

[MS-UDCX]:

Universal Data Connection 2.0 XML File Format

Intellectual Property Rights Notice for Open Specifications Documentation

- **Technical Documentation.** Microsoft publishes Open Specifications documentation (“this documentation”) for protocols, file formats, data portability, computer languages, and standards support. Additionally, overview documents cover inter-protocol relationships and interactions.
- **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 can make copies of it in order to develop implementations of the technologies that are described in this documentation and can distribute portions of it in your implementations that use these technologies or in your documentation as necessary to properly document the implementation. You can also distribute in your implementation, with or without modification, any schemas, IDLs, or code samples that are included in the documentation. This permission also applies to any documents that are referenced in the Open Specifications documentation.
- **No Trade Secrets.** Microsoft does not claim any trade secret rights in this documentation.
- **Patents.** Microsoft has patents that might cover your implementations of the technologies described in the Open Specifications documentation. Neither this notice nor Microsoft's delivery of this documentation grants any licenses under those patents or any other Microsoft patents. However, a given Open Specifications document might be covered by the Microsoft [Open Specifications Promise](#) or the [Microsoft Community Promise](#). If you would prefer a written license, or if the technologies described in this documentation are not covered by the Open Specifications Promise or Community Promise, as applicable, patent licenses are available by contacting iplg@microsoft.com.
- **License Programs.** To see all of the protocols in scope under a specific license program and the associated patents, visit the [Patent Map](#).
- **Trademarks.** The names of companies and products contained in this documentation might 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, email addresses, logos, people, places, and events that are 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 as specifically described above, whether by implication, estoppel, or otherwise.

Tools. The Open Specifications documentation does 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 documents are intended for use in conjunction with publicly available standards specifications and network programming art and, as such, assume that the reader either is familiar with the aforementioned material or has immediate access to it.

Support. For questions and support, please contact dochelp@microsoft.com.

Preliminary Documentation. This particular Open Specifications document provides documentation for past and current releases and/or for the pre-release version of this technology. This document provides final documentation for past and current releases and preliminary documentation, as applicable and specifically noted in this document, for the pre-release version. Microsoft will release final documentation in connection with the commercial release of the updated or new version of this technology. Because this documentation might change between the pre-release version and the final

version of this technology, there are risks in relying on this preliminary documentation. To the extent that you incur additional development obligations or any other costs as a result of relying on this preliminary documentation, you do so at your own risk.

Preliminary

Revision Summary

Date	Revision History	Revision Class	Comments
4/4/2008	0.01	Major	Initial Availability
6/27/2008	1.0	Editorial	Revised and edited technical content
7/13/2009	1.01	Major	Revised and edited the technical content
8/28/2009	1.02	Editorial	Revised and edited the technical content
11/6/2009	1.03	Editorial	Revised and edited the technical content
2/19/2010	2.0	Major	Updated and revised the technical content
3/31/2010	2.01	Editorial	Revised and edited the technical content
4/30/2010	2.02	Editorial	Revised and edited the technical content
6/7/2010	2.03	Editorial	Revised and edited the technical content
6/29/2010	2.04	Editorial	Changed language and formatting in the technical content.
7/23/2010	2.05	Editorial	Changed language and formatting in the technical content.
9/27/2010	2.05	None	No changes to the meaning, language, or formatting of the technical content.
11/15/2010	2.05	None	No changes to the meaning, language, or formatting of the technical content.
12/17/2010	2.05	None	No changes to the meaning, language, or formatting of the technical content.
3/18/2011	2.5.1	Editorial	Changed language and formatting in the technical content.
6/10/2011	2.5.1	None	No changes to the meaning, language, or formatting of the technical content.
1/20/2012	3.0	Major	Significantly changed the technical content.
4/11/2012	3.0	None	No changes to the meaning, language, or formatting of the technical content.
7/16/2012	3.0	None	No changes to the meaning, language, or formatting of the technical content.
10/8/2012	3.0	None	No changes to the meaning, language, or formatting of the technical content.
2/11/2013	3.0	None	No changes to the meaning, language, or formatting of the technical content.
7/30/2013	3.1	Minor	Clarified the meaning of the technical content.
11/18/2013	3.1	None	No changes to the meaning, language, or formatting of the technical content.
2/10/2014	3.1	None	No changes to the meaning, language, or formatting of the technical content.
4/30/2014	3.1	None	No changes to the meaning, language, or formatting of the technical content.

Date	Revision History	Revision Class	Comments
7/31/2014	3.1	None	No changes to the meaning, language, or formatting of the technical content.
10/30/2014	3.1	None	No changes to the meaning, language, or formatting of the technical content.
2/26/2016	4.0	Major	Significantly changed the technical content.
6/23/2016	4.0	None	No changes to the meaning, language, or formatting of the technical content.
7/15/2016	4.0	None	No changes to the meaning, language, or formatting of the technical content.
9/14/2016	4.0	None	No changes to the meaning, language, or formatting of the technical content.
7/24/2018	5.0	Major	Significantly changed the technical content.

Preliminary

Table of Contents

1	Introduction	7
1.1	Glossary	7
1.2	References	9
1.2.1	Normative References	9
1.2.2	Informative References	10
1.3	Structure Overview (Synopsis)	10
1.4	Relationship to Protocols and Other Structures	10
1.5	Applicability Statement	11
1.6	Versioning and Localization	11
1.7	Vendor-Extensible Fields	11
2	Structures	12
2.1	Namespaces	12
2.2	UDC Processing Instructions	12
2.3	UDC Schema	12
2.3.1	DataSource	12
2.3.2	Name	13
2.3.3	Description	13
2.3.4	Type	13
2.3.5	ConnectionInfo	15
2.3.6	WsdUrl	15
2.3.7	SelectCommand	16
2.3.8	ListId	17
2.3.9	WebUrl	17
2.3.10	ConnectionString	17
2.3.11	Query	18
2.3.12	UpdateCommand	18
2.3.13	Submit	19
2.3.14	FileName	19
2.3.15	SoapAction	20
2.3.16	OperationName	20
2.3.17	FolderName	21
2.3.18	ServiceUrl	21
2.3.19	Authentication	22
2.3.20	UseExplicit	23
2.3.21	UserId	23
2.3.22	Password	24
2.3.23	SSO	24
2.3.24	CredentialTypeEnumeration	24
2.3.25	SubType	25
2.4	Connection Type Requirements	26
2.4.1	SharePointList Requirements	26
2.4.2	SharePointLibrary Requirements	26
2.4.3	Database Requirements	27
2.4.4	XmlQuery Requirements	27
2.4.5	WebService Requirements	27
2.4.6	XmlSubmit Requirements	27
2.4.7	Rest Requirements	28
3	Structure Examples	29
3.1	Database	29
3.2	WebService	29
3.3	Empty Authentication	30
4	Security Considerations	31

5 Appendix A: Full XML Schemas 32
6 Appendix B: Product Behavior 35
7 Change Tracking..... 36
8 Index..... 37

Preliminary

1 Introduction

The Universal Data Connection 2.0 XML File Structure provides a container for data connection information. A Universal Data Connection (UDC) file uses XML to represent this information.

