

[MS-CSOM]: SharePoint Client Query Protocol Specification

Intellectual Property Rights Notice for Open Specifications Documentation

- **Technical Documentation.** Microsoft publishes Open Specifications documentation for protocols, file formats, languages, standards as well as overviews of the interaction among each of these technologies.
- **Copyrights.** This documentation is covered by Microsoft copyrights. Regardless of any other terms that are contained in the terms of use for the Microsoft website that hosts this documentation, you may make copies of it in order to develop implementations of the technologies described in the Open Specifications and may distribute portions of it in your implementations using these technologies or your documentation as necessary to properly document the implementation. You may also distribute in your implementation, with or without modification, any schema, IDL's, or code samples that are included in the documentation. This permission also applies to any documents that are referenced in the Open Specifications.
- **No Trade Secrets.** Microsoft does not claim any trade secret rights in this documentation.
- **Patents.** Microsoft has patents that may cover your implementations of the technologies described in the Open Specifications. Neither this notice nor Microsoft's delivery of the documentation grants any licenses under those or any other Microsoft patents. However, a given Open Specification may be covered by Microsoft [Open Specification Promise](#) or the [Community Promise](#). If you would prefer a written license, or if the technologies described in the Open Specifications are not covered by the Open Specifications Promise or Community Promise, as applicable, patent licenses are available by contacting iplg@microsoft.com.
- **Trademarks.** The names of companies and products contained in this documentation may be covered by trademarks or similar intellectual property rights. This notice does not grant any licenses under those rights.
- **Fictitious Names.** The example companies, organizations, products, domain names, e-mail addresses, logos, people, places, and events depicted in this documentation are fictitious. No association with any real company, organization, product, domain name, email address, logo, person, place, or event is intended or should be inferred.

Reservation of Rights. All other rights are reserved, and this notice does not grant any rights other than specifically described above, whether by implication, estoppel, or otherwise.

Tools. The Open Specifications do not require the use of Microsoft programming tools or programming environments in order for you to develop an implementation. If you have access to Microsoft programming tools and environments you are free to take advantage of them. Certain Open Specifications are intended for use in conjunction with publicly available standard specifications and network programming art, and assumes that the reader either is familiar with the aforementioned material or has immediate access to it.

Preliminary Documentation. This Open Specification provides documentation for past and current releases and/or for the pre-release (beta) version of this technology. This Open Specification is final

documentation for past or current releases as specifically noted in the document, as applicable; it is preliminary documentation for the pre-release (beta) versions. Microsoft will release final documentation in connection with the commercial release of the updated or new version of this technology. As the documentation may change between this preliminary version and the final version of this technology, there are risks in relying on preliminary documentation. To the extent that you incur additional development obligations or any other costs as a result of relying on this preliminary documentation, you do so at your own risk.

Revision Summary

Date	Revision History	Revision Class	Comments
07/13/2009	0.1	Major	Initial Availability
08/28/2009	0.2	Editorial	Revised and edited the technical content
11/06/2009	0.3	Editorial	Revised and edited the technical content
02/19/2010	1.0	Editorial	Revised and edited the technical content
03/31/2010	1.01	Editorial	Revised and edited the technical content
04/30/2010	1.02	Minor	Updated the technical content
06/07/2010	1.03	Editorial	Revised and edited the technical content
06/29/2010	1.04	Editorial	Changed language and formatting in the technical content.
07/23/2010	1.04	No change	No changes to the meaning, language, or formatting of the technical content.
09/27/2010	1.04	No change	No changes to the meaning, language, or formatting of the technical content.
11/15/2010	1.04	No change	No changes to the meaning, language, or formatting of the technical content.
12/17/2010	1.04	No change	No changes to the meaning, language, or formatting of the technical content.
03/18/2011	1.04	No change	No changes to the meaning, language, or formatting of the technical content.
06/10/2011	1.04	No change	No changes to the meaning, language, or formatting of the technical content.
01/20/2012	2.0	Major	Significantly changed the technical content.

Table of Contents

1 Introduction	12
1.1 Glossary	12
1.2 References	13
1.2.1 Normative References	13
1.2.2 Informative References	14
1.3 Protocol Overview (Synopsis)	14
1.4 Relationship to Other Protocols	16
1.5 Prerequisites/Preconditions	16
1.6 Applicability Statement	16
1.7 Versioning and Capability Negotiation	16
1.8 Vendor-Extensible Fields	17
1.9 Standards Assignments	17
2 Messages	18
2.1 Transport	18
2.2 Common Message Syntax	18
2.2.1 Namespaces	19
2.2.2 Messages	20
2.2.3 Elements	20
2.2.4 Complex Types	20
2.2.4.1 CSOM Array	20
2.2.4.1.1 CSOM Array XML Value	20
2.2.4.1.2 CSOM Array JSON Value	21
2.2.4.2 CSOM Dictionary	21
2.2.4.2.1 CSOM Dictionary XML Value	21
2.2.4.2.2 CSOM Dictionary JSON Value	21
2.2.4.3 CSOM Null	22
2.2.4.3.1 CSOM Null XML Value	22
2.2.4.3.2 CSOM Null JSON Value	22
2.2.4.4 CSOM Object	22
2.2.4.4.1 Object Path XML Value	22
2.2.4.4.2 CSOM Object JSON Value	22
2.2.4.5 CSOM Value Object	23
2.2.4.5.1 CSOM Value Object XML Value	23
2.2.4.5.2 CSOM Value Object JSON Value	23
2.2.4.6 CSOM Stream	23
2.2.4.6.1 CSOM Stream XML Value	23
2.2.4.6.2 CSOM Stream JSON Value	24
2.2.5 Simple Types	24
2.2.5.1 CSOM Binary	25
2.2.5.1.1 CSOM Binary XML Value	25
2.2.5.1.2 CSOM Binary JSON Value	26
2.2.5.2 CSOM Boolean	27
2.2.5.2.1 CSOM Boolean XML Value	27
2.2.5.2.2 CSOM Boolean JSON Value	27
2.2.5.3 CSOM Byte	27
2.2.5.3.1 CSOM Byte XML Value	27
2.2.5.3.2 CSOM Byte JSON Value	27
2.2.5.4 CSOM Char	27
2.2.5.4.1 CSOM Char XML Value	27

2.2.5.4.2 CSOM Char JSON Value	28
2.2.5.5 CSOM DateTime	28
2.2.5.5.1 CSOM DateTime XML Value	29
2.2.5.5.2 CSOM DateTime JSON Value.....	29
2.2.5.6 CSOM Double.....	31
2.2.5.6.1 CSOM Double XML Value	31
2.2.5.6.2 CSOM Double JSON Value	31
2.2.5.7 CSOM Enum.....	31
2.2.5.7.1 CSOM Enum XML Value.....	32
2.2.5.7.2 CSOM Enum JSON Value	32
2.2.5.8 CSOM GUID	32
2.2.5.8.1 CSOM Guid XML Value	32
2.2.5.8.2 CSOM GUID JSON Value.....	32
2.2.5.9 CSOM Int16	33
2.2.5.9.1 CSOM Int16 XML Value	33
2.2.5.9.2 CSOM Int16 JSON Value	33
2.2.5.10 CSOM Int32	33
2.2.5.10.1 CSOM Int32 XML Value	33
2.2.5.10.2 CSOM Int32 JSON Value.....	33
2.2.5.11 CSOM Int64	33
2.2.5.11.1 CSOM Int64 XML Value	34
2.2.5.11.2 CSOM Int64 JSON Value.....	34
2.2.5.12 CSOM SByte.....	34
2.2.5.12.1 CSOM SByte XML Value.....	34
2.2.5.12.2 CSOM SByte JSON Value	34
2.2.5.13 CSOM Single	34
2.2.5.13.1 CSOM Single XML Value	34
2.2.5.13.2 CSOM Single JSON Value.....	35
2.2.5.14 CSOM String	35
2.2.5.14.1 CSOM String XML Value	35
2.2.5.14.2 CSOM String JSON Value.....	35
2.2.5.15 CSOM UInt16	36
2.2.5.15.1 CSOM UInt16 XML Value	36
2.2.5.15.2 CSOM UInt16 JSON Value.....	36
2.2.5.16 CSOM UInt32	36
2.2.5.16.1 CSOM UInt32 XML Value	36
2.2.5.16.2 CSOM UInt32 JSON Value.....	36
2.2.5.17 CSOM UInt64	37
2.2.5.17.1 CSOM UInt64 XML Value	37
2.2.5.17.2 CSOM UInt64 JSON Value.....	37
2.2.5.18 CSOM Decimal.....	37
2.2.5.18.1 CSOM Decimal XML Value.....	37
2.2.5.18.2 CSOM Decimal JSON Value	37
2.2.5.19 CSOM TimeSpan	37
2.2.5.19.1 CSOM TimeSpan XML Value	38
2.2.5.19.2 CSOM TimeSpan JSON Value	38
2.2.6 Attributes.....	38
2.2.7 Groups.....	38
2.2.8 Attribute Groups	38
3 Protocol Details.....	39
3.1 Server Details	39
3.1.1 Abstract Data Model	39

3.1.1.1	Protocol Server Type Set	40
3.1.1.2	Client Actions	41
3.1.1.3	Request Processing	42
3.1.2	Timers	42
3.1.3	Initialization	42
3.1.4	Message Processing Events and Sequencing Rules	42
3.1.4.1	ProcessQuery	43
3.1.4.1.1	Message	43
3.1.4.1.1.1	ProcessQueryIn	44
3.1.4.1.1.2	ProcessQueryOut	45
3.1.4.1.2	Elements	46
3.1.4.1.2.1	Request	46
3.1.4.1.3	Complex Types	46
3.1.4.1.3.1	ActionInstantiateObjectPathType	48
3.1.4.1.3.1.1	Schema	49
3.1.4.1.3.1.2	Attributes	49
3.1.4.1.3.1.3	Child Elements	49
3.1.4.1.3.2	ActionInvokeMethodType	49
3.1.4.1.3.2.1	Schema	49
3.1.4.1.3.2.2	Attributes	50
3.1.4.1.3.2.3	Child Elements	50
3.1.4.1.3.3	ActionInvokeStaticMethodType	50
3.1.4.1.3.3.1	Schema	50
3.1.4.1.3.3.2	Attributes	51
3.1.4.1.3.3.3	Child Elements	51
3.1.4.1.3.4	ActionObjectIdentityQueryType	51
3.1.4.1.3.4.1	Schema	51
3.1.4.1.3.4.2	Attributes	51
3.1.4.1.3.4.3	Child Elements	52
3.1.4.1.3.5	ActionQueryType	52
3.1.4.1.3.5.1	Schema	52
3.1.4.1.3.5.2	Attributes	52
3.1.4.1.3.5.3	Child Elements	52
3.1.4.1.3.6	ActionSetPropertyType	52
3.1.4.1.3.6.1	Schema	53
3.1.4.1.3.6.2	Attributes	53
3.1.4.1.3.6.3	Child Elements	53
3.1.4.1.3.7	ActionSetStaticPropertyType	53
3.1.4.1.3.7.1	Schema	53
3.1.4.1.3.7.2	Attributes	54
3.1.4.1.3.7.3	Child Elements	54
3.1.4.1.3.8	ActionTypes	54
3.1.4.1.3.8.1	Schema	54
3.1.4.1.3.8.2	Attributes	54
3.1.4.1.3.8.3	Child Elements	54
3.1.4.1.3.9	ChildItemQueryType	55
3.1.4.1.3.9.1	Schema	55
3.1.4.1.3.9.2	Attributes	55
3.1.4.1.3.9.3	Child Elements	55
3.1.4.1.3.10	ConditionalScopeType	55
3.1.4.1.3.10.1	Schema	56
3.1.4.1.3.10.2	Attributes	57
3.1.4.1.3.10.3	Child Elements	57

3.1.4.1.3.11	ExceptionHandlingScopeSimpleType.....	57
3.1.4.1.3.11.1	Schema	58
3.1.4.1.3.11.2	Attributes	58
3.1.4.1.3.11.3	Child Elements	58
3.1.4.1.3.12	ExceptionHandlingScopeType	59
3.1.4.1.3.12.1	Schema	59
3.1.4.1.3.12.2	Attributes	60
3.1.4.1.3.12.3	Child Elements	61
3.1.4.1.3.13	ExpressionConvertExpressionType	61
3.1.4.1.3.13.1	Schema	61
3.1.4.1.3.13.2	Attributes	62
3.1.4.1.3.13.3	Child Elements	62
3.1.4.1.3.14	ExpressionLeftRightOperandExpressionType.....	63
3.1.4.1.3.14.1	Schema	63
3.1.4.1.3.14.2	Attributes	64
3.1.4.1.3.14.3	Child Elements	64
3.1.4.1.3.15	ExpressionMethodExpressionType	65
3.1.4.1.3.15.1	Schema	65
3.1.4.1.3.15.2	Attributes	66
3.1.4.1.3.15.3	Child Elements	66
3.1.4.1.3.16	ExpressionParameterExpressionType.....	66
3.1.4.1.3.16.1	Schema	67
3.1.4.1.3.16.2	Attributes	67
3.1.4.1.3.16.3	Child Elements	67
3.1.4.1.3.17	ExpressionPropertyExpressionType	67
3.1.4.1.3.17.1	Schema	67
3.1.4.1.3.17.2	Attributes	67
3.1.4.1.3.17.3	Child Elements	68
3.1.4.1.3.18	ExpressionQueryableExpressionType	68
3.1.4.1.3.18.1	Schema	68
3.1.4.1.3.18.2	Attributes	69
3.1.4.1.3.18.3	Child Elements	69
3.1.4.1.3.19	ExpressionQueryableTakeType	69
3.1.4.1.3.19.1	Schema	69
3.1.4.1.3.19.2	Attributes	69
3.1.4.1.3.19.3	Child Elements	70
3.1.4.1.3.20	ExpressionQueryableWhereType	70
3.1.4.1.3.20.1	Schema	70
3.1.4.1.3.20.2	Attributes	71
3.1.4.1.3.20.3	Child Elements	71
3.1.4.1.3.21	ExpressionStaticMethodExpressionType	71
3.1.4.1.3.21.1	Schema	71
3.1.4.1.3.21.2	Attributes	72
3.1.4.1.3.21.3	Child Elements	72
3.1.4.1.3.22	ExpressionStaticPropertyExpressionType	73
3.1.4.1.3.22.1	Schema	73
3.1.4.1.3.22.2	Attributes	73
3.1.4.1.3.22.3	Child Elements	73
3.1.4.1.3.23	ExpressionType	73
3.1.4.1.3.23.1	Schema	73
3.1.4.1.3.23.2	Attributes	74
3.1.4.1.3.23.3	Child Elements	74
3.1.4.1.3.24	MethodParameterType.....	74

3.1.4.1.3.24.1	Schema	75
3.1.4.1.3.24.2	Attributes	76
3.1.4.1.3.24.3	Child Elements	76
3.1.4.1.3.24.4	MethodParameterArrayType	76
3.1.4.1.3.24.4.1	Schema	76
3.1.4.1.3.24.4.2	Attributes	76
3.1.4.1.3.24.4.3	Child Elements	76
3.1.4.1.3.24.5	MethodParameterBooleanType	77
3.1.4.1.3.24.5.1	Schema	77
3.1.4.1.3.24.5.2	Attributes	77
3.1.4.1.3.24.5.3	Child Elements	77
3.1.4.1.3.24.6	MethodParameterByteArrayType	77
3.1.4.1.3.24.6.1	Schema	77
3.1.4.1.3.24.6.2	Attributes	77
3.1.4.1.3.24.6.3	Child Elements	77
3.1.4.1.3.24.7	MethodParameterByteType	77
3.1.4.1.3.24.7.1	Schema	78
3.1.4.1.3.24.7.2	Attributes	78
3.1.4.1.3.24.7.3	Child Elements	78
3.1.4.1.3.24.8	MethodParameterCharType	78
3.1.4.1.3.24.8.1	Schema	78
3.1.4.1.3.24.8.2	Attributes	78
3.1.4.1.3.24.8.3	Child Elements	78
3.1.4.1.3.24.9	MethodParameterDateTimeType	78
3.1.4.1.3.24.9.1	Schema	78
3.1.4.1.3.24.9.2	Attributes	79
3.1.4.1.3.24.9.3	Child Elements	79
3.1.4.1.3.24.10	MethodParameterDictionaryType	79
3.1.4.1.3.24.10.1	Schema	79
3.1.4.1.3.24.10.2	Attributes	79
3.1.4.1.3.24.10.3	Child Elements	79
3.1.4.1.3.24.11	MethodParameterDoubleType	79
3.1.4.1.3.24.11.1	Schema	79
3.1.4.1.3.24.11.2	Attributes	80
3.1.4.1.3.24.11.3	Child Elements	80
3.1.4.1.3.24.12	MethodParameterEnumType	80
3.1.4.1.3.24.12.1	Schema	80
3.1.4.1.3.24.12.2	Attributes	80
3.1.4.1.3.24.12.3	Child Elements	80
3.1.4.1.3.24.13	MethodParameterGuidType	80
3.1.4.1.3.24.13.1	Schema	80
3.1.4.1.3.24.13.2	Attributes	80
3.1.4.1.3.24.13.3	Child Elements	81
3.1.4.1.3.24.14	MethodParameterInt16Type	81
3.1.4.1.3.24.14.1	Schema	81
3.1.4.1.3.24.14.2	Attributes	81
3.1.4.1.3.24.14.3	Child Elements	81
3.1.4.1.3.24.15	MethodParameterInt32Type	81
3.1.4.1.3.24.15.1	Schema	81
3.1.4.1.3.24.15.2	Attributes	81
3.1.4.1.3.24.15.3	Child Elements	81
3.1.4.1.3.24.16	MethodParameterInt64Type	81
3.1.4.1.3.24.16.1	Schema	82

3.1.4.1.3.24.16.2	Attributes	82
3.1.4.1.3.24.16.3	Child Elements	82
3.1.4.1.3.24.17	MethodParameterNullType	82
3.1.4.1.3.24.17.1	Schema	82
3.1.4.1.3.24.17.2	Attributes	82
3.1.4.1.3.24.17.3	Child Elements	82
3.1.4.1.3.24.18	MethodParameterNumberType	82
3.1.4.1.3.24.18.1	Schema	82
3.1.4.1.3.24.18.2	Attributes	83
3.1.4.1.3.24.18.3	Child Elements	83
3.1.4.1.3.24.19	MethodParameterObjectPathType	83
3.1.4.1.3.24.19.1	Schema	83
3.1.4.1.3.24.19.2	Attributes	83
3.1.4.1.3.24.19.3	Child Elements	83
3.1.4.1.3.24.20	MethodParameterSByteType	83
3.1.4.1.3.24.20.1	Schema	83
3.1.4.1.3.24.20.2	Attributes	83
3.1.4.1.3.24.20.3	Child Elements	83
3.1.4.1.3.24.21	MethodParameterSingleType	83
3.1.4.1.3.24.21.1	Schema	84
3.1.4.1.3.24.21.2	Attributes	84
3.1.4.1.3.24.21.3	Child Elements	84
3.1.4.1.3.24.22	MethodParameterStringType	84
3.1.4.1.3.24.22.1	Schema	84
3.1.4.1.3.24.22.2	Attributes	84
3.1.4.1.3.24.22.3	Child Elements	84
3.1.4.1.3.24.23	MethodParameterUInt16Type	84
3.1.4.1.3.24.23.1	Schema	84
3.1.4.1.3.24.23.2	Attributes	85
3.1.4.1.3.24.23.3	Child Elements	85
3.1.4.1.3.24.24	MethodParameterUInt32Type	85
3.1.4.1.3.24.24.1	Schema	85
3.1.4.1.3.24.24.2	Attributes	85
3.1.4.1.3.24.24.3	Child Elements	85
3.1.4.1.3.24.25	MethodParameterUInt64Type	85
3.1.4.1.3.24.25.1	Schema	85
3.1.4.1.3.24.25.2	Attributes	85
3.1.4.1.3.24.25.3	Child Elements	86
3.1.4.1.3.24.26	MethodParameterUnspecifiedType	86
3.1.4.1.3.24.26.1	Schema	86
3.1.4.1.3.24.26.2	Attributes	86
3.1.4.1.3.24.26.3	Child Elements	86
3.1.4.1.3.24.27	MethodParameterValueObjectType	86
3.1.4.1.3.24.27.1	Schema	86
3.1.4.1.3.24.27.2	Attributes	87
3.1.4.1.3.24.27.3	Child Elements	87
3.1.4.1.3.24.28	MethodParameterBinaryType	87
3.1.4.1.3.24.28.1	Schema	87
3.1.4.1.3.24.28.2	Attributes	87
3.1.4.1.3.24.28.3	Child Elements	87
3.1.4.1.3.24.29	MethodParameterDecimalType	87
3.1.4.1.3.24.29.1	Schema	87
3.1.4.1.3.24.29.2	Attributes	88

3.1.4.1.3.24.29.3	Child Elements	88
3.1.4.1.3.24.30	MethodParameterTimeSpanType	88
3.1.4.1.3.24.30.1	Schema	88
3.1.4.1.3.24.30.2	Attributes	88
3.1.4.1.3.24.30.3	Child Elements	88
3.1.4.1.3.25	ObjectPathConstructorType	88
3.1.4.1.3.25.1	Schema	88
3.1.4.1.3.25.2	Attributes	89
3.1.4.1.3.25.3	Child Elements	89
3.1.4.1.3.26	ObjectPathMethodType	89
3.1.4.1.3.26.1	Schema	89
3.1.4.1.3.26.2	Attributes	89
3.1.4.1.3.26.3	Child Elements	89
3.1.4.1.3.27	ObjectPathObjectIdentityNameType	90
3.1.4.1.3.27.1	Schema	90
3.1.4.1.3.27.2	Attributes	90
3.1.4.1.3.27.3	Child Elements	90
3.1.4.1.3.28	ObjectPathPropertyType	90
3.1.4.1.3.28.1	Schema	90
3.1.4.1.3.28.2	Attributes	90
3.1.4.1.3.28.3	Child Elements	90
3.1.4.1.3.29	ObjectPathStaticMethodType	91
3.1.4.1.3.29.1	Schema	91
3.1.4.1.3.29.2	Attributes	91
3.1.4.1.3.29.3	Child Elements	91
3.1.4.1.3.30	ObjectPathStaticPropertyType	91
3.1.4.1.3.30.1	Schema	91
3.1.4.1.3.30.2	Attributes	92
3.1.4.1.3.30.3	Child Elements	92
3.1.4.1.3.31	ObjectPathsType	92
3.1.4.1.3.31.1	Schema	92
3.1.4.1.3.31.2	Attributes	92
3.1.4.1.3.31.3	Child Elements	92
3.1.4.1.3.32	QueryPropertyType	93
3.1.4.1.3.32.1	Schema	93
3.1.4.1.3.32.2	Attributes	93
3.1.4.1.3.32.3	Child Elements	93
3.1.4.1.3.33	QueryType	94
3.1.4.1.3.33.1	Schema	94
3.1.4.1.3.33.2	Attributes	94
3.1.4.1.3.33.3	Child Elements	94
3.1.4.1.3.34	RequestType	94
3.1.4.1.3.34.1	Schema	94
3.1.4.1.3.34.2	Attributes	95
3.1.4.1.3.34.3	Child Elements	95
3.1.4.1.4	Simple Types	95
3.1.4.1.4.1	ActionIdType	96
3.1.4.1.4.2	GuidType	96
3.1.4.1.4.3	IdType	96
3.1.4.1.4.4	MethodNameType	96
3.1.4.1.4.5	MethodParameterTypeType	96
3.1.4.1.4.6	ObjectPathIdType	98
3.1.4.1.4.7	PropertyNameType	98

3.1.4.1.4.8	StaticMethodNameType	98
3.1.4.1.4.9	StaticPropertyNameType	98
3.1.4.1.4.10	TypeIdGuidType	99
3.1.4.1.4.11	VersionStringType	99
3.1.4.1.5	Attributes	99
3.1.4.1.6	Groups	99
3.1.4.1.6.1	ActionGroup	99
3.1.4.1.6.1.1	Schema	99
3.1.4.1.6.1.2	Attributes	100
3.1.4.1.6.1.3	Child Elements	100
3.1.4.1.6.2	ExpressionGroup	100
3.1.4.1.6.2.1	Schema	100
3.1.4.1.6.2.2	Attributes	101
3.1.4.1.6.2.3	Child Elements	101
3.1.4.1.6.3	ExpressionQueryableExpressionGroup	103
3.1.4.1.6.3.1	Schema	103
3.1.4.1.6.3.2	Attributes	103
3.1.4.1.6.3.3	Child Elements	103
3.1.4.1.7	Attribute Groups	103
3.1.4.1.8	JSON Types	104
3.1.4.1.8.1	JSON Object Types	104
3.1.4.1.8.1.1	CSOM Dictionary JSON Value	104
3.1.4.1.8.1.2	CSOM Error JSON Value	104
3.1.4.1.8.1.3	CSOM Object JSON Value	105
3.1.4.1.8.1.3.1	JSON Member Name for Expando Field	106
3.1.4.1.8.1.4	CSOM Value Object JSON Value	108
3.1.4.1.8.1.5	Response Header JSON Value	109
3.1.4.1.8.2	JSON Response Structure	109
3.1.4.1.8.2.1	ActionResponseTypes	110
3.1.4.1.8.2.1.1	ConditionalScopeResponse JSON Value	110
3.1.4.1.8.2.1.2	ExceptionHandlingScopeResponse JSON Value	110
3.1.4.1.8.2.1.3	ExceptionHandlingScopeSimpleResponse JSON Value	110
3.1.4.1.8.2.1.4	MethodResponse JSON Value	111
3.1.4.1.8.2.1.5	ObjectIdentityQueryResponse JSON Value	112
3.1.4.1.8.2.1.6	ObjectPathResponse JSON Value	112
3.1.4.1.8.2.1.7	QueryResponse JSON Value	113
3.1.5	Timer Events	113
3.1.6	Other Local Events	113
4	Protocol Examples	114
4.1	Retrieve Book Information	117
4.2	Retrieve Books by a Specific Author	118
4.3	Update Book Information	120
4.4	Add a Book to a Catalog	122
4.5	Unsuccessfully Add a Book to a Catalog	124
4.6	Retrieve Book Sample Content	125
4.7	Update Book Sample Content	126
5	Security	129
5.1	Security Considerations for Implementers	129
5.2	Index of Security Parameters	129
6	Appendix A: XML Schema	130

6.1 Request XML Schema	130
7 Appendix B: Product Behavior	147
8 Change Tracking.....	148
9 Index	155

Preliminary

1 Introduction

This document specifies the SharePoint Client Query Protocol, which allows a protocol client to call methods and access data on a protocol server. The actions to be executed are sent by a protocol client as part of a request, and the results are returned by a protocol server as part of a response.

Sections 1.8, 2, and 3 of this specification are normative and contain RFC 2119 language. Sections 1.5 and 1.9 are also normative but cannot contain RFC 2119 language. All other sections and examples in this specification are informative.

1.1 Glossary

The following terms are defined in [\[MS-GLOS\]](#):

Augmented Backus-Naur Form (ABNF)
Coordinated Universal Time (UTC)
GUID
Hypertext Transfer Protocol (HTTP)
Hypertext Transfer Protocol over Secure Sockets Layer (HTTPS)
Unicode
XML

The following terms are defined in [\[MS-OFCGLOS\]](#):

base64 encoding
child item query
CSOM action
CSOM action list
CSOM action response structure
CSOM array
CSOM binary
CSOM Boolean
CSOM Byte
CSOM Char
CSOM DateTime
CSOM dictionary
CSOM Double
CSOM error
CSOM expando field
CSOM expression
CSOM GUID
CSOM Int16
CSOM Int32
CSOM Int64
CSOM method
CSOM Object
CSOM Object type
CSOM property
CSOM SByte
CSOM Single
CSOM String
CSOM type
CSOM type identifier
CSOM type name
CSOM UInt16

CSOM UInt32
CSOM UInt64
CSOM value object type
expression
JavaScript Object Notation (JSON)
Multipurpose Internet Mail Extensions (MIME)
Request-URI
Status-Code
Web Services Description Language (WSDL)
Web site
XML schema

The following terms are specific to this document:

CSOM value object: An object that contains a set of named values, which are referred to as members. It has a Unicode string value, referred to as a CSOM type name, that identifies its type.

default scalar property set: A set of properties that are retrieved by default for an object. The properties map to fields in a storage schema.

object identity: An optional, implementation-specific string that uniquely identifies a CSOM Object. It can be used in queries to retrieve a specific CSOM object.

object path: A string that is used to access namespaces, classes, objects, and instances. Each object on a system has a unique path that identifies it locally or over a network.

queryable expression: A syntax that is used by protocol clients to retrieve a set of CSOM Objects that meet a specific set of criteria, based on state data that is stored on a protocol server.

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

1.2 References

References to Microsoft Open Specification documents do not include a publishing year because links are to the latest version of the documents, which are updated frequently. References to other documents include a publishing year when one is available.

1.2.1 Normative References

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

[MS-DTYP] Microsoft Corporation, "[Windows Data Types](#)".

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

[RFC2234] Crocker, D., and Overell, P., "Augmented BNF for Syntax Specifications: ABNF", RFC 2234, November 1997, <http://www.ietf.org/rfc/rfc2234.txt>

[RFC2387] Levinson, E., "The MIME Multipart/Related Content-type", RFC 2387, August 1998, <http://ietf.org/rfc/rfc2387.txt>

[RFC2616] Fielding, R., Gettys, J., Mogul, J., et al., "Hypertext Transfer Protocol -- HTTP/1.1", RFC 2616, June 1999, <http://www.ietf.org/rfc/rfc2616.txt>

[RFC4627] Crockford, D., "The application/json Media Type for Javascript Object Notation (JSON)", RFC 4627, July 2006, <http://www.ietf.org/rfc/rfc4627.txt>

[WSDL] Christensen, E., Curbera, F., Meredith, G., and Weerawarana, S., "Web Services Description Language (WSDL) 1.1", W3C Note, March 2001, <http://www.w3.org/TR/2001/NOTE-wsdl-20010315>

[XMLNS] Bray, T., Hollander, D., Layman, A., et al., Eds., "Namespaces in XML 1.0 (Third Edition)", W3C Recommendation, December 2009, <http://www.w3.org/TR/2009/REC-xml-names-20091208/>

[XMLSCHEMA1] Thompson, H.S., Ed., Beech, D., Ed., Maloney, M., Ed., and Mendelsohn, N., Ed., "XML Schema Part 1: Structures", W3C Recommendation, May 2001, <http://www.w3.org/TR/2001/REC-xmlschema-1-20010502/>

[XMLSCHEMA2] Biron, P.V., Ed. and Malhotra, A., Ed., "XML Schema Part 2: Datatypes", W3C Recommendation, May 2001, <http://www.w3.org/TR/2001/REC-xmlschema-2-20010502/>

1.2.2 Informative References

[MS-CSOMSPT] Microsoft Corporation, "[SharePoint Client-Side Object Model Protocol Specification](#)".

[MS-GLOS] Microsoft Corporation, "[Windows Protocols Master Glossary](#)".

[MS-OFGLGLOS] Microsoft Corporation, "[Microsoft Office Master Glossary](#)".

[RFC2818] Rescorla, E., "HTTP Over TLS", RFC 2818, May 2000, <http://www.ietf.org/rfc/rfc2818.txt>

1.3 Protocol Overview (Synopsis)

This protocol enables a protocol client to execute method calls in batches and to perform read/write operations on properties of logical objects or class types on a protocol server.

This protocol defines a system for locating instances of types, calling methods that are defined by those types, and performing read/write operations for properties of those types. This protocol defines two roles: protocol client and protocol server. A protocol client initiates communication by generating a list of actions. The protocol client then sends that list to the protocol server for processing. The protocol server executes the actions on the specified objects, and then returns a list of results for each of the specified actions.

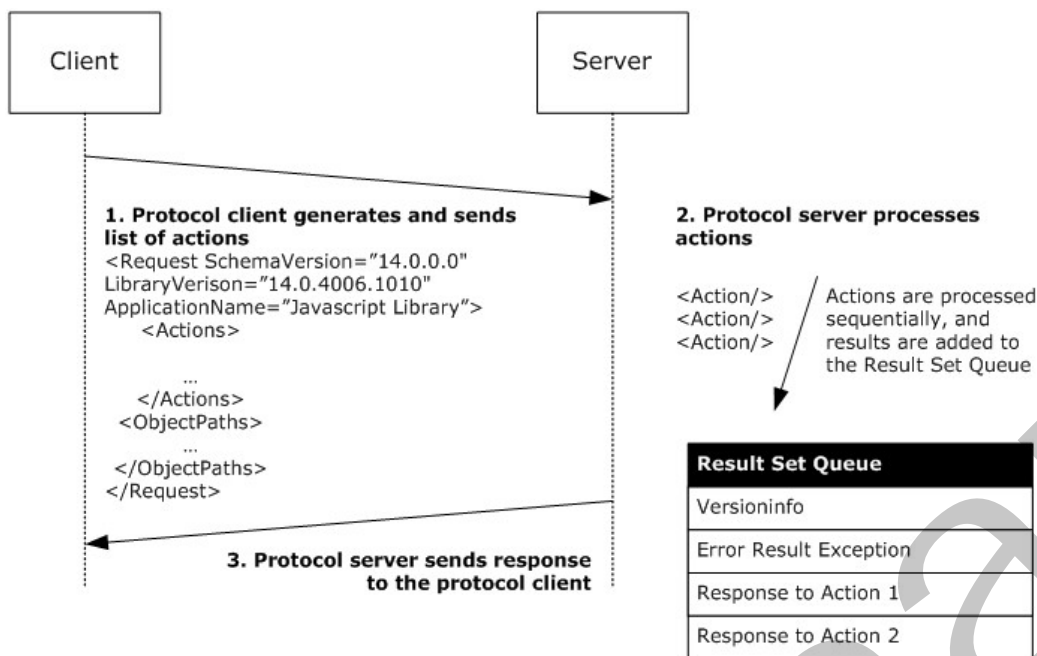


Figure 1: Overview of a request/response sequence

Actions can be performed against properties and methods of objects or class types. This protocol defines two types of properties and methods, scalar and object path. Scalar properties have values that are based on simple data types. Similarly, scalar methods have return values that are based on simple data types. Object path properties have values that are based on references to other logical objects. Similarly, object path methods return values that are based on references to other logical objects.

Actions can:

- Instantiate objects.
- Query the values of scalar properties for a specified object.
- Query the values of scalar properties for child objects of a collection object.
- Query the canonical identity of an object.
- Set the values of scalar properties.
- Call methods.
- Evaluate Boolean conditional expressions and execute a different set of actions based on evaluated values.
- Employ a try/catch/finally mechanism that executes different sets of actions, depending on whether an unhandled exception occurs.

The protocol server builds a queue of responses for each specified action. If the protocol server encounters an unhandled exception or executes all of the actions that are specified by the protocol client, the protocol server sends the appropriate response to the protocol client.

1.4 Relationship to Other Protocols

This protocol enables a protocol client to send a request that calls methods and accesses data on a protocol server, and then receive a corresponding set of results from the protocol server. This protocol depends on other structures and protocols to transport messages. Additional protocols, such as the SharePoint Client-Side Object Model protocol described in [\[MS-CSOMSPT\]](#), define the properties and methods that are exposed to protocol clients through this protocol. Applications are layered on top of this protocol, in combination with related protocols that define sets of logical types and related methods and properties.

The messages that are sent from the protocol client to the protocol server are encoded as **XML**. It transmits those messages by using **HTTP**, as described in [\[RFC2616\]](#), or **HTTPS**, as described in [\[RFC2818\]](#). Responses from the protocol server are encoded by using **JavaScript Object Notation (JSON)**, as described in [\[RFC4627\]](#).

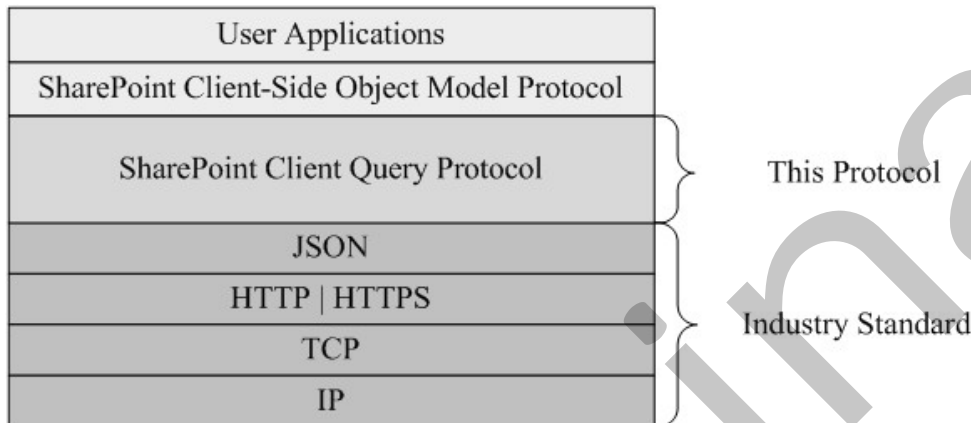


Figure 2: This protocol in relation to other protocols

1.5 Prerequisites/Preconditions

This protocol operates against a protocol server that is configured to listen for HTTP or HTTPS requests and a protocol client that knows the **Request-URI** of the protocol server.

This protocol additionally requires that the protocol client and protocol server agree to use the same version of types, methods, and properties. For more information about version validation, see section [1.7](#).

1.6 Applicability Statement

This protocol is useful for transferring information about object state and for performing method calls in a distributed environment. Due to the batch-processing aspects of this protocol, this protocol is well-suited for environments in which the time that is used to send messages from a protocol client to a protocol server is relatively high compared to the execution of the specified methods and properties.

1.7 Versioning and Capability Negotiation

This document covers versioning issues in the following areas:

- **Supported Transports:** This protocol can use HTTP or HTTPS as a transport. For more information, see section [2.1](#).

- **Protocol Versions:** Currently, there are only two versions of this protocol. The version is specified by the **SchemaVersion** property and the value of that property is "14.0.0.0" or "15.0.0.0". To interoperate, a protocol client includes the **SchemaVersion** property with a value of "14.0.0.0" or "15.0.0.0", as described in section [3.1.4.1.3.34](#), and a protocol server includes the **SchemaVersion** attribute with a value of "14.0.0.0" or "15.0.0.0" in its response, as described in section [3.1.4.1.8.1.5](#).
- **API Versions:** A protocol client uses the **LibraryVersion** attribute to specify the expected version of the API library. The protocol server can use the value of this attribute to indicate which library of types, methods, and properties is used.

1.8 Vendor-Extensible Fields

This protocol does not define any vendor-extensible fields. However, this protocol does not preclude implementers from adding custom HTTP headers, as specified in [\[RFC2616\]](#) section 4.2.

1.9 Standards Assignments

None.

2 Messages

2.1 Transport

Protocol servers MUST support HTTP. Protocol servers SHOULD additionally support HTTPS to help secure communications with protocol clients. Messages that are sent by a protocol client to a protocol server MUST be formatted as specified for **ProcessQueryIn** messages, as specified in section [3.1.4.1.1.1](#). Protocol clients MUST use the **POST** method to send messages to protocol servers. Protocol messages that are sent from the protocol server to the protocol client MUST be formatted as specified for **ProcessQueryOut** messages, as specified in section [3.1.4.1.1.2](#).

2.2 Common Message Syntax

This section contains common definitions that are used by this protocol. The syntax of the definitions uses **XML schema**, as specified in [\[XMLSCHEMA1\]](#) and [\[XMLSCHEMA2\]](#), and **WSDL**, as specified in [\[WSDL\]](#).

The syntax of the definitions also uses JavaScript Object Notation (JSON), as defined in [\[RFC4627\]](#).

