[MS-EXSPWS]:
Excel Calculation Web Service Protocol Specification

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1 Introduction

This document specifies the Excel Calculation Web Service Protocol. This protocol enables communication between a protocol client that displays workbooks for viewing and interacting with a protocol server that loads and calculates workbooks.

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

1.1 Glossary

The following terms are defined in [MS-GLOS]:

anonymous user
credential
Hypertext Transfer Protocol (HTTP)
Hypertext Transfer Protocol over Secure Sockets Layer (HTTPS)
security identifier (SID)
Universal Naming Convention (UNC)
XML

The following terms are defined in [MS-OFCGLOS]:

access model
active cell
active sheet
alert
ancestor
ascending order
AutoFilter
AutoFilter item
border
border formatting
border style
border thickness
bottom N filter
bottom N filter by count
bottom N filter by percent
bottom N filter by sum
calculate
caption
CDATA section
cell contents
chart sheet
child
child PivotTable member
clear all state
collapsed outline state
color stop
column
column field
compact axis
confirmation

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connected data
connection
control button
cube
custom filter
custom label filter
custom value filter
data bar
data connection
data culture
data provider
default column
default filter value
default font face color
default row
default sheet
default sheet tab color
descendant
descending order
dimension
drill indicator
expand
expanded outline state
expire
external data
fallback data culture
fallback UI culture
fill color
filter
filtering control
filtering state
flow
font face decoration
formula
gradient fill
gridline
group
grow
Help topic identifier
hidden
hidden row
hierarchy
horizontal indent
horizontal text
host data language
hyperlink
item
key performance indicator (KPI)
left-to-right
level
list
login name
manual filter
member property
merged cell

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merged range
named object
named object view
native PivotTable
number format
OLAP
Open Item permission
outline
outline collapse
outline expand
outline level
outline state
page field parameter
pattern color
pattern fill
pattern mask
patterned overlay mask
permission
PivotTable
PivotTable data field
PivotTable filter parameter
PivotTable member
pixel
point
published
published item
published range
published sheet
query
R1C1 notation
range
reading order
refresh
rich text
right-to-left
row
search down
search up
selected
session
session identifier
sheet
sheet tab
shrink to fit
Simple Object Access Protocol (SOAP)
single sign-on (SSO) ticket
site identifier
snapshot
SOAP action
SOAP body
SOAP fault
SOAP fault detail
sort
sort order
state changing

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summary
system resources
table
table header
time zone
time zone bias
time zone daylight bias
time zone daylight date
time zone standard bias
time zone standard date
token
top N filter
top N filter by count
top N filter by percent
top N filter by sum
trusted subsystem
UI culture
Uniform Resource Identifier (URI)
Uniform Resource Locator (URL)
vertical indent
vertical text
visible
web service
Web Services Description Language (WSDL)
workbook file
workbook parameter
worksheet header
worksheet image
WSDL message
XML document
XML namespace
XML namespace prefix
XML schema
zero-based index
z-order

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.

cell formatting: The set of properties that, as a whole, specify the appearance of a cell, such as font characteristics and fill color.

delegation: A model of communication between server components in which the caller can make requests on behalf of a user by passing a service ticket that was retrieved for that user.

font face color: A property of a cell that specifies the color that is used to render a font.

navigation operation: An operation that changes a webpage when users use the navigation controls in a web browser.

session view: The rendering of the contents of a workbook that is associated with a specific session.

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

1.2 References

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

1.2.1 Normative References

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

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

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1.3 Protocol Overview (Synopsis)

1.3.1 Client-Server Protocol

This protocol is used for communication between a protocol server, which provides access to workbooks, and a protocol client, which renders the data provided by the protocol server. The communication is always initiated by the protocol client using different operations, whose functionality is outlined in section 1.3.3. For an overview of a specific implementation of a workbook server system that uses this protocol, see [MSDN-ESTO].

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1.3.2 Session-based Protocol

The protocol is **session (2)** based and uses a unique **session identifier (2)**. This session identifier (2) is generated when a new session is created and is used thereafter to refer to that particular session.

Multiple sessions can exist at the same time. Sessions can be created and closed independently.

1.3.3 Protocol Operations

This protocol provides the following functionality, which can be used on workbooks:

- Open and close.
- Retrieve the full contents of the current open copy.
- Recalculation.
- **Refresh connected data**.
- Set specific values into a **range**.
- Get specific values from a range.
- Get rendering data for a range.
- **Sort** and **filter tables**.
- Sort, filter, and **expand PivotTables**.
- Find values.
- Cancel a request.
- Get information about a session (2).
- Get the version of the protocol.

1.3.4 Published Items and Results Returned by This Protocol

A protocol server can have functionality where only portions of the workbook are available for consumption by protocol clients. The parts of the workbook that are available to be accessed by the protocol client are known as **published**. Some of the operations in this protocol could fail if the workbook **item** being exposed or changed is not published or if the user does not have sufficient **permissions** to view items that are not published.

1.4 Relationship to Other Protocols

This protocol uses the **SOAP** message protocol for formatting request and response messages, as described in [SOAP1.1], [SOAP1.2/1] and [SOAP1.2/2]. It transmits those messages by using **HTTP**, as described in [RFC2616], or **Hypertext Transfer Protocol over Secure Sockets Layer (HTTPS)**, as described in [RFC2818].

The following diagram shows the underlying messaging and transport stack used by the protocol:

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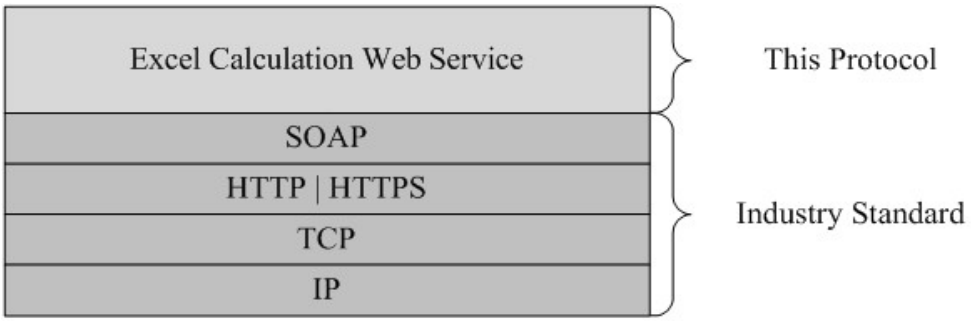

Figure 1: This protocol in relation to other protocols

1.5 Prerequisites/Preconditions

This protocol operates against a protocol server that is identified by a **URL** that is known by protocol clients. The protocol endpoint is formed by appending "ExcelCalculationServer/ExcelService.asmx" to the URL of the protocol server, for example, http://www.contoso.com:56737/SharedServices1/ExcelCalculationServer/ExcelService.asmx.

This protocol assumes that authentication has been performed by the underlying protocols.

This protocol imposes the following on the protocol client:

- If the protocol server **access model** is set to **trusted subsystem** then the protocol client access model must also be set to trusted subsystem.
- If the protocol server access model is set to **delegation** then the protocol client access model must also be set to delegation.

1.6 Applicability Statement

This protocol enables communication between a protocol server, which **calculates** workbooks, and a protocol client, which does the following:

- Displays workbooks and enables users to interact with those workbooks.
- Provides programmatic access to those workbooks through a public Web service.

1.7 Versioning and Capability Negotiation

This document covers versioning issues in the following areas:

- **Supported transports:** This protocol uses multiple transports with SOAP as described in the section 2.1 section.
- **Localization:** This protocol includes text strings in various messages. Localization considerations for such strings are described in sections 2.2 and 3.1.4.

1.8 Vendor-Extensible Fields

None.

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1.9 Standards Assignments

None.

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2 Messages

In the following sections, the schema definition might be less restrictive than the processing rules imposed by the protocol. The **WSDL** in this specification matches the WSDL that shipped with the product and provides a base description of the schema. The text that introduces the WSDL specifies additional restrictions that reflect actual Microsoft product behavior. For example, the schema definition might allow for an element to be empty, null, or not present but the behavior of the protocol as specified restricts the same elements to being non-empty, not null, and present.

2.1 Transport

Protocol servers MUST support SOAP over HTTP or HTTPS.

Protocol messages MUST be formatted as specified either in [SOAP1.1] section 4 or in [SOAP1.2/1] section 5. Protocol server faults MUST be returned either using HTTP Status Codes as specified in [RFC2616] section 10 or using **SOAP faults** as specified either in [SOAP1.1] section 4.4 or in [SOAP1.2/1] section 5.4. The version of the SOAP fault returned MUST correspond to the version of SOAP used for the request **WSDL message**.

2.2 Common Message Syntax

This section contains common definitions used by this protocol. The syntax of the definitions uses XML Schema as defined in [XMLSCHEMA1] and [XMLSCHEMA2], and WSDL as defined in [WSDL].

2.2.1 Namespaces

This specification defines and references various **XML namespaces** 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
soap	http://schemas.xmlsoap.org/wsdl/soap/	[SOAP1.1]
tns	http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/	
s1	http://microsoft.com/wsdl/types/	
s	http://www.w3.org/2001/XMLSchema	[XMLSCHEMA1] [XMLSCHEMA2]
soap12	http://schemas.xmlsoap.org/wsdl/soap12/	[SOAP1.2/1] [SOAP1.2/2]
(none)	http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/	
wsdl	http://schemas.xmlsoap.org/wsdl/	[WSDL]

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2.2.2 Messages

None.

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
ArrayOfAnyType	The ArrayOfAnyType type is an array of **anyType** elements.
ArrayOfAutoFilterCriteria	The ArrayOfAutoFilterCriteria type is an array of **AutoFilterCriteria** elements (section 2.2.4.8).
ArrayOfAutoFilterDateNodeInfo	The ArrayOfAutoFilterDateNodeInfo complex type is used to specify an array of **AutoFilterDateNodeInfo** (section 2.2.4.9).
ArrayOfExcelServerMessage	The ArrayOfExcelServerMessage type is an array of **ExcelServerMessage** elements (section 2.2.4.16).
ArrayOfInt	The ArrayOfInt type is an array of integer elements.
ArrayOfPivotFilterItem	The ArrayOfPivotFilterItem type is an array of **PivotFilterItem** elements (section 2.2.4.18).
ArrayOfString	The ArrayOfString complex type is used to specify an array of strings.
AutoFilterCriteria	AutoFilterCriteria is used to instruct the protocol server how to apply a filter on either a worksheet or a table. This complex type is used as part of the **AutoFilterOptions** complex type (section 2.2.4.10) through the **ArrayOfAutoFilterCriteria** complex type (section 2.2.4.2).
AutoFilterDateNodeInfo	AutoFilterDateNodeInfo specifies how auto-filter date value is filtered by the protocol server.
AutoFilterOptions	AutoFilterOptions is used to specify the filter applied to an **AutoFilter column**.
CommandParameter	The CommandParameter complex type is an input used by all protocol server operations.
CommandResult	The CommandResult complex type is an operation response message used by most protocol server operations.
CommandResultExtendedInfo	The CommandResultExtendedInfo complex type provides extended information for **CommandResult** (section 2.2.4.12).
CredentialsRequest	The **CredentialsRequest** type is used by the protocol server to request a **single sign-on (SSO) ticket** as specified in **CommandResultExtendedInfo** (section 2.2.4.13).

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Complex type	Description
CredentialsResponse	The CredentialsResponse type is used by the protocol client to send a single sign-on (SSO) ticket using the **SingleSignOnTicket** (section 2.2.4.23) to the protocol server.
ExcelServerMessage	ExcelServerMessage is **alert (2)** information returned by the protocol server.
PeriodicRefreshInfo	The PeriodicRefreshInfo complex type is used to return expired **external data** related information.
PivotFilterItem	PivotFilterItem is a **PivotTable member** that is part of a PivotTable **manual filter hierarchy**.
PivotFilterItemList	PivotFilterItemList is a list of PivotTable members.
PivotFilterOptions	The PivotFilterOptions type is a container for common information used in the following operations related to PivotTables: ▪ **ApplyPivotFilter** (section 3.1.4.2) ▪ **ApplyPivotSort** (section 3.1.4.3) ▪ **ApplyPivotTop10Filter** (section 3.1.4.4) ▪ **ConnectAndGetPivotFilterItemList** (section 3.1.4.8) ▪ **GetPivotFilterItemList** (section 3.1.4.13) ▪ **GetPivotMenu** (section 3.1.4.14) ▪ **RemovePivotFilter** (section 3.1.4.26.2.1) ▪ **TogglePivotDrill** (section 3.1.4.31)
SessionIdentifier	The **SessionIdentifier** string is used to uniquely identify a session (2) on the protocol server, and to contain information about the session (2).
SheetRange	SheetRange specifies a range on a worksheet in a workbook.
SingleSignOnTicket	The SingleSignOnTicket type is used by the protocol client to send a single sign-on (SSO) ticket to the protocol server.
SpreadsheetDataXML	SpreadsheetDataXML specifies information about a workbook.
VisibleSheetRange	The VisibleSheetRange complex type is used to specify the **SpreadsheetDataXML** range (section 2.2.4.24) to be returned in the response message.
WorkOnBehalf	The WorkOnBehalf type is used by the protocol client to send information about the user to the protocol server.

2.2.4.1 ArrayOfAnyType

The **ArrayOfAnyType** type is an array of **anyType** elements.

```
<s:complexType name="ArrayOfAnyType">
```


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```
  <s:sequence>
    <s:element name="anyType" nillable="true" minOccurs="0" maxOccurs="unbounded"/>
  </s:sequence>
</s:complexType>
```

anyType: An **anyType** value.

2.2.4.2 ArrayOfAutoFilterCriteria

The **ArrayOfAutoFilterCriteria** type is an array of **AutoFilterCriteria** elements (section 2.2.4.8).

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

AutoFilterCriteria: The **AutoFilter** criteria as specified in **AutoFilterCriteria**.

2.2.4.3 ArrayOfAutoFilterDateNodeInfo

The **ArrayOfAutoFilterDateNodeInfo** complex type is used to specify an array of **AutoFilterDateNodeInfo** (section 2.2.4.9).

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

AutoFilterDateNodeInfo: A list of **AutoFilterDateNodeInfo**. Specifies AutoFilter filter date values as specified in section 2.2.4.9.

2.2.4.4 ArrayOfExcelServerMessage

The **ArrayOfExcelServerMessage** type is an array of **ExcelServerMessage** elements (section 2.2.4.16).

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

ExcelServerMessage: An alert (2) message as specified in **ExcelServerMessage**.

2.2.4.5 ArrayOfInt

The **ArrayOfInt** type is an array of integer elements.

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```
<s:complexType name="ArrayOfInt">
  <s:sequence>
    <s:element name="int" type="s:int" minOccurs="0" maxOccurs="unbounded"/>
  </s:sequence>
</s:complexType>
```

int: An integer value.

2.2.4.6 ArrayOfPivotFilterItem

The **ArrayOfPivotFilterItem** type is an array of **PivotFilterItem** elements (section 2.2.4.18).

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

PivotFilterItem: A **PivotFilterItem** element as specified in **PivotFilterItem**.

2.2.4.7 ArrayOfString

The **ArrayOfString** complex type is used to specify an array of strings.

```
<s:complexType name="ArrayOfString">
  <s:sequence>
    <s:element name="string" type="s:string" nillable="true" minOccurs="0"
maxOccurs="unbounded"/>
  </s:sequence>
</s:complexType>
```

string: A string value.

2.2.4.8 AutoFilterCriteria

AutoFilterCriteria is used to instruct the protocol server how to apply a filter on either a worksheet or a table. This complex type is used as part of the **AutoFilterOptions** complex type (section 2.2.4.10) through the **ArrayOfAutoFilterCriteria** complex type (section 2.2.4.2).

```
<s:complexType name="AutoFilterCriteria">
  <s:sequence>
    <s:element name="Type" type="tns:OperationType"/>
    <s:element name="Relation" type="tns:RelationOperator"/>
    <s:element name="Value" type="s:string" minOccurs="0"/>
  </s:sequence>
</s:complexType>
```

Type: The type of operation as specified in **OperationType** (section 2.2.5.8). Used when comparing the **Value** element as specified in **AutoFilterOptions**.

Relation: Specifies how to combine an instance of this filter with one appearing after it in an **ArrayOfAutoFilterCriteria** complex type:

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- When this complex type is the last element inside an **ArrayOfAutoFilterCriteria** complex type, it MUST contain the Nil value specified in section 2.2.5.11.
- When this complex type is not the last element inside an **ArrayOfAutoFilterCriteria** complex type, it MUST contain either the "And" or "Or" values specified in section 2.2.5.11.

Value: The string that will be used to filter a worksheet or a table. MUST be present. MUST NOT be longer than 32,768 characters.

2.2.4.9 AutoFilterDateNodeInfo

AutoFilterDateNodeInfo specifies how auto-filter date value is filtered by the protocol server.

This complex type is defined as follows.

```
<s:complexType name="AutoFilterDateNodeInfo">
  <s:sequence>
    <s:element name="NodeType" type="tns:DateNodeType"/>
    <s:element name="Year" type="s:short"/>
    <s:element name="Month" type="s:short"/>
    <s:element name="Day" type="s:short"/>
    <s:element name="Hour" type="s:short"/>
    <s:element name="Minute" type="s:short"/>
    <s:element name="Second" type="s:short"/>
  </s:sequence>
</s:complexType>
```

NodeType: The type of the node. Specifies the element that is included in the filter as specified in section 2.2.5.3.

Year: The year part of a date. MUST be greater than or equal to 1900 and less than or equal to 9999.

Month: The month part of a date. MUST be greater than or equal to 0 and less than or equal to 12. The protocol server MUST ignore the value 0.

Day: The day part of a date. MUST be greater than or equal to 0 and less than or equal to 31, and SHOULD<1> be a valid day of the month for the year specified in the **Year** element and month specified **Month** element. The protocol server SHOULD<2> ignore the value 0.

Hour: The hour part of a date. MUST be greater than or equal to 0 and less than or equal to 23.

Minute: The minute part of a date. MUST be greater than or equal to 0 and less than or equal to 59.

Second: The second part of a date. MUST be greater than or equal to 0 and less than or equal to 59.

2.2.4.10 AutoFilterOptions

AutoFilterOptions is used to specify the filter applied to an AutoFilter column (2).

This complex type is defined as follows.

```
<s:complexType name="AutoFilterOptions">
  <s:sequence>
```


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```
      <s:element name="AutoFilterType" type="s:string" minOccurs="0"/>
      <s:element name="Criteria" type="tns:ArrayOfAutoFilterCriteria" minOccurs="0"/>
      <s:element name="CriteriaType" type="tns:AutoFilterCriteriaType"/>
      <s:element name="Id" type="s:unsignedInt"/>
      <s:element name="SheetName" type="s:string" minOccurs="0"/>
      <s:element name="Column" type="s:int"/>
      <s:element name="NamedObjectView" type="s:boolean"/>
    </s:sequence>
  </s:complexType>
```

AutoFilterType: The object on which the filter operates. MUST be present. MUST be either "Sheet" or "Table".

Criteria: The list of **AutoFilterCriteria** complex types (section 2.2.4.8) that specify how values are filtered. If the **CriteriaType** element contains a value other than "Nil", this element MUST NOT be present. If **Criteria** contains two **AutoFilterCriteria** elements, they MUST be one of the following:

- The **Type** and **Relation** elements of the first **AutoFilterCriteria** MUST be **GTEQ** and **And** respectively. The **Type** and **Relation** elements of the second **AutoFilterCriteria** MUST be **LTEQ** and "Nil" respectively.
- The **Type** and **Relation** elements of the first **AutoFilterCriteria** MUST be **LT** and **Or** respectively. The **Type** and **Relation** elements of the second **AutoFilterCriteria** MUST be **GT** and "Nil" respectively.

CriteriaType: The type of filtering to apply as specified in section 2.2.5.1.

Id: The identifier of the table that has the filter applied to it. If the **AutoFilterType** element contains the string "Sheet" then this element MUST be ignored by the protocol server. If the **AutoFilterType** element contains the string "Table" then this element MUST contain a value that was previously returned from the protocol server in the **ID** attribute of the **AutoFilter** element (section 2.2.4.24.19).

SheetName: The name of the worksheet or **named object** containing the **AutoFilter**. MUST be present. MUST NOT be empty. If the **NamedObjectView** element is set to **true**, the following apply:

- The value in the **SheetName** element is a named object on the workbook.
- The length of **SheetName** MUST NOT be longer than 287 characters.

If the **NamedObjectView** element is set to **false**, the following apply:

- The value in the **SheetName** element is a worksheet on the workbook.
- The length of **SheetName** MUST NOT be greater than 31 characters.

Column: Specifies the one-based index of the column (2) of the **AutoFilter**. If the **AutoFilterType** element contains the value "Table" then this value MUST be greater than or equal to 1 and less than or equal to the number of column (2) in the Table containing the **AutoFilter**. If the **AutoFilterType** element contains the value "Sheet" then this value MUST be greater than or equal to 1 and less than or equal to the last numeric index of the column (2) on the worksheet that contains an AutoFilter.

NamedObjectView: Specifies whether this filter is to be applied to an AutoFilter which is located on a worksheet or on a named object. MUST be set to **true** if AutoFilter is located on a named object; MUST be **false** otherwise.

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2.2.4.11 CommandParameter

The **CommandParameter** complex type is an input used by all protocol server operations.

```
<s:complexType name="CommandParameter">
  <s:sequence>
    <s:element name="WorkbookId" type="s:string" minOccurs="0"/>
    <s:element name="StateId" type="s:int"/>
    <s:element name="VisibleSheetRangeRequest" type="tns:VisibleSheetRange" minOccurs="0"/>
    <s:element name="WorkOnBehalfRequest" type="tns:WorkOnBehalf" minOccurs="0"/>
    <s:element name="CredentialsResponse" type="tns:CredentialsResponse" minOccurs="0"/>
    <s:element name="Confirmation" type="tns:ExcelServerMessageId"/>
    <s:element name="ConfirmationChoice" type="s:boolean"/>
    <s:element name="EwrCall" type="s:boolean"/>
  </s:sequence>
</s:complexType>
```

The following applies to the **CommandParameter** complex type, unless extended or overridden by an operation specification:

WorkbookId: The session identifier (2) that is returned in the **workbookId** as specified in section 3.1.4.20.2.2. See section 2.2.4.21. If present, it MUST NOT be empty. For all operations other than **OpenWorkbook** operation, **WorkbookId** MUST have a value which has been obtained from a previous call to **OpenWorkbook** operation. For the **OpenWorkbook** operation:

- If a session identifier (2) has already been returned by the protocol server for a previous **OpenWorkbook** operation, **WorkbookId** MUST have that value.
- If this operation is used to create a new session (2) on the protocol server, **WorkbookId** MUST NOT be present.

StateId: The state identifier as specified in Section 3.1.1. The state identifier for a session (2) MUST be incremented on every operation that changes the state of the session (2). The protocol server MUST verify that **StateId**, sent by the protocol client, is equal to the state identifier for the session (2), unless **StateId** is -1 or the operation is **OpenWorkbook**, in which case the protocol server MUST ignore it. In the event that the **StateId,** sent by the protocol client, is not equal to the state identifier for the session (2), the server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be **OperationOnInvalidState**.

VisibleSheetRangeRequest: The requested range that will be returned by the protocol server in **SpreadsheetData**, as specified in section 2.2.4.12. See section 2.2.4.25.

WorkOnBehalfRequest: User information as specified in section 2.2.4.26. MUST be present if the access model is trusted subsystem. Otherwise, MUST NOT be present.

CredentialsResponse: A single sign-on (SSO) ticket as specified in section 2.2.4.15. MUST be present and MUST NOT be empty, if **CredentialsRequest** in the last response from the protocol server, as specified in section 2.2.4.13, was present.

Confirmation: The external data refresh **confirmation**. MUST be either **ConfirmDataRefresh** or **Blank**. MUST be **ConfirmDataRefresh**, with **ConfirmationChoice** set to **true** to allow external data refresh for the lifetime of the session (2), or with **ConfirmationChoice** set to **false** to prevent external data refresh for the current operation. Otherwise, the protocol server MUST ignore **ConfirmationChoice**.

ConfirmationChoice: The external data refresh confirmation choice. See **Confirmation**.

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EwrCall: The protocol server MUST ignore the value unless specified otherwise. The protocol client MAY pass any value.

2.2.4.12 CommandResult

The **CommandResult** complex type is an operation response message used by most protocol server operations.

```
<s:complexType name="CommandResult">
  <s:sequence>
    <s:element name="StateId" type="s:int"/>
    <s:element name="SpreadsheetData" type="s:string" minOccurs="0"/>
    <s:element name="ExtendedInfo" type="tns:CommandResultExtendedInfo" minOccurs="0"/>
    <s:element name="PeriodicRefreshInfo" type="tns:PeriodicRefreshInfo" minOccurs="0"/>
  </s:sequence>
</s:complexType>
```

The following applies to the **CommandResult** complex type, unless extended or overridden by an operation specification:

StateId: The state identifier as specified in section 3.1.1. The protocol server MUST set **StateId** to the state identifier value for the current session (2).

SpreadsheetData: The retrieved **SpreadsheetDataXML** range (section 2.2.4.24). The following apply:

- MUST NOT be present if **VisibleSheetRangeRequest** was not present in **CommandParameter** (section 2.2.4.11) in the request message of the same operation.
- MUST be present if **VisibleSheetRangeRequest** was present in **CommandParameter** in the request message of the same operation.

ExtendedInfo: More information about the result of the operation. See **CommandResultExtendedInfo**.

PeriodicRefreshInfo: Information about external data on the workbook that can **expire**. See **PeriodicRefreshInfo** (section 2.2.4.17). MUST NOT be present if the **Messages** element of **CommandResultExtendedInfo** contains at least one element.

2.2.4.13 CommandResultExtendedInfo

The **CommandResultExtendedInfo** complex type provides extended information for **CommandResult** (section 2.2.4.12).

```
<s:complexType name="CommandResultExtendedInfo">
  <s:sequence>
    <s:element name="CredentialsRequest" type="tns:CredentialsRequest" minOccurs="0"/>
    <s:element name="Messages" type="tns:ArrayOfExcelServerMessage" minOccurs="0"/>
    <s:element name="WarnOnManualDataRefresh" type="s:boolean"/>
  </s:sequence>
</s:complexType>
```

CredentialsRequest: A request for **credentials**. MUST be present when the protocol server requires a single sign-on (SSO) ticket. MUST NOT be present when the **Ticket** element is present in the **CredentialsResponse** (section 2.2.4.15) sent by the protocol client in the

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CommandParameter (section 2.2.4.11). When received by the protocol client, the protocol client MUST reissue the last request to the protocol server with **CredentialsResponse** present in **CommandParameter**.

Messages: Alert information. (See section 2.2.4.4.) MUST be present.

WarnOnManualDataRefresh: Specifies whether external data refresh confirmation is needed. MUST be **true** if external data refresh has never been confirmed as specified in **CommandParameter**. MUST be **false** if external data refresh has been confirmed or if it is not required as specified in **CommandParameter**, or if **WorkbookId** is not present inside **parameter** in the **OpenWorkbook** element, as specified in the **OpenWorkbook** operation (section 3.1.4.20).

2.2.4.14 CredentialsRequest

The **CredentialsRequest** type is used by the protocol server to request a single sign-on (SSO) ticket as specified in **CommandResultExtendedInfo** (section 2.2.4.13).

```
<s:complexType name="CredentialsRequest">
  <s:sequence>
    <s:element name="ReserveTicket" type="s:boolean"/>
  </s:sequence>
</s:complexType>
```

ReserveTicket: Specifies a request for a single sign-on (SSO) ticket from the protocol client by the protocol server. MUST be set to **true**.

2.2.4.15 CredentialsResponse

The **CredentialsResponse** type is used by the protocol client to send a single sign-on (SSO) ticket using the **SingleSignOnTicket** (section 2.2.4.23) to the protocol server.

```
<s:complexType name="CredentialsResponse">
  <s:sequence>
    <s:element name="Ticket" type="tns:SingleSignOnTicket" minOccurs="0"/>
  </s:sequence>
</s:complexType>
```

Ticket: The single sign-on (SSO) ticket. MUST be present.

2.2.4.16 ExcelServerMessage

ExcelServerMessage is alert (2) information returned by the protocol server.

```
<s:complexType name="ExcelServerMessage">
  <s:sequence>
    <s:element name="HasOpenItemPermission" type="s:boolean"/>
    <s:element name="Id" type="tns:ExcelServerMessageId"/>
    <s:element name="Severity" type="tns:ExcelServerMessageSeverity"/>
    <s:element name="Type" type="tns:ExcelServerMessageType"/>
    <s:element name="Buttons" type="tns:ExcelServerMessageButtons"/>
    <s:element name="Description" type="s:string" minOccurs="0"/>
    <s:element name="ExtendedDescription" type="s:string" minOccurs="0"/>
    <s:element name="Caption" type="s:string" minOccurs="0"/>
    <s:element name="HelpTopicId" type="s:string" minOccurs="0"/>
```


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```
      <s:element name="HelpDisplayText" type="s:string" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
```

HasOpenItemPermission: Specifies whether the user has **Open Item permission** to the **workbook file**.

Id: The identifier of the alert (2) as specified in section 2.2.5.5.

Severity: The severity of the alert (2) as specified in section 2.2.5.6.

Type: The type of the alert (2) as specified in section 2.2.5.7.

Buttons: The **control buttons** associated with the alert (2) as specified in section 2.2.5.4.

Description: A text description of the alert (2). MUST be present. MUST NOT be empty. MUST be in the language **UI culture** of the session (2).

ExtendedDescription: An extended description of the alert (2). MUST be present. MUST be in the language UI culture of the session (2).

Caption: A **caption** for the alert (2). MUST be present. MUST be in the language UI culture of the session (2).

HelpTopicId: The **Help topic identifier**.

HelpDisplayText: A description of the Help topic. MUST be present. MUST be in the language UI culture of the session (2).

2.2.4.17 PeriodicRefreshInfo

The **PeriodicRefreshInfo** complex type is used to return expired external data related information.

```
<s:complexType name="PeriodicRefreshInfo">
  <s:sequence>
    <s:element name="ExpirationTime" type="s:int"/>
    <s:element name="ConnectionNames" type="tns:ArrayOfString" minOccurs="0"/>
  </s:sequence>
</s:complexType>
```

ExpirationTime: The number of seconds left before the next external data expires. MUST be greater than or equal to 0.

ConnectionNames: The names of the **data connections (2)** that will expire after the number of seconds specified by **ExpirationTime**. MUST be present. MUST have one or more entries. Each entry MUST NOT have the **xsi:nil** attribute set to **true** and MUST NOT be empty.

