[MS-OXPHISH]: Phishing Warning Protocol Specification

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1 Introduction

This document specifies the Phishing Warning protocol that is used by the client to identify and mark e-mail messages that are designed to trick recipients into divulging sensitive information (such as passwords and/or other personal information) to a non-trustworthy source.

1.1 Glossary

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

GUID
handle
message
Message object
named property
phishing
phishing message
property
property ID

The following data types are defined in [MS-DTYP]:

bit
byte

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

1.2 References

1.2.1 Normative References

[MS-DTYP] Microsoft Corporation, "Windows Data Types", March 2007, http://go.microsoft.com/fwlink/?LinkId=111558.

[MS-OXCMSG] Microsoft Corporation, "Message and Attachment Object Protocol Specification", June 2008.

[MS-OXCSPAM] Microsoft Corporation, "Spam Confidence Level, Allow and Block Lists Protocol Specification", June 2008.

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

[MS-OXOMSG] Microsoft Corporation, "E-Mail Object Protocol Specification", June 2008.

[MS-OXOSFLD] Microsoft Corporation, "Special Folders Protocol Specification", June 2008.

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

1.2.2 Informative References

None.

1.3 Protocol Overview

This protocol enables the client to identify and mark e-mail **messages** that are likely to be **phishing**. When an e-mail message is delivered to a messaging client, the client examines the message properties to determine the likelihood of it being a **phishing message**. If the examination determines that the message is likely to be phishing, the client modifies a **property** on the message to mark it as suspicious. A messaging client's user interface can utilize this property value to identify a potential phishing message and display a warning to the end-user.

This protocol does not specify the algorithm that determines the likelihood of a message being a phishing message; it only specifies how the **message object** is changed to indicate the result of the algorithm.

1.4 Relationship to Other Protocols

The Phishing Warning protocol uses a **property** on the **Message object** as a means of identifying and marking messages that are likely to be **phishing**. Therefore, this specification relies on the following:

- An understanding of the Message object, as specified in [MS-OXOMSG].
- An understanding of getting and setting properties, as specified in [MS-OXCMSG].

1.5 Prerequisites/Preconditions

This specification assumes that the client has previously logged on to the server and has acquired a **handle** to the message for which it has to identify or designate **phishing** status.

1.6 Applicability Statement

A client can use this protocol to identify or mark messages that are likely to be **phishing**. This protocol does not specify the algorithm that determines the likelihood of a message that is a **phishing message**; it only specifies how the **Message object** is changed to indicate the result of such analysis.

1.7 Versioning and Capability Negotiation

None.

1.8 Vendor-Extensible Fields

None.

1.9 Standards Assignments

None.

2 Messages

2.1 Transport

Message properties are transported between client and server, as specified in [MS-OXCMSG].

2.2 Message Syntax

Before sending requests to the server, the client MUST obtain a **handle** to the **Message object** used in **property** operations.

2.2.1 PidNamePhishingStamp Property

The following **property** is specific to the Phishing Warning protocol:

http://schemas.microsoft.com/outlook/phishingstamp (4 **bytes**): A **named property**. The value is a 32-**bit** integer and the **GUID** is {00020329-0000-0000-C000000000000046}. The following table shows the representation of the property. The most significant fourth bit represents whether the user has enabled functionality (such as hyperlinks, reply, and attachments) within the **message**. The default value for this bit is zero (0), which indicates that the user has not enabled functionality. The least significant 28 bits (shown with a gray background in the following table) are obtained from the fifth value of the **PidTagAdditionalRenEntryIds** property. (For more information about this property, see [MS-OXOSFLD]).

Byte 1		Byte 2	Byte 3	Byte 4
XXXX	XXXX	XXXXXXXX	XXXXXXXX	XXXXXXXX

The client SHOULD set this property if it is determined that the message is likely to be **phishing**. The client SHOULD use the value of this property to warn the user when a message is likely to be phishing.

3 Protocol Details

The role of the client is to determine whether a **message** is **phishing** and to update the **PidNamePhishingStamp property** (as specified in section 3.1.1.1) to indicate the results of such analysis. The client then checks the value of the **PidNamePhishingStamp** property when the message is opened, and conveys a warning to the end user for any message that is likely to be phishing.

