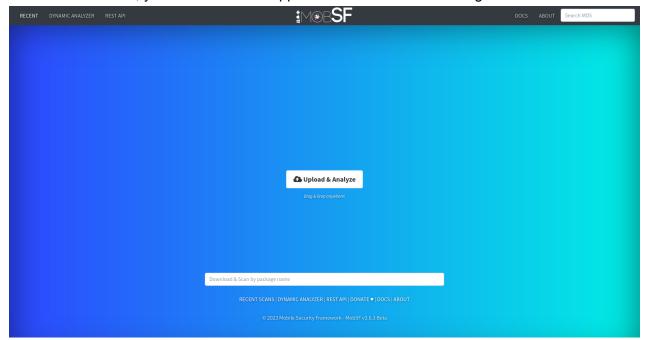
MOBSF DEMO

Installation: https://allabouttesting.org/quick-tutorial-mobsf-installation-on-linux-windows/

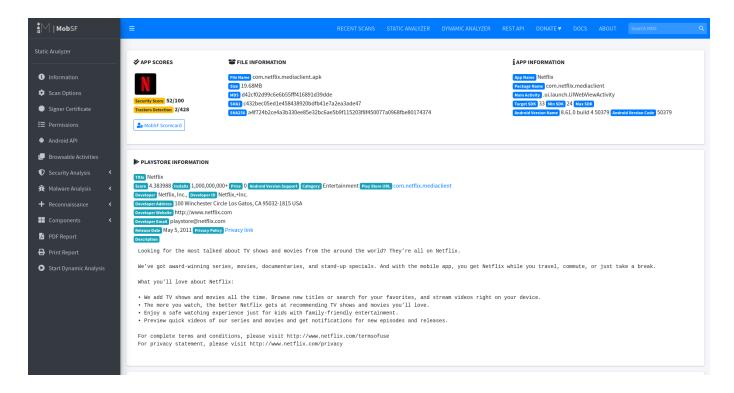
After the installation, you can launch the application and see the following interface.



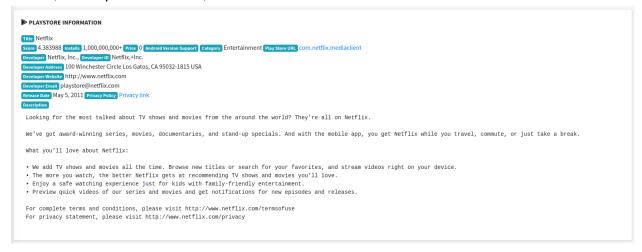
As you can see, there is a button we can use to upload an apk to analyze. We can also specify the name of the package we want to analyze, and MobSF will download it for us from apktada.com.

As a sample application, we will analyze the netflix app. After the analysis ends, we can start inspecting the report.

First, we can see the general information of the application: the file name, various hashes, as well as its main activity and the versions of the android SDK it uses. On the left side of the page, there is a menu which lists the different sections of the report: first, there are some sections with general information, then there are specific sections related to the app security and the malware analysis.



Moving on, we can find the Play Store information section. This section contains all the information MobSF fetched from the Play Store, such as the number of downloads, number of installs, developer information, and so on.



The next section is a summary about the various components of the app: it reports the number of components for each type (Activity, BroadcastReceiver, Service and Provider), as well as the number of exported components. This gives us an idea about the entry points we could use to find vulnerabilities in the app.

Next, we can see the decompiled code section. This section provides us with links we can use to access the files that were decompiled from the app, which we can use for manual analysis.

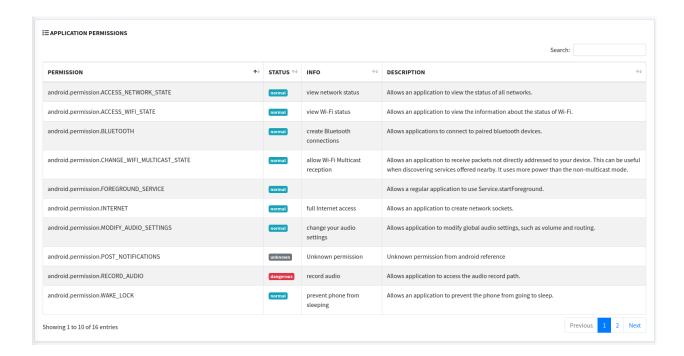
For example, clicking on the View AndroidManifest.xml button we can have a look at the extracted manifest of the application.



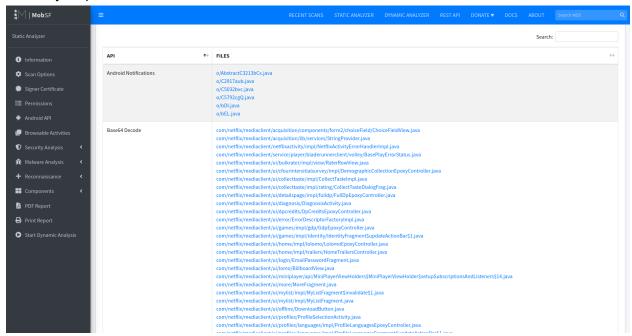
In the signer certificate section, MobSF reports all the information contained in the app certificate. This information can be useful to detect potential repackaged APK files, since we can compare the info reported on the apk with the developer info. In the security analysis section, MobSF performs some additional analysis on the app certificate, which we will see in a bit.



