JUNE 2023

Virus Bulletin

Covering the global threat landscape

VBSPAM EMAIL SECURITY COMPARATIVE REVIEW JUNE 2023

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In the Q2 2023 VBSpam test – which forms part of *Virus Bulletin*'s continuously running security product test suite – we measured the performance of a number of email security solutions against various streams of wanted, unwanted and malicious emails. One third of the solutions we tested opted to be included in the public test, the rest opting for private testing (all details and results remaining unpublished). The solutions tested publicly were: nine full email security solutions, one custom configured solution[1], one open-source solution and one blocklist.

We continue to see the majority of spam successfully being blocked by email security solutions, and with higher scores this time against malware and phishing samples. Besides keeping a balance between spam and legitimate emails, the challenge for the email security solutions seems to be timely detection of sophisticated threats which appear less frequently and have a short life span.

For some additional background to this report, the table and map below show the geographical distribution (based on sender IP address) of the spam emails seen in the test. *(Note: these statistics are relevant only to the spam samples we received during the test period.)*

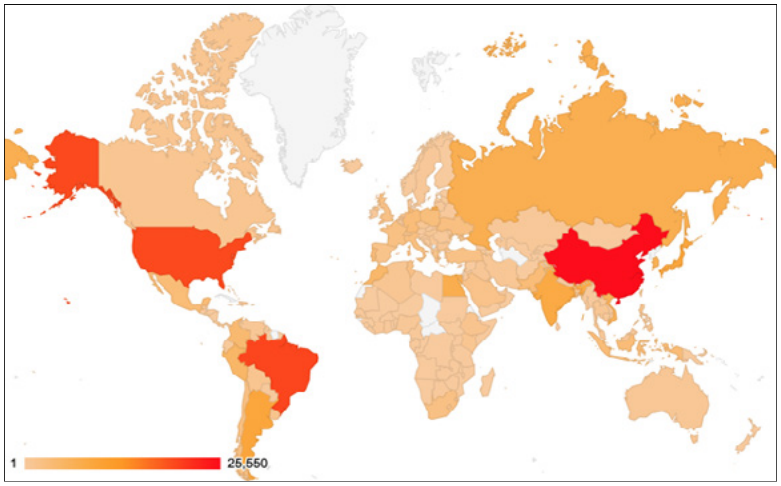
HIGHLIGHTS

Remcos RAT

The malware email that was most commonly missed by the solutions in this test contained an archive (InvoiceXTSZX45583.tar.lz), in which there was an scr file containing Remcos, a sophisticated remote access trojan that can be used to control and monitor *Windows* computers.

#	Sender's IP country	Percentage of spam
1	China	11.10%
2	Brazil	8.63%
3	United States	8.46%
4	Argentina	3.95%
5	Japan	3.87%
6	India	3.54%
7	Egypt	3.14%
8	Russian Federation	2.99%
9	Republic of Korea	2.80%
10	Vietnam	2.49%

Top 10 countries from which spam was sent.



Geographical distribution of spam based on sender IP address.

[1] *Spamhaus DQS* is a custom solution built on top of the *SpamAssassin* open-source anti-spam platform.

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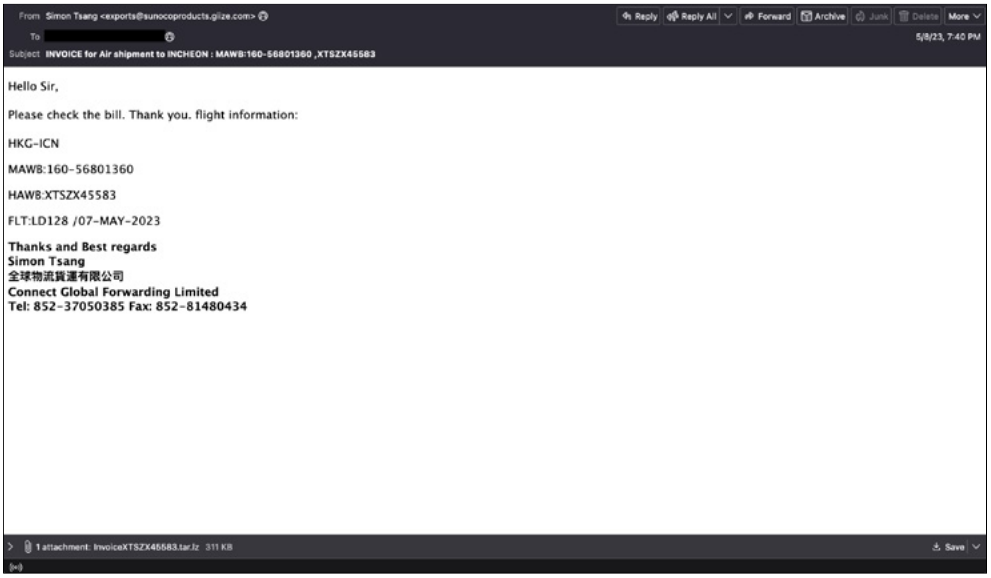


From Simon Tsang <exports@sunocoproducts.gize.com>
To [redacted]
Subject INVOICE for Air shipment to INCHEON : MAWB:160-56801360 ,XTSZX45583
5/8/23, 7:40 PM

Hello Sir,

Please check the bill. Thank you. flight information:

