



VIRUS

BULLETIN

Fighting malware and spam

JANUARY 2012 VBSPAM COMPARATIVE REVIEW

INTRODUCTION

Intel recently published a fascinating infographic¹ entitled 'What Happens in an Internet Minute'. It shows, for instance, that every minute, 1.3 million *YouTube* videos are being watched; over 2 million *Google* searches are being performed; 6 million people are viewing *Facebook* and 20 million people are viewing photos on *Flickr*. All of these numbers are dwarfed, however, by the 204 million emails that are being sent.

Intel doesn't specify whether this number includes spam, but even if it does, that still means some 50 million legitimate emails are sent over the Internet every minute. That is over 70 billion legitimate emails every day. It puts the oft heard predictions that email is on its way out – soon to be replaced by social media – into perspective.

Does this mean that I believe email is here to stay forever? No, it doesn't. It may be, and I actually believe that the protocol will be here for many decades to come, but I could be wrong. Things do, after all, change quickly on the Internet – who would have predicted a few years ago that today, millions of people using ever faster computers would communicate via a website that had a 140-character limit on messages?

From an anti-spam and more general security point of view, it doesn't matter much how accurately you can predict the future; not even if you want your company to protect its customers in the future. What does matter is how well you can adapt to the changes that actually happen.

This is also one of the principles behind the VBSpam tests. In this report, we show how well products performed against email threats that were circulating throughout the holiday period. This is useful for potential customers reading this report in the first half of 2012, but will become less useful

¹http://www.circleid.com/posts/20120104_in_an_internet_minute/

as time goes on – which is why we will continue to run tests and publish reports every other month.

We had 22 products on the test bench for this test, 20 of which were full solutions. The other two were partial solutions (DNS blacklists) which are designed to be used in conjunction with other products to provide anti-spam protection. All of the full solutions achieved a VBSpam award but their performance differed greatly in the details.

THE TEST SET-UP

The VBSpam test methodology can be found at <http://www.virusbtn.com/vbspam/methodology/>. As usual, email was sent to the products in parallel and in real time, and products were given the option to block email pre-DATA. Four products chose to make use of this option.

As in previous tests, the products that needed to be installed on a server were installed on a *Dell PowerEdge R200*, with a 3.0GHz dual core processor and 4GB of RAM. The *Linux* products ran on *SuSE Linux Enterprise Server 11*; the *Windows Server* products ran on either the 2003 or the 2008 version, depending on which was recommended by the vendor.

To compare the products, we calculate a 'final score', which is defined as the spam catch (SC) rate minus five times the false positive (FP) rate. Products earn VBSpam certification if this value is at least 97:

$$SC - (5 \times FP) \geq 97$$

THE EMAIL CORPUS

The test ran for 16 consecutive days, from 12am GMT on Wednesday 21 December 2011 until 12am GMT on Friday 6 January 2012.

