
Outlook 2003/2007 NK2 File Format and Developer Guidelines

This post explains how Microsoft® Office Outlook® 2007 interacts with the nickname cache file, also known as the “.nk2 file.” The .nk2 file is where Outlook 2007 persists the autocomplete list, which is the list of names that displays in the **To**, **Cc**, and **Bcc** edit boxes while composing an e-mail. This post also discusses the binary format of the file and the recommended ways for interacting with the .nk2 file.

This blog post should contain sufficient information to support reading and modifying the .nk2 file.

You can use any programming language to write your application because there are no dependencies on the Outlook object model or MAPI APIs.

Outlook 2007 Interaction with the .nk2 file

When a user logs on to Outlook 2007, Outlook reads the user’s MAPI Profile. Later, when the autocomplete list is shown, the .nk2 file is loaded. The .nk2 file has the same name as the profile that was used to log on, typically *outlook.nk2*, in the default scenario.

This file can be found here:

```
%APPDATA%\Microsoft\Outlook
```

Outlook 2007 interacts with the .nk2 file in two ways:

1. Loading the .nk2 file.
2. And, later, saving the .nk2 file.

Loading the .nk2 file

Outlook 2007 loads the .nk2 file when any item with addressing functionality gets initialized. For example, e-mail addresses are used in a new mail, a mail reply, a contact item, a meeting request, etc. To load, Outlook 2007 reads all of the contents of the file as a binary stream into a structure in memory.

For autocomplete operations, Outlook interacts exclusively with this in-memory structure for the duration of the *outlook.exe* process lifetime. Outlook 2007 **does not interact with the .nk2 file** in any additional ways until it saves the in-memory structure back to disk on shutdown.

Saving the .nk2 file

Outlook 2007 saves the .nk2 file on shutdown if the autocomplete list has changed in any way.

Here are the ways that the autocomplete list gets changed:

- A new nickname entry is added through resolving a name, picking a recipient from the address book dialog, or sending mail to a recipient that was not already in the list.
- An entry is modified by sending mail to an existing recipient in the list.

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- An entry is removed by the user through the UI.
 - Other minor scenarios not relevant to this blog post

Outlook 2007 does not save the .nk2 file on shutdown if the autocomplete list has not changed. The save involves writing the in-memory structure to the .nk2 file as a binary stream.

If the size of the .nk2 file contents shrink during an Outlook session (for example, the user deletes some entries), Outlook saves the new contents to the file, but the file itself will not shrink in size.

Recommendations

- Never partially modify the .nk2 file. The supported interaction is to 1) read the entire file into memory, 2) modify the memory structure, and 3) write out the entire file when the modifications are finished.
- We recommend locking the file from modification by other processes while you're reading it and writing it using standard Windows file locking APIs (e.g. **LockFile** in C/C++ and **FileStream.Lock** in C#).
- Don't interact with the .nk2 file while Outlook is running. If Outlook is running while you modify the file, Outlook will likely overwrite your changes when it shuts down.
- **Do not write properties of type PT_MV_UNICODE and PR_MV_STRING8 into an .nk2 file to be consumed by Outlook 2003.** These properties are only understood by Outlook 2007.
- **Do not write properties of types that are not mentioned in this document.**

NK2 File Format

In addition to knowing how Outlook interacts with the .nk2 file, you must also understand the binary file format of the .nk2 file.

The .nk2 file is a set of recipient property rows that are saved as a binary stream along with some bookkeeping metadata that is used only by Outlook 2007 and Outlook 2003.

The metadata is relevant to Outlook's interactions with the .nk2 file so third parties must preserve what is in each metadata block when saving a modified .nk2 file. In other words, third parties should modify only the row-set portion of the binary format and preserve what was already in the metadata blocks of the file.

When creating a new .nk2 file from scratch, use the metadata values from the binary example below to populate the metadata in the new file.

File Visualization

The high-level layout of the file looks like this:

Metadata (12 bytes)

Number of rows n (4 bytes)

Number of properties p in row one (4 bytes)

Property 1's property tag (4 bytes)

Property 1's reserved data (4 bytes)

Property 1's value union (8 bytes)

Property 1's value data (0 or variable bytes)

... (property 2 through property $P-1$)

Property p 's property tag (4 bytes)

Property p 's reserved data (4 bytes)

Property p 's value union (8 bytes)

Property p 's value data (0 or variable bytes)

Number of properties q in row two (4 bytes)

... (row two's properties)

... (row 3 through row $n-1$)

Number of properties r in row n (4 bytes)

... (row n 's properties)

Metadata (12 bytes)

For an example of a binary file structure, see [here](#).

High-level Layout

Broadly speaking, this is the layout of the .nk2 file:

Value Data	Number of Bytes
Metadata	12
Row-set	Variable
Metadata	12

Row-set Layout

The row-set layout is as follows:

Value Data	Number of Bytes
Number of rows	4
Rows	Variable

The number of rows identifies how many rows will come in the next part of the binary stream sequence.

Row Layout

Each row is of the following format:

Value Data	Number of Bytes
Number of properties	4
Properties	Variable

The number of properties identifies how many properties will come in the next part of the binary stream sequence.

Property Layout

Each property is of the following format:

Value Data	Number of Bytes
Property Tag	4
Reserved Data	4
Property Value Union	8
Value Data	0 or variable (depending on the prop tag)

Interpreting the Property Value

The Property Value Union and the Value Data are to be interpreted based on the property tag in the first 4 bytes of the property block. This property tag is in the same format as a MAPI property tag. Bits 0 through 15 of the property tag are the property's type. Bits 16 through 31 are the property's identifier. The property type determines how the rest of the property should be read.