The JSON, **Augmented Backus-Naur Form (ABNF)** grammar, as specified in [\[RFC4627\]](#), for this protocol is as follows.

```
rfc4627-begin-array      = rfc4627-ws %x5B rfc4627-ws ; [ left square bracket
rfc4627-begin-object    = rfc4627-ws %x7B rfc4627-ws ; { left curly bracket
rfc4627-end-array       = rfc4627-ws %x5D rfc4627-ws ; ] right square bracket
rfc4627-end-object      = rfc4627-ws %x7D rfc4627-ws ; } right curly bracket
rfc4627-name-separator  = rfc4627-ws %x3A rfc4627-ws ; : colon
rfc4627-value-separator = rfc4627-ws %x2C rfc4627-ws ; , comma

rfc4627-ws = *(
    %x20 /           ; Space
    %x09 /           ; Horizontal tab
    %x0A /           ; Line feed or New line
    %x0D             ; Carriage return
)

rfc4627-value = rfc4627-false / rfc4627-null / rfc4627-true / rfc4627-object / rfc4627-array
/ rfc4627-number / rfc4627-string
rfc4627-false = %x66.61.6c.73.65 ; false
rfc4627-null  = %x6e.75.6c.6c   ; null
rfc4627-true  = %x74.72.75.65   ; true

rfc4627-object = rfc4627-begin-object [ rfc4627-member *( rfc4627-value-separator rfc4627-
member ) ] rfc4627-end-object
rfc4627-member = rfc4627-string rfc4627-name-separator rfc4627-value

rfc4627-number = [ rfc4627-minus ] rfc4627-int [ rfc4627-frac ] [ rfc4627-exp ]
rfc4627-decimal-point = %x2E ; .
rfc4627-digit1-9 = %x31-39 ; 1-9
rfc4627-e = %x65 / %x45 ; e E
rfc4627-exp = rfc4627-e [ rfc4627-minus / rfc4627-plus ] 1*DIGIT
rfc4627-frac = rfc4627-decimal-point 1*DIGIT
rfc4627-int = rfc4627-zero / ( rfc4627-digit1-9 *DIGIT )
rfc4627-minus = %x2D ; -
rfc4627-plus = %x2B ; +
rfc4627-zero = %x30 ; 0
```

```

rfc4627-array = rfc4627-begin-array [ rfc4627-value *( rfc4627-value-separator value ) ]
rfc4627-end-array

rfc4627-string = rfc4627-quotation-mark *rfc4627-char rfc4627-quotation-mark
rfc4627-char = rfc4627-unescape /
    rfc4627-escape (
        %x22 /          ; "    quotation mark    U+0022
        %x5C /          ; \    reverse solidus  U+005C
        %x2F /          ; /    solidus          U+002F
        %x62 /          ; b    backspace       U+0008
        %x66 /          ; f    form feed       U+000C
        %x6E /          ; n    line feed       U+000A
        %x72 /          ; r    carriage return  U+000D
        %x74 /          ; t    tab              U+0009
        %x75 4HEXDIG ) ; uXXXX    U+XXXX
rfc4627-escape = %x5C          ; \
rfc4627-quotation-mark = %x22 ; "
rfc4627-unescape = %x20-21 / %x23-5B / %x5D-10FFFF

```

The following table summarizes the types that are defined in [\[RFC4627\]](#).

JSON value	ABNF grammar
JSON object	rfc4627-object ; ([RFC4627] section 2.2)
JSON array	rfc4627-array ; ([RFC4627] section 2.3)
JSON literal false	rfc4627-false ; ([RFC4627] section 2.1)
JSON literal true	rfc4627-true ; ([RFC4627] section 2.1)
JSON literal null	rfc4627-null ; ([RFC4627] section 2.1)
JSON string	rfc4627-string ; ([RFC4627] section 2.5)
JSON number	rfc4627-number ; ([RFC4627] section 2.4)

2.2.1 Namespaces

This specification defines and references various XML namespaces using the mechanisms specified in [\[XMLNS\]](#). Although this specification associates a specific XML namespace prefix for each XML namespace that is used, the choice of any particular XML namespace prefix is implementation-specific and not significant for interoperability.

Prefix	Namespace URI	Reference
mstns	http://schemas.microsoft.com/sharepoint/clientquery/2009	
xs	http://www.w3.org/2001/XMLSchema	[XMLSCHEMA1]
wsu	http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-utility-1.0.xsd	
wsp	http://schemas.xmlsoap.org/ws/2004/09/policy	
wsaw	http://www.w3.org/2006/05/addressing/wsdl	

Prefix	Namespace URI	Reference
tns	http://schemas.microsoft.com/sharepoint/soap/	
xsd	http://www.w3.org/2001/XMLSchema	
http	http://schemas.microsoft.com/ws/06/2004/policy/http	
wsdl	http://schemas.xmlsoap.org/wsdl/	
(none)	http://schemas.microsoft.com/sharepoint/clientquery/2009	

2.2.2 Messages

This specification does not define any common WSDL message definitions.

2.2.3 Elements

This specification does not define any common XML schema element definitions.

2.2.4 Complex Types

The following table summarizes the set of common XML schema complex type definitions defined by this specification. XML schema complex type definitions that are specific to a particular operation are described with the operation.

Complex type	Description
CSOM array	An ordered collection of values.
CSOM dictionary	An object that contains a set of key/value pairs.
CSOM null	A special value indicating that no instance is specified.
CSOM Object	An object that contains a set of named values and a set of methods that operates on those values.
CSOM Stream	A sequence of bytes.
CSOM value object	An object that contains a set of named values.

2.2.4.1 CSOM Array

The **CSOM array** complex type contains an ordered collection of values. The values are identified by position and position is determined by a zero-based **integer** index.

2.2.4.1.1 CSOM Array XML Value

If a **CSOM array** value is used in request XML, it MUST conform to the following XML schema:

```
<xs:complexType name="CSOMArray">
  <xs:sequence>
    <xs:element name="Object" minOccurs="0" maxOccurs="unbounded">
      <xs:complexType>
        <xs:sequence>
```

```

        <xs:any />
      </xs:sequence>
    </xs:complexType>
  </xs:element>
</xs:sequence>
<xs:attribute name="Type" type="xs:string" use="required" fixed="Array" />
</xs:complexType>

```

It MUST also conform to the restricted format of a **MethodParameterArrayType** type, as specified in section [3.1.4.1.3.24](#).

2.2.4.1.2 CSOM Array JSON Value

If a **CSOM array** value is used in response JSON text, it is a JSON array and it MUST conform to the following format:

```
csom-array-value = rfc4627-array
```

2.2.4.2 CSOM Dictionary

The **CSOM dictionary** complex type is an object that contains an unordered collection of key/value pairs, each of which is represented by a **Property** element. Each key MUST contain a unique name.

2.2.4.2.1 CSOM Dictionary XML Value

If a CSOM dictionary value is used in request XML, it MUST conform to the following XML schema:

```

<xs:complexType name="CSOMDictionary">
  <xs:sequence>
    <xs:element name="Property" minOccurs="0" maxOccurs="unbounded">
      <xs:complexType>
        <xs:sequence>
          <xs:any />
        </xs:sequence>
        <xs:attribute name="Name" type="xs:string" use="required"/>
      </xs:complexType>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="Type" type="xs:string" use="required" fixed="Dictionary" />
</xs:complexType>

```

It MUST also conform to the restricted format of a **MethodParameterDictionaryType** type, as specified in section [3.1.4.1.3.24.10](#).

2.2.4.2.2 CSOM Dictionary JSON Value

If a CSOM dictionary value is used in response JSON text, it MUST conform to the format of a **CSOM dictionary JSON value** object, as specified in section [3.1.4.1.8.1.1](#).

2.2.4.3 CSOM Null

The **CSOM null** complex type is a special value that can be used in place of a **CSOM Object**, as specified in section [2.2.4.4, CSOM value object](#), as specified in section [2.2.4.5, CSOM array](#), as specified in section [2.2.4.1, CSOM binary](#), as specified in section [2.2.5.1](#), or **CSOM String**, as specified in section [2.2.5.14](#). The **CSOM null** type indicates that no instance is specified.

2.2.4.3.1 CSOM Null XML Value

If a **CSOM null** value is used in request XML, it MUST conform to the following XML schema:

```
<xs:complexType name="CSOMNull">
  <xs:attribute name="Type" type="xs:string" use="required" fixed="Null" />
</xs:complexType>
```

2.2.4.3.2 CSOM Null JSON Value

If a **CSOM null** value is used in response JSON text, it is a **JSON literal null**, as specified in section [2.2](#), and MUST conform to the following format:

```
csom-null-value = rfc4627-null
```

2.2.4.4 CSOM Object

The **CSOM Object** complex type is an object that contains a set of named values and methods, which are referred to as members. In addition, a CSOM Object has a **Unicode string** value that identifies its type and is referred to as a **CSOM type name**.

2.2.4.4.1 Object Path XML Value

If a CSOM Object value is used in request XML, the request XML MUST specify both the **object path** identifier that is used to obtain the object path and the object path that is used to obtain the **CSOM Object**. The object path XML value MUST conform to one of the formats listed in the following table.

Format	Section
ObjectPathConstructorType	3.1.4.1.3.25
ObjectPathMethodType	3.1.4.1.3.26
ObjectPathObjectIdentityNameType	3.1.4.1.3.27
ObjectPathPropertyType	3.1.4.1.3.28
ObjectPathStaticMethodType	3.1.4.1.3.29
ObjectPathStaticPropertyType	3.1.4.1.3.30

2.2.4.4.2 CSOM Object JSON Value

If CSOM Object data is used in response JSON text, it MUST conform to the format of a **CSOM Object JSON value** type, as specified in section [3.1.4.1.8.1.3](#).

2.2.4.5 CSOM Value Object

The **CSOM value object** complex type is an object that contains a set of named values, which are referred to as members. A **CSOM value object** has a Unicode **string** value that identifies its type and is referred to as a CSOM type name.

2.2.4.5.1 CSOM Value Object XML Value

If a CSOM value object value is used in request XML, it MUST conform to the following XML schema:

```
<xs:complexType name="CSOMValueObject">
  <xs:sequence>
    <xs:element name="Property" minOccurs="0" maxOccurs="unbounded">
      <xs:complexType>
        <xs:sequence>
          <xs:any />
        </xs:sequence>
        <xs:attribute name="Name" type="xs:string" use="required" />
        <xs:anyAttribute />
      </xs:complexType>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="TypeId" type="GuidType" use="required" />
</xs:complexType>
```

It MUST also conform to the restricted format of a **MethodParameterValueObjectType** type, as specified in section [3.1.4.1.3.24.27](#).

2.2.4.5.2 CSOM Value Object JSON Value

If a CSOM value object value is used in response JSON text, it MUST conform to the format of a **CSOM value object JSON value** type, as specified in section [3.1.4.1.8.1.4](#).

2.2.4.6 CSOM Stream

The **CSOM Stream**[<1>](#) complex type contains a sequence of bytes.

2.2.4.6.1 CSOM Stream XML Value

If a CSOM Stream value is used in request, the CSOM Stream XML Value in the request XML message specifies the MIME part which contains the stream data. The CSOM Stream XML Value MUST conform to the following XML schema:

```
<xs:complexType name="CSOMStream">
  <xs:attribute name="href" type="xs:string" use="required" />
</xs:complexType>
```

href: the attribute that specifies the **MIME** part which contains the stream's data. The value of the href attribute MUST conform to the following format:

```
csom-stream-href-value = csom-stream-id-prefix csom-stream-id
csom-stream-id-prefix = %x63.69.64.3A ; "cid:"
csom-stream-id       = 1*VCHAR
```

where the csom-stream-id is the id of the stream. The csom-stream-id MUST be unique within one request.

The content-id of the MIME part that contains the stream data MUST conform to the following format:

```
csom-mime-part-content-id = "<" csom-stream-id ">"
```

The CSOM Stream XML value MUST also conform to the restricted format of a **MethodParameterBinaryType** type, as specified in section [3.1.4.1.3.24.28](#).

2.2.4.6.2 CSOM Stream JSON Value

If a CSOM Stream value is used in the response, the CSOM Stream JSON Value in the response JSON text message specifies the MIME part which contains the stream data. The CSOM Stream JSON value is a JSON **string** and it MUST conform to the following format:

```
csom-stream-json-value = rfc4627-quotation-mark csom-stream-prefix
                        url-encoded-csom-stream-id csom-stream-suffix
                        rfc4627-quotation-mark
csom-stream-prefix    = %x5C.2F.42.69.6E.61.72.79.28 ; "\/Binary("
csom-stream-suffix    = %x29.5C.2F ; ")\"
csom-stream-id        = 1*VCHAR
url-encoded-csom-stream-id = rfc1738-url; The url defined in RFC 1738
```

The **url-encoded-csom-stream-id** is the URL encoded value for csom-stream-id and csom-stream-id is the id of the stream. The csom-stream-id MUST be unique within one response.

The content-id of the MIME part that contains stream data MUST conform to the following format:

```
csom-mime-part-content-id = "<" csom-stream-id ">"
```

2.2.5 Simple Types

The following table summarizes the set of simple type definitions defined in [\[MS-DTYP\]](#).

Simple Type	Section
BYTE	[MS-DTYP] section 2.2.6
DOUBLE	[MS-DTYP] section 2.2.8
FLOAT	[MS-DTYP] section 2.2.15
INT8	[MS-DTYP] section 2.2.20
INT16	[MS-DTYP] section 2.2.21
INT32	[MS-DTYP] section 2.2.22
INT64	[MS-DTYP] section 2.2.23
UINT16	[MS-DTYP] section 2.2.47

Simple Type	Section
UINT32	[MS-DTYP] section 2.2.48
UINT64	[MS-DTYP] section 2.2.49

The following table summarizes the set of simple type definitions defined by this specification. XML Schema simple type definitions that are specific to a particular operation are described with the operation.

Simple type	Description
CSOM binary	An array of unsigned 8-bit integers .
CSOM Boolean	A Boolean value.
CSOM Byte	An unsigned 8-bit integer value.
CSOM Char	A Unicode character value.
CSOM DateTime	A date-time value.
CSOM Decimal	A 128-bit, fixed precision, numeric value.
CSOM Double	A 64-bit, double-precision floating-point value.
CSOM Enum	An integer that is constrained to a specific set of integers .
CSOM GUID	A GUID .
CSOM Int16	A 16-bit signed integer value.
CSOM Int32	A 32-bit signed integer value.
CSOM Int64	A 64-bit signed integer value.
CSOM SByte	An 8-bit signed integer value.
CSOM Single	A 32-bit, single-precision floating-point value.
CSOM String	A string of Unicode characters.
CSOM TimeSpan	A duration of time.
CSOM UInt16	An unsigned 16-bit integer value.
CSOM UInt32	An unsigned 32-bit integer value.
CSOM UInt64	An unsigned 64-bit integer value.

2.2.5.1 CSOM Binary

The **CSOM binary** simple type is an array of unsigned 8-bit **integers**.

2.2.5.1.1 CSOM Binary XML Value

If a **CSOM binary** value is used in request XML, it MUST conform to the following XML schema:

```

<xs:simpleType name="CSOMBinary">
  <xs:restriction base="xs:base64Binary"></xs:restriction>
</xs:simpleType>

```

For example, if a binary is of length 4, the first byte is "61", the second byte is "62", the third byte is "63", the fourth byte is "64", and it is specified as:

PT4/QA==

2.2.5.1.2 CSOM Binary JSON Value

If a **CSOM binary** value is used in response JSON text, it is a JSON **string** and it MUST conform to the following format:

```

csom-binary-json-value = rfc4627-quotation-mark csom-binary-prefix
                        base64String csom-binary-suffix rfc4627-quotation-mark
csom-binary-prefix    = %x5C.2F.42.61.73.65.36.34.42.69.6E.61.72.79.28
                        ; "\/Base64Binary("
csom-binary-suffix    = %x29.5C.2F ; ")\"
base64String          = *base64Char
base64Char            = ALPHA / DIGIT / plus / solidus / pad
plus                  = "+"
solidus               = "\u002f" / "\u002F"
pad                   = "="

```

The **base64String** is obtained by replacing the character solidus "/" (U+002F) in the **base64 encoding** result of the byte array with "\u002f" or "\u002F". For example, if a binary is of length 4, the first byte is "61", the second byte is "62", the third byte is "63", the fourth byte is "64", and the base64 encoding result is:

PT4/QA==

The **base64String** is either:

PT4\u002fQA==

Or:

PT4\u002FQA==

For example, if a binary is of length 4, the first byte is "61", the second byte is "62", the third byte is "63", and the fourth byte is "64", then the **CSOM binary** JSON value is specified as either:

"\/Base64Binary (PT4\u002fQA==)\"

Or:

"\/Base64Binary (PT4\u002FQA==)\"

2.2.5.2 CSOM Boolean

The **CSOM Boolean** simple type is a **Boolean** value of either "true" or "false".

2.2.5.2.1 CSOM Boolean XML Value

If a **CSOM Boolean** value is used in request XML, it MUST conform to the following XML schema:

```
<xs:simpleType name="CSOMBoolean">
  <xs:restriction base="xs:boolean"/></xs:restriction>
</xs:simpleType>
```

2.2.5.2.2 CSOM Boolean JSON Value

If a **CSOM Boolean** value is used in response JSON text, it MUST conform to the following format:

```
csom-boolean-json-value = rfc4627-true / rfc4627-false
```

In this format, "rfc4627-true" represents a value of "true" and "rfc4627-false" represents a value of "false".

2.2.5.3 CSOM Byte

The **CSOM Byte** simple type is an unsigned 8-bit **integer** value that represents the **BYTE** type specified in [\[MS-DTYP\]](#) section 2.2.6. The range of **CSOM Byte** values is 0–255.

2.2.5.3.1 CSOM Byte XML Value

If a **CSOM Byte** value is used in request XML, it MUST conform to the following XML schema:

```
<xs:simpleType name="CSOMByte">
  <xs:restriction base="xs:unsignedByte"/></xs:restriction>
</xs:simpleType>
```

2.2.5.3.2 CSOM Byte JSON Value

If a **CSOM Byte** value is used in response JSON text, it is a JSON number and it MUST be in the range 0–255. It MUST also conform to the following ABNF syntax, as specified in [\[RFC2234\]](#):

```
csom-byte-json-value = 1*3DIGIT
```

2.2.5.4 CSOM Char

The **CSOM Char** simple type is a Unicode character value.

2.2.5.4.1 CSOM Char XML Value

If a **CSOM Char** value is used in request XML, it MUST conform to the following XML schema:

```
<xs:simpleType name="CSOMChar">
  <xs:restriction base="xs:string"/>
</xs:simpleType>
```

```

    <xs:length value="1" />
  </xs:restriction>
</xs:simpleType>

```

2.2.5.4.2 CSOM Char JSON Value

If a **CSOM Char** value is used in response JSON text, it is a JSON **string** and it **MUST** conform to the following ABNF syntax, as specified in [\[RFC2234\]](#):

```

csom-char-value      = rfc4627-quotation-mark
                      restricted-char
                      rfc4627-quotation-mark
rfc4627-quotation-mark = %x22 ; "
restricted-char       = rfc4627-unescaped /
                      rfc4627-escape (
                        %x22 / ; " quotation mark U+0022
                        %x5C / ; \ reverse solidus U+005C
                        %x62 / ; b backspace U+0008
                        %x66 / ; f form feed U+000C
                        %x6E / ; n line feed U+000A
                        %x72 / ; r carriage return U+000D
                        %x74 / ; t tab U+0009
                        %x75 4HEXDIG ) ; uXXXX U+XXXX
rfc4627-escape       = %x5C ; \
rfc4627-quotation-mark = %x22 ; "
rfc4627-unescaped    = %x20-21 / %x23-5B / %x5D-10FFFF

```

For example, the Unicode character with the value "0x2000" is specified as:

```
"\u2000"
```

The Unicode character solidus "/" (U+002F) is specified as either:

```
"\u002f"
```

Or:

```
"\u002F"
```

2.2.5.5 CSOM DateTime

The **CSOM DateTime** simple type is an instant of time that is represented as an **INT64** value and specifies the number of 100-nanosecond intervals that have elapsed since 12:00:00 A.M., January 1, 0001. The range of values for 100-nanosecond intervals begins at 12:00:00 A.M., January 1, 0001, and ends at 23:59:59.9999999, December 31, 9999. A **CSOM DateTime** value can also indicate time zone information, as follows.

Time zone value	Description
Unspecified	Time zone information is not specified.

Time zone value	Description
UTC	The time is specified in the Coordinated Universal Time (UTC) time zone.
Local	The time is specified as a UTC time with a local time zone offset.

2.2.5.5.1 CSOM DateTime XML Value

If a **CSOM DateTime** value is used in request XML, it MUST conform to the following XML schema:

```
<xs:simpleType name="CSOMDateTime">
  <xs:restriction base="xs:dateTime"/>
</xs:simpleType>
```

2.2.5.5.2 CSOM DateTime JSON Value

If a **CSOM DateTime** value is used in response JSON text, it MUST conform to the structure of a JSON **string**. It MUST also conform to the following format:

```
csom-datetime-value      = rfc4627-quotation-mark datetime-prefix
                           datetime-components
                           datetime-suffix
                           rfc4627-quotation-mark
datetime-prefix          = %x5C.2F.44.61.74.65.28 ; "\/Date("
datetime-suffix          = %x29.5C.2F ; ")\"
datetime-components      = datetime-unspecified /
                           datetime-utc /
                           datetime-local
datetime-utc              = ticks
datetime-local            = ticks ( "+" / "-" ) timeZoneOffset
datetime-unspecified      = year "," month "," day ","
                           hour "," minute "," second "," millisecond
year                      = int
month                     = int
day                       = int
hour                      = int
minute                    = int
second                    = int
millisecond                = int
ticks                     = int
timeZoneOffset            = int
int                       = [rfc4627-minus] 1*DIGIT
```

If the **CSOM DateTime** value is in the **datetime-unspecified** format, the value is relative to 12:00:00 A.M., January 1, 0001 and the time zone of the value is not specified:

```
"\/Date(year,month,day,hour,minute,second,millisecond)\"
```

The following table summarizes the attributes of a **CSOM DateTime** value.

Name	Description
year	An integer value that represents the year component of a CSOM DateTime value. It MUST

Name	Description
	be in the range 1–9999, where a value such as "2009" means the 2009 calendar year.
month	An integer value that represents the month component of a CSOM DateTime value. It MUST be in the range 0–11, where January is "0", February is "1", and so forth.
day	An integer value that represents the day component of a CSOM DateTime value. It MUST be in the range 1–31, where "1" is the first day of the month, "2" is the second day of the month, and so forth. The year, month, and day components together MUST form a valid date-time value.
hour	An integer value that represents the hour component of a CSOM DateTime value. It MUST be in the range 0–23, where 12:00 A.M. is "0", 1:00 A.M. is "1", 12:00 P.M. is "12", 1:00 P.M. is "13", and so forth.
minute	An integer value that represents the minute component of a CSOM DateTime value. It MUST be in the range 0–59, where "0" is the starting point of an hour, "1" is the first minute of the hour, "2" is the second minute of the hour, and so forth.
second	An integer value that represents the second component of a CSOM DateTime value. It MUST be in the range 0–59, where "0" is the starting point of a minute, "1" is the first (that is, 1 st) second of the minute, "2" is the second (that is, 2 nd) second of the minute, and so forth.
millisecond	An integer value that represents the millisecond component of a CSOM DateTime value. It MUST be in the range 0–999, where "0" is the starting point of a second, "1" is the first millisecond of the second, "2" is the second millisecond of the second, and so forth.

For example, May 22, 2009, 05:12 P.M. is specified as:

```
"\Date(2009,4,22,17,12,0,0)\/"
```

If the **CSOM DateTime** value is in the **datetime-utc** format, the value is:

```
"\Date(ticks)\/"
```

In this value, **ticks** is an **integer** value that represents the number of ticks since January 1, 1970, 12:00:00 A.M. in the UTC time zone. A tick is 100 nanoseconds. If the value is negative, it represents an earlier time.

For example, the UTC date and time May 22, 2009, 05:12 P.M. is specified as:

```
"\Date(1243012320000)\/"
```

The UTC date and time May 22, 1968, 05:12 P.M. is specified as:

```
"\Date(-50827680000)\/"
```

If the **CSOM DateTime** value is in the **datetime-local** format, the value is:

```
"\Date(ticks+timeZoneOffset)\/"
```

Or:

```
"\Date(ticks-timeZoneOffset)\/"
```

The following table summarizes the parameters of the **datetime-local** format of a **CSOM DateTime** value.

Name	Description
ticks	An integer value that represents the number of ticks since January 1, 1970, 12:00:00 A.M. in the UTC time zone. A tick is 100 nanoseconds. If the value is negative, it represents an earlier time.
timeZoneOffset	This MUST be of the form <i>hhmm</i> where <i>hh</i> is an integer in the range 0–13 and <i>mm</i> is an integer in the range 0–59. This value represents the difference between a local time zone and the UTC time zone. If the date and time has +timeZoneOffset , the local time zone is <i>hh</i> hours and <i>mm</i> minutes after the UTC time zone. If the date and time has -timeZoneOffset , the local time zone is <i>hh</i> hours and <i>mm</i> minutes before the UTC time zone.

For example, the local date and time May 22, 2009, 05:12 P.M. Pacific Daylight Time is specified as:

```
"\Date(1243037520000-0700)\/"
```

2.2.5.6 CSOM Double

The **CSOM Double** simple type is a 64-bit, double-precision, floating-point value and is the **DOUBLE** type specified in [\[MS-DTYP\]](#) section 2.2.8. A **CSOM Double** value MUST be in the range from $-1.79769313486232e308$ to $1.79769313486232e308$.

2.2.5.6.1 CSOM Double XML Value

If a **CSOM Double** value is used in request XML, it MUST conform to the following XML schema:

```
<xs:simpleType name="CSOMDouble">  
  <xs:restriction base="xs:double" />  
</xs:simpleType>
```

2.2.5.6.2 CSOM Double JSON Value

If a **CSOM Double** value is used in response JSON text, it is a JSON number and it MUST be in the range from $-1.79769313486232e308$ to $1.79769313486232e308$. It MUST also conform to the following format:

```
csom-double-value = rfc4627-number
```

2.2.5.7 CSOM Enum

The **CSOM Enum** simple type is an **integer** whose values are constrained to a specific set of values.

2.2.5.7.1 CSOM Enum XML Value

If a **CSOM Enum** value is used in request XML, it MUST conform to the following XML schema:

```
<xs:simpleType name="CSOMEnum">
  <xs:restriction base="xs:integer" />
</xs:simpleType>
```

2.2.5.7.2 CSOM Enum JSON Value

If a **CSOM Enum** value is used in response JSON text, it is a JSON number and it MUST conform to the following format:

```
csom-enum-value          = [rfc4627-minus] 1*DIGIT
```

2.2.5.8 CSOM GUID

The **CSOM GUID** simple type is a GUID and is the **GUID** type specified in [\[MS-DTYP\]](#) section 2.3.2.2.

2.2.5.8.1 CSOM Guid XML Value

If a **CSOM GUID** value is used in request XML, it MUST conform to the following XML schema:

```
<xs:simpleType name="CSOMGUID">
  <xs:restriction base="xs:string">
    <xs:pattern value="\{[0-9A-Fa-f]{8}-[0-9A-Fa-f]{4}-[0-9A-Fa-f]{4}-[0-9A-
      Fa-f]{4}-[0-9A-Fa-f]{12}\}" />
  </xs:restriction>
</xs:simpleType>
```

2.2.5.8.2 CSOM GUID JSON Value

If a **CSOM GUID** value is used in response JSON text, it is a JSON **string** and it MUST conform to the following format:

```
csom-guid-value          = rfc4627-quotation-mark guid-prefix
                           guid-string
                           guid-suffix rfc4627-quotation-mark
guid-prefix              = %x5C.2F.47.75.69.64.28 ; "\/Guid("
guid-suffix              = %x29.5C.2F ; ")\/"
guid-string              = 4hexOctet "-" 2hexOctet "-" 2hexOctet
                           "-" 2hexOctet "-" 6hexOctet
hexOctet                 = hexDigit hexDigit
hexDigit                 = "0" / "1" / "2" / "3" / "4" /
                           "5" / "6" / "7" / "8" / "9" /
                           "a" / "b" / "c" / "d" / "e" / "f" /
                           "A" / "B" / "C" / "D" / "E" / "F"
```

For example, a **CSOM GUID** value of "af300e5f-ec35-4f39-998f-6c3694a04706" is specified as:

"\Guid(af300e5f-ec35-4f39-998f-6c3694a04706)\\"/>"

2.2.5.9 CSOM Int16

The **CSOM Int16** simple type is a 16-bit, signed **integer** value and is the **INT16** type specified in [\[MS-DTYP\]](#) section 2.2.21. The range of **CSOM Int16** values is from -32768 to 32767.

2.2.5.9.1 CSOM Int16 XML Value

If a **CSOM Int16** value is used in request XML, it MUST conform to the following XML schema:

```
<xs:simpleType name="CSOMInt16">
  <xs:restriction base="xs:short" />
</xs:simpleType>
```

2.2.5.9.2 CSOM Int16 JSON Value

If a **CSOM Int16** value is used in response JSON text, it is a JSON number and it MUST be in the range from -32768 to 32767. It MUST also conform to the following format:

```
csom-int16-value = [rfc4627-minus] 1*5DIGIT
```

2.2.5.10 CSOM Int32

The **CSOM Int32** simple type is a 32-bit, signed **integer** value and is the **INT32** type specified in [\[MS-DTYP\]](#) section 2.2.22. The range of **CSOM Int32** values is from -2147483648 to 2147483647.

2.2.5.10.1 CSOM Int32 XML Value

If a **CSOM Int32** value is used in request XML, it MUST conform to the following XML schema:

```
<xs:simpleType name="CSOMInt32">
  <xs:restriction base="xs:int" />
</xs:simpleType>
```

2.2.5.10.2 CSOM Int32 JSON Value

If a **CSOM Int32** value is used in response JSON text, it is a JSON number and it MUST be in the range from -2147483648 to 2147483647. It MUST also conform to the following format:

```
csom-int32-value = [rfc4627-minus] 1*10DIGIT
```

2.2.5.11 CSOM Int64

The **CSOM Int64** simple type is a 64-bit, signed **integer** value and is the **INT64** type specified in [\[MS-DTYP\]](#) section 2.2.23. The range of **CSOM Int64** values is from -9223372036854775808 to 9223372036854775807.

2.2.5.11.1 CSOM Int64 XML Value

If a **CSOM Int64** value is used in request XML, it MUST conform to the following XML schema:

```
<xs:simpleType name="CSOMInt64">
  <xs:restriction base="xs:long" />
</xs:simpleType>
```

2.2.5.11.2 CSOM Int64 JSON Value

If a **CSOM Int64** value is used in response JSON text, it is a JSON number and it MUST conform to the following format:

```
csom-int64-value      = [rfc4627-minus] 1*19DIGIT
```

2.2.5.12 CSOM SByte

The **CSOM SByte** simple type is an 8-bit, signed **integer** value and is the **INT8** type specified in [\[MS-DTYP\]](#) section 2.2.20. The range of **CSOM SByte** values is from -128 to 127.

2.2.5.12.1 CSOM SByte XML Value

If a **CSOM SByte** value is used in request XML, it MUST conform to the following XML schema:

```
<xs:simpleType name="CSOMSByte">
  <xs:restriction base="xs:byte" />
</xs:simpleType>
```

2.2.5.12.2 CSOM SByte JSON Value

If a **CSOM SByte** value is used in response JSON text, it is a JSON number and it MUST be in the range from -128 to 127. It MUST also conform to the following format:

```
csom-sbyte-value     = [rfc4627-minus] 1*3DIGIT
```

2.2.5.13 CSOM Single

The **CSOM Single** simple type is a 32-bit, single-precision, floating-point value and is the **FLOAT** type specified in [\[MS-DTYP\]](#) section 2.2.15. The range of **CSOM Single** values is from -3.402823e38 to 3.402823e38.

2.2.5.13.1 CSOM Single XML Value

If a **CSOM Single** value is used in request XML, it MUST conform to the following XML schema:

```
<xs:simpleType name="CSOMSingle">
  <xs:restriction base="xs:float" />
</xs:simpleType>
```

2.2.5.13.2 CSOM Single JSON Value

If a **CSOM Single** value is used in response JSON text, it is a JSON number and it MUST be in the range from $-3.402823e38$ to $3.402823e38$. It MUST also conform to the following format:

```
csom-single-value = rfc4627-number
```

2.2.5.14 CSOM String

The **CSOM String** simple type is a representation of text as a series of Unicode characters.

2.2.5.14.1 CSOM String XML Value

If a **CSOM String** value is used in request XML, it MUST conform to the following XML schema:

```
<xs:simpleType name="CSOMString">
  <xs:restriction base="xs:string" />
</xs:simpleType>
```

2.2.5.14.2 CSOM String JSON Value

If a **CSOM String** value is used in response JSON text, all of the characters except the Unicode character solidus `"\"` (U+002F) are represented by using the value `"rfc4627-char"`. The Unicode character solidus `"\"` (U+002F) MUST be escaped as:

```
\"u002f
```

Or:

```
\"u002F
```

Not:

```
\"/
```

The **CSOM String** value is a JSON **string** and it MUST conform to the following format:

```
csom-string-value = rfc4627-quotation-mark
                   *restricted-char
                   rfc4627-quotation-mark
rfc4627-quotation-mark = %x22 ; "
restricted-char = rfc4627-unescaped /
                 rfc4627-escape (
                   %x22 / ; " quotation mark U+0022
                   %x5C / ; \ reverse solidus U+005C
                   %x62 / ; b backspace U+0008
                   %x66 / ; f form feed U+000C
                   %x6E / ; n line feed U+000A
                   %x72 / ; r carriage return U+000D
                   %x74 / ; t tab U+0009
                   %x75 4HEXDIG ) ; uXXXX U+XXXX
```

```
rfc4627-escape           = %x5C           ; \
rfc4627-quotation-mark  = %x22           ; "
rfc4627-unescaped       = %x20-21 / %x23-5B / %x5D-10FFFF
```

For example, the **string** literal value "example/bar" is specified as:

```
"example\u002fbar"
```

2.2.5.15 CSOM UInt16

The **CSOM UInt16** simple type is an unsigned, 16-bit **integer** value and is the **UINT16** type specified in [\[MS-DTYP\]](#) section 2.2.47. The range of **CSOM UInt16** values is 0–65535.

2.2.5.15.1 CSOM UInt16 XML Value

If a **CSOM UInt16** value is used in request XML, it MUST conform to the following XML schema:

```
<xs:simpleType name="CSOMUInt16">
  <xs:restriction base="xs:unsignedShort" />
</xs:simpleType>
```

2.2.5.15.2 CSOM UInt16 JSON Value

If a **CSOM UInt16** value is used in response JSON text, it is a JSON number and it MUST be in the range 0–65535. It MUST also conform to the following format:

```
csom-uint16-value      = 1*5DIGIT
```

2.2.5.16 CSOM UInt32

The **CSOM UInt32** simple type is an unsigned, 32-bit **integer** value and is the **UINT32** type specified in [\[MS-DTYP\]](#) section 2.2.48. The range of **CSOM UInt32** values is 0–4294967295.

2.2.5.16.1 CSOM UInt32 XML Value

If a **CSOM UInt32** value is used in request XML, it MUST conform to the following XML schema:

```
<xs:simpleType name="CSOMUInt32">
  <xs:restriction base="xs:unsignedInt" />
</xs:simpleType>
```

2.2.5.16.2 CSOM UInt32 JSON Value

If a **CSOM UInt32** value is used in response JSON text, it is a JSON number and it MUST be in the range 0–4294967295. It MUST also conform to the following format:

```
csom-uint32-value     = 1*10DIGIT
```

2.2.5.17 CSOM UInt64

The **CSOM UInt64** simple type is an unsigned, 64-bit **integer** value and is the **UINT64** type specified in [\[MS-DTYP\]](#) section 2.2.49. The range of **CSOM UInt64** values is 0–18446744073709551615.

2.2.5.17.1 CSOM UInt64 XML Value

If a **CSOM UInt64** value is used in request XML, it MUST conform to the following XML schema:

```
<xs:simpleType name="CSOMUInt64">
  <xs:restriction base="xs:unsignedLong" />
</xs:simpleType>
```

2.2.5.17.2 CSOM UInt64 JSON Value

If a **CSOM UInt64** value is used in response JSON text, it is a JSON number and it MUST be in the range 0–18446744073709551615. It MUST also conform to the following format:

```
csom-uint64-value = 1*20DIGIT
```

2.2.5.18 CSOM Decimal

The **CSOM Decimal**[<2>](#) simple type is a 128-bit, fixed precision, numeric value. A **CSOM Decimal** value MUST be in the range from -79,228,162,514,264,337,593,543,950,335 through 79,228,162,514,264,337,593,543,950,335.

2.2.5.18.1 CSOM Decimal XML Value

If a **CSOM Decimal** value is used in request XML, it MUST conform to the following XML schema:

```
<xs:simpleType name="CSOMDecimal">
  <xs:restriction base="xs:decimal" />
</xs:simpleType>
```

2.2.5.18.2 CSOM Decimal JSON Value

If a **CSOM Decimal** value is used in response JSON text, it is a JSON string whose string value is the XML string representation of the decimal value. It MUST also conform to the following format:

```
csom-decimal-value = rfc4627-quotation-mark
                    csom-decimal
                    rfc4627-quotation-mark
csom-decimal       = [ rfc4627-minus ]
                    1*29DIGIT
                    [ "." 1*29DIGIT ]
```

2.2.5.19 CSOM TimeSpan

The **CSOM TimeSpan**[<3>](#) simple type represents a duration of time.

2.2.5.19.1 CSOM TimeSpan XML Value

If a **CSOM TimeSpan** value is used in request XML, it MUST conform to the following XML schema:

```
<xs:simpleType name="CSOMTimeSpan">
  <xs:restriction base="xs:duration" />
</xs:simpleType>
```

2.2.5.19.2 CSOM TimeSpan JSON Value

If a **CSOM TimeSpan** value is used in response JSON text, it is a JSON string and the JSON string value MUST be the XML representation of the duration data type specified by [\[XMLSCHEMA2\]](#). It MUST also conform to the following format:

```
csom-timespan-value    = rfc4627-quotation-mark
                        csom-duration
                        rfc4627-quotation-mark
csom-duration          = <defined by the lexical representation for duration
                        in [XMLSCHEMA2] >
```

For example, a duration of 2 days 3 hours 4 minutes 5 seconds is specified as:

```
"P2DT3H4M5S"
```

2.2.6 Attributes

This specification does not define any common XML schema attribute definitions.

2.2.7 Groups

This specification does not define any common XML schema group definitions.

2.2.8 Attribute Groups

This specification does not define any common XML schema attribute group definitions.

3 Protocol Details

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

This protocol allows protocol servers to perform implementation-specific authorization checks and to notify protocol clients of authorization faults by using either HTTP **Status-Codes** or **CSOM error JSON** values. Except where specified otherwise, protocol clients SHOULD interpret HTTP Status-Codes as specified in [\[RFC2616\]](#) section 10 and CSOM error JSON values as specified in section [3.1.4.1.8.1.2](#).

3.1 Server Details

3.1.1 Abstract Data Model

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

The SharePoint Client Query Data Model represents the data structures that are used by a protocol client and a protocol server. The following figure shows the communication sequence between a protocol client and a protocol server.

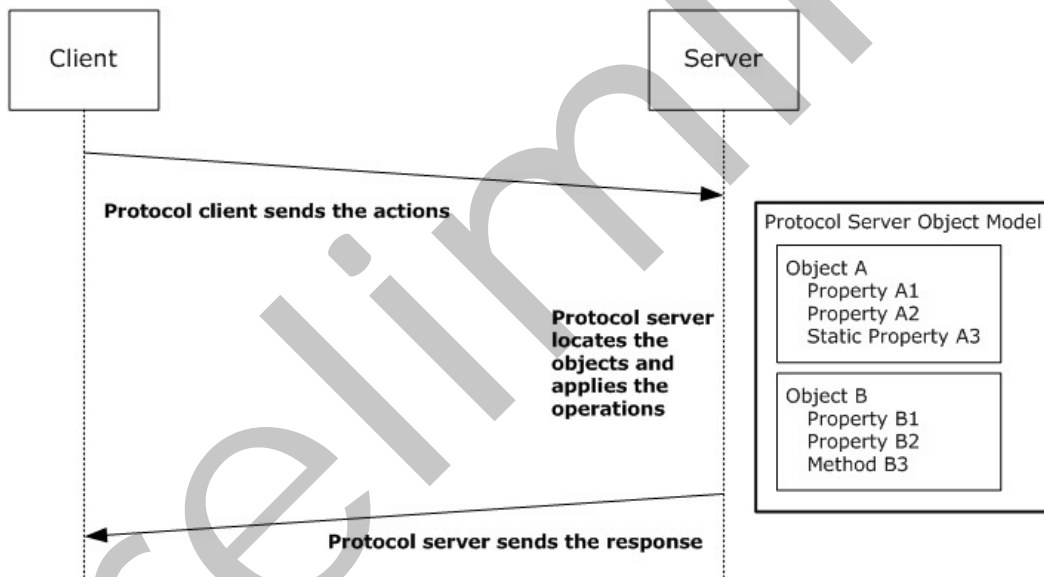


Figure 3: Communication sequence between a protocol client and a protocol server

3.1.1.1 Protocol Server Type Set

A protocol server exposes one or more sets of types that are accessible and can be called by a protocol client. Each type set contains a set of **CSOM value object types**, **CSOM Object types**, and CSOM **enumerations**.

