**[MS-OXTNEF]:**

**Transport Neutral Encapsulation Format (TNEF) Data Algorithm**

Intellectual Property Rights Notice for Open Specifications Documentation

* **Technical Documentation.** Microsoft publishes Open Specifications documentation (“this documentation”) for protocols, file formats, data portability, computer languages, and standards support. Additionally, overview documents cover inter-protocol relationships and interactions.
* **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 can make copies of it in order to develop implementations of the technologies that are described in this documentation and can distribute portions of it in your implementations that use these technologies or in your documentation as necessary to properly document the implementation. You can also distribute in your implementation, with or without modification, any schemas, IDLs, or code samples that are included in the documentation. This permission also applies to any documents that are referenced in the Open Specifications documentation.
* **No Trade Secrets**. Microsoft does not claim any trade secret rights in this documentation.
* **Patents**. Microsoft has patents that might cover your implementations of the technologies described in the Open Specifications documentation. Neither this notice nor Microsoft's delivery of this documentation grants any licenses under those patents or any other Microsoft patents. However, a given Open Specifications document might be covered by the Microsoft [Open Specifications Promise](https://go.microsoft.com/fwlink/?LinkId=214445) or the [Microsoft Community Promise](https://go.microsoft.com/fwlink/?LinkId=214448). If you would prefer a written license, or if the technologies described in this documentation are not covered by the Open Specifications Promise or Community Promise, as applicable, patent licenses are available by contacting [iplg@microsoft.com](mailto:iplg@microsoft.com).
* **License Programs**. To see all of the protocols in scope under a specific license program and the associated patents, visit the [Patent Map](https://aka.ms/AA9ufj8).
* **Trademarks**. The names of companies and products contained in this documentation might be covered by trademarks or similar intellectual property rights. This notice does not grant any licenses under those rights. For a list of Microsoft trademarks, visit [www.microsoft.com/trademarks](https://www.microsoft.com/trademarks).
* **Fictitious Names**. The example companies, organizations, products, domain names, email addresses, logos, people, places, and events that are 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 as specifically described above, whether by implication, estoppel, or otherwise.

**Tools**. The Open Specifications documentation does 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 documents are intended for use in conjunction with publicly available standards specifications and network programming art and, as such, assume that the reader either is familiar with the aforementioned material or has immediate access to it.

**Support.** For questions and support, please contact [dochelp@microsoft.com](mailto:dochelp@microsoft.com).

**Revision Summary**

| Date | Revision History | Revision Class | Comments |
| --- | --- | --- | --- |
| 4/4/2008 | 0.1 | New | Initial Availability. |
| 4/25/2008 | 0.2 | Minor | Revised and updated property names and other technical content. |
| 6/27/2008 | 1.0 | Major | Initial Release. |
| 8/6/2008 | 1.01 | Minor | Revised and edited technical content. |
| 9/3/2008 | 1.02 | Minor | Revised and edited technical content. |
| 12/3/2008 | 1.03 | Minor | Revised and edited technical content. |
| 3/4/2009 | 1.04 | Minor | Revised and edited technical content. |
| 4/10/2009 | 2.0 | Major | Updated technical content and applicable product releases. |
| 7/15/2009 | 3.0 | Major | Revised and edited for technical content. |
| 11/4/2009 | 3.1.0 | Minor | Updated the technical content. |
| 2/10/2010 | 4.0.0 | Major | Updated and revised the technical content. |
| 5/5/2010 | 5.0.0 | Major | Updated and revised the technical content. |
| 8/4/2010 | 5.1 | Minor | Clarified the meaning of the technical content. |
| 11/3/2010 | 5.2 | Minor | Clarified the meaning of the technical content. |
| 3/18/2011 | 5.2 | None | No changes to the meaning, language, and formatting of the technical content. |
| 8/5/2011 | 5.2 | None | No changes to the meaning, language, or formatting of the technical content. |
| 10/7/2011 | 6.0 | Major | Significantly changed the technical content. |
| 1/20/2012 | 7.0 | Major | Significantly changed the technical content. |
| 4/27/2012 | 7.1 | Minor | Clarified the meaning of the technical content. |
| 7/16/2012 | 7.1 | None | No changes to the meaning, language, or formatting of the technical content. |
| 10/8/2012 | 8.0 | Major | Significantly changed the technical content. |
| 2/11/2013 | 8.0 | None | No changes to the meaning, language, or formatting of the technical content. |
| 7/26/2013 | 8.1 | Minor | Clarified the meaning of the technical content. |
| 11/18/2013 | 8.1 | None | No changes to the meaning, language, or formatting of the technical content. |
| 2/10/2014 | 8.1 | None | No changes to the meaning, language, or formatting of the technical content. |
| 4/30/2014 | 8.2 | Minor | Clarified the meaning of the technical content. |
| 7/31/2014 | 8.2 | None | No changes to the meaning, language, or formatting of the technical content. |
| 10/30/2014 | 8.3 | Minor | Clarified the meaning of the technical content. |
| 3/16/2015 | 9.0 | Major | Significantly changed the technical content. |
| 5/26/2015 | 9.0 | None | No changes to the meaning, language, or formatting of the technical content. |
| 9/14/2015 | 9.0 | None | No changes to the meaning, language, or formatting of the technical content. |
| 6/13/2016 | 9.0 | None | No changes to the meaning, language, or formatting of the technical content. |
| 9/14/2016 | 9.0 | None | No changes to the meaning, language, or formatting of the technical content. |
| 9/19/2017 | 9.1 | Minor | Clarified the meaning of the technical content. |
| 7/24/2018 | 10.0 | Major | Significantly changed the technical content. |
| 10/1/2018 | 11.0 | Major | Significantly changed the technical content. |
| 4/22/2021 | 12.0 | Major | Significantly changed the technical content. |
| 8/17/2021 | 13.0 | Major | Significantly changed the technical content. |
| 2/15/2022 | 13.0 | None | No changes to the meaning, language, or formatting of the technical content. |
| 8/20/2024 | 14.0 | Major | Significantly changed the technical content. |

Table of Contents

[1 Introduction 6](#_Toc174600593)

[1.1 Glossary 6](#_Toc174600594)

[1.2 References 7](#_Toc174600595)

[1.2.1 Normative References 8](#_Toc174600596)

[1.2.2 Informative References 8](#_Toc174600597)

[1.3 Overview 8](#_Toc174600598)

[1.4 Relationship to Protocols and Other Algorithms 9](#_Toc174600599)

[1.5 Applicability Statement 9](#_Toc174600600)

[1.6 Standards Assignments 9](#_Toc174600601)

[2 Algorithm Details 10](#_Toc174600602)

[2.1 Common Algorithm Details 10](#_Toc174600603)

[2.1.1 Abstract Data Model 10](#_Toc174600604)

[2.1.2 Initialization 10](#_Toc174600605)

[2.1.3 Processing Rules 10](#_Toc174600606)

[2.1.3.1 Conventions 10](#_Toc174600607)

[2.1.3.1.1 Address Representations 11](#_Toc174600608)

[2.1.3.1.2 ABNF Rules 11](#_Toc174600609)

[2.1.3.2 ABNF Description 11](#_Toc174600610)

[2.1.3.3 Attributes 14](#_Toc174600611)

[2.1.3.3.1 attTnefVersion Attribute 14](#_Toc174600612)

[2.1.3.3.2 attOemCodepage Attribute 14](#_Toc174600613)

[2.1.3.3.3 attFrom Attribute 14](#_Toc174600614)

[2.1.3.3.4 Date Attributes 15](#_Toc174600615)

[2.1.3.3.5 Message Class Attributes 16](#_Toc174600616)

[2.1.3.3.6 attMessageID Attribute 16](#_Toc174600617)

[2.1.3.3.7 attSubject Attribute 16](#_Toc174600618)

[2.1.3.3.8 attMessageStatus Attribute 16](#_Toc174600619)

[2.1.3.3.9 attBody Attribute 17](#_Toc174600620)

[2.1.3.3.10 attPriority Attribute 17](#_Toc174600621)

[2.1.3.3.11 attAttachData Attribute 17](#_Toc174600622)

[2.1.3.3.12 attAttachTitle Attribute 17](#_Toc174600623)

[2.1.3.3.13 attAttachMetaFile Attribute 17](#_Toc174600624)

[2.1.3.3.14 attAttachTransportFilename Attribute 17](#_Toc174600625)

[2.1.3.3.15 attAttachRendData Attribute 18](#_Toc174600626)

[2.1.3.3.16 attOwner Attribute 18](#_Toc174600627)

[2.1.3.3.17 attSentFor Attribute 19](#_Toc174600628)

[2.1.3.3.18 attDelegate Attribute 19](#_Toc174600629)

[2.1.3.3.19 attAidOwner Attribute 19](#_Toc174600630)

[2.1.3.3.20 attRequestRes Attribute 19](#_Toc174600631)

[2.1.3.3.21 attMsgProps Attribute 19](#_Toc174600632)

[2.1.3.3.22 attRecipTable Attribute 19](#_Toc174600633)

[2.1.3.3.23 attAttachment Attribute 19](#_Toc174600634)

[2.1.3.4 Encapsulated Message and Attachment Properties 20](#_Toc174600635)

[2.1.3.5 Other Compatibility Issues 23](#_Toc174600636)

[2.1.3.5.1 attOemCodepage Attribute Handling 23](#_Toc174600637)

[2.1.3.5.2 TNEF Encapsulation Versus Outer Wrapper Attributes 23](#_Toc174600638)

[2.1.3.5.2.1 attBody Attribute Handling 23](#_Toc174600639)

[2.1.3.5.2.2 attRecipTable Attribute Handling 23](#_Toc174600640)

[2.1.3.5.2.3 attFrom Attribute Handling 23](#_Toc174600641)

[2.1.3.5.2.4 attSubject Attribute Handling 23](#_Toc174600642)

[2.2 TNEF Writer Algorithm Details 24](#_Toc174600643)

[2.2.1 Abstract Data Model 24](#_Toc174600644)

[2.2.2 Initialization 24](#_Toc174600645)

[2.2.3 Processing Rules 24](#_Toc174600646)

[2.2.3.1 attTnefVersion Attribute Handling by the TNEF Writer 24](#_Toc174600647)

[2.2.3.2 attOemCodepage Attribute Handling by TNEF Writer 24](#_Toc174600648)

[2.2.3.3 attFrom Attribute Handling by the TNEF Writer 24](#_Toc174600649)

[2.2.3.4 Message Class Attribute Handling by the TNEF Writer 25](#_Toc174600650)

[2.2.3.5 attSubject Attribute Handling by the TNEF Writer 25](#_Toc174600651)

[2.2.3.6 attBody Attribute Handling by the TNEF Writer 25](#_Toc174600652)

[2.2.3.7 attMessageID Attribute Handling by the TNEF Writer 25](#_Toc174600653)

[2.2.3.8 attAttachData Attribute Handling by the TNEF Writer 25](#_Toc174600654)

[2.2.3.9 attAttachTitle Attribute Handling by the TNEF Writer 26](#_Toc174600655)

[2.2.3.10 attAttachRendData Attribute Handling by the TNEF Writer 26](#_Toc174600656)

[2.2.3.11 attOwner Attribute Handling by the TNEF Writer 26](#_Toc174600657)

[2.2.3.12 attSentFor Attribute Handling by the TNEF Writer 26](#_Toc174600658)

[2.2.3.13 attDelegate Attribute Handling by the TNEF Writer 26](#_Toc174600659)

[2.2.3.14 attMsgProps Attribute Handling by the TNEF Writer 27](#_Toc174600660)

[2.2.3.15 attAttachment Attribute Handling by the TNEF Writer 27](#_Toc174600661)

[2.2.3.16 attRecipTable Attribute Handling by the TNEF Writer 27](#_Toc174600662)

[2.3 TNEF Reader Algorithm Details 27](#_Toc174600663)

[2.3.1 Abstract Data Model 27](#_Toc174600664)

[2.3.2 Initialization 27](#_Toc174600665)

[2.3.3 Processing Rules 27](#_Toc174600666)

[2.3.3.1 attTnefVersion Attribute Handling by the TNEF Reader 27](#_Toc174600667)

[2.3.3.2 attOemCodepage Attribute Handling by the TNEF Reader 27](#_Toc174600668)

[2.3.3.3 attFrom Attribute Handling by the TNEF Reader 28](#_Toc174600669)

[2.3.3.4 attMessageClass Attribute Handling by the TNEF Reader 28](#_Toc174600670)

[2.3.3.5 attMessageID Attribute Handling by the TNEF Reader 28](#_Toc174600671)

[2.3.3.6 attSubject Attribute Handling by the TNEF Reader 29](#_Toc174600672)

[2.3.3.7 attAttachData Attribute Handling by the TNEF Reader 29](#_Toc174600673)

[2.3.3.8 attAttachTitle Attribute Handling by the TNEF Reader 29](#_Toc174600674)

[2.3.3.9 attAttachRendData Attribute Handling by the TNEF Reader 29](#_Toc174600675)

[2.3.3.10 attOwner Attribute Handling by the TNEF Reader 29](#_Toc174600676)

[2.3.3.11 attSentFor Attribute Handling by the TNEF Reader 29](#_Toc174600677)

[2.3.3.12 attDelegate Attribute Handling by the TNEF Reader 30](#_Toc174600678)

[3 Algorithm Examples 31](#_Toc174600679)

[3.1 Sample Message 31](#_Toc174600680)

[3.2 Sample Meeting Response 45](#_Toc174600681)

[4 Security 48](#_Toc174600682)

[4.1 Security Considerations for Implementers 48](#_Toc174600683)

[4.2 Index of Security Parameters 48](#_Toc174600684)

[5 Appendix A: Product Behavior 49](#_Toc174600685)

[6 Change Tracking 50](#_Toc174600686)

[7 Index 51](#_Toc174600687)

# Introduction

The Transport Neutral Encapsulation Format (TNEF) Data Algorithm enables the [**encoding**](#gt_84791550-b1fe-4392-97fe-7533e3e8eda4) of rich properties in electronic mail messages over a serial data stream. The result can be transported as a stream, as a file attachment in an arbitrary transport, or as a [**MIME**](#gt_af6ba277-34c1-493d-8103-71d2af36ce30) entity body on an Internet transport.

Sections 1.6 and 2 of this specification are normative. All other sections and examples in this specification are informative.

## Glossary

This document uses the following terms:

**address type**: An identifier for the type of email address, such as [**SMTP**](#gt_0678be67-e739-4e33-97fe-2b03b903a379) and EX.

**Augmented Backus-Naur Form (ABNF)**: A modified version of Backus-Naur Form (BNF), commonly used by Internet specifications. ABNF notation balances compactness and simplicity with reasonable representational power. ABNF differs from standard BNF in its definitions and uses of naming rules, repetition, alternatives, order-independence, and value ranges. For more information, see [[RFC5234]](https://go.microsoft.com/fwlink/?LinkId=123096).

**binary large object (BLOB)**: A discrete packet of data that is stored in a database and is treated as a sequence of uninterpreted bytes.

**body part**: A part of an Internet message, as described in [[RFC2045]](https://go.microsoft.com/fwlink/?LinkId=90307).

**character set**: (1) A mapping between the characters of a written language and the values that are used to represent those characters to a computer.

(2) The range of characters used to represent textual data within a [**MIME**](#gt_af6ba277-34c1-493d-8103-71d2af36ce30) [**body part**](#gt_7296866d-d4b9-4238-af3a-4d772989e348), as described in [[RFC2046]](https://go.microsoft.com/fwlink/?LinkId=90308).

**checksum**: A value that is the summation of a byte stream. By comparing the checksums computed from a data item at two different times, one can quickly assess whether the data items are identical.

**code page**: An ordered set of characters of a specific script in which a numerical index (code-point value) is associated with each character. Code pages are a means of providing support for [**character sets**](#gt_5004b992-4a9c-41c9-b65c-b2e7a2b04204) and keyboard layouts used in different countries. Devices such as the display and keyboard can be configured to use a specific code page and to switch from one code page (such as the United States) to another (such as Portugal) at the user's request.

**display name**: A text string that is used to identify a principal or other object in the user interface. Also referred to as title.

**email address**: A string that identifies a user and enables the user to receive Internet messages.

**encoding**: A process that specifies a Content-Transfer-Encoding for transforming character data from one form to another.

**EntryID**: A sequence of bytes that is used to identify and access an object.

**Internet Message Access Protocol - Version 4 (IMAP4)**: A protocol that is used for accessing email and news items from mail servers, as described in [[RFC3501]](https://go.microsoft.com/fwlink/?LinkId=193307).

**little-endian**: Multiple-byte values that are byte-ordered with the least significant byte stored in the memory location with the lowest address.

**message class**: A property that loosely defines the type of a message, contact, or other Personal Information Manager (PIM) object in a mailbox.

**Message object**: A set of properties that represents an email message, appointment, contact, or other type of personal-information-management object. In addition to its own properties, a Message object contains recipient properties that represent the addressees to which it is addressed, and an attachments table that represents any files and other Message objects that are attached to it.

**Multipurpose Internet Mail Extensions (MIME)**: A set of extensions that redefines and expands support for various types of content in email messages, as described in [RFC2045], [RFC2046], and [[RFC2047]](https://go.microsoft.com/fwlink/?LinkId=90309).

**named property**: A property that is identified by both a GUID and either a string name or a 32-bit identifier.

**non-delivery report**: A report message that is generated and sent by a server to the sender of a message if an email message could not be received by an intended recipient.