2.2.4.18 PivotFilterItem

PivotFilterItem is a PivotTable member that is part of a PivotTable manual filter hierarchy.

```
<s:complexType name="PivotFilterItem" mixed="false">
  <s:complexContent mixed="false">
    <s:extension base="tns:PivotFilterItemList">
      <s:sequence>
```


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```
          <s:element name="ChildItems" type="tns:ArrayOfPivotFilterItem" minOccurs="0"/>
          <s:element name="CalculatedMember" type="s:boolean"/>
          <s:element name="LeafItem" type="s:boolean"/>
          <s:element name="Selected" type="s:boolean"/>
          <s:element name="Id" type="s:int"/>
          <s:element name="DisplayString" type="s:string" minOccurs="0"/>
        </s:sequence>
      </s:extension>
    </s:complexContent>
  </s:complexType>
```

ItemListMaxExceeded: Specifies whether there are more PivotTable members available on the protocol server than the amount returned in **PivotFilterItems**. MUST be set to **true** if there are more than 1000 **child PivotTable members**, and MUST be set to **false** otherwise.

IsBlanksSelected: Unused. MUST be set to **false** and MUST be ignored by the protocol client.

HasBlanks: Unused. MUST be set to **false**.

PivotFilterItems: The list of child PivotTable members. MUST be present. MUST contain an empty list if **LeafItem** is **true**. MUST contain an empty list if all the child PivotTable members are **selected** and **Selected** is **true**, or if none of the child PivotTable members are selected and **Selected** is **false**. Otherwise, it MUST be present and contain the list of all the child PivotTable members if there are 1000 or fewer child PivotTable members, and MUST contain the first 1000 child PivotTable members if there are more than 1000 child PivotTable members.

ChildItems: The list of child PivotTable members. MUST be the same as **PivotFilterItems**.

CalculatedMember: Specifies whether the PivotTable member is a calculated PivotTable member. MUST be set to **true** if the PivotTable member is a calculated PivotTable member, and MUST be set to **false** otherwise.

LeafItem: Specifies whether the PivotTable member has no **child** objects in the PivotTable manual filter hierarchy. The protocol server sets to **true** if the PivotTable member has no child objects in the PivotTable manual filter hierarchy, otherwise sets to **false**.

Selected: Specifies whether the PivotTable member or all its **descendants** in the hierarchy are selected. If **LeafItem** is **true**, **Selected** MUST be set to **true** if the PivotTable member is selected, and MUST be set to **false** otherwise. If **LeafItem** is **false**, **Selected** MUST be set to **true** if all the descendants of the PivotTable member in the hierarchy are selected, and MUST be set to **false** otherwise.

Id: A unique identifier of the PivotTable member. MUST be greater than or equal to 0. MUST be unique across all the PivotTable members in the PivotTable manual filter hierarchy.

DisplayString: The caption of the PivotTable member. MUST be present. MUST NOT be empty.

2.2.4.19 PivotFilterItemList

PivotFilterItemList is a list of PivotTable members.

```
<s:complexType name="PivotFilterItemList">
  <s:sequence>
    <s:element name="ItemListMaxExceeded" type="s:boolean"/>
    <s:element name="IsBlanksSelected" type="s:boolean"/>
    <s:element name="HasBlanks" type="s:boolean"/>
```


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```
      <s:element name="PivotFilterItems" type="tns:ArrayOfPivotFilterItem" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
```

ItemListMaxExceeded: Specifies whether more PivotTable members are available on the protocol server than the amount returned in **PivotFilterItems**, as specified in section 3.1.4.8.2.1 and section 3.1.4.13.

IsBlanksSelected: Unused. MUST be set to **false** and MUST be ignored by the protocol client.

HasBlanks: Unused. MUST be set to **false**.

PivotFilterItems: A list of PivotTable members. MUST be present. MUST contain **PivotFilterItem** elements (section 2.2.4.18) as specified in **ConnectAndGetPivotFilterItemList** and **GetPivotFilterItemList**.

2.2.4.20 PivotFilterOptions

The **PivotFilterOptions** type is a container for common information used in the following operations related to PivotTables:

- **ApplyPivotFilter** (section 3.1.4.2)
- **ApplyPivotSort** (section 3.1.4.3)
- **ApplyPivotTop10Filter** (section 3.1.4.5)
- **ConnectAndGetPivotFilterItemList** (section 3.1.4.8)
- **GetPivotFilterItemList** (section 3.1.4.13)
- **GetPivotMenu** (section 3.1.4.14)
- **RemovePivotFilter** (section 3.1.4.26)
- **TogglePivotDrill** (section 3.1.4.31)

Some of the elements of this type have a common usage with all these operations and are specified here. Other elements have specific usage information that is specified in the sections of this document addressing those operations.

```
<s:complexType name="PivotFilterOptions">
  <s:sequence>
    <s:element name="SheetName" type="s:string" minOccurs="0"/>
    <s:element name="SourceIndex" type="s:int"/>
    <s:element name="IsNamedObject" type="s:boolean"/>
    <s:element name="FieldId" type="s:string" minOccurs="0"/>
    <s:element name="DataFieldId" type="s:string" minOccurs="0"/>
    <s:element name="MemberPropertyId" type="s:string" minOccurs="0"/>
    <s:element name="FilterValue1" type="s:string" minOccurs="0"/>
    <s:element name="FilterValue2" type="s:string" minOccurs="0"/>
    <s:element name="FilterType" type="tns:PivotFilterType"/>
    <s:element name="ParentId" type="s:int"/>
    <s:element name="Column" type="s:int"/>
    <s:element name="Row" type="s:int"/>
    <s:element name="Items" type="tns:ArrayOfInt" minOccurs="0"/>
  </s:sequence>
```


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```
</s:complexType>
```

SheetName: The name of the worksheet or named object on which the operation is performed. MUST be present. If the **IsNamedObject** element is set to **true**, the following apply:

- The **SheetName** element MUST refer to a named object on the workbook.
- The length of **SheetName** MUST NOT be longer than 287 characters.

If the **IsNamedObject** element is set to **false**, the following apply:

- The **SheetName** element MUST refer to a worksheet on the workbook.
- The length of **SheetName** MUST NOT be longer than 31 characters.

SourceIndex: The index of the connected data. MUST be the value of the **ExternalSourceIndex** attribute of the PivotTable (section 2.2.4.24.24) element that is the PivotTable on which the operation is performed, except when used in the **GetPivotMenu** operation that specifies a different behavior.

IsNamedObject: Specifies whether the operation is performed on a named object. MUST be set to **true** if the operation is performed on a named object, and MUST be set to **false** otherwise.

FieldId: The identifier for the **PivotTable** field on which the operation is performed. MUST be present and MUST be equal to either the **IdString** element of one of the **PivotField** elements that have **IsHierarchy** set to **false** and that are nested inside the **PivotFields** element of the **pivotMenu** element that was retrieved from the protocol server in a previous call to **GetPivotMenu** on the same PivotTable area or to the **PageFieldID** attribute of the **Cell** element (section 2.2.4.24.38), except when used in the following operations, which specify a different behavior:

- **GetPivotMenu**
- **TogglePivotDrill**

DataFieldId: The identifier for the **PivotTable data field**. MUST NOT be present, except when used in the following operations, which specify a different behavior:

- **ApplyPivotFilter**
- **ApplyPivotTop10Filter**

MemberPropertyId: The identifier of the **member property**. MUST NOT be present, except when used in the **ApplyPivotFilter** operation, which specifies a different behavior.

FilterValue1: The first **PivotTable filter parameter**. MUST NOT be present, except when used in the **ApplyPivotFilter** operation, which specifies a different behavior.

FilterValue2: The second PivotTable filter parameter. MUST NOT be present, except when used in the **ApplyPivotFilter** operation, which specifies a different behavior.

FilterType: The type of filter used in the operation. MUST have the value of **Invalid**, except when used in the following operations, which specify a different behavior:

- **ApplyPivotFilter**
- **ApplyPivotTop10Filter**

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ParentId: The identifier of the PivotTable member on which the operation is performed. MUST be ignored on receipt by the protocol server, except when used in the following operations, which specify a different behavior:

- **ConnectAndGetPivotFilterItemList**
- **GetPivotFilterItemList**

Column: The column (2) of the PivotTable area location. MUST be the zero-based column (2) number of a worksheet cell of the PivotTable that has the **HasDropDown** attribute of the **Cell** element (Section 2.2.4.24.38) set to **true**, except when used in the **TogglePivotDrill** operation, which specifies a different behavior.

Row: The **row (2)** of the PivotTable area location. MUST be the zero-based row (2) number of a worksheet cell of the PivotTable that has the **HasDropDown** attribute of the **Cell** element set to **true**, except when used in the **TogglePivotDrill** operation, which specifies a different behavior.

Items: The list of PivotTable members applied in a PivotTable manual filter. MUST NOT be present, except when used in the **ApplyPivotFilter** operation, which specifies a different behavior.

2.2.4.21 SessionIdentifier

The **SessionIdentifier** string is used to uniquely identify a session (2) on the protocol server, and to contain information about the session (2).

The **SessionIdentifier** MUST have the following layout. (Numeric values in parts 1, 3, 4, 6, and 8 MUST follow the **s:integer** type representation.)

- **Part 1:** The number of characters in part 2, followed by a period (.).
- **Part 2:** A unique string. MUST be greater than or equal to 20 and less than or equal to 32,647 characters.
- **Part 3:** The sum of number of characters in parts 4-9, followed by a period (.).
- **Part 4:** The number of characters in part 5, followed by a period (.).
- **Part 5:** The UI culture of the session (2). Five characters long representation of a language tag, as specified in [RFC1766] section 2.
- **Part 6:** The number of characters in part 7, followed by a period (.).
- **Part 7:** The **data culture** of the session (2). Five characters long representation of a language tag, as specified in [RFC1766] section 2.
- **Part 8:** The number of characters in part 9, followed by a period (.).
- **Part 9:** The **time zone** of the session (2) as specified in **CultureCommandParameter** complex type (section 3.1.4.20.3.1).

The following are examples of valid session (2) identifier strings.

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Part	1	2	3	4	5	6	7	8	9
Character	22.	13DtHGRoLRYHG9jSUfeQGy	90.	5.	en-US	5.	en-US	73.	+0480#0000-11-0

```
Index          1111111111222222222233333333334444444444555555555
               0123456789012345678901234567890123456789012345678901234567890123456789
```

Part	9 (continued)
Character	0-01T02:00:00:0000#+0000#0000-03-00-02T02:00:00:0000#-0060

```
Index                                                          111111111111111111
               666666666677777777778888888888999999999900000000011111111
               012345678901234567890123456789012345678901234567890123456789
```

2.2.4.22 SheetRange

SheetRange specifies a range on a worksheet in a workbook.

```
<s:complexType name="SheetRange">
  <s:sequence>
    <s:element name="SheetName" type="s:string" minOccurs="0"/>
    <s:element name="FirstRow" type="s:int"/>
    <s:element name="LastRow" type="s:int"/>
    <s:element name="FirstColumn" type="s:int"/>
    <s:element name="LastColumn" type="s:int"/>
  </s:sequence>
</s:complexType>
```

SheetName: The name of the worksheet. Length MUST NOT be more than 31 characters.

FirstRow: The **zero-based index** of the first row (2) of the described range. MUST be greater than or equal to 0 and less than or equal to 1,048,575.

LastRow: The zero-based index of the last row (2) of the range. MUST be greater than or equal to **FirstRow**. MUST be less than or equal to 1,048,575.

FirstColumn: The zero-based index of the first column (2) of the range. MUST be greater than or equal to 0 and less than or equal to 16,383.

LastColumn: The zero-based index of the last column (2) of the range. MUST be greater than or equal to **FirstColumn**. MUST be less than or equal to 16,383.

2.2.4.23 SingleSignOnTicket

The **SingleSignOnTicket** type is used by the protocol client to send a single sign-on (SSO) ticket to the protocol server.

```
<s:complexType name="SingleSignOnTicket">
  <s:sequence>
    <s:element name="FailedToReserveTicket" type="s:boolean"/>
    <s:element name="Value" type="s:string" minOccurs="0"/>
```


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```
    </s:sequence>
  </s:complexType>
```

FailedToReserveTicket: Specifies whether the protocol client succeeded in acquiring a single sign-on (SSO) ticket. MUST be **true** if the protocol client failed to acquire a single sign-on (SSO) ticket, and **false** otherwise.

Value: The single sign-on (SSO) ticket. MUST be present if **FailedToReserveTicket** is **false**. MUST NOT be present if **FailedToReserveTicket** is **true**.

2.2.4.24 SpreadsheetDataXML

SpreadsheetDataXML specifies information about a workbook.

```
<s:complexType name="SpreadsheetDataXML">
  <s:sequence>
    <s:element name="Workbook" type="Workbook">
      <s:key name="styleIDKey">
        <s:selector xpath="./Styles/Style"/>
        <s:field xpath="@ID"/>
      </s:key>
      <s:keyref name="tableStyleIDKeyRef" refer="styleIDKey">
        <s:selector xpath="./Worksheet/Table"/>
        <s:field xpath="@StyleID"/>
      </s:keyref>
      <s:keyref name="columnStyleIDKeyRef" refer="styleIDKey">
        <s:selector xpath="./Worksheet/Table/Column"/>
        <s:field xpath="@StyleID"/>
      </s:keyref>
      <s:keyref name="columnBorderStyleIDKeyRef" refer="styleIDKey">
        <s:selector xpath="./Worksheet/Table/Column"/>
        <s:field xpath="@BorderID"/>
      </s:keyref>
      <s:keyref name="rowStyleIDKeyRef" refer="styleIDKey">
        <s:selector xpath="./Worksheet/Table/Row"/>
        <s:field xpath="@StyleID"/>
      </s:keyref>
      <s:keyref name="rowBorderStyleIDKeyRef" refer="styleIDKey">
        <s:selector xpath="./Worksheet/Table/Row"/>
        <s:field xpath="@BorderID"/>
      </s:keyref>
      <s:keyref name="cellStyleIDKeyRef" refer="styleIDKey">
        <s:selector xpath="./Worksheet/Table/Row/Cell"/>
        <s:field xpath="@StyleID"/>
      </s:keyref>
      <s:keyref name="cellBorderStyleIDKeyRef" refer="styleIDKey">
        <s:selector xpath="./Worksheet/Table/Row/Cell"/>
        <s:field xpath="@BorderID"/>
      </s:keyref>
      <s:keyref name="imagesBorderStyleIDKeyRef" refer="styleIDKey">
        <s:selector xpath="./Worksheet/Images/Image"/>
        <s:field xpath="@BorderID"/>
      </s:keyref>
    </s:element>
  </s:sequence>
</s:complexType>
```


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Workbook: This node contains information about a workbook based on the range requested by the protocol client as specified in the **SpreadsheetData** element of **CommandResult** (section 2.2.4.12).

2.2.4.24.1 Workbook

Specifies a workbook.

```
<s:complexType name="Workbook">
  <s:sequence>
    <s:element name="WorkbookOptions" type="WorkbookOptions" />
    <s:element name="Parameters" type="Parameters" minOccurs="0" maxOccurs="1" />
    <s:element name="NamedObjects" type="NamedObjects" minOccurs="0" maxOccurs="1" />
    <s:element name="Styles" type="Styles" minOccurs="0" maxOccurs="1" />
    <s:element name="Worksheet" type="Worksheet" minOccurs="1" maxOccurs="unbounded" />
  </s:sequence>
</s:complexType>
```

WorkbookOptions: A collection of settings for the workbook.

Parameters: List of **workbook parameters** as specified in **Parameters** (section 2.2.4.24.3). If there are no workbook parameters, this element MUST NOT be present.

NamedObjects: List of named objects as specified in section 2.2.4.24.5. If there are no named objects, this element MUST NOT be present.

Styles: An unordered collection of **Style** elements (section 2.2.4.24.7). MUST be omitted when one of the following conditions is **true**:

- The requested range is a chart sheet.
- The requested range is a named object containing a single chart and a **border** is not specified.

Worksheet: A **sheet (2)** or a named object in the workbook. When this element represents a sheet (2), there MUST be an entry for every **published sheet** in the workbook and the order of entries MUST be the same as in the workbook. In **named object view** mode, there MUST be a single **Worksheet** element representing the named object.

2.2.4.24.2 WorkbookOptions

A collection of settings for the workbook.

```
<s:complexType name="WorkbookOptions">
  <s:sequence>
    <s:element name="HideWorkbookTabs" type="s:boolean" minOccurs="0" maxOccurs="1" />
  </s:sequence>
</s:complexType>
```

HideWorkbookTabs: Specifies whether **sheet tabs** are **hidden**. This element MUST be present if the sheet tabs on the workbook are hidden. This element MUST NOT be present if the sheet tabs are not hidden.

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2.2.4.24.3 Parameters

An unordered list of workbook parameters. MUST contain the unordered list of all the workbook parameters in the workbook.

```
<s:complexType name="Parameters">
  <s:sequence>
    <s:element name="Parameter" type="Parameter" minOccurs="1" maxOccurs="255" />
  </s:sequence>
</s:complexType>
```

Parameter: A workbook parameter.

2.2.4.24.4 Parameter

A workbook parameter.

```
<s:complexType name="Parameter">
  <s:attribute name="Name" use="required">
    <s:simpleType>
      <s:restriction base="s:string">
        <s:minLength value="1" />
        <s:maxLength value="255" />
      </s:restriction>
    </s:simpleType>
  </s:attribute>
  <s:attribute name="Comment" use="optional">
    <s:simpleType>
      <s:restriction base="s:string">
        <s:maxLength value="255" />
      </s:restriction>
    </s:simpleType>
  </s:attribute>
  <s:attribute name="IsPivotPageField" type="s:boolean" default="false" use="optional" />
  <s:attribute name="RequiresConnection" type="s:boolean" default="false" use="optional" />
</s:complexType>
```

Name: The name of a workbook parameter. MUST be unique across the list of workbook parameters in the workbook.

Comment: The comment for a workbook parameter.

IsPivotPageField: MUST be **true** if the workbook parameter is a PivotTable **page field parameter**, and MUST NOT be present otherwise.

RequiresConnection: MUST be **true** if the workbook parameter requires an external data **connection (2)** to update the contents of the workbook parameter.

2.2.4.24.5 NamedObjects

An unordered list of named objects. MUST contain all the published named objects in the workbook.

```
<s:complexType name="NamedObjects">
  <s:sequence>
    <s:element name="NamedObject" type="NamedObject" minOccurs="1" maxOccurs="unbounded">
```


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```
    </s:element>
  </s:sequence>
</s:complexType>
```

NamedObject: A named object.

2.2.4.24.6 NamedObject

A named object.

```
<s:complexType name="NamedObject">
  <s:attribute name="Name" type="nonEmptyString" use="required" />
</s:complexType>
```

Name: The name of the named object MUST be unique across the list of named objects in the workbook.

2.2.4.24.7 Styles

An unordered collection of **Style** elements (section 2.2.4.24.8). For a worksheet or a named object containing a range within a worksheet, this collection MUST contain the default style **cellStyleID** (section 2.2.4.24.41).

```
<s:complexType name="Styles">
  <s:sequence>
    <s:element name="Style" type="Style" minOccurs="0" maxOccurs="unbounded" />
  </s:sequence>
</s:complexType>
```

Style: **Cell formatting** or **border formatting** applied to one or more worksheet cells, **worksheet header** cells, or charts.

2.2.4.24.8 Style

Cell formatting or border formatting.

```
<s:complexType name="Style">
  <s:choice>
    <s:group ref="cellStyle" />
    <s:group ref="borderStyle" />
  </s:choice>
  <s:attribute name="ID" use="required">
    <s:simpleType>
      <s:union memberTypes="cellStyleID borderStyleID" />
    </s:simpleType>
  </s:attribute>
</s:complexType>
```

ID: A **cellStyleID** (section 2.2.4.24.41). MUST be present when a **cellStyle** group (section 2.2.4.24.8.1) is present. A **borderStyleID** (section 2.2.4.24.40) MUST be present when a **BorderStyle** group (section 2.2.4.24.8.2) is present.

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2.2.4.24.8.1 CellStyle

A group (4) of cell formatting specific elements.

```
<s:group name="cellStyle">
  <s:sequence>
    <s:element name="Font" type="Font"/>
    <s:element name="Alignment" minOccurs="0" maxOccurs="1" type="Alignment"/>
    <s:choice minOccurs="0" maxOccurs="1">
      <s:element name="Interior" type="Interior"/>
      <s:element name="gradient" type="Gradient"/>
    </s:choice>
  </s:sequence>
</s:group>
```

Font: The font specification for one or more worksheet cells or worksheet headers.

Alignment: The alignment and **flow** of text and **conditional formatting** within a worksheet cell. This element MUST be omitted if all its attributes are their respective default **XML schema** values, and MUST otherwise be present.

Interior: The **fill color** or **pattern mask** and **pattern color**. This element MUST be present when a solid or **pattern fill** is present, and MUST otherwise be omitted.

gradient: The **gradient fill** style and color. This element MUST be present when a gradient fill is present, and MUST otherwise be omitted.

2.2.4.24.8.2 BorderStyle

A group (4) of border formatting specific elements.

```
<s:group name="borderStyle">
  <s:sequence>
    <s:element name="Borders" type="Borders"/>
  </s:sequence>
</s:group>
```

Borders: An unordered collection of **Border** elements (section 2.2.4.24.12).

2.2.4.24.9 Font

The font specification for a worksheet cells or worksheet headers.

```
<s:complexType name="Font">
  <s:attribute name="Size" default="11" use="optional">
    <s:simpleType>
      <s:restriction base="s:double">
        <s:minInclusive value="1" />
        <s:maxInclusive value="409" />
      </s:restriction>
    </s:simpleType>
  </s:attribute>
  <s:attribute name="FontName" type="s:string" use="required" />
  <s:attribute name="Color" type="rgbTuple" default="#000000" use="optional" />
  <s:attribute name="Bold" type="s:boolean" default="false" use="optional" />
```


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```
    <s:attribute name="Italic" type="s:boolean" default="false" use="optional" />
    <s:attribute name="StrikeThrough" type="s:boolean" default="false" use="optional" />
    <s:attribute name="VerticalAlign" type="enmFontVerticalAlignment" default="None"
  use="optional" />
    <s:attribute name="Underline" type="enmFontUnderline" default="None" use="optional" />
  </s:complexType>
```

Size: Font size in **points**.

FontName: Font name.

Color: **Font face color**. This attribute MUST be omitted when the **default font face color** is set.

Bold: Font face weight. This attribute MUST be set to **true** when the font face weight is greater than 600.

Italics: **Font face decoration.**

StrikeThrough: Font face decoration.

VerticalAlign: Vertical alignment of the text.

Underline: Font face decoration.

2.2.4.24.10 Alignment

The alignment and flow of text and conditional formatting within a worksheet cell.

```
  <s:complexType name="Alignment">
    <s:attribute name="Horizontal" type="enmHorizontalAlignment" default="Automatic"
  use="optional" />
    <s:attribute name="WrapText" type="s:boolean" default="false" use="optional" />
    <s:attribute name="Rotate" default="0" use="optional">
      <s:simpleType>
        <s:restriction base="s:int">
          <s:minInclusive value="-90" />
          <s:maxInclusive value="90" />
        </s:restriction>
      </s:simpleType>
    </s:attribute>
    <s:attribute name="VerticalText" type="s:boolean" default="false" use="optional" />
    <s:attribute name="Vertical" type="enmVerticalAlignment" default="Bottom" use="optional" />
    <s:attribute name="ReadingOrder" type="enmReadOrder" default="Context" use="optional" />
    <s:attribute name="ShrinkToFit" type="s:boolean" default="false" use="optional" />
    <s:attribute name="Indent" type="s:unsignedInt" default="0" use="optional" />
  </s:complexType>
```

Horizontal: Horizontal alignment of text. Equivalent to the **horizontal** attribute of the **CT_CellAlignment** element specified in [ECMA-376].

WrapText: Specifies whether text wraps at whitespace. Equivalent to the **wrapText** attribute of the **CT_CellAlignment** element specified in [ECMA-376].

Rotate: Angle of rotation in degrees, where the first character in the worksheet cell is the center of rotation. A positive number indicates that the text is rotated counter-clockwise from the 0 position.

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0 indicates the text is not rotated. A negative number indicates that the text is rotated by the absolute value of the number clockwise from the 0 position.

VerticalText: Specifies whether the text is **vertical text**.

Vertical: Vertical alignment of text. Equivalent to the **vertical** attribute of the **CT_CellAlignment** element specified in [ECMA-376].

ReadingOrder: The **reading order** of the worksheet cell.

ShrinkToFit: Specifies whether to **shrink to fit**. Equivalent to the **shrinkToFit** attribute of the **CT_CellAlignment** element specified in [ECMA-376].

Indent: A scaling factor used in conjunction with the **DefaultIndentSize** attribute on the **Table** element (section 2.2.4.24.35) to create a margin in points. Equivalent to the **indent** attribute of the **CT_CellAlignment** element specified in [ECMA-376].

2.2.4.24.11 Borders

An unordered collection of **Border** elements(section 2.2.4.24.12).

```
<s:complexType name="Borders">
  <s:sequence>
    <s:element name="Border" type="Border" minOccurs="0" maxOccurs="4" />
  </s:sequence>
</s:complexType>
```

Border: Specifies a border. There MUST be an element for every value of **enmBorderPosition** (section 2.2.4.24.43) for which the border is present.

2.2.4.24.12 Border

A border.

```
<s:complexType name="Border">
  <s:attribute name="Position" type="enmBorderPosition" use="required" />
  <s:attribute name="LineStyle" type="enmBorderLineStyle" default="None" use="optional" />
  <s:attribute name="Weight" use="required">
    <s:simpleType>
      <s:restriction base="s:int">
        <s:minInclusive value="0" />
        <s:maxInclusive value="3" />
      </s:restriction>
    </s:simpleType>
  </s:attribute>
  <s:attribute name="Color" type="rgbTuple" use="required" />
</s:complexType>
```

Position: The edge to which the border information applies.

LineStyle: The border line style.

Weight: The **border thickness** in **pixels**.

Color: The border color.

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2.2.4.24.13 Interior

The worksheet cell fill color or pattern mask and pattern color.

```
<s:complexType name="Interior">
  <s:attribute name="Color" type="rgbTuple"/>
  <s:attribute name="Pattern" type="enmPattern" use="optional"/>
  <s:attribute name="PatternColor" type="rgbTuple" use="optional"/>
</s:complexType>
```

Color: The background fill color.

Pattern: The foreground pattern mask. This attribute MUST be present when a pattern fill is present, and MUST otherwise be omitted.

PatternColor: The foreground pattern color. This attribute MUST be present when the **Pattern** attribute is present and not equal to "Solid", and MUST otherwise be omitted.

2.2.4.24.14 Gradient

The gradient fill for a worksheet cell. For visual examples, see the **CT_GradientFill** element in [ECMA-376].

```
<s:complexType name="Gradient">
  <s:sequence>
    <s:element name="stop" minOccurs="2" maxOccurs="3" type="Stop"/>
  </s:sequence>
  <s:attribute name="degree" default="0.0" use="optional">
    <s:simpleType>
      <s:restriction base="s:double">
        <s:minInclusive value="0.0" />
        <s:maxExclusive value="360.0" />
      </s:restriction>
    </s:simpleType>
  </s:attribute>
  <s:attribute name="type" type="enmGradientType" default="Linear" use="optional" />
  <s:attribute name="left" type="percentage" default="0" use="optional" />
  <s:attribute name="right" type="percentage" default="0" use="optional" />
  <s:attribute name="top" type="percentage" default="0" use="optional" />
  <s:attribute name="bottom" type="percentage" default="0" use="optional" />
</s:complexType>
```

stop: A **color stop** for the gradient. Each **Stop** element (section 2.2.4.24.15) in the sequence other than the first one MUST have the value of its **position** attribute greater than the value of the **position** attribute of the preceding **Stop** element.

degree: The angle of rotation of the gradient **Stop**. 0 degrees is horizontal from left to right with clockwise rotation from the bottom left corner of the worksheet cell.

type: The type of gradient.

left: The left edge of the color **Stop** as a percentage of the containing worksheet cell.

right: The right edge of the color **Stop** as a percentage of the containing worksheet cell.

top: The top edge of the color **Stop** as a percentage of the containing worksheet cell.

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bottom: The bottom edge of the color **Stop** as a percentage of the containing worksheet cell.

2.2.4.24.15 Stop

A color stop for a gradient.

```
<s:complexType name="Stop">
  <s:attribute name="position" type="percentage" use="required" />
  <s:attribute name="Color" type="rgbTuple" use="required" />
</s:complexType>
```

position: The starting position for the gradient.

Color: The color of the color **Stop**.

2.2.4.24.16 Worksheet

A sheet (2) or a named object in the workbook.

```
<s:complexType name="Worksheet">
  <s:sequence>
    <s:element name="WorksheetOptions" type="WorksheetOptions" minOccurs="0" maxOccurs="1" />
    <s:element name="autofilters" type="AutoFilters" minOccurs="0" maxOccurs="1" />
    <s:element name="PivotTables" type="PivotTables" minOccurs="0" maxOccurs="1" />
    <s:element name="Hyperlinks" type="Hyperlinks" minOccurs="0" maxOccurs="1" />
    <s:element name="Images" type="Images" minOccurs="0" maxOccurs="1" />
    <s:element name="Table" type="Table" minOccurs="0" maxOccurs="1" />
  </s:sequence>
  <s:attribute name="ChartSheet" type="s:boolean" default="false" use="optional" />
  <s:attribute name="Name" type="s:string" use="required" />
  <s:attribute name="NameRTL" type="s:boolean" default="false" use="optional" />
  <s:attribute name="NamedRange" type="s:boolean" default="false" use="optional" />
  <s:attribute name="SheetName" type="s:string" use="optional" />
</s:complexType>
```

WorksheetOptions: A collection of settings and options for the sheet (2).

This element MUST be present if any one of the following conditions is **true**:

- The **NamedRange** attribute is **false**.
- The **NamedRange** attribute is **true** and the **ChartSheet** attribute is **false**.
- The **NamedRange** attribute is **true** and the **ChartSheet** attribute is **true** and the sheet (2) is displayed **right-to-left**.

It MUST NOT be present otherwise.

AutoFilters: A list of auto filters This element MUST NOT be present if the **Chartsheet** attribute is **true**. If the **Chartsheet** attribute is **false**, it MUST be present if any one of the following conditions is **true**:

- The **NamedRange** attribute is **false** and the **Name** attribute is equal to the **SheetName** element in the **VisibleSheetRangeRequest** parameter (section 2.2.4.25) sent by the protocol client and there are one or more auto filters present within the range defined in the **Table** element (section 2.2.4.24.35).

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- The **NamedRange** attribute is **false** and the **SheetName** element in the **VisibleSheetRangeRequest** sent by the protocol client is empty and there are one or more autofilters present within the range defined in the **Table** element and one of the following conditions is met:

  - The worksheet represented by this element is the **active sheet** in the workbook, and the worksheet is a **visible** published sheet.

  - The active sheet in the workbook is not visible or not published, and the worksheet represented by this element is the first visible published sheet in the workbook.

- The **NamedRange** attribute is **true**, and there are one or more auto filters present within the range defined in the **Table** element. It MUST NOT be present otherwise.

PivotTables: A list of PivotTables. This element MUST NOT be present if the **Chartsheet** attribute is **true**. If the **Chartsheet** attribute is **false**, it MUST be present if any one of the following conditions is **true**:

- The **NamedRange** attribute is **false**, and the **Name** attribute is equal to the **SheetName** element in the **VisibleSheetRangeRequest** parameter sent by the protocol client and there are one or more PivotTables present within the range defined in the **Table** element.

- The **NamedRange** attribute is **false**, and the **SheetName** element in the **VisibleSheetRangeRequest** parameter sent by the protocol client is empty and there are one or more PivotTables present within the range defined in the **Table** element and one of the following conditions is met:

  - The worksheet represented by this element is the active sheet in the workbook, and the worksheet is a visible published sheet.

  - The active sheet in the workbook is not visible or not published, and the worksheet represented by this element is the first visible published sheet in the workbook.

- The **NamedRange** attribute is **true**, and there are one or more PivotTables present within the range defined in the **Table** element.