HKG-ICN

MAWB:160-56801360

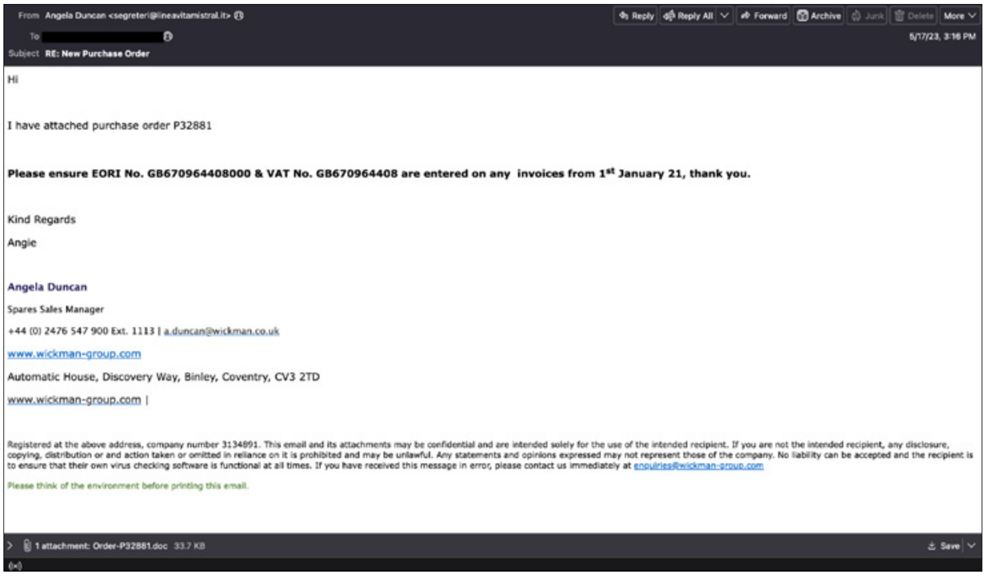
HAWB:XTSZX45583

FLT:LD128 /07-MAY-2023

Thanks and Best regards
Simon Tsang
全球物流貨運有限公司
Connect Global Forwarding Limited
Tel: 852-37050385 Fax: 852-81480434

1 attachment: InvoiceXTSZX45583.tar.lz 311 KB

Malicious email with attachment containing Remcos.



From Angela Duncan <segreteri@lineavitamistral.it>
To [redacted]
Subject RE: New Purchase Order
5/17/23, 3:16 PM

Hi

I have attached purchase order P32881

Please ensure EORI No. GB670964408000 & VAT No. GB670964408 are entered on any invoices from 1st January 21, thank you.

Kind Regards

Angie

Angela Duncan

Spares Sales Manager

+44 (0) 2476 547 900 Ext. 1113 | a.duncan@wickman.co.uk

www.wickman-group.com

Automatic House, Discovery Way, Binley, Coventry, CV3 2TD

www.wickman-group.com |

Registered at the above address, company number 3134891. This email and its attachments may be confidential and are intended solely for the use of the intended recipient. If you are not the intended recipient, any disclosure, copying, distribution or and action taken or omitted in reliance on it is prohibited and may be unlawful. Any statements and opinions expressed may not represent those of the company. No liability can be accepted and the recipient is to ensure that their own virus checking software is functional at all times. If you have received this message in error, please contact us immediately at enquiries@wickman-group.com

Please think of the environment before printing this email.

1 attachment: Order-P32881.doc 33.7 KB

Email containing Agent Tesla.

We didn't see it as part of a spam campaign. It was detected only once, on 8 May.

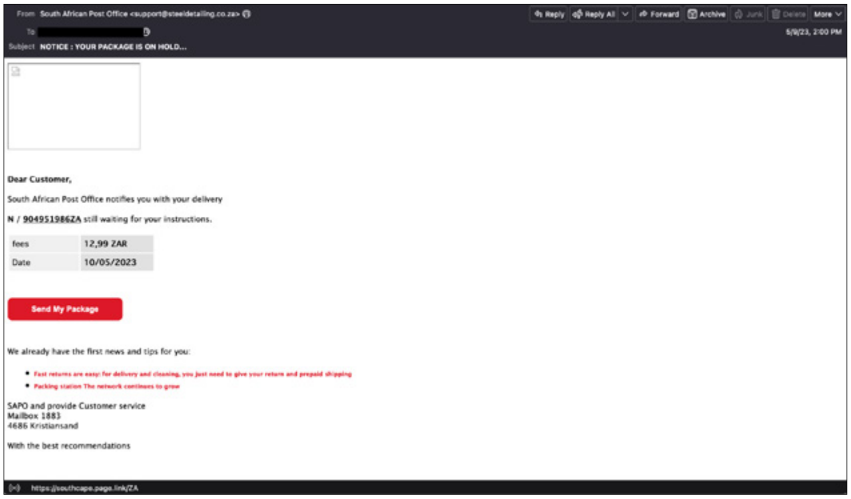
Agent Tesla

This quarter we continued to see attachments leading to Agent Tesla-infected payloads, this time exploiting the Equation Editor vulnerability in *Microsoft Office* (CVE-2017-11882). On opening the attached doc file the infected exe file was downloaded.

We detected only two samples of this kind, on 17 May, which were missed by a few solutions.

Shipment / postal phishing

In this test the majority of missed phishing emails looked to impersonate postal or parcel shipping services, in a wide variety of languages. There were no large campaigns with many emails of this kind, and both the scarcity of samples and the varied languages they covered seemed to make it a challenge for the security solutions to detect them in real time.



From South African Post Office <support@steeldetailing.co.za>

To [redacted]

Subject NOTICE : YOUR PACKAGE IS ON HOLD...