CSOM Value Object Type

A CSOM value object type is a **CSOM type** that contains a set of named values, which are referred to as members. Each CSOM value object type has type information that is identified by a Unicode **string**, which is referred to as a CSOM type name. Each CSOM value object type is also associated with a **CSOM GUID**, which is referred to as a **CSOM type identifier**.

CSOM Object Type

A CSOM Object type is a CSOM type that contains a set of named values and methods, which are referred to as members. Each CSOM Object type has a type name that is identified by a Unicode **string**, which is referred to as a CSOM type name. Each CSOM Object type is also associated with a **CSOM GUID**, which is referred to as a CSOM type identifier.

CSOM Null

A **CSOM null** is a special value that can be used instead of a CSOM Object, CSOM value object, **CSOM array**, **CSOM binary**, or **CSOM String**. A **CSOM null** value indicates that no instance is specified.

CSOM Property

A **CSOM property** is a member that is declared in a CSOM value object type or a CSOM Object type. The value of a CSOM property can be read and, optionally, changed by a protocol client. A definition of a CSOM property includes the following:

- **Name:** A Unicode **string** that represents the name of the CSOM property.
- **Accessibility:** Whether the protocol client can only read or can also change the value of the CSOM property.
- **Type:** The CSOM type of the value that is contained by the CSOM property.

CSOM Expando Field

A protocol client can have predefined knowledge of the methods and properties that are exposed for types in a type set that is on a protocol server. A protocol server can expose additional properties for objects. These custom properties, which are referred to as CSOM expando fields, contain additional state information that applies to an instance of the type. These properties behave similarly to other instances of scalar properties for the type.

Protocol servers that expose types with CSOM expando fields can use a naming convention to help identify these properties as custom properties. For example, "PropertySetName\$PropertyName" is one such convention, where a protocol client can assume that any property that is returned by the protocol server and starts with "PropertySetName\$" is a custom property.

With the exception of server-defined, implementation-specific, naming conventions, this protocol does not specify a mechanism for discovering the exact set of CSOM expando fields for an object. A protocol client cannot define or specify additional CSOM expando fields for a type. It can only process the CSOM expando fields that are returned from the protocol server.

CSOM Method

A **CSOM method** is a method that is declared in a CSOM Object type and can be invoked by a protocol client. A definition of a CSOM method includes the following:

- **Name:** A Unicode **string** that represents the name of the CSOM method.
- **Arguments:** An ordered collection of parameters that can be passed when the method is called. Each parameter has a CSOM type.
- **Return type:** The CSOM type of the value that is returned by the CSOM method. If the CSOM method does not return any value, it does not have a return type.

The protocol server can provide access control restrictions to CSOM properties and CSOM methods. If a protocol server implements access control restrictions, all of the operations that are provided by this protocol respect those restrictions when calling methods and reading or writing property values.

CSOM Expression

A **CSOM expression** is an expression that is evaluated on a protocol server.

CSOM Error

A CSOM error is a type that contains information about an error that occurred on a protocol server. The error information consists of an error code, which is a **CSOM Int32**, an error message, which is a CSOM String, a call-stack trace, which is a **CSOM String**, a type name, which is a **CSOM String**, and an additional information value, which is a **CSOM String**.

CSOM Object Path

A CSOM Object path is the data that a protocol server uses to obtain the CSOM Object that a **CSOM action** is performed on.

CSOM Object Path List

A CSOM Object path list is a list of zero or more paths to a CSOM Object on a protocol server.

3.1.1.2 Client Actions

A protocol client sends one or more actions that execute against a type set that is exposed by a protocol server.

CSOM Action

A CSOM action is an action to be performed on a protocol server. The different types of actions are:

- **ObjectPath:** Instantiates a CSOM Object.
- **Query:** Queries the values of scalar properties for a specified CSOM Object or CSOM Object type.
- **ChildItemQuery:** Queries the values of scalar properties of CSOM Objects that are child objects of a specified CSOM Object collection.
- **ObjectIdentityQuery:** Queries the canonical identity of a specified CSOM Object.
- **SetProperty or SetStaticProperty:** Sets the value of a scalar property for a specified CSOM Object or CSOM Object type.

- **Method or StaticMethod:** Calls a method for a specified CSOM Object or CSOM Object type.
- **ConditionalScope:** Evaluates a **Boolean** conditional expression and executes a set of actions based on the evaluated value that results from the expression.
- **ExceptionHandlingScope:** Performs a try/catch/finally mechanism. The set of actions for the try block is executed. If an unhandled exception occurs, it is caught and the set of actions for the catch block is executed, followed by the set of actions for the finally block. If an unhandled exception does not occur, the set of actions for the finally block is executed after the set of actions for the try block.

CSOM Action List

A **CSOM action list** is an ordered list of zero or more CSOM actions to be processed by a protocol server.

CSOM Action Response Structure

A **CSOM action response structure** contains the data that results from processing a CSOM action list.

3.1.1.3 Request Processing

A protocol client initiates this protocol by sending a request to the protocol server. The request consists of a CSOM action list and a CSOM Object path list. The CSOM action list contains the CSOM actions to be executed by the protocol server. The CSOM Object path list contains the CSOM Object path that the protocol server can use to obtain the CSOM Object or CSOM Object type that a CSOM action is performed on.

After the protocol server finishes processing the CSOM action list, it sends a response to the protocol client. If no unhandled errors occurred during processing, the response contains a CSOM action response structure that contains the processing results for the CSOM action list. Otherwise, the response contains a CSOM error that provides details about the unhandled error.

3.1.2 Timers

None.

3.1.3 Initialization

None.

3.1.4 Message Processing Events and Sequencing Rules

The following table summarizes the list of WSDL operations as defined by this specification:

Operation	Description
ProcessQuery	Process the CSOM action list in the request message and respond with JSON text that contains the results of executing the specified CSOM actions

3.1.4.1 ProcessQuery

During this operation, the protocol server receives a message and extracts the XML request message that contains a CSOM action list, processes that CSOM action list, and then responds with JSON text that contains the results of processing the CSOM action list.

The protocol server endpoint for this operation is formed by appending "/_vti_bin/client.svc/ProcessQuery" to the URL of the **Web site (2)**, for example "http://www.example.com/Repository/_vti_bin/client.svc/ProcessQuery".

The protocol client sends a **ProcessQueryIn** (section [3.1.4.1.1.1](#)) message, and the protocol server responds with a **ProcessQueryOut**(section [3.1.4.1.1.2](#)) message, as follows:

1. The protocol client sends a **ProcessQueryIn** request message that contains a CSOM action list and a CSOM Object path list. The CSOM action list contains the CSOM actions to be executed by the protocol server. The CSOM Object path list contains the CSOM Object paths that the protocol server can use to obtain the CSOM Object or CSOM Object type on which a CSOM action is to be performed.
2. The protocol server receives the **ProcessQueryIn** request message and processes the CSOM action list.
3. After the protocol server finishes processing the CSOM action list, it responds to the protocol client with a **ProcessQueryOut** response message. If no unhandled errors occur during processing, the response contains a CSOM action response structure that contains the processing results for the CSOM action list. Otherwise, the response contains a CSOM error that provides details about the unhandled error.

The protocol server processes a CSOM action list as follows:

1. The CSOM action response structure is initially empty.
2. If all of the CSOM actions in the CSOM action list have been processed, the protocol server MUST stop processing the CSOM action list.
3. If one or more of the CSOM actions in the CSOM action list have not been processed, the protocol server MUST execute the first unprocessed CSOM action in the CSOM action list.
4. If the CSOM action is executed successfully, the CSOM action is considered processed, and the result of the CSOM action execution MUST be appended to the CSOM action response structure when the CSOM action has result. The protocol server then repeats steps 2 and 3.
5. If an unhandled exception occurs when executing the CSOM action, the protocol server MUST stop processing the CSOM action list.

The operation ends when the protocol server stops processing the CSOM action list.

If no unhandled exceptions occur while processing the CSOM action list, the protocol server MUST respond with JSON output data in the form of a CSOM action response structure. If an unhandled exception occurs while processing the CSOM action list, the protocol server MUST respond with JSON output data in the form of a CSOM error that provides details about the unhandled error.

3.1.4.1.1 Message

The following table summarizes the set of WSDL message definitions that are specific to this operation.

Message	Description
ProcessQueryIn	The request message for the ProcessQuery Web service method.
ProcessQueryOut	The response message for the ProcessQuery Web service method.

3.1.4.1.1.1 ProcessQueryIn

The **ProcessQueryIn** message is the request message for the **ProcessQuery** Web service method.

When there is no CSOM Stream data involved in the request, the **ProcessQueryIn** message is an XML document that MUST adhere to the request XML schema specified in section [6.1](#).

When there is CSOM Stream data involved in the request, the **ProcessQueryIn** message is a MIME multipart/related message as specified by [\[RFC2387\]](#), and the first MIME part is an XML document that MUST adhere to the request XML schema specified in section [6.1](#). The other MIME parts contain CSOM Stream data used by the request. Each MIME part in the MIME multipart/related message MUST have a Content-Length MIME header.

For example, the following is a request message that contains three MIME parts where the first MIME part is the XML document and the other two MIME parts contain CSOM Stream data used by the request.

```
--D1995E12-4610-4C2B-AB08-C1A0ECE8CE4D+id=1
Content-ID: <http://sharepoint.microsoft.com/client/634551683559778320>
Content-Transfer-Encoding: 8bit
Content-Type: application/xop+xml;charset=utf-8;type="application/xml"
Content-Length: 1203

<Request AddExpandoFieldTypeSuffix="true" SchemaVersion="15.0.0.0" LibraryVersion="15.0.0.0"
ApplicationName=".NET Library"
xmlns="http://schemas.microsoft.com/sharepoint/clientquery/2009"><Actions><ObjectPath Id="2"
ObjectPathId="1" /><ObjectPath Id="4" ObjectPathId="3" /><ObjectPath Id="6" ObjectPathId="5"
/><Method Name="UpdateSampleStream" Id="7" ObjectPathId="5"><Parameters><Parameter
Type="Binary"><Include href="cid:http://sharepoint.microsoft.com/8"
/></Parameter></Parameters></Method><ObjectPath Id="10" ObjectPathId="9" /><Method
Name="UpdateSampleStream" Id="11" ObjectPathId="9"><Parameters><Parameter
Type="Binary"><Include href="cid:http://sharepoint.microsoft.com/12"
/></Parameter></Parameters></Method></Actions><ObjectPaths><StaticProperty Id="1"
TypeId="{acc57e47-24b0-4400-b1c7-aa1cf3c9542d}" Name="Catalog" /><Property Id="3"
ParentId="1" Name="Books" /><Method Id="5" ParentId="3" Name="GetById"><Parameters><Parameter
Type="Guid">{3387ac63-e73d-421f-bff7-359a4aa2bc38}</Parameter></Parameters></Method><Method
Id="9" ParentId="3" Name="GetById"><Parameters><Parameter Type="Guid">{704655a3-c136-469c-
a578-f79652a93f9b}</Parameter></Parameters></Method></ObjectPaths></Request>
--D1995E12-4610-4C2B-AB08-C1A0ECE8CE4D+id=1
Content-ID: <http://sharepoint.microsoft.com/8>
Content-Transfer-Encoding: binary
Content-Type: application/octet-stream
Content-Length: 26

New sample content of book
--D1995E12-4610-4C2B-AB08-C1A0ECE8CE4D+id=1
Content-ID: <http://sharepoint.microsoft.com/12>
Content-Transfer-Encoding: binary
Content-Type: application/octet-stream
Content-Length: 28

New sample content of book 2
```

3.1.4.1.1.2 ProcessQueryOut

The **ProcessQueryOut** message is the response message for the **ProcessQuery** Web service method.

If no CSOM Stream is returned to the protocol client, the message is JSON text that MUST adhere to the JSON response structure specified in section [3.1.4.1.8.2](#).

If CSOM Stream is returned to the protocol client, the message is a MIME multipart/related message as specified by [RFC2387](#), and the first MIME part is the JSON text that MUST adhere to the JSON response structure specified in section [3.1.4.1.8.2](#). The other MIME parts contain the CSOM Stream data returned by the protocol server. Each MIME part MUST have a Content-Length MIME header.

For example, the following is a response message that contains three MIME parts where the first MIME part is the JSON text and the other two MIME parts contain CSOM Stream data returned by the protocol server.

```
--1599120F-20CE-4389-9371-BDC377356FEF+id=1
Content-ID: <http://sharepoint.microsoft.com/client/634551729566307786>
Content-Transfer-Encoding: eightbit
Content-Type: application/jop+json;charset=utf-8;type="application/json"
Content-Length: 653

[
  {
    "SchemaVersion":"15.0.0.0","LibraryVersion":"15.0.3421.3000","ErrorInfo":null
  },2,{
    "IsNull":false
  },4,{
    "IsNull":false
  },6,{
    "IsNull":false
  },7,{
    "_ObjectType_":"SampleCode.Book","Author":"Soha Kamal","Id":"\Guid(3387ac63-e73d-421f-bff7-359a4aa2bc38)\","PublishDate":"\Date(2008,2,1,0,0,0)\","Status":0,"Title":"How to Cook Chinese Food"
  },8,"\Binary(http%3a%2f%2fsharepoint.microsoft.com%2fclient%2fattachment%2f0%2f634551729566257776)\","10,{
    "IsNull":false
  },11,{
    "_ObjectType_":"SampleCode.Book","Author":"Patrick Hines","Status":0
  },12,"\Binary(http%3a%2f%2fsharepoint.microsoft.com%2fclient%2fattachment%2f1%2f634551729566307786)\"]
--1599120F-20CE-4389-9371-BDC377356FEF+id=1
Content-ID: <http://sharepoint.microsoft.com/client/attachment/0/634551729566257776>
Content-Transfer-Encoding: binary
Content-Type: application/octet-stream
Content-Length: 48

Sample Content of book How to Cook Chinese Food.
--1599120F-20CE-4389-9371-BDC377356FEF+id=1
Content-ID: <http://sharepoint.microsoft.com/client/attachment/1/634551729566307786>
Content-Transfer-Encoding: binary
```

Content-Type: application/octet-stream
Content-Length: 37

Sample Content of book Family Recipe.
--1599120F-20CE-4389-9371-BDC377356FEF+id=1--

3.1.4.1.2 Elements

The following table summarizes the XML schema element definitions that are specific to this operation.

Element	Description
Request	Contains the input data for a ProcessQuery operation.

3.1.4.1.2.1 Request

The **Request** element contains the input data for a **ProcessQuery** operation. The definition of the **Request** element is:

```
<xs:element name="Request" type="RequestType" xmlns:xs="http://www.w3.org/2001/XMLSchema"/>
```

3.1.4.1.3 Complex Types

The following table summarizes the XML schema complex type definitions that are specific to this operation.

Complex type	Description
ActionInstantiateObjectPathType	A CSOM action that instantiates the CSOM Object associated with the specified CSOM Object path identifier.
ActionInvokeMethodType	A CSOM action that calls a method on a CSOM Object, which is obtained from a specified CSOM Object path identifier, passing any parameters for the method.
ActionInvokeStaticMethodType	A CSOM action that invokes a static method on a CSOM Object type, which is obtained from a specified CSOM Object path, passing any parameters.
ActionObjectIdentityQueryType	A CSOM action that obtains the object identity of a CSOM Object.
ActionQueryType	A CSOM action that obtains the data resulting from a child item query on a CSOM Object.
ActionSetPropertyType	A CSOM action that sets the property of a CSOM Object to a specified parameter value.
ActionSetStaticPropertyType	A CSOM action that sets the static property of a CSOM Object type to a specified parameter value.
ActionTypes	An ordered list of CSOM actions to execute.

Complex type	Description
ChildItemQueryType	The child item query that is applied to a CSOM Object collection.
ConditionalScopeType	A CSOM action that evaluates a conditional expression that does not have any input parameters.
ExceptionHandlingScopeSimpleType	A CSOM action that attempts to execute an ordered list of CSOM actions.
ExceptionHandlingScopeType	a CSOM action that attempts to execute an ordered list of CSOM actions specified by a TryScope element.
ExpressionConvertExpressionType	A component of an expression that takes the evaluated value of an expression and converts that value to a specified type.
ExpressionLeftRightOperandExpressionType	A component of an expression that represents the left and right operands of a binary expression.
ExpressionMethodExpressionType	A component of an expression that represents a method to call, including any applicable parameters, on the CSOM Object specified by its first immediate child element.
ExpressionParameterExpressionType	A component of an expression that represents the input parameter of an expression.
ExpressionPropertyExpressionType	A component of an expression that represents a property of a CSOM Object or CSOM value object.
ExpressionQueryableExpressionType	A component of an expression that represents the queryable expression component of a child item query that is applied to a CSOM Object collection to retrieve a filtered subset of child CSOM Objects.
ExpressionQueryableTakeType	A component of an expression that represents a filtered set of CSOM Objects that are returned from an inner queryable expression that returns a specified number of CSOM Objects.
ExpressionQueryableWhereType	A component of an expression that represents a filtered set of CSOM Objects that are returned from an inner queryable expression.
ExpressionStaticMethodExpressionType	A component of an expression that represents a static method to call, including any parameters, on a CSOM Object type.
ExpressionStaticPropertyExpressionType	A component of an expression that represents a static property of a CSOM Object type.
ExpressionType	An expression, which is a combination of operators, symbols, constants, literal values, functions, names of fields or columns, controls, and properties that evaluates to a single value.
MethodParameterType	A parameter that can be passed when calling a method or setting a property.

Complex type	Description
ObjectPathConstructorType	A CSOM Object path that specifies the CSOM Object that is obtained by invoking a constructor method, including any parameters, of a specified type.
ObjectPathMethodType	A CSOM Object path that specifies a CSOM Object that is obtained by calling a method, including any parameters, of a CSOM Object.
ObjectPathObjectIdentityNameType	A CSOM Object path that specifies the CSOM Object that is obtained from a specified CSOM Object identity.
ObjectPathPropertyType	A CSOM Object path that specifies the CSOM Object that is obtained by accessing a property of a CSOM Object.
ObjectPathStaticMethodType	A CSOM Object path that specifies the CSOM Object that is obtained by calling a static method, including any parameters, of a CSOM Object type.
ObjectPathStaticPropertyType	A CSOM Object path that specifies the CSOM Object that is obtained by accessing a static property of a CSOM Object type.
ObjectPathsType	A CSOM Object path list.
QueryPropertyType	A child item query component that retrieves property data for a CSOM Object.
QueryType	A child item query that returns data about a specified CSOM Object.
RequestType	The root element of a ProcessQueryIn XML request, as specified in section 3.1.4.1.1.1 .

3.1.4.1.3.1 ActionInstantiateObjectPathType

The **ActionInstantiateObjectPathType** complex type specifies a CSOM action that instantiates the CSOM Object associated with the specified CSOM Object path identifier. The protocol server MUST instantiate the CSOM Object with the specified CSOM Object path identifier only once. If the CSOM Object with the specified CSOM Object path identifier is already instantiated, this CSOM action MUST NOT instantiate the object again.

If the CSOM action executes successfully, the protocol server MUST append the CSOM action identifier and an **ObjectPathResponse** JSON value, as specified in section [3.1.4.1.8.2.1.6](#), to the JSON response structure, as specified in section [3.1.4.1.8.2](#).

If the CSOM action fails and the exception is not handled by **ExceptionHandlingScopeSimpleType**, as specified in section [3.1.4.1.3.11](#), or **ExceptionHandlingScopeType**, as specified in section [3.1.4.1.3.12](#), the protocol server MUST set the exception information in the **ErrorInfo** member of **Response Header JSON Value**, as specified in section [3.1.4.1.8.1.5](#).

3.1.4.1.3.1.1 Schema

```
<xs:complexType name="ActionInstantiateObjectPathType"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:attribute name="Id" type="mstns:ActionIdType" use="required"/>
  <xs:attribute name="ObjectPathId" type="mstns:ObjectPathIdType" use="required"/>
</xs:complexType>
```

3.1.4.1.3.1.2 Attributes

Id: The identifier of the CSOM action. This value MUST be unique from all other **IdType** values, as specified in section [3.1.4.1.4.3](#), in the request.

ObjectPathId: The identifier of the CSOM Object path, which is used to obtain the CSOM Object on which the CSOM action is performed.

3.1.4.1.3.1.3 Child Elements

None.

3.1.4.1.3.2 ActionInvokeMethodType

The **ActionInvokeMethodType** complex type specifies a CSOM action that calls a method on a CSOM Object, which is obtained from a specified CSOM Object path identifier, and passes any parameters for the method.

If the CSOM action executes successfully and the method that is called does not have a void return type, the protocol server MUST append the CSOM action identifier and a **MethodResponse** JSON value, as specified in section [3.1.4.1.8.2.1.4](#), to the JSON response structure, as specified in section [3.1.4.1.8.2](#).

If the CSOM action executes successfully and the method that is called has a void return type, the protocol server MUST NOT modify the JSON response structure, as specified in section [3.1.4.1.8.2](#).

If the CSOM action fails and the exception is not handled by **ExceptionHandlingScopeSimpleType**, as specified in section [3.1.4.1.3.11](#), or **ExceptionHandlingScopeType**, as specified in section [3.1.4.1.3.12](#), the protocol server MUST set the exception information in the **ErrorInfo** member of **Response Header JSON Value**, as specified in section [3.1.4.1.8.1.5](#).

3.1.4.1.3.2.1 Schema

```
<xs:complexType name="ActionInvokeMethodType" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element name="Parameters" minOccurs="0">
      <xs:complexType>
        <xs:sequence>
          <xs:element name="Parameter" type="mstns:MethodParameterType" minOccurs="0"
maxOccurs="unbounded"/>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="Id" type="mstns:ActionIdType" use="required"/>
  <xs:attribute name="ObjectPathId" type="mstns:ObjectPathIdType" use="required"/>
  <xs:attribute name="Name" type="mstns:MethodNameType" use="required"/>
</xs:complexType>
```

```
<xs:attribute name="Version" type="xs:string" use="optional"/>
</xs:complexType>
```

3.1.4.1.3.2.2 Attributes

Id: The identifier of the CSOM action. This value MUST be unique from all other **IdType** values, as specified in section [3.1.4.1.4.3](#), in the request.

Name: The name of the method to call on the CSOM Object that is specified by the **ObjectPathId** attribute. It MUST be the name of a valid method of the CSOM Object.

ObjectPathId: The identifier of the CSOM Object path, which is used to obtain the CSOM Object on which the CSOM action is performed.

Version: The version of the CSOM Object. If this attribute exists and the specified method requires that the object version is checked, the protocol server MUST first check this value against the current version of the CSOM Object. If the specified version does not match the actual version, the server MUST fail the method call and return an error with both the error code "-2130575339" and the error type name "Microsoft.SharePoint.Client.VersionConflictException".

3.1.4.1.3.2.3 Child Elements

Parameter: A parameter in the parameter list that is passed into the method call.

Parameters: The list of parameters that is passed into the method call.

3.1.4.1.3.3 ActionInvokeStaticMethodType

The **ActionInvokeStaticMethodType** complex type specifies a CSOM action that invokes a static method on a CSOM Object type, which is obtained from a specified CSOM Object path, and passes any parameters.

If the CSOM action executes successfully and the static method that is called does not have a void return type, the protocol server MUST append the CSOM action identifier and a **MethodResponse** JSON value, as specified in section [3.1.4.1.8.2.1.4](#), to the JSON response structure, as specified in section [3.1.4.1.8.2](#).

If the CSOM action executes successfully and the static method that is called has a void return type, the protocol server MUST NOT modify the JSON response structure, as specified in section [3.1.4.1.8.2](#).

If the CSOM action fails and the exception is not handled by **ExceptionHandlingScopeSimpleType**, as specified in section [3.1.4.1.3.11](#), or **ExceptionHandlingScopeType**, as specified in section [3.1.4.1.3.12](#), the protocol server MUST set the exception information in the **ErrorInfo** member of **Response Header JSON Value**, as specified in section [3.1.4.1.8.1.5](#).

3.1.4.1.3.3.1 Schema

```
<xs:complexType name="ActionInvokeStaticMethodType"
  xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element name="Parameters" minOccurs="0">
      <xs:complexType>
        <xs:sequence>
```

```

        <xs:element name="Parameter" type="mstns:MethodParameterType" minOccurs="0"
maxOccurs="unbounded"/>
    </xs:sequence>
</xs:complexType>
</xs:element>
</xs:sequence>
<xs:attribute name="Id" type="mstns:ActionIdType" use="required"/>
<xs:attribute name="TypeId" type="mstns:TypeIdGuidType" use="required"/>
<xs:attribute name="Name" type="mstns:StaticMethodNameType" use="required"/>
</xs:complexType>

```

3.1.4.1.3.3.2 Attributes

Id: The identifier of this CSOM action. This value MUST be unique from all other **IdType** values, as specified in section [3.1.4.1.4.3](#), in the request.

Name: The name of the static method to call on the CSOM Object type that is specified by the **TypeId** attribute. It MUST be the name of a valid static method of the CSOM Object type.

TypeId: A GUID that identifies the CSOM Object type on which to call the static method.

3.1.4.1.3.3.3 Child Elements

Parameter: A parameter in the parameter list to be passed into the static method call.

Parameters: The list of parameters that is passed into the static method call.

3.1.4.1.3.4 ActionObjectIdentityQueryType

The **ActionObjectIdentityQueryType** complex type specifies a CSOM action that obtains the object identity of a CSOM Object.

If the CSOM action executes successfully, the protocol server MUST append the CSOM action identifier and an **ObjectIdentityQueryResponse** JSON value, as specified in section [3.1.4.1.8.2.1.5](#), to the JSON response structure, as specified in section [3.1.4.1.8.2](#).

If the CSOM action fails and the exception is not handled by **ExceptionHandlingScopeSimpleType**, as specified in section [3.1.4.1.3.11](#), or **ExceptionHandlingScopeType**, as specified in section [3.1.4.1.3.12](#), the protocol server MUST set the exception information in the **ErrorInfo** member of **Response Header JSON Value**, as specified in section [3.1.4.1.8.1.5](#).

3.1.4.1.3.4.1 Schema

```

<xs:complexType name="ActionObjectIdentityQueryType"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
    <xs:attribute name="Id" type="mstns:ActionIdType" use="required"/>
    <xs:attribute name="ObjectPathId" type="mstns:ObjectPathIdType" use="required"/>
</xs:complexType>

```

3.1.4.1.3.4.2 Attributes

Id: The identifier of the CSOM action. This value MUST be unique from all other **IdType** values, as specified in section [3.1.4.1.4.3](#), in the request.

ObjectPathId: The identifier of a CSOM Object path, which is used to obtain the CSOM Object on which the CSOM action is performed.

3.1.4.1.3.4.3 Child Elements

None.

3.1.4.1.3.5 ActionQueryType

The **ActionQueryType** complex type specifies a CSOM action that obtains the data resulting from a child item query on a CSOM Object.

If the CSOM action executes successfully, the protocol server **MUST** append the CSOM action identifier and a **QueryResponse** JSON value, as specified in section [3.1.4.1.8.2.1.7](#), to the JSON response structure, as specified in section [3.1.4.1.8.2](#).

If the CSOM action fails and the exception is not handled by **ExceptionHandlingScopeSimpleType**, as specified in section [3.1.4.1.3.11](#), or **ExceptionHandlingScopeType**, as specified in section [3.1.4.1.3.12](#), the protocol server **MUST** set the exception information in the **ErrorInfo** member of **Response Header JSON Value**, as specified in section [3.1.4.1.8.1.5](#).

3.1.4.1.3.5.1 Schema

```
<xs:complexType name="ActionQueryType" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element name="Query" type="mstns:QueryType"/>
    <xs:element name="ChildItemQuery" type="mstns:ChildItemQueryType" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="Id" type="mstns:ActionIdType" use="required"/>
  <xs:attribute name="ObjectPathId" type="mstns:ObjectPathIdType" use="required"/>
</xs:complexType>
```

3.1.4.1.3.5.2 Attributes

Id: The identifier of the CSOM action. This value **MUST** be unique from all other **IdType** values, as specified in section [3.1.4.1.4.3](#), in the request.

ObjectPathId: The identifier of a CSOM Object path, which is used to obtain the CSOM Object on which the action is performed.

3.1.4.1.3.5.3 Child Elements

ChildItemQuery: The child item query that is applied to the CSOM Object specified by the **ObjectPathId** attribute. If the **ChildItemQuery** element is present, the CSOM Object specified by the **ObjectPathId** attribute **MUST** be a CSOM Object collection.

Query: The child item query that is applied to the CSOM Object specified by the **ObjectPathId** attribute.

3.1.4.1.3.6 ActionSetPropertyType

The **ActionSetPropertyType** complex type specifies a CSOM action that sets the property of a CSOM Object to a specified parameter value.

If the CSOM action executes successfully, the protocol server MUST NOT modify the JSON response structure, as specified in section [3.1.4.1.8.2](#).

If the CSOM action fails and the exception is not handled by **ExceptionHandlingScopeSimpleType**, as specified in section [3.1.4.1.3.11](#), or **ExceptionHandlingScopeType**, as specified in section [3.1.4.1.3.12](#), the protocol server MUST set the exception information in the **ErrorInfo** member of **Response Header JSON Value**, as specified in section [3.1.4.1.8.1.5](#).

3.1.4.1.3.6.1 Schema

```
<xs:complexType name="ActionSetPropertyType" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element name="Parameter" type="mstns:MethodParameterType"/>
  </xs:sequence>
  <xs:attribute name="Id" type="mstns:ActionIdType" use="required"/>
  <xs:attribute name="ObjectPathId" type="mstns:ObjectPathIdType" use="required"/>
  <xs:attribute name="Name" type="mstns:PropertyNameType" use="required"/>
</xs:complexType>
```

3.1.4.1.3.6.2 Attributes

Id: The identifier of the CSOM action. This value MUST be unique from all other [IdType](#) values, as specified in section [3.1.4.1.4.3](#), in the request.

Name: The name of the property to set. It MUST be the name of a valid property of the CSOM Object specified by the **ObjectPathId** attribute.

ObjectPathId: The identifier of a CSOM Object path, which is used to obtain the CSOM Object on which the CSOM action is performed.

3.1.4.1.3.6.3 Child Elements

Parameter: The parameter value to set the property to.

3.1.4.1.3.7 ActionSetStaticPropertyType

The **ActionSetStaticPropertyType** complex type specifies a CSOM action that sets the static property of a CSOM Object type to a specified parameter value.

If the CSOM action executes successfully, the protocol server MUST NOT modify the JSON response structure, as specified in section [3.1.4.1.8.2](#).

If the CSOM action fails and the exception is not handled by **ExceptionHandlingScopeSimpleType**, as specified in section [3.1.4.1.3.11](#), or **ExceptionHandlingScopeType**, as specified in section [3.1.4.1.3.12](#), the protocol server MUST set the exception information in the **ErrorInfo** member of **Response Header JSON Value**, as specified in section [3.1.4.1.8.1.5](#).

3.1.4.1.3.7.1 Schema

```
<xs:complexType name="ActionSetStaticPropertyType"
  xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element name="Parameter" type="mstns:MethodParameterType"/>
  </xs:sequence>
</xs:complexType>
```

```

</xs:sequence>
<xs:attribute name="Id" type="mstns:ActionIdType" use="required"/>
<xs:attribute name="TypeId" type="mstns:TypeIdGuidType" use="required"/>
<xs:attribute name="Name" type="mstns:StaticPropertyNameType" use="required"/>
</xs:complexType>

```

3.1.4.1.3.7.2 Attributes

Id: The identifier of the CSOM action. This value MUST be unique from all other **IdType** values, as specified in section [3.1.4.1.4.3](#), in the request.

Name: The name of the static property to set. It MUST be the name of a valid static property of the CSOM Object type specified by the **TypeId** attribute.

TypeId: A GUID that identifies the CSOM Object type that contains the static property to set.

3.1.4.1.3.7.3 Child Elements

Parameter: The parameter value to set the static property to.

3.1.4.1.3.8 ActionsType

The **ActionsType** complex type specifies an ordered list of CSOM actions to execute.

3.1.4.1.3.8.1 Schema

```

<xs:complexType name="ActionsType" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:choice minOccurs="0" maxOccurs="unbounded">
      <xs:element name="SetProperty" type="mstns:ActionSetPropertyType"/>
      <xs:element name="SetStaticProperty" type="mstns:ActionSetStaticPropertyType"/>
      <xs:element name="Method" type="mstns:ActionInvokeMethodType"/>
      <xs:element name="StaticMethod" type="mstns:ActionInvokeStaticMethodType"/>
      <xs:element name="ObjectPath" type="mstns:ActionInstantiateObjectPathType"/>
      <xs:element name="ObjectIdentityQuery" type="mstns:ActionObjectIdentityQueryType"/>
      <xs:element name="Query" type="mstns:ActionQueryType"/>
      <xs:element name="ExceptionHandlingScope" type="mstns:ExceptionHandlingScopeType"/>
      <xs:element name="ExceptionHandlingScopeSimple"
type="mstns:ExceptionHandlingScopeSimpleType"/>
      <xs:element name="ConditionalScope" type="mstns:ConditionalScopeType"/>
    </xs:choice>
  </xs:sequence>
</xs:complexType>

```

3.1.4.1.3.8.2 Attributes

None.

3.1.4.1.3.8.3 Child Elements

ConditionalScope: See section [3.1.4.1.6.1.3](#).

ExceptionHandlingScope: See section [3.1.4.1.6.1.3](#).

ExceptionHandlingScopeSimple: See section [3.1.4.1.6.1.3](#).

Method: See section [3.1.4.1.6.1.3](#).

ObjectIdentityQuery: See section [3.1.4.1.6.1.3](#).

ObjectPath: See section [3.1.4.1.6.1.3](#).

Query: See section [3.1.4.1.6.1.3](#).

SetProperty: See section [3.1.4.1.6.1.3](#).

SetStaticProperty: See section [3.1.4.1.6.1.3](#).

StaticMethod: See section [3.1.4.1.6.1.3](#).

3.1.4.1.3.9 ChildItemQueryType

The **ChildItemQueryType** complex type specifies the child item query that is applied to a CSOM Object collection.

3.1.4.1.3.9.1 Schema

```
<xs:complexType name="ChildItemQueryType" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:complexContent>
    <xs:extension base="mstns:QueryType">
      <xs:sequence>
        <xs:element name="QueryableExpression" type="mstns:ExpressionQueryableExpressionType"
minOccurs="0"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

3.1.4.1.3.9.2 Attributes

None.

3.1.4.1.3.9.3 Child Elements

QueryableExpression: The queryable expression that is applied to a CSOM Object collection. This results in a filtered subset of child CSOM Objects.

3.1.4.1.3.10 ConditionalScopeType

The **ConditionalScopeType** complex type specifies a CSOM action that evaluates a conditional expression that does not have any input parameters. Depending on the outcome of the evaluation, it executes an ordered list of CSOM actions for either the "true" or "false" case, if a list of such actions is present.

If the CSOM action executes successfully, the protocol server MUST append the CSOM action identifier and a **ConditionalScopeResponse** JSON value, as specified in section [3.1.4.1.8.2.1.1](#), to the JSON response structure, as specified in section [3.1.4.1.8.2](#), before it executes the ordered list of CSOM actions specified inside the **IfTrueScope** or **IfFalseScope** element.

If the CSOM action fails and the exception is not handled by **ExceptionHandlingScopeSimpleType**, as specified in section [3.1.4.1.3.11](#), or **ExceptionHandlingScopeType**, as specified in section [3.1.4.1.3.12](#), the protocol server MUST set

the exception information in the **ErrorInfo** member of **Response Header JSON Value**, as specified in section [3.1.4.1.8.1.5](#).

3.1.4.1.3.10.1 Schema

```
<xs:complexType name="ConditionalScopeType" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element name="Test">
      <xs:complexType>
        <xs:all>
          <xs:element name="Body" type="mstns:ExpressionType"/>
        </xs:all>
      </xs:complexType>
    </xs:element>
    <xs:element name="IfTrueScope" minOccurs="0">
      <xs:complexType>
        <xs:sequence>
          <xs:choice minOccurs="0" maxOccurs="unbounded">
            <xs:element name="SetProperty" type="mstns:ActionSetPropertyType"/>
            <xs:element name="SetStaticProperty" type="mstns:ActionSetStaticPropertyType"/>
            <xs:element name="Method" type="mstns:ActionInvokeMethodType"/>
            <xs:element name="StaticMethod" type="mstns:ActionInvokeStaticMethodType"/>
            <xs:element name="ObjectPath" type="mstns:ActionInstantiateObjectPathType"/>
            <xs:element name="ObjectIdentityQuery"
type="mstns:ActionObjectIdentityQueryType"/>
            <xs:element name="Query" type="mstns:ActionQueryType"/>
            <xs:element name="ExceptionHandlingScope"
type="mstns:ExceptionHandlingScopeType"/>
            <xs:element name="ExceptionHandlingScopeSimple"
type="mstns:ExceptionHandlingScopeSimpleType"/>
            <xs:element name="ConditionalScope" type="mstns:ConditionalScopeType"/>
          </xs:choice>
        </xs:sequence>
        <xs:attribute name="Id" type="mstns:IdType" use="required"/>
      </xs:complexType>
    </xs:element>
    <xs:element name="IfFalseScope" minOccurs="0">
      <xs:complexType>
        <xs:sequence>
          <xs:choice minOccurs="0" maxOccurs="unbounded">
            <xs:element name="SetProperty" type="mstns:ActionSetPropertyType"/>
            <xs:element name="SetStaticProperty" type="mstns:ActionSetStaticPropertyType"/>
            <xs:element name="Method" type="mstns:ActionInvokeMethodType"/>
            <xs:element name="StaticMethod" type="mstns:ActionInvokeStaticMethodType"/>
            <xs:element name="ObjectPath" type="mstns:ActionInstantiateObjectPathType"/>
            <xs:element name="ObjectIdentityQuery"
type="mstns:ActionObjectIdentityQueryType"/>
            <xs:element name="Query" type="mstns:ActionQueryType"/>
            <xs:element name="ExceptionHandlingScope"
type="mstns:ExceptionHandlingScopeType"/>
            <xs:element name="ExceptionHandlingScopeSimple"
type="mstns:ExceptionHandlingScopeSimpleType"/>
            <xs:element name="ConditionalScope" type="mstns:ConditionalScopeType"/>
          </xs:choice>
        </xs:sequence>
        <xs:attribute name="Id" type="mstns:IdType" use="required"/>
      </xs:complexType>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```



```
<xs:attribute name="Id" type="mstns:ActionIdType" use="required"/>
</xs:complexType>
```

3.1.4.1.3.10.2 Attributes

Id: The identifier of the CSOM action. This value MUST be unique from all other **IdType** values, as specified in section [3.1.4.1.4.3](#), in the request.

IfFalseScope::Id: The identifier for the "false" scope. This value MUST be unique from all other **IdType** values, as specified in section [3.1.4.1.4.3](#), in the request. Use of this attribute is implementation-specific.

IfTrueScope::Id: The identifier for the "true" scope. This value MUST be unique from all other **IdType** values, as specified in section [3.1.4.1.4.3](#), in the request. Use of this attribute is implementation-specific.

3.1.4.1.3.10.3 Child Elements

Body: The conditional expression to evaluate.

ConditionalScope: See section [3.1.4.1.6.1.3](#).

ExceptionHandlingScope: See section [3.1.4.1.6.1.3](#).

ExceptionHandlingScopeSimple: See section [3.1.4.1.6.1.3](#).

IfFalseScope: The ordered list of CSOM actions to execute if the conditional expression specified by the **Body** attribute evaluates to "false".

IfTrueScope: The ordered list of CSOM actions to execute if the conditional expression specified by the **Body** attribute evaluates to "true".

Method: See section [3.1.4.1.6.1.3](#).

ObjectIdentityQuery: See section [3.1.4.1.6.1.3](#).

ObjectPath: See section [3.1.4.1.6.1.3](#).

Query: See section [3.1.4.1.6.1.3](#).

SetProperty: See section [3.1.4.1.6.1.3](#).

SetStaticProperty: See section [3.1.4.1.6.1.3](#).

StaticMethod: See section [3.1.4.1.6.1.3](#).

Test: An element that contains the conditional expression to evaluate.

3.1.4.1.3.11 ExceptionHandlingScopeSimpleType

The **ExceptionHandlingScopeSimpleType** complex type specifies a CSOM action that attempts to execute an ordered list of CSOM actions.

If an unhandled exception does not occur, all of the CSOM actions in the list are executed.

If an unhandled exception occurs while executing a CSOM action in the list, the protocol server MUST catch the exception and MUST NOT execute any of the remaining CSOM actions in the list.

