[MS-OXABREF]:
Address Book Name Service Provider Interface (NSPI) Referral Protocol Specification

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Revision Summary

Date	Revision History	Revision Class	Comments
04/04/2008	0.1		Initial Availability.
04/25/2008	0.2		Revised and updated property names and other technical content.
06/27/2008	1.0		Initial Release.
08/06/2008	1.01		Revised and edited technical content.
09/03/2008	1.02		Updated references.
12/03/2008	1.03		Updated IP notice.
04/10/2009	2.0		Updated technical content and applicable product releases.
07/15/2009	3.0	Major	Revised and edited for technical content.
11/04/2009	4.0.0	Major	Updated and revised the technical content.

Table of Contents

1 Introduction

This document describes the **address book Name Service Provider Interface (NSPI)** Referral Service (NSPIReferral). NSPIReferral is a **remote procedure call (RPC)** service that supplies a caller with the name of an NSPI server. Additionally, NSPIReferral can return the **domain name system (DNS)** **fully qualified domain name (FQDN)** of a **Mailbox** server, given the **distinguished name (DN)** of that server.

1.1 Glossary

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

Address Book object
binding handle
distinguished name (DN)
domain
Domain Name System (DNS)
dynamic endpoint
endpoint (2)
flags
Interface Definition Language (IDL)
Name Service Provider Interface (NSPI)
Network Data Representation (NDR)
NT LAN Manager (NTLM)
remote procedure call (RPC)
RPC protocol sequence
security provider
universal unique identifier (UUID)
well-known endpoint

The following terms are specific to this document:

binding: The string representation of the protocol sequence, NetworkAddress, and optionally the endpoint. Also referred to as "string binding". For more information, see [C706].

directory service (DS): A service that stores and organizes information about a computer network's users and resources, and that allows network administrators to manage network resources, users, and their access to network resources.

Fully Qualified Domain Name (FQDN): An unambiguous reference to a unique domain name.

Kerberos: An authentication system that enables two parties to exchange private information across an otherwise open network by assigning a unique key (called a ticket) to each user that logs on to the network and then embedding these tickets into messages sent by the users. For more information, see [MS-KILE].

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

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

[C706] The Open Group, "DCE 1.1: Remote Procedure Call", C706, August 1997, http://www.opengroup.org/public/pubs/catalog/c706.htm.

[MS-NSPI] [MS-NSPI] Microsoft Corporation, "Name Service Provider Interface (NSPI) Protocol Specification", June 2008, http://go.microsoft.com/fwlink/?LinkID=154742.

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

[MS-OXOABK] Microsoft Corporation, "Address Book Object Protocol Specification", June 2008.

[MS-RPCE] Microsoft Corporation, "Remote Procedure Call Protocol Extensions", July 2006, http://go.microsoft.com/fwlink/?LinkId=112246.

[RFC1035] Mockapetris, P., "Domain Names – Implementation and Specification", RFC 1035, November 1987, http://www.ietf.org/rfc/rfc1035.txt.

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

1.2.2 Informative References

[MSDN-MIDL] Microsoft Corporation, "Microsoft Interface Definition Language (MIDL)", http://go.microsoft.com/fwlink/?LinkId=112244.

[MSDN-RPC] Microsoft Corporation, "Remote Procedure Call", http://go.microsoft.com/fwlink/?LinkId=112245.

1.3 Protocol Overview

NSPIReferral serves to return the network name of a server to a client. It has two methods, RfrGetNewDSA, which returns the name of an NSPI server, and RfrGetFQDNFromServerDN, which returns the DNS FQDN of a mailbox server. Figure 1 shows the RfrGetNewDSA method call. Figure 2 shows the RfrGetFQDNFromServerDN method call.

