

[MS-WSSREST]:

ListData Data Service Protocol

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.

Revision Summary

Date	Revision History	Revision Class	Comments
7/13/2009	0.1	Major	Initial Availability
8/28/2009	0.2	Editorial	Revised and edited the technical content
11/6/2009	0.3	Editorial	Revised and edited the technical content
2/19/2010	1.0	Editorial	Revised and edited the technical content
3/31/2010	1.01	Editorial	Revised and edited the technical content
4/30/2010	1.02	Editorial	Revised and edited the technical content
6/7/2010	1.03	Editorial	Revised and edited the technical content
6/29/2010	1.04	Editorial	Changed language and formatting in the technical content.
7/23/2010	1.05	Minor	Clarified the meaning of the technical content.
9/27/2010	1.05	None	No changes to the meaning, language, or formatting of the technical content.
11/15/2010	1.05	None	No changes to the meaning, language, or formatting of the technical content.
12/17/2010	1.05	None	No changes to the meaning, language, or formatting of the technical content.
3/18/2011	1.05	None	No changes to the meaning, language, or formatting of the technical content.
6/10/2011	1.05	None	No changes to the meaning, language, or formatting of the technical content.
1/20/2012	2.0	Major	Significantly changed the technical content.
4/11/2012	2.0	None	No changes to the meaning, language, or formatting of the technical content.
7/16/2012	2.0	None	No changes to the meaning, language, or formatting of the technical content.
9/12/2012	2.0	None	No changes to the meaning, language, or formatting of the technical content.
10/8/2012	2.1	Minor	Clarified the meaning of the technical content.
2/11/2013	2.1	None	No changes to the meaning, language, or formatting of the technical content.
7/30/2013	2.1	None	No changes to the meaning, language, or formatting of the technical content.
11/18/2013	2.1	None	No changes to the meaning, language, or formatting of the technical content.
2/10/2014	2.1	None	No changes to the meaning, language, or formatting of the technical content.
4/30/2014	2.2	Minor	Clarified the meaning of the technical content.

Date	Revision History	Revision Class	Comments
7/31/2014	2.3	Minor	Clarified the meaning of the technical content.
10/30/2014	2.3	None	No changes to the meaning, language, or formatting of the technical content.
3/16/2015	3.0	Major	Significantly changed the technical content.
6/30/2015	4.0	Major	Significantly changed the technical content.
2/26/2016	5.0	Major	Significantly changed the technical content.
4/14/2016	6.0	Major	Significantly changed the technical content.
7/15/2016	6.0	None	No changes to the meaning, language, or formatting of the technical content.
9/14/2016	6.0	None	No changes to the meaning, language, or formatting of the technical content.
7/24/2018	7.0	Major	Significantly changed the technical content.
10/1/2018	8.0	Major	Significantly changed the technical content.
4/22/2021	9.0	Major	Significantly changed the technical content.
6/25/2021	10.0	Major	Significantly changed the technical content.
7/20/2021	11.0	Major	Significantly changed the technical content.
8/17/2021	12.0	Major	Significantly changed the technical content.

Table of Contents

1	Introduction	6
1.1	Glossary	6
1.2	References	7
1.2.1	Normative References	7
1.2.2	Informative References	7
1.3	Overview	8
1.3.1	Roles	8
1.3.2	Protocol Server.....	8
1.3.3	Protocol Client.....	8
1.4	Relationship to Other Protocols	8
1.5	Prerequisites/Preconditions	9
1.6	Applicability Statement	9
1.7	Versioning and Capability Negotiation	9
1.8	Vendor-Extensible Fields	9
1.9	Standards Assignments.....	9
2	Messages.....	10
2.1	Transport.....	10
2.2	Common Message Syntax	10
2.2.1	Messages.....	10
2.2.2	Elements	10
2.2.2.1	List	10
2.2.2.2	List Item.....	10
2.2.3	Complex Types.....	11
2.2.4	Simple Types	11
2.2.5	Attributes	12
2.2.6	Groups	12
2.2.7	Attribute Groups.....	12
3	Protocol Details.....	13
3.1	Server Details.....	13
3.1.1	Abstract Data Model.....	13
3.1.2	Timers	13
3.1.3	Initialization.....	13
3.1.4	Message Processing Events and Sequencing Rules	13
3.1.4.1	Attachment	14
3.1.4.2	Choice or Multi-Choice Field.....	14
3.1.4.3	Document	14
3.1.5	Timer Events.....	15
3.1.6	Other Local Events.....	15
4	Protocol Examples.....	16
4.1	Retrieve a CSDL Document	16
4.2	Retrieve List Items.....	20
4.2.1	Retrieve a Collection of List Items.....	20
4.2.2	Retrieve the Count of a Collection of List Items	26
4.2.3	Retrieve a Collection of Entities with an Inline Count	26
4.2.4	Retrieve the First Two List Items in a List	32
4.2.5	Retrieve the Last Two List Items in a List.....	33
4.2.6	Retrieve the Middle Two List Items in a List	35
4.2.7	Retrieve a List Item by ID.....	37
4.2.8	Retrieve List Items That Satisfy Specified Criteria	38
4.2.9	Retrieve List Items in a Specified Order	40
4.3	Insert a New List Item	43
4.4	Update a List Item	44

4.4.1	Update a List Item Using Replace-based Semantics.....	44
4.4.2	Update a List Item Using Merge-based Semantics.....	46
4.5	Delete a List Item	48
4.6	Batch Requests.....	48
5	Security.....	50
5.1	Security Considerations for Implementers	50
5.2	Index of Security Parameters	50
6	Appendix A: Full WSDL	51
7	Appendix B: Sample Site Data	52
8	Appendix C: Product Behavior	53
9	Change Tracking.....	54
10	Index.....	55

1 Introduction

This document specifies the ListData Data Service Protocol, which specifies extensions to the Atom Publishing Protocol (AtomPub) [\[RFC5023\]](#) and the Open Data Protocol (ODATA) Specification [\[MS-ODATA\]](#).

The extensions specified in this document enable applications to expose list data, using common web technologies, as a data service that can be consumed by clients within corporate networks and across the Internet.

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

1.1 Glossary

This document uses the following terms:

attachment: An external file that is included with an Internet message or associated with an item in a SharePoint list.

content type identifier: A unique identifier that is assigned to a content type.

document: An object in a content database such as a file, folder, **list**, or **site**. Each object is identified by a URI.

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

entity: An instance of an EntityType element that has a unique identity and an independent existence. An entity is an operational unit of consistency.

field: A container for metadata within a SharePoint list and associated list items.

field definition: The definition of a field in the Collaborative Application Markup Language (CAML).

field type: A name that identifies the action or effect that a field has within a document. Examples of field types are Author, Page, Comments, and Date.

hidden: A condition of an object that prevents it from being displayed in rendered output.

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.

list item: An individual entry within a SharePoint list. Each list item has a schema that maps to fields in the list that contains the item, depending on the content type of the item.

lookup field: A field of the Lookup type that enables users to select an item from another data source.

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.

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

Web 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.

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.

[MC-CSDL] Microsoft Corporation, "[Conceptual Schema Definition File Format](#)".

[MS-ODATA] Microsoft Corporation, "[Open Data Protocol \(OData\)](#)".

[MS-WSSTS] Microsoft Corporation, "[Windows SharePoint Services](#)".

[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.rfc-editor.org/rfc/rfc2616.txt>

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

[RFC5023] Gregorio, J., and de hOra, B., Eds., "The Atom Publishing Protocol", RFC 5023, October 2007, <http://www.rfc-editor.org/rfc/rfc5023.txt>

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

[XMLSCHEMA1/2] Thompson, H., Beech, D., Maloney, M., and Mendelsohn, N., Eds., "XML Schema Part 1: Structures Second Edition", W3C Recommendation, October 2004, <http://www.w3.org/TR/2004/REC-xmlschema-1-20041028/>

[XMLSCHEMA2/2] Biron, P., and Malhotra, A., Eds., "XML Schema Part 2: Datatypes Second Edition", W3C Recommendation, October 2004, <http://www.w3.org/TR/2004/REC-xmlschema-2-20041028/>

1.2.2 Informative References

None.

1.3 Overview

This protocol enables protocol clients to manage **lists** of data maintained by a protocol server. The protocol allows the client to control list data stored within the lists. A typical scenario for using this protocol is a data tracking application that allows users to access data remotely. Such an application could use this protocol to provide users with a way to maintain data on a central protocol server and access it through multiple protocol clients at different locations.

1.3.1 Roles

Two roles are always being played whenever this protocol is used. There is always a protocol client issuing requests to a protocol server, and there is always a protocol server to receive, process, and respond to the requests of protocol clients.

1.3.2 Protocol Server

The protocol server implements the Web service described by this protocol. It also maintains lists of data that are manipulated through that Web service.

1.3.3 Protocol Client

Protocol clients issue commands to the protocol server via the Web service methods described in this protocol.

1.4 Relationship to Other Protocols

This protocol uses the AtomPub messaging protocol as described in [\[RFC5023\]](#) and the OData protocol as described in [\[MS-ODATA\]](#) for formatting requests and responses. It transmits these messages using the HTTP protocol as described in [\[RFC2616\]](#) or the HTTPS protocol as described in [\[RFC2818\]](#). The mapping relationship of abstract data model as specified in [\[MS-WSSTS\]](#) and the Entity Data Model as specified in [\[MC-CSDL\]](#) depends on this protocol **[MS-WSSREST]**.

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

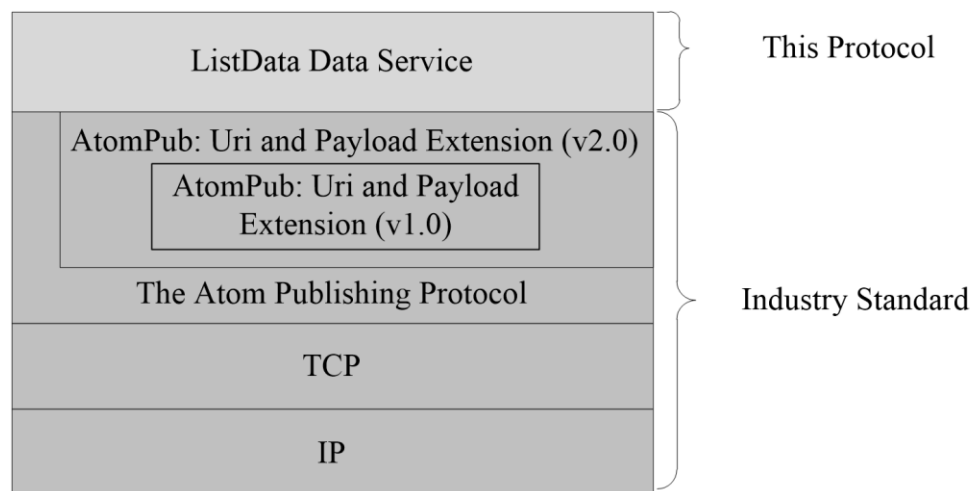


Figure 1: This protocol in relation to other protocols

1.5 Prerequisites/Preconditions

This protocol operates against a **site** that is identified by a **URL** that is known by protocol clients. It is a prerequisite that the client obtain a URL to the server before these extensions can be used.

1.6 Applicability Statement

AtomPub, as described in [\[RFC5023\]](#), and the OData, as described in [\[MS-ODATA\]](#), in combination with the extensions defined in this document, is appropriate for use in Web services that need a uniform, flexible, general purpose interface for exposing create, retrieve, update, delete operations on a data model to clients. It is less suited for Web services that are primarily method-oriented or in which data operations are constrained to certain prescribed patterns.

1.7 Versioning and Capability Negotiation

This document covers versioning issues in the following areas:

- **Supported Transports:** This document can be implemented on top of the Atom Publishing Protocol as described in section [2.1](#).
- **Protocol Versions:** Clients specify the protocol version as described in [\[MS-ODATA\]](#).
- **Capability Negotiation:** Capability negotiation is performed as described in [\[MS-ODATA\]](#).

1.8 Vendor-Extensible Fields

None.

1.9 Standards Assignments

None.

2 Messages

2.1 Transport

Protocol server transmits request and response messages using the HTTP protocol as specified in [\[RFC2616\]](#) or the HTTPS protocol as specified in [\[RFC2818\]](#). No new transports are required except for those specified in [\[MS-ODATA\]](#) section [2.1](#).

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 [\[XMLSCHEMA1/2\]](#) and [\[XMLSCHEMA2/2\]](#), and **WSDL**, as specified in [\[WSDL\]](#).

2.2.1 Messages

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

2.2.2 Elements

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

Element	Description
List	A container within a site that stores list items .
List item	An individual entry within a list .

2.2.2.1 List

Each **list** is represented as an EntitySet as specified in [\[MC-CSDL\]](#) section [2.1.18](#), which contains **Entities** of a single EntityType as specified in [\[MC-CSDL\]](#) section 2.1.2. This EntityType contains properties for every non-**hidden field** in the list whose **field type** is supported as well as a subset of hidden fields. List of supported field types and their mappings to the Entity Data Model property types is specified in section [2.2.2.2](#).

The following table specifies minimum set of hidden fields, as specified in [\[MS-WSSTS\]](#) section 2.4.2, which are supported and MUST be provided by server:

Field internal name	Entity Data Model property name
owshiddenversion	Owshiddenversion
FileDirRef	Path

The **owshiddenversion** field serves as the ETag property, as specified in [\[MS-ODATA\]](#) section [2.2.5.4](#), of the EntityType. The **FileDirRef** field represents the **list item**'s server-relative path.

2.2.2.2 List Item

Every **list item** is represented as an **Entity** of a particular EntityType as specified in [\[MC-CSDL\]](#) section 2.1.2. EntityTypes are created based on the **list** to which the list item belongs. Properties on

the EntityType correspond to **fields** of the list, with the field's type determining the type of the property, where these primitive and navigation property types are specified in [MC-CSDL] section 1.

The following table details the mapping between **field types**, as specified in [MS-WSSTS] section 2.3.1, and Entity Data Model property types:

Field type	Entity Data Model property type
AllDayEvent	Primitive (Boolean)
Attachments	Navigation
Boolean	Primitive (Boolean)
Choice	Navigation
ContentTypeId	Primitive (String)
Counter	Primitive (Int32)
CrossProjectLink	Primitive (Boolean)
Currency	Primitive (Double)
DateTime	Primitive (DateTime)
File	Primitive (String)
GridChoice	Primitive (String)
Integer	Primitive (Int32)
Lookup	Navigation
MaxItems	Primitive (Int32)
ModStat	Primitive (String)
MultiChoice	Navigation
Note	Primitive (String)
Number	Primitive (Double)
PageSeparator	Primitive (String)
Recurrence	Primitive (Boolean)
Text	Primitive (String)
ThreadIndex	Primitive (Int32)
URL	Primitive (String)
User	Navigation
WorkflowEventType	Primitive (String)
WorkflowStatus	Primitive (Int32)

2.2.3 Complex Types

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

2.2.4 Simple Types

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

2.2.5 Attributes

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

2.2.6 Groups

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

2.2.7 Attribute Groups

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

3 Protocol Details

3.1 Server Details

3.1.1 Abstract Data Model

This section describes the relationship between the abstract data model as specified in [MS-WSSTS] section 2.1.2.7 and the Entity Data Model as specified in [MC-CSDL] section 1.0. The mapping between Entity Data Model concepts and those of the AtomPub specification is specified in [MS-ODATA] section 2.2.1. The described relationship is provided to facilitate the explanation of how the protocol behaves. This document does not mandate that implementations adhere to this model, as long as their external behavior is consistent with the behavior specified in [MS-ODATA] and [MC-CSDL].

Data structures as specified in [MS-WSSTS] map to Entity Data Model terms as shown in the following table:

Site and list data structure	Entity Data Model term
List	EntitySet
Lookup field	NavigationProperty
Choice Field	NavigationProperty
Attachments Field	NavigationProperty
ID Field	Entity Key

3.1.2 Timers

None.

3.1.3 Initialization

None.

3.1.4 Message Processing Events and Sequencing Rules

This protocol provides operations support as described in the following table.

