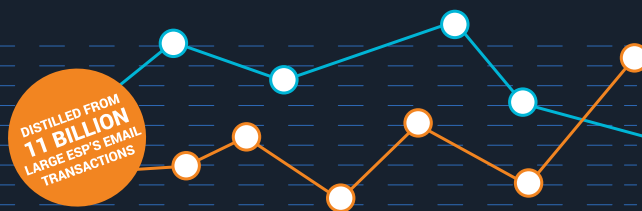


Q4 Postmastery's Email Delivery Benchmark

2 0 2 4 — Compare your email delivery performance with the performance of others...



Postmastery is pleased to present the fourth edition of our Email Delivery Benchmark report, building on the insights from our previous analyses.

This report offers a refined analysis of email delivery metrics, incorporating billions of additional email transactions from newly partnered senders to deliver an even more

robust and comprehensive overview of email performance. Conducted from October to December 2024, this study evaluates the most recent delivery trends across leading ESPs.

By assessing key metrics such as delivery rates, bounce rates, and deferred rates, this report provides industry professionals with actionable benchmarks to optimize their strategies in an evolving digital landscape.

The expanded dataset offers greater accuracy, making this report a critical tool for navigating the evolving landscape of email deliverability.

Key performance indicators

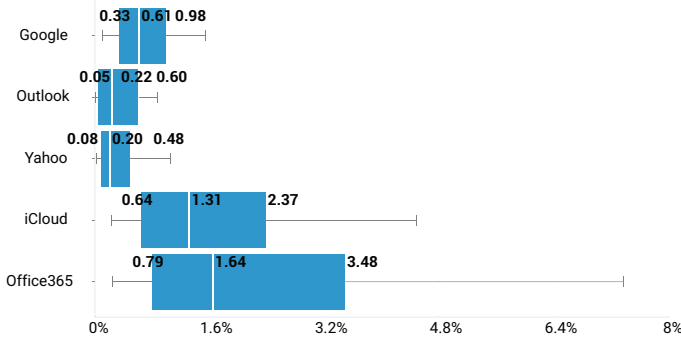
MAILBOX PROVIDERS	DELIVERY RATE	BOUNCE RATE	DEFERRED RATE	AVERAGE DELIVERY TIME
GOOGLE	99.39	0.62	0.18	0:02:55
OUTLOOK	99.78	0.22	0.41	0:08:02
YAHOO	99.82	0.20	0.09	0:02:56
ICLOUD	98.69	1.31	0.35	0:07:14
OFFICE365	99.24	1.64	0.30	0:02:47
SEZNAM	99.97	0.03	0.04	0:00:19
BTINTERNET	98.73	1.28	2.59	0:08:02
PRODIGY	99.82	0.18	0.07	0:00:13
VIRGINMEDIA	99.85	0.18	0.09	0:02:19
PROOFPOINT	98.82	1.37	1.28	0:04:23
GMX	99.26	0.74	0.19	0:00:50
ORANGE	99.44	0.56	0.04	0:13:04
MIMECAST	95.44	4.56	9.44	0:03:13
COMCAST	99.04	0.96	13.56	0:26:16
ZIGGO	99.83	0.17	0.15	0:01:48

➔ **Note:** All metrics in this table are the median values of the sender cohort considered for the Benchmark. Delivery rate is the percentage of messages delivered compared to messages sent. Bounce rate is the percentage of messages that bounced compared to messages sent. Deferred Rate is the percentage of unique delivery attempts compared to messages sent. Average delivery time is the total delivery time divided by the number of messages delivered.

