

[MS-BDCDP]: Business Data Catalog Data Web Service Protocol

Intellectual Property Rights Notice for Open Specifications Documentation

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

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

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

Revision Summary

Date	Revision History	Revision Class	Comments
04/04/2008	0.1		Initial Availability
06/27/2008	1.0	Major	Revised and edited the technical content
12/12/2008	1.01	Editorial	Revised and edited the technical content
07/13/2009	1.02	Major	Changes made for template compliance
08/28/2009	1.03	Editorial	Revised and edited the technical content
11/06/2009	1.04	Editorial	Revised and edited the technical content
02/19/2010	2.0	Minor	Updated the technical content
03/31/2010	2.01	Editorial	Revised and edited the technical content
04/30/2010	2.02	Minor	Updated the technical content
06/07/2010	2.03	Editorial	Revised and edited the technical content
06/29/2010	2.04	Editorial	Changed language and formatting in the technical content.
07/23/2010	2.04	No change	No changes to the meaning, language, or formatting of the technical content.
09/27/2010	2.04	No change	No changes to the meaning, language, or formatting of the technical content.
11/15/2010	2.04	No change	No changes to the meaning, language, or formatting of the technical content.
12/17/2010	2.04	No change	No changes to the meaning, language, or formatting of the technical content.
03/18/2011	2.04	No change	No changes to the meaning, language, or formatting of the technical content.
06/10/2011	2.04	No change	No changes to the meaning, language, or formatting of the technical content.
01/20/2012	3.0	Major	Significantly changed the technical content.
04/11/2012	3.0	No change	No changes to the meaning, language, or formatting of the technical content.
07/16/2012	3.0	No change	No changes to the meaning, language, or formatting of the technical content.
09/12/2012	3.0	No change	No changes to the meaning, language, or formatting of the technical content.
10/08/2012	3.1	Minor	Clarified the meaning of the technical content.

Date	Revision History	Revision Class	Comments
02/11/2013	3.1	No change	No changes to the meaning, language, or formatting of the technical content.
07/30/2013	3.2	Minor	Clarified the meaning of the technical content.

Table of Contents

1 Introduction	6
1.1 Glossary	6
1.2 References	6
1.2.1 Normative References	6
1.2.2 Informative References	7
1.3 Overview	7
1.4 Relationship to Other Protocols	8
1.5 Prerequisites/Preconditions	8
1.6 Applicability Statement	8
1.7 Versioning and Capability Negotiation	8
1.8 Vendor-Extensible Fields	8
1.9 Standards Assignments	9
2 Messages	10
2.1 Transport	10
2.2 Common Message Syntax	10
2.2.1 Namespaces	10
2.2.2 Messages	10
2.2.3 Elements	10
2.2.4 Complex Types	11
2.2.5 Simple Types	11
2.2.6 Attributes	11
2.2.7 Groups	11
2.2.8 Attribute Groups	11
3 Protocol Details	12
3.1 Protocol Server Details	12
3.1.1 Abstract Data Model	12
3.1.2 Timers	12
3.1.3 Initialization	12
3.1.4 Message Processing Events and Sequencing Rules	12
3.1.4.1 Resolve	13
3.1.4.1.1 Messages	13
3.1.4.1.1.1 ResolveSoapIn	13
3.1.4.1.1.2 ResolveSoapOut	14
3.1.4.1.2 Elements	14
3.1.4.1.2.1 Resolve	14
3.1.4.1.2.2 ResolveResponse	15
3.1.4.1.3 Complex Types	15
3.1.4.1.3.1 ResolveResult	15
3.1.4.1.3.2 IdentifierField	16
3.1.4.1.3.3 ArrayOfFieldRecord	16
3.1.4.1.3.4 FieldRecord	16
3.1.4.1.4 Simple Types	16
3.1.4.1.4.1 ResolveStatus	17
3.1.4.1.5 Attributes	17
3.1.4.1.6 Groups	17
3.1.4.1.7 Attribute Groups	17
3.1.5 Timer Events	17
3.1.6 Other Local Events	17

4 Protocol Examples	18
4.1 Retrieving Field Values for LobSystem Entities.....	18
5 Security	19
5.1 Security Considerations for Implementers.....	19
5.2 Index of Security Parameters	19
6 Appendix A: Full WSDL	20
7 Appendix B: Product Behavior	23
8 Change Tracking	24
9 Index	26

1 Introduction

The Business Data Catalog Data Web Service Protocol is an interface that protocol clients can use to search software systems that store business data and process rules for an instance of a particular entity.