Element	Operations support
Attachment	Support for create, retrieve, update, delete operations.
Choice or multi-choice field	Support for retrieve operation on choice and multi-choice fields.
Document	Support for inserting a new document into a document library.

3.1.4.1 Attachment

To facilitate create, retrieve, update, delete operations support for **list item attachments**, an additional EntitySet is created. This EntitySet does not correspond to any **list**. Attachments are represented as a multi-valued navigation property on an **Entity**.

The EntityType for this EntitySet contains three properties, "EntitySet", "ItemId" and "Name". All the three properties together serve as its Entity Key, as specified in [\[MC-CSDL\]](#) section 2.1.5.

The protocol client MUST include a Slug header (as specified in [\[RFC5023\]](#) section 9.7) whose value is the name of the EntitySet followed by the identifier of the entity the attachment belongs to as well as the name of the attachment. The Augmented BNF for SLUG header construction when inserting new attachments is as follows:

```
slug      = entityset "|" entityid "|" filename

entityset  = *pchar                ; section 3.3 of [RFC3986]
           ; the name of an Entity Set in the EDM model in which the attachment belongs

entityid   = *pchar                ; section 3.3 of [RFC3986]
           ; the ID of the entity to which this attachment belongs

filename   = *pchar                ; section 3.3 of [RFC3986]
           ; desired name of attachment including its extension
```

Using the preceding Augmented BNF causes an attachment to be created on the protocol server. For more details, see [\[MS-ODATA\]](#) section [3.2.5](#).

3.1.4.2 Choice or Multi-Choice Field

An EntitySet is created for every choice or multi-choice **field** belonging to a **list**. For a particular choice or multi-choice field, this EntitySet will contain **Entities** representing each option of the field specified in the **field definition** of the field.

The EntityType for this EntitySet as specified in [\[MC-CSDL\]](#) section [2.1.18](#) contains a single property "Value", which also serves as its Entity Key as specified in [\[MC-CSDL\]](#) section 2.1.5.

Choice and multi-choice fields are mapped as navigation properties between the EntityType corresponding to the **list item** and the EntityType mentioned earlier.

For more details, see [\[MS-ODATA\]](#) section [3.2.5](#).

3.1.4.3 Document

Document libraries are represented as EntityTypes that have an associated media resource, as specified in [\[RFC5023\]](#).

Inserting new **documents** to a document library involve sending a POST request containing the contents of the document to the EntitySet representing the document library. The protocol client MUST include the SLUG header (as specified in [\[RFC5023\]](#) section 9.7) whose value is the name of the file that is being created in their POST requests. The client can include the **content type identifier** of the document. If the content type identifier is omitted, the document will be assigned the default content type identifier of the document library. The Augmented BNF for SLUG header construction when inserting new documents is as follows:

```
slug      = path [ "|" contenttype ]

path      = serverpath
           "/"
```

```
filename

serverpath    = *pchar                ; section 3.3 of [RFC3986]
               ; server-relative path of document

filename      = *pchar                ; section 3.3 of [RFC3986]
               ; desired name of the document including its extension

contenttype   = *pchar                ; section 3.3 of [RFC3986]
               ; content type identifier of the document
```

Using the preceding Augmented BNF causes a document to be created on the protocol server. For more details, see [\[MS-ODATA\]](#) section [3.2.5](#).

3.1.5 Timer Events

None.

3.1.6 Other Local Events

None.

4 Protocol Examples

All examples in this section use the sample site data shown in Appendix B: Sample Site Data, section 7.

4.1 Retrieve a CSDL Document

The following example illustrates the exchange of messages required for a client to retrieve the conceptual schema definition language (CSDL) document of a data service using the AtomPub format.

HTTP Request:

```
GET /_vti_bin/ListData.svc/$metadata HTTP/1.1
Accept: application/xml
Host: www.contoso.com
```

HTTP Response:

```
<?xml version="1.0" encoding="utf-8" standalone="yes"?>
<edmx:Edmx Version="1.0" xmlns:edmx="http://schemas.microsoft.com/ado/2007/06/edmx">
  <edmx:DataServices>
    <Schema Namespace="Microsoft.SharePoint.DataService"
      xmlns:d="http://schemas.microsoft.com/ado/2007/08/dataservices"
      xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metadata"
      xmlns:m2="http://schemas.microsoft.com/ado/2008/11/dataservices/metadata"
      xmlns="http://schemas.microsoft.com/ado/2007/05/edm">
      <EntityType Name="Attachments" m2:HasStream="$default">
        <Key>
          <PropertyRef Name="Url" />
        </Key>
        <Property Name="Url" Type="Edm.String" Nullable="false" />
      </EntityType>
      <EntityType Name="EmployeesItem">
        <Key>
          <PropertyRef Name="ID" />
        </Key>
        <Property Name="FullName" Type="Edm.String" Nullable="true" m2:EpmAtom="true"
          m2:EpmTargetPath="EpmSyndicationTitle" m2:EpmContentKind="EpmPlaintext"
          m2:EpmKeepContent="true" />
        <Property Name="HireDate" Type="Edm.DateTime" Nullable="true" />
        <Property Name="Salary" Type="Edm.Double" Nullable="true" />
        <NavigationProperty Name="Projects"
          Relationship="Microsoft.SharePoint.DataService.EmployeesItem_Projects"
          FromRole="EmployeesItem" ToRole="Projects" />
        <Property Name="ID" Type="Edm.Int32" Nullable="false" />
        <Property Name="Modified" Type="Edm.DateTime" Nullable="true" />
        <Property Name="Created" Type="Edm.DateTime" Nullable="true" />
        <NavigationProperty Name="CreatedBy"
          Relationship="Microsoft.SharePoint.DataService.EmployeesItem_CreatedBy"
          FromRole="EmployeesItem" ToRole="CreatedBy" />
        <NavigationProperty Name="ModifiedBy"
          Relationship="Microsoft.SharePoint.DataService.EmployeesItem ModifiedBy"
          FromRole="EmployeesItem" ToRole="ModifiedBy" />
        <Property Name="Owshiddenversion" Type="Edm.Int32" Nullable="true"
          ConcurrencyMode="Fixed" />
        <Property Name="Version" Type="Edm.String" Nullable="true" />
        <NavigationProperty Name="Attachments"
          Relationship="Microsoft.SharePoint.DataService.EmployeesItem Attachments"
          FromRole="EmployeesItem" ToRole="Attachments" />
        <Property Name="Path" Type="Edm.String" Nullable="true" />
      </EntityType>
      <EntityType Name="LocationsItem">
        <Key>
```



```

    <PropertyRef Name="ID" />
  </Key>
  <Property Name="Name" Type="Edm.String" Nullable="true" m2:EpmAtom="true"
    m2:EpmTargetPath="EpmSyndicationTitle" m2:EpmContentKind="EpmPlaintext"
    m2:EpmKeepContent="true" />
  <Property Name="Address" Type="Edm.String" Nullable="true" />
  <Property Name="City" Type="Edm.String" Nullable="true" />
  <Property Name="State" Type="Edm.String" Nullable="true" />
  <Property Name="ZipCode" Type="Edm.String" Nullable="true" />
  <Property Name="ID" Type="Edm.Int32" Nullable="false" />
  <Property Name="Modified" Type="Edm.DateTime" Nullable="true" />
  <Property Name="Created" Type="Edm.DateTime" Nullable="true" />
  <NavigationProperty Name="CreatedBy"
    Relationship="Microsoft.SharePoint.DataService.LocationsItem_CreatedBy"
    FromRole="LocationsItem" ToRole="CreatedBy" />
  <NavigationProperty Name="ModifiedBy"
    Relationship="Microsoft.SharePoint.DataService.LocationsItem ModifiedBy"
    FromRole="LocationsItem" ToRole="ModifiedBy" />
  <Property Name="Owshiddenversion" Type="Edm.Int32" Nullable="true"
    ConcurrencyMode="Fixed" />
  <Property Name="Version" Type="Edm.String" Nullable="true" />
  <Property Name="Path" Type="Edm.String" Nullable="true" />
</EntityType>
<EntityType Name="ProjectsItem">
  <Key>
    <PropertyRef Name="ID" />
  </Key>
  <Property Name="Title" Type="Edm.String" Nullable="true" m2:EpmAtom="true"
    m2:EpmTargetPath="EpmSyndicationTitle" m2:EpmContentKind="EpmPlaintext"
    m2:EpmKeepContent="true" />
  <Property Name="Description" Type="Edm.String" Nullable="true" />
  <Property Name="DueDate" Type="Edm.DateTime" Nullable="true" />
  <Property Name="OnTrack" Type="Edm.Boolean" Nullable="true" />
  <NavigationProperty Name="Location"
    Relationship="Microsoft.SharePoint.DataService.ProjectsItem_Location"
    FromRole="ProjectsItem" ToRole="Location" />
  <Property Name="ID" Type="Edm.Int32" Nullable="false" />
  <Property Name="Modified" Type="Edm.DateTime" Nullable="true" />
  <Property Name="Created" Type="Edm.DateTime" Nullable="true" />
  <NavigationProperty Name="CreatedBy"
    Relationship="Microsoft.SharePoint.DataService.ProjectsItem_CreatedBy"
    FromRole="ProjectsItem" ToRole="CreatedBy" />
  <NavigationProperty Name="ModifiedBy"
    Relationship="Microsoft.SharePoint.DataService.ProjectsItem_ModifiedBy"
    FromRole="ProjectsItem" ToRole="ModifiedBy" />
  <Property Name="Owshiddenversion" Type="Edm.Int32" Nullable="true"
    ConcurrencyMode="Fixed" />
  <Property Name="Version" Type="Edm.String" Nullable="true" />
  <NavigationProperty Name="Attachments"
    Relationship="Microsoft.SharePoint.DataService.ProjectsItem_Attachments"
    FromRole="ProjectsItem" ToRole="Attachments" />
  <Property Name="Path" Type="Edm.String" Nullable="true" />
</EntityType>
<EntityType Name="UserInformationListItem">
  <Key>
    <PropertyRef Name="ID" />
  </Key>
  <Property Name="ID" Type="Edm.Int32" Nullable="false" />
  <Property Name="Name" Type="Edm.String" Nullable="true" m2:EpmAtom="true"
    m2:EpmTargetPath="EpmSyndicationTitle" m2:EpmContentKind="EpmPlaintext"
    m2:EpmKeepContent="true" />
  <Property Name="Modified" Type="Edm.DateTime" Nullable="true" />
  <Property Name="Created" Type="Edm.DateTime" Nullable="true" />
  <NavigationProperty Name="CreatedBy"
    Relationship="Microsoft.SharePoint.DataService.UserInformationListItem CreatedBy"
    FromRole="UserInformationListItem" ToRole="CreatedBy" />
  <NavigationProperty Name="ModifiedBy"
    Relationship="Microsoft.SharePoint.DataService.UserInformationListItem_ModifiedBy"
    FromRole="UserInformationListItem" ToRole="ModifiedBy" />

```

```

<Property Name="Owshiddenversion" Type="Edm.Int32" Nullable="true"
  ConcurrencyMode="Fixed" />
<Property Name="Version" Type="Edm.String" Nullable="true" />
<NavigationProperty Name="Attachments"
  Relationship="Microsoft.SharePoint.DataService.UserInformationListItem_Attachments"
  FromRole="UserInformationListItem" ToRole="Attachments" />
<Property Name="Path" Type="Edm.String" Nullable="true" />
<Property Name="Account" Type="Edm.String" Nullable="true" />
<Property Name="EMail" Type="Edm.String" Nullable="true" />
<Property Name="MobileNumber" Type="Edm.String" Nullable="true" />
<Property Name="AboutMe" Type="Edm.String" Nullable="true" />
<Property Name="SIPAddress" Type="Edm.String" Nullable="true" />
<Property Name="IsSiteAdmin" Type="Edm.Boolean" Nullable="true" />
<Property Name="Deleted" Type="Edm.Boolean" Nullable="true" />
<Property Name="Picture" Type="Edm.String" Nullable="true" />
<Property Name="Department" Type="Edm.String" Nullable="true" />
<Property Name="JobTitle" Type="Edm.String" Nullable="true" />
</EntityType>
<Association Name="EmployeesItem Projects">
  <End Role="Projects" Type="Microsoft.SharePoint.DataService.ProjectsItem"
    Multiplicity="*" />
  <End Role="EmployeesItem" Type="Microsoft.SharePoint.DataService.EmployeesItem"
    Multiplicity="*" />
</Association>
<Association Name="EmployeesItem_CreatedBy">
  <End Role="CreatedBy" Type="Microsoft.SharePoint.DataService.UserInformationListItem"
    Multiplicity="0..1" />
  <End Role="EmployeesItem" Type="Microsoft.SharePoint.DataService.EmployeesItem"
    Multiplicity="*" />
</Association>
<Association Name="EmployeesItem ModifiedBy">
  <End Role="ModifiedBy"
Type="Microsoft.SharePoint.DataService.UserInformationListItem"
    Multiplicity="0..1" />
  <End Role="EmployeesItem" Type="Microsoft.SharePoint.DataService.EmployeesItem"
    Multiplicity="*" />
</Association>
<Association Name="EmployeesItem Attachments">
  <End Role="Attachments" Type="Microsoft.SharePoint.DataService.Attachments"
    Multiplicity="*" />
  <End Role="EmployeesItem" Type="Microsoft.SharePoint.DataService.EmployeesItem"
    Multiplicity="*" />
</Association>
<Association Name="LocationsItem_CreatedBy">
  <End Role="CreatedBy" Type="Microsoft.SharePoint.DataService.UserInformationListItem"
    Multiplicity="0..1" />
  <End Role="LocationsItem" Type="Microsoft.SharePoint.DataService.LocationsItem"
    Multiplicity="*" />
</Association>
<Association Name="LocationsItem ModifiedBy">
  <End Role="ModifiedBy"
Type="Microsoft.SharePoint.DataService.UserInformationListItem"
    Multiplicity="0..1" />
  <End Role="LocationsItem" Type="Microsoft.SharePoint.DataService.LocationsItem"
    Multiplicity="*" />
</Association>
<Association Name="LocationsItem Attachments">
  <End Role="Attachments" Type="Microsoft.SharePoint.DataService.Attachments"
    Multiplicity="*" />
  <End Role="LocationsItem" Type="Microsoft.SharePoint.DataService.LocationsItem"
    Multiplicity="*" />
</Association>
<Association Name="ProjectsItem Location">
  <End Role="Location" Type="Microsoft.SharePoint.DataService.LocationsItem"
    Multiplicity="0..1" />
  <End Role="ProjectsItem" Type="Microsoft.SharePoint.DataService.ProjectsItem"
    Multiplicity="*" />
</Association>
<Association Name="ProjectsItem_CreatedBy">