Deepdive into the Key Performance Indicators

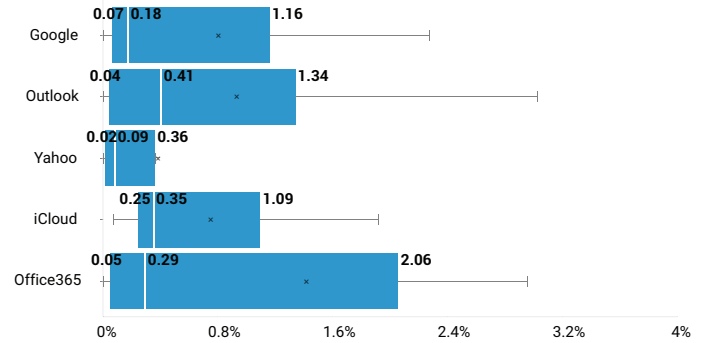
Bounce Rate of top-4 MBP

Box and Whisker Bar Chart



Deferred Rate of top-4 MBP

Box and Whisker Bar Chart

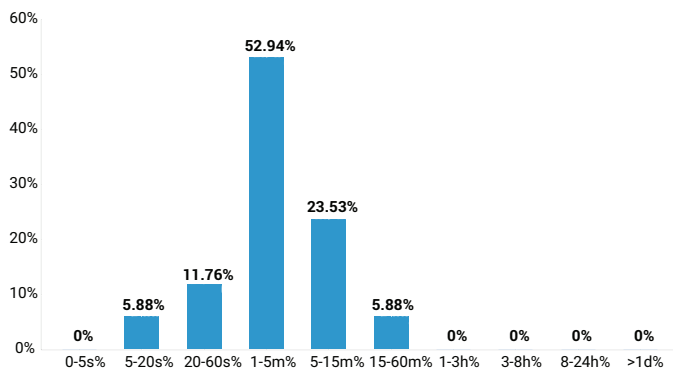


➔ Note: The line inside the box marks the median (second quartile), the cross marks the arithmetic mean (average).

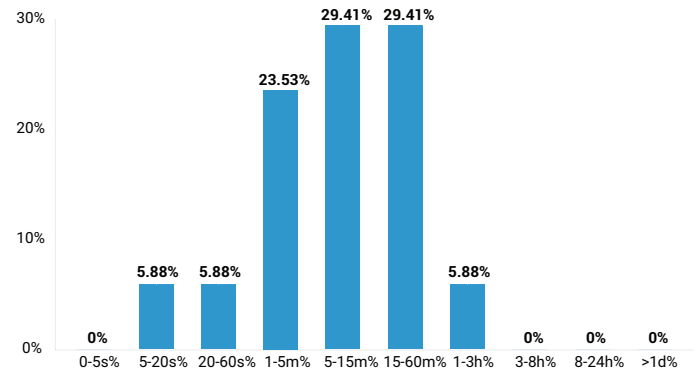
Average Delivery time distribution of top-4 MBP

Distribution of Average Delivery times by Senders per Delivery time buckets.

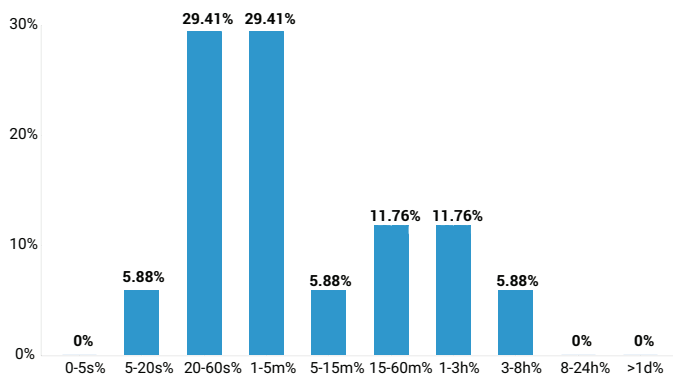
Google



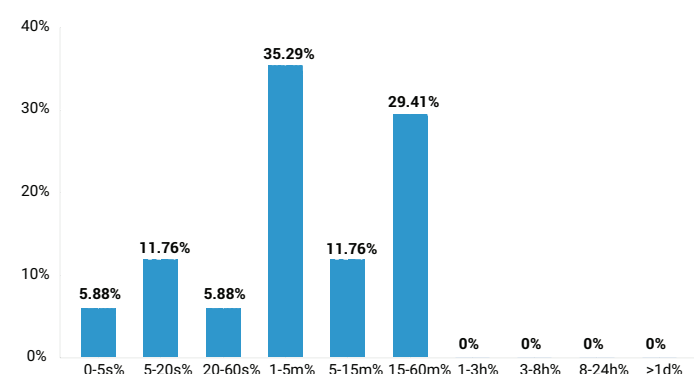
Outlook



Yahoo



Office 365



Essential Insights: Q3 vs. Q4

Google (Gmail):

- Delivery rate slightly improved (99.27% > 99.39%).
- Deferred rate significantly improved from 0.71% to 0.18%.
- Average delivery time also dropped from **4m 26s to 2m 55s**, indicating better efficiency.

