Mailbox Search Web Service Protocol

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<th>Revision History</th>
<th>Revision Class</th>
<th>Comments</th>
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<td>Significantly changed the technical content.</td>
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</tbody>
</table>
Table of Contents

1 Introduction ........................................................................................................... 6
  1.1 Glossary ............................................................................................................. 6
  1.2 References ....................................................................................................... 7
    1.2.1 Normative References ............................................................................. 7
    1.2.2 Informative References ........................................................................... 8
  1.3 Overview .......................................................................................................... 9
  1.4 Relationship to Other Protocols ...................................................................... 9
  1.5 Prerequisites/Preconditions ............................................................................. 9
  1.6 Applicability Statement .................................................................................. 10
  1.7 Versioning and Capability Negotiation .......................................................... 10
  1.8 Vendor-Extensible Fields ................................................................................ 10
  1.9 Standards Assignments .................................................................................. 10

2 Messages............................................................................................................... 11
  2.1 Transport ......................................................................................................... 11
  2.2 Common Message Syntax .............................................................................. 11
    2.2.1 Namespaces .............................................................................................. 11
    2.2.2 Messages .................................................................................................. 11
    2.2.3 Elements .................................................................................................. 11
      2.2.3.1 tns:And Element ............................................................................... 12
      2.2.3.2 tns:Contains Element ....................................................................... 13
      2.2.3.3 tns:Excludes Element ..................................................................... 13
      2.2.3.4 tns:Exists Element .......................................................................... 13
      2.2.3.5 tns:IsEqualTo Element ..................................................................... 13
      2.2.3.6 tns:IsGreaterThan Element .............................................................. 13
      2.2.3.7 tns:IsGreaterThanOrEqualTo Element ................................................. 13
      2.2.3.8 tns:LessThan Element ...................................................................... 14
      2.2.3.9 tns:LessThanOrEqualTo Element ....................................................... 14
      2.2.3.10 tns:Not Element ........................................................................... 14
      2.2.3.11 tns:Or Element ............................................................................. 15
      2.2.3.12 tns:SearchExpression Element .................................................... 15
      2.2.3.13 PerformInstantSearch Element ....................................................... 15
      2.2.3.14 PerformInstantSearchResponse Element ....................................... 15
      2.2.3.15 tns:SearchExpression Element .................................................... 15
      2.2.4 Complex Types ....................................................................................... 15
      2.2.4.1 t:AndType Complex Type ................................................................. 17
      2.2.4.2 t:ArrayOfCalendarsItemType Complex Type .................................... 17
      2.2.4.3 t:ArrayOfGroupedItemsType Complex Type .................................... 18
      2.2.4.4 t:ArrayOfItemsType Complex Type ................................................. 18
      2.2.4.5 t:BasePagingType Complex Type ................................................... 19
      2.2.4.6 t:ContainsExpressionType Complex Type ........................................ 19
      2.2.4.7 t:ExcludesType Complex Type ........................................................ 20
      2.2.4.8 t:ExcludesValueType Complex Type ............................................... 21
      2.2.4.9 t:ExistsType Complex Type ............................................................. 21
      2.2.4.10 t:FindFolderParentType Complex Type .......................................... 22
      2.2.4.11 m:FindFolderResponseMessageType Complex Type ..................... 22
      2.2.4.12 t:FindItemType Complex Type ......................................................... 23
      2.2.4.13 m:FindItemResponseMessageType Complex Type ......................... 23
      2.2.4.14 t:FractionalPageViewType Complex Type ....................................... 24
      2.2.4.15 t:GroupedItemsType Complex Type ............................................... 24
      2.2.4.16 t:IndexedPageViewType Complex Type ......................................... 25
      2.2.4.17 t:InstantSearchPayloadType Complex Type .................................... 26
      2.2.4.18 t:IsEqualToType Complex Type ...................................................... 26
      2.2.4.19 t:IsGreaterThanOrEqualToType Complex Type .............................. 27
      2.2.4.20 t:IsGreaterThanType Complex Type ............................................... 27
2.2.4.21 \( t:\text{IsLessThanOrEqualToType} \) Complex Type .................................................. 27
2.2.4.22 \( t:\text{IsLessThanType} \) Complex Type .................................................. 27
2.2.4.23 \( t:\text{IsNotEqualToType} \) Complex Type .................................................. 28
2.2.4.24 \( t:\text{MultipleOperandBooleanExpressionType} \) Complex Type .................. 28
2.2.4.25 \( t:\text{NotType} \) Complex Type .................................................. 29
2.2.4.26 \( t:\text{OrType} \) Complex Type .................................................. 29
2.2.4.27 \( m:\text{PerformInstantSearchRequest} \) Complex Type ............................. 29
2.2.4.28 \( m:\text{PerformInstantSearchResponse} \) Complex Type .......................... 30
2.2.4.29 \( m:\text{queryStringType} \) Complex Type ............................................. 31
2.2.4.30 \( t:\text{RestrictionType} \) Complex Type .............................................. 31
2.2.4.31 \( t:\text{SearchExpressionType} \) Complex Type ........................................ 31
2.2.4.32 \( t:\text{SearchFolderType} \) Complex Type ........................................... 32
2.2.4.33 \( t:\text{SearchParametersType} \) Complex Type .................................... 32
2.2.4.34 \( t:\text{SeekToConditionPageViewType} \) Complex Type .......................... 33
2.2.4.35 \( t:\text{TwoOperandExpressionType} \) Complex Type .............................. 34
2.2.5 Simple Types .................................................................................. 34
  2.2.5.1 \( t:\text{ContainmentComparisonType} \) Simple Type .............................. 35
  2.2.5.2 \( t:\text{ContainmentModeType} \) Simple Type ........................................ 36
  2.2.5.3 \( t:\text{FolderQueryTraversalType} \) Simple Type ............................... 37
  2.2.5.4 \( t:\text{IndexBasePointTraversalType} \) Simple Type ............................ 37
  2.2.5.5 \( t:\text{InstantSearchItemType} \) Simple Type ...................................... 38
  2.2.5.6 \( t:\text{InstantSearchResultType} \) Simple Type ................................... 38
  2.2.5.7 \( t:\text{ItemQueryTraversalType} \) Simple Type ................................... 39
  2.2.5.8 \( t:\text{QueryOptionsType} \) Simple Type ........................................... 40
  2.2.5.9 \( t:\text{SearchFolderTraversalType} \) Simple Type .............................. 40
2.2.6 Attributes .................................................................................. 41
2.2.7 Groups ....................................................................................... 41
2.2.8 Attribute Groups ........................................................................ 41

3 Protocol Details .............................................................................. 42
  3.1 ExchangeServicePortType Server Details .......................................... 42
  3.1.1 Abstract Data Model ....................................................................... 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 FindFolder Operation ................................................................. 42
      3.1.4.1.1 Messages ........................................................................... 43
        3.1.4.1.1.1 \( \text{tns:FindFolderSoapIn} \) Message .................................. 43
        3.1.4.1.1.2 \( \text{tns:FindFolderSoapOut} \) Message .............................. 44
      3.1.4.1.2 Elements ...................................................................... 44
        3.1.4.1.2.1 \( \text{tns:FindFolderElement} \) ........................................ 45
        3.1.4.1.2.2 \( \text{tns:FindFolderResponseElement} \) ....................... 45
      3.1.4.1.3 Complex Types .................................................................. 45
        3.1.4.1.3.1 \( m:\text{FindFolderResponseType} \) Complex Type ....... 45
        3.1.4.1.3.2 \( m:\text{FindFolderType} \) Complex Type .................... 45
    3.1.4.2 FindItem Operation ................................................................. 47
      3.1.4.2.1 Messages ........................................................................... 47
        3.1.4.2.1.1 \( \text{tns:FindItemSoapIn} \) Message .................................. 47
        3.1.4.2.1.2 \( \text{tns:FindItemSoapOut} \) Message .............................. 48
      3.1.4.2.2 Elements ...................................................................... 49
        3.1.4.2.2.1 \( \text{tns:FindItemElement} \) ........................................ 49
        3.1.4.2.2.2 \( \text{tns:FindItemResponseElement} \) ....................... 49
      3.1.4.2.3 Complex Types .................................................................. 49
        3.1.4.2.3.1 \( m:\text{FindItemResponseType} \) Complex Type ....... 50
        3.1.4.2.3.2 \( m:\text{FindItemType} \) Complex Type .................... 50
        3.1.4.2.3.3 \( t:\text{AggregateOnType} \) Complex Type ................ 53
        3.1.4.2.3.4 \( t:\text{BaseGroupByType} \) Complex Type ............ 54
        3.1.4.2.3.5 \( t:\text{DistinguishedGroupByType} \) Complex Type .... 54
<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1.4.2.3.6</td>
<td>t:FieldOrderType Complex Type</td>
<td>55</td>
</tr>
<tr>
<td>3.1.4.2.3.7</td>
<td>t:GroupByType Complex Type</td>
<td>55</td>
</tr>
<tr>
<td>3.1.4.2.3.8</td>
<td>t:NonEmptyArrayOfFieldOrdersType Complex Type</td>
<td>56</td>
</tr>
<tr>
<td>3.1.4.2.4</td>
<td>Simple Types</td>
<td>57</td>
</tr>
<tr>
<td>3.1.4.2.4.1</td>
<td>t:AggregateType Simple Type</td>
<td>57</td>
</tr>
<tr>
<td>3.1.4.2.4.2</td>
<td>t:SortDirectionType Simple Type</td>
<td>57</td>
</tr>
<tr>
<td>3.1.4.2.4.3</td>
<td>t:StandardGroupByType Simple Type</td>
<td>58</td>
</tr>
<tr>
<td>3.1.5</td>
<td>Timer Events</td>
<td>58</td>
</tr>
<tr>
<td>3.1.6</td>
<td>Other Local Events</td>
<td>58</td>
</tr>
<tr>
<td>4</td>
<td>Protocol Examples</td>
<td>59</td>
</tr>
<tr>
<td>5</td>
<td>Security</td>
<td>64</td>
</tr>
<tr>
<td>5.1</td>
<td>Security Considerations for Implementers</td>
<td>64</td>
</tr>
<tr>
<td>5.2</td>
<td>Index of Security Parameters</td>
<td>64</td>
</tr>
<tr>
<td>6</td>
<td>Appendix A: Full WSDL</td>
<td>65</td>
</tr>
<tr>
<td>7</td>
<td>Appendix B: Full XML Schema</td>
<td>68</td>
</tr>
<tr>
<td>7.1</td>
<td>Messages Schema</td>
<td>68</td>
</tr>
<tr>
<td>7.2</td>
<td>Types Schema</td>
<td>70</td>
</tr>
<tr>
<td>8</td>
<td>Appendix C: Product Behavior</td>
<td>77</td>
</tr>
<tr>
<td>9</td>
<td>Change Tracking</td>
<td>79</td>
</tr>
<tr>
<td>10</td>
<td>Index</td>
<td>80</td>
</tr>
</tbody>
</table>
1 Introduction

The Mailbox Search Web Service Protocol is used to search the contents of a server and return the results of that search.

Sections 1.5, 1.8, 1.9, 2, and 3 of this specification are normative. All other sections and examples in this specification are informative.

1.1 Glossary

This document uses the following terms:

**Deleted Items folder**: A special folder that is the default location for objects that have been deleted.

**endpoint**: A communication port that is exposed by an application server for a specific shared service and to which messages can be addressed.

**Hypertext Transfer Protocol (HTTP)**: An application-level protocol for distributed, collaborative, hypermedia information systems (text, graphic images, sound, video, and other multimedia files) on the World Wide Web.

**Hypertext Transfer Protocol Secure (HTTPS)**: An extension of HTTP that securely encrypts and decrypts web page requests. In some older protocols, "Hypertext Transfer Protocol over Secure Sockets Layer" is still used (Secure Sockets Layer has been deprecated). For more information, see [SSL3] and [RFC5246].

**mailbox**: A message store that contains email, calendar items, and other Message objects for a single recipient.

**message store**: A unit of containment for a single hierarchy of Folder objects, such as a mailbox or public folders.

**Root folder**: The special folder that is the top-level folder in a message store hierarchy. It contains all other Folder objects in that message store.

**search folder**: A collection of related items to be crawled by a search service.

**SOAP**: A lightweight protocol for exchanging structured information in a decentralized, distributed environment. SOAP uses XML technologies to define an extensible messaging framework, which provides a message construct that can be exchanged over a variety of underlying protocols. The framework has been designed to be independent of any particular programming model and other implementation-specific semantics. SOAP 1.2 supersedes SOAP 1.1. See [SOAP1.2-1/2003].

**SOAP action**: The HTTP request header field used to indicate the intent of the SOAP request, using a URI value. See [SOAP1.1] section 6.1.1 for more information.

**SOAP body**: A container for the payload data being delivered by a SOAP message to its recipient. See [SOAP1.2-1/2007] section 5.3 for more information.

**SOAP header**: A mechanism for implementing extensions to a SOAP message in a decentralized manner without prior agreement between the communicating parties. See [SOAP1.2-1/2007] section 5.2 for more information.

**SOAP message**: An XML document consisting of a mandatory SOAP envelope, an optional SOAP header, and a mandatory SOAP body. See [SOAP1.2-1/2007] section 5 for more information.
Uniform Resource Identifier (URI): A string that identifies a resource. The URI is an addressing mechanism defined in Internet Engineering Task Force (IETF) Uniform Resource Identifier (URI): Generic Syntax [RFC3986].

Uniform Resource Locator (URL): A string of characters in a standardized format that identifies a document or resource on the World Wide Web. The format is as specified in [RFC1738].

Web server: A server computer that hosts websites and responds to requests from applications.

Web Services Description Language (WSDL): An XML format for describing network services as a set of endpoints that operate on messages that contain either document-oriented or procedure-oriented information. The operations and messages are described abstractly and are bound to a concrete network protocol and message format in order to define an endpoint. Related concrete endpoints are combined into abstract endpoints, which describe a network service. WSDL is extensible, which allows the description of endpoints and their messages regardless of the message formats or network protocols that are used.

WSDL message: An abstract, typed definition of the data that is communicated during a WSDL operation [WSDL]. Also, an element that describes the data being exchanged between web service providers and clients.

WSDL operation: A single action or function of a web service. The execution of a WSDL operation typically requires the exchange of messages between the service requestor and the service provider.

WSDL port type: A named set of logically-related, abstract Web Services Description Language (WSDL) operations and messages.

XML namespace: A collection of names that is used to identify elements, types, and attributes in XML documents identified in a URI reference [RFC3986]. A combination of XML namespace and local name allows XML documents to use elements, types, and attributes that have the same names but come from different sources. For more information, see [XMLNS-2ED].

XML namespace prefix: An abbreviated form of an XML namespace, as described in [XML].

XML schema: A description of a type of XML document that is typically expressed in terms of constraints on the structure and content of documents of that type, in addition to the basic syntax constraints that are imposed by XML itself. An XML schema provides a view of a document type at a relatively high level of abstraction.

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

1.2 References

Links to a document in the Microsoft Open Specifications library point to the correct section in the most recently published version of the referenced document. However, because individual documents in the library are not updated at the same time, the section numbers in the documents may not match. You can confirm the correct section numbering by checking the Errata.

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.

[MS-OXWSCDATA] Microsoft Corporation, "Common Web Service Data Types".

[MS-OXWSCONT] Microsoft Corporation, "Contacts Web Service Protocol".

[MS-OXWSSRCH] - v20181001
Mailbox Search Web Service Protocol
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Release: October 1, 2018
1.3 Overview

This protocol provides clients with operations that enable them to search the contents of a server message store and to return the results of that search.

1.4 Relationship to Other Protocols

A client that implements this protocol can use the Autodiscover Publishing and Lookup SOAP-based Web Service Protocol, as described in [MS-OXWSADISC], or the Autodiscover Publishing and Lookup Protocol, as described in [MS-OXDSCLI], to identify the target endpoint to use for each operation.

This protocol uses the SOAP Protocol, as described in [SOAP1.1], to describe the structure information that is exchanged between the client and server. This protocol uses the XML Protocol, as described in [XMLSCHEMA1] and [XMLSCHEMA2], to describe the message content that is sent to and from the server.

This protocol uses the Simple Object Access Protocol (SOAP) over the Hypertext Transfer Protocol (HTTP), as described in [RFC2616], and SOAP over the Hypertext Transfer Protocol over Secure Sockets Layer (HTTPS), as described in [RFC2818], as shown in the following layering diagram.

![Layering Diagram]

Figure 1: This protocol in relation to other protocols

This protocol specifies searches that identify items in the server message store. After the item identifier is returned, one of the following protocols is used to return the information from the message store:

- Folders and Folder Permissions Web Service Protocol, as described in [MS-OXWSFOLD]
- Email Message Types Web Service Protocol, as described in [MS-OXWSMSG]
- Calendaring Web Service Protocol, as described in [MS-OXWSMTGS]
- Post Items Web Service Protocol, as described in [MS-OXWSPOST]
- Tasks Web Service Protocol, as described in [MS-OXWSTASK]

For conceptual background information and overviews of the relationships and interactions between this and other protocols, see [MS-OXPROTO].

1.5 Prerequisites/Preconditions

The endpoint URL that is returned by either the Autodiscover Publishing Lookup SOAP-Based Web Service Protocol, as described in [MS-OXWSADISC], or the Autodiscover Publishing Lookup Protocol,
as described in [MS-OXDSCLI], is required to form the HTTP request to the web server that hosts this protocol. The operations that this protocol defines cannot be accessed unless the correct endpoint is identified in the HTTP Web requests that target this protocol.

### 1.6 Applicability Statement

This protocol is applicable to client applications that search the contents of the server message store.

### 1.7 Versioning and Capability Negotiation

This document covers versioning issues in the following areas:

- **Supported Transports:** This protocol uses multiple transports with SOAP 1.1, as specified in section 2.1.