```

```

    <End Role="CreatedBy" Type="Microsoft.SharePoint.DataService.UserInformationListItem"
      Multiplicity="0..1" />
    <End Role="ProjectsItem" Type="Microsoft.SharePoint.DataService.ProjectsItem"
      Multiplicity="*" />
  </Association>
  <Association Name="ProjectsItem ModifiedBy">
    <End Role="ModifiedBy"
      Type="Microsoft.SharePoint.DataService.UserInformationListItem"
      Multiplicity="0..1" />
    <End Role="ProjectsItem" Type="Microsoft.SharePoint.DataService.ProjectsItem"
      Multiplicity="*" />
  </Association>
  <Association Name="ProjectsItem Attachments">
    <End Role="Attachments" Type="Microsoft.SharePoint.DataService.Attachments"
      Multiplicity="*" />
    <End Role="ProjectsItem" Type="Microsoft.SharePoint.DataService.ProjectsItem"
      Multiplicity="*" />
  </Association>
  <Association Name="UserInformationListItem CreatedBy">
    <End Role="CreatedBy" Type="Microsoft.SharePoint.DataService.UserInformationListItem"
      Multiplicity="0..1" />
    <End Role="UserInformationListItem"
      Type="Microsoft.SharePoint.DataService.UserInformationListItem" Multiplicity="*" />
  </Association>
  <Association Name="UserInformationListItem ModifiedBy">
    <End Role="ModifiedBy"
      Type="Microsoft.SharePoint.DataService.UserInformationListItem"
      Multiplicity="0..1" />
    <End Role="UserInformationListItem"
      Type="Microsoft.SharePoint.DataService.UserInformationListItem" Multiplicity="*" />
  </Association>
  <Association Name="UserInformationListItem Attachments">
    <End Role="Attachments" Type="Microsoft.SharePoint.DataService.Attachments"
      Multiplicity="*" />
    <End Role="UserInformationListItem"
      Type="Microsoft.SharePoint.DataService.UserInformationListItem" Multiplicity="*" />
  </Association>
  <EntityContainer Name="TeamSiteDataContext" m:IsDefaultEntityContainer="true">
    <EntitySet Name="Attachments"
      EntityType="Microsoft.SharePoint.DataService.Attachments" />
    <EntitySet Name="Employees"
      EntityType="Microsoft.SharePoint.DataService.EmployeesItem" />
    <EntitySet Name="Locations"
      EntityType="Microsoft.SharePoint.DataService.LocationsItem" />
    <EntitySet Name="Projects"
      EntityType="Microsoft.SharePoint.DataService.ProjectsItem" />
    <EntitySet Name="UserInformationList"
      EntityType="Microsoft.SharePoint.DataService.UserInformationListItem" />
    <AssociationSet Name="EmployeesItem Projects"
      Association="Microsoft.SharePoint.DataService.EmployeesItem_Projects">
      <End Role="Projects" EntitySet="Projects" />
      <End Role="EmployeesItem" EntitySet="Employees" />
    </AssociationSet>
    <AssociationSet Name="EmployeesItem CreatedBy"
      Association="Microsoft.SharePoint.DataService.EmployeesItem_CreatedBy">
      <End Role="CreatedBy" EntitySet="UserInformationList" />
      <End Role="EmployeesItem" EntitySet="Employees" />
    </AssociationSet>
    <AssociationSet Name="EmployeesItem ModifiedBy"
      Association="Microsoft.SharePoint.DataService.EmployeesItem_ModifiedBy">
      <End Role="ModifiedBy" EntitySet="UserInformationList" />
      <End Role="EmployeesItem" EntitySet="Employees" />
    </AssociationSet>
    <AssociationSet Name="EmployeesItem Attachments"
      Association="Microsoft.SharePoint.DataService.EmployeesItem Attachments">
      <End Role="Attachments" EntitySet="Attachments" />
      <End Role="EmployeesItem" EntitySet="Employees" />
    </AssociationSet>
    <AssociationSet Name="LocationsItem_CreatedBy"

```

```

    Association="Microsoft.SharePoint.DataService.LocationsItem CreatedBy">
    <End Role="CreatedBy" EntitySet="UserInformationList" />
    <End Role="LocationsItem" EntitySet="Locations" />
</AssociationSet>
<AssociationSet Name="LocationsItem_ModifiedBy"
    Association="Microsoft.SharePoint.DataService.LocationsItem ModifiedBy">
    <End Role="ModifiedBy" EntitySet="UserInformationList" />
    <End Role="LocationsItem" EntitySet="Locations" />
</AssociationSet>
<AssociationSet Name="LocationsItem Attachments"
    Association="Microsoft.SharePoint.DataService.LocationsItem Attachments">
    <End Role="Attachments" EntitySet="Attachments" />
    <End Role="LocationsItem" EntitySet="Locations" />
</AssociationSet>
<AssociationSet Name="ProjectsItem_Location"
    Association="Microsoft.SharePoint.DataService.ProjectsItem_Location">
    <End Role="Location" EntitySet="Locations" />
    <End Role="ProjectsItem" EntitySet="Projects" />
</AssociationSet>
<AssociationSet Name="ProjectsItem_CreatedBy"
    Association="Microsoft.SharePoint.DataService.ProjectsItem_CreatedBy">
    <End Role="CreatedBy" EntitySet="UserInformationList" />
    <End Role="ProjectsItem" EntitySet="Projects" />
</AssociationSet>
<AssociationSet Name="ProjectsItem_ModifiedBy"
    Association="Microsoft.SharePoint.DataService.ProjectsItem_ModifiedBy">
    <End Role="ModifiedBy" EntitySet="UserInformationList" />
    <End Role="ProjectsItem" EntitySet="Projects" />
</AssociationSet>
<AssociationSet Name="ProjectsItem Attachments"
    Association="Microsoft.SharePoint.DataService.ProjectsItem Attachments">
    <End Role="Attachments" EntitySet="Attachments" />
    <End Role="ProjectsItem" EntitySet="Projects" />
</AssociationSet>
<AssociationSet Name="UserInformationListItem_CreatedBy"
    Association="Microsoft.SharePoint.DataService.UserInformationListItem_CreatedBy">
    <End Role="CreatedBy" EntitySet="UserInformationList" />
    <End Role="UserInformationListItem" EntitySet="UserInformationList" />
</AssociationSet>
<AssociationSet Name="UserInformationListItem_ModifiedBy"
    Association="Microsoft.SharePoint.DataService.UserInformationListItem_ModifiedBy">
    <End Role="ModifiedBy" EntitySet="UserInformationList" />
    <End Role="UserInformationListItem" EntitySet="UserInformationList" />
</AssociationSet>
<AssociationSet Name="UserInformationListItem Attachments"
    Association="Microsoft.SharePoint.DataService.UserInformationListItem Attachments">
    <End Role="Attachments" EntitySet="Attachments" />
    <End Role="UserInformationListItem" EntitySet="UserInformationList" />
</AssociationSet>
</EntityContainer>
</Schema>
</edmx:DataServices>
</edmx:Edmx>

```

4.2 Retrieve List Items

4.2.1 Retrieve a Collection of List Items

The following example illustrates the exchange of messages required for a client to retrieve all Employee list items from a data service using the AtomPub format.

HTTP Request:

```

GET /_vti_bin/ListData.svc/Employees HTTP/1.1
Accept: application/atom+xml

```

DataServiceVersion: 1.0
MaxDataServiceVersion: 2.0
Host: www.contoso.com

HTTP Response:

HTTP/1.1 200 OK
Cache-Control: no-cache
Content-Type: application/atom+xml;charset=utf-8
Server: Microsoft-IIS/7.0
SPRequestGuid: d08f639f-59f9-451d-b09a-f4d073914262
DataServiceVersion: 2.0;
X-AspNet-Version: 2.0.50727
Set-Cookie: SDA Callback=05/01/2009 12:36:35; expires=Fri, 01-May-2009 19:46:35 GMT; path=/
Set-Cookie: WSS_KeepSessionAuthenticated={afbe7ca4-c701-4f7d-9021-25cab947ae3f}; path=/
X-Powered-By: ASP.NET
MicrosoftSharePointTeamServices: 14.0.0.4006
Date: Fri, 01 May 2009 19:36:50 GMT
Content-Length: ###

```
<?xml version="1.0" encoding="utf-8" standalone="yes"?>
<feed xml:base="http://www.contoso.com/_vti_bin/ListData.svc/"
  xmlns:d="http://schemas.microsoft.com/ado/2007/08/dataservices"
  xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metadata"
  xmlns="http://www.w3.org/2005/Atom">
  <title type="text">Employees</title>
  <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees</id>
  <updated>2009-05-01T19:36:50Z</updated>
  <link rel="self" title="Employees" href="Employees" />
  <entry m:etag="W/&quot;l&quot;">
    <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees(1)</id>
    <title type="text">Margeret Smith</title>
    <updated>2009-05-01T19:36:50Z</updated>
    <author>
      <name />
    </author>
    <link rel="edit" title="EmployeesItem" href="Employees(1)" />
    <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Projects"
      type="application/atom+xml;type=feed" title="Projects"
      href="Employees(1)/Projects" />
    <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"
      type="application/atom+xml;type=entry" title="CreatedBy"
      href="Employees(1)/CreatedBy" />
    <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"
      type="application/atom+xml;type=entry" title="ModifiedBy"
      href="Employees(1)/ModifiedBy" />
    <category term="Microsoft.SharePoint.DataService.EmployeesItem"
      scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
    <content type="application/xml">
      <m:properties>
        <d:FullName>Margeret Smith</d:FullName>
        <d:Salary m:type="Edm.Double">75000</d:Salary>
        <d:HireDate m:type="Edm.DateTime">1984-01-07T00:00:00</d:HireDate>
        <d:ID m:type="Edm.Int32">1</d:ID>
        <d:Modified m:type="Edm.DateTime">2009-05-01T12:21:21</d:Modified>
        <d:Created m:type="Edm.DateTime">2009-05-01T12:21:21</d:Created>
        <d:Owshiddenversion m:type="Edm.Int32">1</d:Owshiddenversion>
        <d:Version>1.0</d:Version>
        <d:Path>/Lists/Employees</d:Path>
      </m:properties>
    </content>
  </entry>
  <entry m:etag="W/&quot;l&quot;">
    <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees(2)</id>
    <title type="text">Sean Jacobson</title>
    <updated>2009-05-01T19:36:50Z</updated>
    <author>
      <name />
    </author>
```

```

</author>
<link rel="edit" title="EmployeesItem" href="Employees (2)" />
<link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Projects"
  type="application/atom+xml;type=feed" title="Projects"
  href="Employees (2)/Projects" />
<link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"
  type="application/atom+xml;type=entry" title="CreatedBy"
  href="Employees (2)/CreatedBy" />
<link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"
  type="application/atom+xml;type=entry" title="ModifiedBy"
  href="Employees (2)/ModifiedBy" />
<category term="Microsoft.SharePoint.DataService.EmployeesItem"
  scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
<content type="application/xml">
  <m:properties>
    <d:FullName>Sean Jacobson</d:FullName>
    <d:Salary m:type="Edm.Double">92000</d:Salary>
    <d:HireDate m:type="Edm.DateTime">1974-06-20T00:00:00</d:HireDate>
    <d:ID m:type="Edm.Int32">2</d:ID>
    <d:Modified m:type="Edm.DateTime">2009-05-01T12:21:21</d:Modified>
    <d:Created m:type="Edm.DateTime">2009-05-01T12:21:21</d:Created>
    <d:Owshiddenversion m:type="Edm.Int32">1</d:Owshiddenversion>
    <d:Version>1.0</d:Version>
    <d:Path>/Lists/Employees</d:Path>
  </m:properties>
</content>
</entry>
<entry m:etag="W/&quot;1&quot;">
  <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees (3)</id>
  <title type="text">Alex Gurthner</title>
  <updated>2009-05-01T19:36:50Z</updated>
  <author>
    <name />
  </author>
  <link rel="edit" title="EmployeesItem" href="Employees (3)" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Projects"
    type="application/atom+xml;type=feed" title="Projects"
    href="Employees (3)/Projects" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"
    type="application/atom+xml;type=entry" title="CreatedBy"
    href="Employees (3)/CreatedBy" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"
    type="application/atom+xml;type=entry" title="ModifiedBy"
    href="Employees (3)/ModifiedBy" />
  <category term="Microsoft.SharePoint.DataService.EmployeesItem"
    scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
  <content type="application/xml">
    <m:properties>
      <d:FullName>Alex Gurthner</d:FullName>
      <d:Salary m:type="Edm.Double">68000</d:Salary>
      <d:HireDate m:type="Edm.DateTime">1990-10-14T00:00:00</d:HireDate>
      <d:ID m:type="Edm.Int32">3</d:ID>
      <d:Modified m:type="Edm.DateTime">2009-05-01T12:21:21</d:Modified>
      <d:Created m:type="Edm.DateTime">2009-05-01T12:21:21</d:Created>
      <d:Owshiddenversion m:type="Edm.Int32">1</d:Owshiddenversion>
      <d:Version>1.0</d:Version>
      <d:Path>/Lists/Employees</d:Path>
    </m:properties>
  </content>
</entry>
<entry m:etag="W/&quot;1&quot;">
  <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees (4)</id>
  <title type="text">Phyllis Allen</title>
  <updated>2009-05-01T19:36:50Z</updated>
  <author>
    <name />
  </author>
  <link rel="edit" title="EmployeesItem" href="Employees (4)" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Projects"

```

```

    type="application/atom+xml;type=feed" title="Projects"
    href="Employees (4) /Projects" />
<link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"
    type="application/atom+xml;type=entry" title="CreatedBy"
    href="Employees (4) /CreatedBy" />
<link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"
    type="application/atom+xml;type=entry" title="ModifiedBy"
    href="Employees (4) /ModifiedBy" />
<category term="Microsoft.SharePoint.DataService.EmployeesItem"
    scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
<content type="application/xml">
  <m:properties>
    <d:FullName>Phyllis Allen</d:FullName>
    <d:Salary m:type="Edm.Double">108000</d:Salary>
    <d:HireDate m:type="Edm.DateTime">1975-03-28T00:00:00</d:HireDate>
    <d:ID m:type="Edm.Int32">4</d:ID>
    <d:Modified m:type="Edm.DateTime">2009-05-01T12:21:21</d:Modified>
    <d:Created m:type="Edm.DateTime">2009-05-01T12:21:21</d:Created>
    <d:Owshiddenversion m:type="Edm.Int32">1</d:Owshiddenversion>
    <d:Version>1.0</d:Version>
    <d:Path>/Lists/Employees</d:Path>
  </m:properties>
</content>
</entry>
<entry m:etag="W/&quot;1&quot;">
  <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees (5)</id>
  <title type="text">Carol Beck</title>
  <updated>2009-05-01T19:36:50Z</updated>
  <author>
    <name />
  </author>
  <link rel="edit" title="EmployeesItem" href="Employees (5)" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Projects"
    type="application/atom+xml;type=feed" title="Projects"
    href="Employees (5) /Projects" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"
    type="application/atom+xml;type=entry" title="CreatedBy"
    href="Employees (5) /CreatedBy" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"
    type="application/atom+xml;type=entry" title="ModifiedBy"
    href="Employees (5) /ModifiedBy" />
  <category term="Microsoft.SharePoint.DataService.EmployeesItem"
    scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
  <content type="application/xml">
    <m:properties>
      <d:FullName>Carol Beck</d:FullName>
      <d:Salary m:type="Edm.Double">88000</d:Salary>
      <d:HireDate m:type="Edm.DateTime">1989-08-11T00:00:00</d:HireDate>
      <d:ID m:type="Edm.Int32">5</d:ID>
      <d:Modified m:type="Edm.DateTime">2009-05-01T12:21:21</d:Modified>
      <d:Created m:type="Edm.DateTime">2009-05-01T12:21:21</d:Created>
      <d:Owshiddenversion m:type="Edm.Int32">1</d:Owshiddenversion>
      <d:Version>1.0</d:Version>
      <d:Path>/Lists/Employees</d:Path>
    </m:properties>
  </content>
</entry>
<entry m:etag="W/&quot;1&quot;">
  <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees (6)</id>
  <title type="text">Willie Brooks</title>
  <updated>2009-05-01T19:36:50Z</updated>
  <author>
    <name />
  </author>
  <link rel="edit" title="EmployeesItem" href="Employees (6)" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Projects"
    type="application/atom+xml;type=feed" title="Projects"
    href="Employees (6) /Projects" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"