SPF, DKIM, and DMARC enforcement remains **a major cause of bounces and deferrals**.

Gmail deferrals due to “unusual rate of unsolicited mail” suggest **stricter rate-limiting rules**.

Office365

(Microsoft Business Accounts):

Delivery rate slightly declined (99.3% > 99.24%), while **bounce and deferred rates increased**, along with longer average delivery times.

Bounce rates increased, mainly due to IP reputation issues.

More messages deferred, likely due to stricter rate-limiting.

Outlook (Hotmail, Live, MSN...):

Minor drop in delivery rate (99.89% > 99.78%).

The deferred rate remained stable, but the **average delivery time increased significantly (3m 45s > 8m 02s)**.

IP reputation and Spamhaus listings remain common issues.

More messages hit rate limits or maximum concurrent connections.

BTinternet:

Deferred rate increased significantly (0.17% > 2.59%), along with a much higher average delivery time.

VirginMedia:

Bounce rate remained stable, while **deferred rate improved significantly**.

Yahoo (Yahoo Mail, AOL):

Delivery rate improved slightly and deferred rate remained stable.

Some improvement in bounce and deferred rates, **suggesting senders are adapting to new policies**.

Proofpoint & Mimecast:

Both saw increased bounce and deferred rates.

Most frequent Google SMTP Errors

Google Bounces

550 5.7.1 [XX.XX.XX.XX 12] Gmail has detected that this message is likely unsolicited mail. To reduce the amount of spam sent to Gmail, this message has been blocked. For more information, go to <https://support.google.com/mail/?p=UnsolicitedMessageError>

550 5.1.1 The email account that you tried to reach does not exist. Please try double-checking the recipient's email address for typos or unnecessary spaces. For more information, go to <https://support.google.com/mail/?p=NoSuchUser>

550 5.7.1 [XX.XX.XX.XX 19] Gmail has detected that this message is likely suspicious due to the very low reputation of the sending domain. To best protect our users from spam, the message has been blocked. For more information, go to <https://support.google.com/mail/answer/188131>

550 5.7.28 [XX.XX.XX.XX 1] Gmail has detected an unusual rate of unsolicited mail originating from your IP address. To protect our users from spam, mail sent from your IP address has been blocked. For more information, go to <https://support.google.com/mail/?p=UnsolicitedIPError> to review our Bulk Email Senders Guidelines.

550 5.7.26 Your email has been blocked because the sender is unauthenticated. Gmail requires all senders to authenticate with either SPF or DKIM. Authentication results: DKIM = did not pass SPF [domain.com] with ip: [XX.XX.XX.XX] = did not pass For instructions on setting up authentication, go to <https://support.google.com/mail/answer/81126#authentication>

550 5.2.1 The user you are trying to contact is receiving mail at a rate that prevents additional messages from being delivered. For more information, go to <https://support.google.com/mail/?p=ReceivingRatePerm>

552 5.2.2 The recipient's inbox is out of storage space and inactive. Please direct the recipient to <https://support.google.com/mail/?p=OverQuotaPerm>

550 5.2.1 The email account that you tried to reach is inactive. For more information, go to <https://support.google.com/mail/?p=DisabledUser>

550 5.7.26 Unauthenticated email from domain.com is not accepted due to domain's DMARC policy. Please contact the administrator of domain.com domain if this was a legitimate mail. To learn about the DMARC initiative, go to <https://support.google.com/mail/?p=DmarcRejection>

550 5.7.1 The user or domain that you are sending to (or from) has a policy that prohibited the mail that you sent. Please contact your domain administrator for further details. For more information, go to <https://support.google.com/a/answer/172179>

550 5.7.26 The MAIL FROM domain [domain.com] has an SPF record with a hard fail policy (-all) but it fails to pass SPF checks with the ip: [XX.XX.XX.XX]. To best protect our users from spam and phishing, the message has been blocked. For instructions on setting up authentication, go to <https://support.google.com/mail/answer/81126#authentication>

550 5.7.25 [XX.XX.XX.XX] The IP address sending this message does not have a PTR record setup, or the corresponding forward DNS entry does not match the sending IP. As a policy, Gmail does not accept messages from IPs with missing PTR records. For more information, go to <https://support.google.com/a?p=sender-guidelines-ip> To learn more about Gmail requirements for bulk senders, visit <https://support.google.com/a?p=sender-guidelines>.

