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Connection and Throughput Guide

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This document is intended to be used as a general guideline. In most cases, the allowed connection and throughput setting by mailbox provider (MBP) varies based on a company's sending reputation and volume. Senders should adjust connection and throughput settings for each mailbox provider accordingly.

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Introduction

There are two common parameters used to control a sender's connection and throughput rates in order to maximize deliverability.

- The number of simultaneous SMTP connections to each receiving mailserver.
- The number of messages sent over each SMTP connection.

Connections

Each MBP has limited resources in order to manage the large amount of email received. Senders should make every effort to respect MBP resources to ensure timely delivery of email. MBPs usually inform senders when limits are exceeded through SMTP bounce messages and SMTP rejections.

As a general recommendation, senders should stay under a maximum of 150 simultaneous connections at most top MBPs. This refers to the number of SMTP connections from any given sending IP to a single mail server (MX) at the destination domain.

For example:

Imagine a 200 simultaneous connection scenario, sending with the maximum 100 messages per connection (20,000 messages sent with those connections). If each SMTP conversation takes 2-3 seconds (a conservative estimate), an elapsed time of 200-300 seconds (3-5 minutes) is needed. A sender's intent on presenting themselves as a friendly mailer should consider how often they need to get 20,000 messages delivered to any one mailbox provider in a 3-5 minute timeframe.

Simultaneous Connections	Messages per Connection	Average SMTP Conversation	Elapsed Time	Messages Delivered
100	50	2-3 secs.	100-150 secs.	5,000
150	50	2-3 secs.	100-150 secs.	7,500
200	50	2-3 secs.	100-150 secs.	10,000
100	100	2-3 secs.	200-300 secs.	10,000
150	100	2-3 secs.	200-300 secs.	15,000
200	100	2-3 secs.	200-300 secs.	20,000

Limits on Messages per SMTP Connection

In general, limiting the number of messages per connection to 50 is acceptable for most top MBPs. This value refers to the number of individual messages that are sent on a connection. It is not related to the number of recipients per message. Most Validity clients send an individual message to every recipient.

Senders should manage any resulting SMTP error responses appropriately (disconnect and reconnect) if more message throughput is needed. These SMTP error responses are usually encoded as "421". Please note that this recommendation assumes that the sender is in accordance with the recommended number of connection settings.

Limits on Recipients per Message

According to RFC 2821 (worldwide Internet email standards), the *minimum* number of recipients per message that receiving MTAs should support is 100. This is not an issue for most of Validity's clients because they send an individual message for each recipient rather than sending messages with multiple recipients.

Recommendations by Region

For European mailbox providers not specified in this document, start with 2 - 5 simultaneous connections and a maximum of 100 messages per connection.

For Chinese mailbox providers not specified in this document, start with 4000 messages per hour, for each IP, as the daily sending limit.

Connection and Throughput Recommendations Table

MBP	Connections	Throughput
ATT[a]	Unspecified by MBP Recommended at 5	Unspecified by MBP Recommended at 100
BellSouth[a]	Unspecified by MBP Recommended at 5	Unspecified by MBP Recommended at 100
BlueTie (Excite)[b]	10	10
Cablevision (Optimum)[c]	Unspecified by MBP Recommended at 5	Unspecified by MBP Recommended at 50
Charter (Spectrum)[d]	Unspecified by MBP Recommended at 150	Unspecified by MBP Recommended at 50
Comcast[e]	25	Varies based on sender reputation
Cox (Yahoo/AOL)[f]	5	100
Earthlink[g]	Unspecified by MBP Recommended at 150	Unspecified by MBP Recommended at 50
Fastweb	Less than 10	Unspecified by MBP Recommended at 100
Gmail	150	50
Italia Online[h]	<2	See below
Libero	2-5	100
Lycos	150	50

Mac.com	150	50
Mail.com	150	50
Microsoft (Outlook.com)[i]	500	Unspecified by MBP Recommended at 50
Names.co.uk	<10	Unlimited for less than 3 simultaneous connections. Limit unknown for large volume senders.
Netease[j]	150	50
Netscape	150	50
Netzero	150	50
NTT Group (Keita)[k]	Unspecified by MBP	100
Orange (Wanadoo)[l]	3	100
QQ/Tencent[m]	See below	See below
Road Runner (Spectrum)[n]	Unspecified by MBP	Unspecified by MBP Recommended at 100
SBC	150	50
Seznam	500 every 5 minutes for each IP	Maximum 100000; 260 MB
Sohu[o]	See below	See below
Swisscom	5	100

TDC	<10	3
Telefonica	5	Unspecified by MBP Recommended at 100
Telenor	5	Unspecified by MBP Recommended at 100
Telstra (Bigpond)[p]	6	Maximum = 2000 per hour per connection
United Internet	5	Unspecified by MBP Recommended at 100
UOL Mail (uol.com.br)[q]	-	200 per hour
USA.net	150	50
WP.pl	<10	Unspecified by MBP Recommended at 100
Yahoo/AOL[r]	150	Maximum = 20

Special Cases

a. AT&T/Bellsouth

It is not necessary to align connection and throughput with Verizon Media's (AOL and Yahoo!) connection and throughput as AT&T/Bellsouth has a different gateway.