- **Protocol Versions:** This protocol specifies only one WSDL port type version. The WSDL version of the request is identified by using the RequestServerVersion element, as described in [MS-OXWSCDATA] section 2.2.3.9, and the version of the server responding to the request is identified by using the ServerVersionInfo element, as described in [MS-OXWSCDATA] section 2.2.3.10.

- **Security and Authentication Methods:** This protocol relies on the Web server that is hosting it to perform authentication.

- **Localization:** This protocol includes text strings in various messages. Localization considerations for such strings are specified in section 3.1.4.

- **Capability Negotiation:** This protocol does not support version negotiation.

### 1.8 Vendor-Extensible Fields

None.

### 1.9 Standards Assignments

None.
2 Messages

In the following sections, the schema definition might differ from the processing rules imposed by the protocol. The WSDL in this specification provides a base description of the protocol. The schema in this specification provides a base description of the message syntax. The text that specifies the WSDL and schema might specify restrictions that reflect actual protocol behavior. For example, the schema definition might allow for an element to be empty, null, or not present but the behavior of the protocol as specified restricts the same elements to being non-empty, not null, or present.

2.1 Transport

The SOAP version that is supported is SOAP 1.1. For details, see [SOAP1.1].

This protocol relies on the web server that hosts the application to perform authentication. Protocol servers MUST support SOAP over HTTP, as defined in [RFC2616]. The protocol SHOULD additionally support secure communications via HTTPS, as defined in [RFC2818].

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 defined in [XMLSCHEMA1] and [XMLSCHEMA2], and Web Services Description Language (WSDL), as defined in [WSDL].

2.2.1 Namespaces

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

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Namespace URI</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>soap</td>
<td><a href="http://schemas.xmlsoap.org/wsdl/soap/">http://schemas.xmlsoap.org/wsdl/soap/</a></td>
<td>[SOAP1.1]</td>
</tr>
<tr>
<td>tns</td>
<td><a href="http://schemas.microsoft.com/exchange/services/2006/messages">http://schemas.microsoft.com/exchange/services/2006/messages</a></td>
<td></td>
</tr>
<tr>
<td>wsdl</td>
<td><a href="http://schemas.xmlsoap.org/wsdl/">http://schemas.xmlsoap.org/wsdl/</a></td>
<td>[WSDL]</td>
</tr>
<tr>
<td>wsi</td>
<td><a href="http://ws-i.org/schemas/conformanceClaim/">http://ws-i.org/schemas/conformanceClaim/</a></td>
<td>[WSIBASIC]</td>
</tr>
<tr>
<td>t</td>
<td><a href="http://schemas.microsoft.com/exchange/services/2006/types">http://schemas.microsoft.com/exchange/services/2006/types</a></td>
<td></td>
</tr>
<tr>
<td>xs</td>
<td><a href="http://www.w3.org/2001/XMLSchema">http://www.w3.org/2001/XMLSchema</a></td>
<td>[XMLSCHEMA1], [XMLSCHEMA2]</td>
</tr>
</tbody>
</table>

2.2.2 Messages

This specification does not define any common WSDL message definitions.

2.2.3 Elements

The following table summarizes the set of common XML schema element definitions that are defined by this specification. XML schema element definitions that are specific to a particular operation are defined with the operation.
<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>And</td>
<td>Specifies a search expression that performs a Boolean AND operation between two or more search expressions.</td>
</tr>
<tr>
<td>Contains</td>
<td>Specifies a search expression that determines whether a given property contains the supplied constant string value.</td>
</tr>
<tr>
<td>Excludes</td>
<td>Specifies a search expression that performs a bitwise mask of the specified property and a supplied value.</td>
</tr>
<tr>
<td>Exists</td>
<td>Specifies a search expression that determines whether the specified property exists on an item.</td>
</tr>
<tr>
<td>IsEqualTo</td>
<td>Specifies a search expression that compares a property value with either a constant value or another property value and evaluates to true if the two are equal.</td>
</tr>
<tr>
<td>IsGreaterThan</td>
<td>Specifies a search expression that compares a property with either a constant value or another property value and evaluates to true if the first property is greater than the second.</td>
</tr>
<tr>
<td>IsGreaterThanOrEqualTo</td>
<td>Specifies a search expression that compares a property with either a constant value or another property value and evaluates to true if the first property is greater than or equal to the second.</td>
</tr>
<tr>
<td>IsLessThan</td>
<td>Specifies a search expression that compares a property to either a constant value or another property and evaluates to true if the first property is less than the second.</td>
</tr>
<tr>
<td>IsLessThanOrEqualTo</td>
<td>Specifies a search expression that compares a property to either a constant value or another property and evaluates to true if the first property is less than or equal to the second.</td>
</tr>
<tr>
<td>IsNotEqualTo</td>
<td>Specifies a search expression that compares a property value with either a constant value or another property value and evaluates to true if the two are not the same.</td>
</tr>
<tr>
<td>Not</td>
<td>Specifies a search expression that negates the Boolean value of a search expression that it contains.</td>
</tr>
<tr>
<td>Or</td>
<td>Specifies a search expression that performs a Boolean OR operation on two or more search expressions.</td>
</tr>
<tr>
<td>PerformInstantSearch</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>PerformInstantSearchResponse</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>SearchExpression</td>
<td>Specifies the base schema type for all search expressions. This type is abstract and will never occur directly within instance documents.</td>
</tr>
</tbody>
</table>

2.2.3.1 tns:And Element

The And element specifies a search expression that performs a Boolean AND operation between two or more search expressions. The AND operation evaluates to TRUE if all the search expressions that are contained within the And element are TRUE.

```xml
<xs:element name="And"
    type="t:AndType"
    substitutionGroup="t:SearchExpression"
```
2.2.3.2 tns:Contains Element

The Contains element specifies a search expression that determines whether a given property contains the supplied constant string value.

```xml
<xs:element name="Contains"
    type="t:ContainsExpressionType"
    substitutionGroup="t:SearchExpression"/>
```

2.2.3.3 tns:Excludes Element

The Excludes element specifies a search expression that performs a bitwise mask of the specified property and a supplied value.

```xml
<xs:element name="Excludes"
    type="t:ExcludesType"
    substitutionGroup="t:SearchExpression"/>
```

2.2.3.4 tns:Exists Element

The Exists element specifies a search expression that determines whether the specified property exists on an item. The Exists element evaluates to true if the specified property exists on the item.

```xml
<xs:element name="Exists"
    type="t:ExistsType"
    substitutionGroup="t:SearchExpression"/>
```

2.2.3.5 tns:IsEqualTo Element

The IsEqualTo element specifies a search expression that compares a property value with either a constant value or another property value and evaluates to true if they are equal.

```xml
<xs:element name="IsEqualTo"
    type="t:IsEqualToType"
    substitutionGroup="t:SearchExpression"/>
```

2.2.3.6 tns:IsGreaterThan Element

The IsGreaterThan element specifies a search expression that compares a property with either a constant value or another property and evaluates to true if the first property is greater.

```xml
<xs:element name="IsGreaterThan"
    type="t:IsGreaterThanType"
    substitutionGroup="t:SearchExpression"/>
```
2.2.3.7 tns:IsGreaterThanOrEqualTo Element

The IsGreaterThanOrEqualTo element specifies a search expression that compares a property with either a constant value or another property and evaluates to true if the first property is greater than or equal to the second.

```xml
<xsd:element name="IsGreaterThanOrEqualTo" type="t:IsGreaterThanOrEqualToType" substitutionGroup="t:SearchExpression"/>
```

2.2.3.8 tns:IsLessThan Element

The IsLessThan element specifies a search expression that compares a property to either a constant value or another property and evaluates to true if the first property is less than the second.

```xml
<xsd:element name="IsLessThan" type="t:IsLessThanType" substitutionGroup="t:SearchExpression"/>
```

2.2.3.9 tns:IsLessThanOrEqualTo Element

The IsLessThanOrEqualTo element specifies a search expression that compares a property to either a constant value or another property and evaluates to true if the first property is less than or equal to the second.

```xml
<xsd:element name="IsLessThanOrEqualTo" type="t:IsLessThanOrEqualToType" substitutionGroup="t:SearchExpression"/>
```

2.2.3.10 tns:IsNotEqualTo Element

The IsNotEqualTo element specifies a search expression that compares a property value with either a constant value or another property value and evaluates to true if they are not the same.

```xml
<xsd:element name="IsNotEqualTo" type="t:IsNotEqualToType" substitutionGroup="t:SearchExpression"/>
```

2.2.3.11 tns:Not Element

The Not element specifies a search expression that negates the Boolean value of a search expression that it contains.

```xml
<xsd:element name="Not" type="t:NotType" substitutionGroup="t:SearchExpression"/>
```
2.2.3.12  tns:Or Element

The Or element specifies a search expression that performs a logical OR on the search expressions that it contains and evaluates to true if any of the search expressions evaluate to true.

```
<xs:element name="Or"
    type="t:OrType"
    substitutionGroup="t:SearchExpression" />
```

2.2.3.13  PerformInstantSearch Element

The PerformInstantSearch element is for internal use only. 1

```
<xs:element name="PerformInstantSearch"
    type="m:PerformInstantSearchRequest" />
```

2.2.3.14  PerformInstantSearchResponse Element

The PerformInstantSearchResponse element is for internal use only. 2

```
<xs:element name="PerformInstantSearchResponse"
    type="m:PerformInstantSearchResponse" />
```

2.2.3.15  tns:SearchExpression Element

The SearchExpression element specifies the base schema type for all search expressions. This type is abstract and will never occur directly within instance documents. This type defines a substitution group.

```
<xs:element name="SearchExpression"
    type="t:SearchExpressionType" />
```

2.2.4  Complex Types

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

<table>
<thead>
<tr>
<th>Complex type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FindFolderResponseMessageType</td>
<td>Specifies the result body for the FindFolder operation (section 3.1.4.1).</td>
</tr>
<tr>
<td>FindItemResponseMessageType</td>
<td>Specifies the result body from the FindItem operation (section 3.1.4.2).</td>
</tr>
<tr>
<td>Complex type</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>AndType</td>
<td>Specifies a search expression that performs a Boolean <strong>AND</strong> operation between two or more search expressions.</td>
</tr>
<tr>
<td>ArrayOfCalendaryItemsType</td>
<td>Specifies an array of <strong>CalendarItemType</strong> complex types ([MS-OXWSMTGS] section 2.2.4.8).</td>
</tr>
<tr>
<td>ArrayOfGroupedItemsType</td>
<td>Specifies an array of items that are returned by the <strong>FindItem</strong> operation.</td>
</tr>
<tr>
<td>ArrayOfItemsType</td>
<td>Specifies an array of <strong>ItemType</strong> complex types ([MS-OXWSCORE] section 2.2.4.23).</td>
</tr>
<tr>
<td>BasePagingType</td>
<td>Specifies the base type for derived types that specify paged views.</td>
</tr>
<tr>
<td>ContainsExpressionType</td>
<td>Specifies a search expression that determines whether a given property contains the supplied constant string value.</td>
</tr>
<tr>
<td>ExcludesType</td>
<td>Specifies a bitwise mask of a property for an exclude search restriction.</td>
</tr>
<tr>
<td>ExcludesValueType</td>
<td>Specifies a hexadecimal or decimal mask for an exclude search restriction.</td>
</tr>
<tr>
<td>ExistsType</td>
<td>Specifies a search restriction that resolves to true if the supplied property exists on an item.</td>
</tr>
<tr>
<td>FindFolderParentType</td>
<td>Specifies the results of searching a single Root folder during a <strong>FindFolder</strong> operation, as specified in section 3.1.4.1.</td>
</tr>
<tr>
<td>FindItemParentType</td>
<td>Specifies the results of searching a single <strong>Root folder</strong> during a <strong>FindItem</strong> operation, as specified in section 3.1.4.2.</td>
</tr>
<tr>
<td>FractionalPageViewType</td>
<td>Specifies where a paged view starts and the maximum number of items that are returned.</td>
</tr>
<tr>
<td>GroupedItemsType</td>
<td>Specifies a collection of items that are the result of a grouped <strong>FindItem</strong> operation.</td>
</tr>
<tr>
<td>IndexedPageViewType</td>
<td>Specifies how paged item information is returned by the <strong>FindItem</strong> or the <strong>FindFolder</strong> operation.</td>
</tr>
<tr>
<td>InstantSearchPayloadType</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>IsEqualToType</td>
<td>Specifies a search expression that compares a property with either a constant value or another property and evaluates to &quot;true&quot; if they are equal.</td>
</tr>
<tr>
<td>IsGreaterThanOrEqualToType</td>
<td>Specifies a search expression that compares a property with either a constant value or another property and evaluates to &quot;true&quot; if the first property is greater than or equal to the second.</td>
</tr>
<tr>
<td>IsGreaterThanType</td>
<td>Specifies a search expression that compares a property with either a constant value or another property and returns &quot;true&quot; if the first property is greater.</td>
</tr>
<tr>
<td>IsLessThanOrEqualToType</td>
<td>Specifies a search expression that compares a property with either a constant value or another property and evaluates to true if the first property is less than or equal to the second.</td>
</tr>
<tr>
<td>IsLessThanType</td>
<td>Specifies a search expression that compares a property with either a constant value or another property and evaluates to true if the first property is less than the second.</td>
</tr>
<tr>
<td>Complex type</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>IsNotEqualToType</td>
<td>Specifies a search expression that compares a property with either a constant value or another property and evaluates to true if the values are not the same.</td>
</tr>
<tr>
<td>MultipleOperandBooleanExpressionType</td>
<td>Specifies the base type for search expressions that are formed by two or more Boolean operands.</td>
</tr>
<tr>
<td>NotType</td>
<td>Specifies a search expression that negates the Boolean value of the search expression that it contains.</td>
</tr>
<tr>
<td>OrType</td>
<td>Specifies a search expression that performs a logical OR on the search expression that it contains.</td>
</tr>
<tr>
<td>PerformInstantSearchRequest</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>PerformInstantSearchResponse</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>RestrictionType</td>
<td>Specifies a search restriction or query for the FindItem operation or the FindFolder operation.</td>
</tr>
<tr>
<td>SearchExpressionType</td>
<td>Specifies the base type for all search expressions.</td>
</tr>
<tr>
<td>SearchParametersType</td>
<td>Specifies the search parameters that define the contents of a search folder.</td>
</tr>
<tr>
<td>SeekToConditionPageViewType</td>
<td>Specifies a condition that has to be met in order for an item to be included in the result set that is returned by the FindItem operation or the FindFolder operation.</td>
</tr>
<tr>
<td>TwoOperandExpressionType</td>
<td>Specifies the base type for derived classes that represent a restriction that is formed by comparing two values against one another.</td>
</tr>
<tr>
<td>QueryStringType</td>
<td>Specifies a query string.</td>
</tr>
</tbody>
</table>

### 2.2.4.1 t:AndType Complex Type

The **AndType** complex type specifies a search expression that performs a Boolean **AND** operation between two or more search expressions. The result of the **AND** operation is **TRUE** if all the search expressions that are contained within the **AndType** complex type are true. The **AndType** complex type extends the **MultipleOperandBooleanExpressionType** complex type, as specified in section 2.2.4.24.

```xml
<xs:complexType name="AndType">
  <xs:complexContent>
    <xs:extension base="t:MultipleOperandBooleanExpressionType"/>
  </xs:complexContent>
</xs:complexType>
```

### 2.2.4.2 t:ArrayOfCalendarItemsType Complex Type

The **ArrayOfCalendarItemsType** complex type specifies an array of calendar items that are returned in a search.<5>
The following table describes the child element of the **ArrayOfCalendarItemsType** complex type.

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CalendarItem</td>
<td>t:CalendarItemType ([MS-OXWSMTGS] section 2.2.4.7)</td>
<td>A calendar item.</td>
</tr>
</tbody>
</table>

### 2.2.4.3 t:ArrayOfGroupedItemsType Complex Type

The **ArrayOfGroupedItemsType** complex type specifies an array of items that are returned by the **FindItem** operation, as specified in section 3.1.4.2.

The following table lists the child element of the **ArrayOfGroupedItemsType** complex type.

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GroupedItems</td>
<td>t:GroupedItemsType (section 2.2.4.15)</td>
<td>Specifies an array of items that are returned by the <strong>FindItem</strong> operation.</td>
</tr>
</tbody>
</table>

### 2.2.4.4 t:ArrayOfItemsType Complex Type

The **ArrayOfItemsType** complex type specifies an array of items that are returned in a search.  

The following table describes the child element of the **ArrayOfItemsType** complex type.

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item</td>
<td>t:ItemType ([MS-OXWSCORE] section 2.2.4.23)</td>
<td>A generic item.</td>
</tr>
</tbody>
</table>
2.2.4.5 t:BasePagingType Complex Type

The **BasePagingType** complex type specifies the base type for derived types that specify paged views.

```xml
<xs:complexType name="BasePagingType"
abstract="true">
  <xs:attribute name="MaxEntriesReturned"
type="xs:int"
use="optional"/>
</xs:complexType>
```

The following table lists the attribute definition for the **BasePagingType** complex type.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MaxEntriesReturned</td>
<td>xs:int</td>
<td>Specifies the maximum number of entries that are returned with each page of the response. This attribute can be specified.</td>
</tr>
</tbody>
</table>

2.2.4.6 t:ContainsExpressionType Complex Type

The **ContainsExpressionType** complex type specifies a search expression that determines whether a given property contains the supplied constant string value. The **ContainsExpressionType** complex type extends the **SearchExpressionType** complex type, as specified in section 2.2.4.31.

```xml
<xs:complexType name="ContainsExpressionType">
  <xs:complexContent>
    <xs:extension base="t:SearchExpressionType">
      <xs:sequence>
        <xs:element ref="t:Path"/>
        <xs:element name="Constant" type="t:ConstantValueType"/>
      </xs:sequence>
      <xs:attribute name="ContainmentMode" type="t:ContainmentModeType" use="optional"/>
      <xs:attribute name="ContainmentComparison" type="t:ContainmentComparisonType" use="optional"/>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

The following table lists the child elements of the **ContainsExpressionType** complex type.
### Element | Type | Description
--- | --- | ---
Path | `t:Path ([MS-OXWSCDATA] section 2.2.3.8)` | Specifies the property to use in a `contains` search expression. The `Path` element specifies a substitution group, as specified in [XMLSCHEMA0]. An element that is represented by the `Path` element `substitutionGroup` attribute MUST be present.

Constant | `t:ConstantValueType ([MS-OXWSCDATA] section 2.2.4.23)` | Specifies a constant value for a search restriction.

The following table lists the attribute definitions for the `ContainsExpressionType` complex type.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ContainmentMode</td>
<td><code>t:ContainmentModeType (section 2.2.5.2)</code></td>
<td>Specifies the boundaries of a search.</td>
</tr>
<tr>
<td>ContainmentComparison</td>
<td><code>t:ContainmentComparisonType (section 2.2.5.1)</code></td>
<td>Specifies whether a search ignores cases and spaces.</td>
</tr>
</tbody>
</table>

#### 2.2.4.7 `t:ExcludesType` Complex Type

The `ExcludesType` complex type specifies a bitwise mask of a property for an `exclude` search restriction. The `ExcludesType` complex type extends the `SearchExpressionType` complex type, as specified in section 2.2.4.31.