**plain text message body**: A message body for which the Content-Type value of the Email Text Body header field is "text/plain". A plain text message body can be identified explicitly in the content, or implicitly if it is in a message that is as described in [[RFC822]](https://go.microsoft.com/fwlink/?LinkId=90497) or a message that does not contain a Content-Type header field.

**Post Office Protocol - Version 3 (POP3)**: A protocol that is used for accessing email from mail servers, as described in [[RFC1939]](https://go.microsoft.com/fwlink/?LinkId=90299).

**recipient**: An entity that can receive email messages.

**Simple Mail Transfer Protocol (SMTP)**: A member of the TCP/IP suite of protocols that is used to transport Internet messages, as described in [[RFC5321]](https://go.microsoft.com/fwlink/?LinkId=144740).

**Transport Neutral Encapsulation Format (TNEF)**: A binary type-length-value encoding that is used to encode properties for transport, as described in [[MS-OXTNEF]](%5bMS-OXTNEF%5d.pdf#Section_1f0544d730b74194b58fadc82f3763bb).

**Transport Neutral Encapsulation Format (TNEF) Reader**: An entity that decodes a [**Transport Neutral Encapsulation Format (TNEF)**](#gt_87fc4eff-2e8d-4687-8cd0-a4fdb52415c4) structure after receiving a message, for the purpose of reconstructing the rich properties that are contained in the stream.

**Transport Neutral Encapsulation Format (TNEF) Writer**: An entity that encodes or builds a [**Transport Neutral Encapsulation Format (TNEF)**](#gt_87fc4eff-2e8d-4687-8cd0-a4fdb52415c4) structure for the purpose of transporting rich properties.

**Unicode**: A character encoding standard developed by the Unicode Consortium that represents almost all of the written languages of the world. The [**Unicode**](#gt_c305d0ab-8b94-461a-bd76-13b40cb8c4d8) standard [[UNICODE5.0.0/2007]](https://go.microsoft.com/fwlink/?LinkId=154659) provides three forms (UTF-8, UTF-16, and UTF-32) and seven schemes (UTF-8, UTF-16, UTF-16 BE, UTF-16 LE, UTF-32, UTF-32 LE, and UTF-32 BE).

**MAY, SHOULD, MUST, SHOULD NOT, MUST NOT:** These terms (in all caps) are used as defined in [[RFC2119]](https://go.microsoft.com/fwlink/?LinkId=90317). All statements of optional behavior use either MAY, SHOULD, or SHOULD NOT.

## References

Links to a document in the Microsoft Open Specifications library point to the correct section in the most recently published version of the referenced document. However, because individual documents in the library are not updated at the same time, the section numbers in the documents may not match. You can confirm the correct section numbering by checking the [Errata](https://go.microsoft.com/fwlink/?linkid=850906).

### 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](mailto:dochelp@microsoft.com). We will assist you in finding the relevant information.

[MS-DTYP] Microsoft Corporation, "[Windows Data Types](%5bMS-DTYP%5d.pdf#Section_cca2742956894a16b2b49325d93e4ba2)".

[MS-OXCDATA] Microsoft Corporation, "[Data Structures](%5bMS-OXCDATA%5d.pdf#Section_1afa0cd9b1a04520b623bf15030af5d8)".

[MS-OXCMAIL] Microsoft Corporation, "[RFC 2822 and MIME to Email Object Conversion Algorithm](%5bMS-OXCMAIL%5d.pdf#Section_b60d48db183f4bf5a908f584e62cb2d4)".

[MS-OXCMSG] Microsoft Corporation, "[Message and Attachment Object Protocol](%5bMS-OXCMSG%5d.pdf#Section_7fd7ec40deec4c0694931bc06b349682)".

[MS-OXCPRPT] Microsoft Corporation, "[Property and Stream Object Protocol](%5bMS-OXCPRPT%5d.pdf#Section_302967c881d54ec58319cccc14a76bb5)".

[MS-OXOCAL] Microsoft Corporation, "[Appointment and Meeting Object Protocol](%5bMS-OXOCAL%5d.pdf#Section_09861fdec8e440289346e7c214cfdba1)".

[MS-OXOMSG] Microsoft Corporation, "[Email Object Protocol](%5bMS-OXOMSG%5d.pdf#Section_daa9120ff3254afba73828f91049ab3c)".

[MS-OXPROPS] Microsoft Corporation, "[Exchange Server Protocols Master Property List](%5bMS-OXPROPS%5d.pdf#Section_f6ab1613aefe447da49c18217230b148)".

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997, [https://www.rfc-editor.org/info/rfc2119](https://go.microsoft.com/fwlink/?LinkId=90317)

[RFC5234] Crocker, D., Ed., and Overell, P., "Augmented BNF for Syntax Specifications: ABNF", STD 68, RFC 5234, January 2008, [https://www.rfc-editor.org/info/rfc5234](https://go.microsoft.com/fwlink/?LinkId=123096)

### Informative References

[MS-OXCFOLD] Microsoft Corporation, "[Folder Object Protocol](%5bMS-OXCFOLD%5d.pdf#Section_c0f31b95c07f486c98d9535ed9705fbf)".

[MS-OXCSPAM] Microsoft Corporation, "[Spam Confidence Level Protocol](%5bMS-OXCSPAM%5d.pdf#Section_522f85874aed4cd6831b40bd87862189)".

[MS-OXORMDR] Microsoft Corporation, "[Reminder Settings Protocol](%5bMS-OXORMDR%5d.pdf#Section_5454ebcce5d14da8a598d393b101caab)".

[MS-OXOTASK] Microsoft Corporation, "[Task-Related Objects Protocol](%5bMS-OXOTASK%5d.pdf#Section_55600ec061954730843659c7931ef27e)".

[MS-OXPROTO] Microsoft Corporation, "[Exchange Server Protocols System Overview](%5bMS-OXPROTO%5d.pdf#Section_734ab967e43e425babe1974af56c0283)".

[MS-WMF] Microsoft Corporation, "[Windows Metafile Format](%5bMS-WMF%5d.pdf#Section_4813e7fd52d04f42965f228c8b7488d2)".

[MSDN-UAF] Microsoft Corporation, "UUENCODE Attachment Format", [http://msdn.microsoft.com/en-us/library/aa579638(v=EXCHG.80).aspx](https://go.microsoft.com/fwlink/?LinkId=202256)

[RFC2045] Freed, N., and Borenstein, N., "Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies", RFC 2045, November 1996, [https://www.rfc-editor.org/info/rfc2045](https://go.microsoft.com/fwlink/?LinkId=90307)

## Overview

This algorithm organizes a hierarchy of rich message properties into a flattened structure that can be represented as a serial data stream. The typical format of a particular property within the stream is: identifier (which usually also includes type information), size (where not exactly determined by type), and data. In some cases, as described in this document, groups of properties or multiple-value properties include counts. Others might include padding to enforce a particular alignment of the data.

A typical scenario for using this algorithm is as follows. A [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) encodes rich properties into a serial data stream in order to transmit the properties through a messaging system that does not support those properties directly. By encoding the properties in [**TNEF**](#gt_87fc4eff-2e8d-4687-8cd0-a4fdb52415c4), the properties that do not have direct representations in the underlying messaging system can be encapsulated during transport and then decoded by a [**TNEF Reader**](#gt_bc53d521-7e22-4fb2-b8f4-76bb81dbaffe) in order to make all the properties included in the original message available to the client application.

## Relationship to Protocols and Other Algorithms

This algorithm is intended to permit the transmission of rich message property information over transports that have no mechanism for representing that information natively.

The output of the algorithm can be included in any of the following:

* A file attachment (winmail.dat).
* A [**MIME**](#gt_af6ba277-34c1-493d-8103-71d2af36ce30) [**body part**](#gt_7296866d-d4b9-4238-af3a-4d772989e348), as described in [[RFC2045]](https://go.microsoft.com/fwlink/?LinkId=90307), using the "application/ms-TNEF" media type.
* As an addition to the transmitted [**plain text message body**](#gt_db6a4512-bc29-45c1-b041-6223cb93424c) using UUENCODE, as described in [[MSDN-UAF]](https://go.microsoft.com/fwlink/?LinkId=202256), or a similar method to be decoded at the [**recipient**](#gt_53dfe4f3-05d0-41aa-8217-ecd1962b340b) end.
* A transmission from the sender to the recipient using whatever means are provided by the protocol employed in transmitting message information between them.

Specifically, this algorithm transmits message data over [**Simple Mail Transfer Protocol (SMTP)**](#gt_0678be67-e739-4e33-97fe-2b03b903a379), [**Post Office Protocol - Version 3 (POP3)**](#gt_8ef66909-36c3-4370-b455-d73a73562a6b), [**Internet Message Access Protocol - Version 4 (IMAP4)**](#gt_ee8c9703-9e1d-43bc-9491-03050a18ff7f), or other Internet protocols that incorporate MIME, as described in [RFC2045].

For conceptual background information and overviews of the relationships and interactions between this and other protocols, see [[MS-OXPROTO]](%5bMS-OXPROTO%5d.pdf#Section_734ab967e43e425babe1974af56c0283).

## Applicability Statement

The original application of the algorithm was to permit the creation and representation of [**message classes**](#gt_bed860a9-daa0-4ea5-8da6-bf8f3c0b25d8) other than simple email messages, and some additional attributes that were not natively supported by the transport protocol.

This application was further extended to allow the transport of the rich set of properties required by more modern messaging clients, including [**named properties**](#gt_e6245def-e67d-4ab2-8c7d-04863b1c1063). For backward compatibility with the original implementation, a special attribute is used to encapsulate the new message properties, and those properties with analogues to the original implementation are usually represented using the original attribute syntax.

## Standards Assignments

None.

# Algorithm Details

## Common Algorithm Details

This section specifies details that are common to both the [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) and [**TNEF Reader**](#gt_bc53d521-7e22-4fb2-b8f4-76bb81dbaffe) roles. For details specific to the TNEF Writer role, see section [2.2](#Section_686b951a4de44f19bc84a0a0f0670273). For details specific to the TNEF Reader role, see section [2.3](#Section_f466d116e86d4cdba52d74969e354f77).

All numeric data types in this algorithm that are greater than one byte in size are little-endian, and any handling of these values on platforms that are not [**little-endian**](#gt_079478cb-f4c5-4ce5-b72b-2144da5d2ce7) are required to take this into account and perform the appropriate transformations to get correct numbers, counts, values, and so on.

String examples in this document are shown in [**Augmented Backus-Naur Form (ABNF)**](#gt_24ddbbb4-b79e-4419-96ec-0fdd229c9ebf) format, as specified in [[RFC5234]](https://go.microsoft.com/fwlink/?LinkId=123096). When the string has a terminating null character, the terminating null character is included as well; for example, "user1@example.com" %x00. For the purpose of string examples, the different terminating null character size in a [**Unicode**](#gt_c305d0ab-8b94-461a-bd76-13b40cb8c4d8) [**character set (1)**](#gt_5004b992-4a9c-41c9-b65c-b2e7a2b04204) is not illustrated.

### Abstract Data Model

None.

### Initialization

None.

### Processing Rules

In this specification, attributes using the original syntax described in section [1.5](#Section_882c70ec904441e49465b1f0341fd7ff) are referred to as "attributes" and the rich set of properties described in section 1.5 will be referred to as "properties".

The [**TNEF**](#gt_87fc4eff-2e8d-4687-8cd0-a4fdb52415c4) stream starts with a signature, a legacy key value, an attribute containing a legacy version number, and an attribute containing the [**code page**](#gt_210637d9-9634-4652-a935-ded3cd434f38) used by the encoder for ANSI attributes and properties. After that, the stream is a series of attributes laid out, one after the other – message attributes followed by attachment attributes. The special attributes **attMsgProps**, **attRecipTable**, and **attAttachment** contain the various message and attachment properties. **attMsgProps** and **attAttachment** are counted lists; **attRecipTable** is a counted list of counted lists.

Each attribute is laid out as follows: the level at which it applies (message or attachment), ID, length of the contained data, the data itself, and a simple 16-bit [**checksum**](#gt_fa444149-ef93-4512-a278-2e756295630c) of the bytes comprising the data.

The **attMsgProps** attribute SHOULD be encoded after all other message attributes, and the **attAttachment** attribute SHOULD be encoded after all other attachment attributes. Values of encapsulated properties SHOULD be used instead of any conflicting mapped attribute values. Message attributes and properties SHOULD be encoded before attachment attributes and properties.

Each set of attachment attributes MUST begin with the **attAttachRendData** attribute, as specified in section [2.1.3.3.15](#Section_b649fe2d5eb04a5eb17134a9eaa4d29e), followed by any other attributes; attachment properties encoded in the **attAttachment** attribute, as specified in section [2.1.3.3.23](#Section_4761076869e6434e8fea96147db7b863), SHOULD be last.

#### Conventions

This algorithm uses the conventions and common definitions defined in this section for address representations and [**ABNF**](#gt_24ddbbb4-b79e-4419-96ec-0fdd229c9ebf) rule definitions.

##### Address Representations

Address elements other than [**recipients**](#gt_53dfe4f3-05d0-41aa-8217-ecd1962b340b), such as From and Sender, are represented in a [**Message object**](#gt_b6c15d0c-d992-421d-ba96-99d3b63894cf) by a group of four properties: [**display name**](#gt_bbb09154-8d26-498e-b05e-f649e5a43700), [**address type**](#gt_435e947e-e78d-42d8-bee0-4598c959f0ba), [**email address**](#gt_2abe03c8-7fe4-4170-833f-9b1112d972b6), [**EntryID**](#gt_64df5f51-e2e6-4cf2-a15f-5bc1167087b5). In subsequent sections, these groups are referred to as described here.

**PidTagReceivedRepresenting\_XXX**: Refers to the **PidTagReceivedRepresentingName** ([[MS-OXOMSG]](%5bMS-OXOMSG%5d.pdf#Section_daa9120ff3254afba73828f91049ab3c) section 2.2.1.26), **PidTagReceivedRepresentingAddressType** ([MS-OXOMSG] section 2.2.1.23), and **PidTagReceivedRepresentingEmailAddress** ([MS-OXOMSG] section 2.2.1.24), or **PidTagReceivedRepresentingEntryId** ([MS-OXOMSG] section 2.2.1.25) properties, where either would suffice to fully represent the display name, email transport type, and email address of a particular recipient or person on behalf of whom a message was received.

**PidTagSender\_XXX**: Refers to **PidTagSenderName** ([MS-OXOMSG] section 2.2.1.51), **PidTagSenderAddressType** ([MS-OXOMSG] section 2.2.1.48), and **PidTagSenderEmailAddress** ([MS-OXOMSG] section 2.2.1.49), or **PidTagSenderEntryId** ([MS-OXOMSG] section 2.2.1.50) properties, where either would suffice to fully represent the display name, email transport type, and email address of a sender.

**PidTagSentRepresenting\_XXX**: Refers to **PidTagSentRepresentingName** ([MS-OXOMSG] section 2.2.1.57), **PidTagSentRepresentingAddressType** ([MS-OXOMSG] section 2.2.1.54), and **PidTagSentRepresentingEmailAddress** ([MS-OXOMSG] section 2.2.1.55), or **PidTagSentRepresentingEntryId** ([MS-OXOMSG] section 2.2.1.56) properties, where either would suffice to fully represent the display name, email transport type, and email address of a sender or person on behalf of whom a message was sent.

