

[MS-STANOPOP3]: Outlook Post Office Protocol Version 3 (POP3) Standards Compliance

Intellectual Property Rights Notice for Open Specifications Documentation

- **Technical Documentation.** Microsoft publishes Open Specifications documentation for protocols, file formats, languages, standards as well as overviews of the interaction among each of these technologies.
- **Copyrights.** This documentation is covered by Microsoft copyrights. Regardless of any other terms that are contained in the terms of use for the Microsoft website that hosts this documentation, you may make copies of it in order to develop implementations of the technologies described in the Open Specifications and may distribute portions of it in your implementations using these technologies or your documentation as necessary to properly document the implementation. You may also distribute in your implementation, with or without modification, any schema, IDL's, or code samples that are included in the documentation. This permission also applies to any documents that are referenced in the Open Specifications.
- **No Trade Secrets.** Microsoft does not claim any trade secret rights in this documentation.
- **Patents.** Microsoft has patents that may cover your implementations of the technologies described in the Open Specifications. Neither this notice nor Microsoft's delivery of the documentation grants any licenses under those or any other Microsoft patents. However, a given Open Specification may be covered by Microsoft's Open Specification Promise (available here: <http://www.microsoft.com/interop/osp>) or the Community Promise (available here: <http://www.microsoft.com/interop/cp/default.mspx>). If you would prefer a written license, or if the technologies described in the Open Specifications are not covered by the Open Specifications Promise or Community Promise, as applicable, patent licenses are available by contacting iplg@microsoft.com.
- **Trademarks.** The names of companies and products contained in this documentation may be covered by trademarks or similar intellectual property rights. This notice does not grant any licenses under those rights.
- **Fictitious Names.** The example companies, organizations, products, domain names, e-mail addresses, logos, people, places, and events depicted in this documentation are fictitious. No association with any real company, organization, product, domain name, email address, logo, person, place, or event is intended or should be inferred.

Reservation of Rights. All other rights are reserved, and this notice does not grant any rights other than specifically described above, whether by implication, estoppel, or otherwise.

Tools. The Open Specifications do not require the use of Microsoft programming tools or programming environments in order for you to develop an implementation. If you have access to Microsoft programming tools and environments you are free to take advantage of them. Certain Open Specifications are intended for use in conjunction with publicly available standard specifications and network programming art, and assumes that the reader either is familiar with the aforementioned material or has immediate access to it.

Revision Summary

Date	Revision History	Revision Class	Comments
07/15/2009	1.0.0	Major	Initial Availability.
10/01/2008	1.1.0	Minor	Updated IP notice.
04/10/2009	2.0.0	Major	Updated applicable product releases.
07/15/2009	3.0.0	Major	Revised and edited technical content.
11/04/2009	3.0.1	Editorial	Revised and edited the technical content.
02/10/2010	3.0.1	None	Version 3.0.1 release
08/04/2010	3.1	Minor	Clarified the meaning of the technical content.

Contents

1 Introduction	4
1.1 Glossary	4
1.2 Normative References	4
1.3 Informative References	4
1.4 Microsoft Implementations	4
1.5 Conformance Requirements	4
1.6 Notation	5
2 Conformance Statements	6
2.1 Normative Variations	6
2.2 Clarifications	6
2.2.1 [RFC1939] Section 3, Basic Operation	6
2.2.2 [RFC1939] Section 4, The AUTHORIZATION State	7
2.2.3 [RFC1939] Section 4, QUIT Command	8
2.2.4 [RFC1939] Section 5, The TRANSACTION State	8
2.2.5 [RFC1939] Section 5, STAT Command	9
2.2.6 [RFC1939] Section 5, LIST Command	9
2.2.7 [RFC1939] Section 5, RETR Command	10
2.2.8 [RFC1939] Section 5, DELE Command	11
2.2.9 [RFC1939] Section 5, NOOP Command	11
2.2.10 [RFC1939] Section 5, RSET Command	12
2.2.11 [RFC1939] Section 6, QUIT Command	12
2.2.12 [RFC1939] Section 7, Optional POP3 Commands	12
2.2.13 [RFC1939] Section 7, TOP Command	12
2.2.14 [RFC1939] Section 7, UIDL Command	13
2.2.15 [RFC1939] Section 7, USER Command	15
2.2.16 [RFC1939] Section 7, PASS Command	16
2.2.17 [RFC1939] Section 7, APOP Command	16
2.3 Error Handling	16
2.4 Security	16
3 Change Tracking	17
4 Index	19

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 [\[MS-OXGLOS\]](#):

**Carriage Return Line Feed (CRLF)
message
Post Office Protocol – Version 3 (POP3)
Transmission Control Protocol (TCP)**

The following terms are specific to 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.