Sections 1.8, 2, and 3 of this specification are normative and can contain the terms MAY, SHOULD, MUST, MUST NOT, and SHOULD NOT as defined in RFC 2119. Sections 1.5 and 1.9 are also normative but cannot contain those terms. All other sections and examples in this specification are informative.

1.1 Glossary

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

SOAP action
SOAP body
SOAP fault
XML namespace

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

Entity
EntityInstance
EntityInstanceId
field
Identifier
line-of-business (LOB) system
LobSystem
LobSystemInstance
metadata store
MetadataObject
Model
site
Uniform Resource Locator (URL)
Web Services Description Language (WSDL)
WSDL message
XML schema

The following terms are specific to this document:

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

1.2 References

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

1.2.1 Normative References

We conduct frequent surveys of the normative references to assure their continued availability. If you have any issue with finding a normative reference, please contact dochelp@microsoft.com. We

will assist you in finding the relevant information. Please check the archive site, <http://msdn2.microsoft.com/en-us/library/E4BD6494-06AD-4aed-9823-445E921C9624>, as an additional source.

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

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

[RFC3986] Berners-Lee, T., Fielding, R., and Masinter, L., "Uniform Resource Identifier (URI): Generic Syntax", STD 66, RFC 3986, January 2005, <http://www.ietf.org/rfc/rfc3986.txt>

[SOAP1.1] Box, D., Ehnebuske, D., Kakivaya, G., et al., "Simple Object Access Protocol (SOAP) 1.1", May 2000, <http://www.w3.org/TR/2000/NOTE-SOAP-20000508/>

[SOAP1.2/1] Gudgin, M., Hadley, M., Mendelsohn, N., Moreau, J., and Nielsen, H.F., "SOAP Version 1.2 Part 1: Messaging Framework", W3C Recommendation, June 2003, <http://www.w3.org/TR/2003/REC-soap12-part1-20030624>

[SOAP1.2/2] Gudgin, M., Hadley, M., Mendelsohn, N., Moreau, J., and Nielsen, H.F., "SOAP Version 1.2 Part 2: Adjuncts", W3C Recommendation, June 2003, <http://www.w3.org/TR/2003/REC-soap12-part2-20030624>

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

[XML10] World Wide Web Consortium, "Extensible Markup Language (XML) 1.0 (Third Edition)", February 2004, <http://www.w3.org/TR/2004/REC-xml-20040204/>

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

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

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

1.2.2 Informative References

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

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

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

1.3 Overview

This document specifies a consistent selection process for information stored in any line-of-business (LOB) system for protocol client retrieval.

Enterprises store a variety of information in various **line-of-business (LOB) systems**. This protocol specifies unified information selection for all types of **LobSystems**. The protocol enables consistent processing for the user experience because it describes **LobSystems** in terms of **Models**,

LobSystemInstances, and the business data types they store as **Entities**. It also describes how the protocol client selects information from the protocol server.

This protocol enables a protocol client to retrieve an **EntityInstanceId** and the values for a list of **field (4)** names for an **Entity** associated with a **LobSystemInstance**. The protocol allows the protocol client to send the **LobSystemInstance** name, the **Entity** name, a value to resolve, and a list of **Entity** fields (4) to the protocol server, and to receive the serialized **EntityInstanceId** and the list of **Entity** field (4) name-value pairs.

1.4 Relationship to Other Protocols

This protocol uses the SOAP messaging protocol for formatting requests and responses as described either in [\[SOAP1.1\]](#) or in [\[SOAP1.2/1\]](#) and [\[SOAP1.2/2\]](#). It transmits these messages using the HTTP protocol as described in [\[RFC2616\]](#) or the HTTPS protocol as described in [\[RFC2818\]](#).