##### ABNF Rules

This section specifies [**ABNF**](#gt_24ddbbb4-b79e-4419-96ec-0fdd229c9ebf) rules for data types common throughout section [2](#Section_bcd89d59ebf94e0283cf45cce7def006). For more details about these data types, see [[MS-DTYP]](%5bMS-DTYP%5d.pdf#Section_cca2742956894a16b2b49325d93e4ba2).

| Data type | ABNF rules |
| --- | --- |
| **INT16** | **INT16** = ["-"] 1\*5DIGIT |
| **INT32** | **INT32** = ["-"] 1\*10DIGIT |
| **INT64** | **INT64** = ["-"] 1\*19DIGIT |
| **UINT16** | **UINT16** = 1\*5DIGIT |
| **UINT32** | **UINT32** = 1\*10DIGIT |
| **OCTET** | **%x0-FF** |
| **CHAR** | **%x0-FF** |

#### ABNF Description

1. TNEFStream = TNEFHeader TNEFVersion OEMCodePage MessageData \*AttachData
2. TNEFHeader = TNEFSignature LegacyKey
3. TNEFSignature = %x78.9F.3E.22
4. ; Any number will suffice here. This is now legacy.
5. LegacyKey = UINT16
6. TNEFVersion = attrLevelMessage idTnefVersion Length TNEFVersionData Checksum
7. OEMCodePage = attrLevelMessage idOEMCodePage Length OEMCodePageData Checksum
8. MessageData = \*MessageAttribute [MessageProps]
9. MessageAttribute = attrLevelMessage idMessageAttr Length Data Checksum
10. MessageProps = attrLevelMessage idMsgProps Length Data Checksum
11. ; An attachment is determined/delimited by attAttachRendData, followed by
12. ; other encoded attributes, if any, and ending with attAttachment if there are
13. ; any encoded properties.
14. AttachData = AttachRendData [\*AttachAttribute] [AttachProps]
15. AttachRendData = attrLevelAttachment idAttachRendData Length Data Checksum
16. AttachAttribute = attrLevelAttachment idAttachAttr Length Data Checksum
17. AttachProps = attrLevelAttachment idAttachment Length Data Checksum
18. ; TNEF Version. Any number will suffice here. This is now legacy.
19. TNEFVersionData = 4\*4OCTET
20. ; This is the code page of attribute strings. The TNEF stream MUST contain a
21. ; code page in which all characters are 8 bits
22. ; in length, for compatibility with legacy applications that cannot handle
23. ; strings with embedded zero characters.
24. OEMCodePageData = PrimaryCodePage SecondaryCodePage
25. PrimaryCodePage=UINT32
26. ; Secondary CodePage is unused. It SHOULD contain zero.
27. SecondaryCodePage=%x00.00.00.00
28. ; The length of the following data field in bytes. All attribute lengths are
29. ; 32-bit integers, including any terminating null characters.
30. Length = INT32
31. ; Data of the attribute itself, flattened out based on the particular attribute
32. ; according to the rules that follow.
33. Data = 0\*OCTET
34. ; 16-bit unsigned integer that is the sum, modulo 65536, of the data bytes for
35. ; the attribute value data, calculated over the entire length of the attribute data.
36. ; In the case where the attribute contains enhanced properties with padding, the
37. ; pad bytes MUST be included in the calculation.
38. Checksum = UINT16
39. ; Level where attribute applies, either to the message itself or to
40. ; an attachment.
41. attrLevelMessage = %x01
42. attrLevelAttachment = %x02
43. ; Attribute ID Tags
44. ; TNEF Version
45. idTnefVersion = %x06.90.08.00
46. ; OEM Codepage. See attOemCodepage handling in section 5 and Appendix A.
47. idOemCodepage = %x07.90.06.00
48. ; Message-level attributes. SHOULD all be at attrLevelMessage.
49. idMessageAttr = idMessageClass / idFrom / idSubject / idDateSent /
50. idDateRecd / idMessageStatus / idMessageID /
51. idBody / idPriority / idDateModified /
52. idRecipTable / idOriginalMessageClass / idOwner / idSentFor /
53. idDelegate / idDateStart / idDateEnd / idAidOwner / idRequestRes
54. ; PidTagMessageClass property ([[MS-OXOMSG]](%5bMS-OXOMSG%5d.pdf#Section_daa9120ff3254afba73828f91049ab3c) section 2.2.2.1)
55. idMessageClass = %x08.80.07.00
56. ; PidTagSender\_XXX properties, as specified in section [2.1.3.1.1](#Section_83dff00e2f7248bd952b4e1f15e13b9e)
57. idFrom = %x00.80.00.00
58. ; PidTagSubject property ([[MS-OXCMSG]](%5bMS-OXCMSG%5d.pdf#Section_7fd7ec40deec4c0694931bc06b349682) section 2.2.1.46)
59. idSubject = %x04.80.01.00
60. ; PidTagClientSubmitTime property ([MS-OXOMSG] section 2.2.3.11)
61. idDateSent = %x05.80.03.00
62. ; PidTagMessageDeliveryTime property ([MS-OXOMSG] section 2.2.3.9)
63. idDateRecd = %x06.80.03.00
64. ; PidTagMessageFlags property ([MS-OXCMSG] section 2.2.1.6)
65. idMessageStatus = %x07.80.06.00
66. ; PidTagSearchKey property ([[MS-OXCPRPT]](%5bMS-OXCPRPT%5d.pdf#Section_302967c881d54ec58319cccc14a76bb5) section 2.2.1.9)
67. idMessageID = %x09.80.01.00
68. ; PidTagBody property ([MS-OXCMSG] section 2.2.1.58.1)
69. idBody = %x0C.80.02.00
70. ; PidTagImportance property ([MS-OXCMSG] section 2.2.1.11)
71. idPriority = %x0D.80.04.00
72. ; PidTagLastModificationTime property ([MS-OXCMSG] section 2.2.2.2)
73. ; for the message
74. idDateModified = %x20.80.03.00
75. ; Message Property Encapsulation
76. idMsgProps = %x03.90.06.00
77. ; PidTagMessageRecipients propety ([MS-OXCMSG] section 2.2.1.47).
78. ; For more details, see section [2.1.3.5.2.2](#Section_aa9359966d0048338bd85eca16ead67b).
79. idRecipTable = %x04.90.06.00
80. ; PidTagOriginalMessageClass property ([[MS-OXPROPS]](%5bMS-OXPROPS%5d.pdf#Section_f6ab1613aefe447da49c18217230b148) section 2.831)
81. idOriginalMessageClass = %x00.06.07.00
82. ; PidTagReceivedRepresenting\_XXX or
83. PidTagSentRepresenting\_XXX properties, as specified in section 2.1.3.1.1
84. idOwner = %x00.00.06.00
85. ; PidTagSentRepresenting\_XXX properties, as specified in section 2.1.3.1.1
86. idSentFor = %x01.00.06.00
87. ; PidTagReceivedRepresentingEntryId property ([MS-OXOMSG] section 2.2.1.25)
88. idDelegate = %x02.00.06.00
89. ; PidTagStartDate property ([[MS-OXOCAL]](%5bMS-OXOCAL%5d.pdf#Section_09861fdec8e440289346e7c214cfdba1) section 2.2.1.30)
90. idDateStart = %x06.00.03.00
91. ; PidTagEndDate property ([MS-OXOCAL] section 2.2.1.31)
92. idDateEnd = %x07.00.03.00
93. ; PidTagOwnerAppointmentId property ([MS-OXOCAL] section 2.2.1.29)
94. idAidOwner = %x08.00.05.00
95. ; PidTagResponseRequested property ([MS-OXOCAL] section 2.2.1.36)
96. idRequestRes = %x09.00.04.00
97. ; Attachment-level attributes. All MUST be at attrLevelAttachment.
98. idAttachAttr = idAttachData / idAttachTitle / idAttachMetaFile /
99. idAttachCreateDate / idAttachModifyDate / idAttachTransportFilename
100. ; PidTagAttachDataBinary property ([MS-OXCMSG] section 2.2.2.7)
101. idAttachData = %x0F.80.06.00
102. ; PidTagAttachFilename property ([MS-OXCMSG] section 2.2.2.11)
103. idAttachTitle = %x10.80.01.00
104. ; PidTagAttachRendering property ([MS-OXCMSG] section 2.2.2.17)
105. idAttachMetaFile = %x11.80.06.00
106. ; PidTagCreationTime property ([MS-OXCMSG] section 2.2.2.3)
107. idAttachCreateDate = %x12.80.03.00
108. ; PidTagLastModificationTime property ([MS-OXCMSG] section 2.2.2.2)
109. ; for the attachment.
110. idAttachModifyDate = %x13.80.03.00
111. ; PidTagAttachTransportName property ([MS-OXCMSG] section 2.2.2.19)
112. idAttachTransportFilename = %x01.90.06.00
113. ; Attachment RendData, as specified in section [2.1.3.3.15](#Section_b649fe2d5eb04a5eb17134a9eaa4d29e)
114. idAttachRendData = %x02.90.06.00
115. ; Attachment table row
116. idAttachment = %x05.90.06.00

#### Attributes

This section specifies the attributes that appear in the [**TNEF**](#gt_87fc4eff-2e8d-4687-8cd0-a4fdb52415c4) stream, including the structure of the attributes, the message properties they map to, and any required conversions between them and message properties.

Each attribute is described by a level at which it applies (message or attachment), the attribute ID, the length of the attribute data, the attribute data, and a simple [**checksum**](#gt_fa444149-ef93-4512-a278-2e756295630c). They are documented in the following sections in the form "**attXXXX**". For example, **attSubject** refers to the following:

**attrLevelMessage** idSubject Length 1\*CHAR Checksum

##### attTnefVersion Attribute

For details about how the [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) handles this attribute, see section [2.2.3.1](#Section_52e9011809b046f7b9cd2c9d6cfd269f). For details about the [**TNEF Reader**](#gt_bc53d521-7e22-4fb2-b8f4-76bb81dbaffe) handles this attribute, see section [2.3.3.1](#Section_5f371b6f1e264a95ab395b13a0fe29c9).

##### attOemCodepage Attribute

The **attOemCodepage** attribute contains the [**code page**](#gt_210637d9-9634-4652-a935-ded3cd434f38) used by the [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) for all attribute string values, and for any ANSI strings in the encapsulated message properties. For more information about code page handling, see section [2.1.3.5.1](#Section_f421b6a7d6f646638e1ac9e38fc388cd).

##### attFrom Attribute

The **attFrom** attribute is a message-level attribute that maps to and from the **PidTagSender\_XXX** properties, as specified in section [2.1.3.1.1](#Section_83dff00e2f7248bd952b4e1f15e13b9e).

The data for this attribute encodes as follows:

1. TRP-structure = TRP-header sender-display-name sender-email empty
2. TRP-header = trpidOneOff structure-length sender-name-length sender-email-length
3. ; Structure type
4. trpidOneOff = %x04.00
5. ; The length of the entire structure. See the following description.
6. structure-length = **UINT16**
7. ; Length of sender display name string, including the terminating null character.
8. sender-name-length = **UINT16**
9. ; Length of sender email string, including the terminating null character.
10. sender-email-length = **UINT16**
11. sender-display-name = 1\***OCTET** %x00
12. sender-email = sender-email-type ":" sender-email-address %x00
13. sender-email-type = 1\***CHAR**
14. sender-email-address = 1\***CHAR**

;Empty 8-byte structure

empty = 8\*%x00

The **structure-length** field is calculated as eight (the size of TRP-header in OCTETs) plus the length of sender-display-name (including the terminating null character), plus the length of sender-email (including the terminating null character), plus eight (the size of the empty eight bytes).

The **sender-name-length** field is the length of sender-display-name in OCTETs (including the terminating null character).

The **sender-email-length** field is calculated as the length of sender-email (including the terminating null character).

The **sender-email** field is composed of four parts, the address-type (for example, the literal sequence "SMTP" for Internet addresses), a literal colon (":"), the address itself, and a terminating null character. For example, the string "SMTP:user2@example.com" %x00 is a legal sender-email value.

The **empty** field is a zero-filled 8-byte structure.

For details about how the [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) handles the **sender-email** field, see section [2.2.3.3](#Section_ad393acc759047b6bcdff5cf47a89e00). For details about the [**TNEF Reader**](#gt_bc53d521-7e22-4fb2-b8f4-76bb81dbaffe) handles the **sender-email** field, see section [2.3.3.3](#Section_fbf4c99870744c5e9a3548f918b5f494).

##### Date Attributes

The date attributes, which are of type **PtypTime** ([[MS-OXCDATA]](%5bMS-OXCDATA%5d.pdf#Section_1afa0cd9b1a04520b623bf15030af5d8) section 2.11.1), are encoded into a **Date Time Record** structure, as follows. The encoding process used is implementation-dependent.

1. DTR = wYear wMonth wDay wHour wMinute wSecond wDayOfWeek
2. wYear = **UINT16**
3. wMonth = **UINT16**
4. wDay = **UINT16**
5. wHour = **UINT16**
6. wMinute = **UINT16**
7. wSecond = **UINT16**
8. wDayOfWeek = **UINT16**

The **wYear** field contains the year (for example, 2008 is %xD8.07); the **wMonth** field is 1 for January, and so on; The **WDay** field is 1 for the first day of the month; the **wHour**, **wMinute**, and **wSecond** fields contain the time; the **wDayOfWeek** field is 1 for Monday.

| Attribute (in TNEF) | Level | Message property |
| --- | --- | --- |
| **attDateSent** | Message | **PidTagClientSubmitTime** ([[MS-OXOMSG]](%5bMS-OXOMSG%5d.pdf#Section_daa9120ff3254afba73828f91049ab3c) section 2.2.3.11) |
| **attDateRecd** | Message | **PidTagMessageDeliveryTime** ([MS-OXOMSG] section 2.2.3.9) |
| **attAttachCreateDate** | Attachment | **PidTagCreationTime** ([[MS-OXCMSG]](%5bMS-OXCMSG%5d.pdf#Section_7fd7ec40deec4c0694931bc06b349682) section 2.2.2.3) |
| **attAttachModifyDate** | Attachment | **PidTagLastModificationTime** ([MS-OXCMSG] section 2.2.2.2) |
| **attDateModified** | Message | **PidTagLastModificationTime** |
| **attDateStart** | Message | **PidTagStartDate** ([[MS-OXOCAL]](%5bMS-OXOCAL%5d.pdf#Section_09861fdec8e440289346e7c214cfdba1) section 2.2.1.30) |
| **attDateEnd** | Message | **PidTagEndDate** ([MS-OXOCAL] section 2.2.1.31) |

##### Message Class Attributes

The [**message class**](#gt_bed860a9-daa0-4ea5-8da6-bf8f3c0b25d8) attribute value is stored as a zero-terminated string that holds the name specified by the client.

Message class attributes in [**TNEF**](#gt_87fc4eff-2e8d-4687-8cd0-a4fdb52415c4) are as follows:

| Attribute in TNEF | Level | Message Property |
| --- | --- | --- |
| **attMessageClass** | Message | **PidTagMessageClass** ([[MS-OXPROPS]](%5bMS-OXPROPS%5d.pdf#Section_f6ab1613aefe447da49c18217230b148) section 2.788) |
| **attOriginalMessageClass** | Message | **PidTagOriginalMessageClass** ([MS-OXPROPS] section 2.831) |

For details about how the [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) handles these attributes, see section [2.2.3.4](#Section_50a640ddbc084d7e898dd65170e69375). For details about the [**TNEF Reader**](#gt_bc53d521-7e22-4fb2-b8f4-76bb81dbaffe) handles this field, see section [2.3.3.4](#Section_7dede3e6d44547169f7eba04ed960b7c).

##### attMessageID Attribute

The **attMessageID** attribute is a message-level attribute that maps to the **PidTagSearchKey** property ([[MS-OXCPRPT]](%5bMS-OXCPRPT%5d.pdf#Section_302967c881d54ec58319cccc14a76bb5) section 2.2.1.9). The **PidTagSearchKey** property that maps to this attribute is stored in binary, but the attribute is represented in text format.

For details about how the [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) handles this attribute, see section [2.2.3.7](#Section_e78a053e4fac4c70a10826bfd958cf81). For details about how the [**TNEF Reader**](#gt_bc53d521-7e22-4fb2-b8f4-76bb81dbaffe) handles this attribute, see section [2.3.3.5](#Section_3d8df855c46846ab84366e075a472fbe).

##### attSubject Attribute

The **attSubject** attribute is a message-level attribute that maps to and from the **PidTagSubject** property ([[MS-OXCMSG]](%5bMS-OXCMSG%5d.pdf#Section_7fd7ec40deec4c0694931bc06b349682) section 2.2.1.46).

The data for this attribute is stored as a string with a terminating null character.

##### attMessageStatus Attribute

The **attMessageStatus** attribute is a message-level attribute that maps to and from the **PidTagMessageFlags** property ([[MS-OXCMSG]](%5bMS-OXCMSG%5d.pdf#Section_7fd7ec40deec4c0694931bc06b349682) section 2.2.1.6).

The data for this attribute is stored as an unsigned 32-bit integer, with the correct bit value set to indicate the message status. For compatibility, these MUST be mapped to and from the following values:

| Status | Attribute Flag (in TNEF) | Bit Value | Message Property Flag | Bit Value |
| --- | --- | --- | --- | --- |
| Read | **fmsRead** | 0x20 | **MSGFLAG\_READ** | 0x01 |
| Unmodified | **fmsModified** | 0x01 | **MSGFLAG\_UNMODIFIED** | 0x02 |
| Submitted | **fmsSubmitted** | 0x04 | **MSGFLAG\_SUBMIT** | 0x04 |
| Unsent | **fmsLocal** | 0x02 | **MSGFLAG\_UNSENT** | 0x08 |
| Has Attachments | **fmsHasAttach** | 0x80 | **MSGFLAG\_HASATTACH** | 0x10 |

If the **fmsModified** attribute flag is set, then the corresponding message property flag (**MSGFLAG\_UNMODIFIED**) is clear (that is, not set). If the **fmsModified** attribute flag is clear, then the corresponding message property flag (**MSGFLAG\_UNMODIFIED**) is set. For all other flags, either both the attribute flag and corresponding message property flag are set or both the attribute flag and corresponding message property flag are clear.

##### attBody Attribute

The **attBody** attribute MAY[<1>](#Appendix_A_1" \o "Product behavior note 1) be supported.

The **attBody** attribute is a message-level attribute that maps to and from the **PidTagBody** property ([[MS-OXCMSG]](%5bMS-OXCMSG%5d.pdf#Section_7fd7ec40deec4c0694931bc06b349682) section 2.2.1.58.1).

The data for this attribute is stored as a string with a terminating null character.

For more details about how the [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) handles this attribute, see section [2.2.3.6](#Section_7142272fb2644b37924e81a63c5300cd).

##### attPriority Attribute

The **attPriority** attribute is a message-level attribute that maps to and from the **PidTagImportance** property ([[MS-OXCMSG]](%5bMS-OXCMSG%5d.pdf#Section_7fd7ec40deec4c0694931bc06b349682) section 2.2.1.11).

The data for this attribute is stored as an unsigned 16-bit integer. For compatibility, these MUST be mapped to and from the following values:

| Priority | Value (in TNEF) | Message Property Value |
| --- | --- | --- |
| Low | 3 | 0 |
| Normal | 2 | 1 |
| High | 1 | 2 |

##### attAttachData Attribute

The **attAttachData** attribute is an attachment-level attribute that maps to and from the **PidTagAttachDataBinary** property ([[MS-OXCMSG]](%5bMS-OXCMSG%5d.pdf#Section_7fd7ec40deec4c0694931bc06b349682) section 2.2.2.7).

The data for this attribute is stored as a binary stream.

