Small Business Endpoint Protection Performance Benchmarks

February 2011

GFI Software conducted objective performance testing on four, publically available small-medium business endpoint protection security software products on Windows 7 Pro Edition during the first quarter of 2011.

VIPRE® AntivirusBusiness

Performance Metrics Summary

We have selected a set of objective metrics which provide a comprehensive and realistic indication of the areas in which endpoint protection products may impact system performance for end users. Our metrics test the impact of the software on common tasks that end-users would perform on a daily basis.

All of GFI Software's test methods can be replicated by third parties using the same environment to obtain similar benchmark results. Detailed descriptions of the methodologies used in our tests are available in the "***Methodology Description***" of this report.

Testing was performed on all products using eight performance metrics. These performance metrics are as follows:

- Installation time
- Boot time
- Scan time on demand
- Average cpu usage during idle
- Average cpu usage during scan
- Memory usage during system idle
- Memory usage during scan
- File compression and decompression

Benchmark 1 – Installation Time

This test measures the minimum installation time required by the endpoint protection software to be fully functional and ready for use by the end user. Lower installation times represent products which are quicker for a user to install.

Benchmark 2 – Boot Time

This metric measures the amount of time taken for the machine to boot into the operating system. Security software is generally launched at Windows startup, adding an additional amount of time and delaying the startup of the operating system. Shorter boot times indicate that the application has had less impact on the normal operation of the machine.

Benchmark 3 – Scan Time on Demand

All endpoint protection solutions have functionality designed to detect viruses and various other forms of malware by scanning files on the system. This metric measured the amount of time required to scan a set of clean files. Our sample file set comprised a total file size of 5.45 GB and was made up of files that would typically be found on end-user machines, such as media files, system files and Microsoft Office documents.

Benchmark 4 – Average CPU Usage during Idle

This metric measures the amount of CPU used when the system and product are idle.

Benchmark 5 – Average CPU Usage during Scan

This metric measures the amount of CPU used when performing a scan.

Benchmark 6 – Memory Usage during System Idle

This metric measures the amount of memory (RAM) used by the product while the machine and endpoint protection software are in an idle state. The amount of memory used while the machine is idle provides a good indication of the amount of system resources being consumed by the endpoint protection software on a permanent basis. Better performing products occupy less memory while the machine is idle.

Benchmark 7 – Memory Usage during Scan

This metric measures the amount of memory (RAM) used by the product while the endpoint software is performing a system scan. The amount of memory used while the machine is idle provides a good indication of the amount of system resources being consumed by the endpoint protection software during an active scan.

Benchmark 8 – File Compression and Decompression

This metric measures the amount of time taken to compress and decompress different types of files. Files formats used in this test included documents, images, and audio files.

Test Environment

- Dell optiplex 360 - Windows 7 professional (32-bit) Endpoint System
- CPU: Intel Core Duo E7500 2.93GHz 2.92GHz
- Video Card: ATI Radeon HD 2400 1522MB
- RAM: 4GB DDR2
- HDD: Western Digital Caviar Blue WD1600AAJS 160GB SATA

Products and Versions

In this report, we have tested the following versions of Endpoint Protection software*:

Endpoint Security Suites Under Test

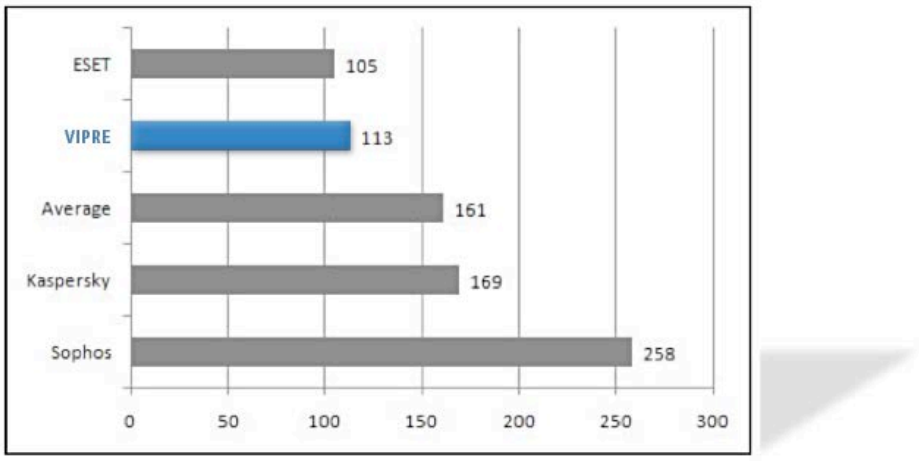
Vendor	Product	Version
VIPRE	Antivirus Business Premium	4.0.3907
ESET	Smart Security 4 Business Edition	4.2.67.10
Kaspersky	Business Space Security	6.0.4.1424
Sophos	Computer Security for Small Business	9.0.5