Static Values

Some properties have no Value Data and only have data in the union. The following property types (which come from the Property Tag) should interpret the 8-byte Property Union data as follows:

Prop Type	Property Union Interpretation
PT_I2	short int
PT_LONG	long
PT_R4	float
PT_DOUBLE	double
PT_BOOLEAN	short int
PT_SYSTIME	FILETIME
PT_I8	LARGE_INTEGER

Dynamic Values

Other properties have data in a Value Data block after the first 16 bytes that contain the Property Tag, the Reserved Data, and the Property Value Union. Unlike static values, the data stored in the 8 byte Property Value union is irrelevant on reading. When writing, make sure to fill these 8 bytes with something, but the content of the 8 bytes doesn't matter. In dynamic values, the property tag's type determines how to interpret the Value Data.

PT_STRING8

Value Data	Number of Bytes
Number of bytes n	4
Bytes to be interpreted as an ANSI string (includes NULL terminator)	n

PT_UNICODE

Value Data	Number of Bytes
Number of bytes n	4
Bytes to be interpreted as a UNICODE string (includes NULL	n

terminator)	
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PT_CLSID

Value Data	Number of Bytes
Bytes to be interpreted as a GUID	16

PT_BINARY

Value Data	Number of Bytes
Number of bytes n	4
Bytes to be interpreted as a byte array	n

PT_MV_BINARY

Value Data	Number of Bytes
Number of binary arrays X	4
A run of bytes containing X binary arrays. Each array should be interpreted like the PT_BINARY byte run described above.	Variable

PT_MV_STRING8 (Outlook 2007)

Value Data	Number of Bytes
Number of ANSI strings X	4
A run of bytes containing X ANSI strings. Each string should be interpreted like the PT_STRING8 byte run described above.	Variable

PT_MV_UNICODE (Outlook 2007)

Value Data	Number of Bytes
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Number of UNICODE strings X	4
A run of bytes containing X UNICODE strings. Each string should be interpreted like the PT_UNICODE byte run described above.	Variable

For an example of a binary file structure, see [here](#).

Significant properties

As mentioned above, the binary blocks that represent properties have property tags that correspond to properties on address book recipients. For properties that aren't listed here, you can look up the property description at [http://msdn.microsoft.com/en-us/library/cc433490\(EXCHG.80\).aspx](http://msdn.microsoft.com/en-us/library/cc433490(EXCHG.80).aspx).

The properties below are the minimum set of properties necessary for a row to be valid. Therefore, new rows added to the .nk2 file must be populated with the properties below.

Property Name	Property Tag	Description (see MSDN for more details)
PR_NICK_NAME_W (not transmitted on recipients, specific to .nk2 file only)	0x6001001F	This property must be first in each recipient row. Functionally serves as a key identifier for the recipient row.
PR_ENTRYID	0x0FFF0102	The address book entry identifier for the recipient.
PR_DISPLAY_NAME_W	0x3001001F	The recipient's display name.
PR_EMAIL_ADDRESS_W	0x3003001F	The recipient's e-mail address (e.g. johndoe@contoso.com or /o=Contoso/OU=Foo/cn=Recipients/cn=johndoe).
PR_ADDRTYPE_W	0x3002001F	The recipient's address type (e.g. SMTP or EX).
PR_SEARCH_KEY	0x300B0102	The recipient's MAPI search key.
PR_SMTP_ADDRESS_W	0x39FE001F	The recipient's SMTP address.
PR_OBJECT_TYPE	0x0FFE0003	Represents the type of this recipient. Values can either be MAPI_MAILUSER or

		MAPI_DISTLIST.
PR_DISPLAY_TYPE	0x39000003	Similar to PR_OBJECT_TYPE, but it's used by Outlook's UI to determine how to display the recipient (for example, bolding a distribution list). Common values for this are DT_DISTLIST and DT_MAILUSER.
PR_NEW_NICK_NAME (not transmitted on recipients, specific to .nk2 file only)	0x6002000B	Specifies whether this row was just added to the nickname cache or not. If you are creating a new row, this should be set to true.
PR_DROPDOWN_DISPLAY_NAME_W (not transmitted on recipients, specific to .nk2 file only)	0x6003001F	The display string that shows up in the autocomplete list.
PR_NICK_NAME_WEIGHT (not transmitted on recipients, specific to .nk2 file only)	0x60040003	The weight of this autocomplete entry. The weight is used to determine in what order autocomplete entries show up when matching the autocomplete list. Entries with higher weight will show before entries with lower weight. The entire autocomplete list is sorted by this property. The weight periodically decreases over time and increases when the user sends an e-mail to this recipient. See the description below for more information about this property.

PR_NICK_NAME_WEIGHT

The set of rows in the .nk2 file is sorted in descending order by the PR_NICK_NAME_WEIGHT property and the .nk2 file should always preserve this sorted characteristic. Therefore, any changes to a row's weight should also ensure that the row's position retains the sorted order of the entire set of rows. Any additions to the row-set should be inserted to the proper position to maintain the sorted order.

The minimum value of this weight is 0x1 and the maximum value is LONG_MAX. Any other values for the weight are considered invalid.

When Outlook 2007 sends a mail to or resolves a recipient, it will increase that recipient's weight by 0x2000.