The following diagram shows the underlying messaging and transport stack that the protocol uses:

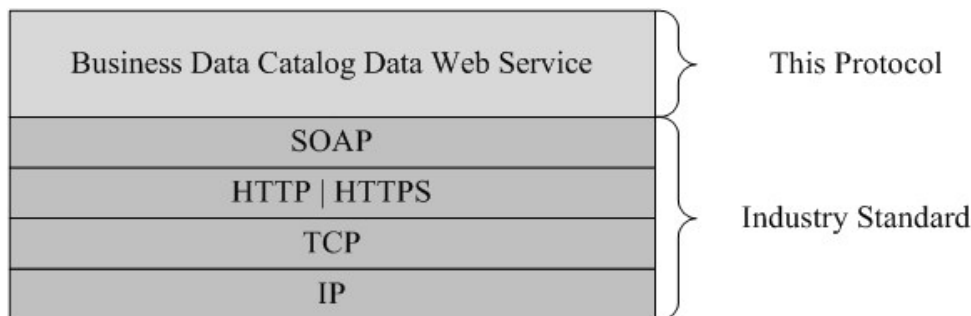


Figure 1: This protocol in relation to other protocols

1.5 Prerequisites/Preconditions

This protocol operates against a **site (2)** that is known to protocol clients by its **URL**. The protocol client forms an endpoint by appending `"/_vti_bin/bdcfieldsresolver.asmx"` to the URL of the site, for example `"http://www.contoso.com/Repository/_vti_bin/bdcfieldsresolver.asmx"`. This protocol assumes that the underlying protocols perform authentication.

1.6 Applicability Statement

None.

1.7 Versioning and Capability Negotiation

This document describes versioning issues in the following areas:

- **Supported transports:** This protocol uses multiple transports with SOAP as specified in section [2.1](#).

1.8 Vendor-Extensible Fields

None.

1.9 Standards Assignments

None.

2 Messages

2.1 Transport

Protocol servers MUST support SOAP over HTTP. Protocol servers additionally support SOAP over HTTPS to secure communication with protocol clients.

Protocol messages MUST be formatted as specified either in [\[SOAP1.1\]](#), section 4 or in [\[SOAP1.2/1\]](#) section 5. Protocol server faults MUST be returned using HTTP Status Codes as specified in [\[RFC2616\]](#) section 10, or using **SOAP faults** as specified in [\[SOAP1.1\]](#) section 4.4 or in [\[SOAP1.2/1\]](#) section 5.4.

2.2 Common Message Syntax

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

2.2.1 Namespaces

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

Prefix	Namespace URI	Reference
soap	http://schemas.xmlsoap.org/wsdl/soap/	[SOAP1.1]
tns	http://microsoft.com/webservices/SharePointPortalServer/BDCClientWS/	
s	http://www.w3.org/2001/XMLSchema	[XMLSCHEMA1] [XMLSCHEMA2]
soap12	http://schemas.xmlsoap.org/wsdl/soap12/	[SOAP1.2/1] [SOAP1.2/2]
(none)	http://microsoft.com/webservices/SharePointPortalServer/BDCClientWS/	
wsdl	http://schemas.xmlsoap.org/wsdl/	[WSDL]
mime	http://schemas.xmlsoap.org/wsdl/mime/	[WSDL]
http	http://schemas.xmlsoap.org/wsdl/http/	[WSDL]
tm	http://microsoft.com/wsdl/mime/textMatching/	[WSDL]
soapenc	http://schemas.xmlsoap.org/soap/encoding/	

2.2.2 Messages

This specification does not define any common **WSDL message** definitions.

2.2.3 Elements

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

2.2.4 Complex Types

This specification does not define any common XML schema complex type definitions.

2.2.5 Simple Types

This specification does not define any common XML schema simple type definitions.

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

This protocol operates between the protocol client and a protocol server. The protocol client initiates the communication, and the protocol server responds. The protocol server does not retain any states.

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

Except where specified, protocol clients interpret HTTP status codes returned by the protocol server as specified in [\[RFC2616\]](#) section 10.

Protocol servers perform implementation-specific authorization checks and notify protocol clients of authorization faults using either HTTP status codes or SOAP faults.

