

Introducing Microsoft's commitment to interoperability
(Office, Windows, and SQL)

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**Software is the
universal tool**

Microsoft's mission is to ...

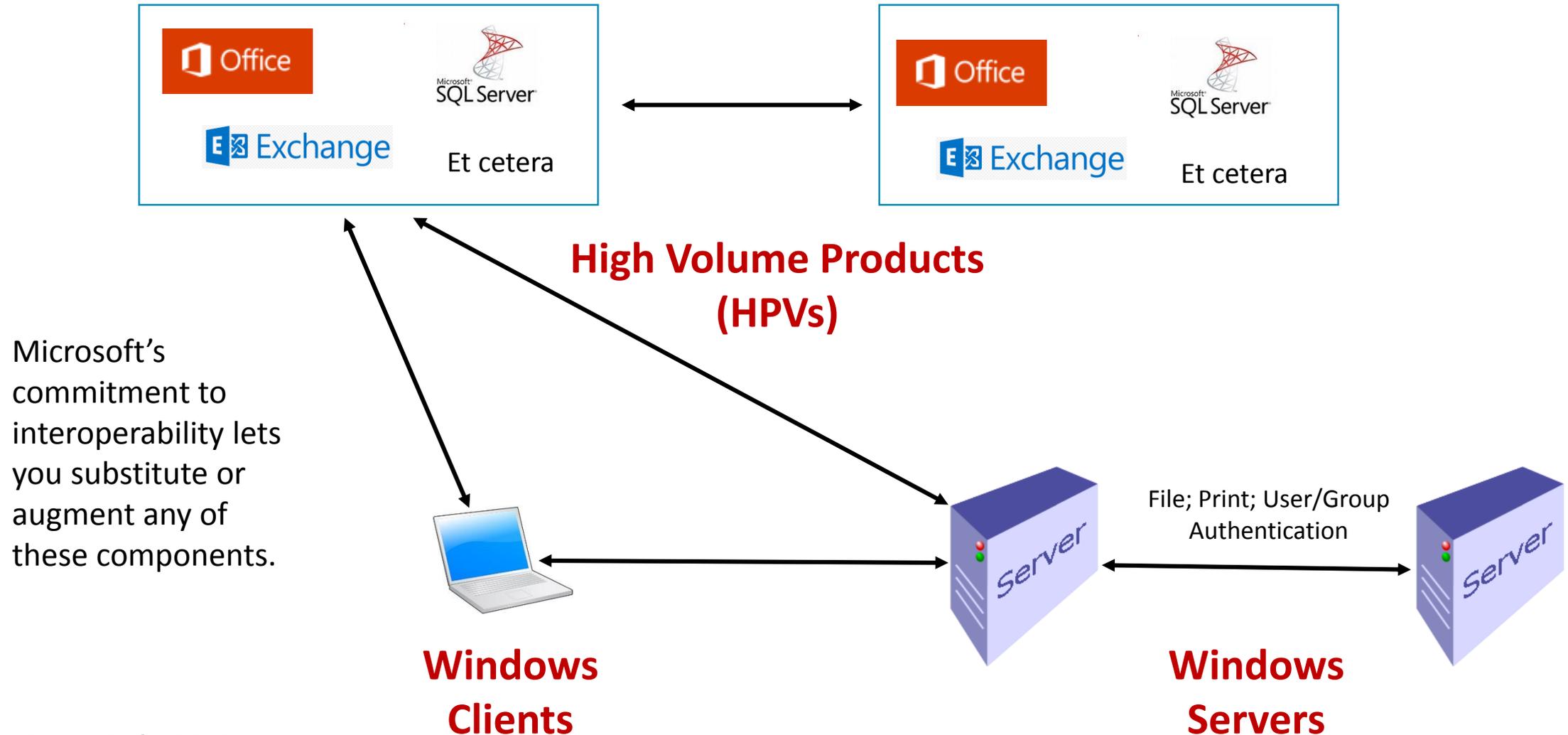
**Empower every person and
every organization on the
planet to achieve more.**

We integrate into your solutions

- Best in class server (check out Windows Server 2016)
- Powerful and proven client in Windows 10
- Most widely used productivity tools in Office
- Most widely use email solutions with Exchange and Outlook
- Best in class database platform (check out SQL Server 2016)
- Plus more, such as SharePoint

This is not a standalone environment. These are components used in larger interconnected solutions.

Microsoft Open Specifications describe the interfaces



Our commitment to interoperability

- Events
- Support
- Test Tools
- Documentation
- License to use applicable Microsoft intellectual property

MSDN Open Specifications Dev Center

Start Here

The screenshot shows a web browser window with the URL <https://msdn.microsoft.com/en-us/openspecifications/cc721659.aspx>. The page features the Microsoft logo and the title "Open Specifications | Dev Center". A search bar with the text "Search MSDN with Bing" is visible. Below the navigation menu, the main heading is "Open Specifications Dev Center". The introductory text states: "Through the Open Specifications program, Microsoft is helping developers open new opportunities by making technical documents related to interoperability for certain popular Microsoft products available to view and download from MSDN at no charge. This documentation includes protocols, computer languages, standards support, and data portability." It also mentions that some patents are available at no charge under patent promises. A paragraph encourages users to learn about Microsoft's commitment to interoperability by watching Open Specifications Plugfest videos, such as the "Interoperability Protocols Keynote".

