

# [MS-ESREST]: Excel Services REST Protocol Specification

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## Revision Summary

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02/19/2010	1.0	Major	Initial Availability.
03/31/2010	1.01	Editorial	Revised and edited the technical content
04/30/2010	1.02	Editorial	Revised and edited the technical content
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06/29/2010	1.04	Editorial	Changed language and formatting in the technical content.
07/23/2010	1.04	No change	No changes to the meaning, language, or formatting of the technical content.
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04/11/2012	2.0	No change	No changes to the meaning, language, or formatting of the technical content.
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Preliminary

# 1 Introduction

This document specifies the Excel Services REST Protocol extensions to the Atom Publishing Protocol (AtomPub) [\[RFC5023\]](#) and its extensions specified in the Open Data Protocol (ODATA) Specification [\[MS-ODATA\]](#).

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

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

## 1.1 Glossary

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

**atom feed**  
**cell**  
**formula**  
**Hypertext Markup Language (HTML)**  
**list**  
**named range**  
**number format**  
**PivotTable**  
**published item**  
**range**  
**row**  
**site**  
**table**  
**Uniform Resource Locator (URL)**  
**Web Services Description Language (WSDL)**  
**workbook**  
**workbook file**  
**worksheet**  
**XML namespace**  
**XML schema**

The following terms are specific to this document:

**cell error value:** Any of a number of special values that are returned as a result of an unsuccessful formula calculation.

**HTML fragment:** Lines of text that adhere to HTML tag rules, as described in [HTML], but do not have processing instructions or any other type of header information.

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

## 1.2 References

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

### 1.2.1 Normative References

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

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

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

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

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

[RFC4287] Nottingham, M., and Sayre, E.R., "The Atom Syndication Format", RFC 4287, December 2005, <http://www.ietf.org/rfc/rfc4287.txt>

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

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

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

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

### 1.2.2 Informative References

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

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

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

## 1.3 Protocol Overview (Synopsis)

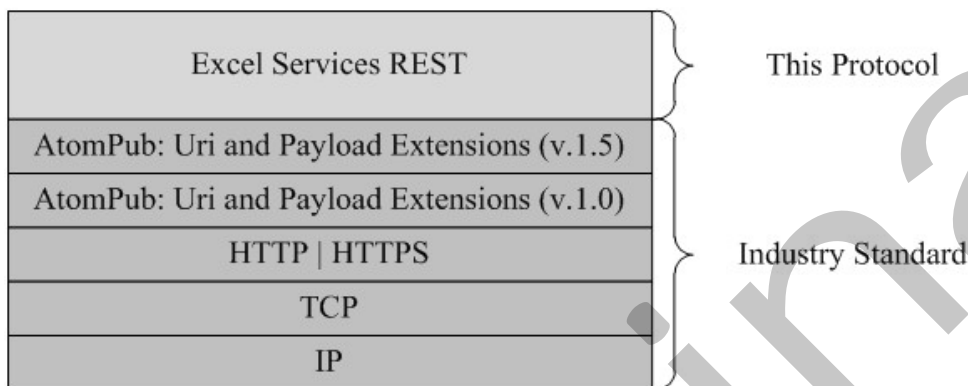
This protocol enables protocol clients to access information stored in **workbooks** maintained by a protocol server using common Web technologies. Various types of resources within spreadsheets can be retrieved, such as **ranges**, **tables**, charts, and **PivotTable** reports. The information returned by the protocol can be in one of several formats, such as **HTML**, image, and as an **Atom feed**. This protocol client also allows for values to be inserted into cells of the workbook.

A typical scenario for using this protocol is a custom application where workbook data is used as a data source that is connected to other processes that act on that data, such as displaying it in a novel way or taking specific action based on the contents of that data. Another typical scenario for this protocol is in embedding of workbook data into applications that support common Web standards.

## 1.4 Relationship to Other Protocols

This protocol uses the AtomPub messaging protocol for formatting requests and responses as described in [\[RFC5023\]](#) and URI and Payload extensions to the AtomPub protocol as described in [\[MS-ODATA\]](#). It transmits these messages using the HTTP protocol as described in [\[RFC2616\]](#) or the HTTPS protocol as described in [\[RFC2818\]](#).

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



**Figure 1: This protocol in relation to other protocols**

## 1.5 Prerequisites/Preconditions

This protocol operates against a **site (1)** 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 [\[RFC5023\]](#), 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 retrieve operations on a data model to clients.

## 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 [\[MS-ODATA\]](#).
- **Localization:** This document does not specify any localization-dependent behavior.
- **Capability negotiation:** Capability negotiation is performed as described in [\[MS-ODATA\]](#).

## **1.8 Vendor-Extensible Fields**

None.

## **1.9 Standards Assignments**

None.

Preliminary



## 2 Messages

### 2.1 Transport

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

#### 2.2.1 Namespaces

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

Prefix	Namespace URI	Reference
tns	<a href="http://schemas.microsoft.com/office/excel/server/webservices">http://schemas.microsoft.com/office/excel/server/webservices</a>	
xs	<a href="http://www.w3.org/2001/XMLSchema">http://www.w3.org/2001/XMLSchema</a>	<a href="#">[XMLSCHEMA1]</a> <a href="#">[XMLSCHEMA2]</a>
atom	<a href="http://www.w3.org/2005/Atom">http://www.w3.org/2005/Atom</a>	<a href="#">[RFC4287]</a>

#### 2.2.2 Messages

This specification does not define any common WSDL message definitions.