*All Products were tested using their default settings

Test Results

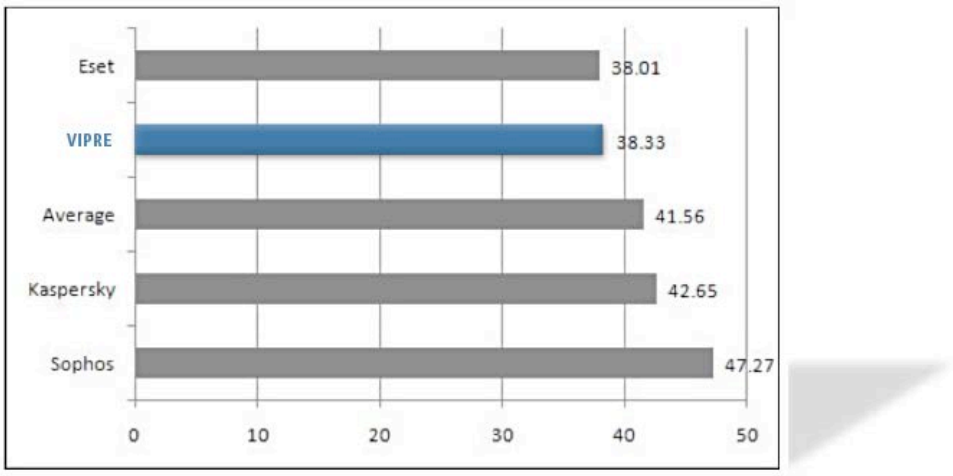
Benchmark 1 – Installation Time (seconds)

The following chart compares the minimum installation time it takes for products to be fully functional and ready for use by the end user. Products with lower installation times are considered better performing products in this category.



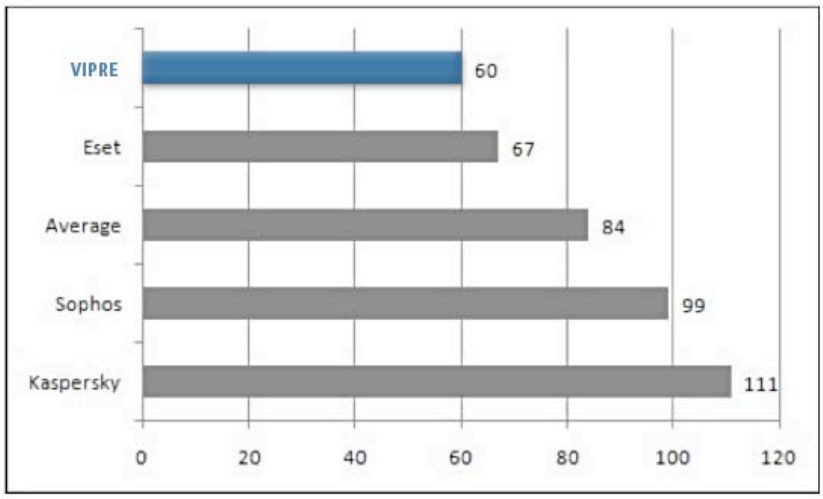
Benchmark 2 – Boot Time (seconds)

The following chart compares the average time taken for the system to boot (from a sample of five boots) for each product tested. Products with lower boot times are considered better performing products in this category.



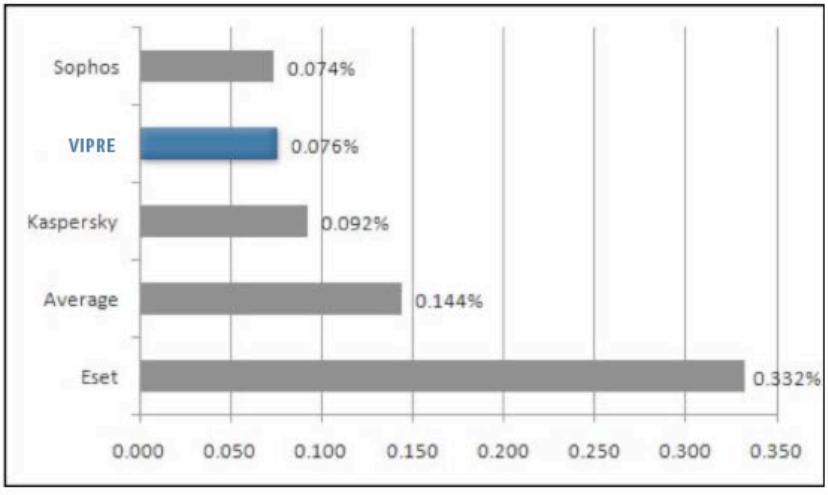
Benchmark 3 – Scan Time on Demand (seconds)

The following chart compares the average time taken to scan a set of media files, system files and Microsoft Office documents that totaled 5.45 GB. This time is calculated by averaging the initial (Run 1) and subsequent (Runs 2-5) scan times. Products with lower scan times are considered better performing products in this category.