3.1 Protocol Server Details

3.1.1 Abstract Data Model

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

The protocol server MUST maintain lists of the following **MetadataObject** types: **LobSystem**, **LobSystemInstance**, and **Entity**. The protocol server maintains the following relationships between these **MetadataObject** types:

- **LobSystems** contain all **Entities**.
- **LobSystems** contain all **LobSystemInstances**.

The protocol server MUST assign unique names to the following **MetadataObjects**.

- All **Entities** contained by a particular **LobSystem**.
- All **LobSystemInstances** contained by a **metadata store**.
- All **LobSystems** contained by a **metadata store**.

3.1.2 Timers

None.

3.1.3 Initialization

None.

3.1.4 Message Processing Events and Sequencing Rules

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

Operation	Description
Resolve	This operation retrieves the values of a list of Entity fields (4) associated with the EntityInstance that was specified in the input criteria.

3.1.4.1 Resolve

This operation searches for an **EntityInstance** that matches the specified input criteria. The input criteria are the **LobSystemInstance** name, the **Entity** name, value to resolve, and the **Entity** field (4) names. The mechanism used by the protocol server to match the **EntityInstances** is implementation-specific.

```
<wsdl:operation name="Resolve">
  <wsdl:input message="tns:ResolveSoapIn" />
  <wsdl:output message="tns:ResolveSoapOut" />
</wsdl:operation>
```

The protocol client sends a **ResolveSoapIn** request message and the protocol server responds with a **ResolveSoapOut** response message. The protocol client **MUST** specify the following:

- The name of the **LobSystemInstance** to search.
- The name of the **Entity** to search.
- The search string that represents the value to resolve.
- The field (4) names of the **Entity** for which to retrieve the values of the specified **EntityInstance**.

If exactly one **EntityInstance** is found, the protocol server sends the serialized **EntityInstanceId** of the specified **EntityInstance**, along with the list of name-value pairs for the fields (4) of the specified **Entity** and the status of the operation.

This operation **MUST** return a **ResolveResult** message with the **ResolveStatus** element set, as specified in sections [3.1.4.1.3.1](#).

3.1.4.1.1 Messages

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

Message	Description
ResolveSoapIn	A request message for the Resolve operation.
ResolveSoapOut	The response message for the Resolve operation.

3.1.4.1.1.1 ResolveSoapIn

The **ResolveSoapIn** message is the request message for the **Resolve** operation.

The **SOAP action** value of the message is:

```
http://microsoft.com/webservices/SharePointPortalServer/BDCClientWS/Resolve
```

The **SOAP body** contains a **Resolve** element.

3.1.4.1.1.2 ResolveSoapOut

The **ResolveSoapOut** message is the response message for the **Resolve** operation.

The SOAP body contains a **ResolveResponse** element that MUST specify the status of the operation.

3.1.4.1.2 Elements

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

Element	Description
Resolve	A message containing the input data for the Resolve operation.
ResolveResponse	A message containing the output data of a Resolve operation.

3.1.4.1.2.1 Resolve

The **Resolve** message contains the input data for the **Resolve** operation.

```
<s:element name="Resolve">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="1" maxOccurs="1" name="systemInstance" type="s:string" />
      <s:element minOccurs="1" maxOccurs="1" name="entity" type="s:string" />
      <s:element minOccurs="1" maxOccurs="1" name="valueToResolve" type="s:string" />
      <s:element minOccurs="1" maxOccurs="1" name="fieldNames" type="s:string" />
    </s:sequence>
  </s:complexType>
</s:element>
```

systemInstance: This element contains the name of the LobSystemInstance. The value is encoded as specified in [\[XML10\]](#). The protocol server MUST only match EntityInstances obtained from the specified **LobSystemInstance**.

entity: This element contains the name of the Entity. The value is encoded as specified in [\[XML10\]](#). The protocol server MUST only match **EntityInstances** of the specified **Entity**.

valueToResolve: This element contains the value to resolve to an **EntityInstance**. The value is encoded as specified in [\[XML10\]](#). The value is resolved to **EntityInstances** using an implementation-specific algorithm. For example, a specific implementation of a protocol server could resolve a given value of "ab" and **Entity** "Customer", by returning customers that have names starting with "ab". Another implementation of the protocol server could return customer whose names, last names, or addresses contain "ab".

fieldNames: This element contains the field (4) names associated with the **Entity**. Each field name is encoded as specified in [\[RFC3986\]](#). The field names are concatenated into a single string with a colon (:) between field names.