Programs Programs, patent pledges, and interoperability principles	Patents Patent map, patent promises, and the Open Web Foundation Agreement	Documentation Technical documents for protocols, languages, standards support, and data portability	News Recent newsletters and highlights from the interoperability and Open Specifications blogs
Plugfests and Events Upcoming and past events, Open XML and ODF, Document Interoperability Initiative	Test Tools Message Analyzer, test suites, validators, interoperability labs, and more	Support Forums, blogs, Microsoft Support, knowledge base, partner programs, and more	Case Studies Companies have used the Open Specifications for innovative, interoperable solutions

Events

- Microsoft began hosting interop **Plugfests** and **IO labs** over ten years ago
 - >50 conferences, Plugfests, and IO Labs
 - 265 partners
- We will continue to host and participate in events that best supports the industry
 - Plans for this year include the Redmond Plugfest, SNIA Storage Developer's Conference, a Remote Desktop IO Lab, DevDays Asia, etc.
 - We want these events to meet your needs – talk to Microsoft attendees about your event experiences and feedback; suggest topics and locations

Support

¥ No cost



24 x 7 Monitoring



Email: DocHelp@Microsoft.com



Issues acknowledged < 24hrs



Forums: <http://social.msdn.microsoft.com/Forums/en-US/category/OpenSpecifications>

Communicate in Chinese or English



[Link](#)

The screenshot shows a web browser window with the URL <https://msdn.microsoft.com/en-us/openspecifications/cc816063>. The page is titled "Development Support" and is part of the "Open Specifications | Dev Center" section. The Microsoft logo is in the top left, and the "msdn" logo is in the top right. A navigation menu includes "Home", "Documentation", "Events", "Test", "Support" (highlighted), "Programs", and "Patents". A search bar with the text "Search MSDN with Bing" is also present. The main content area features a "Support" button and a heading "Development Support". Below this, a paragraph explains that developers can obtain assistance from Microsoft and its engineers through various means, including:

- Forums
- Microsoft Knowledge Base
- Other support options, including Microsoft Support, chat, blogs, and partner programs

A link to "Interop Documentation Support Team" is provided for more information. Below this is a section titled "Ask a Question in the Forums" which contains a table of forum categories:

Office XML, ODF, and Binary File Formats	Discuss the technical content and implementation of the Office binary file formats (.doc, .xls, .ppt, .pst, etc.), the Open XML file formats (ISO/IEC 29500) (.docx, .xlsx, .pptx, etc.), the ODF 1.1 standard, and the Open Packaging Conventions APIs (ISO/IEC 29500-2). For questions about the Open XML format itself, visit the forums on OpenXMLDeveloper.org .
Office Protocols	Discuss the technical content and implementation of the Office protocols described in the Open Specifications.
Exchange Server Protocols	Discuss the technical content and implementation of the Exchange Server protocols described in the Open Specifications.
SharePoint Server Protocols	Discuss the technical content and implementation of the SharePoint Server protocols described in the Open Specifications.
SQL Server Protocols	Discuss the technical content and implementation of the SQL Server protocols described in the Open Specifications.
Windows File Sharing Protocols	Discuss the technical content and implementation of Server Message Block (SMB) protocols described in the Open Specifications.
Windows Protocols	Discuss the technical content and implementation of the Windows (including .NET Framework) protocols described in the Open Specifications.
Open Specifications Questions	Discuss the technical content and implementation of the Open Specifications documents, their organization, language conventions, references, and interoperability scenarios.

Below the table is a section titled "Search the Microsoft Knowledge Base" with a search box and a "Search" button. The search box contains the text "Enter your error code or search term in the box below to search for Knowledge Base articles only".

At the bottom of the page, there is a link to "Additional Support Options" with the URL <https://msdn.microsoft.com/en-us/openspecifications/cc816063>.

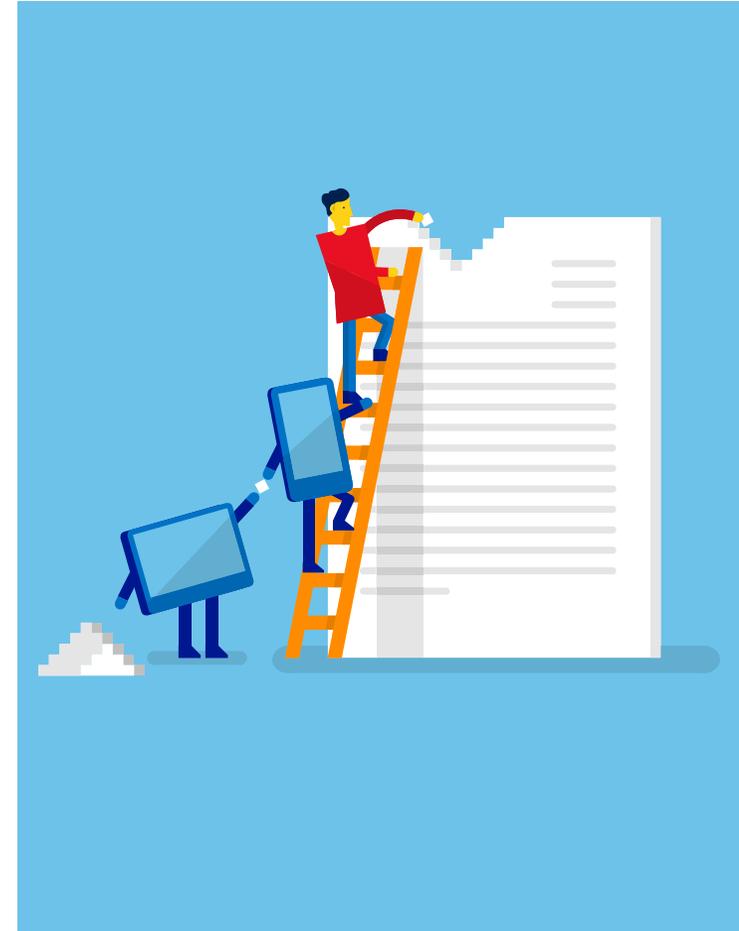
Tools

- Test Tools
- Message Analyzer
- MailSim
- OData Validator
- Etc.