It MUST NOT be present otherwise.

Hyperlinks: A list of hyperlinks. This element MUST NOT be present if the **Chartsheet** attribute is **true**. If the **Chartsheet** attribute is **false**, it MUST be present if any one of the following conditions is **true**:

- The **NamedRange** attribute is **false**, and the **Name** attribute is equal to the **SheetName** element in the **VisibleSheetRangeRequest** parameter sent by the protocol client and there are one or more hyperlinks present within the range defined in the **Table** element.

- The **NamedRange** attribute is **false**, and the **SheetName** element in the **VisibleSheetRangeRequest** parameter sent by the protocol client is empty and there are one or more hyperlinks present within the range defined in the **Table** element and one of the following conditions is met:

  - The worksheet represented by this element is the active sheet in the workbook, and the worksheet is a visible published sheet.

  - The active sheet in the workbook is not visible or not published, and the worksheet represented by this element is the first and visible published sheet in the workbook.

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- The **NamedRange** attribute is **true**, and there are one or more hyperlinks present within the range defined in the **Table** element.

It MUST NOT be present otherwise.

Images: A list of **worksheet images**. This element MUST be present if any one of the following conditions is **true**:

- The **Chartsheet** attribute is **true** and the **Name** attribute is equal to the **SheetName** element in the **VisibleSheetRangeRequest** parameter sent by the protocol client.
- The Chartsheet attribute is **true** and the **SheetName** element in the **VisibleSheetRangeRequest** parameter sent by the protocol client is empty and one of the following conditions is met:
  - The chart sheet represented by this element is the active sheet in the workbook, and the chart sheet is a visible published sheet.
  - The active sheet in the workbook is not visible or not published, and the chart sheet represented by this element is the first visible published sheet in the workbook.
- The **NamedRange** attribute is **false** and the **Name** attribute is equal to the **SheetName** element in the **VisibleSheetRangeRequest** parameter sent by the protocol client and there are one or more worksheet images present within the range defined in the **Table** element.
- The **NamedRange** attribute is **false**, and the **SheetName** element in the **VisibleSheetRangeRequest** parameter sent by the protocol client is empty, there are one or more worksheet images present within the range defined in the **Table** element, and one of the following conditions is met:
  - The worksheet represented by this element is the active sheet in the workbook, and the worksheet is a visible published sheet.
  - The active sheet in the workbook is not visible or not published, and the worksheet represented by this element is the first visible published sheet in the workbook.
- The **NamedRange** attribute is **true**, and there are one or more worksheet images present in the range specified in the **Table** element.

It MUST NOT be present otherwise.

Table: This element contains information about a range, represented in tabular format. This element MUST NOT be present if the **Chartsheet** attribute is **true**. If the **Chartsheet** element is **false**, it MUST be present if any one of the following conditions is **true**:

- The **NamedRange** attribute is **false**, and the **Name** attribute is equal to the **SheetName** element in the **VisibleSheetRangeRequest** parameter sent by the protocol client.
- The **NamedRange** attribute is **false** and the **SheetName** element in the **VisibleSheetRangeRequest** parameter sent by the protocol client is empty and one of the following conditions is met:
  - The worksheet represented by this element is the active sheet in the workbook, and the worksheet is a visible published sheet.
  - The active sheet in the workbook is not visible or not published, and the worksheet represented by this element is the first visible published sheet in the workbook.

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- The **NamedRange** attribute is **true**.

It MUST NOT be present otherwise.

ChartSheet: Specifies whether the **Worksheet** element is a chart sheet or a named object of type chart. This attribute MUST be set to **true** if the **Worksheet** element represents a chart sheet or it represents a named object of type chart.

Name: The name of the sheet (2) or the named object represented by the **Worksheet** element. The length of this attribute MUST be less than or equal to 31 characters if the **NamedRange** attribute is **false**; it MUST be less than or equal to 255 characters if the **NamedRange** attribute is **true**.

NameRTL: Specifies whether the sheet name is in right-to-left format. This attribute MUST be set to **true** when the sheet name is in right-to-left format; otherwise, MUST be set to **false**.

NamedRange: Specifies the **Worksheet** element represents a named object. This attribute MUST be set to **true** if the **Worksheet** element represents a named object; otherwise, MUST be set to **false**.

SheetName: The name of the sheet (2) on which the named object resides, if the **Worksheet** element is a named object. This attribute MUST be present if the **NamedRange** attribute is **true**; it MUST NOT be present otherwise.

2.2.4.24.17 WorksheetOptions

A collection of settings and options for the sheet (2).

```
<s:complexType name="WorksheetOptions">
  <s:sequence>
    <s:element name="DoNotDisplayGridlines" type="s:boolean" minOccurs="0" maxOccurs="1" />
    <s:element name="DoNotDisplayHeadings" type="s:boolean" minOccurs="0" maxOccurs="1" />
    <s:element name="DisplayRightToLeft" type="s:boolean" minOccurs="0" maxOccurs="1" />
    <s:element name="TabColor" type="rgbTuple" minOccurs="0" maxOccurs="1" />
  </s:sequence>
</s:complexType>
```

DoNotDisplayGridLines: Specifies whether the **gridlines** are visible. This element MUST be present if the **Chartsheet** attribute of the **Worksheet** element (section 2.2.4.24.16) is **false** and there are no gridlines present on the worksheet. This element MUST NOT be present if the **Chartsheet** attribute of the **Worksheet** element is **true**. This element MUST NOT be present if the **Chartsheet** attribute of the **Worksheet** element is **false** and there are gridlines present on the worksheet.

DoNotDisplayHeadings: Specifies whether row (2) and column headers are visible. This element MUST be present if the **Chartsheet** attribute of the **Worksheet** element is **false** and row (2) and column headers are not visible. This element MUST NOT be present if the **Chartsheet** attribute of the **Worksheet** element is **true**. This element MUST NOT be present if the **Chartsheet** attribute of the **Worksheet** element is **false** and row (2) and column headers are visible.

DisplayRightToLeft: Specifies whether the sheet (2) or named object is displayed in right-to-left format. This element MUST be present if the sheet (2) or named object represented by the **Worksheet** element is displayed right-to-left. This element MUST NOT be present if the sheet (2) or named object is displayed **left-to-right**.

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TabColor: The color of the sheet tab for the sheet (2) represented by the **Worksheet** element, or the color of the sheet tab for the sheet (2) on which the named object represented by the **Worksheet** element resides. This element MUST be present if the **default sheet tab color** is not set and MUST NOT be present otherwise.

2.2.4.24.18 Autofilters

A list of auto filters. This element MUST contain the collection of all auto filters that are contained within the range defined in the **Table** element (section 2.2.4.24.35). An AutoFilter is considered to be contained within a range if one or more worksheet cells defined in a nested **Item** element (section 2.2.4.24.20) lie within the range. If an AutoFilter is defined on a **hidden row (2)** within the range defined in the **Table** element, that AutoFilter MUST NOT be included in this collection. If all the worksheet cells defined in the nested **Item** elements that lie within the range defined in the **Table** element are present on hidden columns, that AutoFilter MUST NOT be included in this collection. This element MUST have one or zero AutoFilter elements having the **Type** attribute set to "Sheet".

```
<s:complexType name="AutoFilters">
  <s:sequence>
    <s:element name="autofilter" type="AutoFilter" minOccurs="0" maxOccurs="unbounded" />
  </s:sequence>
</s:complexType>
```

AutoFilter: An AutoFilter that lies within the range defined in the **Table** element.

2.2.4.24.19 AutoFilter

An AutoFilter in a worksheet.

```
<s:complexType name="AutoFilter">
  <s:sequence>
    <s:element name="item" type="Item" minOccurs="0" maxOccurs="16384" />
  </s:sequence>
  <s:attribute name="ID" type="s:int" default="0" use="optional" />
  <s:attribute name="Row" type="excelRowNumber" default="0" use="optional" />
  <s:attribute name="ColFirst" type="excelColNumber" default="0" use="optional" />
  <s:attribute name="Type" use="required">
    <s:simpleType>
      <s:restriction base="s:string">
        <s:enumeration value="Sheet" />
        <s:enumeration value="Table" />
      </s:restriction>
    </s:simpleType>
  </s:attribute>
</s:complexType>
```

item: A column (2) in the AutoFilter.

ID: If the AutoFilter is part of a table, this attribute denotes the identifier of the table. This element MUST be present when the **Type** is "Table". It MUST NOT be present otherwise.

Row: The row (2) number on which the AutoFilter exists.

ColFirst: The column (2) number of the first visible column (2) in the AutoFilter.

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Type: Specifies whether the AutoFilter is part of a table. If the AutoFilter is part of a table, this attribute MUST have a value of "Table"; otherwise, it MUST have a value of "Sheet". The following table describes possible values.

Value	Meaning
Sheet	The AutoFilter is not a part of a table.
Table	The AutoFilter is a part of a table.

2.2.4.24.20 Item

An **AutoFilter item** in an AutoFilter.

```
<s:complexType name="Item">
  <s:sequence>
    <s:element name="Criteria" type="Criteria" minOccurs="0" maxOccurs="2" />
    <s:element name="top10" type="Top10" minOccurs="0" maxOccurs="1" />
  </s:sequence>
  <s:attribute name="Index" type="excelColNumber" default="0" use="optional" />
  <s:attribute name="Name" type="s:string" use="optional" />
  <s:attribute name="Top10" type="s:boolean" default="false" use="optional" />
  <s:attribute name="Type" type="enmFilterItemType" default="None" use="optional" />
  <s:attribute name="CriteriaType" type="enmAutoFilterItemCriteriaType" default="Nil"
use="optional" />
  <s:attribute name="DataType" type="enmAutoFilterItemType" default="Number" use="optional"
/>
  <s:attribute name="Filter" type="s:boolean" default="false" use="optional" />
  <s:attribute name="Custom" type="s:boolean" default="false" use="optional" />
</s:complexType>
```

Criteria: The rule defined in a **custom filter**. This element MUST be present if a custom filter is applied to the AutoFilter item and MUST NOT be present otherwise. If the custom filter contains two rules, then there MUST be two **Criteria** elements present; if the custom filter contains a single rule, there MUST be one **Criteria** element present.

top10: This element holds information pertaining to the **top N filter** or **bottom N filter** applied to an **Item** (section 2.2.4.24.20). This element MUST be present if the **Top10** attribute is **true**, and it MUST NOT be present otherwise.

Index: The column (2) number on which the **AutoFilter** item exists.

Name: The name of the **AutoFilter** item in the AutoFilter. Its value MUST be equal to the value of the **Data** element (section 2.2.4.24.39) nested under the **Cell** element (section 2.2.4.24.38) that represent the worksheet cell on which the **AutoFilter** item is present.

Top10: Specifies whether a top N filter is applied to the **AutoFilter** item. This attribute MUST NOT be **true** if the **Custom** attribute is **true**, the **Filter** attribute is **true**, or the **CriteriaType** attribute is present. This attribute MUST be present and set to **true** when a top N filter is applied to the **AutoFilter** item.

Type: This attribute denotes the type of sorting or filtering applied to the **AutoFilter** item.

CriteriaType: A specific date or number filter that is applied to the **AutoFilter** item. This attribute MUST NOT be present if the **Top10** attribute (section 2.2.4.24.22) is **true**, or the **Filter** attribute is **true** or the **Custom** attribute is **true**.

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DataType: The type of data in the underlying worksheet cells of the **AutoFilter** item.

Filter: Specifies whether a manual filter is applied to the **AutoFilter** item. This attribute MUST be present and set to **true** when a manual filter is applied to the **AutoFilter** item. This attribute MUST NOT be **true** if the **Top10** attribute is **true** or the **Custom** attribute is **true** or the **CriteriaType** attribute is present.

Custom: Specifies whether a filter that is not supported on the protocol server is applied to the **AutoFilter** item. This attribute MUST be present and set to **true** when the **AutoFilter** item has a filter that is not supported on the protocol server applied to it. This attribute MUST NOT be **true** if the **Top10** attribute is **true**, the **Filter** attribute is **true**, or the **CriteriaType** attribute is present.

2.2.4.24.21 Criteria

Criteria applied in a custom filter.

```
<s:complexType name="Criteria">
  <s:attribute name="Type" type="enmAutoFilterCriteriaOperationType" default="EQ"
use="optional" />
  <s:attribute name="Relation" type="enmAutoFilterCriteriaRelationOperator" default="Nil"
use="optional" />
  <s:attribute name="value" use="required">
    <s:simpleType>
    <s:restriction base="s:string">
    <s:maxLength value="250" />
  </s:restriction>
    </s:simpleType>
  </s:attribute>
</s:complexType>
```

Type: Specifies the comparison operator applied between **cell contents** and the value attribute during filtering.

Relation: If there are two criteria in the custom filter, the logical operator is applied between them. If the parent **Item** element (section 2.2.4.24.20) has two criteria elements, this attribute MUST be set on the first criteria element in the **Item**. This attribute MUST NOT be present on the last criteria element in the parent **Item**.

value: The value that is used with the relational operator defined in the **Type** attribute for filtering.

2.2.4.24.22 Top10

A top N filter or a bottom N filter applied to an **Item** (section 2.2.4.24.20).

```
<s:complexType name="Top10">
  <s:attribute name="percent" type="s:boolean" use="required" />
  <s:attribute name="top" type="s:boolean" use="required" />
  <s:attribute name="value" type="s:int" use="required" />
</s:complexType>
```

percent: Specifies whether the top N filter or bottom N filter is based on percentage of the total sum of values in the column (2) or not. This attribute MUST be **true** when a **top N filter by percent** or a **bottom N filter by percent** is applied. It MUST be **false** when a **top N filter by count** or a **bottom N filter by count** is applied.

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top: Specifies whether a top N filter or a bottom N filter is applied. This attribute MUST be **true** when a top N filter is applied. It MUST be **false** when a bottom N filter is applied.

value: Value based on which the top N filter or bottom N filter is applied. If percent is **true**, the value of this attribute MUST be greater than or equal to 0 and less than or equal to 100. If percent is **false**, the value of this attribute MUST be greater than or equal to 0 and less than or equal to 500.

2.2.4.24.23 PivotTables

An unordered list of PivotTables.

```
<s:complexType name="PivotTables">
  <s:sequence>
    <s:element name="PivotTable" type="PivotTable" minOccurs="1" maxOccurs="unbounded" />
  </s:sequence>
</s:complexType>
```

PivotTable: A PivotTable in which the range of the PivotTable intersects with the returned range.

2.2.4.24.24 PivotTable

A PivotTable.

```
<s:complexType name="PivotTable">
  <s:sequence>
    <s:element name="Ranges" type="Ranges" minOccurs="1" maxOccurs="1" />
    <s:element name="DataFields" type="DataFields" minOccurs="0" maxOccurs="1" />
  </s:sequence>
  <s:attribute name="ExternalSourceIndex" type="s:nonNegativeInteger" default="0"
use="optional" />
  <s:attribute name="AdvancedFilters" type="s:boolean" default="false" use="optional" />
  <s:attribute name="LocalSource" type="s:boolean" use="optional" default="false" />
  <s:attribute name="Name" type="nonEmptyString" />
  <s:attribute name="DataConnectionName" type="nonEmptyString" />
  <s:attribute name="ShowDrillIndicators" type="s:boolean" default="true" use="optional" />
  <s:attribute name="RequiresConnection" type="s:boolean" use="optional" default="false" />
</s:complexType>
```

Ranges: MUST contain the unordered list of all the ranges where the range of the PivotTable intersects with the returned range.

DataFields: MUST contain the list of all the PivotTable data fields of the PivotTable represented by the parent element.

ExternalSourceIndex: An identifier that the protocol server uses to identify a connected data.

AdvancedFilters: MUST be ignored on receipt by the protocol client.

LocalSource: MUST be **true** if the PivotTable is a **native PivotTable**.

Name: The identifier of a PivotTable.

DataConnectionName: An identifier that the protocol server uses to identify the data connection (2).

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ShowDrillIndicators: MUST be **true** if the PivotTable allows PivotTable **drill indicators**.

RequiresConnection: MUST be **true** if the PivotTable requires an external data connection (2) to update the contents of the PivotTable.

2.2.4.24.25 Ranges

An unordered list of ranges.

```
<s:complexType name="Ranges">
  <s:sequence>
    <s:element name="range" type="Range" minOccurs="1" maxOccurs="unbounded" />
  </s:sequence>
</s:complexType>
```

range: A range of the PivotTable that intersects with the returned range.

2.2.4.24.26 Range

A range of a PivotTable.

```
<s:complexType name="Range">
  <s:sequence>
    <s:element name="Operations" type="Operations" minOccurs="1" maxOccurs="1" />
  </s:sequence>
  <s:attribute name="FirstColumn" type="excelColNumber" use="optional" default="0" />
  <s:attribute name="FirstRow" type="excelRowNumber" use="optional" default="0" />
  <s:attribute name="LastColumn" type="excelColNumber" use="optional" default="0" />
  <s:attribute name="LastRow" type="excelRowNumber" use="optional" default="0" />
</s:complexType>
```

Operations: MUST contain the list of all the operations that are allowed on the range.

FirstColumn: When present, MUST be either the first column (2) of the PivotTable or the first column (2) of the requested range, whichever is greater.

FirstRow: When present, MUST be either the first row (2) of the PivotTable or the first row (2) of the requested range, whichever is greater.

LastColumn: When present, MUST be either the last column (2) of the PivotTable or the last column (2) of the requested range, whichever is less.

LastRow: When present, MUST be either the last row (2) of the PivotTable or the last row (2) of the requested range, whichever is less.

2.2.4.24.27 Operations

A list of all the operations that are allowed on the range.

```
<s:complexType name="Operations">
  <s:sequence>
    <s:element name="Operation" type="Operation" minOccurs="1" maxOccurs="1" />
  </s:sequence>
</s:complexType>
```


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Operation: Specifies an operation that is allowed on the range.

2.2.4.24.28 Operation

An operation that is allowed on a range.

```
<s:complexType name="Operation">
  <s:attribute name="Type" type="enmPivotRangeOperation" />
</s:complexType>
```

Type: The type of range operation.

2.2.4.24.29 DataFields

A list of PivotTable data fields.

```
<s:complexType name="DataFields">
  <s:sequence>
    <s:element name="DataField" type="DataField" minOccurs="1" maxOccurs="unbounded" />
  </s:sequence>
</s:complexType>
```

DataField: A PivotTable data field.

2.2.4.24.30 DataField

A PivotTable data field.

```
<s:complexType name="DataField">
  <s:attribute name="Name" type="nonEmptyString" />
  <s:attribute name="Id" type="nonEmptyString" />
</s:complexType>
```

Name: The PivotTable data field caption.

Id: An identifier for the PivotTable data field.

2.2.4.24.31 Hyperlinks

Unordered collection of **Hyperlink** elements (section 2.2.4.24.32) that intersect the result range.

```
<s:complexType name="Hyperlinks">
  <s:sequence>
    <s:element name="Hyperlink" type="Hyperlink" minOccurs="1" maxOccurs="unbounded" />
  </s:sequence>
</s:complexType>
```

Hyperlink: A **Hyperlink** for each unique hyperlink that intersects the returned range defined in the **Table** element (section 2.2.4.24.35). Worksheet cells which contain hyperlinks and intersect a PivotTable, or reference workbooks other than the current workbook MUST be omitted.

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2.2.4.24.32 Hyperlink

A reference to a named object or range within the current workbook, or to an external resource.

```
<s:complexType name="Hyperlink">
  <s:sequence>
    <s:choice minOccurs="1" maxOccurs="1">
      <s:element name="Target" type="s:string" />
      <s:element name="Location" type="s:string" />
    </s:choice>
    <s:element name="Tooltip" type="nonEmptyString" minOccurs="0" maxOccurs="1" />
  </s:sequence>
  <s:attribute name="top" type="excelRowNumber" use="required" />
  <s:attribute name="left" type="excelColNumber" use="required" />
  <s:attribute name="bottom" type="excelRowNumber" use="required" />
  <s:attribute name="right" type="excelColNumber" use="required" />
</s:complexType>
```

Target: An external resource. The element MAY<3> be a valid [RFC1738] URL.

Location: A named object or range which MUST exist within the current workbook and MUST be present when the **Target** element is omitted.

Tooltip: Descriptive text for the hyperlink. This element MUST be omitted when descriptive text is not present; in which case the value of **Target** or Location element specifies the **hyperlink**.

top: The first row (2) of the range to which the hyperlink information applies.

left: The first column (2) of the range to which the hyperlink information applies.

bottom: The last row (2) of the range to which the hyperlink information applies.

right: The last column (2) of the range to which the hyperlink information applies.

2.2.4.24.33 Images

A list of worksheet images.

```
<s:complexType name="Images">
  <s:sequence>
    <s:element name="Image" type="Image" minOccurs="1" maxOccurs="unbounded" />
  </s:sequence>
</s:complexType>
```

Image: A worksheet image.

2.2.4.24.34 Image

A worksheet image.

```
<s:complexType name="Image">
  <s:sequence />
    <s:attribute name="Id" type="nonEmptyString" use="required" />
    <s:attribute name="Type" type="enmImageType" use="optional" default="chart" />
    <s:attribute name="Width" type="nonNegativeDouble" use="required" />
```


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```
    <s:attribute name="Height" type="nonNegativeDouble" use="required" />
    <s:attribute name="BorderID" type="borderStyleID" use="optional" />
    <s:attribute name="ZOrder" type="s:int" use="required" />
    <s:attribute name="XOriginDelta" type="s:double" default="0" use="optional" />
    <s:attribute name="YOriginDelta" type="s:double" default="0" use="optional" />
    <s:attribute name="ClippedWidth" type="nonNegativeDouble" default="0" use="optional" />
    <s:attribute name="ClippedHeight" type="nonNegativeDouble" default="0" use="optional" />
    <s:attribute name="Visible" type="s:boolean" default="true" use="optional" />
    <s:attribute name="AltText" type="s:string" use="optional" />
</s:complexType>
```

Id: An identifier for the worksheet image. MUST be unique across all the worksheet images of the workbook.

Type: The type of worksheet image.

Width: The width of the image. MUST be in points.

Height: The height of the image. MUST be in points.

BorderID: A **Style** (section 2.2.4.24.8) describing any borders applied to the worksheet image. If the **NamedRange** attribute on the Worksheet element is **true** or if the **ChartSheet** attribute on the **Worksheet** element (section 2.2.4.24.16) is **true**, this attribute MUST NOT be present.

ZOrder: The **z-order** for the worksheet image.

XOriginDelta: The X coordinate of the offset of the origin of the worksheet image from the starting column (2) of the requested range. MUST be in points.

YOriginDelta: The Y coordinate of the offset of the origin of the worksheet image from the starting row (2) of the requested range. MUST be in points.

ClippedWidth: The width of the portion of the image that intersects the requested range. MUST be in points.

ClippedHeight: The height of the portion of the image that intersects the requested range. MUST be in points.

Visible: Specifies whether the worksheet image is a visible worksheet image.

AltText: An alternative text used by the protocol server to provide an error message when the worksheet image is not supported.

2.2.4.24.35 Table

A range represented in tabular format. This element contains information about the following range:

- If the **NamedRange** attribute on the parent **Worksheet** element (section 2.2.4.24.16) is **false**, the range represented is the range in the **VisibleSheetRangeRequest** parameter (section 2.2.4.25) sent by the protocol client.
- If the **NamedRange** attribute on the parent **Worksheet** element is **true**, the range represented is the intersection of the range in the **VisibleSheetRangeRequest** parameter and the range defined on the named object.

```
<s:complexType name="Table">
```


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```
<s:sequence>
  <s:element name="Column" type="ColumnAxisItem" minOccurs="0" maxOccurs="16384"  />
  <s:element name="Row" type="RowAxisItem" minOccurs="0" maxOccurs="1048576" />
</s:sequence>
<s:attribute name="LastNonEmptyRow" type="excelRowNumber1Based" use="required" />
<s:attribute name="LastNonEmptyColumn" type="excelColNumber1Based" use="required" />
<s:attribute name="CurrentFirstRow" type="excelRowNumber1Based" use="optional" />
<s:attribute name="FirstVisibleRow" use="required">
  <s:simpleType>
    <s:union memberTypes="excelRowNumber1Based">
      <s:simpleType>
        <s:restriction base="s:int">
          <s:enumeration value="-1" />
          <s:enumeration value="0" />
        </s:restriction>
      </s:simpleType>
    </s:union>
  </s:simpleType>
</s:attribute>
<s:attribute name="LastVisibleRow" use="optional">
  <s:simpleType>
    <s:union memberTypes="excelRowNumber1Based">
      <s:simpleType>
        <s:restriction base="s:int">
          <s:enumeration value="0" />
        </s:restriction>
      </s:simpleType>
    </s:union>
  </s:simpleType>
</s:attribute>
<s:attribute name="CurrentFirstColumn" type="excelColNumber1Based" use="optional" />
<s:attribute name="FirstVisibleColumn" use="required">
  <s:simpleType>
    <s:union memberTypes="excelColNumber1Based">
      <s:simpleType>
        <s:restriction base="s:int">
          <s:enumeration value="-1" />
          <s:enumeration value="0" />
        </s:restriction>
      </s:simpleType>
    </s:union>
  </s:simpleType>
</s:attribute>
<s:attribute name="LastVisibleColumn" use="optional">
  <s:simpleType>
    <s:union memberTypes="excelColNumber1Based">
      <s:simpleType>
        <s:restriction base="s:int">
          <s:enumeration value="0" />
        </s:restriction>
      </s:simpleType>
    </s:union>
  </s:simpleType>
</s:attribute>
<s:attribute name="DefaultRowHeight" default="12.75" use="optional">
  <s:simpleType>
    <s:union>
      <s:simpleType>
        <s:restriction base="rowHeight"/>
```


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```
          </s:simpleType>
          <s:simpleType>
            <s:restriction base="s:double">
              <s:enumeration value="0" />
            </s:restriction>
          </s:simpleType>
        </s:union>
      </s:simpleType>
    </s:attribute>
    <s:attribute name="DefaultColumnWidth" default="48" use="optional">
      <s:simpleType>
        <s:union>
          <s:simpleType>
            <s:restriction base="columnWidth"/>
          </s:simpleType>
          <s:simpleType>
            <s:restriction base="s:double">
              <s:enumeration value="0" />
            </s:restriction>
          </s:simpleType>
        </s:union>
      </s:simpleType>
    </s:attribute>
    <s:attribute name="DefaultIndentWidth" type="columnWidth" default="9" use="optional"
  />
    <s:attribute name="SelectionTop" default="0" use="optional" >
      <s:simpleType>
        <s:restriction base="s:int">
          <s:minInclusive value="0" />
          <s:maxInclusive value="1048576" />
        </s:restriction>
      </s:simpleType>
    </s:attribute>
    <s:attribute name="SelectionLeft" default="0" use="optional" >
      <s:simpleType>
        <s:restriction base="s:int">
          <s:minInclusive value="0" />
          <s:maxInclusive value="16384" />
        </s:restriction>
      </s:simpleType>
    </s:attribute>
    <s:attribute name="summaryRight" type="s:boolean" default="true" />
    <s:attribute name="summaryBelow" type="s:boolean" default="true" />
    <s:attribute name="outlineLevelCol" type="excelOutlineLevels" use="optional" />
    <s:attribute name="outlineLevelRow" type="excelOutlineLevels" use="optional" />
  </s:complexType>
```

Column: This element represents one or more columns in the range represented by the Table element. There MUST be one element for every column (2) or collection of contiguous columns that have identical hidden status, **outline level (2)** and width. The entries for this element MUST be ordered according to the column (2) indices.

Row: This element represents one or more rows in the range represented by the **Table** element. There MUST be one element for every row (2) or collection of contiguous hidden rows. The entries for this element MUST be ordered according to the row (2) indices.

LastNonEmptyRow: The value of this attribute is the minimum of the following values:

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- The last visible row (2) in the worksheet or the named object, or 1 if there are no visible rows in the worksheet or the named object.
- The greater of the following two values:
  - The last row in the worksheet or the named object containing a worksheet cell that has data or formatting.
  - The last row (2) in the range in the **VisibleSheetRangeRequest** parameter sent by the protocol client.

LastNonEmptyColumn: The value of this attribute is the minimum of the following values:

- The last visible column (2) in the worksheet or the named object, or 1 if there are no visible columns in the worksheet or the named object.
- The greater of the following two values:
  - The last column (2) in the worksheet or the named object containing a worksheet cell that has data or formatting.
  - The last column (2) in the range in the **VisibleSheetRangeRequest** parameter sent by the protocol client.

CurrentFirstRow: If all the rows in the worksheet are hidden, this attribute MUST be omitted. If the **NamedRange** attribute in the parent **Worksheet** element is **false**, this attribute represents the index of the first row (2) in the range in the **VisibleSheetRangeRequest** parameter sent by the protocol client. If the **NamedRange** attribute in the parent **Worksheet** element is **true**, this attribute represents the index of the first row (2) in the intersection of the range in the **VisibleSheetRangeRequest** parameter sent by the protocol client and the range defined on the named object. If the aforementioned ranges are disjoint, the value of this attribute MUST be 1.

FirstVisibleRow: If all the rows in the worksheet are hidden, this attribute MUST be -1. If the **NamedRange** attribute in the parent **Worksheet** element is **false**, this attribute represents the index of the first visible row (2) in the worksheet. If the **NamedRange** attribute in the parent **Worksheet** element is **true** this attribute is the index of the first visible row (2) in the range defined on the named object. If the range in the **VisibleSheetRangeRequest** parameter sent by the protocol client and the range defined on the named object are disjoint, the value of this attribute MUST be 0.

LastVisibleRow: If all the rows in the worksheet are hidden, this attribute MUST be omitted. If the **NamedRange** attribute in the parent **Worksheet** element is **false**, this attribute represents the index of the last visible row (2) in the worksheet. If the **NamedRange** attribute in the parent **Worksheet** element is **true**, this attribute represents the index of the last visible row (2) in the range defined on the named object. If the range in the **VisibleSheetRangeRequest** parameter sent by the protocol client and the range defined on the named object are disjoint, the value of this attribute MUST be 0.

CurrentFirstColumn: If all the columns in the worksheet are hidden, this attribute MUST be omitted. If the **NamedRange** attribute in the parent **Worksheet** element is **false**, this attribute represents the index of the first column (2) in the range in the **VisibleSheetRangeRequest** parameter sent by the protocol client. If the **NamedRange** attribute in the parent **Worksheet** element is **true**, this attribute represents the index of the first column (2) in the intersection of the range in the **VisibleSheetRangeRequest** parameter sent by the protocol client and the range defined on the named object. If the aforementioned ranges are disjoint, the value of this attribute MUST be 1.

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FirstVisibleColumn: If all the columns in the worksheet are hidden, this attribute MUST be -1. If the **NamedRange** attribute in the parent **Worksheet** element is **false**, this attribute represents the index of the first visible column (2) in the worksheet. If the **NamedRang**e attribute in the parent **Worksheet** element is **true**, this attribute represents the index of the first visible column (2) in the range defined on the named object. If the range in the **VisibleSheetRangeRequest** parameter sent by the protocol client and the range defined on the named object are disjoint, the value of this attribute MUST be 0.

LastVisibleColumn: If all the columns in the worksheet are hidden, this attribute MUST be omitted. If the **NamedRange** attribute in the parent **Worksheet** element is **false**, this attribute represents the index of the last visible column (2) in the worksheet. If the **NamedRange** attribute in the parent **Worksheet** element is **true**, this attribute represents the index of the last visible column (2) in the range defined on the named object. If the range in the **VisibleSheetRangeRequest** parameter sent by the protocol client and the range defined on the named object are disjoint, the value of this attribute MUST be 0.

DefaultRowHeight: The default height of a row (2) in points.

DefaultColumnWidth: The default width of a column (2) in points.

DefaultIndentWidth: The default **vertical indent** or **horizontal indent** used for rendering cell contents for worksheet cells with vertical text or **horizontal text** respectively, in points.

SelectionTop: The index of the row (2) which has the **active cell**. This attribute MUST have a value other than 0 if all the following conditions are **true**:

- The **NamedRange** attribute in **Worksheet** is **false**.
- The worksheet has an active cell.
- There are one or more visible rows in the worksheet.
- There are one or more visible columns in the worksheet.
- The row (2) index of the active cell is greater than or equal to the value of the **FirstVisibleRow** attribute.
- The row (2) index of the active cell is less than or equal to the value of the **LastVisibleRow** attribute.
- The column (2) index of the active cell is greater than or equal to the value of the **FirstVisibleColumn** attribute.
- The column (2) index of the active cell is less than or equal to the value of the **LastVisibleColumn** attribute.

It MUST be omitted or have a value of 0 otherwise.

SelectionLeft: The index of the column (2) which has the active cell. This attribute MUST have a value other than 0 if all the following conditions are **true**:

- The **NamedRange** attribute in **Worksheet** is **false**.
- The worksheet has an active cell.
- There are one or more visible rows in the worksheet.
- There are one or more visible columns in the worksheet.

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- The row (2) index of the active cell is greater than or equal to the value of the **FirstVisibleRow** attribute.
- The row (2) index of the active cell is less than or equal to the value of the **LastVisibleRow** attribute.
- The column (2) index of the active cell is greater than or equal to the value of the **FirstVisibleColumn** attribute.
- The column (2) index of the active cell is less than or equal to the value of the **LastVisibleColumn** attribute.

It MUST be omitted or have a value of 0 otherwise.

SummaryRight: Specifies whether the **summary** of a set of grouped columns is displayed to the right of the grouped data. When this attribute is set to **true**, it denotes that the summary of a set of grouped columns is displayed to the right of grouped data. This attribute MUST be present and set to **false** if **outlines** are visible on the worksheet and the summary of grouped columns in the worksheet is displayed to the left of the grouped columns.

SummaryBelow: Specifies whether the summary of a set of grouped rows is displayed below the grouped data. When this attribute is set to **true**, it denotes that the summary of a set of grouped rows is displayed below the grouped data. This attribute MUST be present and set to **false** if outlines are visible on the worksheet and the summary of grouped rows in the worksheet is displayed above the grouped rows.

outlineLevelCol: The maximum number of outline levels (2) of outlining in a set of grouped columns within the range represented by the Table element. This attribute MUST be present if outlines are visible on the worksheet and there are one or more grouped columns in the range represented by the **Table** element (section 2.2.4.24.35).

outlineLevelRow: The maximum number of outline levels (2) of outlining in a set of grouped rows within the range represented by the Table element. This attribute MUST be present if outlines are visible on the worksheet and there are one or more grouped rows in the range represented by the **Table** element.

2.2.4.24.36 RowAxisItem

A type for representing a single row (2) or multiple contiguous hidden rows, from the range defined in the parent **Table** element (section 2.2.4.24.35).