3.1.4.1.2.2 ResolveResponse

The **ResolveResponse** message contains the output data of a **Resolve** operation.

```
<s:element name="ResolveResponse">
  <s:complexType>
    <s:sequence>
      <s:element minOccurs="1" maxOccurs="1" name="ResolveResult" type="tns:ResolveResult" />
    </s:sequence>
  </s:complexType>
</s:element>
```

ResolveResult: This element contains the serialized **EntityInstanceId** element that is associated with the specified **EntityInstance** element, along with the list of name-value pairs for the fields (4) of the specified **Entity** and the status of the operation.

3.1.4.1.3 Complex Types

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

Complex type	Description
ResolveResult	A message containing the output data of a Resolve operation.
IdentifierField	An element containing the Identifier of the EntityInstance .
ArrayOfFieldRecord	An element containing an array of elements of type FieldRecord .
FieldRecord	An element containing the Entity field (4) name-value pair.

3.1.4.1.3.1 ResolveResult

The **ResolveResult** message contains the output data of a **Resolve** operation.

```
<s:complexType name="ResolveResult">
  <s:sequence>
    <s:element minOccurs="0" maxOccurs="1" name="Identifier" type="tns:IdentifierField" />
    <s:element minOccurs="0" maxOccurs="1" name="Results" type="tns:ArrayOfFieldRecord" />
    <s:element minOccurs="1" maxOccurs="1" name="Status" type="tns:ResolveStatus" />
  </s:sequence>
</s:complexType>
```

Identifier: This element contains the Identifier of the EntityInstance found. If exactly one **EntityInstance** is not found, the value MUST be absent.

Results: This element contains the list of name-value pairs of the fields (4) of the specified Entity if the **fieldNames** element is not absent. If exactly one **EntityInstance** element is not found, the value MUST be absent.

Status: This element contains the status of the operation. This **ResolveStatus** element MUST be present. The protocol server MUST set this value as specified in section [3.1.4.1.4.1](#).

3.1.4.1.3.2 IdentifierField

The **IdentifierField** element contains the Identifier of the **EntityInstance**. If exactly one **EntityInstance** is not found, the value MUST be absent.

```
<s:complexType name="IdentifierField">
  <s:simpleContent>
    <s:extension base="s:string"/>
  </s:simpleContent>
</s:complexType>
```

3.1.4.1.3.3 ArrayOfFieldRecord

This **ArrayOfFieldRecord** element contains an array of elements of type **FieldRecord**, as specified in section [3.1.4.1.3.4](#).

```
<s:complexType name="ArrayOfFieldRecord">
  <s:sequence>
    <s:element name="FieldRecord" type="tns:FieldRecord" nillable="true" minOccurs="0"
      maxOccurs="unbounded"/>
  </s:sequence>
</s:complexType>
```

FieldRecord: This element contains the **Entity** field (4) name-value pair.

3.1.4.1.3.4 FieldRecord

The **FieldRecord** element contains the **Entity** field (4) name-value pair. The name of the field is contained in the **FieldName** attribute of the element and the value of the field is the value of the element.

```
<s:complexType name="FieldRecord">
  <s:simpleContent>
    <s:extension base="s:string">
      <s:attribute name="FieldName" type="s:string"/>
    </s:extension>
  </s:simpleContent>
</s:complexType>
```

FieldName: This attribute contains the name of the field (4). Each field (4) name is encoded as specified in [\[RFC3986\]](#).

3.1.4.1.4 Simple Types

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

Simple type	Description
ResolveStatus	An enumeration that specifies the status of the Resolve operation.

3.1.4.1.4.1 ResolveStatus

The **ResolveStatus** simple type specifies the enumeration of status of the **Resolve** operation, as specified in section [3.1.4.1](#).

```
<s:simpleType name="ResolveStatus">
  <s:restriction base="s:string">
    <s:enumeration value="NoMatch"/>
    <s:enumeration value="MultipleMatch"/>
    <s:enumeration value="UniqueMatch"/>
    <s:enumeration value="InvalidData"/>
  </s:restriction>
</s:simpleType>
```

The values for this enumeration are specified in the following table.