If this CSOM action executes successfully, even if the protocol catches the exception while executing the CSOM action list, the protocol server MUST append the CSOM action identifier of this CSOM action and an **ExceptionHandlingScopeSimpleResponse** JSON value, as specified in section [3.1.4.1.8.2.1.3](#), to the JSON response structure, as specified in section [3.1.4.1.8.2](#), after executing the CSOM actions specified inside this CSOM action.

If this CSOM action fails and the exception is not handled by an outer **ExceptionHandlingScopeSimpleType**, as specified in section [3.1.4.1.3.11](#), or **ExceptionHandlingScopeType**, as specified in section [3.1.4.1.3.12](#), the protocol server MUST set the exception information in the **ErrorInfo** member of **Response Header JSON Value**, as specified in section [3.1.4.1.8.1.5](#).

3.1.4.1.3.11.1 Schema

```
<xs:complexType name="ExceptionHandlingScopeSimpleType"
  xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:choice minOccurs="0" maxOccurs="unbounded">
      <xs:element name="SetProperty" type="mstns:ActionSetPropertyType"/>
      <xs:element name="SetStaticProperty" type="mstns:ActionSetStaticPropertyType"/>
      <xs:element name="Method" type="mstns:ActionInvokeMethodType"/>
      <xs:element name="StaticMethod" type="mstns:ActionInvokeStaticMethodType"/>
      <xs:element name="ObjectPath" type="mstns:ActionInstantiateObjectPathType"/>
      <xs:element name="ObjectIdentityQuery" type="mstns:ActionObjectIdentityQueryType"/>
      <xs:element name="Query" type="mstns:ActionQueryType"/>
      <xs:element name="ExceptionHandlingScope" type="mstns:ExceptionHandlingScopeType"/>
      <xs:element name="ExceptionHandlingScopeSimple"
        type="mstns:ExceptionHandlingScopeSimpleType"/>
      <xs:element name="ConditionalScope" type="mstns:ConditionalScopeType"/>
    </xs:choice>
  </xs:sequence>
  <xs:attribute name="Id" type="mstns:ActionIdType" use="required"/>
</xs:complexType>
```

3.1.4.1.3.11.2 Attributes

Id: The identifier of the CSOM action. This value MUST be unique from all other **IdType** values, as specified in section [3.1.4.1.4.3](#), in the request.

3.1.4.1.3.11.3 Child Elements

ConditionalScope: See section [3.1.4.1.6.1.3](#).

ExceptionHandlingScope: See section [3.1.4.1.6.1.3](#).

ExceptionHandlingScopeSimple: See section [3.1.4.1.6.1.3](#).

Method: See section [3.1.4.1.6.1.3](#).

ObjectIdentityQuery: See section [3.1.4.1.6.1.3](#).

ObjectPath: See section [3.1.4.1.6.1.3](#).

Query: See section [3.1.4.1.6.1.3](#).

SetProperty: See section [3.1.4.1.6.1.3](#).

SetStaticProperty: See section [3.1.4.1.6.1.3](#).

StaticMethod: See section [3.1.4.1.6.1.3](#).

3.1.4.1.3.12 ExceptionHandlingScopeType

The **ExceptionHandlingScopeType** complex type specifies a CSOM action that attempts to execute an ordered list of CSOM actions specified by a **TryScope** element.

If an unhandled exception does not occur, all of the CSOM actions in the list are executed. In addition, the ordered list of CSOM actions specified in the **FinallyScope** element, if present, is executed.

If an unhandled exception occurs while executing an action specified in a **TryScope** element, the protocol server MUST catch the exception and MUST NOT execute the remaining CSOM actions specified in the **TryScope** element. In addition, the ordered list of CSOM actions specified in the **CatchScope** element, if present, is executed, and then the ordered list of CSOM actions specified in the **FinallyScope** element, if present, is executed.

If this CSOM action executes successfully, even if the protocol server catches the exception while executing actions inside **TryScope** element, the protocol server MUST append the CSOM action identifier of this CSOM action and an **ExceptionHandlingScopeResponse** JSON value, as specified in section [3.1.4.1.8.2.1.2](#), to the JSON response structure, as specified in section [3.1.4.1.8.2](#), after executing the CSOM actions specified inside this CSOM action.

If this CSOM action fails and the exception is not handled by an outer **ExceptionHandlingScopeSimpleType**, as specified in section [3.1.4.1.3.11](#), or **ExceptionHandlingScopeType**, as specified in section [3.1.4.1.3.12](#), the protocol server MUST set the exception information in the **ErrorInfo** member of **Response Header JSON Value**, as specified in section [3.1.4.1.8.1.5](#).

3.1.4.1.3.12.1 Schema

```
<xs:complexType name="ExceptionHandlingScopeType"
  xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element name="TryScope">
      <xs:complexType>
        <xs:sequence>
          <xs:choice minOccurs="0" maxOccurs="unbounded">
            <xs:element name="SetProperty" type="mstns:ActionSetPropertyType"/>
            <xs:element name="SetStaticProperty" type="mstns:ActionSetStaticPropertyType"/>
            <xs:element name="Method" type="mstns:ActionInvokeMethodType"/>
            <xs:element name="StaticMethod" type="mstns:ActionInvokeStaticMethodType"/>
            <xs:element name="ObjectPath" type="mstns:ActionInstantiateObjectPathType"/>
            <xs:element name="ObjectIdentityQuery"
              type="mstns:ActionObjectIdentityQueryType"/>
            <xs:element name="Query" type="mstns:ActionQueryType"/>
            <xs:element name="ExceptionHandlingScope"
              type="mstns:ExceptionHandlingScopeType"/>
            <xs:element name="ExceptionHandlingScopeSimple"
              type="mstns:ExceptionHandlingScopeSimpleType"/>
            <xs:element name="ConditionalScope" type="mstns:ConditionalScopeType"/>
          </xs:choice>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
    <xs:attribute name="Id" type="mstns:IdType" use="required"/>
  </xs:sequence>
</xs:complexType>
```

```

    </xs:complexType>
  </xs:element>
  <xs:element name="CatchScope" minOccurs="0">
    <xs:complexType>
      <xs:sequence>
        <xs:choice minOccurs="0" maxOccurs="unbounded">
          <xs:element name="SetProperty" type="mstns:ActionSetPropertyType"/>
          <xs:element name="SetStaticProperty" type="mstns:ActionSetStaticPropertyType"/>
          <xs:element name="Method" type="mstns:ActionInvokeMethodType"/>
          <xs:element name="StaticMethod" type="mstns:ActionInvokeStaticMethodType"/>
          <xs:element name="ObjectPath" type="mstns:ActionInstantiateObjectPathType"/>
          <xs:element name="ObjectIdentityQuery"
type="mstns:ActionObjectIdentityQueryType"/>
          <xs:element name="Query" type="mstns:ActionQueryType"/>
          <xs:element name="ExceptionHandlingScope"
type="mstns:ExceptionHandlingScopeType"/>
          <xs:element name="ExceptionHandlingScopeSimple"
type="mstns:ExceptionHandlingScopeSimpleType"/>
          <xs:element name="ConditionalScope" type="mstns:ConditionalScopeType"/>
        </xs:choice>
      </xs:sequence>
      <xs:attribute name="Id" type="mstns:IdType" use="required"/>
    </xs:complexType>
  </xs:element>
  <xs:element name="FinallyScope" minOccurs="0">
    <xs:complexType>
      <xs:sequence>
        <xs:choice minOccurs="0" maxOccurs="unbounded">
          <xs:element name="SetProperty" type="mstns:ActionSetPropertyType"/>
          <xs:element name="SetStaticProperty" type="mstns:ActionSetStaticPropertyType"/>
          <xs:element name="Method" type="mstns:ActionInvokeMethodType"/>
          <xs:element name="StaticMethod" type="mstns:ActionInvokeStaticMethodType"/>
          <xs:element name="ObjectPath" type="mstns:ActionInstantiateObjectPathType"/>
          <xs:element name="ObjectIdentityQuery"
type="mstns:ActionObjectIdentityQueryType"/>
          <xs:element name="Query" type="mstns:ActionQueryType"/>
          <xs:element name="ExceptionHandlingScope"
type="mstns:ExceptionHandlingScopeType"/>
          <xs:element name="ExceptionHandlingScopeSimple"
type="mstns:ExceptionHandlingScopeSimpleType"/>
          <xs:element name="ConditionalScope" type="mstns:ConditionalScopeType"/>
        </xs:choice>
      </xs:sequence>
      <xs:attribute name="Id" type="mstns:IdType" use="required"/>
    </xs:complexType>
  </xs:element>
  </xs:sequence>
  <xs:attribute name="Id" type="mstns:ActionIdType" use="required"/>
</xs:complexType>

```

3.1.4.1.3.12.2 Attributes

CatchScope::Id: The identifier of the catch scope. This value MUST be unique from all other **IdType** values, as specified in section [3.1.4.1.4.3](#), in the request. Use of this attribute is implementation-specific.

FinallyScope::Id: The identifier of the finally scope. This value MUST be unique from all other **IdType** values, as specified in section [3.1.4.1.4.3](#), in the request. Use of this attribute is implementation-specific.

Id: The identifier of the CSOM action. This value MUST be unique from all other **IdType** values, as specified in section [3.1.4.1.4.3](#), in the request.

TryScope::Id: The identifier of the try scope. This value MUST be unique from all other **IdType** values, as specified in section [3.1.4.1.4.3](#), in the request. Use of this attribute is implementation-specific.

3.1.4.1.3.12.3 Child Elements

CatchScope: Optional. The list of CSOM actions to execute if an unhandled exception occurs while executing the list of CSOM actions that are specified by the **TryScope** element. If an unhandled exception does not occur, the protocol server MUST NOT execute the list of CSOM actions specified by this element.

ConditionalScope: See section [3.1.4.1.6.1.3](#).

ExceptionHandlingScope: See section [3.1.4.1.6.1.3](#).

ExceptionHandlingScopeSimple: See section [3.1.4.1.6.1.3](#).

FinallyScope: Optional. The list of CSOM actions to execute after executing the CSOM actions specified by the **TryScope** and **CatchScope** elements.

Method: See section [3.1.4.1.6.1.3](#).

ObjectIdentityQuery: See section [3.1.4.1.6.1.3](#).

ObjectPath: See section [3.1.4.1.6.1.3](#).

Query: See section [3.1.4.1.6.1.3](#).

SetProperty: See section [3.1.4.1.6.1.3](#).

SetStaticProperty: See section [3.1.4.1.6.1.3](#).

StaticMethod: See section [3.1.4.1.6.1.3](#).

TryScope: The ordered list of CSOM actions to execute. If an unhandled exception occurs while executing a CSOM action, the protocol server MUST catch the exception and MUST NOT execute the remaining CSOM actions.

3.1.4.1.3.13 ExpressionConvertExpressionType

The **ExpressionConvertExpressionType** complex type is a component of an expression. It takes the evaluated value of an expression and converts that value to a specified type. It's inner element is the value to convert.

3.1.4.1.3.13.1 Schema

```
<xs:complexType name="ExpressionConvertExpressionType"
  xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:choice>
```

```

<xs:element name="GT" type="mstns:ExpressionLeftRightOperandExpressionType"/>
<xs:element name="LT" type="mstns:ExpressionLeftRightOperandExpressionType"/>
<xs:element name="EQ" type="mstns:ExpressionLeftRightOperandExpressionType"/>
<xs:element name="NE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
<xs:element name="GE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
<xs:element name="LE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
<xs:element name="AND" type="mstns:ExpressionLeftRightOperandExpressionType"/>
<xs:element name="OR" type="mstns:ExpressionLeftRightOperandExpressionType"/>
<xs:element name="NOT" type="mstns:ExpressionType"/>
<xs:element name="ExpressionMethod" type="mstns:ExpressionMethodExpressionType"/>
<xs:element name="ExpressionStaticMethod"
type="mstns:ExpressionStaticMethodExpressionType"/>
<xs:element name="ExpressionProperty" type="mstns:ExpressionPropertyExpressionType"/>
<xs:element name="ExpressionStaticProperty"
type="mstns:ExpressionStaticPropertyExpressionType"/>
<xs:element name="ExpressionParameter" type="mstns:ExpressionParameterExpressionType"/>
<xs:element name="ExpressionConvert" type="mstns:ExpressionConvertExpressionType"/>
<xs:element name="ExpressionConstant" type="mstns:MethodParameterType"/>
</xs:choice>
</xs:sequence>
<xs:attribute name="Type" use="required">
<xs:simpleType>
<xs:restriction base="xs:string">
<xs:enumeration value="Boolean"/>
<xs:enumeration value="Byte"/>
<xs:enumeration value="SByte"/>
<xs:enumeration value="Char"/>
<xs:enumeration value="Int16"/>
<xs:enumeration value="UInt16"/>
<xs:enumeration value="Int32"/>
<xs:enumeration value="UInt32"/>
<xs:enumeration value="Int64"/>
<xs:enumeration value="UInt64"/>
<xs:enumeration value="DateTime"/>
<xs:enumeration value="Single"/>
<xs:enumeration value="Double"/>
<xs:enumeration value="Decimal"/>
<xs:enumeration value="TimeSpan"/>
<xs:enumeration value="String"/>
</xs:restriction>
</xs:simpleType>
</xs:attribute>
</xs:complexType>

```

3.1.4.1.3.13.2 Attributes

Type: The type to convert the value to. The conversion behavior and the validity of a specific conversion are implementation-specific.

3.1.4.1.3.13.3 Child Elements

AND: See section [3.1.4.1.6.2.3](#).

EQ: See section [3.1.4.1.6.2.3](#).

ExpressionConstant: See section [3.1.4.1.6.2.3](#).

ExpressionConvert: See section [3.1.4.1.6.2.3](#).

ExpressionMethod: See section [3.1.4.1.6.2.3](#).

ExpressionParameter: See section [3.1.4.1.6.2.3](#).

ExpressionProperty: See section [3.1.4.1.6.2.3](#).

ExpressionStaticMethod: See section [3.1.4.1.6.2.3](#).

ExpressionStaticProperty: See section [3.1.4.1.6.2.3](#).

GE: See section [3.1.4.1.6.2.3](#).

GT: See section [3.1.4.1.6.2.3](#).

LE: See section [3.1.4.1.6.2.3](#).

LT: See section [3.1.4.1.6.2.3](#).

NE: See section [3.1.4.1.6.2.3](#).

NOT: See section [3.1.4.1.6.2.3](#).

OR: See section [3.1.4.1.6.2.3](#).

3.1.4.1.3.14 ExpressionLeftRightOperandExpressionType

The **ExpressionLeftRightOperandExpressionType** complex type is a component of an expression. It represents the left and right operands of a binary expression. Its first immediate child element **MUST** contain the left operand of the binary expression. Its second immediate child element **MUST** contain the right operand of the binary expression.

3.1.4.1.3.14.1 Schema

```
<xs:complexType name="ExpressionLeftRightOperandExpressionType"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:choice>
      <xs:element name="GT" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="LT" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="EQ" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="NE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="GE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="LE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="AND" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="OR" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="NOT" type="mstns:ExpressionType"/>
      <xs:element name="ExpressionMethod" type="mstns:ExpressionMethodExpressionType"/>
      <xs:element name="ExpressionStaticMethod"
type="mstns:ExpressionStaticMethodExpressionType"/>
      <xs:element name="ExpressionProperty" type="mstns:ExpressionPropertyExpressionType"/>
      <xs:element name="ExpressionStaticProperty"
type="mstns:ExpressionStaticPropertyExpressionType"/>
      <xs:element name="ExpressionParameter" type="mstns:ExpressionParameterExpressionType"/>
      <xs:element name="ExpressionConvert" type="mstns:ExpressionConvertExpressionType"/>
      <xs:element name="ExpressionConstant" type="mstns:MethodParameterType"/>
    </xs:choice>
  </xs:sequence>
</xs:complexType>
```

```

<xs:element name="GT" type="mstns:ExpressionLeftRightOperandExpressionType"/>
<xs:element name="LT" type="mstns:ExpressionLeftRightOperandExpressionType"/>
<xs:element name="EQ" type="mstns:ExpressionLeftRightOperandExpressionType"/>
<xs:element name="NE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
<xs:element name="GE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
<xs:element name="LE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
<xs:element name="AND" type="mstns:ExpressionLeftRightOperandExpressionType"/>
<xs:element name="OR" type="mstns:ExpressionLeftRightOperandExpressionType"/>
<xs:element name="NOT" type="mstns:ExpressionType"/>
<xs:element name="ExpressionMethod" type="mstns:ExpressionMethodExpressionType"/>
<xs:element name="ExpressionStaticMethod"
type="mstns:ExpressionStaticMethodExpressionType"/>
<xs:element name="ExpressionProperty" type="mstns:ExpressionPropertyExpressionType"/>
<xs:element name="ExpressionStaticProperty"
type="mstns:ExpressionStaticPropertyExpressionType"/>
<xs:element name="ExpressionParameter" type="mstns:ExpressionParameterExpressionType"/>
<xs:element name="ExpressionConvert" type="mstns:ExpressionConvertExpressionType"/>
<xs:element name="ExpressionConstant" type="mstns:MethodParameterType"/>
</xs:choice>
</xs:sequence>
</xs:complexType>

```

3.1.4.1.3.14.2 Attributes

None.

3.1.4.1.3.14.3 Child Elements

AND: See section [3.1.4.1.6.2.3](#).

EQ: See section [3.1.4.1.6.2.3](#).

ExpressionConstant: See section [3.1.4.1.6.2.3](#).

ExpressionConvert: See section [3.1.4.1.6.2.3](#).

ExpressionMethod: See section [3.1.4.1.6.2.3](#).

ExpressionParameter: See section [3.1.4.1.6.2.3](#).

ExpressionProperty: See section [3.1.4.1.6.2.3](#).

ExpressionStaticMethod: See section [3.1.4.1.6.2.3](#).

ExpressionStaticProperty: See section [3.1.4.1.6.2.3](#).

GE: See section [3.1.4.1.6.2.3](#).

GT: See section [3.1.4.1.6.2.3](#).

LE: See section [3.1.4.1.6.2.3](#).

LT: See section [3.1.4.1.6.2.3](#).

NE: See section [3.1.4.1.6.2.3](#).

NOT: See section [3.1.4.1.6.2.3](#).

OR: See section [3.1.4.1.6.2.3](#).

3.1.4.1.3.15 ExpressionMethodExpressionType

The **ExpressionMethodExpressionType** complex type is a component of an expression. It represents a method to call, including any applicable parameters, on the CSOM Object specified by its first immediate child element.

3.1.4.1.3.15.1 Schema

```
<xs:complexType name="ExpressionMethodExpressionType"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:choice>
      <xs:element name="GT" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="LT" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="EQ" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="NE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="GE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="LE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="AND" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="OR" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="NOT" type="mstns:ExpressionType"/>
      <xs:element name="ExpressionMethod" type="mstns:ExpressionMethodExpressionType"/>
      <xs:element name="ExpressionStaticMethod"
type="mstns:ExpressionStaticMethodExpressionType"/>
      <xs:element name="ExpressionProperty" type="mstns:ExpressionPropertyExpressionType"/>
      <xs:element name="ExpressionStaticProperty"
type="mstns:ExpressionStaticPropertyExpressionType"/>
      <xs:element name="ExpressionParameter" type="mstns:ExpressionParameterExpressionType"/>
      <xs:element name="ExpressionConvert" type="mstns:ExpressionConvertExpressionType"/>
      <xs:element name="ExpressionConstant" type="mstns:MethodParameterType"/>
    </xs:choice>
    <xs:element name="Parameters" minOccurs="0">
      <xs:complexType>
        <xs:sequence>
          <xs:choice minOccurs="0" maxOccurs="unbounded">
            <xs:element name="GT" type="mstns:ExpressionLeftRightOperandExpressionType"/>
            <xs:element name="LT" type="mstns:ExpressionLeftRightOperandExpressionType"/>
            <xs:element name="EQ" type="mstns:ExpressionLeftRightOperandExpressionType"/>
            <xs:element name="NE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
            <xs:element name="GE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
            <xs:element name="LE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
            <xs:element name="AND" type="mstns:ExpressionLeftRightOperandExpressionType"/>
            <xs:element name="OR" type="mstns:ExpressionLeftRightOperandExpressionType"/>
            <xs:element name="NOT" type="mstns:ExpressionType"/>
            <xs:element name="ExpressionMethod" type="mstns:ExpressionMethodExpressionType"/>
            <xs:element name="ExpressionStaticMethod"
type="mstns:ExpressionStaticMethodExpressionType"/>
            <xs:element name="ExpressionProperty"
type="mstns:ExpressionPropertyExpressionType"/>
            <xs:element name="ExpressionStaticProperty"
type="mstns:ExpressionStaticPropertyExpressionType"/>
            <xs:element name="ExpressionParameter"
type="mstns:ExpressionParameterExpressionType"/>
            <xs:element name="ExpressionConvert"
type="mstns:ExpressionConvertExpressionType"/>
            <xs:element name="ExpressionConstant" type="mstns:MethodParameterType"/>
          </xs:choice>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

```
</xs:sequence>
</xs:complexType>
</xs:element>
</xs:sequence>
<xs:attribute name="Name" type="mstns:MethodNameType" use="required"/>
</xs:complexType>
```

3.1.4.1.3.15.2 Attributes

Name: The name of the method to call. It MUST be the name of a valid method of the CSOM Object.

3.1.4.1.3.15.3 Child Elements

AND: See section [3.1.4.1.6.2.3](#).

EQ: See section [3.1.4.1.6.2.3](#).

ExpressionConstant: See section [3.1.4.1.6.2.3](#).

ExpressionConvert: See section [3.1.4.1.6.2.3](#).

ExpressionMethod: See section [3.1.4.1.6.2.3](#).

ExpressionParameter: See section [3.1.4.1.6.2.3](#).

ExpressionProperty: See section [3.1.4.1.6.2.3](#).

ExpressionStaticMethod: See section [3.1.4.1.6.2.3](#).

ExpressionStaticProperty: See section [3.1.4.1.6.2.3](#).

GE: See section [3.1.4.1.6.2.3](#).

GT: See section [3.1.4.1.6.2.3](#).

LE: See section [3.1.4.1.6.2.3](#).

LT: See section [3.1.4.1.6.2.3](#).

NE: See section [3.1.4.1.6.2.3](#).

NOT: See section [3.1.4.1.6.2.3](#).

OR: See section [3.1.4.1.6.2.3](#).

Parameters: The list of parameters to be passed when calling the method. Each parameter is an **ExpressionGroup** element, as specified in section [3.1.4.1.6.2](#).

3.1.4.1.3.16 ExpressionParameterExpressionType

The **ExpressionParameterExpressionType** complex type is a component of an expression. It represents the input parameter of an expression.

3.1.4.1.3.16.1 Schema

```
<xs:complexType name="ExpressionParameterExpressionType"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:attribute name="Name" type="xs:string" use="required"/>
</xs:complexType>
```

3.1.4.1.3.16.2 Attributes

Name: The name of the input parameter of an expression.

3.1.4.1.3.16.3 Child Elements

None.

3.1.4.1.3.17 ExpressionPropertyExpressionType

The **ExpressionPropertyExpressionType** complex type is a component of an expression. It represents a property of a CSOM Object or CSOM value object. Its first immediate child element specifies the CSOM Object or CSOM value object that the property applies to.

3.1.4.1.3.17.1 Schema

```
<xs:complexType name="ExpressionPropertyExpressionType"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:choice>
      <xs:element name="GT" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="LT" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="EQ" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="NE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="GE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="LE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="AND" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="OR" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="NOT" type="mstns:ExpressionType"/>
      <xs:element name="ExpressionMethod" type="mstns:ExpressionMethodExpressionType"/>
      <xs:element name="ExpressionStaticMethod"
type="mstns:ExpressionStaticMethodExpressionType"/>
      <xs:element name="ExpressionProperty" type="mstns:ExpressionPropertyExpressionType"/>
      <xs:element name="ExpressionStaticProperty"
type="mstns:ExpressionStaticPropertyExpressionType"/>
      <xs:element name="ExpressionParameter" type="mstns:ExpressionParameterExpressionType"/>
      <xs:element name="ExpressionConvert" type="mstns:ExpressionConvertExpressionType"/>
      <xs:element name="ExpressionConstant" type="mstns:MethodParameterType"/>
    </xs:choice>
  </xs:sequence>
  <xs:attribute name="Name" type="mstns:PropertyNameType" use="required"/>
</xs:complexType>
```

3.1.4.1.3.17.2 Attributes

Name: The name of the property of the CSOM Object or CSOM value object that is specified by its first immediate child element. It MUST be the name of a valid property of the CSOM Object or CSOM value object.

3.1.4.1.3.17.3 Child Elements

AND: See section [3.1.4.1.6.2.3](#).

EQ: See section [3.1.4.1.6.2.3](#).

ExpressionConstant: See section [3.1.4.1.6.2.3](#).

ExpressionConvert: See section [3.1.4.1.6.2.3](#).

ExpressionMethod: See section [3.1.4.1.6.2.3](#).

ExpressionParameter: See section [3.1.4.1.6.2.3](#).

ExpressionProperty: See section [3.1.4.1.6.2.3](#).

ExpressionStaticMethod: See section [3.1.4.1.6.2.3](#).

ExpressionStaticProperty: See section [3.1.4.1.6.2.3](#).

GE: See section [3.1.4.1.6.2.3](#).

GT: See section [3.1.4.1.6.2.3](#).

LE: See section [3.1.4.1.6.2.3](#).

LT: See section [3.1.4.1.6.2.3](#).

NE: See section [3.1.4.1.6.2.3](#).

NOT: See section [3.1.4.1.6.2.3](#).

OR: See section [3.1.4.1.6.2.3](#).

3.1.4.1.3.18 ExpressionQueryableExpressionType

The **ExpressionQueryableExpressionType** complex type is a component of an expression. It represents the queryable expression component of a child item query that is applied to a CSOM Object collection to retrieve a filtered subset of child CSOM Objects.

3.1.4.1.3.18.1 Schema

```
<xs:complexType name="ExpressionQueryableExpressionType"
  xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:choice>
      <xs:element name="Take" type="mstns:ExpressionQueryableTakeType"/>
      <xs:element name="Where" type="mstns:ExpressionQueryableWhereType"/>
      <xs:element name="OrderBy" type="mstns:ExpressionQueryableWhereType"/>
      <xs:element name="OrderByDescending" type="mstns:ExpressionQueryableWhereType"/>
      <xs:element name="ThenBy" type="mstns:ExpressionQueryableWhereType"/>
      <xs:element name="ThenByDescending" type="mstns:ExpressionQueryableWhereType"/>
      <xs:element name="QueryableObject">
        <xs:complexType/>
      </xs:element>
    </xs:choice>
  </xs:sequence>
</xs:complexType>
```

3.1.4.1.3.18.2 Attributes

None.

3.1.4.1.3.18.3 Child Elements

OrderBy: An expression of the **ExpressionQueryableWhereType** type, as specified in section [3.1.4.1.3.20](#), which specifies the sorted set of CSOM Objects in ascending order.

OrderByDescending: An expression of the **ExpressionQueryableWhereType** type, as specified in section [3.1.4.1.3.20](#), which specifies the sorted set of CSOM Objects in descending order.

QueryableObject: See section [3.1.4.1.6.3.3](#).

Take: See section [3.1.4.1.6.3.3](#).

ThenBy: An expression of the **ExpressionQueryableWhereType** type, as specified in section [3.1.4.1.3.20](#), which specifies the sorted set of CSOM Objects in ascending order.

ThenByDescending: An expression of the **ExpressionQueryableWhereType** type, as specified in section [3.1.4.1.3.20](#), which specifies the sorted set of CSOM Objects in descending order.

Where: An expression of the **ExpressionQueryableWhereType** type, as specified in section [3.1.4.1.3.20](#), which specifies the filtered set of CSOM Objects.

3.1.4.1.3.19 ExpressionQueryableTakeType

The **ExpressionQueryableTakeType** complex type is a component of an expression. It represents a filtered set of CSOM Objects that are returned from an inner queryable expression that returns a specified number of CSOM Objects. Its first immediate child element specifies the inner queryable expression.

3.1.4.1.3.19.1 Schema

```
<xs:complexType name="ExpressionQueryableTakeType"
  xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:choice>
      <xs:element name="Take" type="mstns:ExpressionQueryableTakeType"/>
      <xs:element name="Where" type="mstns:ExpressionQueryableWhereType"/>
      <xs:element name="OrderBy" type="mstns:ExpressionQueryableWhereType"/>
      <xs:element name="OrderByDescending" type="mstns:ExpressionQueryableWhereType"/>
      <xs:element name="ThenBy" type="mstns:ExpressionQueryableWhereType"/>
      <xs:element name="ThenByDescending" type="mstns:ExpressionQueryableWhereType"/>
      <xs:element name="QueryableObject">
        <xs:complexType/>
      </xs:element>
    </xs:choice>
  </xs:sequence>
  <xs:attribute name="Count" type="xs:nonNegativeInteger"/>
</xs:complexType>
```

3.1.4.1.3.19.2 Attributes

Count: The maximum number of child CSOM Objects to return. If the total number of CSOM Objects that are returned from the inner queryable expression is larger than this value, the protocol server

MUST return only the first *n* CSOM Objects, where *n* is the value specified by the **Count** attribute. Otherwise, the protocol server MUST return all of the CSOM Objects.

3.1.4.1.3.19.3 Child Elements

OrderBy: An expression of the **ExpressionQueryableWhereType** type, as specified in section [3.1.4.1.3.20](#), which specified the sorted set of CSOM Objects in ascending order.

OrderByDescending: An expression of the **ExpressionQueryableWhereType** type, as specified in section [3.1.4.1.3.20](#), which specifies the sorted set of CSOM Objects in descending order.

QueryableObject: See section [3.1.4.1.6.3.3](#).

Take: See section [3.1.4.1.6.3.3](#).

ThenBy: An expression of the **ExpressionQueryableWhereType** type, as specified in section [3.1.4.1.3.20](#), which specified the sorted set of CSOM Objects in ascending order.

ThenByDescending: An expression of the **ExpressionQueryableWhereType** type, as specified in section [3.1.4.1.3.20](#), which specified the sorted set of CSOM Objects in descending order.

Where: An expression of the **ExpressionQueryableWhereType** type, as specified section [3.1.4.1.3.20](#), which specified the filtered set of CSOM Objects.

3.1.4.1.3.20 ExpressionQueryableWhereType

The **ExpressionQueryableWhereType** complex type is a component of an expression. It represents a filtered or sorted set of CSOM Objects that are returned from an inner queryable expression. When it is a filtered set of CSOM Objects, the protocol server MUST return only those CSOM Objects that meet the conditions that are defined by the expression. When it is sorted set of CSOM Objects, the protocol server MUST return the CSOM Objects sorted by the value specified by the expression.

3.1.4.1.3.20.1 Schema

```
<xs:complexType name="ExpressionQueryableWhereType"
  xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element name="Test">
      <xs:complexType>
        <xs:all>
          <xs:element name="Body" type="mstns:ExpressionType"/>
          <xs:element name="Parameters">
            <xs:complexType>
              <xs:sequence>
                <xs:element name="Parameter">
                  <xs:complexType>
                    <xs:attribute name="Name" type="xs:string"/>
                  </xs:complexType>
                </xs:element>
              </xs:sequence>
            </xs:complexType>
          </xs:element>
        </xs:all>
      </xs:complexType>
    </xs:element>
    <xs:element name="Object" type="mstns:ExpressionQueryableExpressionType"/>
  </xs:sequence>
</xs:complexType>
```

```
</xs:sequence>
</xs:complexType>
```

3.1.4.1.3.20.2 Attributes

Name: The name of the input parameter in the expression.

3.1.4.1.3.20.3 Child Elements

Body: The expression to evaluate.

Object: The set of child CSOM Objects to filter.

Parameter: The input parameter in the expression. Inside the expression **Body** element, when the input parameter is referenced by an element whose type is

ExpressionParameterExpressionType, as specified in section [3.1.4.1.3.16](#), and whose name attribute is same as the name of the input parameter, the value of the input parameter is the child object in the set of CSOM Objects that are returned from an inner queryable expression.

Parameters: The collection of input parameters for the expression.

Test: An element that contains the expression to evaluate.

3.1.4.1.3.21 ExpressionStaticMethodExpressionType

The **ExpressionStaticMethodExpressionType** complex type is a component of an expression. It represents a static method to call, including any parameters, on a CSOM Object type.

3.1.4.1.3.21.1 Schema

```
<xs:complexType name="ExpressionStaticMethodExpressionType"
  xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element name="Parameters" minOccurs="0">
      <xs:complexType>
        <xs:sequence>
          <xs:choice minOccurs="0" maxOccurs="unbounded">
            <xs:element name="GT" type="mstns:ExpressionLeftRightOperandExpressionType"/>
            <xs:element name="LT" type="mstns:ExpressionLeftRightOperandExpressionType"/>
            <xs:element name="EQ" type="mstns:ExpressionLeftRightOperandExpressionType"/>
            <xs:element name="NE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
            <xs:element name="GE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
            <xs:element name="LE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
            <xs:element name="AND" type="mstns:ExpressionLeftRightOperandExpressionType"/>
            <xs:element name="OR" type="mstns:ExpressionLeftRightOperandExpressionType"/>
            <xs:element name="NOT" type="mstns:ExpressionType"/>
            <xs:element name="ExpressionMethod" type="mstns:ExpressionMethodExpressionType"/>
            <xs:element name="ExpressionStaticMethod"
              type="mstns:ExpressionStaticMethodExpressionType"/>
            <xs:element name="ExpressionProperty"
              type="mstns:ExpressionPropertyExpressionType"/>
            <xs:element name="ExpressionStaticProperty"
              type="mstns:ExpressionStaticPropertyExpressionType"/>
            <xs:element name="ExpressionParameter"
              type="mstns:ExpressionParameterExpressionType"/>
          </xs:choice>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

```

        <xs:element name="ExpressionConvert"
type="mstns:ExpressionConvertExpressionType"/>
        <xs:element name="ExpressionConstant" type="mstns:MethodParameterType"/>
        </xs:choice>
    </xs:sequence>
</xs:complexType>
</xs:element>
</xs:sequence>
<xs:attribute name="Name" type="mstns:StaticMethodNameType" use="required"/>
<xs:attribute name="TypeId" type="mstns:TypeIdGuidType" use="required"/>
</xs:complexType>

```

3.1.4.1.3.21.2 Attributes

Name: The name of the static method to call on the CSOM Object type that is specified by the **TypeId** attribute. It MUST be the name of a valid static method of the specified CSOM Object type.

TypeId: A GUID that identifies the CSOM Object type on which to call the static method.

3.1.4.1.3.21.3 Child Elements

AND: See section [3.1.4.1.6.2.3](#).

EQ: See section [3.1.4.1.6.2.3](#).

ExpressionConstant: See section [3.1.4.1.6.2.3](#).

ExpressionConvert: See section [3.1.4.1.6.2.3](#).

ExpressionMethod: See section [3.1.4.1.6.2.3](#).

ExpressionParameter: See section [3.1.4.1.6.2.3](#).

ExpressionProperty: See section [3.1.4.1.6.2.3](#).

ExpressionStaticMethod: See section [3.1.4.1.6.2.3](#).

ExpressionStaticProperty: See section [3.1.4.1.6.2.3](#).

GE: See section [3.1.4.1.6.2.3](#).

GT: See section [3.1.4.1.6.2.3](#).

LE: See section [3.1.4.1.6.2.3](#).

LT: See section [3.1.4.1.6.2.3](#).

NE: See section [3.1.4.1.6.2.3](#).

NOT: See section [3.1.4.1.6.2.3](#).

OR: See section [3.1.4.1.6.2.3](#).

Parameters: The list of parameters to be passed when calling the static method. Each parameter is an **ExpressionGroup** element, as specified in section [3.1.4.1.6.2](#).

3.1.4.1.3.22 ExpressionStaticPropertyExpressionType

The **ExpressionStaticPropertyExpressionType** complex type is a component of an expression. It represents a static property of a CSOM Object type.

3.1.4.1.3.22.1 Schema

```
<xs:complexType name="ExpressionStaticPropertyExpressionType"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence/>
  <xs:attribute name="Name" type="mstns:StaticPropertyNameType" use="required"/>
  <xs:attribute name="TypeId" type="mstns:TypeIdGuidType" use="required"/>
</xs:complexType>
```

3.1.4.1.3.22.2 Attributes

Name: The name of the static property of the CSOM Object type that is specified by the **TypeId** attribute. It MUST be the name of a valid static property of the CSOM Object type.

TypeId: A GUID that identifies the CSOM Object type.

3.1.4.1.3.22.3 Child Elements

None.

3.1.4.1.3.23 ExpressionType

The **ExpressionType** complex type represents an expression, which is a combination of operators, symbols, constants, literal values, functions, names of fields or columns, controls, and properties that evaluates to a single value.

3.1.4.1.3.23.1 Schema

```
<xs:complexType name="ExpressionType" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:choice>
      <xs:element name="GT" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="LT" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="EQ" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="NE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="GE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="LE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="AND" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="OR" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="NOT" type="mstns:ExpressionType"/>
      <xs:element name="ExpressionMethod" type="mstns:ExpressionMethodExpressionType"/>
      <xs:element name="ExpressionStaticMethod"
type="mstns:ExpressionStaticMethodExpressionType"/>
      <xs:element name="ExpressionProperty" type="mstns:ExpressionPropertyExpressionType"/>
      <xs:element name="ExpressionStaticProperty"
type="mstns:ExpressionStaticPropertyExpressionType"/>
      <xs:element name="ExpressionParameter" type="mstns:ExpressionParameterExpressionType"/>
      <xs:element name="ExpressionConvert" type="mstns:ExpressionConvertExpressionType"/>
      <xs:element name="ExpressionConstant" type="mstns:MethodParameterType"/>
    </xs:choice>
  </xs:sequence>
```

</xs:complexType>

3.1.4.1.3.23.2 Attributes

None.

3.1.4.1.3.23.3 Child Elements

AND: See section [3.1.4.1.6.2.3](#).

EQ: See section [3.1.4.1.6.2.3](#).

ExpressionConstant: See section [3.1.4.1.6.2.3](#).

ExpressionConvert: See section [3.1.4.1.6.2.3](#).

ExpressionMethod: See section [3.1.4.1.6.2.3](#).

ExpressionParameter: See section [3.1.4.1.6.2.3](#).

ExpressionProperty: See section [3.1.4.1.6.2.3](#).

ExpressionStaticMethod: See section [3.1.4.1.6.2.3](#).

ExpressionStaticProperty: See section [3.1.4.1.6.2.3](#).

GE: See section [3.1.4.1.6.2.3](#).

GT: See section [3.1.4.1.6.2.3](#).

LE: See section [3.1.4.1.6.2.3](#).

LT: See section [3.1.4.1.6.2.3](#).

NE: See section [3.1.4.1.6.2.3](#).

NOT: See section [3.1.4.1.6.2.3](#).

OR: See section [3.1.4.1.6.2.3](#).

3.1.4.1.3.24 MethodParameterType

The **MethodParameterType** complex type is a parameter that can be passed when calling a method or setting a property. The **MethodParameterType** complex type MUST contain only one instance of the **ObjectPathId**, **TypeId**, and **Type** attributes. Additionally, it MUST conform to one of the following XML types:

- **MethodParameterArrayType**
- **MethodParameterBooleanType**
- **MethodParameterByteArrayType**
- **MethodParameterByteType**
- **MethodParameterCharType**

- **MethodParameterDateTimeType**
- **MethodParameterDictionaryType**
- **MethodParameterDoubleType**
- **MethodParameterEnumType**
- **MethodParameterGuidType**
- **MethodParameterInt16Type**
- **MethodParameterInt32Type**
- **MethodParameterInt64Type**
- **MethodParameterNullType**
- **MethodParameterNumberType**
- **MethodParameterObjectPathType**
- **MethodParameterSByteType**
- **MethodParameterSingleType**
- **MethodParameterStringType**
- **MethodParameterUInt16Type**
- **MethodParameterUInt32Type**
- **MethodParameterUInt64Type**
- **MethodParameterUnspecifiedType**
- **MethodParameterValueObjectType**

3.1.4.1.3.24.1 Schema

```

<xs:complexType name="MethodParameterType" mixed="true"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element name="Property" minOccurs="0" maxOccurs="unbounded">
      <xs:complexType>
        <xs:complexContent>
          <xs:extension base="mstns:MethodParameterType">
            <xs:attribute name="Name" type="mstns:PropertyNameType" use="required"/>
          </xs:extension>
        </xs:complexContent>
      </xs:complexType>
    </xs:element>
    <xs:element name="Object" type="mstns:MethodParameterType" minOccurs="0"
maxOccurs="unbounded"/>
    <xs:element name="Include" minOccurs="0" maxOccurs="1">
      <xs:complexType>
        <xs:attribute name="href" use="required" type="xs:string"/>
      </xs:complexType>
    </xs:element>
  </xs:sequence>
</xs:complexType>

```

```

</xs:sequence>
<xs:attribute name="ObjectPathId" type="mstns:ObjectPathIdType" use="optional"/>
<xs:attribute name="TypeId" type="mstns:TypeIdGuidType" use="optional"/>
<xs:attribute name="Type" type="mstns:MethodParameterTypeType" use="optional"/>
</xs:complexType>

```

3.1.4.1.3.24.2 Attributes

href:

Name: The name of a property of the object. If the **Property** element is present, this value **MUST** be a CSOM value object.

