[MS-STANOPOP3]:
Outlook POP3 Conformance Document

This document provides a statement of conformance for protocol implementations. It is intended for use in conjunction with the Microsoft protocol technical specifications, publicly available standard specifications, network programming art, and Microsoft distributed systems concepts. It assumes that the reader is either familiar with the aforementioned material or has immediate access to it.

A protocol conformance document does not require the use of Microsoft programming tools or programming environments in order to implement the protocols in the system. Developers who have access to Microsoft programming tools and environments are free to take advantage of them.

Abstract

This document describes the choices made when implementing the POP3 protocol. It identifies ambiguities and implementation choices and indicates the approach taken in the implementation. These details of the protocols are described in the protocol specifications for each of the protocols and data structures not in this document.

Revision Summary

Date	Revision History	Revision Class	Comments
10/01/2008	1.0		Initial Release.
12/03/2008	1.01		Updated IP notice.
04/10/2009	2.0		Updated applicable product releases.
07/15/2009	3.0	Major	Revised and edited technical content.

Table of Contents

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1   Introduction

This document specifies the level of support provided by Microsoft Office Outlook 2007 and Microsoft Outlook 2010 for the **Post Office Protocol - Version 3 (POP3)**, as specified in [RFC1939]. Outlook uses the POP3 protocol to retrieve **messages** from the server.

1.1   Glossary

The following terms are defined in [MS-OXGLOS]:

> **message**
> **Post Office Protocol – Version 3 (POP3)**

The following terms are newly defined in this document:

MAY, SHOULD, MUST, SHOULD NOT, MUST NOT: These terms (in all caps) are used as described in [RFC2119]. All statements of optional behavior use either MAY, SHOULD, or SHOULD NOT.

The following protocol abbreviations are used in this document:

CRLF: Carriage Return Line Feed

TCP: Transmission Control Protocol

1.2   Normative References

[MS-OXGLOS] Microsoft Corporation, "Exchange Server Protocols Master Glossary", June 2008.

[MS-OXPOP3] Microsoft Corporation, "Post Office Protocol Version 3 (POP3) Extensions Specification", June 2008.

[RFC822] Crocker, D.H., "Standard for ARPA Internet Text Messages", RFC 822, August 1982, http://www.ietf.org/rfc/rfc0822.txt.

[RFC1939] Myers, J. and Rose, M., "Post Office Protocol – Version 3", RFC 1939, May 1996, http://www.ietf.org/rfc/rfc1939.txt.

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997, http://www.ietf.org/rfc/rfc2119.txt.

[RFC2449] Gellens, R., Newman, C., and Lundblade, L., "POP3 Extension Mechanism", RFC 2449, November 1998, http://www.ietf.org/rfc/rfc2449.txt.

We conduct frequent surveys of the normative references to assure their continued availability. If you have any issue with finding a normative reference, please contact dochelp@microsoft.com. We will assist you in finding the relevant information. Please check the archive site, http://msdn2.microsoft.com/en-us/library/E4BD6494-06AD-4aed-9823-445E921C9624, as an additional source.

1.3   Informative References

None.

We conduct frequent surveys of the informative references to assure their continued availability. If you have any issue with finding an informative reference, please contact dochelp@microsoft.com. We will assist you in finding the relevant information. Please check the archive site,

, as an additional source.

1.4 Microsoft Implementations

Microsoft Office Outlook 2007

Microsoft Outlook 2010

1.5 Conformance Requirements

The conformance requirements for [RFC1939] are that all required portions of the specifications are implemented according to the specification, and any optional portions that are implemented are implemented according to the specification.

The following table lists the sections of [RFC1939] that are considered normative and the sections that are considered informative.

Section(s)	Normative/Informative
1 – 2	Informative
3 – 7	Normative
8 – 11	Informative
12	Normative
13 – 15	Informative

1.6 Notation

The following notations are used in this specification.

Notation	Explanation
C####	This identifies a clarification of ambiguity in the target specification. This includes imprecise statements, omitted information, discrepancies, and errata. This does not include data formatting clarifications.
V####	This identifies an intended point of variability in the target specification such as the use of MAY, SHOULD, or RECOMMENDED. This does not include extensibility points.
E####	Because the use of extensibility points (such as optional implementation-specific data) may impair interoperability, this profile indentifies such points in the target specification.

