MailQ

SMTP / POP3 Mail Server
Version 1.14

Administrator's Reference

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Acknowledgements

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Conventions Used in This Manual

Command-line arguments (switches) may be separated from any parameters by either a colon or equals sign.

required-parameter
<required-parameter>
[optional-parameter]

Example	Description
↵	Line-continuation character. The following lines should be entered as one line
Value=x	INI value x is required (mandatory) and of type indicated, e.g. Boolean, String, Number
Value=<x>	INI value x is required (mandatory) and of type indicated, e.g. Boolean, String, Number
Value=[x | y]	Either value x or y is required
Value=x..y	Mandatory value between x and y
/arg	Argument with no parameter possible
/arg:x	Parameter x is required
/arg:<x>	Parameter x is required
/arg[:x]	Parameter x is optional
/arg[:x | y]	Either parameter x or y is optional
/arg:x..y	Mandatory value between x and y
/arg:[x..y]	Optional value between x and y

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Introduction to MailQ

MailQ was written to provide a simple and extremely compact, full-featured, multi-threaded mail-server which requires minimal configuration and have no reliance on database interaction. It was not written to handle very heavily loaded corporate mail servers and there are plenty of excellent free mail-servers available which can fill that niche such as **hMailServer**. The design-goal was to create a minimal but flexible mail-server without the need for unwieldy runtime dependencies such as Microsoft dotNet and which would have a binary footprint in the kilobytes rather than megabytes and which could run readily from a USB or other removable device.

Another goal was to keep the versions of Windows supported as wide as possible and offer support for legacy versions of Windows as far back as NT4(SP6a).

MailQ is suited to small test and development environments, personal learning/development or small organisations of up to perhaps 100 or so users. Although it may handle many more users **MailQ** wasn't designed to be an enterprise-class mail server. If you have enterprise-level requirements then you are recommended to use a commercial product instead.

All processing is designed to be performed within the local file system rather than use database dependencies. Each email is processed within a standard-format EML text file. Authentication for each message is handled within a separate authentication and tracking file. This file tracks each email or recipient as a message is processed. This means the health and efficiency of the underlying file-system is important. NTFS formatted disks are recommended.

Consequently there are both advantages and drawbacks to **MailQ**. The advantage is simplicity in configuration and operation. The main disadvantage is that performance is limited by the speed offered by the underlying file-system although this would be mitigated by the use of high-speed disks, RAID-0 striping or hybrid/SSD.drives.

The program makes no use at all of the Windows registry and is completely “portable”. Instead, all necessary configuration is held within a single INI configuration file. This includes user-account details and password-hashes.

MailQ was written to be RFC-compatible as far as possible and was written in C++

MailQ Features

MailQ offers the following features:

- Extremely compact EXE size, around 170Kb with single EXE binary
- Fast and efficient, written in C++
- No complex or large external runtime dependencies (MSVCRT is built into Windows)
- Small memory footprint, typically under 4Mb in operation
- No database dependencies. Makes full use of the local (NTFS or FAT) file system
- Multi-threaded for both the SMTP and POP3 server
- Supports multi-process (multi-instance)/multi-threading on the same machine
- SMTP and POP modules are run as independent processes/instances
- Separate SMTP threads for MDA (MUA) and MXA (MTA) agents
- Public DNS Black Lists (DNSBL) spam-block lookups
- Local IP block lists and automatic POP/SMTP IP-banning/intruder-blocking
- Thread inactivity watchdogs and dead session auto-disconnect
- SMTP and POP3 server modes are provided by a single binary executable
- Automatic POP account intruder-locking
- Supports CRAM-MD5/APOP secure authentication
- Supports email aliases
- Can act as a flexible mail-proxy using DNS or Local MX configuration
- Queue retrying on failed transmissions
- Wide range of Mail-client compatibility
- Flexible, customisable and portable
- Highly-configurable from the command-line or INI file
- Detailed log files for administrators
- System and user-level external scripting
- Compatible with ClamWin command-line anti-virus scanner
- Capable of operating a full mail server from a USB or portable hard drive
- Runs on a wide range of Windows from legacy to modern, from NT4 to Windows 10
- A useful educational tool or introduction to mail-server administration
- Freeware for private and corporate use

The disadvantages of **MailQ** are currently:

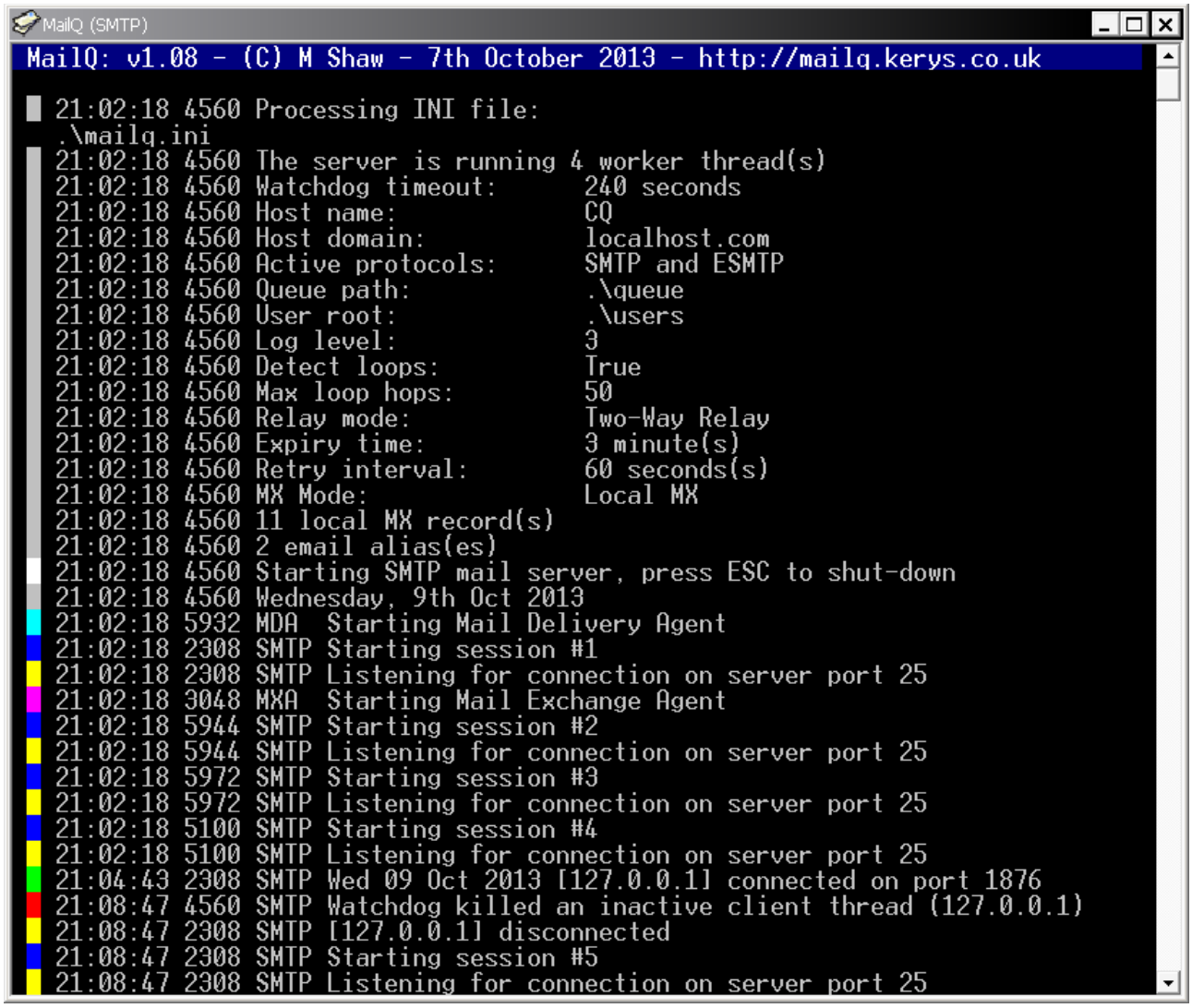
- No SSL/TLS support. (Supports CRAM-MD5/APOP secure authentication)
- Currently no built-in IMAP4 support by design
- No shared mailboxes (requires IMAP)
- No built-in webmail support
- No deduplication. Duplicated emails take up additional disk space (i.e. no single record pointers)
- No automated user-password change facility
- No delivery status notifications (DSNs)

MailQ Mail Sever

SMTP Sever

MailQ provides a multi-threaded, routing Simple Mail Transport Protocol (SMTP) mail server capable of handling numerous, simultaneous inbound connections. The SMTP server handles only inbound mail. Outbound mail is handled by a separate and optional MXA thread (*See MXA*). Local mail deliveries are handled by separate MDA thread (*see MDA*)

The SMTP server is run by launching **MailQ** without the **/POP** argument, this is the default operating mode for **MailQ**



You may, additionally, always run the MXA and MDA threads using **/MDA** or **/MXA** or by configuring the INI file and using the **MDA=True** and/or **MXA=True** configuration. The MDA and MXA thread are a functional component of the SMTP server and cannot be run separately from it

Example: **mailq.exe /MDA /MXA**

The SMTP server is multi-threaded with the ability to handle up to a theoretical maximum of 64 threads; although a smaller number such as 10 or 20 is recommended

The built-in SMTP connector accepts inbound SMTP connections and also routes outbound SMTP email. The mail-delivery and routing/queueing is handled by the MDA and MXA thread modules respectively. Both the MDA and MXA are always single-thread processes.

The SMTP server places received mail into a processing queue where it can be picked up by the Mail Delivery Agent (MDA)..The Mail Delivery Agent or MDA reads the processing queue at intervals and sorts the mail for internal and external users. Mail for internal users is placed in the respective user folder ready for collection by a POP or IMAP server. Depending on the configuration any mail for unknown users in a local domain is placed in an unknown queue or in a folder unique to the unknown user. Unknown mail which does match a registered domain is assumed to be external and is placed in the external processing queue folder for the attention of the Mail Exchange Agent or MXA.

The Mail Exchange Agent or MXA checks the external queue at intervals and, depending on the configuration, will either relay to a remote SMTP server, route according to local MX rules or use a standard DNS-based MX lookup to identify the target server for each addressee. If the remote server fails to respond then the message is copied on a per-user basis to the retry queue. Retries are performed at a configurable interval in order not to block the MXA processing queue due to a flood of unresponsive emails. (See the **[MXA]->SendRetrySeconds** option)

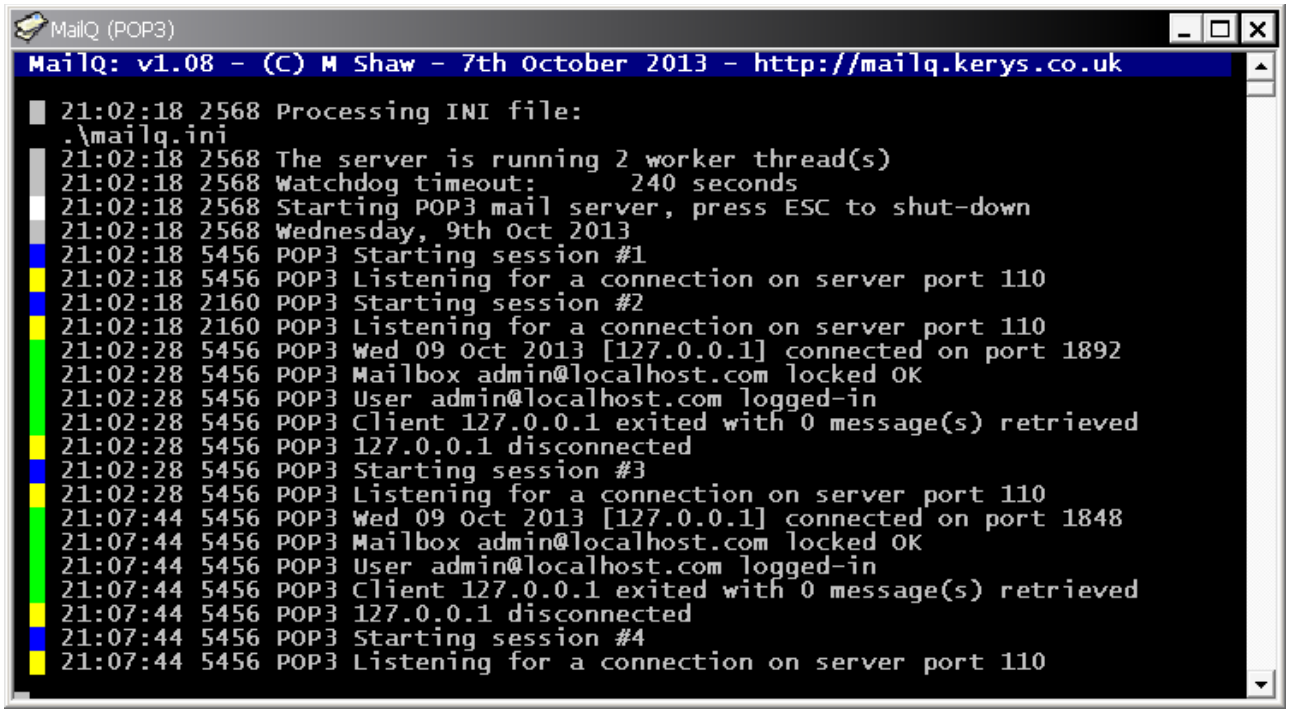
Once an email has been successfully sent to a remote host it is normally copied to the “sent” mail folder. This folder is configurable and may reside in any accessible location. If there is a transmission failure then the mail is copied to the “failed” folder.