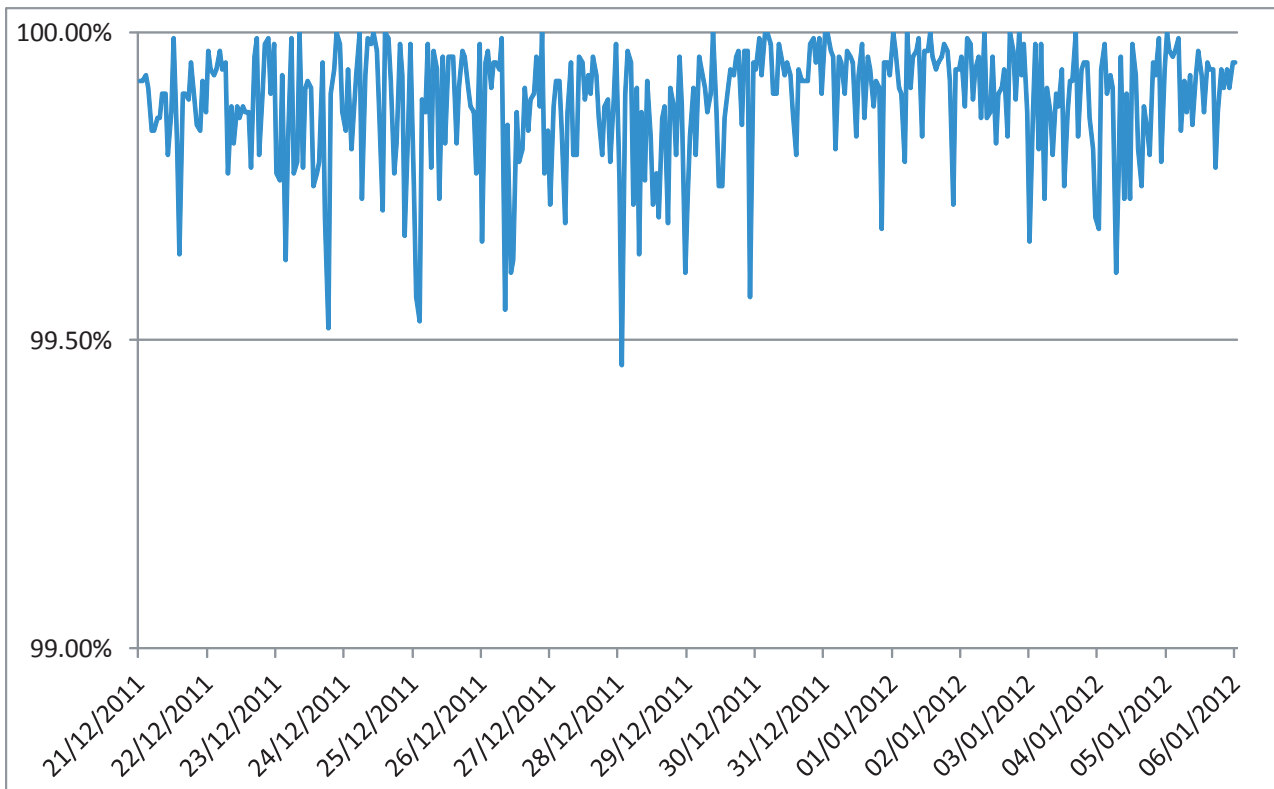


Figure 1: Spam catch rate of all full solutions throughout the test period.

The corpus contained 152,236 emails, 146,121 of which were spam. Of these, 69,238 were provided by *Project Honey Pot*, and 76,883 were provided by *Spamfeed.me*, a product from *Abusix*. They were all relayed in real time, as were the 5,934 legitimate emails ('ham') and the remaining 181 emails, which were all legitimate newsletters.

Figure 1 shows the catch rate of all full solutions throughout the test. To avoid the average being skewed by poorly performing products, the highest and lowest catch rate have been excluded for each hour. It was nice to see that all of the products performed rather well – especially given that, in businesses, many employees will have been away during this holiday period. In the past, spammers have taken advantage of this fact and launched new spam campaigns over the Christmas and New Year holidays, in the hope that they would take longer to be blocked.

Taking into account the increased size of the ham corpus, the average false positive rate was slightly lower than in the previous test². On average, participating products missed one in 1,240 legitimate emails. This may not sound like

²Note that the test rules prescribe that no more than four false positives are counted per sender and/or subject line

much, but it would mean that users would not be able to ignore their email quarantine, or trust the perimeter-level filter not to discard any legitimate emails.

Of course, we acknowledge that some legitimate emails are difficult to filter. Our corpus contains many emails that the average user does not receive, such as messages in (modern) Greek or Russian, or messages that discuss advanced scientific subjects or specialist computer software. But then, doesn't most people's email traffic contain messages that are in some way unusual for the average user?

Moreover, even the most 'difficult' legitimate emails were incorrectly blocked by only four products or fewer. As we have said before, the odd false positive is not a major issue and, much as it can be a nuisance to an end-user, is not the end of the world. But avoiding them altogether remains the goal. Kudos, therefore, to the six solutions that did so.

FILTERING SPAM VERSUS FILTERING EMAIL: DKIM AND NEWSLETTER FILTERS

The VBSpam tests, as the name suggests, are about spam: unsolicited email that appears to have been sent in bulk.

The main purpose of the tests is, and will always be, to determine which products are capable of stopping as much spam as possible, while at the same time managing to avoid blocking legitimate emails.

In reality, of course, the situation is more complicated than that and, rather than a black-and-white world of spam and ham, there are varying degrees of 'greyness'. We believe that filters should adapt to this reality.

One of many ways in which this can be done is to include DKIM-based filtering in a product.

If an email contains a valid DKIM signature of the domain example.com, it means that the email is signed by example.com. This may seem like stating the obvious, but the important part of the sentence is the word 'is': other than the sending IP address, none of the properties of an email can be guaranteed to be correct. This means it is impossible to use such properties to whitelist on, or to use them in a reputation-based filter.