552 5.7.0 This message was blocked because its content presents a potential security issue. To review our message content and attachment content guidelines, go to <https://support.google.com/mail/?p=BlockedMessage>

550 5.7.1 User is over their Google storage limit. They must reduce storage before they can send/receive emails.

550 5.7.1 [XX.XX.XX.XX] Messages missing a valid Message-ID header are not accepted. For more information, go to <https://support.google.com/mail/?p=RfcMessageNonCompliant> and review RFC 5322 specifications.

Most frequent Google SMTP Errors

Google Deferrals

452 4.2.2 The recipient's inbox is out of storage space. Please direct the recipient to <https://support.google.com/mail/?p=OverQuotaTemp>

450 4.2.1 The user you are trying to contact is receiving mail at a rate that prevents additional messages from being delivered. Please resend your message at a later time. If the user is able to receive mail at that time, your message will be delivered. For more information, go to <https://support.google.com/mail/?p=ReceivingRate>

421 4.7.28 Gmail has detected an unusual rate of mail originating from your DKIM domain [domain.com 36]. To protect our users from spam, mail sent from your domain has been temporarily rate limited. For more information, go to <https://support.google.com/mail/?p=UnsolicitedRateLimitError> to review our Bulk Email Senders Guidelines.

421 4.7.23 [XX.XX.XX.XX] The IP address sending this message does not have a PTR record, or the corresponding forward DNS entry does not match the sending IP. To protect our users from spam, mail has been temporarily rate limited. To learn more about IP address requirements for sending to Gmail, visit <https://support.google.com/a?p=sender-guidelines-ip> To learn more about Gmail requirements for bulk senders, visit <https://support.google.com/a?p=sender-guidelines>.

421 4.7.28 Gmail has detected an unusual rate of mail originating from your SPF domain [domain.com 35]. To protect our users from spam, mail sent from your domain has been temporarily rate limited. For more information, go to <https://support.google.com/mail/?p=UnsolicitedRateLimitError> to review our Bulk Email Senders Guidelines.

421 4.7.28 Gmail has detected an unusual rate of unsolicited mail. To protect our users from spam, mail has been temporarily rate limited. For more information, go to <https://support.google.com/mail/?p=UnsolicitedRateLimitError> to review our Bulk Email Senders Guidelines.

421 4.7.0 [XX.XX.XX.XX] Gmail has detected that this message is suspicious due to the nature of the content and/or the links within. To best protect our users from spam, the message has been blocked. For more information, go to <https://support.google.com/mail/answer/188131>

421 4.7.30 Your email has been rate limited because DKIM authentication didn't pass for this message. Gmail requires all bulk email senders to authenticate with DKIM. Authentication results: DKIM = did not pass To set up DKIM for your sending domains, visit <https://support.google.com/a?p=turn-on-dkim> To learn more about Gmail requirements for bulk senders, visit <https://support.google.com/a?p=sender-guidelines>.

421 4.7.0 [XX.XX.XX.XX] Gmail has detected that this message is suspicious due to the very low reputation of the sending domain. To best protect our users from spam, the message has been blocked. For more information, go to <https://support.google.com/mail/answer/188131>

421 4.7.27 Your email has been rate limited because SPF authentication didn't pass for this message. Gmail requires all bulk email senders to authenticate with SPF. Authentication results: SPF [domain.com] with ip: [XX.XX.XX.XX] = did not pass To set up SPF for your sending domains, visit <https://support.google.com/a?p=set-up-spf> To learn more about Gmail requirements for bulk senders, visit <https://support.google.com/a?p=sender-guidelines>.