POP3 Server

MailQ can operate as a fully-functional POP3 (Post Office Protocol) server serving mail to email client software such as Outlook or Thunderbird. The POP server is multi-threaded and can run up to 64 threads concurrently with the maximum practical number of threads being governed by your operating system. IMAP is not currently supported. The POP server is run as a separate application instance or process and does not run as part of the SMTP server.

A useful maximum will be between 10 and 20 threads. Small mail sites may only need to run 4 or 5 threads. Each thread consumes as small amount of memory and other resources so it is recommended to keep the number of threads to a minimum.

The server is written to be RFC-compatible as far as possible, but does not implement all of the optional POP3 features. The POP3 CAPA command will list available features for the current version of **MailQ**.



Mail Delivery Agent (MDA)

This is known as the Mail User Agent (MUA) in RFC documentation. The MDA runs as a single thread and is responsible for local (internal) mail delivery and delivery housekeeping. It simply refiles mail from one folder to another and performs basic checks on message consistency. It picks up mail from the main processing queue and delivers it either to individual user folders or to the external queue for processing and delivery by the Mail Exchange Agent (MXA).

The MDA also runs any scripts which are configured, **after** final delivery of each email message to a user's home folder.

The MDA is run as part of the SMTP server either by using the **/MDA** switch or by configuring the following option in the INI file. It cannot be run when running in POP mode.

```
[MDA]
Enabled=True
```

Mail Exchange Agent (MXA)

This is termed a Mail Transport Agent (MTA) in RFC documentation. The MXA runs as a single thread as part of the SMTP server and its job is to handle the delivery of external mail to remote servers. It picks up mail from an “external” queue and manages deliveries and retries to other mail systems, refiling messages as necessary

In order to do this is has to either have a static route or perform some kind of MX (Mail Exchanger) lookup to decide which server to send a given message to. Additionally the MXA is responsible for the queueing and periodic retrying of failed messages.

The MXA is enabled either by using the **/MXA** switch at the command-line or by configuring the following setting in the INI file.

```
[MXA]
Enabled=True
```

MailQ's MXA can handle the mail-routing task in one of three ways.

MXA Routing Mode	Description
Gateway MX	**Gateway** A static route or "gateway" to another SMTP mail server with all mail being forwarded to this server. This can be an ISP's mail server, another SMTP server or another instance of **MailQ**.
Local MX	A **local MX** lookup table is specified in the **MailQ** configuration (INI) file. This has the Ability to fall-back to DNS-MX or a fixed SMTP gateway for unknown emails
DNS MX	A standard, **DNS-based MX** lookup is performed via an external DNS server. This requires DNS to be configured and/or available. This may either be an internal or external DNS server.

Instances of **MailQ** or other mail-servers can be chained-together to form complex routing networks

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10 Minutes to Setting up a Test Server

A test server can be set up on any Windows PC running Windows from NT4/SP6a to Windows 8/Server 2012.

The simplest way to do this is to create a fake domain name called "**localhost.com**"

To do this. Edit the Windows HOSTS file in **C:\windows\system32\drivers\etc**

To do this, run notepad.exe as Administrator (elevated) to have sufficient access rights to the file or run from an elevated command prompt (as below)

You may need to halt any anti-virus software which is protecting the hosts file from modification. Editing this file is perfectly safe. Open a console prompt and type the following: Note that some antivirus software may block editing of the HOSTS file

```
C:\>cd \windows\system32\drivers\etc
C:\WINDOWS\System32\drivers\etc\>
attrib hosts -r -h -s\
notepad hosts
```

Within notepad add the following new entry if not already present:

127.0.0.1 localhost.com

If you wish you can use **mail.localhost.com** instead if not already present:

127.0.0.1 mail.localhost.com

Then re-save the file. If you have a virus scanner enabled it may either roll-back the file or prevent you from saving it. If so then you can't continue until this is resolved.

Once you've done this, **ping** the address **localhost.com** from a command prompt. You should get something looking like this. Don't forget to re-enable your anti-virus scanner.

```
C:\>ping localhost.com
Pinging localhost.com [127.0.0.1] with 32 bytes of data:

Reply from 127.0.0.1: bytes=32 time<1ms TTL=128

Ping statistics for 127.0.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milliseconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Once the above is completed, copy **mailq.exe** to a new folder which will host your test mail-server

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e.g. say, **c:\apps\mailq**

Now run notepad and save a new file into this folder called: **mailq.ini**

Enter the following configuration into a new file called **mailq.ini**

```
[Config]
Bind=*                          ; IP address to bind (may be omitted)* to bind all
HostName=localhost.com          ; Name this server responds to and announces
HostDomain=localhost.com        ; Fixed server domain which we accept mail for
QueuePath=".\queue"             ; Root path for the SMTP queue (full letter/path)
FixHeaders=True                 ; Default is (True) to fix missing headers

EnableMouseSelect=False         ; Windows mouse select can hang the server
DNSBLEnabled=True               ; DNSBL is disabled by default
NoBackSpace=True                ; Telnet to allow backspace delete (0x08)
LogLevel=3                      ; 0=Off,1=Normal,2=Info,3=Extra,4=Debug
AutoBan=20                      ; Default AutoBan threshold = 100
IPBlockEnabled=True             ; Whether to use an IP block file

SMTPAuthRequired=False          ; Permit no-auth HELO mode or enforce EHLO mode
SMTPThreads=4                   ; Number of process threads, 1..64
SMTPMode=3                      ; 1 SMTP, 2 ESMTP, 3 Both
SMTPRelayLevel=2                ; 0 None, 1 One-Way, 2 Two-Way, 3 Open-Relay
SMTPVRFYEnabled=False           ; Enable the SMTP VRFY command

POPPort=110                     ; Standard POP port is 110
POPThreads=4                    ; Number of process threads, 1..64
POPRenameOnDelete=False         ; /POPROD renames on POP3 DELE operation

[Domains]                       ; Local domains which we answer-to
Domain1=localhost.com
Domain2=localhost.net

[MDA]                           ; Mail Delivery Agent (MDA/MUA)
Enabled=True
UserPath=".\users"              ; Path relative to exe file (Default=.\users”)

[MXA]                           ; Mail Exchange Agent (MXA/MTA)
Enabled=True
MX=Local                        ; Enables Local MX mode
SendRetrySeconds=60             ; Retry failed message-deliveries every n seconds
MessageExpiry=3                 ; Expire messages after n minutes

[LocalMX]                       ; MX table for Local MX if enabled
Item1=localhost.com,localhost ; ItemN=<domain>,<remotehost>[,port]
```

Now save the file and open a console prompt in the folder where you chose to install your test mail server (e.g. **C:\apps\mailq**)

MailQ Mail Sever

Type the following command to add a new test user:

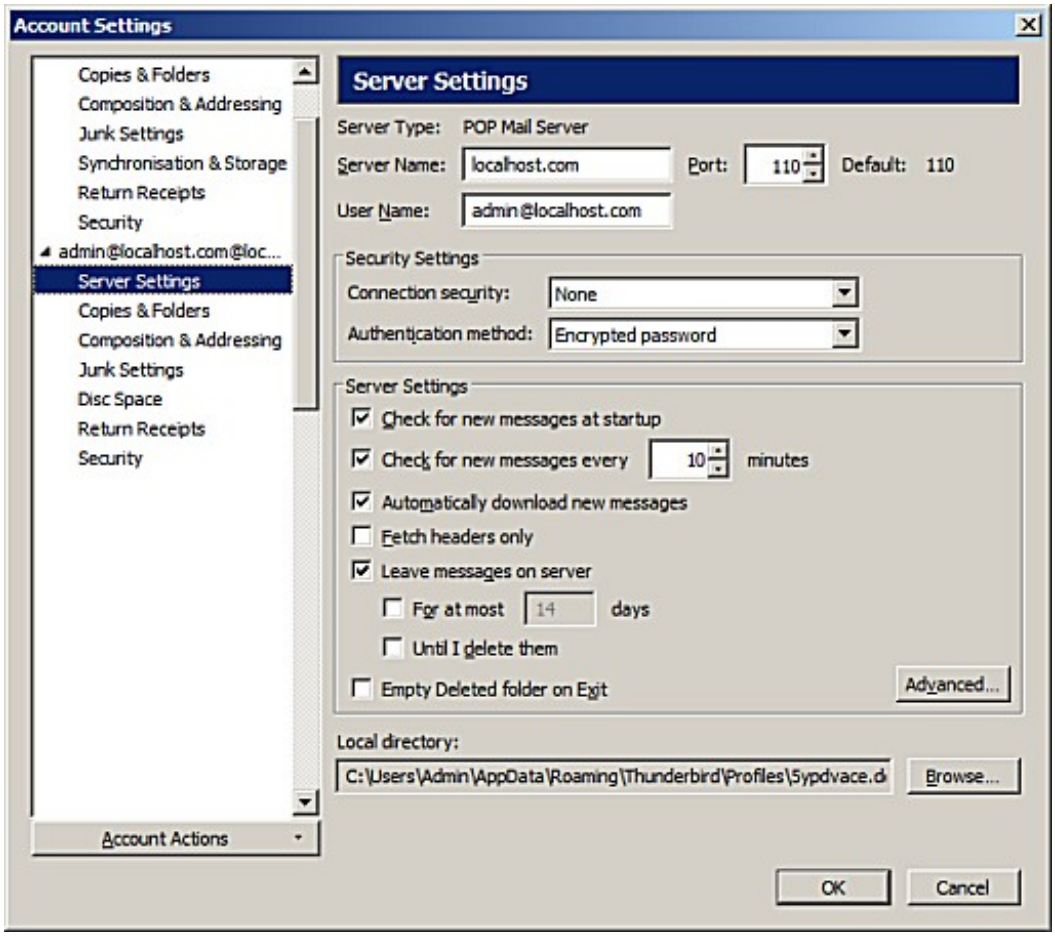
```
C:\apps\mailq\>mailq.exe /adduser:admin@localhost.com /pw:secret
```

This will create a single user called "admin" with the password "secret". You can add further test-users if you wish. You can now run both the POP3 and SMTP mail servers as follows:

```
C:\apps\mailq\>start mailq.exe /pop
C:\apps\mailq\>start mailq.exe /mxa /mda
```

If you were supplied with a copy of **go.bat** then you may use this instead.

You should now configure your favourite email client software with the above credentials and try sending/receiving emails. You can also use telnet to test



Thunderbird example POP3 mail configuration

Telnet Testing SMTP (Mail Sending)

Telnet is not installed by default on some versions of Windows. You may need to go to Control Panel->Programs and Features->Turn Windows Features On or Off and select “Telnet Client from the list of options.

Windows telnet or Putty may be used from a console prompt (or use Putty) to connect to the mail server.

The following commands may be used to test SMTP connectivity on port 25

```
C:\>telnet localhost.com 25
Connecting To localhost.com...

220 Hello [127.0.0.1] - MailQ v1.08, CQ (2 CPU) on CQ Monday, 7th October 2013
+0100 18:06:06

HELO localhost
250 [127.0.0.1] Hello localhost pleased to meet you
mail from: admin@localhost.com
250 <admin@localhost.com>, Sender OK
rcpt to: admin@localhost.com
250 <admin@localhost.com>, Recipient OK
data
354 Enter message, end with single dot on a line (CRLF.CRLF)
This is a test message
.
250 OK, message queued as 201310071706069033867 6 (27)
quit
221 KTHXBYE
```

Telnet Testing POP3 (Mail Receipt)

Telnet is not installed by default on some versions of Windows. You may need to go to Control Panel->Programs and Features->Turn Windows Features On or Off and select “Telnet Client from the list of options.

The following commands may be used to test POP3 connectivity on port 110

```
C:\>telnet localhost.com 110
Connecting To localhost.com...

