

Windows Protocols Errata

This topic lists the Errata found in the Windows Protocols Technical Specifications, Overview Documents, and Reference documents since they were 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.

Errata are content issues in 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.

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

The sections below list the Windows Protocols documents that contain active Errata (i.e., Errata not yet released with the documents on MSDN) and provide links to archived Errata (i.e., Errata already released with the documents on MSDN).

Protocols Documents with Active Errata

[\[MC-NMF\]: .NET Message Framing Protocol](#)

[\[MS-ADFSP/IP\]: Active Directory Federation Services and Proxy Integration Protocol](#)

[\[MS-ADTS\]: Active Directory Technical Specification](#)

[\[MS-CIFS\]: Common Internet File System \(CIFS\) Protocol](#)

[\[MS-CMRP\]: Failover Cluster: Management API \(ClusAPI\) Protocol](#)

[\[MS-CSRA\]: Certificate Services Remote Administration Protocol](#)

[\[MS-CSSP\]: Credential Security Support Provider \(CredSSP\) Protocol](#)

[\[MS-DFSC\]: Distributed File System \(DFS\) Referral Protocol](#)

[\[MS-DNSP\]: Domain Name Service \(DNS\) Server Management Protocol](#)

[\[MS-DSCPM\]: Desired State Configuration Pull Model Protocol](#)

[\[MS-DTYP\]: Windows Data Types](#)

[\[MS-EVEN6\]: EventLog Remoting Protocol Version 6.0](#)

[\[MS-FAX\]: Fax Server and Client Remote Protocol](#)

[\[MS-FSA\]: File System Algorithms](#)

[\[MS-FSCC\]: File System Control Codes](#)

[\[MS-GPPREF\]: Group Policy: Preferences Extension Data Structure](#)

[\[MS-GPSB\]: Group Policy: Security Protocol Extension](#)

[\[MS-HGSA\]: Host Guardian Service: Attestation Protocol](#)

[\[MS-IPHTTPS\]: IP over HTTPS \(IP-HTTPS\) Tunneling Protocol](#)

[\[MS-LCID\]: Windows Language Code Identifier \(LCID\) Reference](#)

[\[MS-MDE2\]: Mobile Device Enrollment Protocol Version 2](#)

[\[MS-MICE\]: Miracast over infrastructure Connection Establishment](#)

[\[MS-MWBF\]: Microsoft Web Browser Federated Sign-On Protocol](#)

[\[MS-NCNBI\]: Network Controller Northbound Interface Specification](#)

[\[MS-OAPX\]: OAuth 2.0 Protocol Extensions](#)

[\[MS-OAPXBC\]: OAuth 2.0 Protocol Extensions for Broker Clients](#)

[\[MS-OLEDS\]: Object Linking and Embedding \(OLE\) Data Structures](#)

[\[MS-RDPADRV\]: Remote Desktop Protocol Audio Level and Drive Letter Persistence Virtual Channel Extension](#)

[\[MS-RDPBCGR\]: Remote Desktop Protocol: Basic Connectivity and Graphics Remoting](#)

[\[MS-RDPECLIP\]: Remote Desktop Protocol: Clipboard Virtual Channel Extension](#)

[\[MS-RDPEDYC\]: Remote Desktop Protocol: Dynamic Channel Virtual Channel Extension](#)

[\[MS-RDPEGFX\]: Remote Desktop Protocol: Graphics Pipeline Extension](#)

[\[MS-RDPELE\]: Remote Desktop Protocol: Licensing Extension](#)

[\[MS-RDPERP\]: Remote Desktop Protocol: Remote Programs Virtual Channel Extension](#)

[\[MS-RRP\]: Windows Remote Registry Protocol](#)

[\[MS-SAMR\]: Security Account Manager \(SAM\) Remote Protocol \(Client-to-Server\)](#)

[\[MS-SCMR\]: Service Control Manager Remote Protocol](#)

[\[MS-SHLLINK\]: Shell Link \(.LNK\) Binary File Format](#)

[\[MS-SMB\]: Server Message Block \(SMB\) Protocol](#)

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

[\[MS-TDS\]: Tabular Data Stream Protocol](#)

[\[MS-TSGU\]: Terminal Services Gateway Server Protocol](#)

[\[MS-TSWP\] Terminal Services Workspace Provisioning Protocol](#)

[\[MS-WSMV\]: Web Services Management Protocol Extensions for Windows Vista](#)

[\[MS-WDSOSD\]: Windows Deployment Services Operation System Deployment Protocol](#)

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Last date updated: September 3, 2018

[MC-DTCXA]: MSDTC Connection Manager OleTx XA Protocol

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[MC-NMF]: .NET Message Framing Protocol

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Errata below are for Protocol Document Version [V9.0 - 2018/03/16](#).

Errata Published*	Description
2018/07/02	<p>In Section 2.2.6, Preamble Message, the field descriptions have been modified as follows and have been moved to follow the packet diagram.</p> <p>Changed from:</p> <p>The VersionRecord MUST be formatted as specified in section 2.2.3.1. The ModeRecord MUST be formatted as specified in section 2.2.3.2. The ViaRecord MUST be formatted as specified in section 2.2.3.3. The EnvelopeEncodingRecord MUST be formatted as specified in section 2.2.3.4</p> <p>Changed to:</p> <p>VersionRecord (3 bytes): This field MUST be formatted as specified in section 2.2.3.1. ModeRecord (2 bytes): This field MUST be formatted as specified in section 2.2.3.2. ViaRecord (variable): This field MUST be formatted as specified in section 2.2.3.3. EnvelopeEncodingRecord (variable): This field MUST be formatted as specified in section 2.2.3.4</p>

*Date format: YYYY/MM/DD

[MC-PRCR]: Peer Channel Custom Resolver Protocol

This topic lists the Errata found in [MC-PRCR] 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.



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[MS-ABTP]: Automatic Bluetooth Pairing Protocol

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[MS-ADA2]: Active Directory Schema Attributes M

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[MS-ADA3]: Active Directory Schema Attributes N-Z

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[MS-ADDM]: Active Directory Web Services: Data Model and Common Elements

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[MS-ADFSOAL]: Active Directory Federation Services OAuth Authorization Code Lookup Protocol

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[MS-ADFSPIP]: Active Directory Federation Services and Proxy Integration Protocol

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Errata below are for Protocol Document Version [V6.0 – 2017/12/01](#).

Errata Published*	Description														
2018/03/05	<p>In Section 2.2.2.4, Configuration, AD_FS_BEHAVIOR_LEVEL_3 has been mapped to the appropriate value for farm-behavior-version-number.</p> <p>Changed from:</p> <table border="1"><tbody><tr><td>ad_fs_behavior_level</td><td>farm-behavior-version-number</td></tr><tr><td>AD_FS_BEHAVIOR_LEVEL_1</td><td>"6.3"</td></tr><tr><td>AD_FS_BEHAVIOR_LEVEL_2</td><td>"10.0"</td></tr></tbody></table> <p>Changed to:</p> <table border="1"><tbody><tr><td>ad_fs_behavior_level</td><td>farm-behavior-version-number</td></tr><tr><td>AD_FS_BEHAVIOR_LEVEL_1</td><td>"6.3"</td></tr><tr><td>AD_FS_BEHAVIOR_LEVEL_2</td><td>"10.0"</td></tr><tr><td>AD_FS_BEHAVIOR_LEVEL_3</td><td>"10.0"</td></tr></tbody></table>	ad_fs_behavior_level	farm-behavior-version-number	AD_FS_BEHAVIOR_LEVEL_1	"6.3"	AD_FS_BEHAVIOR_LEVEL_2	"10.0"	ad_fs_behavior_level	farm-behavior-version-number	AD_FS_BEHAVIOR_LEVEL_1	"6.3"	AD_FS_BEHAVIOR_LEVEL_2	"10.0"	AD_FS_BEHAVIOR_LEVEL_3	"10.0"
ad_fs_behavior_level	farm-behavior-version-number														
AD_FS_BEHAVIOR_LEVEL_1	"6.3"														
AD_FS_BEHAVIOR_LEVEL_2	"10.0"														
ad_fs_behavior_level	farm-behavior-version-number														
AD_FS_BEHAVIOR_LEVEL_1	"6.3"														
AD_FS_BEHAVIOR_LEVEL_2	"10.0"														
AD_FS_BEHAVIOR_LEVEL_3	"10.0"														

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[MS-ADFSWAP]: Active Directory Federation Service (AD FS) Web Agent Protocol

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[MS-ADLS]: Active Directory Lightweight Directory Services Schema

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[MS-ADSC]: Active Directory Schema Classes

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[MS-ADTS]: Active Directory Technical Specification

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Errata below are for Protocol Document Version [V48.0 - 2018/03/16](#).

Errata Published*	Description
2018/08/20	<p>In Section 3.1.1.3.1.3.1, Search Filters, the following paragraph was added to the end of the section:</p> <p>Filter clauses of the form (objectClass=*), (distinguishedName=*), (name=*), and (objectGUID=*) always evaluate to true for all objects.</p>
2018/05/21	<p>In Section 3.1.1.4.5.36, msDS-ResultantPSO, information about certain products that do not enforce the check for the RID value DOMAIN_USER_RID_KRBTGT in U!objectSid was added:</p> <p>Changed from:</p> <ul style="list-style-type: none">• If the RID in U!objectSid is equal to DOMAIN_USER_RID_KRBTGT, then there is no value in this attribute. <p>Changed to:</p> <ul style="list-style-type: none">• If the RID in U!objectSid is equal to DOMAIN_USER_RID_KRBTGT, then there is no value in this attribute. <p>Note: Windows Server 2016 and earlier and Windows Server v1803 and earlier do not enforce this check.</p>

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[MS-AIPS]: Authenticated Internet Protocol

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[MS-APDS]: Authentication Protocol Domain Support

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[MS-AZOD]: Authorization Protocols Overview

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[MS-BKRP]: BackupKey Remote Protocol

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[MS-CAPR]: Central Access Policy Identifier (ID) Retrieval Protocol

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[MS-CDP]: Connected Devices Platform Protocol Version 3

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[MS-CHAP]: Extensible Authentication Protocol Method for Microsoft Challenge Handshake Authentication Protocol (CHAP)

This topic lists the Errata found in the MS-CHAP document 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.



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[MS-CFB]: Compound File Binary File Format

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[MS-CIFS]: Common Internet File System (CIFS) Protocol

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Errata below are for Protocol Document Version [V28.0 – 2017/12/01](#).

Errata Published*	Description
2018/07/30	<p>In Section 2.2.7.1.1, Request, the description of FILE_OVERWRITE and FILE_OVERWRITE_IF have been changed from:</p> <p>FILE_OVERWRITE: If the file already exists, it SHOULD be opened and truncated. If the file does not already exist, the operation MUST fail. The client MUST open the file with at least GENERIC_WRITE access for the command to succeed.</p> <p>FILE_OVERWRITE_IF: If the file already exists, it SHOULD be opened and truncated. If the file does not already exist, it SHOULD be created. The client MUST open the file with at least GENERIC_WRITE access.</p> <p>Changed to:</p> <p>FILE_OVERWRITE: If the file already exists, it SHOULD be opened and truncated. If the file does not already exist, the operation MUST fail.</p> <p>FILE_OVERWRITE_IF: If the file already exists, it SHOULD be opened and truncated. If the file does not already exist, it SHOULD be created.</p>
2017/12/18	<p>In Section 2.2.4.64.1, Request, the description of FILE_OVERWRITE and FILE_OVERWRITE_IF have been changed from:</p> <p>FILE_OVERWRITE: If the file already exists, it SHOULD be opened and truncated. If the file does not already exist, the operation MUST fail. The client MUST open the file with at least GENERIC_WRITE access for the command to succeed.</p> <p>FILE_OVERWRITE_IF: If the file already exists, it SHOULD be opened and truncated. If the file does not already exist, it SHOULD be created. The client MUST open the file with at least GENERIC_WRITE access.</p> <p>Changed to:</p>

Errata Published*	Description
	FILE_OVERWRITE: If the file already exists, it SHOULD be opened and truncated. If the file does not already exist, the operation MUST fail. FILE_OVERWRITE_IF: If the file already exists, it SHOULD be opened and truncated. If the file does not already exist, it SHOULD be created.

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[MS-CMRP]: Failover Cluster: Management API (ClusAPI) Protocol

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Errata below are for Protocol Document Version [V34.1 - 2018/03/16](#).

Errata Published*	Description
2018/08/20	<p>In the sections listed below, the language in the description for the Version field has been clarified to indicate that the specified value is required:</p> <p>2.2.3.46 NodeUtilizationInfo 2.2.3.48 CLUS_GET_CLUSBFLT_PATHINFO_EX_IN 2.2.3.49 CLUS_PHYSICAL_DISK_INFO_EX_IN 2.2.3.53 CLUS_GET_SBL_DISK_STATE_EX_IN 2.2.3.57 CLUS_SBL_CACHE_CONFIG_EX_IN 2.2.3.58 CLUS_SBL_CACHE_CONFIG</p> <p>Changed from:</p> <p>Version (4 bytes): A 32-bit value containing the version of the request structure. This field is set to 0x00000001.</p> <p>Changed to:</p> <p>Version (4 bytes): A 32-bit value containing the version of the request structure. This field MUST be set to 0x00000001.</p> <p>In the sections listed below, the language in the description for the Version field has been clarified to indicate what the value must be, and that it is required:</p> <p>2.2.3.50 CLUS_PHYSICAL_DISK_INFO_HEADER 2.2.3.54 CLUS_SBL_DISK_STATE</p> <p>Changed from:</p> <p>Version (4 bytes): Indicates the version of the request structure.</p>

Errata Published*	Description
	<p>Changed to:</p> <p>Version (4 bytes): Indicates the version of the request structure. This field MUST be set to 0x00000001.</p> <p>In Section 2.2.3.47, CBFLT_PATH_IDS, the language in the description for the Version field has been clarified to describe how the value is derived.</p> <p>Changed from:</p> <p>Version (4 bytes): Indicates the version of this structure.</p> <p>Changed to:</p> <p>Version (4 bytes): Indicates the version of this structure, expressed as its size in bytes</p>

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[MS-COMA]: Component Object Model Plus (COMplus) Remote Administration Protocol

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[MS-CSRA]: Certificate Services Remote Administration Protocol

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Errata below are for Protocol Document Version [V37.0 - 2018/03/16](#).

Errata Published*	Description
2018/07/30	<p>In Section 3.1.1.4.1, CRL Table Required Data Elements, the CRL_Name_Id element name was corrected in the description.</p> <p>Changed from:</p> <p>CRL_Name_Id: Column name "CRLNameId". The sequential number that indicates which CA key the CRL is for. For example, if a CA certificate has been renewed with a new key three times and the CA issues a CRL for each key, the CRLNameId field can be used to distinguish each of the four issued CRLs.</p> <p>Changed to:</p> <p>CRL_Name_Id: Column name "CRLNameId". The sequential number that indicates which CA key the CRL is for. For example, if a CA certificate has been renewed with a new key three times and the CA issues a CRL for each key, the CRL_Name_Id field can be used to distinguish each of the four issued CRLs.</p>

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[MS-CSSP]: Credential Security Support Provider (CredSSP) Protocol

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Errata below are for Protocol Document Version [V16.0 - 2018/03/16](#).

Errata Published*	Description
2018/04/09	<p>In Section 3.1.5, Processing Events and Sequencing Rules, UNICODE has been removed from the instructions.</p> <p>In Step 3 Version 5 or 6, changed from:</p> <p>Set ClientServerHash to SHA256(UNICODE(ClientServerHashMagic), Nonce, SubjectPublicKey)</p> <p>Changed to:</p> <p>Set ClientServerHash to SHA256(ClientServerHashMagic, Nonce, SubjectPublicKey)</p> <p>In Step 4, Version 5 and 6, changed from:</p> <p>Set ServerClientHash to SHA256(UNICODE(ServerClientHashMagic), Nonce, SubjectPublicKey)</p> <p>Changed to:</p> <p>Set ServerClientHash to SHA256(ServerClientHashMagic, Nonce, SubjectPublicKey)</p>

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[MS-CSVP]: Failover Cluster: Setup and Validation Protocol (ClusPrep)

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[MS-DCOM]: Distributed Component Object Model (DCOM) Remote Protocol

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[MS-DFSC]: Distributed File System (DFS) Referral Protocol

This topic lists the Errata found in [MS-DFSC] 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.



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Errata below are for Protocol Document Version [V27.0 – 2017/12/01](#).

Errata Published*	Description
2018/07/30	<p>In Section 3.2.5.5, Receiving a Root Referral Request or Link Referral Request, product behavior note 30 has been changed from:</p> <p>Servers SHOULD<30> return fully qualified DNS host names of targets in responses to root referral requests and link referral requests.</p> <p><30> Section 3.2.5.5: By default, Windows Server 2003, Windows Server 2008, Windows 7, Windows Server 2008 R2, Windows 8, Windows Server 2012, Windows 8.1, Windows Server 2012 R2, Windows 10, Windows Server 2016, and Windows Server operating system return DNS host names that are not fully qualified for targets.</p> <p>Changed to:</p> <p>Servers SHOULD<30> return fully qualified DNS host names of targets in responses to root referral requests and link referral requests.</p> <p><30> Section 3.2.5.5: By default, Windows Server 2003, Windows Server 2008, Windows Server 2008 R2, Windows Server 2012, and Windows Server 2012 R2 return DNS host names that are not fully qualified for targets.</p>

*Date format: YYYY/MM/DD

[MS-DHCPM]: Microsoft Dynamic Host Configuration Protocol (DHCP) Server Management Protocol

This topic lists the Errata found in [MS-DHCPM] 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.



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[MS-DNSP]: Domain Name Service (DNS) Server Management Protocol

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Errata below are for Protocol Document Version [V33.0 - 2017/12/01](#).

Errata Published*	Description
2018/09/03	<p>In Section 3.1.4.5, R_DnssrvUpdateRecord (Opnum 4), a processing rule to describe how aging is handled in new records when aging is disabled has been added.</p> <p>Changed from:</p> <ul style="list-style-type: none">• If pszZoneName is NULL or points to "..Cache" then the operation SHOULD be performed on the DNS server's cache and MAY be performed on the DNS server's set of root hint records.<276> If pszZoneName points to "..RootHints" then the operation MUST be performed on the DNS server's set of root hint records.• If pszZoneName points to a primary zone, attempt to perform addition/deletion/update of the record. If the operation is successful, increment the zone serial number using serial number arithmetic [RFC1982]. If the last record at the node is being deleted and the zone is stored in the ... <p>...</p> <p>Changed to:</p> <ul style="list-style-type: none">• If pszZoneName is NULL or points to "..Cache" then the operation SHOULD be performed on the DNS server's cache and MAY be performed on the DNS server's set of root hint records.<276> If pszZoneName points to "..RootHints" then the operation MUST be performed on the DNS server's set of root hint records.• If a node indicated by pszNodeName already exists and has at least one record for which aging is disabled, then subsequent records added on the node will also have aging disabled.• If pszZoneName points to a primary zone, attempt to perform addition/deletion/update of the record. If the operation is successful, increment the zone serial number using serial number arithmetic [RFC1982]. If the last record at the node is being deleted and the zone is stored in the .. <p>...</p>

*Date format: YYYY/MM/DD

[MS-DPWSSN]: Devices Profile for Web Services (DPWS) Size Negotiation Extension

This topic lists the Errata found in [MS-DPWSSN] 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.



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[MS-DRSR]: Directory Replication Service (DRS) Remote Protocol

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[MS-DTCO]: MSDTC Connection Manager: OleTx Transaction Protocol

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[MS-DSCPM]: Desired State Configuration Pull Model Protocol

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Errata below are for Protocol Document Version [V7.0 - 2017/12/01](#).

Errata Published*	Description
2018/01/16	<p>In the sections listed below, unnecessary blank spaces have been removed from the syntax and/or section numbers linked corrected. For example, in Section 3.9.5.1.1, PUT, "DSC- RegisterDscAgentRequest-URI-End" has been changed to " DSC- RegisterDscAgentRequest-URI-End" and in Section 3.12.5.1.1.3, Processing Details, the linked section number has been changed from 3.11.5.1.1.1 to 3.12.5.1.1.1.</p> <p>3.5.5.1.1, GET 3.7.5.1.1, GET 3.9.5.1.1, PUT 3.10.5.1.1, POST 3.11.5.1.1, GET 3.12, CertificateRotation Details 3.12.5.1.1, POST 3.12.5.1.1.3, Processing Details</p>

*Date format: YYYY/MM/DD

[MS-DTYP]: Windows Data Types

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Errata below are for Protocol Document Version [V34.0 - 2017/12/01](#).

Errata Published*	Description								
2018/01/29	<p>In Section 2.3.2, EVENT_HEADER, two new entries - EVENT_HEADER_FLAG_DECODE_GUID and EVENT_HEADER_FLAG_PROCESSOR_INDEX - have been added to the Flags field.</p> <p>Changed from:</p> <p>Flags: Flags that provide information about the event such as the type of session it was logged to and whether the event contains extended data. This member can contain one or more of the following flags.</p> <table border="1"><thead><tr><th>Value</th><th>Meaning</th></tr></thead><tbody><tr><td>...</td><td>...</td></tr><tr><td>EVENT_HEADER_FLAG_64_BIT_HEADER</td><td>Indicates that the provider was running on a 64-bit computer.</td></tr><tr><td>EVENT_HEADER_FLAG_CLASSIC_HEADER</td><td>Indicates that provider used a trace event function to log the event.</td></tr></tbody></table> <p>Changed to:</p> <p>Flags: Flags that provide information about the event such as the type of session it was logged to and whether the event contains extended data. This member can contain one or more of the following flags.</p>	Value	Meaning	EVENT_HEADER_FLAG_64_BIT_HEADER	Indicates that the provider was running on a 64-bit computer.	EVENT_HEADER_FLAG_CLASSIC_HEADER	Indicates that provider used a trace event function to log the event.
Value	Meaning								
...	...								
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Errata Published*	Description													
	<table border="1" data-bbox="511 191 1414 947"> <thead> <tr> <th data-bbox="511 191 1015 243">Value</th> <th data-bbox="1015 191 1414 243">Meaning</th> </tr> </thead> <tbody> <tr> <td data-bbox="511 243 1015 296">...</td> <td data-bbox="1015 243 1414 296">...</td> </tr> <tr> <td data-bbox="511 296 1015 369">EVENT_HEADER_FLAG_64_BIT_HEADER</td> <td data-bbox="1015 296 1414 369">Indicates that the provider was running on a 64-bit computer.</td> </tr> <tr> <td data-bbox="511 369 1015 495">EVENT_HEADER_FLAG_DECODE_GUID</td> <td data-bbox="1015 369 1414 495">Indicates that the ProviderId member of the event record is a decode GUID rather than a control GUID.<2></td> </tr> <tr> <td data-bbox="511 495 1015 600">EVENT_HEADER_FLAG_CLASSIC_HEADER</td> <td data-bbox="1015 495 1414 600">Indicates that provider used a trace event function to log the event.</td> </tr> <tr> <td data-bbox="511 600 1015 947">EVENT_HEADER_FLAG_PROCESSOR_INDEX</td> <td data-bbox="1015 600 1414 947"> <p>If this flag is set, the identifier for the CPU that logged the event MUST be accessed using the ProcessorIndex member of the BufferContext member of the event record.</p> <p>If this flag is not set, the identifier for the CPU that logged the event MUST be read from the ProcessorNumber member of the BufferContext member of the event record.<3></p> </td> </tr> </tbody> </table> <p data-bbox="495 989 1414 1146"><2> Section 2.3.2: Not supported in Windows versions earlier than the Windows 10 v1709 operating system client or the Windows Server v1709 operating system server releases. The control GUID will usually be found in the ExtendedData array. Typically, the presence of this flag indicates that the event is associated with an automatically-generated manifest, such as one generated by the Windows software trace preprocessor.</p> <p data-bbox="495 1146 1414 1199"><3> Section 2.3.2: Not supported in Windows versions earlier than the Windows 8 client or Windows Server 2012 server releases.</p>		Value	Meaning	EVENT_HEADER_FLAG_64_BIT_HEADER	Indicates that the provider was running on a 64-bit computer.	EVENT_HEADER_FLAG_DECODE_GUID	Indicates that the ProviderId member of the event record is a decode GUID rather than a control GUID.<2>	EVENT_HEADER_FLAG_CLASSIC_HEADER	Indicates that provider used a trace event function to log the event.	EVENT_HEADER_FLAG_PROCESSOR_INDEX	<p>If this flag is set, the identifier for the CPU that logged the event MUST be accessed using the ProcessorIndex member of the BufferContext member of the event record.</p> <p>If this flag is not set, the identifier for the CPU that logged the event MUST be read from the ProcessorNumber member of the BufferContext member of the event record.<3></p>
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2017/12/18	<p data-bbox="495 1230 1414 1283">In Section 2.4.7, SECURITY_INFORMATION, an entry for the PROCESS_TRUST_LABEL_SECURITY_INFORMATION value has been added:</p> <table border="1" data-bbox="511 1325 1414 1451"> <thead> <tr> <th data-bbox="511 1325 1096 1377">Value</th> <th data-bbox="1096 1325 1414 1377">Meaning</th> </tr> </thead> <tbody> <tr> <td data-bbox="511 1377 1096 1451">PROCESS_TRUST_LABEL_SECURITY_INFORMATION 0x00000080</td> <td data-bbox="1096 1377 1414 1451">Reserved.</td> </tr> </tbody> </table>		Value	Meaning	PROCESS_TRUST_LABEL_SECURITY_INFORMATION 0x00000080	Reserved.								
Value	Meaning													
PROCESS_TRUST_LABEL_SECURITY_INFORMATION 0x00000080	Reserved.													

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[MS-DVRD]: Device Registration Discovery Protocol

This topic lists the Errata found in [MS-DVRD] 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.



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[MS-DVRE]: Device Registration Enrollment Protocol

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[MS-DVRJ]: Device Registration Join Protocol

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[MS-ECS]: Enterprise Client Synchronization Protocol

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[MS-EFSR]: Encrypting File System Remote (EFSRPC) Protocol

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[MS-EMF]: Enhanced Metafile Format

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[MS-EMFPLUS]: Enhanced Metafile Format Plus Extensions

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[MS-ERREF]: Windows Error Codes

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[MS-EVEN]: EventLog Remoting Protocol

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[MS-EVEN6]: EventLog Remoting Protocol Version 6.0

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Errata below are for Protocol Document Version [V21.0 - 2018/03/16](#).

Errata Published*	Description
2018/07/30	<p>In Section 2.2.1, RpcInfo, a space between "DWORD" and "m_error" has been added.</p> <p>Changed from:</p> <pre>typedef struct tag_RpcInfo { DWORDm_error, m_subErr, m_subErrParam; } RpcInfo;</pre> <p>Changed to:</p> <pre>typedef struct tag_RpcInfo { DWORD m_error, m_subErr, m_subErrParam; } RpcInfo;</pre>

*Date format: YYYY/MM/DD

[MS-FASP]: Firewall and Advanced Security Protocol

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[MS-FAX]: Fax Server and Client Remote Protocol

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Errata below are for Protocol Document Version [V25.0 - 2017/09/15](#).

Errata Published*	Description
2018/06/04	<p>In Section 2.2.10, FAX_DEVICE_STATUS, changes were made to the Job type values.</p> <p>Changed the value of JT_SEND to: 0x00000001</p> <p>Changed the value of JT_RECEIVE to: 0x00000002</p> <p>In Section 3.1.1, Abstract Data Model, changes were made to the Job type values.</p> <p>Changed the value of JT_UNKNOWN to: 0x00000000</p> <p>Changed the value of JT_SEND to: 0x00000001</p> <p>Changed the value of JT_RECEIVE to: 0x00000002</p> <p>Changed the value of JT_ROUTING to: 0x00000003</p> <p>Changed the value of JT_FAIL_RECEIVE to: 0x00000004</p>

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[MS-FRS2]: Distributed File System Replication Protocol

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[MS-FSA]: File System Algorithms

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Errata below are for Protocol Document Version [V27.0 - 2018/03/16](#).