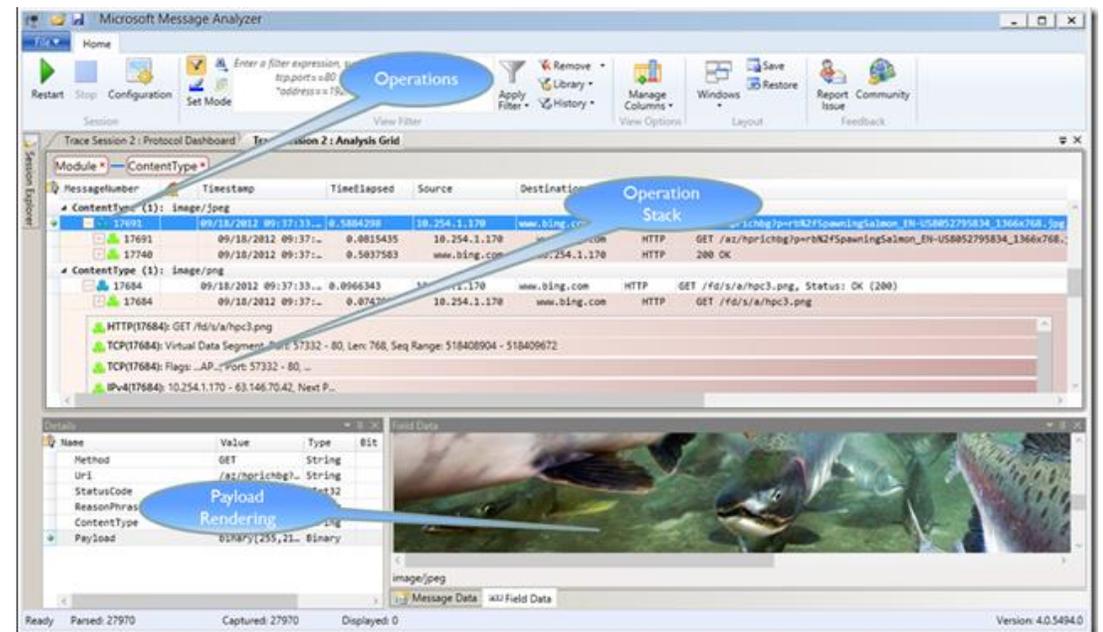
Test Tools

- Synthetic, automated clients that generate real protocol traffic
- Validation of the server response
- Connect to your non-Microsoft server or validate your man-in-the-middle product
- Support for over 50 protocols across Windows, Office, SharePoint, and Exchange



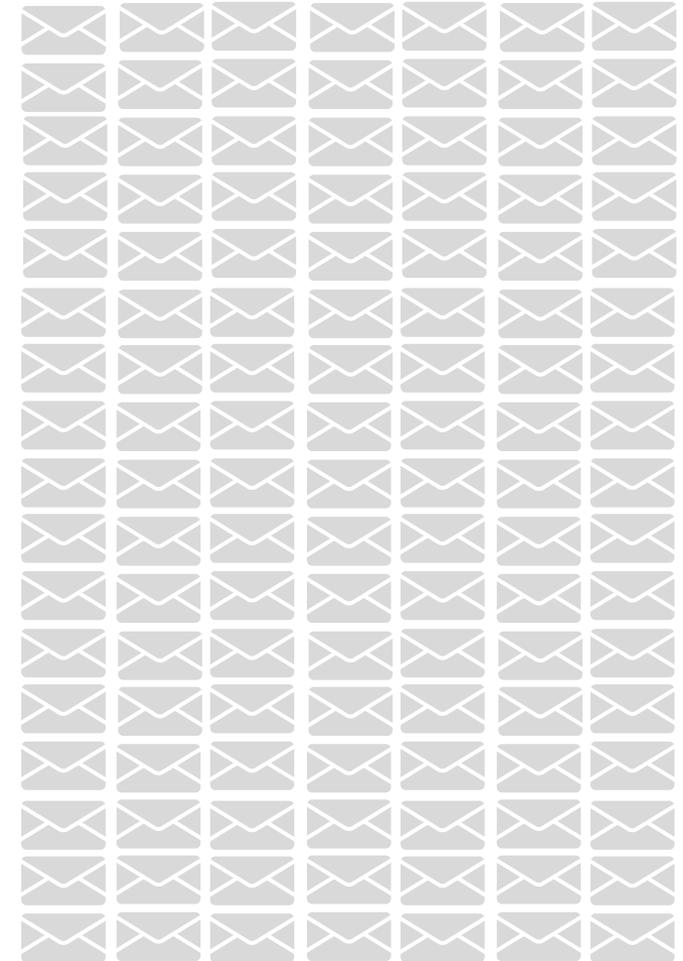
Message Analyzer

- Capture and analyze network traffic
- Gain clarity over the wire
- Debug traffic more effectively
- Parsers available for Skype, Office, SharePoint, Exchange, Windows, and SQL Server
- Network captures that augment examples in overview documents