```
<s:complexType name="RowAxisItem">
  <s:sequence>
    <s:element name="Cell" type="Cell" minOccurs="0" maxOccurs="16384" />
  </s:sequence>
  <s:attribute name="Span" use="optional" >
    <s:simpleType>
      <s:restriction base="s:int">
        <s:minInclusive value="1" />
        <s:maxInclusive value="1048575" />
      </s:restriction>
    </s:simpleType>
  </s:attribute>
  <s:attribute name="Hidden" type="s:boolean" use="optional" default="false" />
  <s:attribute name="collapsed" type="s:boolean" default="false" use="optional" />
  <s:attribute name="outlineLevel" type="excelOutlineLevels" use="optional" />
  <s:attribute name="Index" type="excelRowNumber1Based" use="optional" />
```


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```
    <s:attribute name="Height" type="rowHeight" use="optional"/>
  </s:complexType>
```

Cell: A worksheet cell that has data or has formatting applied to it. This element MUST NOT be present if the **Hidden** attribute is **true**. If the **Hidden** attribute is not **true**, there MUST be an element for every worksheet cell in the row (2) that has data or has formatting applied to it.

Span: If the element represents more than one row (2), this attribute denotes the additional number of rows represented by the element. This attribute MUST be present if the **Hidden** attribute is **true** and there is more than one contiguous hidden row. It MUST NOT be present otherwise.

Hidden: Specifies whether the rows are hidden. This attribute MUST be present and set to **true** if the rows represented by the element are hidden.

collapsed: If the row (2) represented by this element is part of a **group (4)**, this attribute denotes whether the outlining at the current outline level (2) is collapsed. This attribute MUST be present and set to **true** if the **Hidden** attribute is not **true** and the row (2) is part of a group (4) and outlining for the outline level (2) of the row (2) is collapsed. It MUST NOT be present otherwise.

outlineLevel: The outline level (2) of outlining at the row (2) represented by the current element. This attribute MUST be present if the **Hidden** attribute is not **true** and the row (2) is part of a group (4). It MUST NOT be present otherwise.

Index: Index of the row (2) represented by the element. This attribute MUST NOT be present for the first **Row** element in the parent **Table** element. If it is not the first **Row** element, it MUST be present if the previous **Row** element has a **Hidden** attribute set to **true**. It MUST NOT be present otherwise.

Height: Height of the row (2), in points. This attribute MUST be present if the **Hidden** attribute is not **true**. It MUST NOT be present otherwise.

2.2.4.24.37 ColumnAxisItem

A type for representing one or more contiguous columns having identical hidden status, style, outline level (2) and width, from the range defined in the parent **Table** element (section 2.2.4.24.35).

```
<s:complexType name="ColumnAxisItem">
  <s:attribute name="Span" use="optional">
    <s:simpleType>
      <s:restriction base="s:int">
        <s:minInclusive value="1" />
        <s:maxInclusive value="16383" />
      </s:restriction>
    </s:simpleType>
  </s:attribute>
  <s:attribute name="Hidden" type="s:boolean" use="optional" default="false" />
  <s:attribute name="collapsed" type="s:boolean" default="false" use="optional" />
  <s:attribute name="outlineLevel" type="excelOutlineLevels" use="optional" />
  <s:attribute name="Index" type="excelColNumber1Based" use="optional" />
  <s:attribute name="Width" type="columnWidth" use="optional" />
</s:complexType>
```


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Span: If the element represents more than one column (2), this attribute denotes the additional number of columns represented by the element. This attribute MUST be present if the element represents more than one column (2); it MUST NOT be present otherwise. This attribute MUST NOT be present if the **collapsed** attribute is present and set to **true**.

Hidden: Specifies whether the columns are hidden. This attribute MUST be present and set to **true** if the columns represented by the element are hidden.

collapsed: If the column (2) represented by this element is part of a group (4), this attribute denotes whether the outlining at the current outline level (2) is collapsed. This attribute MUST be present and set to **true** if the column (2) is part of a group (4) and outlining for the outline level (2) of the column (2) is "collapsed" and the **Hidden** attribute is **false**. This attribute MUST NOT be present if the **Span** attribute is present.

outlineLevel: The outline level (2) of outlining at the columns represented by the current element. This attribute MUST be present if the columns are part of a group (4) and the **Hidden** attribute is **false**; it MUST NOT be present otherwise.

Index: Index of the first column (2) in the set of columns represented by the element. This attribute MUST NOT be present for the first **Column** element () in the parent **Table** element. If it is not the first **Column** element, it MUST be present if any one of the following conditions is **true**:

- The previous **Column** element has a **Span** attribute.
- The previous **Column** element has a **Hidden** attribute set to **true**.

It MUST NOT be present otherwise.

Width: The width of the columns in points. This attribute MUST NOT be present if the **Hidden** attribute is present and set to **true**. If the **Hidden** attribute is set to **false**, it MUST be present if any one of the following conditions is **true**:

- The value of the **Width** attribute in the previous **Column** element is different from the width of the columns represented by this element.
- The **Hidden** attribute in the previous **Column** element is **true**.
- The value of the **collapsed** or **outlineLevel** attributes are **true** on the element or the preceding sibling **ColumnAxisItem** element (section 2.2.4.24.37).
- The **collapsed** or **outlineLevel** attributes are present on the element.
- This is the first **Column** child element of the **Table** element.
- This is the last **Column** child element of the **Table** element.

It MUST NOT be present otherwise.

2.2.4.24.38 Cell

A worksheet cell that is not empty or has **BorderStyle** (section 2.2.4.24.8.2) or **CellStyle** (section 2.2.4.24.8.1) formatting other than the respective defaults.

```
<s:complexType name="Cell">
  <s:sequence>
    <s:element name="Data" type="Data" minOccurs="0" maxOccurs="1" />
  </s:sequence>
```


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```
<s:attribute name="BorderID" type="borderStyleID" default="bD" use="optional" />
<s:attribute name="Index" type="excelColNumber1Based" use="optional" />
<s:attribute name="StyleID" type="cellStyleID" default="sD" use="optional" />
<s:attribute name="DatabarLength" use="optional" default="0">
  <s:simpleType>
    <s:restriction base="s:double">
      <s:minInclusive value="0.0" />
      <s:maxInclusive value="100.0" />
    </s:restriction>
  </s:simpleType>
</s:attribute>
<s:attribute name="DatabarColor" type="rgbTuple" use="optional" />
<s:attribute name="HasDropDown" type="s:boolean" use="optional" default="false" />
<s:attribute name="KpiSet" use="optional" default="-1">
  <s:simpleType>
    <s:restriction base="s:short">
      <s:enumeration value="-1" />
      <s:enumeration value="0" />
      <s:enumeration value="1" />
      <s:enumeration value="2" />
      <s:enumeration value="3" />
      <s:enumeration value="4" />
      <s:enumeration value="5" />
      <s:enumeration value="6" />
      <s:enumeration value="7" />
      <s:enumeration value="8" />
      <s:enumeration value="9" />
      <s:enumeration value="10" />
      <s:enumeration value="11" />
      <s:enumeration value="12" />
      <s:enumeration value="13" />
      <s:enumeration value="14" />
      <s:enumeration value="15" />
      <s:enumeration value="16" />
    </s:restriction>
  </s:simpleType>
</s:attribute>
<s:attribute name="KpiIcon" use="optional">
  <s:simpleType>
    <s:restriction base="s:short">
      <s:minInclusive value="0" />
      <s:maxInclusive value="4" />
    </s:restriction>
  </s:simpleType>
</s:attribute>
<s:attribute name="KpiSize" use="optional">
  <s:simpleType>
    <s:restriction base="s:short">
      <s:enumeration value="0" />
      <s:enumeration value="1" />
      <s:enumeration value="2" />
    </s:restriction>
  </s:simpleType>
</s:attribute>
<s:attribute name="MergeDown" use="optional">
  <s:simpleType>
    <s:restriction base="s:int">
      <s:minInclusive value="1" />
      <s:maxInclusive value="1048575" />
```


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```
      </s:restriction>
    </s:simpleType>
  </s:attribute>
  <s:attribute name="MergeAcross" use="optional">
    <s:simpleType>
      <s:restriction base="s:int">
        <s:minInclusive value="1" />
        <s:maxInclusive value="16383" />
      </s:restriction>
    </s:simpleType>
  </s:attribute>
  <s:attribute name="OriginalText" type="s:string" use="optional" />
  <s:attribute name="DropDownType" type="enmFilterItemType" use="optional" default="None" />
  <s:attribute name="IsPivotPageField" type="s:boolean" use="optional" />
  <s:attribute name="PageFieldID" type="s:string" use="optional" />
  <s:attribute name="Drillable" type="s:boolean" use="optional" />
  <s:attribute name="HasDrillIndicator" type="s:boolean" default="false" use="optional" />
  <s:attribute name="CompactAxis" type="s:boolean" default="false" use="optional" />
  <s:attribute name="ExtraIndentSpace" type="s:boolean" use="optional" />
  <s:attribute name="WideIndent" type="s:boolean" use="optional" />
  <s:attribute name="Expanded" type="s:boolean" use="optional" />
  <s:attribute name="Horizontal" type="enmHorizontalAlignment" default="Automatic"
use="optional" />
  <s:attribute name="iconOnly" type="s:boolean" use="optional" />
</s:complexType>
```

Data: Information pertaining to the worksheet cell value. This element MUST be present if the worksheet cell is not empty.

BorderID: The **border style** associated with the **Cell** (section 2.2.4.24.38).

Index: The index of the column (2) associated with the worksheet cell. This attribute MUST be omitted for the first **Cell** in the **Row**, otherwise this attribute MUST be present when one or more preceding adjacent **Cell** elements are omitted. **Cell** elements are omitted in the following situations:

- The worksheet cell is hidden.
- The worksheet cell is part of a **merged range** and is not the first worksheet cell in a given merged range.
- The worksheet cell is empty, the default **cellStyleID** (section 2.2.4.24.41) is applied, the default **borderStyleID** (section 2.2.4.24.40) is applied, and there are neither **filtering control** nor PivotTable drill indicators.

StyleID: The formatting style associated with the worksheet cell.

DatabarLength: The percentage of the worksheet cell width occupied by the **data bar**. This attribute MUST be present when a data bar is present and MUST otherwise be omitted.

DatabarColor: The color of the data bar in the worksheet cell. This attribute MUST be present when **DatabarLength** is present and MUST otherwise be omitted.

HasDropDown: Specifies whether a PivotTable filtering control is associated with the worksheet cell.

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KpiSet: Mapping to a particular set of **key performance indicators (KPIs)** to use for conditional formatting in the worksheet cell. If this attribute is present, it MUST have a value as described in the following table.

Value	Meaning	KpiIcon range
-1	No key performance indicators.	N/A
0	Equivalent to the [ECMA-376] **ST_IconSetType 3Arrows** enumeration value.	0 to 2
1	Equivalent to the [ECMA-376] **ST_IconSetType 3ArrowsGray** enumeration value.	0 to 2
2	Equivalent to the [ECMA-376] **ST_IconSetType 3Flags** enumeration value.	0 to 2
3	Equivalent to the [ECMA-376] **ST_IconSetType 3TrafficLights1** enumeration value.	0 to 2
4	Equivalent to the [ECMA-376] **ST_IconSetType 3TrafficLights2** enumeration value.	0 to 2
5	Equivalent to the [ECMA-376] **ST_IconSetType 3Signs** enumeration value.	0 to 2
6	Equivalent to the [ECMA-376] **ST_IconSetType 3Symbols** enumeration value.	0 to 2
7	Equivalent to the [ECMA-376] **ST_IconSetType 3Symbols2** enumeration value.	0 to 2
8	Equivalent to the [ECMA-376] **ST_IconSetType 4Arrows** enumeration value.	0 to 3
9	Equivalent to the [ECMA-376] **ST_IconSetType 4ArrowsGray** enumeration value.	0 to 3
10	Equivalent to the [ECMA-376] **ST_IconSetType 4RedToBlack** enumeration value.	0 to 3
11	Equivalent to the [ECMA-376] **ST_IconSetType 4Rating** enumeration value.	0 to 3
12	Equivalent to the [ECMA-376] **ST_IconSetType 4TrafficLights** enumeration value.	0 to 3
13	Equivalent to the [ECMA-376] **ST_IconSetType 5Arrows** enumeration value.	0 to 4
14	Equivalent to the [ECMA-376] **ST_IconSetType 5ArrowsGray** enumeration value.	0 to 4
15	Equivalent to the [ECMA-376] **ST_IconSetType 5Ratings** enumeration value.	0 to 4
16	Equivalent to the [ECMA-376] **ST_IconSetType 5Quarters** enumeration value.	0 to 4

KpiIcon: Mapping to an icon within the set of key performance indicator (KPI) icons specified by the **KpiSet** attribute. This attribute MUST be present when the **KpiSet** attribute is present and has a value other than -1 and MUST have a value within the range specified in the "KpiIcon range" column (2) in the previous table for the row (2) corresponding to the value of **KpiSet**. It MUST otherwise be omitted.

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KpiSize: The size of the KPI icon to use. This attribute MUST be present when the **KpiSet** attribute is present and has a value other than -1. It MUST otherwise be omitted. Possible values are described in the following table.

Value	Meaning
0	Large icons.
1	Medium icons.
2	Small icons.

MergeDown: The number of additional rows in the merged range excluding the current worksheet cell. This attribute MUST be present if any one of the following conditions is **true**:

- The **DisplayRightToLeft** element is not present and the worksheet cell is the upper-left visible worksheet cell in a merged range.
- The **DisplayRightToLeft** element is present and the worksheet cell is the upper-right visible worksheet cell in a merged range.

It MUST NOT be present otherwise.

MergeAcross: The number of additional columns in the merged range excluding the current worksheet cell. This attribute MUST be present if any one of the following conditions is **true**:

- The **DisplayRightToLeft** element is not present and the worksheet cell is the upper-left visible worksheet cell in a merged range.
- The **DisplayRightToLeft** element is present and the worksheet cell is the upper-right visible worksheet cell in a merged range.

It MUST NOT be present otherwise.

OriginalText: The cell contents of the worksheet cell. This attribute MUST be present when the worksheet cell has a tool tip, **rich text** formatting, or the worksheet cell value is clipped, and MUST otherwise be omitted.

DropDownType: The filter applied to the filtering control. This attribute MUST be present when the **HasDropDown** attribute is **true** and MUST otherwise be omitted.

IsPivotPageField: Specifies whether the worksheet cell is a PivotTable page field. This attribute MUST be omitted if the **HasDropDown** attribute is **false**.

PageFieldID: The identifier for the PivotTable page field filter associated with the worksheet cell. This attribute MUST be omitted if the **IsPivotPageField** attribute is **false**.

Drillable: Specifies whether the worksheet cell is a **row field** or a **column field** in an **OLAP** PivotTable. This attribute MUST be present and set to **true** for all worksheet cells that are row fields or column fields in an OLAP PivotTable. It MUST NOT be present otherwise.

HasDrillIndicator: Specifies whether there is a PivotTable drill indicator present in the worksheet cell. This attribute MUST be present and set to **true** for all worksheet cells that are row fields or column fields in a PivotTable and have a drill indicator.

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CompactAxis: Specifies whether the row field has a **compact axis**. This attribute MUST be present and set to **true** if the **HasDrillIndicator** attribute is **true** and the row field represented by the worksheet cell has a compact axis.

ExtraIndentSpace: Specifies whether the cell contents require additional indentation. This attribute MUST be present and set to **true** if any one of the following conditions is **true**:

- The **HasDrillIndicator** attribute is **true** and the **CompactAxis** attribute is not **true**.
- The worksheet cell represents a row field in a PivotTable, and the row field has a compact axis and the row field has child items.

It MUST NOT be present otherwise.

WideIndent: Specifies whether indentation for the cell contents is incremented during rendering. This attribute MUST be present and set to **true** if the worksheet cell represents a row field in a PivotTable and if the row field has a compact axis and the indentation for row captions is set to 1 character in the worksheet. It MUST NOT be present otherwise.

Expanded: Specifies whether the drill indicator is in an expanded or collapsed state when the worksheet cell has a PivotTable drill indicator. This attribute MUST be present and set to **true** if the **HasDrillIndicator** attribute is **true** and the PivotTable drill indicator in the worksheet cell is in an expanded state. It MUST NOT be present otherwise.

Horizontal: The type of horizontal alignment applied to the key performance indicator icon in a worksheet cell with conditional formatting. This attribute MUST NOT be present if the **iconOnly** attribute is not **true**. If the **iconOnly** attribute is **true**, this attribute MUST be present if horizontal alignment is applied. It MUST NOT be present otherwise.

iconOnly: Specifies whether only the key performance indicator icon is shown in the worksheet cell, without the data in the worksheet cell. This attribute MUST be present and set to **true** if a key performance indicator icon is present in the worksheet cell, without the data in the worksheet cell. It MUST NOT be present otherwise.

2.2.4.24.39 Data

The data in the worksheet cell.

```
<s:complexType name="Data">
  <s:simpleContent>
    <s:extension base="s:string">
      <s:attribute name="RTF" type="s:boolean" default="false" use="optional" />
    </s:extension>
  </s:simpleContent>
</s:complexType>
```

RTF: Specifies whether the data in the worksheet cell represented by the parent **Cell** element (section 2.2.4.24.38) has rich text formatting.

2.2.4.24.40 borderStyleID

A unique identifier for a border **Style** element (section 2.2.4.24.8) within the **Styles** collection (section 2.2.4.24.7).

The default worksheet cell border style is "bD".

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```
<s:simpleType name="borderStyleID" final="restriction">
  <s:restriction base="s:string">
    <s:pattern value="bD|\-[1-9][0-9]*" />
  </s:restriction>
</s:simpleType>
```

2.2.4.24.41 cellStyleID

A unique identifier for a cell **Style** element (section 2.2.4.24.8) within the **Styles** collection (section 2.2.4.24.7).

The default worksheet cell and worksheet header style is "sD".

```
<s:simpleType name="cellStyleID" final="restriction">
  <s:restriction base="s:string">
    <s:pattern value="sD|0|[1-9][0-9]*" />
  </s:restriction>
</s:simpleType>
```

2.2.4.24.42 rgbTuple

An [HTML] color in unabbreviated form.

```
<s:simpleType name="rgbTuple" final="restriction">
  <s:restriction base="s:string">
    <s:pattern value="#[0-9|A-F|a-f]{6}" />
    <s:length value="7" />
  </s:restriction>
</s:simpleType>
```

2.2.4.24.43 enmBorderPosition

Specifies the position to which border information is applied.

```
<s:simpleType name="enmBorderPosition">
  <s:restriction base="s:string">
    <s:enumeration value="None" />
    <s:enumeration value="Left" />
    <s:enumeration value="Right" />
    <s:enumeration value="Top" />
    <s:enumeration value="Bottom" />
  </s:restriction>
</s:simpleType>
```

The following table shows the enumeration values for this type.

Value	Meaning
None	Border position undefined. MUST NOT be used.
Left	Border information for left edge. In sheets with a right-to-left reading order this position corresponds to the right-most side of the element on the screen.

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Value	Meaning
Right	Border information for right edge. In sheets with a right-to-left reading order this position corresponds to the left-most side of the element on the screen.
Top	Border information for top edge.
Bottom	Border information for bottom edge.

2.2.4.24.44 enmBorderLineStyle

The visual appearance of a border line.

```
<s:simpleType name="enmBorderLineStyle">
  <s:restriction base="s:string">
    <s:enumeration value="None" />
    <s:enumeration value="Continuous" />
    <s:enumeration value="Dash" />
    <s:enumeration value="Dot" />
    <s:enumeration value="DashDot" />
    <s:enumeration value="DashDotDot" />
    <s:enumeration value="SlantDashDot" />
    <s:enumeration value="Double" />
  </s:restriction>
</s:simpleType>
```

The following table shows the enumeration values for this type.

Value	Meaning
None	No border.
Continuous	Equivalent to the [ECMA-376] **ST_BorderStyle** medium enumeration value.
Dash	Equivalent to the [ECMA-376] **ST_BorderStyle** dash enumeration value.
Dot	Equivalent to the [ECMA-376] **ST_BorderStyle** dot enumeration value.
DashDot	Equivalent to the [ECMA-376] **ST_BorderStyle** dashDot enumeration value.
DashDotDot	Equivalent to the [ECMA-376] **ST_BorderStyle** dashDotDot enumeration value.
SlantDashDot	Equivalent to the [ECMA-376] **ST_BorderStyle** slantDashDot enumeration value.
Double	Equivalent to the [ECMA-376] **ST_BorderStyle** double enumeration value.

2.2.4.24.45 enmHorizontalAlignment

The horizontal alignment and internal spacing of the worksheet cell value or conditional formatting.

```
<s:simpleType name="enmHorizontalAlignment">
  <s:restriction base="s:string">
    <s:enumeration value="Automatic" />
    <s:enumeration value="Center" />
    <s:enumeration value="Left" />
    <s:enumeration value="Right" />
```


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```
    <s:enumeration value="Fill" />
    <s:enumeration value="Justify" />
    <s:enumeration value="CenterAcrossSelection" />
    <s:enumeration value="Distributed" />
    <s:enumeration value="JustifyDistributed" />
  </s:restriction>
</s:simpleType>
```

The following table shows the enumeration values for this type.

Value	Meaning
Automatic	Equivalent to the [ECMA-376] **ST_HorizontalAlignment** general enumeration value.
Center	Equivalent to the [ECMA-376] **ST_HorizontalAlignment** center enumeration value.
Left	Equivalent to the [ECMA-376] **ST_HorizontalAlignment** left enumeration value.
Right	Equivalent to the [ECMA-376] **ST_HorizontalAlignment** right enumeration value.
Fill	Equivalent to the [ECMA-376] **ST_HorizontalAlignment** fill enumeration value.
Justify	Equivalent to the [ECMA-376] **ST_HorizontalAlignment** justify enumeration value.
CenterAcrossSelection	Equivalent to the [ECMA-376] **ST_HorizontalAlignment centerContinuous** enumeration value.
Distributed	Equivalent to the [ECMA-376] **ST_HorizontalAlignment** distributed enumeration value.
JustifyDistributed	Combination of **Justify** and **Distributed** enumeration values.

2.2.4.24.46 enmVerticalAlignment

The vertical alignment and internal spacing of the worksheet cell value or conditional formatting.

```
<s:simpleType name="enmVerticalAlignment">
  <s:restriction base="s:string">
    <s:enumeration value="Automatic" />
    <s:enumeration value="Top" />
    <s:enumeration value="Bottom" />
    <s:enumeration value="Center"/>
    <s:enumeration value="Justify" />
    <s:enumeration value="Distributed" />
    <s:enumeration value="JustifyDistributed" />
  </s:restriction>
</s:simpleType>
```

The following table shows the enumeration values for this type.

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Value	Meaning
Automatic	Equivalent to the [ECMA-376] **ST_VerticalAlignment** bottom enumeration value.
Top	Equivalent to the [ECMA-376] **ST_VerticalAlignment** top enumeration value.
Bottom	Equivalent to the [ECMA-376] **ST_VerticalAlignment** bottom enumeration value.
Center	Equivalent to the [ECMA-376] **ST_VerticalAlignment** center enumeration value.
Justify	Equivalent to the [ECMA-376] **ST_VerticalAlignment** justify enumeration value.
Distributed	Equivalent to the [ECMA-376] **ST_VerticalAlignment** distributed enumeration value.
JustifyDistributed	Combination of **Justify** and **Distributed** enumeration values.

2.2.4.24.47 enmAutoFilterCriteriaOperationType

This enumeration defines a set of comparison operators. The operator is applied between cell contents and the value attribute in **Criteria** (section 2.2.4.24.21).

```
<s:simpleType name="enmAutoFilterCriteriaOperationType">
  <s:restriction base="s:string">
    <s:enumeration value="EQ" />
    <s:enumeration value="NEQ" />
    <s:enumeration value="GT" />
    <s:enumeration value="GTEQ"/>
    <s:enumeration value="LT" />
    <s:enumeration value="LTEQ" />
  </s:restriction>
</s:simpleType>
```

The following table shows the enumeration values for this type.

Value	Meaning
EQ	Equals comparison operator.
NEQ	Not equals comparison operator.
GT	Greater than comparison operator.
GTEQ	Greater than or equal to comparison operator.
LT	Less than comparison operator.
LTEQ	Less than or equal to comparison operator.

2.2.4.24.48 enmAutoFilterCriteriaRelationOperator

This enumeration defines a set of logical operators. It is applied to the **Relation** attribute of the **Criteria** (section 2.2.4.24.21) to define the relationship between two **Criteria** elements.

```
<s:simpleType name="enmAutoFilterCriteriaRelationOperator">
  <s:restriction base="s:string">
    <s:enumeration value="Nil " />
```


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```
    <s:enumeration value="And" />
    <s:enumeration value="Or" />
  </s:restriction>
</s:simpleType>
```

The following table shows the enumeration values for this type.

Value	Meaning
Nil	Indicates that only one **Criteria** element is applied and no logical operator is required.
And	AND logical operator: The condition in both the **Criteria** elements needs to be met.
Or	OR logical operator: The condition in either one or both the **Criteria** elements needs to be met.

2.2.4.24.49 enmAutoFilterItemType

This enumeration defines a set of data types. It is applied to the **DataType** attribute of an **Item** (section 2.2.4.24.20) to indicate the nature of the underlying worksheet cell values of that **Item**.

```
<s:simpleType name="enmAutoFilterItemType">
  <s:restriction base="s:string">
    <s:enumeration value="Number" />
    <s:enumeration value="Text" />
    <s:enumeration value="Date" />
  </s:restriction>
</s:simpleType>
```

The following table shows the enumeration values for this type.

Value	Meaning
Number	Underlying worksheet cell values are numbers, as determined by the protocol server.
Text	Underlying worksheet cell values are strings, as determined by the protocol server.
Date	Underlying worksheet cell values represent dates, as determined by the protocol server.

2.2.4.24.50 enmAutoFilterItemCriteriaType

This enumeration defines a set of filters. Each set of filters can be applied to either dates or numbers. It is applied to the **CriteriaType** attribute in an **Item** (section 2.2.4.24.20).

```
<s:simpleType name="enmAutoFilterItemCriteriaType">
  <s:restriction base="s:string">
    <s:enumeration value="Nil" />
    <s:enumeration value="AboveAverage" />
    <s:enumeration value="BelowAverage" />
    <s:enumeration value="Tomorrow" />
    <s:enumeration value="Today" />
    <s:enumeration value="Yesterday" />
    <s:enumeration value="NextWeek" />
    <s:enumeration value="ThisWeek" />
    <s:enumeration value="LastWeek" />
```


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```
      <s:enumeration value="NextMonth" />
      <s:enumeration value="ThisMonth" />
      <s:enumeration value="LastMonth" />
      <s:enumeration value="NextQuarter" />
      <s:enumeration value="ThisQuarter" />
      <s:enumeration value="LastQuarter" />
      <s:enumeration value="NextYear" />
      <s:enumeration value="ThisYear" />
      <s:enumeration value="LastYear" />
      <s:enumeration value="YearToDate" />
      <s:enumeration value="Q1" />
      <s:enumeration value="Q2" />
      <s:enumeration value="Q3" />
      <s:enumeration value="Q4" />
      <s:enumeration value="M1" />
      <s:enumeration value="M2" />
      <s:enumeration value="M3" />
      <s:enumeration value="M4" />
      <s:enumeration value="M5" />
      <s:enumeration value="M6" />
      <s:enumeration value="M7" />
      <s:enumeration value="M8" />
      <s:enumeration value="M9" />
      <s:enumeration value="M10" />
      <s:enumeration value="M11" />
      <s:enumeration value="M12" />
    </s:restriction>
  </s:simpleType>
```

The following table shows the enumeration values for this type.

Value	Meaning
Nil	Default value for no filter applied.
AboveAverage	Number filter in which all worksheet cell values except those above the average of the worksheet cell values being filtered are filtered out.
BelowAverage	Number filter in which all worksheet cell values except those below the average of the worksheet cell values being filtered are filtered out.
Tomorrow	Date filter in which all worksheet cell values except those with the date for the following day are filtered out.
Today	Date filter in which all worksheet cell values except those with the date for today are filtered out.
Yesterday	Date filter in which all worksheet cell values except those with the date for the previous day are filtered out.
NextWeek	Date filter in which all worksheet cell values except those in the following week are filtered out.
ThisWeek	Date filter in which all worksheet cell values except those in the current week are filtered out.
LastWeek	Date filter in which all worksheet cell values except those in the previous week are filtered out.