Errata Published*	Description
2018/09/03	<p>In Section 2.1.5.9.5, FSCTL_DUPLICATE_EXTENTS_TO_FILE_EX, the following has been added to the Pseudocode:</p> <ul style="list-style-type: none">• If InputBuffer.StructureSize is not equal to sizeof(DUPLICATE_EXTENTS_DATA_EX), the operation MUST be failed with STATUS_NOT_SUPPORTED.
2018/08/20	<p>In Section 2.1.5.6, Server Requests Flushing Cached Data, the content has been changed from:</p> <p>The server provides:</p> <ul style="list-style-type: none">• Open: An Open of a DataFile or DirectoryFile for which it is to flush cached data. On completion, the object store MUST return:• Status: An NTSTATUS code that specifies the result. <p>The object store MUST flush all persistent attributes for Open.File to stable storage. In addition:</p> <ul style="list-style-type: none">• If Open.File.Volume.IsReadOnly is TRUE, the operation MUST be failed with STATUS_MEDIA_WRITE_PROTECTED.• The operation MUST be failed with the status code returned from the underlying physical storage. The operation flushes all eligible objects; however, only the first failure encountered is returned.• The operation ensures that the directory structure is persisted to stable storage.<62> <p>Pseudocode for the operation is as follows:</p> <ul style="list-style-type: none">• If Open.FileType is DirectoryFile:• CurrentDirectory = Open.DirectoryFile

Errata Published*	Description
	<ul style="list-style-type: none"> ● Flush CurrentDirectory ● While CurrentDirectory != CurrentDirectory.Volume.RootDirectory: ● Set CurrentLink to the head of CurrentDirectory.LinkList, which is the only link because directories cannot have hard links. ● CurrentDirectory = CurrentLink.ParentFile ● Flush CurrentDirectory ● EndWhile ● EndIf ● Flush all open objects on the volume. ● If Open.File is equal to Open.File.Volume.RootDirectory: ● For each OpenFile in Open.File.Volume.OpenFileList: ● Flush OpenFile ● EndFor ● EndIf <p>Changed to:</p> <p>The server provides:</p> <ul style="list-style-type: none"> ● Open: An Open of a DataFile or DirectoryFile for which it is to flush cached data. <p>On completion, the object store MUST return:</p> <ul style="list-style-type: none"> ● Status: An NTSTATUS code that specifies the result. <p>The object store MUST flush all persistent attributes for Open.File to stable storage. In addition:</p> <ul style="list-style-type: none"> ● If Open.File.Volume.IsReadOnly is TRUE, the operation MUST be failed with STATUS_MEDIA_WRITE_PROTECTED. ● The operation MUST be failed with the status code returned from the underlying physical storage. The operation flushes all eligible objects; however, only the first failure encountered is returned. ● The operation ensures that the directory structure is persisted to stable storage.<62> <p>Pseudocode for the operation is as follows:</p> <ul style="list-style-type: none"> ● If Open.Stream.StreamType is DataStream: ● Flush cached data of Open.File ● Flush file system metadata associated with Open.File. ● Else if Open.Stream.StreamType is DirectoryStream: ● Flush file system metadata associated with Open.File ● Else if Open.File is equal to Open.File.Volume.RootDirectory: ● For each OpenFile in Open.File.Volume.OpenFileList: ● Flush OpenFile ● Flush file system metadata associated with OpenFile ● EndFor ● EndIf <p>Flush the underlying physical storage.</p>
2018/07/16	<p>In Section 2.1.5.1, Server Requests an Open of a File Phase 7, changed from:</p> <ul style="list-style-type: none"> ● Phase 7 -- Type of file to open: ● The object store MUST use the following algorithm to determine which type of file is being opened: ● Set FileTypeToOpen to empty.

Errata Published*	Description
	<ul style="list-style-type: none"> • If RootOpen.File.Volume.IsPhysicalRoot is TRUE, then set FileTypeToOpen to ViewIndexFile under any of the following conditions: <ul style="list-style-type: none"> • If RootOpen.File.Volume.IsObjectIDsSupported is TRUE, BuildRelativeName(Open.Link, Open.File.Volume.RootDirectory) is equal to "\\$Extend\\$ObjId", StreamNameToOpen is equal to "\$O", and StreamTypeNameToOpen is equal to "\$INDEX_ALLOCATION" (using case-insensitive string comparisons). • If RootOpen.File.Volume.IsQuotasSupported is TRUE, BuildRelativeName(Open.Link, Open.File.Volume.RootDirectory) is equal to "\\$Extend\\$Quota", StreamNameToOpen is equal to "\$O" or "\$Q", and StreamTypeNameToOpen is equal to "\$INDEX_ALLOCATION" (using case-insensitive string comparisons). • If RootOpen.File.Volume.IsReparsePointsSupported is TRUE, BuildRelativeName(Open.Link, Open.File.Volume.RootDirectory) is equal to "\\$Extend\\$Reparse", StreamNameToOpen is equal to "\$R", and StreamTypeNameToOpen is equal to "\$INDEX_ALLOCATION" (using case-insensitive string comparisons). • EndIf • // Note that when FileTypeToOpen is ViewIndexFile, the file always exists in the object store and • // Open.File.FileType is ViewIndexFile. • If FileTypeToOpen is empty: <ul style="list-style-type: none"> • If StreamTypeNameToOpen is "\$INDEX_ALLOCATION" and StreamNameToOpen has a value other than an empty stream or "\$I30", the operation SHOULD<44> be failed with STATUS_INVALID_PARAMETER. • If CreateOptions.FILE_DIRECTORY_FILE is TRUE then FileTypeToOpen = DirectoryFile. • Else if CreateOptions.FILE_NON_DIRECTORY_FILE is TRUE then FileTypeToOpen = DataFile. • Else if StreamTypeNameToOpen is "\$INDEX_ALLOCATION" then FileTypeToOpen = DirectoryFile. • Else if StreamTypeNameToOpen is "\$DATA" then FileTypeToOpen = DataFile. • Else if Open.File is not NULL and Open.File.FileType is DirectoryFile, then FileTypeToOpen = DirectoryFile. • Else if PathName contains a trailing backslash then FileTypeToOpen = DirectoryFile. • Else FileTypeToOpen = DataFile. • EndIf • If FileTypeToOpen is DirectoryFile and Open.File is not NULL and Open.File.FileType is not DirectoryFile: <ul style="list-style-type: none"> • If CreateDisposition == FILE_CREATE then the operation MUST be failed with STATUS_OBJECT_NAME_COLLISION, else the operation MUST be failed with STATUS_NOT_A_DIRECTORY. • EndIf • If FileTypeToOpen is DataFile and StreamNameToOpen is empty and Open.File is not NULL and Open.File.FileType is DirectoryFile, the operation MUST be failed with STATUS_FILE_IS_A_DIRECTORY. <p>Changed to:</p> <ul style="list-style-type: none"> • Phase 7 -- Type of stream to open: • The object store MUST use the following algorithm to determine which type of stream is being opened: • Set StreamTypeToOpen to empty.

Errata Published*	Description
	<ul style="list-style-type: none"> • If RootOpen.File.Volume.IsPhysicalRoot is TRUE, then set StreamTypeToOpen to ViewIndexStream under any of the following conditions: <ul style="list-style-type: none"> • If RootOpen.File.Volume.IsObjectIDsSupported is TRUE, BuildRelativeName(Open.Link, Open.File.Volume.RootDirectory) is equal to "\\$Extend\\$ObjId", StreamNameToOpen is equal to "\$O", and StreamTypeNameToOpen is equal to "\$INDEX_ALLOCATION" (using case-insensitive string comparisons). • If RootOpen.File.Volume.IsQuotasSupported is TRUE, BuildRelativeName(Open.Link, Open.File.Volume.RootDirectory) is equal to "\\$Extend\\$Quota", StreamNameToOpen is equal to "\$O" or "\$Q", and StreamTypeNameToOpen is equal to "\$INDEX_ALLOCATION" (using case-insensitive string comparisons). • If RootOpen.File.Volume.IsReparsePointsSupported is TRUE, BuildRelativeName(Open.Link, Open.File.Volume.RootDirectory) is equal to "\\$Extend\\$Reparse", StreamNameToOpen is equal to "\$R", and StreamTypeNameToOpen is equal to "\$INDEX_ALLOCATION" (using case-insensitive string comparisons). • EndIf • // Note that when StreamTypeToOpen is ViewIndexStream, the file always exists in the object store and • // Open.File.FileType is ViewIndexFile. • If StreamTypeToOpen is empty: <ul style="list-style-type: none"> • If StreamTypeNameToOpen is "\$INDEX_ALLOCATION": <ul style="list-style-type: none"> • If StreamNameToOpen has a value other than an empty string or "\$I30", the operation SHOULD<44> be failed with STATUS_INVALID_PARAMETER. • Else if StreamTypeNameToOpen is not "\$DATA" and not empty: <ul style="list-style-type: none"> • If CreateDisposition is one of FILE_SUPERSEDE, FILE_OVERWRITE, or FILE_OVERWRITE_IF, then the operation MUST be failed with STATUS_ACCESS_DENIED. • EndIf • If CreateOptions.FILE_DIRECTORY_FILE is TRUE then StreamTypeToOpen = DirectoryStream. • Else if StreamTypeNameToOpen is "\$INDEX_ALLOCATION" then StreamTypeToOpen = DirectoryStream. • Else if CreateOptions.FILE_NON_DIRECTORY_FILE is FALSE, StreamNameToOpen is empty, StreamTypeNameToOpen is empty, Open.File is not NULL, and Open.File.FileType is DirectoryFile then StreamTypeToOpen = DirectoryStream. • Else StreamTypeToOpen = DataStream. • EndIf • EndIf • If StreamTypeToOpen is DirectoryStream: <ul style="list-style-type: none"> • If StreamTypeNameToOpen is not "\$INDEX_ALLOCATION": <ul style="list-style-type: none"> • If StreamNameToOpen is not empty or StreamTypeNameToOpen is not empty, then the operation MUST be failed with STATUS_NOT_A_DIRECTORY. • EndIf • If Open.File is not NULL and Open.File.FileType is DataFile: <ul style="list-style-type: none"> • If CreateDisposition == FILE_CREATE then the operation MUST be failed with STATUS_OBJECT_NAME_COLLISION, else the operation MUST be failed with STATUS_NOT_A_DIRECTORY. • EndIf • Else if StreamTypeToOpen is DataStream: <ul style="list-style-type: none"> • If StreamNameToOpen is empty and Open.File is not NULL and Open.File.FileType is DirectoryFile, the operation MUST be failed with STATUS_FILE_IS_A_DIRECTORY.

Errata Published*	Description
	<ul style="list-style-type: none"> • EndIf • If PathName contains a trailing backslash: • If StreamTypeToOpen is DataStream or CreateOptions.FILE_NON_DIRECTORY_FILE is TRUE, the operation MUST be failed with STATUS_OBJECT_NAME_INVALID. • EndIf <p>In Section 2.1.5.1.1, Creation of a New File, all instances of FileTypeToOpen were changed to StreamTypeToOpen and all instances of DirectoryFile were changed to DirectoryStream.</p> <p>In that same section, the following was changed from:</p> <ul style="list-style-type: none"> • File.FileType set to FileTypeToOpen. <p>Changed to:</p> <ul style="list-style-type: none"> • File.FileType set to DirectoryFile if StreamTypeToOpen is DirectoryStream, else it is set to DataFile. <p>The following was changed from:</p> <ul style="list-style-type: none"> • If StreamTypeNameToOpen is empty or "\$DATA", then the object store MUST create a new data stream for the file as follows: <p>Changed to:</p> <ul style="list-style-type: none"> • If StreamTypeToOpen is DataStream, then the object store MUST create a new data stream for the file as follows: <p>In Section 2.1.5.1.2, Open of an Existing File, all instances of FileTypeToOpen were changed to StreamTypeToOpen, all instances of DirectoryFile were changed to DirectoryStream, all instances of DataFile were changed to DataStream, and all instances of ViewIndexFile were changed to ViewIndexStream.</p>
2018/07/16	<p>In Section 2.1.4.12, Algorithm to Check for an Oplock Break, the following line was changed from:</p> <p>Case OPEN_BREAK_H, as specified in section 2.1.5.1:</p> <p>Changed to:</p> <p>Case OPEN_BREAK_H, as specified in section 2.1.5.1.2:</p>
2018/06/18	<p>In Section 2.1.4.12, Algorithm to Check for an Oplock Break, the following case was added:</p> <p>Case SET_SECURITY, as specified in section 2.1.5.16</p> <p>Set BreakCacheState to HANDLE_CACHING</p> <p>EndCase</p>

Errata Published*	Description
	<p>In Section 2.1.5.16, Server Requests Setting of Security Information, the following processing rule was added:</p> <p>If Open.Stream.Oplock is not empty, the object store MUST check for an oplock break according to the algorithm in section 2.1.4.12, with input values as follows:</p> <ul style="list-style-type: none">Open equal to this operation's OpenOplock equal to Open.Stream.OplockOperation equal to "SET_SECURITY"OpParams empty

*Date format: YYYY/MM/DD

[MS-FSCC]: File System Control Codes

This topic lists the Errata found in the MS-FSCC document 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.



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December 1, 2017 - [Download](#)

Errata below are for Protocol Document Version [V44.0 - 2018/03/16](#).

Errata Published*	Description
2018/09/03	<p>In Section 2.3.9, FSCTL_DUPLICATE_EXTENTS_TO_FILE_EX Request, a new field has been added:</p> <p>StructureSize (8 bytes): A 64-bit unsigned integer value that specifies the size of the structure, in bytes.</p>

*Date format: YYYY/MM/DD

[MS-FSRVP]: File Server Remote VSS Protocol

This topic lists the Errata found in the MS-FSRVP document 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.



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[MS-FSVCA]: File Set Version Comparison Algorithms

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[MS-GPPREF]: Group Policy: Preferences Extension Data Structure

This topic lists the Errata found in [MS-GPPREF] 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.



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Errata below are for Protocol Document Version [V25.0 – 2017/12/01](#).

Errata Published*	Description															
2018/01/16	<p>In Section, 2.2.1.22, Targeting, Windows Server operating system has been added to the table of OS version attributes.</p> <p>Changed from:</p> <table border="1"> <thead> <tr> <th>Criterion</th> <th>Attribute</th> <th>Attribute description</th> </tr> </thead> <tbody> <tr> <td>...</td> <td>...</td> <td>...</td> </tr> <tr> <td>FilterOs</td> <td></td> <td>Note From the perspective of interoperability, the same enumeration values for class and version are required for the correct filtering operation to occur for the classes and versions defined in their respective enumerations. An implementation is not constrained from including additional enumeration values for class or version to provide support for additional platforms.</td> </tr> <tr> <td></td> <td>class</td> <td>(optional) SHOULD<16> be NE, 9X, or NT.</td> </tr> <tr> <td></td> <td>version</td> <td>(optional) The value SHOULD<17> correspond to the operating system version.</td> </tr> </tbody> </table> <p><17> Section 2.2.1.22: The enumerated values and corresponding Windows releases are as follows:</p>	Criterion	Attribute	Attribute description	FilterOs		Note From the perspective of interoperability, the same enumeration values for class and version are required for the correct filtering operation to occur for the classes and versions defined in their respective enumerations. An implementation is not constrained from including additional enumeration values for class or version to provide support for additional platforms.		class	(optional) SHOULD<16> be NE, 9X, or NT.		version	(optional) The value SHOULD<17> correspond to the operating system version.
Criterion	Attribute	Attribute description														
...														
FilterOs		Note From the perspective of interoperability, the same enumeration values for class and version are required for the correct filtering operation to occur for the classes and versions defined in their respective enumerations. An implementation is not constrained from including additional enumeration values for class or version to provide support for additional platforms.														
	class	(optional) SHOULD<16> be NE, 9X, or NT.														
	version	(optional) The value SHOULD<17> correspond to the operating system version.														

Version attribute	Windows release	Version attribute	Windows release
NE	Any	2K8	Windows Server 2008
95	Windows 95	WIN7	Windows 7
98	Windows 98	2K8R2	Windows Server 2008 R2
ME	Windows Millennium Edition	WIN8	Windows 8
NT	Windows NT operating system	WIN8S	Windows Server 2012
2K	Windows 2000 operating system	WINBLUE	Windows 8.1
XP	Windows XP	WINBLUESRV	Windows Server 2012 R2
2K3	Windows Server 2003	WINTHRESHOLD	Windows 10
2K3R2	Windows Server 2003 R2	WINTHRESHOLDSRV	Windows Server 2016
VISTA	Windows Vista		

Changed to:

Criterion	Attribute	Attribute description
...
FilterOs		Note From the perspective of interoperability, the same enumeration values for class and version are required for the correct filtering operation to occur for the classes and versions defined in their respective enumerations. An implementation is not constrained from including additional enumeration values for class or version to provide support for additional platforms.
	class	(optional) SHOULD<16> be NE, 9X, or NT.
	version	(optional) The value SHOULD<17> correspond to the

Errata Published*	Description																																														
			operating system version.																																												
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	<table border="1"> <thead> <tr> <th data-bbox="511 367 727 415">Version attribute</th> <th data-bbox="727 367 946 415">Windows release</th> <th data-bbox="946 367 1198 415">Version attribute</th> <th data-bbox="1198 367 1414 415">Windows release</th> </tr> </thead> <tbody> <tr> <td data-bbox="511 415 727 493">NE</td> <td data-bbox="727 415 946 493">Any</td> <td data-bbox="946 415 1198 493">2K8</td> <td data-bbox="1198 415 1414 493">Windows Server 2008</td> </tr> <tr> <td data-bbox="511 493 727 546">95</td> <td data-bbox="727 493 946 546">Windows 95</td> <td data-bbox="946 493 1198 546">WIN7</td> <td data-bbox="1198 493 1414 546">Windows 7</td> </tr> <tr> <td data-bbox="511 546 727 623">98</td> <td data-bbox="727 546 946 623">Windows 98</td> <td data-bbox="946 546 1198 623">2K8R2</td> <td data-bbox="1198 546 1414 623">Windows Server 2008 R2</td> </tr> <tr> <td data-bbox="511 623 727 726">ME</td> <td data-bbox="727 623 946 726">Windows Millennium Edition</td> <td data-bbox="946 623 1198 726">WIN8</td> <td data-bbox="1198 623 1414 726">Windows 8</td> </tr> <tr> <td data-bbox="511 726 727 804">NT</td> <td data-bbox="727 726 946 804">Windows NT operating system</td> <td data-bbox="946 726 1198 804">WIN8S</td> <td data-bbox="1198 726 1414 804">Windows Server 2012</td> </tr> <tr> <td data-bbox="511 804 727 877">2K</td> <td data-bbox="727 804 946 877">Windows 2000 operating system</td> <td data-bbox="946 804 1198 877">WINBLUE</td> <td data-bbox="1198 804 1414 877">Windows 8.1</td> </tr> <tr> <td data-bbox="511 877 727 951">XP</td> <td data-bbox="727 877 946 951">Windows XP</td> <td data-bbox="946 877 1198 951">WINBLUESRV</td> <td data-bbox="1198 877 1414 951">Windows Server 2012 R2</td> </tr> <tr> <td data-bbox="511 951 727 1029">2K3</td> <td data-bbox="727 951 946 1029">Windows Server 2003</td> <td data-bbox="946 951 1198 1029">WINTHRESHOLD</td> <td data-bbox="1198 951 1414 1029">Windows 10</td> </tr> <tr> <td data-bbox="511 1029 727 1157">2K3R2</td> <td data-bbox="727 1029 946 1157">Windows Server 2003 R2</td> <td data-bbox="946 1029 1198 1157">WINTHRESHOLDSRV</td> <td data-bbox="1198 1029 1414 1157">Windows Server 2016, Windows Server operating system</td> </tr> <tr> <td data-bbox="511 1157 727 1213">VISTA</td> <td data-bbox="727 1157 946 1213">Windows Vista</td> <td data-bbox="946 1157 1198 1213"></td> <td data-bbox="1198 1157 1414 1213"></td> </tr> </tbody> </table>			Version attribute	Windows release	Version attribute	Windows release	NE	Any	2K8	Windows Server 2008	95	Windows 95	WIN7	Windows 7	98	Windows 98	2K8R2	Windows Server 2008 R2	ME	Windows Millennium Edition	WIN8	Windows 8	NT	Windows NT operating system	WIN8S	Windows Server 2012	2K	Windows 2000 operating system	WINBLUE	Windows 8.1	XP	Windows XP	WINBLUESRV	Windows Server 2012 R2	2K3	Windows Server 2003	WINTHRESHOLD	Windows 10	2K3R2	Windows Server 2003 R2	WINTHRESHOLDSRV	Windows Server 2016, Windows Server operating system	VISTA	Windows Vista		
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VISTA	Windows Vista																																														

*Date format: YYYY/MM/DD

[MS-GPSB]: Group Policy: Security Protocol Extension

This topic lists the Errata found in [MS-GPSB] 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.



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Errata below are for Protocol Document Version [V21.0 - 2017/12/01](#).

Errata Published*	Description
2018/07/02	<p>In Section 2.2, Message Syntax, the syntax was changed from:</p> <pre>InfFile = UnicodePreamble VersionPreamble Sections UnicodePreamble = *("[Unicode]" LineBreak "Unicode=yes" LineBreak) VersionPreamble = "[Version]" LineBreak "signature=" DQUOTE "\$SCHICAGO\$" DQUOTE LineBreak "Revision=1" LineBreak Sections = Section / Section Sections Section = Header Settings Header = "[" HeaderValue "]" LineBreak HeaderValue = stringWithSpaces Settings = Setting / Setting Settings Setting = Key Wsp "=" Wsp ValueList LineBreak / ValueList = Value / Value Wsp "," Wsp ValueList Key = String Value = String / QuotedString</pre> <p>Changed to:</p> <pre>InfFile = UnicodePreamble VersionPreamble Sections UnicodePreamble = *("[Unicode]" LineBreak "Unicode=yes" LineBreak) VersionPreamble = "[Version]" LineBreak "signature=" DQUOTE "\$SCHICAGO\$" DQUOTE LineBreak "Revision=1" LineBreak Sections = Section / Section Sections Section = Header Settings Header = "[" HeaderValue "]" LineBreak HeaderValue = stringWithSpaces Settings = Setting / Setting Settings Setting = Key Wsp "=" Wsp ValueList LineBreak / Name "," Mode "," AclString LineBreak Name = String / QuotedString Mode = [0-9]+ AclString = SDDL / DQUOTE SDDL DQUOTE ValueList = Value / Value Wsp "," Wsp ValueList Key = String Value = String / QuotedString</pre>

Errata Published*	Description
	<p>Also, throughout this section, "Service General Settings" was changed to "Service General Setting".</p> <p>In Section 2.2.8, Service General Settings, the section title was changed to Service General Setting.</p> <p>In this section the syntax was changed from:</p> <pre>Header = "[" HeaderValue "]" LineBreak HeaderValue = "Service General Setting" Settings = Setting / Setting Settings ServiceName = 1*256IdCharacter / DQUOTE 1*256IdCharacter DQUOTE IdCharacter = ALPHANUM/ %d33 / %d35-43 / %d45-46 / %d58-64 / %d91 / %d93-96 / %d123-126 Setting = ServiceName "," StartupMode "," AclString LineBreak StartupMode = DIGIT AclString = SDDL / DQUOTE SDDL DQUOTE</pre> <p>Changed to:</p> <pre>Header = "[" HeaderValue "]" LineBreak HeaderValue = "Service General Setting" Settings = Setting / Setting Settings Setting = ServiceName "," StartupMode "," AclString LineBreak ServiceName = 1*256IdCharacter / DQUOTE 1*256IdCharacter DQUOTE IdCharacter = ALPHANUM/ %d33 / %d35-43 / %d45-46 / %d58-64 / %d91 / %d93-96 / %d123-126 StartupMode = DIGIT AclString = SDDL / DQUOTE SDDL DQUOTE</pre> <p>In Section 3.2.5.10, Service General Setting, "Service General Settings" was changed to "Service General Setting" throughout.</p>

*Date format: YYYY/MM/DD

[MS-GPOL]: Group Policy: Core Protocol

This topic lists the Errata found in [MS-GPOL] 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.



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[MS-GSSA]: Generic Security Service Algorithm for Secret Key Transaction Authentication for DNS (GSS-TSIG) Protocol Extension

This topic lists the Errata found in the MS-GSSA document 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.



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[MS-HGSA]: Host Guardian Service: Attestation Protocol

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Errata below are for Protocol Document Version [V4.0 - 2018/03/16](#).

Errata Published*	Description
2018/06/04	<p>In three sections in this document, text was modified to update the AttestationResultTypes values.</p> <p>The following sections were updated:</p> <ul style="list-style-type: none">2.2.1.33.1.5.1,1.33.1.5.2.1.1.3 <p>For details on the changes, see the difference document in PDF format here.</p>

*Date format: YYYY/MM/DD

[MS-HTTPE]: Hypertext Transfer Protocol (HTTP) Extensions

This topic lists the Errata found in [MS-HTTPE] 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.



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[MS-HVRS]: Hyper-V Remote Storage Profile

This topic lists the Errata found in [MS-HVRS] 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.



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[MS-ICPR]: ICertPassage Remote Protocol

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[MS-IKEX]: Internet Key Exchange Protocol Extensions

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[MS-IPAMM2]: IP Address Management (IPAM) Management Protocol Version 2

This topic lists the Errata found in [MS-IPAMM2] 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.



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[MS-IPHTTPS]: IP over HTTPS (IP-HTTPS) Tunneling Protocol

This topic lists the Errata found in the MS-IPHTTPS document 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.



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Errata below are for Protocol Document Version [V10.0 - 2017/09/15](#).

Errata Published*	Description
2018/07/16	<p>In this document, several changes were made:</p> <ul style="list-style-type: none">• In Section 4.1, Packet Flow and Connection Establishment, the second "Complete HTTPS handshake" interaction in the diagram was removed.• In Section 4.2, Attack Scenarios, the sub-section titled "Unauthorized Client Connecting to an IP-HTTPS Server" (formerly section 4.2.1) was removed.• In Section 4.2.1 (formerly section 4.2.2), Unauthorized Client Connecting to an IP-HTTPS Server (When Authentication Mode Is Set to Certificates), the "SSL negotiation" message in the diagram was updated to be "Begin SSL negotiation". The "HTTP request" message in the diagram was removed. <p>For details on the changes, see the difference document in PDF format here.</p>
2018/07/16	<p>In Section 4.2, Attack Scenarios, the sub-section titled "Man in the Middle" (formerly section 4.2.5) was removed.</p>

*Date format: YYYY/MM/DD

[MS-IRP]: Internet Information Services (IIS) Inetinfo Remote Protocol

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[MS-KILE]: Kerberos Protocol Extensions

This topic lists the Errata found in [MS-KILE] 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.



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[MS-KPP]: Key Provisioning Protocol

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[MS-KPS]: Key Protection Service Protocol

This topic lists the Errata found in the MS-KPP document 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.



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[MS-LCID]: Windows Language Code Identifier (LCID) Reference

This topic lists the Errata found in [MS-LCID] 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.



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Errata below are for Protocol Document Version [V11.0 - 2017/12/01](#).

Errata Published*	Description
2018/06/18	In Section 2.2, LCID Structure, the reserved values of 0xF2EE and 0xE000 were added to the table of Language IDs.

*Date format: YYYY/MM/DD

[MS-LSAD]: Local Security Authority (Domain Policy) Remote Protocol

This topic lists the Errata found in [MS-LSAD] 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.



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[MS-LSAT]: Local Security Authority (Translation Methods) Remote Protocol

This topic lists the Errata found in [MS-LSAT] 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.



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[MS-MDE]: Mobile Device Enrollment Protocol

This topic lists the Errata found in [MS-MDE] 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.