The application permissions section lists all the permissions declared by the application. We can also sort the permissions by protection level (e.g. normal, dangerous), so that we see all the dangerous permissions used by the app. In this case, we can see that the app uses the RECORD_AUDIO and the WRITE_EXTERNAL_STORAGE dangerous permissions. The information in this section is useful to understand if an application declares some unexpected permissions: if for example a notes app declares the FINE_LOCATION permission, it may be an indication of some unwanted data collection.

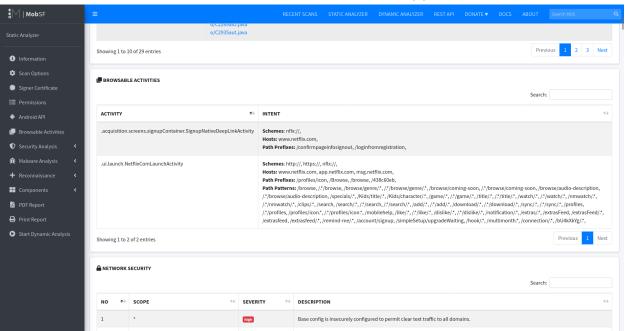


The next section is the Android API section, which lists what kind of APIs are used by the app. For example, in this case, we see that the Netflix app uses some notification API. On the right we can also see the list of files where such operations were detected, which we can click to manually inspect the affected code.

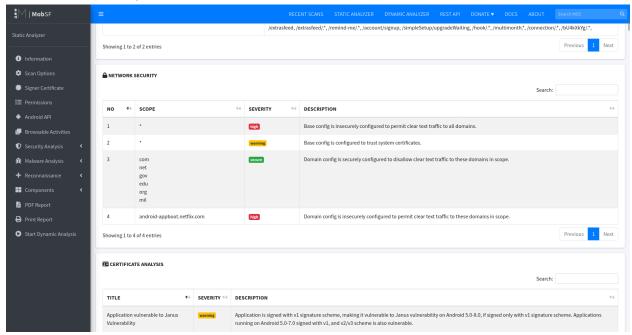


The information given by this section can be used to find what kind of operations are performed by an app, and to detect any unusual operation.

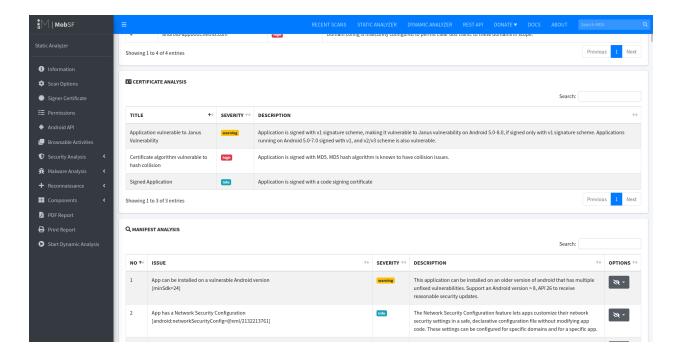
The browsable activities section reports, as the name suggests, a list of browsable activities exported by the app. These activities are activities that can be launched by links in the browser. For example, the first activity in the list can be launched by a webpage by using a link with a "nflx://" scheme and www.netflix.com as the host. This information can be used to find additional attack vectors: if one browsable activity contains a vulnerability, an attacker does not need to install a malicious app on the victim's device to launch it, but may just send a link via email.



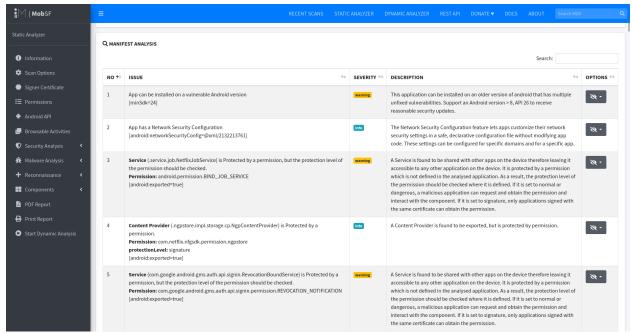
Next, we start with the Security Analysis sections. First of all, there is the Network Security, which contains information about the network configuration of the app. Here, we can see that the app is configured to allow non-encrypted traffic, which could expose it to man-in-the-middle attacks. We see that there are some exceptions, so domains ending with .com, .edu, ... do not allow such traffic, but it is still possible that the app does perform unencrypted communication with other domains. In the case of app developers, this information can be used to ensure that no sensitive data is transmitted to such domains, and in case of attackers this information can be used to potentially intercept and edit the app's network traffic.