```xml
<xs:complexType name="ExcludesType">
  <xs:complexContent>
    <xs:extension base="t:SearchExpressionType">
      <xs:sequence>
        <xs:element ref="t:Path" />
        <xs:element name="Bitmask" type="t:ExcludesValueType" />
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

The following table lists the child elements of the `ExcludesType` complex type.

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Path</td>
<td><code>t:Path ([MS-OXWSCDATA] section 2.2.3.8)</code></td>
<td>Specifies the property to use in an <code>excludes</code> search expression. The <code>Path</code> element specifies a substitution group, as specified in [XMLSCHEMA0]. An element that is represented by the <code>Path</code> element <code>substitutionGroup</code> attribute MUST be present.</td>
</tr>
<tr>
<td>Bitmask</td>
<td><code>t:ExcludesValueType (section 2.2.4.8)</code></td>
<td>Specifies a hexadecimal or decimal mask for an <code>excludes</code> restriction.</td>
</tr>
</tbody>
</table>

An `excludes` restriction can only be applied to a property that has an integer value.
2.2.4.8 t:ExcludesValueType Complex Type

The ExcludesValueType complex type specifies a hexadecimal or decimal mask for a restriction that excludes some results.

```xml
<xs:complexType name="ExcludesValueType">
  <xs:attribute name="Value" type="t:ExcludesAttributeType" use="required"/>
</xs:complexType>
```

The following table lists the attribute definition for the ExcludesValueType complex type.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>t:ExcludesAttributeType ([MS-OXWSCDATA] section 2.2.5.15)</td>
<td>Specifies a decimal or hexadecimal bitmask for an exclude restriction.</td>
</tr>
</tbody>
</table>

2.2.4.9 t:ExistsType Complex Type

The ExistsType complex type specifies a search restriction that resolves to true if the supplied property exists on an item. The ExistsType complex type extends the SearchExpressionType complex type, as specified in section 2.2.4.31.

```xml
<xs:complexType name="ExistsType">
  <xs:complexContent>
    <xs:extension base="t:SearchExpressionType">
      <xs:sequence>
        <xs:element ref="t:Path"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

The following table lists the child element of the ExistsType complex type.

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Path</td>
<td>Path ([MS-OXWSCDATA] section 2.2.3.8)</td>
<td>Specifies the property to use in an excludes search expression. The Path element specifies a substitution group, as specified in [XMLSCHEMA0]. An element that is represented by the Path element substitutionGroup attribute MUST be present.</td>
</tr>
</tbody>
</table>
2.2.4.10  t:FindFolderParentType Complex Type

The **FindFolderParentType** complex type specifies an array of folders and paging information that are returned in the results of a call to the **FindFolder** operation, as specified in section 3.1.4.1.

```
<xs:complexType name="FindFolderParentType">
  <xs:sequence>
    <xs:element name="Folders" type="t:ArrayOfFoldersType" minOccurs="0"/>
  </xs:sequence>
  <xs:attributeGroup ref="t:FindResponsePagingAttributes"/>
</xs:complexType>
```

The following table lists the child element of the **FindFolderParentType** complex type.

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Folders</td>
<td>t:ArrayOfFoldersType ([MS-OXWSFOLD] section 2.2.4.2)</td>
<td>Specifies the folders in the result set.</td>
</tr>
</tbody>
</table>

The following table lists the attribute group that is defined for the **FindFolderParentType** complex type.

<table>
<thead>
<tr>
<th>Attribute group</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>t:FindResponsePagingAttributes ([MS-OXWSCDATA] section 2.2.8.1)</td>
<td>Specifies zero or more attributes that describe the result set.</td>
</tr>
</tbody>
</table>

2.2.4.11  m:FindFolderResponseMessageType Complex Type

The **FindFolderResponseMessageType** complex type specifies the response message for the **FindFolder** operation, as specified in section 3.1.4.1. The **FindFolderResponseMessageType** complex type extends the **ResponseMessageType** complex type, as specified in [MS-OXWSCDATA] section 2.2.4.67.

```
<xs:complexType name="FindFolderResponseMessageType">
  <xs:complexContent>
    <xs:extension base="m:ResponseMessageType">
      <xs:sequence>
        <xs:element name="RootFolder" type="t:FindFolderParentType" minOccurs="0"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

The following table lists the child element of the **FindFolderResponseMessageType** complex type.

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RootFolder</td>
<td>t:FindFolderParentType (section 2.2.4.10)</td>
<td>Specifies an array of folders and paging information that is returned by the <strong>FindFolder</strong> operation.</td>
</tr>
</tbody>
</table>
2.2.4.12  **t:FindItemParentType Complex Type**

The **FindItemParentType** complex type specifies the results of a search of a single **Root folder**.

```xml
<xs:complexType name="FindItemParentType">
  <xs:choice>
    <xs:element name="Items" type="t:ArrayOfRealItemsType" />
    <xs:element name="Groups" type="t:ArrayOfGroupedItemsType" />
  </xs:choice>
  <xs:attributeGroup ref="t:FindResponsePagingAttributes" />
</xs:complexType>
```

The following table lists the child elements of the **FindItemParentType** complex type.

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Items</td>
<td>t:ArrayOfRealItemsType ([MS-OXWSCDATA] section 2.2.4.10)</td>
<td>Specifies the results of a search in which the items returned are not grouped.</td>
</tr>
<tr>
<td>Groups</td>
<td>t:ArrayOfGroupedItemsType (section 2.2.4.3)</td>
<td>Specifies the grouped results of a search.</td>
</tr>
</tbody>
</table>

The following table lists the attribute group that is defined for the **FindItemParentType** complex type.

<table>
<thead>
<tr>
<th>Attribute group</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>t:FindResponsePagingAttributes ([MS-OXWSCDATA] section 2.2.8.1)</td>
<td>Specifies zero or more attributes that describe the result set.</td>
</tr>
</tbody>
</table>

If a **GroupBy** or **DistinguishedGroupBy** element was specified in the **FindItemType** complex type, as specified in section 3.1.4.2.3.2, instance that was sent to the **FindItem** operation, as specified in section 3.1.4.2, any results of the operation are returned in the **Groups** element; otherwise, the results are returned in the **Items** element.

2.2.4.13  **m:FindItemResponseMessageType Complex Type**

The **FindItemResponseMessageType** complex type specifies the result body from the **FindItem** operation, as specified in section 3.1.4.2. The **FindItemResponseMessageType** complex type extends the **ResponseMessageType** complex type, as specified in [MS-OXWSCDATA] section 2.2.4.67.

```xml
<xs:complexType name="FindItemResponseMessageType">
  <xs:complexContent>
    <xs:extension base="m:ResponseMessageType">
      <xs:sequence>
        <xs:element name="RootFolder" type="t:FindItemParentType" minOccurs="0" />
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```
The following table lists the child element of the FindItemResponseMessageType complex type.

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RootFolder</td>
<td>t:FindItemParentType (section 2.2.4.12)</td>
<td>Specifies the Root folder of the response.</td>
</tr>
</tbody>
</table>

2.2.4.14  t:FractionalPageViewType Complex Type

The FractionalPageViewType complex type specifies where a paged view starts and the maximum number of items that are returned. The FractionalPageViewType complex type extends the BasePagingType complex type, as specified in section 2.2.4.5.

```
<xs:complexType name="FractionalPageViewType">
  <xs:complexContent>
    <xs:extension base="t:BasePagingType">
      <xs:attribute name="Numerator" type="xs:int" use="required"/>
      <xs:attribute name="Denominator" type="xs:int" use="required"/>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

The following table lists the attributes that are defined for the FractionalPageViewType complex type.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denominator</td>
<td>xs:int [XMLSCHEMA2]</td>
<td>Specifies the denominator of the fractional offset from the start of the total number of items in the result set.</td>
</tr>
<tr>
<td>Numerator</td>
<td>xs:int</td>
<td>Specifies the numerator of the fractional offset from the start of the total number of items in the result set.</td>
</tr>
</tbody>
</table>

2.2.4.15  t:GroupedItemsType Complex Type

The GroupedItemsType complex type specifies a collection of items that are the result of a grouped FindItem operation, as specified in section 3.1.4.2.

```
<xs:complexType name="GroupedItemsType">
  <xs:sequence>
    <xs:element name="GroupIndex"/>
  </xs:sequence>
</xs:complexType>
```
The following table lists the child elements of the **GroupedItemsType** complex type.

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GroupIndex</td>
<td>xs:string [[XMLSCHEMA2]]</td>
<td>Specifies the property value that is used to group the items.</td>
</tr>
<tr>
<td>Items</td>
<td>t:ArrayOfRealItemsType (MS-OXWSCDATA section 2.2.4.10)</td>
<td>Specifies the group of items that correspond to the specified group value.</td>
</tr>
</tbody>
</table>

### 2.2.4.16 t:IndexedPageViewType Complex Type

The **IndexedPageViewType** complex type specifies how paged item information is returned by the FindItem operation, as specified in section 3.1.4.2, or the FindFolder operation, as specified in section 3.1.4.1. The **IndexedPageViewType** complex type extends the **BasePagingType** complex type, as specified in section 2.2.4.5.

```xml
<xs:complexType name="IndexedPageViewType">
  <xs:complexContent>
    <xs:extension base="t:BasePagingType">
      <xs:attribute name="Offset" type="xs:int" use="required"/>
      <xs:attribute name="BasePoint" type="t:IndexBasePointType" use="required"/>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

The following table lists the attributes that are defined for the **IndexedPageViewType** complex type.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offset</td>
<td>xs:int [[XMLSCHEMA2]]</td>
<td>Specifies the offset from the <strong>BasePoint</strong> element. This attribute MUST be specified.</td>
</tr>
<tr>
<td>BasePoint</td>
<td>t:IndexBasePointType (section 2.2.5.4)</td>
<td>Specifies whether the page of items starts at the beginning or end of the set of items that were found by the search. This attribute MUST be specified.</td>
</tr>
</tbody>
</table>
2.2.4.17  t:InstantSearchPayloadType Complex Type

The InstantSearchPayloadType complex type is for internal use only.<7>

```xml
<xs:complexType name="InstantSearchPayloadType">
  <xs:sequence>
    <xs:element name="SearchSessionId" type="xs:string" minOccurs="1" maxOccurs="1"/>
    <xs:element name="SearchRequestId" type="xs:long" minOccurs="1" maxOccurs="1"/>
    <xs:element name="ResultType" type="t:InstantSearchResultType" minOccurs="1" maxOccurs="1"/>
    <xs:element name="Items" type="t:ArrayOfItemsType" minOccurs="0" maxOccurs="1"/>
    <xs:element name="Conversations" type="t:ArrayOfConversationsType" minOccurs="0" maxOccurs="1"/>
    <xs:element name="CalendarItems" type="t:ArrayOfCalendarItemsType" minOccurs="0" maxOccurs="1"/>
  </xs:sequence>
</xs:complexType>
```

The following table lists the child elements of the InstantSearchPayloadType complex type.

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SearchSessionId</td>
<td>xs:string ([XMLSCHEMA2] )</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>SearchRequestId</td>
<td>xs:long ([XMLSCHEMA2] )</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>ResultType</td>
<td>t:InstantSearchResultType (section 2.2.5.6)</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>Items</td>
<td>t:ArrayOfItemsType (section 2.2.4.4)</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>Conversations</td>
<td>t:ArrayOfConversationsType ([MS-OXWSCONV] section 3.1.4.2.3.1)</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>CalendarItems</td>
<td>t:ArrayOfCalendarItemsType (section 2.2.4.2)</td>
<td>For internal use only.</td>
</tr>
</tbody>
</table>

2.2.4.18  t:IsEqualToType Complex Type

The IsEqualToType complex type specifies a search expression that compares a property with either a constant value or another property and evaluates to true if they are equal. The IsEqualToType complex type extends the TwoOperandExpressionType complex type, as specified in section 2.2.4.35.

```xml
<xs:complexType name="IsEqualToType">
  <xs:complexContent>
    <xs:extension base="t:TwoOperandExpressionType"/>
  </xs:complexContent>
</xs:complexType>
```
2.2.4.19  t:IsGreaterThanOrEqualToType Complex Type

The IsGreaterThanOrEqualToType complex type specifies a search expression that compares a property with either a constant value or another property and evaluates to "true" if the first property is greater than or equal to the second. The IsGreaterThanOrEqualToType complex type extends the TwoOperandExpressionType complex type, as specified in section 2.2.4.35.

```xml
<xs:complexType name="IsGreaterThanOrEqualToType">
  <xs:complexContent>
    <xs:extension base="t:TwoOperandExpressionType"/>
  </xs:complexContent>
</xs:complexType>
```

2.2.4.20  t:IsGreaterThanType Complex Type

The IsGreaterThanType complex type specifies a search expression that compares a property with either a constant value or another property and returns "true" if the first property is greater. The IsGreaterThanType complex type extends the TwoOperandExpressionType complex type, as specified in section 2.2.4.35.

```xml
<xs:complexType name="IsGreaterThanType">
  <xs:complexContent>
    <xs:extension base="t:TwoOperandExpressionType"/>
  </xs:complexContent>
</xs:complexType>
```

2.2.4.21  t:IsLessThanOrEqualToType Complex Type

The IsLessThanOrEqualToType complex type specifies a search expression that compares a property with either a constant value or another property and evaluates to "true" if the first property is less than or equal to the second. The IsLessThanOrEqualToType complex type extends the TwoOperandExpressionType complex type, as specified in section 2.2.4.35.

```xml
<xs:complexType name="IsLessThanOrEqualToType">
  <xs:complexContent>
    <xs:extension base="t:TwoOperandExpressionType"/>
  </xs:complexContent>
</xs:complexType>
```

2.2.4.22  t:IsLessThanType Complex Type

The IsLessThanType complex type specifies a search expression that compares a property with either a constant value or another property and evaluates to "true" if the first property is less than the second. The IsLessThanType complex type extends the TwoOperandExpressionType complex type, as specified in section 2.2.4.35.

```xml
<xs:complexType name="IsLessThanType">
  <xs:complexContent>
    <xs:extension base="t:TwoOperandExpressionType"/>
  </xs:complexContent>
</xs:complexType>
```
2.2.4.23  t:IsNotEqualToType Complex Type

The **IsNotEqualToType** complex type specifies a search expression that compares a property with either a constant value or another property and evaluates to "true" if the values are not the same. The **IsNotEqualToType** complex type extends the **TwoOperandExpressionType** complex type, as specified in section 2.2.4.35.

```xml
<xs:complexType name="IsNotEqualToType">
  <xs:complexContent>
    <xs:extension base="t:TwoOperandExpressionType"/>
  </xs:complexContent>
</xs:complexType>
```

2.2.4.24  t:MultipleOperandBooleanExpressionType Complex Type

The **MultipleOperandBooleanExpressionType** complex type specifies the base type for search expressions that are formed by two or more Boolean operands. The **MultipleOperandBooleanExpressionType** complex type extends the **SearchExpressionType** complex type, as specified in section 2.2.4.31.

```xml
<xs:complexType name="MultipleOperandBooleanExpressionType" abstract="true">
  <xs:complexContent>
    <xs:extension base="t:SearchExpressionType">
      <xs:sequence>
        <xs:element minOccurs="1" maxOccurs="unbounded" ref="t:SearchExpression"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

The following table lists the child element of the **MultipleOperandBooleanExpressionType** complex type.

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SearchExpression</td>
<td>t:SearchExpression</td>
<td>(section 2.2.3.15)</td>
</tr>
</tbody>
</table>
### 2.2.4.25  t:NotType Complex Type

The **NotType** complex type specifies a search expression that negates the Boolean value of the search expression that it contains. The **NotType** complex type extends the **SearchExpressionType** complex type, as specified in section 2.2.4.31.

```xml
<xs:complexType name="NotType">
  <xs:complexContent>
    <xs:extension base="t:SearchExpressionType">
      <xs:sequence>
        <xs:element ref="t:SearchExpression" />
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

The following table lists the child element of the **NotType** complex type.

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SearchExpression</td>
<td>t:SearchExpression (section 2.2.3.15)</td>
<td>Specifies a search expression.</td>
</tr>
</tbody>
</table>

### 2.2.4.26  t:OrType Complex Type

The **OrType** complex type specifies a search expression that performs a logical **OR** on the search expression that it contains. The result of the **OR** operation is **TRUE** if any of the search expressions that are contained within the **OrType** complex type is true. The **OrType** complex type extends the **MultipleOperandBooleanExpressionType** complex type, as specified in section 2.2.4.24.