For details about how the [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) handles this attribute, see section [2.2.3.8](#Section_b67709541a7f47dd857429a14318ca9e). For details about how the [**TNEF Reader**](#gt_bc53d521-7e22-4fb2-b8f4-76bb81dbaffe) handles this attribute, see section [2.3.3.7](#Section_b32abd3ef040400f99f20fc2d8174329).

##### attAttachTitle Attribute

The **attAttachTitle** attribute is an attachment-level attribute that maps to and from the **PidTagAttachLongFilename** property ([[MS-OXCMSG]](%5bMS-OXCMSG%5d.pdf#Section_7fd7ec40deec4c0694931bc06b349682) section 2.2.2.10).

The data for this attribute is stored as a string with a terminating null character.

For details about how the [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) handles this attribute, see section [2.2.3.9](#Section_a31ee1437d194b059137193b12f7f4c1). For details about how the [**TNEF Reader**](#gt_bc53d521-7e22-4fb2-b8f4-76bb81dbaffe) handles this attribute, see section [2.3.3.8](#Section_30a27c91bc024c8cbf0d13190060dcda).

##### attAttachMetaFile Attribute

The **attAttachMetaFile** attribute is an attachment-level attribute that maps to and from the **PidTagAttachRendering** property ([[MS-OXCMSG]](%5bMS-OXCMSG%5d.pdf#Section_7fd7ec40deec4c0694931bc06b349682) section 2.2.2.17).

The data for this attribute is stored as a binary stream. For a description of the content of the binary stream, see [[MS-WMF]](%5bMS-WMF%5d.pdf#Section_4813e7fd52d04f42965f228c8b7488d2).

##### attAttachTransportFilename Attribute

The **attAttachTransportFilename** attribute is an attachment-level attribute that maps to and from the **PidTagAttachTransportName** property ([[MS-OXCMSG]](%5bMS-OXCMSG%5d.pdf#Section_7fd7ec40deec4c0694931bc06b349682) section 2.2.2.19).

The data for this attribute is stored as a string with a terminating null character.

##### attAttachRendData Attribute

The **attAttachRendData** attribute is an attachment-level attribute that contains a structure of information that can be used for rendering the attachment in the body.

Each set of attachment attributes MUST begin with the **attAttachRendData** attribute, followed by any other attributes; attachment properties encoded in the **attAttachment** attribute SHOULD be last.

The structure is formatted as follows:

1. attAttachRendData = AttachType AttachPosition RenderWidth RenderHeight DataFlags
2. AttachType = AttachTypeFile / AttachTypeOle
3. AttachTypeFile=%x01.00
4. AttachTypeOle=%x02.00
5. AttachPosition= **INT32**
6. RenderWidth=**INT16**
7. RenderHeight=**INT16**
8. DataFlags = FileDataDefault / FileDataMacBinary
9. FileDataDefault= %x00.00.00.00
10. FileDataMacBinary=%x01.00.00.00

The **AttachPosition** field maps to and from the **PidTagRenderingPosition** property ([[MS-OXCMSG]](%5bMS-OXCMSG%5d.pdf#Section_7fd7ec40deec4c0694931bc06b349682) section 2.2.2.16).

For details about how the [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) handles this attribute, see section [2.2.3.10](#Section_6290e0ad90654cfaaa90c75d3849ac6b). For details about how the [**TNEF Reader**](#gt_bc53d521-7e22-4fb2-b8f4-76bb81dbaffe) handles this attribute, see section [2.3.3.9](#Section_218ebed265a54e1e96339d86fb78fe75).

##### attOwner Attribute

The **attOwner** attribute is a message-level attribute that is also a meeting attribute that maps to and from the **PidTagReceivedRepresenting\_XXX** or **PidTagSentRepresenting\_XXX** properties, as specified in section [2.1.3.1.1](#Section_83dff00e2f7248bd952b4e1f15e13b9e).

The **attOwner** attribute is encoded as counted strings laid end-to-end. The format for **attOwner** attribute is as follows:

1. attOwner=display-name-length display-name address-length address
2. ; Length of "display-name," including terminating null character.
3. display-name-length=**UINT16**
4. display-name=\***CHAR** %x00
5. ; Length of "address", including terminating null character.
6. address-length=**UINT16**
7. address= 1\***CHAR** ":" 1\***CHAR** %x00

The display-name-length and address-length are unsigned 16-bit values, including the terminating null characters for the strings. The type and address strings in the email-address entry are separated by a colon (:) character; for example, "SMTP:user1@example.com" %x00.

The mapping of message properties to the **attOwner** attribute is dependent on the [**message class**](#gt_bed860a9-daa0-4ea5-8da6-bf8f3c0b25d8) of the message being encoded.

For details about how the [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) handles this attribute, see section [2.2.3.11](#Section_48b60614b7f147de9176b50997584411). For details about how the [**TNEF Reader**](#gt_bc53d521-7e22-4fb2-b8f4-76bb81dbaffe) handles this attribute, see section [2.3.3.10](#Section_978a7bcd57d74bc8925f9130966f9ca0).

##### attSentFor Attribute

The **attSentFor** attribute is a message-level attribute that is also a meeting attribute that maps to and from the **PidTagSentRepresenting\_XXX** properties, as specified in section [2.1.3.1.1](#Section_83dff00e2f7248bd952b4e1f15e13b9e).

For details about how the [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) handles this attribute, see section [2.2.3.12](#Section_99b77e8d407b44acafe5dd518ca9eed5). For details about how the [**TNEF Reader**](#gt_bc53d521-7e22-4fb2-b8f4-76bb81dbaffe) handles this attribute, see section [2.3.3.11](#Section_969e656bca1e4ee7afd03fedd146c50c).

##### attDelegate Attribute

The **attDelegate** attribute MAY[<2>](#Appendix_A_2" \o "Product behavior note 2) be supported.

The **attDelegate** attribute is a message-level attribute that is a meeting attribute that maps to and from **PidTagReceivedRepresentingEntryId** property ([[MS-OXOMSG]](%5bMS-OXOMSG%5d.pdf#Section_daa9120ff3254afba73828f91049ab3c) section 2.2.1.25).

The content can be transported as a [**binary large object (BLOB)**](#gt_ad861812-8cb0-497a-80bb-13c95aa4e425).

For details about how the [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) handles this attribute, see section [2.2.3.13](#Section_b77ff807ba3b4bab8287d8999ec60fc3). For details about how the [**TNEF Reader**](#gt_bc53d521-7e22-4fb2-b8f4-76bb81dbaffe) handles this attribute, see section [2.3.3.12](#Section_3a9af52b4a3a4ee59b9aa644faf5dfde).

##### attAidOwner Attribute

The **attAidOwner** attribute is a message-level attribute that is a meeting attribute that maps to and from the **PidTagOwnerAppointmentId** property ([[MS-OXOCAL]](%5bMS-OXOCAL%5d.pdf#Section_09861fdec8e440289346e7c214cfdba1) section 2.2.1.29).

The content can be transported as a [**BLOB**](#gt_ad861812-8cb0-497a-80bb-13c95aa4e425).

##### attRequestRes Attribute

The **attRequestRes** attribute is a message-level attribute that is a meeting attribute that maps to and from the **PidTagResponseRequested** property ([[MS-OXOCAL]](%5bMS-OXOCAL%5d.pdf#Section_09861fdec8e440289346e7c214cfdba1) section 2.2.1.36).

The data type of this value is a **BOOLEAN** ([[MS-DTYP]](%5bMS-DTYP%5d.pdf#Section_cca2742956894a16b2b49325d93e4ba2)); however, it SHOULD be transported as an **INT16** value ([MS-DTYP]). The 2-byte **INT16** value contains a null byte as the high-order 8 bits and the value of the **PidTagResponseRequested** property as the low-order 8 bits.

##### attMsgProps Attribute

The **attMsgProps** attribute is a message-level attribute that maps to and from an arbitrary set of message properties.

For a description of the encoding for this attribute, see section [2.1.3.4](#Section_c27c89ec7f8b48d39e27dc7600d23854).

For details about how the [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) handles this attribute, see section [2.2.3.14](#Section_daeb9754a83e44998df20a82d4dfce93).

##### attRecipTable Attribute

The **attRecipTable** attribute is a message-level attribute that maps to and from the **PidTagMessageRecipients** property ([[MS-OXCMSG]](%5bMS-OXCMSG%5d.pdf#Section_7fd7ec40deec4c0694931bc06b349682) section 2.2.1.47).

For a description of the encoding for this attribute, see section [2.1.3.4](#Section_c27c89ec7f8b48d39e27dc7600d23854).

##### attAttachment Attribute

The **attAttachment** attribute is an attachment-level attribute that maps to and from an arbitrary set of properties for a single attachment.

For a description of the encoding for this attribute, see section [2.1.3.4](#Section_c27c89ec7f8b48d39e27dc7600d23854).

For details about how the [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) handles this attribute, see section [2.2.3.15](#Section_82a9eb19105e470e92d5b339d038d3ed).

#### Encapsulated Message and Attachment Properties

The **attMsgProps** and **attAttachment** attributes, as specified in sections section [2.1.3.3.21](#Section_cfde13126883472cab94e06e7381420e) and section [2.1.3.3.23](#Section_4761076869e6434e8fea96147db7b863) respectively, are special in that they are used to encode any message or attachment property that does not have a counterpart in the set of existing [**TNEF**](#gt_87fc4eff-2e8d-4687-8cd0-a4fdb52415c4)-defined attributes. The attribute data is a counted set of message or attachment properties laid end-to-end. The format of this encoding, which allows for any set of message or attachment properties, is as follows.

1. ; Attributes containing encapsulated properties:
2. ; attMsgProps - Maps to and from an arbitrary set of message properties.
3. MsgPropsData = MsgPropertyList
4. ; attRecipTable - Maps to and from PidTagMessageRecipients,
5. ; as specified in [MS-OXCMSG] section 2.2.1.47.
6. ; Number of table rows followed by the rows.
7. RecipTableData = NumRows \*RecipRow
8. NumRows = UINT32
9. RecipRow = MsgPropertyList
10. ; attAttachment – Maps to/from an arbitrary set of properties for a single attachment.
11. AttachPropsData = MsgPropertyList
12. MsgPropertyList = MsgPropertyCount \*MsgPropertyValue
13. MsgPropertyCount = UINT32
14. MsgPropertyValue = MsgPropertyTag MsgPropertyData
15. MsgPropertyTag = MsgPropertyType MsgPropertyId [NamedPropSpec]
16. ; This property MUST be present when MsgPropertyId is >= 0x8000 (the minimum value
17. ; of property ID for named properties, as specified in
18. ; [MS-OXPROPS] section 1.3.3).
19. NamedPropSpec = PropNameSpace PropIDType PropMap
20. ; Contains a GUID, as specified in [MS-OXCDATA], to specify the namespace.
21. ; The TNEF Writer obtains this value by using the RopGetNamesFromPropertyIDs ROP,
22. ; as specified in [MS-OXCROPS] section 2.2.8.2.
23. PropNameSpace = GUID
24. PropIDType = IDTypeNumber / IDTypeString
25. PropMap = PropMapID / PropMapString
26. IDTypeNumber = %x00.00.00.00
27. IDTypeString = %x01.00.00.00
28. ; Used if PropIDType is IDTypeNumber. Contains a number, as specified in
29. ; [MS-OXPROPS] section 1.3.4.2, that is used to identify the property within the namespace.
30. PropMapID = UINT32
31. ; Used if PropIDType is IDTypeString. Contains a length, then a
32. ; UTF-16LE encoded Unicode string.
33. ; The length is the length of the UTF-16LE encoded Unicode string
34. ; (including the terminating 2-byte null character).
35. ; Optional padding to UINT32 boundary.
36. ; The TNEF Writer obtains this value by using the RopGetNamesFromPropertyIds
37. ; ROP, as specified in [MS-OXCROPS] section 2.2.8.2.
38. PropMapString = UINT32 \*UINT16 %x00.00 [PropMapPad]
39. ; Padding for a UTF-16LE encoded Unicode string to achieve a
40. ; multiple of 4 bytes in length.
41. ; The TNEF Writer MUST use zero bytes and the TNEF Reader
42. ; MUST permit non-zero bytes.
43. ; SHOULD be either 0 or 2 bytes.
44. PropMapPad=\*1UINT16
45. MsgPropertyType = TypeUnspecified / TypeNull / TypeInt16 / TypeInt32 /
46. TypeFlt32 / TypeFlt64 / TypeCurrency / TypeAppTime / TypeError /
47. TypeBoolean / TypeObject / TypeInt64 / TypeString8 / TypeUnicode /
48. TypeSystime / TypeCLSID / TypeBinary / TypeMVInt16 / TypeMVInt32 /
49. TypeMVFlt32 / TypeMVFlt64 / TypeMVCurrency / TypeMVAppTime /
50. TypeMVSystime / TypeMVString8 / TypeMVBinary / TypeMVUnicode /
51. TypeMVCLSID / TypeMVInt64
52. ; An arbitrary value that corresponds to the property. For named properties, the value is >= 0x8000 (as specified in [MS-OXPROPS] section 1.3.3).
53. MsgPropertyId = UINT16
54. TypeUnspecified = %x00.00
55. TypeNull = %x01.00
56. ; Signed 16-bit value = INT16.
57. TypeInt16 = %x02.00
58. TypeMVInt16 = %x02.10
59. ; Signed 32-bit value = INT32.
60. TypeInt32 = %x03.00
61. TypeMVInt32 = %x03.10
62. ; Signed 32-bit floating point= FLOAT.
63. TypeFlt32 = %x04.00
64. TypeMVFlt32 = %x04.10
65. ; 64-bit floating point= DOUBLE.
66. TypeFlt64 = %x05.00
67. TypeMVFlt64 = %x05.10
68. ; Signed 64-bit int = OLE CURRENCY type.
69. TypeCurrency = %x06.00
70. TypeMVCurrency = %x06.10
71. ; Application time= OLE DATE type.
72. TypeAppTime = %x07.00
73. TypeMVAppTime = %x07.10
74. TypeError = %x0A.00
75. ; 16-bit Boolean (non-zero = TRUE)
76. TypeBoolean = %x0B.00
77. ; Embedded object on a property.
78. TypeObject = %x0D.00
79. ; 8-byte signed integer= INT64.
80. TypeInt64 = %x14.00
81. TypeMVInt64 = %x14.10
82. ; 8-bit character string with terminating null character.
83. TypeString8 = %x1E.00
84. TypeMVString8 = %x1E.10
85. ; UTF-16LE or variant character string with terminating 2-byte null character.
86. TypeUnicode = %x1F.00
87. TypeMVUnicode = %x1F.10
88. ; FILETIME (a PtypTime value, as specified in [MS-OXCDATA] section 2.11.1)
89. TypeSystime = %x40.00
90. TypeMVSystime = %x40.10
91. ; OLE GUID
92. TypeCLSID = %x48.00
93. TypeMVCLSID = %x48.10
94. ; Uninterpreted BLOB.
95. TypeBinary = %x02.01
96. TypeMVBinary = %x02.11
97. ; MsgPropertyData varies by property type. Individual property values
98. ; are formatted as specified in [MS-OXCDATA] section 2.11, with
99. ; padding as specified in this document.
100. MsgPropertyData = PropertyScalarContent / PropertyMultiScalarContent /
101. PropertyMultiVariableContent
102. ; Scalars – Types Int16, Int32, Flt32, Flt64, Currency, AppTime,
103. ; Bool, Int64, Systime, CLSID
104. ; The data for the particular property is written to the stream and if necessary,
105. ; padded with bytes (which SHOULD be zero) to achieve a multiple of 4-bytes in length.
106. PropertyScalarContent = MsgPropertyContent [PropertyPad]
107. ; PropertyPad – between 0 and 3 zero-filled bytes, added to the streamed
108. ; property values to achieve 4-byte boundary. The TNEF Writer MUST use zero bytes
109. ; and the TNEF Reader MUST permit non-zero bytes. These pad bytes MUST be counted
110. ; in the checksum of the containing attribute.
111. PropertyPad=\*3ZERO
112. ZERO= %x00
113. ; Multi-value Scalars – Types MVInt16, MVInt32, MVFlt32, MVFlt64, MVCurrency,
114. ; MVAppTime, MVInt64, MVSystime, MVCLSID
115. ; The number of values for the property is written to the stream as a 4-byte
116. ; value, then the data for each value is written to the stream and if need
117. ; be, padded with bytes (which SHOULD be zero) to achieve a multiple of 4 bytes in length.
118. PropertyMultiScalarContent = PropertyContentCount \*PropertyScalarContent
119. PropertyContentCount = UINT32
120. ; Variable-length – Types Unicode, String8, Object, Binary.
121. ; These are handled as a special case of Multi-Variable-Length with the number of values=1.
122. ; Multi-Variable-length – Types MVUnicode, MVString8, MVBinary
123. ; The number of values for the property is written to the stream as a 4-byte value. ; Then, for each value, the size of the property is written to the stream as a
124. ; 4-byte value, then the data for the property is written to the stream and, if
125. ; necessary, padded with zero bytes to achieve a multiple of 4 bytes in length.
126. PropertyMultiVariableContent = MsgPropertyCount 1\*PropertyVariableContent
127. MsgPropertyCount = UINT32
128. ; The size of the property is written to the stream as a 4-byte value, then the data
129. ; for the property is written to the stream and if necessary, padded with zero bytes
130. ; to achieve a multiple of 4 bytes in length. The size includes the Interface
131. ; Identifier at the beginning of the value stream for an object but does not include
132. ; the padding bytes.
133. ;
134. ; If the property is of type PtypObject, as specified in
135. ; [MS-OXCDATA] section 2.11.1,
136. ; the value-size is followed by the Interface Identifier of the object, then the serialized
137. ; stream of the data of the object. Only the Interface Identifier values
138. ; %x0B.00.00.00.00.00.00.00.C0.00.00.00.00.00.00.46,
139. ; %x0C.00.00.00.00.00.00.00.C0.00.00.00.00.00.00.46, and the Interface Identifiers of
140. ; Message objects are supported. The size of the Interface Identifier is
141. ; included in the calculation of value-size.
142. ;
143. ; If the object is an attached message (that is, it has a property type of
144. ; PtypObject (as specified in [MS-OXCDATA] section 2.11.1) and an
145. ; Interface Identifier %x07.03.02.00.00.00.00.00.C0.00.00.00.00.00.00.46,
146. ; (that of a Message object), the value data is encoded as an embedded TNEF
147. ; stream (that is, a complete TNEF stream as defined by this specification).
148. PropertyVariableContent = MsgPropertySize MsgPropertyContent [PropertyPad]
149. MsgPropertySize = UINT32

#### Other Compatibility Issues

The preceding sections addressed issues of compatibility between the original implementation of [**TNEF**](#gt_87fc4eff-2e8d-4687-8cd0-a4fdb52415c4) and the richer implementation that is now used. This section discusses some compatibility issues within the richer implementation.