+OK CQ MailQ POP3 Daemon (C) M Shaw <3260.C32F54B5FE180430@localhost.com>

user admin@localhost.com
+OK admin@localhost.com is a real hoopy frood
pass secret
+OK Mailbox has 2 message(s) (272625 octets)
stat
+OK 2 272625
uidl
+OK
1 201310070728225532 8542
2 20131007170606903386 76
.
retr 1
+OK 272192 octets
Return-path: <admin@localhost.com>
X-Envelope-to: <admin@localhost.com>
Date: Mon, 07 Oct 2013 18:06:51 +0100
X-Debug: MailQ Added Date field
X-MailQueue: MailQ/v1.08
Received: from localhost ([127.0.0.1])
        by CQ with SMTP
        id 20131007170606903386 76; Monday, 7th October 2013 18:06:51 +0100
From: admin@localhost.com
Subject: Unspecified subject
To: Unspecified recipients
X-Fixed-Header: MailQ

Hello world
.
quit
+OK KTHXBYE
```

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Installation

Installation of **MailQ** is simple. There is no Windows installer program. The executable is simply copied to a desired location and an appropriate configuration set up. Once this is done the program EXE file can be run to start the server in either SMTP or POP3 mode.

The basic steps of installing a **MailQ** server are as follows:

1. Create a local folder to hold the **MailQ** program file
2. Copy the **MailQ** program exe file (mailq.exe) to this folder location
3. Plan and make notes on your mail configuration and routing
4. Create an appropriate configuration file (mailq.ini) to match your configuration
5. Create a test user. (The examples here use "admin@localhost.com")
6. Decide on how you're going to launch **MailQ**, scheduler, registry start-up or batch file
7. Run **MailQ**
8. Test connectivity using telnet and/or mail client software
9. Monitor log files and the **MailQ** console for problems during operation
10. Tweak your configuration and security as necessary

These tasks can be expanded in more detail as follows:

1. A suitable folder would be in a portable apps folder or dedicated "root" folder on the hard drive such as **C:\Apps\MailQ** or **C:\MailQ**

2. Copy the **mailq.exe** file using the command line or Windows Explorer

3. Planning a mail server for production use requires careful consideration. A test server run entirely on an internal LAN and with no external routing requires almost no consideration and you can play around with **MailQ** if you want to learn how a mail server works

4. For production use the configuration file will depend on the details of your infrastructure plan. For test use the basic defaults will usually be enough to get a server up and running providing you set the basic configuration options

5. To use a realistic test domain name. Create a hosts file entry for “localhost.com”. To do this, run notepad.exe elevated (right-click in Windows->run as Administrator), browse to **\Windows\system32\drivers\etc** and open the file called “hosts”. Then enter a new line as follows:

   127.0.0.1 locahost.com

   And then save the file. Test by pinging localhost.com:

   ping localhost.com

6. Add a mailbox/user. Open a console prompt, change to the **MailQ** directory and type:

mailq.exe /adduser:admin@localhost.com /pw:secret

7. Use keyboard commands, a batch file or Windows shortcut to launch **MailQ**

8. Open a console prompt or create a batch file (a suitable batch file is included with the server called GO.BAT)

   To run the SMTP server together with Mail Exchange Agent (MXA) and Mail Delivery Agent (MDA), enter:

   start mailq.exe /mxa /mda

   To run the POP3 server, enter:

   start mailq.exe /pop

9. Refer to the Troubleshooting section for details on how to test connectivity using tenet.

   Configuration of the mail client will depend on the particular software. Assuming you have configured a test server to respond on a dummy localhost.com domain and have a test user called "admin@localhost.com" you will need to enter

POP3 Server:	localhost.com
Name:	Admin
Username:	admin@localhost.com
Password:	<Password used when the account was created>
Authentication:	Use password submitted insecurely or encrypted password **MailQ** Supports: PLAINTEXT, APOP, RPOP authentication SSL/TLS is not supported
SMTP Server:	localhost.com
Login required:	Yes
Username:	admin@localhost.com
Password:	<Password used when the account was created>
Authentication:	Use password submitted insecurely or encrypted password **MailQ** Supports: EHLO AUTH LOGIN, PLAIN, CRAM-MD5 authentication HELO (no authentication/configurable) SSL/TLS is not supported

10. If the logging option is enabled log files will be written to the **.\logs** subdirectory. You can use tail or notepad to view them.

11. Tweak your configuration by keeping an eye on the server console and server log files. You can use tail or **tailcmd.exe** to monitor the log files in real time. Console logging should be kept to a minimum. You can use the **mailq.ini** to configure this appropriately

Operation

MailQ is a console-mode application. It is run at the Windows command line with appropriate arguments and/or configuration values set in the configuration file. It is recommended that a configuration file is used and command-line arguments avoided.

The server can run in either of two distinct modes. As an SMTP server with optional Mail-Exchanger and Mail Delivery options or as a POP3 mail server serving mail clients. The following commands must be run from the same folder as **mailq.exe**

Example command	Description
mailq.exe	Run as an SMTP server
mailq.exe /mxa	Run as an SMTP server with Mail Exchanger
mailq.exe /mda	Run as an SMTP server with Mail Delivery
mailq.exe /mda /mxa	Run as an SMTP server with both Mail Exchanger and Mail Delivery (recommended)
mailq.exe /pop	Run as an POP3 mail server with no SMTP support
mailq.exe /stop	Either stop all services
mailq.exe /stop:smtp	Stop the SMTP server service only
mailq.exe /stop:pop	Stop the POP3 server service only

If MailQ detects that the lock (LCK) files re missing then the server will shut down as soon as it is idle. You can use the /STOP argument to the same effect

```
@ECHO OFF
REM Name:    GO.BAT
REM Purpose: Safe (re-)launch file for MailQ
REM Requires sleep.exe
REM ------------------------------------------------
REM Stop ALL MailQ services
ECHO Shutting down the mail server...
start "MailQ (POP3)" "%~dp0mailq.exe" /stop
sleep.exe 5
REM Start the server (again)
start "MailQ (POP3)" "%~dp0mailq.exe" /pop %1 %2
start "MailQ (SMTP)" "%~dp0mailq.exe" /mda /mxa %1 %2
```

A Quick and Dirty Way of Restarting MailQ

Note: It is generally recommended that a Windows batch file is used to launch **MailQ** and that the ESC or window control box close button is used to shut down the server. Using pskill.exe will cause an unclean shutdown which may result in a loss of data.

```
@ECHO OFF
REM Name:    GO.BAT
REM Purpose: Quick-and-dirty launch file for MailQ
REM Requires SysInternals' PSKILL.EXE
REM ------------------------------------------------
REM Kill the mail server instance(s) if any
pskill mailq.exe
REM Release the lock files which prevent a restart
del popserver.lck
del smtpserver.lck
REM Start the server (again)
start "MailQ (POP3)" "%~dp0mailq.exe" /pop %1 %2
start "MailQ (SMTP)" "%~dp0mailq.exe" /mda /mxa %1 %2
```

Console Output Interpretation

Console output can be configured for various levels of verbosity using the **LogLevel** mailq.ini file setting or the **/LOGLEVEL:n** command-line argument. If the /Q argument is used then no console output will be sent and the program will run in "Quiet mode". A console window will still open even if /Q is used. Depending on the log-level configuration a summary of the server's configuration will be shown at startup.

1. The first column shows the local time of the logged event. This will match the current local system time.

2. The second column shows the thread ID of the process which is making the log-entry.

3. The third column indicates which type of process is making the entry. This will be one of SMTP, ESMTP, MXA, MDA, DNSBL or POP3.

4. The fourth column may show the status as Success/Failure/Information

5. The fourth column may show a description of the event.
   This may include the current date in UTC (GMT) time. Where message date/times are shown in this column these will reference UTC and not relate to the local date or time. UTC time references are used as tags for processing and have no specific local date/time meaning. Each new message is given a UTC time stamp but this stamp may change when a message is resubmitted to retry a failed delivery. The uniqueness of a message is tracked by means of a GUID string which is later included in the delivery headers.

6. Other columns will add relevant information such as filenames or IP addresses

Events listed at the console screen are highlighted in colour to quickly indicate the nature of the event.

Entries show the current time and the thread ID of the relevant process along with descriptive text. Coloured bullets indicate status as follows:

Colour	Meaning
White	Key information such as DNSBL results, statistics, startup, shutdown etc.
Grey	Start-up and configuration information
Blue	Thread start and initialisation
Green	Successful action within a SMTP, POP3, MDA or MXA thread
Yellow	Idle state. A thread is waiting for work
Cyan	Mail Delivery Agent (MDA) thread
Magenta	Mail Exchange Agent (MXA) thread

Red	Error condition

MailQ Log Files

MailQ maintains a series of log files in Comma-Separated-Value (CSV) format in the .\logs folder. These should be analysed for problems on a frequent basis on any operational mail-server.

As log files can take up a considerable amount of space and require maintenance logging is disabled by default. You need to enable it.

The logs are enabled using **/LOG** command-line option or the **[Config]->LogLevel=Boolean** configuration option in mailq.ini. Any value >0 enables logging with the latter option. The command /LOG alone enables logging at the lowest-level.

The **/LOGLEVEL:n** command-line option has the same effect as the configuration file option

0	OFF	Logging OFF
1	NORMAL	Normal logging (default)
2	INFO	Additional connection information
3	CRIT	Show critical SMTP error conditions
4	DEBUG	Include debugging info

Logs can be monitored in real time using tail. This is a program included with most distributions of Linux/Unix but you need to obtain a copy for use with windows. A command-line version called **tailcmd.exe** is usually included with the distributions of **MailQ**.

To monitor a log file using tailcmd.exe use the following command-line:

tailcmd.exe <filename> -n=10 -f

e.g.

tailcmd “smtp-20140614.log” -n=10 -f

This will bring 10 lines from the file and then continue to “follow” updates in real time, outputting text to the console.

You can also open the log files in Microsoft Excel or OpenOffice Calc but be sure to choose the text or CSV import filter option.

MailQ Log Files

The **MailQ** log files are as follows:

Log Filename	Description
server.log	Main server log
smtp-<date>.log	SMTP activity log
pop3-<date>.log	POP3 activity log
mxa-<date>.log	Mail Exchange Agent (MXA) activity log
mda-<date>.log	Mail Delivery Agent (MDA) activity log
received-<date>.log	Log of received emails

MX Routing Configuration

The SMTP Mail-Exchanger process is used to exchange email with other mail-servers. MailQ can both send to other mail-servers and received from them. **MailQ** can operate using one of three separate Mail-Exchanger (MX) modes to route messages.

These are:

- **Fixed/static "gateway" route to another SMTP server**

  This is where mail is relayed to a single server such as an ISP's off-site mail server

  Advantages: The remote mail server will handle routing complexity
  Disadvantages: Inflexibility, can't handle multiple local servers

- **Local/internal MX lookup from the configuration file**

  The Local MX or “Smart MX” option allows you to configure mail redirection amongst a small number of mail servers and is typically used with an internal mail system. This option also lets you default unknown mail to either a fixed relay or to send via a DNS lookup.

  Advantages: Flexible, can handle multiple local servers, can handle custom port configurations. Able to fall back to a static link or DNS MX
  Disadvantages: Requires careful manual configuration and updating

- **Standard remote/external DNS/hosts-file based MX lookups**

  External or DNS-based MX uses either an internet or internal DNS lookup to locate the correct target mail server for message-delivery. All routing has to be controlled via DNS

  Advantages: Industry-standard mechanisms for mail server lookup
  Disadvantages: May require the implementation of a local DNS server for internal use

Configure the MX mode from the command-line using the command:

/MX=<type>

Where <type> is one of **GATEWAY**, **LOCAL** or **REMOTE**

Examples:

/MX:GATEWAY
/MX:LOCAL
/MX:REMOTE

External (DNS based) MX requires no further **MailQ** configuration, lookups being performed via the DNS system that Windows is registered to communicate with.

To set up the MX type via the configuration file instead of the command line then Gateway and Internal MX require the creation of the following INI sections.

For **/MX:GATEWAY** create the following entry:

[MXA]
Gateway=<server>

Example:

[MXA]
Gateway=smtp.example.com

For **/MX:LOCAL** you should create the following section: Be careful to separate lookup-pairs with a comma

[LocalMX]
ItemN=<source>,<target>

Example:

```
[LocalMX]
Item1=localhost.com,snoopy          ; Send localhost.com mail to "snoopy"
Item2=example.com,bart              ; Send example.com mail to "bart"
Item3=mydomain.org,192.168.2.2      ; Send mydomain.org to 192.168.2.2
Item4=localhost,127.0.0.1           ; Send localhost to the loopback IP
```

The example above will route mail addressed to clients @localhost.com via server with DNS or NETBIOS name "snoopy", emails @example.com to server "bart", emails to @mydomain.org to the server at local (Class C network) address 192.168.2.2 and @localhost to the local server on loopback address 127.0.0.1

Local MX also supports a fall-back catch-all routing to a single target mail host or external SMTP server such as one provided by an external ISP

ItemN=*,<target>

Example:

```
[LocalMX]
Item1=localhost.com,snoopy      ; Send localhost.com mail to "snoopy"
Item2=example.com,bart          ; Send example.com mail to "bart"
Item3=*,smtp.isp.com            ; Route everything else via the ISP
```

This will take effect if no matching mapping is found for a domain. Thus you can route all internal mail statically via local MX and route all other (external) mail to a fixed SMTP relay.

Additionally a secondary fall-back to DNS based MX can be specified using an entry:

ItemN=*,*

Example:

```
[LocalMX]
Item1=localhost.com,snoopy      ; Send localhost.com mail to "snoopy"
Item2=example.com,bart          ; Send example.com mail to "bart"
Item3=*,*                       ; Route everything else directly via DNS MX
```

With this option the fall-back will query and send using a DNS-based MX query direct to the relevant DNS server instead of sending via a fixed relay.

There is a 100 node limit on the number of Local MX entries. If you need a greater number of MX records then change over to a DNS-based MX configuration

You may also specify an optional port value for each local MX entry. Under normal circumstances this should be omitted, in which case the default value of 25 (SMTP) will be used. However you may wish to relay to an internal or external SMTP server which uses a non-standard port such as 2525. This configuration option may be necessary if your ISP is one of the many who block the standard port 25.

There is no point in specifying a port for external DNS entries (ItemN=*,*) since you won't be able to guarantee that the resolved server will operate on the specified port. You will have to assume when using the external DNS option in Local MX that the port will be 25.

Example:

```
[LocalMX]
Item1=localhost.com,snoopy      ; Send localhost.com mail to "snoopy", port 25
Item2=example.com,bart:26       ; Send example.com mail to "bart", port 26
Item3=*,mail.isp.com:2525       ; Route everything else via ISP on 2525
```

The port value alone for outbound mail to a routeable host can be changed by adding a dummy entry. e.g. to change localhost.com from 25 to 2525 whilst retaining the same routing, add the following entry:

```
[LocalMX]
Item1=localhost.com,localhost.com:2525        ; Translate port from 25 to 2525
```

Caution:

- *Changes to the MX configuration require a server restart to become effective*
- *Take care to use a comma to separate the MX pairs. Beware of typos*
- *Take care when testing the server with external MX enabled as test messages may "escape" into the internet!*
- *Take care when setting custom port values in Local MX*
- *Don't set port values for DNS lookup entries in Local MX*

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Mail Relaying

MailQ can apply mail relay restrictions in one of four modes depending on the configuration. These settings regulate inbound connections to **MailQ** irrespective of any internal MX configuration.

Either use the **/RELAY:n** argument or set the following value in the configuration file.

[Config]
SMTPRelay=<relay-value>

Relay Value	Relay Type	Description
0	**Relay Off** **Internal only**	No relaying. Email is confined to the internal system and local users only
1	**One-Way** **Outbound Only** **Internal to External**	One-way, outbound mail relay only. Mail is relayed from local users to external servers but no mail can be sent inbound to local recipients
2	**Two-Way** **Internal to External** **External to Internal**	Two-way relaying. Mail can be relayed from local users to external servers and external servers can relay to local users
3	**Open Relay** **External to external** **(WARNING Security risk)**	External users can relay mail to other external users. It is highly-recommended that this option is **never used.** **Warning**, *open mail-relays are frequently abused by criminals to send spam*

Security

Extreme care should be taken when configuring any internet-facing mail-server. Ideally such a server should be configured by someone with expertise in mail-security. Internal mail servers are of less concern but should still be set up properly to avoid support issues due to improperly-configured security settings.

Many servers now support encrypted connections. SSL and TLS are currently not supported my **MailQ** but Cram MD5 authentication is offered,.both for SMTP and POP3 (via APOP). SMTP authentication is also supported.

Internet-based SMTP relays typically use no encryption. Internal SMTP access may be password protected although this can cause problems for reporting agents and services used by various items of IT equipment such as printers

With respect to operating system security, the system user account used to run **MailQ** should have write-access to the relevant configuration, queue and user folders. Depending on the level of security desired access to these folders should be restricted by adding appropriate individual or group permissions to NTFS folders. This account should be granted network access rights in order to send email.

Access Control Security and Open Relays

Avoid enabling your server as an "open-relay". This is a mail server which allows a "foreign" email address to send to another "foreign" email address.

Servers which allow local users to send to "foreign" addresses or "foreign" addresses to send to local users are "closed relay".

There are two configuration settings which control this. One is to set the SMTP operating mode to ESMTP only (EHLO mode) and disable standard SMTP mode (HELO mode). This forces clients to authenticate using a username and password.

In the configuration file this is:

SMTPMode=n

Where N is either 0 for standard SMTP (HELO) only, 1 for ESMTP (EHLO) only and 2 for both SMTP and ESMTP. The recommended setting is to always operate with SMTPMode=1 and only provide ESMTP.

Secondly there is a relay-mode setting which controls 4 levels of SMTP relay operation.

SMTPRelay=n

Where the following settings are available. It is recommended that this is set to 2 or lower and that level 3 (open-relay) is never used. Each successively higher value above zero includes the permissions of the lower values (I.e.. level 2 includes level 1 capabilities)

Mode Number	Description
0	Relaying Off
1	Internal to External relaying
2	External to Internal relaying (Includes level 1 access)
3	Open-Relay (Includes levels 1 and 2 access)

To further regulate security of inbound traffic, authentication may be forced on or off using **SMTPAuthRequired=** value in the configuration file.

Mode Number	Description
0 | False	Authentication is not required
1 | True	Authentication is mandatory. SMTP clients must log in using a known, local SMTP username and with a valid password

Setting Message Size Limits

SMTP email is not designed to be used as a file-transfer medium. Even if your own system can handle such use you can guarantee that other mail relays will be less tolerant of large mail messages.

The default maximum message size limit is set internally at 20Mb. You can change this value using the /**SIZE:n** command-line argument or by using the following configuration file option:

[Config]
SMTPMaxMessageSize=n

AntiVirus Scanning

External anti-virus software may be used. Ideally, this should be one provides real-time scanning and which allows configurable folder exceptions such as ClamWin, Microsoft Free Anti virus, Microsoft Antivirus, Avast! or AVG etc.

Scanning should be performed on the .**\users** folder tree only and mail should be scanned only once delivered.

Antivirus scanning exclusions **must** be set on the queue folder tree as the locking of file sets during threaded processing by **MailQ** will cause loss of emails. If you implement delivery scripts which call a virus scanner they must do so only on final mailbox delivery.

A collaborative open-source project - ClamWin Antivirus virus-scanner may be used for periodic scanning. This doesn't, at present, have a “real-time” scanner.

See the Scripts section for more information about directly scanning messages on delivery

Setting the Inbound SMTP Server Signature

If you have an internet-facing mail-server which is set up to use an internet domain-name with DNS MX record and you are receiving internet mail then you will almost certainly need to set up your server connection signature so that it matches that of your MX domain record.

e.g. if your domain is www.example.com and you have an MX entry mail.example.com then you should configure your SMTP welcome message to respond with this MX name so that it sends a 220 welcome message with the correct name.

220 mail.example.com

If you don't do this other mail-servers may refuse to communicate with your server although this generally affects outbound mail from your site to external SMTP mail servers.

To configure, edit the mailq.ini file and change the SMTPWelcome= entry to include your domain name. Take care NOT to include the 220 response code - e.g.

SMTPWelcome=”mail.example.com”

or

SMTPWelcome=”mail.example.com – Welcome to our SMTP mail server”

or, for a really long welcome message with macros (see macros).

SMTPWelcome=”mail.example.com – Hello [$CLIENT_IP] - $EXENAME v$ver, $env.USERDOMAIN^ ($env.NUMBER_OF_PROCESSORS^ CPU) on $env.COMPUTERNAME^ $fulldate $O $time""”

Setting the Outbound (MXA) SMTP Server Signature

More importantly, this is the HELO or EHLO string sent to other SMTP servers when the MXA is sending messages to other nodes. If this typically does not match the reverse DNS lookup for your external IP address then the remote node will refuse to accept emails. You may require your ISP create a reverse DNS (rDNS) entry for you.

The outbound connector (MXA) signature is set within the mailq.ini configuration file using the

HostName=<String>

option. e.g.

HostName=mail.example.com

The server will not start until a host name value has been set

Shutting Down the Server

The server may be shut down by using the mailq.exe /STOP command. Since **MailQ** allows multiple instances running from separate folders this command-line argument applies to the instances from the same folder as mailq.exe.

Shutdown works by releasing (deleting) the lock/LCK file. If MailQ detects a missing LCK file it will shut down as soon as it can.

You can either shut-down all instances running from the current folder or shut down selectively. This method is preferred to using pskill or tskill to exit the server. The latter could cause data-loss.

You can alternatively use your own batch scripts to remove the relevant process LCK files which will cause the server to close down and exit as soon as transactions are complete.

Syntax: **mailq.exe /STOP[:SMTP|POP]**

Command	Description
mailq.exe /stop	Stop both SMTP and POP3 instances running from current folder
mailq.exe /stop:smtp	Stop SMTP instance running from current folder
mailq.exe /stop:pop	Stop POP3 instance running from current folder

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Managing Email Accounts

To operate in POP3 and authenticated SMTP mode you need to have at least one user account created and registered in the configuration. All user accounts are stored in the configuration file. Passwords aren't stored but an encrypted hash of the password is stored to enable MD5 authentication to be supported.

Creating Email Accounts

From the Windows command prompt use the /ADDUSER command:

mailq.exe /ADDUSER:<email address> /PW:<password>

A password is mandatory. **MailQ** requires that all mail accounts have a password.

Changing an Account Password

From the Windows command prompt use the /SETPASS argument

mailq.exe /SETPASS:<email address> /PW:<password>

Deleting Email Accounts

Use the /DELUSER argument as follows

mailq.exe /DELUSER:<email address>

Unlocking a Locked Email Account

Use the /UNLOCK argument as follows to unlock an intruder-locked mail-account

mailq.exe /UNLOCK:<email address>

Setting up Address Aliases

Mail address aliases are configured by editing the mailq.ini configuration file. The alias entries are entered under the **[EmailAlias]** section. You will need to create this section if it isn't already present

Aliases are used only for mail-routing. Aliases cannot be used for authentication purposes.

Each entry under the [EmailAlias] section represents one alias mapping. Take care not to create circular mappings They are entered as:

[EmailAlias]
ItemN=Alias account,Real Account

Aliases allow shorter or more friendly names to be used. e.g.

[EmailAlias]
Item1=fred@localhost.com,frederick.j.smith@localhost.com

In the above example, emails sent to fred@localhost.com will be sent to the account for frederick.j.smith@localhost.com. It is not possible to authenticate as fred@localhost.com

Aliases affect only received email. Mail client software may or may not cooperate with assigned aliases when sending or retrieving email.

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Compatibility

MailQ is RFC-compliant and should be compatible with other RFC-compliant mail clients and servers. The RFC allows scope for varying levels compliance and implementing many optional features. Not all SMTP or POP3 features are provided.

MailQ has been tested with the following operating systems and email clients. Efforts have been made to ensure that **MailQ** will work as far as possible with legacy operating systems as far back as Windows NT4(SP6a).

Compatible Operating Systems

Operating System	Notes
Windows 8.1	Untested
Windows 8	Works perfectly
Windows 7	Works perfectly
Windows XP	Works perfectly
Windows 2000	Works perfectly. Full support
Windows NT4.0 (SP6a)	Works perfectly. Minimal level of support
Windows NT3.51	Incompatible
Windows 95/98/ME	Untested. Not supported
ReactOS	Incompatible with 0.3.15 or earlier
Wine on (CentOS Linux)	Works if ports are set >1024 Linux limits access to ports <=1024 to the superuser account Suggest ports 2525 (SMTP) and 1100 (POP3) May issue spurious address-in-use messages

Compatible Email Applications

The recommended mail client is Mozilla Thunderbird ESR

Compatible Mail Clients	Comments
Alpine	Console client. Works ok
MailCMD	Author's command-line emailer Works ok
Blat	A command line emailer Works ok
Thunderbird 10.0.11 ESR for Windows	Works perfectly for POP3 and SMTP
Seamonkey 1.xx, 2.xx Mail	Works perfectly for POP3 and SMTP
Microsoft Exchange 2010	Works ok as an SMTP mail relay
Opera Mail 1.x	Works ok
Incredimail Xe	Works ok
Windows Live Mail	Works ok
PocoMail 2.6.4	Works ok
Outlook Express 6	Works ok. Disable secure SMTP authentication
Outlook 2003	Works ok
Outlook 2010	Bug. Sends CAPA and USER command simultaneously. Workaround implemented within **MailQ**
Outlook 2013	Untested
Claws Mail	Works ok
Sylpheed 3.3.0	Works ok
IScribe 1.x and 2.0	Works ok
Windows Telnet	Works ok
Linux Telnet	Works ok
Putty Telnet	Works ok
Pegasus Mail 4.x	Works ok
Thunderbird 10.0.11 ESR for Linux	Works ok
KMail for Linux 1.12.4	Works ok
Evolution for Linux	Works ok

Incompatible Email Clients

Issues or problems have been found with the following mail clients or they have not yet been tested for compatibility

Incompatible and Untested Clients	Comments
Outlook 2007	Unknown
Outlook 2013	Untested
No other issues known	N/A

Compatible Mail Servers

The following is not an exhaustive list and includes only those servers where some testing has been performed.

Compatible Mail Clients	Comments
Microsoft Exchange 2010	Works ok as an inbound SMTP mail relay to Exchange 2010
None known	N/A

Server Configuration

The **MailQ** configuration file (**mailq.ini** file) is broken into several configuration sections:

[Config]	Core configuration options for SMTP and POP3
[Domains]	Domains which the server will be configured to handle
[MDA]	Mail Delivery Agent (MUA) configuration (optional)
[MXA]	Mail Exchange Agent (MTA) configuration (optional)
[LocalMX]	Local Mail Exchange (MX) lookup details (optional)
[EmailAlias]	Aliases which apply to local mail-accounts (optional)
[Users]	Local user-account details, Updated using MailQ in command-mode
[IPConfig]	This section is automatically-configured by the server at startup
[Pop-Locked]	This section is automatically-configured by MailQ as required

*All settings require a server restart to take effect except those marked with **D** (dynamic)*

[Config]	D	General Server, SMTP and POP Configuration
Bind=< ipv4-address | * >		IP v4 address of the interface to bind to or use * to bind to all local addresses. You may also omit this value in which case * will be assumed
HostName=String		The name the server is configured to display in all responses. This may be a FQDN or a local (NETBIOS) name
HostDomain=String		The domain-name which the server is configured to answer to and offer during SMTP sends. This is separate from any domains configured in the [Domains] section
QueuePath=String		Where to store the queued emails. This can be on a different disk to other **MailQ** folders if necessary
LogLevel=Value		Verbosity level of the log files
Timeout=Value		How long a thread will allow a client to remain inactive. Before forcing a disconnect
IPBlockEnabled=Boolean		Whether to use a local IP blockfile (ipblock.txt)
CacheIPBlockFile=Boolean		Whether to internally-cache the IP block file.
FixHeaders=Boolean		Whether or not to add headers to emails which have no RFC-compatible header detected
HTTPGet=Boolean		Whether to respond to HTTP GET requests. The internal default is True
EnableMouseSelect=Boolean		A console mouse-select of text can hang the mail server. It is therefore disabled by default. It is recommended that mouse-select remain disabled

NoBackSpace=Boolean		For telnet compatibility. This prevents the backspace character 0x08 being interpreted
SMTPThreads=Value		Number of threads (maximum is 64) The recommended number is between 4 and 10
SMTPPort=n		The standard SMTP port is 25
SMTPThreads=1..64		How many threads to activate in the SMTP server (64 maximum) The recommended number is between 4 and 10
SMTPMode=n		0 SMTP, 1 ESMTP, 2 BOTH
SMTPRelay=n		0 None, 1 Int to int, 2 Int to ext, 3 Ext to ext
SMTPAuthRequired=Bool		0 Authentication not required, 1 Required
SMTPMessageExpiry=n		How long a message can remain queued before expiring
SMTPMaxMessageSize=n		Set the maximum message size cap to n Mb The default is 20 Mb maximum
SMTPEnableFailureBounce=Bool		Bounce failed emails back to the sender
SMTPDeleteOnSend=Bool		Whether to delete or refile mails which are deleted by the mail system. If set to **False** then this allows separate archiving of emails
SMTPDetectMessageLoops=Bool		Whether or not to try and detect message loops. The default is to delete after 50 loop iterations are detected
SMTPVRFYEnabled=Boolean		Whether to enable the VRFY (verify) command..This is a potential security weakness since it allows an attacker to obtain user account information. It is disabled by default
POPPort=n		Port for the pop server service to listen to. The default port is 110
POPThreads=1..64		How many threads to activate in the POP3 server (64 maximum) The recommended number is between 4 and 10
POPRenameOnDelete=Boolean		Whether to delete or refile mails which are deleted by the POP server. Setting this to **True** allows manual archiving
[Domains]		**Domains this server will process mail for**
DomainN=string		Configures a domain which is recognised by the server and for which email is handled

[MDA]		**Mail Delivery Agent Configuration**
Enabled=Boolean		Mail Delivery Agent (MDA). This is often called a Mail User Agent (MUA). This is a separate SMTP module thread which handles local/internal mail deliveries and which refiles mail either into user folders or into the external mail queue pending collection by the MXA (MTA)
[MXA]		**Mail Exchange Agent Configuration**
Enabled=Boolean		Mail Exchange Agent (MXA). This is sometimes called a Mail Transport Agent (MTA) This is a separate SMTP module thread which handles extremal mail deliveries
MX=<Local | Gateway | Remote>		Specify the Mail Exchanger mode for the MXA. Local, Gateway or Remote **Local** maps to the [LocalMX] section. The configuration table for the Local MX option is stored under the [LocalMX] section (see below) **Gateway** specifies a single, fixed remote domain or IP address **Remote** enables a DNS-based MX lookup Note that mail addresses which we are configured to answer to are delivered internally
Gateway=String		An optional, fixed/static route for sending outbound mails, Requires [MXA]->MX=Gateway
SendRetrySeconds=n		How many seconds between failed MXA retries. Failed messages are queued on a per-addressee basis and retried according to this interval
[LocalMX]		**Local Mail-Exchanger Configuration**
ItemN=<source>,<target>[:port]	**D**	Define N entries for use with the MX=Local option. Each item should be in numbered sequence and each will map a pair of entries for the source domain and target (translated) domain Example:

		Item1=mail.company.com,bart **Item2=mail.domain.com,homer** A final entry can be added to deliver unknown mail to either a static gateway or to use DNS to resolve. Route unknown mail via a static:route **Item3=*,smtp.isp.com** or Route unknown mail via DNS MX routing **Item3=*.*** A port value for each entry is optional and is specified by a trailing colon (:) and a value >0. The default is 25
[EmailAlias]		**Local Email Aliases (Optional)**
ItemN=<email alias>,<real account>	**D**	Define N entries for use with the SMTP addressee lookup. Each item maps to a pair of entries for the alias email and a mapping to an actual, local account. Email aliases are fully-optional Example: Item1=sales@company.com,jim@company.com
[Scripts]		**Scripts to Execute**
Enabled=True		Enable scripts. Will be run on the delivery of a message to a registered user-account. Specify either a user account name or * to run as a system script for every mail delivery. See also /ENABLESCRIPTS
<username>=path\to\script	**D**	A user-account script These are located in .**\scripts\<username>**
***=path\to\script**	**D**	A system-level script These are located in .**\scripts** root
[Users] **[IPConfig]**		**This section should not be configured manually. Use the /ADDUSER command to add a user.** **Don't edit this section. It is generated automatically**

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Security

MailQ offers a number of features to aid mail-serve security

POP and SMTP IP-Address Auto-Banning

This permits the automatic blocking (auto ban) of an IP address which fails to authenticate a given number of times within a session.

You can enable this feature on the command-line using the /AUTOBAN:n argument where “n” is the number of authentication failure attempts allowed before the client IP-address is added to the block list. If this is set to 0 then auto-banning is disabled. The auto-ban feature applies to both POP and SMTP modules.

The feature may also be enabled within the **mailq.ini** configuration file as follows:

[Config]
AutoBan=n

A limitation of the auto-ban feature is that it applies only to the current session. Once the client disconnects a new session is started. Due to DHCP there is no way to know if an incoming connection on the same IP address is the same client or not. Client software which disconnects or issues a POP or SMTP QUIT command or simply drops the connection will never get blocked.

To un-ban an IP address you will need to open the ipblock.txt file in Notepad or another editor and comment out the entry with a # character or remove it completely.

POP Account-Locking

This feature will lock a POP mail account where the password for the account is input more than a specified number of times.

This feature is enabled on the command-line using the **/POPLOCK:n** argument where n is the number of failed login attempts accepted before the POP account is locked. If you set the value to 0 then the locking feature is disabled. The default value is 5. You can also specify this value within the mailq.ini configuration file as follows:

```
[Config]
POPLockout=5
```

To unlock a mail-account you will need to use the **/UNLOCK**:account command. This can be executed whilst the server is running. e.g.

```
mailq.exe /unlock:admin@localhost.com
```

Alternatively you may edit the mailq.ini configuration file and remove the entry for the account under the **[pop-locked]** section. And either remove the entry or set the value to False e.g.:

```
[pop-locked]
admin@localhost.com=True
```

HTTP GET Responder

HTTP and SMTP/POP use different connection strategies. The former is a stateless protocol, the latter is stateful. The difference is analogous between the former as text-messaging and the latter as a phone conversation. With HTTP a request is made and the TCP/IP socket connection is expected to be dropped after each request, with email the connection is expected to be kept active until either side decides to properly terminate the conversation.

This means that an attacker can “hang” a mail-server thread by making a web-page request on the appropriate port. e.g. http://localhost.com:25 or http://localhost.com:110. Whilst it is true that many browsers block low-value port connections by default this would present no obstacle to an attacker since they can, in most cases, override these restrictions or use telnet etc. If you run only a small number of threads then a relatively small number of HTTP (GET) requests can block anyone else from contacting your mail server and act as a Denial of Service (DOS) attack.

Since **MailQ** is designed to work with a small number of threads it responds by default to any HTTP GET request by answering and then dropping the connection. No information other than what could be publicly gained by making a telnet connection on a POP or SMTP port is revealed.

You can override this default behaviour using the /NOHTTPGET argument or the [Config]->HttpGet=Bool INI file option.

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Command Line Arguments

Command line arguments are as follows. All of these are optional

Command	INI File	Description
/? or /H		Show the Help screen
/ADDUSER:username		Add a user account. A password must be specified using **/PW:<password>**
/DELUSER:username		Delete a user from the configuration. Note that this does not delete or free any mail store folder. You must delete the mail store manually
/SETPASS:username		Change a user-account password
/UNLOCK:username		Unlock an intruder-locked mail-account
/PW:string		Specify a password for a user account
/MDA	**Y**	Enable the SMTP Mail Delivery Agent (MUA)
/MXA	**Y**	Enable the SMTP Mail Exchange Agent (MTA)
/POP		Run as a POP3 mail server The default is to run as an SMTP mail server
/STOP[:SMTP|:POP]		Shut down the server, optionally specifying which instance If no instance type given then all instances will be shut down. This is achieved by removing the lock (LCK) file(s)
/BIND:<ip address | *>?	**Y**	IP address of the interface to bind to or use * to bind to all local addresses. If omitted then * will be assumed
/PORT:Value		Set the port value for whichever operating mode is chosen (either SMTP or POP3 mode)
/SMTPTHREADS:Value **/POPTHREADS:Value**	**Y**	Set the number of threads for whichever operating mode is chosen. There is a limit of 64 threads each for SMTP or POP3 mode instances
/SMTPAUTH	**Y**	SMTP connections must be authenticated using ESMTP
/SMTPMODE:1|2|3	**Y**	Set the operating mode for SMTP 1 SMTP Only (HELO) 2 ESMTP Only (EHLO) 3 SMTP and ESMTP (HELO and EHLO)
/RELAY:0|1|2|3	**Y**	Set mail relaying level (default=Internal to External) Each level includes the permissions of the lower level 0 Relaying OFF. Internal email only

		Neither internal nor external users can relay 1 Internal users can relay to external domains (default) 2 External users can relay to internal and external domains 3 Both 1 and 2 apply
/VRFY	**Y**	Enable the SMTP VRFY command (default is disabled as this is a security risk)
/QPATH:string	**Y**	Set the mail processing queue storage path. This may be on the same drive or a different drive to other paths
/UPATH:string	**Y**	Set the user data storage path root folder. User folders will be created under here. This may be a different drive or volume to the queue path
/NOSCRIPT	**Y**	Disable external scripts and override configuration file settings which enable them
/LOG	**Y**	Enable file-logging. See also /LOGLEVEL:n
/LOGLEVEL:Value	**Y**	Enable logging at various levels Also sets the console display level 0 **OFF** Logging OFF 1 **NORMAL** Normal logging (default) 2 **INFO** Additional connection information 3 **CRIT** Show extra SMTP error conditions 4 **DEBUG** Include debugging info
/MX:String	**Y**	Select from: GATEWAY, LOCAL or REMOTE (default is no MX)
/GATEWAY:hostname	**Y**	Set a fixed/static (non-MX) external SMTP gateway host All outbound SMTP mail will be sent to this host
/WM:String	**Y**	Set an SMTP or POP3 welcome message (optional) If none is specified the defaults will be used. The welcome message may include macros (see macros)
/SIZE:Value	**Y**	Limit messages to given message size in bytes The default limit is 20Mb
/TIMEOUT:Value	**Y**	Set client inactivity watchdog timer to n seconds (default value is 120 seconds)
/NICE:Value	**Y**	Sleep interval in milliseconds between thread re-use This value should be kept above 100 ms and preferably around 500 milliseconds (default value)
/NOFIXHDRS	**Y**	Don't add missing SMTP headers Missing headers e.g. from telnet email are added automatically by default

/EXPIRY:Value	**Y**	Failed messages expire after n hours (default is 24 hours) This applies to messages which are held in the retry queue
/DELETEONSEND	**Y**	Delete SMTP emails on successful send The default is to move/archive to the .\sent folder
/RPOP	**Y**	Enable RPOP logins if on same network subnet (not recommended)
/POPROD	**Y**	POP Rename-On-Delete for the POP3 DELE command Rename POP3 messages instead of deleting them
/AUTOBAN:n	**Y**	Automatically ban IP addresses after n authentication failures If n==0 then auto-ban is disabled Removing a ban will require editing the ipblock.txt file
/POPLOCK:n	**Y**	Lock POP3 accounts after n authentication failures Requires reset via **mailq.exe /unlock:<username>** If n=0 then never intruder-lock
/NOBACKSPACE	**Y**	Don't allow backspaces (0x08) in a telnet session
/NOIPBLOCK	**Y**	Don't process the ipblock.txt file (if configured)
/NOHTTPGET	**Y**	Don't respond to HTTP GET responses
/NOINI		Don't process the INI file if present
/SELECT	**Y**	Enable QuickEdit mouse select This is disabled by default as it can hang server threads
/Q		Quiet mode. No console output You will need to monitor the server logs for correct operation
/TEST		Don't write emails to disk or send via MXA to remote servers
/DEBUG		Debug mode Display extra information

DNS Blacklist (DNSBL) Configuration

A remote DNS blacklist (DNSBL) service can be used to prevent known spammers from connecting to your mail-server. These are DNS based public services which are usually free for non-commercial use.

The connecting IP address is looked up using a DNS reference on the DNSLBL server. If an entry is found then the connecting IP is a known spamming IP which is recorded on their database. A properly configured DNSBL setup can help prevent criminals from exploiting your mail server to send junk or dangerous emails.

DNSBL is an optional configuration in **MailQ** and is disabled by default. You may configure several DNSBL lookup servers but in practice it is probably a good idea to keep the number of servers you use to two or three at the most. Any more and you risk generating extra internet traffic and slowing down your mail-server.

DNSBL requires enabling in the main configuration section of the INI file and it also requires an entry for each DNSBL server you wish to use in a [DNSBL] section..Once configured DNSBL operation is fully-automatic and blocked addresses are logged.

[Config]
DNSBLEnabled=True

[DNSBL]
Item1=zen.spamhaus.org
Item2=bl.spamcop.net
Item3=dnsbl.sorbs.net

Hosts are checked in the order configured and checking stops at the first positive match. No further checks are made after a positive match is found. Place more reliable DNSBL servers first in the list. Local loopback addresses (127.*.*.*) are never checked against any DNSBL list.

There are many DNSBL servers in operation, it usually requires research and experience to select the best one for use with your server. Popular services are SORBS, SpamCop and Spamhaus. It is suggested you research within internet mail-server forums before deciding on a DNSBL server to use.

Macros

The SMTP and POP3 server welcome messages have a standard welcome string defined which is RFC-compliant. If you wish you may specify customised welcome strings in the configuration file. These may include macro values as follows. These are similar to the PHP date values

Macro Value	Example	Description
$fulldate	**Monday, 30th June 2014**	The full date (excluding time)
$time	**13:32**	24-hour time
$yyyy	**2014**	4 digit year value
$yy	**14**	2 digit year value
$mmmm	**June**	Full month day
$mmm	**Jun**	3-letter month abbreviation
$mm	**06**	2-digit month number
$dddd	**Monday**	Full day name
$ddd	**Mon**	3-letter day abbreviation
$dd	**30**	2-digit day number
$hh	**13**	2-digit 24 hour value
$ii	**32**	2-digit minute value
$ss	**12**	2-digit seconds value
$isodate	**20140630**	ISO format date
$usdate	**06302013**	US format date
$ukdate	**30062013**	UK format date
$yearday	**181**	The day number of the year
$O	**+01:00**	The time offset as + or - NNNN
$r	**Monday, 30th Jun 2014 13:32:12 +01:00**	A complete, formatted date string
$exename	**mailq.exe**	The name of the **MailQ** binary
$env.varname^	**$env.computername^** returns: **SNOOPY**	Any variable from the environment table. Note that the string must end with either a **^** or **&** character
$pop_id	**<4260.EEE17315E4133505@example.com>**	A full POP (APOP) signature used for the POP AUTH MD5 login method

Script Configuration

MailQ can run a custom script on successful delivery of a new email message to a local user. This may be a Windows batch, CMD, VBScript or other program.

Scripts are configured on a per-user or global/system basis. Scripts are currently **experimental** and should **not** currently be relied on, particularly if they cannot guarantee thread exit. Certain script files may make the server unstable or consume unreasonable CPU time.

Security is of serious concern when enabling scripts. You **must** ensure that SMTP authentication is enabled and all users have strong passwords set.

Scripts may also be highly-CPU intensive and improper use may seriously impact on mail-server performance. When considering scripts to perform anti-virus scanning a dedicated external anti-virus program may be more efficient at scanning inbound emails than using a server script to drive a command-line one.

The Mail Delivery Agent (MDA) is responsible for running scripts immediately after an email is delivered to a local user folder. A custom environment table is passed to the script or application which contains the following variables.