5/9/23, 2:00 PM

Dear Customer,

South African Post Office notifies you with your delivery

N / **904951986ZA** still waiting for your instructions.

fees	12,99 ZAR
Date	10/05/2023

Send My Package

We already have the first news and tips for you:

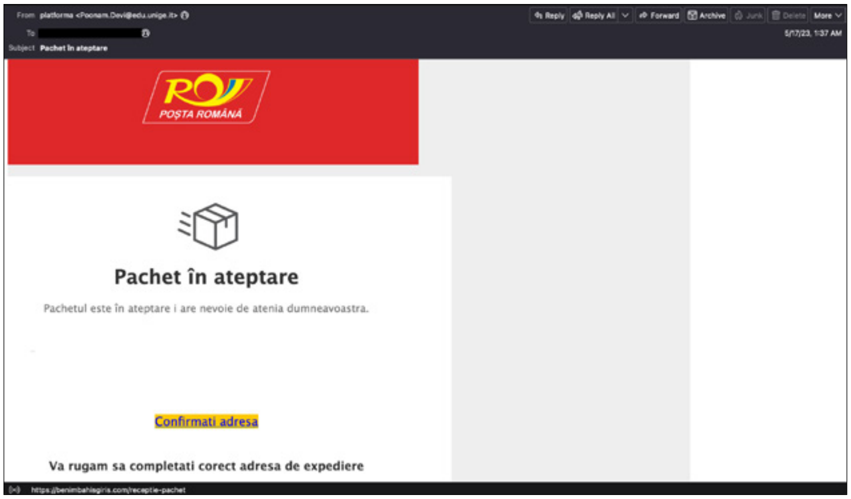
- Fast returns are easy: for delivery and cleaning, you just need to give your return and prepaid shipping
- Packing station The network continues to grow

SAPO and provide Customer service
Mailbox 1883
4686 Kristiansand

With the best recommendations

https://southcape.page.link/ZA

South African Post Office phishing email.



From platforma <Poonam.Devi@edu.unige.it>

To [redacted]

Subject Pachet în ateptare

5/17/23, 1:37 AM

Pachet în ateptare

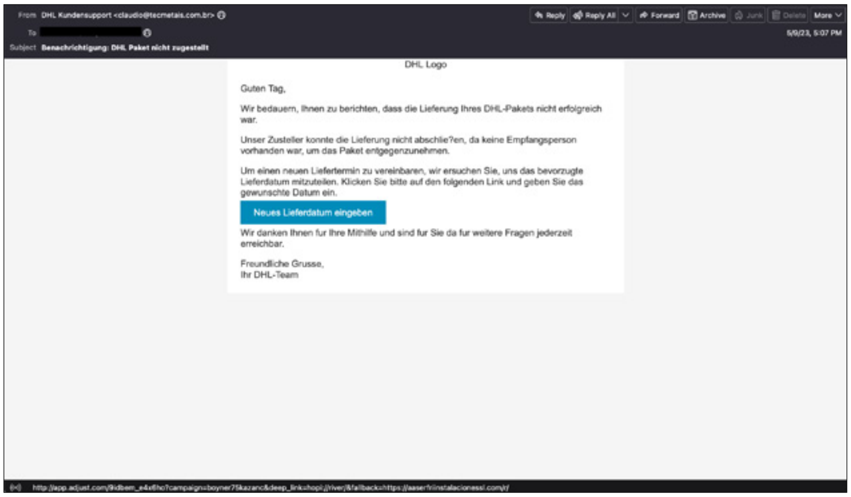
Pachetul este în ateptare i are nevoie de atenia dumneavoastra.

Confirmati adresa

Va rugam sa completati corect adresa de expediere

https://benimbahisgiris.com/receptie-pachet

Romanian Post phishing email.



From DHL Kundensupport <claudio@tecmetais.com.br>

To [redacted]

Subject Benachrichtigung: DHL Paket nicht zugestellt

5/9/23, 5:07 PM

DHL Logo

Guten Tag,

Wir bedauern, Ihnen zu berichten, dass die Lieferung Ihres DHL-Pakets nicht erfolgreich war.

Unser Zusteller konnte die Lieferung nicht abschlie?en, da keine Empfangsperson vorhanden war, um das Paket entgegenzunehmen.

Um einen neuen Liefertermin zu vereinbaren, wir ersuchen Sie, uns das bevorzugte Lieferdatum mitzuteilen. Klicken Sie bitte auf den folgenden Link und geben Sie das gewunschte Datum ein.

Neues Lieferdatum eingeben

Wir danken Ihnen fur Ihre Mithilfe und sind fur Sie da fur weitere Fragen jederzeit erreichbar.

Freundliche Grusse,
Ihr DHL-Team

http://app.adjust.com/9idbem_e4x6ho?campaign=boyner75kazanc&deep_link=hopi://river/&fallback=https://aaserfriinstalacionessl.com/r/

German DHL phishing email.

Banking phishing

The particularity of the banking phishing emails that evaded the filters of most of the security solutions in this test was that they were in German. Posing as emails sent by real banks in order to update the user's personal data or to enable security features, we saw a variety of samples.

RESULTS

The majority of the tested solutions managed to achieve high spam catch rates, with values exceeding 99%. This is why a better comparison can be made by analysing the malware and phishing catch rates, both of which are subsets of the spam corpus. We highlight the performances of *Cleanmail*, *Mimecast, N-able Mail Assure, N-able SpamExperts* and *SEPPmail*, each with a 100% malware catch rate, and again *SEPPmail*, which blocked 100% of phishing samples.