```

```

    type="application/atom+xml;type=entry" title="CreatedBy"
    href="Employees (6) /CreatedBy" />
<link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"
    type="application/atom+xml;type=entry" title="ModifiedBy"
    href="Employees (6) /ModifiedBy" />
<category term="Microsoft.SharePoint.DataService.EmployeesItem"
    scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
<content type="application/xml">
    <m:properties>
        <d:FullName>Willie Brooks</d:FullName>
        <d:Salary m:type="Edm.Double">95000</d:Salary>
        <d:HireDate m:type="Edm.DateTime">1983-02-06T00:00:00</d:HireDate>
        <d:ID m:type="Edm.Int32">6</d:ID>
        <d:Modified m:type="Edm.DateTime">2009-05-01T12:21:21</d:Modified>
        <d:Created m:type="Edm.DateTime">2009-05-01T12:21:21</d:Created>
        <d:Owshiddenversion m:type="Edm.Int32">1</d:Owshiddenversion>
        <d:Version>1.0</d:Version>
        <d:Path>/Lists/Employees</d:Path>
    </m:properties>
</content>
</entry>
<entry m:etag="W/\";1\";">
    <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees (7)</id>
    <title type="text">Isaiah Morgan</title>
    <updated>2009-05-01T19:36:50Z</updated>
    <author>
        <name />
    </author>
    <link rel="edit" title="EmployeesItem" href="Employees (7) " />
    <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Projects"
        type="application/atom+xml;type=feed" title="Projects"
        href="Employees (7) /Projects" />
    <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"
        type="application/atom+xml;type=entry" title="CreatedBy"
        href="Employees (7) /CreatedBy" />
    <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"
        type="application/atom+xml;type=entry" title="ModifiedBy"
        href="Employees (7) /ModifiedBy" />
    <category term="Microsoft.SharePoint.DataService.EmployeesItem"
        scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
    <content type="application/xml">
        <m:properties>
            <d:FullName>Isaiah Morgan</d:FullName>
            <d:Salary m:type="Edm.Double">74000</d:Salary>
            <d:HireDate m:type="Edm.DateTime">2003-12-21T00:00:00</d:HireDate>
            <d:ID m:type="Edm.Int32">7</d:ID>
            <d:Modified m:type="Edm.DateTime">2009-05-01T12:21:21</d:Modified>
            <d:Created m:type="Edm.DateTime">2009-05-01T12:21:21</d:Created>
            <d:Owshiddenversion m:type="Edm.Int32">1</d:Owshiddenversion>
            <d:Version>1.0</d:Version>
            <d:Path>/Lists/Employees</d:Path>
        </m:properties>
    </content>
</entry>
<entry m:etag="W/\";1\";">
    <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees (8)</id>
    <title type="text">Leslie Rubio</title>
    <updated>2009-05-01T19:36:50Z</updated>
    <author>
        <name />
    </author>
    <link rel="edit" title="EmployeesItem" href="Employees (8) " />
    <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Projects"
        type="application/atom+xml;type=feed" title="Projects"
        href="Employees (8) /Projects" />
    <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"
        type="application/atom+xml;type=entry" title="CreatedBy"
        href="Employees (8) /CreatedBy" />
    <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"

```



```

    type="application/atom+xml;type=entry" title="ModifiedBy"
    href="Employees (8)/ModifiedBy" />
<category term="Microsoft.SharePoint.DataService.EmployeesItem"
  scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
<content type="application/xml">
  <m:properties>
    <d:FullName>Leslie Rubio</d:FullName>
    <d:Salary m:type="Edm.Double">82000</d:Salary>
    <d:HireDate m:type="Edm.DateTime">1976-01-23T00:00:00</d:HireDate>
    <d:ID m:type="Edm.Int32">8</d:ID>
    <d:Modified m:type="Edm.DateTime">2009-05-01T12:21:21</d:Modified>
    <d:Created m:type="Edm.DateTime">2009-05-01T12:21:21</d:Created>
    <d:Owshiddenversion m:type="Edm.Int32">1</d:Owshiddenversion>
    <d:Version>1.0</d:Version>
    <d:Path>/Lists/Employees</d:Path>
  </m:properties>
</content>
</entry>
<entry m:etag="W/&quot;1&quot;">
  <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees (9)</id>
  <title type="text">Zachary Martin</title>
  <updated>2009-05-01T19:36:50Z</updated>
  <author>
    <name />
  </author>
  <link rel="edit" title="EmployeesItem" href="Employees (9)" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Projects"
    type="application/atom+xml;type=feed" title="Projects"
    href="Employees (9)/Projects" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"
    type="application/atom+xml;type=entry" title="CreatedBy"
    href="Employees (9)/CreatedBy" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"
    type="application/atom+xml;type=entry" title="ModifiedBy"
    href="Employees (9)/ModifiedBy" />
  <category term="Microsoft.SharePoint.DataService.EmployeesItem"
    scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
  <content type="application/xml">
    <m:properties>
      <d:FullName>Zachary Martin</d:FullName>
      <d:Salary m:type="Edm.Double">112000</d:Salary>
      <d:HireDate m:type="Edm.DateTime">1974-08-15T00:00:00</d:HireDate>
      <d:ID m:type="Edm.Int32">9</d:ID>
      <d:Modified m:type="Edm.DateTime">2009-05-01T12:21:21</d:Modified>
      <d:Created m:type="Edm.DateTime">2009-05-01T12:21:21</d:Created>
      <d:Owshiddenversion m:type="Edm.Int32">1</d:Owshiddenversion>
      <d:Version>1.0</d:Version>
      <d:Path>/Lists/Employees</d:Path>
    </m:properties>
  </content>
</entry>
<entry m:etag="W/&quot;1&quot;">
  <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees (10)</id>
  <title type="text">Kathleen Gill</title>
  <updated>2009-05-01T19:36:50Z</updated>
  <author>
    <name />
  </author>
  <link rel="edit" title="EmployeesItem" href="Employees (10)" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Projects"
    type="application/atom+xml;type=feed" title="Projects"
    href="Employees (10)/Projects" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"
    type="application/atom+xml;type=entry" title="CreatedBy"
    href="Employees (10)/CreatedBy" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"
    type="application/atom+xml;type=entry" title="ModifiedBy"
    href="Employees (10)/ModifiedBy" />
  <category term="Microsoft.SharePoint.DataService.EmployeesItem"

```

```

    scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
<content type="application/xml">
  <m:properties>
    <d:FullName>Kathleen Gill</d:FullName>
    <d:Salary m:type="Edm.Double">102000</d:Salary>
    <d:HireDate m:type="Edm.DateTime">1989-03-22T00:00:00</d:HireDate>
    <d:ID m:type="Edm.Int32">10</d:ID>
    <d:Modified m:type="Edm.DateTime">2009-05-01T12:21:21</d:Modified>
    <d:Created m:type="Edm.DateTime">2009-05-01T12:21:21</d:Created>
    <d:Owshiddenversion m:type="Edm.Int32">1</d:Owshiddenversion>
    <d:Version>1.0</d:Version>
    <d:Path>/Lists/Employees</d:Path>
  </m:properties>
</content>
</entry>
</feed>

```

4.2.2 Retrieve the Count of a Collection of List Items

The following example illustrates the exchange of messages required for a client to retrieve the count of all Employee list items from a data service using the AtomPub format.

HTTP Request:

```

GET /_vti_bin/ListData.svc/Employees/$count HTTP/1.1
Accept: text/plain
Host: www.contoso.com

```

HTTP Response:

```

HTTP/1.1 200 OK
Cache-Control: no-cache
Content-Type: text/plain; charset=utf-8
ETag: W/"1"
Server: Microsoft-IIS/7.0
SPRequestGuid: 33dfca5a-c05a-415e-a1d3-1a3b9fdf923d
DataServiceVersion: 2.0;
X-AspNet-Version: 2.0.50727
Set-Cookie: SDA_Callback=05/01/2009 12:52:33; expires=Fri, 01-May-2009 20:02:33 GMT; path=/
Set-Cookie: WSS_KeepSessionAuthenticated={afbe7ca4-c701-4f7d-9021-25cab947ae3f}; path=/
X-Powered-By: ASP.NET
MicrosoftSharePointTeamServices: 14.0.0.4006
Date: Fri, 01 May 2009 19:52:33 GMT
Content-Length: ###

```

10

4.2.3 Retrieve a Collection of Entities with an Inline Count

The following example illustrates the exchange of messages required for a client to retrieve all Employee list items from a data service and to instruct it to include the count of items retrieved in the response using the AtomPub format.

HTTP Request:

```

GET /_vti_bin/ListData.svc/Employees?$inlinecount=allpages HTTP/1.1
Accept: application/atom+xml
Host: www.contoso.com

```

HTTP Response:

```
HTTP/1.1 200 OK
Cache-Control: no-cache
Content-Type: application/atom+xml;charset=utf-8
Server: Microsoft-IIS/7.0
SPRequestGuid: d08f639f-59f9-451d-b09a-f4d073914262
DataServiceVersion: 2.0;
X-AspNet-Version: 2.0.50727
Set-Cookie: SDA_Callback=05/01/2009 12:36:35; expires=Fri, 01-May-2009 19:46:35 GMT; path=/
Set-Cookie: WSS_KeepSessionAuthenticated={afbe7ca4-c701-4f7d-9021-25cab947ae3f}; path=/
X-Powered-By: ASP.NET
MicrosoftSharePointTeamServices: 14.0.0.4006
Date: Fri, 01 May 2009 19:36:50 GMT
Content-Length: ###
```

```
<?xml version="1.0" encoding="utf-8" standalone="yes"?>
<feed xml:base="http://www.contoso.com/_vti_bin/ListData.svc/"
  xmlns:d="http://schemas.microsoft.com/ado/2007/08/dataservices"
  xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metadata"
  xmlns="http://www.w3.org/2005/Atom">
  <title type="text">Employees</title>
  <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees</id>
  <updated>2009-05-01T19:36:50Z</updated>
  <link rel="self" title="Employees" href="Employees" />
  <m2:count xmlns:m2="http://schemas.microsoft.com/ado/2008/11/dataservices/metadata">
    10
  </m2:count>
  <entry m:etag="W/&quot;1&quot;">
    <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees(1)</id>
    <title type="text">Margeret Smith</title>
    <updated>2009-05-01T19:36:50Z</updated>
    <author>
      <name />
    </author>
    <link rel="edit" title="EmployeesItem" href="Employees(1)" />
    <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Projects"
      type="application/atom+xml;type=feed" title="Projects"
      href="Employees(1)/Projects" />
    <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"
      type="application/atom+xml;type=entry" title="CreatedBy"
      href="Employees(1)/CreatedBy" />
    <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"
      type="application/atom+xml;type=entry" title="ModifiedBy"
      href="Employees(1)/ModifiedBy" />
    <category term="Microsoft.SharePoint.DataService.EmployeesItem"
      scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
    <content type="application/xml">
      <m:properties>
        <d:FullName>Margeret Smith</d:FullName>
        <d:Salary m:type="Edm.Double">75000</d:Salary>
        <d:HireDate m:type="Edm.DateTime">1984-01-07T00:00:00</d:HireDate>
        <d:ID m:type="Edm.Int32">1</d:ID>
        <d:Modified m:type="Edm.DateTime">2009-05-01T12:21:21</d:Modified>
        <d:Created m:type="Edm.DateTime">2009-05-01T12:21:21</d:Created>
        <d:Owshiddenversion m:type="Edm.Int32">1</d:Owshiddenversion>
        <d:Version>1.0</d:Version>
        <d:Path>/Lists/Employees</d:Path>
      </m:properties>
    </content>
  </entry>
  <entry m:etag="W/&quot;1&quot;">
    <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees(2)</id>
    <title type="text">Sean Jacobson</title>
    <updated>2009-05-01T19:36:50Z</updated>
    <author>
      <name />
    </author>
    <link rel="edit" title="EmployeesItem" href="Employees(2)" />
```

```

<link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Projects"
  type="application/atom+xml;type=feed" title="Projects"
  href="Employees(2)/Projects" />
<link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"
  type="application/atom+xml;type=entry" title="CreatedBy"
  href="Employees(2)/CreatedBy" />
<link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"
  type="application/atom+xml;type=entry" title="ModifiedBy"
  href="Employees(2)/ModifiedBy" />
<category term="Microsoft.SharePoint.DataService.EmployeesItem"
  scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
<content type="application/xml">
  <m:properties>
    <d:FullName>Sean Jacobson</d:FullName>
    <d:Salary m:type="Edm.Double">92000</d:Salary>
    <d:HireDate m:type="Edm.DateTime">1974-06-20T00:00:00</d:HireDate>
    <d:ID m:type="Edm.Int32">2</d:ID>
    <d:Modified m:type="Edm.DateTime">2009-05-01T12:21:21</d:Modified>
    <d:Created m:type="Edm.DateTime">2009-05-01T12:21:21</d:Created>
    <d:Owshiddenversion m:type="Edm.Int32">1</d:Owshiddenversion>
    <d:Version>1.0</d:Version>
    <d:Path>/Lists/Employees</d:Path>
  </m:properties>
</content>
</entry>
<entry m:etag="W/&quot;1&quot;">
  <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees(3)</id>
  <title type="text">Alex Gurthner</title>
  <updated>2009-05-01T19:36:50Z</updated>
  <author>
    <name />
  </author>
  <link rel="edit" title="EmployeesItem" href="Employees(3)" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Projects"
    type="application/atom+xml;type=feed" title="Projects"
    href="Employees(3)/Projects" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"
    type="application/atom+xml;type=entry" title="CreatedBy"
    href="Employees(3)/CreatedBy" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"
    type="application/atom+xml;type=entry" title="ModifiedBy"
    href="Employees(3)/ModifiedBy" />
  <category term="Microsoft.SharePoint.DataService.EmployeesItem"
    scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
  <content type="application/xml">
    <m:properties>
      <d:FullName>Alex Gurthner</d:FullName>
      <d:Salary m:type="Edm.Double">68000</d:Salary>
      <d:HireDate m:type="Edm.DateTime">1990-10-14T00:00:00</d:HireDate>
      <d:ID m:type="Edm.Int32">3</d:ID>
      <d:Modified m:type="Edm.DateTime">2009-05-01T12:21:21</d:Modified>
      <d:Created m:type="Edm.DateTime">2009-05-01T12:21:21</d:Created>
      <d:Owshiddenversion m:type="Edm.Int32">1</d:Owshiddenversion>
      <d:Version>1.0</d:Version>
      <d:Path>/Lists/Employees</d:Path>
    </m:properties>
  </content>
</entry>
<entry m:etag="W/&quot;1&quot;">
  <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees(4)</id>
  <title type="text">Phyllis Allen</title>
  <updated>2009-05-01T19:36:50Z</updated>
  <author>
    <name />
  </author>
  <link rel="edit" title="EmployeesItem" href="Employees(4)" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Projects"
    type="application/atom+xml;type=feed" title="Projects"
    href="Employees(4)/Projects" />

```

```

<link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"
  type="application/atom+xml;type=entry" title="CreatedBy"
  href="Employees(4)/CreatedBy" />
<link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"
  type="application/atom+xml;type=entry" title="ModifiedBy"
  href="Employees(4)/ModifiedBy" />
<category term="Microsoft.SharePoint.DataService.EmployeesItem"
  scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
<content type="application/xml">
  <m:properties>
    <d:FullName>Phyllis Allen</d:FullName>
    <d:Salary m:type="Edm.Double">108000</d:Salary>
    <d:HireDate m:type="Edm.DateTime">1975-03-28T00:00:00</d:HireDate>
    <d:ID m:type="Edm.Int32">4</d:ID>
    <d:Modified m:type="Edm.DateTime">2009-05-01T12:21:21</d:Modified>
    <d:Created m:type="Edm.DateTime">2009-05-01T12:21:21</d:Created>
    <d:Owshiddenversion m:type="Edm.Int32">1</d:Owshiddenversion>
    <d:Version>1.0</d:Version>
    <d:Path>/Lists/Employees</d:Path>
  </m:properties>
</content>
</entry>
<entry m:etag="W/&quot;1&quot;">
  <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees(5)</id>
  <title type="text">Carol Beck</title>
  <updated>2009-05-01T19:36:50Z</updated>
  <author>
    <name />
  </author>
  <link rel="edit" title="EmployeesItem" href="Employees(5)" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Projects"
    type="application/atom+xml;type=feed" title="Projects"
    href="Employees(5)/Projects" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"
    type="application/atom+xml;type=entry" title="CreatedBy"
    href="Employees(5)/CreatedBy" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"
    type="application/atom+xml;type=entry" title="ModifiedBy"
    href="Employees(5)/ModifiedBy" />
  <category term="Microsoft.SharePoint.DataService.EmployeesItem"
    scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
  <content type="application/xml">
    <m:properties>
      <d:FullName>Carol Beck</d:FullName>
      <d:Salary m:type="Edm.Double">88000</d:Salary>
      <d:HireDate m:type="Edm.DateTime">1989-08-11T00:00:00</d:HireDate>
      <d:ID m:type="Edm.Int32">5</d:ID>
      <d:Modified m:type="Edm.DateTime">2009-05-01T12:21:21</d:Modified>
      <d:Created m:type="Edm.DateTime">2009-05-01T12:21:21</d:Created>
      <d:Owshiddenversion m:type="Edm.Int32">1</d:Owshiddenversion>
      <d:Version>1.0</d:Version>
      <d:Path>/Lists/Employees</d:Path>
    </m:properties>
  </content>
</entry>
<entry m:etag="W/&quot;1&quot;">
  <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees(6)</id>
  <title type="text">Willie Brooks</title>
  <updated>2009-05-01T19:36:50Z</updated>
  <author>
    <name />
  </author>
  <link rel="edit" title="EmployeesItem" href="Employees(6)" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Projects"
    type="application/atom+xml;type=feed" title="Projects"
    href="Employees(6)/Projects" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"
    type="application/atom+xml;type=entry" title="CreatedBy"
    href="Employees(6)/CreatedBy" />