Sections 1.7 and 2 of this specification are normative. All other sections and examples in this specification are informative.

1.1 Glossary

This document uses the following terms:

absolute URL: The full Internet address of a page or other World Wide Web resource. The absolute URL includes a protocol, such as "http," a network location, and an optional path and file name — for example, <http://www.treyresearch.net/>.

Augmented Backus-Naur Form (ABNF): A modified version of Backus-Naur Form (BNF), commonly used by Internet specifications. ABNF notation balances compactness and simplicity with reasonable representational power. ABNF differs from standard BNF in its definitions and uses of naming rules, repetition, alternatives, order-independence, and value ranges. For more information, see [\[RFC5234\]](#).

authentication: The act of proving an identity to a server while providing key material that binds the identity to subsequent communications.

credential: Previously established, **authentication** data that is used by a security principal to establish its own identity. When used in reference to the Netlogon Protocol, it is the data that is stored in the NETLOGON_CREDENTIAL structure.

data connection: A collection of information, such as the type and location, that defines how to connect to an external data source, such as a database, **web service**, SharePoint list, or **XML** file.

data source: A database, web service, disk, file, or other collection of information from which data is queried or submitted. Supported data sources vary based on application and data provider.

document library: A type of list that is a container for documents and folders.

explicit authentication: An **authentication** mechanism that requires users to provide **credentials**, such as a login name and password, before they can gain access to one or more resources.

form template: A file or set of files that defines the data structure, appearance, and behavior of a form.

globally unique identifier (GUID): A term used interchangeably with universally unique identifier (UUID) in Microsoft protocol technical documents (TDs). Interchanging the usage of these terms does not imply or require a specific algorithm or mechanism to generate the value. Specifically, the use of this term does not imply or require that the algorithms described in [\[RFC4122\]](#) or [\[C706\]](#) must be used for generating the **GUID**. See also universally unique identifier (UUID).

HTTP POST: An HTTP method, as described in [\[RFC2616\]](#).

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.

Kerberos: An **authentication** system that enables two parties to exchange private information across an otherwise open network by assigning a unique key (called a ticket) to each user that logs on to the network and then embedding these tickets into messages sent by the users. For more information, see [\[MS-KILE\]](#).

list: A container within a SharePoint site that stores list items. A list has a customizable schema that is composed of one or more fields.

message body: The content within an HTTP message, as described in [RFC2616] section 4.3.

Representational State Transfer (REST): A class of **web services** that is used to transfer domain-specific data by using **HTTP**, without additional messaging layers or session tracking, and returns textual data, such as **XML**.

server-relative URL: A relative URL that does not specify a scheme or host, and assumes a base URI of the root of the host, as described in [\[RFC3986\]](#).

single sign-on (SSO): A process that enables users who have a domain user account to log on to a network and gain access to any computer or resource in the domain without entering their **credentials** multiple times.

site: A group of related pages and data within a SharePoint site collection. The structure and content of a site is based on a site definition. Also referred to as SharePoint site and web site.

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 node: An element in a SOAP message that identifies the node on a SOAP message path that causes a fault to occur, as described in [\[SOAP1.1\]](#).

Structured Query Language (SQL): A database query and programming language that is widely used for accessing, querying, updating, and managing data in relational database systems.

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 [\[RFC1738\]](#).

Universal Data Connection (.udc, .udcx) file: An **XML** file that has a .udc or .udcx file name extension that contains user credentials and other authentication information that is used to connect to a data source.

web service: A unit of application logic that provides data and services to other applications and can be called by using standard Internet transport protocols such as **HTTP**, Simple Mail Transfer Protocol (SMTP), or File Transfer Protocol (FTP). Web services can perform functions that range from simple requests to complicated business processes.

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 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.

XML: The Extensible Markup Language, as described in [\[XML1.0\]](#).

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-ADTG] Microsoft Corporation, "[Remote Data Services \(RDS\) Transport Protocol](#)".

[MS-FSPP] Microsoft Corporation, "[Forms Services Proxy Web Service Protocol](#)".

[MS-SFU] Microsoft Corporation, "[Kerberos Protocol Extensions: Service for User and Constrained Delegation Protocol](#)".

[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>

[RFC2396] Berners-Lee, T., Fielding, R., and Masinter, L., "Uniform Resource Identifiers (URI): Generic Syntax", RFC 2396, August 1998, <http://www.rfc-editor.org/rfc/rfc2396.txt>

[RFC2617] Franks, J., Hallam-Baker, P., Hostetler, J., et al., "HTTP Authentication: Basic and Digest Access Authentication", RFC 2617, June 1999, <http://www.rfc-editor.org/rfc/rfc2617.txt>

[RFC4120] Neuman, C., Yu, T., Hartman, S., and Raeburn, K., "The Kerberos Network Authentication Service (V5)", RFC 4120, July 2005, <https://www.rfc-editor.org/rfc/rfc4120.txt>

[RFC4559] Jaganathan, K., Zhu, L., and Brezak, J., "SPNEGO-based Kerberos and NTLM HTTP Authentication in Microsoft Windows", RFC 4559, June 2006, <http://www.rfc-editor.org/rfc/rfc4559.txt>

[RFC5234] Crocker, D., Ed., and Overell, P., "Augmented BNF for Syntax Specifications: ABNF", STD 68, RFC 5234, January 2008, <http://www.rfc-editor.org/rfc/rfc5234.txt>

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

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

[XML] World Wide Web Consortium, "Extensible Markup Language (XML) 1.0 (Fourth Edition)", W3C Recommendation 16 August 2006, edited in place 29 September 2006, <http://www.w3.org/TR/2006/REC-xml-20060816/>

1.2.2 Informative References

[MS-INFODCF] Microsoft Corporation, "[InfoPath Data Connection File Download Protocol](#)".

[NTLM] Microsoft Corporation, "Microsoft NTLM", <http://msdn.microsoft.com/en-us/library/aa378749.aspx>

1.3 Structure Overview (Synopsis)

The Universal Data Connection (UDC) file specifies settings for **data connections** used by **form templates**. Each **Universal Data Connection (.udc, .udcx) file** provides the necessary information to connect to a **data source**. The UDC file is constructed of three main parts:

- Name and description.
- Type and purpose.
- Connection information.

The UDC file is used to provide a layer of indirection for data connection settings so that the settings can be changed for multiple form templates by modifying a single file. In addition, the UDC file allows specification of server-side properties, such as an implementation-specific reference to **authentication credentials** stored in an encrypted database. At runtime, a protocol client retrieves the latest data connection settings from the data connection file and uses them to make the requested data connection. A single data connection file provides settings to connect to a single data source.

The following figure shows the structure of a UDC file.