Of the participating full solutions, two – *Cleanmail Domain Gateway* and *SEPPmail.cloud Filter* – achieved a VBSpam award, while seven – *Bitdefender GravityZone Premium, FortiMail*, *Mimecast*, *N-able Mail Assure*, *N-able SpamExperts*, *Net At Work NoSpamProxy* and *Zoho Mail* – plus the custom configured solution *Spamhaus DQS + SpamAssassin* were awarded VBSpam+ certification.

Bitdefender GravityZone Premium

SC rate: 99.99%

FP rate: 0.00%

Final score: 99.99

Malware catch rate: 99.88%

Phishing catch rate: 99.95%

Project Honey Pot SC rate: 100.00%

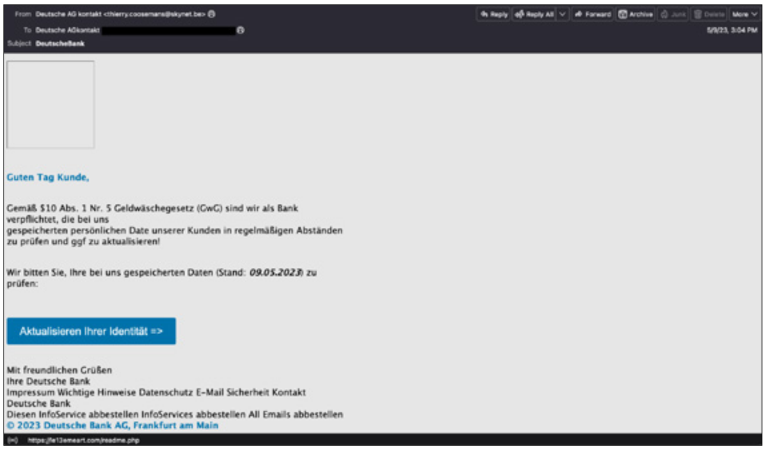
Abusix SC rate: 99.99%

MXMailData SC rate: 99.87%

Newsletters FP rate: 0.0%

Speed: 10%: ●; 50%: ●; 95%: ●; 98%: ●

vb June 2023 VERIFIED SPAM + virusbtn.com



From Deutsche AG kontakt <thierry.coosemans@skynet.be>
To Deutsche AGkontakt [redacted]
Subject DeutscheBank
5/9/23, 3:04 PM

Guten Tag Kunde,

Gemäß $10 Abs. 1 Nr. 5 Geldwäschegesetz (GwG) sind wir als Bank
verpflichtet, die bei uns
gespeicherten persönlichen Date unserer Kunden in regelmäßigen Abständen
zu prüfen und ggf zu aktualisieren!

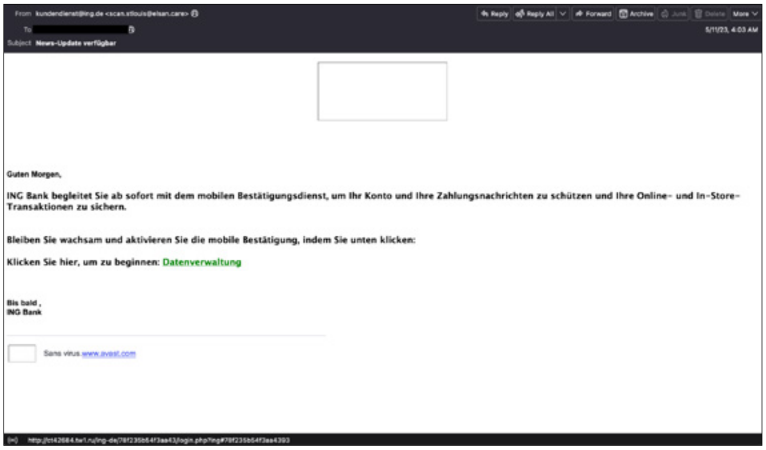
Wir bitten Sie, Ihre bei uns gespeicherten Daten (Stand: *09.05.2023*) zu
prüfen:

Aktualisieren Ihrer Identität =>

Mit freundlichen Grüßen
Ihre Deutsche Bank
Impressum Wichtige Hinweise Datenschutz E-Mail Sicherheit Kontakt
Deutsche Bank
Diesen InfoService abbestellen InfoServices abbestellen All Emails abbestellen
© 2023 Deutsche Bank AG, Frankfurt am Main

https://fe13emeart.com/readme.php

Deutsche Bank phishing email.



From kundendienst@ing.de <scan.stlouis@elsan.care>
To [redacted]
Subject News-Update verfügbar
5/11/23, 4:03 AM

Guten Morgen,

ING Bank begleitet Sie ab sofort mit dem mobilen Bestätigungsdienst, um Ihr Konto und Ihre Zahlungsnachrichten zu schützen und Ihre Online- und In-Store-Transaktionen zu sichern.

Bleiben Sie wachsam und aktivieren Sie die mobile Bestätigung, indem Sie unten klicken:

Klicken Sie hier, um zu beginnen: Datenverwaltung

Bis bald ,
ING Bank

Sans virus.www.avast.com

http://ct42684.tw1.ru/ing-de/78f235b64f3aa43/login.php?ing#78f235b64f3aa4393

ING Bank phishing email.

Bitdefender's solution continues its solid performance, blocking more than 99.99% of spam samples with no false positives of any kind. It easily earns a VBSpam+ award.