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Value	Meaning
NextMonth	Date filter in which all worksheet cell values except those in the following month are filtered out.
ThisMonth	Date filter in which all worksheet cell values except those in the current month are filtered out.
LastMonth	Date filter in which all worksheet cell values except those in the previous month are filtered out.
NextQuarter	Date filter in which all worksheet cell values except those in the following quarter are filtered out.
ThisQuarter	Date filter in which all worksheet cell values except those in the current quarter are filtered out.
LastQuarter	Date filter in which all worksheet cell values except those in the previous quarter are filtered out.
NextYear	Date filter in which all worksheet cell values except those in the following year are filtered out.
ThisYear	Date filter in which all worksheet cell values except those in the current year are filtered out.
LastYear	Date filter in which all worksheet cell values except those in the previous year are filtered out.
YearToDate	Date filter in which all worksheet cell values except those in the current year up to and inclusive of the current date are filtered out.
Q1	Date filter in which all worksheet cell values except those in the first quarter of the current year are filtered out.
Q2	Date filter in which all worksheet cell values except those in the second quarter of the current year are filtered out.
Q3	Date filter in which all worksheet cell values except those in the third quarter of the current year are filtered out.
Q4	Date filter in which all worksheet cell values except those in the fourth quarter of the current year are filtered out.
M1	Date filter in which all worksheet cell values except those in the month of January are filtered out.
M2	Date filter in which all worksheet cell values except those in the month of February are filtered out.
M3	Date filter in which all worksheet cell values except those in the month of March are filtered out.
M4	Date filter in which all worksheet cell values except those in the month of April are filtered out.
M5	Date filter in which all worksheet cell values except those in the month of May are filtered out.
M6	Date filter in which all worksheet cell values except those in the month of June are filtered out.

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Value	Meaning
M7	Date filter in which all worksheet cell values except those in the month of July are filtered out.
M8	Date filter in which all worksheet cell values except those in the month of August are filtered out.
M9	Date filter in which all worksheet cell values except those in the month of September are filtered out.
M10	Date filter in which all worksheet cell values except those in the month of October are filtered out.
M11	Date filter in which all worksheet cell values except those in the month of November are filtered out.
M12	Date filter in which all worksheet cell values except those in the month of December are filtered out.

2.2.4.24.51 excelRowNumber

The range of values for zero-based row (2) number.

```
<s:simpleType name="excelRowNumber">
  <s:restriction base="s:int">
    <s:minInclusive value="0" />
    <s:maxInclusive value="1048575" />
  </s:restriction>
</s:simpleType>
```

2.2.4.24.52 excelColNumber

The range of values for zero-based column (2) number.

```
<s:simpleType name="excelColNumber">
  <s:restriction base="s:int">
    <s:minInclusive value="0" />
    <s:maxInclusive value="16383" />
  </s:restriction>
</s:simpleType>
```

2.2.4.24.53 excelRowNumber1Based

The range of values for 1-based row (2) number.

```
<s:simpleType name="excelRowNumber1Based">
  <s:restriction base="s:int">
    <s:minInclusive value="1" />
    <s:maxInclusive value="1048576" />
  </s:restriction>
</s:simpleType>
```


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2.2.4.24.54 excelColNumber1Based

The range of values for 1-based column (2) number.

```
<s:simpleType name="excelColNumber1Based">
  <s:restriction base="s:int">
    <s:minInclusive value="1" />
    <s:maxInclusive value="16384" />
  </s:restriction>
</s:simpleType>
```

2.2.4.24.55 excelOutlineLevels

The range of values for defining the outline level (2) of outlining in a set of grouped rows or columns.

```
<s:simpleType name="excelOutlineLevels">
  <s:restriction base="s:short">
    <s:minInclusive value="1" />
    <s:maxInclusive value="8" />
  </s:restriction>
</s:simpleType>
```

2.2.4.24.56 enmFilterItemType

This enumeration defines whether filtering or sorting is applied and the order of sorting in case sorting is applied. It is used on the **DropDownType** attribute in a **Cell** (section 2.2.4.24.38) and the **Type** attribute in an **Item** (section 2.2.4.24.20).

```
<s:simpleType name="enmFilterItemType">
  <s:restriction base="s:string">
    <s:enumeration value="None" />
    <s:enumeration value="Filtered" />
    <s:enumeration value="SortedAsc" />
    <s:enumeration value="SortedDesc" />
    <s:enumeration value="BothAsc" />
    <s:enumeration value="BothDesc" />
    <s:enumeration value="Both" />
    <s:enumeration value="Sorted" />
  </s:restriction>
</s:simpleType>
```

The following table shows the enumeration values for this type.

Value	Meaning
None	No filter or sort is applied.
Filtered	A filter is applied to the worksheet cells.
SortedAsc	Worksheet cells are sorted in **ascending order**.
SortedDesc	Worksheet cells are sorted in **descending order**.

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Value	Meaning
BothAsc	A filter is applied to the worksheet cells and they are sorted in ascending order.
BothDesc	A filter is applied to the worksheet cells and they are sorted in descending order.
Both	A filter is applied to the worksheet cells and they are sorted but the **sort order (2)** is not known.
Sorted	Worksheet cells are sorted but the sort order (2) is not known.

2.2.4.24.57 enmImageType

Enumerates the different types of worksheet images.

```
<s:simpleType name="enmImageType">
  <s:restriction base="s:string">
    <s:enumeration value="none" />
    <s:enumeration value="chart" />
    <s:enumeration value="image" />
  </s:restriction>
</s:simpleType>
```

Possible values are described in the following table.

Value	Meaning
none	MUST NOT be used.
chart	A chart image.
image	MUST NOT be used.

2.2.4.24.58 enmReadOrder

Horizontal text reading order.

```
<s:simpleType name="enmReadOrder">
  <s:restriction base="s:string">
    <s:enumeration value="Context" />
    <s:enumeration value="LeftToRight" />
    <s:enumeration value="RightToLeft" />
  </s:restriction>
</s:simpleType>
```

The following table shows the enumeration values for this type.

Value	Meaning
Context	Same reading order as the sheet (2).
LeftToRight	Left-to-right reading order.
RightToLeft	Right-to-left reading order.

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2.2.4.24.59 enmGradientType

Background gradient fill effect.

```
<s:simpleType name="enmGradientType">
  <s:restriction base="s:string">
    <s:enumeration value="Linear" />
    <s:enumeration value="Path" />
  </s:restriction>
</s:simpleType>
```

The following table shows the enumeration values for this type.

Value	Meaning
Linear	Equivalent to the **linear** enumeration value of the **ST_GradientType** simple type specified in [ECMA-376].
Path	Equivalent to the **path** enumeration value of the **ST_GradientType** simple type specified in [ECMA-376].

2.2.4.24.60 enmFontVerticalAlignment

Vertical text position relative to the baseline.

```
<s:simpleType name="enmFontVerticalAlignment">
  <s:restriction base="s:string">
    <s:enumeration value="None" />
    <s:enumeration value="Subscript" />
    <s:enumeration value="Superscript" />
  </s:restriction>
</s:simpleType>
```

The following table shows the enumeration values for this type.

Value	Meaning
None	Equivalent to the [ECMA-376] **ST_VerticalAlignRun** baseline enumeration value.
Subscript	Equivalent to the [ECMA-376] **ST_VerticalAlignRun** subscript enumeration value.
Superscript	Equivalent to the [ECMA-376] **ST_VerticalAlignRun** superscript enumeration value.

2.2.4.24.61 enmPivotRangeOperation

Enumerates the types of operations that are allowed on a PivotTable.

```
<s:simpleType name="enmPivotRangeOperation">
  <s:restriction base="s:string">
    <s:enumeration value="Refresh" />
  </s:restriction>
</s:simpleType>
```


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The following table shows the enumeration values for this type.

Value	Meaning
Refresh	Indicates that the source of the PivotTable data can be refreshed to retrieve updated data.

2.2.4.24.62 enmFontUnderline

Underline style for worksheet cell text.

```
<s:simpleType name="enmFontUnderline">
  <s:restriction base="s:string">
    <s:enumeration value="None" />
    <s:enumeration value="Single" />
    <s:enumeration value="Double" />
    <s:enumeration value="SingleAccounting" />
    <s:enumeration value="DoubleAccounting" />
  </s:restriction>
</s:simpleType>
```

The following table shows the enumeration values for this type.

Value	Meaning
None	Equivalent to the [ECMA-376] **ST_UnderlineValues** none enumeration value.
Single	Equivalent to the [ECMA-376] **ST_UnderlineValues** single enumeration value.
Double	Equivalent to the [ECMA-376] **ST_UnderlineValues** double enumeration value.
SingleAccounting	Equivalent to the [ECMA-376] **ST_UnderlineValues singleAccounting** enumeration value.
DoubleAccounting	Equivalent to the [ECMA-376] **ST_UnderlineValues doubleAccounting** enumeration value.

2.2.4.24.63 enmPattern

A **patterned overlay mask**.

```
<s:simpleType name="enmPattern">
  <s:restriction base="s:string">
    <s:enumeration value="None" />
    <s:enumeration value="Solid" />
    <s:enumeration value="Gray50" />
    <s:enumeration value="Gray75" />
    <s:enumeration value="Gray25" />
    <s:enumeration value="HorzStripe" />
    <s:enumeration value="VertStripe" />
    <s:enumeration value="ReverseDiagStripe" />
    <s:enumeration value="DiagStripe" />
    <s:enumeration value="DiagCross" />
    <s:enumeration value="ThickDiagCross" />
    <s:enumeration value="ThinHorzStripe" />
    <s:enumeration value="ThinVertStripe" />
    <s:enumeration value="ThinReverseDiagStripe" />
```


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```
      <s:enumeration value="ThinDiagStripe" />
      <s:enumeration value="ThinHorzCross" />
      <s:enumeration value="ThinDiagCross" />
      <s:enumeration value="Gray125" />
      <s:enumeration value="Gray0625" />
    </s:restriction>
  </s:simpleType>
```

Possible values are described in the following table.

Value	Meaning
None	Equivalent to the [ECMA-376] **ST_PatternType** none enumeration value. MUST NOT be used.
Solid	Equivalent to the [ECMA-376] **ST_PatternType** solid enumeration value.
Gray50	Equivalent to the [ECMA-376] **ST_PatternType mediumGray** enumeration value.
Gray75	Equivalent to the [ECMA-376] **ST_PatternType darkGray** enumeration value.
Gray25	Equivalent to the [ECMA-376] **ST_PatternType lightGray** enumeration value.
HorzStripe	Equivalent to the [ECMA-376] **ST_PatternType darkHorizontal** enumeration value.
VertStripe	Equivalent to the [ECMA-376] **ST_PatternType darkVertical** enumeration value.
ReverseDiagStripe	Equivalent to the [ECMA-376] **ST_PatternType darkDown** enumeration value.
DiagStripe	Equivalent to the [ECMA-376] **ST_PatternType darkUp** enumeration value.
DiagCross	Equivalent to the [ECMA-376] **ST_PatternType darkGrid** enumeration value.
ThickDiagCross	Equivalent to the [ECMA-376] **ST_PatternType darkTrellis** enumeration value.
ThinHorzStripe	Equivalent to the [ECMA-376] **ST_PatternType lightHorizontal** enumeration value.
ThinVertStripe	Equivalent to the [ECMA-376] **ST_PatternType lightVertical** enumeration value.
ThinReverseDiagStripe	Equivalent to the [ECMA-376] **ST_PatternType lightDown** enumeration value.
ThinDiagStripe	Equivalent to the [ECMA-376] **ST_PatternType lightUp** enumeration value.
ThinHorzCross	Equivalent to the [ECMA-376] **ST_PatternType lightGrid** enumeration value.
ThinDiagCross	Equivalent to the [ECMA-376] **ST_PatternType lightTrellis** enumeration value.
Gray125	Equivalent to the [ECMA-376] **ST_PatternType gray125** enumeration value.
Gray0625	Equivalent to the [ECMA-376] **ST_PatternType gray0625** enumeration value.

2.2.4.24.64 percentage

A percentage specified in decimal form.

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```
<s:simpleType name="percentage">
  <s:restriction base="s:double">
    <s:minInclusive value="0.0" />
    <s:maxInclusive value="1.0" />
  </s:restriction>
</s:simpleType>
```

2.2.4.24.65 nonNegativeDouble

Decimal value that MUST be greater than or equal to zero.

```
<s:simpleType name="nonNegativeDouble">
  <s:restriction base="s:double">
    <s:minInclusive value="0" />
  </s:restriction>
</s:simpleType>
```

2.2.4.24.66 nonEmptyString

A non-empty string.

```
<s:simpleType name="nonEmptyString">
  <s:restriction base="s:string">
    <s:minLength value="1" />
  </s:restriction>
</s:simpleType>
```

2.2.4.24.67 rowHeight

The range of sizes in points for row (2) height.

```
<s:simpleType name="rowHeight">
  <s:restriction base="s:double">
    <s:minInclusive value="0.2" />
    <s:maxInclusive value="409.6" />
  </s:restriction>
</s:simpleType>
```

2.2.4.24.68 columnWidth

The range of sizes in points for column (2) width.

```
<s:simpleType name="columnWidth">
  <s:restriction base="s:double">
    <s:minInclusive value="0.75" />
    <s:maxInclusive value="1343" />
  </s:restriction>
</s:simpleType>
```


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2.2.4.25 VisibleSheetRange

The **VisibleSheetRange** complex type is used to specify the **SpreadsheetDataXML** range (section 2.2.4.24) to be returned in the response message.

The **baseline range**, in the context of this type and the operation that uses it, is the raw range initially found on the workbook before it is modified to only include visible worksheet cells.

If the **ObjectName** element is present and not empty, the following apply:

- If the **ExcelRange** element is present and not empty:
  - The sheet (2) of the baseline range is determined in the following manner:
    - If a sheet (2) was specified by **ExcelRange**, that is the sheet (2) which will be used.
    - Otherwise, the protocol server will locate a **published item** by matching **ObjectName** to the name of the published item name.
      - If a match is found, the sheet (2) which contains the matching published item MUST be used.
      - Otherwise, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be **EcsInvalidNamedObject**.
  - The protocol server will locate a **published range** which exactly matches **ExcelRange** on the **baseline range**'s sheet (2).
    - If a match is found, the published range is the baseline range.
    - Otherwise, the protocol server MUST be a published item on the **baseline range**'s sheet (2), which contains **ExcelRange** completely.
      - If a match was found, the published item is the baseline range.
      - Otherwise, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be **EcsInvalidNamedObject.**
- If **ExcelRange** is not present or is empty, the protocol server will locate **ObjectName** in all the published items that belong to the workbook by matching **ObjectName** to the published item's name, and the following apply.
  - If a match was found, the baseline range MUST be the published item's range.
  - Otherwise, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be **EcsInvalidNamedObject**.
- The protocol server MUST NOT use any range outside of the baseline range to retrieve data from.

If **ObjectName** is not present or is empty and the workbook contains published items, the following apply:

- If **ExcelRange** is present and not empty, the following apply:
  - The sheet (2) of the baseline range MUST be determined in the following manner:

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- If a sheet (2) was specified by **ExcelRange**, that is the sheet (2) which MUST be used.
- Otherwise, the sheet (2) which contains the first published item MUST be used.

- The protocol server will locate a published range which exactly matches **ExcelRange** on the baseline range's sheet (2) in the following manner:
  - If a match is found, the published range is the baseline range.
  - Otherwise, the protocol server will locate a published item on the baseline range's sheet (2), which contains **ExcelRange** completely.
    - If a match was found, the published item is the baseline range.
    - Otherwise, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be **EcsInvalidNamedObject.**

- If **ExcelRange** is not present or is empty, the baseline range MUST be the range of the first published item.
- The protocol server MUST NOT use any range outside of the baseline range to retrieve data from.

If **ObjectName** is not present or is empty and the workbook does not contain any published items:

- If **SheetName** is not present or empty, the baseline range MUST be the **default sheet**. Otherwise, **SheetName** MUST be the sheet (2) of the baseline range.
- If **FirstRow** is -1, the **default row** MUST be the first row (2) of the baseline range. Otherwise, **FirstRow** MUST be the first row (2) of the baseline range.
- If **FirstColumn** is -1, the **default column** MUST be the first column (2) of the baseline range. Otherwise, **First**Column MUST be the first column (2) of the baseline range**.**
- First row (2) of the baseline range plus **VisibleRowsRequested** MUST be the last row (2) of the baseline range.
- First column (2) of the baseline range plus **VisibleColumnsRequested** MUST be the last column (2) of the baseline range.
- **FirstColumn** MUST be -1 if **FirstRow** is -1.
- **FirstRow** MUST be -1 if **FirstColumn** is -1.

The product of **VisibleRowsRequested** and **VisibleColumnsRequested** MUST be less than or equal to 1000000.

The first row (2) of the retrieved range MUST be the following:

- The first visible row (2) at or after first row (2) of **baseline range+VisibleFirstRowOffset**, if **VisibleFirstRowOffset** is greater than or equal to 0.The first visible row (2) at or before first row (2) of the baseline range plus **VisibleFirstRowOffset**, if **VisibleFirstRowOffset** is less than 0.If there are less than **VisibleRowsRequested** visible rows between that first visible row (2) and the last visible row (2) of the **baseline range**, the first row (2) will be the first visible row (2) such that there are **VisibleRowsRequested** rows between it and the last visible row (2) of **baseline range**.
- Greater than or equal to 0, and less than or equal to 1,048,575.

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The amount of visible rows in the retrieved range MUST be equal to **VisibleRowsRequested**, unless there are not enough visible rows in the baseline range to retrieve, in which case all the remaining visible rows in the baseline range MUST be retrieved.

The first column (2) of the retrieved range MUST be:

- The first visible column (2) at or after first column (2) of the baseline range plus **VisibleFirstColumnOffset**, if **VisibleFirstColumnOffset** is greater than or equal to 0.
- The first visible column (2) at or before first column (2) of the baseline range plus **VisibleFirstColumnOffset**, if **VisibleFirstColumnOffset** is less than 0.
- If there are less than **VisibleColumnsRequested** visible columns between that first visible column (2) and the last visible column (2) of the baseline range, the first column (2) will be the first visible column (2) such that there are **VisibleColumnsRequested** columns between it and the last visible column (2) of **baseline range**.
- Greater than or equal to 0 and less than or equal to 16,383.

The amount of visible columns in the retrieved range MUST be equal to **VisibleColumnsRequested** unless there are not enough visible columns in the baseline range to retrieve, in which case all the remaining visible columns in the baseline range MUST be retrieved.

If the retrieved range is completely covered by a published chart, and either a) **ObjectName** is present and not empty, or b) **ObjectName** is not present or is empty, and the workbook contains published items, then the returned **SpreadsheetDataXML** will contain the **Images** element (section 2.2.4.24.33) with a single **Image** element (section 2.2.4.24.34). The **type** attribute of the **Image** element (section 2.2.4.24.34) MUST be "chart", as specified section 2.2.4.24.57.

```
<s:complexType name="VisibleSheetRange">
  <s:sequence>
    <s:element name="SheetName" type="s:string" minOccurs="0"/>
    <s:element name="ObjectName" type="s:string" minOccurs="0"/>
    <s:element name="ExcelRange" type="s:string" minOccurs="0"/>
    <s:element name="FirstRow" type="s:int"/>
    <s:element name="VisibleRowsRequested" type="s:int"/>
    <s:element name="FirstColumn" type="s:int"/>
    <s:element name="VisibleColumnsRequested" type="s:int"/>
    <s:element name="VisibleFirstRowOffset" type="s:int"/>
    <s:element name="VisibleFirstColumnOffset" type="s:int"/>
  </s:sequence>
</s:complexType>
```

SheetName: The name of the sheet (2) to retrieve the range from. MUST NOT be longer than 31 characters.

ObjectName: The name of the published item to retrieve the range from. If the value is longer than 287 characters, then the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be **EcsInvalidNamedObject**.

ExcelRange: A **RangeReference** to the range to retrieve. MUST follow the **RangeReference** specification in section 2.2.5.10, with the following exceptions:

- The protocol server MUST support the **R1C1 notation**.

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- If the value is longer than 287 characters, then the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2, with the value of the **id** element of the **ExcelServerMessage** set to **EcsInvalidNamedObject**.

FirstRow: The zero-based index of the first row (2). MUST be greater than or equal to -1 and less than or equal to 1,048,575.

VisibleRowsRequested: The amount of visible rows to retrieve in the range. MUST be greater than 0 and less than or equal to 1,048,575.

FirstColumn: The zero-based index of the first column (2). MUST be greater than or equal to -1 and less than or equal to 16,383.

VisibleColumnsRequested: The amount of visible columns to retrieve in the range. MUST be greater than 0 and less than or equal to 16,383.

VisibleFirstRowOffset: The visible row (2) offset from **FirstRow** of the range to retrieve. MUST be greater than or equal to -1048575 and less than or equal to 1,048,575.

VisibleFirstColumnOffset: The visible column (2) offset from **FirstColumn** of the range to retrieve. MUST be greater than or equal to -16383 and less than or equal to 16,383.

2.2.4.26 WorkOnBehalf

The **WorkOnBehalf** type is used by the protocol client to send information about the user to the protocol server.

```
<s:complexType name="WorkOnBehalf">
  <s:sequence>
    <s:element name="UserName" type="s:string" minOccurs="0"/>
    <s:element name="UserSid" type="s:string" minOccurs="0"/>
    <s:element name="UserToken" type="s:base64Binary" minOccurs="0"/>
  </s:sequence>
</s:complexType>
```

UserName: The user's **login name**. MUST be present. MUST NOT be empty. MUST uniquely identify a user. For all operations on a session (2) the value MUST be identical to the value passed in the **OpenWorkbook** operation (section 3.1.4.20).

UserSid: The security descriptor definition language (SDDL) string representation of **security identifier (SID)** for the user as specified in [MS-DTYP] section 2.5.1. MUST be present. For all operations on a session (2) the value MUST be identical to the value passed in the **OpenWorkbook** operation.

UserToken: The **token** for the user as specified in [MS-WSSFO] section 2.2.4.2. If the user is not an **anonymous user** and used in the **OpenWorkbook** operation then MUST be present, otherwise MUST NOT be present.

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.

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Simple type	Description
AutoFilterCriteriaType	Specifies what data to be filtered by the protocol server when using the **AutoFilterOptions** complex type.
CellError	The **CellError** type is an enumeration of a set of cell error values that a worksheet cell can contain.
DateNodeType	Specifies how AutoFilter dates data is filtered by the protocol server when using the **AutoFilterDateNodeInfo**.
ExcelServerMessageButtons	The **ExcelServerMessageButtons** type is a list (2) of enumeration values of the control buttons associated with the alert (2) that the protocol server returns to the protocol client.
ExcelServerMessageId	The **ExcelServerMessageId** type is an enumeration of alerts that are passed between the protocol client and the **protocol** server.
ExcelServerMessageSeverity	The **ExcelServerMessageSeverity** type is an enumeration of the severity of the alert (2) that the protocol server returns to the protocol client**.**
ExcelServerMessageType	The **ExcelServerMessageType** type is an enumeration of the type of the alert (2) that the protocol server returns to the protocol client.
OperationType	Used to instruct the protocol server which comparison method to use when filtering worksheets or tables.
PivotFilterType	The **PivotFilterType** is an enumeration of types of PivotTable filters that can be applied on a PivotTable field.
RangeReference	A string which is used by the protocol server to identify a range on a worksheet in a workbook, in some of the operations specified by this protocol.
RelationOperator	Specifies the relationship between an **AutoFilterCriteria** element contained in an **ArrayOfAutoFilterCriteria** and the one that potentially follows it.
Guid	Specifies a GUID value as specified in [RFC4122]

2.2.5.1 AutoFilterCriteriaType

Specifies what data to be filtered by the protocol server when using the **AutoFilterOptions** complex type (section 2.2.4.10).

```
<s:simpleType name="AutoFilterCriteriaType">
  <s:restriction base="s:string">
    <s:enumeration value="Nil"/>
    <s:enumeration value="AboveAverage"/>
    <s:enumeration value="BelowAverage"/>
    <s:enumeration value="Tomorrow"/>
    <s:enumeration value="Today"/>
    <s:enumeration value="Yesterday"/>
    <s:enumeration value="NextWeek"/>
    <s:enumeration value="ThisWeek"/>
    <s:enumeration value="LastWeek"/>
    <s:enumeration value="NextMonth"/>
    <s:enumeration value="ThisMonth"/>
```


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```
      <s:enumeration value="LastMonth"/>
      <s:enumeration value="NextQuarter"/>
      <s:enumeration value="ThisQuarter"/>
      <s:enumeration value="LastQuarter"/>
      <s:enumeration value="NextYear"/>
      <s:enumeration value="ThisYear"/>
      <s:enumeration value="LastYear"/>
      <s:enumeration value="YearToDate"/>
      <s:enumeration value="Q1"/>
      <s:enumeration value="Q2"/>
      <s:enumeration value="Q3"/>
      <s:enumeration value="Q4"/>
      <s:enumeration value="M1"/>
      <s:enumeration value="M2"/>
      <s:enumeration value="M3"/>
      <s:enumeration value="M4"/>
      <s:enumeration value="M5"/>
      <s:enumeration value="M6"/>
      <s:enumeration value="M7"/>
      <s:enumeration value="M8"/>
      <s:enumeration value="M9"/>
      <s:enumeration value="M10"/>
      <s:enumeration value="M11"/>
      <s:enumeration value="M12"/>
      <s:enumeration value="LastCount"/>
    </s:restriction>
  </s:simpleType>
```

Each enumeration value falls under one of three categories shown in the following table. The category that MUST be used is determined by the **Item** element (Section 2.2.4.24.20).

Category	Meaning
Agnostic	Enumeration values falling under the Agnostic category can always be passed to the protocol server.
Numeric	Enumeration values falling under the Numeric category MUST be passed only for auto filters that have the **DataType** attribute of the **Item** element **(**Section 2.2.4.24.20**)** either missing or containing the string "Number".
Calendar	Enumeration values falling under the Calendar category MUST be passed only for auto filters that have the **DataType** attribute of the **Item** element **(**Section 2.2.4.24.20**)** containing the string "Date"

The following table specifies possible values for the **AutoFilterCriteriaType**.

Value	Category	Meaning
Nil	Agnostic	MUST be used when the **Criteria** element of the **AutoFilterOptions** is present.
AboveAverage	Numeric	Filters all numeric values that are greater than the average of the numeric values being filtered.
BelowAverage	Numeric	Filters all numeric values that are less than the average of the numeric values being filtered.

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Value	Category	Meaning
Tomorrow	Calendar	Filters all date values that are set to tomorrow's date.
Today	Calendar	Filters all date values that are set to today's date.
Yesterday	Calendar	Filters all date values that are set to yesterday's date.
NextWeek	Calendar	Filters all date values that fall within next week.
ThisWeek	Calendar	Filters all date values that fall within this week.
LastWeek	Calendar	Filters all date values that fall within last week.
NextMonth	Calendar	Filters all date values that fall within next month.
ThisMonth	Calendar	Filters all date values that fall within this month.
LastMonth	Calendar	Filters all date values that fall within last month.
NextQuarter	Calendar	Filters all date values that fall within the next quarter.
ThisQuarter	Calendar	Filters all date values that fall within this quarter.
LastQuarter	Calendar	Filters all date values that fall within the last quarter.
NextYear	Calendar	Filters all date values that fall within next year.
ThisYear	Calendar	Filters all date values that fall within this year.
LastYear	Calendar	Filters all date values that fall within the last year.
YearToDate	Calendar	Filters all date values that occurred between the beginning of the year and up to and including the current date.
Q1	Calendar	Filters all date values that fall within the first quarter of a year.
Q2	Calendar	Filters all date values that fall the second quarter of a year.
Q3	Calendar	Filters all date values that fall within the third quarter of a year.
Q4	Calendar	Filters all date values that fall within the fourth quarter of a year.
M1	Calendar	Filters all date values that fall within the first month of a year.
M2	Calendar	Filters all date values that fall within the second month of a year.
M3	Calendar	Filters all date values that fall within the third month of a year.
M4	Calendar	Filters all date values that fall within the fourth month of a year.
M5	Calendar	Filters all date values that fall within the fifth month of a year.
M6	Calendar	Filters all date values that fall within the sixth month of a year.
M7	Calendar	Filters all date values that fall within the seventh month of a year.
M8	Calendar	Filters all date values that fall within the eighth month of a year.
M9	Calendar	Filters all date values that fall within the ninth month of a year.

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Value	Category	Meaning
M10	Calendar	Filters all date values that fall within the tenth month of a year.
M11	Calendar	Filters all date values that fall within the eleventh month of a year.
M12	Calendar	Filters all date values that fall within the twelfth month of a year.
LastCount		MUST NOT be used.

2.2.5.2 CellError

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

The **CellError** type MUST only be used in a **cellValues** element of **GetRangeValuesResponse** (section 3.1.4.16.2.2) and in a **cellValues** element of **GetRangeValuesA1Response** (section 3.1.4.17.2.2).

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

The following table specifies possible values for **CellError**.

Value	Meaning
Div0	Worksheet cell contains a number that is divided by 0.
NotApplicable	Worksheet cell contains a value not available to a **formula**.
Name	Worksheet cell contains text not recognized by a formula.
Null	Worksheet cell contains an intersection of two areas that do not intersect.
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.

2.2.5.3 DateNodeType

Specifies how AutoFilter dates data is filtered by the protocol server when using the **AutoFilterDateNodeInfo** (section 2.2.4.9).

```
<s:simpleType name="DateNodeType">
  <s:restriction base="s:string">
```


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```
      <s:enumeration value="Nil"/>
      <s:enumeration value="Year"/>
      <s:enumeration value="Month"/>
      <s:enumeration value="Day"/>
      <s:enumeration value="Hour"/>
      <s:enumeration value="Minute"/>
      <s:enumeration value="Second"/>
      <s:enumeration value="Max"/>
    </s:restriction>
  </s:simpleType>
```

The following table specifies possible values for **DateNodeType**.

Value	Meaning
Nil	Specifies that the value in **AutoFilterDateNodeInfo** is excluded from the Filtered values of the AutoFilter.
Year	Specifies that the **Year** element value in **AutoFilterDateNodeInfo** is included in the Filtered values of the AutoFilter.
Month	Specifies that the **Month** element value in **AutoFilterDateNodeInfo** is included in the Filtered values of the AutoFilter.
Day	Specifies that the **Day** element value in **AutoFilterDateNodeInfo** is included in the Filtered values of the AutoFilter.
Hour	Specifies that the **Hour** element value in **AutoFilterDateNodeInfo** is included in the Filtered values of the AutoFilter.
Minute	Specifies that the **Minute** element value in **AutoFilterDateNodeInfo** is included in the Filtered values of the AutoFilter.
Second	Specifies that the **Second** element value in **AutoFilterDateNodeInfo** is included in the Filtered values of the AutoFilter.
Max	MUST NOT be used.