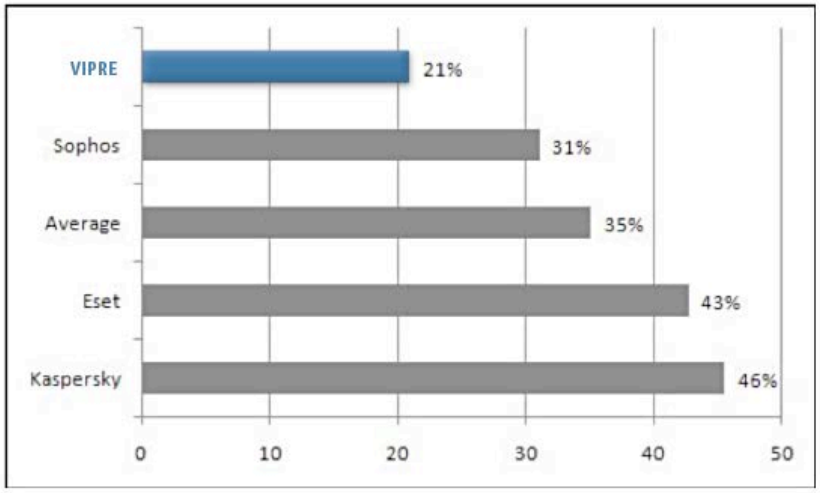
Benchmark 4 – CPU Usage during Idle (percent)

The following chart compares the average CPU usage during system idle. This value is calculated by averaging five CPU usage samples, rebooting the machine after every test. Products with lower CPU usage are considered better performing products in this category.



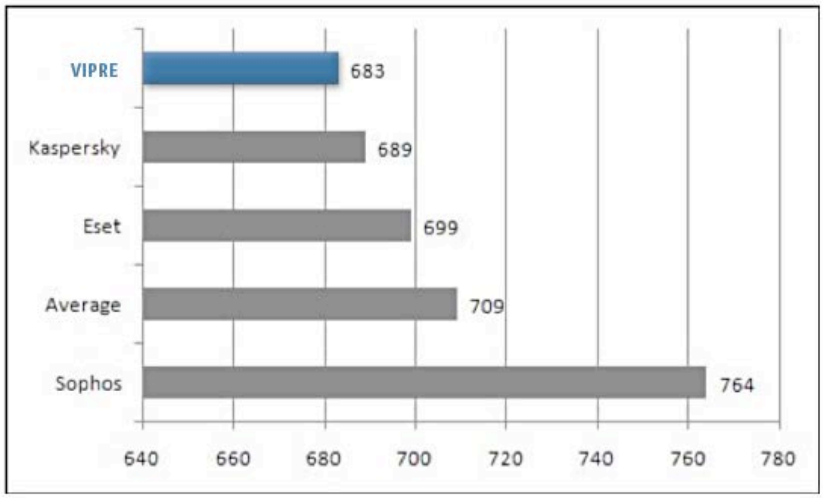
Benchmark 5 –CPU Usage during Scan (percent)

The following chart compares the average CPU usage during a scan of a set of media files, system files and Microsoft Office documents that totaled 5.45 GB. This value is calculated by averaging the initial (Run 1) and subsequent (Runs 2-5) CPU usage results. Products with lower CPU usage are considered better performing products in this category.



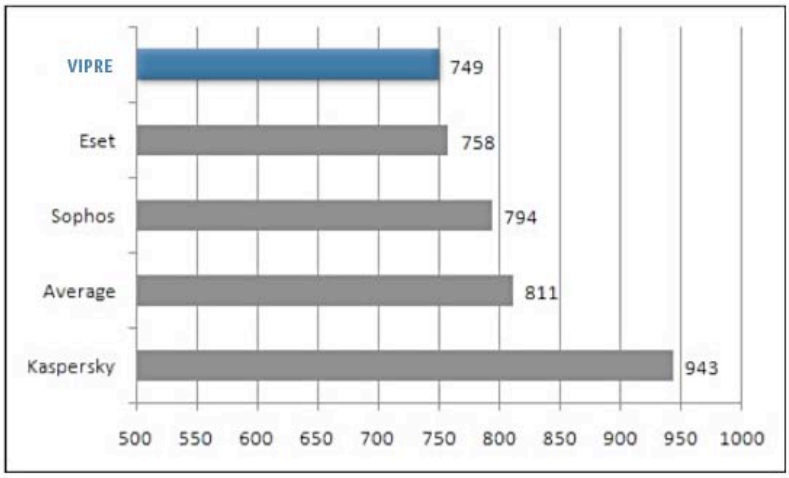
Benchmark 6 – Memory Usage during System Idle (megabytes)