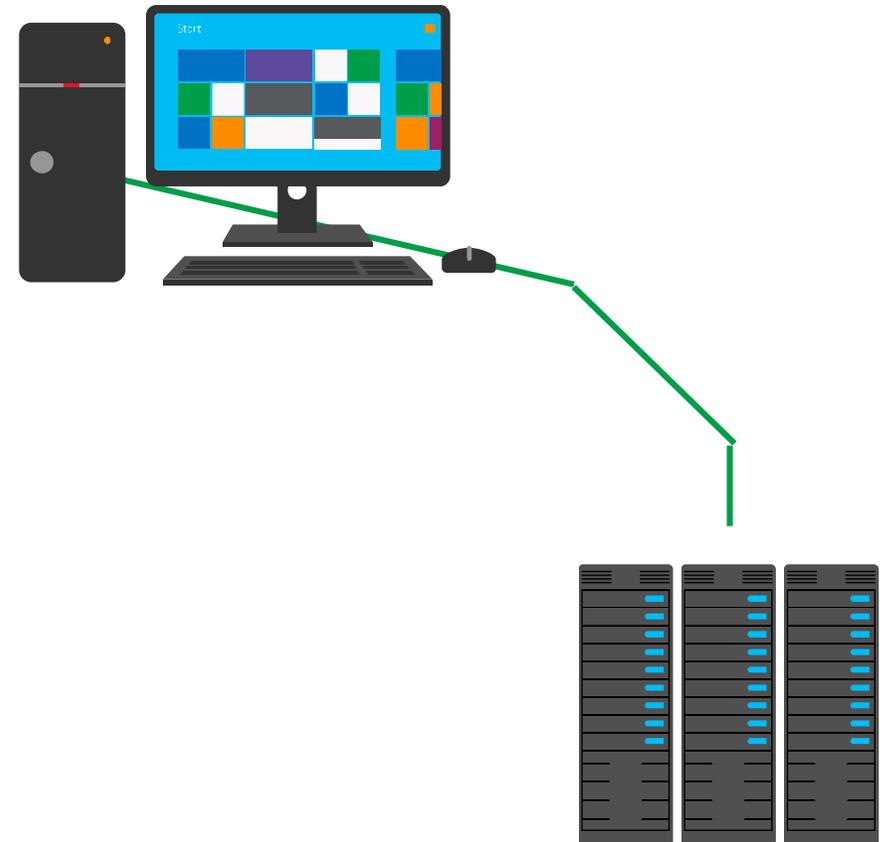
MailSim

- Generate email to server through Outlook or REST Mail client
- Automates core Outlook operations
- Define quantities of mail traffic and repeat
- Server sizing, testing, or network traffic simulation
- Open Source (GitHub)
 - <https://github.com/OfficeDev/Interop-MailSim>



OData Validator

- Bases on OData protocol specs
- Supports multiple OData versions, payload formats, validation of resource endpoint types
- Serves as an online tool
- Has five optional validation approaches: By URI, By Direct Input, Conformance Level, Metadata Validation, Service Implementation



Documentation

- Overview documents
- Protocol specifications
- Data structures
- Algorithms
- File formats
- Industry standards – extensions and subset implementations
- Computer languages

Documentation published in several formats

- HTML
- PDF
- DOCX (MS Word format)
- Errata
- DIFF (a PDF file with highlighted change tracking)
- Network captures (to augment examples in overview documents)
- Preview Documents (new and changed document usually associated with public Beta previews of software)

Documentation

The screenshot shows a web browser window with the address bar displaying <https://msdn.microsoft.com/en-us/library/dd208104.aspx>. The page title is "Open Specifications".

MSDN Library

- Open Specifications
 - Forums and Blogs
 - Document Programs
 - Preview Specifications
 - Archive
 - Protocols
 - Computer Languages
 - Standards Support
 - Data Portability

Explore Open Specifications Documentation

	Protocols Microsoft publishes technical documents for protocols that are implemented in Windows client (including .NET Framework) and Windows Server (collectively Windows), Office, SharePoint Products and Technologies, Exchange Server, and Microsoft SQL Server and are used to communicate with other Microsoft software products.
	Computer Languages Microsoft publishes technical documents for the VBA programming language and Extensible Application Markup Language (XAML).
	Standards Support Microsoft publishes technical documents that describe support for specific standards implemented in Exchange Server and Outlook; Internet Explorer; OData; Microsoft SQL Server; Windows WordPad; and Word, Excel, and PowerPoint.
	Data Portability Microsoft publishes technical documents for the file formats created by Word, Excel, PowerPoint, and Outlook and by SQL Server. Additionally, it publishes technical documents that describe how user-created data in SQL Server can be extracted for use in other software products.

Microsoft revises the technical documents regularly and, particularly, in connection with the release of significant product updates and new versions.

Forums and Blogs

	Open Specifications Forums These MSDN user forums are available to answer technical questions about the Open Specifications documents.
	Open Specifications Blogs These blogs, authored by the engineers who support the Open Specifications documents provide a different venue for further discussion of those documents.

Also in this section

- Document Programs
- Preview Specifications
- Archive

Overview documents

- In addition to specifications for individual protocols, Microsoft publishes overview documents.
 - Link: [Windows Overview documents on MSDN](#)
- When a group of protocols are used together to accomplish a set of common scenarios, such as remote desktop sessions or joining a domain, an overview document may be created for those scenarios.
 - Example: [\[MS-RDSOD\]: Remote Desktop System Overview Document](#)
 - Annotated network captures are created to describe the interactions

Windows protocols



- General definition for a communication protocol is *a system of rules for data exchange*
- This graphic shows common categories of Windows network protocols
- Over 450 specifications for Windows network protocols and related information are currently published on MSDN
 - MSDN Library > [Open Specifications](#)
- Office, Exchange, SharePoint, and SQL Server also inventory protocols and publish documents.

[Link](#)

Overview Documents

This section provides overview documents for the Windows Protocols documentation set. The overview documents supplement the technical documents by describing context, conceptual background, and inter-protocol relationship and interaction information. They provide examples of some common use cases. The overview documents do not restate the processing rules and other details that are specific for each protocol. Those details are described in the protocol specifications for each of the protocols and data structures that belong to the protocols group described in an overview document.

Network captures for the examples described in the overview documents are available as downloadable ZIP files.

Note The inter-document links in a PDF version of a technical document are functional only if all the cross-referenced documents are saved to the same local directory folder. An error message appears if you click a link that references a PDF document that is not located in the same folder (when viewing via your local hard drive) or is part of a different download (when viewing online). To save a complete set of PDF files to the same folder, download the [Windows Protocols .zip file](#). This is a large file and can take a few minutes to download.

Specification	Description
[MS-ADFSOD]: Active Directory Federation Services (AD FS) Protocols Overview	Provides an overview of the functionality and relationships of the Active Directory Federation Services (AD FS) protocols. AD FS provides a means for distributed identification, authentication, and authorization across organizational and platform boundaries. It extends the ability to use single sign-on functionality that is normally available only within a single security or enterprise boundary to Internet-facing applications, which gives customers, partners, and suppliers a streamlined user experience while accessing the web-based applications of an organization. The AD FS protocols that are described in this document provide for tasks such as sharing of authorization codes among groups of AD FS servers, obtaining security tokens for users from security token services, and integrating AD FS with preauthentication proxies. These protocols include [MS-ADFSOAL], [MS-ADFSPPI], [MS-ADFSPPP], [MS-ADFSSWAP], [MS-MWBE], [MS-MWBF], [MS-OAPX], and [MS-SAMLPR], along with various industry standards. Click here to view this version of the [MS-ADFSOD] PDF.
[MS-ADOD]: Active Directory Protocols Overview	Provides an overview of the functionality and relationship of the protocols that make up the client-server and server-to-server behavior of Active Directory. The Active Directory protocols provide directory services for the centralized storage of identity and account information, as well as storage for other forms of data such as group policies and printer location information, a foundation for authentication services in a domain environment, domain services, and directory replication services in Windows. The Active Directory protocols are specified in [LDAP], [MS-ADTS], [MS-SRPL], [MS-DRSR], [MS-SNTP], [MS-LSAD], [MS-LSAT], [MS-DSSP], [MS-SAMR], [MS-SAMS], [MS-WSDS], [WSXFR], [WSENUM], [MS-WSTIM], [MS-ADDM], [MS-WSPELD], and [MS-]CAP].