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[MS-MDE2]: Mobile Device Enrollment Protocol Version 2

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Errata below are for Protocol Document Version [V7.0 - 2018/03/16](#).

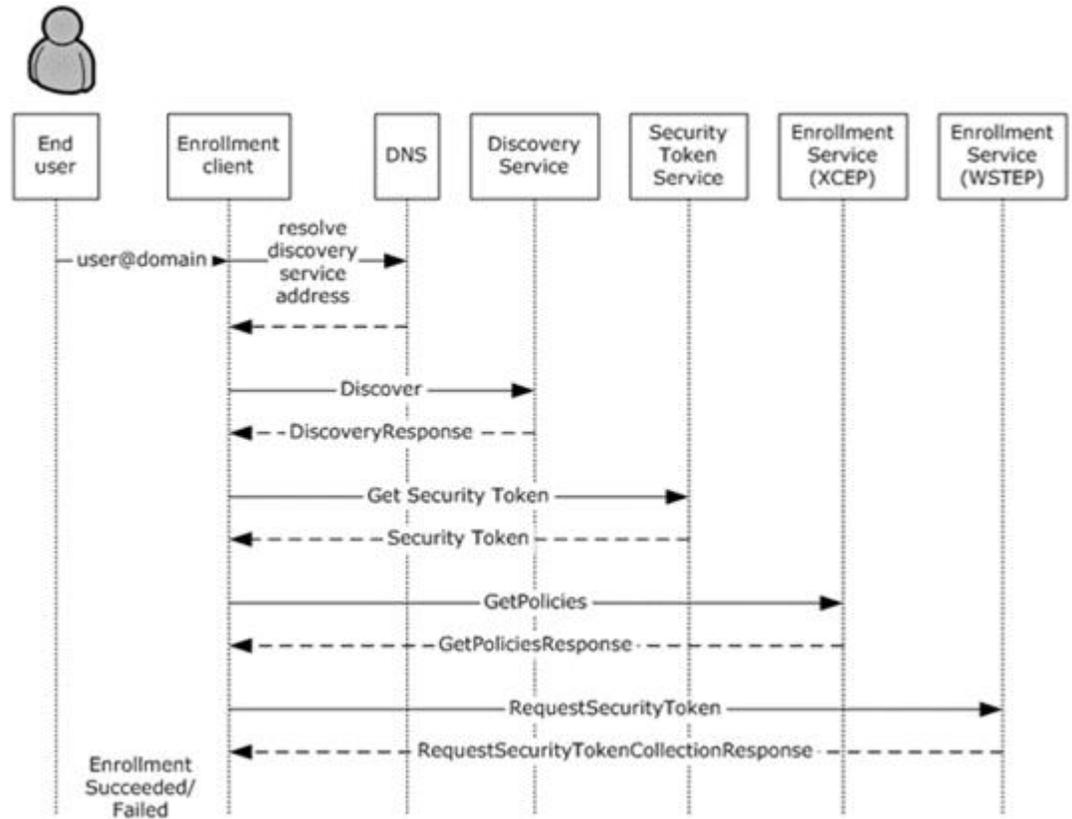
Errata Published*	Description																																			
2018/07/16	<p>In Section 2.2.10, Faults, a description was added for the EnrollmentServer subcode in the first table,</p> <p>Changed from:</p> <table border="1"> <thead> <tr> <th>Namespace</th> <th>Subcode</th> <th>Error</th> <th>Description</th> <th>HRESULT</th> </tr> </thead> <tbody> <tr> <td>...</td> <td>...</td> <td>...</td> <td>...</td> <td>...</td> </tr> <tr> <td>s:</td> <td>EnrollmentServer</td> <td>MENROLL_E_DEVICE_CONFIGMGRSERVER_ERROR</td> <td></td> <td>80180005</td> </tr> <tr> <td>...</td> <td>...</td> <td>...</td> <td>...</td> <td>...</td> </tr> </tbody> </table> <p>Changed to:</p> <table border="1"> <thead> <tr> <th>Namespace</th> <th>Subcode</th> <th>Error</th> <th>Description</th> <th>HRESULT</th> </tr> </thead> <tbody> <tr> <td>...</td> <td>...</td> <td>...</td> <td>...</td> <td>...</td> </tr> <tr> <td>s:</td> <td>EnrollmentServer</td> <td>MENROLL_E_DEVICE_CONFIGMGRSERVER_ERROR</td> <td>Generic failure from management server, such as a</td> <td>80180005</td> </tr> </tbody> </table>	Namespace	Subcode	Error	Description	HRESULT	s:	EnrollmentServer	MENROLL_E_DEVICE_CONFIGMGRSERVER_ERROR		80180005	Namespace	Subcode	Error	Description	HRESULT	s:	EnrollmentServer	MENROLL_E_DEVICE_CONFIGMGRSERVER_ERROR	Generic failure from management server, such as a	80180005
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...																																
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Errata Published*	Description				
				database access error.	

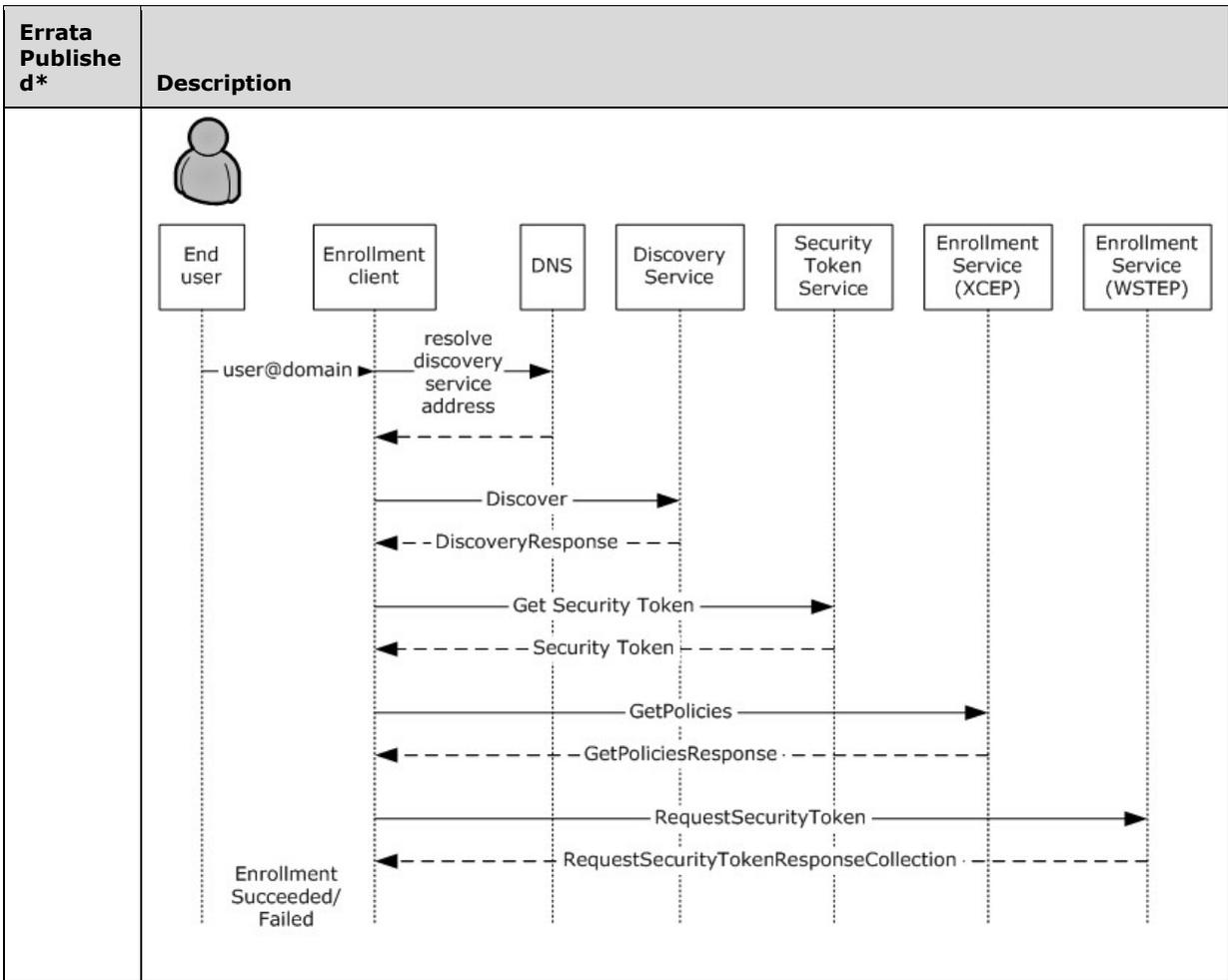
2018/07/16

In Section 1.3, Overview, the art for Figure 1, Typical sequence for enrolling a message using MDE2, was modified to reference "RequestSecurityTokenResponseCollection" rather than "RequestSecurityTokenCollectionResponse".

Changed from:



Changed to:



*Date format: YYYY/MM/DD

[MS-MDM]: Mobile Device Management Protocol

This topic lists the Errata found in [MS-MDM] 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.



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[MS-MICE]: Miracast over infrastructure Connection Establishment Protocol

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Errata below are for Protocol Document Version [V2.0 – 2018/03/16](#).

Errata Published*	Description
2018/08/20	<p>In Section 4.1, Vendor Extension Attribute Example, the value of the Capability info field in the example has been changed from:</p> <p>88 // Capability info</p> <p>Changed to:</p> <p>05 // Capability info</p>
2018/06/04	<p>In Section 2.2.4.1, Capability Attribute, the following fields were changed from:</p> <p>X - Reserved (1 bit): Reserved.</p> <p>X - Reserved (3 bits): Reserved.</p> <p>Changed to:</p> <p>X - Reserved (1 bit): This bit MUST be set to zero and MUST be ignored on receipt.</p> <p>X - Reserved (3 bits): These bits MUST be set to zero and MUST be ignored on receipt.</p>

*Date format: YYYY/MM/DD

[MS-MSSOD]: Media Streaming Server Protocols Overview

This topic lists the Errata found in [MS-MSSOD] 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.



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[MS-MWBE]: Microsoft Web Browser Federated Sign-On Protocol Extensions

This topic lists the Errata found in [MS-MWBE] 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.



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[MS-MWBF]: Microsoft Web Browser Federated Sign-On Protocol

This topic lists the Errata found in [MS-MWBF] 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.



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Errata below are for Protocol Document Version [V13.0 - 2017/12/01](#).

Errata Published*	Description
2018/03/05	<p>In Section 1.2.1, Normative References, a new reference has been added: "[MSKB-4088889] Microsoft Corporation, "March 20, 2018-KB4088889", https://support.microsoft.com/en-us/help/4088889"</p> <p>In Section 2.2.3, wsignin1.0 Request Message, information has been added about the support for the mfa_max_age parameter that was added through KB 4088889.</p> <p>Changed from: mfa_max_age (optional): This value is a string The AD FS server ignores this parameter unless its ad_fs_behavior_level is AD_FS_BEHAVIOR_LEVEL_3 or higher ([MS-OAPX] section 3.2.1.1). The IP/STS SHOULD have a setting that configures it ...</p> <p>Changed to: mfa_max_age (optional): This value is a string The AD FS server ignores this parameter unless its ad_fs_behavior_level is AD_FS_BEHAVIOR_LEVEL_3 or higher ([MS-OAPX] section 3.2.1.1).<21> The IP/STS SHOULD have a setting that configures it ...</p> <p><21> Section 2.2.3: Even though AD_FS_BEHAVIOR_LEVEL_3 is supported on Windows Server 2016, the mfa_max_age parameter is supported on Windows Server 2016 only if [MSKB-4088889] is installed.</p>

*Date format: YYYY/MM/DD

[MS-NCNBI]: Network Controller Northbound Interface Specification

This topic lists the Errata found in the MS-NCNBI document 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.



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Errata below are for Protocol Document Version [V5.0 – 2018/03/16](#).

Errata Published*	Description
2018/07/16	<p>In Section 2.2.3.4, resourceId, "publicIpAddresses" was changed to "publicIPAddresses".</p> <p>Changed from:</p> <p>... networkConnections, outboundNatRules, networkInterfaces, policyMaps, probes, publicIpAddresses, routes, routeTables, servers, serviceInsertions, VirtualGateways, virtualNetworks, and virtualServers.</p> <p>Changed to:</p> <p>... networkConnections, outboundNatRules, networkInterfaces, policyMaps, probes, publicIPAddresses, routes, routeTables, servers, serviceInsertions, VirtualGateways, virtualNetworks, and virtualServers.</p> <p>In Section 2.2.4, Data Structures, W"virtualGateways" was changed to "VirtualGateways".</p> <p>Changed from:</p> <p>IPv4AddressPrefixes The vpnConfiguration in the virtualGateways resource, section 3.1.5.17. ...</p> <p>Changed to:</p> <p>IPv4AddressPrefixes The vpnConfiguration in the VirtualGateways resource, section 3.1.5.17. ...</p> <p>In Section, 3.1.5.17.2.2.1.1, PUT, "virtualGateways" was changed to "VirtualGateways".</p> <p>Changed from:</p> <p><code>https://<url>/networking/v1/virtualGateways/{grandParentResourceId}/bgpRouters/{parentResourceId}/bgpPeers/{resourceId}</code></p>

Errata Published*	Description																		
	<p>Changed to:</p> <p><a href="https://<url>/networking/v1/VirtualGateways/{grandParentResourceId}/bgpRouters/{parentResourceId}/bgpPeers/{resourceId}">https://<url>/networking/v1/VirtualGateways/{grandParentResourceId}/bgpRouters/{parentResourceId}/bgpPeers/{resourceId}</p>																		
2018/07/16	<p>In Section 2.2.3.4, resourceId. "connectivityChecksResults" was changed to "connectivityCheckResults".</p> <p>Changed from:</p> <p>The resourceId parameter is system-defined for the following resources: Diagnostics connectivityChecksResults, Diagnostics slbStateResults, operations, and operationResults.</p> <p>Changed to:</p> <p>The resourceId parameter is system-defined for the following resources: Diagnostics connectivityCheckResults, Diagnostics slbStateResults, operations, and operationResults.</p>																		
2018/06/18	<p>In Section 2.2.4 Data StructureS, bgpNetworks was removed and routerIPAddress changed to routerIP.</p> <p>Changed from:</p> <table border="1" data-bbox="365 951 1279 1722"> <thead> <tr> <th data-bbox="365 951 669 1003">Data structure</th> <th data-bbox="669 951 974 1003">Section</th> <th data-bbox="974 951 1279 1003">Description</th> </tr> </thead> <tbody> <tr> <td data-bbox="365 1003 669 1209">backendIPConfigurations</td> <td data-bbox="669 1003 974 1209">The backendAddressPools resource, section 3.1.5.5.2.</td> <td data-bbox="974 1003 1279 1209">An array of references to ipConfigurations resources. There is no restriction on having the same IP configurations in multiple backendAddressPools.</td> </tr> <tr> <td data-bbox="365 1209 669 1388">bgpNetworks</td> <td data-bbox="669 1209 974 1388">In the VirtualGateways resource, the bgpRouters resource, section 3.1.5.17.2</td> <td data-bbox="974 1209 1279 1388">Collection of network prefixes in IP address/prefix format that identifies the networks that are to be announced by the router.</td> </tr> <tr> <td data-bbox="365 1388 669 1543">bgpPeers</td> <td data-bbox="669 1388 974 1543">In the VirtualGateways resource, in the bgpPeers resource, the bgpRouters resource, section 3.1.5.17.2.2.</td> <td data-bbox="974 1388 1279 1543">A collection of Border Gateway Protocol (BGP) peers associated with the bgpRouters resource.</td> </tr> <tr> <td data-bbox="365 1543 669 1591">...</td> <td data-bbox="669 1543 974 1591">...</td> <td data-bbox="974 1543 1279 1591">...</td> </tr> <tr> <td data-bbox="365 1591 669 1722">routerIPAddress</td> <td data-bbox="669 1591 974 1722">The bgpRouters resource in the VirtualGateways resource, section 3.1.5.17.2</td> <td data-bbox="974 1591 1279 1722">Indicates IP addresses to which BGP peering can be established.</td> </tr> </tbody> </table> <p>Changed to:</p>	Data structure	Section	Description	backendIPConfigurations	The backendAddressPools resource, section 3.1.5.5.2.	An array of references to ipConfigurations resources. There is no restriction on having the same IP configurations in multiple backendAddressPools.	bgpNetworks	In the VirtualGateways resource, the bgpRouters resource, section 3.1.5.17.2	Collection of network prefixes in IP address/prefix format that identifies the networks that are to be announced by the router.	bgpPeers	In the VirtualGateways resource, in the bgpPeers resource, the bgpRouters resource, section 3.1.5.17.2.2.	A collection of Border Gateway Protocol (BGP) peers associated with the bgpRouters resource.	routerIPAddress	The bgpRouters resource in the VirtualGateways resource, section 3.1.5.17.2	Indicates IP addresses to which BGP peering can be established.
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	...																																
	Changed to:																																
	<table border="1"> <thead> <tr> <th data-bbox="365 619 669 661">Element name</th> <th data-bbox="669 619 974 661">Type</th> <th data-bbox="974 619 1430 661">Description</th> </tr> </thead> <tbody> <tr> <td data-bbox="365 661 669 766">Etag</td> <td data-bbox="669 661 974 766">Read-only</td> <td data-bbox="974 661 1430 766">Specified in Common JSON Elements, section 2.2.2.</td> </tr> <tr> <td data-bbox="365 766 669 871">provisioningState</td> <td data-bbox="669 766 974 871">Read-only</td> <td data-bbox="974 766 1430 871">Specified in Common JSON Elements, section 2.2.2.</td> </tr> <tr> <td data-bbox="365 871 669 924">isEnabled</td> <td data-bbox="669 871 974 924"></td> <td data-bbox="974 871 1430 924">Reserved for future use.</td> </tr> <tr> <td data-bbox="365 924 669 1228">requireIGPSync</td> <td data-bbox="669 924 974 1228">Read/write</td> <td data-bbox="974 924 1430 1228">If this is set to TRUE, BGP will not advertise a route before all routers in an Autonomous System (AS) learn about the route via IGP. BGP waits until IGP propagates the route within the AS and then advertises it to external peers.</td> </tr> <tr> <td data-bbox="365 1228 669 1333">extAsNumber</td> <td data-bbox="669 1228 974 1333">Read/write</td> <td data-bbox="974 1228 1430 1333">Extended (4-byte) ASN of the local BGP Router in XX.YY format.</td> </tr> <tr> <td data-bbox="365 1333 669 1375">routerId</td> <td data-bbox="669 1333 974 1375">Read/write</td> <td data-bbox="974 1333 1430 1375">Indicates Router ID.</td> </tr> <tr> <td data-bbox="365 1375 669 1480">routerIP[]</td> <td data-bbox="669 1375 974 1480">Read/write</td> <td data-bbox="974 1375 1430 1480">Indicates IP addresses to which BGP peering can be established.</td> </tr> <tr> <td data-bbox="365 1480 669 1669">isGenerated</td> <td data-bbox="669 1480 974 1669">Read-only</td> <td data-bbox="974 1480 1430 1669">If this BGP router is automatically enabled, without making any REST calls then isGenerated is set to TRUE.</td> </tr> <tr> <td data-bbox="365 1669 669 1820">bgpPeers[]</td> <td data-bbox="669 1669 974 1820">Read/write</td> <td data-bbox="974 1669 1430 1820">Collection of BGP peers associated with the bgpRouters resource. See section 3.1.5.17.2.2, for details.</td> </tr> </tbody> </table>			Element name	Type	Description	Etag	Read-only	Specified in Common JSON Elements, section 2.2.2.	provisioningState	Read-only	Specified in Common JSON Elements, section 2.2.2.	isEnabled		Reserved for future use.	requireIGPSync	Read/write	If this is set to TRUE, BGP will not advertise a route before all routers in an Autonomous System (AS) learn about the route via IGP. BGP waits until IGP propagates the route within the AS and then advertises it to external peers.	extAsNumber	Read/write	Extended (4-byte) ASN of the local BGP Router in XX.YY format.	routerId	Read/write	Indicates Router ID.	routerIP[]	Read/write	Indicates IP addresses to which BGP peering can be established.	isGenerated	Read-only	If this BGP router is automatically enabled, without making any REST calls then isGenerated is set to TRUE.	bgpPeers[]	Read/write	Collection of BGP peers associated with the bgpRouters resource. See section 3.1.5.17.2.2, for details.
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Errata Published*	Description
	<p>...</p> <p>In Section 3.1.5.17.2.1.1.1, Request Body, the bgpNetworks property was removed.</p> <p>Changed from:</p> <pre> "properties": { "provisioningState": "Succeeded", "isEnabled": "true", "requireIGPSync": "true", "extASNumber": "0.3458", "routerIP": [], "bgpNetworks": [], "isGenerated": false, "bgpPeers": [</pre> <p>Changed to:</p> <pre> "properties": { "provisioningState": "Succeeded", "isEnabled": "true", "requireIGPSync": "true", "extASNumber": "0.3458", "routerIP": [], "isGenerated": false, "bgpPeers": [</pre> <p>In Section 6.15.1, PUT schema, the bgpNetworks property was removed.</p> <p>Changed from:</p> <pre> "routerIP": { "type": "array", "items": { } }, "bgpNetworks": { "type": "array", "items": { } }, "isGenerated": { "type": "boolean" </pre>

Errata Published*	Description
	<pre> }, . . . "required": ["isEnabled", "requireIGPSync", "extASNumber", "routerIP", "bgpNetworks", "isGenerated", "bgpPeers"] </pre> <p>Changed to:</p> <pre> "routerIP": { "type": "array", "items": { } }, "isGenerated": { "type": "boolean" }, . . . "required": ["isEnabled", "requireIGPSync", "extASNumber", "routerIP", "isGenerated", "bgpPeers"] </pre> <p>In Section 6.15.4.1, PUT schema, the bgpNetworks property was removed.</p> <p>Changed from:</p> <pre> "routerIP": { "type": "array", "items": { } }, "bgpNetworks": { "type": "array", "items": { } }, "isGenerated": { "type": "boolean" }, . . . "required": ["isEnabled", "requireIGPSync", "extASNumber", "routerIP", "bgpNetworks", "isGenerated", "bgpPeers"] </pre>

Errata Published*	Description
	<p data-bbox="423 254 440 275">]</p> <p data-bbox="349 365 483 386">Changed to:</p> <pre data-bbox="399 449 654 831"> "routerIP": { "type": "array", "items": { } }, "isGenerated": { "type": "boolean" }, . . . "required": ["isEnabled", "requireIGPSync", "extASNumber", "routerIP", "isGenerated", "bgpPeers"] </pre>

*Date format: YYYY/MM/DD

[MS-NCT]: Network Cost Transfer Protocol

This topic lists the Errata found in the MS-NCT document 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.



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[MS-NFPB]: Near Field Proximity Bidirectional Services Protocol

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[MS-NFPS]: Near Field Proximity Sharing Protocol

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[MS-NKPU]: Network Key Protector Unlock Protocol

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[MS-NLMP]: NT LAN Manager (NTLM) Authentication Protocol

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[MS-NMFMB]: .NET Message Framing MSMQ Binding Protocol

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[MS-NNS]: .NET NegotiateStream Protocol

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[MS-NRPC]: Netlogon Remote Protocol

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[MS-NSPI]: Name Service Provider Interface (NSPI) Protocol

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[MS-OAPX]: OAuth 2.0 Protocol Extensions

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Errata below are for Protocol Document Version [V8.0 - 2017/12/01](#).

Errata Published*	Description								
2018/08/20	<p>In Section 3.2.1.1, Global Server Settings, a table has been added to show constants and corresponding values.</p> <p>Changed from:</p> <p>...</p> <p>ad_fs_behavior_level (Public): The AD FS behavior level, a specification of the functionality available at the AD FS server. Possible values are AD_FS_BEHAVIOR_LEVEL_1, AD_FS_BEHAVIOR_LEVEL_2, and AD_FS_BEHAVIOR_LEVEL_3.<7></p> <p>Changed to:</p> <p>...</p> <ul style="list-style-type: none">ad_fs_behavior_level (Public): Stores the AD FS behavior level, which is a specification of the functionality that is available at the AD FS server. The following values are possible.<7> <table border="1"><thead><tr><th>Symbolic constant</th><th>Value</th></tr></thead><tbody><tr><td>AD_FS_BEHAVIOR_LEVEL_1</td><td>1</td></tr><tr><td>AD_FS_BEHAVIOR_LEVEL_2</td><td>2</td></tr><tr><td>AD_FS_BEHAVIOR_LEVEL_3</td><td>3</td></tr></tbody></table>	Symbolic constant	Value	AD_FS_BEHAVIOR_LEVEL_1	1	AD_FS_BEHAVIOR_LEVEL_2	2	AD_FS_BEHAVIOR_LEVEL_3	3
Symbolic constant	Value								
AD_FS_BEHAVIOR_LEVEL_1	1								
AD_FS_BEHAVIOR_LEVEL_2	2								
AD_FS_BEHAVIOR_LEVEL_3	3								
2018/03/05	<p>In Section 1.2.1, Normative References, a new reference has been added: "[MSKB-4088889] Microsoft Corporation, "March 20, 2018-KB4088889", https://support.microsoft.com/en-us/help/4088889"</p> <p>In Section 2.2.2, Common URI Parameters, information has been added about the support for the mfa_max_age parameter that was added through KB 4088889..</p> <p>Changed from:</p>								

Errata Published*	Description								
	<table border="1" data-bbox="516 201 1414 352"> <tr> <td data-bbox="516 201 959 352">mfa_max_age</td> <td data-bbox="959 201 1414 352">OPTIONAL. This query parameter is used... The AD FS server ignores this parameter unless its ad_fs_behavior_level is AD_FS_BEHAVIOR_LEVEL_3 or higher.</td> </tr> </table> <p data-bbox="500 401 634 422">Changed to:</p> <table border="1" data-bbox="516 432 1414 611"> <tr> <td data-bbox="516 432 959 611">mfa_max_age</td> <td data-bbox="959 432 1414 611">OPTIONAL. This query parameter is used... The AD FS server ignores this parameter unless its ad_fs_behavior_level is AD_FS_BEHAVIOR_LEVEL_3 or higher.<5></td> </tr> </table> <p data-bbox="500 657 1414 730"><5> Section 2.2.2: Even though AD_FS_BEHAVIOR_LEVEL_3 is supported on Windows Server 2016, the mfa_max_age parameter is supported on Windows Server 2016 only if [MSKB-408889] is installed.</p> <p data-bbox="500 810 1333 856">In Section 2.2.2.11, mfa_max_age, a reference has been added for additional support information about the mfa_max_age parameter.</p> <p data-bbox="500 905 662 926">Changed from:</p> <p data-bbox="500 936 1300 982">The AD FS server ignores this parameter unless its ad_fs_behavior_level is AD_FS_BEHAVIOR_LEVEL_3 or higher.</p> <p data-bbox="500 1031 634 1052">Changed to:</p> <p data-bbox="500 1062 1349 1136">The AD FS server ignores this parameter unless its ad_fs_behavior_level is AD_FS_BEHAVIOR_LEVEL_3 or higher. See section 2.2.2 for additional support information.</p> <p data-bbox="500 1213 1393 1287">In Section 7, Appendix B Product Behavior, product behavior note <6> (for section 3.2.1.1): AD_FS_BEHAVIOR_LEVEL_3 has been added to the list of behavior levels that are supported by Windows Server 2016.</p> <p data-bbox="500 1335 662 1356">Changed from:</p> <table border="1" data-bbox="516 1367 1414 1451"> <tr> <td data-bbox="516 1367 959 1451">Windows Server 2016</td> <td data-bbox="959 1367 1414 1451">AD_FS_BEHAVIOR_LEVEL_1, AD_FS_BEHAVIOR_LEVEL_2</td> </tr> </table> <p data-bbox="500 1497 634 1518">Changed to:</p> <table border="1" data-bbox="516 1528 1414 1646"> <tr> <td data-bbox="516 1528 959 1646">Windows Server 2016</td> <td data-bbox="959 1528 1414 1646">AD_FS_BEHAVIOR_LEVEL_1, AD_FS_BEHAVIOR_LEVEL_2, AD_FS_BEHAVIOR_LEVEL_3</td> </tr> </table>	mfa_max_age	OPTIONAL. This query parameter is used... The AD FS server ignores this parameter unless its ad_fs_behavior_level is AD_FS_BEHAVIOR_LEVEL_3 or higher.	mfa_max_age	OPTIONAL. This query parameter is used... The AD FS server ignores this parameter unless its ad_fs_behavior_level is AD_FS_BEHAVIOR_LEVEL_3 or higher.<5>	Windows Server 2016	AD_FS_BEHAVIOR_LEVEL_1, AD_FS_BEHAVIOR_LEVEL_2	Windows Server 2016	AD_FS_BEHAVIOR_LEVEL_1, AD_FS_BEHAVIOR_LEVEL_2, AD_FS_BEHAVIOR_LEVEL_3
mfa_max_age	OPTIONAL. This query parameter is used... The AD FS server ignores this parameter unless its ad_fs_behavior_level is AD_FS_BEHAVIOR_LEVEL_3 or higher.								
mfa_max_age	OPTIONAL. This query parameter is used... The AD FS server ignores this parameter unless its ad_fs_behavior_level is AD_FS_BEHAVIOR_LEVEL_3 or higher.<5>								
Windows Server 2016	AD_FS_BEHAVIOR_LEVEL_1, AD_FS_BEHAVIOR_LEVEL_2								
Windows Server 2016	AD_FS_BEHAVIOR_LEVEL_1, AD_FS_BEHAVIOR_LEVEL_2, AD_FS_BEHAVIOR_LEVEL_3								

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[MS-OAPXBC]: OAuth 2.0 Protocol Extensions for Broker Clients

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Errata below are for Protocol Document Version [V6.0 – 2017/12/01](#).