2.2.5.4 ExcelServerMessageButtons

The **ExcelServerMessageButtons** type is a list (2) of enumeration values of the control buttons associated with the alert (2) that the protocol server returns to the protocol client. The list (2) MUST contain either OK or the combination of "Yes" and "No".

```
<s:simpleType name="ExcelServerMessageButtons">
  <s:list>
    <s:simpleType>
      <s:restriction base="s:string">
        <s:enumeration value="OK"/>
        <s:enumeration value="Yes"/>
        <s:enumeration value="No"/>
      </s:restriction>
    </s:simpleType>
  </s:list>
</s:simpleType>
```


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The following table specifies possible values for **ExcelServerMessageButtons**.

Value	Meaning
OK	An OK control button
Yes	A Yes control button
No	A No control button

2.2.5.5 ExcelServerMessageId

The **ExcelServerMessageId** type is an enumeration of alerts that are passed between the protocol client and the protocol server.

```
<s:simpleType name="ExcelServerMessageId">
  <s:restriction base="s:string">
    <s:enumeration value="Blank"/>
    <s:enumeration value="ConfirmDataRefresh"/>
    <s:enumeration value="ExternalDataRefreshFailed"/>
    <s:enumeration value="ExternalDataRefreshFailed_Details"/>
    <s:enumeration value="PivotNoOverlapAllowed"/>
    <s:enumeration value="PivotOverlapList"/>
    <s:enumeration value="PivotCubeNotUnique"/>
    <s:enumeration value="NoDataItemsOlap"/>
    <s:enumeration value="OlapSchemaFail"/>
    <s:enumeration value="InvalidPivot"/>
    <s:enumeration value="OlapNoMoreDetail"/>
    <s:enumeration value="DrillActionInvalid"/>
    <s:enumeration value="DriverNotOlap"/>
    <s:enumeration value="CubeMissing"/>
    <s:enumeration value="SkipLine"/>
    <s:enumeration value="CDimMismatch"/>
    <s:enumeration value="DataSetAxisTooBig"/>
    <s:enumeration value="CubeIntegrityError"/>
    <s:enumeration value="PivotNotExpandedtoProtectCellContents"/>
    <s:enumeration value="PivotTruncatedSheetEdge"/>
    <s:enumeration value="DdlGrpNotSup"/>
    <s:enumeration value="PivotFormulasCollided"/>
    <s:enumeration value="NoRetItems"/>
    <s:enumeration value="OlapConnectVisualModeProvider"/>
    <s:enumeration value="PivotNoSourceData"/>
    <s:enumeration value="PivotFilteringError"/>
    <s:enumeration value="PivotTableIncorrectDateFormat"/>
    <s:enumeration value="PivotTableEndingLargerThanStarting"/>
    <s:enumeration value="PivotTableIncorrectNumberFormat"/>
    <s:enumeration value="PivotTableOutOfRange"/>
    <s:enumeration value="MergedCellOverlap"/>
    <s:enumeration value="PivotSourceNotAvailable"/>
    <s:enumeration value="UnexpectedPivotError"/>
    <s:enumeration value="UnsupportedUICulture"/>
    <s:enumeration value="UnsupportedDataCulture"/>
  </s:restriction>
</s:simpleType>
```

The following table specifies possible values for **ExcelServerMessageId**.

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Value	Meaning
Blank	Empty value
ConfirmDataRefresh	An external data refresh confirmation is requested by the protocol client before external data refresh on a workbook.
ExternalDataRefreshFailed	Connected data refresh failed.
ExternalDataRefreshFailed_Details	Connected data refresh failed.
PivotNoOverlapAllowed	A PivotTable grew to the point where it would overlap another PivotTable.
PivotOverlapList	A PivotTable grew to the point where it would overlap a **list (2)**.
PivotCubeNotUnique	An OLAP **query** found more than one **cube** of the same name.
NoDataItemsOlap	An OLAP query found nothing to display.
OlapSchemaFail	An OLAP query was unable to fetch the schema of the cube.
InvalidPivot	A PivotTable is invalid.
OlapNoMoreDetail	A PivotTable has reached the lowest **level** of detail.
DrillActionInvalid	A PivotTable member cannot be expanded any further.
DriverNotOlap	The database does not support OLAP.
CubeMissing	The OLAP query was unable to locate the cube in the database.
SkipLine	Not all data received from the OLAP query could be displayed.
CDimMismatch	The OLAP **data provider** returned an unexpected number of **dimensions**.
DataSetAxisTooBig	The row (2) or column (2) area of the PivotTable is too large.
CubeIntegrityError	There was a problem with the structure of the OLAP cube.
PivotNotExpandedtoProtectCellContents	The PivotTable would have filled worksheet cells that already contain values so the operation was canceled.
PivotTruncatedSheetEdge	The PivotTable was truncated by a worksheet edge.
DdlGrpNotSup	The PivotTable operation is not supported by the OLAP data provider.
PivotFormulasCollided	Some calculated PivotTable members were removed from the PivotTable because new PivotTable members of the same name appeared during refresh.
NoRetItems	The query of the PivotTable page field did not return any items.
OlapConnectVisualModeProvider	The PivotTable operation is not supported by the OLAP data provider.
PivotNoSourceData	The PivotTable was saved without the underlying data.
PivotFilteringError	The PivotTable could not be filtered.

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Value	Meaning
PivotTableIncorrectDateFormat	An invalid date was used to filter the PivotTable.
PivotTableEndingLargerThanStarting	An invalid pair of starting and ending values was used to filter the PivotTable.
PivotTableIncorrectNumberFormat	A non-numeric value was used to filter the PivotTable, when a numeric value was required.
PivotTableOutOfRange	An out of range value was used to filter the PivotTable.
MergedCellOverlap	The PivotTable could not **grow** over part of a **merged cell**.
PivotSourceNotAvailable	The PivotTable could not be refreshed because its source is missing.
UnexpectedPivotError	The PivotTable has encountered an unexpected error.
UnsupportedUICulture	The UI culture is not supported by the protocol server.
UnsupportedDataCulture	The data culture is not supported by the protocol server.

2.2.5.6 ExcelServerMessageSeverity

The **ExcelServerMessageSeverity** type is an enumeration of the severity of the alert (2) that the protocol server returns to the protocol client.

```
<s:simpleType name="ExcelServerMessageSeverity">
  <s:restriction base="s:string">
    <s:enumeration value="Error"/>
    <s:enumeration value="Warning"/>
  </s:restriction>
</s:simpleType>
```

The following table specifies possible values for **ExcelServerMessageSeverity**.

Value	Meaning
Error	The alert (2) is of type error.
Warning	The alert (2) is of type warning.

2.2.5.7 ExcelServerMessageType

The **ExcelServerMessageType** type is an enumeration of the type of the alert (2) that the protocol server returns to the protocol client.

```
<s:simpleType name="ExcelServerMessageType">
  <s:restriction base="s:string">
    <s:enumeration value="Alert"/>
    <s:enumeration value="Confirmation"/>
  </s:restriction>
</s:simpleType>
```


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The following table specifies possible values for **ExcelServerMessageType**.

Value	Meaning
Alert	The alert (2) is of type alert (2).
Confirmation	The alert (2) is of type confirmation.

2.2.5.8 OperationType

Used to instruct the protocol server which comparison method to use when filtering worksheets or tables. All data that is being filtered is compared to the **Value** element in the **AutoFilterCriteria** complex type (section 2.2.4.8).

```
<s:simpleType name="OperationType">
  <s:restriction base="s:string">
    <s:enumeration value="EQ"/>
    <s:enumeration value="NEQ"/>
    <s:enumeration value="GT"/>
    <s:enumeration value="GTEQ"/>
    <s:enumeration value="LT"/>
    <s:enumeration value="LTEQ"/>
    <s:enumeration value="LastCount"/>
  </s:restriction>
</s:simpleType>
```

The following table specifies possible values for the **OperationType**.

Operation Type	Meaning
EQ	Filter all data that is equal to the value.
NEQ	Filter all data that is not equal to the value.
GT	Filter all data that is greater than the value.
GTEQ	Filter all data that is either greater than or equal to the value.
LT	Filter all data that is less than the value.
LTEQ	Filter all data that is less than or equal to the value.
LastCount	MUST NOT be used.

2.2.5.9 PivotFilterType

The **PivotFilterType** is an enumeration of types of PivotTable filters that can be applied on a PivotTable field. The following types of PivotTable filters are supported:

- Top N filter or a bottom N filter.
- PivotTable **custom label filter**.
- PivotTable **custom value filter**.

```
<s:simpleType name="PivotFilterType">
```


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```
<s:restriction base="s:string">
  <s:enumeration value="Invalid"/>
  <s:enumeration value="FirstTop10"/>
  <s:enumeration value="Count"/>
  <s:enumeration value="Percent"/>
  <s:enumeration value="Sum"/>
  <s:enumeration value="LastTop10"/>
  <s:enumeration value="CaptionFirst"/>
  <s:enumeration value="CaptionEquals"/>
  <s:enumeration value="CaptionDoesNotEqual"/>
  <s:enumeration value="CaptionBeginsWith"/>
  <s:enumeration value="CaptionDoesNotBeginWith"/>
  <s:enumeration value="CaptionEndsWith"/>
  <s:enumeration value="CaptionDoesNotEndWith"/>
  <s:enumeration value="CaptionContains"/>
  <s:enumeration value="CaptionDoesNotContain"/>
  <s:enumeration value="CaptionIsGreaterThan"/>
  <s:enumeration value="CaptionIsGreaterThanOrEqualTo"/>
  <s:enumeration value="CaptionIsLessThan"/>
  <s:enumeration value="CaptionIsLessThanOrEqualTo"/>
  <s:enumeration value="CaptionIsBetween"/>
  <s:enumeration value="CaptionIsNotBetween"/>
  <s:enumeration value="ValueFirst"/>
  <s:enumeration value="ValueEqual"/>
  <s:enumeration value="ValueNotEqual"/>
  <s:enumeration value="ValueGreaterThan"/>
  <s:enumeration value="ValueGreaterThanOrEqual"/>
  <s:enumeration value="ValueLessThan"/>
  <s:enumeration value="ValueLessThanOrEqual"/>
  <s:enumeration value="ValueBetween"/>
  <s:enumeration value="ValueNotBetween"/>
  <s:enumeration value="DateFirst"/>
  <s:enumeration value="DateEquals"/>
  <s:enumeration value="DateOlderThan"/>
  <s:enumeration value="DateNewerThan"/>
  <s:enumeration value="DateBetween"/>
  <s:enumeration value="DateTomorrow"/>
  <s:enumeration value="DateToday"/>
  <s:enumeration value="DateYesterday"/>
  <s:enumeration value="DateNextWeek"/>
  <s:enumeration value="DateThisWeek"/>
  <s:enumeration value="DateLastWeek"/>
  <s:enumeration value="DateNextMonth"/>
  <s:enumeration value="DateThisMonth"/>
  <s:enumeration value="DateLastMonth"/>
  <s:enumeration value="DateNextQuarter"/>
  <s:enumeration value="DateThisQuarter"/>
  <s:enumeration value="DateLastQuarter"/>
  <s:enumeration value="DateNextYear"/>
  <s:enumeration value="DateThisYear"/>
  <s:enumeration value="DateLastYear"/>
  <s:enumeration value="DateYearToDate"/>
  <s:enumeration value="DateAllDatesInPeriodQuarter1"/>
  <s:enumeration value="DateAllDatesInPeriodQuarter2"/>
  <s:enumeration value="DateAllDatesInPeriodQuarter3"/>
  <s:enumeration value="DateAllDatesInPeriodQuarter4"/>
  <s:enumeration value="DateAllDatesInPeriodJanuary"/>
  <s:enumeration value="DateAllDatesInPeriodFebruary"/>
  <s:enumeration value="DateAllDatesInPeriodMarch"/>
```


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```
      <s:enumeration value="DateAllDatesInPeriodApril"/>
      <s:enumeration value="DateAllDatesInPeriodMay"/>
      <s:enumeration value="DateAllDatesInPeriodJune"/>
      <s:enumeration value="DateAllDatesInPeriodJuly"/>
      <s:enumeration value="DateAllDatesInPeriodAugust"/>
      <s:enumeration value="DateAllDatesInPeriodSeptember"/>
      <s:enumeration value="DateAllDatesInPeriodOctober"/>
      <s:enumeration value="DateAllDatesInPeriodNovember"/>
      <s:enumeration value="DateAllDatesInPeriodDecember"/>
      <s:enumeration value="DateNotEqual"/>
      <s:enumeration value="DateOlderOrEqual"/>
      <s:enumeration value="DateNewerOrEqual"/>
      <s:enumeration value="DateNotBetween"/>
      <s:enumeration value="Last"/>
    </s:restriction>
  </s:simpleType>
```

The following table specifies possible values for **PivotFilterType**.

Value	Meaning
Invalid	Neither a PivotTable custom filter nor a top N filter nor a bottom N filter are applied.
FirstTop10	A top N filter by count or a bottom N filter by count is applied. Used with top N filter or bottom N filter.
Count	A top N filter by count or a bottom N filter by count is applied. Used with top N filter or bottom N filter.
Percent	A top N filter by percent or a bottom N filter by percent is applied. Used with top N filter or bottom N filter.
Sum	A **top N filter by sum** or a **bottom N filter by sum** is applied. Used with top N filter or bottom N filter.
LastTop10	A top N filter by sum or a bottom N filter by sum is applied. Used with top N filter or bottom N filter.
CaptionFirst	The PivotTable member caption is equal to the value of the PivotTable filter parameter. Supports one PivotTable filter parameter. Used with PivotTable custom label filter.
CaptionEquals	The PivotTable member caption is equal to the value of the PivotTable filter parameter. Supports one PivotTable filter parameter. Used with PivotTable custom label filter.
CaptionDoesNotEqual	The PivotTable member caption is not equal to the value of the PivotTable filter parameter. Supports one PivotTable filter parameter. Used with PivotTable custom label filter.
CaptionBeginsWith	The PivotTable member caption begins with the value in the PivotTable filter parameter. Supports one PivotTable filter parameter. Used with PivotTable custom label filter.
CaptionDoesNotBeginWith	The PivotTable member caption does not begin with the value in the PivotTable filter parameter. Supports one PivotTable filter parameter. Used with PivotTable custom label filter.

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Value	Meaning
CaptionEndsWith	The PivotTable member caption ends with the value in the PivotTable filter parameter. Supports one PivotTable filter parameter. Used with PivotTable custom label filter.
CaptionDoesNotEndWith	The PivotTable member caption does not end with the value in the PivotTable filter parameter. Supports one PivotTable filter parameter. Used with PivotTable custom label filter.
CaptionContains	The PivotTable member caption contains the value in the PivotTable filter parameter. Supports one PivotTable filter parameter. Used with PivotTable custom label filter.
CaptionDoesNotContain	The PivotTable member caption does not contain the value in the PivotTable filter parameter. Supports one PivotTable filter parameter. Used with PivotTable custom label filter.
CaptionIsGreaterThan	The PivotTable member caption is greater than the value in the PivotTable filter parameter. Supports one PivotTable filter parameter. Used with PivotTable custom label filter.
CaptionIsGreaterThanOrEqualTo	The PivotTable member caption is greater than or equal to the value in the PivotTable filter parameter. Supports one PivotTable filter parameter. Used with PivotTable custom label filter.
CaptionIsLessThan	The PivotTable member caption is less than the value in the PivotTable filter parameter. Supports one PivotTable filter parameter. Used with PivotTable custom label filter.
CaptionIsLessThanOrEqualTo	The PivotTable member caption is less than or equal to the value in the PivotTable filter parameter. Supports one PivotTable filter parameter. Used with PivotTable custom label filter.
CaptionIsBetween	The PivotTable member caption is greater than or equal to the value of the first PivotTable filter parameter and less than or equal to the value of the second PivotTable filter parameter. Supports two PivotTable filter parameters. Used with PivotTable custom label filter.
CaptionIsNotBetween	The PivotTable member caption is less than the value of the first PivotTable filter parameter or greater than the value of the second PivotTable filter parameter. Supports two PivotTable filter parameters. Used with PivotTable custom label filter.
ValueFirst	The value of the PivotTable member is equal to the value of the PivotTable filter parameter. Supports one PivotTable filter parameter. Used with PivotTable custom value filter.
ValueEqual	The value of the PivotTable member is equal to the value of the PivotTable filter parameter. Supports one PivotTable filter parameter. Used with PivotTable custom value filter.
ValueNotEqual	The value of the PivotTable member is not equal to the value of the PivotTable filter parameter. Supports one PivotTable filter parameter. Used with PivotTable custom value filter.
ValueGreaterThan	The value of the PivotTable member is greater than the value of the PivotTable filter parameter. Supports one PivotTable filter parameter. Used with PivotTable custom value filter.
ValueGreaterThanOrEqual	The value of the PivotTable member is greater than or equal to the

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Value	Meaning
	value of the PivotTable filter parameter. Supports one PivotTable filter parameter. Used with PivotTable custom value filter.
ValueLessThan	The value of the PivotTable member is less than the value of the PivotTable filter parameter. Supports one PivotTable filter parameter. Used with PivotTable custom value filter.
ValueLessThanOrEqual	The value of the PivotTable member is less than or equal to the value of the PivotTable filter parameter. Supports one PivotTable filter parameter. Used with PivotTable custom value filter.
ValueBetween	The value of the PivotTable member is greater than or equal to the value of the first PivotTable filter parameter and less than or equal to the value of the second PivotTable filter parameter. Supports two PivotTable filter parameters. Used with PivotTable custom value filter.
ValueNotBetween	The value of the PivotTable member is less than the value of the first PivotTable filter parameter or greater than the value of the second PivotTable filter parameter. Supports two PivotTable filter parameters. Used with PivotTable custom value filter.
DateFirst	The PivotTable member caption is equal to the date value of the PivotTable filter parameter. Supports one PivotTable filter parameter. Used with PivotTable custom label filter.
DateEquals	The PivotTable member caption is equal to the date value of the PivotTable filter parameter. Supports one PivotTable filter parameter. Used with PivotTable custom label filter.
DateOlderThan	The PivotTable member caption is less than the date value of the PivotTable filter parameter. Supports one PivotTable filter parameter. Used with PivotTable custom label filter.
DateNewerThan	The PivotTable member caption is greater than the date value of the PivotTable filter parameter. Supports one PivotTable filter parameter. Used with PivotTable custom label filter.
DateBetween	The PivotTable member caption is greater than or equal to the value of the first PivotTable filter parameter and less than or equal to the value of the second PivotTable filter parameter. Supports two PivotTable filter parameters. Used with PivotTable custom label filter.
DateTomorrow	The PivotTable member caption is tomorrow's date. Supports zero PivotTable filter parameters. Used with PivotTable custom label filter.
DateToday	The PivotTable member caption is today's date. Supports zero PivotTable filter parameters. Used with PivotTable custom label filter.
DateYesterday	The PivotTable member caption is yesterday's date. Supports zero PivotTable filter parameters. Used with PivotTable custom label filter.
DateNextWeek	The PivotTable member caption is a date next week. Supports zero PivotTable filter parameters. Used with PivotTable custom label filter.
DateThisWeek	The PivotTable member caption is a date this week. Supports zero PivotTable filter parameters. Used with PivotTable custom label filter.
DateLastWeek	The PivotTable member caption is a date last week. Supports zero PivotTable filter parameters. Used with PivotTable custom label filter.

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Value	Meaning
DateNextMonth	The PivotTable member caption is a date next month. Supports zero PivotTable filter parameters. Used with PivotTable custom label filter.
DateThisMonth	The PivotTable member caption is a date this month. Supports zero PivotTable filter parameters. Used with PivotTable custom label filter.
DateLastMonth	The PivotTable member caption is a date last month. Supports zero PivotTable filter parameters. Used with PivotTable custom label filter.
DateNextQuarter	The PivotTable member caption is a date next quarter. Supports zero PivotTable filter parameters. Used with PivotTable custom label filter.
DateThisQuarter	The PivotTable member caption is a date this quarter. Supports zero PivotTable filter parameters. Used with PivotTable custom label filter.
DateLastQuarter	The PivotTable member caption is a date last quarter. Supports zero PivotTable filter parameters. Used with PivotTable custom label filter.
DateNextYear	The PivotTable member caption is a date next year. Supports zero PivotTable filter parameters. Used with PivotTable custom label filter.
DateThisYear	The PivotTable member caption is a date this year. Supports zero PivotTable filter parameters. Used with PivotTable custom label filter.
DateLastYear	The PivotTable member caption is a date last year. Supports zero PivotTable filter parameters. Used with PivotTable custom label filter.
DateYearToDate	The PivotTable member caption is a date year to date. Supports zero PivotTable filter parameters. Used with PivotTable custom label filter.
DateAllDatesInPeriodQuarter1	The PivotTable member caption is a date in the first quarter. Supports zero PivotTable filter parameters. Used with PivotTable custom label filter.
DateAllDatesInPeriodQuarter2	The PivotTable member caption is a date in the second quarter. Supports zero PivotTable filter parameters. Used with PivotTable custom label filter.
DateAllDatesInPeriodQuarter3	The PivotTable member caption is a date in the third quarter. Supports zero PivotTable filter parameters. Used with PivotTable custom label filter.
DateAllDatesInPeriodQuarter4	The PivotTable member caption is a date in the fourth quarter. Supports zero PivotTable filter parameters. Used with PivotTable custom label filter.
DateAllDatesInPeriodJanuary	The PivotTable member caption is a date in January. Supports zero PivotTable filter parameters. Used with PivotTable custom label filter.
DateAllDatesInPeriodFebruary	The PivotTable member caption is a date in February. Supports zero PivotTable filter parameters. Used with PivotTable custom label filter.
DateAllDatesInPeriodMarch	The PivotTable member caption is a date in March. Supports zero PivotTable filter parameters. Used with PivotTable custom label filter.
DateAllDatesInPeriodApril	The PivotTable member caption is a date in April. Supports zero PivotTable filter parameters. Used with PivotTable custom label filter.
DateAllDatesInPeriodMay	The PivotTable member caption is a date in May. Supports zero

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Value	Meaning
	PivotTable filter parameters. Used with PivotTable custom label filter.
DateAllDatesInPeriodJune	The PivotTable member caption is a date in June. Supports zero PivotTable filter parameters. Used with PivotTable custom label filter.
DateAllDatesInPeriodJuly	The PivotTable member caption is a date in July. Supports zero PivotTable filter parameters. Used with PivotTable custom label filter.
DateAllDatesInPeriodAugust	The PivotTable member caption is a date in August. Supports zero PivotTable filter parameters. Used with PivotTable custom label filter.
DateAllDatesInPeriodSeptember	The PivotTable member caption is a date in September. Supports zero PivotTable filter parameters. Used with PivotTable custom label filter.
DateAllDatesInPeriodOctober	The PivotTable member caption is a date in October. Supports zero PivotTable filter parameters. Used with PivotTable custom label filter.
DateAllDatesInPeriodNovember	The PivotTable member caption is a date in November. Supports zero PivotTable filter parameters. Used with PivotTable custom label filter.
DateAllDatesInPeriodDecember	The PivotTable member caption is a date in December. Supports zero PivotTable filter parameters. Used with PivotTable custom label filter.
DateNotEqual	The PivotTable member caption is not equal to the date value of the PivotTable filter parameter. Supports one PivotTable filter parameter. Used with PivotTable custom label filter.
DateOlderOrEqual	The PivotTable member caption is less than or equal to the date value of the PivotTable filter parameter. Supports one PivotTable filter parameter. Used with PivotTable custom label filter.
DateNewerOrEqual	The PivotTable member caption is greater than or equal to the date value of the PivotTable filter parameter. Supports one PivotTable filter parameter. Used with PivotTable custom label filter.
DateNotBetween	The PivotTable member caption is a date less than the first parameter or greater than the second parameter PivotTable filter parameters. Supports two PivotTable filter parameters. Used with PivotTable custom label filter.
Last	MUST NOT be used.

2.2.5.10 RangeReference

A string that is used by the protocol server to identify a range on a worksheet in a workbook, in some of the operations specified by this protocol. MUST NOT be longer than 32,768 characters. MAY<4> use any format to identify the range.

```
<xs:simpleType name="RangeReference">
  <xs:restriction base="xs:string"/>
</xs:simpleType>
```

2.2.5.11 RelationOperator

Specifies the relationship between an **AutoFilterCriteria** element (section 2.2.4.8) contained in an **ArrayOfAutoFilterCriteria** (section 2.2.4.2) and the one that potentially follows it.

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```
<s:simpleType name="RelationOperator">
  <s:restriction base="s:string">
    <s:enumeration value="Nil"/>
    <s:enumeration value="And"/>
    <s:enumeration value="Or"/>
    <s:enumeration value="LastCount"/>
  </s:restriction>
</s:simpleType>
```

The following table specifies possible values for **RelationOperator**.

RelationOperator	Meaning
Nil	See the **Relation** element in the **AutoFilterCriteria** section.
And	See the **Relation** element in the **AutoFilterCriteria** section. The protocol server will satisfy the conditions specified both in the **AutoFilterCriteria** that contains this value and in the one coming after it in the **ArrayOfAutoFilterCriteria**.
Or	See the **Relation** element in the **AutoFilterCriteria** section. The protocol server will satisfy the conditions specified in either the **AutoFilterCriteria** that contains this value **or** in the one coming after it in the **ArrayOfAutoFilterCriteria**.
LastCount	MUST NOT be used.

2.2.5.12 guid

Specifies a GUID value as specified in [RFC4122].

```
<s:simpleType name="guid">
  <s:restriction base="s:string">
    <s:pattern value="[0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-
F]{12}" />
    </s:restriction>
</s:simpleType>
```

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 Faults

In the event of an application error the protocol server returns a soap fault as a response to the operation, as specified in [SOAP1.1] section 4.4.

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- The protocol client MUST ignore all elements of the soap fault, except for the **SOAP fault detail** element.
- The soap fault detail element MUST contain the protocol server alert (2) as specified in section 2.2.9.2.

2.2.9.1 Simple Types

2.2.9.1.1 MessageButtons

The **MessageButtons** type is a list (2) of enumeration values of the control buttons associated with the alert (2) that the protocol server returns to the protocol client. The list (2) MUST contain either "OK" or the combination of "Yes" and "No".

```
<s:simpleType name="MessageButtons">
  <s:list>
    <s:simpleType>
      <s:restriction base="s:string">
        <s:enumeration value="OK"/>
        <s:enumeration value="Yes"/>
        <s:enumeration value="No"/>
      </s:restriction>
    </s:simpleType>
  </s:list>
</s:simpleType>
```

The following table specifies possible values for **MessageButtons**.

Value	Meaning
OK	An **OK** control button
Yes	A **Yes** control button
No	A **No** control button

2.2.9.1.2 MessageSeverity

The **MessageSeverity** type is an enumeration of the severity of the alert (2) that the protocol server returns to the protocol client.

```
<s:simpleType name="MessageSeverity">
  <s:restriction base="s:string">
    <s:enumeration value="Error"/>
    <s:enumeration value="Warning"/>
    <s:enumeration value="Information"/>
  </s:restriction>
</s:simpleType>
```

The following table specifies possible values for **MessageSeverity**.

Value	Meaning
Error	The alert (2) is of type error.

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Value	Meaning
Warning	The alert (2) is of type warning.
Information	The alert (2) is of type information.

2.2.9.1.3 MessageType

The **MessageType** type is an enumeration of the type of the alert (2) that the protocol server returns to the protocol client.

```
<s:simpleType name="MessageType">
  <s:restriction base="s:string">
    <s:enumeration value="Alert"/>
    <s:enumeration value="Confirmation"/>
    <s:enumeration value="Status"/>
  </s:restriction>
</s:simpleType>
```

The following table specifies possible values for **MessageType**.

Value	Meaning
Alert	The alert (2) is of type alert (2).
Confirmation	The alert (2) is of type confirmation.
Status	The alert (2) is of type status.

2.2.9.2 Detail Node of the Soap Fault

In the event of an application error, the protocol server sets the alert (2) in the soap fault detail.

The following schema specifies the structure of the soap fault detail element in the SOAP Fault used by application errors in this protocol:

```
<s:element name="detail">
  <s:complexType>
    <s:sequence>
      <s:element name="ExcelServerMessage" type="s:string" minOccurs="1" maxOccurs="1"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

ExcelServerMessage: The alert (2) returned by the protocol server. MUST contain a single **XML document** contained in a **CDATA section** as specified in section 2.2.9.3.

2.2.9.3 Detail Node XML Document

In the event of an application error, the protocol server sets the alert (2) in the soap fault detail in the form of an XML document. The elements in the XML document MUST NOT have an XML namespace. The XML document MUST conform to the following XML schema.