2   Conformance Statements

2.1   Normative Variations

There are no normative variations from [RFC1939].

2.2   Clarifications

The following sub-sections identify clarifications relative to [RFC1939].

Additional Outlook **POP3** extensions to [RFC1939] are as specified in [MS-OXPOP3].

2.2.1   [RFC1939] Section 3, Basic Operation

C0001:

> The specification states: "When a client host wishes to make use of the service, it establishes a TCP connection with the server host."
>
> Outlook 2007, Outlook 2010
>
> > When a client host wishes to make use of the service, it MUST establish a TCP connection with the server host.

C0002:

> The specification states: "When the connection is established, the **POP3** server sends a greeting."
>
> Outlook 2007, Outlook 2010
>
> > When the connection is established, the POP3 server MUST send a greeting. If Outlook does not receive a greeting, then the POP synchronization will hang.

C0003:

> The specification states: "All commands are terminated by a CRLF pair. Keywords and arguments consist of printable ASCII characters."
>
> Outlook 2007, Outlook 2010
>
> > All commands sent by the client to the server MUST be terminated by a CRLF pair and MUST consist only of printable ASCII characters.

C0004:

> The specification states: "Keywords and arguments are each separated by a single SPACE character."
>
> Outlook 2007, Outlook 2010
>
> > When the client sends a command, keywords and arguments MUST be separated by a single SPACE character. When the client receives a response to a command, the client MUST accept multiple SPACE characters and tab characters between keywords and arguments.

C0005:

> The specification states: "All responses are terminated by a CRLF pair."

Outlook 2007, Outlook 2010

The server response MUST be terminated by a CRLF pair. If Outlook does not receive the terminating CRLF pair, then the POP synchronization hangs.

V0001:

The specification states: "Servers MUST send the '+OK' and "-ERR" in upper case."

Outlook 2007, Outlook 2010

Outlook treats any response that begins with "+" as positive and any other response as negative. The casing of the status indicators has no affect on how Outlook interprets the responses.

C0006:

The specification states: "In these cases, which are clearly indicated below, after sending the first line of the response and a CRLF, any additional lines are sent, each terminated by a CRLF pair. When all lines of the response have been sent, a final line is sent, consisting of a termination octet (decimal code 046, '.') and a CRLF pair."

Outlook 2007, Outlook 2010

Each line MUST be terminated with a CRLF. The final line MUST consist of a termination octet and a CRLF pair. If Outlook does not receive the terminating CRLF, then the POP synchronization hangs.

V0002:

The specification states: "When examining a multi-line response, the client checks to see if the line begins with the termination octet. If so and if octets other than CRLF follow, the first octet of the line (the termination octet) is stripped away. If so and if CRLF immediately follows the termination character, then the response from the POP server is ended and the line containing '.CRLF' is not considered part of the multi-line response."

Outlook 2007, Outlook 2010

The client MUST examine the octets after the termination octet and, if anything other than the CRLF pair follows the termination octet, then the client MUST remove the termination octet to process the rest of the line normally. Outlook only looks for the termination octet at the beginning of the line and does not check past the termination octet for the LIST, UIDL, and CAPA commands. The CAPA command is specified in [RFC2449] section 5.

C0007:

The specification states: "Once the TCP connection has been opened and the POP3 server has sent the greeting, the session enters the AUTHORIZATION state. In this state, the client must identify itself to the POP3 server."

Outlook 2007, Outlook 2010

The client MUST identify itself to the server after it has received the greeting.

2.2.2   [RFC1939] Section 4, The AUTHORIZATION State

C0008:

The specification states: "The client must now identify and authenticate itself to the **POP3** server."

Outlook 2007, Outlook 2010

> The client MUST now identify and authenticate itself to the POP3 server.

C0009:

The specification states: "While there is no single authentication mechanism that is required of all POP3 servers, a POP3 server must of course support at least one authentication mechanism."

Outlook 2007, Outlook 2010

> While there is no single authentication mechanism that is required of all POP3 servers, a POP3 server MUST support at least one authentication mechanism.

> Without an authentication method that Outlook supports, Outlook is not able to authenticate to the server.

C0010:

The specification states: "If the server does not close the connection, the client may either issue a new authentication command and start again, or the client may issue the QUIT command."