#### 2.2.3 Elements

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

#### 2.2.4 Complex Types

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

Complex type	Description
<b>Range</b>	A range of <b>cells</b> in a worksheet.
<b>Row</b>	Represents a <b>row(2)</b> in a <b>worksheet</b> .

##### 2.2.4.1 Range

Represents a range of cells in a worksheet.

This complex type is defined as follows.

```

<xs:complexType name="Range">
  <xs:element name="row" type="Row" minOccurs="0" maxOccurs="unbounded"/>
  <xs:attribute name="name" type="string" use="required"/>
</xs:complexType>

```

**row:** Represents a row (2) from the spreadsheet.

**name:** Contains the name of the range.

### 2.2.4.2 Row

Represents a row(2) in a worksheet.

This complex type is defined as follows.

```

<xs:complexType name="Row">
  <xs:element name="c" type="Cell" minOccurs="0" maxOccurs="unbounded"/>
</xs:complexType>

```

**c:** Represents a cell in the worksheet. The number of **c** elements inside a **row** element **MUST** be the same for all **row** elements inside the same **range** element.

#### 2.2.4.2.1 Cell

Represents a cell in a worksheet.

This complex type is defined as follows.

```

<xs:complexType name="Cell">
  <xs:element name="fv" xsi-type="xs:string" minOccurs="0" maxOccurs="1"/>
  <xs:element name="v" xsi-type="xs:anyType" minOccurs="0" maxOccurs="1"/>
</xs:complexType>

```

**fv:** Represents a cell formatted using a **number format** according to how the worksheet cell is number formatted in the workbook value in a cell. If the **v** element is present and the **xsi-type** attribute on it is set to "string" then this element **MUST NOT** be present. **MUST NOT** be present if the cell is empty.

**v:** Represents the value of the cell. The **xsi-type** attribute **MUST** be set to either "double" (as the default), "Boolean", "String" or "Error". **MUST** be present if the cell is not empty.

### 2.2.5 Simple Types

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

Simple type	Description
<b>Error</b>	An enumeration of the set of <b>cell error values</b> that a worksheet cell can contain.

### 2.2.5.1 Error

The **Error** type is an enumeration of the set of cell error values that a worksheet cell can contain.

This simple type is defined as follows.

```
<xs:simpleType name="Error">
  <xs:restriction base="xs:string">
    <xs:enumeration value="Div0"/>
    <xs:enumeration value="Name"/>
    <xs:enumeration value="Num"/>
    <xs:enumeration value="Value"/>
    <xs:enumeration value="NotApplicable"/>
    <xs:enumeration value="Null"/>
    <xs:enumeration value="Ref"/>
  </xs:restriction>
</xs:simpleType>
```

The following table specifies the allowable values for Error:

Value	Meaning
Div0	Worksheet cell contains a number that is divided by 0.
NotApplicable	Worksheet cell contains a value not available to a <b>formula</b> .
Name	Worksheet cell contains text not recognized by a formula.
Null	Worksheet cell contains an empty intersection of two areas.
Num	Worksheet cell contains invalid numeric values in a formula.
Ref	Worksheet cell contains a reference that is not valid.
Value	Worksheet cell contains a formula that includes worksheet cells that contain different data types.

### 2.2.6 Attributes

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

### 2.2.7 Groups

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

### 2.2.8 Attribute Groups

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

### 2.2.9 Common Data Structures

This specification does not define any common XML schema data structures.

## 3 Protocol Details

### 3.1 Server Details

#### 3.1.1 Abstract Data Model

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

The relationship between the Excel Services REST Protocol Specification data model and the Entity Data Model defined in [MC-CSDL] are described as follows. The mapping between Entity Data Model concepts and those of the AtomPub specification is described 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 described in [MS-ODATA] and [MC-CSDL].

Spreadsheet data structure	Description	Entity Data Model term
Model	Information about the spreadsheet.	<b>EntitySet</b>
Ranges	The list of ranges that are exposed by the spreadsheet.	<b>EntitySet</b>
Charts	The list of charts that are exposed by the spreadsheet	<b>EntitySet</b>
Tables	The list of tables that are exposed by the spreadsheet.	<b>EntitySet</b>
PivotTables	The list of pivot tables that are exposed by the spreadsheet.	<b>EntitySet</b>
Range	A range from the spreadsheet.	<b>Entity</b>
Table	A table from the spreadsheet	<b>Entity</b>
PivotTable	A PivotTable from the spreadsheet	<b>Entity</b>
Chart	A chart from the spreadsheet	None. Returned as a binary response to the request.
OData	The OData service document, as specified in [MS-ODATA]	None. This is the OData service document, as specified in [MS-ODATA]
Sessions	Entry point for creating a view session on the protocol server.	<b>EntitySet</b>

When the **\$format** Uniform Resource Locator (URL) parameter is specified, it overrides the logic specified in [MS-ODATA] with relation to the ACCEPT HTTP header. When there are multiple response formats that satisfy the ACCEPT HTTP header, if one of the content types corresponds to the default format for the EntityType or EntitySet, that is the one that will be returned. If none of the content types specified in the ACCEPT HTTP header is the default one, the protocol server MUST return the supported format that is with the highest priority in the ACCEPT HTTP header.

Requests can contain a URL parameter where the key starts with "Ranges(" and ends with ")" (case insensitive), between these two strings, the key will contain a string that refers to a range . When such a parameter is passed, the protocol server should place the value associated with the parameter in the spreadsheet range specified by the parameter and recalculate the spreadsheet before returning the result from the same spreadsheet. The range specified in the parameter MUST correspond to a single cell in the spreadsheet.