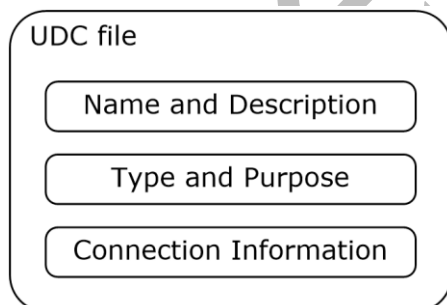


Figure 1: UDC file structure

1.4 Relationship to Protocols and Other Structures

The UDC file is used by the Forms Services Proxy Web Service Protocol, as described in [\[MS-FSPP\]](#) section 1, to connect to a target **web service** and optionally use the **credentials** specified in the UDC file.

A **form template** uses the information in a UDC file to connect to a **data source**. The InfoPath Data Connection File Download Protocol, as described in [\[MS-INFODCF\]](#) section 1, provides a method for a protocol client that has a form template to request a UDC file.

1.5 Applicability Statement

The UDC file is used to store **data connection** information outside of a **form template**. This enables multiple form templates to share the same data connections. When a UDC file is used to specify the data connections for a form template, the data connections can be updated without modifying the form template by changing the information in the UDC file.

1.6 Versioning and Localization

This document specifies the Universal Data Connection version 2.0 file format.

1.7 Vendor-Extensible Fields

None.

Preliminary

2 Structures

2.1 Namespaces

This specification specifies and references various **XML namespaces** using the mechanisms specified in [\[XMLNS\]](#) and [\[RFC2396\]](#). Although this specification associates a specific **XML namespace prefix** for each XML namespace that is used, the choice of any particular XML namespace prefix is implementation-specific and not significant for interoperability.

This specification references the XML namespace prefixes listed in the following table.

Prefix	Namespace URI	Reference
xsd	http://www.w3.org/2001/XMLSchema	[XMLSCHEMA1] [XMLSCHEMA2]
udc	http://schemas.microsoft.com/office/infopath/2006/udc	

2.2 UDC Processing Instructions

The following **XML** processing instruction tag, as specified in [\[XML\]](#) section 2.6, **MUST** appear in the UDC file:

```
<?MicrosoftWindowsSharePointServices...?>
```

A formal definition in **Augmented Backus-Naur Form (ABNF)**, as specified in [\[RFC5234\]](#), of the XML processing instructions is as follows.

```
UDC_PI = '<?MicrosoftWindowsSharePointServices ' CONTENT_ID_TYPE '?>' CRLF
CONTENT_ID_TYPE = 'ContentTypeID="0x010100B4CBD48E029A4AD8B62CB0E41868F2B0"'
```

2.3 UDC Schema

The following sections specify the elements and attributes of the UDC file.

2.3.1 DataSource

A container for the elements of the UDC file.

Child Elements
ConnectionInfo
Description
Name
Type

Attributes:

MajorVersion: The major version of the UDC file.

MinorVersion: The minor version of the UDC file.

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="DataSource">
  <xsd:complexType>
    <xsd:all>
      <xsd:element name="Name" type="xsd:string"/>
      <xsd:element name="Description" type="xsd:string"/>
      <xsd:element ref="udc:Type"/>
      <xsd:element ref="udc:ConnectionInfo"/>
    </xsd:all>
    <xsd:attribute name="MajorVersion" fixed="2" use="required" type="xsd:int"/>
    <xsd:attribute name="MinorVersion" fixed="0" use="required" type="xsd:int"/>
  </xsd:complexType>
</xsd:element>
```

2.3.2 Name

The name of the UDC file.

Parent Elements
DataSource

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="Name" type="xsd:string"/>
```

2.3.3 Description

A long description for the UDC file.

Parent Elements
DataSource

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="Description" type="xsd:string"/>
```

2.3.4 Type

The connection type for the UDC file.

Parent Elements
DataSource

Child Elements
SubType

Attributes:

MajorVersion: The major version of the UDC file. MUST be ignored by the protocol server.

MinorVersion: The minor version of the UDC file. MUST be ignored by the protocol server.

Type: The connection type of the UDC file. MUST be one of the following values:

- SharePointList
- SharePointLibrary
- Database
- XmlQuery
- WebService
- XmlSubmit
- Rest

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="Type">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element ref="udc:SubType" minOccurs="0"/>
    </xsd:sequence>
    <xsd:attribute name="MajorVersion" type="xsd:string" use="optional"/>
    <xsd:attribute name="MinorVersion" type="xsd:string" use="optional"/>
    <xsd:attribute name="Type" use="required">
      <xsd:simpleType>
        <xsd:restriction base="xsd:string">
          <xsd:enumeration value="SharePointList"/>
          <xsd:enumeration value="SharePointLibrary"/>
          <xsd:enumeration value="Database"/>
          <xsd:enumeration value="XmlQuery"/>
          <xsd:enumeration value="WebService"/>
          <xsd:enumeration value="XmlSubmit"/>
          <xsd:enumeration value="Rest"/>
        </xsd:restriction>
      </xsd:simpleType>
    </xsd:attribute>
  </xsd:complexType>
```

</xsd:element>

2.3.5 ConnectionInfo

Contains the information used to establish a connection to a **data source**.

Parent Elements
DataSource

Child Elements
Authentication
SelectCommand
UpdateCommand
WsdlUrl

Attributes:

AltDataSource: A **Uniform Resource Locator (URL)** to another UDC file in the same library. The protocol server MUST NOT support **absolute URLs** for this value. The protocol server MUST use the UDC file specified in this attribute instead of the current UDC file.

Purpose: Determines whether the connection is for a query or submit operation. MUST be one of the following values: "ReadOnly", "WriteOnly", or "ReadWrite". MUST be ignored by the protocol server.

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="ConnectionInfo">
  <xsd:complexType>
    <xsd:all>
      <xsd:element name="WsdlUrl" minOccurs="0" type="xsd:string"/>
      <xsd:element ref="udc:SelectCommand"/>
      <xsd:element ref="udc:UpdateCommand"/>
      <xsd:element ref="udc:Authentication" minOccurs="0"/>
    </xsd:all>
    <xsd:attribute name="Purpose" use="required">
      <xsd:simpleType>
        <xsd:restriction base="xsd:string">
          <xsd:enumeration value="ReadOnly"/>
          <xsd:enumeration value="WriteOnly"/>
          <xsd:enumeration value="ReadWrite"/>
        </xsd:restriction>
      </xsd:simpleType>
    </xsd:attribute>
    <xsd:attribute name="AltDataSource" type="xsd:string" use="optional"/>
  </xsd:complexType>
</xsd:element>
```

2.3.6 WsdUrl

When the value of the **Type** attribute of the **Type** element equals "WebService", this element MUST exist and its value MUST be a **URL** to the **Web Services Description Language (WSDL)** of a **web service** where a **SOAP** query or SOAP submit is executed. The protocol server MUST support **absolute URLs** and SHOULD [<1>](#) support **server-relative URLs** for this value.

When the value of the **Type** attribute of the **Type** element is not equal to "WebService", the **WsdUrl** element MUST be ignored by the protocol client and protocol server.

Parent Elements
ConnectionInfo

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="WsdUrl" minOccurs="0" type="xsd:string"/>
```

2.3.7 SelectCommand

Contains the information used to query data from a **data source**.