3.1 Client Details

3.1.1 Abstract Data Model

This section describes a conceptual model of possible data organization that an implementation maintains to participate in this protocol. The described organization is provided to facilitate the explanation of how the protocol behaves. This document does not mandate that implementations adhere to this model as long as their external behavior is consistent with the behavior described in this document.

3.1.1.1 Setting the PidNamePhishingStamp Property

If the client determines that a **message** is **phishing**, it SHOULD then update the value of the **PidNamePhishingStamp property** to indicate whether a message is likely to be phishing.

The **PidNamePhishingStamp** property value is calculated as follows:

1. A query for the fifth value in the **PidTagAdditionalRenEntryIds** property is performed. Let the queried value be called QueriedValue_FromEntryID.
2. The mask (0x0FFFFFFF) to QueriedValue_FromEntryID is then applied. That is, the bitwise operation (0x0FFFFFFF AND QueriedValue_FromEntryID) is performed. Let the resulting value be called QueriedValue_FromEntryIDMasked.
3. If the user has not enabled functionality on the **message**, the final **property** value is QueriedValue_FromEntryIDMasked. If the user determines that the message is not a **phishing message** and indicates as such by the interaction with the user interface, the value of the property is modified as follows: (QueriedValue_FromEntryIDMasked OR 0x10000000).

3.1.2 Timers

None.

3.1.3 Initialization

Before matching the **PidNamePhishingStamp** on the **message**, the existence of the fifth value of **PidTagAdditionalRenEntryIds** MUST be ensured. If it is not present, the value MUST be created.

3.1.4 Higher-Layer Triggered Events

3.1.4.1 Client Receives a New Message

When the client receives a new **message**, the client determines whether the message is likely to be **phishing**. If on delivery, the client determines that the message is likely to be phishing, the client sets the **PidNamePhishingStamp property** on the message (as specified in section 3.1.1.1).

3.1.4.2 End-User Opens a Message

When an end user opens a **message**, the client tries to retrieve the value of the **PidNamePhishingStamp property** (as specified in the section 2.2.1). If the property is present, then its least significant 28 **bits** are compared against the fifth value of the multi-valued property **PidTagAdditionalRenEntryIds**. If this comparison does not result in a match, the **PidNamePhishingStamp** property SHOULD be ignored. If the comparison results in a match, the client considers the message to be a **phishing message**. If the value of the most significant fourth bit in the **PidNamePhishingStamp** property is 1, the user has enabled the functionality, and the client SHOULD display the message as a normal message. If instead, the value of this bit in the **PidNamePhishingStamp** property is zero (0), the client SHOULD disable functionality of the message.

The user has the option to enable all functionality within a message by interaction with the user interface. If the user enables functionality within a message, the value of the most significant fourth bit of the **PidNamePhishingStamp** property on that message (as specified in 2.2.1) is set to 1.

The functionality is also enabled when the **PidTagJunkPhishingEnableLinks** property (as specified in [MS-OXCSPAM]) is set to **true**.

3.1.5 Message Processing Events and Sequencing Rules

None.

3.1.6 Timer Events

None.

3.1.7 Other Local Events

None.

4 Protocol Examples

4.1 Setting the PidNamePhishingStamp Property

When the client receives a new **message**, the client determines whether the message is likely to be **phishing**. If the client determines that the message is likely to be phishing, the client sets the **PidNamePhishingStamp property** on the message (as specified in section 3.1.1.1) on

message delivery. The client calculates the **PidNamePhishingStamp** property value as described in the following example:

- If the fifth value queried from **PidTagAdditionalRenEntryIds** is: 0xAE241D99
- The client calculates the **PidNamePhishingStamp** property value as follows: (0xAE241D99 AND 0x0FFFFFFF) = 0x0E241D99

The value of the most significant fourth **bit** of the **PidNamePhishingStamp** property can be either zero (0), if the user has not enabled functionality of the message, or 1, if the user has enabled the functionality of the message.

4.2 Evaluating the PidNamePhishingStamp property

For purposes of the examples in section 4.2, let the fifth value queried from **PidTagAdditionalRenEntryIds** be called **PhishingTagValue**.

4.2.1 No PidNamePhishingStamp Property

If the **PidNamePhishingStamp property** is absent from a **message**, the client does not consider the message to be a **phishing message**.