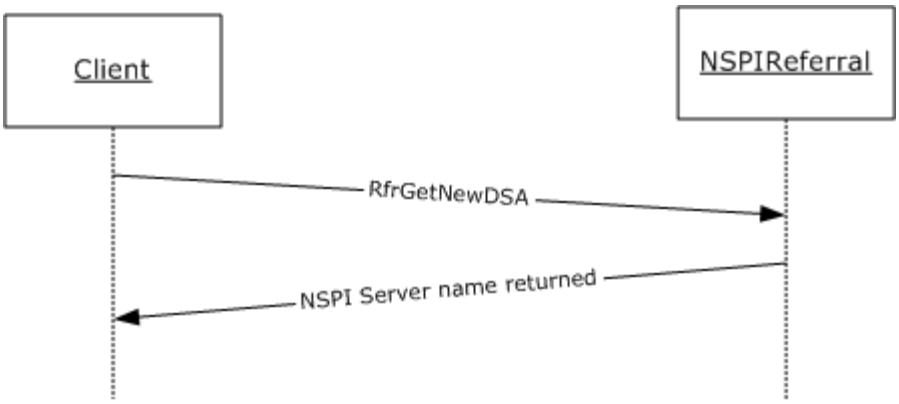

Figure 1: Relationship between client and NSPIReferral

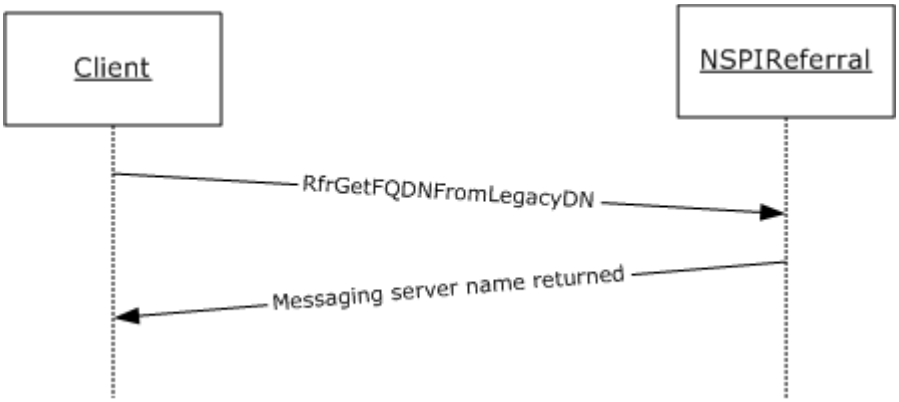

Figure 2: Client retrieving mailbox **server name from NSPIReferral**

1.4 Relationship to Other Protocols

NSPIReferral is built on the Microsoft remote procedure call (RPC) interface (as specified in [C706] and [MS-RPCE]). It supports only **RPC protocol sequences** ncacn_ip_tcp and ncacn_http, as specified in [MS-RPCE] sections 2.1.1.1 and 2.1.1.8, respectively.

1.5 Prerequisites/Preconditions

None.

1.6 Applicability Statement

Clients request an NSPI server by using the **RfrGetNewDSA** method of NSPIReferral before the client engages in any NSPI requests. This gives the NSPIReferral server the ability to control which NSPI server an NSPI client will connect to, for purposes including but not limited to balancing the client load across multiple NSPI servers, choosing the best version of NSPI server for that particular client, or satisfying network requirements that are not discernible by the client.

The **RfrGetFQDNFromServerDN** method of NSPIReferral is appropriate when a client knows the distinguished name (DN) of a Mailbox server but not the FQDN of the Mailbox server (as specified in [RFC1035]) with which it can make a network connection to that server. In practice, this is necessary in several cases:

- When creating client mail settings, a client uses an NSPI server to read an **Address Book object** representing its Mailbox, which includes the DN of the messaging server that hosts the Mailbox.
- When connecting to the wrong Mailbox or **public folder** server, an error will be returned containing the DN of the correct server.
- When connecting to another user's Mailbox, having only the PidTagAddressBookHomeMessageDatabase property for that Mailbox. For more details about the PidTagAddressBookHomeMessageDatabase **property**, see [MS-OXOABK] section 2.2.4.67.

1.7 Versioning and Capability Negotiation

This specification covers versioning issues in the following areas:

- **Supported Transports:** This protocol uses multiple RPC protocol sequences as specified in section 2.1.
- **Protocol Versions:** NSPIReferral has only one interface version. The use of these methods is specified in section 3.1.
- **Security and Authentication Methods:** NSPIReferral supports the following authentication methods: **NT LAN Manager Authentication Protocol (NTLM)** and **Kerberos**.

There is no capability negotiation.

1.8 Vendor-Extensible Fields

RfrGetNewDSA and **RfrGetFQDNFromServerDN** return HRESULT values as defined in [MS-DTYP] section 2.2.16. Vendors MAY define their own HRESULT values, provided that they set the C bit (0x20000000) for each vendor-defined value to indicate that the value is a customer code.

RfrGetNewDSA can also return other error values. Any non-zero return code indicates an error.

1.9 Standards Assignments

This protocol uses a well known **endpoint**, as specified in section 2.1. This protocol uses RPC **dynamic endpoints** as defined in [C706] part 4.