The IP address has historically been useful, but does not allow for some of the subtleties that DKIM can offer; also, it will become significantly harder (and probably impossible) to keep good IP-based whitelists and blacklists for IPv6. DKIM has the potential to solve these problems.

Several of the products participating in the test allow administrators to whitelist (and sometimes blacklist) emails based on the presence of a valid DKIM signature of a certain domain. We would be able to test for this. However, many other products use DKIM in a more subtle way as part of the filter – which we are not able to measure and, by only testing products that allow for whitelisting and/or blacklisting, we don't feel we would do justice to the latter kind of product.

Moreover, for technical reasons, our test set-up is not very DKIM-friendly³, and as a result we decided against including DKIM in this report. We will continue to look for ways in which to test the products that include DKIM in their filtering.

Two tests ago, we introduced a feed of newsletters⁴ and began to measure products' performance against this corpus. Because newsletters – even those that have been subscribed to – are rarely considered important by their recipients, we exclude this measure from the final score. Some products actually have one or more separate categories for such newsletters, which allows end-users to filter them to a particular folder, thus avoiding a clogged inbox, while still being able to read the newsletters at their leisure.

³ DKIM is very sensitive to the smallest modifications to emails; unfortunately, we sometimes have to make such modifications.

⁴ This includes commercial emails ('these are our weekly offers') as well as mailings of a less (obvious) commercial nature ('this is what's going on at our school next week').

For products that are capable of doing this, we have decided to look at how well they manage to correctly classify newsletters as such⁵. In this test, only one participating product (*Vade Retro*) was both willing and able to turn this feature on; we consider it important enough to include this in the report.

RESULTS

In the text that follows, unless otherwise specified, 'ham' or 'legitimate email' refers to email in the ham corpus – which excludes the newsletters – and a 'false positive' is a message in that corpus that has been erroneously marked by a product as spam.

Because the size of the newsletter corpus is significantly smaller than that of the ham corpus, a missed newsletter will have a much greater effect on the newsletter false positive rate than a missed legitimate email will have on the false positive rate for the ham corpus (e.g. one missed email in the ham corpus results in an FP rate of 0.02%, while one missed email in the newsletter corpus results in an FP rate of 0.5%).

Anubis Networks

SC rate: 99.95%

FP rate: 0.02%

Final score: 99.86

Project Honey Pot SC rate: 99.89%

Abusix SC rate: 99.997%

Newsletters FP rate: 0.00%

With a single false positive in the ham corpus (none among the newsletters), and one of the highest spam catch rates in this month's test, *Anubis* is back on top form this month, achieving the fourth highest final score and earning its ninth VBSpam award in as many tests.



BitDefender Security for Mail Servers 3.0.2

SC rate: 99.85%

FP rate: 0.08%

Final score: 99.43

Project Honey Pot SC rate: 99.71%

Abusix SC rate: 99.97%

Newsletters FP rate: 0.00%

BitDefender prides itself on being the only product to have participated in every VBSpam test since the start, and



⁵ Newsletters classified as 'ordinary ham' or as 'spam' are considered to have been misclassified.

	True negatives	False positives	FP rate	False negatives	True positives	SC rate	Final score
Anubis Networks	5933	1	0.02%	78	146043	99.95%	99.86
BitDefender	5929	5	0.08%	219	145902	99.85%	99.43
FortiMail	5934	0	0.00%	390	145731	99.73%	99.73
GFI MailEssentials	5931	3	0.05%	176	145945	99.88%	99.63
Halon Security	5929	5	0.08%	668	145453	99.54%	99.12
IBM Lotus Protector	5930	4	0.07%	157	145964	99.89%	99.56
Kaspersky Anti-Spam	5933	1	0.02%	364	145757	99.75%	99.67
Libra Esva	5934	0	0.00%	62	146059	99.96%	99.96
McAfee Email Gateway	5921	13	0.22%	213	145908	99.85%	98.76
McAfee EWS	5929	5	0.08%	118	146003	99.92%	99.50
McAfee SaaS	5928	6	0.10%	67	146054	99.95%	99.45
Messaging Architects M+Guardian	5905	29	0.49%	52	146069	99.96%	97.52
OnlyMyEmail	5933	1	0.02%	4	146117	99.997%	99.91
Sophos Email Appliance	5925	9	0.15%	288	145833	99.80%	99.04
SpamTitan	5928	6	0.10%	47	146074	99.97%	99.46
Spider Antispam	5929	5	0.08%	124	145997	99.92%	99.49
Symantec Messaging Gateway	5929	5	0.08%	143	145978	99.90%	99.48
The Email Laundry	5927	7	0.12%	190	145931	99.87%	99.28
Vade Retro	5934	0	0.00%	80	146041	99.95%	99.95
Vamsoft ORF	5934	0	0.00%	859	145262	99.41%	99.41
Spamhaus ZEN+DBL*	5934	0	0.00%	1342	144779	99.08%	99.08
SURBL*	5934	0	0.00%	49060	97061	66.43%	66.43