4.2.2 PidNamePhishingStamp Property Mismatch

If the **PidNamePhishingStamp property** is present, the client will compare its least significant 28 **bits** with those of **PhishingTagValue**. If the **PidNamePhishingStamp** property value is 0x0EAE2103 and **PhishingTagValue** is 0xAE241D99, the comparison does not result in a match. Therefore, the client ignores the **PidNamePhishingStamp** property, resulting in enabled **message** functionality and no added **phishing**-related user interface elements.

4.2.3 PidTagJunkPhishingEnableLinks Property set to true

If the **PidTagJunkPhishingEnableLinks property** is present and is set to **true**, the client will ignore the **PidNamePhishingStamp** property and will treat the **message** as non-phishing.

4.2.4 Phishing Message Functionality Not Enabled By the User

If the **PidNamePhishingStamp property** is present, the client will compare its least significant 28 **bits** with those of **PhishingTagValue**. If the **PidNamePhishingStamp** property value is 0x0E241D99, and **PhishingTagValue** is 0xAE241D99, the comparison results in a match, indicating that the **message** is likely to be **phishing**. If the value of the most significant fourth bit of the **PidNamePhishingStamp** property is zero (0), the user has not enabled functionality within the message. Therefore, the client will disable functionality within the message, display a warning to the user, and add phishing-related user interface elements that allow the user to enable message functionality.

4.2.5 Phishing Message Functionality Enabled By the User

If the **PidNamePhishingStamp property** is present, the client will compare its least significant 28 **bits** with those of **PhishingTagValue**. If the **PidNamePhishingStamp** property value is 0x1E241D99 and **PhishingTagValue** is 0xAE241D99, the comparison

results in a match, which indicates that the **message** is likely to be **phishing**. Because the value of the most significant fourth bit of the **PidNamePhishingStamp** property is 1, the user has enabled functionality within the message. Therefore, the client will treat the message as non-phishing.

4.3 Sample Properties on a Phishing Message

The following is a description of what a client does to stamp the **message** that has been identified as **phishing** and the responses that a server returns.

Because the **PidNamePhishingStamp property** is a **named property**, the client has to ask the server to perform mapping from named properties to property identifiers, by using **RopGetPropertyIDsOfNames**.

Property	Property Set GUID	Name or ID
PidNamePhishingStamp	{00020329-0000-0000-C000-000000000046}	http://schemas.microsoft.com/outlook/phishingstamp

The server returns the following **property IDs** in response to **RopGetPropertyIDsOfNames**.

Property	Property ID
PidNamePhishingStamp	0x831F

After determining the value of the property, the client uses **RopSetProperties** to transmit the data to the server.

Property	Property ID	Property Type	Value
PidNamePhishingStamp	0x831F	0x0003(PT_LONG)	0x0A73AE09

If the user enables the functionality of the **phishing message**, the property value is changed and the client uses **RopSetProperties** to transmit the new value to the server.

Property	Property ID	Property Type	Value
PidNamePhishingStamp	0x831F	0x0003(PT_LONG)	0x1A73AE09

The client then uses **RopSaveChangesMessage** to commit the properties to the server.

5 Security

5.1 Security Considerations for Implementers

On delivery of the **message**, the presence of the **PidNamePhishingStamp** with a successful match of the least significant 28 **bits** signals the client that the message has already been

evaluated for **phishing** and SHOULD NOT be filtered again. Therefore, care has to be taken while setting the **PidNamePhishingStamp property** on the message and all precautions for evaluation of the fifth value of **PidTagAdditionalRenEntryIds** have to be followed (as specified in [MS-OXCMSG]).

5.2 Index of Security Parameters

None.

6 Appendix A: Office/Exchange Behavior

The information in this specification is applicable to the following versions of Office/Exchange:

- Office 2003 with Service Pack 3 applied
- Exchange 2003 with Service Pack 2 applied
- Office 2007 with Service Pack 1 applied
- Exchange 2007 with Service Pack 1 applied

Exceptions, if any, are noted below. Unless otherwise specified, any statement of optional behavior in this specification prescribed using the terms SHOULD or SHOULD NOT implies Office/Exchange behavior in accordance with the SHOULD or SHOULD NOT prescription. Unless otherwise specified, the term MAY implies Office/Exchange does not follow the prescription.

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