Parameter	Value	Reference
RFRI RPC interface UUID	(1544f5e0-613c-11d1-93df-00c04fd7bd09)	Appendix A

2 Messages

2.1 Transport

NSPIReferral works over the protocol sequences listed in the following table.

Protocol sequence
ncacn_ip_tcp
ncacn_http

NSPIReferral uses a **well-known endpoint** for network protocol sequence "ncacn_http". The following well-known endpoint is used:

Server	Protocol sequence	Endpoint
NSPIReferral	ncacn_http	6002

For all other network protocol sequences, the protocol uses RPC dynamic endpoints as specified in [C706] Part 4. These endpoints are configurable by the owner of the server, to enable the owner to open a minimum set of ports in a firewall to give clients access to NSPIReferral.

NSPIReferral supports NTLM (RPC_C_AUTHN_WINNT), and Negotiate (RPC_C_AUTHN_GSS_NEGOTIATE) **security providers**. A Negotiate security provider determines whether to use NTLM or **Kerberos** authentication. The default is Kerberos. A Negotiate security provider selects NTLM authentication only in the following cases:

- One of the systems that is involved in the authentication cannot use Kerberos authentication.
- The client does not provide sufficient information to use Kerberos authentication.

Callers MUST be authenticated but no further authorization checks are performed.

2.2 Common Data Types

This protocol MUST indicate to the RPC runtime that it is to support the **Network Data Representation (NDR)** transfer syntax only, as specified in [C706] Part 4.

NSPIReferral makes use of the types, structures, and constants that are specified in [C706] and [MS-RPCE] section 2.

2.2.1 handle_t

The **handle_t** data type is used to represent an explicit RPC **binding handle**, as specified in [C706] and [MS-RPCE] section 2. It is a primitive type of the **Interface Definition Language (IDL)** and does not require an explicit declaration.

3 Protocol Details

The client side of this protocol is simply a pass-through. That is, no additional timers or other **state** is required on the client side of this protocol. Calls made by the higher-layer protocol or application are passed directly to the transport, and the results returned by the transport are passed directly back to the higher-layer protocol or application.

3.1 NSPIReferral Server Details

This is a simple single-request, single-response protocol.

3.1.1 Abstract Data Model

A data structure that tracks the available NSPI servers and their current state is beneficial to any implementation. This internal state means the client is more likely to get a good NSPI server name and connect successfully on the first try. The NSPIReferral server is not required to connect to the NSPI server in order to service clients; therefore, it is important for an NSPIReferral implementation to use some method to maintain up-to-date information about available NSPI servers. This ensures that clients who call RfrGetNewDSA are not given the name of an NSPI server that is not functioning.

3.1.2 Timers

None required.

3.1.3 Initialization

Initialization occurs at server startup. NSPIReferral registers the NSPIReferral protocol interface with the RPC system using the RFRI RPC interface UUID, from section 1.9.

3.1.4 Message Processing Events and Sequencing Rules

This protocol MUST indicate to the RPC runtime that it is to perform a strict NDR data consistency check at target level 5.0, as specified in [MS-RPCE] section 3.

The following table lists the methods that are included in this interface.

Method	Description
RfrGetNewDSA	Returns the name of an NSPI server. **opnum**: 0
RfrGetFQDNFromServerDN	Returns the domain name system (DNS) FQDN of the server corresponding to the passed DN. For more details about **domain** name systems, see [RFC1035]. opnum: 1

All methods MUST NOT throw **exceptions**.

3.1.4.1 RfrGetNewDSA (opnum 0)

The **RfrGetNewDSA** method returns the name of an NSPI server.

```
//opnum 0
```

```
long RfrGetNewDSA(
 [in]          handle_t       hRpc,
 [in]              unsigned long   ulFlags,
 [in, string]    unsigned char *   pUserDN,
 [in,out,unique, string]    unsigned char * * ppszUnused,
 [in,out,unique, string]    unsigned char * * ppszServer);
```

hRpc: An RPC binding handle parameter, as specified in [C706] section 2. MUST NOT be NULL.

ulFlags: An unsigned long value, containing a set of bit **flags**. Unused; SHOULD be set to zero. Other values MUST be ignored by server.

pUserDN: Optional, a DN indicating the Mailbox owned by the client user. The client SHOULD pass this to the server. If supplied, the server SHOULD use that DN to affect which NSPI server is returned to the caller.

ppszUnused: A string. Unused; SHOULD be set to NULL. Other values MUST be ignored by the server.

ppszServer: A string. If the server does not return an error, ppszServer contains the FQDN of an NSPI server <1>.On failure, the value is undefined.