Value	Description
NoMatch	The protocol server MUST return this value when there are no EntityInstances were found.
MultipleMatch	The protocol server MUST return this value when more than one EntityInstances were found.
UniqueMatch	The protocol server MUST return this value when exactly one EntityInstance was found.
InvalidData	The protocol server MUST return this value when the operation has failed because input data is not valid or an implementation-specific error has occurred.

3.1.4.1.5 Attributes

None.

3.1.4.1.6 Groups

None.

3.1.4.1.7 Attribute Groups

None.

3.1.5 Timer Events

None.

3.1.6 Other Local Events

None.

4 Protocol Examples

4.1 Retrieving Field Values for LobSystem Entities

This scenario resolves the specified value to an **EntityInstance**. For this example, the protocol client is aware of the **LobSystemInstance** name, the Entity name, the value to resolve and the **Entity** field (4) names. The steps are as follows.

- The protocol client encodes and concatenates the **Entity** field (4) names using the colon (:) as a separator.

If the values of the fields **ProductKey**, **ProductName**, **Price** and **Color** are to be obtained, the client prepares a string of the form "ProductKey:ProductName:Price:Color"

1. The protocol client issues a **Resolve** request to the protocol server with the **LobSystemInstance** name, the **Entity** name, the value to resolve and the concatenated **Entity** field (4) names.

```
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"><soap:Body><Resolve
xmlns="http://microsoft.com/webservices/SharePointPortalServer/BDCClientWS/"><systemIn
stance>bdcdpExampleInstance</systemInstance><entity>Product</entity><valueToResolve>1<
/valueToResolve><fieldNames>ProductKey:ProductName:Price:Color</fieldNames></Resolve><
/soap:Body></soap:Envelope>
```

2. The protocol server responds with the status of the operation. If the **EntityInstance** is found, the protocol server also returns the specified **EntityInstance** and the name-value pairs for the fields (4).

```
"<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"><soap:Body><ResolveResponse
xmlns="http://microsoft.com/webservices/SharePointPortalServer/BDCClientWS/"><ResolveR
esult><Identifier>__bg40001300</Identifier><Results><FieldRecord
FieldName="ProductKey">1</FieldRecord><FieldRecord
FieldName="ProductName">Bag</FieldRecord><FieldRecord
FieldName="Price">3.0000</FieldRecord><FieldRecord
FieldName="Color">Yellow</FieldRecord></Results><Status>UniqueMatch</Status></ResolveR
esult></ResolveResponse></soap:Body></soap:Envelope>
```

5 Security

5.1 Security Considerations for Implementers

None.

5.2 Index of Security Parameters

None.

6 Appendix A: Full WSDL

For ease of implementation, the full WSDL and schema are provided in this appendix.

```
<?xml version="1.0" encoding="utf-8"?>
<wsdl:definitions xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
xmlns:tm="http://microsoft.com/wsdl/mime/textMatching/"
xmlns:soapenc="http://schemas.xmlsoap.org/soap/encoding/"
xmlns:mime="http://schemas.xmlsoap.org/wsdl/mime/"
xmlns:tns="http://microsoft.com/webservices/SharePointPortalServer/BDCClientWS/"
xmlns:s="http://www.w3.org/2001/XMLSchema"
xmlns:soap12="http://schemas.xmlsoap.org/wsdl/soap12/"
xmlns:http="http://schemas.xmlsoap.org/wsdl/http/"
targetNamespace="http://microsoft.com/webservices/SharePointPortalServer/BDCClientWS/"
xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/">
  <wsdl:documentation xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/">BDC Field Resolver Web
  Service for Clients</wsdl:documentation>
  <wsdl:types>
    <s:schema elementFormDefault="qualified"
targetNamespace="http://microsoft.com/webservices/SharePointPortalServer/BDCClientWS/">
      <s:element name="Resolve">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="1" maxOccurs="1" name="systemInstance"
type="s:string" />
            <s:element minOccurs="1" maxOccurs="1" name="entity" type="s:string" />
            <s:element minOccurs="1" maxOccurs="1" name="valueToResolve"
type="s:string" />
            <s:element minOccurs="1" maxOccurs="1" name="fieldNames" type="s:string" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="ResolveResponse">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="1" maxOccurs="1" name="ResolveResult"
type="tns:ResolveResult" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:complexType name="ResolveResult">
        <s:sequence>
          <s:element minOccurs="0" maxOccurs="1" name="Identifier"
type="tns:IdentifierField" />
          <s:element minOccurs="0" maxOccurs="1" name="Results"
type="tns:ArrayOfFieldRecord" />
          <s:element minOccurs="1" maxOccurs="1" name="Status" type="tns:ResolveStatus"
/>
        </s:sequence>
      </s:complexType>
      <s:complexType name="IdentifierField">
        <s:simpleContent>
          <s:extension base="s:string" />
        </s:simpleContent>
      </s:complexType>
      <s:complexType name="ArrayOfFieldRecord">
        <s:sequence>
          <s:element minOccurs="0" maxOccurs="unbounded" name="FieldRecord"
nillable="true" type="tns:FieldRecord" />
        </s:sequence>
      </s:complexType>
    </s:schema>
  </wsdl:types>