### 3.1.1.1 Model Entity Set

The Model entity set represents the spreadsheet as a whole.

The protocol server will return a value as follows:

- If a URL parameter with a key of "\$format" and value of "workbook" is passed, or the ACCEPT HTTP header, as specified in [\[RFC2616\]](#), fits one of the following content types: "application/vnd.openxmlformats-officedocument.spreadsheetml.sheet", "application/vnd.ms-excel.sheet.binary.macroEnabled.12" or "application/vnd.ms-excel.sheet.macroEnabled.12", then the protocol server will return a **workbook file**.
- Otherwise, accessing The Model Entity Set as an entity set as specified in [\[MS-ODATA\]](#) will result in the list of other entity sets supported by the spreadsheet. The protocol server returns an **EntitySet** containing 4 entity sets, as follows:
  - An entity set with the **category** element present, (as specified in [\[MS-ODATA\]](#) section 2.2.6.2.1, with the **term** attribute set to "ExcelServices.Ranges" which represents the ranges in the workbook.
  - An entity set with the **category** element present, as specified in [\[MS-ODATA\]](#) section 2.2.6.2.1, with the **term** attribute set to "ExcelServices.Charts" which represents the charts in the workbook.
  - An entity set with the **category** element present, as specified in [\[MS-ODATA\]](#) section 2.2.6.2.1, with the **term** attribute set to "ExcelServices.Tables" which represents the tables in the workbook.
  - An entity set with the **category** element present, as specified in [\[MS-ODATA\]](#) section 2.2.6.2.1, with the **term** attribute set to "ExcelServices.PivotTables" which represents the PivotTables in the workbook.

### 3.1.1.2 Ranges Entity Set

Ranges in the spreadsheet are represented as an **EntitySet**, which contains **Entities** of a single **EntityType** as specified in section [3.1.1.3](#). The **Ranges** entity set represents the list of ranges exposed by the spreadsheet. The protocol server returns an entity with the category **element** present, as specified in [\[MS-ODATA\]](#) section 2.2.6.2.1, and the **term** attribute set to "ExcelServices.Range" for every **published item** in the workbook that represents a **named range**.

### 3.1.1.3 Range Entity

The Range entity represents a range in the spreadsheet.

The protocol server will return a value as follows:

- If a URL parameter with a key of "\$format" and value of "html" is passed, or the ACCEPT HTTP header, as specified in [\[RFC2616\]](#) fits the content type: "text/html" then the protocol server will return an **HTML fragment** corresponding to the requested range.

- Accessing the Range Entity as an entity as specified in [\[MS-ODATA\]](#) (or with a URL parameter with a key of "\$format" and value of "atom") will result in a single Entity Type containing the complex type **Range** as defined in [2.2.4.1](#) in a **content** element with a **type** attribute set to "application/xml", as specified in [\[MS-ODATA\]](#).

#### 3.1.1.4 Tables Entity Set

Tables in the spreadsheet are represented as an **EntitySet**, which contains **Entities** of a single **EntityType** as specified in section [3.1.1.5](#). The Tables entity set represents the list of tables exposed by the spreadsheet. The protocol server returns an entity with the category **element** present, as specified in [\[MS-ODATA\]](#) section 2.2.6.2.1, and the **term** attribute set to "ExcelServices.Table" for every published item in the workbook that represents a **list (2)**.

#### 3.1.1.5 Table Entity

The Table entity represents a table in the spreadsheet.

The protocol server will return a value as follows:

- If a URL parameter with a key of "\$format" and value of "html" is passed, or the ACCEPT HTTP header (as specified in [\[RFC2616\]](#)) fits the content type: "text/html", the protocol server will return an HTML fragment representing the requested table.
- Accessing the Table Entity as an entity as specified in [\[MS-ODATA\]](#) (or with a URL parameter with a key of "\$format" and value of "atom") will result in a single **Entity** containing the complex type **Range** as defined in section [2.2.4.1](#) in a **content** element with a **type** attribute set to "application/xml", as specified in [\[MS-ODATA\]](#).

#### 3.1.1.6 PivotTables Entity Set

PivotTables in the spreadsheet are represented as an **EntitySet**, which contains **Entities** of a single **EntityType** as specified in section [3.1.1.7](#). The **PivotTables** entity set represents the list of PivotTables exposed by the spreadsheet. The protocol server returns an entity with the category **element** present (as specified in [\[MS-ODATA\]](#) section 2.2.6.2.1) and the **term** attribute set to "ExcelServices.PivotTable" for every published item in the workbook that represents a PivotTable.

#### 3.1.1.7 PivotTable Entity

The **PivotTable** entity represents a PivotTable in the spreadsheet. The protocol server will return a value as follows:

- If a URL parameter with a key of "\$format" and value of "html" is passed, or the ACCEPT HTTP header, as specified in [\[RFC2616\]](#) fits the content type: "text/html" then the protocol server will return an HTML fragment representing the requested PivotTable.
- Accessing the PivotTable Entity as an entity as specified in [\[MS-ODATA\]](#) (or with a URL parameter with a key of "\$format" and value of "atom") will result in a single Entity Type containing the complex type **Range** as defined in section [2.2.4.1](#) in a **content** element with a **type** attribute set to "application/xml", as specified in [\[MS-ODATA\]](#).