Cleanmail Domain Gateway

SC rate: 99.84%

FP rate: 0.03%

Final score: 99.68

Malware catch rate: 100.00%

Phishing catch rate: 99.91%

Project Honey Pot SC rate: 99.67%

Abusix SC rate: 99.85%

MXMailData SC rate: 100.00%

Newsletters FP rate: 0.0%

Speed: 10%: ●; 50%: ●; 95%: ●; 98%: ●

Cleanmail Domain Gateway earns VBSpam certification in the Q2 2023 test. No malicious sample passed through *Cleanmail*'s filters and no newsletter sample was blocked.

Fortinet FortiMail

SC rate: 99.98%

FP rate: 0.00%

Final score: 99.98

Malware catch rate: 99.84%

Phishing catch rate: 99.95%

Project Honey Pot SC rate: 99.93%

Abusix SC rate: 99.99%

MXMailData SC rate: 99.74%

Newsletters FP rate: 0.0%

Speed: 10%: ●; 50%: ●; 95%: ●; 98%: ●

In this test *Fortinet* showed a similarly impressive performance to those we have seen from it previously. Higher than 99% catch rates on the malware and phishing corpus, combined with no false positives, sets it up for VBSpam+ certification.

Mimecast

SC rate: 99.94%

FP rate: 0.00%

Final score: 99.88

Malware catch rate: 100.00%

Phishing catch rate: 99.15%

Project Honey Pot SC rate: 99.49%

Abusix SC rate: 99.97%

MXMailData SC rate: 100.00%

Newsletters FP rate: 2.4%

Speed: 10%: ●; 50%: ●; 95%: ●; 98%: ●

VBSpam+ certification is awarded to *Mimecast* in the Q2 2023 VBSpam test. The solution impresses on this occasion with a 100% catch rate of malware samples and no false positives.

N-able Mail Assure

SC rate: 99.94%

FP rate: 0.00%

Final score: 99.91

Malware catch rate: 100.00%

Phishing catch rate: 99.62%

Project Honey Pot SC rate: 99.91%

Abusix SC rate: 99.95%

MXMailData SC rate: 100.00%

Newsletters FP rate: 1.2%

Speed: 10%: ●; 50%: ●; 95%: ●; 98%: ●

It was another great performance from *N-able Mail Assure* in the Q2 2023 test. Blocking 99.94% of the spam samples and with no false positives, VBSpam+ certification is awarded.

N-able SpamExperts

SC rate: 99.94%

FP rate: 0.00%

Final score: 99.91

Malware catch rate: 100.00%

Phishing catch rate: 99.65%

Project Honey Pot SC rate: 99.91%

Abusix SC rate: 99.95%

MXMailData SC rate: 100.00%

Newsletters FP rate: 1.2%

Speed: 10%: ●; 50%: ●; 95%: ●; 98%: ●

With almost identical scores to its sister product, *N-able SpamExperts* also earns VBSpam+ certification in this test.

Net At Work NoSpamProxy

SC rate: 99.97%

FP rate: 0.00%

Final score: 99.97

Malware catch rate: 99.72%

Phishing catch rate: 99.91%

Project Honey Pot SC rate: 99.70%

Abusix SC rate: 99.99%

MXMailData SC rate: 99.55%

Newsletters FP rate: 0.0%

Speed: 10%: ●; 50%: ●; 95%: ●; 98%: ●

Net at Work's email security solution marks its return to VBSpam testing with a VBSpam+ certification. Correctly classifying all the legitimate samples and blocking 99.97% of spam samples, *NoSpamProxy* shows a balanced performance.

Rspamd

SC rate: 98.19%

FP rate: 0.29%

Final score: 96.68

Malware catch rate: 72.73%

Phishing catch rate: 92.62%

Project Honey Pot SC rate: 93.70%

Abusix SC rate: 98.71%

MXMailData SC rate: 69.79%

Newsletters FP rate: 2.4%

Speed: 10%: 🟢; 50%: 🟢; 95%: 🟢; 98%: 🟢

Rspamd scores a higher than 98% catch rate on spam while blocking more than 90% of the phishing samples. The open-source solution had a challenge in dealing with the malware samples, but we saw an improvement in the product's overall performance from the last test.

SEPPmail.cloud Filter

vb June 2023 VERIFIED SPAM virusbtn.com

SC rate: 99.99%

FP rate: 0.00%

Final score: 99.86

Malware catch rate: 100.00%

Phishing catch rate: 100.00%

Project Honey Pot SC rate: 99.85%

Abusix SC rate: 99.9995%

MXMailData SC rate: 100.00%

Newsletters FP rate: 4.8%

Speed: 10%: 🟢; 50%: 🟢; 95%: 🟢; 98%: 🟢

SEPPmail.cloud Filter was the only solution to score a 100% catch rate on both the phishing and malware corpus. It was only a high false positive rate in the newsletter corpus that stood in the way of achieving a VBSpam+ award. VBSpam certification is well deserved.

Spamhaus Data Query Service + SpamAssassin

vb June 2023 VERIFIED SPAM + virusbtn.com

SC rate: 99.81%

FP rate: 0.00%

Final score: 99.81

Malware catch rate: 98.23%

Phishing catch rate: 98.84%

Project Honey Pot SC rate: 99.71%

Abusix SC rate: 99.83%

MXMailData SC rate: 97.75%

Newsletters FP rate: 0.0%

Speed: 10%: 🟢; 50%: 🟢; 95%: 🟢; 98%: 🟡

Spamhaus SpamAssassin Data Query Service (*DQS*) is a custom configured solution that integrates the *Spamhaus DQS* DNSBL service and the free open-source solution *SpamAssassin*. In this test no ham or newsletter sample was blocked by the combined solution. With a final score of 99.81 the solution earns VBSpam+ certification.