421 4.7.32 Your email has been rate limited because the From: header (RFC5322) in this message isn't aligned with either the authenticated SPF or DKIM organizational domain. To learn more about DMARC alignment, visit <https://support.google.com/a?p=dmarc-alignment> To learn more about Gmail requirements for bulk senders, visit <https://support.google.com/a?p=sender-guidelines>.

451 4.3.0 Mail server temporarily rejected message. For more information, go to <https://support.google.com/a/answer/3221692>

421 4.7.0 [XX.XX.XX.XX] Gmail has detected that this message is suspicious due to the very low reputation of the sending IP address. To protect our users from spam, mail sent from your IP address has been temporarily rate limited. For more information, go to <https://support.google.com/mail/answer/188131>

421 4.7.28 Gmail has detected an unusual rate of mail containing one of your URL domains. To protect our users from spam, mail with the URL has been temporarily rate limited. For more information, go to <https://support.google.com/mail/?p=UnsolicitedRateLimitError> to review our Bulk Email Senders Guidelines.

421 4.7.28 [XX.XX.XX.XX] Gmail has detected an unusual amount of unsolicited mail originating from your IP address. To protect our users from spam, mail sent from your IP address has been temporarily blocked. For more information, go to <https://support.google.com/mail/answer/81126> to review our Bulk Email Senders Guidelines.

Most frequent Outlook SMTP Errors

Outlook Bounces

550 5.7.1 Unfortunately, messages from [XX.XX.XX.XX] weren't sent. Please contact your Internet service provider since part of their network is on our block list (S3150). You can also refer your provider to <http://mail.live.com/mail/troubleshooting.aspx#errors>.

550 5.7.1 Service unavailable, Client host [XX.XX.XX.XX] blocked using Spamhaus. To request removal from this list see <https://www.spamhaus.org/query/ip/XX.XX.XX.XX> (ASXXXX).

550 5.5.0 Requested action not taken: mailbox unavailable.

550 5.7.509 Access denied, sending domain [domain.com] does not pass DMARC verification and has a DMARC policy of reject.

550 5.4.1 Recipient address rejected: Access denied.

554 5.2.122 The recipient has exceeded their limit for the number of messages they can receive per hour.

550 5.7.1 Service unavailable, MailFrom domain is listed in Spamhaus. To request removal from this list see <https://www.spamhaus.org/query/lookup/> (S8002)

552 5.3.4 Message size exceeds fixed maximum message size

Outlook Deferrals

451 4.7.652 The mail server [XX.XX.XX.XX] has exceeded the maximum number of connections.

421 4.4.2 Message submission rate for this client has exceeded the configured limit

451 4.7.650 The mail server [XX.XX.XX.XX] has been temporarily rate limited due to IP reputation. For e-mail delivery information, see <https://postmaster.live.com>

451 4.7.500 Server busy. Please try again later from [XX.XX.XX.XX].

451 4.7.651 The mail server [XX.XX.XX.XX] has been temporarily rate limited due to IP reputation. For e-mail delivery information, see <https://postmaster.live.com>

451 4.3.2 Temporary server error. Please try again later

421 4.3.2 The maximum number of concurrent server connections has exceeded a per-source limit, closing transmission channel

451 4.7.653 The mail server [XX.XX.XX.XX] has exceeded maximum number of messages per connection.

Most frequent Yahoo SMTP Errors

Yahoo Bounces

552 1 Requested mail action aborted, mailbox not found

554 30 Sorry, your message to *****@yahoo.com cannot be delivered. This mailbox is disabled.

554 Message not allowed - [PH01] Email not accepted for policy reasons. Please visit <https://senders.yahooinc.com/error-codes>

554 5.7.9 Message not accepted for policy reasons. See <https://senders.yahooinc.com/error-codes>

554 Message permanently deferred due to unresolvable RFC.5321 from domain. See <https://senders.yahooinc.com/error-codes#unresolvable-from-domain>

554 Message permanently deferred due to unresolvable From header domain notino.co.uk. See <https://senders.yahooinc.com/error-codes#invalid-from>

554 Message not allowed - [299]

Yahoo Deferrals

421 4.7.0 [TSS04] Messages from XX.XX.XX.XX temporarily deferred due to unexpected volume or user complaints - 4.16.55.1; see <https://postmaster.yahooinc.com/error-codes>