Parent Elements
ConnectionInfo

Child Elements
ConnectionString
ListId
OperationName
Query
ServiceUrl
SoapAction
WebUrl

Attributes:

Type: Reserved for future use. MUST be ignored by the protocol server.

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.


```

<xsd:element name="SelectCommand">
  <xsd:complexType>
    <xsd:all>
      <xsd:element name="ListId" minOccurs="0" type="xsd:string"/>
      <xsd:element name="WebUrl" minOccurs="0" type="xsd:string"/>
      <xsd:element name="ConnectionString" minOccurs="0" type="xsd:string"/>
      <xsd:element ref="udc:ServiceUrl" minOccurs="0"/>
      <xsd:element ref="udc:SoapAction" minOccurs="0"/>
      <xsd:element ref="udc:OperationName" minOccurs="0"/>
      <xsd:element name="Query" minOccurs="0" type="xsd:string"/>
    </xsd:all>
    <xsd:attribute name="Type" type="xsd:string" use="optional"/>
  </xsd:complexType>
</xsd:element>

```

2.3.8 ListId

ListId is a unique identifier for a **list** available on the protocol server. When the value of the **Type** attribute of the **Type** element equals "SharePointList", this element and its value **MUST** exist. Otherwise, it **MUST** be ignored by the protocol client and protocol server.

Parent Elements
SelectCommand

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```

<xsd:element name="ListId" minOccurs="0" type="xsd:string"/>

```

2.3.9 WebUrl

When the value of the **Type** attribute of the **Type** element equals "SharePointList", this element **MUST** exist and its value **MUST** be a **URL** to the protocol server that contains the **list** specified by **ListId**. The protocol server **MUST** support **absolute URLs** and **SHOULD** [<2>](#) support **server-relative URLs** for this value.

When the value of the **Type** attribute of the **Type** element is not equal to "SharePointList", the **WebUrl** element **MUST** be ignored by the protocol client and protocol server.

Parent Elements
SelectCommand

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```

<xsd:element name="WebUrl" minOccurs="0" type="xsd:string"/>

```

2.3.10 ConnectionString

A database connection string, as specified in [\[MS-ADTG\]](#) section [2.2.3.13.1](#), to establish and maintain the connection between the database and the protocol server. When the value of the **Type** attribute of the **Type** element equals "Database", this element and its value MUST exist. Otherwise, it MUST be ignored by the protocol client and protocol server.

Parent Elements
SelectCommand

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="ConnectionString" minOccurs="0" type="xsd:string"/>
```

2.3.11 Query

A query or **URL**. MUST be one of the following:

- If the value of the **Type** attribute of the **Type** element equals "Database", the value of the **Query** element MUST be a **Structured Query Language (SQL)** query that can access and retrieve data from the database specified in the **ConnectionString** element to the protocol server.
- When the value of the **Type** attribute of the **Type** element equals "XmlQuery", the **Query** element MUST exist and its value MUST be a URL to an **XML** file stored on a Web server that can access and retrieve data from a Web server to the protocol server. The protocol server MUST support **absolute URLs** and SHOULD [<3>](#) support **server-relative URLs** for this value.
- If the value of the **Type** attribute of the **Type** element equals "Rest", this element MUST exist and its value MUST be an absolute URL to a **Representational State Transfer (REST) web service** that can access and retrieve data from the web service to the protocol server.
- Otherwise, this element MUST be ignored by the protocol server.

Parent Elements
SelectCommand

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="Query" minOccurs="0" type="xsd:string"/>
```

2.3.12 UpdateCommand

Contains the information used to submit data to a **data source**. Section [2.4](#) specifies which elements are required for each value of the **Type** attribute in the **Type** element.

Parent Elements
ConnectionInfo

Child Elements
FileName
FolderName
OperationName
ServiceUrl
SoapAction
Submit

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="UpdateCommand">
  <xsd:complexType>
    <xsd:all>
      <xsd:element ref="udc:ServiceUrl" minOccurs="0"/>
      <xsd:element ref="udc:SoapAction" minOccurs="0"/>
      <xsd:element ref="udc:OperationName" minOccurs="0"/>
      <xsd:element name="Submit" minOccurs="0" type="xsd:string"/>
      <xsd:element name="FileName" minOccurs="0" type="xsd:string"/>
      <xsd:element ref="udc:FolderName" minOccurs="0"/>
    </xsd:all>
  </xsd:complexType>
</xsd:element>
```

2.3.13 Submit

An **absolute URL** to a Web server. The Web server **MUST** be able to accept **HTTP POST** requests with **XML** in the **message body**. When the value of the **Type** attribute of the **Type** element equals "XmlSubmit", this element and its value **MUST** exist. Otherwise, it **MUST** be ignored by the protocol client and protocol server.

Parent Elements
UpdateCommand

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="Submit" minOccurs="0" type="xsd:string"/>
```

2.3.14 FileName

The default file name for submitting to a **document library** on a protocol server. MUST be ignored by the protocol server.

Parent Elements
UpdateCommand

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="FileName" minOccurs="0" type="xsd:string"/>
```

2.3.15 SoapAction

The name of the method to execute on the **SOAP node** specified in the **ServiceUrl** element for the **SelectCommand** element or the **UpdateCommand** element. When the value of the **Type** attribute of the **Type** element equals "WebService", this element and its value MUST exist. Otherwise, it MUST be ignored by the protocol client and protocol server.

Parent Elements
SelectCommand
UpdateCommand

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="SoapAction" type="xsd:string"/>
```

2.3.16 OperationName

The name of the **WSDL operation** on a **SOAP node** specified in the **ServiceUrl** element for the **SelectCommand** element or the **UpdateCommand** element. The protocol server MUST ignore this element.

Parent Elements
SelectCommand

Parent Elements

UpdateCommand

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="OperationName" type="xsd:string"/>
```

2.3.17 FolderName

A **URL** for the **document library** hosted on the protocol server. When the value of the **Type** attribute of the **Type** element equals "SharePointLibrary", this element and its value **MUST** exist. Otherwise, it **MUST** be ignored by the protocol client and protocol server.

Parent Elements

UpdateCommand

Attributes:

AllowOverwrite: Determines whether a file override is allowed or not. If the value of this attribute is "true" or "1", the protocol server **MUST** overwrite the content stored in the document library. Otherwise, the protocol server **MUST NOT** overwrite any content in the document library.

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="FolderName">
  <xsd:complexType>
    <xsd:simpleContent>
      <xsd:extension base="xsd:string">
        <xsd:attribute name="AllowOverwrite" use="optional">
          <xsd:simpleType>
            <xsd:restriction base="xsd:string">
              <xsd:enumeration value=""/>
              <xsd:enumeration value="0"/>
              <xsd:enumeration value="1"/>
              <xsd:enumeration value="false"/>
              <xsd:enumeration value="true"/>
            </xsd:restriction>
          </xsd:simpleType>
        </xsd:attribute>
      </xsd:extension>
    </xsd:simpleContent>
  </xsd:complexType>
</xsd:element>
```

2.3.18 ServiceUrl

When the value of the **Type** attribute of the **Type** element equals "WebService", this element **MUST** exist and its value **MUST** be a **URL** for a **SOAP node**. This URL **MUST** be used by the SOAP node to execute the **SOAP** method call specified in the **SoapAction** element. The protocol server **MUST** support **absolute URLs** and **SHOULD** [<4>](#) support **server-relative URLs** for this value.