Binary Example

The following binary is an example of an .nk2 with two SMTP recipients in it: johndoe@contoso.com and janesmith@contoso.org.

```
00000000h: 0D F0 AD BA 0A 00 00 00 01 00 00 00 02 00 00 00
00000010h: 17 00 00 00 1F 00 01 60 90 FD 13 00 80 1A E3 04
00000020h: 00 00 00 00 2C 00 00 00 6A 00 61 00 6E 00 65 00
00000030h: 73 00 6D 00 69 00 74 00 68 00 40 00 63 00 6F 00
00000040h: 6E 00 74 00 6F 00 73 00 6F 00 2E 00 6F 00 72 00
00000050h: 67 00 00 00 03 00 15 0C 69 00 74 00 01 00 00 00
00000060h: 63 00 6F 00 0A 00 FE 39 69 00 61 00 0F 01 04 80
00000070h: 65 00 43 00 0A 00 00 3A 2D 00 31 00 0F 01 04 80
00000080h: 00 00 00 00 03 00 71 3A 40 32 1A 39 00 00 00 00
00000090h: F4 FC 5F 03 0B 00 40 3A 90 1E 1C 02 00 00 00 00
000000a0h: D0 FC 5F 03 03 00 00 39 00 00 00 00 00 00 00 00
000000b0h: 90 1E 1C 02 02 01 0B 30 CD A2 60 32 1B 00 00 00
000000c0h: AC 1A E3 04 1B 00 00 00 53 4D 54 50 3A 4A 41 4E
000000d0h: 45 53 4D 49 54 48 40 43 4F 4E 54 4F 53 4F 2E 4F
000000e0h: 52 47 00 02 01 F9 0F 80 06 AC 00 7A 00 00 00 C7
000000f0h: 1A E3 04 7A 00 00 00 00 00 00 81 2B 1F A4 BE
00000100h: A3 10 19 9D 6E 00 DD 01 0F 54 02 00 00 01 90 6A
00000110h: 00 61 00 6E 00 65 00 73 00 6D 00 69 00 74 00 68
00000120h: 00 40 00 63 00 6F 00 6E 00 74 00 6F 00 73 00 6F
00000130h: 00 2E 00 6F 00 72 00 67 00 00 00 53 00 4D 00 54
00000140h: 00 50 00 00 00 6A 00 61 00 6E 00 65 00 73 00 6D
00000150h: 00 69 00 74 00 68 00 40 00 63 00 6F 00 6E 00 74
00000160h: 00 6F 00 73 00 6F 00 2E 00 6F 00 72 00 67 00 00
00000170h: 00 02 01 FF 0F 76 05 00 00 7A 00 00 00 41 1B E3
00000180h: 04 7A 00 00 00 00 00 00 81 2B 1F A4 BE A3 10
00000190h: 19 9D 6E 00 DD 01 0F 54 02 00 00 01 90 6A 00 61
000001a0h: 00 6E 00 65 00 73 00 6D 00 69 00 74 00 68 00 40
000001b0h: 00 63 00 6F 00 6E 00 74 00 6F 00 73 00 6F 00 2E
000001c0h: 00 6F 00 72 00 67 00 00 00 53 00 4D 00 54 00 50
000001d0h: 00 00 00 6A 00 61 00 6E 00 65 00 73 00 6D 00 69
000001e0h: 00 74 00 68 00 40 00 63 00 6F 00 6E 00 74 00 6F
000001f0h: 00 73 00 6F 00 2E 00 6F 00 72 00 67 00 00 00 03
```

00000200h: 00 FE 0F 94 FC 5F 03 06 00 00 00 30 70 22 07 1F
00000210h: 00 03 30 2A AE 60 32 BB 1B E3 04 3C 31 AC 00 2C
00000220h: 00 00 00 6A 00 61 00 6E 00 65 00 73 00 6D 00 69
00000230h: 00 74 00 68 00 40 00 63 00 6F 00 6E 00 74 00 6F
00000240h: 00 73 00 6F 00 2E 00 6F 00 72 00 67 00 00 00 1F
00000250h: 00 02 30 3C 31 AC 00 E7 1B E3 04 7C FC 5F 03 0A
00000260h: 00 00 00 53 00 4D 00 54 00 50 00 00 00 1F 00 01
00000270h: 30 00 00 00 00 F1 1B E3 04 FF FF 00 00 2C 00 00
00000280h: 00 6A 00 61 00 6E 00 65 00 73 00 6D 00 69 00 74
00000290h: 00 68 00 40 00 63 00 6F 00 6E 00 74 00 6F 00 73
000002a0h: 00 6F 00 2E 00 6F 00 72 00 67 00 00 00 03 00 FF
000002b0h: 5F 00 00 00 00 00 00 00 00 00 00 00 03 00 DE
000002c0h: 5F 4F 00 75 00 00 00 00 00 00 00 00 03 00 FD
000002d0h: 5F 41 00 64 00 01 00 00 00 00 00 00 1F 00 F6
000002e0h: 5F 42 00 6F 00 1D 1C E3 04 00 00 00 00 2C 00 00
000002f0h: 00 6A 00 61 00 6E 00 65 00 73 00 6D 00 69 00 74
00000300h: 00 68 00 40 00 63 00 6F 00 6E 00 74 00 6F 00 73
00000310h: 00 6F 00 2E 00 6F 00 72 00 67 00 00 00 02 01 F7
00000320h: 5F AA 0A 18 C7 7A 00 00 00 49 1C E3 04 7A 00 00
00000330h: 00 00 00 00 00 81 2B 1F A4 BE A3 10 19 9D 6E 00
00000340h: DD 01 0F 54 02 00 00 01 90 6A 00 61 00 6E 00 65
00000350h: 00 73 00 6D 00 69 00 74 00 68 00 40 00 63 00 6F
00000360h: 00 6E 00 74 00 6F 00 73 00 6F 00 2E 00 6F 00 72
00000370h: 00 67 00 00 00 53 00 4D 00 54 00 50 00 00 00 6A
00000380h: 00 61 00 6E 00 65 00 73 00 6D 00 69 00 74 00 68
00000390h: 00 40 00 63 00 6F 00 6E 00 74 00 6F 00 73 00 6F
000003a0h: 00 2E 00 6F 00 72 00 67 00 00 00 03 00 DF 5F 80
000003b0h: 19 44 04 00 00 00 00 58 FD 13 00 0B 00 02 60 90
000003c0h: FD 13 00 00 00 00 00 16 00 00 00 1F 00 03 60 30
000003d0h: CF 02 05 C3 1C E3 04 16 00 00 00 2C 00 00 00 6A
000003e0h: 00 61 00 6E 00 65 00 73 00 6D 00 69 00 74 00 68
000003f0h: 00 40 00 63 00 6F 00 6E 00 74 00 6F 00 73 00 6F
00000400h: 00 2E 00 6F 00 72 00 67 00 00 00 03 00 04 60 C7
00000410h: 44 10 30 00 40 00 00 E9 FF FF 7F 17 00 00 00 1F
00000420h: 00 01 60 90 FD 13 00 38 F4 E2 04 00 00 00 00 28
00000430h: 00 00 00 6A 00 6F 00 68 00 6E 00 64 00 6F 00 65

