‘e Scan™

AntiVirus & Content Security

Anti-Virus Software Performance Test

AV comparatives

Performance test

Impact of Anti-Virus Software on System Performance

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Introduction

We want to make clear that the results in this report are intended to give only an indication of the impact on system performance (mainly by the real-time/on-access components) of the Anti-Virus product in these specific tests listed below.

- File copying
- Archiving / Unarchiving
- Encoding / Transcoding
- Installing / Uninstalling applications
- Launching applications
- Downloading files
- Worldbench Testing Suite

Users are encouraged to try out the software on their own PCs and form an opinion based on their own observations. eScan released a performance-improved new version of their product soon after we started the comparative tests in November 2009[1]. Due that, we agreed to retest the new version of eScan and to compare it against its previous version in this report. As other vendors have in the meantime released new versions too, results should not be directly compared with old test results of other products.

Test methods

The tests were performed on an Intel Core 2 Duo E8300 machine with 2GB of RAM and SATAII hard disks. The performance tests were first done on a clean Windows XP Professional SP3 system (English) and then with the installed Anti-Virus software (with default settings).

The hard disk was defragmented before starting the various tests, and care was taken to minimize other factors that could influence the measurements and/or comparability of the systems (network, temperature, etc.). Optimizing processes/fingerprinting used by the products were also considered – this means that the results represent the impact on a system which has already been used by the user for a while. The tests were repeated several times (with and without fingerprinting) in order to get mean values and filter out measurement errors. After each run, the workstation was defragmented and rebooted.

We simulated various file operations that a computer user would execute: copying[2] different types of clean files from one place to another, archiving and unarchiving files, encoding and transcoding[3] audio and video files, converting DVD-Files to IPOD format, downloading files from Internet, launching applications, etc. In previous tests we used a batch testing script to automate those activities. This time we used a windows automation software to replicate the activities and measure the times.

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[1]   http://www.av-comparatives.org/images/stories/test/performance/performance_dec09.pdf
[2]   We used 2GB data of various file categories (pictures, movies, music, various MS Office 2003 and 2007 documents, PDF files, applications/executables, Windows XP system files, archives, etc.).
[3]   Converting MP3 files to WAV, MP3 to WMA, AVI to MPG and MPG to AVI, as well as IPOD format

We also used a third-party industry recognized performance testing suite (Worldbench 6) to measure the system impact during real-world product usage.

Readers are invited to evaluate the various products themselves, to see how they affect their systems (such as software conflicts and/or user preferences, as well as different system configurations that may lead to varying results).

We did not test boot-times on purpose. Anti-Virus products need to load on systems at an early stage to provide security from the very beginning – this load has some impact on the time needed for a system to start up. Measuring boot times accurately is challenging. The most significant issue is to define exactly when the system is fully started, as many operating environments may continue to perform start-up activities for some time after the system appears responsive to the user. It is also important to consider when the protection provided by the security solution being tested is fully active, as this could be a useful measure of boot completion as far as the security solution is concerned. To test this is almost impossible. Some vendors let the user choose if he wants a safe or fast start. We recommend to use the safe start, the user will only loose a few seconds but get more security. Furthermore, some Anti-Virus products are loading their services very late (even minutes later) at boot (users may notice that after some time that the system loaded, the system gets very slow for some moments), so the system looks like loading very fast, but it just loads its services later and makes the system also insecure/vulnerable. As we do not want to support such activities, and considering that in most cases a workstation is powered on only once a day, we decided to do not measure boot times.

Test results

These specific test results show the impact on system performance that Anti-Virus products have. The reported data just give an indication and are not necessarily applicable in all circumstances, as too many factors can play an additional part. As we noticed that delivering percentages gets easily misinterpreted by users (as well as marketing departments of AV vendors), we grouped the results in four categories, as the impact within those categories can be considered almost equal, also considering error measurements. The categories were defined by the testers, based on what would be felt/noticed from user's perspective (e.g. "slow" means that the user would notice and label the added slowdown as too high, also compared to the impact of other security products).

File copying

Some Anti-Virus products do not scan all kind of files by design/default (based on their file extensions), or use fingerprinting technologies, which may skip already scanned files in order to increase the speed.

We copied a set of different file types which are widespread at home and office workstations form one physical hard disk to another physical hard disk.

+0% to +25%   very fast
+25% to +50%   fast
+50% to +100%   mediocre
over +100%   slow

	On first run	On subsequent runs (with fingerprinting, if available)
eScan Nov 2009	slow	mediocre
eScan Feb 2010	*fast*	*very fast*

Archiving and unarchiving

Archives are commonly used for file storage, and the impact of Anti-Virus software on the time taken to create new archives or to unarchive files from existing archives may be of interest for most users.

We archived a set of different file types which are widespread at home and office workstations form one physical hard disk to another physical hard disk and unzipped them after this again on a third physical hard disk.

The results below already consider the fingerprinting/optimization technologies of the Anti-Virus products, as most users usually make archives of files they have on their disk.

+0% to +20%	very fast
+20% to +40%	fast
+40% to +80%	mediocre
over +80%	slow

eScan Nov 2009	very fast
eScan Feb 2010	*very fast*

Encoding/transcoding

Music files are often stored and converted on home systems, and converting such files takes system resources. Due that, many home users may be interested to know if their Anti-Virus products imposes a slowdown while converting multimedia files from one format to another.

We encoded and transcoded some multimedia files with FFmpeg, and for the IPOD conversion we used HandBrakeCLI. The impact during FFmpeg and IPOD converting was almost the same.

+0 to +15%	very fast
+15 to +30%	fast
+30 to +50%	mediocre
over +50%	slow

eScan Nov 2009	very fast
eScan Feb 2010	*very fast*

All tested Anti-Virus products added less than 15% slowdown (very fast) to the process and would add almost unnoticeable impact while encoding/transcoding normal multimedia files.