*Spamhaus and SURBL are both partial solutions and their performance is not to be compared with that of other products, neither should the performance of each be compared with the other.

(Please refer to the text for full product names.)

McAfee Email Gateway (formerly IronMail)

SC rate: 99.85%

FP rate: 0.22%

Final score: 98.76

Project Honey Pot SC rate: 99.83%

Abusix SC rate: 99.88%

Newsletters FP rate: 1.10%

McAfee's Email Gateway appliance blocked 13 legitimate emails in this test. While this is an improvement on the previous test, it continues to be a concern. Thanks to a good spam catch



rate, the product wins its 15th VBSpam award in as many tests – but we hope to see the false positive rate drop in the next test.

McAfee Email and Web Security Appliance

SC rate: 99.92%

FP rate: 0.08%

Final score: 99.50

Project Honey Pot SC rate: 99.84%

Abusix SC rate: 99.99%

Newsletters FP rate: 2.21%



As in the previous test, *McAfee's Email and Web Security Appliance* missed five legitimate emails. But since it also saw its spam catch rate improve a little further – to an impressive 99.92% – the product easily wins another VBSpam award – its 13th out of 14 tests.

McAfee SaaS Email Protection

SC rate: 99.95%
 FP rate: 0.10%
 Final score: 99.45
 Project Honey Pot SC rate: 99.93%
 Abusix SC rate: 99.98%
 Newsletters FP rate: 2.76%



In this test *McAfee's* hosted solution saw its false positive rate significantly reduced. And while six missed legitimate emails are still six too many, with a spam catch rate equally as high as it was in the previous test, the product's final score improved quite a bit and a fourth VBSpam award can be added to the product's tally.

Messaging Architects M+Guardian

SC rate: 99.96%
 FP rate: 0.49%
 Final score: 97.52
 Project Honey Pot SC rate: 99.94%
 Abusix SC rate: 99.99%
 SC rate pre-DATA: 97.89%
 Newsletters FP rate: 11.60%



We want vendors to submit their solutions to our tests, but when a choice must be made between working on a new, improved version of a product or supporting the test, we understand that vendors consider the former more important. It was nice, therefore, to see *M+Guardian* return to the test bench after a 14-month absence. Whereas in the past we tested a hardware appliance, this time we tested a virtual version of the product that runs under *ESXi*.

On its return, *M+Guardian* impressed us with one of the highest spam catch rates in this test, missing just over 50 spam messages. Unfortunately, the product also blocked a few dozen legitimate emails – more than any other product. For now, given the product's long absence, we are willing to blame this on unfamiliarity with the ham corpus, but we hope that the developers can show that this is indeed the case. A VBSpam award should keep their spirits up in the meantime.

OnlyMyEmail's Corporate MX-Defender

SC rate: 99.997%
 FP rate: 0.02%
 Final score: 99.91
 Project Honey Pot SC rate: 99.99%
 Abusix SC rate: 100.00%
 Newsletters FP rate: 0.00%



In this test, *OnlyMyEmail* missed fewer than one in 36,000 spam messages. After several exceptional performances like this, we've almost stopped being surprised and thus it is good to note that many users do not even receive this much spam in a full year! Unfortunately, the product missed a single legitimate email (but no newsletters) and thus it 'only' achieved the third highest final score – but the vendor's eighth consecutive VBSpam award is no less deserved.

Sophos Email Appliance

SC rate: 99.80%
 FP rate: 0.15%
 Final score: 99.04
 Project Honey Pot SC rate: 99.59%
 Abusix SC rate: 99.996%
 Newsletters FP rate: 0.00%



With nine false positives, *Sophos's* performance in this test was a little disappointing and its developers will no doubt try to improve on this score in the next test. For now, thanks to a good spam catch rate, the product's final score remained decent and the vendor's 12th visit to the test bench brought *Sophos* its 12th VBSpam award.