#### 3.1.1.8 Charts Entity Set

Charts in the spreadsheet are represented as an **EntitySet**. The protocol server returns an **entry** element with the **category** element present, as specified in [\[MS-ODATA\]](#) section 2.2.6.2.1, and the **term** attribute set to "ExcelServices.Chart" for every published item in the workbook that represents

a chart. Each **entry** element has a **content** element with the **type** attribute set to "image/png" and the **src** attribute set to a URL that will return the image representing the requested chart.

#### **3.1.1.9 Sessions Entity Set**

A view session is opened on the protocol server when a request is made to the Sessions Entity Set using a POST. [<1>](#) The content of the Entity Set result is single entity which represents the session. Making a request to the entity URL will return a result as described in 3.1.1.1.

#### **3.1.2 Timers**

None.

#### **3.1.3 Initialization**

None.

#### **3.1.4 Message Processing Events and Sequencing Rules**

None.

#### **3.1.5 Timer Events**

None.

#### **3.1.6 Other Local Events**

None.

## 4 Protocol Examples

The examples in this section use the following sample data and configuration:

- A site at <http://www.contoso.com> exists.
- A workbook with the title Sales.xlsx exists on the site. The workbook contains the following resources:
  - A table named "SalesProjections".
  - A chart named "CommissionChart".
  - A range named "CommissionRate\_Bikes".

### 4.1 Retrieve the Entity Container for the Content of a Workbook

The following example illustrates the exchange of messages required for a client to retrieve the entity container for the content of the Sales.xlsx workbook.

#### HTTP Request

```
GET /_vti_bin/ExcelRest.aspx/Cycles/Sales.xlsx/Model/ HTTP/1.1
Accept: application/atom+xml
Host: www.contoso.com
```

#### HTTP Response

```
HTTP/1.1 200 OK
Cache-Control: private
Content-Type: application/atom+xml;charset=utf-8
Server: Microsoft-IIS/7.5
SPRequestGuid: 63c0d5ca-8b6e-43bf-92a5-d6ed45210f5b
X-SharePointHealthScore: 4
X-AspNet-Version: 2.0.50727
X-Powered-By: ASP.NET
MicrosoftSharePointTeamServices: 14.0.0.4732
Date: Wed, 20 Jan 2010 19:48:13 GMT
Content-Length: 3158

<?xml version="1.0" encoding="utf-8" standalone="yes"?>
<feed xmlns="http://www.w3.org/2005/Atom"
xmlns:x="http://schemas.microsoft.com/office/2008/07/excelservices/rest"
xmlns:d="http://schemas.microsoft.com/ado/2007/08/dataservice"
xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metadata">
  <title type="text">Model</title>
  <id>http://www.contoso.com/_vti_bin/ExcelRest.aspx/Cycles/Sales.xlsx/Model/</id>
  <updated>2010-01-20T19:48:13Z</updated>
  <author>
    <name />
  </author>
  <link rel="self"
href="http://www.contoso.com/_vti_bin/ExcelRest.aspx/Cycles/Sales.xlsx/Model/" title="Model"
/>
  <entry>
    <category term="ExcelServices.Ranges"
scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
```



```

<title>Ranges</title>
<id>http://www.contoso.com/_vti_bin/ExcelRest.aspx/Cycles/Sales.xlsx/Model/Ranges</id>
<updated>2010-01-20T19:48:13Z</updated>
<author>
  <name />
</author>
<link rel="alternate"
href="http://www.contoso.com/_vti_bin/ExcelRest.aspx/Cycles/Sales.xlsx/Model/Ranges?$format=atom" title="Ranges" />
  <content type="application/atom+xml; charset=utf-8"
src="http://www.contoso.com/_vti_bin/ExcelRest.aspx/Cycles/Sales.xlsx/Model/Ranges?$format=atom" />
</entry>
<entry>
  <category term="ExcelServices.Charts"
scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
  <title>Charts</title>
  <id>http://www.contoso.com/_vti_bin/ExcelRest.aspx/Cycles/Sales.xlsx/Model/Charts</id>
  <updated>2010-01-20T19:48:13Z</updated>
  <author>
    <name />
  </author>
  <link rel="alternate"
href="http://www.contoso.com/_vti_bin/ExcelRest.aspx/Cycles/Sales.xlsx/Model/Charts?$format=atom" title="Charts" />
    <content type="application/atom+xml; charset=utf-8"
src="http://www.contoso.com/_vti_bin/ExcelRest.aspx/Cycles/Sales.xlsx/Model/Charts?$format=atom" />
  </entry>
<entry>
  <category term="ExcelServices.Tables"
scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
  <title>Tables</title>
  <id>http://www.contoso.com/_vti_bin/ExcelRest.aspx/Cycles/Sales.xlsx/Model/Tables</id>
  <updated>2010-01-20T19:48:13Z</updated>
  <author>
    <name />
  </author>
  <link rel="alternate"
href="http://www.contoso.com/_vti_bin/ExcelRest.aspx/Cycles/Sales.xlsx/Model/Tables?$format=atom" title="Tables" />
    <content type="application/atom+xml; charset=utf-8"
src="http://www.contoso.com/_vti_bin/ExcelRest.aspx/Cycles/Sales.xlsx/Model/Tables?$format=atom" />
  </entry>
<entry>
  <category term="ExcelServices.PivotTables"
scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
  <title>PivotTables</title>

<id>http://www.contoso.com/_vti_bin/ExcelRest.aspx/Cycles/Sales.xlsx/Model/PivotTables</id>
<updated>2010-01-20T19:48:13Z</updated>
<author>
  <name />
</author>
<link rel="alternate"
href="http://www.contoso.com/_vti_bin/ExcelRest.aspx/Cycles/Sales.xlsx/Model/PivotTables?$format=atom" title="PivotTables" />
  <content type="application/atom+xml; charset=utf-8"
src="http://www.contoso.com/_vti_bin/ExcelRest.aspx/Cycles/Sales.xlsx/Model/PivotTables?$format=atom" />

```

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

## 4.2 Retrieve a Table from a Workbook as HTML

The following example illustrates the exchange of messages required for a client to retrieve the HTML representation of a table called SalesProjections within the Sales.xlsx workbook.