00000440h: 00 40 00 63 00 6F 00 6E 00 74 00 6F 00 73 00 6F
00000450h: 00 2E 00 63 00 6F 00 6D 00 00 00 03 00 15 0C 03
00000460h: 00 03 36 01 00 00 00 1F 00 13 36 0A 00 FE 39 00
00000470h: 00 00 00 0F 01 04 80 00 00 00 00 0A 00 00 3A 6E
00000480h: BF EF 38 0F 01 04 80 C4 EB EF 38 03 00 71 3A 40
00000490h: 32 1A 39 00 00 00 00 F4 FC 2B 06 0B 00 40 3A 90
000004a0h: 1E 1C 02 00 00 00 00 D0 FC 2B 06 03 00 00 39 00
000004b0h: 00 00 00 00 00 00 00 90 1E 1C 02 02 01 0B 30 CD
000004c0h: A2 60 32 19 00 00 00 60 F4 E2 04 19 00 00 00 53
000004d0h: 4D 54 50 3A 4A 4F 48 4E 44 4F 45 40 43 4F 4E 54
000004e0h: 4F 53 4F 2E 43 4F 4D 00 02 01 F9 0F 80 06 AC 00
000004f0h: 72 00 00 00 79 F4 E2 04 72 00 00 00 00 00 00 00
00000500h: 81 2B 1F A4 BE A3 10 19 9D 6E 00 DD 01 0F 54 02
00000510h: 00 00 01 90 6A 00 6F 00 68 00 6E 00 64 00 6F 00
00000520h: 65 00 40 00 63 00 6F 00 6E 00 74 00 6F 00 73 00
00000530h: 6F 00 2E 00 63 00 6F 00 6D 00 00 00 53 00 4D 00
00000540h: 54 00 50 00 00 00 6A 00 6F 00 68 00 6E 00 64 00
00000550h: 6F 00 65 00 40 00 63 00 6F 00 6E 00 74 00 6F 00
00000560h: 73 00 6F 00 2E 00 63 00 6F 00 6D 00 00 00 02 01
00000570h: FF 0F 0E 05 00 00 72 00 00 00 EB F4 E2 04 72 00
00000580h: 00 00 00 00 00 00 81 2B 1F A4 BE A3 10 19 9D 6E
00000590h: 00 DD 01 0F 54 02 00 00 01 90 6A 00 6F 00 68 00
000005a0h: 6E 00 64 00 6F 00 65 00 40 00 63 00 6F 00 6E 00
000005b0h: 74 00 6F 00 73 00 6F 00 2E 00 63 00 6F 00 6D 00
000005c0h: 00 00 53 00 4D 00 54 00 50 00 00 00 6A 00 6F 00
000005d0h: 68 00 6E 00 64 00 6F 00 65 00 40 00 63 00 6F 00
000005e0h: 6E 00 74 00 6F 00 73 00 6F 00 2E 00 63 00 6F 00
000005f0h: 6D 00 00 00 03 00 FE 0F 94 FC 2B 06 06 00 00 00
00000600h: 30 B5 3E 07 1F 00 03 30 2A AE 60 32 5D F5 E2 04
00000610h: 3C 31 AC 00 28 00 00 00 6A 00 6F 00 68 00 6E 00
00000620h: 64 00 6F 00 65 00 40 00 63 00 6F 00 6E 00 74 00
00000630h: 6F 00 73 00 6F 00 2E 00 63 00 6F 00 6D 00 00 00
00000640h: 1F 00 02 30 3C 31 AC 00 85 F5 E2 04 7C FC 2B 06
00000650h: 0A 00 00 00 53 00 4D 00 54 00 50 00 00 00 1F 00
00000660h: 01 30 00 00 00 00 8F F5 E2 04 FF FF 00 00 28 00
00000670h: 00 00 6A 00 6F 00 68 00 6E 00 64 00 6F 00 65 00

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00000680h: 40 00 63 00 6F 00 6E 00 74 00 6F 00 73 00 6F 00
00000690h: 2E 00 63 00 6F 00 6D 00 00 00 03 00 FF 5F 00 00
000006a0h: 00 00 00 00 00 00 00 00 00 00 03 00 DE 5F 44 00
000006b0h: 42 00 00 00 00 00 00 00 00 00 03 00 FD 5F 4D 00
000006c0h: 69 00 01 00 00 00 00 00 00 00 1F 00 F6 5F 74 00
000006d0h: 20 00 B7 F5 E2 04 00 00 00 00 28 00 00 00 6A 00
000006e0h: 6F 00 68 00 6E 00 64 00 6F 00 65 00 40 00 63 00
000006f0h: 6F 00 6E 00 74 00 6F 00 73 00 6F 00 2E 00 63 00
00000700h: 6F 00 6D 00 00 00 02 01 F7 5F 67 00 65 00 72 00
00000710h: 00 00 DF F5 E2 04 72 00 00 00 00 00 00 00 81 2B
00000720h: 1F A4 BE A3 10 19 9D 6E 00 DD 01 0F 54 02 00 00
00000730h: 01 90 6A 00 6F 00 68 00 6E 00 64 00 6F 00 65 00
00000740h: 40 00 63 00 6F 00 6E 00 74 00 6F 00 73 00 6F 00
00000750h: 2E 00 63 00 6F 00 6D 00 00 00 53 00 4D 00 54 00
00000760h: 50 00 00 00 6A 00 6F 00 68 00 6E 00 64 00 6F 00
00000770h: 65 00 40 00 63 00 6F 00 6E 00 74 00 6F 00 73 00
00000780h: 6F 00 2E 00 63 00 6F 00 6D 00 00 00 03 00 DF 5F
00000790h: 80 19 44 04 00 00 00 00 58 FD 13 00 0B 00 02 60
000007a0h: 90 FD 13 00 00 00 00 00 14 00 00 00 1F 00 03 60
000007b0h: D0 9F 33 07 51 F6 E2 04 14 00 00 00 28 00 00 00
000007c0h: 6A 00 6F 00 68 00 6E 00 64 00 6F 00 65 00 40 00
000007d0h: 63 00 6F 00 6E 00 74 00 6F 00 73 00 6F 00 2E 00
000007e0h: 63 00 6F 00 6D 00 00 00 03 00 04 60 C7 44 10 30
000007f0h: 00 40 00 00 EB FF FF 7F 00 00 00 00 50 4D F4 7D

```

Binary	Name	Size	Type	Value
0DF0ADBA0A00000001000000	Header	12	Binary	0DF0ADBA0A00000001000000
2000000	Number of rows	4	ULONG	Hex: 0x00000002 Decimal: 2
17000000	Row 1 number of properties	4	ULONG	Hex: 0x00000017 Decimal: 23
1F000160	Row 1 Property 1 Property Tag	4	ULONG	Hex: 0x6001001f Decimal: 1610678303
90FD1300	Reserved	4	ULONG	Hex: 0x0013fd90 Decimal: 1310096
801AE30400000000	Irrelevant Union	8	Binary	801AE30400000000
2C000000	Unicode String bytes	4	ULONG	Hex: 0x0000002c Decimal: 44