```

```

    </s:complexType>
    <s:complexType name="FieldRecord">
      <s:simpleContent>
        <s:extension base="s:string">
          <s:attribute name="FieldName" type="s:string" />
        </s:extension>
      </s:simpleContent>
    </s:complexType>
    <s:simpleType name="ResolveStatus">
      <s:restriction base="s:string">
        <s:enumeration value="NoMatch" />
        <s:enumeration value="MultipleMatch" />
        <s:enumeration value="UniqueMatch" />
        <s:enumeration value="InvalidData" />
      </s:restriction>
    </s:simpleType>
  </s:schema>
</wsdl:types>
<wsdl:message name="ResolveSoapIn">
  <wsdl:part name="parameters" element="tns:Resolve" />
</wsdl:message>
<wsdl:message name="ResolveSoapOut">
  <wsdl:part name="parameters" element="tns:ResolveResponse" />
</wsdl:message>
<wsdl:portType name="BDCFieldsResolverSoap">
  <wsdl:operation name="Resolve">
    <wsdl:input message="tns:ResolveSoapIn" />
    <wsdl:output message="tns:ResolveSoapOut" />
  </wsdl:operation>
</wsdl:portType>
<wsdl:binding name="BDCFieldsResolverSoap" type="tns:BDCFieldsResolverSoap">
  <soap:binding transport="http://schemas.xmlsoap.org/soap/http" />
  <wsdl:operation name="Resolve">
    <soap:operation
      soapAction="http://microsoft.com/webservices/SharePointPortalServer/BDCClientWS/Resolve"
      style="document" />
    <wsdl:input>
      <soap:body use="literal" />
    </wsdl:input>
    <wsdl:output>
      <soap:body use="literal" />
    </wsdl:output>
  </wsdl:operation>
</wsdl:binding>
<wsdl:binding name="BDCFieldsResolverSoap12" type="tns:BDCFieldsResolverSoap">
  <soap12:binding transport="http://schemas.xmlsoap.org/soap/http" />
  <wsdl:operation name="Resolve">
    <soap12:operation
      soapAction="http://microsoft.com/webservices/SharePointPortalServer/BDCClientWS/Resolve"
      style="document" />
    <wsdl:input>
      <soap12:body use="literal" />
    </wsdl:input>
    <wsdl:output>
      <soap12:body use="literal" />
    </wsdl:output>
  </wsdl:operation>
</wsdl:binding>

```

</wsdl:definitions>

7 Appendix B: Product Behavior

The information in this specification is applicable to the following Microsoft products or supplemental software. References to product versions include released service packs:

- Microsoft Office SharePoint Server 2007

Exceptions, if any, are noted below. If a service pack or Quick Fix Engineering (QFE) number appears with the product version, behavior changed in that service pack or QFE. The new behavior also applies to subsequent service packs of the product unless otherwise specified. If a product edition appears with the product version, behavior is different in that product edition.

Unless otherwise specified, any statement of optional behavior in this specification that is prescribed using the terms SHOULD or SHOULD NOT implies product behavior in accordance with the SHOULD or SHOULD NOT prescription. Unless otherwise specified, the term MAY implies that the product does not follow the prescription.