### Request

```
GET /_vti_bin/ExcelRest.aspx/Cycles/Sales.xlsx/Model/Tables('SalesProjections')?$format=html
HTTP/1.1
Accept: text/html
Host: www.contoso.com
```

### Response

```
HTTP/1.1 200 OK
Cache-Control: private
Content-Type: text/html; charset=utf-8
Last-Modified: Wed, 20 Jan 2010 11:49:08 GMT
Vary: Accept-Encoding
Server: Microsoft-IIS/7.5
SPRequestGuid: eaelc496-30f7-4263-92aa-3a31fb2d8c89
X-SharePointHealthScore: 4
X-AspNet-Version: 2.0.50727
X-Powered-By: ASP.NET
MicrosoftSharePointTeamServices: 14.0.0.4732
Date: Wed, 20 Jan 2010 19:49:08 GMT
Content-Length: 18625
```

```
<div style="overflow:hidden"><table cellpadding="0" cellspacing="0" class="ewr-sheettable
tnov rnov bnov lnov" style="border-collapse:collapse;margin-left:-2px;margin-top:-
2px;"><tr><td style="border-bottom:1px solid transparent;width:1px;font-
size:1px;height:1px;line-height:1px;"><div class="clp">&nbsp;</div></td><td style="font-
size:1px;height:1px;line-height:1px;width:97px;"><div class="clp"
style="width:97px;">&nbsp;</div></td><td style="font-size:1px;height:1px;line-
height:1px;width:78px;"><div class="clp" style="width:78px;">&nbsp;</div></td><td
style="font-size:1px;height:1px;line-height:1px;width:62px;"><div class="clp"
style="width:62px;">&nbsp;</div></td><td style="font-size:1px;height:1px;line-
height:1px;width:62px;"><div class="clp" style="width:62px;">&nbsp;</div></td><td
style="font-size:1px;height:1px;line-height:1px;width:69px;"><div class="clp"
style="width:69px;">&nbsp;</div></td><td style="font-size:1px;height:1px;line-
height:1px;width:83px;"><div class="clp" style="width:83px;">&nbsp;</div></td></tr><tr><td
style="border-bottom:1px solid transparent;width:1px;"><div class="clp"
style="height:19px;">&nbsp;</div></td><td data-range="B9" style="text-align:left;vertical-
align:bottom;font:bold 11pt 'Calibri';color:#000000;text-decoration:none;border-top:solid 1px
#F79646;border-left:solid 1px #F79646;"><div class="cv-nw1" style="width:95px;max-
height:18px;">Salesperson</div></td><td data-range="C9" style="text-align:left;vertical-
align:bottom;font:bold 11pt 'Calibri';color:#000000;text-decoration:none;border-top:solid 1px
#F79646;border-left:solid 1px #F79646;"><div class="cv-nw1" style="width:76px;max-
height:18px;">Accessories</div></td><td data-range="D9" style="text-align:left;vertical-
align:bottom;font:bold 11pt 'Calibri';color:#000000;text-decoration:none;border-top:solid 1px
#F79646;border-left:solid 1px #F79646;"><div class="cv-nw1" style="width:60px;max-
height:18px;">Bikes</div></td><td data-range="E9" style="text-align:left;vertical-
align:bottom;font:bold 11pt 'Calibri';color:#000000;text-decoration:none;border-top:solid 1px
#F79646;border-left:solid 1px #F79646;"><div class="cv-nw1" style="width:60px;max-
height:18px;">Clothing</div></td><td data-range="F9" style="text-align:left;vertical-
```

align:bottom;font:bold 11pt 'Calibri';color:#000000;text-decoration:none;border-top:solid 1px #F79646;border-left:solid 1px #F79646;"/>

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Excel Services REST Protocol Specification