Zoho Mail

vb June 2023 VERIFIED SPAM + virusbtn.com

SC rate: 99.61%

FP rate: 0.00%

Final score: 99.61

Malware catch rate: 99.36%

Phishing catch rate: 97.17%

Project Honey Pot SC rate: 98.83%

Abusix SC rate: 99.67%

MXMailData SC rate: 99.04%

Newsletters FP rate: 0.0%

Speed: 10%: 🟢; 50%: 🟢; 95%: 🟢; 98%: 🟢

Zoho's solution managed to block more than 99.50% of the spam samples while correctly classifying all ham and newsletter samples, easily reaching the criteria to earn VBSpam+ certification.

Abusix Mail Intelligence

SC rate: 99.08%

FP rate: 0.00%

Final score: 99.01

Malware catch rate: 76.02%

Phishing catch rate: 96.53%

Project Honey Pot SC rate: 92.56%

Abusix SC rate: 99.78%

MXMailData SC rate: 65.49%

Newsletters FP rate: 2.4%

Abusix Mail Intelligence is a set of blocklists that is tested as a partial solution because it has access only to parts of the emails (IP addresses, domains, URLs), which are queried to their DNS zones. With this setup, the solution's 99.08% spam catch rate and lack of ham false positives are impressive, and *Abusix Mail Intelligence* continues its good performance.

APPENDIX: SET-UP, METHODOLOGY AND EMAIL CORPORA

The full VBSpam test methodology can be found at https://www.virusbulletin.com/testing/vbspam/vbspam-methodology/vbspam-methodology-ver20.

The test ran for 16 days, from 12am on 6 May to 12am on 22 May 2023 (GMT).

The test corpus consisted of 233,390 emails. 230,210 of these were spam, 15,023 of which were provided by *Project Honey Pot*, 213,628 were provided by Abusix with the remaining 1,559 spam emails provided by *MXMailData*. There were 3,097 legitimate emails ('ham') and 83 newsletters, a category that includes various kinds of commercial and non-commercial opt-in mailings.

39 emails in the spam corpus were considered 'unwanted' (see the June 2018 report[2]) and were included with a weight of 0.2; this explains the non-integer numbers in some of the tables.

Moreover, 2,490 emails from the spam corpus were found to contain a malicious attachment while 4,242 contained a link to a phishing or malware site; though we report separate performance metrics on these corpora, it should be noted that these emails were also counted as part of the spam corpus.

Emails were sent to the products in real time and in parallel. Though products received the email from a fixed IP address, all products had been set up to read the original sender's IP address as well as the EHLO/HELO domain sent during the SMTP transaction, either from the email headers or through an optional XCLIENT SMTP command[3].

For those products running in our lab, we all ran them as virtual machines on a *VMware ESXi* cluster. As different products have different hardware requirements – not to mention those running on their own hardware, or those running in the cloud – there is little point comparing the memory, processing power or hardware the products were provided with; we followed the developers' requirements and note that the amount of email we receive is representative of that received by a small organization.

Although we stress that different customers have different needs and priorities, and thus different preferences when it comes to the ideal ratio of false positive to false negatives, we created a one-dimensional 'final score' to compare products. This is defined as the spam catch (SC) rate minus five times the weighted false positive (WFP) rate. The WFP rate is defined as the false positive rate of the ham and newsletter corpora taken together, with emails from the latter corpus having a weight of 0.2:

WFP rate = (#false positives + 0.2 * min(#newsletter false positives , 0.2 * #newsletters)) / (#ham + 0.2 * #newsletters)

while in the spam catch rate (SC), emails considered 'unwanted' (see above) are included with a weight of 0.2. The final score is then defined as:

Final score = SC - (5 x WFP)

In addition, for each product, we measure how long it takes to deliver emails from the ham corpus (excluding false positives) and, after ordering these emails by this time, we colour-code the emails at the 10th, 50th, 95th and 98th percentiles:

🟢 (green) = up to 30 seconds

🟡 (yellow) = 30 seconds to two minutes

🟠 (orange) = two to ten minutes

🔴 (red) = more than ten minutes

Products earn VBSpam certification if the value of the final score is at least 98 and the 'delivery speed colours' at 10 and 50 per cent are green or yellow and that at 95 per cent is green, yellow or orange.

Meanwhile, products that combine a spam catch rate of 99.5% or higher with a lack of false positives, no more than 2.5% false positives among the newsletters and 'delivery speed colours' of green at 10 and 50 per cent and green or yellow at 95 and 98 per cent earn a VBSpam+ award.

Head of Testing: Peter Karsai
Security Test Engineers: Adrian Luca, Csaba Mészáros, Ionuţ Răileanu
Operations Manager: Bálint Tanos
Sales Executive: Allison Sketchley
Editorial Assistant: Helen Martin

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Tel: +44 20 3920 6348 Email: editorial@virusbulletin.com
Web: https://www.virusbulletin.com/

[2] https://www.virusbulletin.com/virusbulletin/2018/06/vbspam-comparative-review.
[3] http://www.postfix.org/XCLIENT_README.html