8 Change Tracking

This section identifies changes that were made to the [MS-BDCDP] protocol document between the February 2013 and July 2013 releases. Changes are classified as New, Major, Minor, Editorial, or No change.

The revision class **New** means that a new document is being released.

The revision class **Major** means that the technical content in the document was significantly revised. Major changes affect protocol interoperability or implementation. Examples of major changes are:

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

The revision class **Minor** means that the meaning of the technical content was clarified. Minor changes do not affect protocol interoperability or implementation. Examples of minor changes are updates to clarify ambiguity at the sentence, paragraph, or table level.

The revision class **Editorial** means that the language and formatting in the technical content was changed. Editorial changes apply to grammatical, formatting, and style issues.

The revision class **No change** means that no new technical or language changes were introduced. The technical content of the document is identical to the last released version, but minor editorial and formatting changes, as well as updates to the header and footer information, and to the revision summary, may have been made.

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

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

- Protocol syntax updated due to protocol revision.
- Protocol syntax removed due to protocol revision.
- New content added for template compliance.
- Content updated for template compliance.
- Content removed for template compliance.
- Obsolete document removed.

Editorial changes are always classified with the change type **Editorially updated**.

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

- **Protocol syntax** refers to data elements (such as packets, structures, enumerations, and methods) as well as interfaces.
- **Protocol revision** refers to changes made to a protocol that affect the bits that are sent over the wire.

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

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change type
3.1.4.1 Resolve	Added the Entity field name as one of the input criteria.	N	Content updated.
3.1.4.1.1.2 ResolveSoapOut	Removed SOAP action value for this message.	N	Content updated.
Z Appendix B: Product Behavior	Updated the list of applicable product versions.	N	Content removed.

9 Index

A

Abstract data model
 [server](#) 12
[Applicability](#) 8
[Attribute groups](#) 11
[Attributes](#) 11

C

[Capability negotiation](#) 8
[Change tracking](#) 24
Client
 [overview](#) 12
[Complex types](#) 11

D

Data model - abstract
 [server](#) 12

E

Events
 [local - server](#) 17
 [timer - server](#) 17
Examples
 [retrieving field values for LobSystem Entities](#) 18

F

[Fields - vendor-extensible](#) 8
[Full WSDL](#) 20

G

[Glossary](#) 6
[Groups](#) 11

I

[Implementer - security considerations](#) 19
[Index of security parameters](#) 19
[Informative references](#) 7
Initialization
 [server](#) 12
[Introduction](#) 6

L

Local events
 [server](#) 17

M

Message processing
 [server](#) 12
Messages

[attribute groups](#) 11
[attributes](#) 11
[complex types](#) 11
[elements](#) 10
[enumerated](#) 10
[groups](#) 11
[namespaces](#) 10
[simple types](#) 11
[syntax](#) 10
[transport](#) 10

N

[Namespaces](#) 10
[Normative references](#) 6

O

Operations
 [Resolve](#) 13
[Overview \(synopsis\)](#) 7

P

[Parameters - security index](#) 19
[Preconditions](#) 8
[Prerequisites](#) 8
[Product behavior](#) 23

R

[References](#) 6
 [informative](#) 7
 [normative](#) 6
[Relationship to other protocols](#) 8
[Retrieving field values for LobSystem Entities](#)
 [example](#) 18

S

Security
 [implementer considerations](#) 19
 [parameter index](#) 19
Sequencing rules
 [server](#) 12
Server
 [abstract data model](#) 12
 [initialization](#) 12
 [local events](#) 17
 [message processing](#) 12
 [overview](#) 12
 [Resolve operation](#) 13
 [sequencing rules](#) 12
 [timer events](#) 17
 [timers](#) 12
[Simple types](#) 11
[Standards assignments](#) 9
Syntax

[messages - overview](#) 10

T

Timer events

[server](#) 17

Timers

[server](#) 12

[Tracking changes](#) 24

[Transport](#) 10

Types

[complex](#) 11

[simple](#) 11

V

[Vendor-extensible fields](#) 8

[Versioning](#) 8

W

[WSDL](#) 20