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Release: July 16, 2012



```
height:19px;">&nbsp;$ &nbsp;$ &nbsp;$ &nbsp;1,287 </div></td><td data-range="E15" style="text-align:left;vertical-align:bottom;font:normal 11pt 'Calibri';color:#000000;text-decoration:none;border-top:solid 1px #F79646;border-left:solid 1px #F79646;"><div class="cv-nwl" style="width:60px;max-height:19px;">&nbsp;$ &nbsp;$ &nbsp;$ &nbsp;3,243 </div></td><td data-range="F15" style="text-align:left;vertical-align:bottom;font:normal 11pt 'Calibri';color:#000000;text-decoration:none;border-top:solid 1px #F79646;border-left:solid 1px #F79646;"><div class="cv-nwl" style="width:67px;max-height:19px;">&nbsp;$ &nbsp;$ &nbsp;$ &nbsp;6,917 </div></td><td data-range="G15" style="text-align:left;vertical-align:bottom;font:bold 11pt 'Calibri';color:#000000;text-decoration:none;border-top:solid 1px #F79646;border-left:solid 1px #F79646;border-right:solid 1px #F79646;"><div class="cv-nwl" style="width:81px;max-height:19px;">&nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;114 </div></td></tr><tr><td style="border-bottom:1px solid transparent;width:1px;"><div class="clp" style="height:19px;">&nbsp;$ &nbsp;$ &nbsp;$ &nbsp; </div></td><td data-range="B16" style="text-align:left;vertical-align:bottom;background-color:#FDE9D9;font:bold 11pt 'Calibri';color:#000000;text-decoration:none;border-top:solid 1px #F79646;border-left:solid 1px #F79646;"><div class="cv-nwl" style="width:95px;max-height:18px;">Elizabeth</div></td><td data-range="C16" style="text-align:left;vertical-align:bottom;background-color:#FDE9D9;font:normal 11pt 'Calibri';color:#000000;text-decoration:none;border-top:solid 1px #F79646;border-left:solid 1px #F79646;"><div class="cv-nwl" style="width:76px;max-height:18px;">&nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;3,454 </div></td><td data-range="D16" style="text-align:left;vertical-align:bottom;background-color:#FDE9D9;font:normal 11pt 'Calibri';color:#000000;text-decoration:none;border-top:solid 1px #F79646;border-left:solid 1px #F79646;"><div class="cv-nwl" style="width:60px;max-height:18px;">&nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;1,719 </div></td><td data-range="E16" style="text-align:left;vertical-align:bottom;background-color:#FDE9D9;font:normal 11pt 'Calibri';color:#000000;text-decoration:none;border-top:solid 1px #F79646;border-left:solid 1px #F79646;"><div class="cv-nwl" style="width:60px;max-height:18px;">&nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;3,489 </div></td><td data-range="F16" style="text-align:left;vertical-align:bottom;background-color:#FDE9D9;font:normal 11pt 'Calibri';color:#000000;text-decoration:none;border-top:solid 1px #F79646;border-left:solid 1px #F79646;"><div class="cv-nwl" style="width:67px;max-height:18px;">&nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;8,662 </div></td><td data-range="G16" style="text-align:left;vertical-align:bottom;background-color:#FDE9D9;font:bold 11pt 'Calibri';color:#000000;text-decoration:none;border-top:solid 1px #F79646;border-left:solid 1px #F79646;border-right:solid 1px #F79646;"><div class="cv-nwl" style="width:81px;max-height:18px;">&nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;139 </div></td></tr><tr><td style="border-bottom:1px solid transparent;width:1px;"><div class="clp" style="height:19px;">&nbsp;$ &nbsp;$ &nbsp;$ &nbsp; </div></td><td data-range="B17" style="text-align:left;vertical-align:bottom;font:bold 11pt 'Calibri';color:#000000;text-decoration:none;border-top:solid 1px #F79646;border-left:solid 1px #F79646;border-bottom:solid 1px #F79646;"><div class="cv-nwl" style="width:95px;max-height:18px;">Total</div></td><td data-range="C17" style="text-align:left;vertical-align:bottom;font:bold 11pt 'Calibri';color:#000000;text-decoration:none;border-top:solid 1px #F79646;border-left:solid 1px #F79646;border-bottom:solid 1px #F79646;"><div class="cv-nwl" style="width:76px;max-height:18px;">&nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;18,167 </div></td><td data-range="D17" style="text-align:left;vertical-align:bottom;font:bold 11pt 'Calibri';color:#000000;text-decoration:none;border-top:solid 1px #F79646;border-left:solid 1px #F79646;border-right:solid 1px #F79646;">&nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;14,500 </div></td><td data-range="E17" style="text-align:left;vertical-align:bottom;font:bold 11pt 'Calibri';color:#000000;text-decoration:none;border-top:solid 1px #F79646;border-left:solid 1px #F79646;border-bottom:solid 1px #F79646;"><div class="cv-nwl" style="width:60px;max-height:18px;">&nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;15,408 </div></td><td data-range="F17" style="text-align:left;vertical-align:bottom;font:bold 11pt 'Calibri';color:#000000;text-decoration:none;border-top:solid 1px #F79646;border-left:solid 1px #F79646;border-bottom:solid 1px #F79646;"><div class="cv-nwl" style="width:67px;max-height:18px;">&nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;48,075 </div></td><td data-range="G17" style="text-align:left;vertical-align:bottom;font:bold 11pt 'Calibri';color:#000000;text-decoration:none;border-top:solid 1px #F79646;border-left:solid 1px #F79646;border-right:solid 1px #F79646;border-bottom:solid 1px #F79646;"><div class="cv-nwl" style="width:81px;max-height:18px;">&nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;$ &nbsp;780 </div></td></tr></table></div>
```

### 4.3 Retrieve a Range from a Workbook as an Atom Feed

The following example illustrates the exchange of messages required for a client to retrieve a range from the Sales.xlsx workbook as an Atom feed.