421 Max message per connection reached, closing transmission channel tnmprscs

450 User is receiving mail too quickly tnmprscs

421 [IPTS04] Messages from XX.XX.XX.XX temporarily deferred due to unexpected volume or user complaints - 4.16.55.1; see <https://senders.yahooinc.com/error-codes>

451 Message temporarily deferred due to unresolvable From header domain domain.com. See <https://senders.yahooinc.com/error-codes#invalid-from>

451 Message temporarily deferred due to unresolvable RFC.5321 from domain. See <https://senders.yahooinc.com/error-codes#unresolvable-from-domain>

Most frequent iCloud SMTP Errors

iCloud Bounces

552 5.2.2 <*****@icloud.com>: user is over quota

554 5.7.1 [CS01] Message rejected due to local policy. Please visit <https://support.apple.com/en-us/HT204137>

550 5.7.1 Mail from IP XX.XX.XX.XX was rejected due to listing in Spamhaus SBL. For details please see <http://www.spamhaus.org/query/bl?ip=XX.XX.XX.XX>

550 5.1.1 <*****@icloud.com>: user does not exist

554 5.7.0 Blocked - see <https://support.proofpoint.com/dns-bl-lookup.cgi?ip=XX.XX.XX.XX>

550 5.2.1 user disabled; cannot receive new *****@icloud.com

550 5.7.1 Your email was rejected due to having a domain present in the Spamhaus DBL -- see <https://www.spamhaus.org/dbl/>

550 5.1.6 user no longer on *****@icloud.com

550 5.1.1 <*****@icloud.com>: inactive email address

554 5.7.1 Your message was rejected due to domain.com's DMARC policy. See <https://support.apple.com/en-us/HT204137> for info

iCloud Deferrals

451 4.7.1 Service unavailable - try again later

450 4.1.8 <bounces@domain.com>: Sender address rejected: Domain not found

421 4.7.0 Message limit exceeded for the session

451 4.3.0 <*****@icloud.com>: Temporary lookup failure

421 4.7.1 Messages to *****@me.com deferred due to excessive volume. Try again later - <https://support.apple.com/en-us/HT204137>

421 4.7.0 Deferred - see <https://ipcheck.proofpoint.com/?ip=XX.XX.XX.XX>

421 4.7.0 Error: too many errors

421 4.3.2 Service not available

421 4.4.2 Error: timeout exceeded

Most frequent Office365 SMTP Errors

Office365 Bounces

550 5.4.1 Recipient address rejected: Access denied.

554 5.2.121 The sender has exceeded the limit for the number of messages they can send to this recipient per hour. For more information go to <http://go.microsoft.com/fwlink/?LinkId=526653>.

550 5.7.1 Service unavailable, Client host [XX.XX.XX.XX] blocked using Spamhaus. To request removal from this list see <https://www.spamhaus.org/query/ip/XX.XX.XX.XX>

554 5.2.122 The recipient has exceeded their limit for the number of messages they can receive per hour. For more information go to <http://go.microsoft.com/fwlink/?LinkId=526653>.

550 5.7.1 Service unavailable, Client host [XX.XX.XX.XX] blocked using Customer Block list

550 5.7.51 TenantInboundAttribution; There is a partner connector configured that matched the message's recipient domain. The connector had either the RestrictDomainsToIPAddresses or RestrictDomainsToCertificate set

550 5.7.64 TenantAttribution; Relay Access Denied

554 5.6.1 Messages of type message/partial are not supported

550 5.7.705 Access denied, tenant has exceeded threshold. For more information please go to <http://go.microsoft.com/fwlink/?LinkId=526653>

554 5.6.0 Invalid message content due to an agent exception. IMC51

551 5.5.1 Unable to relay non-accepted domain ATTR45

550 5.5.0 Requested action not taken: mailbox unavailable (S2017062302).

554 5.6.211 Invalid MIME Content: Single text value size (32809) exceeded allowed maximum (32768) for the 'Subject' header.

550 5.7.606 Access denied, banned sending IP [XX.XX.XX.XX]. To request removal from this list please visit <https://sender.office.com/> and follow the directions. For more information please go to <http://go.microsoft.com/fwlink/?LinkId=526655>

Office365 Deferrals

451 4.7.500 Server busy. Please try again later from [XX.XX.XX.XX].

