asymmetric cryptographic keys.
3	FDP_DEC_EXT.1.1	Security Functional Requirements	Access to Platform Resources	The application has access to ['network connectivity'].
4	FDP_DEC_EXT.1.2	Security Functional Requirements	Access to Platform Resources	The application has access to no sensitive information repositories.
5	FDP_NET_EXT.1.1	Security Functional Requirements	Network Communications	The application has user/application initiated network communications.
6	FDP_DAR_EXT.1.1	Security Functional Requirements	Encryption Of Sensitive Application Data	The application implement functionality to encrypt sensitive data in non-volatile memory.
7	FMT_MEC_EXT.1.1	Security Functional Requirements	Supported Configuration Mechanism	The application invoke the mechanisms recommended by the platform vendor for storing and setting configuration options.
8	FTP_DIT_EXT.1.1	Security Functional Requirements	Protection of Data in Transit	The application does encrypt some transmitted data with HTTPS/TLS/SSH between itself and another trusted IT product.

DOMAIN MALWARE CHECK

DOMAIN	STATUS	GEOLOCATION
www.freechess.org	ok	**IP:** 54.39.129.129 **Country:** Canada **Region:** Quebec **City:** Montreal **Latitude:** 45.508839 **Longitude:** -73.587807 **View:** Google Map
chart.apis.google.com	ok	**IP:** 142.251.39.110 **Country:** United States of America **Region:** California **City:** Mountain View **Latitude:** 37.405991 **Longitude:** -122.078514 **View:** Google Map

HARDCODED SECRETS

POSSIBLE SECRETS
"ics_client_password" : "Password"
"ics_client_password" : "Passwort"
"ics_client_password" : "密码"
"ics_client_password" : "Contraseña"
"ics_client_password" : "Password"

POSSIBLE SECRETS
"ics_client_password" : "Senha"
"ics_client_password" : "Пароль"

Report Generated by - MobSF v3.5.2 Beta

Mobile Security Framework (MobSF) is an automated, all-in-one mobile application (Android/iOS/Windows) pen-testing, malware analysis and security assessment framework capable of performing static and dynamic analysis.