The following chart compares the average amount of RAM in use by each product during a period of system idle. This average is taken from a sample of five memory snapshots taken, rebooting the machine after every test. Products with lower idle RAM usage are considered better performing products in this category.



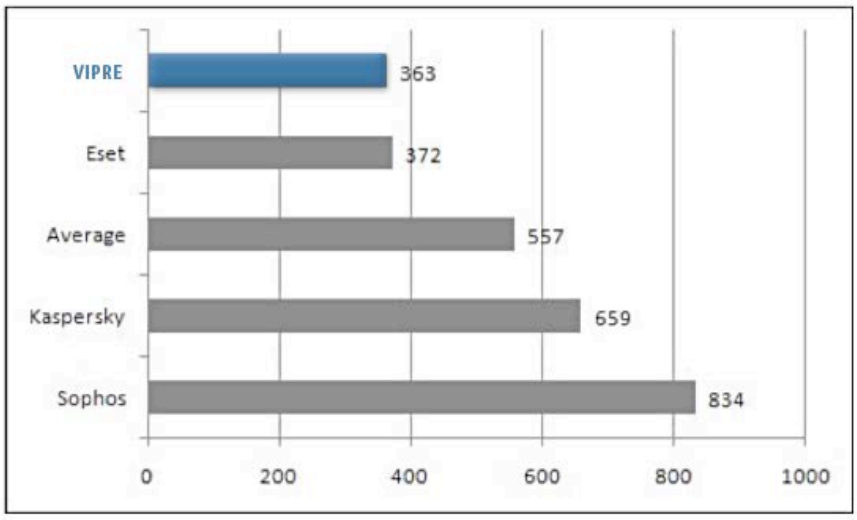
Benchmark 7 – Memory Usage during Scan (megabytes)

The following chart compares the average amount of RAM in use by each product during a virus scan of a set of media files, system files and Microsoft Office documents that totaled 5.45 GB. This value is calculated by averaging the initial (Run 1) and subsequent (Runs 2-5) RAM usage results. Products with lower CPU usage are considered better performing products in this category.



Benchmark 8 – File Compression and Decompression (seconds)

The following chart compares the average time it takes for sample files to be compressed and decompressed for each product tested. Products with lower times are considered better performing products in this category.



Methodology Description

Windows 7 Image Creation

Norton Ghost was used to create a "clean" baseline image prior to testing. The goal was to create a baseline image with the smallest possible footprint and reduce the possibility of variation caused by external operating system factors.

The baseline image was restored prior to testing of each different product. This process ensured that we installed and tested all products on the same, "clean" machine.
The steps taken to create the base Windows 7 image are as follows:

1. Installation and activation of Windows 7 Professional Edition.
2. Installed all available windows updates.
3. Disabled Automatic Updates.
4. Changed User Account Control settings to "Never Notify".
5. Disabled Windows Defender automatic scans to avoid unexpected background activity.
6. Disabled the Windows firewall to avoid interference with security software.
7. Disabled Superfetch to ensure consistent results.
8. Setup Windows Performance Monitor for Performance testing.
9. Disabled updates, accelerators and compatibility view updates in Internet Explorer 8.
10. Created a baseline image using Norton Ghost.

Benchmark 1 – Installation Time

This test measures the minimum installation time a product requires to be fully functional and ready for use by the end user. Installation time can usually be divided in three major phases:

- The **Extraction and Setup phase** consists of file extraction, the EULA prompt, product activation and user configurable options for installation.
- The **File Copy phase** occurs when the product is being installed; usually this phase is indicated by a progress bar.
- The **Post-Installation phase** is any part of the installation that occurs after the File Copy phase. This phase varies widely between products; the time recorded in this phase may include a required reboot to finalize the installation or include the time the program takes to become idle in the system tray.

To reduce the impact of disk drive variables, each product was copied to the Desktop before initializing installation. Each step of the installation process was manually timed with a stopwatch and recorded in as much detail as possible. Where input was required by the end user, the stopwatch was paused.