ObjectPathId: The identifier of a CSOM Object path to the CSOM Object that is used as a parameter.

Type: The type of parameter.

TypeId: A **TypeIdGuidType** simple type, as specified in section [3.1.4.1.4.10](#), that represents the GUID of the CSOM type, if the parameter is a CSOM value object or CSOM Object.

3.1.4.1.3.24.3 Child Elements

Include:

Object: An array element. If the **Object** element is present, this value **MUST** be a CSOM array.

Property: The name of a property of the parameter object. If the **Property** element is present, this value **MUST** be a CSOM value object.

3.1.4.1.3.24.4 MethodParameterArrayType

The **MethodParameterArrayType** XML type is a parameter that represents a CSOM array.

3.1.4.1.3.24.4.1 Schema

```

<xs:complexType name="MethodParameterArrayType" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element name="Object" minOccurs="0" maxOccurs="unbounded"
      type="mstns:MethodParameterType"/>
  </xs:sequence>
  <xs:attribute name="Type" type="xs:string" use="required" fixed="Array"/>
</xs:complexType>

```

3.1.4.1.3.24.4.2 Attributes

Type: The type of the parameter. This value **MUST** be "Array".

3.1.4.1.3.24.4.3 Child Elements

Object: A value in an array of parameter types.

3.1.4.1.3.24.5 MethodParameterBooleanType

The **MethodParameterBooleanType** XML type is a parameter that represents a **CSOM Boolean** value.

3.1.4.1.3.24.5.1 Schema

```
<xs:complexType name="MethodParameterBooleanType"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:simpleContent>
    <xs:extension base="xs:boolean">
      <xs:attribute name="Type" type="xs:string" use="required" fixed="Boolean"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
```

3.1.4.1.3.24.5.2 Attributes

Type: The type of the parameter. This value MUST be "Boolean".

3.1.4.1.3.24.5.3 Child Elements

None.

3.1.4.1.3.24.6 MethodParameterByteArrayType

The **MethodParameterByteArrayType** XML type is a parameter that represents a CSOM binary value.

3.1.4.1.3.24.6.1 Schema

```
<xs:complexType name="MethodParameterByteArrayType"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:simpleContent>
    <xs:extension base="xs:base64Binary">
      <xs:attribute name="Type" type="xs:string" use="required" fixed="Base64Binary"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
```

3.1.4.1.3.24.6.2 Attributes

Type: The type of the parameter. This value MUST be "Base64Binary".

3.1.4.1.3.24.6.3 Child Elements

None.

3.1.4.1.3.24.7 MethodParameterByteType

The **MethodParameterByteType** XML type is a parameter that represents a **CSOM Byte** value.

3.1.4.1.3.24.7.1 Schema

```
<xs:complexType name="MethodParameterByteType" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:simpleContent>
    <xs:extension base="xs:unsignedByte">
      <xs:attribute name="Type" type="xs:string" use="required" fixed="Byte"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
```

3.1.4.1.3.24.7.2 Attributes

Type: The type of the parameter. This value MUST be "Byte".

3.1.4.1.3.24.7.3 Child Elements

None.

3.1.4.1.3.24.8 MethodParameterCharType

The **MethodParameterCharType** XML type is a parameter that represents a **CSOM Char** value.

3.1.4.1.3.24.8.1 Schema

```
<xs:complexType name="MethodParameterCharType" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:simpleContent>
    <xs:extension base="xs:string">
      <xs:attribute name="Type" type="xs:string" use="required" fixed="Char"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
```

3.1.4.1.3.24.8.2 Attributes

Type: The type of the parameter. This value MUST be "Char".

3.1.4.1.3.24.8.3 Child Elements

None.

3.1.4.1.3.24.9 MethodParameterDateTimeType

The **MethodParameterDateTimeType** XML type is a parameter that represents a **CSOM DateTime** value.

3.1.4.1.3.24.9.1 Schema

```
<xs:complexType name="MethodParameterDateTimeType"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:simpleContent>
    <xs:extension base="xs:dateTime">
      <xs:attribute name="Type" type="xs:string" use="required" fixed="DateTime"/>
    </xs:extension>
  </xs:simpleContent>
```

```
</xs:complexType>
```

3.1.4.1.3.24.9.2 Attributes

Type: The type of the parameter. This value MUST be "DateTime".

3.1.4.1.3.24.9.3 Child Elements

None.

3.1.4.1.3.24.10 MethodParameterDictionaryType

The **MethodParameterDictionaryType** XML type is a parameter that represents a CSOM dictionary, which is a collection of key/value pairs.

3.1.4.1.3.24.10.1 Schema

```
<xs:complexType name="MethodParameterDictionaryType"
  xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element name="Property" minOccurs="0" maxOccurs="unbounded">
      <xs:complexType>
        <xs:complexContent>
          <xs:extension base="mstns:MethodParameterType">
            <xs:attribute name="Name" type="xs:string" use="required"/>
          </xs:extension>
        </xs:complexContent>
      </xs:complexType>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="Type" type="xs:string" use="required" fixed="Dictionary"/>
</xs:complexType>
```

3.1.4.1.3.24.10.2 Attributes

Name: The name of the key/value pair.

Type: The type of the parameter. This value MUST be "Dictionary".

3.1.4.1.3.24.10.3 Child Elements

Property: An element that contains one key/value pair.

3.1.4.1.3.24.11 MethodParameterDoubleType

The **MethodParameterDoubleType** XML type is a parameter that represents a **CSOM Double** value.

3.1.4.1.3.24.11.1 Schema

```
<xs:complexType name="MethodParameterDoubleType" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:simpleContent>
    <xs:extension base="xs:double">
      <xs:attribute name="Type" type="xs:string" use="required" fixed="Double"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
```

```
</xs:extension>
</xs:simpleContent>
</xs:complexType>
```

3.1.4.1.3.24.11.2 Attributes

Type: The type of the parameter. This value MUST be "Double".

3.1.4.1.3.24.11.3 Child Elements

None.

3.1.4.1.3.24.12 MethodParameterEnumType

The **MethodParameterEnumType** XML type is a parameter that represents a CSOM enumeration.

3.1.4.1.3.24.12.1 Schema

```
<xs:complexType name="MethodParameterEnumType" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:simpleContent>
    <xs:extension base="xs:integer">
      <xs:attribute name="Type" type="xs:string" use="required" fixed="Enum"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
```

3.1.4.1.3.24.12.2 Attributes

Type: The type of the parameter. This value MUST be "Enum".

3.1.4.1.3.24.12.3 Child Elements

None.

3.1.4.1.3.24.13 MethodParameterGuidType

The **MethodParameterGuidType** XML type is a parameter that represents a CSOM GUID.

3.1.4.1.3.24.13.1 Schema

```
<xs:complexType name="MethodParameterGuidType" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:simpleContent>
    <xs:extension base="mstns:GuidType">
      <xs:attribute name="Type" type="xs:string" use="required" fixed="Guid"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
```

3.1.4.1.3.24.13.2 Attributes

Type: The type of the parameter. This value MUST be "Guid".

3.1.4.1.3.24.13.3 Child Elements

None.

3.1.4.1.3.24.14 MethodParameterInt16Type

The **MethodParameterInt16Type** XML type is a parameter that represents a **CSOM Int16** value.

3.1.4.1.3.24.14.1 Schema

```
<xs:complexType name="MethodParameterInt16Type" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:simpleContent>
    <xs:extension base="xs:short">
      <xs:attribute name="Type" type="xs:string" use="required" fixed="Int16"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
```

3.1.4.1.3.24.14.2 Attributes

Type: The type of the parameter. This value MUST be "Int16".

3.1.4.1.3.24.14.3 Child Elements

None.

3.1.4.1.3.24.15 MethodParameterInt32Type

The **MethodParameterInt32Type** XML type is a parameter that represents a CSOM Int32 value.

3.1.4.1.3.24.15.1 Schema

```
<xs:complexType name="MethodParameterInt32Type" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:simpleContent>
    <xs:extension base="xs:int">
      <xs:attribute name="Type" type="xs:string" use="required" fixed="Int32"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
```

3.1.4.1.3.24.15.2 Attributes

Type: The type of the parameter. This value MUST be "Int32".

3.1.4.1.3.24.15.3 Child Elements

None.

3.1.4.1.3.24.16 MethodParameterInt64Type

The **MethodParameterInt64Type** XML type is a parameter that represents a **CSOM Int64** value.

3.1.4.1.3.24.16.1 Schema

```
<xs:complexType name="MethodParameterInt64Type" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:simpleContent>
    <xs:extension base="xs:long">
      <xs:attribute name="Type" type="xs:string" use="required" fixed="Int64"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
```

3.1.4.1.3.24.16.2 Attributes

Type: The type of the parameter. This value MUST be "Int64".

3.1.4.1.3.24.16.3 Child Elements

None.

3.1.4.1.3.24.17 MethodParameterNullType

The **MethodParameterNullType** XML type is a parameter that represents a CSOM null value.

3.1.4.1.3.24.17.1 Schema

```
<xs:complexType name="MethodParameterNullType" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:attribute name="Type" type="xs:string" use="required" fixed="Null"/>
</xs:complexType>
```

3.1.4.1.3.24.17.2 Attributes

Type: The type of the parameter. This value MUST be "Null".

3.1.4.1.3.24.17.3 Child Elements

None.

3.1.4.1.3.24.18 MethodParameterNumberType

The **MethodParameterNumberType** XML type is a parameter that represents a CSOM Byte, CSOM Double, CSOM Int16, CSOM Int32, CSOM Int64, **CSOM SByte**, **CSOM Single**, **CSOM UInt16**, **CSOM UInt32**, or **CSOM UInt64** value.

3.1.4.1.3.24.18.1 Schema

```
<xs:complexType name="MethodParameterNumberType" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:simpleContent>
    <xs:extension base="xs:decimal">
      <xs:attribute name="Type" type="xs:string" use="required" fixed="Number"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
```

3.1.4.1.3.24.18.2 Attributes

Type: The type of the parameter. This value MUST be "Number".

3.1.4.1.3.24.18.3 Child Elements

None.

3.1.4.1.3.24.19 MethodParameterObjectPathType

The **MethodParameterObjectPathType** XML type is a parameter that represents the CSOM Object path for a CSOM Object.

3.1.4.1.3.24.19.1 Schema

```
<xs:complexType name="MethodParameterObjectPathType"
  xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:attribute name="ObjectPathId" type="mstns:ObjectPathIdType" use="required"/>
</xs:complexType>
```

3.1.4.1.3.24.19.2 Attributes

ObjectPathId: The identifier of a CSOM Object path for a CSOM Object.

3.1.4.1.3.24.19.3 Child Elements

None.

3.1.4.1.3.24.20 MethodParameterSByteType

The **MethodParameterSByteType** XML type is a parameter that represents a CSOM SByte value.

3.1.4.1.3.24.20.1 Schema

```
<xs:complexType name="MethodParameterSByteType" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:simpleContent>
    <xs:extension base="xs:byte">
      <xs:attribute name="Type" type="xs:string" use="required" fixed="SByte"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
```

3.1.4.1.3.24.20.2 Attributes

Type: The type of the parameter. This value MUST be "SByte".

3.1.4.1.3.24.20.3 Child Elements

None.

3.1.4.1.3.24.21 MethodParameterSingleType

The **MethodParameterSingleType** XML type is a parameter that represents a CSOM Single value.

3.1.4.1.3.24.21.1 Schema

```
<xs:complexType name="MethodParameterSingleType" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:simpleContent>
    <xs:extension base="xs:float">
      <xs:attribute name="Type" type="xs:string" use="required" fixed="Single"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
```

3.1.4.1.3.24.21.2 Attributes

Type: The type of the parameter. This value MUST be "Single".

3.1.4.1.3.24.21.3 Child Elements

None.

3.1.4.1.3.24.22 MethodParameterStringType

The **MethodParameterStringType** XML type is a parameter that represents a CSOM String value.

3.1.4.1.3.24.22.1 Schema

```
<xs:complexType name="MethodParameterStringType" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:simpleContent>
    <xs:extension base="xs:string">
      <xs:attribute name="Type" type="xs:string" use="required" fixed="String"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
```

3.1.4.1.3.24.22.2 Attributes

Type: The type of the parameter. This value MUST be "String".

3.1.4.1.3.24.22.3 Child Elements

None.

3.1.4.1.3.24.23 MethodParameterUInt16Type

The **MethodParameterUInt16Type** XML type is a parameter that represents a CSOM UInt16 value.

3.1.4.1.3.24.23.1 Schema

```
<xs:complexType name="MethodParameterUInt16Type" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:simpleContent>
    <xs:extension base="xs:unsignedShort">
      <xs:attribute name="Type" type="xs:string" use="required" fixed="UInt16"/>
    </xs:extension>
  </xs:simpleContent>
```

```
</xs:complexType>
```

3.1.4.1.3.24.23.2 Attributes

Type: The type of the parameter. This value MUST be "UInt16".

3.1.4.1.3.24.23.3 Child Elements

None.

3.1.4.1.3.24.24 MethodParameterUInt32Type

The **MethodParameterUInt32Type** XML type is a parameter that represents a CSOM UInt32 value.

3.1.4.1.3.24.24.1 Schema

```
<xs:complexType name="MethodParameterUInt32Type" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:simpleContent>
    <xs:extension base="xs:unsignedInt">
      <xs:attribute name="Type" type="xs:string" use="required" fixed="UInt32"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
```

3.1.4.1.3.24.24.2 Attributes

Type: The type of the parameter. This value MUST be "UInt32".

3.1.4.1.3.24.24.3 Child Elements

None.

3.1.4.1.3.24.25 MethodParameterUInt64Type

The **MethodParameterUInt64Type** XML type is a parameter that represents a CSOM UInt64 value.

3.1.4.1.3.24.25.1 Schema

```
<xs:complexType name="MethodParameterUInt64Type" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:simpleContent>
    <xs:extension base="xs:unsignedLong">
      <xs:attribute name="Type" type="xs:string" use="required" fixed="UInt64"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
```

3.1.4.1.3.24.25.2 Attributes

Type: The type of parameter. This value MUST be "UInt64".

3.1.4.1.3.24.25.3 Child Elements

None.

3.1.4.1.3.24.26 MethodParameterUnspecifiedType

The **MethodParameterUnspecifiedType** XML type is a parameter that represents a value that does not have a specified type; the protocol client did not specify the type of value that is being passed. The protocol server **MUST** determine the type of the parameter, based on the method definition, and then parse the parameter from the **string**.

3.1.4.1.3.24.26.1 Schema

```
<xs:complexType name="MethodParameterUnspecifiedType"
  xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:simpleContent>
    <xs:extension base="xs:string">
      <xs:attribute name="Type" type="xs:string" use="required" fixed="Unspecified"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
```

3.1.4.1.3.24.26.2 Attributes

Type: A fixed string value that **MUST** be "Unspecified".

3.1.4.1.3.24.26.3 Child Elements

None.

3.1.4.1.3.24.27 MethodParameterValueObjectType

The **MethodParameterValueObjectType** XML type is a parameter that represents a CSOM value object.

3.1.4.1.3.24.27.1 Schema

```
<xs:complexType name="MethodParameterValueObjectType"
  xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element name="Property" minOccurs="0" maxOccurs="unbounded">
      <xs:complexType>
        <xs:complexContent>
          <xs:extension base="mstns:MethodParameterType">
            <xs:attribute name="Name" type="xs:string" use="required"/>
          </xs:extension>
        </xs:complexContent>
      </xs:complexType>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="TypeId" type="mstns:TypeIdGuidType" use="required"/>
</xs:complexType>
```

3.1.4.1.3.24.27.2 Attributes

Name: The name of the property of the CSOM value object.

TypeId: A GUID that identifies the type of the CSOM value object.

3.1.4.1.3.24.27.3 Child Elements

Property: The value of the property that is specified by the **Property.Name** attribute.

3.1.4.1.3.24.28 MethodParameterBinaryType

The **MethodParameterBinaryType**[<4>](#) XML type is a parameter that represents a CSOM Stream value.

3.1.4.1.3.24.28.1 Schema

```
<xs:complexType name="MethodParameterBinaryType" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element name="Include" minOccurs="1" maxOccurs="1">
      <xs:complexType>
        <xs:attribute name="href" use="required" type="xs:string"/>
      </xs:complexType>
    </xs:element>
  </xs:sequence>
</xs:complexType>
```

3.1.4.1.3.24.28.2 Attributes

href: Specifies the MIME part that contains the stream data. The format of value is specified in section [2.2.4.6.1](#).

3.1.4.1.3.24.28.3 Child Elements

Include: Specifies the MIME part that contains the stream data.

3.1.4.1.3.24.29 MethodParameterDecimalType

The **MethodParameterDecimalType**[<5>](#) XML type is a parameter that represents a CSOM Decimal value.

3.1.4.1.3.24.29.1 Schema

```
<xs:complexType name="MethodParameterDecimalType"
  xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:simpleContent>
    <xs:extension base="xs:decimal">
      <xs:attribute name="Type" type="xs:string" use="required" fixed="Decimal"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
```

3.1.4.1.3.24.29.2 Attributes

Type: A fixed string value that MUST be "Decimal".

3.1.4.1.3.24.29.3 Child Elements

None.

3.1.4.1.3.24.30 MethodParameterTimeSpanType

The **MethodParameterTimeSpanType** [<6>](#) XML type is a parameter that represents a CSOM TimeSpan value.

3.1.4.1.3.24.30.1 Schema

```
<xs:complexType name="MethodParameterTimeSpanType"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:simpleContent>
    <xs:extension base="xs:duration">
      <xs:attribute name="Type" type="xs:string" use="required" fixed="TimeSpan"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
```

3.1.4.1.3.24.30.2 Attributes

Type: A fixed string value that MUST be "TimeSpan"

3.1.4.1.3.24.30.3 Child Elements

None.

3.1.4.1.3.25 ObjectPathConstructorType

The **ObjectPathConstructorType** complex type is a CSOM Object path. It specifies the CSOM Object that is obtained by invoking a constructor method, including any parameters, of a specified type.

3.1.4.1.3.25.1 Schema

```
<xs:complexType name="ObjectPathConstructorType" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element name="Parameters" minOccurs="0">
      <xs:complexType>
        <xs:sequence>
          <xs:element name="Parameter" type="mstns:MethodParameterType" minOccurs="0"
maxOccurs="unbounded"/>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="Id" type="mstns:ObjectPathIdType" use="required"/>
  <xs:attribute name="TypeId" type="mstns:TypeIdGuidType" use="required"/>
</xs:complexType>
```


3.1.4.1.3.25.2 Attributes

Id: The identifier of the CSOM Object path. This value MUST be unique from all other **IdType** values, as specified section [3.1.4.1.4.3](#), in the request.

TypeId: The GUID of the CSOM Object type, which is used to identify the constructor method to call.

3.1.4.1.3.25.3 Child Elements

Parameter: A parameter in the parameter list that is passed to the constructor method of the type specified by the **TypeId** attribute.

Parameters: The list of parameters that are passed to the constructor method of the type specified by the **TypeId** attribute.

3.1.4.1.3.26 ObjectPathMethodType

The **ObjectPathMethodType** complex type is a CSOM Object path. It specifies a CSOM Object that is obtained by calling a method, including any parameters, of a CSOM Object.

3.1.4.1.3.26.1 Schema

```
<xs:complexType name="ObjectPathMethodType" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element name="Parameters" minOccurs="0">
      <xs:complexType>
        <xs:sequence>
          <xs:element name="Parameter" type="mstns:MethodParameterType" minOccurs="0"
maxOccurs="unbounded"/>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="Id" type="mstns:ObjectPathIdType" use="required"/>
  <xs:attribute name="ParentId" type="mstns:ObjectPathIdType" use="required"/>
  <xs:attribute name="Name" type="mstns:MethodNameType" use="required"/>
</xs:complexType>
```

3.1.4.1.3.26.2 Attributes

Id: The identifier of the CSOM Object path. This value MUST be unique from all other **IdType** values, as specified section [3.1.4.1.4.3](#), in the request.

Name: The name of the method that is invoked on the CSOM Object specified by the **ParentId** attribute. It MUST be the name of a valid method of the CSOM Object.

ParentId: The identifier of the CSOM Object path of the CSOM Object that defines the method to call.

3.1.4.1.3.26.3 Child Elements

Parameter: A parameter in the parameter list that is passed in the method call.

Parameters: The list of parameters that are passed in the method call.

3.1.4.1.3.27 ObjectPathObjectIdentityNameType

The **ObjectPathObjectIdentityNameType** complex type is a CSOM Object path. It specifies the CSOM Object that is obtained from a specified CSOM Object identity, which is an implementation-specific string that uniquely identifies a CSOM Object.

3.1.4.1.3.27.1 Schema

```
<xs:complexType name="ObjectPathObjectIdentityNameType"
  xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:attribute name="Id" type="mstns:ObjectPathIdType" use="required"/>
  <xs:attribute name="Name" type="xs:string" use="required"/>
</xs:complexType>
```

3.1.4.1.3.27.2 Attributes

Id: The identifier of the CSOM Object path. This value MUST be unique from all other **IdType** values, as specified section [3.1.4.1.4.3](#), in the request.

Name: An implementation-specific **string** that uniquely identifies a CSOM Object.

3.1.4.1.3.27.3 Child Elements

None.

3.1.4.1.3.28 ObjectPathPropertyType

The **ObjectPathPropertyType** complex type is a CSOM Object path. It specifies the CSOM Object that is obtained by accessing a property of a CSOM Object.

3.1.4.1.3.28.1 Schema

```
<xs:complexType name="ObjectPathPropertyType" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:attribute name="Id" type="mstns:ObjectPathIdType" use="required"/>
  <xs:attribute name="ParentId" type="mstns:ObjectPathIdType" use="required"/>
  <xs:attribute name="Name" type="mstns:PropertyNameType" use="required"/>
</xs:complexType>
```

3.1.4.1.3.28.2 Attributes

Id: The identifier of the CSOM Object path. This value MUST be unique from all other **IdType** values, as specified section [3.1.4.1.4.3](#), in the request.

Name: The name of the property that is used to access the CSOM Object. It MUST be the name of a valid property of the CSOM Object that is specified by the **ParentId** attribute.

ParentId: The identifier of the CSOM Object path of the CSOM Object that defines the property to access.

3.1.4.1.3.28.3 Child Elements

None.

3.1.4.1.3.29 ObjectPathStaticMethodType

The **ObjectPathStaticMethodType** complex type is a CSOM Object path. It specifies the CSOM Object that is obtained by calling a static method, including any parameters, of a CSOM Object type.

3.1.4.1.3.29.1 Schema

```
<xs:complexType name="ObjectPathStaticMethodType"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element name="Parameters" minOccurs="0">
      <xs:complexType>
        <xs:sequence>
          <xs:element name="Parameter" type="mstns:MethodParameterType" minOccurs="0"
maxOccurs="unbounded"/>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="Id" type="mstns:ObjectPathIdType" use="required"/>
  <xs:attribute name="TypeId" type="mstns:TypeIdGuidType" use="required"/>
  <xs:attribute name="Name" type="mstns:StaticMethodNameType" use="required"/>
</xs:complexType>
```

3.1.4.1.3.29.2 Attributes

Id: The identifier of the CSOM Object path. This value **MUST** be unique from all other **IdType** values, as specified section [3.1.4.1.4.3](#), in the request.

Name: The name of the static method that is called on the CSOM Object type specified by the **TypeId** attribute. It **MUST** be the name of a valid static method of the CSOM Object type.

TypeId: The GUID that identifies the CSOM Object type on which to call the static method.

3.1.4.1.3.29.3 Child Elements

Parameter: A parameter in the parameter list that is passed in the static method call.

Parameters: The list of parameters that are passed in the static method call.

3.1.4.1.3.30 ObjectPathStaticPropertyType

The **ObjectPathStaticPropertyType** complex type is a CSOM Object path. It specifies the CSOM Object that is obtained by accessing a static property of a CSOM Object type.

3.1.4.1.3.30.1 Schema

```
<xs:complexType name="ObjectPathStaticPropertyType"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:attribute name="Id" type="mstns:ObjectPathIdType" use="required"/>
  <xs:attribute name="TypeId" type="mstns:TypeIdGuidType" use="required"/>
  <xs:attribute name="Name" type="mstns:StaticPropertyNameType" use="required"/>
</xs:complexType>
```

3.1.4.1.3.30.2 Attributes

Id: The identifier of the CSOM Object path. This value MUST be unique from all other **IdType** values, as specified section [3.1.4.1.4.3](#), in the request.

Name: The name of the static property that is used to access the CSOM Object. It MUST be the name of a valid static property of the CSOM Object type that is specified by the **TypeId** attribute.

TypeId: The GUID that identifies the CSOM Object type that defines the static property.

3.1.4.1.3.30.3 Child Elements

None.

3.1.4.1.3.31 ObjectPathsType

The **ObjectPathsType** complex type is a CSOM Object path list.

3.1.4.1.3.31.1 Schema

```
<xs:complexType name="ObjectPathsType" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:choice minOccurs="0" maxOccurs="unbounded">
      <xs:element name="Property" type="mstns:ObjectPathPropertyType"/>
      <xs:element name="StaticProperty" type="mstns:ObjectPathStaticPropertyType"/>
      <xs:element name="Method" type="mstns:ObjectPathMethodType"/>
      <xs:element name="StaticMethod" type="mstns:ObjectPathStaticMethodType"/>
      <xs:element name="Constructor" type="mstns:ObjectPathConstructorType"/>
      <xs:element name="Identity" type="mstns:ObjectPathObjectIdentityNameType"/>
    </xs:choice>
  </xs:sequence>
</xs:complexType>
```

3.1.4.1.3.31.2 Attributes

None.

3.1.4.1.3.31.3 Child Elements

Constructor: The CSOM Object path that is created by invoking the constructor of a CSOM Object type.

Identity: The CSOM Object path that is obtained by its opaque CSOM Object identity, which is an implementation-specific string that uniquely identifies a CSOM Object.

Method: The CSOM Object path that is returned by a method call.

Property: The CSOM Object path that is accessed as a property of another CSOM Object.

StaticMethod: The CSOM Object path that is returned by a static method call.

StaticProperty: The CSOM Object path that is accessed as a static property of a CSOM Object type.

3.1.4.1.3.32 QueryPropertyType

The **QueryPropertyType** complex type is a child item query component that retrieves property data for a CSOM Object.

3.1.4.1.3.32.1 Schema

```
<xs:complexType name="QueryPropertyType" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element name="Query" type="mstns:QueryType" minOccurs="0"/>
    <xs:element name="ChildItemQuery" type="mstns:ChildItemQueryType" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="Name" type="mstns:PropertyNameType" use="required"/>
  <xs:attribute name="ScalarProperty" type="xs:boolean" use="optional"/>
  <xs:attribute name="SelectAll" type="xs:boolean" use="optional"/>
</xs:complexType>
```

3.1.4.1.3.32.2 Attributes

Name: The name of the property or **CSOM expando field**. It MUST be a valid property or CSOM expando field that is defined by the CSOM Object.

ScalarProperty: A **Boolean** value that specifies whether the property is a scalar property.

If this value is "true" and the property is not a scalar property, the protocol server MUST return an error whose error type name is "Microsoft.SharePoint.Client.InvalidClientQueryException".

If this value is "false" and the property is a scalar property, the protocol server MUST return an error whose error type name is "Microsoft.SharePoint.Client.InvalidClientQueryException".

SelectAll: If this value is "true", the property MUST be a CSOM Object collection or a CSOM Object.

If this value is "true" and the property or CSOM expando field is a CSOM Object collection, the protocol server MUST return all of the child objects of the CSOM Object collection. Additionally, for each child object of the CSOM Object collection, the protocol server MUST return all of the default scalar properties and fields, and the query specified by the **ChildItemQuery** element, if that element is present.

Otherwise, if this value is "false" and the property or CSOM expando field is a CSOM Object collection, the protocol server MUST return the query specified by the **ChildItemQuery** element, if that element is present.

If this value is "true" and the property or CSOM expando field is a CSOM Object, the protocol server MUST return all of the default scalar properties of the CSOM Object and the query specified by the **Query** element, if that element is present.

Otherwise, if this value is "false" and the property or CSOM expando field is a CSOM Object, the protocol server MUST return the query specified by the **Query** element, if that element is present.

3.1.4.1.3.32.3 Child Elements

ChildItemQuery: The child item query that is applied to the child CSOM Objects if the property or CSOM expando field is a CSOM Object collection.

Query: The child item query that is applied to the property if the property or CSOM expando field is a CSOM Object.

3.1.4.1.3.33 QueryType

The **QueryType** complex type is a child item query that returns data about a specified CSOM Object.

3.1.4.1.3.33.1 Schema

```
<xs:complexType name="QueryType" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element name="Properties">
      <xs:complexType>
        <xs:sequence>
          <xs:element name="Property" type="mstns:QueryPropertyType" minOccurs="0"
maxOccurs="unbounded"/>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="SelectAllProperties" type="xs:boolean" use="optional"/>
</xs:complexType>
```

3.1.4.1.3.33.2 Attributes

SelectAllProperties: A **Boolean** value that specifies whether the protocol server returns data from the **default scalar property set** of the CSOM Object. If this value is "true", the protocol server **MUST** return data from the default scalar property set of the CSOM Object and any of the properties that are specified by the **Properties** element. If one scalar property is already included in the **Properties** element, the protocol server **MUST** return only one copy of the property. Otherwise, if this value is "false", the protocol server **MUST** return data from the properties specified by the **Properties** element.

3.1.4.1.3.33.3 Child Elements

Properties: A list of properties to return data from.

Property: A property to be returned. It **MUST** be a valid property that is defined by the CSOM Object being queried.

3.1.4.1.3.34 RequestType

The **RequestType** complex type is the root element of a **ProcessQueryIn** XML request, as specified section [3.1.4.1.1.1](#).

3.1.4.1.3.34.1 Schema

```
<xs:complexType name="RequestType" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:sequence>
    <xs:element name="Actions" type="mstns:ActionsType"/>
    <xs:element name="ObjectPaths" type="mstns:ObjectPathsType"/>
  </xs:sequence>
  <xs:attribute name="AddExpandoFieldTypeSuffix" type="xs:boolean" use="optional"/>
  <xs:attribute name="SchemaVersion" type="mstns:VersionStringType" use="required"/>
  <xs:attribute name="LibraryVersion" type="mstns:VersionStringType" use="required"/>
  <xs:attribute name="ApplicationName" use="optional">
    <xs:simpleType>
```

```

    <xs:restriction base="xs:string">
      <xs:maxLength value="128"/>
    </xs:restriction>
  </xs:simpleType>
</xs:attribute>
</xs:complexType>

```

3.1.4.1.3.34.2 Attributes

AddExpandoFieldTypeSuffix: A **Boolean** value that specifies whether the protocol server **MUST** append type information to the name of the JSON member for a CSOM expando field, as specified section [3.1.4.1.8.1.3.1](#). The default value is "false".

ApplicationName: The name of the client application. Use of this attribute is implementation-specific.

LibraryVersion: The version of the CSOM library. Use of this attribute is implementation-specific.

SchemaVersion: The version of the CSOM protocol. This value **MUST** be "14.0.0.0" or "15.0.0.0".

3.1.4.1.3.34.3 Child Elements

Actions: The CSOM action list to be executed.

ObjectPaths: The CSOM Object path list that is used when processing the CSOM action list specified by the **Actions** element.

3.1.4.1.4 Simple Types

The following table summarizes the XML schema simple type definitions that are specific to this operation.

Simple type	Description
ActionIdType	An integer that identifies, and is associated with, a CSOM action.
GuidType	A GUID.
IdType	An integer identifier that MUST be a unique value in a request.
MethodNameType	The name of a method that is defined in a CSOM Object type.
MethodParameterTypeType	Specifies which types can be used as method parameters.
ObjectPathIdType	The integer identifier of a CSOM Object path.
PropertyNameType	The name of a valid property that is defined by a CSOM Object type or CSOM value object type.
StaticMethodNameType	The name of a valid static method that is defined by a CSOM Object type.
StaticPropertyNameType	The name of a valid static property that is defined by a CSOM Object type.
TypeIdGuidType	The GUID of a CSOM type.

Simple type	Description
VersionStringType	A version string .

3.1.4.1.4.1 ActionIdType

The **ActionIdType** simple type is an **integer** that identifies and is associated with a CSOM action.

```
<xs:simpleType name="ActionIdType" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:restriction base="mstns:IdType"/>
</xs:simpleType>
```

3.1.4.1.4.2 GuidType

The **GuidType** simple type is a GUID.

```
<xs:simpleType name="GuidType" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:restriction base="xs:string">
    <xs:pattern value="\{[0-9A-Fa-f]{8}-[0-9A-Fa-f]{4}-[0-9A-Fa-f]{4}-[0-9A-Fa-f]{4}-[0-9A-Fa-f]{12}\}" />
  </xs:restriction>
</xs:simpleType>
```

3.1.4.1.4.3 IdType

The **IdType** simple type is an **integer** identifier that **MUST** be a unique value in a request.

```
<xs:simpleType name="IdType" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:restriction base="xs:integer"/>
</xs:simpleType>
```

3.1.4.1.4.4 MethodNameType

The **MethodNameType** simple type specifies the name of a method that is defined in a CSOM Object type. It **MUST** be the name of a valid method for the CSOM Object type.

```
<xs:simpleType name="MethodNameType" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:restriction base="xs:string"/>
</xs:simpleType>
```

3.1.4.1.4.5 MethodParameterTypeType

The **MethodParameterTypeType** simple type specifies which types can be used as method parameters.

```
<xs:simpleType name="MethodParameterTypeType" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:restriction base="xs:string">
    <xs:enumeration value="Null"/>
    <xs:enumeration value="Boolean"/>
    <xs:enumeration value="Char"/>
    <xs:enumeration value="Byte"/>
  </xs:restriction>
</xs:simpleType>
```



```

    <xs:enumeration value="SByte"/>
    <xs:enumeration value="Int16"/>
    <xs:enumeration value="UInt16"/>
    <xs:enumeration value="Int32"/>
    <xs:enumeration value="UInt32"/>
    <xs:enumeration value="Int64"/>
    <xs:enumeration value="UInt64"/>
    <xs:enumeration value="DateTime"/>
    <xs:enumeration value="Single"/>
    <xs:enumeration value="Double"/>
    <xs:enumeration value="Decimal"/>
    <xs:enumeration value="TimeSpan"/>
    <xs:enumeration value="Guid"/>
    <xs:enumeration value="String"/>
    <xs:enumeration value="Base64Binary"/>
    <xs:enumeration value="Dictionary"/>
    <xs:enumeration value="Array"/>
    <xs:enumeration value="Enum"/>
    <xs:enumeration value="Number"/>
    <xs:enumeration value="Unspecified"/>
    <xs:enumeration value="Binary"/>
  </xs:restriction>
</xs:simpleType>

```

Array: The parameter is a CSOM array.

Base64Binary: The parameter is a CSOM binary.

Binary: The parameter is a CSOM Stream.

Boolean: The parameter is a CSOM Boolean.

Byte: The parameter is a CSOM Byte.

Char: The parameter is a CSOM Char.

DateTime: The parameter is a CSOM DateTime.

Decimal: The parameter is a CSOM Decimal.

Dictionary: The parameter is a CSOM dictionary.

Double: The parameter is a CSOM Double.

Enum: The parameter is a CSOM enumeration.

Guid: The parameter is a CSOM GUID.

Int16: The parameter is a CSOM Int16.

Int32: The parameter is a CSOM Int32.

Int64: The parameter is a CSOM Int64.

Null: The parameter is a CSOM null.

Number: The parameter is a **CSOM Byte**, CSOM SByte, **CSOM Int16**, CSOM UInt16, **CSOM Int32**, CSOM UInt32, **CSOM Int64**, CSOM UInt64, CSOM Single, or **CSOM Double**.

SByte: The parameter is a **CSOM SByte**.

Single: The parameter is a **CSOM Single**.

String: The parameter is a CSOM String.

TimeSpan: The parameter is a CSOM TimeSpan.

UInt16: The parameter is a **CSOM UInt16**.

UInt32: The parameter is a **CSOM UInt32**.

UInt64: The parameter is a **CSOM UInt64**.

Unspecified: The parameter type was not specified by the protocol client. An implementation **MUST** determine the correct parameter type based on the method definition.

3.1.4.1.4.6 ObjectPathIdType

The **ObjectPathIdType** simple type specifies the **integer** identifier of a CSOM Object path. It **MUST** be a unique value in a request.

```
<xs:simpleType name="ObjectPathIdType" xmlns:xs="http://www.w3.org/2001/XMLSchema">  
  <xs:restriction base="mstns:IdType"/>  
</xs:simpleType>
```

3.1.4.1.4.7 PropertyNameType

The **PropertyNameType** simple type specifies the name of a valid property that is defined by a CSOM Object type or CSOM value object type.

```
<xs:simpleType name="PropertyNameType" xmlns:xs="http://www.w3.org/2001/XMLSchema">  
  <xs:restriction base="xs:string"/>  
</xs:simpleType>
```

3.1.4.1.4.8 StaticMethodNameType

The **StaticMethodNameType** simple type specifies the name of a valid static method that is defined by a CSOM Object type.

```
<xs:simpleType name="StaticMethodNameType" xmlns:xs="http://www.w3.org/2001/XMLSchema">  
  <xs:restriction base="xs:string"/>  
</xs:simpleType>
```

3.1.4.1.4.9 StaticPropertyNameType

The **StaticPropertyNameType** simple type specifies the name of a valid static property that is defined by a CSOM Object type.

```
<xs:simpleType name="StaticPropertyNameType" xmlns:xs="http://www.w3.org/2001/XMLSchema">  
  <xs:restriction base="xs:string"/>  
</xs:simpleType>
```

3.1.4.1.4.10 TypeIdGuidType

The **TypeIdGuidType** simple type specifies the GUID of a CSOM type.

```
<xs:simpleType name="TypeIdGuidType" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:restriction base="mstns:GuidType"/>
</xs:simpleType>
```

3.1.4.1.4.11 VersionStringType

The **VersionStringType** simple type specifies a version string.

```
<xs:simpleType name="VersionStringType" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:restriction base="xs:string">
    <xs:pattern value="[0-9]{1,8}\.[0-9]{1,8}\.[0-9]{1,8}\.[0-9]{1,8}"/>
  </xs:restriction>
</xs:simpleType>
```

3.1.4.1.5 Attributes

None.

3.1.4.1.6 Groups

The following table summarizes the XML schema group definitions that are specific to this operation.

Group	Description
ActionGroup	A set of possible CSOM actions.
ExpressionGroup	A set of possible expression components.
ExpressionQueryableExpressionGroup	A set of possible queryable expressions.

3.1.4.1.6.1 ActionGroup

The **ActionGroup** group contains a set of possible CSOM actions.

3.1.4.1.6.1.1 Schema

```
<xs:group name="ActionGroup" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:choice>
    <xs:element name="SetProperty" type="mstns:ActionSetPropertyType"/>
    <xs:element name="SetStaticProperty" type="mstns:ActionSetStaticPropertyType"/>
    <xs:element name="Method" type="mstns:ActionInvokeMethodType"/>
    <xs:element name="StaticMethod" type="mstns:ActionInvokeStaticMethodType"/>
    <xs:element name="ObjectPath" type="mstns:ActionInstantiateObjectPathType"/>
    <xs:element name="ObjectIdentityQuery" type="mstns:ActionObjectIdentityQueryType"/>
    <xs:element name="Query" type="mstns:ActionQueryType"/>
    <xs:element name="ExceptionHandlingScope" type="mstns:ExceptionHandlingScopeType"/>
    <xs:element name="ExceptionHandlingScopeSimple"
      type="mstns:ExceptionHandlingScopeSimpleType"/>
    <xs:element name="ConditionalScope" type="mstns:ConditionalScopeType"/>
  </xs:choice>
```

</xs:group>

3.1.4.1.6.1.2 Attributes

None.

3.1.4.1.6.1.3 Child Elements

ConditionalScope: A CSOM action of the **ConditionalScopeType** type, as specified section [3.1.4.1.3.10](#).

ExceptionHandlingScope: A CSOM action of the **ExceptionHandlingScopeType** type, as specified section [3.1.4.1.3.12](#).