AT&T does not publish Connection & Throughput recommendations. Validity's general recommendation is 5 connections and 100 messages per connection.

b. BlueTie (Excite)

All mail servers connecting to BlueTie must:
* Not attempt to send more than 10 email messages per SMTP connection.
* Not attempt to open more than 10 simultaneous SMTP connections.
* Connections made directly from dynamic or residential IP space may not be accepted.
* Connections from IPs that have a poor or non-existent reputation or have been blocklisted may not be accepted or may be throttled.
* Requirements for Inbound Email

c. Cablevision (Optimum)

Cablevision does not accept connections from unsecured email servers.

d. Charter (Spectrum)

Charter rate limits the number of messages per hour but does not publish allowable rates.

e. Comcast

For Ipv4 and Ipv6 addresses:

* Comcast only allows 1000 messages an hour per netblock for email sent from an Ipv6 address.
* The rate limiting policy for an Ipv4 address is based on sender reputation, provided by Sender Score as well as authentication of the sending server, regardless of the number of domains from that server.

Recipients per Hour	Sender Score*
120	N/A
1200	0 – 15
3600	16 – 25

6000	26 – 30
12000	31 – 50
24000	51 – 70
42,000	71 – 85
60000	86 – 100

*Subject to successful authentication. If the rate-limit is impacting your ability to deliver mail, shortening your server's delivery retry interval should resolve the issue.

f. Cox (Yahoo/AOL)

Cox (Yahoo/AOL) currently allows up to 5 simultaneous connections per sending IP, and up to 100 messages per connection. However, regardless of these limits, Cox (Yahoo/AOL) may throttle your sending ability based on your sender reputation. Cox's (Yahoo/AOL) sending limits and policies are subject to change at any time.

- Cox postmaster

g. Earthlink

The limit changes from day to day, depending on server load and other factors.

h. Italia Online

They are flexible on throughput, so use your discretion and be reasonable. If you are sending too many messages too quickly, expect to receive a 421 throttling message.

i. Microsoft (Outlook.com)

- Sender must not open more than 500 simultaneous connections to Windows Live inbound email servers without making prior arrangements.
- Validity recommends that senders limit the number of messages to 50 per connection.
- Outlook.com postmaster

Note that MSN, Hotmail, Live and Outlook addresses share the same MX so the connections should be shared amongst all of domains.

j. Netease (163.com)

Domains include: (126.com, yeah.net, 163.com, mail.163.com, vip.163.com, vip188.com).
The recommendation is that you send no more than 4k messages per hour, for each IP. The total sending limit in a day should not surpass 96k.

k. NTT Docomo (Keitai)

NTT Docomo does not specify the maximum number of connections allowed but does recommend using as few connections as possible. If you send to more than 100 recipients per connection, you will receive an error code: '554: Transaction failed to respond'. NTT Docomo's primary domain is docomo.ne.jp. Their other domains include docomo.jp, mopera.net, mopera.ne.jp, and dwmail.jp.

- [NTT Docomo's sending recommendations](#)

l. Orange (Wanadoo)

- The maximum number of simultaneous connections is limited to 3 per MX.
- Send 100 emails per open connection.
- Wanadoo and Orange are on the same MX so the connections should be shared amongst both sets of domains.
- This includes Orange's UK and France divisions (orange.fr and wanadoo.fr).

m. QQ/Tencent

The sending limit is 4k messages per hour, for each IP. However, this can vary since QQ determines sending limits based on the volume history for the past 60 days, as well as IP reputation. Validity has seen recommendations by QQ to send 200-500/day to start building a reputation.

n. Road Runner (Spectrum)

Spectrum does not publish connection and throughput limits. According to Road Runner: "We enforce rate limits on inbound mail; those limits are applied to the following metrics:

- Recipients per message (100 maximum recommended)
- Recipients per hour
- Recipients per connection
- Simultaneous or concurrent connections

Notes
- IPs with a good sending reputation enjoy higher rate limits than IPs with a poor sending history.
- IPs that do not have [FCrDNS](#) (that is, the IP resolves to a name that does not resolve back to the IP) are severely limited in their ability to get mail to Road Runner customers.

o. Sohu

Sohu states the following sending limits:

- Less than 200 emails per minute or less than 2k emails per hour.

p. Telstra (Bigpond)

Domains include: bigpond.com, bigpond.com.au, bigpond.net.au, telstra.com, telstra.com.au, and

team.telstra.com.

q. UOL Mail (uol.com.br)

The sending limit practiced by UOL is 200 recipients per hour from the same IP. If the shipments originate in a corporate network, for example, be added to the recipients of that total IP is a single email account or different accounts. Once it exceeds the limit above, new submissions from that IP will be blocked for an hour.

- [Antispam policy](#)

r. AOL and Yahoo!

Yahoo/AOL limits the number of messages to a maximum of 20 per connection. Yahoo/AO does not publish a connection limit, but senders should start with 150 and adjust accordingly.

- [SMTP guidelines](#)

Note that Yahoo! has a number of domains mapped to groups of MX's you can apply the connection settings to each of the following groups:

- ymail.com, geocities.com, y7mail.com, yahoo.ca, yahoo.cl, yahoo.com.ar, yahoo.com.au, yahoo.com.br, yahoo.com.co, yahoo.com.mx, yahoo.com.pe, yahoo.com.tr, yahoo.com.ve, yahoo.co.nz, ymail.com

- yahoo.co.uk, yahoo.co.uk, yahoo.de, yahoo.dk, yahoo.es, yahoo.fi, yahoo.fr, yahoo.gr, yahoo.ie, yahoo.it, yahoo.nl, yahoo.no, yahoo.pl, yahoo.ro, yahoo.se
- yahoo.co.id, yahoo.co.id, yahoo.com.my, yahoo.com.ph, yahoo.com.sg, yahoo.com.vn, yahoo.co.th, yahoo.co.in, yahoo.in
- btinternet.com, btinternet.com, btopenworld.com
- wans.net
- xtra.co.nz, xtra.co.nz, yahooxtra.co.nz