SpamTitan

SC rate: 99.97%
 FP rate: 0.10%
 Final score: 99.46
 Project Honey Pot SC rate: 99.95%
 Abusix SC rate: 99.98%
 Newsletters FP rate: 2.76%



This month, *SpamTitan* achieved what all products aim to do: it both improved its spam catch rate (in fact, it blocked more spam than all but one other product) and reduced its false positive rate, resulting in an increased final score and earning the product its 14th VBSpam award.

	Newsletters		Project Honey Pot		Abusix		pre-DATA [†]		STDev [‡]
	False positives	FP rate	False negatives	SC rate	False negatives	SC rate	False negatives	SC rate	
Anubis Networks	0	0.00%	76	99.89%	2	99.997%			0.13
BitDefender	0	0.00%	198	99.71%	21	99.97%			0.22
FortiMail	0	0.00%	235	99.66%	155	99.80%			0.39
GFI MailEssentials	2	1.10%	157	99.77%	19	99.98%			0.20
Halon Security	0	0.00%	498	99.28%	170	99.78%			0.67
IBM Lotus Protector	1	0.55%	135	99.81%	22	99.97%			0.21
Kaspersky Anti-Spam	0	0.00%	248	99.64%	116	99.85%			0.39
Libra Esva	0	0.00%	53	99.92%	9	99.99%	143818	98.42%	0.11
McAfee Email Gateway	2	1.10%	118	99.83%	95	99.88%			0.31
McAfee EWS	4	2.21%	111	99.84%	7	99.99%			0.16
McAfee SaaS	5	2.76%	50	99.93%	17	99.98%			0.11
Messaging Architects M+Guardian	21	11.60%	42	99.94%	10	99.99%	143031	97.89%	0.10
OnlyMyEmail	0	0.00%	4	99.99%	0	100.00%			0.02
Sophos Email Appliance	0	0.00%	285	99.59%	3	99.996%			0.26
SpamTitan	5	2.76%	32	99.95%	15	99.98%			0.10
Spider Antispam	4	2.21%	92	99.87%	32	99.96%			0.19
Symantec Messaging Gateway	2	1.10%	133	99.81%	10	99.99%			0.17
The Email Laundry	0	0.00%	169	99.76%	21	99.97%	144676	99.01%	0.20
Vade Retro	2	1.10%	79	99.89%	1	99.999%			0.13
Vamssoft ORF	1	0.55%	766	98.89%	93	99.88%			0.49
Spamhaus ZEN+DBL*	0	0.00%	1007	98.55%	335	99.56%	143433	98.16%	0.91
SURBL*	0	0.00%	32483	53.09%	16577	78.44%			11.94

*Spamhaus and SURBL are both partial solutions and their performance is not to be compared with that of other products, neither should the performance of each be compared with the other.

[†] pre-DATA filtering was optional and was applied on the full corpus. One of the false positives for The Email Laundry occurred pre-DATA; all the other false positives occurred post-DATA.

[‡] The standard deviation of a product is calculated using the set of its hourly spam catch rates.

(Please refer to the text for full product names.)