Link

[MS-DOCO]: Windows Pr x

https://msdn.microsoft.com/en-us/library/hh553598.aspx

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[MS-DOCO]: Windows Protocols Documentation Roadmap

Provides an overview of the Windows protocols documentation set. It provides a high-level roadmap for finding and navigating the documentation set and describes the content for each type of document.

This page and associated content may be updated frequently. We recommend you subscribe to the [RSS feed](#) to receive update notifications.

Published Version

Date	Protocol Revision	Revision Class	Downloads
9/26/2016	11.0	Major	PDF DOCX Diff

[Click here to download a zip file of all PDF files for Windows Protocols.](#)

Previous Versions

Date	Protocol Revision	Revision Class	Downloads
7/14/2016	10.0	Major	PDF DOCX Diff
10/16/2015	9.1	Minor	PDF DOCX

- MSDN Library
- Open Specifications
- Protocols
- Windows Protocols
- Overview Documents
- [MS-DOCO]: Windows Protocols Documentation Roadmap**
- 1 Introduction
- 2 Documentation Contents
- 3 Navigating the Documentation Set
- 4 Appendix A: Cross-Reference Matrixes
- 5 Appendix B: Open Specifications Site Map
- 6 Change Tracking
- 7 Index

Microsoft

[Link](#)

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[MS-FASOD]: File Access Services Protocols Overview

Provides an overview of the functionality and relationship of the File Access Services (FAS) protocols, which enable network file access and sharing in Windows and allow a client computer to discover, access, and share files that are hosted on, and made available by, another computer. The FAS protocols are specified in [MS-BRWS], [MS-CIFS], [MS-DFSC], [MS-FSA], [MS-FSCC], [MS-RAP], [RFC1094], [RFC1813], [RFC4918], [RFC5661], [MS-SMB], [MS-SMB2], [MS-SMBD], [MS-WDV], [MS-WDVME], and [MS-WDVSE].

This page and associated content may be updated frequently. We recommend you subscribe to the [RSS feed](#) to receive update notifications.

Published Version

Date	Protocol Revision	Revision Class	Downloads
9/26/2016	5.0	Major	PDF DOCX Diff Capture

[Click here to download a zip file of all PDF files for Windows Protocols.](#)

Previous Versions

Date	Protocol Revision	Revision Class	Downloads
10/16/2015	4.0	None	PDF DOCX
9/24/2015	4.0	Major	PDF DOCX Capture
6/30/2015	3.0	Major	PDF DOCX

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[Link](#)

[MS-FASOD]: Memb x

https://msdn.microsoft.com/en-us/library/jj216037.aspx

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Export (0) | Print

- MSDN Library
- Open Specifications
- Protocols
- Windows Protocols
- Overview Documents
- [MS-FASOD]: File Access Services Protocols Overview
- 2 Functional Architecture
 - 2.1 Overview
 - 2.2 Protocol Summary
 - 2.2.1 Member Protocol Roles**
 - 2.3 Environment
 - 2.4 Assumptions and Preconditions
 - 2.5 Use Cases
 - 2.6 Versioning, Capability Negotiation, and Extensibility
 - 2.7 Error Handling
 - 2.8 Coherency Requirements
 - 2.9 Security
 - 2.10 Additional Considerations

2.2.1 Member Protocol Roles

This section describes all member protocol roles.

The Remote Administration (RAP) Protocol (as described in [\[MS-RAP\]](#)) is an administrative protocol whose function has largely been replaced by newer protocols. In the File Access Services System, RAP is used by legacy systems as a discovery protocol. RAP also supports certain client and server administration methods, such as SMB file share enumeration, but this functionality has been superseded by the Workstation Service Remote Protocol (as described in [\[MS-WKST\]](#)) and Server Service Remote Protocol (as described in [\[MS-SRVSS\]](#)). RAP is not used in IPv6, and can only be used in IPv4 if NetBIOS is enabled.

The Distributed File System (DFS) Namespace Referral Protocol [\[MS-DFSC\]](#) allows SMB file clients to map paths in a virtual distributed namespace to paths on specific file servers.

The Common Internet File System (CIFS) Protocol [\[MS-CIFS\]](#), Server Message Block (SMB) Protocol [\[MS-SMB\]](#), and Server Message Block (SMB) 2.0 Protocol [\[MS-SMB2\]](#) are network file access protocols that support file sharing (remote access to an object store) between computers.

Server Message Block (SMB) version 2 Protocol [\[MS-SMB2\]](#) defines a new version of the SMB protocol. First implemented in Windows Server 2008 operating system and Windows Vista operating system, it is the default file sharing protocol used by Windows. It defines features, such as advanced pipelining, symbolic links, a new form of oplocks called leasing, support for hosted caching, durable and resilient handles, and improved scalability of basic structures like numbers of shares, users, and open files.

In Windows Server 2012 operating system, Windows Server 2012 R2 operating system, and Windows Server 2016 operating system, the Server Message Block (SMB) 2 Protocol has additional transport support for Remote Direct Memory Access (RDMA), as defined in [\[RFC5040\]](#) section 2.1. The SMB Remote Direct Memory Access (RDMA) Transport Protocol (SMB Direct) ([\[MS-SMBD\]](#)) enables direct memory-to-memory data transfers between cooperating SMB3 dialect clients and servers.