Where possible, all requests by products to pre-scan or post-install scan were declined or skipped. Where it was not possible to skip a scan, the time to scan was included as part of the installation time. Where an optional component of the installation formed a reasonable part of the functionality of the software, it was also installed (e.g. website link checking software as part of an Endpoint Security Product).

Installation time includes the time taken by the product installer to download components required in the installation. This may include mandatory updates or the delivery of the application itself from a download. We have excluded product activation times due to network variability in contacting vendor servers or time taken in account creation.

Benchmark 2 – Boot Time

GFI Software used a tool called BootTimer that is available from http://www.planetsoft.org with a view to obtaining more precise and consistent boot time results on the Windows 7 platform.

This utility displays the time taken to load windows. It does not take into effect the time taken to go through BIOS or BIOS bootup password. It takes the time from the instant BIOS starts loading Windows. Our final result is an average of five boot timings.

Benchmark 3 – Scan Time on Demand

Scan Time is the time it took for each product to scan a set of sample files. The sample used was identical in all cases and contained a mixture of system files and Office files. In total there were 3155 files whose combined size was 5.45 GB. Most of these files come from the Windows system folders. As the file types can influence scanning speed, the breakdown of the main file types, file numbers and total sizes of the files in the sample set is given here.

.ANI	34	202KB	.HTM	52	969KB	.SCR	12	2.79MB
.AVI	11	3.23GB	.ISO	1	410MB	.SYS	234	16.4MB
.CHM	328	48.1MB	.JPG	131	248MB	.TXT	21	352KB
.COM	15	354KB	.MP3	203	1.19GB	.WAV	147	6.73MB
.DLL	608	133MB	.OCX	25	12.3MB	.WMF	353	4.82MB
.EXE	415	77.8MB	.PDF	27	62.7MB	.XML	17	668KB
.GIF	322	11.7MB	.PPT	3	304KB	.ZIP	8	5.76MB
.GZIP	10	29.2KB	.RAR	7	2.17MB			
.HLP	147	4.83MB	.RTF	24	2.34MB			

Where possible this scan was run without launching the product's user interface, by right-clicking the test folder and choosing the "Scan Now" option, though some products required entering the UI to scan a folder. To record the scan time, we have used product's built-in scan timer or reporting system. Where this was not possible, scan times were taken manually with a stopwatch.

For each product, five samples were taken with the machine rebooted before each sample to clear any caching effects by the operating systems.

Benchmark 4 – CPU Average during Scan

The Window's Perfmon tool is used for this metric. The system is clean booted and waits for idle (approximately 5 minutes after booting). A Virus Scan is run on a pre-defined set of files while the Window's Perfmon tool is run for the duration of the scan.

Benchmark 5 – CPU Average during Idle

The Window's Perfmon tool is used for this. The system is clean booted and waits for idle (approximately 5 minutes after booting), Window's Perfmon tool is then run for 5 minutes while the system is in an idle state.

Benchmark 6 – Memory Usage during System Idle

The Window's Perfmon tool is used for this. The system is clean booted and waits for idle (approximately 5 minutes after booting), Window's Perfmon tool is then run for 5 minutes while the system is in an idle state.

Benchmark 7 – Memory Usage during Scan

Window's Perfmon tool was used to record memory usage on the system while a scan is in progress.

Benchmark 8 – File Compression and Decompression

This test measured the amount of time required to compress and decompress a sample set of files. For this test, we used a subset of the media and documents files used in **Benchmark 3**.

A stopwatch recorded the amount of time required for *7zip.exe* to compress the files into a *.zip and subsequently decompress the created *.zip file.

This subset comprised 2,941 files with a total size of 1.02GB. The breakdown of the file types, file numbers and total sizes of the files in the sample set is shown in the following table:

.ANI	34	202KB	.HTM	52	969KB	.SCR	12	2.79MB
.CHM	328	48.1MB	.ISO	1	410MB	.SYS	234	16.4MB
.COM	15	354KB	.JPG	131	248MB	.TXT	21	352KB
.DLL	608	133MB	.OCX	25	12.3MB	.WAV	147	6.73MB
.EXE	415	77.8MB	.PDF	27	62.7MB	.WMF	353	4.82MB
.GIF	322	11.7MB	.PPT	3	304KB	.XML	17	668KB
.GZIP	10	29.2KB	.RAR	7	2.17MB	.ZIP	8	5.76MB
.HLP	147	4.83MB	.RTF	24	2.34MB			

This test was conducted five times to obtain the average file compression and decompression speed, with the test machine rebooted between each sample to remove potential caching effects.

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