Spider Antispam

SC rate: 99.92%

FP rate: 0.08%

Final score: 99.49

Project Honey Pot SC rate: 99.87%

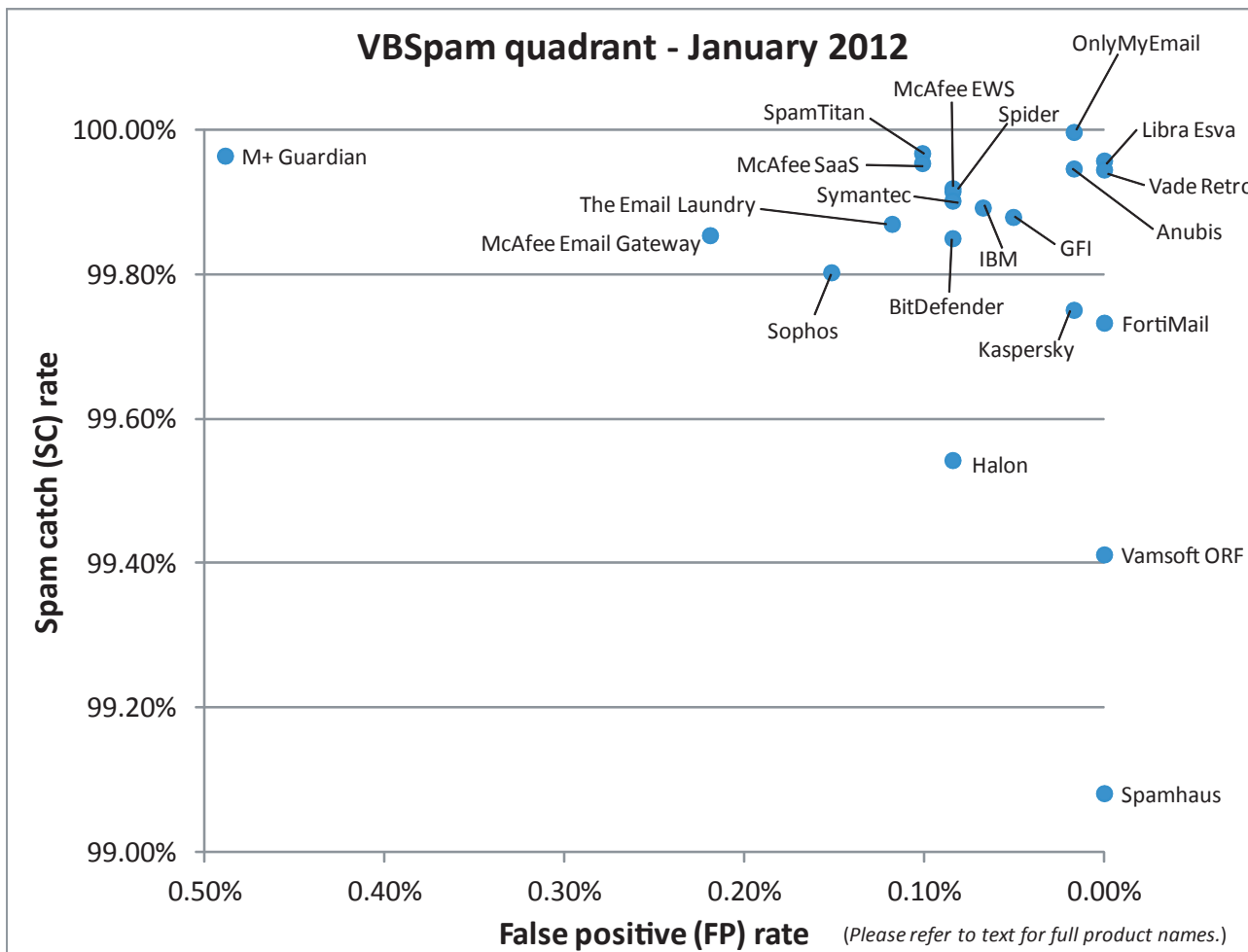
Abusix SC rate: 99.96%

Newsletters FP rate: 2.21%



In this test *Spider Antispam* saw an improvement to what was already a very decent spam catch rate; in fact, the Czech product almost halved its percentage of missed spam compared with the last test.

Unfortunately, the product also picked up a handful of false positives, which reduced the final score a little, but *Spider Antispam* still achieved a high enough score to earn its fourth consecutive VBSpam award.



Symantec Messaging Gateway 9.5 powered by Brightmail

SC rate: 99.90%
 FP rate: 0.08%
 Final score: 99.48
 Project Honey Pot SC rate: 99.81%
 Abusix SC rate: 99.99%
 Newsletters FP rate: 1.10%



As in the last test, *Symantec Messaging Gateway* picked up a few false positives – something the development team will undoubtedly want to look at. But with a slightly improved spam catch rate, the product still managed to achieve a slightly higher final score than on the last occasion – therefore also earning a VBSpam award, which takes its tally to 13 consecutive awards.

The Email Laundry

SC rate: 99.87%
 FP rate: 0.12%
 Final score: 99.28
 Project Honey Pot SC rate: 99.76%
 Abusix SC rate: 99.97%
 SC rate pre-DATA: 99.01%
 Newsletters FP rate: 0.00%



A score of seven false positives is something that the developers at *The Email Laundry* will almost certainly want to improve upon in the next test. Fortunately, as in previous tests the product’s spam catch rate was very good, which ensured that the product’s final score was high enough to earn it its 11th consecutive VBSpam award.