ExceptionHandlingScopeSimple: A CSOM action of the **ExceptionHandlingScopeSimpleType** type, as specified section [3.1.4.1.3.11](#).

Method: A CSOM action of the **ActionInvokeMethodType** type, as specified section [3.1.4.1.3.2](#).

ObjectIdentityQuery: A CSOM action of the **ActionObjectIdentityQueryType** type, as specified section [3.1.4.1.3.4](#).

ObjectPath: A CSOM action of the **ActionInstantiateObjectPathType** type, as specified section [3.1.4.1.3.1](#).

Query: A CSOM action of the **ActionQueryType** type, as specified section [3.1.4.1.3.5](#).

SetProperty: A CSOM action of the **ActionSetPropertyType** type, as specified section [3.1.4.1.3.6](#).

SetStaticProperty: A CSOM action of the **ActionSetStaticPropertyType** type, as specified section [3.1.4.1.3.7](#).

StaticMethod: A CSOM action of the **ActionInvokeStaticMethodType** type, as specified section [3.1.4.1.3.3](#).

3.1.4.1.6.2 ExpressionGroup

The **ExpressionGroup** group contains a set of possible expression components.

3.1.4.1.6.2.1 Schema

```
<xs:group name="ExpressionGroup" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:choice>
    <xs:element name="GT" type="mstns:ExpressionLeftRightOperandExpressionType"/>
    <xs:element name="LT" type="mstns:ExpressionLeftRightOperandExpressionType"/>
    <xs:element name="EQ" type="mstns:ExpressionLeftRightOperandExpressionType"/>
    <xs:element name="NE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
    <xs:element name="GE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
    <xs:element name="LE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
    <xs:element name="AND" type="mstns:ExpressionLeftRightOperandExpressionType"/>
    <xs:element name="OR" type="mstns:ExpressionLeftRightOperandExpressionType"/>
    <xs:element name="NOT" type="mstns:ExpressionType"/>
    <xs:element name="ExpressionMethod" type="mstns:ExpressionMethodExpressionType"/>
    <xs:element name="ExpressionStaticMethod"
      type="mstns:ExpressionStaticMethodExpressionType"/>
    <xs:element name="ExpressionProperty" type="mstns:ExpressionPropertyExpressionType"/>
  </xs:choice>
</xs:group>
```

```

    <xs:element name="ExpressionStaticProperty"
    type="mstns:ExpressionStaticPropertyExpressionType"/>
    <xs:element name="ExpressionParameter" type="mstns:ExpressionParameterExpressionType"/>
    <xs:element name="ExpressionConvert" type="mstns:ExpressionConvertExpressionType"/>
    <xs:element name="ExpressionConstant" type="mstns:MethodParameterType"/>
  </xs:choice>
</xs:group>

```

3.1.4.1.6.2.2 Attributes

None.

3.1.4.1.6.2.3 Child Elements

AND: An expression component of the **ExpressionLeftRightOperandExpressionType** type, as specified section [3.1.4.1.3.14](#). It represents the result of a logical "and" operation that is performed on the left and right operands. The left and right operands MUST evaluate to one of the **Boolean** values listed in the following table.

Left operand	Right operand	Result
true	true	true
true	false	false
false	true/false	false

If the left operand is "false", the protocol server MUST NOT evaluate the right operand.

EQ: An expression component of the **ExpressionLeftRightOperandExpressionType** type, as specified section [3.1.4.1.3.14](#). It represents the result of an equality comparison between the left and right operands. If the left operand and right operand have different CSOM types, the value is "false". If the left operand is equal to the right operand, the value is "true". Otherwise, the value is "false".

ExpressionConstant: An expression component of the **MethodParameterType** type, as specified section [3.1.4.1.3.24](#). It represents a constant value.

ExpressionConvert: An expression component of the **ExpressionConvertExpressionType** type, as specified section [3.1.4.1.3.13](#). It represents the result of a type conversion from a source expression component.

ExpressionMethod: An expression component of the **ExpressionMethodExpressionType** type, as specified section [3.1.4.1.3.15](#). It represents the result of a method call.

ExpressionParameter: An expression component of the **ExpressionParameterExpressionType** type, as specified section [3.1.4.1.3.16](#). It represents a parameter.

ExpressionProperty: An expression component of the **ExpressionPropertyExpressionType** type, as specified section [3.1.4.1.3.17](#). It represents the value of a property of a CSOM Object or CSOM value object.

ExpressionStaticMethod: An expression component of the **ExpressionStaticMethodExpressionType** type, as specified section [3.1.4.1.3.21](#). It represents the result of a static method call.

ExpressionStaticProperty: An expression component of the **ExpressionStaticPropertyExpressionType** type, as specified section [3.1.4.1.3.22](#). It represents the value of a static property of a CSOM Object type.

GE: An expression component of the **ExpressionLeftRightOperandExpressionType** type, as specified section [3.1.4.1.3.14](#). It represents the result of a greater-than-or-equal-to comparison between the left and right operands. If the left operand is greater than or equal to the right operand, the value is "true". Otherwise, the value is "false". The left operand and the right operand **MUST** have the same CSOM type.

GT: An expression component of the **ExpressionLeftRightOperandExpressionType** type, as specified section [3.1.4.1.3.14](#). It represents the result of a greater-than comparison between the left and right operands. If the left operand is greater than the right operand, the value is "true". Otherwise, the value is "false". The left operand and the right operand **MUST** have the same CSOM type.

LE: An expression component of the **ExpressionLeftRightOperandExpressionType** type, as specified section [3.1.4.1.3.14](#). It represents the result of a less-than-or-equal-to comparison between the left and right operands. If the left operand is less than or equal to the right operand, the value is "true". Otherwise, the value is "false". The left operand and the right operand **MUST** have the same CSOM type.

LT: An expression component of the **ExpressionLeftRightOperandExpressionType** type, as specified section [3.1.4.1.3.14](#). It represents the result of a less-than comparison between the left and right operands. If the left operand is less than the right operand, the value is "true". Otherwise, the value is "false". The left operand and the right operand **MUST** have the same CSOM type.

NE: An expression component of the **ExpressionLeftRightOperandExpressionType** type, as specified section [3.1.4.1.3.14](#). It represents the result of a not-equal-to comparison between the left and right operands. If the left operand and right operand have different CSOM types, the value is "true". If the value of the left and right operands is the same, the value is "false". Otherwise, the value is "true".

NOT: An expression component of the **ExpressionType** type, as specified section [3.1.4.1.3.23](#). It represents the result of a logical "not" operation. The operand **MUST** evaluate to one of the **Boolean** values in the following table.

Operand	Result
true	false
false	true

OR: An expression component of the **ExpressionLeftRightOperandExpressionType** type, as specified section [3.1.4.1.3.14](#). It represents the result of a logical "or" operation performed on a left and right operand. The left operand and right operand **MUST** evaluate to one of the **Boolean** values in the following table.

Left operand	Right operand	Result
false	true	true
false	false	false
true	true/false	true

If the left operand is evaluated to be "true", the protocol server MUST NOT evaluate the right operand.

3.1.4.1.6.3 ExpressionQueryableExpressionGroup

The **ExpressionQueryableExpressionGroup** group contains a set of possible queryable expressions.

3.1.4.1.6.3.1 Schema

```
<xs:group name="ExpressionQueryableExpressionGroup"
  xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:choice>
    <xs:element name="Take" type="mstns:ExpressionQueryableTakeType"/>
    <xs:element name="Where" type="mstns:ExpressionQueryableWhereType"/>
    <xs:element name="OrderBy" type="mstns:ExpressionQueryableWhereType"/>
    <xs:element name="OrderByDescending" type="mstns:ExpressionQueryableWhereType"/>
    <xs:element name="ThenBy" type="mstns:ExpressionQueryableWhereType"/>
    <xs:element name="ThenByDescending" type="mstns:ExpressionQueryableWhereType"/>
    <xs:element name="QueryableObject">
      <xs:complexType/>
    </xs:element>
  </xs:choice>
</xs:group>
```

3.1.4.1.6.3.2 Attributes

None.

3.1.4.1.6.3.3 Child Elements

OrderBy: An expression of the **ExpressionQueryableWhereType** type, as specified in section [3.1.4.1.3.20](#), which specifies a sorted set of CSOM Objects in ascending order.

OrderByDescending: An expression of the **ExpressionQueryableWhereType** type, as specified in section [3.1.4.1.3.20](#), which specifies a sorted set of CSOM Objects in descending order.

QueryableObject: An expression that references a collection of CSOM Objects.

Take: An expression of the **ExpressionQueryableTakeType** type, as specified section [3.1.4.1.3.19](#).

ThenBy: An expression of the **ExpressionQueryableWhereType** type, as specified in section [3.1.4.1.3.20](#), which specifies a sorted set of CSOM Objects in ascending order.

ThenByDescending: An expression of the **ExpressionQueryableWhereType** type, as specified in section [3.1.4.1.3.20](#), which specifies a sorted set of CSOM Objects in descending order.

Where: An expression of the **ExpressionQueryableWhereType** type, as specified in section [3.1.4.1.3.20](#), which specifies a filtered set of CSOM Objects.

3.1.4.1.7 Attribute Groups

None.

3.1.4.1.8 JSON Types

The **ProcessQueryOut** response message, as specified section [3.1.4.1.1.2](#), consists of UTF-8 text that contains JSON values.

3.1.4.1.8.1 JSON Object Types

3.1.4.1.8.1.1 CSOM Dictionary JSON Value

The **CSOM dictionary JSON value** object is a JSON object that represents an unordered collection of key/value pairs. Each JSON object name/value member represents a key/value entry in a CSOM dictionary. The name of the JSON member is the dictionary key and the value of the JSON member is the dictionary value.

3.1.4.1.8.1.2 CSOM Error JSON Value

The **CSOM error JSON value** object is a JSON object that contains information about an error that occurred on the protocol server while processing a request. It contains the following JSON members listed in the following table.

Member name	Member value
ErrorCode	A CSOM Int32 JSON value that indicates the error code for the error. This member MUST be present.
ErrorDetails	A CSOM value object JSON value that contains detailed information about the error. This member is optional. If there isn't any detailed information for the error, this member is not present.
ErrorMessage	If an error message is generated while executing the request, this value is a CSOM String JSON value that is set to the value of the error message. If no error message is generated, this value MUST be a CSOM null JSON value. This member MUST be present.
ErrorStackTrace	If a call-stack trace is generated during the execution of the request, this value is a CSOM String JSON value that contains the call-stack trace information for the error. If no call-stack trace is generated, this value MUST be a CSOM null JSON value. This member is optional.
ErrorTypeName	If there is type name information, this value is a CSOM String JSON value with the type name of the error. If there is no type name information, this value MUST be a CSOM null JSON value. This member MUST be present.
ErrorValue	If there is additional error information, this value is a CSOM String JSON value with additional information about the error. If there isn't any additional error information, this MUST be a CSOM null JSON value. This member MUST be present.

The protocol server MUST return the errors listed in the following table when the specified error condition occurs.

ErrorCode	ErrorTypeName	ErrorValue	Description
-2147024891	System.UnauthorizedAccessException	CSOM null JSON value	The user does not have permission to perform the specified actions or access one or more of the specified resources.

ErrorCode	ErrorTypeName	ErrorValue	Description
- 2130575339	Microsoft.SharePoint.Client. VersionConflictException	CSOM null JSON value	The version of the CSOM Object that was passed from the protocol client does not match the version of that object on the protocol server.
- 2147024846	Microsoft.SharePoint.Client. ApiBlockedException	CSOM null JSON value	The property or method is not allowed to be accessed.
- 2130575151	Microsoft.SharePoint.Client. NotSupportedRequestVersionException	A CSOM String JSON value that contains a comma-delimited list of the supported schema versions.	The schema version specified by the SchemaVersion attribute of the Request element is not supported by the protocol server.
- 2130575152	Microsoft.SharePoint.Client. RedirectException	A CSOM String JSON value that contains the URL that the request is redirected to.	The request was redirected to another URL by the protocol server.

3.1.4.1.8.1.3 CSOM Object JSON Value

The **CSOM Object JSON value** object is a JSON object that contains information about a CSOM Object. It has the JSON members listed in the following table.

Member name	Member value
ObjectType	A CSOM String JSON value that identifies the type of a CSOM Object. This member MUST be the first member in the JSON object. This member MUST be present.
ObjectIdentity	A CSOM String JSON value that contains implementation-specific information that uniquely identifies a CSOM Object. By using the ObjectPathObjectIdentityNameType type, as specified section 3.1.4.1.3.27 , this value can be used in subsequent ProcessQuery requests, as specified section 3.1.4.1 , to obtain the CSOM Object. If the CSOM Object has an object identity, this member MUST be present. Otherwise, this member MUST NOT be present.
ObjectVersion	A CSOM String JSON value that contains implementation-specific information about the version of a CSOM Object. By using the ActionInvokeMethodType type, as specified section 3.1.4.1.3.2 , this value can be used in subsequent ProcessQuery requests, as specified section 3.1.4.1 , to verify that a method call is valid, based on the protocol client version of the CSOM Object and the protocol server version of the CSOM Object. If the CSOM Object has a version, this member MUST be present. Otherwise, this member MUST NOT be present.
propName#	The member name is the CSOM Object property name. The member value is the value of the CSOM Object property. If a query is specified in the request XML for the CSOM Object, the protocol server MUST include the properties that are specified by the query in the CSOM Object JSON value. If a query is not specified in the request XML for the CSOM Object, the protocol server MUST include only the scalar properties of the CSOM Object in the CSOM Object JSON value. The propName member can have a numeric suffix, which is indicated by a pound sign (#), and that sign is replaced with a numeral

Member name	Member value
	to represent one CSOM Object property. For example, if there are three properties whose names are Title, Description, and Address, the propName1 , propName2 and propName3 represent those three properties.
expandoProp#	The member name is the name of a CSOM expando field. The member name optionally has a suffix if the value of the AddExpandoFieldTypeSuffix attribute is "true" in the RequestType type, as specified section 3.1.4.1.3.34 . For more information see section 3.1.4.1.8.1.3.1 . The member value is the value of the CSOM expando field. The expandoProp member can have a numeric suffix, which is indicated by a pound sign (#), and that sign is replaced with numeral to represent one CSOM expando field. For example, if there are three CSOM expando fields whose names are Title, Description, and Address, the expandoProp1 , expandoProp2 and expandoProp3 represent those three CSOM expando fields.
_Child_Items_	A CSOM array JSON value that contains child objects of the CSOM Object. This member is optional. The protocol server MUST include this member only if the CSOM Object is a CSOM Object collection and the protocol client queries for child objects of that collection.

3.1.4.1.8.1.3.1 JSON Member Name for Expando Field

If a protocol client specifies that the value of the **AddExpandoFieldTypeSuffix** attribute in a **RequestType** type, as specified section [3.1.4.1.3.34](#), is "true", the protocol server MUST append a suffix to the name of the CSOM expando field and use the resulting name as the name of the JSON member. Otherwise, the protocol server MUST use only the name of the CSOM expando field as the name of the JSON member. The following is the Augmented Backus-Naur Form (ABNF) grammar for defining the name of the JSON member for a CSOM expando field, if a protocol client specifies that value of the **AddExpandoFieldTypeSuffix** attribute is "true" in the **RequestType** type.

```

csom-expando-member-name = rfc4627-quotation-mark csom-expando-property-name
                           [csom-expando-suffix] rfc4627-quotation-mark
csom-expando-property-name = 1*restricted-char
csom-expando-suffix        = csom-expando-suffix-char /
                           csom-expando-suffix-byte /
                           csom-expando-suffix-int16 /
                           csom-expando-suffix-uint16 /
                           csom-expando-suffix-int32 /
                           csom-expando-suffix-uint32 /
                           csom-expando-suffix-single /
                           csom-expando-suffix-double /
                           csom-expando-suffix-array

csom-expando-suffix-char  = %x24.20.20.20.43.68.61.72 ; "$ Char"
csom-expando-suffix-byte  = %x24.20.20.20.42.79.74.65 ; "$ Byte"
csom-expando-suffix-int16 = %x24.20.20.20.49.6E.74.31.36 ; "$ Int16"
csom-expando-suffix-uint16 = %x24.20.55.49.6E.74.31.36 ; "$ UInt16"
csom-expando-suffix-int32 = %x24.20.20.49.6E.74.33.32 ; "$ Int32"
csom-expando-suffix-uint32 = %x24.20.55.49.6E.74.33.32 ; "$ UInt32"
csom-expando-suffix-single = %x24.20.53.69.6E.67.6C.65 ; "$ Single"
csom-expando-suffix-double = %x24.20.44.6F.75.62.6C.65 ; "$ Double"
csom-expando-suffix-array = %x24 csom-expando-array-itemtype
                           %x24.20.20.41.72.72.61.79 ; "$ Array"
csom-expando-array-itemtype = %x42.6F.6F.6C.65.61.6E / ; "Boolean"
                           %x43.68.61.72 / ; "Char"
                           %x53.42.79.74.65 / ; "SByte"
                           %x49.6E.74.31.36 / ; "Int16"
                           %x55.49.6E.74.31.36 / ; "UInt16"

```

```

%x49.6E.74.33.32 / ; "Int32"
%x55.49.6E.74.33.32 / ; "UInt32"
%x49.6E.74.36.34 / ; "Int64"
%x55.49.6E.74.36.34 / ; "UInt64"
%x44.61.74.65.54.69.6D.65 / ; "DateTime"
%x53.69.6E.67.6C.65 / ; "Single"
%x44.6F.75.62.6C.65 / ; "Double"
%x47.75.69.64 / ; "Guid"
%x53.74.72.69.6E.67 / ; "String"
csom-expando-array-itemtypeid
csom-expando-array-itemtypeid = 4hexOctet "-" 2hexOctet "-" 2hexOctet
                                "-" 2hexOctet "-" 6hexOctet
hexOctet = hexDigit hexDigit
hexDigit = "0" / "1" / "2" / "3" / "4" /
           "5" / "6" / "7" / "8" / "9" /
           "a" / "b" / "c" / "d" / "e" / "f" /
           "A" / "B" / "C" / "D" / "E" / "F"

```

In the preceding ABNF, the **restricted-char** rule is specified in the CSOM String JSON value, as specified section [2.2.5.14.2](#).

The protocol server MUST define and append a suffix based on the type of value that is stored in the CSOM expando field, according to the rules in the following table.

Type of value	Suffix
CSOM Char	csom-expando-suffix-char
CSOM Byte	csom-expando-suffix-byte
CSOM Int16	csom-expando-suffix-int16
CSOM UInt16	csom-expando-suffix-uint16
CSOM Int32	csom-expando-suffix-int32
CSOM UInt32	csom-expando-suffix-uint32
CSOM Single	csom-expando-suffix-single
CSOM Double	csom-expando-suffix-double
Array of CSOM Char	csom-expando-suffix-array and csom-expando-array-itemtype is Char.
Array of CSOM SByte	csom-expando-suffix-array and csom-expando-array-itemtype is SByte.
Array of CSOM Int16	csom-expando-suffix-array and csom-expando-array-itemtype is Int16.
Array of CSOM UInt16	csom-expando-suffix-array and csom-expando-array-itemtype is UInt16.
Array of CSOM UInt32	csom-expando-suffix-array and csom-expando-array-itemtype is Int32.
Array of CSOM Int64	csom-expando-suffix-array and csom-expando-array-itemtype is Int64.

Type of value	Suffix
Array of CSOM UInt64	csom-expando-suffix-array and csom-expando-array-itemtype is UInt64.
Array of CSOM DateTime	csom-expando-suffix-array and csom-expando-array-itemtype is DateTime.
Array of CSOM Single	csom-expando-suffix-array and csom-expando-array-itemtype is Single.
Array of CSOM Double	csom-expando-suffix-array and csom-expando-array-itemtype is Double.
Array of CSOM GUID	csom-expando-suffix-array and csom-expando-array-itemtype is Guid.
Array of CSOM object	csom-expando-suffix-array and csom-expando-array-itemtype is csom-expando-array-itemtypeid, which is the CSOM Object type identifier.
Array of CSOM value object	csom-expando-suffix-array and csom-expando-array-itemtype is csom-expando-array-itemtypeid, which is the CSOM value object type identifier.
Other types	The protocol server MUST NOT append any suffix.

For example, if the **AddExpandoFieldTypeSuffix** attribute value of a **RequestType** type is "true", the name of a CSOM expando field is "example", and the property value is a CSOM Int32, the name of the JSON member for the CSOM expando field MUST be:

```
"example$ Int32"
```

In the preceding code, there are two space characters (U+0020) between "\$" and "Int32".

For a CSOM expando field with the name "examples" and a property value that is an array of CSOM Strings, the name of the JSON member for the CSOM expando field MUST be:

```
"examples$string$ Array"
```

In the preceding code, there are two space characters (U+0020) between "\$" and "Array".

For a CSOM expando field with the name "test" and a property value that is an array of CSOM value objects with the type identifier is "3e28ad77-9cf0-4557-8223-6609053f89b8", the name of the JSON member for the CSOM expando field MUST be:

```
"test$3e28ad77-9cf0-4557-8223-6609053f89b8$ Array"
```

In the preceding code, there are two space characters (U+0020) between "\$" and "Array".

3.1.4.1.8.1.4 CSOM Value Object JSON Value

The **CSOM value object JSON value** object is a JSON object that contains information about a CSOM value object. It has the JSON members listed in the following table.

Member name	Member value
ObjectType	A CSOM String JSON value that identifies the type of the CSOM value object. This member MUST be the first member in the JSON object and it MUST be present in the JSON object.
propName#	Represents a property of a CSOM value object and the value of that property. The name of the member is the name of the property. The value of the member is the value of the property. The protocol server MUST include in the JSON object all of the properties of the CSOM value object. The propName member can have a numeric suffix, which is indicated by a pound sign (#), and that sign is replaced with a numeral if the property is a custom property. For example, if there are three properties whose names are Title, Description, and Address, the propName1 , propName2 and propName3 represent those three properties.

3.1.4.1.8.1.5 Response Header JSON Value

The **response header JSON value** object is a JSON object that contains header information for a response. It has the JSON members listed in the following table.

Member name	Member value
SchemaVersion	A CSOM String JSON value that represents the version of the protocol scheme. This value MUST conform to the VersionStringType simple type, as defined in section 3.1.4.1.4.11 . It MUST be "14.0.0.0" or "15.0.0.0". This member MUST be present.
LibraryVersion	A CSOM String JSON value that represents the product version on the protocol server. This value MUST conform to the VersionStringType simple type, as defined in section 3.1.4.1.4.11 . This member MUST be present.
ErrorInfo	If an unhandled error occurs on the protocol server while processing a request, this value is a CSOM error JSON value that contains information about the error. Otherwise, this value is a CSOM null JSON value. This member MUST be present.

3.1.4.1.8.2 JSON Response Structure

The JSON response structure consists of UTF-8 text in JSON format. It represents a response from a **ProcessQuery** request message, as specified section [3.1.4.1](#). The top-level JSON value MUST be a JSON array.

A JSON response structure MUST have at least one element, which is the response header, followed by a "0" (zero), and one or more **actionId** and **actionResponse** value pairs. These values MUST correspond to the CSOM actions that were executed and resulted in a response.

The following table lists the elements in a response JSON array.

Index	Name	Description
0	responseHeader	A response header JSON value, as specified in section 3.1.4.1.8.1.5 .
i + 1	actionId _i	A JSON number that identifies the CSOM action that the actionResponse_i applies to.
i + 2	actionResponse _i	An ActionResponseType result, as specified in section 3.1.4.1.8.2.1 , that results from the protocol server executing the CSOM action specified by the

Index	Name	Description
		actionIdi element.

3.1.4.1.8.2.1 ActionResponseTypes

The **ActionResponseTypes** values in a JSON response structure represent the results of a CSOM action that was executed by a protocol server.

3.1.4.1.8.2.1.1 ConditionalScopeResponse JSON Value

The **ConditionalScopeResponse** JSON value is the response for a CSOM action **ConditionalScopeType** complex type, as specified in section [3.1.4.1.3.10](#).

```
<xs:element name="ConditionalScope" type="ConditionalScopeType"
xmlns:xs="http://www.w3.org/2001/XMLSchema"/>
```

It is a JSON object and it MUST have a **Test** JSON member. The value of the **Test** member is a CSOM Boolean JSON value that represents the result of evaluating a conditional expression. If the conditional expression is evaluated as "true", the value MUST be a JSON literal "true". Otherwise, the value MUST be a JSON literal "false".

3.1.4.1.8.2.1.2 ExceptionHandlingScopeResponse JSON Value

The **ExceptionHandlingScopeResponse** JSON value is the response for a CSOM action **ExceptionHandlingScopeType** complex type, as specified in section [3.1.4.1.3.12](#).

```
<xs:element name="ExceptionHandlingScope" type="ExceptionHandlingScopeType"
xmlns:xs="http://www.w3.org/2001/XMLSchema"/>
```

It is a JSON object and it has the JSON members listed in the following table.

Member name	Member value
HasException	A CSOM Boolean JSON value that indicates whether an unhandled exception occurred on the protocol server while executing the CSOM actions specified by the TryScope element of the ExceptionHandlingScopeType complex type. If an unhandled exception occurred, this value MUST be a JSON literal "true". Otherwise, this value MUST be a JSON literal "false". This member MUST be present.
ErrorInfo	Either a CSOM error JSON value that contains information about the error or, if there is no error message, a CSOM null JSON value. This member MUST be present.

3.1.4.1.8.2.1.3 ExceptionHandlingScopeSimpleResponse JSON Value

The **ExceptionHandlingScopeSimpleResponse** JSON value is the response for a CSOM action **ExceptionHandlingScopeSimpleType** complex type, as specified in section [3.1.4.1.3.11](#).

```
<xs:element name="ExceptionHandlingScopeSimple" type="ExceptionHandlingScopeSimpleType"
xmlns:xs="http://www.w3.org/2001/XMLSchema"/>
```

It is a JSON object and it has the JSON members listed in the following table.

Member name	Member value
HasException	A CSOM Boolean JSON value that indicates whether an unhandled exception occurred on the protocol server while executing the CSOM actions specified by the ExceptionHandlerScopeSimpleType complex type. If an unhandled exception occurred, this value MUST be a JSON literal "true". Otherwise, this value MUST be a JSON literal "false". This member MUST be present.
ErrorInfo	Either a CSOM error JSON value that contains information about the error or, if there is no error message, a CSOM null JSON value. This member MUST be present.

3.1.4.1.8.2.1.4 MethodResponse JSON Value

The **MethodResponse** JSON value is the response of either CSOM action **ActionInvokeMethodType** complex type or CSOM action **ActionInvokeStaticMethodType** complex type when the method does not have a void response type. The **ActionInvokeMethodType** complex type is specified in section [3.1.4.1.3.2](#), as follows:

```
<xs:element name="Method" type="ActionInvokeMethodType"
  xmlns:xs="http://www.w3.org/2001/XMLSchema"/>
```

and the **ActionInvokeStaticMethodType** complex type is specified in section [3.1.4.1.3.3](#), as follows:

```
<xs:element name="StaticMethod" type="ActionInvokeStaticMethodType"
  xmlns:xs="http://www.w3.org/2001/XMLSchema"/>
```

The **MethodResponse** JSON value represents the response for a CSOM action. If the value that is returned while calling the method is null, the protocol server MUST return a CSOM null JSON value. Otherwise, the protocol server MUST return one of the data types listed in the following table, based on the type that is returned by the method.

Method return type	JSON response type
CSOM array	CSOM array JSON value
CSOM binary	CSOM binary JSON value
CSOM Byte	CSOM Byte JSON value
CSOM Char	CSOM Char JSON value
CSOM DateTime	CSOM DateTime JSON value
CSOM dictionary	CSOM dictionary JSON value
CSOM Double	CSOM Double JSON value
CSOM Enum	CSOM Enum JSON value
CSOM GUID	CSOM GUID JSON value
CSOM Int16	CSOM Int16 JSON value

Method return type	JSON response type
CSOM Int32	CSOM Int32 JSON value
CSOM Int64	CSOM Int64 JSON value
CSOM SByte	CSOM SByte JSON value
CSOM Single	CSOM Single JSON value
CSOM String	CSOM String JSON value
CSOM UInt16	CSOM UInt16 JSON value
CSOM UInt32	CSOM UInt32 JSON value
CSOM UInt64	CSOM UInt64 JSON value
CSOM Stream	CSOM Stream JSON value
CSOM Object	CSOM Object JSON value
CSOM value object	CSOM value object JSON value

3.1.4.1.8.2.1.5 ObjectIdentityQueryResponse JSON Value

The **ObjectIdentityQueryResponse** JSON value is an **ActionObjectIdentityQueryType** complex type, as specified in section [3.1.4.1.3.4](#), that represents the response for a CSOM action.

```
<xs:element name="ObjectIdentityQuery" type="ActionObjectIdentityQueryType"
  xmlns:xs="http://www.w3.org/2001/XMLSchema"/>
```

If the CSOM Object obtained from the specified CSOM Object path identifier is null, it is JSON literal null. Otherwise, it is a JSON object and it has the **_ObjectIdentity_** JSON member. The value of the **_ObjectIdentity_** member is a CSOM String JSON value that contains implementation-specific information that uniquely identifies a CSOM Object. By using the **ObjectPathObjectIdentityNameType** complex type, as specified section [3.1.4.1.3.27](#), this value can be used in subsequent **ProcessQuery** request messages, as specified section [3.1.4.1](#), to obtain the CSOM Object.

3.1.4.1.8.2.1.6 ObjectPathResponse JSON Value

The **ObjectPathResponse** JSON value is an **ActionInstantiateObjectPathType** complex type, as specified in section [3.1.4.1.3.1](#), that represents the response for CSOM action.

```
<xs:element name="ObjectPath" type="ActionInstantiateObjectPathType"
  xmlns:xs="http://www.w3.org/2001/XMLSchema"/>
```

It is a JSON object and it MUST have an **IsNull** JSON member. The value of the **IsNull** member is a CSOM Boolean JSON value that indicates whether the CSOM Object obtained from the specified CSOM Object path identifier is null. If the CSOM Object is null, this value MUST be a JSON literal "true". Otherwise, this value MUST be a JSON literal "false".

3.1.4.1.8.2.1.7 QueryResponse JSON Value

The **QueryResponse** JSON value is an **ActionQueryType** complex type, as specified in section [3.1.4.1.3.5](#), that represents a response for a CSOM action.

```
<xs:element name="Query" type="ActionQueryType" xmlns:xs="http://www.w3.org/2001/XMLSchema"/>
```

If the CSOM Object obtained from the specified CSOM Object path identifier is null, it is JSON literal null. Otherwise, it is a CSOM Object JSON value, as specified in section [3.1.4.1.8.1.3](#).

3.1.5 Timer Events

None.

3.1.6 Other Local Events

None.

4 Protocol Examples

The following examples illustrate how a protocol client retrieves and updates data on a protocol server by using this protocol. The example scenario is a book store that has a catalog of books. Each book within that catalog has an identifier, title, author, and status.

In this scenario, the CSOM types listed in the following table are defined on the protocol server.

CSOM type	CSOM type name (identifier)	Description	Properties	Methods
BookStore	SampleCode.BookStore (acc57e47-24b0-4400-b1c7-aa1cf3c9542d)	A CSOM Object type that defines the book store, which contains a catalog.	Catalog – A Catalog type that contains a static property specifying a catalog of books.	None.
Catalog	SampleCode.Catalog (04a81e1b-a5b9-445d-97c0-681fe3f61189)	A CSOM Object type that defines the catalog, which contains a collection of books.	Books – A list of books.	None.
BookCollection	SampleCode.BookCollection (4c456811-3967-4021-8d9f-237ebd9c1170)	A CSOM Object type that defines a collection of books within a catalog.	None.	Add – Returns a Book type and adds a book to the collection. The only parameter is a BookCreationInformation object, which contains the title, author, publish date, and status of a book. GetById – Returns a Book type that represents the book with the specified book identifier. If the book does not exist, the protocol server returns CSOM null. The only parameter is a CSOM GUID that contains the book identifier of the book.
Book	SampleCode.Book (030f9ac0-5f2b-4422-9e32-bcdfc1a0c93a)	A CSOM Object type that defines a specific	Author – A CSOM String that contains the name	Update – Updates information about the book by saving the property values that are currently set for

CSOM type	CSOM type name (identifier)	Description	Properties	Methods
		book in a collection of books.	<p>of the author of the book.</p> <p>Id– A CSOM String value that contains the identification number for the book.</p> <p>PublishDate– A CSOM DateTime value that contains the date when the book was published.</p> <p>Status– A Status type that contains the status of the book.</p> <p>Title– A CSOM String that contains the title of the book.</p>	<p>the book. This method does not define any parameters.</p> <p>GetSampleStream – Get the sample content of the book. This method does not define any parameters..</p> <p>UpdateSampleStream – Update the sample content of the book. The only parameter is a CSOM Stream that contains the sample content of the book.</p>
BookCreationInformation	SampleCode.BookCreationInformation (dda98aeb-f87d-490f-9a61-be08644ad461)	A CSOM value object type that contains information about a book to be added to the catalog for the book store.	<p>Author– A CSOM String that contains the name of the author of the book.</p> <p>PublishDate– A CSOM DateTime value that contains the date when the book was published.</p> <p>Status– A</p>	None.

CSOM type	CSOM type name (identifier)	Description	Properties	Methods
			Status type that contains the status of the book. Title – A CSOM String that contains the title of the book.	
Status		A CSOM enumeration type that specifies whether a book is in stock. If a book is in stock, this value is "0" (zero). If a book is out of stock, this value is "1". If a book is on back order, this value is "2".	None.	None.

In the examples, the catalog contains the following books.

Identifier	Title	Author	Status	Publish date
3387ac63-e73d-421f-bff7-359a4aa2bc38	How to Cook Chinese Food	Soha Kamal	0	March 1, 2008
f6a265ab-86e5-4fbf-937c-49923604b91d	How to Cook Japanese Food	Soha Kamal	1	May 5, 2007
2e80eb25-b64a-4506-b87b-2fff6ddb3f57	Best Recipes	Lisa Andrews	0	January 3, 2009
704655a3-c136-469c-a578-f79652a93f9b	Family Recipes	Patrick Hines	0	December 1, 2005

4.1 Retrieve Book Information

In this example, a protocol client requests information about a book by using the book identifier "3387ac63-e73d-421f-bff7-359a4aa2bc38". The protocol client also requests author and status information for the book that is associated with identifier "704655a3-c136-469c-a578-f79652a93f9b".

The protocol client sends the following message:

```
<Request
  AddExpandoFieldTypeSuffix="true"
  SchemaVersion="15.0.0.0"
  LibraryVersion="15.0.0.0"
  ApplicationName=".NET Library"
  xmlns="http://schemas.microsoft.com/sharepoint/clientquery/2009">
  <Actions>
    <ObjectPath Id="2" ObjectPathId="1" />
    <ObjectPath Id="4" ObjectPathId="3" />
    <ObjectPath Id="6" ObjectPathId="5" />
    <Query Id="7" ObjectPathId="5">
      <Query SelectAllProperties="true">
        <Properties />
      </Query>
    </Query>
    <ObjectPath Id="9" ObjectPathId="8" />
    <Query Id="10" ObjectPathId="8">
      <Query SelectAllProperties="false">
        <Properties>
          <Property Name="Author" ScalarProperty="true" />
          <Property Name="Status" ScalarProperty="true" />
        </Properties>
      </Query>
    </Query>
  </Actions>
  <ObjectPaths>
    <StaticProperty Id="1" TypeId="{acc57e47-24b0-4400-b1c7-aa1cf3c9542d}" Name="Catalog" />
    <Property Id="3" ParentId="1" Name="Books" />
    <Method Id="5" ParentId="3" Name="GetById">
      <Parameters>
        <Parameter Type="Guid">{3387ac63-e73d-421f-bff7-359a4aa2bc38}</Parameter>
      </Parameters>
    </Method>
    <Method Id="8" ParentId="3" Name="GetById">
      <Parameters>
        <Parameter Type="Guid">{704655a3-c136-469c-a578-f79652a93f9b}</Parameter>
      </Parameters>
    </Method>
  </ObjectPaths>
</Request>
```

The protocol server responds with the following message:

```
[
  {
    "SchemaVersion" : "15.0.0.0",
    "LibraryVersion" : "15.0.3421.3000",
    "ErrorInfo" : null
  }
]
```

```

    },
    2,
    {
      "IsNull" : false
    },
    4,
    {
      "IsNull" : false
    },
    6,
    {
      "IsNull" : false
    },
    7,
    {
      "_ObjectType_" : "SampleCode.Book",
      "Author" : "Soha Kamal",
      "Id" : "\\Guid(3387ac63-e73d-421f-bff7-359a4aa2bc38)\\",
      "PublishDate" : "\\Date(2008,2,1,0,0,0)\\",
      "Status" : 0,
      "Title" : "How to Cook Chinese Food"
    },
    9,
    {
      "IsNull" : false
    },
    10,
    {
      "_ObjectType_" : "SampleCode.Book",
      "Author" : "Patrick Hines",
      "Status" : 0
    }
  ]

```

4.2 Retrieve Books by a Specific Author

In this example, a protocol client requests information about all of the books that are associated with the author named Soha Kamal.

The protocol client sends the following message:

```

<Request
  AddExpandoFieldTypeSuffix="true"
  SchemaVersion="15.0.0.0"
  LibraryVersion="15.0.0.0"
  ApplicationName=".NET Library"
  xmlns="http://schemas.microsoft.com/sharepoint/clientquery/2009">
  <Actions>
    <ObjectPath Id="12" ObjectPathId="11" />
    <ObjectPath Id="14" ObjectPathId="13" />
    <Query Id="15" ObjectPathId="13">
      <Query SelectAllProperties="false">
        <Properties />
      </Query>
      <ChildItemQuery SelectAllProperties="true">
        <Properties />
      </ChildItemQuery>
    </Query>
  </Actions>
</Request>

```

```

<QueryableExpression>
  <Where>
    <Test>
      <Parameters>
        <Parameter Name="bk" />
      </Parameters>
      <Body>
        <EQ>
          <ExpressionProperty Name="Author">
            <ExpressionParameter Name="bk" />
          </ExpressionProperty>
          <ExpressionConstant Type="String">Soha Kamal</ExpressionConstant>
        </EQ>
      </Body>
    </Test>
  </Where>
  <QueryableObject />
</QueryableExpression>
</ChildItemQuery>
</Query>
</Actions>
<ObjectPaths>
  <StaticProperty Id="11" TypeId="{acc57e47-24b0-4400-b1c7-aalcf3c9542d}" Name="Catalog" />
  <Property Id="13" ParentId="11" Name="Books" />
</ObjectPaths>
</Request>

```

The protocol server responds with the following message:

```

[
  {
    "SchemaVersion" : "15.0.0.0",
    "LibraryVersion" : "15.0.3421.3000",
    "ErrorInfo" : null
  },
  12,
  {
    "IsNull" : false
  },
  14,
  {
    "IsNull" : false
  },
  15,
  {
    "_ObjectType_" : "SampleCode.BookCollection",
    "_Child_Items_" : [
      {
        "_ObjectType_" : "SampleCode.Book",
        "Author" : "Soha Kamal",
        "Id" : "\/Guid(3387ac63-e73d-421f-bff7-359a4aa2bc38)\/",
        "PublishDate" : "\/Date(2008,2,1,0,0,0)\/",
        "Status" : 0,
        "Title" : "How to Cook Chinese Food"
      },
    ],
  }
]

```

```

    "_ObjectType_" : "SampleCode.Book",
    "Author" : "Soha Kamal",
    "Id" : "\/Guid(f6a265ab-86e5-4fbf-937c-49923604b91d)\/",
    "PublishDate" : "\/Date(2007,4,4,0,0,0)\/",
    "Status" : 1,
    "Title" : "How to Cook Japanese Food"
  }
}
]
]

```

4.3 Update Book Information

In this example, a protocol client sends a request to update author and status information for the book that is associated with the identifier "2e80eb25-b64a-4506-b87b-2fff6ddb3f57", and to retrieve information about all of the books in the catalog.