451 4.4.4 Mail received as unauthenticated, incoming to a recipient domain configured in a hosted tenant which has no mail-enabled subscriptions. ATTR5

452 4.5.3 Recipients belong to multiple tenants

451 4.3.2 Temporary server error. Please try again later ATTR1

451 4.4.62 Mail sent to the wrong Office 365 region. ATTR35. For more information please go to <https://go.microsoft.com/fwlink/?linkid=865268>

451 4.7.651 The mail server [XX.XX.XX.XX] has been temporarily rate limited due to IP reputation. For e-mail delivery information, see <https://postmaster.live.com>

451 4.4.3 Temporary server error. Please try again later ATTR2

452 4.3.1 Insufficient system resources (ProcessorTime)

Q4 Insights you don't want to miss

1. General Trends in Delivery Rates:

Google improved delivery slightly from 99.27% in Q3 to 99.39% in Q4, indicating better sender practices or Gmail easing certain thresholds.

Yahoo continued its positive trajectory, nudging up from 99.78% to 99.82%.

Outlook experienced a minor drop (99.89% > 99.78%) and a significant spike in average delivery time (up to 8m 02s), suggesting increased throttling or congestion during delivery.

Mimecast and Proofpoint both continue to struggle with low delivery efficiency, with Mimecast's delivery rate dropping further to 95.44%, raising concerns over increased scrutiny or filtering behaviors.

2. Bounce Rates: Authentication Remains Critical

Google's bounce rate slightly improved from 0.74% to 0.62%, largely tied to better adoption of SPF/DKIM/DMARC, though errors continue due to failed or missing authentication and domain misalignment.

Office365 bounce rate increased from 0.99% to 1.64%, primarily due to IP reputation and tenant configuration issues.

Mimecast remained the outlier with persistently high bounces (4.56%), often tied to aggressive filtering and enforcement mechanisms.

Seznam continued its near-perfect performance, maintaining its position as the most sender-friendly provider with just 0.03% bounces.

3. Deferred Rates: Rate Limiting on the Rise

Google dramatically reduced its deferred rate from 0.71% to 0.18%, which is a significant positive shift. However, deferral messages still highlight rate limiting due to poor domain or IP reputation and unauthenticated messages.

BTinternet saw the most alarming change: deferred rates spiked from 0.17% to 2.59%, coupled with a large increase in delivery time (matching Outlook at 8m+), suggesting stricter rate controls or infrastructure bottlenecks.

Mimecast and Comcast both showed very high deferred rates, with Comcast topping the chart at 13.56%, confirming its aggressive throttling patterns.

4. Average Delivery Time: Increased Delays Across the Board

Google and Yahoo now maintain sub-3-minute delivery windows, making them the most efficient among top providers.

Outlook and iCloud both saw noticeable increases in delivery times, with Outlook jumping to 8m 02s and iCloud to 7m 14s, likely related to deferral and reputation-related queueing.

Comcast had the worst delivery delay at 26m 16s, showing systemic issues for high-volume senders.

5. Error Messages: Evolving Enforcement

Google's error logs suggest heightened enforcement of RFC compliance, with increased blocks for messages missing Message-ID headers, failing SPF/DKIM/DMARC, or being sent from unauthenticated or poorly reputed sources.

Outlook continues to emphasise Spamhaus listings and connection limits as the leading deferral and bounce triggers.

Yahoo and iCloud remain vigilant on rate-limiting and RFC compliance, especially for header formatting and domain resolution.

6. Strategic Recommendations

Authenticate everything: SPF, DKIM, and DMARC are no longer optional—misalignment is now one of the top delivery blockers across all major MBPs.

Monitor sending patterns: Spikes in volume, even from authenticated domains, can trigger temporary blocks or rate limits, especially with Gmail and Yahoo.

Improve list hygiene: Many bounces are still due to disabled or over-quota inboxes. Regular list maintenance is crucial to maintaining reputation.



In conclusion, this report gives a clear snapshot of the average MBP email delivery performance and with this report senders can map their delivery performance against performance from others; a great baseline for improvement.

Interested in more insights, data or want to be included into the reports? Let us know at: info@postmastery.com