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```
<s:complexType name="ExcelServerMessage">
   <s:sequence>
      <s:element minOccurs="1" maxOccurs="1" name="HasOpenItemPermission" type="s:boolean" />
     <s:element minOccurs="1" maxOccurs="1" name="Id" type="s:string" />
     <s:element minOccurs="1" maxOccurs="1" name="Severity" type="MessageSeverity" />
     <s:element minOccurs="1" maxOccurs="1" name="Type" type="MessageType" />
     <s:element minOccurs="1" maxOccurs="1" name="Buttons" type="MessageButtons" />
     <s:element minOccurs="1" maxOccurs="1" name="Description" type="s:string" />
     <s:element minOccurs="1" maxOccurs="1" name="ExtendedDescription" type="s:string" />
     <s:element minOccurs="1" maxOccurs="1" name="Caption" type="s:string" />
     <s:element minOccurs="0" maxOccurs="1" name="HelpTopicId" type="s:string" />
     <s:element minOccurs="1" maxOccurs="1" name="HelpDisplayText" type="s:string" />
   </s:sequence>
</s:complexType>
```

HasOpenItemPermission: Specifies whether the user has Open Item permission to the workbook file.

Id: The identifier of the alert (2). MUST be one of the identifiers specified in section 2.2.9.4.

Severity: The severity of the alert (2) as specified in section 2.2.9.1.2.

Type: The type of the alert (2) as specified in section 2.2.9.1.3.

Buttons: The control buttons associated with the alert (2) as specified in section 2.2.9.1.1.

Description: A text description of the alert (2). MUST NOT be empty. The text MUST be in the language UI culture of the session (2).

ExtendedDescription: An extended description of the alert (2). MUST be in the language UI culture of the session (2).

Caption: A caption for the alert (2). MUST be in the language UI culture of the session (2).

HelpTopicId: The Help topic identifier.

HelpDisplayText: A description of the help topic. MUST be in the language UI culture of the session (2).

2.2.9.4 Full List of Possible Ids

In the event of an application error the protocol server MUST return one of these alert (2) values in the **Id** element as specified in section 2.2.9.2. The protocol client MUST NOT perform any logical operation on the value of the **Id** element, unless it appears in section 2.2.9.5 or explicitly specified for a message in section 3.1.4. The following are possible errors:

- **CDimMismatch**
- **ChartImageGenFailed**
- **CircularReferencesFound**
- **ConfirmationUnsupported**
- **CubeIntegrityError**
- **CubeMissing**

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- **DataSetAxisTooBig**
- **DdlGrpNotSup**
- **DimensionMismatch**
- **DiscontiguousRangeNotSupported**
- **DrillActionInvalid**
- **DriverNotOlap**
- **EcsInvalidNamedObject**
- **EcsSnapshotAccessDenied**
- **EncryptionTooLow**
- **FormulaEditingNotEnabled**
- **FileCorrupt**
- **FileOpenAccessDenied**
- **FileOpenNotFound**
- **FileOpenSecuritySettings**
- **GenericFileOpenError**
- **InternalError**
- **InvalidOrTimedOutSession**
- **InvalidPivot**
- **InvalidSheetName**
- **IRMedWorkbook**
- **MaxRequestDurationExceeded**
- **MaxSessionsPerUserExceeded**
- **MergedCellOverlap**
- **MultipleRequestsOnSession**
- **NoDataItemsOlap**
- **NoOccurrencesFound**
- **NoPublishedItems**
- **NoRetItems**
- **NotMemberOfRole**
- **ObjectTypeNotSupported**

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- **OlapConnectVisualModeProvider**
- **OlapNoMoreDetail**
- **OlapSchemaFail**
- **OperationCanceled**
- **OperationOnInvalidState**
- **ParameterDoesNotExist**
- **ParameterInvalid**
- **ParameterLimitExceeded**
- **PivotCubeNotUnique**
- **PivotFilteringError**
- **PivotFormulasCollided**
- **PivotNoSourceData**
- **PivotNotExpandedtoProtectCellContents**
- **PivotNoOverlapAllowed**
- **PivotOverlapList**
- **PivotSourceNotAvailable**
- **PivotTableEndingLargerThanStarting**
- **PivotTableIncorrectDateFormat**
- **PivotTableIncorrectNumberFormat**
- **PivotTableOutOfRange**
- **PivotTruncatedSheetEdge**
- **ProductExpired**
- **RangeDefinitionError**
- **RangeParseError**
- **RangeRequestAreaExceeded**
- **RetryError**
- **SaveFailed**
- **SetParameterFailure**
- **SetRangeFailure**
- **SheetRangeMismatch**

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- **SkipLine**
- **SortActionInvalid**
- **SortActionNotSupportedWithPivot**
- **SpecifiedItemNotFound**
- **SpecifiedRangeNotFound**
- **StopOpenOnRefreshFailure**
- **UnexpectedPivotError**
- **WorkbookInternalLimit**
- **WorkbookLockedRead**
- **WorkbookNotSupported**
- **WorkbookNotSupportedViewRight**

2.2.9.5 Common List of Ids

In the event of an application error, the protocol server SHOULD<5> return one of these alert (2) values in the **Id** element as specified in section 2.2.9.2. These errors are described in the following table.

Id	Description
InvalidOrTimedOutSession	The session on the protocol server has timed out. The protocol client SHOULD<6> initiate a new session (2) by calling the **OpenWorkbook** operation (section 3.1.4.20).
RetryError	The protocol server is low on **system resources**.
OperationCanceled	The protocol server has cancelled the operation.
InternalError	The protocol server has encountered an unexpected error.
MultipleRequestsOnSession	There is an operation currently being processed on the session (2), and the protocol server cannot process other concurrent operations on the same session (2).
MaxRequestDurationExceeded	The operation has exceeded the allowed request timeout.
EcsInvalidNamedObject	The range is not a valid range.

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3 Protocol Details

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

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

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

This protocol allows protocol servers to perform implementation-specific authorization checks and notify protocol clients of authorization faults as specified previously in this section.

This protocol allows protocol servers to perform implementation-specific localization of text in various messages. Except where specified, the localization of this text is an implementation-specific behavior of the protocol server and not significant for interoperability.

The following high-level sequence diagram illustrates the operation of the protocol.

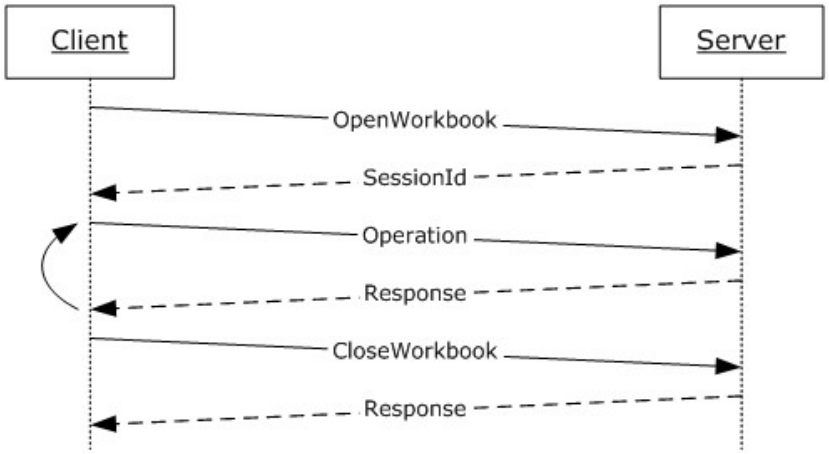

Figure 2: High-level sequence of operations between protocol client and protocol server

Session behavior: A session (2) MUST be created on a successful **OpenWorkbook** request. A session (2) MUST stop responding to operations after a successful call to the **CloseWorkbook** operation or after the session (2) has timed out.

Request behavior: A request is created when a **Web service** operation starts running on the protocol server, and ends when the Web service operation finishes, when it is successfully cancelled by a **CancelRequest** call, or after the request has timed out.

Types of operation: The common behavior of each operation is determined by the set of categories it falls under. The following table specifies the possible categories.

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Category	Meaning
Concurrent	The operation does not change session (2) state on the protocol server. The protocol server MUST allow multiple concurrent operations to execute at the same time as long as there is no NonConcurrent operation executing at the same time.
NonConcurrent	The operation is an exclusive operation on the session (2) in the protocol server, and the protocol server can only process one of such operations on a session (2) at the same time. If the protocol client issues an operation of this category or of the concurrent category on a given session (2) while the protocol server is processing another operation of this category on the same session (2), then the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2, with the value of the **id** element of the **ExcelServerMessage** set to **MultipleRequestsOnSession**. If the protocol client issues an operation of this category on a given session (2) while the protocol server is processing one or more operations of the concurrent category on the same session (2), then the protocol server MAY<7> immediately return an **ExcelServerMessage** as specified in section 2.2.9.2, with the value of the **id** element of the **ExcelServerMessage** set to **MultipleRequestsOnSession**.
ChangesState	The operation is a session (2)'s state changing operation on the protocol server. The protocol server MUST increment the session (2)'s state identifier.
Out of Band	The operation can be processed on the protocol server regardless of the current state of the session (2), or whether there are other operations from any category currently being processed by the protocol server on the session (2).

The following table specifies the combination of the categories per protocol server operation.

Operation	Concurrent	NonConcurrent	ChangesState	Out of Band
ApplyItemFilter		X	X	
ApplyPivotFilter		X	X	
ApplyPivotSort		X	X	
ApplyPivotTop10Filter		X	X	
ApplyTop10Filter		X	X	
CancelRequest				X
CloseWorkbook				X
ConnectAndGetPivotFilterItemList		X	X	
ExpandCollapseOutline		X	X	
FindRange		X		
GetAutoFilterItemList		X		
GetImage	X			
GetPivotFilterItemList		X		
GetPivotMenu		X		

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Operation	Concurrent	NonConcurrent	ChangesState	Out of Band
GetRange	X			
GetRangeValues	X			
GetRangeValuesA1	X			
GetSessionInformation		X		
GetWorkbook		X		
OpenWorkbook		X	X	
Recalc		X	X	
RecalcA1		X	X	
RecalcAll		X	X	
Refresh		X	X	
RefreshAll		X	X	
RemovePivotFilter		X	X	
SetParameters		X	X	
SetRange		X	X	
SetRangeA1		X	X	
SortFilterColumn		X	X	
TogglePivotDrill		X	X	

3.1 ExcelServiceSoapSoap 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 document does not mandate that implementations adhere to this model as long as their external behavior is consistent with that described in this document.

Session: An entity which gives context to operations done against a workbook. A session (2) is associated with a workbook state, which can be modified by state changing requests.

State identifier: Each session (2) has a counter which represents its state.

Request: An entity which represents a running request on the protocol server.

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3.1.2 Timers

3.1.2.1 Session Timeout

The **Session Timeout** timer measures the time it takes for a session (2) to time out.

3.1.2.2 Request Timeout

The **Request Timeout** timer measures the time it takes for a request to time out.

3.1.3 Initialization

None.

3.1.4 Message Processing Events and Sequencing Rules

This protocol includes the operations described in the following table.

Operation	Description
ApplyItemFilter	This operation is used to change the filtering of a table or worksheet AutoFilter in the workbook.
ApplyPivotFilter	This operation is used to apply a PivotTable custom filter or a PivotTable manual filter on a PivotTable field.
ApplyPivotSort	This operation is used to change the sort order (2) of a PivotTable field in the workbook.
ApplyPivotTop10Filter	This operation is used to apply a top N filter or a bottom N filter on a PivotTable field.
ApplyTop10Filter	This operation is used to apply a top N filter or a bottom N filter on a column (2) in a worksheet or in a table.
CancelRequest	This operation is used to cancel an operation that is currently running on the protocol server.
CloseWorkbook	This operation is used to close a session (2) on the protocol server.
ConnectAndGetPivotFilterItemList	This operation is used to return the PivotTable members that are part of a PivotTable manual filter hierarchy.
ExpandCollapseOutline	This operation is used to toggle the **outline state** in the workbook.
FindRange	This operation is used to find a string inside a workbook. What constitutes a match between the search string and the contents of the workbook is dependent on the protocol server implementation.
GetAutoFilterItemList	This operation is used to retrieve the filter values and filter date values and their caption in the AutoFilterItemList in the operation response for an AutoFilter in the workbook.This operation is used to retrieve the filter values and filter date values and their caption in **the AutoFilterItemList** in the operation response for an AutoFilter in the **workbook**.

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Operation	Description
GetImage	This operation is used to return a chart image.
GetPivotFilterItemList	This operation is used to return child PivotTable members that are part of a PivotTable manual filter hierarchy. This operation is used after calling **ConnectAndGetPivotFilterItemList** or after calling **GetPivotFilterItemList** for an **ancestor in the** hierarchy**.**
GetPivotMenu	This operation is used to return information about a PivotTable area.
GetRange	This operation is used to get an **SpreadsheetDataXML** range.
GetRangeValues	This operation is used to get the values contained in a specified range in a workbook.
GetRangeValuesA1	This operation is used to get the values contained in a specified range in a workbook.
GetSessionInformation	This operation is used to return information about a session (2).
GetWorkbook	This operation is used to retrieve a workbook file.
OpenWorkbook	This operation is used to open a session (2) giving access to a workbook on the protocol server.
Recalc	This operation is used to calculate a specified range in the workbook.
RecalcA1	This operation is used to calculate a specified range in the workbook.
RecalcAll	This operation is used to calculate the workbook.
Refresh	This operation is used to refresh connected data on a workbook.
RefreshAll	This operation is used to refresh all connected data on a workbook.
RemovePivotFilter	This operation is used to remove any PivotTable filters that are applied to a PivotTable field.
SetParameters	This operation is used to set values of workbook parameters in a workbook.
SetRange	This operation is used to set values to a range of worksheet cells on a workbook.
SetRangeA1	This operation is used to set values to a range of worksheet cells on a workbook.
SortFilterColumn	This operation is used to change the sort order (2) of a table or worksheet AutoFilter in the workbook.
TogglePivotDrill	This operation is used to expand or collapse a PivotTable member.

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3.1.4.1 ApplyItemFilter

This operation is used to change the filtering of a table or worksheet AutoFilter in the workbook.

```
<wsdl:operation name="ApplyItemFilter">
    <wsdl:input message="ApplyItemFilterSoapIn" />
    <wsdl:output message="ApplyItemFilterSoapOut" />
</wsdl:operation>
```

The protocol client sends an **ApplyItemFilterSoapIn** request message, and the protocol server responds with an **ApplyItemFilterSoapOut** response message, as follows:

- The protocol server sets the filter to the **clear all state** if the **values** element is not present, and the **autoFilterDateNodes** element is not present, and the **blanks** element value is **false**, and the **hideBlanks** element value is **false**, and the value of **CriteriaType** element of **AutoFilterOptions** (section 2.2.4.10) is Nil, and the **Criteria** element of **AutoFilterOptions** is not present.

In the event of an application error on the protocol server during this operation, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be one of the values specified in section 2.2.9.4, and SHOULD<8> be one of the values described in the following table.

Id	Description
InvalidOrTimedOutSession	See section 2.2.9.5.
RetryError	See section 2.2.9.5.
OperationCanceled	See section 2.2.9.5.
InternalError	See section 2.2.9.5.
MaxRequestDurationExceeded	See section 2.2.9.5.
MultipleRequestsOnSession	See section 2.2.9.5.

3.1.4.1.1 Messages

3.1.4.1.1.1 ApplyItemFilterSoapIn

This message is the request message for **ApplyItemFilter**.

The **SOAP action** value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/Apply
ItemFilter
```

The **SOAP body** contains an **ApplyItemFilter** element.

3.1.4.1.1.2 ApplyItemFilterSoapOut

This message is the response message for **ApplyItemFilter**.

The SOAP action value of the message is defined as follows.

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```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/Apply
ItemFilter
```

The SOAP body contains an **ApplyItemFilterResponse** element.

3.1.4.1.2 Elements

3.1.4.1.2.1 ApplyItemFilter

The **ApplyItemFilter** element is specified as follows.

```
<s:element name="ApplyItemFilter">
  <s:complexType>
    <s:sequence>
      <s:element name="parameter" type="tns:CommandParameter" minOccurs="0"/>
      <s:element name="autoFilterOptions" type="tns:AutoFilterOptions" minOccurs="0"/>
      <s:element name="values" type="tns:ArrayOfString" minOccurs="0"/>
      <s:element name="autoFilterDateNodes" type="tns:ArrayOfAutoFilterDateNodeInfo"
minOccurs="0"/>
      <s:element name="blanks" type="s:boolean"/>
      <s:element name="hideBlanks" type="s:boolean"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

parameter: A **CommandParameter** as specified in section 2.2.4.11. MUST be present.

autoFilterOptions: The AutoFilter options for filtering the AutoFilter column (2) as specified in **AutoFilterOptions** (section 2.2.4.10). MUST be present.

values: The values to use when filtering the AutoFilter column (2). Specifies the values the protocol server MUST use to filter the AutoFilter. MUST NOT be present if the value **CriteriaType** element of **AutoFilterOptions** is not "Nil". MUST NOT be present if the **Criteria** element of **AutoFilterOptions** is present. MUST be present if **autoFilterDateNodes** element is present. If present, the count of elements MUST be greater than or equal to 0 and less than or equal to 1000. All **string** elements of **ArrayOfString** (section 2.2.4.7). MUST have a value or be empty. The value of the **string** element of **ArrayOfString**. MUST be equal to one of the **DisplayString** element values of **AutoFilterItem** (section 3.1.4.11.3.3) in the **AutoFilterItemList** (section 3.1.4.11.3.1) of the **GetAutoFilterItemList** response (section 3.1.4.11).

autoFilterDateNodes: The date nodes to use when filtering the AutoFilter column (2). Specifies the date values the protocol server MUST use to filter the AutoFilter as specified in section 2.2.4.9. MUST NOT be present if the **values** element is not present. If present the count of elements MUST be greater than or equal to 0 and less than or equal to 1000. The value of the **NodeType** element of **AutoFilterDateNodeInfo**. MUST NOT be Nil. If the value of the **NodeType** element of **AutoFilterDateNodeInfo** is Year, then the value of the **Month** and **Day** elements of **AutoFilterDateNodeInfo** MUST be 0. If the value of the **NodeType** element of **AutoFilterDateNodeInfo** is "Month", the value of the **Day** element of **AutoFilterDateNodeInfo** MUST be 0.

blanks: Specifies whether to include blank values in the filter. The value **true** specifies to include filter blank values in the filter. The value **false** specifies to exclude filter blank values in the filter.

hideBlanks: Specifies whether to hide blank values in the filter. Specifies filtering to include all values but blank values. The value **true** specifies to include all values but blank values in the filter.

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The value **false** MUST be ignored by the protocol server. The protocol client MUST NOT set this element value to **true** if the values element is present or the **Criteria** element of **AutoFilterOptions** is present or the value of **CriteriaType** element of **AutoFilterOptions** is not "Nil".

3.1.4.1.2.2 ApplyItemFilterResponse

If the operation succeeds it MUST return an **ApplyItemFilterResponse** as follows.

```
<s:element name="ApplyItemFilterResponse">
  <s:complexType>
    <s:sequence>
      <s:element name="ApplyItemFilterResult" type="tns:CommandResult" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

ApplyItemFilterResult: A **CommandResult** as specified in section 2.2.4.12. MUST be present.

3.1.4.2 ApplyPivotFilter

This operation is used to apply a PivotTable custom filter or a PivotTable manual filter on a PivotTable field.

```
<wsdl:operation name="ApplyPivotFilter">
    <wsdl:input message="ApplyPivotFilterSoapIn" />
    <wsdl:output message="ApplyPivotFilterSoapOut" />
</wsdl:operation>
```

The protocol client sends an **ApplyPivotFilterSoapIn** request message and the protocol server responds with an **ApplyPivotFilterSoapOut** response message as follows:

1. The protocol client sends the PivotTable custom filter or PivotTable manual filter to be applied, and the information identifying the PivotTable field in the **pivotFilterOptions** element.
2. The protocol server applies the PivotTable custom filter or PivotTable manual filter to the PivotTable field.

In the event of an application error on the protocol server during this operation, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be one of the values specified in section 2.2.9.4, and SHOULD<9> be one of the values described in the following table.

Id	Description
InvalidOrTimedOutSession	See section 2.2.9.5.
RetryError	See section 2.2.9.5.
OperationCanceled	See section 2.2.9.5.
InternalError	See section 2.2.9.5.
MultipleRequestsOnSession	See section 2.2.9.5.

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Id	Description
MaxRequestDurationExceeded	See section 2.2.9.5.

3.1.4.2.1 Messages

3.1.4.2.1.1 ApplyPivotFilterSoapIn

This message is the request message for **ApplyPivotFilter**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/Apply
PivotFilter
```

The SOAP body contains an **ApplyPivotFilter** element.

3.1.4.2.1.2 ApplyPivotFilterSoapOut

This message is the response message for **ApplyPivotFilter**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/Apply
PivotFilter
```

The SOAP body contains an **ApplyPivotFilterResponse** element.

3.1.4.2.2 Elements

3.1.4.2.2.1 ApplyPivotFilter

The **ApplyPivotFilter** element is specified as follows.

```
<s:element name="ApplyPivotFilter">
  <s:complexType>
    <s:sequence>
      <s:element name="parameter" type="tns:CommandParameter" minOccurs="0"/>
      <s:element name="pivotFilterOptions" type="tns:PivotFilterOptions" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

parameter: A **CommandParameter** as specified in section 2.2.4.11. MUST be present.

pivotFilterOptions: The **PivotTable** field identification and information about the PivotTable custom filter or PivotTable manual filter to apply. MUST be present. The following MUST extend or override the standard behavior specified in section 2.2.4.20:

- **FilterType:** MUST contain the value **Invalid** if a PivotTable manual filter is applied. Otherwise, it MUST contain one of the values used for PivotTable custom filter as specified in section 2.2.5.9.

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- **DataFieldId:** MUST NOT be present if **FilterType** is not used for PivotTable custom value filter as specified in **PivotFilterType**. Otherwise, MUST be present and equal to the **IdString** element of one of the **PivotField** elements nested under the **PivotDataFields** element of the **pivotMenu** element returned from the protocol server in the last call to **GetPivotMenu** (section 3.1.4.14).
- **MemberPropertyId:** MUST NOT be present if **FilterType** has the value **Invalid**. Otherwise, it MUST be present and equal to the **IdString** element of one of the **PivotField** elements nested under the **MemberProperties** element of the **PivotField** element that is the PivotTable field on which the filter is being applied if this is a member properties PivotTable custom filter, and MUST NOT be present otherwise.
- **FilterValue1:** MUST NOT be present if **FilterType** has the value **Invalid**. Otherwise, it MUST NOT be present if **FilterType** supports zero PivotTable filter parameters as specified in **PivotFilterType**. Otherwise, it MUST be present and contain the value of the first PivotTable filter parameter.
- **FilterValue2:** MUST NOT be present if **FilterType** has the value **Invalid**. Otherwise, it MUST NOT be present if **FilterType** supports zero or one PivotTable filter parameters as specified in **PivotFilterType**. Otherwise, it MUST be present and contain the value of the second PivotTable filter parameter.
- **Items:** MUST be present if **FilterType** has the value **Invalid**. MUST contain one or more elements that MUST be equal to the **Id** element of one of the **PivotFilterItem** elements nested under the **itemList** element returned from the protocol server in the last call to **GetPivotFilterItemList** (section 3.1.4.13.2.1). Otherwise, MUST NOT be present.

3.1.4.2.2.2 ApplyPivotFilterResponse

If the operation succeeds it MUST return an **ApplyPivotFilterResponse** as follows.

```
<s:element name="ApplyPivotFilterResponse">
  <s:complexType>
    <s:sequence>
      <s:element name="ApplyPivotFilterResult" type="tns:CommandResult" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

ApplyPivotFilterResult: A **CommandResult** as specified in section 2.2.4.12. MUST be present.

3.1.4.3 ApplyPivotSort

This operation is used to change the sort order (2) of a **PivotTable** field in the workbook.

```
<wsdl:operation name="ApplyPivotSort">
    <wsdl:input message="ApplyPivotSortSoapIn" />
    <wsdl:output message="ApplyPivotSortSoapOut" />
</wsdl:operation>
```

The protocol client sends an **ApplyPivotSortSoapIn** request message, and the protocol server responds with an **ApplyPivotSortSoapOut** response message, as follows:

- The protocol client sends the information identifying the **PivotTable** field in the **pivotFilterOptions** element.

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In the event of an application error on the protocol server during this operation, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be one of the values specified in section 2.2.9.4, and SHOULD<10> be one of the values described in the following table.

Id	Description
InvalidOrTimedOutSession	See section 2.2.9.5.
RetryError	See section 2.2.9.5.
OperationCanceled	See section 2.2.9.5.
InternalError	See section 2.2.9.5.
MultipleRequestsOnSession	See section 2.2.9.5.
MaxRequestDurationExceeded	See section 2.2.9.5.

3.1.4.3.1 Messages

3.1.4.3.1.1 ApplyPivotSortSoapIn

This message is the request message for **ApplyPivotSortResponse**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/Apply
PivotSort
```

The SOAP body contains an **ApplyPivotSort** element.

3.1.4.3.1.2 ApplyPivotSortSoapOut

This message is the response message for **ApplyPivotSortResponse**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/Apply
PivotSort
```

The SOAP body contains an **ApplyPivotSortResponse** element.

3.1.4.3.2 Elements

3.1.4.3.2.1 ApplyPivotSort

The **ApplyPivotSort** element is specified as follows.

```
<s:element name="ApplyPivotSort">
  <s:complexType>
    <s:sequence>
      <s:element name="parameter" type="tns:CommandParameter" minOccurs="0"/>
      <s:element name="pivotFilterOptions" type="tns:PivotFilterOptions" minOccurs="0"/>
```


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```
      <s:element name="ascending" type="s:boolean"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

parameter: A **CommandParameter** as specified in section 2.2.4.11. MUST be present.

pivotFilterOptions: The **PivotTable** field identification as specified in section 2.2.4.20. MUST be present.

ascending: The sort order (2) to apply to the **PivotTable** field. A **true** value specifies an ascending order, and a **false** value specifies a descending order.

3.1.4.3.2.2 ApplyPivotSortResponse

If the operation succeeds it MUST return an **ApplyPivotSortResponse** as follows.

```
<s:element name="ApplyPivotSortResponse">
  <s:complexType>
    <s:sequence>
      <s:element name="ApplyPivotSortResult" type="tns:CommandResult" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

ApplyPivotSortResult: A **CommandResult** as specified in section 2.2.4.12. MUST be present.

3.1.4.4 ApplyPivotTop10Filter

This operation is used to apply a top N filter or a bottom N filter on a PivotTable field.

```
<wsdl:operation name="ApplyPivotTop10Filter">
    <wsdl:input message="ApplyPivotTop10FilterSoapIn" />
    <wsdl:output message="ApplyPivotTop10FilterSoapOut" />
</wsdl:operation>
```

The protocol client sends an **ApplyPivotTop10FilterSoapIn** request message, and the protocol server responds with an **ApplyPivotTop10FilterSoapOut** response message, as follows:

1. The protocol client sends the top N filter or bottom N filter to be applied, and the information identifying the **PivotTable** field in the **pivotFilterOptions** element.
2. The protocol server applies the top N filter or bottom N filter to the **PivotTable** field.

In the event of an application error on the protocol server during this operation, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be one of the values specified in section 2.2.9.4, and SHOULD<11> be one of the values described in the following table.

Id	Description
InvalidOrTimedOutSession	See section 2.2.9.5.
RetryError	See section 2.2.9.5.

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Id	Description
OperationCanceled	See section 2.2.9.5.
InternalError	See section 2.2.9.5.
MultipleRequestsOnSession	See section 2.2.9.5.
MaxRequestDurationExceeded	See section 2.2.9.5.

3.1.4.4.1 Messages

3.1.4.4.1.1 ApplyPivotTop10FilterSoapIn

This message is the request message for **ApplyPivotTop10Filter**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/Apply
PivotTop10Filter
```

The SOAP body contains an **ApplyPivotTop10Filter** element.

3.1.4.4.1.2 ApplyPivotTop10FilterSoapOut

This message is the response message for **ApplyPivotTop10Filter**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/Apply
PivotTop10Filter
```

The SOAP body contains an **ApplyPivotTop10FilterResponse** element.

3.1.4.4.2 Elements

3.1.4.4.2.1 ApplyPivotTop10Filter

The **ApplyPivotTop10Filter** element is specified as follows.

```
<s:element name="ApplyPivotTop10Filter">
  <s:complexType>
    <s:sequence>
      <s:element name="parameter" type="tns:CommandParameter" minOccurs="0"/>
      <s:element name="pivotFilterOptions" type="tns:PivotFilterOptions" minOccurs="0"/>
      <s:element name="top" type="s:boolean"/>
      <s:element name="value" type="s:double"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

parameter: A **CommandParameter** as specified in section 2.2.4.11. MUST be present.

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pivotFilterOptions: The PivotTable field identification and information about the top N filter or bottom N filter to be applied. MUST be present. The following MUST extend or override the standard behavior specified in section 2.2.4.20:

- **DataFieldId** MUST be present and equal to the **IdString** element of one of the **PivotField** elements nested under the **PivotDataFields** element of the **pivotMenu** element returned from the protocol server in the last call to **GetPivotMenu** (section 3.1.4.14).
- **FilterType** MUST be one of the following values, as specified in **PivotFilterType** (section 2.2.5.9): **FirstTop10**, **Percent**, **Sum**.

top: Specifies whether a top N filter or a bottom N filter is performed. MUST be set to **true** to perform a top N filter, and MUST be set to **false** to perform a bottom N filter.

value: The PivotTable filter parameter. If the value of the **FilterType** element of the **pivotFilterOptions** element is **FirstTop10**, **value** MUST be greater than or equal to 0 and less than or equal to the value of the **Top10MaxItems** element of the **pivotMenu** element returned from the protocol server in the last call to **GetPivotMenu**. If the value of the **FilterType** element of the **pivotFilterOptions** element is **Percent**, **value** MUST be greater than or equal to 0 and less than or equal to 100. If the value of the **FilterType** element of the **pivotFilterOptions** element is **Sum**, **value** MUST be greater than or equal to 0.

3.1.4.4.2.2 ApplyPivotTop10FilterResponse

If the operation succeeds it MUST return an **ApplyPivotTop10FilterResponse** as follows.

```
<s:element name="ApplyPivotTop10FilterResponse">
  <s:complexType>
    <s:sequence>
      <s:element name="ApplyPivotTop10FilterResult" type="tns:CommandResult" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

ApplyPivotTop10FilterResult: A **CommandResult** as specified in section 2.2.4.12. MUST be present.

3.1.4.5 ApplyTop10Filter

This operation is used to apply a top N filter or a bottom N filter on a column (2) in a worksheet or in a table.

```
<wsdl:operation name="ApplyTop10Filter">
    <wsdl:input message="ApplyTop10FilterSoapIn" />
    <wsdl:output message="ApplyTop10FilterSoapOut" />
</wsdl:operation>
```

The protocol client sends an **ApplyTop10FilterSoapIn** request message, and the protocol server responds with an **ApplyTop10FilterSoapOut** response message, as follows:

- The protocol client MUST NOT call this operation on auto filters that have their **DataType** attribute in the **AutoFilters** element (Section 2.2.4.24.18) present and with a value different from **Number**.

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In the event of an application error on the protocol server during this operation, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be one of the values specified in section 2.2.9.4, and SHOULD<12> be one of the values described in the following table.

Id	Description
InvalidOrTimedOutSession	See section 2.2.9.5.
RetryError	See section 2.2.9.5.
OperationCanceled	See section 2.2.9.5.
InternalError	See section 2.2.9.5.
MultipleRequestsOnSession	See section 2.2.9.5.
MaxRequestDurationExceeded	See section 2.2.9.5.
InvalidSheetName	The protocol server could not find a worksheet with the name that is in the **SheetName** element.

3.1.4.5.1 Messages

3.1.4.5.1.1 ApplyTop10FilterSoapIn

This message is the request message for **ApplyTop10Filter**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/ApplyTop10Filter
```

The SOAP body contains an **ApplyTop10Filter** element.

3.1.4.5.1.2 ApplyTop10FilterSoapOut

This message is the response message for **ApplyTop10Filter**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/ApplyTop10Filter
```

The SOAP body contains an **ApplyTop10FilterResponse** element.

3.1.4.5.2 Elements

3.1.4.5.2.1 ApplyTop10Filter

The **ApplyTop10Filter** element is specified as follows.

```
<s:element name="ApplyTop10Filter">
  <s:complexType>
```


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```
      <s:sequence>
        <s:element name="parameter" type="tns:CommandParameter" minOccurs="0"/>
        <s:element name="autoFilterOptions" type="tns:AutoFilterOptions" minOccurs="0"/>
        <s:element name="top" type="s:boolean"/>
        <s:element name="percent" type="s:boolean"/>
        <s:element name="value" type="s:int"/>
      </s:sequence>
    </s:complexType>
  </s:element>
```

parameter: A **CommandParameter** as specified in section 2.2.4.11. MUST be present.

autoFilterOptions: The options to be used when filtering the AutoFilter column (2). See section 2.2.4.10. The **CriteriaType** element MUST have the value of "Nil". The **Criteria** element MUST NOT be present.

top: Specifies whether to apply the top N filter or bottom N filter. If **true**, the protocol server MUST apply a top N filter on the specified column (2). If **false**, the protocol server MUST apply a bottom N filter on the specified column (2).

percent: Specifies whether the top N filter or bottom N filter is based on percentage of the total sum of values in the column (2) or not. If **true**, the protocol server applies a top N filter by percent or a bottom N filter by percent on the specified column (2). If **false**, the protocol server applies a top N filter by count or a bottom N filter by count on the specified column (2).

value: The value to be used when applying the top N filter or bottom N filter. If **percent** is **true,** the value of **value** MUST be greater than or equal to 0 and less than or equals to 100. If **percent** is **false,** the value of **value** MUST be greater than 0 and less than or equals to 500.

3.1.4.5.2.2 ApplyTop10FilterResponse

If the operation succeeds it MUST return an **ApplyTop10FilterResponse** as follows.

```
<s:element name="ApplyTop10FilterResponse">
  <s:complexType>
    <s:sequence>
      <s:element name="ApplyTop10FilterResult" type="tns:CommandResult" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

ApplyTop10FilterResult: A **CommandResult** as specified in section 2.2.4.12. MUST be present.