##### attOemCodepage Attribute Handling

The **attOemCodepage** attribute, as specified in section [2.1.3.3.2](#Section_42895aa9ec31430496b9b42a9a92c89c), has been handled inconsistently between multiple implementations of [**TNEF**](#gt_87fc4eff-2e8d-4687-8cd0-a4fdb52415c4). This can be particularly troublesome when forwarding messages with attached messages between systems that have different default [**code pages**](#gt_210637d9-9634-4652-a935-ded3cd434f38). To minimize problems caused by this inconsistent behavior, section [2.2.3.2](#Section_8f58e533030e4e53922dc9a3eaf4a623) specifies the recommended way to handle string encoding and section [2.3.3.2](#Section_c96969b1ba664de9a755e6fbe46168eb) specifies the way to handle string decoding.

##### TNEF Encapsulation Versus Outer Wrapper Attributes

It is possible to encapsulate properties in the [**TNEF**](#gt_87fc4eff-2e8d-4687-8cd0-a4fdb52415c4) stream that represents data that is already conveyed as part of an outer wrapper such as [**MIME**](#gt_af6ba277-34c1-493d-8103-71d2af36ce30). Because in many cases the outer wrapper properties are subject to substantial validation during transport (reverse DNs lookups and other validation), they are considered more trustworthy than information inside an attached file that otherwise could overwrite correct information with incorrect information.

As a general rule, the [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) does not duplicate any data that is already being reliably transported outside the stream and the [**TNEF Reader**](#gt_bc53d521-7e22-4fb2-b8f4-76bb81dbaffe) does not override data from outside the stream with data from inside the stream. Individual implementations determine how this rule is applied. For more details, see [[MS-OXCMAIL]](%5bMS-OXCMAIL%5d.pdf#Section_b60d48db183f4bf5a908f584e62cb2d4). Some highlights of this behavior are specified in the following sections.

###### attBody Attribute Handling

When [**TNEF**](#gt_87fc4eff-2e8d-4687-8cd0-a4fdb52415c4) is being sent as a [**MIME**](#gt_af6ba277-34c1-493d-8103-71d2af36ce30) [**body part**](#gt_7296866d-d4b9-4238-af3a-4d772989e348), the **attBody** attribute is not written to TNEF or read from TNEF either by the client or server. The [**plain text message body**](#gt_db6a4512-bc29-45c1-b041-6223cb93424c) is instead transmitted in a MIME body part. For more details about **attBody** attribute handling by the [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485), see section [2.2.3.6](#Section_7142272fb2644b37924e81a63c5300cd). For more details about MIME body parts, see [[MS-OXCMAIL]](%5bMS-OXCMAIL%5d.pdf#Section_b60d48db183f4bf5a908f584e62cb2d4).

###### attRecipTable Attribute Handling

When [**TNEF**](#gt_87fc4eff-2e8d-4687-8cd0-a4fdb52415c4) is being sent as a [**MIME**](#gt_af6ba277-34c1-493d-8103-71d2af36ce30) [**body part**](#gt_7296866d-d4b9-4238-af3a-4d772989e348), the **attRecipTable** attribute is not written to TNEF or read from TNEF either by the client or server, except when sending or receiving a legacy [**non-delivery report**](#gt_2540c3dc-aeea-4d46-bf5a-a019d9e645f5) message (the value of the **attMessageClass** attribute begins with "REPORT." and ends in ".DR" or ".NDR"). The requisite message [**recipient**](#gt_53dfe4f3-05d0-41aa-8217-ecd1962b340b) information is transmitted in the MIME structure instead.

When TNEF is being sent as a MIME body part, when sending or receiving a legacy non-delivery report message (the value of the **attMessageClass** attribute begins with "REPORT." and ends in ".DR" or ".NDR"), recipient information from the **attRecipTable** attribute is used to populate the received message recipient table.

For more details about **attRecipTable** attribute handling by the [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485), see section [2.2.3.16](#Section_3aa2449b9ddb47fd8b955966b0592993).

###### attFrom Attribute Handling

The **attFrom** attribute is not written to [**TNEF**](#gt_87fc4eff-2e8d-4687-8cd0-a4fdb52415c4) or read from TNEF either by the client or the server for [**MIME**](#gt_af6ba277-34c1-493d-8103-71d2af36ce30) messages. The requisite message [**recipient**](#gt_53dfe4f3-05d0-41aa-8217-ecd1962b340b) information is transmitted in the MIME stream instead. For more details about how the [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) encodes sender information, see section [2.2.3.3](#Section_ad393acc759047b6bcdff5cf47a89e00).

###### attSubject Attribute Handling

The **attSubject** attribute, if present for a [**MIME**](#gt_af6ba277-34c1-493d-8103-71d2af36ce30) message, is overwritten by the subject value in the MIME stream. For details about how the [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) handles this attribute, see section [2.2.3.5](#Section_06c4808ffbfb4215b33dad9182f63614). For details about how the [**TNEF Reader**](#gt_bc53d521-7e22-4fb2-b8f4-76bb81dbaffe) handles this attribute, see section [2.3.3.6](#Section_d7950efa138f4abfb46d4e74cdf4649e).

## TNEF Writer Algorithm Details

The [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) encodes or builds a [**TNEF**](#gt_87fc4eff-2e8d-4687-8cd0-a4fdb52415c4) stream for the purpose of transporting rich properties. This section specifies details specific to the TNEF Writer role.

For details common to both the [**TNEF Reader**](#gt_bc53d521-7e22-4fb2-b8f4-76bb81dbaffe) and TNEF Writer roles, see section [2.1](#Section_151b09df735b4dacae7409787d879542).

### Abstract Data Model

None.

### Initialization

None.

### Processing Rules

This section specifies the processing rules applied by the [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) to specific [**TNEF**](#gt_87fc4eff-2e8d-4687-8cd0-a4fdb52415c4) attributes. For processing rules common to the TNEF Writer and the [**TNEF Reader**](#gt_bc53d521-7e22-4fb2-b8f4-76bb81dbaffe), see section [2.1.3](#Section_3193b9ff7a824873a3df9d9d6f83fae4).

#### attTnefVersion Attribute Handling by the TNEF Writer

The **attTnefVersion** attribute, as specified in section [2.1.3.3.1](#Section_125bffc5feab45daa326b8a41a6b5cd6) MUST be written as %x00.00.01.00 by the [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485).

#### attOemCodepage Attribute Handling by TNEF Writer

The [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) writes all ANSI strings, both the attribute strings and the encapsulated message property strings, with a consistent ANSI [**code page**](#gt_210637d9-9634-4652-a935-ded3cd434f38) and puts its value into the **attOemCodepage** property, as specified in section [2.1.3.3.2](#Section_42895aa9ec31430496b9b42a9a92c89c). Choose a code page that does not allow embedded zero bytes other than the zero terminator.

If **PidTagInternetCodepage** ([[MS-OXCMSG]](%5bMS-OXCMSG%5d.pdf#Section_7fd7ec40deec4c0694931bc06b349682) section 2.2.1.58.6) is being stored in the encapsulated properties, set it to the same value as the **attOemCodepage** attribute. This code page also determines the [**character set (1)**](#gt_5004b992-4a9c-41c9-b65c-b2e7a2b04204) used in [**MIME**](#gt_af6ba277-34c1-493d-8103-71d2af36ce30) if this [**TNEF**](#gt_87fc4eff-2e8d-4687-8cd0-a4fdb52415c4) is transmitted as a MIME entity body.

Do not write to an attribute any string that would suffer data loss if written using the consistent code page. Write to encapsulated properties with a [**Unicode**](#gt_c305d0ab-8b94-461a-bd76-13b40cb8c4d8) data type all strings that would suffer data loss when using the consistent code page.

For compatibility purposes, the **attMessageClass** attribute MUST be written using the consistent code page.

#### attFrom Attribute Handling by the TNEF Writer

When encoding the **sender-email** field of the **attFrom** attribute, as specified in section [2.1.3.3.3](#Section_cf3f7b01672042d78ce945be35316b43), the [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) can use the **PidTagSenderName** ([[MS-OXOMSG]](%5bMS-OXOMSG%5d.pdf#Section_daa9120ff3254afba73828f91049ab3c) section 2.2.1.51), **PidTagSenderAddressType** ([MS-OXOMSG] section 2.2.1.48), and **PidTagSenderEmailAddress** ([MS-OXOMSG] section 2.2.1.49) properties if present, or access their values using the **PidTagSenderEntryId** property ([MS-OXOMSG] section 2.2.1.50).

When [**TNEF**](#gt_87fc4eff-2e8d-4687-8cd0-a4fdb52415c4) is being used to encode an attached message, the sender information is carried in encapsulated message properties in the **attFrom** attribute.

#### Message Class Attribute Handling by the TNEF Writer

The [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) can represent any [**message class**](#gt_bed860a9-daa0-4ea5-8da6-bf8f3c0b25d8), as specified in section [2.1.3.3.5](#Section_45beb1b0c2c8440790fb70c4540a7ad8), whose value is shown in the Message Property Value column of the following table, using the value in the Attribute value column.

| Attribute value (in TNEF) | Message property value |
| --- | --- |
| IPM.Microsoft Mail.Note | IPM.Note |
| IPM.Microsoft Mail.Read Receipt | Report.IPM.Note.IPNRN |
| IPM.Microsoft Mail.Non-Delivery | Report.IPM.Note.NDR |
| IPM.Microsoft Schedule.MtgRespP | IPM.Schedule.Meeting.Resp.Pos |
| IPM.Microsoft Schedule.MtgRespN | IPM.Schedule.Meeting.Resp.Neg |
| IPM.Microsoft Schedule.MtgRespA | IPM.Schedule.Meeting.Resp.Tent |
| IPM.Microsoft Schedule.MtgReq | IPM.Schedule.Meeting.Request |
| IPM.Microsoft Schedule.MtgCncl | IPM.Schedule.Meeting.Canceled |

Values not included in the table SHOULD be written in their original form.

#### attSubject Attribute Handling by the TNEF Writer

When [**TNEF**](#gt_87fc4eff-2e8d-4687-8cd0-a4fdb52415c4) is being used to encode an attached message, the message subject information is carried in encapsulated message properties in the **attMsgProps** attribute, not the **attSubject** attribute.

#### attBody Attribute Handling by the TNEF Writer

When [**TNEF**](#gt_87fc4eff-2e8d-4687-8cd0-a4fdb52415c4) is being used to encode an attached message, the **attBody** attribute, as specified in section [2.1.3.3.9](#Section_df351d3100e14bfb83195975b381c26c), MAY[<3>](#Appendix_A_3" \o "Product behavior note 3) be written and read.

#### attMessageID Attribute Handling by the TNEF Writer

For compatibility, when generating a [**TNEF**](#gt_87fc4eff-2e8d-4687-8cd0-a4fdb52415c4) stream, the [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) MUST translate the binary representation of the **attMessageID** attribute, as specified in section [2.1.3.3.6](#Section_c0c9791413b14a2b9daf56a833d433f6), into a textual one by emitting the two CHAR hexadecimal equivalent per OCTET (i.e. %x01 becomes "01", %x2D becomes "2D", and so on).

#### attAttachData Attribute Handling by the TNEF Writer

The [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) can use the **attAttachData** attribute, as specified in section [2.1.3.3.11](#Section_7a2f9dc9977541a38fc787b1e7464b2a), for the attachment data if the **PidTagAttachMethod** property ([[MS-OXCMSG]](%5bMS-OXCMSG%5d.pdf#Section_7fd7ec40deec4c0694931bc06b349682) section 2.2.2.9) of the original attachment contains the value 0x0001 (ATTACH\_BY\_VALUE). If the **PidTagAttachMethod** of the original attachment contains the value 0x0005 (ATTACH\_EMBEDDED\_MSG) or the value 0x0006 (ATTACH\_OLE), then the TNEF Writer MUST encode the data in **attAttachment** (section [2.1.3.4](#Section_c27c89ec7f8b48d39e27dc7600d23854)).

#### attAttachTitle Attribute Handling by the TNEF Writer

The [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) obtains the value of the **attAttachTitle** attribute, as specified in section [2.1.3.3.12](#Section_17f4dfc55cc24cbb878dff1296561dd8), from the **PidTagAttachLongFilename** property ([[MS-OXCMSG]](%5bMS-OXCMSG%5d.pdf#Section_7fd7ec40deec4c0694931bc06b349682) section 2.2.2.10) if it is available; otherwise, the TNEF Writer obtains the value of the **attAttachTitle** attribute from the **PidTagAttachFilename** property.

#### attAttachRendData Attribute Handling by the TNEF Writer

The **AttachType** field of the **attAttachRendData** attribute, as specified in section [2.1.3.3.15](#Section_b649fe2d5eb04a5eb17134a9eaa4d29e), MUST be set by the [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) to the value of the **AttachTypeFile** attribute when the **PidTagAttachMethod** property ([[MS-OXCMSG]](%5bMS-OXCMSG%5d.pdf#Section_7fd7ec40deec4c0694931bc06b349682) section 2.2.2.9) for the attachment is set to ATTACH\_BY\_VALUE or ATTACH\_EMBEDDED\_MSG, and to the value of the **AttachTypeOle** attribute when the **PidTagAttachMethod** property is set to ATTACH\_OLE.

The **RenderWidth** and **RenderHeight** fields of the **attAttachRendData** attribute SHOULD be set by the TNEF Writer to the size of the system icons if the attachment is a simple file attachment, or to {-1,-1} if the attachment is not a simple file attachment.

The **DataFlags** field SHOULD[<4>](#Appendix_A_4" \o "Product behavior note 4) be set to **FileDataDefault** (%x00.00.00.00), regardless of the attachment’s **PidTagAttachEncoding** property ([MS-OXCMSG] section 2.2.2.20) value. However, if the **PidTagAttachEncoding** property ([MS-OXCMSG] section 2.2.2.20) for the attachment consists of bytes %x2A.86.48.86.F7.14.03.0B.01, then the **FileDataMacBinary** bit MAY[<5>](#Appendix_A_5" \o "Product behavior note 5) be set by the TNEF Writer; otherwise the **FileDataDefault** field SHOULD be set by the TNEF Writer.

#### attOwner Attribute Handling by the TNEF Writer

If the message is either a meeting request or meeting cancellation (from the organizer, who is creating or deleting a meeting), the [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) SHOULD encode the **PidTagSentRepresenting\_XXX** properties, as specified in section [2.1.3.1.1](#Section_83dff00e2f7248bd952b4e1f15e13b9e), in the **attOwner** attribute, as specified in section [2.1.3.3.16](#Section_3540a2ba51504adbae8a2f6dd6c373c6).

If the message is a meeting response of any type (from attendee, accepting, declining, and so on), the TNEF Writer SHOULD encode the **PidTagReceivedRepresenting\_XXX** properties, as specified in section 2.1.3.1.1, in the **attOwner** attribute. The encoding used is implementation-dependent. For details about how to construct the **EntryId** property, see [[MS-OXOMSG]](%5bMS-OXOMSG%5d.pdf#Section_daa9120ff3254afba73828f91049ab3c) section 2.2.1.25.

The TNEF Writer can use the discrete **PidTag{Sent | Rcvd}Representing Name**, **AddressType**, and **EmailAddress** properties if present, or access their values by using the **PidTag{Sent | Rcvd}EntryId** property.

#### attSentFor Attribute Handling by the TNEF Writer

The [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) SHOULD encode the **PidTagSentRepresenting\_XXX** properties, as specified in section [2.1.3.1.1](#Section_83dff00e2f7248bd952b4e1f15e13b9e), in the **attSentFor** attribute, as specified in section [2.1.3.3.17](#Section_9799589dbc714150baa900e729d44663).

The TNEF Writer can use the discrete **PidTagSentRepresentingName** ([[MS-OXOMSG]](%5bMS-OXOMSG%5d.pdf#Section_daa9120ff3254afba73828f91049ab3c) section 2.2.1.57), **PidTagSentRepresentingAddressType** ([MS-OXOMSG] section 2.2.1.54), and **PidTagSentRepresentingEmailAddress** ([MS-OXOMSG] section 2.2.1.55) properties if present, or access their values by using the **PidTagSentRepresentingEntryId** property ([MS-OXOMSG] section 2.2.1.56).