Return Values: The server returns 0 for a successful execution. An error results in an HRESULT or other non-zero error code.

Exceptions Thrown: No exceptions are thrown beyond those thrown by the underlying RPC protocol as specified by [MS-RPCE].

Upon receiving this message, the server MUST process the data from the client to the following constraints. If pUserDN is present and contains the DN of an Address Book object, the server MUST prioritize an NSPI server that contains a writeable copy of that Address Book object over NSPI servers that do not <2>. The server SHOULD take other constraints into account, such as the network location of the NSPI server in comparison to the NSPIReferral server or the client. The server MUST prioritize available, responsive NSPI servers over unresponsive ones. The server SHOULD consider load balancing of clients when more than one NSPI server has equal priority. After considering these constraints, NSPIReferral SHOULD return one NSPI server name in the ppszServer parameter and a return value of zero. If any errors occur and NSPIReferral is not able to return the name of an NSPI server, a non-zero value MUST be returned.

Because the goal of the server is to balance load across multiple NSPI servers, clients MUST NOT expect the same NSPI server to be returned from **RfrGetNewDSA**, even if all inputs are the same.

A client SHOULD call **RfrGetNewDSA** in the NSPIReferral service and connect to the NSPI server returned from that method. The client SHOULD NOT connect to an NSPI server without first requesting a server name from **RfrGetNewDSA** <3>.

The NSPI server returned in ppszServer MUST support the same RPC protocol sequence used by the RPC binding handle.

3.1.4.2 RfrGetFQDNFromServerDN (opnum 1)

The **RfrGetFQDNFromServerDN** method returns the domain name system (DNS) FQDN of the server corresponding to the passed DN.

[C++]

```
// opnum 1
long RfrGetFQDNFromServerDN(
   [in]         handle_t         hRpc,
   [in]         unsigned long      ulFlags,
   [in, range(10,1024)]   unsigned long     cbMailboxServerDN,
   [in, string, size_is(cbMailboxServerDN)]    unsigned char   *   szMailboxServerDN,
   [out,ref,string]    unsigned char   **   ppszServerFQDN);
```

hRpc: An RPC binding handle parameter, as specified in [C706] section 2. MUST NOT be NULL.

ulFlags: An unsigned long value, containing a set of bit flags. Unused; SHOULD be set to zero. Other values MUST be ignored by the server.

cbMailboxServerDN: An unsigned long value containing the number of bytes in the **szMailboxServerDN** string, including terminating NULL. The value is at least 10, at most 1024.

szMailboxServerDN: A DN identifying a Mailbox server <4>.

ppszServerFQDN: A string. If the server does not return an error, ppszServerFQDN contains the FQDN of the Mailbox server identified by szMailboxServerDN.

Return Values: The server returns 0 for a successful execution. An error results in an HRESULT or other non-zero error code.

Exceptions Thrown: No exceptions are thrown beyond those thrown by the underlying RPC protocol as specified by [MS-RPCE].

The server MUST process the data from the client to the following constraints when receiving this **Message**. NSPIReferral MUST perform some lookup to determine the FQDN of the server identified by szMailboxServerDN. After considering these constraints, NSPIReferral SHOULD return one Mailbox server name in ppszServerFQDN and 0 as a return value. If any errors occur and NSPIReferral is not able to return the name of a Mailbox server, a failing HRESULT SHOULD be returned.

3.1.5 Timer Events

None.

3.1.6 Other Local Events

None.

4 Protocol Examples

NSPIReferral is a simple protocol that is well-explained by the following example:

Client requests an NSPI server name from the server by calling RfrGetNewDSA() with pUserDN set to the client's Mailbox DN.

Typical parameters will look like the following:

```
    // RPC handle returned by RPC binding functions
    hRpc
       0x00010480   handle_t
    ulFlags
       0x00000000   unsigned long
    pUserDN
       "/o=First Organization/ou=Exchange Administrative Group
(FYDIBOHF23SPDLT)/cn=Recipients/cn=user1"      unsigned char *
    ppszUnused
       0x00000000   unsigned char * *
    // memory address which will receive output string
    ppszServer
       0x62348000   unsigned char * *
```

Server responds to the RfrGetNewDSA call with return code 0 and a valid server name.