```xml
<xs:complexType name="OrType">
  <xs:complexContent>
    <xs:extension base="t:MultipleOperandBooleanExpressionType" />
  </xs:complexContent>
</xs:complexType>
```

### 2.2.4.27  m:PerformInstantSearchRequest Complex Type

The **PerformInstantSearchRequest** complex type is for internal use only.<sup>8</sup>

```xml
<xs:complexType name="PerformInstantSearchRequest">
  <xs:complexContent>
    <xs:extension base="m:BaseRequestType">
      <xs:sequence>
        <xs:element name="SearchSessionId" type="xs:string" minOccurs="1" maxOccurs="1" />
        <xs:element name="ItemType" type="t:InstantSearchItemType" minOccurs="1" maxOccurs="1" />
        <xs:element name="QueryOptions" type="t:QueryOptionsType" minOccurs="1" maxOccurs="1" />
        <xs:element name="SearchRequestId" type="xs:long" minOccurs="1" maxOccurs="1" />
        <xs:element name="KqlQuery" type="xs:string" minOccurs="1" maxOccurs="1" />
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```
The following table lists the child elements of the **PerformInstantSearchRequest** complex type.

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SearchSessionId</td>
<td>xs:string ([XMLSCHEMA2])</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>ItemType</td>
<td>t:InstantSearchItemType (section 2.2.5.5)</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>QueryOptions</td>
<td>t:QueryOptionsType (section 2.2.5.8)</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>SearchRequestId</td>
<td>xs:long ([XMLSCHEMA2])</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>KqlQuery</td>
<td>xs:string</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>FolderScope</td>
<td>t:ArrayOfFolderIdType ([MS-OXWSPERS] section 2.2.4.4)</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>DistinguishedFolderScope</td>
<td>t:ArrayOfDistinguishedFolderIdType ([MS-OXWSCDATA] section 2.2.4.6)</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>IsDeepTraversal</td>
<td>xs:boolean ([XMLSCHEMA2])</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>WaitOnSearchResults</td>
<td>xs:boolean</td>
<td>For internal use only.</td>
</tr>
</tbody>
</table>

### 2.2.4.28 m:PerformInstantSearchResponse Complex Type

The **PerformInstantSearchResponse** complex type is for internal use only. `<9>`

The following table lists the child element of the **PerformInstantSearchResponse** complex type.

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payload</td>
<td>t:InstantSearchPayloadType (section 2.2.4.17)</td>
<td>For internal use only.</td>
</tr>
</tbody>
</table>
2.2.4.29  m:QueryStringType Complex Type

The **QueryStringType** complex type specifies a query string.

```xml
<xs:complexType name="QueryStringType">
  <xs:simpleContent>
    <xs:extension base="xs:string">
      <xs:attribute name="ResetCache" type="xs:boolean" use="optional"/>
      <xs:attribute name="ReturnHighlightTerms" type="xs:boolean" use="optional"/>
      <xs:attribute name="ReturnDeletedItems" type="xs:boolean" use="optional"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
```

The following table lists and describes the attributes of the **QueryStringType** complex type.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ResetCache</td>
<td>xs:boolean</td>
<td>Specifies whether to clear the cache.</td>
</tr>
<tr>
<td>ReturnHighlightTerms</td>
<td>xs:boolean</td>
<td>Specifies whether to return highlighted terms in the search.</td>
</tr>
<tr>
<td>ReturnDeletedItems</td>
<td>xs:boolean</td>
<td>Specifies whether to return deleted items in the search.</td>
</tr>
</tbody>
</table>

2.2.4.30  t:RestrictionType Complex Type

The **RestrictionType** complex type specifies a search restriction or query for a **FindItem** operation, as specified in section 3.1.4.2, or a **FindFolder** operation, as specified in section 3.1.4.1.

```xml
<xs:complexType name="RestrictionType">
  <xs:sequence>
    <xs:element ref="t:SearchExpression"/>
  </xs:sequence>
</xs:complexType>
```

The following table lists the child element of the **RestrictionType** complex type.

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SearchExpression</td>
<td>t:SearchExpression (section 2.2.3.15)</td>
<td>Specifies the search term that defines the restriction.</td>
</tr>
</tbody>
</table>

2.2.4.31  t:SearchExpressionType Complex Type

The **SearchExpressionType** complex type specifies the base type for all search expressions.
2.2.4.32  t:SearchFolderType Complex Type

The SearchFolderType complex type specifies a representation of a search folder that is contained in a mailbox. This type extends the FolderType complex type, as specified in [MS-OXWSFOLD] section 2.2.4.12.

The following table lists the child elements of the SearchFolderType complex type.

<table>
<thead>
<tr>
<th>Element name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SearchParameters</td>
<td>t:SearchParametersType (section 2.2.4.33)</td>
<td>Specifies the search parameters that define the contents of the search folder. This element can be present.</td>
</tr>
</tbody>
</table>

2.2.4.33  t:SearchParametersType Complex Type

The SearchParametersType complex type specifies the search parameters that define the contents of a search folder.

The following table lists the child elements of the SearchParametersType complex type.
<table>
<thead>
<tr>
<th><strong>Element name</strong></th>
<th><strong>Type</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Restriction</td>
<td>t:RestrictionType (<a href="#">section 2.2.4.30</a>)</td>
<td>Specifies the query that defines the contents of a search folder.</td>
</tr>
<tr>
<td>BaseFolderIds</td>
<td>t:NonEmptyArrayOfBaseFolderIdsType ([MS-OXWSFOLD] <a href="#">section 3.1.4.6.3.3</a>)</td>
<td>Specifies an array of folder identifiers that identify the folders that are searched.</td>
</tr>
</tbody>
</table>

The following table lists the attributes that are defined for the SearchParametersType complex type.

<table>
<thead>
<tr>
<th><strong>Attribute name</strong></th>
<th><strong>Type</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Traversal</td>
<td>t:SearchFolderTraversalType (<a href="#">section 2.2.5.9</a>)</td>
<td>Specifies the depth of a search folder subtree traversal.</td>
</tr>
</tbody>
</table>

---

### 2.2.4.34 t:SeekToConditionPageViewType Complex Type

The SeekToConditionPageViewType complex type specifies a condition that has to be satisfied in order to include an item in the result set from the FindItem operation, as specified in section 3.1.4.2, or the FindFolder operation, as specified in section 3.1.4.1. The SeekToConditionPageViewType complex type extends the BasePagingType complex type, as specified in section 2.2.4.5.<10>

```xml
<xs:complexType name="SeekToConditionPageViewType">
    <xs:complexContent>
        <xs:extension base="t:BasePagingType">
            <xs:sequence>
                <xs:element name="Condition" type="t:RestrictionType" minOccurs="1"/>
            </xs:sequence>
            <xs:attribute name="BasePoint" type="t:IndexBasePointType" use="required"/>
        </xs:extension>
    </xs:complexContent>
</xs:complexType>
```

The following table lists the child element of the SeekToConditionPageViewType complex type.

<table>
<thead>
<tr>
<th><strong>Element</strong></th>
<th><strong>Type</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Condition</td>
<td>t:RestrictionType (<a href="#">section 2.2.4.30</a>)</td>
<td>Specifies the search term used to determine if an item is to be included in the result set.</td>
</tr>
</tbody>
</table>

The following table lists the attribute of the SeekToConditionPageViewType complex type.

<table>
<thead>
<tr>
<th><strong>Attribute</strong></th>
<th><strong>Type</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>BasePoint</td>
<td>t:IndexBasePointType (<a href="#">section 2.2.5.4</a>)</td>
<td>Specifies whether the search term should be applied from the beginning or end of the result set.</td>
</tr>
</tbody>
</table>
2.2.4.35  **t:TwoOperandExpressionType Complex Type**

The `TwoOperandExpressionType` complex type specifies the base type for derived classes that represent a restriction that is formed by comparing two values against one another. The `TwoOperandExpressionType` complex type extends the `SearchExpressionType` complex type, as specified in section 2.2.4.31.

```xml
<xs:complexType name="TwoOperandExpressionType"
    abstract="true">
  <xs:complexContent>
    <xs:extension base="t:SearchExpressionType">
      <xs:sequence>
        <xs:element ref="t:Path" />
        <xs:element name="FieldURIOrConstant" type="t:FieldURIOrConstantType" />
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

The following table lists the child elements of the `TwoOperandExpressionType` complex type.

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Path</td>
<td><code>t:Path</code> ([MS-OXWSCDATA] section 2.2.3.8)</td>
<td>Specifies the property path that is searched on for each item or folder in a search.</td>
</tr>
<tr>
<td>FieldURIOrConstant</td>
<td><code>t:FieldURIOrConstantType</code> ([MS-OXWSCDATA] section 2.2.4.34)</td>
<td>Specifies the property or constant that is compared with each item or folder in a restriction.</td>
</tr>
</tbody>
</table>

2.2.5  **Simple Types**

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

<table>
<thead>
<tr>
<th>Simple type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ContainmentComparisonType</td>
<td>Specifies whether a search is exact or whether it ignores casing and spaces.</td>
</tr>
<tr>
<td>ContainmentModeType</td>
<td>Specifies the search boundaries.</td>
</tr>
<tr>
<td>FolderQueryTraversalType</td>
<td>Specifies the types of subtree traversals for deletion and enumeration.</td>
</tr>
<tr>
<td>IndexBasePointType</td>
<td>Specifies whether a page of items that are returned starts at the beginning or at the end of the set of items that are found by the search.</td>
</tr>
<tr>
<td>InstantSearchItemType</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>InstantSearchResultType</td>
<td>For internal use only.</td>
</tr>
</tbody>
</table>
### ItemQueryTraversalType

Specifies whether a search finds items in folders or in the **Deleted Items** folder.

### QueryOptionsType

For internal use only.

---

#### 2.2.5.1 t:ContainmentComparisonType Simple Type

The **ContainmentComparisonType** simple type specifies whether a search is exact or whether it ignores casing and spaces.

```xml
<xs:simpleType name="ContainmentComparisonType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="Exact"/>
    <xs:enumeration value="IgnoreCase"/>
    <xs:enumeration value="IgnoreCaseAndNonSpacingCharacters"/>
    <xs:enumeration value="IgnoreNonSpacingCharacters"/>
    <xs:enumeration value="Loose"/>
    <xs:enumeration value="IgnoreCaseAndNonSpacingCharacters"/>
    <xs:enumeration value="LooseAndIgnoreCase"/>
    <xs:enumeration value="LooseAndIgnoreNonSpace"/>
  </xs:restriction>
  <xs:enumeration value="LooseAndIgnoreCaseAndIgnoreNonSpace"/>
</xs:simpleType>
```

The following table lists the values that are defined by the **ContainmentComparisonType** simple type.

<table>
<thead>
<tr>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exact</td>
<td>Specifies that the comparison MUST be exact.</td>
</tr>
<tr>
<td>IgnoreCase</td>
<td>Specifies that the comparison ignores casing.</td>
</tr>
<tr>
<td>IgnoreCaseAndNonSpacingCharacters</td>
<td>Specifies that the comparison ignores casing and non-spacing characters.</td>
</tr>
<tr>
<td>IgnoreNonSpacingCharacters</td>
<td>Specifies that the comparison ignores non-spacing characters.</td>
</tr>
<tr>
<td>Loose</td>
<td>This value MUST NOT be used.</td>
</tr>
<tr>
<td>Value</td>
<td>Meaning</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>----------------------------------------------</td>
</tr>
<tr>
<td>LooseAndIgnoreCase</td>
<td>This value MUST NOT be used.</td>
</tr>
<tr>
<td>LooseAndIgnoreCaseAndIgnoreNonSpace</td>
<td>This value MUST NOT be used.</td>
</tr>
<tr>
<td>LooseAndIgnoreNonSpace</td>
<td>This value MUST NOT be used.</td>
</tr>
</tbody>
</table>

### 2.2.5.2 `t:ContainmentModeType` Simple Type

The `ContainmentModeType` simple type specifies the search boundaries.

```xml
<xs:simpleType name="ContainmentModeType">  
  <xs:restriction base="xs:string">  
    <xs:enumeration value="FullString" />  
    <xs:enumeration value="Prefixed" />  
    <xs:enumeration value="Substring" />  
    <xs:enumeration value="PrefixOnWords" />  
    <xs:enumeration value="ExactPhrase" />  
  </xs:restriction>  
</xs:simpleType>
```

The following table lists the values that are defined by the `ContainmentModeType` simple type.

<table>
<thead>
<tr>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>ExactPhrase</td>
<td>Specifies that the comparison is between the exact phrase in the property and the constant. If the phrase and the supplied constant are the same, the expression resolves to true.</td>
</tr>
<tr>
<td>FullString</td>
<td>Specifies that the comparison is between the full string value of the property and the constant. If the property value and the supplied constant are the same, the expression resolves to true.</td>
</tr>
<tr>
<td>Prefixed</td>
<td>Specifies that the comparison is between the prefix of the property and the constant. If the prefix of the property value matches the value that is provided in the constant, the expression resolves to true.</td>
</tr>
<tr>
<td>PrefixOnWords</td>
<td>Specifies that the comparison is between a prefix on any individual word in the property value and the constant. If any of the words are prefixed with a value that matches the value that is provided in the constant, the expression resolves to true.</td>
</tr>
<tr>
<td>Substring</td>
<td>Specifies that the comparison is between a substring of the property value and the constant. If the substring exists anywhere in the property value, the expression resolves to true.</td>
</tr>
</tbody>
</table>
2.2.5.3 *t:FolderQueryTraversalType* Simple Type

The *FolderQueryTraversalType* simple type specifies the types of subtree traversals for deletion and enumeration.

```xml
<xs:simpleType name="FolderQueryTraversalType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="Shallow" />
    <xs:enumeration value="Deep" />
    <xs:enumeration value="SoftDeleted" />
  </xs:restriction>
</xs:simpleType>
```

The following table lists the values that are defined by the *FolderQueryTraversalType* simple type.

<table>
<thead>
<tr>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deep</td>
<td>Specifies a search in all subfolders of the identified parent folder and returns only the folder IDs for items that have not been deleted.</td>
</tr>
<tr>
<td>Shallow</td>
<td>Specifies a search in only the identified folder and returns only the folder IDs for items that have not been deleted.</td>
</tr>
<tr>
<td>SoftDeleted</td>
<td>Specifies a shallow traversal search for items that are in the Deleted Items folder.</td>
</tr>
</tbody>
</table>

2.2.5.4 *t:IndexBasePointType* Simple Type

The *IndexBasePointType* simple type specifies whether a page of items that are returned by the *FindFolder* operation, as specified in section 3.1.4.1, or *FindItem* operation, as specified in section 3.1.4.2, start at the beginning or at the end of the set of items that are found by the search.

```xml
<xs:simpleType name="IndexBasePointType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="Beginning" />
    <xs:enumeration value="End" />
  </xs:restriction>
</xs:simpleType>
```

The following table lists the values that are defined by the *IndexBasePointType* simple type.

<table>
<thead>
<tr>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning</td>
<td>Specifies that the page of items starts from the beginning of the set of items that are returned by the search.</td>
</tr>
</tbody>
</table>
End | Specifies that the page of items starts from the end of the set of items that are returned by the search.

<table>
<thead>
<tr>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>MailItem</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>MailConversation</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>CalendarItem</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>Persona</td>
<td>For internal use only.</td>
</tr>
</tbody>
</table>

### 2.2.5.6  \texttt{t:InstantSearchResultType} Simple Type

The \texttt{InstantSearchResultType} simple type is for internal use only.\cite{12}

\[
\begin{xml}
<xs:simpleType name="InstantSearchResultType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="None"/>
    <xs:enumeration value="Suggestions"/>
    <xs:enumeration value="ItemResults"/>
    <xs:enumeration value="ConversationResults"/>
    <xs:enumeration value="Refiners"/>
    <xs:enumeration value="SearchTerms"/>
    <xs:enumeration value="Errors"/>
    <xs:enumeration value="QueryStatistics"/>
    <xs:enumeration value="CalendarItemResults"/>
    <xs:enumeration value="PersonaResults"/>
    <xs:enumeration value="SuggestionsPrimer"/>
  </xs:restriction>
</xs:simpleType>
\end{xml}
\]
The following table lists the values of the `InstantSearchResultType` simple type.

<table>
<thead>
<tr>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>Suggestions</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>ItemResults</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>ConversationResults</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>Refiners</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>SearchTerms</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>Errors</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>QueryStatistics</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>CalendarItemResults</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>PersonaResults</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>SuggestionsPrimer</td>
<td>For internal use only.</td>
</tr>
</tbody>
</table>

### 2.2.5.7 `t:ItemQueryTraversalType` Simple Type

The `ItemQueryTraversalType` simple type specifies whether the search finds items in folders or in the Deleted Items folder.

```xml
<xs:simpleType name="ItemQueryTraversalType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="Shallow"/>
    <xs:enumeration value="SoftDeleted"/>
  </xs:restriction>
</xs:simpleType>
```

The following table lists the values that are defined by the `ItemQueryTraversalType` simple type.

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shallow</td>
<td>Specifies that only the items in the folder are returned.</td>
</tr>
<tr>
<td>SoftDeleted</td>
<td>Specifies that only the items in the Deleted Items folder are returned.</td>
</tr>
</tbody>
</table>
2.2.5.8 **t:QueryOptionsType Simple Type**

The **QueryOptionsType** simple type is for internal use only.<13>

```xml
<xs:simpleType name="QueryOptionsType">
  <xs:list>
    <xs:restriction base="xs:string">
      <xs:enumeration value="None"/>
      <xs:enumeration value="Suggestions"/>
      <xs:enumeration value="Results"/>
      <xs:enumeration value="Refiners"/>
      <xs:enumeration value="SearchTerms"/>
      <xs:enumeration value="ExplicitSearch"/>
      <xs:enumeration value="SuggestionsPrimer"/>
      <xs:enumeration value="AllowFuzzing"/>
    </xs:restriction>
  </xs:list>
</xs:simpleType>
```

The following table lists the values of the **QueryOptionsType** simple type.

<table>
<thead>
<tr>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>None.</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>Suggestions</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>Results</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>Refiners</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>SearchTerms</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>ExplicitSearch</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>SuggestionsPrimer</td>
<td>For internal use only.</td>
</tr>
<tr>
<td>AllowFuzzing</td>
<td>For internal use only.</td>
</tr>
</tbody>
</table>

2.2.5.9 **t:SearchFolderTraversalType Simple Type**

The **SearchFolderTraversalType** simple type specifies the options for how a folder hierarchy is searched when the contents of a search folder are identified.