	True negatives	False positives	FP rate	False negatives	True positives	SC rate	Final score	VBSpam
Bitdefender GravityZone Premium	3097	0	0.00%	23	230155.8	99.99%	99.99	SPAM+ Verified
Cleanmail Domain Gateway	3096	1	0.03%	360.2	229818.6	99.84%	99.68	SPAM Verified
Fortinet FortiMail	3097	0	0.00%	35.2	230143.6	99.98%	99.98	SPAM+ Verified
Mimecast	3097	0	0.00%	132.8	230046	99.94%	99.88	SPAM+ Verified
N-able Mail Assure	3097	0	0.00%	128	230050.8	99.94%	99.91	SPAM+ Verified
N-able SpamExperts	3097	0	0.00%	127	230051.8	99.94%	99.91	SPAM+ Verified
Net At Work NoSpamProxy	3097	0	0.00%	71	230107.8	99.97%	99.97	SPAM+ Verified
Rspamd	3088	9	0.29%	4167.8	226011	98.19%	96.68	
SEPPmail.cloud Filter	3097	0	0.00%	24	230154.8	99.99%	99.86	SPAM Verified
Spamhaus DQS + SpamAssassin‡	3097	0	0.00%	433	229745.8	99.81%	99.81	SPAM+ Verified
Zoho Mail	3097	0	0.00%	902	229276.8	99.61%	99.61	SPAM+ Verified
Abusix Mail Intelligence*	3097	0	0.00%	2124.6	228054.2	99.08%	99.01	N/A

‡*Spamhaus Data Query Service (DQS) + SpamAssassin is a fully configured solution that integrates Spamhaus DQS on top of SpamAssassin. Spamhaus DQS is not a stand-alone solution but rather a DNSBL service that can be added to MTAs and email security solutions such as SpamAssasssin. The test set up reflects the real-life performance expected from this combined production deployment, not as individual product elements.*

**This product is a partial solution and its performance should not be compared with that of other products.*

	Newsletters		Malware		Phishing		Project Honey Pot		Abusix		MXMailData		STDev[†]
	False positives	FP rate	False negatives	SC rate	False negatives	SC rate	False negatives	SC rate	False negatives	SC rate	False negatives	SC rate	
Bitdefender GravityZone Premium	0	0.0%	3	99.88%	2	99.95%	0	100.00%	21	99.99%	2	99.87%	0.06
Cleanmail Domain Gateway	0	0.0%	0	100.00%	4	99.91%	50	99.67%	310.2	99.85%	0	100.00%	1.50
Fortinet FortiMail	0	0.0%	4	99.84%	2	99.95%	11	99.93%	20.2	99.99%	4	99.74%	0.09
Mimecast	2	2.4%	0	100.00%	36	99.15%	76.4	99.49%	56.4	99.97%	0	100.00%	0.53
N-able Mail Assure	1	1.2%	0	100.00%	16	99.62%	13	99.91%	115	99.95%	0	100.00%	0.22
N-able SpamExperts	1	1.2%	0	100.00%	15	99.65%	13	99.91%	114	99.95%	0	100.00%	0.22
Net At Work NoSpamProxy	0	0.0%	7	99.72%	4	99.91%	45	99.70%	19	99.99%	7	99.55%	0.71
Rspamd	2	2.4%	679	72.73%	313	92.62%	945.4	93.70%	2751.4	98.71%	471	69.79%	3.22
SEPPmail.cloud Filter	4	4.8%	0	100.00%	0	100.00%	23	99.85%	1	99.9995%	0	100.00%	0.38
Spamhaus DQS + SpamAssassin[‡]	0	0.0%	44	98.23%	49	98.84%	44	99.71%	354	99.83%	35	97.75%	1.00
Zoho Mail	0	0.0%	16	99.36%	120	97.17%	175	98.83%	712	99.67%	15	99.04%	1.23
Abusix Mail Intelligence[*]	2	2.4%	597	76.02%	147	96.53%	1115.6	92.56%	471	99.78%	538	65.49%	2.47

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

[‡] *Spamhaus Data Query Service (DQS) + SpamAssassin is a fully configured solution that integrates Spamhaus DQS on top of SpamAssassin. Spamhaus DQS is not a stand-alone solution but rather a DNSBL service that can be added to MTAs and email security solutions such as SpamAssasssin. The test set up reflects the real-life performance expected from this combined production deployment, not as individual product elements.*

[*] *This product is a partial solution and its performance should not be compared with that of other products. None of the queries to the IP blocklist included any information on the attachments; hence its performance on the malware corpus is added purely for information.*

	Speed			
	10%	50%	95%	98%
Bitdefender GravityZone Premium	🟢	🟢	🟢	🟢
Cleanmail Domain Gateway	🟢	🟢	🟢	🟢
Fortinet FortiMail	🟢	🟢	🟢	🟢
Mimecast	🟢	🟢	🟢	🟢
N-able Mail Assure	🟢	🟢	🟢	🟢
N-able SpamExperts	🟢	🟢	🟢	🟢
Net At Work NoSpamProxy	🟢	🟢	🟢	🟢
Rspamd	🟢	🟢	🟢	🟢
SEPPmail.cloud Filter	🟢	🟢	🟢	🟢
Spamhaus DQS + SpamAssassin[‡]	🟢	🟢	🟢	🟡
Zoho Mail	🟢	🟢	🟢	🟢

🟢 *0–30 seconds;* 🟡 *30 seconds to two minutes;* 🟠 *two minutes to 10 minutes;* 🔴 *more than 10 minutes.*

[‡] *Spamhaus Data Query Service (DQS) + SpamAssassin is a fully configured solution that integrates Spamhaus DQS on top of SpamAssassin. Spamhaus DQS is not a stand-alone solution but rather a DNSBL service that can be added to MTAs and email security solutions such as SpamAssasssin. The test set up reflects the real-life performance expected from this combined production deployment, not as individual product elements.*