```
00000800h: 72 B6 CA 01
```

6A0061006E00650073006D0 0690074006800400063006F 006E0074006F0073006F002 E006F00720067000000	Unicode String Value	44	PT_UNICODE	janesmith@contoso.org
0300150C	Row 1 Property 2 Property Tag	4	ULONG	Hex: 0x0c150003 Decimal: 202702851
69007400	Reserved	4	ULONG	Hex: 0x00740069 Decimal: 7602281
0100000063006F00	Property Union	8	PT_I4	Hex: 0x00000001 Decimal: 1
0A00FE39	Row 1 Property 3 Property Tag	4	ULONG	Hex: 0x39fe000a Decimal: 972947466
69006100	Reserved	4	ULONG	Hex: 0x00610069 Decimal: 6357097
0F01048065004300	Irrelevant Union	8	Binary	0F01048065004300
0A00003A	Row 1 Property 4 Property Tag	4	ULONG	Hex: 0x3a00000a Decimal: 973078538
2D003100	Reserved	4	ULONG	Hex: 0x0031002d Decimal: 3211309
0F01048000000000	Irrelevant Union	8	Binary	0F01048000000000
0300713A	Row 1 Property 5 Property Tag	4	ULONG	Hex: 0x3a710003 Decimal: 980484099
40321A39	Reserved	4	ULONG	Hex: 0x391a3240 Decimal: 958018112
00000000F4FC5F03	Property Union	8	PT_I4	Hex: 0x00000000 Decimal: 0
0B00403A	Row 1 Property 6 Property Tag	4	ULONG	Hex: 0x3a40000b Decimal: 977272843
901E1C02	Reserved	4	ULONG	Hex: 0x021c1e90 Decimal: 35397264
00000000D0FC5F03	Property Union	8	PT_BOOLEAN	Hex: 0x00000000 Decimal: 0
3000039	Row 1 Property 7 Property Tag	4	ULONG	Hex: 0x39000003 Decimal: 956301315
0	Reserved	4	ULONG	Hex: 0x00000000 Decimal: 0
00000000901E1C02	Property Union	8	PT_I4	Hex: 0x00000000 Decimal: 0
02010B30	Row 1 Property 8 Property Tag	4	ULONG	Hex: 0x300b0102 Decimal: 806027522
CDA26032	Reserved	4	ULONG	Hex: 0x3260a2cd Decimal: 845193933
1B000000AC1AE304	Irrelevant Union	8	Binary	1B000000AC1AE304
1B000000	Binary num bytes	4	ULONG	Hex: 0x0000001b Decimal: 27
534D54503A4A414E45534D 49544840434F4E544F534F2 E4F524700	Binary content	27	Binary	534D54503A4A414E45534D4 9544840434F4E544F534F2E4 F524700
0201F90F	Row 1 Property 9 Property Tag	4	ULONG	Hex: 0xff90102 Decimal: 267976962

8006AC00	Reserved	4	ULONG	Hex: 0x00ac0680 Decimal: 11273856
7A000000C71AE304	Irrelevant Union	8	Binary	7A000000C71AE304
7A000000	Binary num bytes	4	ULONG	Hex: 0x0000007a Decimal: 122
00000000812B1FA4BEA3101 99D6E00DD010F5402000001 906A0061006E00650073006 D0069007400680040006300 6F006E0074006F0073006F0 02E006F0072006700000053 004D005400500000006A006 1006E00650073006D006900 74006800400063006F006E0 074006F0073006F002E006F 00720067000000	Binary content	122	Binary	00000000812B1FA4BEA3101 99D6E00DD010F5402000001 906A0061006E00650073006 D0069007400680040006300 6F006E0074006F0073006F0 02E006F007200670000005300 4D005400500000006A00610 06E00650073006D00690074 006800400063006F006E0074 006F0073006F002E006F0072 0067000000
0201FF0F	Row 1 Property 10 Property Tag	4	ULONG	Hex: 0x0fff0102 Decimal: 268370178
76050000	Reserved	4	ULONG	Hex: 0x00000576 Decimal: 1398
7A000000411BE304	Irrelevant Union	8	Binary	7A000000411BE304
7A000000	Binary num bytes	4	ULONG	Hex: 0x0000007a Decimal: 122
00000000812B1FA4BEA3101 99D6E00DD010F5402000001 906A0061006E00650073006 D0069007400680040006300 6F006E0074006F0073006F0 02E006F0072006700000053 004D005400500000006A006 1006E00650073006D006900 74006800400063006F006E0 074006F0073006F002E006F 00720067000000	Binary content	122	Binary	00000000812B1FA4BEA3101 99D6E00DD010F5402000001 906A0061006E00650073006 D0069007400680040006300 6F006E0074006F0073006F0 02E006F007200670000005300 4D005400500000006A00610 06E00650073006D00690074 006800400063006F006E0074 006F0073006F002E006F0072 0067000000
0300FE0F	Row 1 Property 11 Property Tag	4	ULONG	Hex: 0x0ffe0003 Decimal: 268304387
94FC5F03	Reserved	4	ULONG	Hex: 0x035ffc94 Decimal: 56622228
600000030702207	Property Union	8	PT_I4	Hex: 0x00000006 Decimal: 6
1F000330	Row 1 Property 12 Property Tag	4	ULONG	Hex: 0x3003001f Decimal: 805503007
2AAE6032	Reserved	4	ULONG	Hex: 0x3260ae2a Decimal: 845196842
BB1BE3043C31AC00	Irrelevant Union	8	Binary	BB1BE3043C31AC00
2C000000	Unicode String bytes	4	ULONG	Hex: 0x0000002c Decimal: 44