When the value of the **Type** attribute of the **Type** element is not equal to "WebService", the **ServiceUrl** element MUST be ignored by the protocol client and protocol server.

Parent Elements
SelectCommand
UpdateCommand

Attributes:

UseFormsServiceProxy: Determines whether the connection needs to use the Forms Services Proxy **web service**. If the value of this attribute is "true", the protocol server MUST use the Forms Services Proxy web service, as specified in [\[MS-FSPP\]](#). Otherwise the protocol server MUST NOT use the Forms Services Proxy web service.

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="ServiceUrl">
  <xsd:complexType>
    <xsd:simpleContent>
      <xsd:extension base="xsd:string">
        <xsd:attribute name="UseFormsServiceProxy" use="optional" type="xsd:boolean"/>
      </xsd:extension>
    </xsd:simpleContent>
  </xsd:complexType>
</xsd:element>
```

2.3.19 Authentication

Contains **authentication** information. If the **Authentication** element is present in the **ConnectionInfo** element, the protocol server MUST support both **single sign-on (SSO)** and **explicit authentication** methods, and the protocol server MUST use the provided **credentials** to authenticate the connections specified by the UDC file as follows:

- If the **SSO** element is present and the **UseExplicit** element is not present in the **Authentication** element, the protocol server MUST use SSO for authentication.
- If the **UseExplicit** element is present and the **SSO** element is not present in the **Authentication** element, the protocol server MUST use explicit authentication for authentication with the credentials provided in the **UseExplicit** element.
- If both the **SSO** and the **UseExplicit** elements are present in the **Authentication** element, the protocol server MUST use SSO for authentication.
- Otherwise, the protocol server MUST NOT attempt separate authentication to perform the operation specified in the file.

Parent Elements
ConnectionInfo

Child Elements
SSO
UseExplicit

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="Authentication">
  <xsd:complexType>
    <xsd:all>
      <xsd:element ref="udc:SSO" minOccurs="0"/>
      <xsd:element ref="udc:UseExplicit" minOccurs="0"/>
    </xsd:all>
  </xsd:complexType>
</xsd:element>
```

2.3.20 UseExplicit

UseExplicit contains the **credentials** for a **data source** for a protocol server to establish and maintain the **data connection**. If the **UserId** element is not specified, the **Password** element MUST be ignored by the protocol server.

Parent Elements
Authentication

Child Elements
Password
UserId

Attributes:

CredentialType: The method of **authentication**. The possible values for this attribute are specified in section [2.3.24](#).

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="UseExplicit">
  <xsd:complexType>
    <xsd:all>
      <xsd:element name="UserId" minOccurs="0" type="xsd:string"/>
      <xsd:element name="Password" minOccurs="0" type="xsd:string"/>
    </xsd:all>
    <xsd:attribute name="CredentialType" use="required"
      type="udc:CredentialTypeEnumeration"/>
  </xsd:complexType>
</xsd:element>
```

2.3.21 UserId

The user name for the **explicit authentication** method specified in [section 2.3.20](#).

Parent Elements
UseExplicit

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="UserId" minOccurs="0" type="xsd:string"/>
```

2.3.22 Password

The password for the **explicit authentication** method specified in [section 2.3.20](#).

Parent Elements
UseExplicit

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="Password" minOccurs="0" type="xsd:string"/>
```

2.3.23 SSO

SSO specifies the **SSO authentication** method.

Parent Elements
Authentication

Attributes:

AppId: Specifies the application to be used for SSO authentication.

CredentialType: Specifies the method of authentication.

The possible values for this attribute are specified in [section 2.3.24](#).

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="SSO">
```



```

<xsd:complexType>
  <xsd:attribute name="AppId" use="required" type="xsd:string"/>
  <xsd:attribute name="CredentialType" use="required"
type="udc:CredentialTypeEnumeration"/>
</xsd:complexType>
</xsd:element>

```

2.3.24 CredentialTypeEnumeration

CredentialTypeEnumeration specifies how the contained **credentials** are used. If the **CredentialType** attribute is empty for either the **SSO** or the **UseExplicit** elements, the protocol server MUST ignore both the **SSO** and the **UseExplicit** elements. The protocol server MUST support the credential type specified in this element.

The value of this element MUST be one of the following:

- **Basic:** Credentials are used to perform **Hypertext Transfer Protocol (HTTP) Basic authentication**, as specified in [\[RFC2617\]](#).
- **CD:** Credentials are used to impersonate a user using constrained delegation, as specified in [\[MS-SFU\]](#) section [3.1](#).
- **Digest:** Credentials are used to perform HTTP Digest authentication, as specified in [\[RFC2617\]](#).
- **Kerberos:** Credentials are used to impersonate a user using **Kerberos**, as specified in [\[RFC4120\]](#) and [\[RFC4559\]](#).
- **Ntlm:** Credentials are used to impersonate a user using Windows challenge/response, as described in [\[NTLM\]](#).
- **Sql:** Credentials are embedded in a database connection string for authentication against a **SQL** server.

Referenced By
SSO.UniversalDataConnection@CredentialType
UseExplicit.UniversalDataConnection@CredentialType

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this simple type.

```

<xsd:simpleType name="CredentialTypeEnumeration">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="Sql"/>
    <xsd:enumeration value="Ntlm"/>
    <xsd:enumeration value="Kerberos"/>
    <xsd:enumeration value="CD"/>
    <xsd:enumeration value="Basic"/>
    <xsd:enumeration value="Digest"/>
  </xsd:restriction>
</xsd:simpleType>

```

2.3.25 SubType

SubType is reserved for future use. MUST be ignored by the protocol server.

Parent Elements
Type

Attributes:

MajorVersion: Reserved for future use. MUST be ignored by the protocol server.

MinorVersion: Reserved for future use. MUST be ignored by the protocol server.

The following W3C XML Schema ([\[XMLSCHEMA1\]](#) section 2.1) fragment specifies the contents of this element.

```
<xsd:element name="SubType">
  <xsd:complexType>
    <xsd:attribute name="MajorVersion" type="xsd:string" use="optional"/>
    <xsd:attribute name="MinorVersion" type="xsd:string" use="optional"/>
  </xsd:complexType>
</xsd:element>
```

2.4 Connection Type Requirements

Each UDC file has only one **ConnectionInfo** element. The contents of the **ConnectionInfo** element depend on the value of the **Type** attribute of the **Type** element as specified in the following subsections.