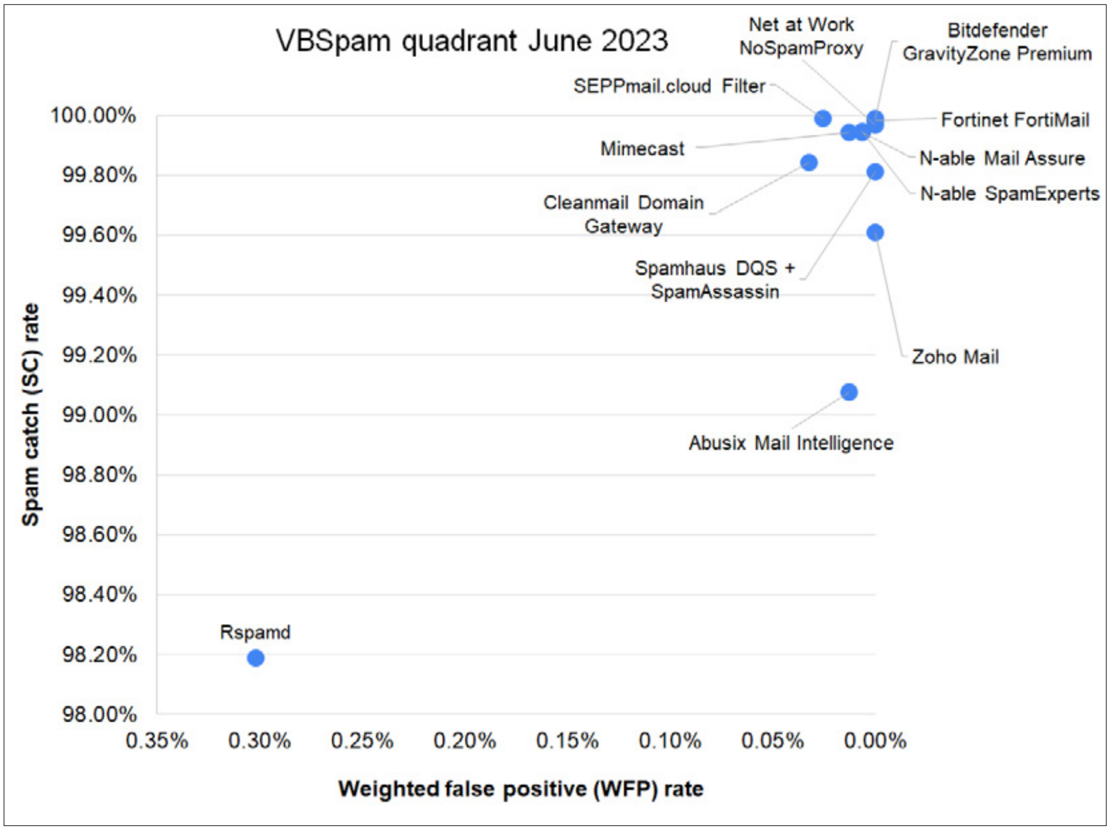
Products ranked by final score	
Bitdefender GravityZone Premium	99.99
Fortinet FortiMail	99.98
Net At Work NoSpamProxy	99.97
N-able SpamExperts	99.91
N-able Mail Assure	99.91
Mimecast	99.88
SEPPmail.cloud Filter	99.86
Spamhaus Data Query Service[‡]	99.81
Cleanmail Domain Gateway	99.68
Zoho Mail	99.61
Rspamd	96.68

[‡] *Spamhaus Data Query Service (DQS) + SpamAssassin is a fully configured solution that integrates Spamhaus DQS on top of SpamAssassin. Spamhaus DQS is not a stand-alone solution but rather a DNSBL service that can be added to MTAs and email security solutions such as SpamAssasssin. The test set up reflects the real-life performance expected from this combined production deployment, not as individual product elements.*

Hosted solutions	Anti-malware	IPv6	DKIM	SPF	DMARC	Multiple MX-records	Multiple locations
Cleanmail Domain Gateway	Cleanmail		√	√	√	√	
Mimecast	Mimecast		√	√	√	√	√
N-able Mail Assure	N-able Mail Assure	√	√	√	√		
N-able SpamExperts	SpamExperts	√	√	√	√		
Net At Work NoSpamProxy	32Guards & NoSpamProxy		√	√	√	√	√
SEPPmail.cloud Filter	SEPPmail	√	√	√	√	√	√
Zoho Mail	Zoho		√	√	√	√	√

Local solutions	Anti-malware	IPv6	DKIM	SPF	DMARC	Interface			
						CLI	GUI	Web GUI	API
Bitdefender GravityZone Premium	Bitdefender	√				√		√	√
Fortinet FortiMail	Fortinet	√	√	√	√	√		√	√
Rspamd	None					√			
Spamhaus DQS + SpamAssassin[‡]	Optional	√	√	√					√

[‡] *Spamhaus Data Query Service (DQS) + SpamAssassin is a fully configured solution that integrates Spamhaus DQS on top of SpamAssassin. Spamhaus DQS is not a stand-alone solution but rather a DNSBL service that can be added to MTAs and email security solutions such as SpamAssasssin.*


VBSpam quadrant June 2023
Net at Work NoSpamProxy
Bitdefender GravityZone Premium
SEPPmail.cloud Filter
Fortinet FortiMail
Mimecast
N-able Mail Assure
N-able SpamExperts
Cleanmail Domain Gateway
Spamhaus DQS + SpamAssassin
Zoho Mail
Abusix Mail Intelligence
Rspamd
Spam catch (SC) rate
Weighted false positive (WFP) rate