```xml
<xs:simpleType name="SearchFolderTraversalType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="Deep"/>
    <xs:enumeration value="Shallow"/>
  </xs:restriction>
</xs:simpleType>
```
The following table lists the values that are defined by the SearchFolderTraversalType simple type.

<table>
<thead>
<tr>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deep</td>
<td>Specifies that a deep search is used to traverse the folder hierarchy.</td>
</tr>
<tr>
<td>Shallow</td>
<td>Specifies that a shallow search is used to traverse the folder hierarchy.</td>
</tr>
</tbody>
</table>

### 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 that are returned by the transport are passed directly back to the higher-layer protocol or application.

3.1 ExchangeServicePortType Server Details

The Mailbox Search Web Service Protocol defines a single port type with two operations. These operations enable client applications to search for items in the mailbox and folders.

3.1.1 Abstract Data Model

None.

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.

<table>
<thead>
<tr>
<th>Operation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FindFolder</td>
<td>Searches the message store and returns a folder or folders that match the specified search criteria.</td>
</tr>
<tr>
<td>FindItem</td>
<td>Searches the message store and returns the item or items that match the specified search criteria.</td>
</tr>
</tbody>
</table>

3.1.4.1 FindFolder Operation

The FindFolder operation obtains a list of folders that meet specified search criteria by searching the subfolders of a specified folder.

The following is the WSDL port type specification of the operation.

```xml
<wsdl:operation name="FindFolder">
  <wsdl:input message="tns:FindFolderSoapIn"/>
  <wsdl:output message="tns:FindFolderSoapOut"/>
</wsdl:operation>
```

The following is the WSDL binding specification of the operation.

```xml
<wsdl:operation name="FindFolder">
  <soap:operation
    soapAction="http://schemas.microsoft.com/exchange/services/2006/messages/FindFolder"/>
</wsdl:operation>
```
3.1.4.1.1 Messages

The following table lists the **WSDL message** definitions that are specific to this operation.

<table>
<thead>
<tr>
<th>Message</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FindFolderSoapIn</td>
<td>Specifies the <strong>SOAP message</strong> that defines the folder or folders to search for.</td>
</tr>
<tr>
<td>FindFolderSoapOut</td>
<td>Specifies the <strong>SOAP message</strong> that is returned by the server in response.</td>
</tr>
</tbody>
</table>

### 3.1.4.1.1.1 tns:FindFolderSoapIn Message

The **FindFolderSoapIn WSDL message** specifies the search criteria for the folder or folders that are to be returned by the **FindFolder** operation.

```xml
<wSDL:message name="FindFolderSoapIn">
  <wSDL:part name="request" element="tns:FindFolder"/>
  <wSDL:part name="Impersonation" element="t:ExchangeImpersonation"/>
  <wSDL:part name="MailboxCulture" element="t:MailboxCulture"/>
  <wSDL:part name="RequestVersion" element="t:RequestServerVersion"/>
  <wSDL:part name="TimeZoneContext" element="t:TimeZoneContext"/>
  <wSDL:part name="ManagementRole" element="t:ManagementRole"/>
</wSDL:message>
```

The **FindFolderSoapIn** WSDL message is the input message for the **SOAP action** 

The parts of the **FindFolderSoapIn** WSDL message are described in the following table.

<table>
<thead>
<tr>
<th>Part</th>
<th>Element/type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>request</td>
<td>tns:FindFolder (section 3.1.4.1.2.1)</td>
<td>Specifies the <strong>SOAP body</strong> of the request.</td>
</tr>
<tr>
<td>Impersonation</td>
<td>t:ExchangeImpersonation ([MS-OXWSCDATA] section 2.2.3.3)</td>
<td>Specifies a <strong>SOAP header</strong> that identifies the user whom the client application is impersonating.</td>
</tr>
<tr>
<td>MailboxCulture</td>
<td>t:MailboxCulture ([MS-OXWSCDATA] section 2.2.3.6)</td>
<td>Specifies a <strong>SOAP header</strong> that identifies the culture to use for accessing the mailbox. The cultures are defined by [RFC3066].</td>
</tr>
<tr>
<td>RequestVersion</td>
<td>t:RequestServerVersion ([MS-OXWSCDATA] section 2.2.3.9)</td>
<td>Specifies a <strong>SOAP header</strong> that identifies the schema version for the FindFolder operation request.</td>
</tr>
</tbody>
</table>
### 3.1.4.1.1.2  tns:FindFolderSoapOut Message

The **FindFolderSoapOut WSDL message** specifies the server response to the **FindFolder** operation request to find a folder or folders.

```xml
<wSDL:message name="FindFolderSoapOut">
  <wSDL:part name="FindFolderResult" element="tns:FindFolderResponse"/>
  <wSDL:part name="ServerVersion" element="t:ServerVersionInfo"/>
</wSDL:message>
```

The **FindFolderSoapOut** WSDL message is the output message for the **SOAP action** http://schemas.microsoft.com/exchange/services/2006/messages/FindFolder.

The parts of the **FindFolderSoapOut** WSDL message are described in the following table.

<table>
<thead>
<tr>
<th>Part</th>
<th>Element/type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FindFolderResult</td>
<td>tns:FindFolderResponse (section 3.1.4.1.2.2)</td>
<td>Specifies SOAP body of the response message to a <strong>FindFolder</strong> operation request.</td>
</tr>
<tr>
<td>ServerVersion</td>
<td>t:ServerVersionInfo ([MS-OXWSCDATA] section 2.2.3.10)</td>
<td>Specifies a SOAP header that identifies the server version for the response.</td>
</tr>
</tbody>
</table>

If the request is successful, the **FindFolder** operation returns a **FindFolderResponse** element with the **ResponseClass** attribute of the **FindFolderResponseMessage** element set to "Success". The **ResponseCode** element of the **FindFolderResponseMessage** element is set to "NoError".

If the request is unsuccessful, the **FindFolder** operation returns a **FindFolderResponse** element with the **ResponseClass** attribute of the **FindFolderResponseMessage** element set to "Error". The **ResponseCode** element of the **FindFolderResponseMessage** element is set to a value of the **ResponseCodeType** simple type, as specified in [MS-OXWSCDATA] section 2.2.5.24.

### 3.1.4.1.2 Elements

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

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FindFolder</td>
<td>Specifies the criteria required to search for a folder or folders.</td>
</tr>
<tr>
<td>FindFolderResponse</td>
<td>Specifies the response body from a request to search for a folder or folders.</td>
</tr>
</tbody>
</table>
3.1.4.1.2.1 tns:FindFolder Element

The **FindFolder** element specifies the base element for a **FindFolder** operation request.

```xml
<xs:element name="FindFolder" type="m:FindFolderType" />
```

3.1.4.1.2.2 tns:FindFolderResponse Element

The **FindFolderResponse** element specifies the response message for a **FindFolder** operation.

```xml
<xs:element name="FindFolderResponse" type="m:FindFolderResponseType" />
```

3.1.4.1.3 Complex Types

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

<table>
<thead>
<tr>
<th>Complex type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FindFolderResponseType</td>
<td>Specifies the response from the <strong>FindFolder</strong> operation.</td>
</tr>
<tr>
<td>FindFolderType</td>
<td>Specifies the criteria for searching for a folder or folders with the <strong>FindFolder</strong> operation.</td>
</tr>
</tbody>
</table>

3.1.4.1.3.1 m:FindFolderResponseType Complex Type

The **FindFolderResponseType** complex type extends the **BaseResponseMessageType** complex type ([MS-OXWSCDATA] section 2.2.4.18).

```xml
<xs:complexType name="FindFolderResponseType">
  <xs:complexContent>
    <xs:extension base="m:BaseResponseMessageType" />
  </xs:complexContent>
</xs:complexType>
```

3.1.4.1.3.2 m:FindFolderType Complex Type

The **FindFolderType** complex type specifies a request to find folders in a mailbox. The **FindFolderType** complex type extends the **BaseRequestType** complex type ([MS-OXWSCDATA] section 2.2.4.17).

```xml
<xs:complexType name="FindFolderType">
  <xs:complexContent>
    <xs:extension base="m:BaseRequestType">
      <xs:sequence>
        <xs:element name="FolderShape" />
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```
The following table lists the child elements of the **FindFolderType** complex type.

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FolderShape</td>
<td><em>t:FolderResponseShapeType</em> ([MS-OXWSCDATA] section 2.2.4.37)</td>
<td>Specifies the contents of the query response.</td>
</tr>
<tr>
<td>IndexedPageFolderView</td>
<td><em>t:IndexedPageViewType</em> (section 2.2.4.16)</td>
<td>Specifies how paged information is returned by the query.</td>
</tr>
<tr>
<td>FractionalPageFolderView</td>
<td><em>t:FractionalPageViewType</em> (section 2.2.4.14)</td>
<td>Specifies the starting item and the number of items that are returned by a paged query.</td>
</tr>
<tr>
<td>Restriction</td>
<td><em>t:RestrictionType</em> (section 2.2.4.30)</td>
<td>Specifies the search parameters that define the folder query.</td>
</tr>
<tr>
<td>ParentFolderIds</td>
<td><em>t:NonEmptyArrayOfBaseFolderIdsType</em> ([MS-OXWSFOLD] section 3.1.4.6.3.3)</td>
<td>Specifies the folders that the query searches.</td>
</tr>
</tbody>
</table>

The following table lists the attribute that is defined for the **FindFolderType** complex type.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traversal</td>
<td><em>t:FolderQueryTraversalType</em> (section 2.2.5.3)</td>
<td>Specifies the traversal scheme that is used to search for folders.</td>
</tr>
</tbody>
</table>

The **FindFolderType** complex type specifies the folders to search for as well as the structure of the response.
Either the `IndexedPageFolderView` element or the `FractionalPageFolderView` element can be specified to paginate the items that are returned in the response.

### 3.1.4.2 FindItem Operation

The **FindItem** operation searches the mailbox and folders and returns items that meet the specified search criteria.

The following is the **WSDL port type** specification for the operation.

```xml
<wsdl:operation name="FindItem">
    <wsdl:input message="tns:FindItemSoapIn"/>
    <wsdl:output message="tns:FindItemSoapOut"/>
</wsdl:operation>
```

The following is the **WSDL** binding specification for the operation.

```xml
<wsdl:operation name="FindItem">
    <soap:operation soapAction="http://schemas.microsoft.com/exchange/services/2006/messages/FindItem"/>
    <wsdl:input>
        <soap:header message="tns:FindItemSoapIn" part="Impersonation" use="literal"/>
        <soap:header message="tns:FindItemSoapIn" part="MailboxCulture" use="literal"/>
        <soap:header message="tns:FindItemSoapIn" part="RequestVersion" use="literal"/>
        <soap:header message="tns:FindItemSoapIn" part="TimeZoneContext" use="literal"/>
        <soap:header message="tns:FindItemSoapIn" part="DateTimePrecision" use="literal"/>
        <soap:header message="tns:FindItemSoapIn" part="ManagementRole" use="literal"/>
        <soap:body parts="request" use="literal"/>
    </wsdl:input>
    <wsdl:output>
        <soap:body parts="FindItemResult" use="literal"/>
        <soap:header message="tns:FindItemSoapOut" part="ServerVersion" use="literal"/>
    </wsdl:output>
</wsdl:operation>
```

#### 3.1.4.2.1 Messages

The following table lists the **WSDL message** definitions that are specific to this operation.

<table>
<thead>
<tr>
<th>Message</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FindItemSoapIn</td>
<td>Specifies the <strong>SOAP message</strong> that contains the criteria required to search for items.</td>
</tr>
<tr>
<td>FindItemSoapOut</td>
<td>Specifies the SOAP message that is returned by the server in response.</td>
</tr>
</tbody>
</table>

#### 3.1.4.2.1.1 tns:FindItemSoapIn Message

The **FindItemSoapIn WSDL message** specifies the search criteria for the items or items that the **FindItem** operation returns.

```xml
<wsdl:message name="FindItemSoapIn">
    <wsdl:part name="request" element="tns:FindItem"/>
    <wsdl:part name="Impersonation" element="t:ExchangeImpersonation"/>
    <wsdl:part name="MailboxCulture" element="t:MailboxCulture"/>
    <wsdl:part name="RequestVersion" element="t:RequestServerVersion"/>
    <wsdl:part name="TimeZoneContext" element="t:TimeZoneContext"/>
</wsdl:message>
```
The FindItemSoapIn WSDL message is the input message for the SOAP action http://schemas.microsoft.com/exchange/services/2006/messages/FindItem.

The parts of the FindItemSoapIn WSDL message are described in the following table.

<table>
<thead>
<tr>
<th>Part</th>
<th>Element/type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>request</td>
<td>tns:FindItem</td>
<td>Specifies SOAP body of the request.</td>
</tr>
<tr>
<td>Impersonation</td>
<td>t:ExchangeImpersonation</td>
<td>Specifies a SOAP header that identifies the user that the client application is impersonating.</td>
</tr>
<tr>
<td>MailboxCulture</td>
<td>t:MailboxCulture</td>
<td>Specifies a SOAP header that identifies the culture to use to access the mailbox. The cultures are defined by [RFC3066].</td>
</tr>
<tr>
<td>RequestVersion</td>
<td>t:RequestServerVersion</td>
<td>Specifies a SOAP header that identifies the schema version for the FindItem operation request.</td>
</tr>
<tr>
<td>TimeZoneContext</td>
<td>t:TimeZoneContext</td>
<td>Specifies a SOAP header that identifies the time zone to use for all responses from the server. All times that are returned from the server will be converted to the specified time zone.</td>
</tr>
<tr>
<td>DateTimePrecision</td>
<td>t:DateTimePrecision</td>
<td>Specifies a SOAP header that identifies the resolution of date/time values in responses from the server, either in seconds or in milliseconds.&lt;16&gt;</td>
</tr>
<tr>
<td>ManagementRole</td>
<td>t:ManagementRole</td>
<td>Specifies a SOAP header that identifies the server roles that are necessary in order for the caller to make the request.&lt;17&gt;</td>
</tr>
</tbody>
</table>

### 3.1.4.2.1.2  tns:FindItemSoapOut Message

The FindItemSoapOut WSDL message specifies the server response to the FindItem operation request.

```xml
<wsdl:message name="FindItemSoapOut">
  <wsdl:part name="FindItemResult" element="tns:FindItemResponse"/>
  <wsdl:part name="ServerVersion" element="t:ServerVersionInfo"/>
</wsdl:message>
```

The FindItemSoapOut WSDL message is the output message for the SOAP action http://schemas.microsoft.com/exchange/services/2006/messages/FindItem.

The parts of the FindItemSoapOut WSDL message are described in the following table.
### 3.1.4.2.2 Elements

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

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FindItem</td>
<td>Specifies the base element for the FindItem operation.</td>
</tr>
<tr>
<td>FindItemResponse</td>
<td>Specifies the response element for the FindItem operation.</td>
</tr>
</tbody>
</table>

#### 3.1.4.2.2.1 tns:FindItem Element

The `FindItem` element specifies the base element for a `FindItem` operation.

```xml
<xs:element name="FindItem"
    type="m:FindItemType"/>
```

#### 3.1.4.2.2.2 tns:FindItemResponse Element

The `FindItemResponse` element specifies the response message for the `FindItem` operation.

```xml
<xs:element name="FindItemResponse"
    type="m:FindItemResponseType"/>
```

#### 3.1.4.2.3 Complex Types

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

<table>
<thead>
<tr>
<th>Complex type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FindItemResponseType</td>
<td>Specifies the response to the FindItem operation request.</td>
</tr>
<tr>
<td>FindItemType</td>
<td>Specifies the request to the FindItem operation.</td>
</tr>
</tbody>
</table>
### 3.1.4.2.3.1  m:FindItemResponseType Complex Type

The **FindItemResponseType** complex type specifies the response message to the **FindItem** operation request. The **FindItemResponseType** complex type extends the **BaseResponseMessageType** complex type ([MS-OXWSCDATA] section 2.2.4.18).

```xml
<xs:complexType name="FindItemResponseType">
  <xs:complexContent>
    <xs:extension base="m:BaseResponseMessageType"/>
  </xs:complexContent>
</xs:complexType>
```