#### attDelegate Attribute Handling by the TNEF Writer

The [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) SHOULD encode the **PidTagReceivedRepresentingEntryId** properties, as specified in [[MS-OXOMSG]](%5bMS-OXOMSG%5d.pdf#Section_daa9120ff3254afba73828f91049ab3c) section 2.2.1.25, in the **attDelegate** attribute, as specified in section [2.1.3.3.18](#Section_dbc4e9edb34745eeb9b965a16e2559ca).

#### attMsgProps Attribute Handling by the TNEF Writer

The [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) SHOULD write the **attMsgProps** attribute, as specified in section [2.1.3.3.21](#Section_cfde13126883472cab94e06e7381420e), after all the other message attributes and immediately before all the attachment attributes. For a description of the encoding for this attribute, see section [2.1.3.4](#Section_c27c89ec7f8b48d39e27dc7600d23854).

#### attAttachment Attribute Handling by the TNEF Writer

The [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) SHOULD write the encapsulated **attAttachment** attribute, as specified in section [2.1.3.3.23](#Section_4761076869e6434e8fea96147db7b863), after all the attributes for an attachment.

#### attRecipTable Attribute Handling by the TNEF Writer

When [**TNEF**](#gt_87fc4eff-2e8d-4687-8cd0-a4fdb52415c4) is being used to encode an attached message, [**recipient**](#gt_53dfe4f3-05d0-41aa-8217-ecd1962b340b) information from the **attRecipTable** attribute, as specified in section [2.1.3.3.22](#Section_3da9f868e8e6410b8a60c57ed16f851d), is used to populate the received message recipient table.

## TNEF Reader Algorithm Details

The [**TNEF Reader**](#gt_bc53d521-7e22-4fb2-b8f4-76bb81dbaffe) decodes a [**TNEF**](#gt_87fc4eff-2e8d-4687-8cd0-a4fdb52415c4) stream after receiving a message, for the purpose of reconstructing the rich properties that are contained in the stream. This section specifies details specific to the TNEF Reader role.

For details common to both the TNEF Reader and [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) roles, see section [2.1](#Section_151b09df735b4dacae7409787d879542).

### Abstract Data Model

None.

### Initialization

None.

### Processing Rules

This section specifies the processing rules applied by the [**TNEF Reader**](#gt_bc53d521-7e22-4fb2-b8f4-76bb81dbaffe) to specific [**TNEF**](#gt_87fc4eff-2e8d-4687-8cd0-a4fdb52415c4) attributes. For processing rules common to the [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) and the TNEF Reader, see section [2.1.3](#Section_3193b9ff7a824873a3df9d9d6f83fae4).

#### attTnefVersion Attribute Handling by the TNEF Reader

The [**TNEF Reader**](#gt_bc53d521-7e22-4fb2-b8f4-76bb81dbaffe) MUST reject values other than %x00.00.01.00 for the **attTnefVersion** attribute, as specified in section [2.1.3.3.1](#Section_125bffc5feab45daa326b8a41a6b5cd6).

#### attOemCodepage Attribute Handling by the TNEF Reader

When performing ANSI string decoding from the [**TNEF**](#gt_87fc4eff-2e8d-4687-8cd0-a4fdb52415c4) stream, the [**TNEF Reader**](#gt_bc53d521-7e22-4fb2-b8f4-76bb81dbaffe) uses the first [**code page**](#gt_210637d9-9634-4652-a935-ded3cd434f38) determined from the following sources:

1. Any non-US-ASCII [**MIME**](#gt_af6ba277-34c1-493d-8103-71d2af36ce30) [**character set (2)**](#gt_5004b992-4a9c-41c9-b65c-b2e7a2b04204), if the stream was transmitted as a MIME [**body part**](#gt_7296866d-d4b9-4238-af3a-4d772989e348) and the character set (2) name is available in MIME, mapped to the most appropriate code page that does not allow embedded zero bytes other than a zero terminator.
2. The **attOemCodepage** attribute, as specified in section [2.1.3.3.2](#Section_42895aa9ec31430496b9b42a9a92c89c), if available and nonzero.
3. The **PidTagInternetCodepage** property ([[MS-OXCMSG]](%5bMS-OXCMSG%5d.pdf#Section_7fd7ec40deec4c0694931bc06b349682) section 2.2.1.58.6), if available in the encapsulated properties, mapped to a code page that does not allow embedded zero bytes other than a null terminator.
4. The most appropriate default code page for the processing environment.

#### attFrom Attribute Handling by the TNEF Reader

When reading the **sender-email** field of the **attFrom** attribute, as specified in section [2.1.3.3.3](#Section_cf3f7b01672042d78ce945be35316b43), the [**TNEF Reader**](#gt_bc53d521-7e22-4fb2-b8f4-76bb81dbaffe) MUST set the **PidTagSenderEntryId** property ([[MS-OXOMSG]](%5bMS-OXOMSG%5d.pdf#Section_daa9120ff3254afba73828f91049ab3c) section 2.2.1.50) and SHOULD decode the **attFrom** attribute into the other **PidTagSender\_XXX** properties, as specified in section [2.1.3.1.1](#Section_83dff00e2f7248bd952b4e1f15e13b9e).

#### attMessageClass Attribute Handling by the TNEF Reader

If the **attMessageClass** or **attOriginalMessageClass** attribute, as specified in section [2.1.3.3.5](#Section_45beb1b0c2c8440790fb70c4540a7ad8), contains a value that is shown in the Attribute value column of the following table, the value that MUST be returned is that of the value in the Message property value column.

| Attribute value (in TNEF) | Message property value |
| --- | --- |
| IPM.Microsoft Mail.Note | IPM.Note |
| IPM.Microsoft Mail.Read Receipt | Report.IPM.Note.IPNRN |
| IPM.Microsoft Mail.Non-Delivery | Report.IPM.Note.NDR |
| IPM.Microsoft Schedule.MtgRespP | IPM.Schedule.Meeting.Resp.Pos |
| IPM.Microsoft Schedule.MtgRespN | IPM.Schedule.Meeting.Resp.Neg |
| IPM.Microsoft Schedule.MtgRespA | IPM.Schedule.Meeting.Resp.Tent |
| IPM.Microsoft Schedule.MtgReq | IPM.Schedule.Meeting.Request |
| IPM.Microsoft Schedule.MtgCncl | IPM.Schedule.Meeting.Canceled |

Values not included in the table SHOULD be read in their original form.

If the value of the **attMessageClass** or **attOriginalMessageClass** attribute begins with the string "Microsoft Mail v3.0 ", the [**TNEF Reader**](#gt_bc53d521-7e22-4fb2-b8f4-76bb81dbaffe) MUST ignore the "Microsoft Mail v3.0 " prefix when attempting to match the value of the **attMessageClass** or **attOriginalMessageClass** attribute to a value in the Attribute Value column. For example, the TNEF Reader considers the value of the **attMessageClass** or **attOriginalMessageClass** attribute Microsoft Mail v3.0 IPM.Microsoft.Mail.Note to be the same as IPM.Microsoft.Mail.Note, which corresponds to the Message Property Value IPM.Note.

The TNEF Reader SHOULD ignore the [**checksum**](#gt_fa444149-ef93-4512-a278-2e756295630c) value for [**message class**](#gt_bed860a9-daa0-4ea5-8da6-bf8f3c0b25d8) attributes because some legacy [**TNEF Writers**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) generated non-valid checksum values.

#### attMessageID Attribute Handling by the TNEF Reader

When reading the **attMessageID** attribute, as specified in section [2.1.3.3.6](#Section_c0c9791413b14a2b9daf56a833d433f6), from [**TNEF**](#gt_87fc4eff-2e8d-4687-8cd0-a4fdb52415c4), the [**TNEF Reader**](#gt_bc53d521-7e22-4fb2-b8f4-76bb81dbaffe) SHOULD attempt to decode the text format back into binary format.

#### attSubject Attribute Handling by the TNEF Reader

When the [**TNEF**](#gt_87fc4eff-2e8d-4687-8cd0-a4fdb52415c4) stream is being decoded, if the **attSubject** attribute, as specified in section [2.1.3.3.7](#Section_647ba165c77b4ad7a6e64fee90df18bf), is present, it is used for the message if there is no [**MIME**](#gt_af6ba277-34c1-493d-8103-71d2af36ce30) structure, if a MIME subject is not available, or if an attached message is being decoded.

#### attAttachData Attribute Handling by the TNEF Reader

If the **PidTagAttachMethod** property ([[MS-OXCMSG]](%5bMS-OXCMSG%5d.pdf#Section_7fd7ec40deec4c0694931bc06b349682) section 2.2.2.9) of the original attachment contains the value 0x0005 (ATTACH\_EMBEDDED\_MSG) or the value 0x0006 (ATTACH\_OLE), then the [**TNEF Reader**](#gt_bc53d521-7e22-4fb2-b8f4-76bb81dbaffe) SHOULD ignore the **attAttachData** attribute, as specified in section [2.1.3.3.11](#Section_7a2f9dc9977541a38fc787b1e7464b2a).

#### attAttachTitle Attribute Handling by the TNEF Reader

The [**TNEF Reader**](#gt_bc53d521-7e22-4fb2-b8f4-76bb81dbaffe) MUST set the value of the **PidTagAttachLongFilename** property ([[MS-OXCMSG]](%5bMS-OXCMSG%5d.pdf#Section_7fd7ec40deec4c0694931bc06b349682) section 2.2.2.10), which maps to the **attAttachTitle** attribute, as specified in section [2.1.3.3.12](#Section_17f4dfc55cc24cbb878dff1296561dd8).

#### attAttachRendData Attribute Handling by the TNEF Reader

The [**TNEF Reader**](#gt_bc53d521-7e22-4fb2-b8f4-76bb81dbaffe) SHOULD set the **PidTagAttachTag** property ([[MS-OXCMSG]](%5bMS-OXCMSG%5d.pdf#Section_7fd7ec40deec4c0694931bc06b349682) section 2.2.2.15) for the attachment to %x2A.86.48.86.F7.14.03.0A.03.02.01 when the **AttachTypeOle** field of the **attAttachRendData** attribute, as specified in section [2.1.3.3.15](#Section_b649fe2d5eb04a5eb17134a9eaa4d29e), is set. The TNEF Reader SHOULD NOT set the **PidTagAttachTag** property for the attachment when **AttachTypeFile** field of the **attAttachRendData** attribute is set.

The TNEF Reader SHOULD set the value of the **PidTagAttachEncoding** property ([MS-OXCMSG] section 2.2.2.20) for the attachment to the same bytes when the **DataFlags** field of the **attAttachRendData** attribute has the **FileDataMacBinary** bit set. If the **DataFlags** field contains the value of FileDataDefault, then the TNEF Reader SHOULD NOT set the value of the **PidTagAttachEncoding** property for the attachment.

#### attOwner Attribute Handling by the TNEF Reader

If the message is either a meeting request or meeting cancellation (from the organizer, who is creating or deleting a meeting), the [**TNEF Reader**](#gt_bc53d521-7e22-4fb2-b8f4-76bb81dbaffe) SHOULD decode the **attOwner** attribute, as specified in section [2.1.3.3.16](#Section_3540a2ba51504adbae8a2f6dd6c373c6), into the **PidTagSentRepresenting\_XXX** properties, as specified in section [2.1.3.1.1](#Section_83dff00e2f7248bd952b4e1f15e13b9e).

If the message is a meeting response of any type (from attendee, accepting, declining, and so on), the TNEF Reader SHOULD decode the **attOwner** attribute into the **PidTagReceivedRepresenting\_XXX** properties, as specified in section 2.1.3.1.1. The decoding process used is implementation-dependent, as long as the decoded property values match those that were originally encoded. For details about how to construct the **PidTagReceivedRepresentingEntryId** property, see [[MS-OXOMSG]](%5bMS-OXOMSG%5d.pdf#Section_daa9120ff3254afba73828f91049ab3c) section 2.2.1.25.

The TNEF Reader MUST set the **PidTag{Sent | Rcvd} EntryId** property and SHOULD decode the **attOwner** attribute into the other **PidTag{Sent | Rcvd} Representing** properties.

#### attSentFor Attribute Handling by the TNEF Reader

The [**TNEF Reader**](#gt_bc53d521-7e22-4fb2-b8f4-76bb81dbaffe) SHOULD decode the **attSentFor** attribute, as specified in section [2.1.3.3.17](#Section_9799589dbc714150baa900e729d44663), into the **PidTagSentRepresenting\_XXX** properties, as specified in section [2.1.3.1.1](#Section_83dff00e2f7248bd952b4e1f15e13b9e).

The TNEF Reader SHOULD set the **PidTagSentRepresentingEntryId** property ([[MS-OXOMSG]](%5bMS-OXOMSG%5d.pdf#Section_daa9120ff3254afba73828f91049ab3c) section 2.2.1.56) and SHOULD decode the **attOwner** attribute, as specified in section [2.1.3.3.16](#Section_3540a2ba51504adbae8a2f6dd6c373c6), into the other **PidTagSentRepresenting\_XXX** properties.

#### attDelegate Attribute Handling by the TNEF Reader

The [**TNEF Reader**](#gt_bc53d521-7e22-4fb2-b8f4-76bb81dbaffe) SHOULD decode the **attDelegate** attribute, as specified in section [2.1.3.3.18](#Section_dbc4e9edb34745eeb9b965a16e2559ca), into the **PidTagReceivedRepresentingEntryId** properties ([[MS-OXOMSG]](%5bMS-OXOMSG%5d.pdf#Section_daa9120ff3254afba73828f91049ab3c) section 2.2.1.25).