6A0061006E00650073006D0 0690074006800400063006F 006E0074006F0073006F002 E006F00720067000000	Unicode String Value	44	PT_UNICODE	janesmith@contoso.org
1F000230	Row 1 Property 13 Property Tag	4	ULONG	Hex: 0x3002001f Decimal: 805437471
3C31AC00	Reserved	4	ULONG	Hex: 0x00ac313c Decimal: 11284796
E71BE3047CFC5F03	Irrelevant Union	8	Binary	E71BE3047CFC5F03
0A000000	Unicode String bytes	4	ULONG	Hex: 0x0000000a Decimal: 10
53004D00540050000000	Unicode String Value	10	PT_UNICODE	SMTP
1F000130	Row 1 Property 14 Property Tag	4	ULONG	Hex: 0x3001001f Decimal: 805371935
0	Reserved	4	ULONG	Hex: 0x00000000 Decimal: 0
F11BE304FFFF0000	Irrelevant Union	8	Binary	F11BE304FFFF0000
2C000000	Unicode String bytes	4	ULONG	Hex: 0x0000002c Decimal: 44
6A0061006E00650073006D0 0690074006800400063006F 006E0074006F0073006F002 E006F00720067000000	Unicode String Value	44	PT_UNICODE	janesmith@contoso.org
0300FF5F	Row 1 Property 15 Property Tag	4	ULONG	Hex: 0x5fff0003 Decimal: 1610547203
0	Reserved	4	ULONG	Hex: 0x00000000 Decimal: 0
0	Property Union	8	PT_I4	Hex: 0x00000000 Decimal: 0
0300DE5F	Row 1 Property 16 Property Tag	4	ULONG	Hex: 0x5fde0003 Decimal: 1608384515
4F007500	Reserved	4	ULONG	Hex: 0x0075004f Decimal: 7667791
0	Property Union	8	PT_I4	Hex: 0x00000000 Decimal: 0
0300FD5F	Row 1 Property 17 Property Tag	4	ULONG	Hex: 0x5ffd0003 Decimal: 1610416131
41006400	Reserved	4	ULONG	Hex: 0x00640041 Decimal: 6553665
1000000000000000	Property Union	8	PT_I4	Hex: 0x00000001 Decimal: 1
1F00F65F	Row 1 Property 18 Property Tag	4	ULONG	Hex: 0x5ff6001f Decimal: 1609957407
42006F00	Reserved	4	ULONG	Hex: 0x006f0042 Decimal: 7274562
1D1CE30400000000	Irrelevant Union	8	Binary	1D1CE30400000000
2C000000	Unicode String bytes	4	ULONG	Hex: 0x0000002c Decimal: 44

6A0061006E00650073006D0 0690074006800400063006F 006E0074006F0073006F002 E006F00720067000000	Unicode String Value	44	PT_UNICODE	janesmith@contoso.org
0201F75F	Row 1 Property 19 Property Tag	4	ULONG	Hex: 0x5ff70102 Decimal: 1610023170
AA0A18C7	Reserved	4	ULONG	Hex: 0xc7180aaa Decimal: - 954725718
7A000000491CE304	Irrelevant Union	8	Binary	7A000000491CE304
7A000000	Binary num bytes	4	ULONG	Hex: 0x0000007a Decimal: 122
00000000812B1FA4BEA3101 99D6E0DD010F5402000001 906A0061006E00650073006 D0069007400680040006300 6F006E0074006F0073006F0 02E006F0072006700000053 004D005400500000006A006 1006E00650073006D006900 74006800400063006F006E0 074006F0073006F002E006F 00720067000000	Binary content	122	Binary	00000000812B1FA4BEA3101 99D6E0DD010F5402000001 906A0061006E00650073006 D0069007400680040006300 6F006E0074006F0073006F0 02E006F007200670000005300 4D005400500000006A00610 06E00650073006D00690074 006800400063006F006E0074 006F0073006F002E006F0072 0067000000
0300DF5F	Row 1 Property 20 Property Tag	4	ULONG	Hex: 0x5fdf0003 Decimal: 1608450051
80194404	Reserved	4	ULONG	Hex: 0x04441980 Decimal: 71571840
0000000058FD1300	Property Union	8	PT_I4	Hex: 0x00000000 Decimal: 0
0B000260	Row 1 Property 21 Property Tag	4	ULONG	Hex: 0x6002000b Decimal: 1610743819
90FD1300	Reserved	4	ULONG	Hex: 0x0013fd90 Decimal: 1310096
16000000	Property Union	8	PT_BOOLEAN	Hex: 0x00000000 Decimal: 0
1F000360	Row 1 Property 22 Property Tag	4	ULONG	Hex: 0x6003001f Decimal: 1610809375
30CF0205	Reserved	4	ULONG	Hex: 0x0502cf30 Decimal: 84070192
C31CE30416000000	Irrelevant Union	8	Binary	C31CE30416000000
2C000000	Unicode String bytes	4	ULONG	Hex: 0x0000002c Decimal: 44
6A0061006E00650073006D0 0690074006800400063006F 006E0074006F0073006F002 E006F00720067000000	Unicode String Value	44	PT_UNICODE	janesmith@contoso.org
3000460	Row 1 Property 23 Property Tag	4	ULONG	Hex: 0x60040003 Decimal: 1610874883

C7441030	Reserved	4	ULONG	Hex: 0x301044c7 Decimal: 806372551
00400000E9FFF7F	Property Union	8	PT_I4	Hex: 0x00004000 Decimal: 16384
17000000	Row 2 number of properties	4	ULONG	Hex: 0x00000017 Decimal: 23