Outlook 2007, Outlook 2010

> If the server does not close the connection, the client can either issue a new authentication command and start again, or the client can issue the QUIT command.

> "May" is not interpreted as "MAY" by Outlook. The server has the option to perform either action, and Outlook does not suggest or require either.

C0011:

The specification states: "The first **message** in the maildrop is assigned a message-number of '1', the second is assigned '2', and so on, so that the nth message in a maildrop is assigned a message-number of 'n'."

Outlook 2007, Outlook 2010

> The server MUST assign the first message in the maildrop a message-number of "1", and so on, so that the nth message in a maildrop is assigned a message-number of "n".

2.2.3   [RFC1939] Section 4, QUIT Command

C0012:

The specification states that the QUIT command has no arguments.

Outlook 2007, Outlook 2010

> The client MUST NOT send arguments with the QUIT command.

2.2.4   [RFC1939] Section 5, The TRANSACTION State

C0013:

The specification states: "The client may now issue any of the following **POP3** commands repeatedly."

Outlook 2007, Outlook 2010

"May" is not interpreted as "MAY" by Outlook.

The client can now issue any of the following POP3 commands repeatedly.

C0014:

The specification states: "After each command, the POP3 server issues a response."

Outlook 2007, Outlook 2010

The server MUST issue a response for each command. If Outlook does not receive a response, then the POP synchronization hangs.

2.2.5 [RFC1939] Section 5, STAT Command

C0015:

The specification states that the STAT command has no arguments.

Outlook 2007, Outlook 2010

The client MUST NOT send arguments with the STAT command.

C0016:

The specification states: "Restrictions: may only be given in the TRANSACTION state".

Outlook 2007, Outlook 2010

The client SHOULD only send the STAT command when in the TRANSACTION state.

C0017:

The specification states: "In order to simplify parsing, all **POP3** servers are required to use a certain format for drop listings. The positive response consists of '+OK' followed by a single space, the number of **messages** in the maildrop, a single space, and the size of the maildrop in octets. This memo makes no requirement on what follows the maildrop size."

Outlook 2007, Outlook 2010

The positive response from the server MUST consist of "+OK" followed by one or more space or tab characters, the number of messages in the maildrop followed by one or more space or tab characters, and the size of the maildrop in octets. The server MAY follow this with additional information.

2.2.6 [RFC1939] Section 5, LIST Command

V0003:

The specification states: "Arguments: a message-number (optional), which, if present, may NOT refer to a **message** marked as deleted".

Outlook 2007, Outlook 2010

The client MAY send the message-number argument with the LIST command.

Outlook never sends an argument to the LIST command.

C0018:

The specification states: "Restrictions: may only be given in the TRANSACTION state".

Outlook 2007, Outlook 2010

The client SHOULD only send the LIST command when in the TRANSACTION state.

C0019:

The specification states: "Discussion: If an argument was given and the **POP3** server issues a positive response with a line containing information for that message. This line is called a "scan listing" for that message."

Outlook 2007, Outlook 2010

If the LIST command includes an argument and the server returns success, then the server MUST issue a positive response line (a "scan listing"). Outlook does not send an argument with the LIST command, so no server response is issued.

C0020:

The specification states: "If no argument was given and the POP3 server issues a positive response, then the response given is multi-line. After the initial '+OK' for each message in the maildrop, the POP3 server responds with a line containing information for that message."

Outlook 2007, Outlook 2010

If the LIST command does not include an argument and the server issues a positive response, then the response given MUST be multi-line. The initial line MUST be the positive response "+OK". Then the server MUST send a "scan list" for each message in the maildrop on its own line.

C0021:

The specification states: "All POP3 servers are required to use a certain format for scan listings. A scan listing consists of the message-number of the message, followed by a single space and the exact size of the message in octets."

Outlook 2007, Outlook 2010

The "scan listing" MUST consist of the number of the message followed by one or more space or tab characters and then the exact size of the message in octets. The server MAY follow this with additional information.

2.2.7   [RFC1939] Section 5, RETR Command

V0004:

The specification states: "Arguments: a message-number (required) which may NOT refer to a **message** marked as deleted"

Outlook 2007, Outlook 2010

The client MUST send the message-number argument with the RETR command.

V0005:

The specification states: "Restrictions: may only be given in the TRANSACTION state".

Outlook 2007, Outlook 2010

    The client SHOULD only send the RETR command when in the TRANSACTION state.