## Request

```
GET /_vti_bin/ExcelRest.aspx/Cycles/Sales.xlsx/Model/Ranges('C17%7CE17')?$format=atom
HTTP/1.1
Accept: application/atom+xml
Host: www.contoso.com
```

## Response

```
HTTP/1.1 200 OK
Cache-Control: private
Content-Type: application/atom+xml;charset=utf-8
Server: Microsoft-IIS/7.5
SPRequestGuid: a8fecc3b-a7ef-48e5-a988-b6152207fad1
X-SharePointHealthScore: 4
X-AspNet-Version: 2.0.50727
X-Powered-By: ASP.NET
MicrosoftSharePointTeamServices: 14.0.0.4732
Date: Wed, 20 Jan 2010 19:50:23 GMT
Content-Length: 1183

<?xml version="1.0" encoding="utf-8"?>
<entry xmlns:x="http://schemas.microsoft.com/office/2008/07/excelservices/rest"
xmlns:d="http://schemas.microsoft.com/ado/2007/08/dataservice"
xmlns:m="http://schemas.microsoft.com/ado/2007/08/dataservices/metadata"
xmlns="http://www.w3.org/2005/Atom">
  <title type="text">C17:E17</title>

  <id>http://www.contoso.com/_vti_bin/ExcelRest.aspx/Cycles/Sales.xlsx/Model/Ranges('C17%7CE17')</id>
  <updated>2010-01-20T19:50:23Z</updated>
  <author>
    <name />
  </author>
  <link rel="self"
href="http://www.contoso.com/_vti_bin/ExcelRest.aspx/Cycles/Sales.xlsx/Model/Ranges('C17%7CE17')?$format=atom" title="C17:E17" />
  <category term="ExcelServices.Range"
scheme="http://schemas.microsoft.com/ado/2007/08/dataservices/scheme" />
  <content type="application/xml">
    <x:range name="C17:E17">
      <x:row>
        <x:c>
          <x:v>18167</x:v>
          <x:fv> $18,167 </x:fv>
        </x:c>
        <x:c>
          <x:v>14500</x:v>
          <x:fv> $14,500 </x:fv>
        </x:c>
        <x:c>
          <x:v>15408</x:v>
          <x:fv> $15,408 </x:fv>
        </x:c>
      </x:row>
    </x:range>
  </content>
</entry>
```

## 4.4 Retrieve a Chart from a Workbook After Setting a Value in the Workbook

The following example illustrates the exchange of messages required for a client to change the value of a range named `CommissionRate_Bikes` in the `Sales.xlsx` workbook while also retrieving a chart named `CommissionChart` from the same workbook. Note the chart is returned as an image. The binary image data is represented here in hexadecimal.

### Request

```
GET
/_vti_bin/ExcelRest.aspx/Cycles/Sales.xlsx/Model/Charts('CommissionChart')?$format=image&ranges('CommissionRate_Bikes')=0.03 HTTP/1.1
Accept: image/png
Host: www.contoso.com
```

### Response

```
HTTP/1.1 200 OK
Cache-Control: private
Content-Type: image/png
Server: Microsoft-IIS/7.5
SPRequestGuid: 976f5ad3-5748-4049-9471-eb2ad4035047
X-SharePointHealthScore: 4
X-AspNet-Version: 2.0.50727
X-Powered-By: ASP.NET
MicrosoftSharePointTeamServices: 14.0.0.4732
Date: Wed, 20 Jan 2010 19:51:32 GMT
Content-Length: 9325
```

```
89504e47 0d0a1a0a 0000000d 49484452
000001b5 00000120 08060000 003301ed
2d000000 01735247 4200aece 1ce90000
00046741 4d410000 b18f0bfc 61050000
00097048 59730000 0ec30000 0ec301c7
6fa86400 00240249 44415478 5eed9ddd
91f320b2 8627a08d 600238a1 f862a3f1
d58964d7 496c0813 c8a9da1b 1f21091b
6124a3e6 bff54cd5 d4379f2d 24f5db0d
8f1a10fc 3cf94101 14400114 4001250a
fc28b103 33500005 50000550 e009d408
02144001 14400135 0a003535 aec41014
40011440 01a0460c a0000aa0 000aa851
00a8a971 2586a000 0aa0000a 00356200
05500005 50408d02 404d8d2b 31040550
00055000 a8110328 80022880 026a1410
42edef79 ffbd3d1f 6a64c010 14400114
40010d0a 9c86dadf fdf7f9f3 f3b3fefe
3eef7f9e 0c8fdbfc ddc227de fab92dfb
eb163cfa 4e83cad8 80022880 02285045
817350fb bb3f7f7f 9c0c6d82 910ba7c7
6d82dd44 33f3ef16 6a8fe7ed c701e0e6
3calef02 b0ac2207 17410114 40011418
598134a8 ed587e0a 6a264bf3 d23a537e
93c98dac 30f78e02 28800228 504d8173
509b6e6b cec64cf7 e3effde9 f73cdabb
fe84daf4 cd9c9dd9 6ecb77b6 3777677a
50339f01 b56a31c0 85500005 50408d02
```