Errata Published*	Description
2018/03/05	<p>In Section 1.2.1, Normative References, a new reference has been added: "[MSKB-4088889] Microsoft Corporation, "March 20, 2018-KB4088889", https://support.microsoft.com/en-us/help/4088889"</p> <p>In Section 2.2.2.1, krctx, information has been added about the support for the krctx parameter and the "winhello_cert_kr" value that was added through KB 4088889.</p> <p>Changed from: The AD FS server ignores this parameter unless its AD FS behavior level is AD_FS_BEHAVIOR_LEVEL_3 or higher ([MS-OAPX] section 3.2.1.1) and the AD FS server is capable of processing the parameter, as indicated by the value "winhello_cert_kr" being included in the capabilities field of the OpenID Provider Metadata ([MS-OIDCE] section 2.2.3.2).</p> <p>Changed to: The AD FS server ignores this parameter unless its AD FS behavior level is AD_FS_BEHAVIOR_LEVEL_3 or higher ([MS-OAPX] section 3.2.1.1) and the AD FS server is capable of processing the parameter, as indicated by the value "winhello_cert_kr" being included in the capabilities field of the OpenID Provider Metadata ([MS-OIDCE] section 2.2.3.2).<1></p> <p><1> Section 2.2.2.1: Even though AD_FS_BEHAVIOR_LEVEL_3 is supported on Windows Server 2016, the krctx parameter and the "winhello_cert_kr" value are supported on Windows Server 2016 only if [MSKB-4088889] is installed.</p> <p>In Section 3.1.5.1.4.3, Processing Details, a reference has been added for additional support information about the krctx parameter and the "winhello_cert_kr" value.</p> <p>Changed from:</p>

Errata Published*	Description
	<p>The "winhello_cert_kr" value is supported on the AD FS server only if its AD FS behavior level is AD_FS_BEHAVIOR_LEVEL_3 or higher. See section 2.2.2.1 for additional support information. The "winhello_cert_kr" value is supported on the AD FS server only if its AD FS behavior level is AD_FS_BEHAVIOR_LEVEL_3 or higher.</p> <p>Changed to:</p> <p>The "winhello_cert_kr" value is supported on the AD FS server only if its AD FS behavior level is AD_FS_BEHAVIOR_LEVEL_3 or higher. See section 2.2.2.1 for additional support information. The "winhello_cert_kr" value is supported on the AD FS server only if its AD FS behavior level is AD_FS_BEHAVIOR_LEVEL_3 or higher. See section 2.2.2.1 for additional support information.</p>

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[MS-OIDCE]: OpenID Connect 1.0 Protocol Extensions

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[MS-OLEDS]: Object Linking and Embedding (OLE) Data Structures

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Errata below are for Protocol Document Version [V9.0 – 2017/12/01](#).

Errata Published*	Description
2018/08/20	<p>In Section 2.1.5, LengthPrefixedUnicodeString, the description of the Length field has been changed from:</p> <p>Length (4 bytes): This MUST be set to the number of Unicode characters in the String field, including the terminating null character. Length MUST be set to 0x00000000 to indicate an empty string.</p> <p>Changed to:</p> <p>Length (4 bytes): This MUST be set to the number of bytes in the String field, including the terminating null character. Length MUST be set to 0x00000000 to indicate an empty string.</p>
2018/08/20	<p>In Section 2.3.3, OLEStream, the following has been changed from:</p> <p>ReservedMonikerStreamSize (4 bytes): This MUST be set to the size, in bytes, of the ReservedMonikerStream field. If this field has a value 0x00000000, the ReservedMonikerStream field MUST NOT be present.</p> <p>RelativeSourceMonikerStreamSize (4 bytes): This MUST be set to the size, in bytes, of the RelativeSourceMonikerStream field. If this field has a value 0x00000000, the RelativeSourceMonikerStream field MUST NOT be present.</p> <p>AbsoluteSourceMonikerStreamSize (4 bytes): This MUST be set to the size, in bytes, of the AbsoluteSourceMonikerStream field. This field MUST NOT contain the value 0x00000000.</p> <p>Changed to:</p> <p>ReservedMonikerStreamSize (4 bytes): This MUST be set to the size, in bytes, of the ReservedMonikerStream field plus the size of this field. If this field has a value 0x00000000, the ReservedMonikerStream field MUST NOT be present.</p> <p>RelativeSourceMonikerStreamSize (4 bytes): This MUST be set to the size, in bytes, of the RelativeSourceMonikerStream field plus the size of this field. If this field has a value 0x00000000, the RelativeSourceMonikerStream field MUST NOT be present.</p> <p>AbsoluteSourceMonikerStreamSize (4 bytes): This MUST be set to the size, in bytes, of the AbsoluteSourceMonikerStream field plus the size of this field. This field MUST NOT contain the value 0x00000000.</p>

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[MS-OTPC]: One-Time Password Certificate Enrollment Protocol

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[MS-PAR]: Print System Asynchronous Remote Protocol

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[MS-PEAP]: Protected Extensible Authentication Protocol (PEAP)

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[MS-PKAP]: Public Key Authentication Protocol

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[MS-PSRDP]: PowerShell Remote Debugging Protocol

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[MS-PSRP]: PowerShell Remoting Protocol

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[MS-RA]: Remote Assistance Protocol

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[MS-RAI]: Remote Assistance Initiation Protocol

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[MS-RDPADRV]: Remote Desktop Protocol Audio Level and Drive Letter Persistence Virtual Channel Extension

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Errata below are for Protocol Document Version [V1.1 – 2017/06/01](#).

Errata Published*	Description
2018/03/13	<p>In Section 1, Introduction, the applicable server context for this protocol has been clarified.</p> <p>Changed from:</p> <p>This document describes an extension to the RDP dynamic virtual channel protocol.</p> <p>Changed to:</p> <p>This document describes an extension to the RDP dynamic virtual channel protocol that is used exclusively in the context of Windows Multipoint Server scenarios.</p>

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[MS-RDPBCGR]: Remote Desktop Protocol: Basic Connectivity and Graphics Remoting

This topic lists the Errata found in [MS-RDPBCGR] 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.



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Errata below are for Protocol Document Version [V48.0 - 2018/03/16](#).

Errata Published*	Description
2018/06/04	<p>In Section 2.2.13.1, Server Redirection Packet (RDP_SERVER_REDIRECTION_PACKET), the description of the TargetCertificate field was updated to specify Unicode format.</p> <p>Changed from:</p> <p>TargetCertificate (variable): A variable-length array of bytes containing a Base64-encoded Target Certificate Container (section 2.2.13.1.2) structure that encapsulates the X.509 certificate of the target server.</p> <p>Changed to:</p> <p>TargetCertificate (variable): A variable-length array of bytes containing a Base64-encoded Target Certificate Container (section 2.2.13.1.2) structure in Unicode format that encapsulates the X.509 certificate of the target server.</p>
2018/06/04	<p>In Section 4.1.13, Client Confirm Active PDU:</p> <p>Changed from:</p> <pre> Decrypted TS_CONFIRM_ACTIVE_PDU: 00000000 ec 01 13 00 ef 03 ea 03 01 00 ea 03 06 00 d6 01 00000010 00 20 73 25 7b e6 12 00 00 00 01 00 18 00 01 00 . s%{..... </pre>

Errata Published*	Description
	<p>Changed to:</p> <pre>Decrypted TS_CONFIRM_ACTIVE_PDU: 00000000 ec 01 13 00 ef 03 ea 03 01 00 ea 03 06 00 d6 01 00000010 4d 53 54 53 43 00 12 00 00 00 01 00 18 00 01 00 MSTSC.....</pre> <p>And changed from:</p> <pre>d6 01 -> TS_CONFIRM_ACTIVE_PDU::lengthCombinedCapabilities = 0xd6 = 470 bytes 00 20 73 25 7b e6 -> TS_CONFIRM_ACTIVE_PDU::sourceDescriptor = "" 12 00 -> TS_CONFIRM_ACTIVE_PDU::numberCapabilities = 18</pre> <p>Changed to:</p> <pre>d6 01 -> TS_CONFIRM_ACTIVE_PDU::lengthCombinedCapabilities = 0xd6 = 470 bytes 4d 53 54 53 43 00 -> TS_CONFIRM_ACTIVE_PDU::sourceDescriptor = "MSTSC" 12 00 -> TS_CONFIRM_ACTIVE_PDU::numberCapabilities = 18</pre>
2018/06/04	<p>In Section 2.2.9.1.1.3.1.1, Palette Update (TS_UPDATE_PALETTE), the structure description was updated to indicate supported RDP versions.</p> <p>Changed from:</p> <p>The TS_UPDATE_PALETTE structure contains global palette information that covers the entire session's palette ([T128] section 8.18.6). Only 256-color palettes are sent in this update.</p> <p>Changed to:</p> <p>The TS_UPDATE_PALETTE structure contains global palette information that covers the entire session's palette ([T128] section 8.18.6). Only 256-color palettes are sent in this update. Palletized color is only supported in RDP 4.0, 5.0, 5.1, 5.2, 6.0, 6.1, 7.0 and 7.1.</p>
2018/05/07	<p>In Section 2.2.13.1, Server Redirection Packet, the description for the TargetCertificate field was revised to state that the field is a Based64 encoded Unicode.</p> <p>Changed from:</p> <p>TargetCertificate (variable): A variable-length array of bytes containing the X.509 certificate of the target server. The certificate is embedded inside a Target Certificate Container (section 2.2.13.1.2) structure.</p> <p>Changed to:</p>

Errata Published*	Description
	TargetCertificate (variable): A variable-length array of bytes containing a Base64-encoded Target Certificate Container (section 2.2.13.1.2) structure that encapsulates the X.509 certificate of the target server.

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[MS-RDPEA]: Remote Desktop Protocol: Audio Output Virtual Channel Extension

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[MS-RDPEAR]: Remote Desktop Protocol Authentication Redirection Virtual Channel

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[MS-RDPECLIP]: Remote Desktop Protocol: Clipboard Virtual Channel Extension

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Errata below are for Protocol Document Version [V12.0 - 2018/03/16](#).

Errata Published*	Description
2018/07/16	<p>In Section 2.2.2.1.1.1, General Capability Set (CLIPRDR_GENERAL_CAPABILITY), changed from:</p> <p>Indicates support for transferring files that are larger than 4,294,967,296 bytes in size. If this flag is not set, then only files of size less than or equal to 4,294,967,296 bytes can be exchanged using the File Contents Request PDU and File Contents Response PDU.</p> <p>Changed to:</p> <p>Indicates support for transferring files that are larger than 4,294,967,295 bytes in size. If this flag is not set, then only files of size less than or equal to 4,294,967,295 bytes can be exchanged using the File Contents Request PDU and File Contents Response PDU.</p>
2018/07/16	<p>In Section 2.2.5.3, File Contents Request PDU (CLIPRDR_FILECONTENTS_REQUEST), a product behavior note about the supported values for nPositionLow was modified.</p> <p>Changed from:</p> <p>nPositionLow (4 bytes): An unsigned, 32-bit integer that specifies the low bytes of the offset into the remote file, identified by the lindex field, from where the data needs to be extracted to satisfy a FILECONTENTS_RANGE operation. This field SHOULD be set to a value less than 2,147,483,648 unless the recipient of the FILECONTENTS_RANGE operation has specified support for huge files by setting the CB_HUGE_FILE_SUPPORT_ENABLED (0x00000020) flag in the General Capability Set (section 2.2.2.1.1.1) of the Clipboard Capabilities PDU (section 2.2.2.1).<2></p> <p><2> 2.2.5.3 File Contents Request PDU (CLIPRDR_FILECONTENTS_REQUEST)The operating systems Windows 10 v1803 operating system and Windows Server v1803 operating system support values larger than 2,147,483,647 and less than or equal to 4,294,967,296 in the nPositionLow field irrespective of the advertised huge file support.</p> <p>Changed to:</p>

Errata Published*	Description
	<p>nPositionLow (4 bytes): An unsigned, 32-bit integer that specifies the low bytes of the offset into the remote file, identified by the lindex field, from where the data needs to be extracted to satisfy a FILECONTENTS_RANGE operation. This field SHOULD be set to a value less than 2,147,483,648 unless the recipient of the FILECONTENTS_RANGE operation has specified support for huge files by setting the CB_HUGE_FILE_SUPPORT_ENABLED (0x00000020) flag in the General Capability Set (section 2.2.2.1.1.1) of the Clipboard Capabilities PDU (section 2.2.2.1). <2></p> <p><2> Section 2.2.5.3: The operating systems Windows 10 v1803 operating system and Windows Server v1803 operating system support values larger than 2,147,483,647 and less than or equal to 4,294,967,295 in the nPositionLow field irrespective of the advertised huge file support.</p>

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[MS-RDPEDYC]: Remote Desktop Protocol: Dynamic Channel Virtual Channel Extension

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Errata below are for Protocol Document Version [V18.0 - 2017/12/01](#).

Errata Published*	Description
2018/01/16	<p>In Section 2.2.1.2, DVC Capabilities Response PDU (DYNVC_CAPS_RSP), changed from:</p> <p>Sp (2 bits): Unused. MUST be set to 0x00.</p> <p>Changed to:</p> <p>Sp (2 bits): Unused. SHOULD be set to 0x00<7>.</p> <p><7>Windows implementations do not initialize the Sp field. As a result, its value is random.</p> <p>In Section 2.2.3.4, DVC Data Compressed PDU (DYNVC_DATA_COMPRESSED), a Product Behavior Note (PBN) has been added to describe the initial value of the Sp field.</p> <p>Changed from:</p> <p>Sp (2 bits): Unused. SHOULD be initialized to 0x00.</p> <p>Changed to:</p> <p>Sp (2 bits): Unused. SHOULD be initialized to 0x00.<9></p> <p><9>Windows implementations do not initialize the Sp field. As a result, its value is random.</p> <p>In Section 2.2.1.1.1, Version 1 (DYNVC_CAPS_VERSION1), the Product Behavior Note (PBN) has been revised to clarify the description of the initial value of the Sp field.</p> <p>Changed from:</p>

Errata Published*	Description
	<p>Sp (2 bits): Unused. SHOULD be initialized to 0x00.<2></p> <p><2>Windows implementations initialize Sp to 0x02.</p> <p>Changed to:</p> <p>Sp (2 bits): Unused. SHOULD be initialized to 0x00.<2></p> <p><2>Windows implementations do not initialize the Sp field. As a result, its value is random.</p> <p>In Section 2.2.1.1.2, Version 2 (DYNVC_CAPS_VERSION2), the Product Behavior Note (PBN) has been revised to clarify the description of the initial value of the Sp field.</p> <p>Changed from:</p> <p>Sp (2 bits): Unused. SHOULD be set to 0x00.<4></p> <p><4>Windows implementations initialize Sp to 0x02.</p> <p>Changed to:</p> <p>Sp (2 bits): Unused. SHOULD be set to 0x00.<4></p> <p><4>Windows implementations do not initialize the Sp field. As a result, its value is random.</p> <p>In Section 2.2.1.1.3, Version 3 (DYNVC_CAPS_VERSION3), the Product Behavior Note (PBN) has been revised to clarify the description of the initial value of the Sp field.</p> <p>Changed from:</p> <p>Sp (2 bits): Unused. SHOULD be set to 0x00.<6></p> <p><6>Windows implementations initialize Sp to 0x02.</p> <p>Changed to:</p> <p>Sp (2 bits): Unused. SHOULD be set to 0x00.<6></p> <p><6>Windows implementations do not initialize the Sp field. As a result, its value is random.</p>

*Date format: YYYY/MM/DD

[MS-RDPEFS]: Remote Desktop Protocol: File System Virtual Channel Extension

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[MS-RDPEGDI]: Remote Desktop Protocol: Graphics Device Interface (GDI) Acceleration Extensions

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[MS-RDPEGFX]: Remote Desktop Protocol: Graphics Pipeline Extension

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Errata below are for Protocol Document Version [V13.0 - 2018/03/16](#).

Errata Published*	Description
2018/07/16	<p>In the following sections, "graphics output buffer" was changed to "Graphics Output Buffer ADM element".</p> <p>Section 2.2.2.14, RDPGFX_RESET_GRAPHICS_PDU Section 2.2.2.15, RDPGFX_MAP_SURFACE_TO_OUTPUT_PDU Section 2.2.2.22, RDPGFX_MAP_SURFACE_TO_SCALED_OUTPUT_PDU</p> <p>For example, in Section 2.2.2.22, RDPGFX_MAP_SURFACE_TO_SCALED_OUTPUT_PDU, changed from:</p> <p>The RDPGFX_MAP_SURFACE_TO_SCALED_OUTPUT_PDU message is sent by the server to instruct the client to map a surface to a rectangular area of the graphics output buffer, including a target width and height to which the surface MUST be scaled.</p> <p>Changed to: The RDPGFX_MAP_SURFACE_TO_SCALED_OUTPUT_PDU message is sent by the server to instruct the client to map a surface to a rectangular area of the Graphics Output Buffer (section 3.3.1.7) ADM element, including a target width and height to which the surface MUST be scaled</p> <p>In that same section, changed from:</p> <p>outputOriginX (4 bytes): A 32-bit unsigned integer that specifies the x-coordinate of the point, relative to the origin of the Graphics Output Buffer (section 3.3.1.7), at which to map the top-left corner of the surface.</p> <p>outputOriginY (4 bytes): A 32-bit unsigned integer that specifies the y-coordinate of the point, relative to the origin of the Graphics Output Buffer, at which to map the upper-left corner of the surface.</p>

Errata Published*	Description
	<p>targetWidth (4 bytes): A 32-bit unsigned integer that specifies the width of the target graphics output buffer to which the surface will be mapped, as specified in section 3.3.1.7.</p> <p>targetHeight (4 bytes): A 32-bit unsigned integer that specifies the height of the target graphics output buffer to which the surface will be mapped.</p> <p>Changed to:</p> <p>outputOriginX (4 bytes): A 32-bit unsigned integer that specifies the x-coordinate of the point, relative to the origin of the Graphics Output Buffer ADM element, at which to map the top-left corner of the surface.</p> <p>outputOriginY (4 bytes): A 32-bit unsigned integer that specifies the y-coordinate of the point, relative to the origin of the Graphics Output Buffer ADM element, at which to map the upper-left corner of the surface.</p> <p>targetWidth (4 bytes): A 32-bit unsigned integer that specifies the width of the target Graphics Output Buffer ADM element to which the surface will be mapped, as specified in section 3.3.1.7.</p> <p>targetHeight (4 bytes): A 32-bit unsigned integer that specifies the height of the target Graphics Output Buffer ADM element to which the surface will be mapped.</p>
2018/06/04	<p>Two sections have been updated to clarify how AVC444/AVC444v2 is encoded and decoded.</p> <p>In Section 2.2.4.5, RFX_AVC444_BITMAP_STREAM, changed from:</p> <p>These bitstreams MUST be decoded by the same MPEG-4 AVC/H.264 decoder as one stream.</p> <p>Changed to:</p> <p>These bitstreams MUST be encoded using the same MPEG-4 AVC/H.264 encoder and decoded by a single MPEG-4 AVC/H.264 decoder as one stream.</p> <p>-</p> <p>Changed from:</p> <p>If no luma frame is present, then this field MUST be set to zero.</p> <p>Changed to:</p> <p>If no YUV420 frame is present, then this field MUST be set to zero.</p> <p>Changed from:</p> <p>0x1 A YUV420 frame is contained in the avc420EncodedBitstream1 field, and no data is present in the avc420EncodedBitstream2 field. No Chroma420 frame is present.</p> <p>0x2 A Chroma420 frame is contained in the avc420EncodedBitstream1 field, and no data is present in the avc420EncodedBitstream2 field. No YUV420 frame is present.</p> <p>Changed to:</p> <p>0x1 A YUV420 frame is contained in the avc420EncodedBitstream1 field, and no data is present in the avc420EncodedBitstream2 field. No Chroma420 frame is</p>

Errata Published*	Description
	<p>present. The Chroma420 frame corresponding to the updates in the YUV420 frame is sent in a RFX_AVC444_BITMAP_STREAM message in subsequent frames if required.</p> <p>0x2 A Chroma420 frame is contained in the avc420EncodedBitstream1 field, and no data is present in the avc420EncodedBitstream2 field. No YUV420 frame is present. The Chroma420 frame MUST be combined with the decoded AVC stream from previous frames.</p> <p>In Section 2.2.4.6, RFX_AVC444V2_BITMAP_STREAM, changed from:</p> <p>These bitstreams MUST be decoded by the same MPEG-4 AVC/H.264 decoder as one stream.</p> <p>Changed to:</p> <p>These bitstreams MUST be encoded using the same MPEG-4 AVC/H.264 encoder and decoded by a single MPEG-4 AVC/H.264 decoder as one stream.</p> <p>Changed from:</p> <p>If no luma frame is present, then this field MUST be set to zero.</p> <p>Changed to:</p> <p>If no YUV420 frame is present, then this field MUST be set to zero.</p> <p>Changed from:</p> <p>0x1 A YUV420 frame is contained in the avc420EncodedBitstream1 field, and no data is present in the avc420EncodedBitstream2 field. No Chroma420 frame is present.</p> <p>0x2 A Chroma420 frame is contained in the avc420EncodedBitstream1 field, and no data is present in the avc420EncodedBitstream2 field. No YUV420 frame is present.</p> <p>Changed to:</p> <p>0x1 A YUV420 frame is contained in the avc420EncodedBitstream1 field, and no data is present in the avc420EncodedBitstream2 field. No Chroma420 frame is present. The Chroma420 frame corresponding to the updates in the YUV420 frame is sent in a RFX_AVC444V2_BITMAP_STREAM message in subsequent frames if required.</p> <p>0x2 A Chroma420 frame is contained in the avc420EncodedBitstream1 field, and no data is present in the avc420EncodedBitstream2 field. No YUV420 frame is present. The Chroma420 frame MUST be combined with the decoded AVC stream from previous frames.</p>
2018/05/07	<p>In Section 3.2.5.19, Sending an RDPGFX_CAPS_CONFIRM_PDU message, specific RDPGFX_CAPSET versions were removed from the description.</p> <p>Changed from:</p> <p>The structure and fields of the RDPGFX_CAPS_CONFIRM_PDU message are specified in section 2.2.2.19. The command fields MUST be populated in accordance with this</p>

Errata Published*	Description
	<p>description. The server MUST populate the capsSet field with a single instance of a correctly initialized RDPGFX_CAPSET_VERSION8 (section 2.2.3.1) or RDPGFX_CAPSET_VERSION81 (section 2.2.3.2) structure.</p> <p>Changed to:</p> <p>The structure and fields of the RDPGFX_CAPS_CONFIRM_PDU message are specified in section 2.2.2.19. The command fields MUST be populated in accordance with this description. The server MUST populate the capsSet field with a single instance of a correctly initialized capability set structure (section 2.2.3).</p>
2018/04/23	<p>In Section 1.5.2, Server Implementation Requirements, the list of capability sets that servers support that must be capable of processing the RDPGFX_QOE_FRAME_ACKNOWLEDGE_PDU message was updated.</p> <p>Changed from:</p> <p>Servers that support the RDPGFX_CAPSET_VERSION10 (section 2.2.3.3) capability set must be capable of processing the RDPGFX_QOE_FRAME_ACKNOWLEDGE_PDU (section 2.2.2.21) message.</p> <p>Changed to:</p> <p>Servers that support the RDPGFX_CAPSET_VERSION10 (section 2.2.3.3), RDPGFX_CAPSET_VERSION102 (section 2.2.3.5), RDPGFX_CAPSET_VERSION103 (section 2.2.3.6), RDPGFX_CAPSET_VERSION104 (section 2.2.3.7), or RDPGFX_CAPSET_VERSION105 (section 2.2.3.8) capability sets must be capable of processing the RDPGFX_QOE_FRAME_ACKNOWLEDGE_PDU (section 2.2.2.21) message.</p>
2018/04/23	<p>In Section 3.3.1.4, Bitmap Cache, the flag field list identifying the bitmap cache limit was updated to include RDPGFX_CAPSET_VERSION104 and RDPGFX_CAPSET_VERSION105.</p> <p>Changed from:</p> <p>The size of the bitmap cache is capped at 100 MB or 16 MB, depending on whether the RDPGFX_CAPS_FLAG_THINCLIENT (0x00000001) flag or RDPGFX_CAPS_FLAG_SMALL_CACHE (0x00000002) flag is specified in the flags field of an RDPGFX_CAPSET_VERSION8 (section 2.2.3.1), RDPGFX_CAPSET_VERSION81 (section 2.2.3.2), RDPGFX_CAPSET_VERSION10 (section 2.2.3.3), or RDPGFX_CAPSET_VERSION102 (section 2.2.3.5) structure, which is encapsulated in the server-to-client RDPGFX_CAPS_CONFIRM_PDU (section 2.2.2.19) message.</p> <p>Changed to:</p> <p>The size of the bitmap cache is capped at 100 MB or 16 MB, depending on whether the RDPGFX_CAPS_FLAG_THINCLIENT (0x00000001) flag or RDPGFX_CAPS_FLAG_SMALL_CACHE (0x00000002) flag is specified in the flags field of an RDPGFX_CAPSET_VERSION8 (section 2.2.3.1), RDPGFX_CAPSET_VERSION81 (section 2.2.3.2), RDPGFX_CAPSET_VERSION10 (section 2.2.3.3), RDPGFX_CAPSET_VERSION102 (section 2.2.3.5), RDPGFX_CAPSET_VERSION104 (section 2.2.3.7), or RDPGFX_CAPSET_VERSION105 (section 2.2.3.8) structure, which is encapsulated in the server-to-client RDPGFX_CAPS_CONFIRM_PDU (section 2.2.2.19) message.</p>

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[MS-RDPEGT]: Remote Desktop Protocol Geometry Tracking Virtual Channel Protocol Extension

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[MS-RDPEI]: Remote Desktop Protocol: Input Virtual Channel Extension

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[MS-RDPELE]: Remote Desktop Protocol: Licensing Extension

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Errata below are for Protocol Document Version [V13.0 - 2017/09/15](#).