1.2 Normative References

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.

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

[RFC1939] Myers, J., and Rose, M., "Post Office Protocol – Version 3", RFC 1939, May 1996, <ftp://ftp.rfc-editor.org/in-notes/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, <ftp://ftp.rfc-editor.org/in-notes/rfc2449.txt>

1.3 Informative References

[MS-OXGLOS] Microsoft Corporation, "[Exchange Server Protocols Master Glossary](#)", April 2008.

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 identifies 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."

Office 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."

Office 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."

Office 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."

Office 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."

Office 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."

Office 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 effect 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."

Office 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."

Office 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."

Office 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."

Office 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."

Office 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."

Office 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'."

Office 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.

Office 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."

Office 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."

Office 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.

Office 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."

Office 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."

Office 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."

Office 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."

Office 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."

Office 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."

Office 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."

Office 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."

Office 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."

Office 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."

Office 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."

Office 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."

Office 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."

Office 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."

Office 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.

Office Outlook 2007, Outlook 2010

The client MUST NOT send arguments with the NOOP command.

C0028:

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

Office 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."

Office 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.

Office 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.

Office 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."

Office 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)."

Office 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."

Office 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."

Office 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."

Office 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."

Office 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."

Office 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."

Office 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."

Office 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."

Office 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."

Office 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."

Office 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."

Office 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."

Office 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."

Office 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."

Office 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)."

Office 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."

Office 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.

Office Outlook 2007, Outlook 2010

Office 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 Change Tracking

This section identifies changes that were made to the [MS-STANOPOP3] protocol document between the February 2010 and August 2010 releases. Changes are classified as New, Major, Minor, Editorial, or No change.

The revision class **New** means that a new document is being released.

The revision class **Major** means that the technical content in the document was significantly revised. Major changes affect protocol interoperability or implementation. Examples of major changes are:

- A document revision that incorporates changes to interoperability requirements or functionality.
- An extensive rewrite, addition, or deletion of major portions of content.
- The removal of a document from the documentation set.
- Changes made for template compliance.

The revision class **Minor** means that the meaning of the technical content was clarified. Minor changes do not affect protocol interoperability or implementation. Examples of minor changes are updates to clarify ambiguity at the sentence, paragraph, or table level.

The revision class **Editorial** means that the language and formatting in the technical content was changed. Editorial changes apply to grammatical, formatting, and style issues.

The revision class **No change** means that no new technical or language changes were introduced. The technical content of the document is identical to the last released version, but minor editorial and formatting changes, as well as updates to the header and footer information, and to the revision summary, may have been made.

Major and minor changes can be described further using the following change types:

- New content added.
- Content updated.
- Content removed.
- New product behavior note added.
- Product behavior note updated.
- Product behavior note removed.
- New protocol syntax added.
- Protocol syntax updated.
- Protocol syntax removed.
- New content added due to protocol revision.
- Content updated due to protocol revision.
- Content removed due to protocol revision.
- New protocol syntax added due to protocol revision.

- Protocol syntax updated due to protocol revision.
- Protocol syntax removed due to protocol revision.
- New content added for template compliance.
- Content updated for template compliance.
- Content removed for template compliance.
- Obsolete document removed.

Editorial changes are always classified with the change type "Editorially updated."

Some important terms used in the change type descriptions are defined as follows:

- **Protocol syntax** refers to data elements (such as packets, structures, enumerations, and methods) as well as interfaces.
- **Protocol revision** refers to changes made to a protocol that affect the bits that are sent over the wire.

The changes made to this document are listed in the following table. For more information, please contact protocol@microsoft.com.

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change type
1.2 Normative References	55751 Moved [MS-OXGLOS] from Normative References section to Informative References section.	N	Content update.
1.2 Normative References	57617 Removed [RFC822] from list of references.	N	Content update.

4 Index

C

[Change tracking](#) 17
[Clarifications - conformance](#) 6
Conformance
 [clarifications](#) 6
 [error handling](#) 16
 [normative variations](#) 6
[Conformance requirements](#) 4

E

[Error handling - conformance](#) 16

G

[Glossary](#) 4

I

[Introduction](#) 4

M

[Microsoft implementations](#) 4

N

[Normative references](#) 4
[Normative variations - conformance](#) 6
[Notation](#) 5

R

References
 [normative](#) 4
Requirements
 [conformance](#) 4

T

[Tracking changes](#) 17