Network File System (NFS) version 2 and 3 is a protocol originally developed by Sun Microsystems in 1984, defined in [\[RFC1094\]](#) (version 2) and [\[RFC1813\]](#) (version 3) that allows a computer to access files over a network. A client implementation of the NFS V2 and NFS V3 protocols shipped in Windows Vista, Windows 7 operating system, Windows 8 operating system, Windows 8.1 operating system, Windows 10 operating system, Windows Server 2003 operating system, Windows Server 2003 R2 operating system, Windows Server 2008, Windows Server 2008 R2 operating system, Windows Server 2012, Windows Server 2012 R2, and Windows Server 2016. The server implementation of NFS V2 and V3 protocol shipped in Windows Server 2003, Windows Server 2003 R2, Windows Server 2008, Windows Server 2008 R2, Windows Server 2012, Windows Server 2012 R2, and Windows Server

Microsoft

What is a protocol?

- A **protocol** defines a data format (syntax) communicated between different computing devices that either defines actions to be taken by the computing device or generates messages by itself (semantics).

If data is sent or received between computing devices,
you may have a protocol.

Common protocol types

Type	Description	Example
Block	Defines the format of the bits on the wire; typically uses TCP or UDP as the transport (and sometimes even HTTP)	Internet Control Message Protocol (ICMP) , Server Message Block Versions 2 and 3
RPC and DCOM	Defines RPC packets sent over the wire; defined by an IDL	Netlogon Remote Protocol
SOAP	Similar to RPC, but use info sets instead of RPC-defined data structures and marshalling	WS-Addressing , WS-Trust
HTTP	Defines client/server communication using a request/response paradigm to access resources. These typically use HTTP with XML or JSON.	Smooth Streaming Protocol , PowerShell Web Access Protocol , BitLocker Recovery Key Backup Protocol

Protocol classifications

- A protocol can be defined by **Microsoft** (such as MS-SMB2) or it can be defined by an **industry standards group** or **3rd-party** (such as HTTP, Kerberos, or Netflix APIs)
- Microsoft can **extend** or **subset** a protocol
 - Adding syntax or semantics that are not in the existing specification *extends* a protocol
 - Implementing only a subset or changing the syntax or semantics of an existing protocol creates a *profile* of that protocol
 - Microsoft publishes specifications for extensions and profiles of other protocols
- Protocols can depend on additional **data structures** and **algorithms** for interoperability:
 - A data structure defines syntax only -- the order, size, nature, allowable values, and format for data that is used by a protocol
 - An algorithm defines semantics only -- how to compute a value (in other words, when to send data, a cryptographic key, or a number to put in a message, etc.) that is used by a protocol

Example 1: Kerberos authentication



RFC 4120: The Kerberos Network Authentication Service (V5)

Kerberos is an Internet Engineering Task Force (IETF) industry standard, defined in RFC 4120. The RFC describes Kerberos concepts and specifies Version 5 of the Kerberos protocol.

[[RFC](#)]



[MS-KILE]: Kerberos Protocol Extensions

Microsoft implements RFC 4120, but also extends authorization aspects of this protocol to support group membership, claims, etc. These extensions are specified in MS-KILE.

[[Doc](#)]



[MS-PAC]: Privilege Attribute Certificate Data Structure

MS-KILE encodes authorization data into a Privileged Attribute Certificate (PAC) data structure. This structure is specified in MS-PAC.

[[Doc](#)]

2.1.4.1 Kerberos Protocols

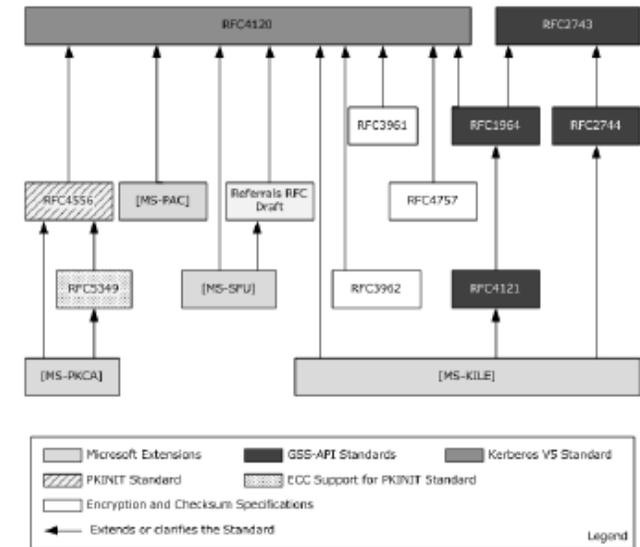


Figure 13: Relationships between Kerberos protocol standards and Microsoft extensions

[MS-AUTHSOD: Authentication Services Protocols Overview](#)

The Authentication Services overview document describes how these and other protocols are used together for Microsoft authentication implementations, including Kerberos.

Example 2: Server Message Block



[MS-SMB2]: Server Message Block (SMB) Protocol Versions 2 and 3
MS-SMB2 is a Microsoft-proprietary protocol that supports the sharing of file and print resources between machines. There are many external implementations of this protocol (Samba, Apple, etc.).

[\[Doc\]](#)



[MS-FSCC]: File System Control Codes

MS-FSCC defines control codes and data structures used for Windows remote file access, specifically supported by file systems. This information is used by the MS-SMB2 protocol and others.