Errata Published*	Description
2018/05/07	<p>In various sections throughout this document, text was added, modified, or removed to describe temporary and permanent licenses.</p> <p>The following sections were updated: 1.2.2 2.2.2.6.4</p> <p>The following sections are new: 2.2.2.8 2.2.2.8.1 2.2.2.8.1.1 2.2.2.8.2 2.2.2.8.2.1 2.2.2.8.2.2</p> <p>The following section was removed: 5.1.1</p> <p>For details on the changes, see the difference document in PDF format here.</p>

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[MS-RDPEMC]: Remote Desktop Protocol: Multiparty Virtual Channel Extension

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[MS-RDPEMT]: Remote Desktop Protocol: Multitransport Extension

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[MS-RDPEPC]: Remote Desktop Protocol: Print Virtual Channel Extension

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[MS-RDPEPNP]: Remote Desktop Protocol: Plug and Play Devices Virtual Channel Extension

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[MS-RDPERP]: Remote Desktop Protocol: Remote Programs Virtual Channel Extension

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Errata below are for Protocol Document Version [V13.0 – 2017/09/15](#).

Errata Published*	Description
2018/06/04	<p>In various sections throughout this document, text was added, modified, or removed to describe the Taskbar Tab Info PDU (TS_RAIL_ORDER_TASKBARINFO).</p> <p>The following sections were updated:</p> <ul style="list-style-type: none">1.11.2.12.2.2.1 <p>The following new sections were added:</p> <ul style="list-style-type: none">2.2.2.142.2.2.14.13.2.5.2.123.2.5.2.12.13.3.5.2.113.3.5.2.11.1 <p>For details on the changes, see the difference document in PDF format here.</p>

*Date format: YYYY/MM/DD

[MS-RDPESC]: Remote Desktop Protocol: Smart Card Virtual Channel Extension

This topic lists the Errata found in [MS-RDPESC] 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.



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[MS-RDPESP]: Remote Desktop Protocol: Serial and Parallel Port Virtual Channel Extension

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[MS-RDPEUDP]: Remote Desktop Protocol: UDP Transport Extension

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[MS-RDPEV]: Remote Desktop Protocol: Video Redirection Virtual Channel Extension

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[MS-RDPEVOR]: Remote Desktop Protocol: Video Optimized Remoting Virtual Channel Extension

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[MS-RDPEXPS]: Remote Desktop Protocol: XML Paper Specification (XPS) Print Virtual Channel Extension

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[MS-RDPRFX]: Remote Desktop Protocol: RemoteFX Codec Extension

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[MS-RMPR]: Rights Management Services (RMS): Client-to-Server Protocol

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[MS-RMSOD]: Rights Management Services Protocols Overview

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[MS-RPCE]: Remote Procedure Call Protocol Extensions

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[MS-RPCH]: Remote Procedure Call over HTTP Protocol

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[MS-RPRN]: Print System Remote Protocol

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[MS-RRASM]: Routing and Remote Access Server (RRAS) Management Protocol

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[MS-RRP]: Windows Remote Registry Protocol

This topic lists the Errata found in the MS-RRP document 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.



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Errata below are for Protocol Document Version [V32.0 - 2018/03/16](#).

Errata Published*	Description
2018/07/16	<p>In Section 2.2.1, RPC_HKEY, the syntax was changed from:</p> <pre>typedef [context_handle] HANDLE RPC_HKEY, *PRPC_HKEY;</pre> <p>Changed to:</p> <pre>typedef [context_handle] HANDLE RPC_HKEY, ; typedef RPC_HKEY *PRPC_HKEY;</pre> <p>Also, Section 2.2.3, error_status_t, was removed from the document.</p>

*Date format: YYYY/MM/DD

[MS-RSMC]: Remote Session Monitoring and Control Protocol

This topic lists the Errata found in [MS-RSMC] 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.



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[MS-RSVD]: Remote Shared Virtual Disk Protocol

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[MS-SAMR]: Security Account Manager (SAM) Remote Protocol (Client-to-Server)

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Errata below are for Protocol Document Version [V39.0 – 2017/12/01](#).

Errata Published*	Description
2018/02/12	<p>In Section 1.1, Glossary, the default setting for UAS Compatibility has been updated.</p> <p>Changed from:</p> <p>UAS Compatibility: A configuration mode that affects protocol behavior constraints specified in this document. "UAS" is the acronym for "User Account Security (Database)" and refers to products no longer supported, such as Microsoft NT LAN Manager. The default setting in Windows is "off".</p> <p>Changed to:</p> <p>UAS Compatibility: A configuration mode that affects protocol behavior constraints specified in this document. "UAS" is the acronym for "User Account Security (Database)" and refers to products no longer supported, such as Microsoft NT LAN Manager. The default setting in Windows is "on".</p> <p>In Section 3.1.1.6, Attribute Constraints for Originating Updates, the value for minPwdLength has been updated.</p> <p>Changed from:</p> <p>...</p> <p>6. minPwdLength MUST be less than or equal to 256 unless uASCompat is nonzero, in which case minPwdLength MUST be less than or equal to 20; on error, return a failure code.</p> <p>Changed to:</p> <p>...</p>

Errata Published*	Description
	6. minPwdLength MUST be less than or equal to 256 unless uASCompat is nonzero, in which case minPwdLength MUST be less than or equal to 14; on error, return a failure code.

*Date format: YYYY/MM/DD

[MS-SAMS]: Security Account Manager (SAM) Remote Protocol (Server-to-Server)

This topic lists the Errata found in the MS-KPP document 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.



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[MS-SCMR]: Service Control Manager Remote Protocol

This topic lists the Errata found in [MS-SCMR] 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.



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Errata below are for Protocol Document Version [V27.1 - 2017/09/15](#).

Errata Published*	Description
2018/01/29	<p>A new section - Section 3.1.4.49, RCreateWowService (Opnum 60) - to document one method, RCreateWowService (Opnum 60), has been added and corresponding updates have been made to the IDL.</p> <p>For details on these changes, see the Diff file here.</p>

*Date format: YYYY/MM/DD

[MS-SHLLINK]: Shell Link (.LNK) Binary File Format

This topic lists the Errata found in [MS-SHLLINK] 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.

Errata below are for Protocol Document Version [V4.0 - 2017/09/15](#).

Errata Published*	Description																		
2018/06/18	<p>In Section 2, Structures, a note was added about the value contained by size fields.</p> <p>Added:</p> <p>Some Shell Link Binary File Format structures contain size fields; for example, HeaderSize in the ShellLinkHeader structure (section 2.1) and LinkInfoSize in the LinkInfo structure (section 2.3). Unless otherwise specified, the value contained by these size fields includes the size of size field itself.</p> <p>In Section 2.1.3, HotKeyFlags, the value 0x00 was added to the LowByte and HighByte tables.</p> <p>Changed from:</p> <p>LowByte (1 byte): An 8-bit unsigned integer that specifies a virtual key code that corresponds to a key on the keyboard. This value MUST be one of the following:</p> <table border="1"><thead><tr><th>Value</th><th>Meaning</th></tr></thead><tbody><tr><td>0x30</td><td>"0" key</td></tr><tr><td>...</td><td>...</td></tr></tbody></table> <p>HighByte (1 byte): An 8-bit unsigned integer that specifies bits that correspond to modifier keys on the keyboard. This value MUST be one or a combination of the following:</p> <table border="1"><thead><tr><th>Value</th><th>Meaning</th></tr></thead><tbody><tr><td>HOTKEYF_SHIFT 0x01</td><td>The "SHIFT" key on the keyboard.</td></tr><tr><td>...</td><td>...</td></tr></tbody></table> <p>Changed to:</p> <p>LowByte (1 byte): An 8-bit unsigned integer that specifies a virtual key code that corresponds to a key on the keyboard. This value MUST be one of the following:</p> <table border="1"><thead><tr><th>Value</th><th>Meaning</th></tr></thead><tbody><tr><td>0x00</td><td>No key assigned.</td></tr><tr><td>0x30</td><td>"0" key</td></tr></tbody></table>	Value	Meaning	0x30	"0" key	Value	Meaning	HOTKEYF_SHIFT 0x01	The "SHIFT" key on the keyboard.	Value	Meaning	0x00	No key assigned.	0x30	"0" key
Value	Meaning																		
0x30	"0" key																		
...	...																		
Value	Meaning																		
HOTKEYF_SHIFT 0x01	The "SHIFT" key on the keyboard.																		
...	...																		
Value	Meaning																		
0x00	No key assigned.																		
0x30	"0" key																		

Errata Published*	Description										
	<table border="1" data-bbox="516 197 1414 247"> <tr> <td data-bbox="516 197 967 247">...</td> <td data-bbox="967 197 1414 247">...</td> </tr> </table> <p data-bbox="500 296 1386 369">HighByte (1 byte): An 8-bit unsigned integer that specifies bits that correspond to modifier keys on the keyboard. This value MUST be one or a combination of the following:</p> <table border="1" data-bbox="516 380 1414 611"> <thead> <tr> <th data-bbox="516 380 967 428">Value</th> <th data-bbox="967 380 1414 428">Meaning</th> </tr> </thead> <tbody> <tr> <td data-bbox="516 428 967 478">0x00</td> <td data-bbox="967 428 1414 478">No modifier key is being used.</td> </tr> <tr> <td data-bbox="516 478 967 562">HOTKEYF_SHIFT 0x01</td> <td data-bbox="967 478 1414 562">The "SHIFT" key on the keyboard.</td> </tr> <tr> <td data-bbox="516 562 967 611">...</td> <td data-bbox="967 562 1414 611">...</td> </tr> </tbody> </table>	Value	Meaning	0x00	No modifier key is being used.	HOTKEYF_SHIFT 0x01	The "SHIFT" key on the keyboard.
...	...										
Value	Meaning										
0x00	No modifier key is being used.										
HOTKEYF_SHIFT 0x01	The "SHIFT" key on the keyboard.										
...	...										
2018/06/18	<p data-bbox="500 632 1398 659">In Section 2.5.10, TrackerDataBlock, the definition of the Length field was clarified.</p> <p data-bbox="500 701 662 728">Changed from:</p> <p data-bbox="500 737 1377 785">Length (4 bytes): A 32-bit, unsigned integer. This value MUST be greater than or equal to 0x0000058.</p> <p data-bbox="500 827 634 854">Changed to:</p> <p data-bbox="500 863 1409 936">Length (4 bytes): A 32-bit, unsigned integer that specifies the size of the rest of the TrackerDataBlock structure, including this Length field. This value MUST be 0x0000058.</p>										
2018/06/18	<p data-bbox="500 961 1414 1016">In Section 2.5.10, TrackerDataBlock, the size information of the MachineID field was corrected in the structure diagram and in the field description.</p> <p data-bbox="500 1058 662 1085">Changed from:</p> <p data-bbox="500 1094 727 1121">MachineID (variable)</p> <p data-bbox="500 1129 1386 1203">MachineID (variable): A character string, as defined by the system default code page, which specifies the NetBIOS name of the machine where the link target was last known to reside.</p> <p data-bbox="500 1245 634 1272">Changed to:</p> <p data-bbox="500 1281 732 1308">MachineID (16 bytes)</p> <p data-bbox="500 1316 1403 1390">MachineID (16 bytes): A NULL-terminated character string, as defined by the system default code page, which specifies the NetBIOS name of the machine where the link target was last known to reside.</p>										
2018/06/18	<p data-bbox="500 1413 1409 1467">In Section 2.5.1, ConsoleDataBlock, the size information of the FontWeight field was corrected.</p> <p data-bbox="500 1509 662 1537">Changed from:</p> <p data-bbox="500 1545 1403 1598">FontWeight (4 bytes): A 16-bit, unsigned integer that specifies the stroke weight of the font used in the console window.</p> <p data-bbox="500 1640 634 1667">Changed to:</p> <p data-bbox="500 1675 1403 1728">FontWeight (4 bytes): A 32-bit, unsigned integer that specifies the stroke weight of the font used in the console window.</p>										
2018/06/18	<p data-bbox="500 1743 1333 1795">In Section 2.5.1, ConsoleDataBlock, the definition of the FontFamily field was clarified.</p>										

Errata Published*	Description																												
	<p>Changed from:</p> <p>FontFamily (4 bytes): A 32-bit, unsigned integer that specifies the family of the font used in the console window. This value MUST be one of the following:</p> <table border="1" data-bbox="516 325 1414 596"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>FF_DONTCARE 0x0000</td> <td>The font family is unknown.</td> </tr> <tr> <td>...</td> <td>...</td> </tr> <tr> <td>FF_DECORATIVE 0x0050</td> <td>The font is a novelty font; for example, "Old English".</td> </tr> </tbody> </table> <p>Changed to:</p> <p>FontFamily (4 bytes): A 32-bit, unsigned integer that specifies the family of the font used in the console window. This value MUST be comprised of a font family and a font pitch. The values for the font family are shown in the following table:</p> <table border="1" data-bbox="516 758 1414 1029"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>FF_DONTCARE 0x0000</td> <td>The font family is unknown.</td> </tr> <tr> <td>...</td> <td>...</td> </tr> <tr> <td>FF_DECORATIVE 0x0050</td> <td>The font is a novelty font; for example, "Old English".</td> </tr> </tbody> </table> <p>A bitwise OR of one or more of the following font-pitch bits is added to the font family from the previous table:</p> <table border="1" data-bbox="516 1129 1414 1606"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>TMPF_NONE 0x0000</td> <td>A font pitch does not apply.</td> </tr> <tr> <td>TMPF_FIXED_PITCH 0x0001</td> <td>The font is a fixed-pitch font.</td> </tr> <tr> <td>TMPF_VECTOR 0x0002</td> <td>The font is a vector font.</td> </tr> <tr> <td>TMPF_TRUETYPE 0x0004</td> <td>The font is a true-type font.</td> </tr> <tr> <td>TMPF_DEVICE 0x0008</td> <td>The font is specific to the device.</td> </tr> </tbody> </table>	Value	Meaning	FF_DONTCARE 0x0000	The font family is unknown.	FF_DECORATIVE 0x0050	The font is a novelty font; for example, "Old English".	Value	Meaning	FF_DONTCARE 0x0000	The font family is unknown.	FF_DECORATIVE 0x0050	The font is a novelty font; for example, "Old English".	Value	Meaning	TMPF_NONE 0x0000	A font pitch does not apply.	TMPF_FIXED_PITCH 0x0001	The font is a fixed-pitch font.	TMPF_VECTOR 0x0002	The font is a vector font.	TMPF_TRUETYPE 0x0004	The font is a true-type font.	TMPF_DEVICE 0x0008	The font is specific to the device.
Value	Meaning																												
FF_DONTCARE 0x0000	The font family is unknown.																												
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Value	Meaning																												
TMPF_NONE 0x0000	A font pitch does not apply.																												
TMPF_FIXED_PITCH 0x0001	The font is a fixed-pitch font.																												
TMPF_VECTOR 0x0002	The font is a vector font.																												
TMPF_TRUETYPE 0x0004	The font is a true-type font.																												
TMPF_DEVICE 0x0008	The font is specific to the device.																												
2018/06/18	<p>In Section 2.5.1, ConsoleDataBlock, the definition of the FontSize field was clarified.</p> <p>Changed from:</p> <p>FontSize (4 bytes): A 32-bit, unsigned integer that specifies the size, in pixels, of the font used in the console window.</p>																												

Errata Published*	Description
	<p>Changed to:</p> <p>FontSize (4 bytes): A 32-bit, unsigned integer that specifies the size, in pixels, of the font used in the console window. The two most significant bytes contain the font height and the two least significant bytes contain the font width. For vector fonts, the width is set to zero.</p>
2018/06/18	<p>In Section 2.3.1, VolumeID, the description of the VolumeLabelOffsetUnicode field was updated.</p> <p>Changed from:</p> <p>VolumeLabelOffsetUnicode (4 bytes): An optional, 32-bit, unsigned integer ...</p> <p>If the value of the VolumeLabelOffset field is not 0x00000014, this field MUST be ignored, and the value of the VolumeLabelOffset field MUST be used to locate the volume label string.</p> <p>Changed to:</p> <p>VolumeLabelOffsetUnicode (4 bytes): An optional, 32-bit, unsigned integer ...</p> <p>If the value of the VolumeLabelOffset field is not 0x00000014, this field MUST NOT be present; instead, the value of the VolumeLabelOffset field MUST be used to locate the volume label string.</p>

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[MS-SFMWA]: Server and File Management Web APIs

This topic lists the Errata found in [MS-SFMWA] 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.



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[MS-SMB]: Server Message Block (SMB) Protocol

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Errata below are for Protocol Document Version [V47.0 - 2017/12/01](#).

Errata Published*	Description
2017/12/18	<p>In Section 3.3.5.10.1, Receiving any Information Level, changed from:</p> <p>If the server receives client request with a pass-through Information Level (section 2.2.2.3.5) and the server supports the CAP_INFOLEVEL_PASSTHRU capability in Server.Capabilities, then the server MUST decrement the Information Level value by SMB_INFO_PASSTHROUGH by treating the value as little-endian, and pass that value to the underlying object store. If the Information Level includes any request data, then the data MUST also be passed to the underlying object store.<129></p> <p>If the server does not support pass-through Information Levels, then it MUST fail this request with STATUS_INVALID_PARAMETER.</p> <p>The returned status and response data, if any, are sent to the client in a Trans2 subcommand response message that corresponds to the same subcommand that initiated the request.</p> <p>Changed to:</p> <p>If the server receives client request with a pass-through Information Level (section 2.2.2.3.5) and the CAP_INFOLEVEL_PASSTHRU bit is set in Server.Capabilities, then the server MUST decrement the Information Level value by SMB_INFO_PASSTHROUGH by treating the value as little-endian, and pass that value to the underlying object store. If the Information Level includes any request data, then the data MUST also be passed to the underlying object store.<129></p> <p>If the server does not support pass-through Information Levels, then it MUST fail this request with STATUS_INVALID_PARAMETER.</p> <p>The returned status and response data, if any, are sent to the client in a Trans2 subcommand response message that corresponds to the same subcommand that initiated the request.<130></p> <p><130> Section 3.3.5.10.1: If CAP_INFOLEVEL_PASSTHRU capability is set in Server.Capabilities, and client requested "FileAllInformation" pass-through</p>

Errata Published*	Description
	<p>Information Level, Windows-based servers respond with the structure specified in [MS-CIFS] section 2.2.8.3.10.</p> <p>In Section 2.2.2.3.5, Pass-through Information Level Codes, changed from:</p> <p>This document provides an extension of a new Information Level code value range called pass-through Information Levels, which can be used to set or query information on the server. These Information Levels allow SMB clients to directly query Information Levels native to the underlying object store.<18></p> <p><18> Section 2.2.2.3.5: pass-through Information Levels on Windows-based servers map directly to native Windows NT operating system Information Classes, as specified in [MS-FSCC] sections 2.4 and 2.5. Windows- based servers do not support setting the following NT Information Levels via the pass-through Information Level mechanism.</p> <p>Changed to:</p> <p>This document provides an extension of a new Information Level code value range called pass-through Information Levels, which can be used to set or query information on the server. These Information Levels allow SMB clients to directly query Information Levels native to the underlying object store.<18></p> <p><18> Section 2.2.2.3.5: On Windows-based servers, pass-through Information level "FileAllInformation" is mapped to SMB_QUERY_FILE_ALL_INFO, as specified in [MS-CIFS] section 2.2.8.3.10. All other pass-through Information Levels map directly to native Windows NT operating system Information Classes, as specified in [MS-FSCC] sections 2.4 and 2.5. Windows- based servers do not support setting the following NT Information Levels via the pass-through Information Level mechanism.</p>

*Date format: YYYY/MM/DD

[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.



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Errata below are for Protocol Document Version [V55.0 - 2018/03/16](#).

Errata Published*	Description						
2018/09/03	<p>In Section 3.3.5.15, Receiving an SMB2 IOCTL Request, product behavior note 317 has been changed from:</p> <p><317> Section 3.3.5.15: Windows 8, Windows Server 2012, Windows 8.1, Windows Server 2012 R2, Windows 10, Windows Server 2016, and Windows Server operating system allow only the CtlCode values, as specified in section 2.2.31, and the following CtlCode values, as specified in [MS-FSCC] section 2.3.</p> <p>...</p> <p>Windows 10, Windows Server 2016, and Windows Server operating system allow the additional CtlCode value, as specified in [MS-FSCC].</p> <table border="1"><thead><tr><th>FSCTL name</th><th>FSCTL function number</th></tr></thead><tbody><tr><td>FSCTL_DUPLICATE_EXTENTS_TO_FILE</td><td>0x98344</td></tr><tr><td>FSCTL_DUPLICATE_EXTENTS_TO_FILE_EX</td><td>0x983e8</td></tr></tbody></table> <p>Changed to:</p> <p><317> Section 3.3.5.15: Windows 8, Windows Server 2012, Windows 8.1, Windows Server 2012 R2, Windows 10, Windows Server 2016, and Windows Server operating system allow only the CtlCode values, as specified in section 2.2.31, and the following CtlCode values, as specified in [MS-FSCC] section 2.3.</p>	FSCTL name	FSCTL function number	FSCTL_DUPLICATE_EXTENTS_TO_FILE	0x98344	FSCTL_DUPLICATE_EXTENTS_TO_FILE_EX	0x983e8
FSCTL name	FSCTL function number						
FSCTL_DUPLICATE_EXTENTS_TO_FILE	0x98344						
FSCTL_DUPLICATE_EXTENTS_TO_FILE_EX	0x983e8						

Errata Published*	Description								
	<p>...</p> <p>Windows 10, Windows Server 2016, and Windows Server operating system allow the additional CtlCode value, as specified in [MS-FSCC].</p> <table border="1" data-bbox="513 289 1417 394"> <thead> <tr> <th>FSCTL name</th> <th>FSCTL function number</th> </tr> </thead> <tbody> <tr> <td>FSCTL_DUPLICATE_EXTENTS_TO_FILE</td> <td>0x98344</td> </tr> </tbody> </table> <p>Windows 10 v1803 operating system and later and Windows Server v1803 operating system and later allow the additional CtlCode value, as specified in [MS-FSCC].</p> <table border="1" data-bbox="513 527 1417 632"> <thead> <tr> <th>FSCTL name</th> <th>FSCTL function number</th> </tr> </thead> <tbody> <tr> <td>FSCTL_DUPLICATE_EXTENTS_TO_FILE_EX</td> <td>0x983e8</td> </tr> </tbody> </table>	FSCTL name	FSCTL function number	FSCTL_DUPLICATE_EXTENTS_TO_FILE	0x98344	FSCTL name	FSCTL function number	FSCTL_DUPLICATE_EXTENTS_TO_FILE_EX	0x983e8
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FSCTL_DUPLICATE_EXTENTS_TO_FILE_EX	0x983e8								
2018/09/03	<p>In Section 3.3.2.1, Oplock Break Acknowledgment Timer, the following has been changed from:</p> <p>This timer controls the amount of time the server waits for an oplock break acknowledgment from the client (as specified in section 2.2.24) after sending an oplock break notification (as specified in section 2.2.23) to the client. The server MUST wait for an interval of time greater than or equal to the oplock break acknowledgment timer. This timer MUST be smaller than the client Request Expiration time, as specified in section 3.2.6.1.<176> If the server implements the SMB 2.1 or SMB 3.x dialect family, this timer MUST also be used to control the time a server waits for a Lease Break Acknowledgment from the client (as specified in section 2.2.24.2).</p> <p><169> Section 3.3.2.1: This timer has a default value of 35 seconds, but its value could be changed by system policy to any range between 5 seconds and infinite (4,294,967,295 seconds).</p> <p>Changed to:</p> <p>This timer controls the amount of time the server waits for an oplock break acknowledgment from the client (as specified in section 2.2.24.1) after sending an oplock break notification (as specified in section 2.2.23.1) to the client. The server MUST wait for an interval of time greater than or equal to the oplock break acknowledgment timer. This timer MUST be smaller than the client Request Expiration time, as specified in section 3.2.6.1.<169></p> <p><169> Section 3.3.2.1: Windows SMB2 servers set this timer to 35 seconds.</p> <p>In Section 3.3.6.1, Oplock Break Acknowledgment Timer Event, the following has been changed from:</p> <p>The oplock break acknowledgment timer MUST be started when the server sends an SMB2 OPLOCK_BREAK Notification as specified in section 2.2.23 to the client as a result of the underlying object store indicating an oplock break or lease break on a file.</p> <p>When the oplock break acknowledgment timer expires, the server MUST scan for oplock breaks that have not been acknowledged by the client within the configured time. It does this by enumerating all opens in the GlobalOpenTable. For each open, if Open.OplockState is Breaking and Open.OplockTimeout is earlier than the current time, the server MUST acknowledge the oplock break to the underlying object store represented by Open.LocalOpen, set Open.OplockLevel to SMB2_OPLOCK_LEVEL_NONE, and set Open.OplockState to None.</p>								

Errata Published*	Description
	<p>If Open.Connection.Dialect is "2.1" or belongs to the SMB 3.x dialect family, and the server supports leasing, the server MUST scan for lease breaks that have not been acknowledged by the client within the configured time. It does this by enumerating all lease tables in GlobalLeaseTableList. For each lease table, it enumerates all leases in LeaseTable.LeaseList. For each lease, if Lease.Breaking is TRUE and Lease.LeaseBreakTimeout is earlier than the current time, the server MUST acknowledge the lease break to the underlying object store represented by the opens in Lease.LeaseOpens, and set Lease.LeaseState to NONE.</p> <p>The timer MUST then be restarted to expire again at the time of the next oplock time-out. If no other opens have Open.OplockState equal to Breaking, and no leases (if implemented) have Lease.Breaking set to TRUE, the timer MUST NOT be restarted.</p> <p>Changed to:</p> <p>The oplock break acknowledgment timer MUST be started when the server sends an oplock break notification, as specified in section 2.2.23.1, to the client as a result of the underlying object store indicating an oplock break on a file.</p> <p>When the oplock break acknowledgment timer expires, the server MUST scan for oplock breaks that have not been acknowledged by the client within the configured time. It does this by enumerating all opens in the GlobalOpenTable. For each open, if Open.OplockState is Breaking and Open.OplockTimeout is earlier than the current time, the server MUST acknowledge the oplock break to the underlying object store represented by Open.LocalOpen with SMB2_OPLOCK_LEVEL_NONE as the new oplock level, and MUST set Open.OplockLevel to SMB2_OPLOCK_LEVEL_NONE, and Open.OplockState to None.</p> <p>The timer MUST be restarted if there is an open where Open.OplockState is equal to "Breaking".</p> <p>In Section 3.3.4.7, Object Store Indicates a Lease Break, the following has been changed from:</p> <p>If the server succeeds in sending the message on any Open.Connection associated with this Lease, the server MUST start the oplock break acknowledgment timer as specified in section 3.3.2.5.</p> <p>Changed to:</p> <p>If the server succeeds in sending the Lease Break Notification, the server MUST set Lease.BreakNotification to empty and MUST start the lease break acknowledgment timer as specified in section 3.3.2.5.</p> <p>In the same section, the following has been changed from:</p> <p>The server then MUST construct an oplock break response using the syntax specified in section 2.2.25 with the following value:</p> <p>Changed to:</p> <p>The server then MUST construct an oplock break response using the syntax specified in section 2.2.25.1 with the following value:</p> <p>In Section 3.3.5.22.2, Processing a Lease Acknowledgment, the following has been changed from:</p>