The protocol client sends the following message:

```

<Request
  AddExpandoFieldTypeSuffix="true"
  SchemaVersion="15.0.0.0"
  LibraryVersion="15.0.0.0"
  ApplicationName=".NET Library"
  xmlns="http://schemas.microsoft.com/sharepoint/clientquery/2009">
  <Actions>
    <ObjectPath Id="18" ObjectPathId="17" />
    <ObjectPath Id="20" ObjectPathId="19" />
    <ObjectPath Id="22" ObjectPathId="21" />
    <SetProperty Id="23" ObjectPathId="21" Name="Author">
      <Parameter Type="String">Lisa Andrews</Parameter>
    </SetProperty>
    <SetProperty Id="24" ObjectPathId="21" Name="Status">
      <Parameter Type="Enum">1</Parameter>
    </SetProperty>
    <Method Name="Update" Id="25" ObjectPathId="21" />
    <Query Id="26" ObjectPathId="19">
      <Query SelectAllProperties="true">
        <Properties />
      </Query>
      <ChildItemQuery SelectAllProperties="true">
        <Properties />
      </ChildItemQuery>
    </Query>
  </Actions>
  <ObjectPaths>
    <StaticProperty Id="17" TypeId="{acc57e47-24b0-4400-b1c7-aalcf3c9542d}" Name="Catalog" />
    <Property Id="19" ParentId="17" Name="Books" />
    <Method Id="21" ParentId="19" Name="GetById">
      <Parameters>
        <Parameter Type="Guid">{2e80eb25-b64a-4506-b87b-2fff6ddb3f57}</Parameter>
      </Parameters>
    </Method>
  </ObjectPaths>
</Request>

```


The protocol server responds with the following message:

```
[
  {
    "SchemaVersion" : "15.0.0.0",
    "LibraryVersion" : "15.0.3421.3000",
    "ErrorInfo" : null
  },
  18,
  {
    "IsNull" : false
  },
  20,
  {
    "IsNull" : false
  },
  22,
  {
    "IsNull" : false
  },
  26,
  {
    "_ObjectType_" : "SampleCode.BookCollection",
    "_Child_Items_" : [
      {
        "_ObjectType_" : "SampleCode.Book",
        "Author" : "Soha Kamal",
        "Id" : "\/Guid(3387ac63-e73d-421f-bff7-359a4aa2bc38)\/",
        "PublishDate" : "\/Date(2008,2,1,0,0,0)\/",
        "Status" : 0,
        "Title" : "How to Cook Chinese Food"
      },
      {
        "_ObjectType_" : "SampleCode.Book",
        "Author" : "Soha Kamal",
        "Id" : "\/Guid(f6a265ab-86e5-4fbf-937c-49923604b91d)\/",
        "PublishDate" : "\/Date(2007,4,4,0,0,0)\/",
        "Status" : 1,
        "Title" : "How to Cook Japanese Food"
      },
      {
        "_ObjectType_" : "SampleCode.Book",
        "Author" : "Lisa Andrews",
        "Id" : "\/Guid(2e80eb25-b64a-4506-b87b-2fff6ddb3f57)\/",
        "PublishDate" : "\/Date(2009,0,3,0,0,0)\/",
        "Status" : 1,
        "Title" : "Best Recipe"
      },
      {
        "_ObjectType_" : "SampleCode.Book",
        "Author" : "Patrick Hines",
        "Id" : "\/Guid(704655a3-c136-469c-a578-f79652a93f9b)\/",
        "PublishDate" : "\/Date(2005,11,1,0,0,0)\/",
        "Status" : 0,
        "Title" : "Family Recipe"
      }
    ]
  }
]
```

4.4 Add a Book to a Catalog

In this example, the protocol client submits a request to add a book to the catalog and to retrieve a list of all of the books in the catalog.

The protocol client sends the following message:

```
<Request
  AddExpandoFieldTypeSuffix="true"
  SchemaVersion="15.0.0.0"
  LibraryVersion="15.0.0.0"
  ApplicationName=".NET Library"
  xmlns="http://schemas.microsoft.com/sharepoint/clientquery/2009">
  <Actions>
    <ObjectPath Id="29" ObjectPathId="28" />
    <ObjectPath Id="31" ObjectPathId="30" />
    <ObjectPath Id="33" ObjectPathId="32" />
    <Query Id="34" ObjectPathId="30">
      <Query SelectAllProperties="true">
        <Properties />
      </Query>
      <ChildItemQuery SelectAllProperties="true">
        <Properties />
      </ChildItemQuery>
    </Query>
  </Actions>
  <ObjectPaths>
    <StaticProperty Id="28" TypeId="{acc57e47-24b0-4400-b1c7-aalcf3c9542d}" Name="Catalog" />
    <Property Id="30" ParentId="28" Name="Books" />
    <Method Id="32" ParentId="30" Name="Add">
      <Parameters>
        <Parameter TypeId="{dda98aeb-f87d-490f-9a61-be08644ad461}">
          <Property Name="Author" Type="String">Neil Black</Property>
          <Property Name="PublishDate" Type="DateTime">2009-08-01T00:00:00.0000000</Property>
          <Property Name="Status" Type="Enum">2</Property>
          <Property Name="Title" Type="String">Simple Cookbook</Property>
        </Parameter>
      </Parameters>
    </Method>
  </ObjectPaths>
</Request>
```

The protocol server responds with the following message:

```
[
  {
    "SchemaVersion" : "15.0.0.0",
    "LibraryVersion" : "15.0.3421.3000",
    "ErrorInfo" : null
  },
  29,
  {
    "IsNull" : false
  },
],
```

```

31,
{
  "IsNull" : false
},
33,
{
  "IsNull" : false
},
34,
{
  "_ObjectType_" : "SampleCode.BookCollection",
  "_Child_Items_" : [
    {
      "_ObjectType_" : "SampleCode.Book",
      "Author" : "Soha Kamal",
      "Id" : "\/Guid(3387ac63-e73d-421f-bff7-359a4aa2bc38)\/",
      "PublishDate" : "\/Date(2008,2,1,0,0,0)\/",
      "Status" : 0,
      "Title" : "How to Cook Chinese Food"
    },
    {
      "_ObjectType_" : "SampleCode.Book",
      "Author" : "Soha Kamal",
      "Id" : "\/Guid(f6a265ab-86e5-4fbf-937c-49923604b91d)\/",
      "PublishDate" : "\/Date(2007,4,4,0,0,0)\/",
      "Status" : 1,
      "Title" : "How to Cook Japanese Food"
    },
    {
      "_ObjectType_" : "SampleCode.Book",
      "Author" : "Lisa Andrews",
      "Id" : "\/Guid(2e80eb25-b64a-4506-b87b-2fff6ddb3f57)\/",
      "PublishDate" : "\/Date(2009,0,3,0,0,0)\/",
      "Status" : 1,
      "Title" : "Best Recipe"
    },
    {
      "_ObjectType_" : "SampleCode.Book",
      "Author" : "Patrick Hines",
      "Id" : "\/Guid(704655a3-c136-469c-a578-f79652a93f9b)\/",
      "PublishDate" : "\/Date(2005,11,1,0,0,0)\/",
      "Status" : 0,
      "Title" : "Family Recipe"
    },
    {
      "_ObjectType_" : "SampleCode.Book",
      "Author" : "Neil Black",
      "Id" : "\/Guid(63a687c6-921b-f898-4204-22f09533f28e)\/",
      "PublishDate" : "\/Date(2009,7,1,0,0,0)\/",
      "Status" : 2,
      "Title" : "Simple Cookbook"
    }
  ]
}
]
]

```

4.5 Unsuccessfully Add a Book to a Catalog

In this example, the protocol client submits a request to add a book to the catalog. The protocol server returns a CSOM error JSON value, as specified section [3.1.4.1.8.1.2](#), because the book already exists in the catalog.

The protocol client sends the following message:

```
<Request
  AddExpandoFieldTypeSuffix="true"
  SchemaVersion="15.0.0.0"
  LibraryVersion="15.0.0.0"
  ApplicationName=".NET Library"
  xmlns="http://schemas.microsoft.com/sharepoint/clientquery/2009">
  <Actions>
    <ObjectPath Id="37" ObjectPathId="36" />
    <ObjectPath Id="39" ObjectPathId="38" />
    <ObjectPath Id="41" ObjectPathId="40" />
    <Query Id="42" ObjectPathId="38">
      <Query SelectAllProperties="true">
        <Properties />
      </Query>
      <ChildItemQuery SelectAllProperties="true">
        <Properties />
      </ChildItemQuery>
    </Query>
  </Actions>
  <ObjectPaths>
    <StaticProperty Id="36" TypeId="{acc57e47-24b0-4400-b1c7-aa1cf3c9542d}" Name="Catalog" />
    <Property Id="38" ParentId="36" Name="Books" />
    <Method Id="40" ParentId="38" Name="Add">
      <Parameters>
        <Parameter TypeId="{dda98aeb-f87d-490f-9a61-be08644ad461}">
          <Property Name="Author" Type="String">Lisa Andrews</Property>
          <Property Name="PublishDate" Type="DateTime">2006-07-20T00:00:00.0000000</Property>
          <Property Name="Status" Type="Enum">0</Property>
          <Property Name="Title" Type="String">Best Recipe</Property>
        </Parameter>
      </Parameters>
    </Method>
  </ObjectPaths>
</Request>
```

The protocol server responds with the following message:

```
[
  {
    "SchemaVersion" : "15.0.0.0",
    "LibraryVersion" : "15.0.3421.3000",
    "ErrorInfo" : {
      "ErrorMessage" : "The book with title 'Best Recipe' already exists in the book store.",
      "ErrorValue" : null,
      "ErrorCode" : -2147024809,
      "ErrorTypeName" : "System.ArgumentException"
    }
  }
]
```

4.6 Retrieve Book Sample Content

In this example, a protocol client sends a request to retrieve book's sample content stream.

The protocol client sends the following message:

```
<Request
  AddExpandoFieldTypeSuffix="true"
  SchemaVersion="15.0.0.0"
  LibraryVersion="15.0.0.0"
  ApplicationName=".NET Library"
  xmlns="http://schemas.microsoft.com/sharepoint/clientquery/2009">
  <Actions>
    <ObjectPath Id="45" ObjectPathId="44" />
    <ObjectPath Id="47" ObjectPathId="46" />
    <ObjectPath Id="49" ObjectPathId="48" />
    <Query Id="50" ObjectPathId="48">
      <Query SelectAllProperties="true">
        <Properties />
      </Query>
    </Query>
    <Method Name="GetSampleStream" Id="51" ObjectPathId="48" />
    <ObjectPath Id="53" ObjectPathId="52" />
    <Query Id="54" ObjectPathId="52">
      <Query SelectAllProperties="false">
        <Properties>
          <Property Name="Author" ScalarProperty="true" />
          <Property Name="Status" ScalarProperty="true" />
        </Properties>
      </Query>
    </Query>
    <Method Name="GetSampleStream" Id="55" ObjectPathId="52" />
  </Actions>
  <ObjectPaths>
    <StaticProperty Id="44" TypeId="{acc57e47-24b0-4400-b1c7-aalcf3c9542d}" Name="Catalog" />
    <Property Id="46" ParentId="44" Name="Books" />
    <Method Id="48" ParentId="46" Name="GetById">
      <Parameters>
        <Parameter Type="Guid">{3387ac63-e73d-421f-bff7-359a4aa2bc38}</Parameter>
      </Parameters>
    </Method>
    <Method Id="52" ParentId="46" Name="GetById">
      <Parameters>
        <Parameter Type="Guid">{704655a3-c136-469c-a578-f79652a93f9b}</Parameter>
      </Parameters>
    </Method>
  </ObjectPaths>
</Request>
```

The protocol server responds with the following message including the HTTP headers:

```
HTTP/1.1 200 OK
```

```
Content-Type: multipart/related;type="application/jop+json";boundary="742FC209-4650-4E0E-8BBF-F47E18AD3028+id=1";start="<http://sharepoint.microsoft.com/client/634551857588785297>";start-info="application/json"
Server: Microsoft-IIS/7.5
X-AspNet-Version: 4.0.30319
X-Powered-By: ASP.NET
Date: Wed, 26 Oct 2011 00:29:18 GMT
Content-Length: 1506
```

```
--742FC209-4650-4E0E-8BBF-F47E18AD3028+id=1
Content-ID: <http://sharepoint.microsoft.com/client/634551857588785297>
Content-Transfer-Encoding: eightbit
Content-Type: application/jop+json;charset=utf-8;type="application/json"
Content-Length: 658
```

```
[
{
"SchemaVersion":"15.0.0.0","LibraryVersion":"15.0.3421.3000","ErrorInfo":null
},45,{
"IsNull":false
},47,{
"IsNull":false
},49,{
"IsNull":false
},50,{
"_ObjectType_":"SampleCode.Book","Author":"Soha Kamal","Id":"\\Guid(3387ac63-e73d-421f-bff7-359a4aa2bc38)\\","PublishDate":"\\Date(2008,2,1,0,0,0)\\","Status":0,"Title":"How to Cook Chinese Food"
},51,"\\Binary(http%3a%2f%2fsharepoint.microsoft.com%2fclient%2fattachment%2f0%2f634551857588775295)\\",53,{
"IsNull":false
},54,{
"_ObjectType_":"SampleCode.Book","Author":"Patrick Hines","Status":0
},55,"\\Binary(http%3a%2f%2fsharepoint.microsoft.com%2fclient%2fattachment%2f1%2f634551857588780296)\\/"
]

```

```
--742FC209-4650-4E0E-8BBF-F47E18AD3028+id=1
Content-ID: <http://sharepoint.microsoft.com/client/attachment/0/634551857588775295>
Content-Transfer-Encoding: binary
Content-Type: application/octet-stream
Content-Length: 48
```

Sample Content of book How to Cook Chinese Food.

```
--742FC209-4650-4E0E-8BBF-F47E18AD3028+id=1
Content-ID: <http://sharepoint.microsoft.com/client/attachment/1/634551857588780296>
Content-Transfer-Encoding: binary
Content-Type: application/octet-stream
Content-Length: 37
```

Sample Content of book Family Recipe.

```
--742FC209-4650-4E0E-8BBF-F47E18AD3028+id=1--
```

4.7 Update Book Sample Content

In this example, a protocol client sends a request to update book's sample content stream.

The protocol client sends the following message including the HTTP headers:

```
POST http://www.example.com/_vti_bin/client.svc/ProcessQuery HTTP/1.1
Content-Type: multipart/related;type="application/xop+xml";boundary="8F66EEF4-511A-4328-B8F7-
B25B75D7A236+id=1";start="<http://sharepoint.microsoft.com/client/634551857589435427>";start-
info="application/xml"
Content-Length: 1961

--8F66EEF4-511A-4328-B8F7-B25B75D7A236+id=1
Content-ID: <http://sharepoint.microsoft.com/client/634551857589435427>
Content-Transfer-Encoding: 8bit
Content-Type: application/xop+xml;charset=utf-8;type="application/xml"
Content-Length: 1221

<Request AddExpandoFieldTypeSuffix="true" SchemaVersion="15.0.0.0" LibraryVersion="15.0.0.0"
ApplicationName=".NET Library"
xmlns="http://schemas.microsoft.com/sharepoint/clientquery/2009"><Actions><ObjectPath Id="57"
ObjectPathId="56" /><ObjectPath Id="59" ObjectPathId="58" /><ObjectPath Id="61"
ObjectPathId="60" /><Method Name="UpdateSampleStream" Id="62"
ObjectPathId="60"><Parameters><Parameter Type="Binary"><Include
href="cid:http://sharepoint.microsoft.com/63" /></Parameter></Parameters></Method><ObjectPath
Id="65" ObjectPathId="64" /><Method Name="UpdateSampleStream" Id="66"
ObjectPathId="64"><Parameters><Parameter Type="Binary"><Include
href="cid:http://sharepoint.microsoft.com/67"
/></Parameter></Parameters></Method></Actions><ObjectPaths><StaticProperty Id="56"
TypeId="{acc57e47-24b0-4400-b1c7-aalcf3c9542d}" Name="Catalog" /><Property Id="58"
ParentId="56" Name="Books" /><Method Id="60" ParentId="58"
Name="GetById"><Parameters><Parameter Type="Guid">{3387ac63-e73d-421f-bff7-
359a4aa2bc38}</Parameter></Parameters></Method><Method Id="64" ParentId="58"
Name="GetById"><Parameters><Parameter Type="Guid">{704655a3-c136-469c-a578-
f79652a93f9b}</Parameter></Parameters></Method></ObjectPaths></Request>
--8F66EEF4-511A-4328-B8F7-B25B75D7A236+id=1
Content-ID: <http://sharepoint.microsoft.com/63>
Content-Transfer-Encoding: binary
Content-Type: application/octet-stream
Content-Length: 26

New sample content of book
--8F66EEF4-511A-4328-B8F7-B25B75D7A236+id=1
Content-ID: <http://sharepoint.microsoft.com/67>
Content-Transfer-Encoding: binary
Content-Type: application/octet-stream
Content-Length: 28

New sample content of book 2
--8F66EEF4-511A-4328-B8F7-B25B75D7A236+id=1--
```

The protocol server responds with the following message:

```
{
  {
    "SchemaVersion" : "15.0.0.0",
    "LibraryVersion" : "15.0.3421.3000",
    "ErrorInfo" : null
  },
  57,
  {
    "IsNull" : false
  }
}
```

```
},  
59,  
{  
  "IsNull" : false  
},  
61,  
{  
  "IsNull" : false  
},  
65,  
{  
  "IsNull" : false  
}  
]
```

Preliminary

5 Security

5.1 Security Considerations for Implementers

None.

5.2 Index of Security Parameters

None.

Preliminary

6 Appendix A: XML Schema

6.1 Request XML Schema

For ease of implementation, the full XML schema for request XML is provided in the following code:

```
<xs:schema id="clientquery"
targetNamespace="http://schemas.microsoft.com/sharepoint/clientquery/2009"
elementFormDefault="qualified"
xmlns:mstns="http://schemas.microsoft.com/sharepoint/clientquery/2009"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:simpleType name="GuidType">
    <xs:restriction base="xs:string">
      <xs:pattern value="\{[0-9A-Fa-f]{8}-[0-9A-Fa-f]{4}-[0-9A-Fa-f]{4}-[0-9A-Fa-f]{4}-[0-9A-Fa-f]{12}\}" />
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="ObjectPathIdType">
    <xs:restriction base="mstns:IdType" />
  </xs:simpleType>
  <xs:simpleType name="IdType">
    <xs:restriction base="xs:integer" />
  </xs:simpleType>
  <xs:simpleType name="ActionIdType">
    <xs:restriction base="mstns:IdType" />
  </xs:simpleType>
  <xs:simpleType name="TypeIdGuidType">
    <xs:restriction base="mstns:GuidType" />
  </xs:simpleType>
  <xs:simpleType name="PropertyNameType">
    <xs:restriction base="xs:string" />
  </xs:simpleType>
  <xs:simpleType name="StaticPropertyNameType">
    <xs:restriction base="xs:string" />
  </xs:simpleType>
  <xs:simpleType name="MethodNameType">
    <xs:restriction base="xs:string" />
  </xs:simpleType>
  <xs:simpleType name="StaticMethodNameType">
    <xs:restriction base="xs:string" />
  </xs:simpleType>
  <xs:simpleType name="MethodParameterTypeType">
    <xs:restriction base="xs:string">
      <xs:enumeration value="Null" />
      <xs:enumeration value="Boolean" />
      <xs:enumeration value="Char" />
      <xs:enumeration value="Byte" />
      <xs:enumeration value="SByte" />
      <xs:enumeration value="Int16" />
      <xs:enumeration value="UInt16" />
      <xs:enumeration value="Int32" />
      <xs:enumeration value="UInt32" />
      <xs:enumeration value="Int64" />
      <xs:enumeration value="UInt64" />
      <xs:enumeration value="DateTime" />
      <xs:enumeration value="Single" />
      <xs:enumeration value="Double" />
      <xs:enumeration value="Decimal" />
    </xs:restriction>
  </xs:simpleType>

```

```

    <xs:enumeration value="TimeSpan"/>
    <xs:enumeration value="Guid"/>
    <xs:enumeration value="String"/>
    <xs:enumeration value="Base64Binary"/>
    <xs:enumeration value="Dictionary"/>
    <xs:enumeration value="Array"/>
    <xs:enumeration value="Enum"/>
    <xs:enumeration value="Number"/>
    <xs:enumeration value="Unspecified"/>
    <xs:enumeration value="Binary"/>
  </xs:restriction>
</xs:simpleType>
<xs:complexType name="MethodParameterType" mixed="true">
  <xs:sequence>
    <xs:element name="Property" minOccurs="0" maxOccurs="unbounded">
      <xs:complexType>
        <xs:complexContent>
          <xs:extension base="mstns:MethodParameterType">
            <xs:attribute name="Name" type="mstns:PropertyNameType" use="required"/>
          </xs:extension>
        </xs:complexContent>
      </xs:complexType>
    </xs:element>
    <xs:element name="Object" type="mstns:MethodParameterType" minOccurs="0"
maxOccurs="unbounded"/>
    <xs:element name="Include" minOccurs="0" maxOccurs="1">
      <xs:complexType>
        <xs:attribute name="href" use="required" type="xs:string"/>
      </xs:complexType>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="ObjectPathId" type="mstns:ObjectPathIdType" use="optional"/>
  <xs:attribute name="TypeId" type="mstns:TypeIdGuidType" use="optional"/>
  <xs:attribute name="Type" type="mstns:MethodParameterTypeType" use="optional"/>
</xs:complexType>
<xs:complexType name="MethodParameterNullType">
  <xs:attribute name="Type" type="xs:string" use="required" fixed="Null"/>
</xs:complexType>
<xs:complexType name="MethodParameterBooleanType">
  <xs:simpleContent>
    <xs:extension base="xs:boolean">
      <xs:attribute name="Type" type="xs:string" use="required" fixed="Boolean"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
<xs:complexType name="MethodParameterCharType">
  <xs:simpleContent>
    <xs:extension base="xs:string">
      <xs:attribute name="Type" type="xs:string" use="required" fixed="Char"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
<xs:complexType name="MethodParameterByteType">
  <xs:simpleContent>
    <xs:extension base="xs:unsignedByte">
      <xs:attribute name="Type" type="xs:string" use="required" fixed="Byte"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>

```

```

<xs:complexType name="MethodParameterSByteType">
  <xs:simpleContent>
    <xs:extension base="xs:byte">
      <xs:attribute name="Type" type="xs:string" use="required" fixed="SByte"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
<xs:complexType name="MethodParameterInt16Type">
  <xs:simpleContent>
    <xs:extension base="xs:short">
      <xs:attribute name="Type" type="xs:string" use="required" fixed="Int16"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
<xs:complexType name="MethodParameterUInt16Type">
  <xs:simpleContent>
    <xs:extension base="xs:unsignedShort">
      <xs:attribute name="Type" type="xs:string" use="required" fixed="UInt16"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
<xs:complexType name="MethodParameterInt32Type">
  <xs:simpleContent>
    <xs:extension base="xs:int">
      <xs:attribute name="Type" type="xs:string" use="required" fixed="Int32"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
<xs:complexType name="MethodParameterUInt32Type">
  <xs:simpleContent>
    <xs:extension base="xs:unsignedInt">
      <xs:attribute name="Type" type="xs:string" use="required" fixed="UInt32"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
<xs:complexType name="MethodParameterInt64Type">
  <xs:simpleContent>
    <xs:extension base="xs:long">
      <xs:attribute name="Type" type="xs:string" use="required" fixed="Int64"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
<xs:complexType name="MethodParameterUInt64Type">
  <xs:simpleContent>
    <xs:extension base="xs:unsignedLong">
      <xs:attribute name="Type" type="xs:string" use="required" fixed="UInt64"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
<xs:complexType name="MethodParameterSingleType">
  <xs:simpleContent>
    <xs:extension base="xs:float">
      <xs:attribute name="Type" type="xs:string" use="required" fixed="Single"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
<xs:complexType name="MethodParameterDoubleType">
  <xs:simpleContent>
    <xs:extension base="xs:double">

```

```

        <xs:attribute name="Type" type="xs:string" use="required" fixed="Double"/>
    </xs:extension>
</xs:simpleContent>
</xs:complexType>
<xs:complexType name="MethodParameterDecimalType">
    <xs:simpleContent>
        <xs:extension base="xs:decimal">
            <xs:attribute name="Type" type="xs:string" use="required" fixed="Decimal"/>
        </xs:extension>
    </xs:simpleContent>
</xs:complexType>
<xs:complexType name="MethodParameterTimeSpanType">
    <xs:simpleContent>
        <xs:extension base="xs:duration">
            <xs:attribute name="Type" type="xs:string" use="required" fixed="TimeSpan"/>
        </xs:extension>
    </xs:simpleContent>
</xs:complexType>
<xs:complexType name="MethodParameterDateTimeType">
    <xs:simpleContent>
        <xs:extension base="xs:dateTime">
            <xs:attribute name="Type" type="xs:string" use="required" fixed="DateTime"/>
        </xs:extension>
    </xs:simpleContent>
</xs:complexType>
<xs:complexType name="MethodParameterGuidType">
    <xs:simpleContent>
        <xs:extension base="mstns:GuidType">
            <xs:attribute name="Type" type="xs:string" use="required" fixed="Guid"/>
        </xs:extension>
    </xs:simpleContent>
</xs:complexType>
<xs:complexType name="MethodParameterStringType">
    <xs:simpleContent>
        <xs:extension base="xs:string">
            <xs:attribute name="Type" type="xs:string" use="required" fixed="String"/>
        </xs:extension>
    </xs:simpleContent>
</xs:complexType>
<xs:complexType name="MethodParameterByteArrayType">
    <xs:simpleContent>
        <xs:extension base="xs:base64Binary">
            <xs:attribute name="Type" type="xs:string" use="required" fixed="Base64Binary"/>
        </xs:extension>
    </xs:simpleContent>
</xs:complexType>
<xs:complexType name="MethodParameterDictionaryType">
    <xs:sequence>
        <xs:element name="Property" minOccurs="0" maxOccurs="unbounded">
            <xs:complexType>
                <xs:complexContent>
                    <xs:extension base="mstns:MethodParameterType">
                        <xs:attribute name="Name" type="xs:string" use="required"/>
                    </xs:extension>
                </xs:complexContent>
            </xs:complexType>
        </xs:element>
    </xs:sequence>
    <xs:attribute name="Type" type="xs:string" use="required" fixed="Dictionary"/>

```

```

</xs:complexType>
<xs:complexType name="MethodParameterNumberType">
  <xs:simpleContent>
    <xs:extension base="xs:decimal">
      <xs:attribute name="Type" type="xs:string" use="required" fixed="Number"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
<xs:complexType name="MethodParameterObjectPathType">
  <xs:attribute name="ObjectPathId" type="mstns:ObjectPathIdType" use="required"/>
</xs:complexType>
<xs:complexType name="MethodParameterBinaryType">
  <xs:sequence>
    <xs:element name="Include" minOccurs="1" maxOccurs="1">
      <xs:complexType>
        <xs:attribute name="href" use="required" type="xs:string"/>
      </xs:complexType>
    </xs:element>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="MethodParameterValueObjectType">
  <xs:sequence>
    <xs:element name="Property" minOccurs="0" maxOccurs="unbounded">
      <xs:complexType>
        <xs:complexContent>
          <xs:extension base="mstns:MethodParameterType">
            <xs:attribute name="Name" type="xs:string" use="required"/>
          </xs:extension>
        </xs:complexContent>
      </xs:complexType>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="TypeId" type="mstns:TypeIdGuidType" use="required"/>
</xs:complexType>
<xs:complexType name="MethodParameterArrayType">
  <xs:sequence>
    <xs:element name="Object" minOccurs="0" maxOccurs="unbounded"
type="mstns:MethodParameterType"/>
  </xs:sequence>
  <xs:attribute name="Type" type="xs:string" use="required" fixed="Array"/>
</xs:complexType>
<xs:complexType name="MethodParameterEnumType">
  <xs:simpleContent>
    <xs:extension base="xs:integer">
      <xs:attribute name="Type" type="xs:string" use="required" fixed="Enum"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
<xs:complexType name="MethodParameterUnspecifiedType">
  <xs:simpleContent>
    <xs:extension base="xs:string">
      <xs:attribute name="Type" type="xs:string" use="required" fixed="Unspecified"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
<xs:simpleType name="VersionStringType">
  <xs:restriction base="xs:string">
    <xs:pattern value="[0-9]{1,8}\.[0-9]{1,8}\.[0-9]{1,8}\.[0-9]{1,8}"/>
  </xs:restriction>

```

```

</xs:simpleType>
<xs:complexType name="RequestType">
  <xs:sequence>
    <xs:element name="Actions" type="mstns:ActionsType"/>
    <xs:element name="ObjectPaths" type="mstns:ObjectPathsType"/>
  </xs:sequence>
  <xs:attribute name="AddExpandoFieldTypeSuffix" type="xs:boolean" use="optional"/>
  <xs:attribute name="SchemaVersion" type="mstns:VersionStringType" use="required"/>
  <xs:attribute name="LibraryVersion" type="mstns:VersionStringType" use="required"/>
  <xs:attribute name="ApplicationName" use="optional">
    <xs:simpleType>
      <xs:restriction base="xs:string">
        <xs:maxLength value="128"/>
      </xs:restriction>
    </xs:simpleType>
  </xs:attribute>
</xs:complexType>
<xs:complexType name="ObjectPathsType">
  <xs:sequence>
    <xs:choice minOccurs="0" maxOccurs="unbounded">
      <xs:element name="Property" type="mstns:ObjectPathPropertyType"/>
      <xs:element name="StaticProperty" type="mstns:ObjectPathStaticPropertyType"/>
      <xs:element name="Method" type="mstns:ObjectPathMethodType"/>
      <xs:element name="StaticMethod" type="mstns:ObjectPathStaticMethodType"/>
      <xs:element name="Constructor" type="mstns:ObjectPathConstructorType"/>
      <xs:element name="Identity" type="mstns:ObjectPathObjectIdentityNameType"/>
    </xs:choice>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="ObjectPathPropertyType">
  <xs:attribute name="Id" type="mstns:ObjectPathIdType" use="required"/>
  <xs:attribute name="ParentId" type="mstns:ObjectPathIdType" use="required"/>
  <xs:attribute name="Name" type="mstns:PropertyNameType" use="required"/>
</xs:complexType>
<xs:complexType name="ObjectPathStaticPropertyType">
  <xs:attribute name="Id" type="mstns:ObjectPathIdType" use="required"/>
  <xs:attribute name="TypeId" type="mstns:TypeIdGuidType" use="required"/>
  <xs:attribute name="Name" type="mstns:StaticPropertyNameType" use="required"/>
</xs:complexType>
<xs:complexType name="ObjectPathMethodType">
  <xs:sequence>
    <xs:element name="Parameters" minOccurs="0">
      <xs:complexType>
        <xs:sequence>
          <xs:element name="Parameter" type="mstns:MethodParameterType" minOccurs="0"
maxOccurs="unbounded"/>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="Id" type="mstns:ObjectPathIdType" use="required"/>
  <xs:attribute name="ParentId" type="mstns:ObjectPathIdType" use="required"/>
  <xs:attribute name="Name" type="mstns:MethodNameType" use="required"/>
</xs:complexType>
<xs:complexType name="ObjectPathStaticMethodType">
  <xs:sequence>
    <xs:element name="Parameters" minOccurs="0">
      <xs:complexType>
        <xs:sequence>

```

```

        <xs:element name="Parameter" type="mstns:MethodParameterType" minOccurs="0"
maxOccurs="unbounded"/>
    </xs:sequence>
</xs:complexType>
</xs:element>
</xs:sequence>
<xs:attribute name="Id" type="mstns:ObjectPathIdType" use="required"/>
<xs:attribute name="TypeId" type="mstns:TypeIdGuidType" use="required"/>
<xs:attribute name="Name" type="mstns:StaticMethodNameType" use="required"/>
</xs:complexType>
<xs:complexType name="ObjectPathConstructorType">
    <xs:sequence>
        <xs:element name="Parameters" minOccurs="0">
            <xs:complexType>
                <xs:sequence>
                    <xs:element name="Parameter" type="mstns:MethodParameterType" minOccurs="0"
maxOccurs="unbounded"/>
                </xs:sequence>
            </xs:complexType>
        </xs:element>
    </xs:sequence>
    <xs:attribute name="Id" type="mstns:ObjectPathIdType" use="required"/>
    <xs:attribute name="TypeId" type="mstns:TypeIdGuidType" use="required"/>
</xs:complexType>
<xs:complexType name="ObjectPathObjectIdentityNameType">
    <xs:attribute name="Id" type="mstns:ObjectPathIdType" use="required"/>
    <xs:attribute name="Name" type="xs:string" use="required"/>
</xs:complexType>
<xs:complexType name="ActionTypes">
    <xs:sequence>
        <xs:choice minOccurs="0" maxOccurs="unbounded">
            <xs:element name="SetProperty" type="mstns>ActionSetPropertyType"/>
            <xs:element name="SetStaticProperty" type="mstns>ActionSetStaticPropertyType"/>
            <xs:element name="Method" type="mstns>ActionInvokeMethodType"/>
            <xs:element name="StaticMethod" type="mstns>ActionInvokeStaticMethodType"/>
            <xs:element name="ObjectPath" type="mstns>ActionInstantiateObjectPathType"/>
            <xs:element name="ObjectIdentityQuery" type="mstns>ActionObjectIdentityQueryType"/>
            <xs:element name="Query" type="mstns>ActionQueryType"/>
            <xs:element name="ExceptionHandlingScope" type="mstns:ExceptionHandlingScopeType"/>
            <xs:element name="ExceptionHandlingScopeSimple"
type="mstns:ExceptionHandlingScopeSimpleType"/>
            <xs:element name="ConditionalScope" type="mstns:ConditionalScopeType"/>
        </xs:choice>
    </xs:sequence>
</xs:complexType>
<xs:group name="ActionGroup">
    <xs:choice>
        <xs:element name="SetProperty" type="mstns>ActionSetPropertyType"/>
        <xs:element name="SetStaticProperty" type="mstns>ActionSetStaticPropertyType"/>
        <xs:element name="Method" type="mstns>ActionInvokeMethodType"/>
        <xs:element name="StaticMethod" type="mstns>ActionInvokeStaticMethodType"/>
        <xs:element name="ObjectPath" type="mstns>ActionInstantiateObjectPathType"/>
        <xs:element name="ObjectIdentityQuery" type="mstns>ActionObjectIdentityQueryType"/>
        <xs:element name="Query" type="mstns>ActionQueryType"/>
        <xs:element name="ExceptionHandlingScope" type="mstns:ExceptionHandlingScopeType"/>
        <xs:element name="ExceptionHandlingScopeSimple"
type="mstns:ExceptionHandlingScopeSimpleType"/>
        <xs:element name="ConditionalScope" type="mstns:ConditionalScopeType"/>
    </xs:choice>

```



```

</xs:group>
<xs:complexType name="ActionSetPropertyType">
  <xs:sequence>
    <xs:element name="Parameter" type="mstns:MethodParameterType"/>
  </xs:sequence>
  <xs:attribute name="Id" type="mstns:ActionIdType" use="required"/>
  <xs:attribute name="ObjectPathId" type="mstns:ObjectPathIdType" use="required"/>
  <xs:attribute name="Name" type="mstns:PropertyNameType" use="required"/>
</xs:complexType>
<xs:complexType name="ActionSetStaticPropertyType">
  <xs:sequence>
    <xs:element name="Parameter" type="mstns:MethodParameterType"/>
  </xs:sequence>
  <xs:attribute name="Id" type="mstns:ActionIdType" use="required"/>
  <xs:attribute name="TypeId" type="mstns:TypeIdGuidType" use="required"/>
  <xs:attribute name="Name" type="mstns:StaticPropertyNameType" use="required"/>
</xs:complexType>
<xs:complexType name="ActionInvokeMethodType">
  <xs:sequence>
    <xs:element name="Parameters" minOccurs="0">
      <xs:complexType>
        <xs:sequence>
          <xs:element name="Parameter" type="mstns:MethodParameterType" minOccurs="0"
maxOccurs="unbounded"/>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="Id" type="mstns:ActionIdType" use="required"/>
  <xs:attribute name="ObjectPathId" type="mstns:ObjectPathIdType" use="required"/>
  <xs:attribute name="Name" type="mstns:MethodNameType" use="required"/>
  <xs:attribute name="Version" type="xs:string" use="optional"/>
</xs:complexType>
<xs:complexType name="ActionInvokeStaticMethodType">
  <xs:sequence>
    <xs:element name="Parameters" minOccurs="0">
      <xs:complexType>
        <xs:sequence>
          <xs:element name="Parameter" type="mstns:MethodParameterType" minOccurs="0"
maxOccurs="unbounded"/>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="Id" type="mstns:ActionIdType" use="required"/>
  <xs:attribute name="TypeId" type="mstns:TypeIdGuidType" use="required"/>
  <xs:attribute name="Name" type="mstns:StaticMethodNameType" use="required"/>
</xs:complexType>
<xs:complexType name="ActionInstantiateObjectPathType">
  <xs:attribute name="Id" type="mstns:ActionIdType" use="required"/>
  <xs:attribute name="ObjectPathId" type="mstns:ObjectPathIdType" use="required"/>
</xs:complexType>
<xs:complexType name="ActionObjectIdentityQueryType">
  <xs:attribute name="Id" type="mstns:ActionIdType" use="required"/>
  <xs:attribute name="ObjectPathId" type="mstns:ObjectPathIdType" use="required"/>
</xs:complexType>
<xs:complexType name="ActionQueryType">
  <xs:sequence>
    <xs:element name="Query" type="mstns:QueryType"/>
  </xs:sequence>
</xs:complexType>

```

```

    <xs:element name="ChildItemQuery" type="mstns:ChildItemQueryType" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="Id" type="mstns:ActionIdType" use="required"/>
  <xs:attribute name="ObjectPathId" type="mstns:ObjectPathIdType" use="required"/>
</xs:complexType>
<xs:complexType name="QueryType">
  <xs:sequence>
    <xs:element name="Properties">
      <xs:complexType>
        <xs:sequence>
          <xs:element name="Property" type="mstns:QueryPropertyType" minOccurs="0"
maxOccurs="unbounded"/>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="SelectAllProperties" type="xs:boolean" use="optional"/>
</xs:complexType>
<xs:complexType name="ChildItemQueryType">
  <xs:complexContent>
    <xs:extension base="mstns:QueryType">
      <xs:sequence>
        <xs:element name="QueryableExpression"
type="mstns:ExpressionQueryableExpressionType" minOccurs="0"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
<xs:complexType name="QueryPropertyType">
  <xs:sequence>
    <xs:element name="Query" type="mstns:QueryType" minOccurs="0"/>
    <xs:element name="ChildItemQuery" type="mstns:ChildItemQueryType" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="Name" type="mstns:PropertyNameType" use="required"/>
  <xs:attribute name="ScalarProperty" type="xs:boolean" use="optional"/>
  <xs:attribute name="SelectAll" type="xs:boolean" use="optional"/>
</xs:complexType>
<xs:complexType name="ExceptionHandlingScopeSimpleType">
  <xs:sequence>
    <xs:choice minOccurs="0" maxOccurs="unbounded">
      <xs:element name="SetProperty" type="mstns:ActionSetPropertyType"/>
      <xs:element name="SetStaticProperty" type="mstns:ActionSetStaticPropertyType"/>
      <xs:element name="Method" type="mstns:ActionInvokeMethodType"/>
      <xs:element name="StaticMethod" type="mstns:ActionInvokeStaticMethodType"/>
      <xs:element name="ObjectPath" type="mstns:ActionInstantiateObjectPathType"/>
      <xs:element name="ObjectIdentityQuery" type="mstns:ActionObjectIdentityQueryType"/>
      <xs:element name="Query" type="mstns:ActionQueryType"/>
      <xs:element name="ExceptionHandlingScope" type="mstns:ExceptionHandlingScopeType"/>
      <xs:element name="ExceptionHandlingScopeSimple"
type="mstns:ExceptionHandlingScopeSimpleType"/>
      <xs:element name="ConditionalScope" type="mstns:ConditionalScopeType"/>
    </xs:choice>
  </xs:sequence>
  <xs:attribute name="Id" type="mstns:ActionIdType" use="required"/>
</xs:complexType>
<xs:complexType name="ExceptionHandlingScopeType">
  <xs:sequence>
    <xs:element name="TryScope">
      <xs:complexType>