1F000160	Row 2 Property 1 Property Tag	4	ULONG	Hex: 0x6001001f Decimal: 1610678303
90FD1300	Reserved	4	ULONG	Hex: 0x0013fd90 Decimal: 1310096
38F4E20400000000	Irrelevant Union	8	Binary	38F4E20400000000
28000000	Unicode String bytes	4	ULONG	Hex: 0x00000028 Decimal: 40
6A006F0068006E0064006F006500400063006F006E0074006F0073006F002E0063006F006D000000	Unicode String Value	40	PT_UNICODE	johndoe@contoso.com
0300150C	Row 2 Property 2 Property Tag	4	ULONG	Hex: 0x0c150003 Decimal: 202702851
3000336	Reserved	4	ULONG	Hex: 0x36030003 Decimal: 906166275
010000001F001336	Property Union	8	PT_I4	Hex: 0x00000001 Decimal: 1
0A00FE39	Row 2 Property 3 Property Tag	4	ULONG	Hex: 0x39fe000a Decimal: 972947466
0	Reserved	4	ULONG	Hex: 0x00000000 Decimal: 0
0F01048000000000	Irrelevant Union	8	Binary	0F01048000000000
0A00003A	Row 2 Property 4 Property Tag	4	ULONG	Hex: 0x3a00000a Decimal: 973078538
6EBFEF38	Reserved	4	ULONG	Hex: 0x38efbf6e Decimal: 955236206
0F010480C4EBEF38	Irrelevant Union	8	Binary	0F010480C4EBEF38
0300713A	Row 2 Property 5 Property Tag	4	ULONG	Hex: 0x3a710003 Decimal: 980484099
40321A39	Reserved	4	ULONG	Hex: 0x391a3240 Decimal: 958018112
0000000F4FC2B06	Property Union	8	PT_I4	Hex: 0x00000000 Decimal: 0
0B00403A	Row 2 Property 6 Property Tag	4	ULONG	Hex: 0x3a40000b Decimal: 977272843
901E1C02	Reserved	4	ULONG	Hex: 0x021c1e90 Decimal: 35397264
00000000D0FC2B06	Property Union	8	PT_BOOLEAN	Hex: 0x00000000 Decimal: 0
3000039	Row 2 Property 7 Property Tag	4	ULONG	Hex: 0x39000003 Decimal: 956301315
0	Reserved	4	ULONG	Hex: 0x00000000 Decimal: 0
00000000901E1C02	Property Union	8	PT_I4	Hex: 0x00000000 Decimal: 0
02010B30	Row 2 Property 8 Property Tag	4	ULONG	Hex: 0x300b0102 Decimal:

				806027522
CDA26032	Reserved	4	ULONG	Hex: 0x3260a2cd Decimal: 845193933
1900000060F4E204	Irrelevant Union	8	Binary	1900000060F4E204
19000000	Binary num bytes	4	ULONG	Hex: 0x00000019 Decimal: 25
534D54503A4A4F484E444F4540434F4E544F534F2E434F4D00	Binary content	25	Binary	534D54503A4A4F484E444F4540434F4E544F534F2E434F4D00
0201F90F	Row 2 Property 9 Property Tag	4	ULONG	Hex: 0x0ff90102 Decimal: 267976962
8006AC00	Reserved	4	ULONG	Hex: 0x00ac0680 Decimal: 11273856
7200000079F4E204	Irrelevant Union	8	Binary	7200000079F4E204
72000000	Binary num bytes	4	ULONG	Hex: 0x00000072 Decimal: 114
00000000812B1FA4BEA310199D6E00DD010F5402000001906A006F0068006E0064006F006500400063006F006E0074006F0073006F002E0063006F006D000000053004D005400500000006A006F0068006E0064006F006500400063006F006E0074006F0073006F002E0063006F006D0000000	Binary content	114	Binary	00000000812B1FA4BEA310199D6E00DD010F5402000001906A006F0068006E0064006F006500400063006F006E0074006F0073006F002E0063006F006D000000053004D005400500000006A006F0068006E0064006F006500400063006F006E0074006F0073006F002E0063006F006D0000000
0201FF0F	Row 2 Property 10 Property Tag	4	ULONG	Hex: 0x0fff0102 Decimal: 268370178
0E050000	Reserved	4	ULONG	Hex: 0x0000050e Decimal: 1294
72000000EBF4E204	Irrelevant Union	8	Binary	72000000EBF4E204
72000000	Binary num bytes	4	ULONG	Hex: 0x00000072 Decimal: 114
00000000812B1FA4BEA310199D6E00DD010F5402000001906A006F0068006E0064006F006500400063006F006E0074006F0073006F002E0063006F006D000000053004D005400500000006A006F0068006E0064006F006500400063006F006E0074006F0073006F002E0063006F006D0000000	Binary content	114	Binary	00000000812B1FA4BEA310199D6E00DD010F5402000001906A006F0068006E0064006F006500400063006F006E0074006F0073006F002E0063006F006D000000053004D005400500000006A006F0068006E0064006F006500400063006F006E0074006F0073006F002E0063006F006D0000000
0300FE0F	Row 2 Property 11 Property Tag	4	ULONG	Hex: 0x0ffe0003 Decimal: 268304387
94FC2B06	Reserved	4	ULONG	Hex: 0x062bfc94 Decimal: 103546004

0600000030B53E07	Property Union	8	PT_I4	Hex: 0x00000006 Decimal: 6
1F000330	Row 2 Property 12 Property Tag	4	ULONG	Hex: 0x3003001f Decimal: 805503007
2AAE6032	Reserved	4	ULONG	Hex: 0x3260ae2a Decimal: 845196842