Errata Published*	Description
	<p>The server then MUST construct a lease break response using the syntax specified in section 2.2.25 with the following values:</p> <p>Changed to:</p> <p>The server then MUST construct a lease break response using the syntax specified in section 2.2.25.2 with the following values:</p> <p>The following two sections have been added:</p> <p>3.3.2.5 Lease Break Acknowledgment Timer If the server implements the SMB 2.1 or SMB 3.x dialect family and supports leasing, this timer controls the amount of time the server waits for a Lease Break acknowledgment from the client, as specified in section 2.2.24.2, after sending a lease break notification, as specified in section 2.2.23.2, to the client. The server MUST wait for an interval of time greater than or equal to the lease break acknowledgment timer. This timer MUST be smaller than the client Request Expiration time, as specified in section 3.2.6.1.<172> <172> Section 3.3.2.5: Windows SMB2 servers set this timer to 35 seconds.</p> <p>3.3.6.5 Lease Break Acknowledgment Timer Event The Lease Break acknowledgment timer MUST be started when the server sends a lease break notification, as specified in section 2.2.23.2, to the client as a result of the underlying object store indicating a lease break on a file. When the lease break acknowledgment timer expires, the server MUST scan for lease breaks that have not been acknowledged by the client within the configured time. It does this by enumerating all lease tables in GlobalLeaseTableList. For each lease table, it enumerates all leases in LeaseTable.LeaseList. For each lease, if Lease.Breaking is TRUE and Lease.LeaseBreakTimeout is earlier than the current time, the server MUST acknowledge the lease break to the underlying object store represented by the opens in Lease.LeaseOpens with NONE as the new lease state and MUST set Lease.LeaseState to NONE and Lease.Breaking to FALSE. The timer MUST be restarted if there is a lease where Lease.Breaking is set to TRUE.</p>
2018/09/03	<p>In Section 3.3.1.12, Per Lease, the following has been added:</p> <ul style="list-style-type: none"> ● Lease.BreakNotification: A Lease Break Notification, as specified in section 2.2.23.2, if any, to be sent to the client. <p>In Section 3.3.4.7, Object Store Indicates a Lease Break, the processing rules have been changed from:</p> <p>The underlying object store indicates the breaking of a lease by specifying the ClientGuid, the ClientLeaseId, and the new lease state. The new lease state MUST be one of NONE, R, RW, and RH.</p> <p>When the underlying object store indicates the lease break, the server MUST locate the Lease Table by performing a lookup in GlobalLeaseTableList using the provided ClientGuid as the lookup key, and then locate the Lease entry by performing a lookup in the LeaseTable.LeaseList using the provided ClientLeaseId as the lookup key.</p> <p>If no entry is found, the server MUST NOT generate a Lease Break Notification. Instead, the server MUST complete the lease break call from the underlying object store with "NONE" as the new lease state, and take no further action.</p>

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	<p>If a Lease entry is found, the server MUST check the state of Open.Connection for all Opens in Lease.LeaseOpens. If Open.Session.Connection.Dialect belongs to the SMB 3.x dialect family and Open.Connection is NULL, the server MUST select an alternate connection in Open.Session.Channellist and update Open.Connection.</p> <p>If Open.Connection is NULL, Open.IsResilient is FALSE and Open.IsPersistent is FALSE, the server MUST close the Open as specified in section 3.3.4.17 for the following cases:</p> <ul style="list-style-type: none"> • Open.IsDurable is FALSE. • Lease.BreakToLeaseState does not contain SMB2_LEASE_HANDLE_CACHING and Open.IsDurable is TRUE. <p>If Lease.LeaseOpens is empty, the server MUST NOT generate a Lease Break Notification. Instead, the server MUST complete the lease break call from the underlying object store with "NONE" as the new lease state, set Lease.LeaseState to "NONE", and take no further action.</p> <p>If Lease.LeaseOpens is not empty, the server MUST construct a Lease Break Notification (section 2.2.23.2) message to send to the client.</p> <p>The server MUST set the Command field in the SMB2 header to SMB2_OPLOCK_BREAK, and the MessageId field to 0xFFFFFFFFFFFF. The server MUST set the SessionId and TreeId fields in the SMB2 header to 0.</p> <p>If Lease.LeaseState is SMB2_LEASE_READ_CACHING, the server MUST set the Flags field of the message to zero and MUST set Open.OplockState to "None" for all opens in Lease.LeaseOpens. The server MUST set Lease.Breaking to FALSE, and the LeaseKey field MUST be set to Lease.LeaseKey.</p> <p>Otherwise, the server MUST set the Flags field of the message to SMB2_NOTIFY_BREAK_LEASE_FLAG_ACK_REQUIRED, indicating to the client that lease acknowledgment is required. The LeaseKey field MUST be set to Lease.LeaseKey. The server MUST set Open.OplockState to "Breaking" for all Opens in Lease.LeaseOpens. The server MUST set the CurrentLeaseState field of the message to Lease.LeaseState, set Lease.Breaking to TRUE, set Lease.BreakToLeaseState to the new lease state indicated by the object store, and set Lease.LeaseBreakTimeout to the current time plus an implementation-specific<194> default value in milliseconds.</p> <p>If the server implements the SMB 3.x dialect family and Lease.Version is 2, the server MUST set NewEpoch to Lease.Epoch + 1. Otherwise, NewEpoch MUST be set to zero.</p> <p>The SMB2 Lease Break Notification is sent to the client using the connection specified in Open.Connection of the first Open in Lease.LeaseOpens. The message SHOULD NOT be signed. If the server fails to send the message to the client, the server MUST retry the send using the connection specified in Open.Connection of the next Open in Lease.LeaseOpens.</p> <p>If the server succeeds in sending the message on any Open.Connection associated with this Lease, the server MUST start the oplock break acknowledgment timer as specified in section 3.3.2.5.</p> <p>Otherwise, the server MUST perform the following steps:</p> <ul style="list-style-type: none"> • If Open.IsPersistent is TRUE, and Lease.LeaseState is not SMB2_LEASE_READ_CACHING, and Open.DurableOpenTimeout is not earlier than the current time, the server MUST take no further action. • Otherwise, the server MUST set Open.Lease.Breaking to FALSE, set Lease.Held to FALSE, and MUST complete the lease break call from the underlying object store with "NONE" as the new lease state. <p>Changed to:</p> <p>The underlying object store indicates the breaking of a lease by specifying the ClientGuid, the ClientLeaseId, and the new lease state. The new lease state MUST be one of NONE, R, RW, and RH.</p>

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	<p>When the underlying object store indicates the lease break, the server MUST locate the Lease Table by performing a lookup in GlobalLeaseTableList using the provided ClientGuid as the lookup key, and then locate the Lease entry by performing a lookup in the LeaseTable.LeaseList using the provided ClientLeaseId as the lookup key.</p> <p>If no entry is found, the server MUST complete the lease break call from the underlying object store with "NONE" as the new lease state, set Lease.LeaseState to "NONE", and take no further action.</p> <p>If a Lease entry is found, the server MUST perform the following:</p> <p>If Lease.LeaseOpens is empty, the server MUST complete the lease break call from the underlying object store with "NONE" as the new lease state, set Lease.LeaseState to "NONE", and take no further action.</p> <p>Otherwise, for each Open in Lease.LeaseOpens, if Open.Connection is NULL, Open.IsResilient is FALSE and Open.IsPersistent is FALSE, the server MUST close the Open as specified in section 3.3.4.17 for the following cases:</p> <ul style="list-style-type: none"> • Open.IsDurable is FALSE. • Lease.BreakToLeaseState does not contain SMB2_LEASE_HANDLE_CACHING and Open.IsDurable is TRUE. <p>If Lease.LeaseOpens is not empty, the server MUST construct a Lease Break Notification (section 2.2.23.2) message to send to the client.</p> <p>The server MUST set the Command field in the SMB2 header to SMB2 OPLOCK_BREAK, and the MessageId field to 0xFFFFFFFFFFFFFFFF. The server MUST set the SessionId and TreeId fields in the SMB2 header to 0.</p> <p>If Lease.LeaseState is SMB2_LEASE_READ_CACHING, the server MUST set the Flags field of the message to zero and MUST set Open.OplockState to "None" for all opens in Lease.LeaseOpens. The server MUST set Lease.Breaking to FALSE, and the LeaseKey field MUST be set to Lease.LeaseKey.</p> <p>Otherwise, the server MUST set the Flags field of the message to SMB2_NOTIFY_BREAK_LEASE_FLAG_ACK_REQUIRED, indicating to the client that lease acknowledgment is required. The LeaseKey field MUST be set to Lease.LeaseKey. The server MUST set Open.OplockState to "Breaking" for all Opens in Lease.LeaseOpens. The server MUST set the CurrentLeaseState field of the message to Lease.LeaseState, set Lease.Breaking to TRUE, set Lease.BreakToLeaseState to the new lease state indicated by the object store, and set Lease.LeaseBreakTimeout to the current time plus an implementation-specific<194> default value in milliseconds.</p> <p>If the server implements the SMB 3.x dialect family and Lease.Version is 2, the server MUST set NewEpoch to Lease.Epoch + 1. Otherwise, NewEpoch MUST be set to zero.</p> <p>The message SHOULD NOT be signed. The server MUST set Lease.BreakNotification to the newly constructed Lease Break Notification.</p> <p>The server MUST look up all the connections in ConnectionList where Connection.ClientGuid matches the provided ClientGuid. The server MUST send Lease.BreakNotification using the first available connection. If the server fails to send the notification to the client, the server MUST retry the send using an alternate connection available.</p> <p>If the server succeeds in sending the Lease Break Notification, the server MUST set Lease.BreakNotification to empty and MUST start the lease break acknowledgment timer as specified in section 3.3.2.5.</p> <p>Otherwise, the server MUST perform the following steps:</p> <ul style="list-style-type: none"> • If Open.IsPersistent is TRUE and Lease.LeaseState is not SMB2_LEASE_READ_CACHING, the server MUST take no further action. • Otherwise, the server MUST set Open.Lease.Breaking to FALSE, Lease.Held to FALSE, Open.OplockState to None, Lease.BreakNotification to empty, and MUST complete the lease break call from the underlying object store with "NONE" as the new lease state.

Errata Published*	Description
	<p>In Section 3.3.5.9.7, Handling the SMB2_CREATE_DURABLE_HANDLE_RECONNECT Create Context, the following has been removed:</p> <ul style="list-style-type: none"> • If Open.IsPersistent is TRUE and the SMB2_DHANDLE_FLAG_PERSISTENT bit is set in the Flags field of the SMB2_CREATE_DURABLE_HANDLE_RECONNECT Create Context request, Open.Lease.Breaking MUST be set to TRUE and the SMB2_LEASE_FLAG_BREAK_IN_PROGRESS bit MUST be set in the Flags field of the response. The server MUST send Lease Break Notification to the client as specified in section 3.3.4.7. <p>In that same section, the following has been added:</p> <p>If Open.IsPersistent is TRUE, Open.Lease.Breaking is TRUE, and Open.Lease.BreakNotification is not empty, the server MUST send Open.Lease.BreakNotification to the client over an available connection in ConnectionList where Open.ClientGuid matches Connection.ClientGuid. If the server succeeds in sending the notification, the server MUST set Open.Lease.BreakNotification to empty and MUST start the lease break acknowledgment timer as specified in section 3.3.2.5.</p> <p>In Section 3.3.5.9.12, Handling the SMB2_CREATE_DURABLE_HANDLE_RECONNECT_V2 Create Context, the following has been removed:</p> <ul style="list-style-type: none"> • If Open.IsPersistent is TRUE and the SMB2_DHANDLE_FLAG_PERSISTENT bit is set in the Flags field of the SMB2_CREATE_DURABLE_HANDLE_RECONNECT_V2 Create Context request, Open.Lease.Breaking MUST be set to TRUE and the SMB2_LEASE_FLAG_BREAK_IN_PROGRESS bit MUST be set in the Flags field of the response. The server MUST send Lease Break Notification to the client as specified in section 3.3.4.7. <p>In that same section, the following has been added:</p> <p>If Open.IsPersistent is TRUE, Open.Lease.Breaking is TRUE, and Open.Lease.BreakNotification is not empty, the server MUST send Open.Lease.BreakNotification to the client over an available connection in ConnectionList where Open.ClientGuid matches Connection.ClientGuid. If the server succeeds in sending the notification, the server MUST set Open.Lease.BreakNotification to empty and MUST start the lease break acknowledgment timer as specified in section 3.3.2.5.</p> <p>In Section 3.3.5.22.2, Processing a Lease Acknowledgment, the following has been changed from:</p> <p>The server completes the lease break request received from the object store as described in section 3.3.4.7. The server MUST set Lease.LeaseState to LeaseState received in the request, and MUST set Lease.Breaking to FALSE.</p> <p>Changed to:</p> <p>The server completes the lease break request received from the object store as described in section 3.3.4.7. The server MUST set Lease.LeaseState to LeaseState received in the request, Open.OplockState to "Held", and Lease.Breaking to FALSE.</p>

Errata Published*	Description
2018/08/20	<p>In Section 3.3.4.6, Object Store Indicates an Oplock Break, the following has been changed from:</p> <p>If an entry is found, the server MUST check the state of Open.Connection. If Open.Session.Connection.Dialect belongs to the SMB 3.x dialect family and Open.Connection is NULL, the server MUST select an alternate connection in Open.Session.ChannelList and update Open.Connection.</p> <p>If Open.Connection is NULL, Open.IsResilient is FALSE, Open.IsDurable is FALSE and Open.IsPersistent is FALSE, the server SHOULD close the Open as specified in section 3.3.4.17.</p> <p>If Open.Connection is not NULL, the server MUST construct an Oplock Break Notification following the syntax specified in section 2.2.23.1 to send back to the client. The server MUST set the Command in the SMB2 header to SMB2 OPLOCK_BREAK, and the MessageId to 0xFFFFFFFFFFFFFFFF. The server SHOULD<191> set the SessionId in the SMB2 header to Open.Session.SessionId. The server MUST set the TreeId in the SMB2 header to zero. The FileId field of the response structure MUST be set to the values from the Open structure, with the volatile part set to Open.FileId and the persistent part set to Open.DurableFileId. The oplock Level of the response MUST be set to the value provided by the object store. The server MUST set Open.OplockState to Breaking and set Open.OplockTimeout to the current time plus an implementation-specific default value in milliseconds.<192> The SMB2 Oplock Break Notification is sent to the client. The message SHOULD NOT be signed. The server MUST start the oplock break acknowledgment timer as specified in section 3.3.2.1.</p> <p>Changed to:</p> <p>If an entry is found, the server MUST perform the following:</p> <p>If Open.Connection is NULL, Open.IsResilient is FALSE, Open.IsDurable is FALSE and Open.IsPersistent is FALSE, the server SHOULD close the Open as specified in section 3.3.4.17.</p> <p>The server MUST construct an Oplock Break Notification following the syntax specified in section 2.2.23.1 to send back to the client. The server MUST set the Command in the SMB2 header to SMB2 OPLOCK_BREAK, and the MessageId to 0xFFFFFFFFFFFFFFFF. The server SHOULD<191> set the SessionId in the SMB2 header to Open.Session.SessionId. The server MUST set the TreeId in the SMB2 header to zero. The FileId field of the response structure MUST be set to the values from the Open structure, with the volatile part set to Open.FileId and the persistent part set to Open.DurableFileId. The oplock Level of the response MUST be set to the value provided by the object store. The server MUST set Open.OplockState to Breaking and set Open.OplockTimeout to the current time plus an implementation-specific default value in milliseconds.<192> The message SHOULD NOT be signed.</p> <p>If the server implements the SMB 3.x dialect family, SMB2 Oplock Break Notification MUST be sent to the client using the first available connection in Open.Session.ChannelList where Channel.Connection is not NULL. If the server fails to send the notification to the client, the server MUST retry the send using an alternate connection, if available, in Open.Session.ChannelList.</p> <p>Otherwise, SMB2 Oplock Break Notification MUST be sent to the client using Open.Connection.</p> <p>If the notification could not be sent on any connection, the server MUST complete the oplock break from the underlying object store with SMB2_OPLOCK_LEVEL_NONE as the new oplock level and MUST set Open.OplockLevel to SMB2_OPLOCK_LEVEL_NONE and Open.OplockState to None.</p> <p>If the server succeeds in sending the notification, the server MUST start the oplock break acknowledgment timer as specified in section 3.3.2.1.</p>

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2018/08/20	<p>In Section 3.2.4.2, Application Requests a Connection to a Share, the following has been changed from:</p> <p>SpecifiedDialect: An optional dialect to be negotiated.</p> <p>If provided by the application, SpecifiedDialect matches the Connection.Dialect.</p> <p>Changed to:</p> <p>SpecifiedDialects: An optional list of dialects to be negotiated. If provided, this MUST be one or more values as specified in Dialects field of SMB2 NEGOTIATE Request in section 2.2.3.</p> <p>If provided by the application, the highest dialect in the SpecifiedDialects matches the Connection.Dialect.</p> <p>In Section 3.2.4.2.2.2, SMB2-Only Negotiate, the following has been changed from:</p> <p>If the application provided a dialect in SpecifiedDialect, the client MUST do the following:</p> <ul style="list-style-type: none"> Set the DialectCount to 1. Set the value in Dialects[0] array to SpecifiedDialect. <p>Changed to:</p> <p>If the application has provided SpecifiedDialects, the client MUST do the following:</p> <ul style="list-style-type: none"> Set the DialectCount to number of elements in the SpecifiedDialects. Set the value in Dialects array to the values in SpecifiedDialects. <p>In Section 3.2.5.2, Receiving an SMB2 NEGOTIATE Response, the following has been added:</p> <p>If the DialectRevision field in the SMB2 NEGOTIATE Response is equal to one of the values in the Dialects field of the SMB2 NEGOTIATE request, the client MUST set Connection.Dialect to DialectRevision. Otherwise, the client MUST close the connection and SHOULD fail the application request.</p> <p>The following has been changed from:</p> <p>If the DialectRevision in the SMB2 NEGOTIATE Response is 0x02FF, the client MUST issue a new SMB2 NEGOTIATE request as described in section 3.2.4.2.2.2 with the only exception that the client MUST allocate sequence number 1 from Connection.SequenceWindow, and MUST set MessageId field of the SMB2 header to 1. Otherwise, the client MUST proceed as follows.</p> <p>Changed to:</p> <p>If the DialectRevision field in the SMB2 NEGOTIATE Response is 0x02FF, the client MUST issue a new SMB2 NEGOTIATE request as described in section 3.2.4.2.2.2 with the only exception that the client MUST allocate sequence number 1 from</p>

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	<p>Connection.SequenceWindow, and MUST set MessageId field of the SMB2 header to 1. Otherwise, the client MUST proceed as follows.</p> <p>The following has been removed:</p> <p>The client MUST set Connection.Dialect to DialectRevision in the SMB2 NEGOTIATE Response.</p>
2018/07/16	<p>In Section 1.2.2, Informative References, the following reference was removed:</p> <p>[MSKB-978491] Microsoft Corporation, "FIX: A server that is running Server Message Block Version 2 does not respond to certain FSCTL_SRV_NOTIFY_TRANSACTION requests from clients that are running Windows Vista or Windows Server 2008", 2011,</p> <p>In Section 3.3.5.15, Receiving an SMB2 IOCTL Request, a product behavior note was changed from:</p> <p>The server SHOULD<317> fail the request with STATUS_NOT_SUPPORTED when an FSCTL is not allowed on the server, and SHOULD<318> fail the request with STATUS_INVALID_DEVICE_REQUEST when the FSCTL is allowed, but is not supported on the file system on which the file or directory handle specified by the FSCTL exists, as specified in [MS-FSCC] section 2.2.</p> <p><318> Section 3.3.5.15: Windows Vista SP1 and Windows Server 2008 servers without , and Windows 7 and Windows Server 2008 R2 without Service Pack 1 ignore a FSCTL_SRV_NOTIFY_TRANSACTION request specifying a valid FileId, don't send a response to the client, and reply to a FSCTL_SRV_NOTIFY_TRANSACTION with an invalid or -1 FileId with STATUS_INVALID_PARAMETER.</p> <p>For the following FSCTLs, Windows Vista SP1, Windows Server 2008, Windows 7, and Windows Server 2008 R2 return STATUS_FILE_CLOSED instead of STATUS_INVALID_DEVICE_REQUEST:</p> <ul style="list-style-type: none"> ● FSCTL_QUERY_NETWORK_INTERFACE_INFO ● FSCTL_DFS_GET_REFERRALS_EX ● FSCTL_VALIDATE_NEGOTIATE_INFO <p>Changed to:</p> <p>The server SHOULD<317> fail the request with STATUS_NOT_SUPPORTED when an FSCTL is not allowed on the server, and SHOULD<318> fail the request with STATUS_INVALID_DEVICE_REQUEST when the FSCTL is allowed, but is not supported on the file system on which the file or directory handle specified by the FSCTL exists, as specified in [MS-FSCC] section 2.2.</p> <p><318> Section 3.3.5.15: For the following FSCTLs, Windows Vista SP1, Windows Server 2008, Windows 7, and Windows Server 2008 R2 return STATUS_FILE_CLOSED instead of STATUS_INVALID_DEVICE_REQUEST:</p> <ul style="list-style-type: none"> ● FSCTL_QUERY_NETWORK_INTERFACE_INFO ● FSCTL_DFS_GET_REFERRALS_EX ● FSCTL_VALIDATE_NEGOTIATE_INFO
2018/07/02	<p>In Section 3.3.1.10, Per Open, the following was changed from:</p>

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	<ul style="list-style-type: none"> • Open.DurableOpenTimeout: A time value that indicates when a handle that has been preserved for durability will be closed by the system if a client has not reclaimed it. <p>Changed to:</p> <ul style="list-style-type: none"> • Open.DurableOpenTimeout: The time the server waits before closing a handle that has been preserved for durability, if a client has not reclaimed it. • Open.DurableOpenScavengerTimeout: A time stamp value, if non-zero, representing the maximum time to preserve the open for reclaim. <p>In Section 3.3.3, Initialization, the following was added:</p> <ul style="list-style-type: none"> • Open.DurableOpenScavengerTimeout MUST be set to zero. <p>In Section 3.3.5.9.6, Handling the SMB2_CREATE_DURABLE_HANDLE_REQUEST Create Context, the following paragraph has been changed from:</p> <p>In the "Successful Open Initialization" phase, if the underlying object store does not grant durability, the server MUST skip the rest of the processing in this phase. Otherwise, the server MUST set Open.IsDurable to TRUE and Open.DurableOwner to a security descriptor accessible only by the user represented by Open.Session.SecurityContext.</p> <p>Changed to:</p> <p>In the "Successful Open Initialization" phase, if the underlying object store does not grant durability, the server MUST skip the rest of the processing in this phase. Otherwise, the server MUST set Open.IsDurable to TRUE and Open.DurableOwner to a security descriptor accessible only by the user represented by Open.Session.SecurityContext and Open.DurableOpenTimeout MUST be set to an implementation specific value<268>.</p> <p><268> Section 3.3.5.9.6: Windows Vista, Windows Server 2008, Windows 7, and Windows Server 2008 R2 set Open.DurableOpenTimeout to 16 minutes. Windows 8, Windows Server 2012, Windows 8.1, Windows Server 2012 R2, Windows 10, Windows Server 2016, and Windows Server set Open.DurableOpenTimeout to 2 minutes.</p> <p>In Section 3.3.5.9.10, Handling the SMB2_CREATE_DURABLE_HANDLE_REQUEST_V2 Create Context, the following was changed from:</p> <p>Open.DurableOpenTimeout SHOULD<276> be set to the Timeout value in the response.</p> <p>Changed to:</p> <p>Open.DurableOpenTimeout MUSTS be set to the Timeout value in the response.</p> <p>The following was removed:</p> <p><285> Section 3.3.5.9.10: Windows 8 and Windows Server 2012 R2 SMB2 servers set Open.DurableOpenTimeout to 60 seconds.</p>

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	<p>The following was changed from:</p> <p><275> Section 3.3.5.9.10: If the Timeout value in the request is not zero, Windows 8 and Windows Server 2012 SMB2 servers set Timeout to the Timeout value in the request.</p> <p><276> Section 3.3.5.9.10: If the Timeout value in the request is zero and Share.CATimeout is not zero, Windows 8 and Windows Server 2012 SMB2 servers set Timeout to Share.CATimeout. If the Timeout value in the request is zero and Share.CATimeout is zero, Windows 8 and Windows Server 2012 SMB2 servers set Timeout to 60 seconds.</p> <p>If the Timeout value in the request is zero, Windows 8.1 and Windows Server 2012 R2 SMB2 servers set Timeout to 180 seconds.</p> <p>Changed to:</p> <p><275> Section 3.3.5.9.10: If the Timeout value in the request is not zero, Windows 8, Windows Server 2012, Windows 8.1, and Windows Server 2012 R2 SMB2 servers set Timeout to the Timeout value in the request.</p> <p><276> Section 3.3.5.9.10: If the Timeout value in the request is zero and Share.CATimeout is not zero, Windows 8, Windows Server 2012, Windows 8.1, Windows Server 2012 R2, Windows 10, Windows Server 2016, and Windows Server SMB2 servers set Timeout to Share.CATimeout. If the Timeout value in the request is zero and Share.CATimeout is zero, Windows 8 and Windows Server 2012 SMB2 servers set Timeout to 60 seconds.</p> <p>In Section 3.3.6.2, Durable Open Scavenger Timer Event, the following was changed from:</p> <p>When the durable open scavenger timer expires, the server MUST scan for durable opens that have not been reclaimed by a client within the configured time. It does this by enumerating all opens in the GlobalOpenTable. For each open, if Open.IsDurable is TRUE, Open.Connection is NULL, and Open.DurableOpenTimeout is earlier than the current time, the server MUST close the open as specified in section 3.3.4.17.</p> <p>Changed to:</p> <p>When the durable open scavenger timer expires, the server MUST scan for durable opens that have not been reclaimed by a client within the configured time. It does this by enumerating all opens in the GlobalOpenTable. For each open, if Open.IsDurable is TRUE, Open.Connection is NULL, and Open.DurableOpenScavengerTimeout is earlier than the system time, the server MUST close the open as specified in section 3.3.4.17.</p> <p>In Section 3.3.7.1, Handling Loss of a Connection, the following was changed from:</p> <ul style="list-style-type: none"> • If Open.Connection.Dialect belongs to the SMB 3.x dialect family, and if Open.DurableOpenTimeOut is not zero, the server MUST add the current time to its value. • Otherwise, the server MUST set Open.DurableOpenTimeOut to the current time plus an implementation-specific default value. <381> <p><381> Section 3.3.7.1: Windows-based servers set this value to 16 minutes.</p>

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	<p>Changed toL</p> <ul style="list-style-type: none"> The server MUST set Open.DurableOpenScavengerTimeout to the system time plus Open.DurableOpenTimeOut.
2018/07/02	<p>In Section 3.3.5.11, Receiving an SMB2 FLUSH Request, the following was added:</p> <p>If the Open is on a file and Open.GrantedAccess includes neither FILE_WRITE_DATA nor FILE_APPEND_DATA, the server MUST fail the request with STATUS_ACCESS_DENIED.</p> <p>If the Open is on a directory and Open.GrantedAccess includes neither FILE_ADD_FILE nor FILE_ADD_SUBDIRECTORY, the server MUST fail the request with STATUS_ACCESS_DENIED.</p> <p>If Open.IsPersistent is TRUE, the server MUST succeed the operation and MUST respond with an SMB2 FLUSH Response specified in section 2.2.18.</p> <p>The following was changed from:</p> <p>The server MUST issue a request to the underlying object store to flush any cached data for Open.LocalOpen.</p> <p>Changed to:</p> <p>Otherwise, the server MUST issue a request to the underlying object store to flush any cached data for Open.LocalOpen.</p>
2018/06/18	<p>In Section 3.2.4.6, Application Requests Reading from a File or Named Pipe, the bullet list was changed from:</p> <p>Otherwise, the following fields of the request MUST be initialized as follows:</p> <ul style="list-style-type: none"> The Channel field MUST be set to 0. The first byte of the Buffer field MUST be set to 0. The ReadChannelInfoOffset field MUST be set to 0. The ReadChannelInfoLength field MUST be set to 0. <p>Changed to:</p> <p>Otherwise, the following fields of the request MUST be initialized as follows:</p> <ul style="list-style-type: none"> If Connection.Dialect belongs to the SMB 3.x dialect family: The Channel field MUST be set to SMB2_CHANNEL_NONE. The ReadChannelInfoOffset field MUST be set to 0. The ReadChannelInfoLength field MUST be set to 0. The first byte of the Buffer field MUST be set to 0. <p>In Section 3.2.4.7, Application Requests Writing to a File or Named Pipe, the following was changed from:</p> <ul style="list-style-type: none"> The DataOffset field is set to the offset from the beginning of the SMB2 header to the data being written. This value SHOULD be 0x70, which is the default offset for write requests. If Connection.Dialect is not "2.0.2", and application-supplied WriteThrough is TRUE, the SMB2_WRITEFLAG_WRITE_THROUGH bit in the Flags field MUST be set.