```

```

    <xs:sequence>
      <xs:choice minOccurs="0" maxOccurs="unbounded">
        <xs:element name="SetProperty" type="mstns:ActionSetPropertyType"/>
        <xs:element name="SetStaticProperty" type="mstns:ActionSetStaticPropertyType"/>
        <xs:element name="Method" type="mstns:ActionInvokeMethodType"/>
        <xs:element name="StaticMethod" type="mstns:ActionInvokeStaticMethodType"/>
        <xs:element name="ObjectPath" type="mstns:ActionInstantiateObjectPathType"/>
        <xs:element name="ObjectIdentityQuery"
type="mstns:ActionObjectIdentityQueryType"/>
        <xs:element name="Query" type="mstns:ActionQueryType"/>
        <xs:element name="ExceptionHandlingScope"
type="mstns:ExceptionHandlingScopeType"/>
        <xs:element name="ExceptionHandlingScopeSimple"
type="mstns:ExceptionHandlingScopeSimpleType"/>
        <xs:element name="ConditionalScope" type="mstns:ConditionalScopeType"/>
      </xs:choice>
    </xs:sequence>
    <xs:attribute name="Id" type="mstns:IdType" use="required"/>
  </xs:complexType>
</xs:element>
<xs:element name="CatchScope" minOccurs="0">
  <xs:complexType>
    <xs:sequence>
      <xs:choice minOccurs="0" maxOccurs="unbounded">
        <xs:element name="SetProperty" type="mstns:ActionSetPropertyType"/>
        <xs:element name="SetStaticProperty" type="mstns:ActionSetStaticPropertyType"/>
        <xs:element name="Method" type="mstns:ActionInvokeMethodType"/>
        <xs:element name="StaticMethod" type="mstns:ActionInvokeStaticMethodType"/>
        <xs:element name="ObjectPath" type="mstns:ActionInstantiateObjectPathType"/>
        <xs:element name="ObjectIdentityQuery"
type="mstns:ActionObjectIdentityQueryType"/>
        <xs:element name="Query" type="mstns:ActionQueryType"/>
        <xs:element name="ExceptionHandlingScope"
type="mstns:ExceptionHandlingScopeType"/>
        <xs:element name="ExceptionHandlingScopeSimple"
type="mstns:ExceptionHandlingScopeSimpleType"/>
        <xs:element name="ConditionalScope" type="mstns:ConditionalScopeType"/>
      </xs:choice>
    </xs:sequence>
    <xs:attribute name="Id" type="mstns:IdType" use="required"/>
  </xs:complexType>
</xs:element>
<xs:element name="FinallyScope" minOccurs="0">
  <xs:complexType>
    <xs:sequence>
      <xs:choice minOccurs="0" maxOccurs="unbounded">
        <xs:element name="SetProperty" type="mstns:ActionSetPropertyType"/>
        <xs:element name="SetStaticProperty" type="mstns:ActionSetStaticPropertyType"/>
        <xs:element name="Method" type="mstns:ActionInvokeMethodType"/>
        <xs:element name="StaticMethod" type="mstns:ActionInvokeStaticMethodType"/>
        <xs:element name="ObjectPath" type="mstns:ActionInstantiateObjectPathType"/>
        <xs:element name="ObjectIdentityQuery"
type="mstns:ActionObjectIdentityQueryType"/>
        <xs:element name="Query" type="mstns:ActionQueryType"/>
        <xs:element name="ExceptionHandlingScope"
type="mstns:ExceptionHandlingScopeType"/>
        <xs:element name="ExceptionHandlingScopeSimple"
type="mstns:ExceptionHandlingScopeSimpleType"/>
        <xs:element name="ConditionalScope" type="mstns:ConditionalScopeType"/>
      </xs:choice>
    </xs:sequence>
  </xs:complexType>
</xs:element>

```

```

        </xs:sequence>
        <xs:attribute name="Id" type="mstns:IdType" use="required"/>
    </xs:complexType>
</xs:element>
</xs:sequence>
<xs:attribute name="Id" type="mstns:ActionIdType" use="required"/>
</xs:complexType>
<xs:complexType name="ConditionalScopeType">
    <xs:sequence>
        <xs:element name="Test">
            <xs:complexType>
                <xs:all>
                    <xs:element name="Body" type="mstns:ExpressionType"/>
                </xs:all>
            </xs:complexType>
        </xs:element>
        <xs:element name="IfTrueScope" minOccurs="0">
            <xs:complexType>
                <xs:sequence>
                    <xs:choice minOccurs="0" maxOccurs="unbounded">
                        <xs:element name="SetProperty" type="mstns:ActionSetPropertyType"/>
                        <xs:element name="SetStaticProperty" type="mstns:ActionSetStaticPropertyType"/>
                        <xs:element name="Method" type="mstns:ActionInvokeMethodType"/>
                        <xs:element name="StaticMethod" type="mstns:ActionInvokeStaticMethodType"/>
                        <xs:element name="ObjectPath" type="mstns:ActionInstantiateObjectPathType"/>
                        <xs:element name="ObjectIdentityQuery"
type="mstns:ActionObjectIdentityQueryType"/>
                        <xs:element name="Query" type="mstns:ActionQueryType"/>
                        <xs:element name="ExceptionHandlingScope"
type="mstns:ExceptionHandlingScopeType"/>
                        <xs:element name="ExceptionHandlingScopeSimple"
type="mstns:ExceptionHandlingScopeSimpleType"/>
                        <xs:element name="ConditionalScope" type="mstns:ConditionalScopeType"/>
                    </xs:choice>
                </xs:sequence>
                <xs:attribute name="Id" type="mstns:IdType" use="required"/>
            </xs:complexType>
        </xs:element>
        <xs:element name="IfFalseScope" minOccurs="0">
            <xs:complexType>
                <xs:sequence>
                    <xs:choice minOccurs="0" maxOccurs="unbounded">
                        <xs:element name="SetProperty" type="mstns:ActionSetPropertyType"/>
                        <xs:element name="SetStaticProperty" type="mstns:ActionSetStaticPropertyType"/>
                        <xs:element name="Method" type="mstns:ActionInvokeMethodType"/>
                        <xs:element name="StaticMethod" type="mstns:ActionInvokeStaticMethodType"/>
                        <xs:element name="ObjectPath" type="mstns:ActionInstantiateObjectPathType"/>
                        <xs:element name="ObjectIdentityQuery"
type="mstns:ActionObjectIdentityQueryType"/>
                        <xs:element name="Query" type="mstns:ActionQueryType"/>
                        <xs:element name="ExceptionHandlingScope"
type="mstns:ExceptionHandlingScopeType"/>
                        <xs:element name="ExceptionHandlingScopeSimple"
type="mstns:ExceptionHandlingScopeSimpleType"/>
                        <xs:element name="ConditionalScope" type="mstns:ConditionalScopeType"/>
                    </xs:choice>
                </xs:sequence>
                <xs:attribute name="Id" type="mstns:IdType" use="required"/>
            </xs:complexType>
        </xs:element>
    </xs:sequence>
</xs:complexType>

```

```

    </xs:element>
  </xs:sequence>
  <xs:attribute name="Id" type="mstns:ActionIdType" use="required"/>
</xs:complexType>
<xs:complexType name="ExpressionType">
  <xs:sequence>
    <xs:choice>
      <xs:element name="GT" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="LT" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="EQ" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="NE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="GE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="LE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="AND" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="OR" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="NOT" type="mstns:ExpressionType"/>
      <xs:element name="ExpressionMethod" type="mstns:ExpressionMethodExpressionType"/>
      <xs:element name="ExpressionStaticMethod"
type="mstns:ExpressionStaticMethodExpressionType"/>
      <xs:element name="ExpressionProperty" type="mstns:ExpressionPropertyExpressionType"/>
      <xs:element name="ExpressionStaticProperty"
type="mstns:ExpressionStaticPropertyExpressionType"/>
      <xs:element name="ExpressionParameter"
type="mstns:ExpressionParameterExpressionType"/>
      <xs:element name="ExpressionConvert" type="mstns:ExpressionConvertExpressionType"/>
      <xs:element name="ExpressionConstant" type="mstns:MethodParameterType"/>
    </xs:choice>
  </xs:sequence>
</xs:complexType>
<xs:group name="ExpressionGroup">
  <xs:choice>
    <xs:element name="GT" type="mstns:ExpressionLeftRightOperandExpressionType"/>
    <xs:element name="LT" type="mstns:ExpressionLeftRightOperandExpressionType"/>
    <xs:element name="EQ" type="mstns:ExpressionLeftRightOperandExpressionType"/>
    <xs:element name="NE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
    <xs:element name="GE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
    <xs:element name="LE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
    <xs:element name="AND" type="mstns:ExpressionLeftRightOperandExpressionType"/>
    <xs:element name="OR" type="mstns:ExpressionLeftRightOperandExpressionType"/>
    <xs:element name="NOT" type="mstns:ExpressionType"/>
    <xs:element name="ExpressionMethod" type="mstns:ExpressionMethodExpressionType"/>
    <xs:element name="ExpressionStaticMethod"
type="mstns:ExpressionStaticMethodExpressionType"/>
    <xs:element name="ExpressionProperty" type="mstns:ExpressionPropertyExpressionType"/>
    <xs:element name="ExpressionStaticProperty"
type="mstns:ExpressionStaticPropertyExpressionType"/>
    <xs:element name="ExpressionParameter" type="mstns:ExpressionParameterExpressionType"/>
    <xs:element name="ExpressionConvert" type="mstns:ExpressionConvertExpressionType"/>
    <xs:element name="ExpressionConstant" type="mstns:MethodParameterType"/>
  </xs:choice>
</xs:group>
<xs:complexType name="ExpressionLeftRightOperandExpressionType">
  <xs:sequence>
    <xs:choice>
      <xs:element name="GT" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="LT" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="EQ" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="NE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="GE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
    </xs:choice>
  </xs:sequence>
</xs:complexType>

```

```

<xs:element name="LE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
<xs:element name="AND" type="mstns:ExpressionLeftRightOperandExpressionType"/>
<xs:element name="OR" type="mstns:ExpressionLeftRightOperandExpressionType"/>
<xs:element name="NOT" type="mstns:ExpressionType"/>
<xs:element name="ExpressionMethod" type="mstns:ExpressionMethodExpressionType"/>
<xs:element name="ExpressionStaticMethod"
type="mstns:ExpressionStaticMethodExpressionType"/>
<xs:element name="ExpressionProperty" type="mstns:ExpressionPropertyExpressionType"/>
<xs:element name="ExpressionStaticProperty"
type="mstns:ExpressionStaticPropertyExpressionType"/>
<xs:element name="ExpressionParameter"
type="mstns:ExpressionParameterExpressionType"/>
<xs:element name="ExpressionConvert" type="mstns:ExpressionConvertExpressionType"/>
<xs:element name="ExpressionConstant" type="mstns:MethodParameterType"/>
</xs:choice>
<xs:choice>
<xs:element name="GT" type="mstns:ExpressionLeftRightOperandExpressionType"/>
<xs:element name="LT" type="mstns:ExpressionLeftRightOperandExpressionType"/>
<xs:element name="EQ" type="mstns:ExpressionLeftRightOperandExpressionType"/>
<xs:element name="NE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
<xs:element name="GE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
<xs:element name="LE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
<xs:element name="AND" type="mstns:ExpressionLeftRightOperandExpressionType"/>
<xs:element name="OR" type="mstns:ExpressionLeftRightOperandExpressionType"/>
<xs:element name="NOT" type="mstns:ExpressionType"/>
<xs:element name="ExpressionMethod" type="mstns:ExpressionMethodExpressionType"/>
<xs:element name="ExpressionStaticMethod"
type="mstns:ExpressionStaticMethodExpressionType"/>
<xs:element name="ExpressionProperty" type="mstns:ExpressionPropertyExpressionType"/>
<xs:element name="ExpressionStaticProperty"
type="mstns:ExpressionStaticPropertyExpressionType"/>
<xs:element name="ExpressionParameter"
type="mstns:ExpressionParameterExpressionType"/>
<xs:element name="ExpressionConvert" type="mstns:ExpressionConvertExpressionType"/>
<xs:element name="ExpressionConstant" type="mstns:MethodParameterType"/>
</xs:choice>
</xs:sequence>
</xs:complexType>
<xs:complexType name="ExpressionPropertyExpressionType">
<xs:sequence>
<xs:choice>
<xs:element name="GT" type="mstns:ExpressionLeftRightOperandExpressionType"/>
<xs:element name="LT" type="mstns:ExpressionLeftRightOperandExpressionType"/>
<xs:element name="EQ" type="mstns:ExpressionLeftRightOperandExpressionType"/>
<xs:element name="NE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
<xs:element name="GE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
<xs:element name="LE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
<xs:element name="AND" type="mstns:ExpressionLeftRightOperandExpressionType"/>
<xs:element name="OR" type="mstns:ExpressionLeftRightOperandExpressionType"/>
<xs:element name="NOT" type="mstns:ExpressionType"/>
<xs:element name="ExpressionMethod" type="mstns:ExpressionMethodExpressionType"/>
<xs:element name="ExpressionStaticMethod"
type="mstns:ExpressionStaticMethodExpressionType"/>
<xs:element name="ExpressionProperty" type="mstns:ExpressionPropertyExpressionType"/>
<xs:element name="ExpressionStaticProperty"
type="mstns:ExpressionStaticPropertyExpressionType"/>
<xs:element name="ExpressionParameter"
type="mstns:ExpressionParameterExpressionType"/>
<xs:element name="ExpressionConvert" type="mstns:ExpressionConvertExpressionType"/>
<xs:element name="ExpressionConstant" type="mstns:MethodParameterType"/>

```

```

    </xs:choice>
  </xs:sequence>
  <xs:attribute name="Name" type="mstns:PropertyNameType" use="required"/>
</xs:complexType>
<xs:complexType name="ExpressionStaticPropertyExpressionType">
  <xs:sequence/>
  <xs:attribute name="Name" type="mstns:StaticPropertyNameType" use="required"/>
  <xs:attribute name="TypeId" type="mstns:TypeIdGuidType" use="required"/>
</xs:complexType>
<xs:complexType name="ExpressionMethodExpressionType">
  <xs:sequence>
    <xs:choice>
      <xs:element name="GT" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="LT" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="EQ" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="NE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="GE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="LE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="AND" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="OR" type="mstns:ExpressionLeftRightOperandExpressionType"/>
      <xs:element name="NOT" type="mstns:ExpressionType"/>
      <xs:element name="ExpressionMethod" type="mstns:ExpressionMethodExpressionType"/>
      <xs:element name="ExpressionStaticMethod"
type="mstns:ExpressionStaticMethodExpressionType"/>
      <xs:element name="ExpressionProperty" type="mstns:ExpressionPropertyExpressionType"/>
      <xs:element name="ExpressionStaticProperty"
type="mstns:ExpressionStaticPropertyExpressionType"/>
      <xs:element name="ExpressionParameter"
type="mstns:ExpressionParameterExpressionType"/>
      <xs:element name="ExpressionConvert" type="mstns:ExpressionConvertExpressionType"/>
      <xs:element name="ExpressionConstant" type="mstns:MethodParameterType"/>
    </xs:choice>
    <xs:element name="Parameters" minOccurs="0">
      <xs:complexType>
        <xs:sequence>
          <xs:choice minOccurs="0" maxOccurs="unbounded">
            <xs:element name="GT" type="mstns:ExpressionLeftRightOperandExpressionType"/>
            <xs:element name="LT" type="mstns:ExpressionLeftRightOperandExpressionType"/>
            <xs:element name="EQ" type="mstns:ExpressionLeftRightOperandExpressionType"/>
            <xs:element name="NE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
            <xs:element name="GE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
            <xs:element name="LE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
            <xs:element name="AND" type="mstns:ExpressionLeftRightOperandExpressionType"/>
            <xs:element name="OR" type="mstns:ExpressionLeftRightOperandExpressionType"/>
            <xs:element name="NOT" type="mstns:ExpressionType"/>
            <xs:element name="ExpressionMethod"
type="mstns:ExpressionMethodExpressionType"/>
            <xs:element name="ExpressionStaticMethod"
type="mstns:ExpressionStaticMethodExpressionType"/>
            <xs:element name="ExpressionProperty"
type="mstns:ExpressionPropertyExpressionType"/>
            <xs:element name="ExpressionStaticProperty"
type="mstns:ExpressionStaticPropertyExpressionType"/>
            <xs:element name="ExpressionParameter"
type="mstns:ExpressionParameterExpressionType"/>
            <xs:element name="ExpressionConvert"
type="mstns:ExpressionConvertExpressionType"/>
            <xs:element name="ExpressionConstant" type="mstns:MethodParameterType"/>
          </xs:choice>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
  </xs:sequence>

```

```

        </xs:complexType>
      </xs:element>
    </xs:sequence>
    <xs:attribute name="Name" type="mstns:MethodNameType" use="required"/>
  </xs:complexType>
  <xs:complexType name="ExpressionStaticMethodExpressionType">
    <xs:sequence>
      <xs:element name="Parameters" minOccurs="0">
        <xs:complexType>
          <xs:sequence>
            <xs:choice minOccurs="0" maxOccurs="unbounded">
              <xs:element name="GT" type="mstns:ExpressionLeftRightOperandExpressionType"/>
              <xs:element name="LT" type="mstns:ExpressionLeftRightOperandExpressionType"/>
              <xs:element name="EQ" type="mstns:ExpressionLeftRightOperandExpressionType"/>
              <xs:element name="NE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
              <xs:element name="GE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
              <xs:element name="LE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
              <xs:element name="AND" type="mstns:ExpressionLeftRightOperandExpressionType"/>
              <xs:element name="OR" type="mstns:ExpressionLeftRightOperandExpressionType"/>
              <xs:element name="NOT" type="mstns:ExpressionType"/>
              <xs:element name="ExpressionMethod"
type="mstns:ExpressionMethodExpressionType"/>
              <xs:element name="ExpressionStaticMethod"
type="mstns:ExpressionStaticMethodExpressionType"/>
              <xs:element name="ExpressionProperty"
type="mstns:ExpressionPropertyExpressionType"/>
              <xs:element name="ExpressionStaticProperty"
type="mstns:ExpressionStaticPropertyExpressionType"/>
              <xs:element name="ExpressionParameter"
type="mstns:ExpressionParameterExpressionType"/>
              <xs:element name="ExpressionConvert"
type="mstns:ExpressionConvertExpressionType"/>
              <xs:element name="ExpressionConstant" type="mstns:MethodParameterType"/>
            </xs:choice>
          </xs:sequence>
        </xs:complexType>
      </xs:element>
    </xs:sequence>
    <xs:attribute name="Name" type="mstns:StaticMethodNameType" use="required"/>
    <xs:attribute name="TypeId" type="mstns:TypeIdGuidType" use="required"/>
  </xs:complexType>
  <xs:complexType name="ExpressionConvertExpressionType">
    <xs:sequence>
      <xs:choice>
        <xs:element name="GT" type="mstns:ExpressionLeftRightOperandExpressionType"/>
        <xs:element name="LT" type="mstns:ExpressionLeftRightOperandExpressionType"/>
        <xs:element name="EQ" type="mstns:ExpressionLeftRightOperandExpressionType"/>
        <xs:element name="NE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
        <xs:element name="GE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
        <xs:element name="LE" type="mstns:ExpressionLeftRightOperandExpressionType"/>
        <xs:element name="AND" type="mstns:ExpressionLeftRightOperandExpressionType"/>
        <xs:element name="OR" type="mstns:ExpressionLeftRightOperandExpressionType"/>
        <xs:element name="NOT" type="mstns:ExpressionType"/>
        <xs:element name="ExpressionMethod" type="mstns:ExpressionMethodExpressionType"/>
        <xs:element name="ExpressionStaticMethod"
type="mstns:ExpressionStaticMethodExpressionType"/>
        <xs:element name="ExpressionProperty" type="mstns:ExpressionPropertyExpressionType"/>
        <xs:element name="ExpressionStaticProperty"
type="mstns:ExpressionStaticPropertyExpressionType"/>
      </xs:choice>
    </xs:sequence>
  </xs:complexType>

```



```

    <xs:element name="ExpressionParameter"
type="mstns:ExpressionParameterExpressionType"/>
    <xs:element name="ExpressionConvert" type="mstns:ExpressionConvertExpressionType"/>
    <xs:element name="ExpressionConstant" type="mstns:MethodParameterType"/>
  </xs:choice>
</xs:sequence>
<xs:attribute name="Type" use="required">
  <xs:simpleType>
    <xs:restriction base="xs:string">
      <xs:enumeration value="Boolean"/>
      <xs:enumeration value="Byte"/>
      <xs:enumeration value="SByte"/>
      <xs:enumeration value="Char"/>
      <xs:enumeration value="Int16"/>
      <xs:enumeration value="UInt16"/>
      <xs:enumeration value="Int32"/>
      <xs:enumeration value="UInt32"/>
      <xs:enumeration value="Int64"/>
      <xs:enumeration value="UInt64"/>
      <xs:enumeration value="DateTime"/>
      <xs:enumeration value="Single"/>
      <xs:enumeration value="Double"/>
      <xs:enumeration value="Decimal"/>
      <xs:enumeration value="TimeSpan"/>
      <xs:enumeration value="String"/>
    </xs:restriction>
  </xs:simpleType>
</xs:attribute>
</xs:complexType>
<xs:complexType name="ExpressionParameterExpressionType">
  <xs:attribute name="Name" type="xs:string" use="required"/>
</xs:complexType>
<xs:group name="ExpressionQueryableExpressionGroup">
  <xs:choice>
    <xs:element name="Take" type="mstns:ExpressionQueryableTakeType"/>
    <xs:element name="Where" type="mstns:ExpressionQueryableWhereType"/>
    <xs:element name="OrderBy" type="mstns:ExpressionQueryableWhereType"/>
    <xs:element name="OrderByDescending" type="mstns:ExpressionQueryableWhereType"/>
    <xs:element name="ThenBy" type="mstns:ExpressionQueryableWhereType"/>
    <xs:element name="ThenByDescending" type="mstns:ExpressionQueryableWhereType"/>
    <xs:element name="QueryableObject">
      <xs:complexType/>
    </xs:element>
  </xs:choice>
</xs:group>
<xs:complexType name="ExpressionQueryableExpressionType">
  <xs:sequence>
    <xs:choice>
      <xs:element name="Take" type="mstns:ExpressionQueryableTakeType"/>
      <xs:element name="Where" type="mstns:ExpressionQueryableWhereType"/>
      <xs:element name="OrderBy" type="mstns:ExpressionQueryableWhereType"/>
      <xs:element name="OrderByDescending" type="mstns:ExpressionQueryableWhereType"/>
      <xs:element name="ThenBy" type="mstns:ExpressionQueryableWhereType"/>
      <xs:element name="ThenByDescending" type="mstns:ExpressionQueryableWhereType"/>
      <xs:element name="QueryableObject">
        <xs:complexType/>
      </xs:element>
    </xs:choice>
  </xs:sequence>

```

```

</xs:complexType>
<xs:complexType name="ExpressionQueryableTakeType">
  <xs:sequence>
    <xs:choice>
      <xs:element name="Take" type="mstns:ExpressionQueryableTakeType"/>
      <xs:element name="Where" type="mstns:ExpressionQueryableWhereType"/>
      <xs:element name="OrderBy" type="mstns:ExpressionQueryableWhereType"/>
      <xs:element name="OrderByDescending" type="mstns:ExpressionQueryableWhereType"/>
      <xs:element name="ThenBy" type="mstns:ExpressionQueryableWhereType"/>
      <xs:element name="ThenByDescending" type="mstns:ExpressionQueryableWhereType"/>
      <xs:element name="QueryableObject">
        <xs:complexType/>
      </xs:element>
    </xs:choice>
  </xs:sequence>
  <xs:attribute name="Count" type="xs:nonNegativeInteger"/>
</xs:complexType>
<xs:complexType name="ExpressionQueryableWhereType">
  <xs:sequence>
    <xs:element name="Test">
      <xs:complexType>
        <xs:all>
          <xs:element name="Body" type="mstns:ExpressionType"/>
          <xs:element name="Parameters">
            <xs:complexType>
              <xs:sequence>
                <xs:element name="Parameter">
                  <xs:complexType>
                    <xs:attribute name="Name" type="xs:string"/>
                  </xs:complexType>
                </xs:element>
              </xs:sequence>
            </xs:complexType>
          </xs:element>
        </xs:all>
      </xs:complexType>
    </xs:element>
    <xs:element name="Object" type="mstns:ExpressionQueryableExpressionType"/>
  </xs:sequence>
</xs:complexType>
<xs:element name="Request" type="mstns:RequestType"/>
</xs:schema>

```

7 Appendix B: Product Behavior

The information in this specification is applicable to the following Microsoft products or supplemental software. References to product versions include released service packs:

- Microsoft® SharePoint® Foundation 2010
- Microsoft® SharePoint® Foundation 15 Technical Preview

Exceptions, if any, are noted below. If a service pack or Quick Fix Engineering (QFE) number appears with the product version, behavior changed in that service pack or QFE. The new behavior also applies to subsequent service packs of the product unless otherwise specified. If a product edition appears with the product version, behavior is different in that product edition.

Unless otherwise specified, any statement of optional behavior in this specification that is prescribed using the terms SHOULD or SHOULD NOT implies product behavior in accordance with the SHOULD or SHOULD NOT prescription. Unless otherwise specified, the term MAY implies that the product does not follow the prescription.

[<1> Section 2.2.4.6:](#) This type is available only in SharePoint Foundation 15 Technical Preview.

[<2> Section 2.2.5.18:](#) This type is available only in SharePoint Foundation 15 Technical Preview.

[<3> Section 2.2.5.19:](#) This type is available only in SharePoint Foundation 15 Technical Preview.

[<4> Section 3.1.4.1.3.24.28:](#) This type is available only in SharePoint Foundation 15 Technical Preview.

[<5> Section 3.1.4.1.3.24.29:](#) This type is available only in SharePoint Foundation 15 Technical Preview.

[<6> Section 3.1.4.1.3.24.30:](#) This type is available only in SharePoint Foundation 15 Technical Preview.

8 Change Tracking

This section identifies changes that were made to the [MS-CSOM] protocol document between the June 2011 and January 2012 releases. Changes are classified as New, Major, Minor, Editorial, or No change.

The revision class **New** means that a new document is being released.

The revision class **Major** means that the technical content in the document was significantly revised. Major changes affect protocol interoperability or implementation. Examples of major changes are:

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

The revision class **Minor** means that the meaning of the technical content was clarified. Minor changes do not affect protocol interoperability or implementation. Examples of minor changes are updates to clarify ambiguity at the sentence, paragraph, or table level.

The revision class **Editorial** means that the language and formatting in the technical content was changed. Editorial changes apply to grammatical, formatting, and style issues.

The revision class **No change** means that no new technical or language changes were introduced. The technical content of the document is identical to the last released version, but minor editorial and formatting changes, as well as updates to the header and footer information, and to the revision summary, may have been made.

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

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

- Protocol syntax updated due to protocol revision.
- Protocol syntax removed due to protocol revision.
- New content added for template compliance.
- Content updated for template compliance.
- Content removed for template compliance.
- Obsolete document removed.

Editorial changes are always classified with the change type **Editorially updated**.

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

- **Protocol syntax** refers to data elements (such as packets, structures, enumerations, and methods) as well as interfaces.
- **Protocol revision** refers to changes made to a protocol that affect the bits that are sent over the wire.

The changes made to this document are listed in the following table. For more information, please contact protocol@microsoft.com.

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change type
1.7 Versioning and Capability Negotiation	Clarified that the protocol can also use HTTPS and that there are two versions of the protocol.	N	Content updated.
2.2.4.6 CSOM Stream	Added this section about CSOM Stream.	Y	New content added.
2.2.4.6.1 CSOM Stream XML Value	Added this section.	Y	New content added.
2.2.4.6.2 CSOM Stream JSON Value	Added this section.	Y	New content added.
2.2.5 Simple Types	Added the CSOM Decimal and CSOM TimeSpan simple types.	N	New content added.
2.2.5.5.2 CSOM DateTime JSON Value	Added introductory text for the two tables in this section.	N	Content updated.
2.2.5.14.2 CSOM String JSON Value	Clarified that all characters except the Unicode solidus are represented by "rfc4629-char".	N	Content updated.
2.2.5.18 CSOM Decimal	Added this section about CSOM Decimal.	Y	New content added.

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change type
2.2.5.18.1 CSOM Decimal XML Value	Added this section.	Y	New content added.
2.2.5.18.2 CSOM Decimal JSON Value	Added this section.	Y	New content added.
2.2.5.19 CSOM TimeSpan	Added this section about CSOM TimeSpan.	Y	New content added.
2.2.5.19.1 CSOM TimeSpan XML Value	Added this section.	Y	New content added.
2.2.5.19.2 CSOM TimeSpan JSON Value	Added this section.	Y	New content added.
3.1.4.1 ProcessQuery	Clarified the normative language for how the server processes a CSOM action list, and for how it responds when there is and is not an unhandled exception.	N	Content updated.
3.1.4.1.1.1 ProcessQueryIn	Clarified the schema of the ProcessQueryIn message both when there is CSOM Stream data and when there is not.	Y	New content added.
3.1.4.1.1.2 ProcessQueryOut	Clarified the schema of the ProcessQueryOut message both when there is CSOM Stream data and when there is not.	Y	New content added.
3.1.4.1.3 Complex Types	Added a table of complex types.	N	New content added.
3.1.4.1.3.1 ActionInstantiateObjectPathType	Added the case for when the action fails.	N	Content updated.
3.1.4.1.3.2 ActionInvokeMethodType	Explained what the server does if the CSOM action fails and the exception is not handled.	N	New content added.
3.1.4.1.3.3 ActionInvokeStaticMethodType	Explained what the server does if the CSOM action fails and the exception is not handled.	N	New content added.
3.1.4.1.3.4 ActionObjectIdentityQueryType	Added the case for when the action fails.	N	Content updated.
3.1.4.1.3.5 ActionQueryType	Explained what the server does if the CSOM action fails and the exception	N	New content

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change type
	is not handled.		added.
3.1.4.1.3.6 ActionSetPropertyType	Explained what the server does if the CSOM action fails and the exception is not handled.	N	New content added.
3.1.4.1.3.7 ActionSetStaticPropertyType	Explained what the server does if the CSOM action fails and the exception is not handled.	N	New content added.
3.1.4.1.3.10 ConditionalScopeType	Explained what the server does if the CSOM action fails and the exception is not handled.	N	New content added.
3.1.4.1.3.11 ExceptionHandlingScopeSimpleType	Explained what the server does if the CSOM action fails and the exception is not handled.	N	New content added.
3.1.4.1.3.12 ExceptionHandlingScopeType	Added the case when the action fails.	N	New content added.
3.1.4.1.3.13.1 Schema	Added values Decimal and TimeSpan.	N	New content added.
3.1.4.1.3.18.1 Schema	Added elements OrderBy, OrderByDescending, ThenBy, and ThenByDescending.	Y	New content added.
3.1.4.1.3.18.3 Child Elements	Added descriptions for elements OrderBy, OrderByDescending, ThenBy, and ThenByDescending.	Y	New content added.
3.1.4.1.3.19.1 Schema	Added elements OrderBy, OrderByDescending, ThenBy, and ThenByDescending.	Y	New content added.
3.1.4.1.3.19.3 Child Elements	Added descriptions for elements OrderBy, OrderByDescending, ThenBy, and ThenByDescending.	Y	New content added.
3.1.4.1.3.20 ExpressionQueryableWhereType	Clarified that this complex type represents a filtered or sorted set of CSOM Objects, and what the server returns in each case.	N	Content updated.
3.1.4.1.3.20.2 Attributes	Removed "conditional" from the section.	N	Content updated.
3.1.4.1.3.20.3 Child Elements	Removed "conditional" from the descriptions in the section.	N	Content updated.
3.1.4.1.3.24.1 Schema	Added element Include and its attribute href.	Y	New content added.

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change type
3.1.4.1.3.24.28 MethodParameterBinaryType	Added this section.	Y	New content added.
3.1.4.1.3.24.28.1 Schema	Added this section.	Y	New content added.
3.1.4.1.3.24.28.2 Attributes	Added this section.	Y	New content added.
3.1.4.1.3.24.28.3 Child Elements	Added this section.	Y	New content added.
3.1.4.1.3.24.29 MethodParameterDecimalType	Added this section.	Y	New content added.
3.1.4.1.3.24.29.1 Schema	Added this section.	Y	New content added.
3.1.4.1.3.24.29.2 Attributes	Added this section.	Y	New content added.
3.1.4.1.3.24.30 MethodParameterTimeSpanType	Added this section.	Y	New content added.
3.1.4.1.3.24.30.1 Schema	Added this section.	Y	New content added.
3.1.4.1.3.24.30.2 Attributes	Added this section.	Y	New content added.
3.1.4.1.3.32.2 Attributes	Clarified that, if SelectAll is "true", the server must return all of the "default scalar properties" for each child object or for each CSOM Object, depending on the CSOM expando field.	N	Content updated.
3.1.4.1.3.34.2 Attributes	Clarified that SchemaVersion has two possible values.	N	Content updated.
3.1.4.1.4.5 MethodParameterTypeType	Added values Binary, Decimal and TimeSpan.	Y	New content added.
3.1.4.1.6.2.3 Child Elements	Clarified how elements EQ, GE, GT, LE, LT, and NE depend upon the	N	Content updated.

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change type
	CSOM types of the operands.		
3.1.4.1.6.3.1 Schema	Added elements OrderBy, OrderByDescending, ThenBy, and ThenByDescending.	Y	New content added.
3.1.4.1.6.3.3 Child Elements	Added descriptions for elements OrderBy, OrderByDescending, ThenBy, and ThenByDescending. Also clarified that Where specifies a filtered set of CSOM Objects.	Y	New content added.
3.1.4.1.8.1.3 CSOM Object JSON Value	Added an example to the descriptions of propName# and expandoProp#.	N	Content updated.
3.1.4.1.8.1.4 CSOM Value Object JSON Value	Added an example to the description of propName#.	N	Content updated.
3.1.4.1.8.2.1.2 ExceptionHandlingScopeResponse JSON Value	Clarified that member ErrorInfo always needs to be present.	N	Content updated.
3.1.4.1.8.2.1.3 ExceptionHandlingScopeSimpleResponse JSON Value	Clarified that member ErrorInfo always needs to be present.	N	Content updated.
3.1.4.1.8.2.1.4 MethodResponse JSON Value	Added CSOM Stream, CSOM Object, and CSOM value object to the table of method return types.	N	Content updated.
3.1.4.1.8.2.1.5 ObjectIdentityQueryResponse JSON Value	Clarified when ObjectIdentityQueryResponse is a JSON literal null and when it is a JSON object.	N	Content updated.
3.1.4.1.8.2.1.7 QueryResponse JSON Value	Clarified when QueryResponse is a JSON literal null and when it is a JSON object.	N	Content updated.
4 Protocol Examples	Updated the Methods for Book and the author of Family Recipes.	N	Content updated.
4.1 Retrieve Book Information	Clarified the server message for book information.	N	Content updated.
4.2 Retrieve Books by a Specific Author	Clarified the server message for book information.	N	Content updated.
4.3 Update Book Information	Clarified the server message for book information.	N	Content updated.
4.4 Add a Book to a Catalog	Clarified the server message for book information.	N	Content updated.
4.5 Unsuccessfully Add a Book to a Catalog	Clarified the server message for book information.	N	Content updated.

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change type
4.6 Retrieve Book Sample Content	Added this example.	N	Content updated.
4.7 Update Book Sample Content	Added this example.	N	Content updated.
6 Appendix A: XML Schema	Changed the name from "Appendix A: Full WSDL" to "Appendix A: XML Schema".	Y	Content updated.
6 Appendix A: XML Schema	Removed the WSDL information.	Y	Content removed.
6.1 Request XML Schema	Updated the schema for the changes in the rest of the specification.	Y	New content added.
7 Appendix B: Product Behavior	Updated the list of product versions.	N	Content updated.

9 Index

A

Abstract data model
 [server](#) 39
[Add a Book to Catalog example](#) 122
[Applicability](#) 16
[Attribute groups](#) 38
[Attributes](#) 38

C

[Capability negotiation](#) 16
[Change tracking](#) 148
Client
 [overview](#) 39
[Complex types](#) 20
 [CSOM Array](#) 20
 [CSOM Dictionary](#) 21
 [CSOM Null](#) 22
 [CSOM Object](#) 22
 [CSOM Stream](#) 23
 [CSOM Value Object](#) 23
[CSOM Array complex type](#) 20
[CSOM Binary simple type](#) 25
[CSOM Boolean simple type](#) 27
[CSOM Byte simple type](#) 27
[CSOM Char simple type](#) 27
[CSOM DateTime simple type](#) 28
[CSOM Decimal simple type](#) 37
[CSOM Dictionary complex type](#) 21
[CSOM Double simple type](#) 31
[CSOM Enum simple type](#) 31
[CSOM GUID simple type](#) 32
[CSOM Int16 simple type](#) 33
[CSOM Int32 simple type](#) 33
[CSOM Int64 simple type](#) 33
[CSOM Null complex type](#) 22
[CSOM Object complex type](#) 22
[CSOM SByte simple type](#) 34
[CSOM Single simple type](#) 34
[CSOM Stream complex type](#) 23
[CSOM String simple type](#) 35
[CSOM TimeSpan simple type](#) 37
[CSOM UInt16 simple type](#) 36
[CSOM UInt32 simple type](#) 36
[CSOM UInt64 simple type](#) 37
[CSOM Value Object complex type](#) 23

D

Data model - abstract
 [server](#) 39

E

Events
 [local - server](#) 113
 [timer - server](#) 113

Examples

[Add a Book to Catalog](#) 122
[Retrieve Books by Author](#) 118
[Unsuccessfully Add a Book to Catalog](#) 124
Update Book Information ([section 4.3](#) 120,
 [section 4.6](#) 125, [section 4.7](#) 126)

F

[Fields - vendor-extensible](#) 17

G

[Glossary](#) 12
[Groups](#) 38

I

[Implementer - security considerations](#) 129
[Index of security parameters](#) 129
[Informative references](#) 14
Initialization
 [server](#) 42
[Introduction](#) 12

L

Local events
 [server](#) 113

M

Message processing
 [server](#) 42
Messages
 [attribute groups](#) 38
 [attributes](#) 38
 [complex types](#) 20
 [CSOM Array complex type](#) 20
 [CSOM Binary simple type](#) 25
 [CSOM Boolean simple type](#) 27
 [CSOM Byte simple type](#) 27
 [CSOM Char simple type](#) 27
 [CSOM DateTime simple type](#) 28
 [CSOM Decimal simple type](#) 37
 [CSOM Dictionary complex type](#) 21
 [CSOM Double simple type](#) 31
 [CSOM Enum simple type](#) 31
 [CSOM GUID simple type](#) 32
 [CSOM Int16 simple type](#) 33
 [CSOM Int32 simple type](#) 33
 [CSOM Int64 simple type](#) 33
 [CSOM Null complex type](#) 22
 [CSOM Object complex type](#) 22
 [CSOM SByte simple type](#) 34
 [CSOM Single simple type](#) 34
 [CSOM Stream complex type](#) 23
 [CSOM String simple type](#) 35

[CSOM TimeSpan simple type](#) 37
[CSOM UInt16 simple type](#) 36
[CSOM UInt32 simple type](#) 36
[CSOM UInt64 simple type](#) 37
[CSOM Value Object complex type](#) 23
[elements](#) 20
[enumerated](#) 20
[groups](#) 38
[namespaces](#) 19
[simple types](#) 24
[syntax](#) 18
[transport](#) 18

N

[Namespaces](#) 19
[Normative references](#) 13

O

Operations
[ProcessQuery](#) 43
[Overview \(synopsis\)](#) 14

P

[Parameters - security index](#) 129
[Preconditions](#) 16
[Prerequisites](#) 16
[Product behavior](#) 147

R

[References](#) 13
[informative](#) 14
[normative](#) 13
[Relationship to other protocols](#) 16
[Retrieve Books by Author example](#) 118

S

Security
[implementer considerations](#) 129
[parameter index](#) 129
Sequencing rules
[server](#) 42
Server
[abstract data model](#) 39
[initialization](#) 42
[local events](#) 113
[message processing](#) 42
[overview](#) 39
[ProcessQuery operation](#) 43
[sequencing rules](#) 42
[timer events](#) 113
[timers](#) 42
[Simple types](#) 24
[CSOM Binary](#) 25
[CSOM Boolean](#) 27
[CSOM Byte](#) 27
[CSOM Char](#) 27
[CSOM DateTime](#) 28

[CSOM Decimal](#) 37
[CSOM Double](#) 31
[CSOM Enum](#) 31
[CSOM GUID](#) 32
[CSOM Int16](#) 33
[CSOM Int32](#) 33
[CSOM Int64](#) 33
[CSOM SByte](#) 34
[CSOM Single](#) 34
[CSOM String](#) 35
[CSOM TimeSpan](#) 37
[CSOM UInt16](#) 36
[CSOM UInt32](#) 36
[CSOM UInt64](#) 37
[Standards assignments](#) 17
Syntax
[messages - overview](#) 18

T

Timer events
[server](#) 113
Timers
[server](#) 42
[Tracking changes](#) 148
[Transport](#) 18
Types
[complex](#) 20
[simple](#) 24

U

[Unsuccessfully Add a Book to Catalog example](#) 124
Update Book Information example ([section 4.3](#) 120,
[section 4.6](#) 125, [section 4.7](#) 126)

V

[Vendor-extensible fields](#) 17
[Versioning](#) 16