Variable Name	Description
EML_FILE	The email message (EML) file name
SUBJECT	The complete message subject entry
FROM	The recipient email address
TO	The sender email address

Each script is run in a separate thread which will persist as long as the called script is active. Therefore it is recommended that scripts are configure to exit as quickly as possible to avoid hogging memory or thread resources.

It is possible to use custom user accounts combined with user-level scripts to perform remote administration tasks on a server such as shutting-down, rebooting, disk checks, clean-ups, repairs etc. Care should be taken where such scripts are enabled. By this means MailQ can be used as a mail-in remote control application.

For example, you might create a user account called reboot@localhost.com which runs a server reboot script. Again, for obvious reasons you should pay close attention to mail-server security.

Scripts are enabled by configuring a **[Scripts]** section in the **mailq.ini** file as follows

```
[Scripts]
user1@localhost.com=c:\scripts\newmail.bat
admin@localhost.com=.\scripts\special.vbs
```

And by setting a master setting in the **[Config]** section as follows.

```
[Scripts]
Enabled=True
```

Scripts are disabled by default regardless of any script-mappings set up in the **[Scripts]** section until you set this value in the configuration file.

You can disable scripts which have been enabled in the configuration by using the override command **/NOSCRIPT** when starting **MailQ**

When writing script files you should make sure that the script exits and does not leave idle console windows active. Batch scripts should end with the **EXIT** command.

System-level scripts can be run for every user by using an asterisk entry as follows. Only one such script is permitted.

```
[Scripts]
*=c:\scripts\system.bat
```

Example Script

```
@ECHO OFF
REM ClamWin will run asynchronously here (recommended)
START "ClamWin Scan of %EML_FILE%" "%ProgramFiles
%\ClamWin\bin\clamscan.exe" "%EML_FILE%" -d "%ProgramFiles↵
%\ClamWin\bin\.clamwin\db\daily.cld" -scan-mail=yes --show-progress↵
--verbose --log=logs\clamscan.log
EXIT
```

Running MailQ on Linux/WINE

It isn't recommended to run MailQ on WINE under the Linux O/S for a number of technical reasons. However if you wish to experiment then it is important to run **MailQ** (or any other Windows console mode program in the correct way)

You should run from the Linux console prompt using the following command: (the example host name and prompt here is “hostname#”) -

hostname# wine start \path\to\mailq

or:

hostname# wine start cmd

and then run **MailQ** from the appropriate path

Don't run using the following method

hostname# wine cmd

and then run **MailQ** (or any other console mode application)

The reason to launch WINE in this way is that if launched using “start” then the console behaves differently. Colour mode output and keyboard input will work. If launched without using “start” then you will find the application fails to respond to keystrokes and coloured text will not appear. This appears to be some obscure bug or “feature” in WINE.

MailQ – A Brief Technical Discussion

A basic appreciation of how a mail-server handles email is useful when setting up and operating a mail server. This is an outline of how **MailQ** handles mail.

How the Mail Server Works

The server launches a number of independent listening threads. Each of these loop until server shut-down awaiting a connection on the relevant port (POP3 or SMTP).

Once a client is connected the thread will loop in the appropriate transaction states until either the client terminates the connection or the user sends the appropriate QUIT message.
If a connection remains idle for any length of time then a separate watchdog thread terminates the process in order to prevent a Denial of Service attack (DOS). This idle timeout period is configurable.

Mail Delivery

On the completion of a successful SMTP transaction the resulting email is saved to the configured queue folder where it will be picked up and analysed by the MDA thread (if running). If there is no MDA process running then the server will need to be configured with an alternate delivery agent which will sort messages and place them into the correct folders or which serve them to uses via POP or IMAP.

The Mail Delivery Agent (MDA) checks and sorts messages and validates against local accounts. Mail for recognised local accounts is delivered to the respective user folder for pick-up by a POP mail agent. Unrecognised local-domain mail is filed into the unrecognised user folder for attention by the mail-server administrator. Mail which isn't recognised, and which doesn't belong to any configured domain, is moved to the external queue folder for attention by the Mail Exchange Agent (MXA)

Mail Routing

The Mail Exchange Agent (MXA) is a separate thread which continually checks the external queue folder for new mail. Each new message is checked for recipients and is processed on a per-recipient basis. An attempt will be made to send valid messages via any configured MX route. If successful then the message will be refiled into the sent mail folder. If unsuccessful then a new copy of each message is made on a per-recipient basis into the retry queue. After a configurable period of time any mail held in the retry queue will be put back into the external queue for re-processing. This cycle will continue until the message is time-expired, this period also being configurable. Time expiry is determined by examining the file date/time and also looking at the time stamp in the authentication file.

The above MXA mechanism means that messages may not keep the same internal message ID since this is date/time based. The assigned message ID should be assumed to be used for internal processing only. The static tracking ID for a message will be the one held in the mail header.

Message Format

Messages are stored in a standard EML file with routing credentials stored in a separate authentication (AUTH) file. These files have the same file name with a different file extension (*.EML and *.AUTH respectively). The file name is based on the current date and time plus a series of random digits, however this name may change as the message is routed or retried. The original date-stamp is stored within the authentication file. It should be noted that the display file name for the message set represents only the most current invocation of any file during transmission, it doesn't represent any form of trackable ID.

Even when failed messages are retried with a new unique ID Mail IDs remain unique on a per-message basis which means that a POP client can use the UIDL

Note: For the purposes of this discussion the terms MDA and MUA are equivalent and MXA and MTA are equivalent

MailQ Folder Structure

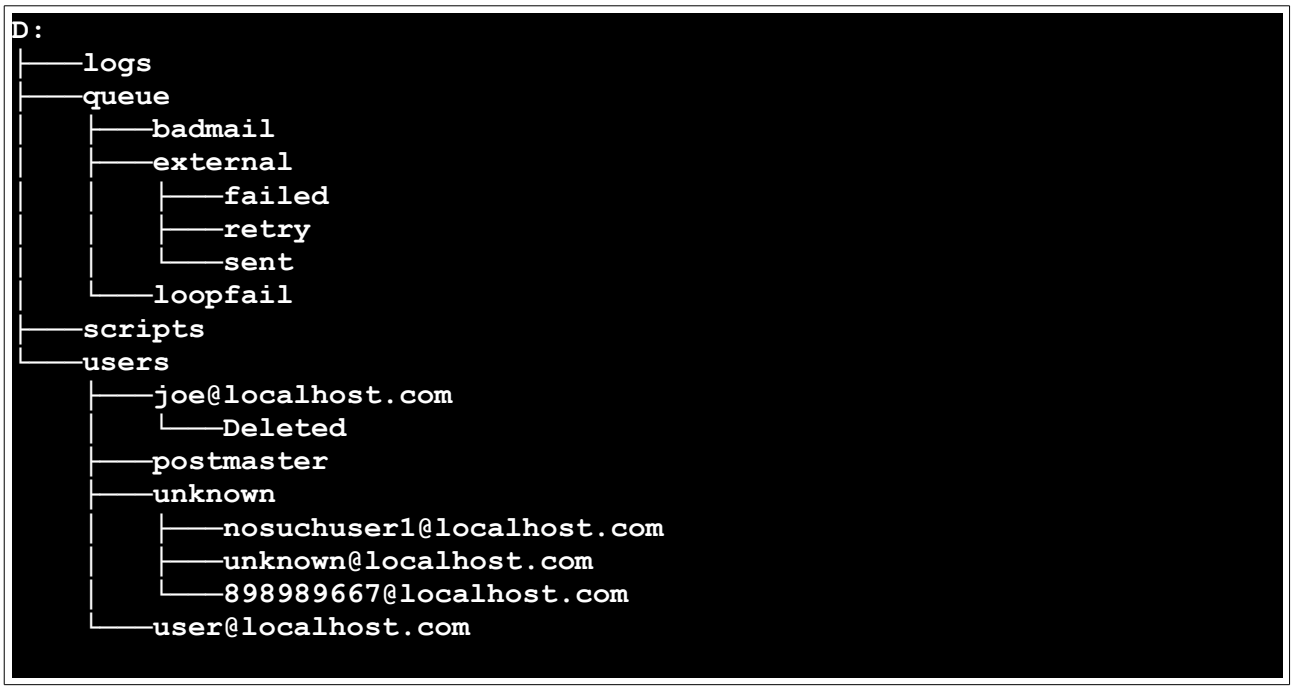
The following is an example of the MailQ folder structure with the parent path omitted for clarity.

Top level folders are **logs**, **queue** and **users**. The **logs** folder is self-explanatory; **queue** is where mail is first delivered to by SMTP and the **users** folder sub-tree is where mail is stored for collection and delivery by the POP3 server.

The MDA delivers mail from **.\queue** to either an individual user folder (if known) or to **.\users\unknown\<address>** if an unknown user at a registered local domain.

External mail is delivered to **..\queue\external** for processing by the MXA.

Deleted mail which was deleted by a POP3 client may optionally be preserved in a **deleted** sub-folder under each user account. This would allow for administrative auditing and archiving.



SMTP RFC Compliance

Efforts have been made to make MailQ as compliant as possible with the relevant RFC specification documents. Unfortunately there are areas where these are either vague or where there are many ambiguous options.

SMTP RFC commands implemented

HELO
EHLO
AUTH PLAIN
AUTH LOGIN
AUTH MD5
MAIL FROM[:]
RCPT TO[:]
DATA
RSET
HELP
VRFY (Optional/configurable command)
SIZE
NOOP
QUIT

Multiple sends are allowed from a single authentication

Non-standard SMTP commands implemented

GET	Malicious HTTP GET requests can hang a server thread. GET prevents this
TIME	Return RFC-formatted time string (max 5 calls per session)

These commands are available only when running the server in debug-mode using the /DEBUG command-line argument.

STAT	Shows session status if running in debug mode
IPCF	Show the IP address if running in debug mode

POP3 RFC Compliance

Efforts have been made to make MailQ as compliant as possible with the relevant RFC specification documents. Unfortunately there are areas where these are either vague or where there are many ambiguous options.

POP3 RFC Commands implemented

CAPA
USER username
PASS password
UIDL [n]
TOP n
STAT
LIST [n]
LAST
RETR n
DELE n
NOOP
HELP
RSET
QUIT

Non-standard POP3 commands implemented

GET	Malicious HTTP GET requests can hang a server thread. GET prevents this
TIME	Return RFC-formatted time string (max 5 calls per session)

These commands are available only when authenticated

MOTD[n]	Message of the day - if enabled

These commands are available only when running the server in debug-mode using the /DEBUG command-line argument.

BANR	Show the POP3 banner if running in debug mode
IPCF	Show the IP address if running in debug mode
NOTO	No Time Out,. Disable connection time-outs if in debug mode
DOWN	Take the POP3 mail server offline if running in debug mode

Message of The Day (MOTD)

This feature allows the transmission of a simple one-line message for logged-in POP3 users where supported. This is typically of no use unless a person has made a telnet connection to the mail-server. Mail-client software will make no use of this feature.

The command is MOTD[n] where n is an optional message number. If the message number is omitted then a random message will be issued. Where the number is higher than the number of messages the highest-numbered message will be shown. e.g.

motd
+OK A stitch in time saves nine

Messages are stored on a one-message-per-line basis in a file called motd.txt which is stored in the root of the configured “users” folder. By default this is “.\users”

The feature is disabled by default but can be enabled within the mailq.ini configuration using the following entry:

[Config]
Motd=True

POP3 and SMTP Time Command

The TIME command is available at initial connect or during authorised/transaction states for both POP3 and SMTP. This is typically of no use unless a person has made a telnet connection to the mail-server. Mail-client software will make no use of this feature and it is non-standard.

For POP3, if the client is authenticated then the time will be echoed in the current session in standard format. If the client is not authenticated then the time will be echoed and the connection will be immediately dropped.

For SMTP if the client has sent a valid HELO or EHLO then the time will be echoed in standard format and the connection kept open, otherwise the time will be echoed in standard format and the connection will be dropped.

POP3 Example