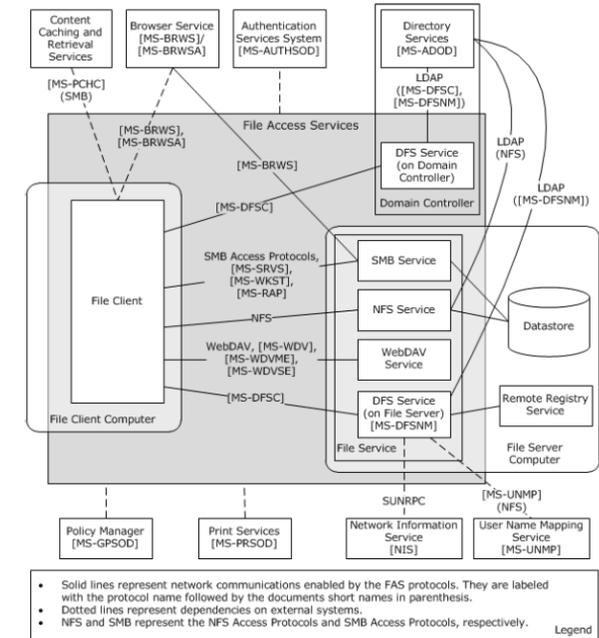
[\[Doc\]](#)



[MS-FSA]: File System Algorithms

Describes wire-visible behavior for backing object stores, including NTFS, REFS, FAT, CDFS, etc.. This document is specific to Windows semantics, as applicable to SMB2 and Win32 application needs.

[\[Doc\]](#)



[MS-FASOD]: File Access Services Protocols Overview

The File Access Services overview document describes how MS-SMB2 and other protocols are used together to enable network file access and sharing.

Technical Document Structure

- The beginning of the document is Normative (typically sections 2 and 3)
 - **Normative** information defines the protocol, data structure, etc. in technical detail
 - Other sections are **Informative**
 - Informative information is added to help the implementer with explanations, examples, and related references
 - The Product Behavior appendix informs the reader about which Microsoft products and versions of those products apply to the documentation
- ▀ **[MS-SMB2]: Server Message Block (SMB) Protocol Versions 2 and 3**
 - 1 Introduction
 - 2 Messages
 - 2.1 Transport
 - 2.2 Message Syntax
 - 3 Protocol Details
 - 3.1 Common Details
 - 3.2 Client Details
 - 3.3 Server Details
 - 4 Protocol Examples
 - 5 Security
 - 6 Appendix A: Product Behavior
 - 7 Change Tracking
 - 8 Index

Prescriptive language

Prescriptive language clarifies the technical requirements for an implementation.

MAY, SHOULD, MUST, SHOULD NOT, MUST NOT:

These terms...are used as defined in [\[RFC 2119\]](#). All statements of optional behavior use either MAY, SHOULD, or SHOULD NOT.

Normative vs Informative sections

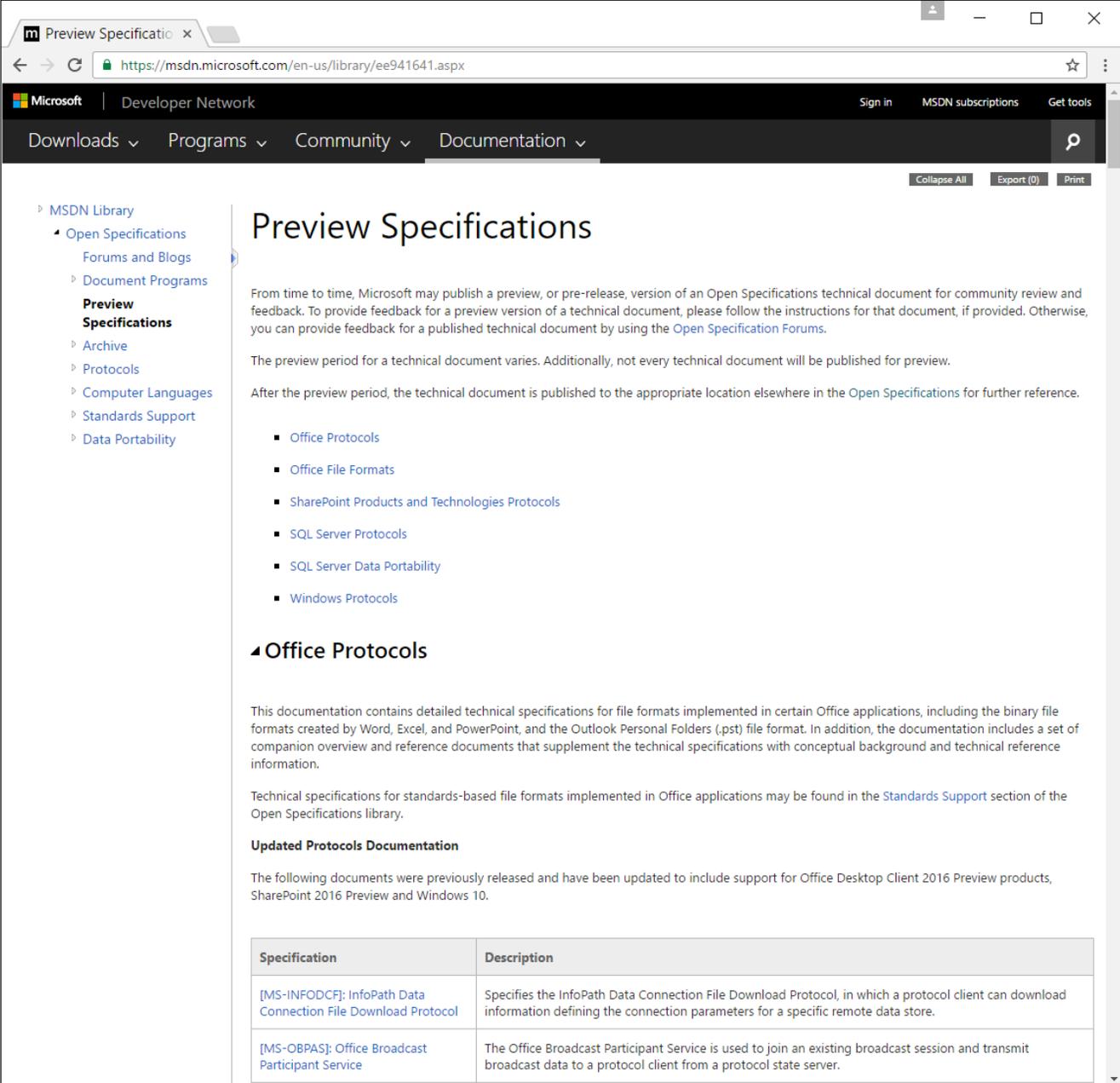
Prescriptive language is restricted to normative sections, by template type.

