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Android Malware Detection Test

2022 Jun

••• Celebrating Technology Innovation

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Report version 1.1, published on 2022.07.19 (added section "Chap.5. Compliance")

Report version 1.2, published on 2022.07.30 (updated content "Chap.5. Compliance")

Chap.1 Background

Android is a mobile operating system developed by Google. It is based on a modified version of the Linux kernel and other open-source software, and is designed primarily for touchscreen mobile devices such as smartphones and tablets. In addition, Google has further developed Android TV for televisions, Android Auto for cars, and Wear OS for wrist watches, each with a specialized user interface. Variants of Android are also used on game consoles, digital cameras, PCs and other electronics. Android's smartphone share will hover with around 85% throughout the forecast. Volumes are expected to grow at a five-year compound annual growth rate (CAGR) of 1.7% with shipments approaching 1.36 billion in 2022. Android maintained its position as the leading mobile operating system worldwide in January 2022, controlling the mobile OS market with a close to 70 percent share. Google's Android and Apple's iOS jointly possess over 99 percent of the global market share. Overall this is a positive sign that consumers are seeing the benefits of moving to a slightly more premium device than they likely previously owned.

Aside from the clear advantages to build mobile devices on Android, the platform also introduces numerous security risks to the platform users. Among them the following malicious activities:

1. Send messages to "premium service" SMS numbers that cost extra money.
2. Send your personal information to unknown parties.
3. Turn your phone into a part of a botnet so others can execute commands remotely for nefarious purposes, such as spam, DDOS attack, and more.
4. Non-authorized persons may monitor your phone calls and text messages.
5. Open you to blackmail, if something embarrassing can be found and sent elsewhere.
6. Trick you into entering financial information, such as account number, birth date, and more.
7. Even stuff on your PC if you connect your PC to your smartphone.

Clearly, to protect user's system and the data from the listed threats and the others, Android-based security applications exist and their efficiency is to be evaluated regularly against the permanently evolving threats.

This test is designed to independently assess the efficiency of consumer security solutions for Android OS on detecting currently spread malicious mobile apps.

Chap.2 Test Process & Test Software

Detailed process is as follows:

1. Several Android based mobile devices are prepared and backup images are created then. Platform: Android 12 on XiaoMi 8.
2. 1554 malware samples and 332 different clean android applications installers are collected, and delivered in a mixed set to the internal storage of mobile devices. The malware is collected from multiple sources (including China region-based ones), clean apps are taken from Google AppStore and other legitimate app stores.
3. Selected security applications are installed on the physical mobile devices in default configuration.
4. Security applications and their antivirus bases are updated.
5. Full scan of the collection by the security application is initiated. Malware detection and false positive rates are recorded.
6. The backup image on each of the mobile device is restored, and steps 2-4 are repeated.
7. Test date: June, 2022.

Vendor	Software	Version
AhnLab	AhnLab V3 Mobile Security	3.3.1.2(Build 3807)
Antiy Labs	AVL for Android	2.8.2
Avast	Avast Mobile Security	6.48.1.510579-6740db4852
Avira	Avira Antivirus Security for Android	7.14.0 build No. 220607001
ESET	ESET Mobile Security	v. 7.3.15.0-15
Kaspersky	Kaspersky Security & VPN	11.84.4.7744
Malwarebytes	Malwarebytes for Android	3.10.2.96
McAfee	McAfee Mobile Security	6.7.1.27
NortonLifeLock	Norton 360 (Norton Mobile Security)	5.36.0.220520002
Sophos	Sophos Intercept X for Mobile	9.7.3495
Trend Micro	Trend Micro Mobile Security	12.15.0.4099

Chap.3 Tested Result (The test results are shown on the following tab)

<i>Vendor</i>	<i>Total Samples</i>	<i>Missed Samples</i>	<i>Detected Samples</i>	<i>Detection Rate</i>	<i>False Positive Counts</i>	<i>Total Score</i>
<i>AhnLab</i>	1554	0	1554	100.00%	0	100.00
<i>Avira</i>	1554	0	1554	100.00%	0	100.00
<i>ESET</i>	1554	0	1554	100.00%	0	100.00
<i>Kaspersky</i>	1554	0	1554	100.00%	0	100.00
<i>Malwarebytes</i>	1554	0	1554	100.00%	0	100.00
<i>NortonLifeLock</i>	1554	0	1554	100.00%	0	100.00
<i>Sophos</i>	1554	0	1554	100.00%	0	100.00
<i>Trend Micro</i>	1554	0	1554	100.00%	1	99.90
<i>Avast</i>	1554	3	1551	99.81%	0	99.81
<i>McAfee</i>	1554	0	1554	100.00%	2	99.80
<i>Antiy Labs</i>	1554	0	1554	100.00%	183	81.70

- For each security solution, a Final Score is calculated once the full test is performed:
- **Final Score = (Detection %) *100 - 0.1*FP**
- Basing on the Final Score, the correspondent rating is grated to each participating security solution, in accordance with the tab below:

<i>final score</i>	<i>monthly award</i>
98.00 - 100.00	5-star rating
95.00 - 97.99	4-star rating
90.00 - 94.99	3-star rating

Chap.4 Test Summary & Monthly Award

- We had helped some vendors to fix crashes that we discovered during the test executing, and then we also had verified and confirmed the released fixes.
- Monthly Award:

2022 June	Android Malware Detection Test from Testing Ground Labs
<p>AhnLab</p> <p>Avira</p> <p>ESET</p> <p>Kaspersky</p> <p>Malwarebytes</p> <p>NortonLifeLock</p> <p>Sophos</p> <p>Trend Micro</p> <p>Avast</p> <p>McAfee</p>	<p>5 Star Monthly Award 2022 June</p> 

Chap.5 Compliance

This test followed all the requirements of the AMTSO Testing Protocol Standard v.1.3 <https://www.amtso.org/standards/>, and is confirmed by AMTSO as the compliant with the Standard. Details about the test compliance are available on page <https://www.amtso.org/tests/testing-ground-labs-q2-2022-android-malware-detection-test/>

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