```

```

<link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"
  type="application/atom+xml;type=entry" title="ModifiedBy"
  href="Employees(6)/ModifiedBy" />
<category term="Microsoft.SharePoint.DataService.EmployeesItem"
  scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
<content type="application/xml">
  <m:properties>
    <d:FullName>Willie Brooks</d:FullName>
    <d:Salary m:type="Edm.Double">95000</d:Salary>
    <d:HireDate m:type="Edm.DateTime">1983-02-06T00:00:00</d:HireDate>
    <d:ID m:type="Edm.Int32">6</d:ID>
    <d:Modified m:type="Edm.DateTime">2009-05-01T12:21:21</d:Modified>
    <d:Created m:type="Edm.DateTime">2009-05-01T12:21:21</d:Created>
    <d:Owshiddenversion m:type="Edm.Int32">1</d:Owshiddenversion>
    <d:Version>1.0</d:Version>
    <d:Path>/Lists/Employees</d:Path>
  </m:properties>
</content>
</entry>
<entry m:etag="W/&quot;1&quot;">
  <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees(7)</id>
  <title type="text">Isaiah Morgan</title>
  <updated>2009-05-01T19:36:50Z</updated>
  <author>
    <name />
  </author>
  <link rel="edit" title="EmployeesItem" href="Employees(7)" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Projects"
    type="application/atom+xml;type=feed" title="Projects"
    href="Employees(7)/Projects" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"
    type="application/atom+xml;type=entry" title="CreatedBy"
    href="Employees(7)/CreatedBy" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"
    type="application/atom+xml;type=entry" title="ModifiedBy"
    href="Employees(7)/ModifiedBy" />
  <category term="Microsoft.SharePoint.DataService.EmployeesItem"
    scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
  <content type="application/xml">
    <m:properties>
      <d:FullName>Isaiah Morgan</d:FullName>
      <d:Salary m:type="Edm.Double">74000</d:Salary>
      <d:HireDate m:type="Edm.DateTime">2003-12-21T00:00:00</d:HireDate>
      <d:ID m:type="Edm.Int32">7</d:ID>
      <d:Modified m:type="Edm.DateTime">2009-05-01T12:21:21</d:Modified>
      <d:Created m:type="Edm.DateTime">2009-05-01T12:21:21</d:Created>
      <d:Owshiddenversion m:type="Edm.Int32">1</d:Owshiddenversion>
      <d:Version>1.0</d:Version>
      <d:Path>/Lists/Employees</d:Path>
    </m:properties>
  </content>
</entry>
<entry m:etag="W/&quot;1&quot;">
  <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees(8)</id>
  <title type="text">Leslie Rubio</title>
  <updated>2009-05-01T19:36:50Z</updated>
  <author>
    <name />
  </author>
  <link rel="edit" title="EmployeesItem" href="Employees(8)" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Projects"
    type="application/atom+xml;type=feed" title="Projects"
    href="Employees(8)/Projects" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"
    type="application/atom+xml;type=entry" title="CreatedBy"
    href="Employees(8)/CreatedBy" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"
    type="application/atom+xml;type=entry" title="ModifiedBy"
    href="Employees(8)/ModifiedBy" />

```

```

<category term="Microsoft.SharePoint.DataService.EmployeesItem"
  scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
<content type="application/xml">
  <m:properties>
    <d:FullName>Leslie Rubio</d:FullName>
    <d:Salary m:type="Edm.Double">82000</d:Salary>
    <d:HireDate m:type="Edm.DateTime">1976-01-23T00:00:00</d:HireDate>
    <d:ID m:type="Edm.Int32">8</d:ID>
    <d:Modified m:type="Edm.DateTime">2009-05-01T12:21:21</d:Modified>
    <d:Created m:type="Edm.DateTime">2009-05-01T12:21:21</d:Created>
    <d:Owshiddenversion m:type="Edm.Int32">1</d:Owshiddenversion>
    <d:Version>1.0</d:Version>
    <d:Path>/Lists/Employees</d:Path>
  </m:properties>
</content>
</entry>
<entry m:etag="W/&quot;1&quot;">
  <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees(9)</id>
  <title type="text">Zachary Martin</title>
  <updated>2009-05-01T19:36:50Z</updated>
  <author>
    <name />
  </author>
  <link rel="edit" title="EmployeesItem" href="Employees(9)" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Projects"
    type="application/atom+xml;type=feed" title="Projects"
    href="Employees(9)/Projects" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"
    type="application/atom+xml;type=entry" title="CreatedBy"
    href="Employees(9)/CreatedBy" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"
    type="application/atom+xml;type=entry" title="ModifiedBy"
    href="Employees(9)/ModifiedBy" />
  <category term="Microsoft.SharePoint.DataService.EmployeesItem"
    scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
  <content type="application/xml">
    <m:properties>
      <d:FullName>Zachary Martin</d:FullName>
      <d:Salary m:type="Edm.Double">112000</d:Salary>
      <d:HireDate m:type="Edm.DateTime">1974-08-15T00:00:00</d:HireDate>
      <d:ID m:type="Edm.Int32">9</d:ID>
      <d:Modified m:type="Edm.DateTime">2009-05-01T12:21:21</d:Modified>
      <d:Created m:type="Edm.DateTime">2009-05-01T12:21:21</d:Created>
      <d:Owshiddenversion m:type="Edm.Int32">1</d:Owshiddenversion>
      <d:Version>1.0</d:Version>
      <d:Path>/Lists/Employees</d:Path>
    </m:properties>
  </content>
</entry>
<entry m:etag="W/&quot;1&quot;">
  <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees(10)</id>
  <title type="text">Kathleen Gill</title>
  <updated>2009-05-01T19:36:50Z</updated>
  <author>
    <name />
  </author>
  <link rel="edit" title="EmployeesItem" href="Employees(10)" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Projects"
    type="application/atom+xml;type=feed" title="Projects"
    href="Employees(10)/Projects" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"
    type="application/atom+xml;type=entry" title="CreatedBy"
    href="Employees(10)/CreatedBy" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"
    type="application/atom+xml;type=entry" title="ModifiedBy"
    href="Employees(10)/ModifiedBy" />
  <category term="Microsoft.SharePoint.DataService.EmployeesItem"
    scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
  <content type="application/xml">

```

```

    <m:properties>
      <d:FullName>Kathleen Gill</d:FullName>
      <d:Salary m:type="Edm.Double">102000</d:Salary>
      <d:HireDate m:type="Edm.DateTime">1989-03-22T00:00:00</d:HireDate>
      <d:ID m:type="Edm.Int32">10</d:ID>
      <d:Modified m:type="Edm.DateTime">2009-05-01T12:21:21</d:Modified>
      <d:Created m:type="Edm.DateTime">2009-05-01T12:21:21</d:Created>
      <d:Owshiddenversion m:type="Edm.Int32">1</d:Owshiddenversion>
      <d:Version>1.0</d:Version>
      <d:Path>/Lists/Employees</d:Path>
    </m:properties>
  </content>
</entry>
</feed>

```

4.2.4 Retrieve the First Two List Items in a List

The following example illustrates the exchange of messages required for a client to retrieve the first two Employee list items from a data service using the AtomPub format.

HTTP Request:

```

GET / vti bin/ListData.svc/Employees?$top=2 HTTP/1.1
Accept: application/atom+xml
Host: www.contoso.com

```

HTTP Response:

```

HTTP/1.1 200 OK
Cache-Control: no-cache
Content-Type: application/atom+xml; charset=utf-8
Server: Microsoft-IIS/7.0
SPRequestGuid: 8c346d66-81f6-412d-a825-d6fa1e227001
DataServiceVersion: 1.0;
X-AspNet-Version: 2.0.50727
Set-Cookie: SDA_Callback=05/01/2009 13:06:46; expires=Fri, 01-May-2009 20:16:46 GMT; path=/
Set-Cookie: WSS_KeepSessionAuthenticated={afbe7ca4-c701-4f7d-9021-25cab947ae3f}; path=/
X-Powered-By: ASP.NET
MicrosoftSharePointTeamServices: 14.0.0.4006
Date: Fri, 01 May 2009 20:06:46 GMT
Content-Length: ###

<?xml version="1.0" encoding="utf-8" standalone="yes"?>
<feed xml:base="http://www.contoso.com/_vti_bin/ListData.svc/"
  xmlns:d="http://schemas.microsoft.com/ado/2007/08/dataservices"
  xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metadata"
  xmlns="http://www.w3.org/2005/Atom">
  <title type="text">Employees</title>
  <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees</id>
  <updated>2009-05-01T20:06:46Z</updated>
  <link rel="self" title="Employees" href="Employees" />
  <entry m:etag="W/&quot;1&quot;">
    <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees(1)</id>
    <title type="text">Margeret Smith</title>
    <updated>2009-05-01T20:06:46Z</updated>
    <author>
      <name />
    </author>
    <link rel="edit" title="EmployeesItem" href="Employees(1)" />
    <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Projects"
      type="application/atom+xml; type=feed" title="Projects"
      href="Employees(1)/Projects" />
    <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"

```



```

    type="application/atom+xml;type=entry" title="CreatedBy"
    href="Employees(1)/CreatedBy" />
<link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"
    type="application/atom+xml;type=entry" title="ModifiedBy"
    href="Employees(1)/ModifiedBy" />
<category term="Microsoft.SharePoint.DataService.EmployeesItem"
    scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
<content type="application/xml">
  <m:properties>
    <d:FullName>Margeret Smith</d:FullName>
    <d:Salary m:type="Edm.Double">75000</d:Salary>
    <d:HireDate m:type="Edm.DateTime">1984-01-07T00:00:00</d:HireDate>
    <d:ID m:type="Edm.Int32">1</d:ID>
    <d:Modified m:type="Edm.DateTime">2009-05-01T12:21:21</d:Modified>
    <d:Created m:type="Edm.DateTime">2009-05-01T12:21:21</d:Created>
    <d:Owshiddenversion m:type="Edm.Int32">1</d:Owshiddenversion>
    <d:Version>1.0</d:Version>
    <d:Path>/Lists/Employees</d:Path>
  </m:properties>
</content>
</entry>
<entry m:etag="W/\">1\";">
  <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees(2)</id>
  <title type="text">Sean Jacobson</title>
  <updated>2009-05-01T20:06:46Z</updated>
  <author>
    <name />
  </author>
  <link rel="edit" title="EmployeesItem" href="Employees(2)" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Projects"
    type="application/atom+xml;type=feed" title="Projects"
    href="Employees(2)/Projects" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"
    type="application/atom+xml;type=entry" title="CreatedBy"
    href="Employees(2)/CreatedBy" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"
    type="application/atom+xml;type=entry" title="ModifiedBy"
    href="Employees(2)/ModifiedBy" />
  <category term="Microsoft.SharePoint.DataService.EmployeesItem"
    scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
  <content type="application/xml">
    <m:properties>
      <d:FullName>Sean Jacobson</d:FullName>
      <d:Salary m:type="Edm.Double">92000</d:Salary>
      <d:HireDate m:type="Edm.DateTime">1974-06-20T00:00:00</d:HireDate>
      <d:ID m:type="Edm.Int32">2</d:ID>
      <d:Modified m:type="Edm.DateTime">2009-05-01T12:21:21</d:Modified>
      <d:Created m:type="Edm.DateTime">2009-05-01T12:21:21</d:Created>
      <d:Owshiddenversion m:type="Edm.Int32">1</d:Owshiddenversion>
      <d:Version>1.0</d:Version>
      <d:Path>/Lists/Employees</d:Path>
    </m:properties>
  </content>
</entry>
</feed>

```

4.2.5 Retrieve the Last Two List Items in a List

The following example illustrates the exchange of messages required for a client to retrieve the last two Employee list items from a data service using the AtomPub format.

HTTP Request:

```

GET /_vti_bin/ListData.svc/Employees?$skip=8 HTTP/1.1
Accept: application/atom+xml

```

Host: www.contoso.com

HTTP Response:

```
HTTP/1.1 200 OK
Cache-Control: no-cache
Content-Type: application/atom+xml;charset=utf-8
Server: Microsoft-IIS/7.0
SPRequestGuid: f34dbe9d-c55d-4603-b935-bc089293a4f2
DataServiceVersion: 2.0;
X-AspNet-Version: 2.0.50727
Set-Cookie: SDA Callback=05/01/2009 13:10:36; expires=Fri, 01-May-2009 20:20:36 GMT; path=/
Set-Cookie: WSS_KeepSessionAuthenticated={afbe7ca4-c701-4f7d-9021-25cab947ae3f}; path=/
X-Powered-By: ASP.NET
MicrosoftSharePointTeamServices: 14.0.0.4006
Date: Fri, 01 May 2009 20:10:36 GMT
Content-Length: ###
```

```
<?xml version="1.0" encoding="utf-8" standalone="yes"?>
<feed xml:base="http://www.contoso.com/_vti_bin/ListData.svc/"
  xmlns:d="http://schemas.microsoft.com/ado/2007/08/dataservices"
  xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metadata"
  xmlns="http://www.w3.org/2005/Atom">
  <title type="text">Employees</title>
  <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees</id>
  <updated>2009-05-01T20:10:37Z</updated>
  <link rel="self" title="Employees" href="Employees" />
  <entry m:etag="W/&quot;1&quot;">
    <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees(9)</id>
    <title type="text">Zachary Martin</title>
    <updated>2009-05-01T20:10:37Z</updated>
    <author>
      <name />
    </author>
    <link rel="edit" title="EmployeesItem" href="Employees(9)" />
    <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Projects"
      type="application/atom+xml;type=feed" title="Projects"
      href="Employees(9)/Projects" />
    <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"
      type="application/atom+xml;type=entry" title="CreatedBy"
      href="Employees(9)/CreatedBy" />
    <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"
      type="application/atom+xml;type=entry" title="ModifiedBy"
      href="Employees(9)/ModifiedBy" />
    <category term="Microsoft.SharePoint.DataService.EmployeesItem"
      scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
    <content type="application/xml">
      <m:properties>
        <d:FullName>Zachary Martin</d:FullName>
        <d:Salary m:type="Edm.Double">112000</d:Salary>
        <d:HireDate m:type="Edm.DateTime">1974-08-15T00:00:00</d:HireDate>
        <d:ID m:type="Edm.Int32">9</d:ID>
        <d:Modified m:type="Edm.DateTime">2009-05-01T12:21:21</d:Modified>
        <d:Created m:type="Edm.DateTime">2009-05-01T12:21:21</d:Created>
        <d:Owshiddenversion m:type="Edm.Int32">1</d:Owshiddenversion>
        <d:Version>1.0</d:Version>
        <d:Path>/Lists/Employees</d:Path>
      </m:properties>
    </content>
  </entry>
  <entry m:etag="W/&quot;1&quot;">
    <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees(10)</id>
    <title type="text">Kathleen_Gill</title>
    <updated>2009-05-01T20:10:37Z</updated>
    <author>
      <name />
    </author>
```

```

<link rel="edit" title="EmployeesItem" href="Employees(10)" />
<link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Projects"
  type="application/atom+xml;type=feed" title="Projects"
  href="Employees(10)/Projects" />
<link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"
  type="application/atom+xml;type=entry" title="CreatedBy"
  href="Employees(10)/CreatedBy" />
<link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"
  type="application/atom+xml;type=entry" title="ModifiedBy"
  href="Employees(10)/ModifiedBy" />
<category term="Microsoft.SharePoint.DataService.EmployeesItem"
  scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
<content type="application/xml">
  <m:properties>
    <d:FullName>Kathleen Gill</d:FullName>
    <d:Salary m:type="Edm.Double">102000</d:Salary>
    <d:HireDate m:type="Edm.DateTime">1989-03-22T00:00:00</d:HireDate>
    <d:ID m:type="Edm.Int32">10</d:ID>
    <d:Modified m:type="Edm.DateTime">2009-05-01T12:21:21</d:Modified>
    <d:Created m:type="Edm.DateTime">2009-05-01T12:21:21</d:Created>
    <d:Owshiddenversion m:type="Edm.Int32">1</d:Owshiddenversion>
    <d:Version>1.0</d:Version>
    <d:Path>/Lists/Employees</d:Path>
  </m:properties>
</content>
</entry>
</feed>

```

4.2.6 Retrieve the Middle Two List Items in a List

The following example illustrates the exchange of messages required for a client to retrieve the middle two Employee list items from a data service using the AtomPub format.