While we previously saw all the information included in the app certificate, in the certificate analysis section MobSF performs some additional analysis regarding the security of the certificate. In this case, we can see that the app is signed, however it uses the md5 hash which is affected by collision issues. We can also see that the app could be vulnerable to the Janus vulnerability if installed on certain android versions.

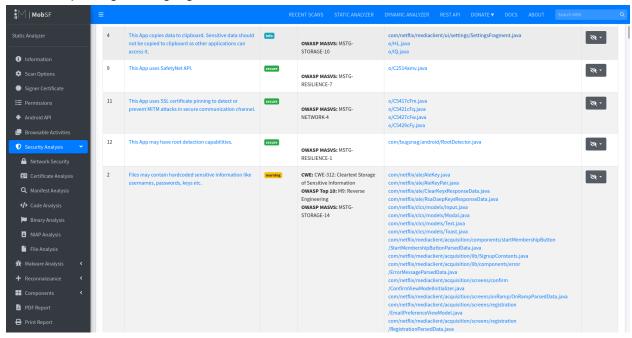


The next section, Manifest Analysis, includes all the information MobSF extracted from the manifest. For example, we can see that the app could be installed on old android devices, which are potentially vulnerable. We can also see information about the components exported by the app. For the NetflixJobService service, MobSF warns the user that while the service is protected, the permission it is protected with is not defined in the app itself, and so the user should check that the permission is defined at the appropriate protection level.



Moving on, the code analysis section contains the information MobSF collected by analyzing the code of the app. MobSF reports all potential vulnerabilities it detected. In this case, if we sort by

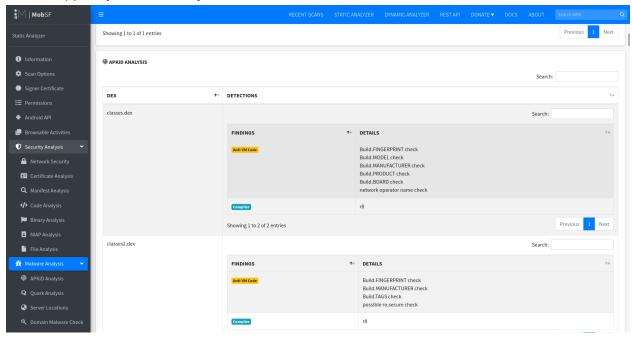
severity, we can see that the Netflix app has webview remote debugging enabled, which should be disabled for security reasons. We can also see that good security practices, such as certificate pinning, are highlighted as well.



The binary analysis section contains information about the native libraries included in the apk file. In this case, there is no info here, probably because the netflix app does not use any native library. If it did, here we could find info about potential security risks related to the native libraries. For example, we could see if a library was compiled without the stack canary. This would be an indication that stack overflow exploits could be effective in attacking that library.

The NIAP analysis section just reports information regarding the NIAP certification, i.e. if the apprespects what is prescribed by the NIAP guidelines or not.

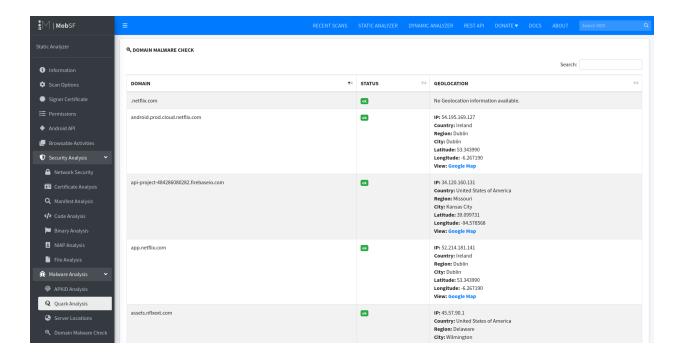
Next, we can take a look at ApkID Analysis, the first section of the malware analysis. Here, we find some information about how the apk was made, as well as if there is some strange behavior, which we can use to detect potential malware. In this case, we can see that the app includes some anti-vm code, which means it may try to detect if it is being run inside an emulator. This information can help us during the dynamic analysis, since we can keep in mind that the app may act differently if run on an emulator or on a stock device.



The Quark Analysis section reports any potential malicious behavior detected by quark engine, another static analysis tool. In this case, no such behavior was found.

In the server location section, we see a map with the locations of the servers the app communicates with.

In the Domain Malware Check section, MobSF lists all the domains the app communicates with, checking if any of them is a known malware-related domain. As you can see, the netflix app does not have this kind of issue.



Finally, there are the reconnaissance and the components sections. In reconnaissance, MobSF lists some strings that could be of interest during the analysis: urls, firebase databases, trackers, email addresses, and potentially hardcoded secrets. This section also reports all the strings included in the apk file.

In components, MobSF simply lists all the components defined by the application, divided by type, as well as the third party libraries used by the app.