Typical parameters will look like the following:

```
    ppszServer   "server1.example.com"   unsigned char * *
```

5 Security

5.1 Security Considerations for Implementers

There are no special security considerations specific to NSPIReferral. General security considerations pertaining to the underlying RPC-based transport apply (see [MS-RPCE]). NSPIReferral usually requires authentication, but generally does not restrict any caller who is authenticated.

5.2 Index of Security Parameters

Security parameter	Section
DS Referral authentication protocols	2.1

6 Appendix A: Full IDL

For ease of implementation, the full IDL is provided below. The syntax uses the IDL syntax extensions as specified in [MS-RPCE] sections 2.2.4 and 3.1.5.1. For example, as specified in [MS-RPCE] section 2.2.4.9, a pointer_default declaration is not required and pointer_default(unique) is assumed.

rfri.IDL:

```
[ uuid (1544f5e0-613c-11d1-93df-00c04fd7bd09),
  version(1.0),
  pointer_default(unique)]
interface rfri
{
long RfrGetNewDSA(
 [in]         handle_t       hRpc,
 [in]             unsigned long   ulFlags,
 [in, string]    unsigned char *   pUserDN,
 [in,out,unique, string]    unsigned char * * ppszUnused,
 [in,out,unique, string]    unsigned char * * ppszServer);

long RfrGetFQDNFromServerDN(
   [in]         handle_t         hRpc,
   [in]         unsigned long      ulFlags,
   [in, range(10,1024)]   unsigned long     cbMailboxServerDN,
   [in, string, size_is(cbMailboxServerDN)]    unsigned char *   szMailboxServerDN,
   [out,ref,string]    unsigned char   **   ppszServerFQDN);
}
```

7 Appendix B: Product Behavior

The information in this specification is applicable to the following product versions. References to product versions include released service packs.

- Microsoft Office Outlook 2003
- Microsoft Exchange Server 2003
- Microsoft Office Outlook 2007
- Microsoft Exchange Server 2007
- Microsoft Outlook 2010
- Microsoft Exchange Server 2010

Exceptions, if any, are noted below. If a service pack number appears with the product version, behavior changed in that service pack. The new behavior also applies to subsequent service packs of the product unless otherwise specified.

Unless otherwise specified, any statement of optional behavior in this specification 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 product does not follow the prescription.

<1> Section 3.1.4.1: Exchange 2007 and Exchange 2003: The Exchange implementation of NSPIReferral returns an NSPI server that listens on the endpoint 6004 for the ncacn_http protocol sequence. This works around network topology considerations which make it technically difficult to expose the NSPI servers directly to NSPI clients outside the local network.

<2> Section 3.1.4.1: Exchange 2007 and Exchange 2003: The Exchange implementation of NSPIReferral follows these NSPI server preference rules: NSPI servers have four properties:

1. Server is up and functioning.

2. Server supports the client's protocol sequence. This does not apply to Exchange 2010.

3. Server has a writeable copy of the object represented by pUserDN.

4. Server is physically close to NSPIReferral server.

The NSPI servers are compared on these four properties in the order above. If two servers both satisfy or both do not satisfy 1, then 2 is used as a tie-breaker; if two servers both satisfy or both do not satisfy 1 and both satisfy or both don't satisfy 2, then 3 is used as a tie-breaker; and so on. The server that breaks the tie by satisfying a property that the other one does not satisfy is the preferred server. If multiple servers tie after comparing all four properties, those servers are returned in "round robin" order, meaning that each call to RfrGetNewDSA will return the next server in the list of tied servers. In the Exchange implementation of NSPIReferral, the administrator of the Exchange NSPIReferral service can configure NSPIReferral to reverse the priorities of properties 3 and 4.

<3> Section 3.1.4.1: Outlook 2007 and Outlook 2003: Outlook can connect to a messaging server with a co-located NSPI server and no NSPIReferral server, as well as a messaging server with an NSPIReferral server. When first connecting, Outlook has not yet determined which type of messaging server it is connecting to, and therefore it will try to connect to the messaging server's

co-located NSPI server. On subsequent connections to that server, Outlook will use NSPIReferral. This is one exception to the protocol documentation that states that clients SHOULD always use NSPIReferral. Clients written to this protocol documentation have no reason to connect to an NSPI server before using NSPIReferral.