HTTP Request:

```

GET /_vti_bin/ListData.svc/Employees?$skip=4&$top=2 HTTP/1.1
Accept: application/atom+xml
Host: www.contoso.com

```

HTTP Response:

```

HTTP/1.1 200 OK
Cache-Control: no-cache
Content-Type: application/atom+xml; charset=utf-8
Server: Microsoft-IIS/7.0
SPRequestGuid: 03ddcf69-cb4e-4e13-bb09-053a81719ffc
DataServiceVersion: 1.0;
X-AspNet-Version: 2.0.50727
Set-Cookie: SDA Callback=05/01/2009 13:16:17; expires=Fri, 01-May-2009 20:26:17 GMT; path=/
Set-Cookie: WSS_KeepSessionAuthenticated={afbe7ca4-c701-4f7d-9021-25cab947ae3f}; path=/
X-Powered-By: ASP.NET
MicrosoftSharePointTeamServices: 14.0.0.4006
Date: Fri, 01 May 2009 20:16:18 GMT
Content-Length: ###

<?xml version="1.0" encoding="utf-8" standalone="yes"?>
<feed xml:base="http://www.contoso.com/_vti_bin/ListData.svc/"
  xmlns:d="http://schemas.microsoft.com/ado/2007/08/dataservices"
  xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metadata"
  xmlns="http://www.w3.org/2005/Atom">
  <title type="text">Employees</title>
  <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees</id>
  <updated>2009-05-01T20:16:17Z</updated>

```

```

<link rel="self" title="Employees" href="Employees" />
<entry m:etag="W/&quot;1&quot;">
  <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees(5)</id>
  <title type="text">Carol Beck</title>
  <updated>2009-05-01T20:16:17Z</updated>
  <author>
    <name />
  </author>
  <link rel="edit" title="EmployeesItem" href="Employees(5)" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Projects"
    type="application/atom+xml;type=feed" title="Projects"
    href="Employees(5)/Projects" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"
    type="application/atom+xml;type=entry" title="CreatedBy"
    href="Employees(5)/CreatedBy" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"
    type="application/atom+xml;type=entry" title="ModifiedBy"
    href="Employees(5)/ModifiedBy" />
  <category term="Microsoft.SharePoint.DataService.EmployeesItem"
    scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
  <content type="application/xml">
    <m:properties>
      <d:FullName>Carol Beck</d:FullName>
      <d:Salary m:type="Edm.Double">88000</d:Salary>
      <d:HireDate m:type="Edm.DateTime">1989-08-11T00:00:00</d:HireDate>
      <d:ID m:type="Edm.Int32">5</d:ID>
      <d:Modified m:type="Edm.DateTime">2009-05-01T12:21:21</d:Modified>
      <d:Created m:type="Edm.DateTime">2009-05-01T12:21:21</d:Created>
      <d:Owshiddenversion m:type="Edm.Int32">1</d:Owshiddenversion>
      <d:Version>1.0</d:Version>
      <d:Path>/Lists/Employees</d:Path>
    </m:properties>
  </content>
</entry>
<entry m:etag="W/&quot;1&quot;">
  <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees(6)</id>
  <title type="text">Willie Brooks</title>
  <updated>2009-05-01T20:16:17Z</updated>
  <author>
    <name />
  </author>
  <link rel="edit" title="EmployeesItem" href="Employees(6)" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Projects"
    type="application/atom+xml;type=feed" title="Projects"
    href="Employees(6)/Projects" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"
    type="application/atom+xml;type=entry" title="CreatedBy"
    href="Employees(6)/CreatedBy" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"
    type="application/atom+xml;type=entry" title="ModifiedBy"
    href="Employees(6)/ModifiedBy" />
  <category term="Microsoft.SharePoint.DataService.EmployeesItem"
    scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
  <content type="application/xml">
    <m:properties>
      <d:FullName>Willie Brooks</d:FullName>
      <d:Salary m:type="Edm.Double">95000</d:Salary>
      <d:HireDate m:type="Edm.DateTime">1983-02-06T00:00:00</d:HireDate>
      <d:ID m:type="Edm.Int32">6</d:ID>
      <d:Modified m:type="Edm.DateTime">2009-05-01T12:21:21</d:Modified>
      <d:Created m:type="Edm.DateTime">2009-05-01T12:21:21</d:Created>
      <d:Owshiddenversion m:type="Edm.Int32">1</d:Owshiddenversion>
      <d:Version>1.0</d:Version>
      <d:Path>/Lists/Employees</d:Path>
    </m:properties>
  </content>
</entry>
</feed>

```

4.2.7 Retrieve a List Item by ID

The following example illustrates the exchange of messages required for a client to retrieve an Employee list item with an ID value of "3" from a data service using the AtomPub format.

HTTP Request:

```
GET /_vti_bin/ListData.svc/Employees(3) HTTP/1.1
Accept: application/atom+xml
Host: www.contoso.com
```

HTTP Response:

```
HTTP/1.1 200 OK
Cache-Control: no-cache
Content-Type: application/atom+xml; charset=utf-8
ETag: W/"1"
Server: Microsoft-IIS/7.0
SPRequestGuid: 28608b24-0e18-4bf7-a30a-58c0e3ce7dfe
DataServiceVersion: 1.0;
X-AspNet-Version: 2.0.50727
Set-Cookie: SDA Callback=05/01/2009 13:18:39; expires=Fri, 01-May-2009 20:28:39 GMT; path=/
Set-Cookie: WSS_KeepSessionAuthenticated={afbe7ca4-c701-4f7d-9021-25cab947ae3f}; path=/
X-Powered-By: ASP.NET
MicrosoftSharePointTeamServices: 14.0.0.4006
Date: Fri, 01 May 2009 20:18:39 GMT
Content-Length: ###
```

```
<?xml version="1.0" encoding="utf-8" standalone="yes"?>
<entry xml:base="http://www.contoso.com/_vti_bin/ListData.svc/"
  xmlns:d="http://schemas.microsoft.com/ado/2007/08/dataservices"
  xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metadata"
  m:etag="W/&quot;1&quot;" xmlns="http://www.w3.org/2005/Atom">
  <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees(3)</id>
  <title type="text">Alex Gurthner</title>
  <updated>2009-05-01T20:18:40Z</updated>
  <author>
    <name />
  </author>
  <link rel="edit" title="EmployeesItem" href="Employees(3)" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Projects"
    type="application/atom+xml;type=feed" title="Projects"
    href="Employees(3)/Projects" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"
    type="application/atom+xml;type=entry" title="CreatedBy"
    href="Employees(3)/CreatedBy" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"
    type="application/atom+xml;type=entry" title="ModifiedBy"
    href="Employees(3)/ModifiedBy" />
  <category term="Microsoft.SharePoint.DataService.EmployeesItem"
    scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
  <content type="application/xml">
    <m:properties>
      <d:FullName>Alex Gurthner</d:FullName>
      <d:Salary m:type="Edm.Double">68000</d:Salary>
      <d:HireDate m:type="Edm.DateTime">1990-10-14T00:00:00</d:HireDate>
      <d:ID m:type="Edm.Int32">3</d:ID>
      <d:Modified m:type="Edm.DateTime">2009-05-01T12:21:21</d:Modified>
      <d:Created m:type="Edm.DateTime">2009-05-01T12:21:21</d:Created>
      <d:Owshiddenversion m:type="Edm.Int32">1</d:Owshiddenversion>
      <d:Version>1.0</d:Version>
      <d:Path>/Lists/Employees</d:Path>
    </m:properties>
  </content>
</entry>
```

4.2.8 Retrieve List Items That Satisfy Specified Criteria

The following example illustrates the exchange of messages required for a client to retrieve a collection of Employee list items whose **Salary** field value is greater than \$100,000 from a data service using the AtomPub format.

HTTP Request:

```
GET /_vti_bin/ListData.svc/Employees?$filter=Salary%20gt%20100000 HTTP/1.1
Accept: application/atom+xml
Host: www.contoso.com
```

HTTP Response:

```
HTTP/1.1 200 OK
Cache-Control: no-cache
Content-Type: application/atom+xml; charset=utf-8
Server: Microsoft-IIS/7.0
SPRequestGuid: 6467cb6e-1043-4bc4-a971-f10bc94a5a48
DataServiceVersion: 2.0;
X-AspNet-Version: 2.0.50727
Set-Cookie: SDA_Callback=05/01/2009 13:44:31; expires=Fri, 01-May-2009 20:54:31 GMT; path=/
Set-Cookie: WSS_KeepSessionAuthenticated={afbe7ca4-c701-4f7d-9021-25cab947ae3f}; path=/
X-Powered-By: ASP.NET
MicrosoftSharePointTeamServices: 14.0.0.4006
Date: Fri, 01 May 2009 20:44:31 GMT
Content-Length: ###
```

```
<?xml version="1.0" encoding="utf-8" standalone="yes"?>
<feed xml:base="http://www.contoso.com/_vti_bin/ListData.svc/"
  xmlns:d="http://schemas.microsoft.com/ado/2007/08/dataservices"
  xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metadata"
  xmlns="http://www.w3.org/2005/Atom">
  <title type="text">Employees</title>
  <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees</id>
  <updated>2009-05-01T20:44:32Z</updated>
  <link rel="self" title="Employees" href="Employees" />
  <entry m:etag="W/&quot;1&quot;">
    <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees(4)</id>
    <title type="text">Phyllis Allen</title>
    <updated>2009-05-01T20:44:32Z</updated>
    <author>
      <name />
    </author>
    <link rel="edit" title="EmployeesItem" href="Employees(4)" />
    <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Projects"
      type="application/atom+xml;type=feed" title="Projects"
      href="Employees(4)/Projects" />
    <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"
      type="application/atom+xml;type=entry" title="CreatedBy"
      href="Employees(4)/CreatedBy" />
    <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"
      type="application/atom+xml;type=entry" title="ModifiedBy"
      href="Employees(4)/ModifiedBy" />
    <category term="Microsoft.SharePoint.DataService.EmployeesItem"
      scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
    <content type="application/xml">
      <m:properties>
        <d:FullName>Phyllis Allen</d:FullName>
        <d:Salary m:type="Edm.Double">108000</d:Salary>
        <d:HireDate m:type="Edm.DateTime">1975-03-28T00:00:00</d:HireDate>
        <d:ID m:type="Edm.Int32">4</d:ID>
        <d:Modified m:type="Edm.DateTime">2009-05-01T13:40:08</d:Modified>
        <d:Created m:type="Edm.DateTime">2009-05-01T13:40:08</d:Created>
        <d:Owshiddenversion m:type="Edm.Int32">1</d:Owshiddenversion>
        <d:Version>1.0</d:Version>
      </m:properties>
    </content>
  </entry>
</feed>
```

```

    <d:Path>/Lists/Employees</d:Path>
  </m:properties>
</content>
</entry>
<entry m:etag="W/&quot;1&quot;">
  <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees(9)</id>
  <title type="text">Zachary Martin</title>
  <updated>2009-05-01T20:44:32Z</updated>
  <author>
    <name />
  </author>
  <link rel="edit" title="EmployeesItem" href="Employees(9)" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Projects"
    type="application/atom+xml;type=feed" title="Projects"
    href="Employees(9)/Projects" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"
    type="application/atom+xml;type=entry" title="CreatedBy"
    href="Employees(9)/CreatedBy" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"
    type="application/atom+xml;type=entry" title="ModifiedBy"
    href="Employees(9)/ModifiedBy" />
  <category term="Microsoft.SharePoint.DataService.EmployeesItem"
    scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
  <content type="application/xml">
    <m:properties>
      <d:FullName>Zachary Martin</d:FullName>
      <d:Salary m:type="Edm.Double">112000</d:Salary>
      <d:HireDate m:type="Edm.DateTime">1974-08-15T00:00:00</d:HireDate>
      <d:ID m:type="Edm.Int32">9</d:ID>
      <d:Modified m:type="Edm.DateTime">2009-05-01T13:40:08</d:Modified>
      <d:Created m:type="Edm.DateTime">2009-05-01T13:40:08</d:Created>
      <d:Owshiddenversion m:type="Edm.Int32">1</d:Owshiddenversion>
      <d:Version>1.0</d:Version>
      <d:Path>/Lists/Employees</d:Path>
    </m:properties>
  </content>
</entry>
<entry m:etag="W/&quot;1&quot;">
  <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees(10)</id>
  <title type="text">Kathleen Gill</title>
  <updated>2009-05-01T20:44:32Z</updated>
  <author>
    <name />
  </author>
  <link rel="edit" title="EmployeesItem" href="Employees(10)" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Projects"
    type="application/atom+xml;type=feed" title="Projects"
    href="Employees(10)/Projects" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"
    type="application/atom+xml;type=entry" title="CreatedBy"
    href="Employees(10)/CreatedBy" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"
    type="application/atom+xml;type=entry" title="ModifiedBy"
    href="Employees(10)/ModifiedBy" />
  <category term="Microsoft.SharePoint.DataService.EmployeesItem"
    scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
  <content type="application/xml">
    <m:properties>
      <d:FullName>Kathleen Gill</d:FullName>
      <d:Salary m:type="Edm.Double">102000</d:Salary>
      <d:HireDate m:type="Edm.DateTime">1989-03-22T00:00:00</d:HireDate>
      <d:ID m:type="Edm.Int32">10</d:ID>
      <d:Modified m:type="Edm.DateTime">2009-05-01T13:40:08</d:Modified>
      <d:Created m:type="Edm.DateTime">2009-05-01T13:40:08</d:Created>
      <d:Owshiddenversion m:type="Edm.Int32">1</d:Owshiddenversion>
      <d:Version>1.0</d:Version>
      <d:Path>/Lists/Employees</d:Path>
    </m:properties>
  </content>

```

```
</entry>
</feed>
```

4.2.9 Retrieve List Items in a Specified Order

The following example illustrates the exchange of messages required for a client to retrieve all Projects list items ordered by the value of their **Due Date** field from a data service using the AtomPub format.