# Algorithm Examples

## Sample Message

| Explanation of content | Byte stream |
| --- | --- |
| TNEF Signature, Value=0x223E9F78 | 1. 78 9f 3e 22 |
| Attach Key, Value=0x0001 | 1. 01 00 |
| Message attribute, **attTnefVersion**  Length=4 bytes | 1. 01 06 90 08 00 2. 04 00 00 00 |
| Value=0x00010000 | 1. 00 00 01 00 |
| Checksum=0x0001 | 1. 01 00 |
| Message attribute, **attOemCodepage**  Length=8 bytes | 1. 01 07 90 06 00 2. 08 00 00 00 |
| Value= (Primary=1252, Secondary=0) | 1. e4 04 00 00 00 00 00 00 |
| Checksum=0x00E8 | 1. e8 00 |
| Message attribute, **attMessageClass**  Length=24 bytes | 1. 01 08 80 07 00 2. 18 00 00 00 |
| Value="IPM.Microsoft Mail.Note" %x00 | 1. 49 50 4d 2e 4d 69 63 72 6f 73 2. 6f 66 74 20 4d 61 69 6c 2e 4e 3. 6f 74 65 00 |
| Checksum=0x0831 | 1. 31 08 |
| Message attribute, **attPriority**  Length=2 bytes | 1. 01 0d 80 04 00 2. 02 00 00 00 |
| Value=0x0002 (Normal Priority) | 1. 02 00 |
| Checksum=0x0002 | 1. 02 00 |
| Message attribute, **attSubject**  Length=15 bytes | 1. 01 04 80 01 00 2. 0f 00 00 00 |
| Value="Simple subject" %x00 | 1. 53 69 6d 70 6c 65 20 73 75 62 6a 65 63 74 00 |
| Checksum=0x057A | 1. 7a 05 |
| Message attribute, **attDateSent**  Length=14 bytes | 1. 01 05 80 03 00 2. 0e 00 00 00 |
| Value= Tuesday, 02/17/2004, 11:25:35 | 1. d4 07 02 00 11 00 0b 00 19 00 23 00 02 00 |
| Checksum=0x0137 | 1. 37 01 |
| Message attribute, **attDateModified**  Length=14 bytes | 1. 01 20 80 03 00 2. 0e 00 00 00 |
| Value= Tuesday, 02/17/2004, 12:26:09 | 1. D4 07 02 00 11 00 0C 00 -- 1A 00 09 00 02 00 |
| Checksum=0x011F | 1. 1F 01 |
| Message attribute, **attMessageID**  Length=33 bytes | 1. 01 09 80 01 00 2. 21 00 00 00 |
| Value= "757BB19CDE936A4087D90BB784C58E3B" | 1. 37 35 37 42 42 31 39 43 44 45 2. 39 33 36 41 34 30 38 37 44 39 3. 30 42 42 37 38 34 43 35 38 45 4. 33 42 00 |
| Checksum=0x0751 | 1. 51 07 |
| Message attribute, Encapsulation, **attMsgProps**  Length=2256 bytes  Number of properties=70 | 1. 01 03 90 06 00 2. d0 08 00 00 3. 46 00 00 00 |
| Message property, **PidTagAlternateRecipientAllowed** ([[MS-OXCMSG]](%5bMS-OXCMSG%5d.pdf#Section_7fd7ec40deec4c0694931bc06b349682) section 2.2.1.36)  Value=1 (TRUE) | 1. 0b 00 02 00 2. 01 00 00 00 |
| Message property, **PidTagPriority** ([MS-OXCMSG] section 2.2.1.12)  Value=0 (LOW) | 1. 03 00 26 00 2. 00 00 00 00 |
| Message property, **PidTagSensitivity** ([MS-OXCMSG] section 2.2.1.13)  Value=0 (LOW) | 1. 03 00 36 00 2. 00 00 00 00 |
| Message property, **PidTagClientSubmitTime** ([[MS-OXOMSG]](%5bMS-OXOMSG%5d.pdf#Section_daa9120ff3254afba73828f91049ab3c) section 2.2.3.11)  Value=Tuesday, 02/17/2004, 19:25:35 | 1. 40 00 39 00 2. AA D6 F3 D0 8B F5 C3 01 |
| Message property, **PidTagSubjectPrefix** ([MS-OXOMSG] section 2.2.1.60)  Number of property values=1  Size of first property=1 | 1. 1e 00 3d 00 2. 01 00 00 00 3. 01 00 00 00 |
| Value = %x00 | 1. 00 |
| Pad=3 bytes | 1. 00 00 00 |
| Message property, **PidTagReceivedByEntryId** ([MS-OXOMSG] section 2.2.1.38)  Number of property values=1  Size of first property=107 | 1. 02 01 3f 00 2. 01 00 00 00 3. 6b 00 00 00 |
| Value | 1. 00 00 00 00 DC A7 40 C8 C0 42 10 1A B4 B9 08 00 2. 2B 2F E1 82 01 00 00 00 00 00 00 00 2F 4F 3D 46 3. 49 52 53 54 20 4F 52 47 41 4E 49 5A 41 54 49 4F 4. 4E 2F 4F 55 3D 46 49 52 53 54 20 41 44 4D 49 4E 5. 49 53 54 52 41 54 49 56 45 20 47 52 4F 55 50 2F 6. 43 4E 3D 52 45 43 49 50 49 45 4E 54 53 2F 43 4E 7. 3D 54 45 53 54 32 31 55 57 32 00 |
| Pad=1 byte | 1. 00 |
| Message property, **PidTagReceivedByName** ([MS-OXOMSG] section 2.2.1.39)  Number of property values=1  Size of first property=10 | 1. 1e 00 40 00 2. 01 00 00 00 3. 0a 00 00 00 |
| Value="Test21uw2" %x00 | 1. 54 65 73 74 32 31 75 77 32 00 |
| Pad=2 bytes | 1. 00 00 |
| Message property, **PidTagReceivedRepresentingEntryId** ([MS-OXOMSG] section 2.2.1.25)  Number of property values=1  Size of first property=107 | 1. 02 01 43 00 2. 01 00 00 00 3. 6b 00 00 00 |
| Value | 1. 00 00 00 00 DC A7 40 C8 C0 42 10 1A B4 B9 08 00 2B 2F E1 82 01 00 00 00 00 00 00 00 2F 4F 3D 46 49 52 53 54 20 4F 52 47 41 4E 49 5A 41 54 49 4F 4E 2F 4F 55 3D 46 49 52 53 54 20 41 44 4D 49 4E 49 53 54 52 41 54 49 56 45 20 47 52 4F 55 50 2F 43 4E 3D 52 45 43 49 50 49 45 4E 54 53 2F 43 4E 3D 54 45 53 54 32 31 55 57 32 00 |
| Pad=1 byte | 1. 00 |
| Message property, **PidTagReceivedRepresentingName** ([MS-OXOMSG] section 2.2.1.26)  Number of property values=1  Size of first property=10 | 1. 1e 00 44 00 01 00 00 00 0a 00 00 00 |
| Value="Test21uw2" %x00 | 1. 54 65 73 74 32 31 75 77 32 00 |
| Pad=2 bytes | 1. 00 00 |
| Message property, **PidTagMessageSubmissionId** ([MS-OXOMSG] section 2.2.1.79)  Number of property values=1  Size of first property=57 | 1. 02 01 47 00 01 00 00 00 39 00 00 00 |
| Value | 1. 63 3D 55 53 3B 61 3D 20 3B 70 3D 46 69 72 73 74 20 4F 72 67 61 6E 69 7A 61 74 69 3B 6C 3D 4A 45 53 45 4F 47 50 55 57 32 2D 30 34 30 32 31 37 31 39 32 35 33 35 5A 2D 32 00 |
| Pad=3 bytes | 1. 00 00 00 |
| Message property, **PidTagReceivedBySearchKey** ([MS-OXOMSG] section 2.2.1.40)  Number of property values=1  Size of first property=82 | 1. 02 01 51 00 01 00 00 00 52 00 00 00 |
| Value | 1. 45 58 3A 2F 4F 3D 46 49 52 53 54 20 4F 52 47 41 4E 49 5A 41 54 49 4F 4E 2F 4F 55 3D 46 49 52 53 54 20 41 44 4D 49 4E 49 53 54 52 41 54 49 56 45 20 47 52 4F 55 50 2F 43 4E 3D 52 45 43 49 50 49 45 4E 54 53 2F 43 4E 3D 54 45 53 54 32 31 55 57 32 00 |
| Pad=2 bytes | 1. 00 00 |
| Message property, **PidTagReceivedRepresentingSearchKey** ([MS-OXOMSG] section 2.2.1.27)  Number of property values=1  Size of first property=82 | 1. 02 01 52 00 01 00 00 00 52 00 00 00 |
| Value | 1. 45 58 3A 2F 4F 3D 46 49 52 53 54 20 4F 52 47 41 4E 49 5A 41 54 49 4F 4E 2F 4F 55 3D 46 49 52 53 54 20 41 44 4D 49 4E 49 53 54 52 41 54 49 56 45 20 47 52 4F 55 50 2F 43 4E 3D 52 45 43 49 50 49 45 4E 54 53 2F 43 4E 3D 54 45 53 54 32 31 55 57 32 00 |
| Pad=2 bytes | 1. 00 00 |
| Message property, **PidTagMessageToMe** ([MS-OXOMSG] section 2.2.1.17)  Value=1 (TRUE) | 1. 0b 00 00 57 01 00 00 00 |
| Message property, **PidTagMessageCcMe** ([MS-OXOMSG] section 2.2.1.18)  Value=0 (FALSE) | 1. 0b 00 00 58 00 00 00 00 |
| Message property **PidTagMessageRecipientMe** ([MS-OXOMSG] section 2.2.1.19)  Value=1 (TRUE) | 1. 0b 00 00 59 01 00 00 00 |
| Message property, **PidTagConversationTopic** ([MS-OXOMSG] section 2.2.1.5)  Number of property values=1  Size of first property=15 | 1. 1e 00 70 00 01 00 00 00 0f 00 00 00 |
| Value="Simple subject" %x00 | 1. 53 69 6D 70 6C 65 20 73 75 62 6A 65 63 74 00 |
| Pad=1 byte | 1. 00 |
| Message property, **PidTagConversationIndex** ([MS-OXOMSG] section 2.2.1.3)  Number of property values=1  Size of first property=22 | 1. 02 01 71 00 01 00 00 00 16 00 00 00 |
| Value | 1. 01 C3 F5 8B 07 63 76 8D 89 1B D0 79 47 C9 8F 66 4E 21 9A D2 4A F2 |
| Pad=2 bytes | 1. 00 00 |
| Message property, **PidTagReceivedByAddressType** ([MS-OXOMSG] section 2.2.1.36)  Number of property values=1  Size of first property=5 | 1. 1e 00 75 00 01 00 00 00 05 00 00 00 |
| Value="SMTP" %x00 | 1. 53 4d 54 50 00 |
| Pad=3 bytes | 1. 00 00 00 |
| Message property, **PidTagReceivedByEmailAddress** ([MS-OXOMSG] section 2.2.1.37)  Number of property values=1  Size of first property=40 | 1. 1e 00 76 00 01 00 00 00 28 00 00 00 |
| Value="Test21uw2@mydomuw2.extest.microsoft.com" %x00 | 1. 54 65 73 74 32 31 75 77 32 40 6D 79 64 6F 6D 75 77 32 2E 65 78 74 65 73 74 2E 6D 69 63 72 6F 73 6F 66 74 2E 63 6F 6D 00 |
| Message property, **PidTagReceivedRepresentingAddressType** ([MS-OXOMSG] section 2.2.1.23)  Number of property values=1  Size of first property=5 | 1. 1e 00 77 00 01 00 00 00 05 00 00 00 |
| Value="SMTP" %x00 | 1. 53 4d 54 50 00 |
| Pad=3 bytes | 1. 00 00 00 |
| Message property, **PidTagReceivedRepresentingEmailAddress** ([MS-OXOMSG] section 2.2.1.24)  Number of property values=1  Size of first property=40 | 1. 1e 00 78 00 01 00 00 00 28 00 00 00 |
| Value="Test21uw2@mydomuw2.extest.microsoft.com" %x00 | 1. 54 65 73 74 32 31 75 77 32 40 6D 79 64 6F 6D 75 77 32 2E 65 78 74 65 73 74 2E 6D 69 63 72 6F 73 6F 66 74 2E 63 6F 6D 00 |
| Message property, **PidTagSenderName** ([MS-OXOMSG] section 2.2.1.51)  Number of property values=1  Size of first property=10 | 1. 1e 00 1A 0C 01 00 00 00 0a 00 00 00 |
| Value="Test21uw2" %x00 | 1. 54 65 73 74 32 31 75 77 32 00 |
| Pad=2 bytes | 1. 00 00 |
| Message property, **PidTagNormalizedSubject** ([MS-OXCMSG] section 2.2.1.10)  Number of property values=1  Size of first property=15 | 1. 1e 00 1D 0E 01 00 00 00 0f 00 00 00 |
| Value="Simple subject" %x00 | 1. 53 69 6D 70 6C 65 20 73 75 62 6A 65 63 74 00 |
| Pad=1 byte | 1. 00 |
| Message property, **PidTagRtfCompressed** ([MS-OXCMSG] section 2.2.1.58.4)  Number of property values=1  Size of first property=150 | 1. 02 01 09 10 01 00 00 00 96 00 00 00 |
| Value | 1. 92 00 00 00 AB 00 00 00 4C 5A 46 75 A8 14 2F 17 03 00 0A 00 72 63 70 67 31 32 35 16 32 00 F8 0B 60 6E 0E 10 30 33 33 4F 01 F7 02 A4 03 E3 02 00 63 68 0A C0 73 B0 65 74 30 20 07 13 02 80 7D 0A 80 9D 00 00 2A 09 B0 09 F0 04 90 61 74 05 B1 1A 52 0D E0 68 09 80 01 D0 20 35 2E 30 35 30 2E 33 13 B0 01 D0 30 32 49 02 80 5C 76 08 90 77 6B 0B 80 64 FA 34 0C 60 63 00 50 0B 03 0B B5 06 00 07 70 C9 0B 50 65 20 07 81 73 61 12 50 0A A2 0B 0A 80 11 E1 00 17 A0 |
| Pad=2 bytes | 1. 00 00 |
| Message property, **PidTagInternetMessageId** ([MS-OXOMSG] section 2.2.1.12)  Number of property values=1  Size of first property=80 | 1. 1e 00 35 10 01 00 00 00 50 00 00 00 |
| Value="<2896107D7E52DF4DB5D10536D  BFEFAD07E37@jeseogpuw2.mydomuw2.  extest.microsoft.com>" %x00 | 1. 3C 32 38 39 36 31 30 37 44 37 45 35 32 44 46 34 44 42 35 44 31 30 35 33 36 44 42 46 45 46 41 44 30 37 45 33 37 40 6A 65 73 65 6F 67 70 75 77 32 2E 6D 79 64 6F 6D 75 77 32 2E 65 78 74 65 73 74 2E 6D 69 63 72 6F 73 6F 66 74 2E 63 6F 6D 3E 00 |
| Message property, **PidTagIconIndex** ([MS-OXOMSG] section 2.2.1.10)  Value=0xFFFFFFFF | 1. 03 00 80 10 ff ff ff ff |
| Unspecified **PtypBinary** property  Number of property values=1  Size of first property=40 | 1. 02 01 f0 10 01 00 00 00 28 00 00 00 |
| Value | 1. 03 00 00 00 01 00 00 00 01 00 00 00 01 00 00 00 01 00 00 00 08 00 00 00 DB 11 00 00 49 53 4F 2D 38 38 35 39 2D 31 00 00 |
| Unspecified property  Number of property values=1  Size of first property=38 | 1. 1f 00 f3 10 01 00 00 00 26 00 00 00 |
| Value="Simple subject.EML" %x00.00 ([**Unicode**](#gt_c305d0ab-8b94-461a-bd76-13b40cb8c4d8)) | 1. 53 00 69 00 6D 00 70 00 6C 00 65 00 20 00 73 00 75 00 62 00 6A 00 65 00 63 00 74 00 2E 00 45 00 4D 00 4C 00 00 00 |
| Pad=2 bytes | 1. 00 00 |
| Message property, **PidTagAttributeHidden** ([[MS-OXCFOLD]](%5bMS-OXCFOLD%5d.pdf#Section_c0f31b95c07f486c98d9535ed9705fbf) section 2.2.2.2.2.1)  Value=0 (FALSE) | 1. 0b 00 f4 10 00 00 00 00 |
| Unspecified **PtypBoolean** ([[MS-OXCDATA]](%5bMS-OXCDATA%5d.pdf#Section_1afa0cd9b1a04520b623bf15030af5d8) section 2.11.1) property  Value=0 (FALSE) | 1. 0b 00 f5 10 00 00 00 00 |
| Message property, **PidTagAttributeReadOnly** ([[MS-OXPROPS]](%5bMS-OXPROPS%5d.pdf#Section_f6ab1613aefe447da49c18217230b148) section 2.612)  Value=0 (FALSE) | 1. 0b 00 f6 10 00 00 00 00 |
| Message property, **PidTagCreationTime** ([MS-OXCMSG] section 2.2.2.3)  Value=Tuesday, 02/17/2004, 20:26:09 | 1. 40 00 07 30 90 24 46 47 94 f5 c3 01 |
| Message property, **PidTagLastModificationTime** ([MS-OXCMSG] section 2.2.2.2)  Value=Tuesday, 02/17/2004, 20:26:09 | 1. 40 00 08 30 90 24 46 47 94 f5 c3 01 |
| Message property, **PidTagInternetCodepage** ([MS-OXCMSG] section 2.2.1.58.6)  Value=(Primary=1252, Secondary=0) | 1. 03 00 de 3f e4 04 00 00 |
| Message property, **PidTagMessageLocaleId** ([MS-OXCMSG] section 2.2.1.5)  Value=(Primary=1033, Secondary=0) | 1. 03 00 f1 3f 09 04 00 00 |
| Message property, **PidTagCreatorName** ([MS-OXPROPS] section 2.657)  Number of property values=1  Size of first property=10 | 1. 1e 00 f8 3f 01 00 00 00 0a 00 00 00 |
| Value="Test21uw2" %x00 | 1. 54 65 73 74 32 31 75 77 32 00 |
| Pad=2 bytes | 1. 00 00 |
| Message property, **PidTagCreatorEntryId** ([MS-OXCMSG] section 2.2.1.31)  Number of property values=1  Size of first property=107 | 1. 02 01 F9 3F 01 00 00 00 6b 00 00 00 |
| Value | 1. 00 00 00 00 DC A7 40 C8 C0 42 10 1A B4 B9 08 00 2B 2F E1 82 01 00 00 00 00 00 00 00 2F 4F 3D 46 49 52 53 54 20 4F 52 47 41 4E 49 5A 41 54 49 4F 4E 2F 4F 55 3D 46 49 52 53 54 20 41 44 4D 49 4E 49 53 54 52 41 54 49 56 45 20 47 52 4F 55 50 2F 43 4E 3D 52 45 43 49 50 49 45 4E 54 53 2F 43 4E 3D 54 45 53 54 32 31 55 57 32 00 |
| Pad=1 byte | 1. 00 |
| Message property, **PidTagLastModifierName** ([[MS-OXCPRPT]](%5bMS-OXCPRPT%5d.pdf#Section_302967c881d54ec58319cccc14a76bb5) section 2.2.1.5)  Number of property values=1  Size of first property=10 | 1. 1e 00 fa 3f 01 00 00 00 0a 00 00 00 |
| Value="Test21uw2" %x00 | 1. 54 65 73 74 32 31 75 77 32 00 |
| Pad=2 bytes | 1. 00 00 |
| Message property, **PidTagLastModifierEntryId** ([MS-OXCMSG] section 2.2.1.32)  Number of property values=1  Size of first property=107 | 1. 02 01 FB 3F 01 00 00 006b 00 00 00 |
| Value | 1. 00 00 00 00 DC A7 40 C8 C0 42 10 1A B4 B9 08 00 2B 2F E1 82 01 00 00 00 00 00 00 00 2F 4F 3D 46 49 52 53 54 20 4F 52 47 41 4E 49 5A 41 54 49 4F 4E 2F 4F 55 3D 46 49 52 53 54 20 41 44 4D 49 4E 49 53 54 52 41 54 49 56 45 20 47 52 4F 55 50 2F 43 4E 3D 52 45 43 49 50 49 45 4E 54 53 2F 43 4E 3D 54 45 53 54 32 31 55 57 32 00 |
| Pad=1 byte | 1. 00 |
| Message property, **PidTagMessageCodepage** ([MS-OXCMSG] section 2.2.1.4)  Value=(Primary=1252, Secondary=0) | 1. 03 00 fd 3f e4 04 00 00 |
| Unspecified message property  Value=0 | 1. 03 00 19 40 00 00 00 00 |
| Message property, **PidTagSentRepresentingFlags** ([MS-OXPROPS] section 2.1016)  Value=0 | 1. 03 00 1A 40 00 00 00 00 |
| Unspecified message property  Value=0 | 1. 03 00 1B 40 00 00 00 00 |
| Unspecified message property,  Value=0 | 1. 03 00 1C 40 00 00 00 00 |
| Unspecified **PtypString** ([MS-OXCDATA] section 2.11.1) property  Number of property values=1  Size of first property=10 | 1. 1e 00 30 40 01 00 00 00 0a 00 00 00 |
| Value="Test21uw2" %x00 | 1. 54 65 73 74 32 31 75 77 32 00 |
| Pad=2 bytes | 1. 00 00 |
| Unspecified **PtypString** property  Number of property values=1  Size of first property=10 | 1. 1e 00 31 40 01 00 00 00 0a 00 00 00 |
| Value="Test21uw2" %x00 | 1. 54 65 73 74 32 31 75 77 32 00 |
| Pad=2 bytes | 1. 00 00 |
| Unspecified **PtypString** property  Number of property values=1  Size of first property=10 | 1. 1e 00 34 40 01 00 00 00 0a 00 00 00 |
| Value="Test21uw2" %x00 | 1. 54 65 73 74 32 31 75 77 32 00 |
| Pad=2 bytes | 1. 00 00 |
| Unspecified **PtypString** property  Number of property values=1  Size of first property=10 | 1. 1e 00 35 40 01 00 00 00 0a 00 00 00 |
| Value="Test21uw2" %x00 | 1. 54 65 73 74 32 31 75 77 32 00 |
| Pad=2 bytes | 1. 00 00 |
| Unspecified **PtypString** property  Number of property values=1  Size of first property=10 | 1. 1e 00 38 40 01 00 00 00 0a 00 00 00 |
| Value="Test21uw2" %x00 | 1. 54 65 73 74 32 31 75 77 32 00 |
| Pad=2 bytes | 1. 00 00 |
| Unspecified **PtypString** property  Number of property values=1  Size of first property=10 | 1. 1e 00 39 40 01 00 00 00 0a 00 00 00 |
| Value="Test21uw2" %x00 | 1. 54 65 73 74 32 31 75 77 32 00 |
| Pad=2 bytes | 1. 00 00 |
| Message property, **PidTagContentFilterSpamConfidenceLevel** ([[MS-OXCSPAM]](%5bMS-OXCSPAM%5d.pdf#Section_522f85874aed4cd6831b40bd87862189) section 2.2.1.3)  Value=0xFFFFFFFF | 1. 03 00 76 40 ff ff ff ff |
| Message property, **PidTagMessageEditorFormat** ([MS-OXOMSG] section 2.2.1.78)  Value=0x00000003 | 1. 03 00 09 59 03 00 00 00 |
| Message property, **PidTagTnefCorrelationKey** ([MS-OXCMSG] section 2.2.1.29)  Number of property values=1  Size of first property=12 | 1. 02 01 7f 00 01 00 00 00 0c 00 00 00 |
| Value | 1. 38 71 6b 6a 30 30 73 67 6d 34 66 00 |
| Message property, **PidLidAgingDontAgeMe** ([MS-OXCMSG] section 2.2.1.33)  PSETID\_Common, MNID\_ID,  Id=0x850E  Value=0 | 1. 0b 00 87 81 08 20 06 00 00 00 00 00 c0 00 00 00 00 00 00 46 00 00 00 00 0e 85 00 00 00 00 00 00 |
| Message property, **PidLidCurrentVersion** ([MS-OXCMSG] section 2.2.1.34)  PSETID\_Common, MNID\_ID,  Id=0x8552  Value=115608 | 1. 03 00 9f 81 08 20 06 00 00 00 00 00 c0 00 00 00 00 00 00 46 00 00 00 00 52 85 00 00 98 c3 01 00 |
| Message property, **PidLidCurrentVersionName** ([MS-OXCMSG] section 2.2.1.35)  PSETID\_Common, MNID\_ID,  Id=0x8554  Number of property values=1  Size of first property=5 | 1. 1E 00 A0 81 08 20 06 00 00 00 00 00 c0 00 00 00 00 00 00 46 00 00 00 00 54 85 00 00 01 00 00 00 05 00 00 00 |
| Value="11.0" %x00 | 1. 31 31 2E 30 00 |
| Pad=3 bytes | 1. 00 00 00 |
| Message property, **PidLidReminderDelta** ([[MS-OXORMDR]](%5bMS-OXORMDR%5d.pdf#Section_5454ebcce5d14da8a598d393b101caab) section 2.2.1.3)  PSETID\_Common, MNID\_ID,  Id=0x8501  Value=0 | 1. 03 00 eb 81 08 20 06 00 00 00 00 00 c0 00 00 00 00 00 00 46 00 00 00 00 01 85 00 00 00 00 00 00 |
| Message property, **PidLidReminderSet** ([MS-OXORMDR] section 2.2.1.1)  PSETID\_Common, MNID\_ID,  Id=0x8503  Value=0 (FALSE) | 1. 0b 00 f0 81 08 20 06 00 00 00 00 00 c0 00 00 00 00 00 00 46 00 00 00 00 03 85 00 00 00 00 00 00 |
| Message property, **PidLidSideEffects** ([MS-OXCMSG] section 2.2.1.16)  PSETID\_Common, MNID\_ID,  Id=0x8510  Value=0 | 1. 03 00 fa 81 08 20 06 00 00 00 00 00 c0 00 00 00 00 00 00 46 00 00 00 00 10 85 00 00 00 00 00 00 |
| Message property, **PidLidTaskMode** ([[MS-OXOTASK]](%5bMS-OXOTASK%5d.pdf#Section_55600ec061954730843659c7931ef27e) section 2.2.2.2.1)  PSETID\_Common, MNID\_ID,  Id=0x8518  Value=0 | 1. 03 00 01 82 08 20 06 00 00 00 00 00 c0 00 00 00 00 00 00 46 00 00 00 00 18 85 00 00 00 00 00 00 |
| Message property, **PidLidPrivate** ([MS-OXCMSG] section 2.2.1.15)  PSETID\_Common, MNID\_ID,  Id=0x8506  Value=0 (FALSE) | 1. 0b 00 43 82 08 20 06 00 00 00 00 00 c0 00 00 00 00 00 00 46 00 00 00 00 06 85 00 00 00 00 00 00 |
| Message property, **PidLidUseTnef** ([MS-OXOMSG] section 2.2.1.66)  PSETID\_Common, MNID\_ID,  Id=0x8582  Value=0 (FALSE) | 1. 0b 00 44 82 08 20 06 00 00 00 00 00 c0 00 00 00 00 00 00 46 00 00 00 00 82 85 00 00 00 00 00 00 |
| Message property, **PidTagReadReceiptRequested** ([MS-OXOMSG] section 2.2.1.29)  Value=0 (FALSE) | 1. 0b 00 29 00 00 00 00 00 |
| Message property, **PidTagOriginatorDeliveryReportRequested** ([MS-OXOMSG] section 2.2.1.20)  Value=0 (FALSE) | 1. 0b 00 23 00 00 00 00 00 |
| Unspecified **PtypInteger32** ([MS-OXCDATA] section 2.11.1) property  Value=0xF00D29FF | 1. 03 00 06 10 ff 29 0d f0 |
| Unspecified **PtypInteger32** property  Value=13 | 1. 03 00 07 10 0d 00 00 00 |
| Unspecified **PtypInteger32** property  Value=0 | 1. 03 00 10 10 00 00 00 00 |
| Unspecified **PtypInteger32** property  Value=0 | 1. 03 00 11 10 00 00 00 00 |
| Unspecified **PtypString** property  Number of property values=1  Size of first property=14 | 1. 1e 00 08 10 01 00 00 00 0e 00 00 00 |
| Value="SIMPLEMESSAGE" %x00 | 1. 53 49 4d 50 4c 45 4d 45 53 53 41 47 45 00 |
| Pad=2 bytes | 1. 00 00 |
| Message property, **PidTagTnefCorrelationKey** ([MS-OXCMSG] section 2.2.1.29)  Number of property values=1  Size of first property=56 | 1. 02 01 7f 00 01 00 00 00 38 00 00 00 |
| Value | 1. 3C 32 38 39 36 31 30 37 44 37 45 35 32 44 46 34 44 42 35 44 31 30 35 33 36 44 42 46 45 46 41 44 30 37 45 33 37 40 75 73 65 72 2E 65 78 61 6D 70 6C 65 2E 63 6F 6D 3E 00 |
| Checksum for **AttMsgProps** | 1. 45 C1 |