5DF5E2043C31AC00	Irrelevant Union	8	Binary	5DF5E2043C31AC00
28000000	Unicode String bytes	4	ULONG	Hex: 0x00000028 Decimal: 40
6A006F0068006E0064006F006500400063006F006E0074006F0073006F002E0063006F006D000000	Unicode String Value	40	PT_UNICODE	johndoe@contoso.com
1F000230	Row 2 Property 13 Property Tag	4	ULONG	Hex: 0x3002001f Decimal: 805437471
3C31AC00	Reserved	4	ULONG	Hex: 0x00ac313c Decimal: 11284796
85F5E2047CFC2B06	Irrelevant Union	8	Binary	85F5E2047CFC2B06
0A000000	Unicode String bytes	4	ULONG	Hex: 0x0000000a Decimal: 10
53004D00540050000000	Unicode String Value	10	PT_UNICODE	SMTP
1F000130	Row 2 Property 14 Property Tag	4	ULONG	Hex: 0x3001001f Decimal: 805371935
0	Reserved	4	ULONG	Hex: 0x00000000 Decimal: 0
8FF5E204FFFF0000	Irrelevant Union	8	Binary	8FF5E204FFFF0000
28000000	Unicode String bytes	4	ULONG	Hex: 0x00000028 Decimal: 40
6A006F0068006E0064006F006500400063006F006E0074006F0073006F002E0063006F006D000000	Unicode String Value	40	PT_UNICODE	johndoe@contoso.com
0300FF5F	Row 2 Property 15 Property Tag	4	ULONG	Hex: 0x5fff0003 Decimal: 1610547203
0	Reserved	4	ULONG	Hex: 0x00000000 Decimal: 0
0	Property Union	8	PT_I4	Hex: 0x00000000 Decimal: 0
0300DE5F	Row 2 Property 16 Property Tag	4	ULONG	Hex: 0x5fde0003 Decimal: 1608384515
44004200	Reserved	4	ULONG	Hex: 0x00420044 Decimal: 4325444
0	Property Union	8	PT_I4	Hex: 0x00000000 Decimal: 0
0300FD5F	Row 2 Property 17 Property Tag	4	ULONG	Hex: 0x5ffd0003 Decimal: 1610416131
4D006900	Reserved	4	ULONG	Hex: 0x0069004d Decimal: 6881357
1000000000000000	Property Union	8	PT_I4	Hex: 0x00000001 Decimal: 1
1F00F65F	Row 2 Property 18 Property Tag	4	ULONG	Hex: 0x5ff6001f Decimal: 1609957407

74002000	Reserved	4	ULONG	Hex: 0x00200074 Decimal: 2097268
B7F5E20400000000	Irrelevant Union	8	Binary	B7F5E20400000000
28000000	Unicode String bytes	4	ULONG	Hex: 0x00000028 Decimal: 40
6A006F0068006E0064006F006500400063006F006E0074006F0073006F002E0063006F006D000000	Unicode String Value	40	PT_UNICODE	johndoe@contoso.com
0201F75F	Row 2 Property 19 Property Tag	4	ULONG	Hex: 0x5ff70102 Decimal: 1610023170
67006500	Reserved	4	ULONG	Hex: 0x00650067 Decimal: 6619239
72000000DFF5E204	Irrelevant Union	8	Binary	72000000DFF5E204
72000000	Binary num bytes	4	ULONG	Hex: 0x00000072 Decimal: 114
00000000812B1FA4BEA310199D6E00DD010F5402000001906A006F0068006E0064006F006500400063006F006E0074006F0073006F002E0063006F006D000000053004D005400500000006A006F0068006E0064006F006500400063006F006E0074006F0073006F002E0063006F006D000000	Binary content	114	Binary	00000000812B1FA4BEA310199D6E00DD010F5402000001906A006F0068006E0064006F006500400063006F006E0074006F0073006F002E0063006F006D000000053004D005400500000006A006F0068006E0064006F006500400063006F006E0074006F0073006F002E0063006F006D000000
0300DF5F	Row 2 Property 20 Property Tag	4	ULONG	Hex: 0x5fdf0003 Decimal: 1608450051
80194404	Reserved	4	ULONG	Hex: 0x04441980 Decimal: 71571840
0000000058FD1300	Property Union	8	PT_I4	Hex: 0x00000000 Decimal: 0
0B000260	Row 2 Property 21 Property Tag	4	ULONG	Hex: 0x6002000b Decimal: 1610743819
90FD1300	Reserved	4	ULONG	Hex: 0x0013fd90 Decimal: 1310096
14000000	Property Union	8	PT_BOOLEAN	Hex: 0x00000000 Decimal: 0
1F000360	Row 2 Property 22 Property Tag	4	ULONG	Hex: 0x6003001f Decimal: 1610809375
D09F3307	Reserved	4	ULONG	Hex: 0x07339fd0 Decimal: 120823760
51F6E20414000000	Irrelevant Union	8	Binary	51F6E20414000000
28000000	Unicode String bytes	4	ULONG	Hex: 0x00000028 Decimal: 40

6A006F0068006E0064006F0 06500400063006F006E0074 006F0073006F002E0063006 F006D000000	Unicode String Value	40	PT_UNICOD E	johndoe@contoso.com
3000460	Row 2 Property 23 Property Tag	4	ULONG	Hex: 0x60040003 Decimal: 1610874883
C7441030	Reserved	4	ULONG	Hex: 0x301044c7 Decimal: 806372551
00400000EBFFFF7F	Property Union	8	PT_I4	Hex: 0x00004000 Decimal: 16384
00000000504DF47D72B6CA0 1	Footer Metadata	12	Binary	00000000504DF47D72B6CA0 1