HTTP Request:

```
GET /_vti_bin/ListData.svc/Projects?$orderby=DueDate HTTP/1.1
Accept: application/atom+xml
Host: www.contoso.com
```

HTTP Response:

```
HTTP/1.1 200 OK
Cache-Control: no-cache
Content-Type: application/atom+xml; charset=utf-8
Server: Microsoft-IIS/7.0
SPRequestGuid: 41cdd8a4-b41f-4b79-8ac5-52dcce4db4e6
DataServiceVersion: 2.0;
X-AspNet-Version: 2.0.50727
Set-Cookie: SDA Callback=05/01/2009 13:48:49; expires=Fri, 01-May-2009 20:58:49 GMT; path=/
Set-Cookie: WSS_KeepSessionAuthenticated={afbe7ca4-c701-4f7d-9021-25cab947ae3f}; path=/
X-Powered-By: ASP.NET
MicrosoftSharePointTeamServices: 14.0.0.4006
Date: Fri, 01 May 2009 20:48:49 GMT
Content-Length: ###
```

```
<?xml version="1.0" encoding="utf-8" standalone="yes"?>
<feed base="http://www.contoso.com/_vti_bin/ListData.svc/"
  xmlns:d="http://schemas.microsoft.com/ado/2007/08/dataservices"
  xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metadata"
  xmlns="http://www.w3.org/2005/Atom">
  <title type="text">Projects</title>
  <id>http://www.contoso.com/_vti_bin/ListData.svc/Projects</id>
  <updated>2009-05-01T20:48:50Z</updated>
  <link rel="self" title="Projects" href="Projects" />
  <entry m:etag="W/&quot;1&quot;">
    <id>http://www.contoso.com/_vti_bin/ListData.svc/Projects(1)</id>
    <title type="text">Water/Sewer #812061</title>
    <updated>2009-05-01T20:48:50Z</updated>
    <author>
      <name />
    </author>
    <link rel="edit" title="ProjectsItem" href="Projects(1)" />
    <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Location"
      type="application/atom+xml;type=entry" title="Location"
      href="Projects(1)/Location" />
    <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"
      type="application/atom+xml;type=entry" title="CreatedBy"
      href="Projects(1)/CreatedBy" />
    <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"
      type="application/atom+xml;type=entry" title="ModifiedBy"
      href="Projects(1)/ModifiedBy" />
    <category term="Microsoft.SharePoint.DataService.ProjectsItem"
      scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
    <content type="application/xml">
      <m:properties>
        <d:ProjectTitle>Water/Sewer #812061</d:ProjectTitle>
        <d:Description>Sewer improvements in San Juan Capistrano. Plans call for
```



```

    improving the existing condition of a hydraulically deficient line through the
    construction of a parallel 27 inch PVC sewer.</d:Description>
<d:DueDate m:type="Edm.DateTime">2009-05-11T00:00:00</d:DueDate>
<d:OnTrack m:type="Edm.Boolean">true</d:OnTrack>
<d:ID m:type="Edm.Int32">1</d:ID>
<d:Modified m:type="Edm.DateTime">2009-05-01T13:40:08</d:Modified>
<d:Created m:type="Edm.DateTime">2009-05-01T13:40:08</d:Created>
<d:Owshiddenversion m:type="Edm.Int32">1</d:Owshiddenversion>
<d:Version>1.0</d:Version>
<d:Path>/Lists/Projects</d:Path>
</m:properties>
</content>
</entry>
<entry m:etag="W/&quot;1&quot;">
<id>http://www.contoso.com/_vti_bin/ListData.svc/Projects(4)</id>
<title type="text">Theatre/Auditoriums #429743</title>
<updated>2009-05-01T20:48:50Z</updated>
<author>
<name />
</author>
<link rel="edit" title="ProjectsItem" href="Projects(4)" />
<link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Location"
type="application/atom+xml;type=entry" title="Location"
href="Projects(4)/Location" />
<link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"
type="application/atom+xml;type=entry" title="CreatedBy"
href="Projects(4)/CreatedBy" />
<link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"
type="application/atom+xml;type=entry" title="ModifiedBy"
href="Projects(4)/ModifiedBy" />
<category term="Microsoft.SharePoint.DataService.ProjectsItem"
scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
<content type="application/xml">
<m:properties>
<d:ProjectTitle>Theatre/Auditoriums #429743</d:ProjectTitle>
<d:Description>The work involves furnishing all labor, materials,
equipment, services, and construction. The project consists of a general
interior build-out of the fourth floor space within the existing Balboa Theatre
and some minor additional miscellaneous work on floors 1, 2, 5 and basement.
This contract includes general mechanical, plumbing, and electrical trades to
complete the build-out as described by the construction documents; all other
work and appurtenances in accordance with the plans and
specifications.</d:Description>
<d:DueDate m:type="Edm.DateTime">2010-06-15T00:00:00</d:DueDate>
<d:OnTrack m:type="Edm.Boolean">true</d:OnTrack>
<d:ID m:type="Edm.Int32">4</d:ID>
<d:Modified m:type="Edm.DateTime">2009-05-01T13:40:08</d:Modified>
<d:Created m:type="Edm.DateTime">2009-05-01T13:40:08</d:Created>
<d:Owshiddenversion m:type="Edm.Int32">1</d:Owshiddenversion>
<d:Version>1.0</d:Version>
<d:Path>/Lists/Projects</d:Path>
</m:properties>
</content>
</entry>
<entry m:etag="W/&quot;1&quot;">
<id>http://www.contoso.com/_vti_bin/ListData.svc/Projects(3)</id>
<title type="text">Educational #623991</title>
<updated>2009-05-01T20:48:50Z</updated>
<author>
<name />
</author>
<link rel="edit" title="ProjectsItem" href="Projects(3)" />
<link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Location"
type="application/atom+xml;type=entry" title="Location"
href="Projects(3)/Location" />
<link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"
type="application/atom+xml;type=entry" title="CreatedBy"
href="Projects(3)/CreatedBy" />
<link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"

```

```

    type="application/atom+xml;type=entry" title="ModifiedBy"
    href="Projects(3)/ModifiedBy" />
<category term="Microsoft.SharePoint.DataService.ProjectsItem"
  scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
<content type="application/xml">
  <m:properties>
    <d:ProjectTitle>Educational #623991</d:ProjectTitle>
    <d:Description>Tenant improvements to an existing educational facility in
      Carlsbad. Completed plans are calling for electrical, mechanical and structural
      upgrades to an elementary school. The project will also include interior
      remodeling and optimizing existing space.</d:Description>
    <d:DueDate m:type="Edm.DateTime">2010-08-21T00:00:00</d:DueDate>
    <d:OnTrack m:type="Edm.Boolean">>false</d:OnTrack>
    <d:ID m:type="Edm.Int32">3</d:ID>
    <d:Modified m:type="Edm.DateTime">2009-05-01T13:40:08</d:Modified>
    <d:Created m:type="Edm.DateTime">2009-05-01T13:40:08</d:Created>
    <d:Owshiddenversion m:type="Edm.Int32">1</d:Owshiddenversion>
    <d:Version>1.0</d:Version>
    <d:Path>/Lists/Projects</d:Path>
  </m:properties>
</content>
</entry>
<entry m:etag="W/&quot;1&quot;">
  <id>http://www.contoso.com/_vti_bin/ListData.svc/Projects(2)</id>
  <title type="text">Roads/Highway #812523</title>
  <updated>2009-05-01T20:48:50Z</updated>
  <author>
    <name />
  </author>
  <link rel="edit" title="ProjectsItem" href="Projects(2)" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Location"
    type="application/atom+xml;type=entry" title="Location"
    href="Projects(2)/Location" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"
    type="application/atom+xml;type=entry" title="CreatedBy"
    href="Projects(2)/CreatedBy" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"
    type="application/atom+xml;type=entry" title="ModifiedBy"
    href="Projects(2)/ModifiedBy" />
  <category term="Microsoft.SharePoint.DataService.ProjectsItem"
    scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
  <content type="application/xml">
    <m:properties>
      <d:ProjectTitle>Roads/Highway #812523</d:ProjectTitle>
      <d:Description>Construct an additional through lane on the north side of Palomar
        Airport Road between Paseo Del Norte and Armada Drive and construct a
        deceleration lane, including install new curb & gutter, sidewalk,
        landscaping, reclaimed water irrigation system, Caltrans truss sign structure,
        and relocate existing utilities.</d:Description>
      <d:DueDate m:type="Edm.DateTime">2012-12-01T00:00:00</d:DueDate>
      <d:OnTrack m:type="Edm.Boolean">>true</d:OnTrack>
      <d:ID m:type="Edm.Int32">2</d:ID>
      <d:Modified m:type="Edm.DateTime">2009-05-01T13:40:08</d:Modified>
      <d:Created m:type="Edm.DateTime">2009-05-01T13:40:08</d:Created>
      <d:Owshiddenversion m:type="Edm.Int32">1</d:Owshiddenversion>
      <d:Version>1.0</d:Version>
      <d:Path>/Lists/Projects</d:Path>
    </m:properties>
  </content>
</entry>
</feed>

```

4.3 Insert a New List Item

The following example illustrates the exchange of messages required for a client to insert a new Employees list item to the Employees list and associate it with Projects list item 2 and 3 using the AtomPub format.

HTTP Request:

```
POST /_vti_bin/ListData.svc/Employees HTTP/1.1
Accept: application/atom+xml
Content-Type: application/atom+xml
Host: www.contoso.com
Content-Length: ###
Expect: 100-continue

<?xml version="1.0" encoding="utf-8" standalone="yes"?>
<entry xmlns:d="http://schemas.microsoft.com/ado/2007/08/dataservices"
  xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metadata"
  xmlns="http://www.w3.org/2005/Atom">
  <category scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme"
    term="Microsoft.SharePoint.DataService.EmployeesItem" />
  <title />
  <author>
    <name />
  </author>
  <updated>2009-04-30T02:15:21.1353156Z</updated>
  <id />
  <link href="http://www.contoso.com/_vti_bin/ListData.svc/Projects(2)"
    rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Projects"
    type="application/atom+xml;type=feed" />
  <link href="http://www.contoso.com/_vti_bin/ListData.svc/Projects(3)"
    rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Projects"
    type="application/atom+xml;type=feed" />
  <content type="application/xml">
    <m:properties>
      <d:Created m:type="Edm.DateTime" m:null="true" />
      <d:FullName>James Earl Jones</d:FullName>
      <d:HireDate m:type="Edm.DateTime">1987-04-29T19:15:14.7861156-07:00</d:HireDate>
      <d:ID m:type="Edm.Int32">0</d:ID>
      <d:Modified m:type="Edm.DateTime" m:null="true" />
      <d:Path m:null="true" />
      <d:Salary m:type="Edm.Double">195000</d:Salary>
      <d:Version m:null="true" />
      <d:Owshiddenversion m:type="Edm.Int32" m:null="true" />
    </m:properties>
  </content>
</entry>
```

HTTP Response:

```
HTTP/1.1 201 Created
Cache-Control: no-cache
Content-Type: application/atom+xml; charset=utf-8
ETag: W/"1"
Location: http://www.contoso.com/_vti_bin/ListData.svc/Employees(11)
Server: Microsoft-IIS/7.0
SPRequestGuid: 49759c6a-7a76-44fc-bd4c-e6bfe3f97a3e
DataServiceVersion: 2.0;
X-AspNet-Version: 2.0.50727
Set-Cookie: SDA_Callback=05/01/2009 14:07:39; expires=Fri, 01-May-2009 21:17:39 GMT; path=/
Set-Cookie: WSS_KeepSessionAuthenticated={afbe7ca4-c701-4f7d-9021-25cab947ae3f}; path=/
X-Powered-By: ASP.NET
MicrosoftSharePointTeamServices: 14.0.0.4006
Date: Fri, 01 May 2009 21:07:41 GMT
Content-Length: ###
```

```

<?xml version="1.0" encoding="utf-8" standalone="yes"?>
<entry xml:base="http://www.contoso.com/_vti_bin/ListData.svc/"
  xmlns:d="http://schemas.microsoft.com/ado/2007/08/dataservices"
  xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metadata"
  m:etag="W/&quot;1&quot;"
  xmlns="http://www.w3.org/2005/Atom">
  <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees(11)</id>
  <title type="text">James Earl Jones</title>
  <updated>2009-05-01T21:07:41Z</updated>
  <author>
    <name />
  </author>
  <link rel="edit" title="EmployeesItem" href="Employees(11)" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Projects"
    type="application/atom+xml;type=feed" title="Projects"
    href="Employees(11)/Projects" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"
    type="application/atom+xml;type=entry" title="CreatedBy"
    href="Employees(11)/CreatedBy" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"
    type="application/atom+xml;type=entry" title="ModifiedBy"
    href="Employees(11)/ModifiedBy" />
  <category term="Microsoft.SharePoint.DataService.EmployeesItem"
    scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
  <content type="application/xml">
    <m:properties>
      <d:FullName>James Earl Jones</d:FullName>
      <d:Salary m:type="Edm.Double">195000</d:Salary>
      <d:HireDate m:type="Edm.DateTime">1987-04-29T19:15:14.7861156-07:00</d:HireDate>
      <d:ID m:type="Edm.Int32">11</d:ID>
      <d:Modified m:type="Edm.DateTime">2009-05-01T14:07:41</d:Modified>
      <d:Created m:type="Edm.DateTime">2009-05-01T14:07:41</d:Created>
      <d:Owshiddenversion m:type="Edm.Int32">1</d:Owshiddenversion>
      <d:Version>1.0</d:Version>
      <d:Path>/Lists/Employees</d:Path>
    </m:properties>
  </content>
</entry>

```

4.4 Update a List Item

4.4.1 Update a List Item Using Replace-based Semantics

The following example illustrates the exchange of messages required for a client to update an existing Employee list item with replace semantics using the AtomPub format.

HTTP Request:

```

PUT /_vti_bin/ListData.svc/Employees(8) HTTP/1.1
If-Match: W/"1"
Accept: application/atom+xml
Content-Type: application/atom+xml
Host: www.contoso.com
Content-Length: ###
Expect: 100-continue

<?xml version="1.0" encoding="utf-8" standalone="yes"?>
<entry xmlns:d="http://schemas.microsoft.com/ado/2007/08/dataservices"
  xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metadata"
  xmlns="http://www.w3.org/2005/Atom">
  <content type="application/xml">
    <m:properties>
      <d:FullName>Leslie Rubio (modified)</d:FullName>
    </m:properties>
  </content>

```

</entry>

HTTP Response:

```
HTTP/1.1 204 No Content
Cache-Control: no-cache
ETag: W/"2"
Server: Microsoft-IIS/7.0
SPRequestGuid: 45daab9b-031e-48c7-bed9-60d96516614e
DataServiceVersion: 1.0;
X-AspNet-Version: 2.0.50727
Set-Cookie: SDA Callback=05/01/2009 14:32:41; expires=Fri, 01-May-2009 21:42:41 GMT; path=/
Set-Cookie: WSS KeepSessionAuthenticated={afbe7ca4-c701-4f7d-9021-25cab947ae3f}; path=/
X-Powered-By: ASP.NET
MicrosoftSharePointTeamServices: 14.0.0.4006
Date: Fri, 01 May 2009 21:32:42 GMT
```

The following retrieve request is not required to update the list item but is included to show the value of the Employee list item after the update finished. Because replace-based semantics were used, non-system properties that were not specified in the update request have been set to their default values (nulls, in this case). Certain properties that are designated as read-only by the protocol server (for example, **Modified**, **Created**, **Version**, **ID**, and so on) are not affected by updates, regardless of whether a user modifies them, and will always retain their values as found on the protocol server.

HTTP Request:

```
GET /_vti_bin/ListData.svc/Employees(8) HTTP/1.1
Accept: application/atom+xml
Host: www.contoso.com
```

HTTP Response:

```
HTTP/1.1 200 OK
Cache-Control: no-cache
Content-Type: application/atom+xml; charset=utf-8
ETag: W/"2"
Server: Microsoft-IIS/7.0
SPRequestGuid: f3f18a87-af3a-41c8-922b-206fb16b8f5f
DataServiceVersion: 1.0;
X-AspNet-Version: 2.0.50727
Set-Cookie: SDA_Callback=05/01/2009 14:33:12; expires=Fri, 01-May-2009 21:43:12 GMT; path=/
Set-Cookie: WSS KeepSessionAuthenticated={afbe7ca4-c701-4f7d-9021-25cab947ae3f}; path=/
X-Powered-By: ASP.NET
MicrosoftSharePointTeamServices: 14.0.0.4006
Date: Fri, 01 May 2009 21:33:13 GMT
Content-Length: 1839
```

```
<?xml version="1.0" encoding="utf-8" standalone="yes"?>
<entry xml:base="http://www.contoso.com/_vti_bin/ListData.svc/"
  xmlns:d="http://schemas.microsoft.com/ado/2007/08/dataservices"
  xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metadata"
  m:etag="W/"&quot;2&quot;"
  xmlns="http://www.w3.org/2005/Atom">
  <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees(8)</id>
  <title type="text">Leslie Rubio (modified)</title>
  <updated>2009-05-01T21:33:13Z</updated>
  <author>
    <name />
  </author>
  <link rel="edit" title="EmployeesItem" href="Employees(8)" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Projects"
```

```

    type="application/atom+xml;type=feed" title="Projects"
    href="Employees(8)/Projects" />
<link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"
    type="application/atom+xml;type=entry" title="CreatedBy"
    href="Employees(8)/CreatedBy" />
<link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"
    type="application/atom+xml;type=entry" title="ModifiedBy"
    href="Employees(8)/ModifiedBy" />
<category term="Microsoft.SharePoint.DataService.EmployeesItem"
    scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
<content type="application/xml">
  <m:properties>
    <d:FullName>Leslie Rubio (modified)</d:FullName>
    <d:Salary m:type="Edm.Double" m:null="true" />
    <d:HireDate m:type="Edm.DateTime" m:null="true" />
    <d:ID m:type="Edm.Int32">8</d:ID>
    <d:Modified m:type="Edm.DateTime">2009-05-01T14:32:43</d:Modified>
    <d:Created m:type="Edm.DateTime">2009-05-01T13:40:08</d:Created>
    <d:Owshiddenversion m:type="Edm.Int32">2</d:Owshiddenversion>
    <d:Version>1.0</d:Version>
    <d:Path>/Lists/Employees</d:Path>
  </m:properties>
</content>
</entry>

```

4.4.2 Update a List Item Using Merge-based Semantics

The following example illustrates the exchange of messages required for a client to update an existing Employee list item with merge semantics using the AtomPub format.