C0022:

The specification states: "If the **POP3** server issues a positive response, then the response given is multi-line."

Outlook 2007, Outlook 2010

    If the server is returning success, then it MUST issue a multi-line response.

C0023:

The specification states: "After the initial +OK, the POP3 server sends the message corresponding to the given message-number."

Outlook 2007, Outlook 2010

    If the server is issuing a positive response, then it MUST return the message corresponding to the given message-number in the multi-line response.

2.2.8   [RFC1939] Section 5, DELE Command

C0024:

The specification states: "Arguments: a message-number (required) which may NOT refer to a **message** marked as deleted."

Outlook 2007, Outlook 2010

    The client MUST send the message-number argument with the DELE command.

C0025:

The specification states: "Restrictions: may only be given in the TRANSACTION state".

Outlook 2007, Outlook 2010

    The client SHOULD only send the DELE command when in the TRANSACTION state.

C0026:

The specification states: "Any future reference to the message-number associated with the message in a **POP3** command generates an error".

Outlook 2007, Outlook 2010

    Any future reference to this message-number in a POP3 command MUST generate an error.

2.2.9   [RFC1939] Section 5, NOOP Command

C0027:

The specification states that the NOOP command has no arguments.

Outlook 2007, Outlook 2010

Release: Sunday, July 12, 2009

The client MUST NOT send arguments with the NOOP command.

C0028:

The specification states: "Restrictions: may only be given in the TRANSACTION state".

Outlook 2007, Outlook 2010

The client SHOULD only send the NOOP command when in the TRANSACTION state.

C0029:

The specification states: "Discussion: The **POP3** server does nothing, it merely replies with a positive response."

Outlook 2007, Outlook 2010

The server MUST return a positive response.

2.2.10   [RFC1939] Section 5, RSET Command

V0006:

The specification states that the RSET command is a required command.

Outlook 2007, Outlook 2010

Outlook never sends the RSET command.

2.2.11   [RFC1939] Section 6, QUIT Command

C0030:

The specification states that the QUIT command has no arguments.

Outlook 2007, Outlook 2010

The client MUST NOT send arguments with the QUIT command.

2.2.12   [RFC1939] Section 7, Optional POP3 Commands

C0031:

The specification states: "The **POP3** commands discussed above must be supported by all minimal implementations of POP3 servers."

Outlook 2007, Outlook 2010

The server MUST support all the commands discussed above.

2.2.13   [RFC1939] Section 7, TOP Command

C0032:

The specification states: "Arguments: a message-number (required) which may NOT refer to a **message** marked as deleted, and a non-negative number of lines (required)".

Outlook 2007, Outlook 2010

The client MUST send two arguments. The first argument is the message-number and the second is a non-negative number of lines.

C0033:

The specification states: "Restrictions: may only be given in the TRANSACTION state".

Outlook 2007, Outlook 2010

The client SHOULD only send the TOP command when in the TRANSACTION state.

C0034:

The specification states: "If the **POP3** server issues a positive response, then the response given is multi-line. After the initial +OK, the POP3 server sends the headers of the message, the blank line separating the headers from the body, and then the number of lines of the indicated message's body."

Outlook 2007, Outlook 2010

If the POP3 server issues a positive response, then the response given MUST be multi-line. The first line MUST be the positive response "+OK". The following line MUST be the headers of the message, the blank line separating headers from body, and then the number of lines on the body indicated in the arguments.

2.2.14   [RFC1939] Section 7, UIDL Command

V0007:

The specification states: "Arguments: a message-number (optional), which, if present, may NOT refer to a **message** marked as deleted".

Outlook 2007, Outlook 2010

The client MAY send an argument.

Outlook never sends the UIDL command with an argument.

C0035:

The specification states: "Restrictions: may only be given in the TRANSACTION state."

Outlook 2007, Outlook 2010

The client SHOULD only send the UIDL command when in the TRANSACTION state.

C0036:

The specification states: "Discussion: If an argument was given and the **POP3** server issues a positive response with a line containing information for that message."

Outlook 2007, Outlook 2010

If the UIDL command includes an argument and the server is returning success, then it MUST issue a positive response line (a "unique-id listing").

This statement has no impact as Outlook never sends the UIDL command with an argument.