Vade Retro Center

SC rate: 99.95%
 FP rate: 0.00%
 Final score: 99.95
 Project Honey Pot SC rate: 99.89%
 Abusix SC rate: 99.999%
 Newsletters FP rate: 1.10%
 Newsletters accuracy: 93.9%



Vade Retro's developers were a little disappointed with the product's relatively low spam catch rate in the last test. Upon investigation, they discovered that this was the result of a misconfiguration in the set-up of our account – causing large emails to evade the filter altogether. Understandably, they were eager to find out how the product had fared this month.

No doubt they will be very happy with the results: not only did the product block all but one in over 1,800 spam messages, but it also avoided blocking legitimate emails altogether. With the second highest final score this month (just a fraction lower than the highest), *Vade Retro* wins its 11th consecutive VBSpam award.

Vade Retro was also the only participating product that was both willing and able to have the accuracy of its newsletter classification feature measured. An accuracy of 93.9% (or 170 out of 181 emails) means that users of the product should easily be able to segregate non-urgent newsletters from the rest of their legitimate mail.

Vamsoft ORF

SC rate: 99.41%
 FP rate: 0.00%
 Final score: 99.41
 Project Honey Pot SC rate: 98.89%
 Abusix SC rate: 99.88%
 Newsletters FP rate: 0.55%



Thanks to its track record, it came as little surprise to find that *Vamsoft ORF* managed to completely avoid blocking legitimate emails in this test – despite the fact that few other solutions managed to achieve the same feat this month. Alongside a score of zero false positives, the Hungarian product managed to increase its spam catch rate, and thus with an increased final score, earns its 11th VBSpam award.

Spamhaus ZEN+DBL

SC rate: 99.08%
 FP rate: 0.00%

Products ranked by final score*	
Libra Esva	99.96
Vade Retro	99.95
OnlyMyEmail	99.91
Anubis Networks	99.86
FortiMail	99.73
Kaspersky Anti-Spam	99.67
GFI MailEssentials	99.63
IBM Lotus Protector	99.56
McAfee EWS	99.50
Spider Antispam	99.49
Symantec Messaging Gateway	99.48
SpamTitan	99.46
McAfee SaaS	99.45
BitDefender	99.43
Vamsoft ORF	99.41
The Email Laundry	99.28
Halon Security	99.12
Sophos Email Appliance	99.04
McAfee Email Gateway	98.76
Messaging Architects M+Guardian	97.52

*Full solutions only.

(Please refer to text for full product names.)

Spamhaus ZEN+DBL contd.

Final score: 99.08
 Project Honey Pot SC rate: 98.55%
 Abusix SC rate: 99.56%
 SC rate pre-DATA: 98.16%
 Newsletters FP rate: 0.00%



After a drop in its spam catch rate in the last test, *Spamhaus* bounced back this

month and blocked more than 99% of spam – more than it has ever done before. For a partial solution (one that is dependent on spammers using IP addresses and domains that are either not used or which are only rarely used to send legitimate email), this is a really good score and another VBSpam award – the product's 13th – is well deserved.

SURBL

SC rate: 66.43%

FP rate: 0.00%

Final score: 66.43

Project Honey Pot SC rate: 53.09%

Abusix SC rate: 78.44%

Newsletters FP rate: 0.00%

Like *Spamhaus*, *SURBL* is a partial solution (and one of a different kind): it only blocks emails based on URIs present in the email body, and no one would consider using it as a spam filter on its own. Close to two-thirds of the spam messages were blocked using the URI-based blacklist – a drop compared to the last test, though this is for the most part explained by the fact that fewer messages in this month's spam corpus contained a (recognizable) URL.

CONCLUSION

Once again this month, all full solutions won a VBSpam award. This is good news and demonstrates the breadth of options available to customers when it comes to filtering spam.

However, from talking to the developers and product managers, I understand that winning an award isn't necessarily at the top of their list of priorities: what they actually want is for their products to perform well and to be placed in the magic top right-hand corner of the VBSpam quadrant – where spam catch rates are high and false positive rates are low. While the top right-hand corner of the quadrant is currently fairly crowded, significant differences can be seen between the various participating solutions. Based on this month's performances, many developers will be spending time over the next few weeks working to improve their products' filtering abilities.

The next VBSpam test will run in February 2012, with the results scheduled for publication in March. Developers interested in submitting products should email martijn.grooten@virusbtn.com.

VIRUS BULLETIN

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