HTTP Request:

```

MERGE / vti bin/ListData.svc/Employees(10) HTTP/1.1
If-Match: W/"1"
Accept: application/atom+xml
Content-Type: application/atom+xml
Host: www.contoso.com
Content-Length: ###
Expect: 100-continue

<?xml version="1.0" encoding="utf-8" standalone="yes"?>
<entry xmlns:d="http://schemas.microsoft.com/ado/2007/08/dataservices"
    xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metadata"
    xmlns="http://www.w3.org/2005/Atom">
  <content type="application/xml">
    <m:properties>
      <d:FullName>Kathleen Gill (modified)</d:FullName>
    </m:properties>
  </content>
</entry>

```

HTTP Response:

```

HTTP/1.1 204 No Content
Cache-Control: no-cache
ETag: W/"2"
Server: Microsoft-IIS/7.0
SPRequestGuid: e1a0ead5-8b76-42ed-816c-95184e007013
DataServiceVersion: 1.0;
X-AspNet-Version: 2.0.50727
Set-Cookie: SDA_Callback=05/01/2009 14:25:12; expires=Fri, 01-May-2009 21:35:12 GMT; path=/
Set-Cookie: WSS_KeepSessionAuthenticated={afbe7ca4-c701-4f7d-9021-25cab947ae3f}; path=/
X-Powered-By: ASP.NET

```

MicrosoftSharePointTeamServices: 14.0.0.4006
Date: Fri, 01 May 2009 21:25:13 GMT

The following retrieve request is not required to update the list item but is included to show the value of the Employee list item after the update finished. Because merge-based semantics were used, properties that were not specified in the update request have not been altered.

HTTP Request:

```
GET /vti/bin/ListData.svc/Employees(10) HTTP/1.1
Accept: application/atom+xml
Host: www.contoso.com
```

HTTP Response:

```
HTTP/1.1 200 OK
Cache-Control: no-cache
Content-Type: application/atom+xml; charset=utf-8
ETag: W/"2"
Server: Microsoft-IIS/7.0
SPRequestGuid: a0a014f1-28db-4381-ac5d-1e7f4f71d6b8
DataServiceVersion: 1.0;
X-AspNet-Version: 2.0.50727
Set-Cookie: SDA_Callback=05/01/2009 14:26:14; expires=Fri, 01-May-2009 21:36:14 GMT; path=/
Set-Cookie: WSS_KeepSessionAuthenticated={afbe7ca4-c701-4f7d-9021-25cab947ae3f}; path=/
X-Powered-By: ASP.NET
MicrosoftSharePointTeamServices: 14.0.0.4006
Date: Fri, 01 May 2009 21:26:14 GMT
Content-Length: ###
```

```
<?xml version="1.0" encoding="utf-8" standalone="yes"?>
<entry xml:base="http://www.contoso.com/_vti_bin/ListData.svc/"
  xmlns:d="http://schemas.microsoft.com/ado/2007/08/dataservices"
  xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metadata"
  m:etag="W/&quot;2&quot;"
  xmlns="http://www.w3.org/2005/Atom">
  <id>http://www.contoso.com/_vti_bin/ListData.svc/Employees(10)</id>
  <title type="text">Kathleen Gill (modified)</title>
  <updated>2009-05-01T21:26:14Z</updated>
  <author>
    <name />
  </author>
  <link rel="edit" title="EmployeesItem" href="Employees(10)" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/Projects"
    type="application/atom+xml;type=feed" title="Projects"
    href="Employees(10)/Projects" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/CreatedBy"
    type="application/atom+xml;type=entry" title="CreatedBy"
    href="Employees(10)/CreatedBy" />
  <link rel="http://schemas.microsoft.com/ado/2007/08/dataservices/related/ModifiedBy"
    type="application/atom+xml;type=entry" title="ModifiedBy"
    href="Employees(10)/ModifiedBy" />
  <category term="Microsoft.SharePoint.DataService.EmployeesItem"
    scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
  <content type="application/xml">
    <m:properties>
      <d:FullName>Kathleen Gill (modified)</d:FullName>
      <d:Salary m:type="Edm.Double">102000</d:Salary>
      <d:HireDate m:type="Edm.DateTime">1989-03-22T00:00:00</d:HireDate>
      <d:ID m:type="Edm.Int32">10</d:ID>
      <d:Modified m:type="Edm.DateTime">2009-05-01T14:25:14</d:Modified>
      <d:Created m:type="Edm.DateTime">2009-05-01T13:40:08</d:Created>
      <d:Owshiddenversion m:type="Edm.Int32">2</d:Owshiddenversion>
      <d:Version>1.0</d:Version>
    </m:properties>
  </content>
</entry>
```

```
    <d:Path>/Lists/Employees</d:Path>
  </m:properties>
</content>
</entry>
```

4.5 Delete a List Item

The following example illustrates the exchange of messages required for a client to delete an existing Employee list item with **ID** value of "1" from a data service using the AtomPub format.

HTTP Request:

```
DELETE /_vti_bin/ListData.svc/Employees(1) HTTP/1.1
If-Match: W/"1"
Accept: application/atom+xml
Host: www.contoso.com
```

HTTP Response:

```
HTTP/1.1 204 No Content
Cache-Control: no-cache
Server: Microsoft-IIS/7.0
SPRequestGuid: 7477c1ef-2e93-4c80-9de1-86d1e4095696
DataServiceVersion: 1.0;
X-AspNet-Version: 2.0.50727
Set-Cookie: SDA_Callback=05/01/2009 14:38:41; expires=Fri, 01-May-2009 21:48:41 GMT; path=/
Set-Cookie: WSS_KeepSessionAuthenticated={afbe7ca4-c701-4f7d-9021-25cab947ae3f}; path=/
X-Powered-By: ASP.NET
MicrosoftSharePointTeamServices: 14.0.0.4006
Date: Fri, 01 May 2009 21:38:42 GMT
```

4.6 Batch Requests

The following example illustrates the exchange of messages required for a client to insert a new Employee list item followed by an update of **Project** list item 1. Request bodies have been replaced with descriptions enclosed by brackets for clarity.

HTTP Request:

```
POST /_vti_bin/ListData.svc/$batch HTTP/1.1
Accept: application/atom+xml,application/xml
Content-Type: multipart/mixed; boundary=batch_2634d583-80b6-4272-904b-f241d72722e4
Host: www.contoso.com
Content-Length: ###
Expect: 100-continue

--batch_2634d583-80b6-4272-904b-f241d72722e4
Content-Type: multipart/mixed; boundary=changeset_20f18de9-b0ba-4c7d-87dd-07ce4836cc5a

--changeset_20f18de9-b0ba-4c7d-87dd-07ce4836cc5a
Content-Type: application/http
Content-Transfer-Encoding: binary

POST /_vti_bin/ListData.svc/Employees HTTP/1.1
Host: www.contoso.com
Content-ID: 1
Content-Type: application/atom+xml;type=entry
Content-Length: ###

<AtomPub representation of a new Employee list item>
```


--changeset_20f18de9-b0ba-4c7d-87dd-07ce4836cc5a
Content-Type: application/http
Content-Transfer-Encoding: binary

MERGE / vti bin/ListData.svc/Projects(1) HTTP/1.1
Host: www.contoso.com
Content-ID: 3
Content-Type: application/atom+xml;type=entry
If-Match: W/"2"
Content-Length: ###

<AtomPub representation of Project list item 1>

--changeset_20f18de9-b0ba-4c7d-87dd-07ce4836cc5a--
--batch_2634d583-80b6-4272-904b-f241d72722e4--

HTTP Response:

HTTP/1.1 202 Accepted
Cache-Control: no-cache
Content-Type: multipart/mixed; boundary=batchresponse_c111d175-b384-44e2-a3af-bf24994b7cb7
Server: Microsoft-IIS/7.0
SPRequestGuid: 240dffff-bf75-40a4-a804-20924faa2e8d
X-AspNet-Version: 2.0.50727
Set-Cookie: SDA Callback=04/30/2009 16:33:03; expires=Thu, 30-Apr-2009 23:43:03 GMT; path=/
Set-Cookie: WSS_KeepSessionAuthenticated={afbe7ca4-c701-4f7d-9021-25cab947ae3f}; path=/
X-Powered-By: ASP.NET
MicrosoftSharePointTeamServices: 14.0.0.4006
Date: Thu, 30 Apr 2009 23:33:04 GMT
Content-Length: ###

--batchresponse_c111d175-b384-44e2-a3af-bf24994b7cb7
Content-Type: multipart/mixed; boundary=changesetresponse_1be3f588-2f05-4166-a76d-7be8935bcbf5

--changesetresponse_1be3f588-2f05-4166-a76d-7be8935bcbf5
Content-Type: application/http
Content-Transfer-Encoding: binary

HTTP/1.1 201 Created
Content-ID: 1
Cache-Control: no-cache
DataServiceVersion: 2.0;
Content-Type: application/atom+xml; charset=utf-8
Location: http://www.contoso.com/_vti_bin/ListData.svc/Employees(11)
ETag: W/"1"

<AtomPub representation of the newly created Employee list item>

--changesetresponse_1be3f588-2f05-4166-a76d-7be8935bcbf5
Content-Type: application/http
Content-Transfer-Encoding: binary

HTTP/1.1 204 No Content
Content-ID: 3
Cache-Control: no-cache
DataServiceVersion: 1.0;
ETag: W/"2"

--changesetresponse_1be3f588-2f05-4166-a76d-7be8935bcbf5--
--batchresponse_c111d175-b384-44e2-a3af-bf24994b7cb7--

5 Security

5.1 Security Considerations for Implementers

None.

5.2 Index of Security Parameters

None.

6 Appendix A: Full WSDL

None.

7 Appendix B: Sample Site Data

All examples in this document use the following sample site data and conceptual schema definition language (CSDL).

Sample Data:

- A site at <http://www.contoso.com> exists.
- A custom list with title Employees exist on the site. The Employees list contains the following fields:
 - Name
 - Salary
 - Hire Date
 - Projects
- A total of 10 list items exist in the Employees list.
- Employees list items with ID values 1, 8, and 10 exist.
- A custom list with title Projects exist on the site. The Projects list contains the following fields:
 - Title
 - Description
 - Due Date
 - On Track
 - Location
- Two Projects list items, one with ID value 2 and the other with ID value 3, exist. Projects list item 2 and 3 are associated with Employees list item 1.

8 Appendix C: Product Behavior

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

- Microsoft Office 2010 suites
- Microsoft Office 2013
- Microsoft SharePoint Foundation 2010
- Microsoft SharePoint Foundation 2013
- Windows 8.1 Update
- Microsoft Office 2016
- Windows 10 operating system
- Microsoft SharePoint Server 2016
- Microsoft Office 2019
- Microsoft SharePoint Server 2019
- Microsoft Office 2021
- Windows 11 operating system
- Microsoft SharePoint Server Subscription Edition 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.

9 Change Tracking

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

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

- A document revision that incorporates changes to interoperability requirements.
- A document revision that captures changes to protocol functionality.

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

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

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

Section	Description	Revision class
8 Appendix C: Product Behavior	Updated list of supported products.	Major

10 Index

A

Abstract data model
[server](#) 13
[Applicability](#) 9
[Attribute groups](#) 12
[Attributes](#) 12

B

[Batch requests example](#) 48

C

[Capability negotiation](#) 9
[Change tracking](#) 54
[Client role](#) 8
[Complex types](#) 11

D

Data model - abstract
[server](#) 13
[Delete a list item example](#) 48

E

Elements
[List](#) 10
[List Item](#) 10
Events
[local - server](#) 15
[timer - server](#) 15
Examples
[batch requests](#) 48
[delete a list item](#) 48
[insert a new list item](#) 43
[overview](#) 16
[retrieve a collection of entities with an inline count](#)
26
[retrieve a collection of list items](#) 20
[retrieve a CSDL document](#) 16
[retrieve a list item by ID](#) 37
[retrieve list items in a specified order](#) 40
[retrieve list items that satisfy specified criteria](#) 38
[retrieve the count of a collection of list items](#) 26
[retrieve the First Two List Items in a List](#) 32
[retrieve the last two items in a list](#) 33
[retrieve the middle two list items in a list](#) 35
[update a list item using merge-based semantics](#) 46
[update a list item using replace-based semantics](#)
44

F

[Fields - vendor-extensible](#) 9
[Full WSDL](#) 51

G

[Glossary](#) 6

[Groups](#) 12

I

[Implementer - security considerations](#) 50
[Index of security parameters](#) 50
[Informative references](#) 7
Initialization
[server](#) 13
[Insert a new list item example](#) 43
[Introduction](#) 6

L

[List element](#) 10
[List Item element](#) 10
Local events
[server](#) 15

M

Message processing
[server](#) 13
Messages
[attribute groups](#) 12
[attributes](#) 12
[complex types](#) 11
[elements](#) 10
[enumerated](#) 10
[groups](#) 12
[List element](#) 10
[List Item element](#) 10
[simple types](#) 11
[syntax](#) 10
[transport](#) 10

N

[Normative references](#) 7

O

Operations
[Attachment](#) 14
[Choice or Multi-Choice Field](#) 14
[Document](#) 14
[Overview \(synopsis\)](#) 8
[client](#) 8
[roles](#) 8
[server](#) 8

P

[Parameters - security index](#) 50
[Preconditions](#) 9
[Prerequisites](#) 9
[Product behavior](#) 53

R

[References](#) 7

[informative](#) 7
[normative](#) 7
[Relationship to other protocols](#) 8
[Retrieve a collection of entities with an inline count example](#) 26
[Retrieve a collection of list items example](#) 20
[Retrieve a CSDL document example](#) 16
[Retrieve a list item by ID example](#) 37
[Retrieve list items in a specified order example](#) 40
[Retrieve list items that satisfy specified criteria example](#) 38
[Retrieve the count of a collection of list items example](#) 26
[Retrieve the First Two List Items in a List example](#) 32
[Retrieve the last two items in a list example](#) 33
[Retrieve the middle two list items in a list example](#) 35
[Roles](#) 8

S

[Sample site data](#) 52
Security
[implementer considerations](#) 50
[parameter index](#) 50
Sequencing rules
[server](#) 13
Server
[abstract data model](#) 13
[Attachment operation](#) 14
[Choice or Multi-Choice Field operation](#) 14
[Document operation](#) 14
[initialization](#) 13
[local events](#) 15
[message processing](#) 13
[sequencing rules](#) 13
[timer events](#) 15
[timers](#) 13
[Server role](#) 8
[Simple types](#) 11
[Standards assignments](#) 9
Syntax
[messages - overview](#) 10

T

Timer events
[server](#) 15
Timers
[server](#) 13
[Tracking changes](#) 54
[Transport](#) 10
Types
[complex](#) 11
[simple](#) 11

U

[Update a list item using merge-based semantics example](#) 46
[Update a list item using replace-based semantics example](#) 44

V

[Vendor-extensible fields](#) 9
[Versioning](#) 9

W

[WSDL](#) 51