### 3.1.4.2.3.2  m:FindItemType Complex Type

The **FindItemType** complex type specifies the search criteria to use for the **FindItem** operation. The **FindItemType** complex type extends the **BaseRequestType** complex type ([MS-OXWSCDATA] section 2.2.4.17).

```xml
<xs:complexType name="FindItemType">
  <xs:complexContent>
    <xs:extension base="m:BaseRequestType">
      <xs:sequence>
        <xs:element name="ItemShape" type="t:ItemResponseShapeType"/>
        <xs:choice minOccurs="0">
          <xs:element name="IndexedPageItemView" type="t:IndexedPageViewType"/>
          <xs:element name="FractionalPageItemView" type="t:FractionalPageViewType"/>
          <xs:element name="CalendarView" type="t:CalendarViewType"/>
          <xs:element name="ContactsView">
        </xs:choice>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```
The following table lists the child elements of the **FindItemType** complex type

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ItemShape</td>
<td>t:ItemResponseShapeType ([MS-OXWSCDATA] section 2.2.4.44)</td>
<td>Specifies the array of items that are returned by the query.</td>
</tr>
<tr>
<td>IndexedPageItemView</td>
<td>t:IndexedPageViewType (section 2.2.4.16)</td>
<td>Specifies how paged item information is returned in the response.</td>
</tr>
<tr>
<td>FractionalPageItemView</td>
<td>t:FractionalPageViewType (section 2.2.4.14)</td>
<td>Specifies the starting item and number of items to return by the query.</td>
</tr>
<tr>
<td>CalendarView</td>
<td>t:CalendarViewType ([MS-OXWSMTGS] section 2.2.4.9)</td>
<td>Specifies the settings that are used to return calendar items as they appear in a calendar.</td>
</tr>
<tr>
<td>ContactsView</td>
<td>t:ContactsViewType ([MS-OXWSCONT] section 3.1.4.1.1.7)</td>
<td>Specifies the settings that are used to return contact items based on their alphabetical display names.</td>
</tr>
<tr>
<td>GroupBy</td>
<td>t:GroupByType (section 3.1.4.2.3.7)</td>
<td>Specifies the grouping for items that are returned by a query.</td>
</tr>
<tr>
<td>DistinguishedGroupBy</td>
<td>t:DistinguishedGroupByType (section)</td>
<td>Specifies a standard grouping.</td>
</tr>
<tr>
<td>Element</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------</td>
<td>----------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Restriction</td>
<td>t:RestrictionType (section 2.2.4.30)</td>
<td>Specifies a search restriction or query.</td>
</tr>
<tr>
<td>SortOrder</td>
<td>t:NonEmptyArrayOfFieldOrdersType (section 3.1.4.2.3.8)</td>
<td>Specifies one or more FieldOrderType complex type (section 3.1.4.2.3.6) elements that specify how the results should be sorted.</td>
</tr>
<tr>
<td>ParentFolderIds</td>
<td>t:NonEmptyArrayOfBaseFolderIdsType ([MS-OXWSFOLD] section 3.1.4.3.3)</td>
<td>Specifies one or more folders that are the root of the search.</td>
</tr>
<tr>
<td>QueryString</td>
<td>m:QueryStringType (section 2.2.4.29)</td>
<td>Specifies the query that is used for the search.</td>
</tr>
</tbody>
</table>

The following table lists the attribute that is defined for the FindItemType complex type.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traversal</td>
<td>t:ItemQueryTraversalType (section 2.2.5.7)</td>
<td>Specifies whether the search finds items in folders or in the Deleted Items folder.</td>
</tr>
</tbody>
</table>

The FindItemType complex type specifies the search criteria to find a set of items by using the FindItem operation as well as the structure of the response.

One of the following elements can be included in the request to specify how the returned items are viewed.

- IndexedPageItemView
- FractionalPageItemView
- CalendarView
- ContactsView

One of the following elements can be included in the request to specify how the results, if any, are to be grouped:

- GroupBy
- DistinguishedGroupBy

When the subelement BaseShape of the ItemShape element is set to "AllProperties" or "Default", the properties that are returned by the FindItem operation depend on the folder that is searched for the items. The properties that are returned are defined by the complex type element or combination of complex type elements that represent the item stored in the folder, as shown in the following table.<19>
### 3.1.4.2.3.3 \( t: \text{AggregateOnType} \) Complex Type

The \textit{AggregateOnType} complex type specifies the property that is used to determine the order of grouped items for a grouped result set. When an \textit{AggregateOnType} complex type element is specified, one of the following child elements MUST be specified:

- **FieldURI**
- **IndexedFieldURI**
- **ExtendedFieldURI**

```xml
<xs:complexType name="AggregateOnType">
  <xs:choice>
    <xs:element name="FieldURI" type="t:PathToUnindexedFieldType" />
    <xs:element name="IndexedFieldURI" type="t:PathToIndexedFieldType" />
    <xs:element name="ExtendedFieldURI" type="t:PathToExtendedFieldType" />
  </xs:choice>
  <xs:attribute name="Aggregate" type="t:AggregateType" use="required" />
</xs:complexType>
```

The following table lists the child elements of the \textit{AggregateOnType} complex type.
## Element Type Description

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FieldURI</td>
<td>t:PathToUnindexedFieldType</td>
<td>Specifies a well-known message store property that is used to group the items.</td>
</tr>
<tr>
<td>IndexedFieldURI</td>
<td>t:PathToIndexedFieldType</td>
<td>Specifies an individual member of a dictionary that is used to group the items.</td>
</tr>
<tr>
<td>ExtendedFieldURI</td>
<td>t:PathToExtendedFieldType</td>
<td>Specifies an extended property that is used to group the items.</td>
</tr>
</tbody>
</table>

The following table lists the attribute that is defined for the `AggregateOnType` complex type.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregate</td>
<td>t:AggregateType</td>
<td>Specifies the value that indicates whether the maximum or minimum value of the property specified is used for ordering a group of items. This attribute MUST be set.</td>
</tr>
</tbody>
</table>

### 3.1.4.2.3.4  t:BaseGroupByType Complex Type

The `BaseGroupByType` complex type specifies the base class for derived complex types that specify grouped queries to the `FindItem` operation, as specified in section 3.1.4.2.

```xml
<xs:complexType name="BaseGroupByType" abstract="true">
  <xs:attribute name="Order" type="t:SortDirectionType" use="required"/>
</xs:complexType>
```

The following table lists the attribute that is defined for the `BaseGroupByType` complex type.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order</td>
<td>t:SortDirectionType</td>
<td>Specifies the sort order of the returned grouped items. This attribute MUST be specified.</td>
</tr>
</tbody>
</table>

### 3.1.4.2.3.5  t:DistinguishedGroupByType Complex Type

The `DistinguishedGroupByType` complex type specifies a standard grouping for the `FindItem` operation. The `DistinguishedGroupByType` complex type extends the `BaseGroupByType` complex type, as specified in section 3.1.4.2.3.4.

```xml
<xs:complexType name="DistinguishedGroupByType">
  <xs:complexContent>
    <xs:extension base="t:BaseGroupByType">
      <xs:sequence>
        <xs:element name="StandardGroupBy" type="t:StandardGroupByType"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```
The following table lists the child element of the DistinguishedGroupByType complex type.

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>StandardGroupBy</td>
<td>t:StandardGroupByType (section 3.1.4.2.4.3)</td>
<td>Specifies one of the standard groupings for returned items.</td>
</tr>
</tbody>
</table>

### 3.1.4.2.3.6  t:FieldOrderType Complex Type

The FieldOrderType complex type specifies a single field by which to sort results and specifies the direction of the sort.

```xml
<xs:complexType name="FieldOrderType">
  <xs:sequence>
    <xs:element ref="t:Path"/>
  </xs:sequence>
  <xs:attribute name="Order" type="t:SortDirectionType" use="required"/>
</xs:complexType>
```

The following table lists the child element of the FieldOrderType complex type.

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Path</td>
<td>t:Path (MS-OXWSCDATA section 2.2.3.8)</td>
<td>Specifies the URI that describes the field by which the results are sorted.</td>
</tr>
</tbody>
</table>

The following table lists the attribute that is defined for the FieldOrderType complex type.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order</td>
<td>t:SortDirectionType (section 3.1.4.2.4.2)</td>
<td>Specifies the direction of the sort. This attribute MUST be specified.</td>
</tr>
</tbody>
</table>

### 3.1.4.2.3.7  t:GroupByType Complex Type

The GroupByType complex type specifies the grouping for items that are returned by the FindItem operation. The GroupByType complex type extends the BaseGroupByType complex type, as specified in section 3.1.4.2.3.4.

```xml
<xs:complexType name="GroupByType">
  <xs:complexContent>
    <xs:extension base="t:BaseGroupByType"
```
The following table lists the child elements of the `GroupByType` complex type.

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FieldURI</td>
<td>t:PathToUnindexedFieldType ([MS-OXWCDATA] section 2.2.4.57)</td>
<td>Specifies the URI to an unindexed item property.</td>
</tr>
<tr>
<td>IndexedFieldURI</td>
<td>t:PathToIndexedFieldType ([MS-OXWCDATA] section 2.2.4.56)</td>
<td>Specifies the URI to an indexed item property.</td>
</tr>
<tr>
<td>ExtendedFieldURI</td>
<td>t:PathToExtendedFieldKeyType ([MS-OXWSXPROP] section 2.1.6)</td>
<td>Specifies an extended item property.</td>
</tr>
<tr>
<td>AggregateOn</td>
<td>t:AggregateOnType (section 3.1.4.2.3.3)</td>
<td>Specifies the item property that is used to determine the order of groups in a response.</td>
</tr>
</tbody>
</table>

### 3.1.4.2.3.8 t:NonEmptyArrayOfFieldOrdersType Complex Type

The `NonEmptyArrayOfFieldOrdersType` complex type specifies an array of `FieldOrderType` complex type, as specified in section 3.1.4.2.3.6, elements that contains at least one member.

```xml
<xs:complexType name="NonEmptyArrayOfFieldOrdersType">
  <xs:sequence>
    <xs:element name="FieldOrder"
                 type="t:FieldOrderType"
                 maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>
```

The following table lists the child element of the `NonEmptyArrayOfFieldOrdersType` complex type.

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FieldOrder</td>
<td>t:FieldOrderType (section 3.1.4.2.3.6)</td>
<td>Specifies a <code>FieldOrderType</code> complex type.</td>
</tr>
</tbody>
</table>
3.1.4.2.4 Simple Types

The following XML schema simple type definitions are specific to this operation.

<table>
<thead>
<tr>
<th>Simple type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AggregateType</td>
<td>Specifies the maximum or minimum value used to order items in a group.</td>
</tr>
<tr>
<td>SortDirectionType</td>
<td>Specifies the ordering options for a group.</td>
</tr>
<tr>
<td>StandardGroupByType</td>
<td>Specifies standard grouping and aggregating mechanisms.</td>
</tr>
</tbody>
</table>

3.1.4.2.4.1 t:AggregateType Simple Type

The AggregateType simple type specifies whether the maximum or minimum value of a representative property is used to order the items in a group that is returned by the FindItem operation.

```
<xs:simpleType name="AggregateType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="Minimum"/>
    <xs:enumeration value="Maximum"/>
  </xs:restriction>
</xs:simpleType>
```

The following table lists the values that are defined by the AggregateType simple type.

<table>
<thead>
<tr>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum</td>
<td>Specifies that the groups are sorted starting with the maximum value for a specified aggregation property.</td>
</tr>
<tr>
<td>Minimum</td>
<td>Specifies that the groups are sorted starting with the minimum value for a specified aggregation property.</td>
</tr>
</tbody>
</table>

3.1.4.2.4.2 t:SortDirectionType Simple Type

The SortDirectionType simple type specifies the ordering options for the groups in the grouped item array that is returned in the response.

```
<xs:simpleType name="SortDirectionType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="Ascending"/>
  </xs:restriction>
</xs:simpleType>
```
The following table lists the values that are defined by the SortDirectionType simple type.

<table>
<thead>
<tr>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ascending</td>
<td>Specifies that the items are sorted in ascending order.</td>
</tr>
<tr>
<td>Descending</td>
<td>Specifies that the items are sorted in descending order.</td>
</tr>
</tbody>
</table>

### 3.1.4.2.4.3 t:StandardGroupByType Simple Type

The StandardGroupByType simple type specifies the standard grouping and aggregating mechanisms for a grouped response to the FindItem operation.

```xml
<xs:simpleType name="StandardGroupByType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="ConversationTopic"/>
  </xs:restriction>
</xs:simpleType>
```

The following table lists the value that is defined by the StandardGroupByType simple type.

<table>
<thead>
<tr>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>ConversationTopic</td>
<td>Specifies that results are grouped by the conversation topic and aggregated on the date and time at which the item was received.</td>
</tr>
</tbody>
</table>

### 3.1.5 Timer Events

None.

### 3.1.6 Other Local Events

None.
4 Protocol Examples

Example XML for FindFolders operation.

Request XML:
<soap:Envelope xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
               xmlns:ms Exchange="http://schemas.microsoft.com/exchange/services/2006/messages"
               xmlns:ms Types="http://schemas.microsoft.com/exchange/services/2006/types"
               xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">
  <soap:Header>
    <t:RequestServerVersion Version="Exchange2013" />
  </soap:Header>
  <soap:Body>
    <m:FindFolder Traversal="Deep">
      <m:FolderShape>
        <t:BaseShape>IdOnly</t:BaseShape>
        <t:AdditionalProperties>
          <t:FieldURI FieldURI="folder:DisplayName" />
        </t:AdditionalProperties>
      </m:FolderShape>
      <m:IndexedPageFolderView MaxEntriesReturned="10" Offset="0" BasePoint="Beginning" />
      <m:Restriction>
        <t:And>
          <t:Contains ContainmentMode="Substring" ContainmentComparison="IgnoreCase">
            <t:FieldURI FieldURI="folder:DisplayName" />
          </t:Contains>
          <t:Contains ContainmentMode="Prefixed" ContainmentComparison="IgnoreCase">
            <t:FieldURI FieldURI="folder:FolderClass" />
            <t:Constant Value="IPF.Note" />
          </t:Contains>
          <t:IsGreaterThan>
            <t:FieldURI FieldURI="folder:TotalCount" />
            <t:FieldURIOrConstant>
              <t:Constant Value="0" />
            </t:FieldURIOrConstant>
          </t:IsGreaterThan>
        </t:And>
      </m:Restriction>
      <m:ParentFolderIds>
        <t:DistinguishedFolderId Id="root" />
      </m:ParentFolderIds>
    </m:FindFolder>
  </soap:Body>
</soap:Envelope>

Response XML:
<s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/">
  <s:Header>
    <h:ServerVersionInfo MajorVersion="15" MinorVersion="1" MajorBuildNumber="31"
                        MinorBuildNumber="0" Version="12.27"
                        xmlns:h="http://schemas.microsoft.com/exchange/services/2006/types"
                        xmlns:ms="http://schemas.microsoft.com/exchange/services/2006/types"
                        xmlns:msxs="http://www.w3.org/2001/XMLSchema-instance"/>
  </s:Header>
  <s:Body xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
         xmlns:ms="http://schemas.microsoft.com/exchange/services/2006/types">
    <m:FindFolderResponse>
      <m:ResponseMessages>
        <m:FindFolderResponseMessage ResponseClass="Success">
          <m:ResponseCode>NoError</m:ResponseCode>
          <m:RootFolder IndexedPagingOffset="1" TotalItemsInView="1" IncludesLastItemInRange="true">
            <t:Folders>
              <t:Folder>
Example XML for FindItem operation:

```xml
<soap:Envelope xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
               xmlns:ms="http://schemas.microsoft.com/exchange/services/2006/messages"
               xmlns:t="http://schemas.microsoft.com/exchange/services/2006/types"
               xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">
  <soap:Header>
    <t:RequestServerVersion Version="Exchange2010"/>
  </soap:Header>
  <soap:Body>
    <m:FindItem Traversal="Shallow">
      <m:ItemShape>
        <t:BaseShape>IdOnly</t:BaseShape>
        <t:AdditionalProperties>
          <t:FieldURI FieldURI="item:Subject"/>
          <t:FieldURI FieldURI="item:DateTimeReceived"/>
          <t:FieldURI FieldURI="message:Sender"/>
        </t:AdditionalProperties>
      </m:ItemShape>
      <m:IndexedPageItemView MaxEntriesReturned="10" Offset="0" BasePoint="Beginning"/>
      <m:GroupBy Order="Descending">
        <t:FieldURI FieldURI="item:Subject"/>
        <t:AggregateOn Aggregate="Maximum">
          <t:FieldURI FieldURI="item:DateTimeReceived"/>
        </t:AggregateOn>
      </m:GroupBy>
      <m:Restriction>
        <t:IsEqualTo>
          <t:FieldURI FieldURI="item:ItemClass"/>
          <t:FieldURIOrConstant>
            <t:Constant Value="IPM.Note"/>
          </t:FieldURIOrConstant>
        </t:IsEqualTo>
      </m:Restriction>
      <m:SortOrder>
        <t:FieldOrder Order="Ascending">
          <t:FieldURI FieldURI="item:DateTimeReceived"/>
        </t:FieldOrder>
      </m:SortOrder>
      <m:ParentFolderIds>
        <t:DistinguishedFolderId Id="inbox"/>
      </m:ParentFolderIds>
    </m:FindItem>
  </soap:Body>
</soap:Envelope>
```

Following example shows the XML that is returned with **FindItems** operation. The **ItemId** and **ChangeKey** attributes have been shortened to preserve readability. In this example, there are three groups in this 10-item response.
<s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/">
  <s:Header/>
      <m:ResponseMessages>
        <m:FindItemResponseMessage ResponseClass="Success">
          <m:ResponseCode>NoError</m:ResponseCode>
          <m:RootFolder IndexedPagingOffset="13" TotalItemsInView="26" IncludesLastItemInRange="false">
            <t:Groups>
              <t:GroupIndex>Testing</t:GroupIndex>
              <t:Items>
                <t:Message>
                  <t:ItemId Id="AQmKAGEyYzQ" ChangeKey="CQAAABYAAA" />
                  <t:Subject>Testing</t:Subject>
                  <t:DateTimeReceived>2009-10-14T16:31:42Z</t:DateTimeReceived>
                  <t:Sender>
                    <t:Mailbox>
                      <t:Name>E14UserTwo</t:Name>
                      <t:MailboxType>OneOff</t:MailboxType>
                    </t:Mailbox>
                  </t:Sender>
                </t:Message>
                <t:Message>
                  <t:ItemId Id="AQmKAGEyYzQ" ChangeKey="CQAAABYAAA" />
                  <t:Subject>Testing</t:Subject>
                  <t:DateTimeReceived>2009-10-14T16:31:50Z</t:DateTimeReceived>
                  <t:Sender>
                    <t:Mailbox>
                      <t:Name>E14UserTwo</t:Name>
                      <t:MailboxType>OneOff</t:MailboxType>
                    </t:Mailbox>
                  </t:Sender>
                </t:Message>
                <t:Message>
                  <t:ItemId Id="AQmKAGEyYzQ" ChangeKey="CQAAABYAAA" />
                  <t:Subject>Testing</t:Subject>
                  <t:DateTimeReceived>2009-10-14T19:44:25Z</t:DateTimeReceived>
                  <t:Sender>
                    <t:Mailbox>
                      <t:Name>E14UserOne</t:Name>
                      <t:MailboxType>OneOff</t:MailboxType>
                    </t:Mailbox>
                  </t:Sender>
                </t:Message>
                <t:Message>
                  <t:ItemId Id="AQmKAGEyYzQ" ChangeKey="CQAAABYAAA" />
                  <t:Subject>Testing</t:Subject>
                  <t:DateTimeReceived>2009-10-14T19:45:02Z</t:DateTimeReceived>
                  <t:Sender>
                    <t:Mailbox>
                      <t:Name>E14UserOne</t:Name>
                      <t:MailboxType>OneOff</t:MailboxType>
                    </t:Mailbox>
                  </t:Sender>
                </t:Message>
                <t:Message>
                  <t:ItemId Id="AQmKAGEyYzQ" ChangeKey="CQAAABYAAA" />
                  <t:Subject>Testing</t:Subject>
                  <t:DateTimeReceived>2009-10-14T19:45:02Z</t:DateTimeReceived>
                  <t:Sender>
                    <t:Mailbox>
                      <t:Name>E14UserOne</t:Name>
                      <t:MailboxType>OneOff</t:MailboxType>
                    </t:Mailbox>
                  </t:Sender>
                </t:Message>
              </t:Items>
            </t:Groups>
          </m:RootFolder>
        </m:FindItemResponseMessage>
      </m:ResponseMessages>
    </m:FindItemResponse>
  </s:Body>
</s:Envelope>
<t:Item Id="AQMkAGEyYzQ" ChangeKey="CQAAABYAAA" />
<t:Subject>Testing</t:Subject>
<t:DateTimeReceived>2009-10-14T19:48:02Z</t:DateTimeReceived>
<t:Sender>
  <t:Mailbox>
    <t:Name>E14UserOne</t:Name>
    <t:MailboxType>OneOff</t:MailboxType>
  </t:Mailbox>
</t:Sender>
</t:Message>