a7a1662d b7636b21 f884a0b6 1c3fc1cc  
c26d0559 0ea8bdc7 f82c34f9 174d8801  
62801818 3906feef 7fff4704 5a31d4e6  
ab99aec3 40c6f601 b58fe3cc ecc965dc  
2d04b5d4 ee47e348 2308bf68 400c1003  
c4c0b831 20a1da39 a8791343 662089a0  
662687ac 9349e6cc cd9f4492 365104a8  
8d1bc434 40f88e18 20066c0c 9487daf4  
669a81d1 3ba5ddb8 abf61a6f 0b4cf9f7  
bf3b9ad2 fff13ac0 49cb801a 95828691  
182006c6 8f81934d ff7cf8b9 4c6dbdc2  
e3969649 496ef44c 19a0367e 30d320e1  
43628018 38d3eedb 630550eb 7f3511a0  
4665a041 24068881 f163a012 d42497a9  
5b06a88d 1fcc3448 f8901820 0624e410  
646a92cb d42d03d4 a80c3488 c4003130  
7e0c48c8 01d498fa cfab0fc4 0031400c  
74190340 6d55804c 6dfc2734 9eb2f121  
31400c00 35a0d6e5 d3168d13 8d133140  
0c486200 a80135a0 46371231 400ca889  
01a006d4 d404b3e4 a98e3264 03c480ae  
18006a40 0da8f194 4e0c1003 6a6200a8  
013535c1 cc13b7ae 276efc89 3f253150  
116a7daf 2ac2ec47 2a90a402 5186b821  
06fa8a81 2a50b3fb a82d8b1a 07d68034  
dbccd815 f8bd3bda 2e6aec2c 86bc96b1  
0b25a76e 100ad4fa 0a4c1a0a fc410c10  
03921828 0fb5799b 982d8c5c 00cdd09a  
96d80f6d 126abffb bc49b3f2 3f5bcf48  
1c4e191a 0a628018 d01c03f5 a1b673c5  
4fa81970 6db7a979 1535599a b7d70c9b  
84525135 57d42bd9 f6ef7ffe e359e2f7  
4a1a5ed9 d6f2509b aef0ea42 0c6c0e6a  
6fe0036a 26c3fbfd 9db23c67 2fb61564  
a19dafcd 67295d90 743f02c5 2b37043d  
d96e80f6 dffffc2b eba3967 4f36722f  
e5da9b2a 50b317b1 636b21f8 04a1b6c9  
d4de3b5f e780da7b d3527703 53fe4617  
62a0750c 94825a6b bbb87ef9 ba651e16  
243f690b 1a9baec3 40c6f61d 6a4bc667  
92b510d4 e87e2cf7 e4c35325 dad68c81  
5250ab69 03d76a57 67ca436d 82989b99  
cd408a81 dad3bc02 b0406cfe 99279cac  
9343dcfb fdef2416 4d65e87e 6c178434  
0068efc6 0050231e 52da0409 024e666a  
4bb7e13b f5de4efe d84ed9f7 a6fccff0  
7a97ddcc 0df1a6f4 7bf3464e db05d4a8  
48291589 b2f9e207 a8e5d3f2 8a7179ba  
f137498d a4d0e316 783f4d72 a2426580  
1a15e98a 0d408f36 03b531ea 628919aa  
3926f448 1021805a dfab8918 1180da18  
15a9c746 987bca1b 3b402daf 9ea5e2b3  
573f5582 9ae43275 cb00b531 2a52a90a  
ca79fbf1 7faf8d25 31b28d91 5efd2421  
87205393 5ca66e19 a0d64fa3 46e3716d  
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e1a65215 889bfdb8 8e51b95d 7d0674e6
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01a09659 504e8702 28800228 d04e01a0
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8c022880 02289059 01a09659 504e8702
28800228 d04e81ff 0789e388 1dbe1730
00000000 0049454e 44ae4260 82
```

#### 4.5 Retrieve the OData service document for a workbook

The following example illustrates the exchange of messages required for a client to request the OData service document.

##### Request

```
GET
http://office/15/teams/DBI/xlservices/_vti_bin/ExcelRest.aspx/Users/adean/DatesAndTimes.xlsx/
OData HTTP/1.1
Accept: text/html, application/xhtml+xml, */*
Accept-Language: en-US
User-Agent: Mozilla/5.0 (compatible; MSIE 9.0; Windows NT 6.1; WOW64; Trident/5.0)
Accept-Encoding: gzip, deflate
Connection: Keep-Alive
Host: office
```

##### Response

```
HTTP/1.1 200 OK
Cache-Control: private
Content-Type: application/xml;charset=utf-8
Server: Microsoft-IIS/7.5
X-SharePointHealthScore: 0
DataServiceVersion: 1.0;
X-AspNet-Version: 4.0.30319
SPRequestGuid: 7cab629b-4882-d026-23a5-2bd43a07d980
X-Powered-By: ASP.NET
MicrosoftSharePointTeamServices: 15.0.0.3407
X-Content-Type-Options: nosniff
```

```
Date: Tue, 18 Oct 2011 19:38:41 GMT
Content-Length: 461
<?xml version="1.0" encoding="utf-8" standalone="yes"?>
<service
xml:base="http://office_vti_bin/ExcelRest.aspx/Users/adean/DatesAndTimes.xlsx/OData/"
xmlns:atom="http://www.w3.org/2005/Atom" xmlns:app="http://www.w3.org/2007/app"
xmlns="http://www.w3.org/2007/app">
  <workspace>
    <atom:title>Default</atom:title>
    <collection href="DatesTextFormatted">
      <atom:title>DatesTextFormatted</atom:title>
    </collection>
  </workspace>
</service>
```

Preliminary

## **5 Security**

### **5.1 Security Considerations for Implementers**

None.

### **5.2 Index of Security Parameters**

None.

Preliminary

## 6 Appendix A: Full WSDL

None.

Preliminary

## 7 Appendix B: Product Behavior

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

- Microsoft® SharePoint® Server 2010
- Microsoft® SharePoint® Server 2013 Preview

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

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

[<1> Section 3.1.1.9](#): This entity set is available only in SharePoint Server 2013 Preview.

## 8 Change Tracking

No table of changes is available. The document is either new or has had no changes since its last release.

Preliminary

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