Algorithm	Section 2 Algorithm Details
Block, HTTP, RPC, SOAP	Sections 1.8 Vendor-Extensible Fields; 2 Messages; 3 Protocol Details
Standards Support	Section 2.1 Normative Variation
Structure	Sections 1.8 Vendor-Extensible Fields; 2 Structures

Preview specifications

- Advanced copies new or modified protocols
- Typically published with the public "BETA" previews a Microsoft product
- Documents are not complete, and the information is subject to change with the final release of the software

[Link](#)



The screenshot shows a web browser window displaying the MSDN Preview Specifications page. The page title is "Preview Specifications" and the URL is "https://msdn.microsoft.com/en-us/library/ee941641.aspx". The page content includes an introduction to preview specifications, a list of categories (Office Protocols, Office File Formats, SharePoint Products and Technologies Protocols, SQL Server Protocols, SQL Server Data Portability, Windows Protocols), and a section for "Office Protocols" which provides detailed technical specifications for file formats implemented in certain Office applications. A table at the bottom lists updated protocols documentation.

Specification	Description
[MS-INFODCF]: InfoPath Data Connection File Download Protocol	Specifies the InfoPath Data Connection File Download Protocol, in which a protocol client can download information defining the connection parameters for a specific remote data store.
[MS-OBPAS]: Office Broadcast Participant Service	The Office Broadcast Participant Service is used to join an existing broadcast session and transmit broadcast data to a protocol client from a protocol state server.

Errata

From time to time updates are made to the documents to clarify information or to correct mistakes.

Customer reported problems are classified as TDIs (Technical Documentation Issues).

The Support groups works with the customer to resolve the TDI. Microsoft then corrects the document and issues an Errata update in order to inform all implementers.

Windows errata is typically published every two weeks. If changes are extensive, Microsoft will publish a new version of the document.

[Link](#)

The screenshot shows a web browser window displaying the MSDN Errata page. The browser's address bar shows the URL <https://msdn.microsoft.com/en-us/library/dn781092.aspx>. The page title is "Errata in Open Specification Protocol Documentation". The page is published on August 17, 2015. A notice states that Errata pages may be updated more frequently than protocols documents and provides links to RSS and Atom feeds. Below this, a paragraph explains that the pages contain Errata for the indicated protocols documents since those documents were last published. The page is divided into sections: "What are Errata?" and "What kinds of issues are not included in Errata?". The "What are Errata?" section explains that Errata are content issues in previously published versions of protocols documents that could impact an implementation. The "What kinds of issues are not included in Errata?" section explains that content issues that don't impact an implementation, such as editorial updates due to typos, formatting updates, and rewrites for readability and clarity, are not included in Errata. A list of links for various protocols Errata is provided at the bottom of the page.

Errata in Open Specification Protocol Documentation

Published: August 17, 2015

The Errata pages may be updated more frequently than the protocols documents. To receive notifications of changes to Errata pages, you can subscribe to these RSS or Atom feeds.

Errata are subject to the same terms as the Open Specifications documentation referenced.

The pages below contain the Errata for the indicated protocols documents since those documents were last published. For more information, please contact dochelp@microsoft.com.

What are Errata?

Errata are content issues in previously published versions of protocols documents that could impact an **implementation**. Examples of errata are errors or missing information in the normative sections of the Technical Specifications or in the use cases (examples) in the Technical Specifications and Overview Documents.

What kinds of issues are not included in Errata?

Content issues that don't impact an implementation, e.g., editorial updates due to typos, formatting updates, and rewrites for readability and clarity, are **not** included in Errata.

[Windows Protocols Errata](#)

[Office Protocols Errata](#)

[SharePoint Protocols Errata](#)

[Exchange Server Protocols Errata](#)

[SQL Server Protocols Errata](#)

[OData Standards Support Errata](#)

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- [MC-DTCXA]: MSDTC Connection Manager OleTx XA Protocol
- [MS-ABTP]: Automatic Bluetooth Pairing Protocol
- [MS-ADA2]: Active Directory Schema Attributes M
- [MS-ADDM]: Active Directory Web Services: Data Model and Common Elements
- [MS-ADFSOAL]: Active Directory Federation Services OAuth Authorization Code Lookup Protocol
- [MS-ADFSPIP]: Active Directory Federation Services and Proxy Integration Protocol
- [MS-ADFSWAP]: Active Directory Federation Service (AD FS) Web Agent Protocol
- [MS-ADSC]: Active Directory Schema Classes
- [MS-ADTS]: Active Directory Technical Specification
- [MS-AIPS]: Authenticated Internet Protocol
- [MS-APDS]:

[MS-SMB2]: Server Message Block (SMB) Protocol Versions 2 and 3

This topic lists the Errata found in [MS-SMB2] since it was last published. Since this topic is updated frequently, we recommend that you subscribe to these RSS or Atom feeds to receive update notifications.

Errata are subject to the same terms as the Open Specifications documentation referenced.

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Errata below are for Protocol Document Version V25.0 – 2016/07/14.

Errata Published*	Description
2016/10/10	<p>In two sections, revised the description of SessionId.</p> <p>In Section 2.2.1.1, SMB2 Packet Header – ASYNC, changed from:</p> <p>SessionId (8 bytes): Uniquely identifies the established session for the command. This MUST be 0 for requests that do not have an associated user context. This MUST be 0 for the first SMB2 SESSION_SETUP Request for a specified security principal. The following SMB 2 Protocol commands do not require the SessionId to be set to a nonzero value received from a previous SMB2 SESSION_SETUP Response. The client MUST set the SessionId to 0, and the server SHOULD ignore this value for the following commands:</p> <ul style="list-style-type: none">• SMB2 NEGOTIATE request• SMB2 NEGOTIATE response <p>Changed to:</p> <p>SessionId (8 bytes): Uniquely identifies the established session for the command. This field MUST be set to 0 for an SMB2_NEGOTIATE request (section 2.2.3) and for an SMB2_NEGOTIATE response (section 2.2.4).</p>

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