The "udc" prefix used in this section maps to the following namespace:

<http://schemas.microsoft.com/office/infopath/2006/udc>

2.4.1 SharePointList Requirements

When the value of the **Type** attribute of the **Type** element equals "SharePointList", the protocol server processes the following properties.

Property	Value description
udc:DataSource/udc:Type/@Type	SharePointList
udc:DataSource/udc:ConnectionInfo/udc:SelectCommand/udc:ListId	GUID of the SharePoint list .
udc:DataSource/udc:ConnectionInfo/udc:UpdateCommand/udc:WebUrl	URL to the site that contains the list.

2.4.2 SharePointLibrary Requirements

When the value of the **Type** attribute of the **Type** element equals "SharePointLibrary", the protocol server processes the following properties.

Property	Value description
udc:DataSource/udc:Type/@Type	SharePointLibrary
udc:DataSource/udc:ConnectionInfo/udc:UpdateCommand/udc:FolderName	A URL for the document library hosted on the protocol server.
udc:DataSource/udc:ConnectionInfo/udc:UpdateCommand/udc:FolderName/@AllowOverwrite	Determines whether to overwrite a file in a document library if the file already exists.

2.4.3 Database Requirements

When the value of the **Type** attribute of the **Type** element equals "Database", the protocol server processes the following properties.

Property	Value description
udc:DataSource/udc:Type/@Type	Database
udc:DataSource/udc:ConnectionInfo/udc:SelectCommand/udc:ConnectionString	Database connection string.
udc:DataSource/udc:ConnectionInfo/udc:SelectCommand/udc:Query	SQL query to execute.

2.4.4 XmlQuery Requirements

When the value of the **Type** attribute of the **Type** element equals "XmlQuery", the protocol server processes the following properties.

Property	Value description
udc:DataSource/udc:Type/@Type	XmlQuery
udc:DataSource/udc:ConnectionInfo/udc:SelectCommand/udc:Query	URL that specifies the source of the XML to retrieve.

2.4.5 WebService Requirements

When the value of the **Type** attribute of the **Type** element equals "WebService", the protocol server processes the following properties.

Property	Value description
udc:DataSource/udc:Type/@Type	WebService
udc:DataSource/udc:ConnectionInfo/udc:WsdlUrl	URL to the WSDL for the web service .
udc:DataSource/udc:ConnectionInfo/udc:UpdateCommand/udc:ServiceUrl	URL to the web service.
udc:DataSource/udc:ConnectionInfo/udc:UpdateCommand/udc:SoapAction	web service SOAP action identifier.

2.4.6 XmlSubmit Requirements

When the value of the **Type** attribute of the **Type** element equals "XmlSubmit", the protocol server processes the following properties.

Property	Value description
udc:DataSource/udc:Type/@Type	XmlSubmit
udc:DataSource/udc:ConnectionInfo/udc:UpdateCommand/udc:Submit	URL that specifies the target of the XML to post.

2.4.7 Rest Requirements

When the value of the **Type** attribute of the **Type** element equals "Rest", the protocol server processes the following properties.

Property	Value description
udc:DataSource/udc:Type/@Type	Rest
udc:DataSource/udc:ConnectionInfo/udc:SelectCommand/udc:Query	URL that specifies the source of the REST web service .

3 Structure Examples

This section contains samples of a UDC file for "Database" and "WebService" **data connection** types. This section also contains an example of an **Authentication** element when the **CredentialType** attribute is empty.

3.1 Database

The following example is a UDC file that retrieves data from a database. When there are child elements in the **ConnectionInfo** element that are not database-related, the protocol server will only use the database-related elements.

```
<?xml version="1.0" encoding="UTF-8"?>
<?MicrosoftWindowsSharePointServices
ContentTypeID="0x010100B4CBD48E029A4AD8B62CB0E41868F2B0"?>
<udc:DataSource
  MajorVersion="2"
  MinorVersion="0"
  xmlns:udc="http://schemas.microsoft.com/office/infopath/2006/udc">
  <udc:Name>DB Connection</udc:Name>
  <udc:Description>Database</udc:Description>
  <udc:Type MajorVersion="2" MinorVersion="0" Type="Database">
    <udc:SubType MajorVersion="0" MinorVersion="0" Type=""></udc:SubType>
  </udc:Type>
  <udc:ConnectionInfo Purpose="ReadOnly" AltDataSource="">
    <udc:WsdlUrl>http://</udc:WsdlUrl>
    <udc>SelectCommand Type="">
      <udc>ListId</udc>ListId>
      <udc:WebUrl>http://</udc:WebUrl>
      <udc:ConnectionString>Provider=SQLOLEDB.1;Password=MyPassword;Persist Security
Info=True;User ID=MyUserName;Initial Catalog=AdventureWorks;Data Source=testmachine;Use
Procedure for Prepare=1;Auto Translate=True;Packet Size=4096;Workstation ID=MYWORKMACHINE;Use
Encryption for Data=False;Tag with column collation when
possible=False</udc:ConnectionString>
      <udc:OperationName></udc:OperationName>
      <udc:ServiceUrl>http://</udc:ServiceUrl>
      <udc:SoapAction></udc:SoapAction>
      <udc:Query>select
"DocumentID", "Title", "FileName", "FileExtension", "Revision", "ChangeNumber", "Status", "Documents
ummary", "Document", "ModifiedDate" from "Production"."Document" as "Document"</udc:Query>
    </udc>SelectCommand>
    <udc:UpdateCommand>
      <udc:OperationName></udc:OperationName>
      <udc:ServiceUrl>http://</udc:ServiceUrl>
      <udc:SoapAction></udc:SoapAction>
      <udc:Submit></udc:Submit>
    </udc:UpdateCommand>
  </udc:ConnectionInfo>
</udc:DataSource>
```

3.2 WebService

The following example is a UDC file that retrieves data from a **web service**. When there are child elements in the **ConnectionInfo** element that are not web service related, the protocol server only uses the web service related elements.

```
<?xml version="1.0" encoding="UTF-8"?>
<?MicrosoftWindowsSharePointServices
ContentTypeID="0x010100B4CBD48E029A4AD8B62CB0E41868F2B0"?>
<udc:DataSource
  MajorVersion="2"
  MinorVersion="0"
```

```

xmlns:udc="http://schemas.microsoft.com/office/infopath/2006/udc">
<udc:Name>Main query</udc:Name>
<udc:Description>Format: UDC V2; Connection Type: WebService; Purpose: ReadOnly; Generated
by Microsoft® Office InfoPath® 2007 on 2008-02-12 at 11:23:51.</udc:Description>
<udc:Type MajorVersion="2" MinorVersion="0" Type="WebService">
  <udc:SubType MajorVersion="0" MinorVersion="0" Type=""/>
</udc:Type>
<udc:ConnectionInfo Purpose="ReadOnly" AltDataSource="">
  <udc:WsdlUrl>http://testmachine/app/service.asmx?WSDL</udc:WsdlUrl>
  <udc>SelectCommand>
    <udc>ListId/>
    <udc:WebUrl/>
    <udc:ConnectionString/>
    <udc:ServiceUrl
UseFormsServiceProxy="true">http://testmachine/app/service.asmx</udc:ServiceUrl>
  <udc:SoapAction>http://testmachine/app/HelloWorld</udc:SoapAction>
  <udc:Query/>
</udc>SelectCommand>
<udc:UpdateCommand>
  <udc:ServiceUrl UseFormsServiceProxy="false"/>
  <udc:SoapAction/>
  <udc:Submit/>
  <udc:FileName>Specify a filename or formula</udc:FileName>
  <udc:FolderName AllowOverwrite=""/>
</udc:UpdateCommand>
</udc:ConnectionInfo>
</udc:DataSource>