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	<ul style="list-style-type: none"> • If Connection.Dialect is "3.0.2" or "3.1.1", and the application-supplied UnbufferedWrite is TRUE, the SMB2_WRITEFLAG_WRITE_UNBUFFERED bit in the Flags field MUST be set. <p>If the number of bytes to write exceeds the Connection.MaxWriteSize, the client MUST split the write into separate write operations no larger than the Connection.MaxWriteSize. The client MAY<111> send these separate writes in any order.</p> <p>If the connection is not established in RDMA mode or if the size of the operation is less than or equal to an implementation-specific threshold <112> or if either Open.TreeConnect.Session.SigningRequired or Open.TreeConnect.Session.EncryptData is TRUE, then</p> <p><118> Section 3.2.4.7: Windows-based clients always put the payload at the beginning of the Buffer field and do not insert padding.</p> <p>Changed to:</p> <ul style="list-style-type: none"> • The DataOffset field MUST be set to an implementation-specific<110> value. • If Connection.Dialect is not "2.0.2", and application-supplied WriteThrough is TRUE, the SMB2_WRITEFLAG_WRITE_THROUGH bit in the Flags field MUST be set. • If Connection.Dialect is "3.0.2" or "3.1.1", and the application-supplied UnbufferedWrite is TRUE, the SMB2_WRITEFLAG_WRITE_UNBUFFERED bit in the Flags field MUST be set. <p>If the number of bytes to write exceeds the Connection.MaxWriteSize, the client MUST split the write into separate write operations no larger than the Connection.MaxWriteSize. The client MAY<111> send these separate writes in any order.</p> <p>If the connection is not established in RDMA mode or if the size of the operation is less than or equal to an implementation-specific threshold <112> or if either Open.TreeConnect.Session.SigningRequired or Open.TreeConnect.Session.EncryptData is TRUE, the following fields of the request MUST be initialized as follows:</p> <ul style="list-style-type: none"> • If Connection.Dialect belongs to the SMB 3.x dialect family, • The Channel field MUST be set to SMB2_CHANNEL_NONE. • The WriteChannelInfoOffset field MUST be set to 0. • The WriteChannelInfoLength field MUST be set to 0. • The RemainingBytes field MUST be set to 0. <p><110> Section 3.2.4.7: Windows-based clients set the DataOffset field to 0x70, which indicates that the payload is always placed at the beginning of the Buffer field.</p> <p>In Section 3.3.5.12, Receiving an SMB2 READ Request, the following was changed from:</p> <ul style="list-style-type: none"> • Channel is not equal to SMB2_CHANNEL_RDMA_V1_INVALIDATE, SMB2_CHANNEL_RDMA_V1, or SMB2_CHANNEL_NONE. • Connection.Dialect is "3.0" and Channel is equal to SMB2_CHANNEL_RDMA_V1_INVALIDATE. • Channel is equal to SMB2_CHANNEL_RDMA_V1 or SMB2_CHANNEL_RDMA_V1_INVALIDATE and the underlying Connection is not RDMA. • Channel is equal to SMB2_CHANNEL_RDMA_V1 or SMB2_CHANNEL_RDMA_V1_INVALIDATE and Length or ReadChannelInfoOffset or ReadChannelInfoLength is equal to 0. • If the server implements the SMB 3.x dialect family, if Connection.Dialect belongs to the SMB 3.x dialect family, and if Channel is equal to SMB2_CHANNEL_RDMA_V1

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	<p>or SMB2_CHANNEL_RDMA_V1_INVALIDATE, and if any of the following conditions is TRUE, the server MUST fail the request with STATUS_INVALID_PARAMETER.</p> <ul style="list-style-type: none"> • Underlying Connection is not RDMA. • The Length or ReadChannelInfoOffset or ReadChannelInfoLength is equal to 0. <p>Changed to:</p> <ul style="list-style-type: none"> • Connection.Dialect is "3.0.2" or "3.1.1" and Channel is not equal to SMB2_CHANNEL_RDMA_V1 or SMB2_CHANNEL_NONE. • Connection.Dialect is "3.0" and Channel is not equal to SMB2_CHANNEL_RDMA_V1_INVALIDATE. • Channel is equal to SMB2_CHANNEL_RDMA_V1 or SMB2_CHANNEL_RDMA_V1_INVALIDATE and any of the following conditions is TRUE: <ul style="list-style-type: none"> • The underlying Connection is not RDMA. • Length, ReadChannelInfoOffset, or ReadChannelInfoLength is equal to 0. <p>In Section 3.3.5.13, Receiving an SMB2 WRITE Request, the following was changed from:</p> <ul style="list-style-type: none"> • Channel is not equal to SMB2_CHANNEL_RDMA_V1_INVALIDATE, SMB2_CHANNEL_RDMA_V1, or SMB2_CHANNEL_NONE. • Connection.Dialect is "3.0" and Channel is equal to SMB2_CHANNEL_RDMA_V1_INVALIDATE. • Channel is equal to SMB2_CHANNEL_RDMA_V1 or SMB2_CHANNEL_RDMA_V1_INVALIDATE and the underlying Connection is not RDMA. • Channel is equal to SMB2_CHANNEL_RDMA_V1 or SMB2_CHANNEL_RDMA_V1_INVALIDATE and Length or DataOffset are not equal to 0. • Channel is equal to SMB2_CHANNEL_RDMA_V1 or SMB2_CHANNEL_RDMA_V1_INVALIDATE and RemainingBytes or WriteChannelInfoOffset or WriteChannelInfoLength are equal to 0. <p>If Channel is equal to 0 and DataOffset is greater than 0x100, the server MUST fail the request with STATUS_INVALID_PARAMETER.</p> <p>If Channel is equal to 0 and the number of bytes received in Buffer is less than (DataOffset + Length), the server MUST fail the request with STATUS_INVALID_PARAMETER.</p> <p>If Connection.SupportsMultiCredit is TRUE, the server MUST validate CreditCharge based on Length, as specified in section 3.3.5.2.5. If the validation fails, it MUST fail the write request with STATUS_INVALID_PARAMETER.</p> <p>Changed to:</p> <ul style="list-style-type: none"> • Connection.Dialect is "3.0.2" or "3.1.1" and Channel is not equal to SMB2_CHANNEL_RDMA_V1 or SMB2_CHANNEL_NONE. • Connection.Dialect is "3.0" and Channel is not equal to SMB2_CHANNEL_RDMA_V1_INVALIDATE. • Channel is equal to SMB2_CHANNEL_RDMA_V1 or SMB2_CHANNEL_RDMA_V1_INVALIDATE and any of the following conditions is TRUE: <ul style="list-style-type: none"> • The underlying Connection is not RDMA. • Length or DataOffset are not equal to 0.

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	<ul style="list-style-type: none"> RemainingBytes, WriteChannelInfoOffset, or WriteChannelInfoLength are equal to 0. <p>If Channel is equal to SMB2_CHANNEL_NONE and DataOffset is greater than 0x100, the server MUST fail the request with STATUS_INVALID_PARAMETER.</p> <p>If Channel is equal to SMB2_CHANNEL_NONE and the number of bytes received in Buffer is less than (DataOffset + Length), the server MUST fail the request with STATUS_INVALID_PARAMETER.</p> <p>The following was removed</p> <p>If Channel is not equal to one of the values specified in section 2.2.21, the server SHOULD<305> consider the Channel field value as SMB2_CHANNEL_NONE and MUST continue processing the request.</p> <p>If Connection.Dialect belongs to the SMB 3.x dialect family and Channel is equal to SMB2_CHANNEL_RDMA_V1 and any of the following conditions is TRUE, the server MUST fail the request with STATUS_INVALID_PARAMETER.</p> <ul style="list-style-type: none"> Underlying Connection is not RDMA. RemainingBytes is equal to 0. Length or DataOffset is not equal to 0. WriteChannelInfoOffset or WriteChannelInfoLength is equal to 0. <p><305> Section 3.3.5.13: If the Channel value is not equal to 0x00000000 or 0x00000001, Windows Server 2012 fails the request with STATUS_INVALID_PARAMETER. If the Channel value is not equal to 0x00000000, Windows 8 fails the request with STATUS_INVALID_PARAMETER.</p>
2018/06/18	<p>In Section 3.2.4.6, Application Requests Reading from a File or Named Pipe, the following was changed from:</p> <ul style="list-style-type: none"> The Channel field MUST be set to 0. <p>Changed to:</p> <ul style="list-style-type: none"> The Channel field MUST be set to SMB2_CHANNEL_NONE.
2018/06/18	<p>In Section 2.2.21, SMB2 WRITE Request, the descriptions of WriteChannelInfoOffset and WriteChannelInfoLength were changed from:</p> <p>WriteChannelInfoOffset (2 bytes): For the SMB 2.0.2 and 2.1 dialects, this field MUST NOT be used and MUST be reserved. The client MUST set this field to 0, and the server MUST ignore it on receipt. For the SMB 3.x dialect family, it contains the length, in bytes, of the channel data as specified by the Channel field of the request.</p> <p>WriteChannelInfoLength (2 bytes): For the SMB 2.0.2 and SMB 2.1 dialects, this field MUST NOT be used and MUST be reserved. The client MUST set this field to 0, and the server MUST ignore it on receipt. For the SMB 3.x dialect family, it contains the offset, in bytes, from the beginning of the SMB2 header to the channel data as described by the Channel field of the request.</p> <p>Changed to:</p> <p>WriteChannelInfoOffset (2 bytes): For the SMB 2.0.2 and 2.1 dialects, this field MUST NOT be used and MUST be reserved. The client MUST set this field to 0, and the server MUST ignore it on receipt. For the SMB 3.x dialect family, it contains the</p>

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	<p>offset, in bytes, from the beginning of the SMB2 header to the channel data as specified by the Channel field of the request.</p> <p>WriteChannelInfoLength (2 bytes): For the SMB 2.0.2 and SMB 2.1 dialects, this field MUST NOT be used and MUST be reserved. The client MUST set this field to 0, and the server MUST ignore it on receipt. For the SMB 3.x dialect family, it contains the length, in bytes, of the channel data as specified by the Channel field of the request.</p>
2018/06/18	<p>In Section 2.2.19, SMB2 READ Request, the first sentence for the description of SMB2_CHANNEL_RDMA_V1_INVALIDATE was changed from:</p> <p>This flag is not valid for the SMB 2.0.2, 2.1, and 3.0 dialects.</p> <p>Changed to:</p> <p>This flag is not valid for the SMB 3.0 dialect.</p> <p>In Section 2.2.21, SMB2 WRITE Request, the first sentence for the description of SMB2_CHANNEL_RDMA_V1_INVALIDATE was changed from:</p> <p>This flag is not valid for the SMB 2.0.2, 2.1, and 3.0 dialects.</p> <p>Changed to:</p> <p>This flag is not valid for the SMB 3.0 dialect.</p> <p>In Section 3.2.4.6, Application Requests Reading from a File or Named Pipe, the following bullet point was changed from:</p> <ul style="list-style-type: none"> ● If Connection.Dialect is "3.0", the Channel field of the request MUST be set to SMB2_CHANNEL_RDMA_V1. If Connection.Dialect is "3.0.2" or "3.1.1", the Channel field of the request SHOULD be set to SMB2_CHANNEL_RDMA_V1_INVALIDATE. <p>Changed to:</p> <ul style="list-style-type: none"> ● If Connection.Dialect is "3.0.2" or "3.1.1" and processing of received remote invalidation is supported as specified in [MS-SMBD] section 3.1.5.8, the Channel field of the request SHOULD be set to SMB2_CHANNEL_RDMA_V1_INVALIDATE. Otherwise, the Channel field of the request MUST be set to SMB2_CHANNEL_RDMA_V1. <p>In Section 3.2.4.7, Application Requests Writing to a File or Named Pipe, the following bullet point was changed from:</p> <ul style="list-style-type: none"> ● If Connection.Dialect is "3.0", the Channel field of the request MUST be set to SMB2_CHANNEL_RDMA_V1. If Connection.Dialect is "3.0.2" or "3.1.1", the Channel field of the request SHOULD be set to SMB2_CHANNEL_RDMA_V1_INVALIDATE. <p>Changed to:</p> <ul style="list-style-type: none"> ● If Connection.Dialect is "3.0.2" or "3.1.1" and processing of received remote invalidation is supported as specified in [MS-SMBD] section 3.1.5.8, the Channel field of the request SHOULD be set to SMB2_CHANNEL_RDMA_V1_INVALIDATE.

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	Otherwise, the Channel field of the request MUST be set to SMB2_CHANNEL_RDMA_V1.
2018/06/18	<p>In Section 3.2.5.1.1, Decrypting the Message, a new bullet point was added:</p> <p>For each response in a compounded response, if the SessionId field of SMB2 header is not equal to the SessionId field in the SMB2 TRANSFORM_HEADER, the client SHOULD<139> discard the entire compounded response and stop processing.</p> <p><139> Section 3.2.5.1.1: Windows 8.1 and Windows Server 2012 R2 do not discard the entire compounded response if SMB2_FLAGS_RELATED_OPERATIONS is set in the Flags field of the SMB2 header of the response.</p> <p>In Section 3.2.5.1.9, Handling Compounded Responses, the following was removed:</p> <p>For the first response:</p> <p>If SMB2_FLAGS_RELATED_OPERATIONS is set in the Flags field of the SMB2 header of the response, the client SHOULD<149> discard the message.</p> <p>If the SessionId field of SMB2 header is not equal to the SessionId field in SMB2 TRANSFORM_HEADER of the response, the client MUST discard the message.</p> <p>For each subsequent response:</p> <p>If SMB2_FLAGS_RELATED_OPERATIONS is not set in the Flags field of the SMB2 header of the response, the client SHOULD<150> discard the message.</p> <p>If the SessionId field of SMB2 header is not equal to the SessionId field in the SMB2 TRANSFORM_HEADER of the response, the client MUST discard the message.</p>
2018/06/18	<p>In Section 3.2.4.1.4, Sending Compounded Requests, the third step was changed from:</p> <p>3. The client MUST construct the subsequent request as it would do normally. For any subsequent requests the client MUST set SMB2_FLAGS_RELATED_OPERATIONS in the Flags field of the SMB2 header to indicate that it is using the SessionId, TreeId, and FileId supplied in the previous request (or generated by the server in processing that request). The client SHOULD<89> set SessionId to 0xFFFFFFFFFFFFFFFF and TreeId to 0xFFFFFFFF, and SHOULD<90> set FileId to { 0xFFFFFFFFFFFFFFFF, 0xFFFFFFFFFFFFFFFF }.</p> <p><89> Section 3.2.4.1.4: Windows-based clients set the SessionId and TreeId fields of subsequent requests with the SessionId and TreeId values of the previous request in the compound chain.</p> <p><90> Section 3.2.4.1.4: When the Windows-based client compounds a FileId-bearing operation with an SMB2 CREATE request, the FileId field is set to an indeterminate value, which the server ignores as specified in section 3.3.5.2.7.2.</p> <p>Changed to:</p> <p>3. The client MUST construct the subsequent request as it would do normally. For any subsequent requests the client MUST set SMB2_FLAGS_RELATED_OPERATIONS in the Flags field of the SMB2 header to indicate that it is using the SessionId, TreeId, and FileId supplied in the previous request (or generated by the server in processing that request). For an operation compounded with an SMB2 CREATE request, the FileId field SHOULD be set to { 0xFFFFFFFFFFFFFFFF, 0xFFFFFFFFFFFFFFFF }.</p>
2018/05/07	In Section 2.2.3, SMB2 NEGOTIATE Request, product behavior note <9> was deleted.

Errata Published*	Description
	<p>Changed from:</p> <p>...</p> <p>Dialects (variable): An array of one or more 16-bit integers specifying the supported dialect revision numbers. The array MUST contain at least one of the following values.<9></p> <p><9> Section 2.2.3: A Windows Vista RTM-based client would send a value of zero in the Dialects array in SMB2 NEGOTIATE Request and a Windows Vista RTM-based server would acknowledge with a value of 6 in DialectRevision in SMB2 NEGOTIATE Response. This behavior is deprecated.</p> <p>Changed to:</p> <p>...</p> <p>Dialects (variable): An array of one or more 16-bit integers specifying the supported dialect revision numbers. The array MUST contain at least one of the following values.</p> <p>In Section 2.2.4, SMB2 NEGOTIATE Response, product behavior note <14> was deleted.</p> <p>Changed from:</p> <p>...</p> <p>DialectRevision (2 bytes): The preferred common SMB 2 Protocol dialect number from the Dialects array that is sent in the SMB2 NEGOTIATE Request (section 2.2.3) or the SMB2 wildcard revision number. The server SHOULD set this field to one of the following values.<14></p> <p><14> Section 2.2.4: A Windows Vista RTM-based client would send a value of zero in the Dialects array in SMB2 NEGOTIATE Request and a Windows Vista RTM-based server would acknowledge with a value of 6 in DialectRevision in SMB2 NEGOTIATE Response. This behavior is deprecated.</p> <p>Changed to:</p> <p>...</p> <p>DialectRevision (2 bytes): The preferred common SMB 2 Protocol dialect number from the Dialects array that is sent in the SMB2 NEGOTIATE Request (section 2.2.3) or the SMB2 wildcard revision number. The server SHOULD set this field to one of the following values.</p> <p>In Section 3.2.4.2.2.1, Multi-Protocol Negotiate, changed from:</p> <p>If the client implements the SMB 2.0.2 dialect, it MUST perform the following:</p> <ul style="list-style-type: none"> the client MUST include the dialect string "SMB 2.002"<101> in the list of dialects, along with any other SMB dialects that it implements. The remaining fields in the request MUST be set up as specified in [MS-SMB] section 3.2.4.2. <p>Otherwise it MUST perform the following:</p> <p>The client MUST include the dialect strings "SMB 2.002" and "SMB 2.???" in the list of dialects, along with any SMB dialects that it implements. The remaining fields in the request MUST be set up as specified in [MS-SMB] section 3.2.4.2.</p>

Errata Published*	Description
	<p>Changed to:</p> <p>If the client implements the SMB 2.0.2 dialect, the client MUST also include the dialect string "SMB 2.002" in the SMB_Data.Bytes.Dialects[] array of the request. If the client implements the SMB 2.1 dialect or SMB 3.x dialect family, the client MUST also include the dialect string "SMB 2.???" in the SMB_Data.Bytes.Dialects[] array of the request.</p> <p>This request MUST be sent to the server.</p> <p>In Section 3.3.5.3.2, SMB 2.0.2 Support, product behavior notes <226> and <227> were removed.</p> <p>Changed from:</p> <p>The server MUST scan the dialects provided for the dialect string "SMB 2.002".<226> If the string is present, the client understands SMB2, and the server MUST respond with an SMB2 NEGOTIATE Response. If the string is not present in the dialect list and the server also implements SMB as specified in [MS-SMB], it MUST terminate SMB2 processing on this connection and start SMB processing on this connection. If the string is not present in the dialect list and the server does not implement SMB, the server MUST disconnect the connection, as specified in section 3.3.7.1, without sending a response.</p> <p>The server MUST set the command of the SMB2 header to SMB2 NEGOTIATE. All other values MUST be set following the syntax specified in section 2.2.1, and any value not defined there with a default MUST be set to 0. The header is followed by an SMB2 NEGOTIATE Response that MUST be constructed as specified in section 2.2.4, with the following specific values:</p> <ul style="list-style-type: none"> • SecurityMode MUST have the SMB2_NEGOTIATE_SIGNING_ENABLED bit set. • If RequireMessageSigning is TRUE, the server MUST also set SMB2_NEGOTIATE_SIGNING_REQUIRED in the SecurityMode. • DialectRevision MUST be set to 0x0202.<227> <p>....</p> <p><226> Section 3.3.5.3.2: When a Windows-based client sends the deprecated "SMB 2.001" dialect, a Windows Vista RTM-based server would acknowledge with a value of 6 in DialectRevision in the SMB2 NEGOTIATE Response. This behavior is deprecated.</p> <p><227> Section 3.3.5.3.2: A Windows Vista RTM-based server sets DialectRevision to 6.</p> <p>Changed to:</p> <p>The server MUST scan the dialects provided for the dialect string "SMB 2.002". If the string is present, the client understands SMB2, and the server MUST respond with an SMB2 NEGOTIATE Response. If the string is not present in the dialect list and the server also implements SMB as specified in [MS-SMB], it MUST terminate SMB2 processing on this connection and start SMB processing on this connection. If the string is not present in the dialect list and the server does not implement SMB, the server MUST disconnect the connection, as specified in section 3.3.7.1, without sending a response.</p> <p>The server MUST set the command of the SMB2 header to SMB2 NEGOTIATE. All other values MUST be set following the syntax specified in section 2.2.1, and any value not defined there with a default MUST be set to 0. The header is followed by an SMB2 NEGOTIATE Response that MUST be constructed as specified in section 2.2.4, with the following specific values:</p>

Errata Published*	Description
	<ul style="list-style-type: none"> • SecurityMode MUST have the SMB2_NEGOTIATE_SIGNING_ENABLED bit set. • If RequireMessageSigning is TRUE, the server MUST also set SMB2_NEGOTIATE_SIGNING_REQUIRED in the SecurityMode. • DialectRevision MUST be set to 0x0202. <p>....</p>
2018/05/07	<p>In Section 6, Appendix A: Product Behavior, product behavior note <96> has been removed.</p> <p>Deleted:</p> <p><96> Section 3.2.4.2: Windows will establish a new connection for every SMB2 session being created.</p> <p>In Section 6, Appendix A: Product Behavior, product behavior notes <95> and <97> have been changed from:</p> <p><95> Section 3.2.4.2: Windows will reuse an existing session if the access is by the same logged-on user and the target server name matches exactly. This means that Windows will establish a new session with the same credentials if the same user is logged on to the client multiple times, or if the user is accessing the server through two different names that resolve to the same server. (NetBIOS and fully qualified domain name, for example.)</p> <p><97> Section 3.2.4.2: Windows establishes a new connection for each new session.</p> <p>Changed to:</p> <p><95> Section 3.2.4.2: Windows will reuse an existing session only if the access is by the same logged-on user and the Connection.ServerName matches the application-supplied ServerName.</p> <p><97> Section 3.2.4.2: Windows will reuse the connection to establish a new session, if a connection is available and Connection.ServerName matches the application-supplied ServerName</p>
2018/05/07	<p>In Section 2.2.1.1, SMB2 Packet Header – ASYNC, changed from:</p> <p>NextCommand (4 bytes): For a compounded request, this field MUST be set to the offset, in bytes, from the beginning of this SMB2 header to the start of the subsequent 8-byte aligned SMB2 header. If this is not a compounded request, or this is the last header in a compounded request, this value MUST be 0.</p> <p>Changed to:</p> <p>NextCommand (4 bytes): For a compounded request or response, this field MUST be set to the offset, in bytes, from the beginning of this SMB2 header to the start of the subsequent 8-byte aligned SMB2 header. If this is not a compounded request or response, or this is the last header in a compounded request or response, this value MUST be 0.</p>

Errata Published*	Description						
2018/05/07	<p>In Section 3.3.5.9.10, Handling the SMB2_CREATE_DURABLE_HANDLE_REQUEST_V2 Create Context, the following has been changed from:</p> <p>The server MUST skip the construction of the SMB2_CREATE_DURABLE_HANDLE_RESPONSE_V2 create context if the SMB2_DHANDLE_FLAG_PERSISTENT bit is not set in the Flags field of the request and if neither of the following conditions is met: Open.OplockLevel is equal to SMB2_OPLOCK_LEVEL_BATCH. Open.Lease.LeaseState has the SMB2_LEASE_HANDLE_CACHING bit set.</p> <p>Changed to:</p> <p>The server MUST skip the construction of the SMB2_CREATE_DURABLE_HANDLE_RESPONSE_V2 create context if the SMB2_DHANDLE_FLAG_PERSISTENT bit is not set in the Flags field of the request and if any of the following conditions is satisfied: Open.FileAttributes includes FILE_ATTRIBUTE_DIRECTORY. Open.OplockLevel is not equal to SMB2_OPLOCK_LEVEL_BATCH and Open.Lease.LeaseState does not contain SMB2_LEASE_HANDLE_CACHING.</p> <p>In Section 3.3.5.9.11, Handling the SMB2_CREATE_REQUEST_LEASE_V2 Create Context, the following was changed from:</p> <p>If the FileAttributes field in the request indicates that this operation is on a directory and LeaseState includes SMB2_LEASE_WRITE_CACHING, the server MUST clear the bit SMB2_LEASE_WRITE_CACHING in the LeaseState field.</p> <p>Changed to:</p> <p>If the FileAttributes field in the request includes FILE_ATTRIBUTE_DIRECTORY and LeaseState includes SMB2_LEASE_WRITE_CACHING, the server MUST clear the bit SMB2_LEASE_WRITE_CACHING in the LeaseState field.</p>						
2018/05/07	<p>In Section 3.2.4.3.8, Requesting a Lease on a File or a Directory, the third bullet point of the first list has been changed from:</p> <p>If Connection.Dialect is equal to "2.1" and the open is on a directory.</p> <p>Changed to:</p> <p>If Connection.Dialect is equal to "2.1" and the application provided create options includes FILE_DIRECTORY_FILE.</p>						
2018/05/07	<p>In Section 2.2.13, SMB2 CREATE Request, the descriptions of FILE_WRITE_THROUGH and FILE_NO_INTERMEDIATE_BUFFERING have been changed from:</p> <table border="1" data-bbox="516 1623 1414 1810"> <thead> <tr> <th data-bbox="516 1623 971 1675">Value</th> <th data-bbox="971 1623 1414 1675">Meaning</th> </tr> </thead> <tbody> <tr> <td data-bbox="516 1675 971 1728">...</td> <td data-bbox="971 1675 1414 1728">...</td> </tr> <tr> <td data-bbox="516 1728 971 1810">FILE_WRITE_THROUGH 0x00000002</td> <td data-bbox="971 1728 1414 1810">The server MUST propagate writes to this open to persistent storage before</td> </tr> </tbody> </table>	Value	Meaning	FILE_WRITE_THROUGH 0x00000002	The server MUST propagate writes to this open to persistent storage before
Value	Meaning						
...	...						
FILE_WRITE_THROUGH 0x00000002	The server MUST propagate writes to this open to persistent storage before						

Errata Published*	Description													
		returning success to the client on write operations.												
												
	FILE_NO_INTERMEDIATE_BUFFERING 0x00000008	The server or underlying object store SHOULD NOT cache data at intermediate layers and SHOULD allow it to flow through to persistent storage.												
												