<t:Message>
  <t:ItemId Id="AQMkAGEyYzQ" ChangeKey="CQAAABYAAA" />
  <t:Subject>Testing</t:Subject>
  <t:DateTimeReceived>2009-10-14T19:48:23Z</t:DateTimeReceived>
  <t:Sender>
    <t:Mailbox>
      <t:Name>E14UserOne</t:Name>
      <t:MailboxType>OneOff</t:MailboxType>
    </t:Mailbox>
  </t:Sender>
</t:Message>

<t:Message>
  <t:ItemId Id="AQMkAGEyYzQ" ChangeKey="CQAAABYAAA" />
  <t:Subject>Over there</t:Subject>
  <t:DateTimeReceived>2009-10-14T19:43:34Z</t:DateTimeReceived>
  <t:Sender>
    <t:Mailbox>
      <t:Name>E14UserOne</t:Name>
      <t:MailboxType>OneOff</t:MailboxType>
    </t:Mailbox>
  </t:Sender>
</t:Message>

<t:Message>
  <t:ItemId Id="AQMkAGEyYzQ" ChangeKey="CQAAABYAAA" />
  <t:Subject>Over there</t:Subject>
  <t:DateTimeReceived>2009-10-14T19:45:47Z</t:DateTimeReceived>
  <t:Sender>
    <t:Mailbox>
      <t:Name>E14UserTwo</t:Name>
      <t:MailboxType>OneOff</t:MailboxType>
    </t:Mailbox>
  </t:Sender>
</t:Message>

<t:Message>
  <t:ItemId Id="AQMkAGEyYzQ" ChangeKey="CQAAABYAAA" />
  <t:Subject>Interesting</t:Subject>
  <t:DateTimeReceived>2009-10-02T22:02:18Z</t:DateTimeReceived>
  <t:Sender>
    <t:Mailbox>
      <t:Name>E14UserTwo</t:Name>
      <t:MailboxType>OneOff</t:MailboxType>
    </t:Mailbox>
  </t:Sender>
</t:Message>

<t:Message>
  <t:ItemId Id="AQMkAGEyYzQ" ChangeKey="CQAAABYAAA" />
  <t:Subject>Interesting</t:Subject>
</t:Items>
</t:GroupedItems>

</t:Items>
</t:GroupedItems>

</t:GroupedItems>

</t:Items>
</t:GroupedItems>

</t:Items>
<t:DateTimeReceived>2009-10-05T20:10:11Z</t:DateTimeReceived>
<t:Sender>
  <t:Mailbox>
    <t:Name>E14UserTwo</t:Name>
    <t:MailboxType>OneOff</t:MailboxType>
  </t:Mailbox>
</t:Sender>
</t:Message>
</t:GroupedItems>
</t:Groups>
</m:RootFolder>
</m:FindItemResponseMessage>
</m:ResponseMessages>
</m:FindItemResponse>
</s:Body>
</s:Envelope>
5  Security

5.1  Security Considerations for Implementers
None.

5.2  Index of Security Parameters
None.
6 Appendix A: Full WSDL

The XML files that are listed in the following table are required in order to implement the functionality specified in this document. The contents of each file are included in this section.

<table>
<thead>
<tr>
<th>File name</th>
<th>Description</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS-OXWSSRCH.wsdl</td>
<td>Contains the WSDL for the implementation of this protocol.</td>
<td>6</td>
</tr>
<tr>
<td>MS-OXWSSRCH-messages.xsd</td>
<td>Contains the XML schema message definitions that are used in this protocol.</td>
<td>7.1</td>
</tr>
<tr>
<td>MS-OXWSSRCH-types.xsd</td>
<td>Contains the XML schema type definitions that are used in this protocol.</td>
<td>7.2</td>
</tr>
</tbody>
</table>

These files have to be placed in a common folder in order for the WSDL to validate and operate. Also, any schema files that are included in or imported into the MS-OXWSSRCH-types.xsd or MS-OXWSSRCH-messages.xsd schemas have to be placed in the common folder along with the files.

This section contains the contents of the MS-OXWSSRCH.wsdl file.

```xml
<?xml version="1.0" encoding="utf-8"?>
<wsdl:definitions xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/
 xmlns:tns="http://schemas.microsoft.com/exchange/services/2006/messages"
 xmlns:targetNamespace="http://schemas.microsoft.com/exchange/services/2006/messages">

<xs:schema id="messages" elementFormDefault="qualified" version="Exchange2016"
 xmlns:tns="http://schemas.microsoft.com/exchange/services/2006/messages"
 xmlns:targetNamespace="http://schemas.microsoft.com/exchange/services/2006/messages">
<xs:include schemaLocation="MS-OXWSSRCH-messages.xsd" />
<xs:include schemaLocation="MS-OXWSSRCH-types.xsd" />
</xs:schema>
</wsdl:definitions>
```
<wsdl:part name="MailboxCulture" element="t:MailboxCulture"/>
<wsdl:part name="RequestVersion" element="t:RequestServerVersion"/>
<wsdl:part name="TimeZoneContext" element="t:TimeZoneContext"/>
<wsdl:part name="ManagementRole" element="t:ManagementRole"/>
</wsdl:message>
<wsdl:message name="FindFolderSoapOut">
<wsdl:part name="FindFolderResult" element="tns:FindFolderResponse"/>
<wsdl:part name="ServerVersion" element="t:ServerVersionInfo"/>
</wsdl:message>
<wsdl:portType name="ExchangeServicePortType">
<wsdl:operation name="FindFolder">
<wsdl:input message="tns:FindFolderSoapIn"/>
<wsdl:output message="tns:FindFolderSoapOut"/>
</wsdl:operation>
<wsdl:operation name="FindItem">
<wsdl:input message="tns:FindItemSoapIn"/>
<wsdl:output message="tns:FindItemSoapOut"/>
</wsdl:operation>
</wsdl:portType>
<wsdl:binding name="ExchangeServiceBinding" type="tns:ExchangeServicePortType">
<wsdl:documentation>
<wsi:Claim conformsTo="http://ws-i.org/profiles/basic/1.0" xmlns:wsi="http://ws-i.org/schemas/conformanceClaim/"/>
</wsdl:documentation>
<soap:binding style="document" transport="http://schemas.xmlsoap.org/soap/http"/>
<wsdl:operation name="FindFolder">
<soap:operation
soapAction="http://schemas.microsoft.com/exchange/services/2006/messages/FindFolder"/>
<wsdl:input>
<soap:header message="tns:FindFolderSoapIn" part="Impersonation" use="literal"/>
<soap:header message="tns:FindFolderSoapIn" part="MailboxCulture" use="literal"/>
<soap:header message="tns:FindFolderSoapIn" part="RequestVersion" use="literal"/>
<soap:header message="tns:FindFolderSoapIn" part="TimeZoneContext" use="literal"/>
<soap:header message="tns:FindFolderSoapIn" part="ManagementRole" use="literal"/>
<soap:body parts="request" use="literal"/>
</wsdl:input>
<wsdl:output>
<soap:body parts="FindFolderResult" use="literal"/>
<soap:header message="tns:FindFolderSoapOut" part="ServerVersion" use="literal"/>
</wsdl:output>
</wsdl:operation>
<wsdl:operation name="FindItem">
<soap:operation
soapAction="http://schemas.microsoft.com/exchange/services/2006/messages/FindItem"/>
<wsdl:input>
<soap:header message="tns:FindItemSoapIn" part="Impersonation" use="literal"/>
<soap:header message="tns:FindItemSoapIn" part="MailboxCulture" use="literal"/>
<soap:header message="tns:FindItemSoapIn" part="RequestVersion" use="literal"/>
<soap:header message="tns:FindItemSoapIn" part="TimeZoneContext" use="literal"/>
<soap:header message="tns:FindItemSoapIn" part="DateTimePrecision" use="literal" />
<soap:header message="tns:FindItemSoapIn" part="ManagementRole" use="literal" />
<soap:body parts="request" use="literal"/>
</wsdl:input>
<wsdl:output>
<soap:body parts="FindItemResult" use="literal"/>
<soap:header message="tns:FindItemSoapOut" part="ServerVersion" use="literal"/>
</wsdl:output>
</wsdl:operation>

Appendix B: Full XML Schema

For ease of implementation, the following sections provide the full XML schema for this protocol.

<table>
<thead>
<tr>
<th>Schema name</th>
<th>Prefix</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Messages schema</td>
<td>m:</td>
<td>7.1</td>
</tr>
<tr>
<td>Types schema</td>
<td>T:</td>
<td>7.2</td>
</tr>
</tbody>
</table>

These files have to be placed in a common folder in order for the WSDL to validate and operate. Also, any schema files that are included in or imported into the MS-OWWWSSRCH-types.xsd or MS-OWWWSSRCH-messages.xsd schemas have to be placed in the common folder along with the files listed in the table.

7.1 Messages Schema

This section provides the contents of the MS-OWWWSSRCH-messages.xsd file and information about additional files that this schema file requires to operate correctly.

MS-OWWWSSRCH-messages.xsd includes or imports the files listed in the following table. For the schema file to operate correctly, these files have to be present in the folder that contains the WSDL, types schema, and messages schema files for this protocol.

<table>
<thead>
<tr>
<th>File name</th>
<th>Defining specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS-OWWWSSRCH-types.xsd</td>
<td>section 7.2</td>
</tr>
<tr>
<td>MS-OWWWSCDATA-messages.xsd</td>
<td>[MS-OWWWSCDATA] section 7.1</td>
</tr>
</tbody>
</table>

```xml
<xs:schema
  targetNamespace="http://schemas.microsoft.com/exchange/services/2006/messages"
  elementFormDefault="qualified"
  version="Exchange2016"
  id="messages">
  <!-- CHANGE THE SCHEMA LOCATION TO REFLECT THE TYPES XSD ASSOCIATED WITH THIS DOCUMENT -->
  <xs:include schemaLocation="MS-OWWWSSRCH-types.xsd"/>
  <xs:include schemaLocation="MS-OWWWSCDATA-messages.xsd"/>
  <xs:complexType name="FindFolderType">
    <xs:extension base="m:BaseRequestType">
      <xs:sequence>
        <xs:element name="FolderShape" type="t:FolderResponseShapeType"/>
        <xs:choice minOccurs="0">
          <xs:element name="IndexedPageFolderView" type="t:IndexedPageViewType"/>
          <xs:element name="FractionalPageFolderView" type="t:FractionalPageViewType"/>
        </xs:choice>
        <xs:element name="Restriction" type="t:RestrictionType" minOccurs="0"/>
        <xs:element name="ParentFolderIds" type="t:NonEmptyArrayOfBaseFolderIdsType" use="required"/>
      </xs:sequence>
      <xs:attribute name="Traversal" type="t:FolderQueryTraversalType" use="required"/>
    </xs:extension>
  </xs:complexType>
</xs:schema>
```
<xs:complexType name="QueryStringType">
    <xs:simpleContent>
        <xs:extension base="xs:string">
            <xs:attribute name="ResetCache" type="xs:boolean" use="optional"/>
            <xs:attribute name="ReturnHighlightTerms" type="xs:boolean" use="optional"/>
            <xs:attribute name="ReturnDeletedItems" type="xs:boolean" use="optional"/>
        </xs:extension>
    </xs:simpleContent>
</xs:complexType>

<xs:complexType name="PerformInstantSearchRequest">
    <xs:complexContent>
        <xs:extension base="m:BaseRequestType">
            <xs:sequence>
                <xs:element name="SearchSessionId" type="xs:string" minOccurs="1" maxOccurs="1"/>
                <xs:element name="ItemType" type="t:InstantSearchItemType" minOccurs="1" maxOccurs="1"/>
                <xs:element name="QueryOptions" type="t:QueryOptionsType" minOccurs="1" maxOccurs="1"/>
                <xs:element name="SearchRequestId" type="xs:long" minOccurs="1" maxOccurs="1"/>
                <xs:element name="KqlQuery" type="xs:string" minOccurs="1" maxOccurs="1"/>
                <xs:element name="FolderScope" type="t:ArrayOfFolderIdType" minOccurs="1" maxOccurs="1"/>
                <xs:element name="IsDeepTraversal" type="xs:boolean" minOccurs="0" maxOccurs="1"/>
                <xs:element name="WaitOnSearchResults" type="xs:boolean" minOccurs="0" maxOccurs="1"/>
            </xs:sequence>
        </xs:extension>
    </xs:complexContent>
</xs:complexType>

<xs:element name="PerformInstantSearch" type="m:PerformInstantSearchRequest"/>

<xs:complexType name="PerformInstantSearchResponse">
    <xs:complexContent>
        <xs:extension base="m:ResponseMessageType">
            <xs:sequence>
                <xs:element name="Payload" type="t:InstantSearchPayloadType" minOccurs="0" maxOccurs="1"/>
            </xs:sequence>
        </xs:extension>
    </xs:complexContent>
</xs:complexType>

<xs:element name="PerformInstantSearchResponse" type="m:PerformInstantSearchResponse"/>

</xs:schema>

7.2 Types Schema

This section contains the contents of the MS-OXWSSRCH-types.xsd file and information about additional files that this schema file requires to operate correctly.

MS-OXWSSRCH-types.xsd includes the file listed in the following table. For the schema file to operate correctly, this file has to be present in the folder that contains the WSDL, types schema, and messages schema files for this protocol.

<table>
<thead>
<tr>
<th>File name</th>
<th>Defining specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS-OXWSCDATA-types.xsd</td>
<td>[MS-OXWSCDATA] section 7.2</td>
</tr>
<tr>
<td>MS-OXWSCONV-types.xsd</td>
<td>[MS-OXWSCONV] section 7.2</td>
</tr>
</tbody>
</table>

<?xml version="1.0" encoding="utf-8"?>
    <xs:import namespace="http://www.w3.org/1999/namespace"/>

70 / 83

[MS-OXWSSRCH] - v20181001
Mailbox Search Web Service Protocol
Copyright © 2018 Microsoft Corporation
Release: October 1, 2018
<xs:include schemaLocation="MS-OWSSDATA-types.xsd"/>
<xs:include schemaLocation="MS-OWSSCONV-types.xsd"/>
<xs:complexType name="AggregateOnType">
  <xs:choice>
    <xs:element name="FieldURI" type="t:PathToUnindexedFieldType"/>
    <xs:element name="IndexedFieldURI" type="t:PathToIndexedFieldtype"/>
    <xs:element name="ExtendedFieldURI" type="t:PathToExtendedFieldtype"/>
  </xs:choice>
  <xs:attribute name="Aggregate" type="t:AggregateType" use="required"/>
</xs:complexType>
<xs:simpleType name="AggregateType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="Minimum"/>
    <xs:enumeration value="Maximum"/>
  </xs:restriction>
</xs:simpleType>
<xs:complexType name="AndType">
  <xs:complexContent>
    <xs:extension base="t:MultipleOperandBooleanExpressionType"/>
  </xs:complexContent>
</xs:complexType>
<xs:element name="And" type="t:AndType" substitutionGroup="t:SearchExpression"/>
<xs:complexType name="ArrayOfCalendarItemsType">
  <xs:choice minOccurs="0" maxOccurs="unbounded">
    <xs:element name="CalendarItem" type="t:CalendarItemType"/>
  </xs:choice>
</xs:complexType>
<xs:complexType name="ArrayOfGroupedItemsType">
  <xs:choice>
    <xs:element name="GroupedItems" type="t:GroupedItemsType" minOccurs="0" maxOccurs="unbounded"/>
  </xs:choice>
</xs:complexType>
<xs:complexType name="ArrayOfItemsType">
  <xs:choice minOccurs="0" maxOccurs="unbounded">
    <xs:element name="Item" type="t:ItemType"/>
  </xs:choice>
</xs:complexType>
<xs:complexType name="BaseGroupByType" abstract="true">
  <xs:attribute name="Order" type="t:SortDirectionType" use="required"/>
</xs:complexType>
<xs:complexType name="BasePagingType" abstract="true">
  <xs:attribute name="MaxEntriesReturned" type="xs:int" use="optional"/>
</xs:complexType>
<xs:simpleType name="ContainmentModeType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="FullString"/>
    <xs:enumeration value="Prefixed"/>
    <xs:enumeration value="Substring"/>
    <xs:enumeration value="PrefixOnWords"/>
    <xs:enumeration value="ExactPhrase"/>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="ContainmentComparisonType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="Exact"/>
    <xs:enumeration value="IgnoreCase"/>
    <xs:enumeration value="IgnoreNonSpacingCharacters"/>
    <xs:enumeration value="Loose"/>
    <xs:enumeration value="IgnoreCaseAndNonSpacingCharacters"/>
    <xs:enumeration value="LooseAndIgnoreCase"/>
    <xs:enumeration value="LooseAndIgnoreCaseAndNonSpacingCharacters"/>
    <xs:enumeration value="LooseAndIgnoreNonSpace"/>
    <xs:enumeration value="LooseAndIgnoreCaseAndIgnoreNonSpace"/>
  </xs:restriction>
</xs:simpleType>
<xs:complexType name="ContainsExpressionType">
  <xs:complexContent>
    <xs:extension base="t:SearchExpressionType"/>
  </xs:complexContent>
</xs:complexType>
<xs:simpleType name="InstantSearchResultType">
  <xs:list>
    <xs:simpleType>
      <xs:restriction base="xs:string">
        <xs:enumeration value="None"/>
        <xs:enumeration value="Suggestions"/>
        <xs:enumeration value="ItemResults"/>
        <xs:enumeration value="ConversationResults"/>
        <xs:enumeration value="Refiners"/>
        <xs:enumeration value="SearchTerms"/>
        <xs:enumeration value="Errors"/>
        <xs:enumeration value="QueryStatistics"/>
        <xs:enumeration value="CalendarItemResults"/>
        <xs:enumeration value="PersonaResults"/>
        <xs:enumeration value="SuggestionsPrimer"/>
      </xs:restriction>
    </xs:simpleType>
  </xs:list>
</xs:simpleType>