Installing/uninstalling applications

We installed several programs (like Visual C++, .NET Framework, etc.) with MSI installers, and then uninstalled them and measured how long it took.

+0% to +25%	very fast
+25% to +50%	fast
+50% to +100%	mediocre
over +100%	slow

eScan Nov 2009	very fast
eScan Feb 2010	*very fast*

Launching applications

Office document files and PDF files are very common. We opened some large document files in Microsoft Office (and closed it) and some large PDF files in Adobe Acrobat Reader (and closed it). Before each opening, the workstation was rebooted. The time taken for the viewer or editor application to open and a document to be displayed was measured.

Although we list the results for the first opening and the subsequent openings, we consider the subsequent openings more important, as normally this operation is done several times by users, and optimization features of the Anti-Virus products take place, minimizing their impact on the systems.

+0% to +50%	very fast
+50% to +100%	fast
+100% to +200%	mediocre
over +200%	slow

	Open Word		Open PDF	
	On first run	On subsequent runs (with fingerprinting, if available)	On first run	On subsequent runs (with fingerprinting, if available)
eScan Nov 2009	mediocre	**very fast**	very fast	**very fast**
eScan Feb 2010	*fast*	*very fast*	*fast*	*very fast*

Some optimization features may not take place in some products (or not reduce enough the impact), as documents and PDF files are common infection targets and therefore are anyway scanned when opened. Nevertheless, the fingerprinting would take place in on-demand scans.

Downloading files from the Internet

Files are commonly downloaded from the internet. To avoid external influences, we used an in-house Apache web server (wget) connected with 1GB LAN and measured the download time. We tested using large files.

+0% to +25%	very fast
+25% to +50%	fast
+50% to +100%	mediocre
over +100%	slow

eScan Nov 2009	very fast
eScan Feb 2010	*very fast*

WorldBench Tests

In order to provide an industry-recognized performance test, we used the WorldBench[4] testing suite of PCWorld. WorldBench6 is considered as leading application-based real-world performance benchmark.

Popular applications are each a component of the final WorldBench score. The WorldBench score (higher is better) is compared against a baseline[5] system. The individual application test times are given in seconds (lower is better).

	WB score - %
without AV	*116*
eScan Feb 2010	**110**
eScan Nov 2009	*49*

The WorldBench testing Suite consists of the following ten tests, simulating real-world usage: Adobe Photoshop CS2, Autodesk 3ds Max 8.0 SP3 (DirectX), Autodesk 3ds Max 8.0 SP3 (Rendering), Mozilla Firefox 2, Microsoft Office 2003 with SP1, Microsoft Windows Media Encoder 9.0, Multitasking: Mozilla Firefox and Windows Media Encoder, Nero 7 Ultra Edition, Roxio VideoWave Movie Creator 1.5 and WinZip 10.0

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[4] For more information, see http://www.worldbench.com or http://en.wikipedia.org/wiki/WorldBench

[5] The Worldbench baseline system (score 100) is an Intel Core 2 Duo E6600, with 2GB RAM. The AV-Comparatives baseline system (score 116) is an Intel Core 2 Duo E8300, with 2GB of RAM.

Summarized results

eScan Antivirus TOTAL score for Feb 2010: 198

	File copying (mean value)	Archiving / unarchiving	Encoding / transcoding	Installing / uninstalling	Download	Launching applications	WorldBench	TOTAL
AVIRA	fast (10)	very fast (15)	very fast (15)	very fast (15)	very fast (15)	very fast (15)	114	199
eScan 2010	very fast (13)	very fast (15)	very fast (15)	very fast (15)	very fast (15)	very fast (15)	110	198
Kingsoft	very fast (15)	very fast (15)	very fast (15)	fast (10)	very fast (15)	very fast (15)	111	196
F-Secure	very fast (8)	very fast (15)	very fast (15)	very fast (15)	very fast (15)	very fast (15)	112	195
Sophos	fast (10)	very fast (15)	very fast (15)	very fast (15)	very fast (15)	fast (10)	112	193
Kaspersky	very fast (13)	very fast (15)	very fast (15)	fast (10)	very fast (15)	very fast (15)	110	193
Microsoft	very fast (8)	very fast (15)	very fast (15)	very fast (15)	very fast (15)	very fast (15)	107	190
Avast	very fast (15)	very fast (15)	very fast (15)	fast (10)	fast (10)	fast (10)	113	188
Symantec	very fast (13)	very fast (15)	very fast (15)	fast (10)	fast (10)	very fast (15)	110	188
ESET	fast (10)	very fast (15)	very fast (15)	very fast (15)	fast (10)	fast (10)	108	183
McAfee	very fast (13)	very fast (15)	very fast (15)	mediocre (5)	mediocre (5)	fast (10)	111	174
Norman	mediocre (5)	very fast (15)	very fast (15)	fast (10)	very fast (15)	mediocre (5)	104	169
AVG	fast (8)	fast (10)	very fast (15)	mediocre (5)	slow (0)	very fast (15)	111	164
Bitdefender	very fast (13)	very fast (15)	very fast (15)	slow (0)	slow (0)	very fast (15)	96	154
G DATA	very fast (8)	very fast (15)	very fast (15)	slow (0)	slow (0)	fast (10)	104	152
eScan 2009	mediocre (3)	very fast (15)	very fast (15)	very fast (15)	very fast (15)	fast (10)	64	137
Trustport	very fast (8)	fast (10)	very fast (15)	slow (0)	slow (0)	mediocre (5)	90	125

There are major performance-improvements compared to eScan Antivirus of Nov 2009 – now it is much faster, especially regarding file copying and background tasks.

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