<4> Section 3.1.4.2: Exchange 2007 and Exchange 2003: The value in the szMailboxServerDN parameter MUST match the server's implementation of server identities. In Exchange, this is a 5-element DN. It follows this format:

```
"/o=" organization-name "/ou=" administrative-group-name
"/CN=configuration/CN=servers/CN=" short-messaging-server-name
```

Note that the client MAY receive a DN identifying a specific database on this server, from sources listed in section 1.6. This DN follows this format:

```
"/o=" organization-name "/ou=" administrative-group-name
"/CN=configuration/CN=servers/CN=" short-messaging-server-name
"/CN=Microsoft Private MDB"
```

Or

```
"/o=" organization-name "/ou=" administrative-group-name
"/CN=configuration/CN=servers/CN=" short-messaging-server-name
"/CN=Microsoft Public MDB"
```

If this is the DN available, it is the client's responsibility to remove the final element before passing the DN to RfrGetFQDNFromServerDN.

Exchange 2010 supports an additional, optional instance-name element following the CN=servers element:

```
"/o=" organization-name "/ou=" administrative-group-name
"/CN=configuration/CN=servers/CN=" instance-name "/CN=" short-messaging-
server-name "/CN=Microsoft Public MDB"
```

8 Change Tracking

This section identifies changes made to [MS-OXABREF] protocol documentation between July 2009 and November 2009 releases. Changes are classed as major, minor, or editorial.

Major changes affect protocol interoperability or implementation. Examples of major changes are:

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

Minor changes do not affect protocol interoperability or implementation. Examples are updates to fix technical accuracy or ambiguity at the sentence, paragraph, or table level.

Editorial changes apply to grammatical, formatting, and style issues.

No changes means that the document is identical to its last release.

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

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

- Content removed for template compliance.
- Obsolete document removed.

Editorial changes always have the revision type "Editorially updated."

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

Protocol syntax refers to data elements (such as packets, structures, enumerations, and methods) as well as interfaces.

Protocol revision refers to changes made to a protocol that affect the bits that are sent over the wire.

Changes are listed in the following table. If you need further information, please contact protocol@microsoft.com.

Section	Tracking number (if applicable) and description	Major change (Y or N)	Revision Type
1.1 Glossary	53070 Moved local term "flags" to MS-OXGLOS list.	N	Content update.
1.1 Glossary	48258 Added terms "binding handle" and "well-known endpoint" to MS-OXGLOS list.	N	Content update.
1.8 Vendor-Extensible Fields	48125 Added reference to MS-DTYP section.	N	Content update.
1.9 Standards Assignments	48165 Clarified UUID parameter name.	Y	Content update.
2.1 Transport	48155 Clarified dynamic endpoint configurability.	Y	Content update.
2.1 Transport	Reordered C706 part reference.	N	Editorially updated.
2.1 Transport	48258 Updated term "well-known endpoint".	N	Editorially updated.
2.2.1 handle_t	48258 Combined terms "binding" and "handle".	N	Editorially updated.
3.1.3 Initialization	48165 Clarified UUID name.	Y	Content update.
3.1.4.1 RfrGetNewDSA (opnum 0)	48134 Added non-null requirement to hRpc parameter.	Y	Content update.
3.1.4.1 RfrGetNewDSA (opnum 0)	48164 Clarified requirement for returned NSPI server's support of RPC protocol	Y	Content update.

Section	Tracking number (if applicable) and description	Major change (Y or N)	Revision Type
	sequences.		
3.1.4.1 RfrGetNewDSA (opnum 0)	48169 Updated normative language in description of server constraint processing.	Y	Content update.
3.1.4.1 RfrGetNewDSA (opnum 0)	48258 Combined terms "binding" and "handle".	N	Editorially updated.
3.1.4.1 RfrGetNewDSA (opnum 0)	48131 Updated Behavior Notes for Exchange 2010.	Y	Content update.
3.1.4.2 RfrGetFQDNFromServerDN (opnum 1)	48132 Added descriptions of return values and exceptions.	Y	Content update.
3.1.4.2 RfrGetFQDNFromServerDN (opnum 1)	48130 Added size_is requirement to szMailboxServerDN parameter.	Y	Content update.
3.1.4.2 RfrGetFQDNFromServerDN (opnum 1)	48258 Combined terms "binding" and "handle".	N	Editorially updated.
3.1.4.2 RfrGetFQDNFromServerDN (opnum 1)	48131 Updated Behavior Note for Exchange 2010.	Y	Product behavior note updated.
6 Appendix A: Full IDL	Added MS-RPCE cross-reference to section 2.2.4.9.	N	Editorially updated.
7 Appendix B: Product Behavior	48131 Added Outlook 2003 and Exchange 2003.	N	Editorially updated.

9 Index