## Sample Meeting Response

This example is particularly short, as it was sent by a mobile application.

| Explanation of content | Byte stream |
| --- | --- |
| TNEF Signature, Value=0x223E9F78 | 1. 78 9f 3e 22 |
| Attach Key, Value=0x0001 | 1. 01 00 |
| Message attribute, **attTnefVersion**  Length=4 bytes | 1. 01 06 90 08 00 04 00 00 00 |
| Value=0x00010000 | 1. 00 00 01 00 |
| Checksum=0x0001 | 1. 01 00 |
| Message attribute, **attOemCodepage**  Length=8 bytes | 1. 01 07 90 06 00 08 00 00 00 |
| Value= (Primary=1252, Secondary=0) | 1. e4 04 00 00 00 00 00 00 |
| Checksum=0x00E8 | 1. e8 00 |
| Message attribute, **attMessageClass**  Length=32 bytes | 1. 01 08 80 07 00 20 00 00 00 |
| Value="IPM.Microsoft Schedule.MtgRespN" %x00 | 1. 49 50 4d 2e 4d 69 63 72 6f 73 6f 66 74 20 53 63 68 65 64 75 6c 65 2e 4d 74 67 52 65 73 70 4e 00 |
| Checksum=0x0B55 | 1. 55 0b |
| Message attribute, **attPriority**  Length=2 bytes | 1. 01 0d 80 04 00 02 00 00 00 |
| Value=0x0002 (Normal Priority) | 1. 02 00 |
| Checksum=0x0002 | 1. 02 00 |
| Message attribute, **attDateSent**  Length=14 bytes | 1. 01 05 80 03 00 0e 00 00 00 |
| Value= Wednesday, 01/16/2008, 23:28:08 | 1. d8 07 01 00 10 00 17 00 1c 00 08 00 03 00 |
| Checksum=0x012E | 1. 2e 01 |
| Message attribute, **attDateModified**  Length=14 bytes | 1. 01 20 80 03 000e 00 00 00 |
| Value= Wednesday, 01/16/2008, 23:28:08 | 1. d8 07 01 00 10 00 17 00 1c 00 08 00 03 00 |
| Checksum=0x012E | 1. 2e 01 |
| Message attribute Encapsulation, **attMsgProps**  Length=136 bytes  Number of properties=2 | 1. 01 03 90 06 00 88 00 00 00 02 00 00 00 |
| Message property, **PidTagTnefCorrelationKey** ([[MS-OXCMSG]](%5bMS-OXCMSG%5d.pdf#Section_7fd7ec40deec4c0694931bc06b349682) section 2.2.1.29)  Number of property values=1  Size of first property=12 | 1. 02 01 7f 00 01 00 00 00 0c 00 00 00 |
| Value | 1. 38 71 6b 6a 30 30 73 67 6d 34 66 00 |
| Message property, **PidTagRtfCompressed** ([MS-OXCMSG] section 2.2.1.58.4)  Number of property values=1  Size of first property=93 | 1. 02 01 09 10 01 00 00 00 5d 00 00 00 |
| Value | 1. 59 00 00 00 b3 00 00 00 4c 5a 46 75 a9 be bb ed 87 00 0a 01 0d 03 43 74 65 78 74 01 f7 ff 02 a4 03 e4 05 eb 02 83 00 50 02 f3 06 b4 02 83 26 32 03 c5 02 00 63 68 0a c0 73 65 d8 74 30 20 07 13 02 80 7d 0a 80 08 cf 3f 09 d9 02 80 0a 84 0b 37 12 c2 01 d0 20 46 10 59 49 00 7d 18 20 |
| Pad=3 bytes | 1. 00 00 00 |
| Checksum for **attMsgProps** | 1. f7 21 |

# Security

## Security Considerations for Implementers

Extreme care is recommended in the use of the **attRecipTable** attribute and the **attFrom** attribute, particularly by the [**TNEF Reader**](#gt_bc53d521-7e22-4fb2-b8f4-76bb81dbaffe), to avoid address or identity spoofing. More information about this can be found in [[MS-OXCMSG]](%5bMS-OXCMSG%5d.pdf#Section_7fd7ec40deec4c0694931bc06b349682) and section [2.1.3.5.2](#Section_a9f03e7298f4488eacf5198906a83478) of this specification.

## Index of Security Parameters

None.

# Appendix A: Product Behavior

The information in this specification is applicable to the following Microsoft products or supplemental software. References to product versions include updates to those products.

* Microsoft Exchange Server 2003
* Microsoft Exchange Server 2007
* Microsoft Exchange Server 2010
* Microsoft Exchange Server 2013
* Microsoft Exchange Server 2016
* Microsoft Office Outlook 2003
* Microsoft Office Outlook 2007
* Microsoft Outlook 2010
* Microsoft Outlook 2013
* Microsoft Outlook 2016
* Microsoft Exchange Server 2019
* Microsoft Outlook 2019
* Microsoft Outlook 2021
* Microsoft Outlook LTSC 2024

Exceptions, if any, are noted in this section. If an update version, service pack or Knowledge Base (KB) number appears with a product name, the behavior changed in that update. The new behavior also applies to subsequent updates unless otherwise specified. If a product edition appears with the product version, behavior is different in that product edition.

Unless otherwise specified, any statement of optional behavior in this specification that is prescribed using the terms "SHOULD" or "SHOULD NOT" implies product behavior in accordance with the SHOULD or SHOULD NOT prescription. Unless otherwise specified, the term "MAY" implies that the product does not follow the prescription.

[<1> Section 2.1.3.3.9](#Appendix_A_Target_1): Exchange 2003 supports the use of the **attBody** attribute.

[<2> Section 2.1.3.3.18](#Appendix_A_Target_2): Exchange 2003 supports the use of the **attDelegate** attribute.

[<3> Section 2.2.3.6](#Appendix_A_Target_3): In Exchange 2003, the [**TNEF Writer**](#gt_04cfbf0c-5ac3-4091-bd57-7da94f45c485) writes the **attBody** attribute when TNEF is used to encode an attached message.

[<4> Section 2.2.3.10](#Appendix_A_Target_4): In Exchange 2003, the TNEF Writer does not set the **DataFlags** field to **FileDataDefault**.

[<5> Section 2.2.3.10](#Appendix_A_Target_5): In Exchange 2003, the TNEF Writer sets the **FileDataMacBinary** bit if the **PidTagAttachEncoding** property ([[MS-OXCMSG]](%5bMS-OXCMSG%5d.pdf#Section_7fd7ec40deec4c0694931bc06b349682) section 2.2.2.20) for the attachment consists of bytes %x2A.86.48.86.F7.14.03.0B.01.

# Change Tracking

This section identifies changes that were made to this document since the last release. Changes are classified as Major, Minor, or None.

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.
* A document revision that captures changes to protocol functionality.

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 **None** means that no new technical changes were introduced. Minor editorial and formatting changes may have been made, but the relevant technical content is identical to the last released version.

The changes made to this document are listed in the following table. For more information, please contact [dochelp@microsoft.com](mailto:dochelp@microsoft.com).

| Section | Description | Revision class |
| --- | --- | --- |
| [5](#Section_a59fe66f231e4ee28a6a9dc344bc5873) Appendix A: Product Behavior | Updated list of supported products. | Major |

# Index

A

[Applicability](#section_882c70ec904441e49465b1f0341fd7ff) 9

C

[Change tracking](#section_55ac43a41ec34c468af702c5813e6103) 50

Common

[overview](#section_151b09df735b4dacae7409787d879542) 10

Common - processing rules

[Processing Rules - common](#section_3193b9ff7a824873a3df9d9d6f83fae4) 10

E

Examples

[Sample Meeting Response](#section_00d0b8f7d9fa4193a09c826313adad64) 45

[Sample Message](#section_7fdb64ee7f634d959af1c672e7475c3a) 31

G

[Glossary](#section_46e82779d04d4e42829df09062c3d330) 6

I

[Implementer - security considerations](#section_10348d955e35448cb9dd2f3e1d2b67ab) 48

[Index of security parameters](#section_e675de0bddbb4ef4a95518143077fb2f) 48

[Informative references](#section_388318d980f144d7afe133846efb0f2c) 8

[Introduction](#section_3f7f977a3db147408d0ed2eb805984c0) 6

N

[Normative references](#section_e31aa23b02f64cf58e2e2a4a5835206b) 8

O

[Overview (synopsis)](#section_600cc241ac5b483bbb384efdbbe4dc2e) 8

P

[Parameters - security index](#section_e675de0bddbb4ef4a95518143077fb2f) 48

[Product behavior](#section_a59fe66f231e4ee28a6a9dc344bc5873) 49

R

References

[informative](#section_388318d980f144d7afe133846efb0f2c) 8

[normative](#section_e31aa23b02f64cf58e2e2a4a5835206b) 8

Relationship to

other protocols

Relationship to

[other algorithms](#section_84819d532d1c47e8ab58c8b1f324e9f8) 9

S

[Sample Meeting Response example](#section_00d0b8f7d9fa4193a09c826313adad64) 45

[Sample Message example](#section_7fdb64ee7f634d959af1c672e7475c3a) 31

Security

[implementer considerations](#section_10348d955e35448cb9dd2f3e1d2b67ab) 48

[parameter index](#section_e675de0bddbb4ef4a95518143077fb2f) 48

[Standards assignments](#section_ab2582a101f843feb6c6c51d6bf49740) 9

T

TNEF Reader

[overview](#section_f466d116e86d4cdba52d74969e354f77) 27

TNEF Reader - processing rules

[Processing Rules - TNEF Reader](#section_2faab00b610f4af8aad2917930f25d4a) 27

TNEF Writer

[overview](#section_686b951a4de44f19bc84a0a0f0670273) 24

TNEF Writer - processing rules

[Processing Rules - TNEF Writer](#section_358b96b952894c249e4f0604b4a03458) 24

[Tracking changes](#section_55ac43a41ec34c468af702c5813e6103) 50