C0037:

The specification states: "If no argument was given and the POP3 server issues a positive response, then the response given is multi-line. After the initial +OK, for each message in the maildrop, the POP3 server responds with a line containing information for that message."

Outlook 2007, Outlook 2010

If the UIDL command does not include an argument and the server is returning a positive response, then the server MUST issue a multi-line response. The initial line MUST be the positive response "+OK". Then the server MUST send a "unique-id list" for each message in the maildrop on its own line.

C0038:

The specification states: "In order to simplify parsing, all POP3 servers are required to use a certain format for unique-id listings. A unique-id listing consists of the message-number of the message, followed by a single space and the unique-id of the message in octets."

Outlook 2007, Outlook 2010

The unique-id listing MUST consist of the number of the message followed by one or more space or tab characters, and then the unique-id of the message in octets. The server MAY follow this with additional information.

C0039:

The specification states: "The unique-id of a message is an arbitrary server-determined string, consisting of one to 70 characters in the range 0x21 to 0x7E, which uniquely identifies a message within a maildrop and which persists across sessions."

Outlook 2007, Outlook 2010

The unique-id MUST consist of one to 70 characters in the range 0x2e to 0x7E. The server MUST persist the unique-id that identifies the message across sessions.

C0040:

The specification states: "The server should never reuse a unique-id in a given maildrop, for as long as the entity using the unique-id exists."

Outlook 2007, Outlook 2010

The server SHOULD NOT reuse a unique-id for as long as the entity using the unique-id exists. If the server violates this statement, then the action expected on one message could be performed unexpectedly on another message with the same unique-id.

C0041:

The specification states: "Clients should be able to handle a situation where two identical copies of a message in a maildrop have the same unique-id.

Outlook 2007, Outlook 2010

The client SHOULD be able to handle two identical copies of a message having the same unique-id.

Outlook does not fully comply with the use of SHOULD in the statement. Using Outlook, an action specified by the user on one message can happen on either message with the identical unique-id during synchronization. But, since the messages are identical, this has little impact. For example, if

a user marks one message header for download, then Outlook can download the other message header instead.

2.2.15 [RFC1939] Section 7, USER Command

C0042:

The specification states: "Arguments: a string identifying a mailbox (required), which is of significance ONLY to the server.

Outlook 2007, Outlook 2010

The client MUST send one argument.

C0043:

The specification states: "Restrictions: may only be given in the AUTHORIZATION state after the **POP3** greeting or after an unsuccessful USER or PASS command".

Outlook 2007, Outlook 2010

The client SHOULD only send the USER command when in the AUTHORIZATION state or when a greeting has not been received.

C0044:

The specification states: "To authenticate using the USER and PASS command combination, the client must first issue the USER command."

Outlook 2007, Outlook 2010

To authenticate using the USER and PASS command combination, the client MUST issue the USER command first.

C0045:

The specification states: "If the POP3 server responds with a positive status indicator ("+OK"), then the client may issue either the PASS command to complete the authentication, or the QUIT command to terminate the POP3 session. If the POP3 server responds with a negative status indicator ("-ERR") to the USER command, then the client may either issue a new authentication command or may issue the QUIT command."

Outlook 2007, Outlook 2010

If the POP3 server responds with a positive status indicator ("+OK"), then the client SHOULD issue either the PASS command to complete the authentication or the QUIT command to terminate the POP3 session. If the POP3 server responds with a negative status indicator ("-ERR") to the USER command, then the client SHOULD either issue a new authentication command or the QUIT command.

2.2.16 [RFC1939] Section 7, PASS Command

C0046:

The specification states: "Arguments: a server/mailbox-specific password (required)".

Outlook 2007, Outlook 2010

The client MUST send one argument.

C0047:

The specification states: "Restrictions: may only be given in the AUTHORIZATION state immediately after a successful USER command."

Outlook 2007, Outlook 2010

The client SHOULD only send the PASS command in the AUTHORIZATION state and immediately following a successful USER command.

2.2.17   [RFC1939] Section 7, APOP Command

V0008:

The specification states that the APOP command is an optional **POP3** command.

Outlook 2007, Outlook 2010

Outlook 2007 and Outlook 2010 do not support the APOP command.

2.3   Error Handling

There are no additional error handling considerations beyond what are discussed in section 2.2.8.

2.4   Security

None.

3 Index

Release: Sunday, July 12, 2009