```
+OK host MailQ POP3(C) M Shaw <3572.5D1CFCE4A3124326@localhost.com>
time
+OK Monday, 23rd Jun 2014 12:47:18 +0100

Connection to host lost.
```

SMTP Example

```
220 mail.kerys.co.uk - MailQ v1.11
time
250 Monday, 23rd Jun 2014 12:47:18 +0100

Connection to host lost.
```

A remote server can use **MailQ** as an emulated Simple Network Time Protocol (SNTP) time server. It would need to take the following actions:

1. Make a connection on the SMTP or POP3 port
2. Drop the response packet, i.e. the welcome message
3. Send the string “TIME<CRLF>”
4. Parse the response by stripping “250<space>” from the reply

The response string format is:

<server response code><sp><day-name>,<month-day-number><ordinal><sp><3-digit-month><sp><4-digit-year><sp><24-hour><:><minutes><:><Seconds><sp><time-offset-from-UTC><CRLF>

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Using the MailTest Diagnostic Tool

MailTest (mailtest.exe) was written to perform very basic tests on mail server connectivity. It can send SMTP email using a variety of authentication methods and provide a debug trace of the operation to aid fault-finding. It can also perform basic POP3 authentication and retrieve message headers.

MailTest supports the following authentication types:

SMTP	NO AUTH, EMTP AUTH PLAIN, AUTH LOGIN, AUTH CRAM MD5
POP3	USER/PASS authentication, APOP, RPOP

The syntax is as follows:

mailtest.exe server userid password /APOP [/Switches]
mailtest.exe server userid /RPOP [/Switches]
mailtest.exe server mail-from rcpt-to [password] [/Switches]
mailtest.exe server <"<>"|rcpt-to> [password] [/Switches]

SMTP mode will attempt to send a small test message if authenticated and POP3 mode will attempt to retrieve the headers for message #1 (if present)

Argument	Description
/POP	POP3 mode. Default authentication for POP3 is user/password
/PORT:n	Set the access port. Default for SMTP is 25 POP3 is 110
/APOP	Authenticate when in POP3 mode using APOP
/RPOP	Authenticate when in POP3 mode using RPOP
/SMTP	SMTP mode (default) Default authentication for SMTP is HELO (none)
/EHLO	Connect to SMTP in ESMTP mode (EHLO) Default is SMTP (HELO)
/AUTHPLAIN	Use AUTH PLAIN authentication
/AUTHLOGIN	Use AUTH LOGIN authentication
/AUTHCRAM	Use AUTH CRAM MD5 authentication
/HTML	Send a message in HTML format (not supported by all mail clients) The default is to send a plain-text email

MailQ Mail Sever

MailTest Errorlevel Returns

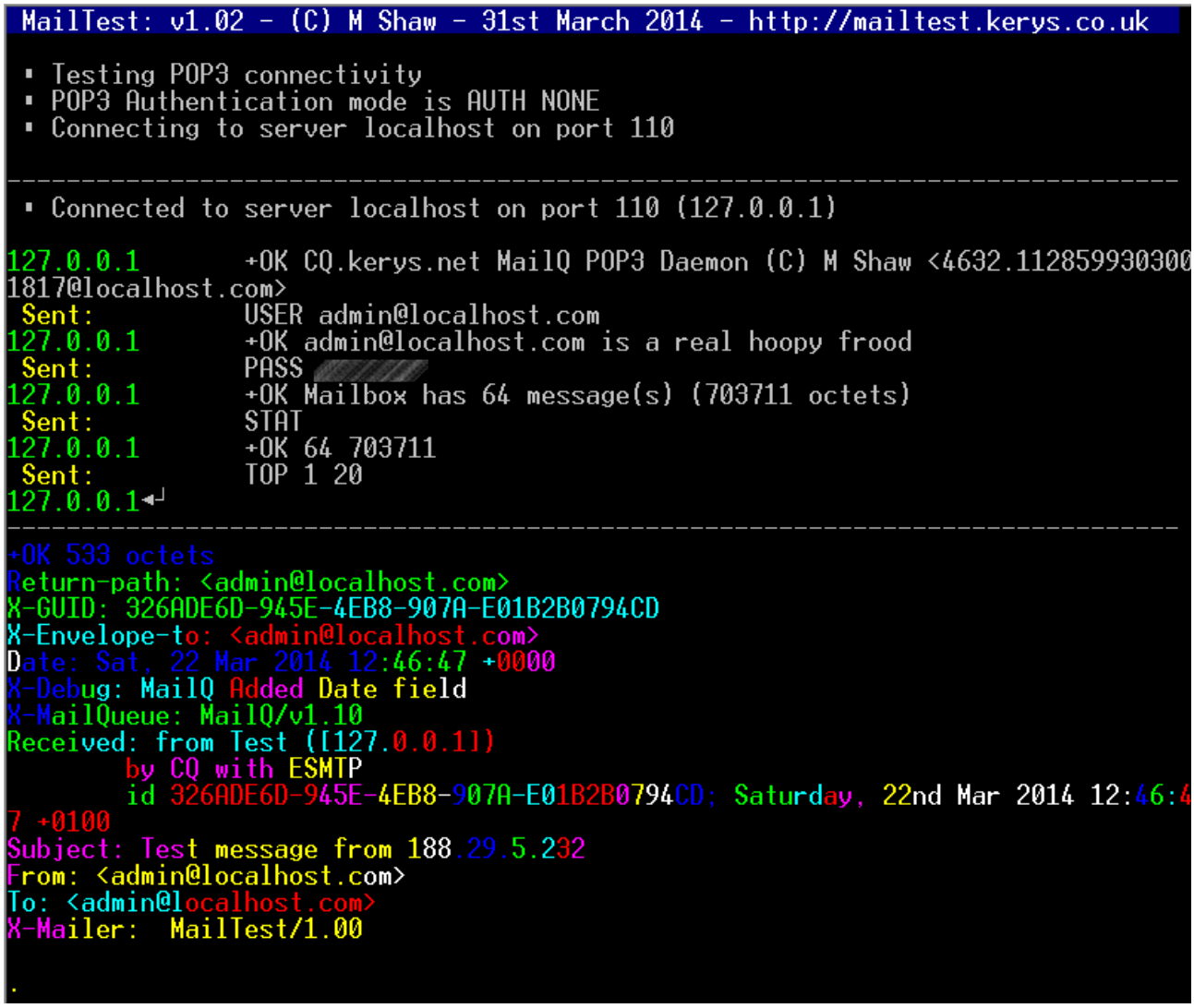
The following ERRORLEVEL values are returned by MailTest to test scripts

Errorlevel	Description
0	SMTP or POP3 Success
1	Too many command-line arguments
2	POP3 Authentication failed
3	POP3 APOP welcome string was empty
4	SMTP mode must have a sender
5	SMTP mode must have a recipient
6	SMTP AUTH PLAIN authentication failed
7	SMTP AUTH LOGIN authentication failed
8	SMTP AUTH CRAM-MD5 authentication failed
9	SMTP AUTH CRAM-MD5 no server response
10	SMTP Failure (See response code)

MailQ Mail Sever

MailTest Screenshot

Note the fragmentation of individual data-packets indicated by the varying colours in the returned email header



Connectivity Troubleshooting

Many problems can be solved by the use of telnet to diagnose performance and connectivity. Windows telnet isn't installed by default with some versions of Windows. You may need to go to Control Panel->Programs and Features and install telnet as an extra Windows option. Alternatively you can use a free telnet program such as Putty.

Log Files

The log files should be a first source of information when checking either the performance of the server or troubleshooting faults. Logs are recorded in CSV format.

Problem: Client cannot connect to POP3 server

- Ping **MailQ** from the client machine. Ensure the server responds
- Ensure the POP3 server is running
- Ensure the POP3 server is bound to the correct host IP address
- Ensure no other service is running and bound to the SMTP port
  Use the command:

  netstat -b

  or

  netstat -a

  to check which services are running and bound to which ports
- Ensure the server PCs firewall allows inbound connections to the POP3 server port (the default is 110)
- Telnet to **MailQ** from the same (server) machine on the configured POP3 port (default is 110)
- Telnet to **MailQ** from the client machine on the configured POP3 port (default is 110)
- If you can connect try logging in via telnet using the following sequence of commands:

  USER <username>
  PASS <password>
  STAT
  QUIT

- If the above tests all pass but you still cannot connect then try using an alternate mail client program

Problem: Client cannot connect to SMTP server

- Ping the **MailQ** server from the client machine. Ensure the server responds
- Ensure the SMTP server is running
- Ensure the SMTP server is bound to the correct host IP address
- Ensure no other service is running and bound to the SMTP port
  Use the command:

  netstat -b

  or

  netstat -a

  to check
- Ensure the server PC's firewall allows inbound connections to the SMTP server port (the default is 25)
- Telnet to **MailQ** from the same (server) machine on the configured SMTP port (default is 25)
- Telnet to **MailQ** from the client machine on the configured SMTP port (default is 25)
  You should get a response starting with:

  220 Hello ...

- If you can connect try logging in via telnet using the following sequence of commands:

  HELO server
  HELP
  MAIL FROM: local-user-account
  RCPT TO: local-user-account
  DATA
  Hello this is a test
  .
  QUIT

- If the above tests all pass but you still cannot connect then try using an alternate mail client program

Problem: Message Looping

By default, **MailQ** is configured to automatically detect and block message loops over 50. You can disable this feature if you wish using the following configuration setting but it is strongly recommended that you leave it enabled.

[Config]
SMTPDetectMessageLoops=False

There is no command-line means of disabling this feature.

Message loops are prevented in two ways:

1. By checking that the target SMTP server is not listed in our recognised [Domains] section of the configuration file. Because of this it is important that the list of domains (possibly including localhost and 127.0.0.1) are correctly added to this section

2. Secondly, by checking the received mail headers and counting the "Received:" entries and ensuring it is less than the configured threshold value (50 default).

Problem: Cannot Route Mail (Static Gateway)

- Check the configuration in the [LocalMX] section of the configuration file
- Check that you can telnet to the gateway server in question
- Check the server host IP and DNS configuration using: **ipconfig /all**

Problem: Cannot Route Mail (Local MX)

- Check the configuration in the [LocalMX] section of the configuration file
- Check that you can ping and telnet to any fixed SMTP targets
- If you have a wildcard option pointing to a DNS MX as an option then check that your external connection and DNS lookups are working. Use the MXLookup.exe utility to check.
- Check the server host IP and DNS configuration using: **ipconfig /all**
- Check any optional port value for your remote server is correct
  Port values are optional with a default of 25 and are specified by a trailing colon (:) and then a port value >0
- If you have external route options set up in Local MX then check that these routes are valid.
- Ensure any domain you wish **MailQ** to handle is registered in the [Domains] section or mail may be refused unless you have an open-relay configured

Problem: Cannot Route Mail (Remote MX)

- Check that your external connection and DNS lookups are working. Use the **MXQuery.exe** utility supplied with **MailQ** to check
  Use either the command: **mxquery.exe** or **mxquery.exe /ALL**
- Check that the given mail server is responding both to ping and telnet
- Check the local **MailQ** server host IP and DNS configuration using: **ipconfig /all**

Frequently Asked Questions (FAQ)

What can I do if my ISP blocks port 25 inbound?

If your ISP is blocking inbound connections from the internet from other mail relays there may be little you can do about it as you will be unable to persuade other mail relays to address your server via the specific port. You could pay the ISP or make a request for the port to be unblocked

Typically ports may be unblocked when leasing a fixed line and static IP address. It is more usual for outbound SMTP ports to be blocked in order to prevent infected PCs sending out spam.

What if my ISP blocks port 25 outbound?

As with the above scenario you could request your ISP to unblock the port. It could take many requests before it is unblocked. For outbound connections you can lease services from a commercial SMTP provider who will offer alternative ports such as 2525. ISPs usually block only a small number of ports.

What if I need to run on a different inbound port inbound from the internet but route mail internally on port 25?

You can configure **MailQ** to listen on the alternate port (e.g. 2525) for traffic coming inbound from the internet and use Local MX with other port values in the configuration for local routes

I have bought a domain name, how do I get mail sent to my server?

You need to be able to configure your DNS MX record to point to your external IP address. For most people this will be problematic as you won't have a fixed address. Some dynamic DNS service providers such as noip.com or dyndns.com may be able to offer a service which updates your external MX record when your dynamic IP address changes.

If you hire a static address and have access to your DNS configuration then all you need to do is point the MX record to your external (static) address and then port forward on port 25 to your mail-server. You may also need to open a port on your firewall to allow inbound traffic on port 25 (SMTP)

You can use the MXQUERY.EXE tool included with **MailQ** to verify your DNS MX configuration.

Can I route local mail internally but make all other mail default to my ISPs mail server?

Yes. Set up Local MX (Smart MX) with your table of internal routes and set a default value for a single external gateway as follows. Let's assume your ISPs mail server runs on a non-standard port (2525) to make this example more informative. Configure **mailq.ini** with a table like this in the **[LocalMX]** section. Ensure you set the MXA section also...