```

3.3 Empty Authentication

The following **Authentication** element example shows how the explicit **credentials** are ignored because the **CredentialType** attribute is empty.

```

<udc:Authentication>
  <udc:UseExplicit CredentialType="">
    <udc:UserId>MyUserName</udc:UserId>
    <udc>Password>DatabasePassword</udc>Password>
  </udc:UseExplicit>
</udc:Authentication>

```

4 Security Considerations

The UDC file contains security-sensitive **credentials** with the provided connection information. If the **explicit authentication** method is used, the username and password are stored in **plaintext** under the **UseExplicit** element. The preferred **authentication** method is **SSO** instead of explicit authentication.

Preliminary

5 Appendix A: Full XML Schemas

For ease of implementation, this section provides the full **XML schema** for the UDC file.

```
<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema
  targetNamespace="http://schemas.microsoft.com/office/infopath/2006/udc"
  elementFormDefault="qualified"
  xmlns:udc="http://schemas.microsoft.com/office/infopath/2006/udc"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema">

  <xsd:element name="DataSource" >
    <xsd:complexType >
      <xsd:all>
        <xsd:element name="Name" type="xsd:string" />
        <xsd:element name="Description" type="xsd:string" />
        <xsd:element ref="udc:Type" />
        <xsd:element ref="udc:ConnectionInfo" />
      </xsd:all>
      <xsd:attribute name="MajorVersion" fixed="2" use="required" type="xsd:int" />
      <xsd:attribute name="MinorVersion" fixed="0" use="required" type="xsd:int" />
    </xsd:complexType>
  </xsd:element>

  <xsd:element name="Type" >
    <xsd:complexType >
      <xsd:sequence>
        <xsd:element ref="udc:SubType" minOccurs="0" />
      </xsd:sequence>
      <xsd:attribute name="MajorVersion" type="xsd:string" use="optional" />
      <xsd:attribute name="MinorVersion" type="xsd:string" use="optional" />
      <xsd:attribute name="Type" use="required" >
        <xsd:simpleType >
          <xsd:restriction base="xsd:string">
            <xsd:enumeration value="SharePointList" />
            <xsd:enumeration value="SharePointLibrary" />
            <xsd:enumeration value="Database" />
            <xsd:enumeration value="XmlQuery" />
            <xsd:enumeration value="WebService" />
            <xsd:enumeration value="XmlSubmit" />
            <xsd:enumeration value="Rest" />
          </xsd:restriction>
        </xsd:simpleType>
      </xsd:attribute>
    </xsd:complexType>
  </xsd:element>

  <xsd:element name="ConnectionInfo" >
    <xsd:complexType >
      <xsd:all>
        <xsd:element name="WsdlUrl" minOccurs="0" type="xsd:string" />
        <xsd:element ref="udc:SelectCommand" />
        <xsd:element ref="udc:UpdateCommand" />
        <xsd:element ref="udc:Authentication" minOccurs="0" />
      </xsd:all>
      <xsd:attribute name="Purpose" use="required" >
        <xsd:simpleType >
          <xsd:restriction base="xsd:string">
            <xsd:enumeration value="ReadOnly" />
            <xsd:enumeration value="WriteOnly" />
            <xsd:enumeration value="ReadWrite" />
          </xsd:restriction>
        </xsd:simpleType>
      </xsd:attribute>
      <xsd:attribute name="AltDataSource" type="xsd:string" use="optional" />
    </xsd:complexType>
  </xsd:element>

```



```

</xsd:element>

<xsd:element name="SelectCommand" >
  <xsd:complexType >
    <xsd:all>
      <xsd:element name="ListId" minOccurs="0" type="xsd:string" />
      <xsd:element name="WebUrl" minOccurs="0" type="xsd:string" />
      <xsd:element name="ConnectionString" minOccurs="0" type="xsd:string" />
      <xsd:element ref="udc:ServiceUrl" minOccurs="0" />
      <xsd:element ref="udc:SoapAction" minOccurs="0" />
      <xsd:element ref="udc:OperationName" minOccurs="0" />
      <xsd:element name="Query" minOccurs="0" type="xsd:string" />
    </xsd:all>
    <xsd:attribute name="Type" type="xsd:string" use="optional" />
  </xsd:complexType>
</xsd:element>

<xsd:element name="UpdateCommand" >
  <xsd:complexType >
    <xsd:all>
      <xsd:element ref="udc:ServiceUrl" minOccurs="0" />
      <xsd:element ref="udc:SoapAction" minOccurs="0" />
      <xsd:element ref="udc:OperationName" minOccurs="0" />
      <xsd:element name="Submit" minOccurs="0" type="xsd:string" />
      <xsd:element name="FileName" minOccurs="0" type="xsd:string" />
      <xsd:element ref="udc:FolderName" minOccurs="0" />
    </xsd:all>
  </xsd:complexType>
</xsd:element>

<xsd:element name="SoapAction" type="xsd:string" />

<xsd:element name="OperationName" type="xsd:string" />

<xsd:element name="FolderName" >
  <xsd:complexType >
    <xsd:simpleContent>
      <xsd:extension base="xsd:string">
        <xsd:attribute name="AllowOverwrite" use="optional" >
          <xsd:simpleType>
            <xsd:restriction base="xsd:string">
              <xsd:enumeration value="" />
              <xsd:enumeration value="0" />
              <xsd:enumeration value="1" />
              <xsd:enumeration value="false" />
              <xsd:enumeration value="true" />
            </xsd:restriction>
          </xsd:simpleType>
        </xsd:attribute>
      </xsd:extension>
    </xsd:simpleContent>
  </xsd:complexType>
</xsd:element>

<xsd:element name="ServiceUrl" >
  <xsd:complexType >
    <xsd:simpleContent>
      <xsd:extension base="xsd:string">
        <xsd:attribute name="UseFormsServiceProxy" use="optional" type="xsd:boolean" />
      </xsd:extension>
    </xsd:simpleContent>
  </xsd:complexType>
</xsd:element>

<xsd:element name="Authentication" >
  <xsd:complexType >
    <xsd:all>
      <xsd:element ref="udc:SSO" minOccurs="0" />