<xs:complexType name="IsEqualToType">
  <xs:complexContent>
    <xs:extension base="t:TwoOperandExpressionType"/>
  </xs:complexContent>
</xs:complexType>

<xs:element name="IsEqualTo" type="t:IsEqualToType"
  substitutionGroup="t:SearchExpression"/>

<xs:complexType name="IsNotEqualToType">
  <xs:complexContent>
    <xs:extension base="t:TwoOperandExpressionType"/>
  </xs:complexContent>
</xs:complexType>

<xs:element name="IsNotEqualTo" type="t:IsNotEqualToType"
  substitutionGroup="t:SearchExpression"/>

<xs:complexType name="IsGreaterThanType">
  <xs:complexContent>
    <xs:extension base="t:TwoOperandExpressionType"/>
  </xs:complexContent>
</xs:complexType>

<xs:element name="IsGreaterThan" type="t:IsGreaterThanType"
  substitutionGroup="t:SearchExpression"/>

<xs:complexType name="IsGreaterThanOrEqualToType">
  <xs:complexContent>
    <xs:extension base="t:TwoOperandExpressionType"/>
  </xs:complexContent>
</xs:complexType>

<xs:element name="IsGreaterThanOrEqualTo" type="t:IsGreaterThanOrEqualToType"
  substitutionGroup="t:SearchExpression"/>

<xs:complexType name="IsLessThanType">
  <xs:complexContent>
    <xs:extension base="t:TwoOperandExpressionType"/>
  </xs:complexContent>
</xs:complexType>

<xs:element name="IsLessThan" type="t:IsLessThanType"
  substitutionGroup="t:SearchExpression"/>

<xs:complexType name="IsLessThanOrEqualToType">
  <xs:complexContent>
    <xs:extension base="t:TwoOperandExpressionType"/>
  </xs:complexContent>
</xs:complexType>

<xs:element name="IsLessThanOrEqualTo" type="t:IsLessThanOrEqualToType"
  substitutionGroup="t:SearchExpression"/>

<xs:complexType name="ItemQueryTraversalType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="Shallow"/>
    <xs:enumeration value="SoftDeleted"/>
    <xs:enumeration value="Associated"/>
  </xs:restriction>
</xs:simpleType>

<xs:complexType name="NotType">
  <xs:complexContent>
    <xs:extension base="t:OneOperandExpressionType"/>
  </xs:complexContent>
</xs:complexType>
<xs:complexContent>
  <xs:extension base="t:SearchExpressionType">
    <xs:sequence>
      <xs:element ref="t:SearchExpression"/>
    </xs:sequence>
  </xs:extension>
</xs:complexType>

<xs:complexType name="MultipleOperandBooleanExpressionType" abstract="true">
  <xs:complexContent>
    <xs:extension base="t:SearchExpressionType">
      <xs:sequence>
        <xs:element ref="t:SearchExpression" minOccurs="1" maxOccurs="unbounded"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:element name="Or" type="t:OrType" substitutionGroup="t:SearchExpression"/>

<xs:complexType name="NonEmptyArrayOfFieldOrdersType">
  <xs:sequence>
    <xs:element name="FieldOrder" type="t:FieldOrderType" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>

<xs:simpleType name="QueryOptionsType">
  <xs:list>
    <xs:simpleType>
      <xs:restriction base="xs:string">
        <xs:enumeration value="None"/>
        <xs:enumeration value="Suggestions"/>
        <xs:enumeration value="Results"/>
        <xs:enumeration value="Refiners"/>
        <xs:enumeration value="SearchTerms"/>
        <xs:enumeration value="ExplicitSearch"/>
        <xs:enumeration value="SuggestionsPrimer"/>
        <xs:enumeration value="AllowFuzzing"/>
      </xs:restriction>
    </xs:simpleType>
  </xs:list>
</xs:complexType>

<xs:complexType name="RestrictionType">
  <xs:sequence>
    <xs:element ref="t:SearchExpression"/>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="SearchExpressionType" abstract="true"/>

<xs:complexType name="SearchFolderTraversalType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="Shallow"/>
    <xs:enumeration value="Deep"/>
  </xs:restriction>
</xs:complexType>

<xs:complexType name="SearchFolderType">
  <xs:complexContent>
    <xs:extension base="t:FolderType">
      <xs:sequence>
        <xs:element name="SearchParameters" type="t:SearchParametersType" minOccurs="0"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType name="SearchParametersType">
  <xs:complexContent>
    <xs:extension base="t:FolderType">
      <xs:sequence>
        <xs:element name="SearchParameters" type="t:SearchParametersType" minOccurs="0"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
8 Appendix C: Product Behavior

The information in this specification is applicable to the following Microsoft products or supplemental software. References to product versions include updates to those products.

- Microsoft Exchange Server 2007
- Microsoft Exchange Server 2010
- Microsoft Exchange Server 2013
- Microsoft Exchange Server 2016
- Microsoft Lync 2010
- Microsoft Lync Client 2013/Skype for Business
- Microsoft Skype for Business 2016
- Microsoft Skype for Business 2019
- Microsoft Exchange Server 2019

Exceptions, if any, are noted in this section. If an update version, service pack or Knowledge Base (KB) number appears with a product name, the behavior changed in that update. The new behavior also applies to subsequent updates 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 2.2.3.13: Exchange 2007, Exchange 2010, and Exchange 2013 do not support the PerformInstantSearch element.

<2> Section 2.2.3.14: Exchange 2007, Exchange 2010, and Exchange 2013 do not support the PerformInstantSearchResponse element.

<3> Section 2.2.4: Exchange 2007 and Exchange 2010 do not implement the SeekToConditionPageViewType complex type.

<4> Section 2.2.4: Exchange 2007 and Exchange 2010 do not implement the QueryStringType complex type.

<5> Section 2.2.4.2: Exchange 2007, Exchange 2010, and Exchange 2013 do not support theArrayOfCalendarItemsType complex type.

<6> Section 2.2.4.4: Exchange 2007, Exchange 2010, and Exchange 2013 do not support theArrayOfItemsType complex type.

<7> Section 2.2.4.17: Exchange 2007, Exchange 2010, and Exchange 2013 do not support the InstantSearchPayloadType complex type.

<8> Section 2.2.4.27: Exchange 2007, Exchange 2010, and Exchange 2013 do not support the PerformInstantSearchRequest complex type.

<9> Section 2.2.4.28: Exchange 2007, Exchange 2010, and Exchange 2013 do not support the PerformInstantSearchResponse complex type.
Section 2.2.4.34: Exchange 2007 and Exchange 2010 do not implement the SeekToConditionPageViewType.

Section 2.2.5.5: Exchange 2007, Exchange 2010, and Exchange 2013 do not support the InstantSearchItemType simple type.

Section 2.2.5.6: Exchange 2007, Exchange 2010, and Exchange 2013 do not support the InstantSearchResultType simple type.

Section 2.2.5.8: Exchange 2007, Exchange 2010, and Exchange 2013 do not support the QueryOptionsType simple type.

Section 3.1.4.1.1.1: Exchange 2007 and Exchange 2010 do not use the ManagementRole part.

Section 3.1.4.2: Exchange 2007, Exchange 2010, and Microsoft Exchange Server 2010 Service Pack 1 (SP1) do not include the DateTimePrecision part.

Section 3.1.4.2.1.1: Exchange 2007, the initial release version of Exchange 2010, and Exchange 2010 SP1 do not use the DateTimePrecision part.

Section 3.1.4.2.1.1: Exchange 2007 and Exchange 2010 do not use the ManagementRole part.

Section 3.1.4.2.3.2: The Query String element is not supported in Exchange 2007.

Section 3.1.4.2.3.2: Exchange 2007 and the initial release version of Exchange 2010 return all properties defined for any item in the specified folder.
9 Change Tracking

This section identifies changes that were made to this document since the last release. Changes are classified as Major, Minor, or None.

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.
- A document revision that captures changes to protocol functionality.

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 **None** means that no new technical changes were introduced. Minor editorial and formatting changes may have been made, but the relevant technical content is identical to the last released version.

The changes made to this document are listed in the following table. For more information, please contact dochelp@microsoft.com.

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Revision class</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 Appendix C: Product Behavior</td>
<td>Updated list of supported products.</td>
<td>Major</td>
</tr>
<tr>
<td>8 Appendix C: Product Behavior</td>
<td>Updated list of supported products.</td>
<td>Major</td>
</tr>
</tbody>
</table>
10 Index

A

Abstract data model  server  42
Applicability  10
Attribute groups  41
Attributes  41

C

Capability negotiation  10
Change tracking  79
Complex types  15
m:FindFolderResponseMessageType Complex Type  22
m:FindItemResponseMessageType Complex Type  23
m:PerformInstantSearchRequest Complex Type  29
m:PerformInstantSearchResponse Complex Type  30
m:QueryStringType Complex Type  31
t:AndType Complex Type  17
t:ArrayOfCalendarItemsType Complex Type  17
t:ArrayOfGroupedItemsType Complex Type  18
t:ArrayOfItemsType Complex Type  18
t:BasePagingType Complex Type  19
t:ContainsExpressionType Complex Type  19
t:ExcludesType Complex Type  20
t:ExcludesValueType Complex Type  21
t:ExistsType Complex Type  21
t:FindFolderParentType Complex Type  22
t:FindItemParentType Complex Type  23
t:FractionalPageViewType Complex Type  24
t:GroupedItemsType Complex Type  24
t:IndexedPageViewType Complex Type  25
t:InstantSearchPayloadType Complex Type  26
t:IsEqualToType Complex Type  26
t:IsGreaterThanOrEqualToType Complex Type  27
t:IsGreaterThan Type Complex Type  27
t:IsLessThanOrEqualToType Complex Type  27
t:IsLessThan Type Complex Type  27
t:IsNotEqualToType Complex Type  28
m:FindFolderResponseMessageType Complex Type  22
m:FindItemResponseMessageType Complex Type  23
m:PerformInstantSearchRequest Complex Type  29
m:PerformInstantSearchResponse Complex Type  30
m:QueryStringType Complex Type  31
Events
local - server  58
timer - server  58
Examples  59

F

Fields - vendor-extensible  10
Full WSDL  65
Full XML schema  68
Messages Schema  68
Types Schema  70

G

Glossary  6
Groups  41

I

Implementer - security considerations  64
Index of security parameters  64
Informative references  8
Initialization
server  42
Introduction  6

L

Local events
server  58

M

m:FindFolderResponseMessageType Complex Type  22
m:FindItemResponseMessageType Complex Type  23
m:PerformInstantSearchRequest Complex Type  29
m:PerformInstantSearchResponse Complex Type  30
m:QueryStringType Complex Type  31
Message processing
server  42
Messages

[MS-OXWSSRCH] - v20181001
Mailbox Search Web Service Protocol
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Release: October 1, 2018
attribute groups 41
attributes 41
complex types 15
elements 11
enumerated 11
groups 41
m:FindFolderResponseMessage Type Complex Type complex type 22
m:FindItemResponseMessage Type Complex Type complex type 23
m:PerformInstantSearchRequest Complex Type complex type 29
m:PerformInstantSearchResponse Complex Type complex type 30
m:QueryString Type Complex Type complex type 31
namespaces 11
PerformInstantSearch Element element 15
PerformInstantSearchResponse Element element 15
simple types 34
syntax 11
t:And Type Complex Type complex type 17
t:ArrayOfCalendarItems Type Complex Type complex type 17
t:ArrayOfGroupedItems Type Complex Type complex type 18
t:ArrayOfItems Type Complex Type complex type 18
t:BasePaging Type Complex Type complex type 19
t:ContainsExpression Type Complex Type complex type 19
t:ContainsExpression Type Complex Type complex type 19
t:ContainsExpression Type Complex Type complex type 19
t:ContainsExpression Type Complex Type complex type 19
t:ContainsValue Type Complex Type complex type 21

N
Namespaces 11
Normative references 7

O
Operations
FindFolder Operation 42
FindItem Operation 47
Overview (synopsis) 9

P
Parameters - security index 64
PerformInstantSearch Element element 15
PerformInstantSearchResponse Element element 15
Preconditions 9
Prerequisites 9
Product behavior 77
Protocol Details
overview 42

R
References 7
informative 8
normative 7
Relationship to other protocols 9

S

Security
implementer considerations 64
parameter index 64
Sequencing rules
server 42
Server
abstract data model 42
FindFolder Operation operation 42
FindItem Operation operation 47
initialization 42
local events 58
message processing 42
sequencing rules 42
timer events 58
timers 42
Simple types 34
t:ContainmentComparisonType Simple Type 35
t:ContainmentModeType Simple Type 36
t:FolderQueryTraversalType Simple Type 37
t:IndexBasePointType Simple Type 37
t:InstantSearchItemType Simple Type 38
t:InstantSearchPayloadType Complex Type complex type 26
t:InstantSearchResultType Simple Type simple type 38
t:InstantSearchFolderTraversalType Simple Type simple type 40
Server abstract data model 42
FindFolder Operation operation 42
FindItem Operation operation 47
initialization 42
local events 58
message processing 42
sequencing rules 42
timer events 58
timers 42
Simple types 34
t:ContainmentComparisonType Simple Type 35
t:ContainmentModeType Simple Type 36
t:FolderQueryTraversalType Simple Type 37
t:IndexBasePointType Simple Type 37
t:InstantSearchItemType Simple Type 38
t:InstantSearchPayloadType Complex Type complex type 26
t:InstantSearchResultType Simple Type simple type 38
t:InstantSearchFolderTraversalType Simple Type simple type 40
Server abstract data model 42
FindFolder Operation operation 42
FindItem Operation operation 47
initialization 42
local events 58
message processing 42
sequencing rules 42
timer events 58
timers 42
Simple types 34
t:ContainmentComparisonType Simple Type 35
t:ContainmentModeType Simple Type 36
t:FolderQueryTraversalType Simple Type 37
t:IndexBasePointType Simple Type 37
t:InstantSearchItemType Simple Type 38
t:InstantSearchPayloadType Complex Type complex type 26
t:InstantSearchResultType Simple Type simple type 38
t:InstantSearchFolderTraversalType Simple Type simple type 40
server 42
Syntax
messages - overview 11
T

t:AndType Complex Type complex type 17
t:ArrayOfCalendarItemsType Complex Type complex type 17
t:ArrayOfGroupedItemsType Complex Type complex type 18
t:ArrayOfItemsType Complex Type complex type 18
t:BasePagingType Complex Type complex type 19
t:ContainsExpressionType Complex Type complex type 19
t:ContainsType Complex Type complex type 19
t:ContainsValueExpressionComplexType complex type 20
t:ContainsExpressionType Complex Type complex type 20
t:ContainsExpressionType Complex Type complex type 21
t:ContainsExpressionType Complex Type complex type 21
t:ContainsExpressionType Complex Type complex type 22
t:ContainsExpressionType Complex Type complex type 22
t:ContainsExpressionType Complex Type complex type 22

t:ContainsExpressionType Complex Type complex type 23
t:ContainsExpressionType Complex Type complex type 23

t:ContainsExpressionType Complex Type complex type 24
t:ContainsExpressionType Complex Type complex type 24
t:ContainsExpressionType Complex Type complex type 24

t:ContainsExpressionType Complex Type complex type 25
t:ContainsExpressionType Complex Type complex type 25

t:ContainsExpressionType Complex Type complex type 26
t:ContainsExpressionType Complex Type complex type 26

t:ContainsExpressionType Complex Type complex type 27
t:ContainsExpressionType Complex Type complex type 27

t:ContainsExpressionType Complex Type complex type 28
t:ContainsExpressionType Complex Type complex type 28

t:ContainsExpressionType Complex Type complex type 29
t:ContainsExpressionType Complex Type complex type 29

t:ContainsExpressionType Complex Type complex type 30
t:ContainsExpressionType Complex Type complex type 30

t:ContainsExpressionType Complex Type complex type 31
t:ContainsExpressionType Complex Type complex type 31

t:ContainsExpressionType Complex Type complex type 32
t:ContainsExpressionType Complex Type complex type 32

t:ContainsExpressionType Complex Type complex type 33
t:ContainsExpressionType Complex Type complex type 33

t:ContainsExpressionType Complex Type complex type 34
t:ContainsExpressionType Complex Type complex type 34

Transport 11
Types
complex 15
simple 34

V

Vendor-extensible fields 10
Versioning 10

W

WSDL 65

82 / 83