```
[MXA]
MX=Local

[LocalMX]
Item1=company.com,server1
Item2=mydomain.com,server2
Item3=*,smtp.isp.com:2525
```

Are there any remote test tools I can use to test my server?

Yes, A basic test utility, **mailtest.exe** is included with **MailQ**. Use **mailtest /?** for more information or consult any enclosed readme file.

You can also use IP Toolbox online test tool at the following website which includes an SMTP send test feature - http://mxtoolbox.com/

How can mail quotas be implemented?

The underlying file-system can be used to apply quotas but this will be regulated by **MailQ** only as a critical out of space condition if quota caps are used. Some versions of Windows can apply folder/directory space quotas.

It is suggested that scheduled jobs archive older failed mail, logs and deleted user-mail in order to conserve disk space. You can use the Windows tasks-scheduler and batch scripts to achieve this.

Does MailQ work on Linux?

MailQ will operate within **WINE** under many versions of Intel Linux, however use under WINE is not recommended for a number of reasons. Firstly, ports under 1024 can't be used by applications unless they are accessed by applications with root access. This means running WINE as root, which is a very bad idea. Also, WINE does not implement the full Win32 API so there could be reliability issues.

Run WINE using the command: **wine start mailq.exe** or **wine start cmd->mailq.exe**

See the topic running **MailQ** on Linux

Does MailQ work on ReactOS?

No. Tests showed that ReactOS 0.3.16 showed that it is not yet stable enough to host network server applications. It suffers spontaneous lock-ups and crashes.

I get a "501 Syntax Error" message sending anonymous mail – why?

Unless you configure **MailQ** to operate as an open-relay you will be unable to send mail anonymously. This is where you send the empty string "<>" (two angled brackets) as the MAIL FROM: sender address. To enable **MailQ** as an open relay you will need to set the following option.

*Note that enabling open-relay mode is **NOT RECOMMENDED** and may result in your internet account being terminated by your ISP if the relay is used by criminals and spammers.*

[Config]
SMTPRelayLevel=3

Where SMTPRelayLevel can be one of

0 No relaying	Local users can only email other local users
1 One-Way	Local users can send outbound mail only
2 Two-Way	External users can email local users and case 1 also applies
3 Open-Relay	External users can email other external users and cases 1+2 apply

Can MailQ run a script when a user gets new mail?

Yes, but these aren't recommended as they may cause a mail thread to slow down and impact on the mail-server responsiveness. See scripts.

I get a 500 or 553 error when routing mail to a remote mail server, what does this mean?

Either your internet connectivity is down (no internet connection) or you are trying to route SMTP messages to a host which does not allow you to do so or your ISP is blocking SMTP traffic.

Typically ISPs will only allow SMTP packets to be routed to their own SMTP server and will block all other such traffic. If you get this error and your TCP/IP connection to the internet is ok then you are probably being blocked from making remote SMTP connections on the specified port (usually port 25)

Can I run two or more copies of MailQ in SMTP mode on the same PC or server?

Yes. With the following conditions. Each **mailq.exe** must reside in separate folders. Each must have a separate mailq.ini file. Each instance must either bind to a different IP address or bind to a different socket address. To route properly each instance should be configured to respond to different domain names and to have different mail accounts by domain name.

Appendices

Appendix - Example Configuration (INI) File

This is an example of a working **MailQ** configuration (INI) file.
Some lines below may appear wrapped:

```
[Config]
Bind=*
Host Name=BART
HostDomain=localhost.com
QueuePath=".\queue"
LogLevel=3
Timeout=240
IPBlockEnabled=False
CacheIPBlockFile=True
FixHeaders=True
NoBackSpace=True

SMTPThreads=4
SMTPPort=25
SMTPMode=2
SMTPRelay=2
SMTPAuthRequired=True
SMTPMessageExpiry=480
SMTPEnableFailureBounce=True
SMTPDeleteOnSend=False
SMTPDetectMessageLoops=True
SMTPMaxMessageSize=20

POPPort=110
POPThreads=4
POPRenameOnDelete=TRUE
;POPWelcome="$server_name POP3 Daemon (C) M Shaw $pop_id"↵
SMTPWelcome="Hello [$CLIENT_IP] - $EXENAME v$ver, $env.USERDOMAIN^↵
($env.NUMBER_OF_PROCESSORS^ CPU) on $env.COMPUTERNAME^ $fulldate $O↵
$time"

[Domains]
Domain1=localhost
Domain2=localhost.com
Domain3=example.com



[IPConfig]
```

```
; IP Configuration is determined at load-time
ipaddress=
netmask=
gateway=
dns1=
dns2=
ActiveInterface=1
ActiveInterfaces=2

[MDA]
Enabled=True
UserPath=".\users"
RefileUnknownUsers=True

[MXA]
Enabled=True
MX=Local
SendRetrySeconds=600
Gateway=HOMER    ; Specimen gateway host configuration (not enabled)


[LocalMX]
Item1=domain.com,server1
Item2=domain.co.uk,127.0.0.1
Item3=some.otherdomain,127.0.0.1
item4=example.com,acer
Item5=*,server1       ; Send everything else to server1

[EmailAlias]
Item1=postmaster,admin@localhost.com
Item2=fred@somedomain.com,admin@localhost.com

[Users]
admin@localhost.com=IBkkRcFlFSpqRgtDPk0oJFUbYjxuGwF+AiNZWRJhHw9eEB0DTSR↵
PLVdkBn02RWAVHAZrOxZXdRg0WgFrK0EGcE8kdKLpVXV4W3xPFDpIOLxMVw1GBG8JdHgZcU↵
kdEGdXGXZhJQ==
joe@localhost.com=QnGagccUw0a34QJxR8Kl1VGCxTTHIuVRtUFA8fXlZwSF0wLV0sWR1↵
mQmN7EjEMJFsNMz50WxZyOEJKXDwBpqRGpLXHTk5MYFVPLIxPESIzXEcHLBNfKnp3TVRpL3↵
EYGX8KSA==
user@localhost.com=LFpja3h1UnJ/KmIvOgRdMXE0TkEcb11/W3x6YysKITs4DTlXLUVX↵
aTJLO3N2Y28AeiZ0bgE3fRZCLVVgDUhloIpqRMtHStrBjxpDLZbCAxmdT4LUUwRaxgkJSYh↵
STECR0s3VA==
```

Appendix - Supplied Files

Use **<exe-program-name> /?** for more information

Filename	Description
mailq.exe	The SMTP and POP3 mail server program
mailq.ini	Example INI configuration file
go.bat	Example batch file to launch
mxquery.exe	DNS MX query tool
showip.exe	General IP configuration and query tool
mailtest.exe	SMTP/POP3 mail connectivity test tool
tailcmd.exe	Command-line version of tail
ask.exe	Batch file control and display utility
kill.exe	Process killer used with example GO.BAT

Appendix - Online Test Tools

The MX Toolbox website included an SMTP send test - http://mxtoolbox.com/

Appendix – Putty Download Website

Putty is a free telnet application for Windows and can be used as an alternative to Windows telnet if required: http://www.putty.org/

Appendix - RFC Reference Documents Used To Develop MailQ

2821	Simple Mail Transfer Protocol
1081	Post Office Protocol
1939	Post Office Protocol Version 3
2449	POP3 Extensions

Appendix - IMAP4 Support

Currently there is no IMAP4 support offered as an alternative to POP3.

IMAP4 is required for certain web-based mail clients and mobile devices. An external IMAP server may be used to serve the contents of the user's mail folder. There are several programs available which can do this.

Appendix – Webmail Support

There is currently no webmail support since most webmail clients require IMAP support.

Appendix - Development - Future Plans

Development of **MailQ** continues only when time permits. This is not a full-time project.

The current features not yet implemented are:

- Delivery status notifications (DSNs)
- SSL/TLA connectivity
- IPBlock auto-purging
- IMAP support

The following goals are planned for future versions of **MailQ** these are (in no particular order):

- Improve logging levels and log-level categorisation
- AUTH NTLM support with fake or actual local authentication
- IMAP4 client to support webmail and mobile devices
- SSL/TLA capability
- Improve performance and possibly add multi-threading to the MXA
- GUI management interface
- Install and run as a Windows service
- Log analysis tools
- Distribution groups
- Email subscription (let one email account subscribe to the emails of another)
- Reliable client scripts which have minimal impact on the server threads
- IPBlock timeout/auto-purging
- Webmail connectivity

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