```

```

        <xsd:element ref="udc:UseExplicit" minOccurs="0" />
    </xsd:all>
</xsd:complexType>
</xsd:element>

<xsd:element name="UseExplicit" >
    <xsd:complexType >
        <xsd:all>
            <xsd:element name="UserId" minOccurs="0" type="xsd:string" />
            <xsd:element name="Password" minOccurs="0" type="xsd:string" />
        </xsd:all>
        <xsd:attribute name="CredentialType" use="required"
type="udc:CredentialTypeEnumeration" />
    </xsd:complexType>
</xsd:element>

<xsd:element name="SSO" >
    <xsd:complexType >
        <xsd:attribute name="AppId" use="required" type="xsd:string" />
        <xsd:attribute name="CredentialType" use="required"
type="udc:CredentialTypeEnumeration" />
    </xsd:complexType>
</xsd:element>

<xsd:simpleType name="CredentialTypeEnumeration" >
    <xsd:restriction base="xsd:string">
        <xsd:enumeration value="Sql" />
        <xsd:enumeration value="Ntlm" />
        <xsd:enumeration value="Kerberos" />
        <xsd:enumeration value="CD" />
        <xsd:enumeration value="Basic" />
        <xsd:enumeration value="Digest" />
    </xsd:restriction>
</xsd:simpleType>

<xsd:element name="SubType" >
    <xsd:complexType >
        <xsd:attribute name="MajorVersion" type="xsd:string" use="optional" />
        <xsd:attribute name="MinorVersion" type="xsd:string" use="optional" />
    </xsd:complexType>
</xsd:element>

</xsd:schema>

```

PRE

6 Appendix B: 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 Office InfoPath 2007
- Microsoft InfoPath 2010
- Microsoft InfoPath 2013
- Microsoft Office SharePoint Server 2007
- Microsoft SharePoint Server 2010
- Microsoft SharePoint Server 2013
- Microsoft SharePoint Server 2016
- Microsoft SharePoint Server 2019 Preview

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 2.3.6](#): Office InfoPath 2007, Microsoft Office Forms Server 2007, Microsoft Office Enterprise 2007 do not support **server-relative URLs** for the value of the **WsdlUrl** element.

<2> [Section 2.3.9](#): Office InfoPath 2007, Office Forms Server 2007, Office Enterprise 2007 do not support server-relative URLs for the value of the **WebUrl** element.

<3> [Section 2.3.11](#): Office InfoPath 2007, Office Forms Server 2007, Office Enterprise 2007 do not support server-relative URLs for the value of the **Query** element.

<4> [Section 2.3.18](#): Office InfoPath 2007, Office Forms Server 2007, Office Enterprise 2007 do not support server-relative URLs for the value of the **ServiceUrl** element.

7 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.

Section	Description	Revision class
6 Appendix B: Product Behavior	Updated list of supported products.	Major

8 Index

A

[Applicability](#) 11
Authentication
 [UDC schema](#) 22

C

[Change tracking](#) 36
[Connection type requirements](#) 26
 [database](#) 27
 [Rest](#) 28
 [SharePointLibrary](#) 26
 [SharePointList](#) 26
 [WebService](#) 27
 [XmlQuery](#) 27
 [XmlSubmit](#) 27
ConnectionInfo
 [UDC schema](#) 15
ConnectionString
 [UDC schema](#) 17
CredentialTypeEnumeration
 [UDC schema](#) 24

D

Database
 [connection type requirements](#) 27
 [Database example](#) 29
DataSource
 UDC schema ([section 2.3.1](#) 12, [section 2.4](#) 26)
Description
 [UDC schema](#) 13
Details - connection type requirements
 [database](#) 27
 [Rest](#) 28
 [SharePointLibrary](#) 26
 [SharePointList](#) 26
 [WebService](#) 27
 [XmlQuery](#) 27
 [XmlSubmit](#) 27
Details - UDC schema
 [Authentication](#) 22
 [ConnectionInfo](#) 15
 [ConnectionString](#) 17
 [CredentialTypeEnumeration](#) 24
 [DataSource](#) 12
 [Description](#) 13
 [FileName](#) 19
 [FolderName](#) 21
 [ListId](#) 17
 [Name](#) 13
 [OperationName](#) 20
 [Password](#) 24
 [Query](#) 18
 [SelectCommand](#) 16
 [ServiceUrl](#) 21
 [SoapAction](#) 20
 [SSO](#) 24
 [Submit](#) 19
 [SubType](#) 25

[Type](#) 13
 [UpdateCommand](#) 18
 [UseExplicit](#) 23
 [UserId](#) 23
 [WebUrl](#) 17
 [WsdlUrl](#) 15

E

[Empty Authentication example](#) 30
Examples 29
 [Database](#) 29
 [Empty Authentication](#) 30
 [WebService](#) 29

F

[Fields - vendor-extensible](#) 11
FileName
 [UDC schema](#) 19
FolderName
 [UDC schema](#) 21
[Full XML schema](#) 32

G

[Glossary](#) 7

I

[Implementer - security considerations](#) 31
[Informative references](#) 10
[Introduction](#) 7

L

ListId
 [UDC schema](#) 17
[Localization](#) 11

N

Name
 [UDC schema](#) 13
[Namespaces](#) 12
[Normative references](#) 9

O

OperationName
 [UDC schema](#) 20
[Overview \(synopsis\)](#) 10

P

Password
 [UDC schema](#) 24
[Product behavior](#) 35

Q

Query	
UDC schema	18
R	
References	9
informative	10
normative	9
Relationship to protocols and other structures	10
Rest	
connection type requirements	28
S	
Security - implementer considerations	31
SelectCommand	
UDC schema	16
ServiceUrl	
UDC schema	21
SharePointLibrary	
connection type requirements	26
SharePointList	
connection type requirements	26
SoapAction	
UDC schema	20
SSO	
UDC schema	24
Structures	
connection type requirements	26
Namespaces	12
UDC namespace	12
UDC processing instructions	12
UDC schema	12
Submit	
UDC schema	19
SubType	
UDC schema	25
T	
Tracking changes	36
Type	
UDC schema	13
U	
UDC namespace	12
UDC processing instructions	12
UDC schema	12
Authentication	22
ConnectionInfo	15
ConnectionString	17
CredentialTypeEnumeration	24
DataSource	12
Description	13
FileName	19
FolderName	21
ListId	17
Name	13
OperationName	20
Password	24
Query	18
SelectCommand	16
ServiceUrl	21
SoapAction	20
SSO	24
Submit	19
SubType	25
Type	13
UpdateCommand	18
UseExplicit	23
UserId	23
WebUrl	17
WsdUrl	15
UpdateCommand	
UDC schema	18
UseExplicit	
UDC schema	23
UserId	
UDC schema	23
V	
Vendor-extensible fields	11
Versioning	11
W	
WebService	
connection type requirements	27
WebService example	29
WebUrl	
UDC schema	17
WsdUrl	
UDC schema	15
X	
XML schema	32
XmlQuery	
connection type requirements	27
XmlSubmit	
connection type requirements	27