	Changed to:													
	<table border="1"> <thead> <tr> <th data-bbox="513 562 971 682">Value</th> <th data-bbox="971 562 1417 682">Meaning</th> </tr> </thead> <tbody> <tr> <td data-bbox="513 682 971 737">...</td> <td data-bbox="971 682 1417 737">...</td> </tr> <tr> <td data-bbox="513 737 971 863">FILE_WRITE_THROUGH 0x00000002</td> <td data-bbox="971 737 1417 863">The server performs file write-through; file data is written to the underlying storage before completing the write operation on this open.</td> </tr> <tr> <td data-bbox="513 863 971 917">...</td> <td data-bbox="971 863 1417 917">...</td> </tr> <tr> <td data-bbox="513 917 971 1043">FILE_NO_INTERMEDIATE_BUFFERING 0x00000008</td> <td data-bbox="971 917 1417 1043">File buffering is not performed on this open; file data is retained in memory before writing or after reading it from the underlying storage.</td> </tr> <tr> <td data-bbox="513 1043 971 1094">...</td> <td data-bbox="971 1043 1417 1094">...</td> </tr> </tbody> </table>		Value	Meaning	FILE_WRITE_THROUGH 0x00000002	The server performs file write-through; file data is written to the underlying storage before completing the write operation on this open.	FILE_NO_INTERMEDIATE_BUFFERING 0x00000008	File buffering is not performed on this open; file data is retained in memory before writing or after reading it from the underlying storage.
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...	...													
	<p data-bbox="496 1167 1185 1220">In Section 2.2.19, SMB2 READ Request, the description of SMB2_READFLAG_READ_UNBUFFERED has been changed from:</p> <p data-bbox="496 1262 1299 1314">The server or underlying object store SHOULD NOT cache the read data at intermediate layers.</p> <p data-bbox="496 1356 631 1381">Changed to:</p> <p data-bbox="496 1423 1073 1449">The data is read directly from the underlying storage.</p> <p data-bbox="496 1491 1250 1543">In Section 2.2.21, SMB2 WRITE Request, FILE_WRITE_THROUGH and FILE_NO_INTERMEDIATE_BUFFERING have been changed from:</p> <p data-bbox="496 1585 1408 1638">The write data is written to persistent storage before the response is sent regardless of how the file was opened. This value is not valid for the SMB 2.0.2 dialect.</p> <p data-bbox="496 1680 1396 1753">The server or underlying object store SHOULD NOT cache the write data at intermediate layers and SHOULD allow it to flow through to persistent storage. This bit is not valid for the SMB 2.0.2, 2.1, and 3.0 dialects.</p>													

Errata Published*	Description
	<p>Changed to:</p> <p>The server performs File write-through on the write operation. This value is not valid for the SMB 2.0.2 dialect.</p> <p>File buffering is not performed. This bit is not valid for the SMB 2.0.2, 2.1, and 3.0 dialects.</p> <p>In Section 3.3.5.11, Receiving an SMB2 FLUSH Request, "persistent storage" was changed to "underlying storage".</p> <p>In Section 3.3.5.13, Receiving an SMB2 WRITE Request, "persistent storage" was changed to "underlying storage".</p>
2018/04/09	<p>In Section 3.3.1.10, Per Open, changed from:</p> <ul style="list-style-type: none"> ● Open.IsDurable: A Boolean that indicates whether the underlying object store supports durable operation for this Open. <p>Changed to:</p> <ul style="list-style-type: none"> ● Open.IsDurable: A Boolean that indicates whether the Open is preserved for reconnect. <p>In Section 3.3.5.9.6, Handling the SMB2_CREATE_DURABLE_HANDLE_REQUEST Create Context, changed from:</p> <p>In the "Successful Open Initialization" phase, if the underlying object store does not grant durability, the server MUST ignore the SMB2_CREATE_DURABLE_HANDLE_REQUEST create context and skip the rest of the processing in this phase. Otherwise, the server MUST set Open.IsDurable to TRUE. This permits the client to use Open.DurableFileId to request a reopen of the file on a subsequent request as specified in section 3.3.5.9.7. The server MUST also set Open.DurableOwner to a security descriptor accessible only by the user represented by Open.Session.SecurityContext.</p> <p>Changed to:</p> <p>In the "Successful Open Initialization" phase, if the underlying object store does not grant durability, the server MUST skip the rest of the processing in this phase. Otherwise, the server MUST set Open.IsDurable to TRUE and Open.DurableOwner to a security descriptor accessible only by the user represented by Open.Session.SecurityContext.</p> <p>In Section 3.3.5.9.10, Handling the SMB2_CREATE_DURABLE_HANDLE_REQUEST_V2 Create Context, changed from:</p> <ul style="list-style-type: none"> ● In the "Successful Open Initialization" phase , the server MUST set Open.IsDurable to TRUE. The server MUST also set Open.DurableOwner to a security descriptor accessible only by the user represented by Open.Session.SecurityContext. If the SMB2_DHANDLE_FLAG_PERSISTENT bit is set in the Flags field of the request, TreeConnect.Share.IsCA is TRUE, and Connection.ServerCapabilities includes SMB2_GLOBAL_CAP_PERSISTENT_HANDLES, the server MUST set Open.IsPersistent to TRUE.

Errata Published*	Description
	<p>Changed to:</p> <ul style="list-style-type: none"> In the "Successful Open Initialization" phase, if the underlying object store does not grant durability, the server MUST skip the rest of the processing in this section. Otherwise , the server MUST set Open.IsDurable to TRUE. The server MUST also set Open.DurableOwner to a security descriptor accessible only by the user represented by Open.Session.SecurityContext. If the SMB2_DHANDLE_FLAG_PERSISTENT bit is set in the Flags field of the request, TreeConnect.Share.IsCA is TRUE, and Connection.ServerCapabilities includes SMB2_GLOBAL_CAP_PERSISTENT_HANDLES, the server MUST set Open.IsPersistent to TRUE.

*Date format: YYYY/MM/DD

[MS-SMBD]: SMB2 Remote Direct Memory Access (RDMA) Transport Protocol

This topic lists the Errata found in [MS-SMBD] 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.



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[MS-SPNG]: Simple and Protected GSS-API Negotiation Mechanism (SPNEGO) Extension

This topic lists the Errata found in [MS-SPNG] 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.



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[MS-SQOS]: Storage Quality of Service Protocol

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[MS-SSTP]: Secure Socket Tunneling Protocol (SSTP)

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[MS-SSTR]: Smooth Streaming Protocol

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[MS-SWN]: Service Witness Protocol

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[MS-TCC]: Tethering Control Channel Protocol

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[MS-TDS]: Tabular Data Stream Protocol

This topic lists the Errata found in [MS-TDS] 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.



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Errata below are for Protocol Document Version [V24.0 - 2018/03/16](#).

Errata Published*	Description								
2018/07/02	<p>In Section 2.2.6.4, LOGIN7, in the first table, one product behavior note was revised and a new product behavior note was added to specify the value returned by SQL Server for ROWCOUNT.</p> <p>Changed from:</p> <table border="1"> <thead> <tr> <th>Parameter</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>...</td> <td>...</td> </tr> <tr> <td>OptionFlags2</td> <td> <p>...</p> <ul style="list-style-type: none"> fODBC: Set if the client is the ODBC driver. This causes the server to set ANSI_DEFAULTS to ON, CURSOR_CLOSE_ON_COMMIT and IMPLICIT_TRANSACTIONS to OFF, TEXTSIZE to 0x7FFFFFFF (2GB) (TDS 7.2 and earlier), TEXTSIZE to infinite (introduced in TDS 7.3), and ROWCOUNT to infinite.<20> <p>...</p> </td> </tr> <tr> <td>TypeFlags</td> <td> <p>...</p> <ul style="list-style-type: none"> fOLEDB: Set if the client is the OLEDB driver. This causes the server to set ANSI_DEFAULTS to ON, CURSOR_CLOSE_ON_COMMIT and IMPLICIT_TRANSACTIONS to OFF, TEXTSIZE to 0x7FFFFFFF (2GB) (TDS 7.2 and earlier), TEXTSIZE to infinite (introduced in TDS 7.3), and ROWCOUNT to infinite. </td> </tr> </tbody> </table>	Parameter	Description	OptionFlags2	<p>...</p> <ul style="list-style-type: none"> fODBC: Set if the client is the ODBC driver. This causes the server to set ANSI_DEFAULTS to ON, CURSOR_CLOSE_ON_COMMIT and IMPLICIT_TRANSACTIONS to OFF, TEXTSIZE to 0x7FFFFFFF (2GB) (TDS 7.2 and earlier), TEXTSIZE to infinite (introduced in TDS 7.3), and ROWCOUNT to infinite.<20> <p>...</p>	TypeFlags	<p>...</p> <ul style="list-style-type: none"> fOLEDB: Set if the client is the OLEDB driver. This causes the server to set ANSI_DEFAULTS to ON, CURSOR_CLOSE_ON_COMMIT and IMPLICIT_TRANSACTIONS to OFF, TEXTSIZE to 0x7FFFFFFF (2GB) (TDS 7.2 and earlier), TEXTSIZE to infinite (introduced in TDS 7.3), and ROWCOUNT to infinite.
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2018/06/18	<p data-bbox="500 1566 1357 1671">In Section 1.2.2, Informative References, the following reference was added: [MSDOCS-DBMirror] Microsoft Corporation, "Database Mirroring in SQL Server", https://docs.microsoft.com/en-us/dotnet/framework/data/adonet/sql/database-mirroring-in-sql-server</p>														
2018/06/18	<p data-bbox="500 1703 1292 1755">In Section 2.2.6.4, LOGIN7, in the second table, the last paragraph of the description of the COLUMNENCRYPTION FeatureExt was changed.</p> <p data-bbox="500 1766 659 1787">Changed from:</p>														

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2018/06/18	In Section 2.2.6.6, RPC Request, the definition for EnclavePackage was added to the stream-specific rules, and the description of EnclavePackage in the table was clarified.									

Errata Published*	Description								
	<p>Changed from:</p> <pre> . . . ParameterData = ParamMetaData ParamLenData [ParamCipherInfo] BatchFlag = %x80 / %xFF ; (Changed to %xFF in TDS 7.2) NoExecFlag = %xFE ; (introduced in TDS 7.2) RPCReqBatch = NameLenProcID OptionFlags *EnclavePackage *ParameterData . . . </pre> <table border="1" data-bbox="516 730 1416 1098"> <thead> <tr> <th>Parameter</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>...</td> <td>...</td> </tr> <tr> <td>EnclavePackage</td> <td>An encrypted byte package that MAY<31> be generated by the client. This package contains information that is required by the server-side enclave to perform computations on encrypted columns. Introduced in TDS 7.4.</td> </tr> <tr> <td>...</td> <td>...</td> </tr> </tbody> </table> <p>Changed to:</p> <pre> . . . ParameterData = ParamMetaData ParamLenData [ParamCipherInfo] EnclavePackage = L_VARBYTE ; (introduced in TDS 7.4) BatchFlag = %x80 / %xFF ; (changed to %xFF in TDS 7.2) NoExecFlag = %xFE ; (introduced in TDS 7.2) RPCReqBatch = NameLenProcID OptionFlags *EnclavePackage *ParameterData . . . </pre>	Parameter	Description	EnclavePackage	An encrypted byte package that MAY<31> be generated by the client. This package contains information that is required by the server-side enclave to perform computations on encrypted columns. Introduced in TDS 7.4.
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2018/06/18	<p data-bbox="500 814 1416 867">In Section 2.2.7.10, FEATUREEXTACK, in the second table, the last paragraph of the description of the COLUMNENCRYPTION FeatureExt was changed.</p> <p data-bbox="500 909 662 930">Changed from:</p> <table border="1" data-bbox="516 940 1416 1360"> <thead> <tr> <th data-bbox="516 940 967 993">FeatureId</th> <th data-bbox="967 940 1416 993">FeatureData Description</th> </tr> </thead> <tbody> <tr> <td data-bbox="516 993 967 1045">...</td> <td data-bbox="967 993 1416 1045">...</td> </tr> <tr> <td data-bbox="516 1045 967 1308">%0x04 (COLUMNENCRYPTION) (introduced in TDS 7.4)</td> <td data-bbox="967 1045 1416 1308"> ... EnclaveType: This field MAY<47> be populated by the server and used by the client to identify the type of enclave that the server is configured to use. If EnclaveType is not returned and the column encryption version is returned as 2, the driver MUST raise an error. </td> </tr> <tr> <td data-bbox="516 1308 967 1360">...</td> <td data-bbox="967 1308 1416 1360">...</td> </tr> </tbody> </table> <p data-bbox="500 1402 638 1423">Changed to:</p> <table border="1" data-bbox="516 1434 1416 1818"> <thead> <tr> <th data-bbox="516 1434 967 1486">FeatureId</th> <th data-bbox="967 1434 1416 1486">FeatureData Description</th> </tr> </thead> <tbody> <tr> <td data-bbox="516 1486 967 1539">...</td> <td data-bbox="967 1486 1416 1539">...</td> </tr> <tr> <td data-bbox="516 1539 967 1818">%0x04 (COLUMNENCRYPTION) (introduced in TDS 7.4)</td> <td data-bbox="967 1539 1416 1818"> ... EnclaveType: This field is a string that MAY<47> be populated by the server and used by the client to identify the type of enclave that the server is configured to use. During login for the initial connection, the client can request COLUMNENCRYPTION with the Length as 1, and either 1 or 2 as the value of </td> </tr> </tbody> </table>	FeatureId	FeatureData Description	%0x04 (COLUMNENCRYPTION) (introduced in TDS 7.4)	... EnclaveType: This field MAY<47> be populated by the server and used by the client to identify the type of enclave that the server is configured to use. If EnclaveType is not returned and the column encryption version is returned as 2, the driver MUST raise an error.	FeatureId	FeatureData Description	%0x04 (COLUMNENCRYPTION) (introduced in TDS 7.4)	... EnclaveType: This field is a string that MAY<47> be populated by the server and used by the client to identify the type of enclave that the server is configured to use. During login for the initial connection, the client can request COLUMNENCRYPTION with the Length as 1, and either 1 or 2 as the value of
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*Date format: YYYY/MM/DD

[MS-TLSP]: Transport Layer Security (TLS) Profile

This topic lists the Errata found in [MS-TLSP] 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.



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[MS-TPMVSC]: Trusted Platform Module (TPM) Virtual Smart Card Management Protocol

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[MS-TSCH]: Task Scheduler Service Remoting Protocol

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[MS-TSGU]: Terminal Services Gateway Server Protocol

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Errata below are for Protocol Document Version [V39.0 - 2017/12/01](#).

Errata Published *	Description
2018/01/16	<p>In Section 2.2.11.8 AUTHN_COOKIE_DATA Structure, a packet diagram has been added and field descriptions have been updated.</p> <p>Changed from: The AUTHN_COOKIE_DATA structure is used to authenticate a UDP connection.</p> <pre>typedef struct { WCHAR* szUserName; WCHAR* szPrimaryUDPAuthScheme; FILETIME ftExpiryTime; WCHAR* szServerIP; WCHAR* szServerName; } AUTHN_COOKIE_DATA;</pre> <p>szUserName: Name of the user for which the side channel is required to be created. szPrimaryUDPAuthScheme: The primary authentication method to be used for authenticating a side channel. By default, all the side channels are authenticated with the UDPCookieAuthentication method. The RDG client and RDG server can also implement other strong authentication methods. For a side channel to be established, an RDG client SHOULD pass both the UDPCookieAuthentication method and the method mentioned in szPrimaryUDPAuthScheme. ftExpiryTime: The time at which the cookie expires. szServerIP: The IP address of the target server. szServerName: The name of the target server.</p> <p>Changed to: The AUTHN_COOKIE_DATA structure is used to authenticate a UDP connection.</p>

Errata Published *	Description																																																																																																																																																																																																																																															
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; text-align: center;">0</td><td style="width: 10%; text-align: center;">1</td><td style="width: 10%; text-align: center;">2</td><td style="width: 10%; text-align: center;">3</td><td style="width: 10%; text-align: center;">4</td><td style="width: 10%; text-align: center;">5</td><td style="width: 10%; text-align: center;">6</td><td style="width: 10%; text-align: center;">7</td><td style="width: 10%; text-align: center;">8</td><td style="width: 10%; text-align: center;">9</td> <td style="width: 10%; text-align: center;">1</td><td style="width: 10%; text-align: center;">0</td><td style="width: 10%; text-align: center;">1</td><td style="width: 10%; text-align: center;">2</td><td style="width: 10%; text-align: center;">3</td><td style="width: 10%; text-align: center;">4</td><td style="width: 10%; text-align: center;">5</td><td style="width: 10%; text-align: center;">6</td><td style="width: 10%; text-align: center;">7</td><td style="width: 10%; text-align: center;">8</td><td style="width: 10%; text-align: center;">9</td> <td style="width: 10%; text-align: center;">2</td><td style="width: 10%; text-align: center;">0</td><td style="width: 10%; text-align: center;">1</td><td style="width: 10%; text-align: center;">2</td><td style="width: 10%; text-align: center;">3</td><td style="width: 10%; text-align: center;">4</td><td style="width: 10%; text-align: center;">5</td><td style="width: 10%; text-align: center;">6</td><td style="width: 10%; text-align: center;">7</td><td style="width: 10%; text-align: center;">8</td><td style="width: 10%; text-align: center;">9</td> <td style="width: 10%; text-align: center;">3</td><td style="width: 10%; text-align: center;">0</td><td style="width: 10%; text-align: center;">1</td> </tr> <tr> <td colspan="34" style="text-align: center;">szUserName (1042 bytes)</td> </tr> <tr> <td colspan="34" style="text-align: center;">szPrimaryUDPAuthScheme (42 bytes)</td> </tr> <tr> <td colspan="34" style="text-align: center;">ftExpiryTime (8 bytes)</td> </tr> <tr> <td colspan="34" style="text-align: center;">szServerIP (114 bytes)</td> </tr> <tr> <td colspan="34" style="text-align: center;">szServerName (520 bytes)</td> </tr> <tr> <td colspan="34" style="text-align: center;">uTSPortNumber (4 bytes)</td> </tr> </table> <p>szUserName (1042 bytes): Name of the user for which the side channel is required to be created in Unicode characters.</p> <p>szPrimaryUDPAuthScheme (42 bytes): The name of the primary authentication method to be used for authenticating a side channel in Unicode characters. By default, all the side channels are authenticated with the UDPCookieAuthentication method. The RDG client and RDG server can also implement other strong authentication methods. For a side channel to be established, an RDG client SHOULD pass both the UDPCookieAuthentication method and the method mentioned in szPrimaryUDPAuthScheme.</p> <p>ftExpiryTime (8 bytes): The time (FILETIME) at which the cookie expires. For information on the FILETIME structure, see [MS-DTYP] section 2.3.3.</p> <p>szServerIP (114 bytes): The IP address of the target server in Unicode characters.</p> <p>szServerName (520 bytes): The name of the target server in Unicode characters.</p> <p>uTSPortNumber (4 bytes): The port number where RDG is listening for incoming UDP connections.</p> <p>In Section 2.2.11.10 CONNECT_PKT_FRAGMENT Structure, a packet diagram has been added.</p> <p>Changed from:</p> <p>The RDG client MUST use the PKT_TYPE_CONNECT_REQ_FRAGMENT packet type to send connection requests to the RDP server. It MUST do so by splitting a CONNECT_PKT request into one or more fragments of type CONNECT_PKT_FRAGMENT.<22></p> <p>Multi-byte values in this structure are transmitted in little-endian byte order.</p> <pre> typedef struct _CONNECT_PKT_FRAGMENT { UDP_PACKET_HEADER hdr; USHORT usFragmentID; USHORT usNoOfFragments; USHORT cbFragmentLength; BYTE fragment[0]; } CONNECT_PKT_FRAGMENT, *PCONNECT_PKT_FRAGMENT; </pre> <p>hdr (4 bytes): A UDP_PACKET_HEADER structure (section 2.2.11.7).</p> <p>usFragmentID (2 bytes): Identifies the fragment number. The first fragment starts with 0.</p> <p>usNoOfFragments (2 bytes): Total number of fragments.</p> <p>cbFragmentLength (2 bytes): Length of this fragment.</p>	0	1	2	3	4	5	6	7	8	9	1	0	1	2	3	4	5	6	7	8	9	2	0	1	2	3	4	5	6	7	8	9	3	0	1	szUserName (1042 bytes)																																		szPrimaryUDPAuthScheme (42 bytes)																																		ftExpiryTime (8 bytes)																																		szServerIP (114 bytes)																																		szServerName (520 bytes)																																		uTSPortNumber (4 bytes)																																	
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	<p>fragment (variable): An array of bytes representing a portion of the CONNECT_PKT request.</p> <p>Changed to:</p> <p>The RDG client MUST use the PKT_TYPE_CONNECT_REQ_FRAGMENT packet type to send connection requests to the RDP server. It MUST do so by splitting a CONNECT_PKT request into one or more fragments of type CONNECT_PKT_FRAGMENT.<22></p> <table border="1" data-bbox="391 447 1411 751"> <tr> <td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>0</td><td>1</td> </tr> <tr> <td colspan="32">UDP_PACKET_HEADER (4 bytes)</td> </tr> <tr> <td colspan="16">usFragmentID (2 bytes)</td> <td colspan="16">usNoOfFragments (2 bytes)</td> </tr> <tr> <td colspan="16">cbFragmentLength (2 bytes)</td> <td colspan="16">Fragment(variable)</td> </tr> <tr> <td colspan="32">...</td> </tr> </table> <p>Multi-byte values in this structure are transmitted in little-endian byte order.</p> <pre> typedef struct _CONNECT_PKT_FRAGMENT { UDP_PACKET_HEADER hdr; USHORT usFragmentID; USHORT usNoOfFragments; USHORT cbFragmentLength; BYTE fragment[0]; } CONNECT_PKT_FRAGMENT, *PCONNECT_PKT_FRAGMENT; </pre> <p>hdr (4 bytes): A UDP_PACKET_HEADER structure (section 2.2.11.7).</p> <p>usFragmentID (2 bytes): Identifies the fragment number. The first fragment starts with 0.</p> <p>usNoOfFragments (2 bytes): Total number of fragments.</p> <p>cbFragmentLength (2 bytes): Length of this fragment.</p> <p>fragment (variable): An array of bytes representing a portion of the CONNECT_PKT request.</p>	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	UDP_PACKET_HEADER (4 bytes)																																usFragmentID (2 bytes)																usNoOfFragments (2 bytes)																cbFragmentLength (2 bytes)																Fragment(variable)																...																															
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[MS-TSTS]: Terminal Services Terminal Server Runtime Interface Protocol

This topic lists the Errata found in [MS-TSTS] 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.



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[MS-TSWP]: Terminal Services Workspace Provisioning Protocol

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Errata below are for Protocol Document Version [V12.0 - 2017/09/15](#).

Errata Published*	Description
2018/05/07	<p>In two sections, examples showing absolute and relative URLs and URLs with parameters have been added to the FileURL element.</p> <p>In Section 4.1.1, Message with One Hosting Terminal Server, a hash was added to all instances of the FileURL element. The following snippet appears three times in this section; each instance was revised as follows.</p> <p>Changed from:</p> <pre>... <Icons> <IconRaw FileType="Ico" FileURL="/RDWeb/Pages/rdp/calc- TestAppCollection-CmsRdsh.ico" /> <Icon32 Dimensions="32x32" FileType="Png" FileURL="/RDWeb/Pages/rdp/calc-TestAppCollection-CmsRdsh_32x32.png" /> </Icons> ...</pre> <p>Changed to:</p> <pre>... <Icons> <IconRaw FileType="Ico" FileURL="/RDWeb/Pages/rdp/calc- TestAppCollection- CmsRdsh.ico?hash=fak41zW0J5Ij8XvPxwtB8F1LpTHwset9rZB4ttg7tsU%3D" /> <Icon32 Dimensions="32x32" FileType="Png" FileURL="/RDWeb/Pages/rdp/calc-TestAppCollection- CmsRdsh_32x32.png?hash=f4eV7HuTXB6H6HRaG59oCI%2BfjXeOjSixtUlnMHPvbVA%3D" /> </Icons> ...</pre> <p>In Section 4.2.2, Message with Subfolders and Display Folder, the FileURL element was revised to provide a URL. The following snippet appears twice in this section; both instances were revised as follows.</p> <p>Changed from:</p>

Errata Published*	Description
	<pre> ... <Icons> <IconRaw FileType="Ico" FileURL="/RDWeb/Pages/rdp/wordpad-Remote-CmsRdsh.ico" /> <Icon32 Dimensions="32x32" FileType="Png" FileURL="/RDWeb/Pages/rdp/wordpad-Remote-CmsRdsh_32x32.png" /> </Icons> ... </pre> <p>Changed to:</p> <pre> ... <Icons> <IconRaw FileType="Ico" FileURL="https://contoso.com/RDWeb/img/rawicon/wordpad-Remote- CmsRdsh.ico" /> <Icon32 Dimensions="32x32" FileType="Png" FileURL="https://contoso.com/RDWeb/img/png/wordpad-Remote- CmsRdsh_32x32.png" /> </Icons> ... </pre>

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[MS-UAMG]: Update Agent Management Protocol

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[MS-UCODEREF]: Windows Protocols Unicode Reference

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[MS-VAPR]: Virtual Application Publication and Reporting (App-V) Protocol

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[MS-VHDX]: Virtual Hard Disk v2 (VHDX) File Format

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[MS-W32T]: W32Time Remote Protocol

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[MS-WCCE]: Windows Client Certificate Enrollment Protocol

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[MS-WCFESAN]: WCF-Based Encrypted Server Administration and Notification Protocol

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[MS-WDSMT]: Windows Deployment Services Multicast Transport Protocol

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[MS-WDSOSD]: Windows Deployment Services Operation System Deployment Protocol

This topic lists the Errata found in the MS-FAX document 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.



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Errata below are for Protocol Document Version [V7.0 – 2018/03/16](#).

Errata Published*	Description
2018/06/04	<p>In Section 2.2.2.14, WDS_LOG_TYPE_CLIENT_APPLY_STARTED_2, updated the message to be used by the WDS server on failure from WDS_LOG_TYPE_CLIENT_APPLY_START to WDS_LOG_TYPE_CLIENT_APPLY_STARTED.</p> <p>Changed from:</p> <p>The WDS server MAY NOT support this status message. The client MUST first try to log this status message, and on failure MUST fall back to using WDS_LOG_TYPE_CLIENT_APPLY_START (section 2.2.2.5).</p> <p>Changed to:</p> <p>The WDS server MAY NOT support this status message. The client MUST first try to log this status message, and on failure MUST fall back to using WDS_LOG_TYPE_CLIENT_APPLY_STARTED (section 2.2.2.5).</p>

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[MS-WFDAA]: Wi-Fi Direct (WFD) Application to Application Protocol

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[MS-WFDPE]: Wi-Fi Display Protocol Extension

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[MS-WKST]: Workstation Service Remote Protocol

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[MS-WPO]: Windows Protocols Overview

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[MS-WMF]: Windows Metafile Format

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[MS-WSDS]: WS-Enumeration Directory Services Protocol Extensions

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[MS-WSMV]: Web Services Management Protocol Extensions for Windows Vista

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Errata below are for Protocol Document Version [V31.0 - 2017/12/01](#).

Errata Published*	Description
2018/06/04	<p>In Section 3.1.4.11, Command, a behavior note was updated to clarify which product versions support the use of the WINRS_CONSOLEMODE_STDIN or WINRS_SKIP_CMD_SHELL options with the Command message.</p> <p>Changed from:</p> <p><117> Section 3.1.4.11: Windows uses option WINRS_CONSOLEMODE_STDIN or WINRS_SKIP_CMD_SHELL with the Command message.</p> <p>Changed to:</p> <p><117> Section 3.1.4.11: Windows Server 2003 R2, Windows Vista SP1, Windows Server 2008, Windows 7, Windows Server 2008 R2, and Windows Server 2012 use option WINRS_CONSOLEMODE_STDIN or WINRS_SKIP_CMD_SHELL with the Command message. Windows Server 2012 R2 and later will ignore these options.</p>

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[MS-WSP]: Windows Search Protocol

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[MS-WSTEP]: WS-Trust X.509v3 Token Enrollment Extensions

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[MS-WSUSAR]: Windows Server Update Services: Administrative API Remoting Protocol

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[MS-WSUSOD]: Windows Server Update Services Protocols Overview

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[MS-WSUSSS]: Windows Update Services: Server-Server Protocol

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[MS-WUSP]: Windows Update Services: Client-Server Protocol

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[MS-XCEP]: X.509 Certificate Enrollment Policy Protocol

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