3.1.4.6 CancelRequest

This operation is used to cancel an operation that is currently running on the protocol server.

```
<wsdl:operation name="CancelRequest">
    <wsdl:input message="CancelRequestSoapIn" />
    <wsdl:output message="CancelRequestSoapOut" />
</wsdl:operation>
```

The protocol client sends a **CancelRequestSoapIn** request message, and the protocol server responds with a **CancelRequestSoapOut** response message, as follows:

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- The protocol server SHOULD<13> try to cancel all requests currently running on the protocol server against the session (2) specified inside the **parameter** element as specified in **CancelRequestSoapIn** (section 3.1.4.6.1.1). The **CancelRequest** operation MUST NOT fail if no operation is currently running or if an operation that is currently running cannot be cancelled.

In the event of an application error on the protocol server during this operation, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be one of the values specified in section 2.2.9.4, and SHOULD<14> be one of the values described in the following table.

Id	Description
InvalidOrTimedOutSession	See section 2.2.9.5.
RetryError	See section 2.2.9.5.
InternalError	See section 2.2.9.5.

3.1.4.6.1 Messages

3.1.4.6.1.1 CancelRequestSoapIn

This message is the request message for **CancelRequest**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/Cancel
lRequest
```

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

3.1.4.6.1.2 CancelRequestSoapOut

This message is the response message for **CancelRequest**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/Cancel
lRequest
```

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

3.1.4.6.2 Elements

3.1.4.6.2.1 CancelRequest

The **CancelRequest** element is specified as follows.

```
<s:element name="CancelRequest">
  <s:complexType>
    <s:sequence>
      <s:element name="parameter" type="tns:CommandParameter" minOccurs="0"/>
    </s:sequence>
```


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```
    </s:complexType>
  </s:element>
```

parameter: Common operation parameters. MUST be present. The **WorkbookId** element of the **CommandParameter** complex type MUST be present. The **WorkOnBehalfRequest** element of the **CommandParameter** complex type MUST be as specified in section 2.2.4.11. All other elements MUST be ignored by the protocol server.

3.1.4.6.2.2 CancelRequestResponse

If the operation succeeds it MUST return the **CancelRequestResponse** as follows.

```
<s:element name="CancelRequestResponse">
  <s:complexType/>
</s:element>
```

3.1.4.7 CloseWorkbook

This operation is used to close a session (2) on the protocol server.

```
<wsdl:operation name="CloseWorkbook">
    <wsdl:input message="CloseWorkbookSoapIn" />
    <wsdl:output message="CloseWorkbookSoapOut" />
</wsdl:operation>
```

The protocol client sends a **CloseWorkbookSoapIn** request message, and the protocol server responds with a **CloseWorkbookSoapOut** response message, as follows:

- The protocol server MUST close the session (2) specified in the **parameter** element as specified in **CloseWorkbookSoapIn** (section 3.1.4.7.1.1).

In the event of an application error on the protocol server during this operation, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be one of the values specified in section 2.2.9.4, and SHOULD<15> be one of the values described in the following table.

Id	Description
InvalidOrTimedOutSession	See section 2.2.9.5.
RetryError	See section 2.2.9.5.
InternalError	See section 2.2.9.5.

3.1.4.7.1 Messages

3.1.4.7.1.1 CloseWorkbookSoapIn

This message is the request message for **CloseWorkbook**.

The SOAP action value of the message is defined as follows.

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```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/CloseWorkbook
```

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

3.1.4.7.1.2 CloseWorkbookSoapOut

This message is the response message for **CloseWorkbook**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/CloseWorkbook
```

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

3.1.4.7.2 Elements

3.1.4.7.2.1 CloseWorkbook

The **CloseWorkbook** element is specified as follows.

```
<s:element name="CloseWorkbook">
  <s:complexType>
    <s:sequence>
      <s:element name="parameter" type="tns:CommandParameter" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

parameter: Common operation parameters. MUST be present. The **WorkbookId** element of the **CommandParameter** complex type MUST be present. The **WorkOnBehalfRequest** element of the **CommandParameter** complex type MUST be as specified in section 2.2.4.11. All other elements MUST be ignored by the protocol server.

3.1.4.7.2.2 CloseWorkbookResponse

If the operation succeeds it MUST return the **CloseWorkbookResponse** as follows.

```
<s:element name="CloseWorkbookResponse">
  <s:complexType/>
</s:element>
```

3.1.4.8 ConnectAndGetPivotFilterItemList

This operation is used to return the PivotTable members that are part of a PivotTable manual filter hierarchy.

```
<wsdl:operation name="ConnectAndGetPivotFilterItemList">
    <wsdl:input message="ConnectAndGetPivotFilterItemListSoapIn" />
    <wsdl:output message="ConnectAndGetPivotFilterItemListSoapOut" />
```


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```
</wsdl:operation>
```

The protocol client sends a **ConnectAndGetPivotFilterItemListSoapIn** request message, and the protocol server responds with a **ConnectAndGetPivotFilterItemListSoapOut** response message, as follows:

1. The protocol client sends the information identifying the PivotTable manual filter in the **pivotFilterOptions** element.
2. The protocol server returns the hierarchy of PivotTable members in **itemList**. The **PivotFilterItems** element of **itemList** MUST contain the list (2) of all the PivotTable members at the top hierarchy level of the PivotTable manual filter if there are no more than 1000 such PivotTable members, and MUST contain the first 1000 such PivotTable members if there are more than 1000 such PivotTable members. The **ItemListMaxExceeded** element of **itemList** MUST be set to **true** if there are more than 1000 PivotTable members at the top hierarchy level of the PivotTable manual filter and MUST be set to **false** otherwise.

In the event of an application error on the protocol server during this operation, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the ExcelServerMessage MUST be one of the values specified in section 2.2.9.4, and SHOULD<16> be one of the following values described in the following table.

Id	Description
InvalidOrTimedOutSession	See section 2.2.9.5.
RetryError	See section 2.2.9.5.
OperationCanceled	See section 2.2.9.5.
InternalError	See section 2.2.9.5.
MultipleRequestsOnSession	See section 2.2.9.5.
MaxRequestDurationExceeded	See section 2.2.9.5.

3.1.4.8.1 Messages

3.1.4.8.1.1 ConnectAndGetPivotFilterItemListSoapIn

This message is the request message for **ConnectAndGetPivotFilterItemList**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/Connect
AndGetPivotFilterItemList
```

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

3.1.4.8.1.2 ConnectAndGetPivotFilterItemListSoapOut

This message is the response message for **ConnectAndGetPivotFilterItemList**.

The SOAP action value of the message is defined as follows.

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```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/Connect
AndGetPivotFilterItemList
```

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

3.1.4.8.2 Elements

3.1.4.8.2.1 ConnectAndGetPivotFilterItemList

The **ConnectAndGetPivotFilterItemList** element is specified as follows.

```
<s:element name="ConnectAndGetPivotFilterItemList">
  <s:complexType>
    <s:sequence>
      <s:element name="parameter" type="tns:CommandParameter" minOccurs="0"/>
      <s:element name="pivotFilterOptions" type="tns:PivotFilterOptions" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

parameter: A **CommandParameter** as specified in section 2.2.4.11. MUST be present.

pivotFilterOptions: The PivotTable manual filter location. MUST be present. The following MUST extend or override the standard behavior specified in section 2.2.4.20:

- **ParentId** MUST be -1.

3.1.4.8.2.2 ConnectAndGetPivotFilterItemListResponse

If the operation succeeds it MUST return a **ConnectAndGetPivotFilterItemListResponse** as follows.

```
<s:element name="ConnectAndGetPivotFilterItemListResponse">
  <s:complexType>
    <s:sequence>
      <s:element name="ConnectAndGetPivotFilterItemListResult" type="tns:CommandResult"
minOccurs="0"/>
      <s:element name="itemList" type="tns:PivotFilterItemList" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

ConnectAndGetPivotFilterItemListResult: A **CommandResult** as specified in section 2.2.4.12. MUST be present.

itemList: The list (2) of PivotTable members at the top hierarchy level of the PivotTable manual filter. MUST be present.

3.1.4.9 ExpandCollapseOutline

This operation is used to toggle the outline state in the workbook.

```
<wsdl:operation name="ExpandCollapseOutline">
```


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```
    <wsdl:input message="ExpandCollapseOutlineSoapIn" />
    <wsdl:output message="ExpandCollapseOutlineSoapOut" />
</wsdl:operation>
```

The protocol client sends an **ExpandCollapseOutlineSoapIn** request message, and the protocol server responds with an **ExpandCollapseOutlineSoapOut** response message, as follows:

- The protocol server MUST **outline expand** the outline state if the outline is in a **collapsed outline state**. The protocol server MUST **outline collapse** the outline state if the outline is in an **expanded outline state**.

In the event of an application error on the protocol server during this operation, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be one of the values specified in section 2.2.9.4, and SHOULD<17> be one of the values described in the following table.

Id	Description
InvalidOrTimedOutSession	See section 2.2.9.5.
RetryError	See section 2.2.9.5.
OperationCanceled	See section 2.2.9.5.
InternalError	See section 2.2.9.5.
MaxRequestDurationExceeded	See section 2.2.9.5.
MultipleRequestsOnSession	See section 2.2.9.5.

3.1.4.9.1 Messages

3.1.4.9.1.1 ExpandCollapseOutlineSoapIn

This message is the request message for **ExpandCollapseOutline**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/ExpandCollapseOutline
```

The SOAP body contains an **ExpandCollapseOutline** element.

3.1.4.9.1.2 ExpandCollapseOutlineSoapOut

This message is the response message for **ExpandCollapseOutline**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/ExpandCollapseOutline
```

The SOAP body contains an **ExpandCollapseOutlineResponse** element.

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3.1.4.9.2 Elements

3.1.4.9.2.1 ExpandCollapseOutline

The **ExpandCollapseOutline** element is specified as follows.

```
<s:element name="ExpandCollapseOutline">
  <s:complexType>
    <s:sequence>
      <s:element name="parameter" type="tns:CommandParameter" minOccurs="0"/>
      <s:element name="sheetName" type="s:string" minOccurs="0"/>
      <s:element name="outlineLevel" type="s:unsignedByte"/>
      <s:element name="rowColumn" type="s:int"/>
      <s:element name="row" type="s:boolean"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

parameter: A **CommandParameter** as specified in section 2.2.4.11. MUST be present.

sheetName: The name of the worksheet or named object containing the outline. MUST be present. If the **ObjectName** element of **VisibleSheetRange** (section 2.2.4.25) is present and not empty, then the value of the **sheetName** element MUST be equal to the value of the **ObjectName** element of **VisibleSheetRange**. If the value of the **sheetName** element is empty or is longer than 31 characters, then the protocol server MUST return an **ExcelServerMessag**e as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be **InternalError**. If the **ObjectName** element of **VisibleSheetRange** is not present, then the value of the **sheetName** element MUST be equal to the value of the **SheetName** element of **VisibleSheetRange**.

outlineLevel: The outline level (2) to outline expand or outline collapse. MUST be greater than or equal to 1 and less than or equal to 8.

rowColumn: The zero-based column (2) or row (2) index of the location of the outline. MUST be greater than or equal to –1. If the **row** element is set to **true**, **rowColumn** MUST be less than or equal to 1048575. If the **row** element is set to **false**, **rowColumn** MUST be less than or equal to 16383. A value of –1 specifies that all outlines at the value of **outlineLevel** MUST be outline expanded or outline collapsed. If **rowColumn** contains a positive value, the following apply:

- If the value of the **row (2)** element is **true**, then the value of **outlineLevel** element MUST be the value specified for the **outlineLevel** attribute of the **RowAxisItem** element (Section 2.2.4.24.36) that corresponds to row (2) index.
- If the value of the **row (2)** element is **false**, then the value of **outlineLevel** element MUST be the value specified for the **outlineLevel** attribute of the **ColumnAxisItem** element (Section 2.2.4.24.37) that corresponds to column (2) index.

row (2): The axis location of the outline specified by the **rowColumn** element. If **true** the outline is located on a row (2). If **false** the outline is located on a column (2).

3.1.4.9.2.2 ExpandCollapseOutlineResponse

If the operation succeeds it MUST return an **ExpandCollapseOutlineResponse** as follows.

```
<s:element name="ExpandCollapseOutlineResponse">
  <s:complexType>
```


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```
      <s:sequence>
        <s:element name="ExpandCollapseOutlineResult" type="tns:CommandResult" minOccurs="0"/>
      </s:sequence>
    </s:complexType>
  </s:element>
```

ExpandCollapseOutlineResult: A **CommandResult** as specified in section 2.2.4.12. MUST be present.

3.1.4.10 FindRange

This operation is used to find a string inside a workbook.

```
<wsdl:operation name="FindRange">
    <wsdl:input message="FindRangeSoapIn" />
    <wsdl:output message="FindRangeSoapOut" />
</wsdl:operation>
```

The protocol client sends a **FindRangeSoapIn** request message, and the protocol server responds with a **FindRangeSoapOut** response message, as follows:

1. The protocol server searches for the string specified by **searchTerm**.
2. The search starts at the adjacent cell of the one specified by **searchAfterCell**, in the direction specified by **searchUp**.
3. If the **ObjectName** element in the **VisibleSheetRangeRequest** element in the **parameter** element is not present, the scope of the search is the worksheet specified by the **SheetName** element in the **searchAfterCell** element. Otherwise, the scope of the search is the named object specified by the **SheetName** element in the **searchAfterCell** element.

In the event of an application error on the protocol server during this operation, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be one of the values specified in section 2.2.9.4, and SHOULD<18> be one of the values described in the following table.

Id	Description
InvalidOrTimedOutSession	See section 2.2.9.5.
RetryError	See section 2.2.9.5.
OperationCanceled	See section 2.2.9.5.
InternalError	See section 2.2.9.5.
MultipleRequestsOnSession	See section 2.2.9.5.
MaxRequestDurationExceeded	See section 2.2.9.5.
NoOccurrencesFound	The protocol server could not match the string in the **searchTerm** element to any worksheet cell relevant to the search.

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3.1.4.10.1 Messages

3.1.4.10.1.1 FindRangeSoapIn

This message is the request message for **FindRange**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/FindRange
```

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

3.1.4.10.1.2 FindRangeSoapOut

This message is the response message for **FindRange**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/FindRange
```

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

3.1.4.10.2 Elements

3.1.4.10.2.1 FindRange

The **FindRange** element is specified as follows.

```
<s:element name="FindRange">
  <s:complexType>
    <s:sequence>
      <s:element name="parameter" type="tns:CommandParameter" minOccurs="0"/>
      <s:element name="searchTerm" type="s:string" minOccurs="0"/>
      <s:element name="searchUp" type="s:boolean"/>
      <s:element name="searchAfterCell" type="tns:SheetCell" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

parameter: A **CommandParameter** as specified in section 2.2.4.11.

- MUST be present.
- The **VisibleSheetRangeRequest** element MUST be present.

searchTerm: The string to search for in the workbook. MUST be present. MUST NOT be empty. MUST NOT be longer than 255 characters.

searchUp: Specifies the search direction. MUST be present. A value of **true** specifies to **search up**. A value of **false** specifies to **search down**.

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searchAfterCell: Specifies the starting point of the search. The **SheetName** element of the **SheetCell** complex type MUST be present and MUST NOT be empty. If **SheetName** is the name of a worksheet, the following apply:

- It MUST NOT be longer than 31 characters.
- The value of the **SheetName** element of **VisibleSheetRange** element (section 2.2.4.25) in **parameter**, MUST be equal to this value.

If **SheetName** is not the name of a worksheet, the following apply:

- If the value of the **SheetName** element is longer than 287 characters, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be **InternalError**.
- The value of the **ObjectName** element of **VisibleSheetRange** element in **parameter**, MUST be equal to this value.

3.1.4.10.2.2 FindRangeResponse

If the operation succeeds it MUST return a **FindRangeResponse** as follows.

```
<s:element name="FindRangeResponse">
  <s:complexType>
    <s:sequence>
      <s:element name="FindRangeResult" type="tns:CommandResult" minOccurs="0"/>
      <s:element name="foundCell" type="tns:SheetCell" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

FindRangeResult: A **CommandResult** as specified in section 2.2.4.12. MUST be present.

foundCell: A worksheet cell that contains the term specified by the **searchTerm** element. MUST be present. The **SheetName** element of the **SheetCell** complex type MUST NOT be present.

3.1.4.10.3 Complex Types

3.1.4.10.3.1 SheetCell

The **SheetCell** complex type is used to specify a worksheet cell location on a worksheet or on a named object.

```
<s:complexType name="SheetCell">
  <s:sequence>
    <s:element name="SheetName" type="s:string" minOccurs="0"/>
    <s:element name="Row" type="s:int"/>
    <s:element name="Column" type="s:int"/>
  </s:sequence>
</s:complexType>
```

SheetName: If present, the name of a worksheet or of a named object.

Row: The zero-based row (2) of the location that is being specified, relative to the first row (2) of the worksheet or the named object which are the scope of the search. MUST be greater than or

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equal to -2 and less than or equal to 1048575. If the value of **searchUp** element is **false**, a negative value specifies to start search from the first row (2) of the worksheet or named object which are the scope of the search. If the value of **searchUp** element is **true**, a negative value specifies to start search from the last row (2) of the worksheet or named object which are the scope of the search.

Column: The zero-based column (2) of the location that is being specified, relative to the first column (2) of the worksheet or the named object which are the scope of the search. MUST be greater than or equal to -2 and less than or equal to 16383. If the value of **searchUp** element is **false**, a negative value specifies to start search from the first column (2) of the worksheet or named object which are the scope of the search. If the value of **searchUp** element is **true**, a negative value specifies to start search from the last column (2) of the worksheet or named object which are the scope of the search.

3.1.4.11 GetAutoFilterItemList

This operation is used to retrieve the filter values and filter date values and their caption in the **AutoFilterItemList** (section 3.1.4.11.3.1) in the operation response for an AutoFilter in the workbook.

```
<wsdl:operation name="GetAutoFilterItemList">
    <wsdl:input message="GetAutoFilterItemListSoapIn" />
    <wsdl:output message="GetAutoFilterItemListSoapOut" />
</wsdl:operation>
```

The protocol client sends a **GetAutoFilterItemListSoapIn** request message, and the protocol server responds with a **GetAutoFilterItemListSoapOut** response message, as follows:

1. The protocol server MUST fill the **AutoFilterItems** and **AutoFilterDateNodes** elements with information about the filtering:

2. The protocol server MUST add the filter values that exist in the AutoFilter with their current **filtering state** as specified in **AutoFilterItem** (section 3.1.4.11.3.3) and **AutoFilterItems**.

3. The protocol server MUST then add the filter date values that exist in the AutoFilter with their current filtering state as specified in **AutoFilterDateNodeInfo** (section 2.2.4.9) and **AutoFilterDateNodes**. The protocol server MUST also add the filter date value caption for the **Year**, **Month**, **Day**, **Hour**, **Minute**, and **Second** elements of the **AutoFilterDateNodeInfo** as follows:

4. Each unique value of the **Year** element in **AutoFilterDateNodeInfo** in the **AutoFilterDateNodes** element MUST be added by the protocol server to **YearKeys** element as specified in **YearKeys** element. The protocol server MUST also add the corresponding caption to **YearValues** as specified in **YearValues** element.

5. Each unique value of the **Month** element in **AutoFilterDateNodeInfo** in the **AutoFilterDateNodes** element MUST be added by the protocol server to **MonthKeys** element as specified in **MonthKeys** element. The protocol server MUST also add the corresponding caption to **MonthValues** as specified in **MonthValues** element.

6. Each unique value of the **Day** element in **AutoFilterDateNodeInfo** in the **AutoFilterDateNodes** element MUST be added by the protocol server to **DayKeys** element as specified in **DayKeys** element. The protocol server MUST also add the corresponding caption to **DayValues** as specified in **DayValues** element.

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7. Each unique value of the **Hour** element in **AutoFilterDateNodeInfo** in the **AutoFilterDateNodes** element MUST be added by the protocol server to **HourKeys** element as specified in **HourKeys** element. The protocol server MUST also add the corresponding caption to **HourValues** as specified in **HourValues** element.

8. Each unique value of the **Minute** element in **AutoFilterDateNodeInfo** in the **AutoFilterDateNodes** element MUST be added by the protocol server to **MinuteKeys** element as specified in **MinuteKeys** element. The protocol server MUST also add the corresponding caption to **MinuteValues** as specified in **MinuteValues** element.

9. Each unique value of the **Second** element in **AutoFilterDateNodeInfo** in the **AutoFilterDateNodes** element MUST be added by the protocol server to **SecondKeys** element as specified in **SecondKeys** element. The protocol server MUST also add the corresponding caption to **SecondValues** as specified in **SecondValues** element.

In the event of an application error on the protocol server during this operation, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be one of the values specified in section 2.2.9.4, and SHOULD<19> be one of the following values.

Id	Description
InvalidOrTimedOutSession	See section 2.2.9.5.
RetryError	See section 2.2.9.5.
OperationCanceled	See section 2.2.9.5.
InternalError	See section 2.2.9.5.
MultipleRequestsOnSession	See section 2.2.9.5.
MaxRequestDurationExceeded	See section 2.2.9.5.

3.1.4.11.1 Messages

3.1.4.11.1.1 GetAutoFilterItemListSoapIn

This message is the request message for **GetAutoFilterItemList**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/GetAutoFilterItemList
```

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

3.1.4.11.1.2 GetAutoFilterItemListSoapOut

This message is the response message for **GetAutoFilterItemList**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/GetAutoFilterItemList
```


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

3.1.4.11.2 Elements

3.1.4.11.2.1 GetAutoFilterItemList

The **GetAutoFilterItemList** element is specified as follows.

```
<s:element name="GetAutoFilterItemList">
  <s:complexType>
    <s:sequence>
      <s:element name="parameter" type="tns:CommandParameter" minOccurs="0"/>
      <s:element name="autoFilterOptions" type="tns:AutoFilterOptions" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

parameter: A **CommandParameter** as specified in section 2.2.4.11. MUST be present.

autoFilterOptions: The options to use when filtering the AutoFilter columns specified in section 2.2.4.10. MUST be present.

3.1.4.11.2.2 GetAutoFilterItemListResponse

If the operation succeeds it MUST return a **GetAutoFilterItemListResponse** as follows.

```
<s:element name="GetAutoFilterItemListResponse">
  <s:complexType>
    <s:sequence>
      <s:element name="GetAutoFilterItemListResult" type="tns:AutoFilterItemList"
minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

GetAutoFilterItemListResult: The filter values, filter date values and blank values filtering state of the AutoFilter as specified in **AutoFilterItemList** (section 3.1.4.11.3.1). MUST be present.

3.1.4.11.3 Complex Types

3.1.4.11.3.1 AutoFilterItemList

Specifies the filtering state of an AutoFilter on the protocol server in the **GetAutoFilterItemList** response (section 3.1.4.11.2.1).

```
<s:complexType name="AutoFilterItemList">
  <s:sequence>
    <s:element name="ShowTime" type="s:boolean"/>
    <s:element name="ItemListMaxExceeded" type="s:boolean"/>
    <s:element name="IsBlanksSelected" type="s:boolean"/>
    <s:element name="HasBlanks" type="s:boolean"/>
    <s:element name="AutoFilterDateNodes" type="tns:ArrayOfAutoFilterDateNodeInfo"
minOccurs="0"/>
    <s:element name="AutoFilterItems" type="tns:ArrayOfAutoFilterItem" minOccurs="0"/>
```


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```
      <s:element name="SecondValues" type="tns:ArrayOfAnyType" minOccurs="0"/>
      <s:element name="SecondKeys" type="tns:ArrayOfAnyType" minOccurs="0"/>
      <s:element name="MinuteValues" type="tns:ArrayOfAnyType" minOccurs="0"/>
      <s:element name="MinuteKeys" type="tns:ArrayOfAnyType" minOccurs="0"/>
      <s:element name="HourValues" type="tns:ArrayOfAnyType" minOccurs="0"/>
      <s:element name="HourKeys" type="tns:ArrayOfAnyType" minOccurs="0"/>
      <s:element name="DayValues" type="tns:ArrayOfAnyType" minOccurs="0"/>
      <s:element name="DayKeys" type="tns:ArrayOfAnyType" minOccurs="0"/>
      <s:element name="MonthValues" type="tns:ArrayOfAnyType" minOccurs="0"/>
      <s:element name="MonthKeys" type="tns:ArrayOfAnyType" minOccurs="0"/>
      <s:element name="YearValues" type="tns:ArrayOfAnyType" minOccurs="0"/>
      <s:element name="YearKeys" type="tns:ArrayOfAnyType" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
```

ShowTime: Specifies whether the AutoFilter filtering includes hour, minute and seconds. If the value is **true**, the following apply:

- The protocol client MUST ignore the **Second**, **Hour**, and **Minute** elements of the **AutoFilterDateNodeInfo** elements (section 2.2.4.9) contained in **AutoFilterDateNodes** element.
- The protocol client MUST ignore the **HourValues**, **HourKeys**, **MinuteValues**, **MinuteKeys**, **SecondValues**, and **SecondKeys** elements.

ItemListMaxExceeded: Specifies whether the number of filter values and filter date values in the AutoFilter is larger than 1000. The protocol server MUST set the value to **true** if it has more than 1000 elements for both the **AutoFilterDateNodes** and **AutoFilterItems** combined.

IsBlanksSelected: Specifies whether the AutoFilter is filtering blank values. The value set to **true** specifies that the AutoFilter filtering includes blank values, the value set to **false** specifies that AutoFilter filtering does not include filtering blank values. This value MUST be **false** if the value of the **HasBlanks** element is **false**.

HasBlanks: Specifies whether the AutoFilter contains a blank value. The value **true** specifies that blank values exist. The value **false** specifies that there is no blank value.

AutoFilterDateNodes: A list (2) of filter date values as specified in **AutoFilterDateNodeInfo**. MUST be present. If the list (2) contains 0 elements, the protocol client MUST ignore it. MUST NOT contain more than a 1000 **AutoFilterDateNodeInfo** elements. If the value of **ShowTime** element is **false**, then for all elements in the **AutoFilterDateNodes** element the filter date values for the **Hour**, **Minute**, and **Second** elements of the **AutoFilterDateNodeInfo** complex type MUST be set to 0. When the protocol client needs to determine the caption for the **Year, Month, Day, Hour, Minute or Second** elements of **AutoFilterDateNodeInfo**, it MUST do the following:

- For the **Year** element value in **AutoFilterDateNodeInfo**, determine the element index of a matching value in the **YearKeys** element and then access the value at the determined index in the **YearValues** element.
- For the **Month** element value in **AutoFilterDateNodeInfo**, determine the element index of a matching value in the **MonthKeys** element, and then accessing the value at the determined index in the **MonthValues** element.
- For the **Day** element value in **AutoFilterDateNodeInfo**, determine the element index of a matching value in the **DayKeys** element and then access the value at the determined index in the **DayValues** element.

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- For the **Hour** element value in **AutoFilterDateNodeInfo**, determine the element index of a matching value in the **HourKeys** element and then access the value at the determined index in the **HourValues** element.
- For the **Minute** element value in **AutoFilterDateNodeInfo**, determine the element index of a matching value in the **MinuteKeys** element and then access the value at the determined index in the **MinuteValues** element.
- For the **Second** element value in **AutoFilterDateNodeInfo**, determine the element index of a matching value in the **SecondKeys** element and then access the value at the determined index in the **SecondValues** element.

AutoFilterItems: A list (2) of filter values as specified in **ArrayOfAutoFilterItem** (section 3.1.4.11.3.2). MUST be present. If the list (2) contains 0 elements, the client protocol MUST ignore it. MUST NOT contain more than the subtraction of the count of **AutoFilterDateNodeInfo** in the **AutoFilterDateNodes** element from a 1000.

SecondValues: A list (2) of caption corresponding to second filter date values. MUST be present. The contained elements MUST be of type **s:string**. MUST be formatted in the data culture of the session (2). MUST contain 0 elements if the value of **ShowTime** is **false**.

SecondKeys: A sorted list (2) of number values that represent seconds. MUST be present. The contained elements MUST be of type **s:short**. MUST contain the same number of elements that **SecondValues** list (2) contains. The elements MUST be sorted by their values in ascending order. MUST NOT contain duplicate values. The index of each contained element in the list (2) MUST match the index of its corresponding display string value element in **SecondValues** list (2).

MinuteValues: A list (2) of caption corresponding to minute filter date values. MUST be present. The contained elements MUST be of type **s:string**. MUST be formatted in the data culture of the session (2). MUST contain 0 elements if the value of **ShowTime** is **false**.

MinuteKeys: A sorted list (2) of number values that represent minutes. MUST be present. The contained elements MUST be of type **s:short**. MUST contain the same number of elements that **MinuteValues** list (2) contains. The elements MUST be sorted by their values in ascending order. MUST NOT contain duplicate values. The index of each contained element in the list (2) MUST match the index of its corresponding display string value element in **MinuteValues** list (2).

HourValues: A list (2) of caption corresponding to hour filter date values. MUST be present. The contained elements MUST be of type **s:string**. MUST be formatted in the data culture of the session (2). MUST contain 0 elements if the value of **ShowTime** is **false**.

HourKeys: A sorted list (2) of number values that represent hours. MUST be present. The contained elements MUST be of type **s:short**. MUST contain the same number of elements that **HourValues** list (2) contains. The elements MUST be sorted by their values in ascending order. MUST NOT contain duplicate values. The index of each contained element in the list (2) MUST match the index of its corresponding display string value element in **HourValues** list (2).

DayValues: A list (2) of caption corresponding to day filter date values. MUST be present. The contained elements MUST be of type **s:string**. MUST be formatted in the data culture of the session (2).

DayKeys: A sorted list (2) of number values that represent days. MUST be present. The contained elements MUST be of type **s:short**. MUST contain the same number of elements that **DayValues** list (2) contains. The elements MUST be sorted by their values in ascending order. MUST NOT contain duplicate values. The index of each contained element in the list (2) MUST match the index of its corresponding display string value element in **DayValues** list (2).

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MonthValues: A list (2) of caption corresponding to month filter date values. MUST be present. The contained elements MUST be of type **s:string**. MUST be formatted in the data culture of the session (2).

MonthKeys: A sorted list (2) of number values that represent months. MUST be present. The contained elements MUST be of type **s:short**. MUST contain the same number of elements that **MonthValues** list (2) contains. The elements MUST be sorted by their values in ascending order. MUST NOT contain duplicate values. The index of each contained element in the list (2) MUST match the index of its corresponding display string value element in **MonthValues** list (2).

YearValues: A list (2) of caption corresponding to year filter date values. MUST be present. The contained elements MUST be of type **s:string**. MUST be formatted in the data culture of the session (2).

YearKeys: A sorted list (2) of number values that represent years. MUST be present. The contained elements MUST be of type **s:short**. MUST contain the same number of elements that **YearValues** list (2) contains. The elements MUST be sorted by their values in ascending order. MUST NOT contain duplicate values. The index of each contained element in the list (2) MUST match the index of its corresponding display string value element in **YearValues** list.

3.1.4.11.3.2 ArrayOfAutoFilterItem

A list of filter values caption and filtering state.

```
<s:complexType name="ArrayOfAutoFilterItem">
  <s:sequence>
    <s:element name="AutoFilterItem" type="tns:AutoFilterItem" minOccurs="0"
maxOccurs="unbounded"/>
  </s:sequence>
</s:complexType>
```

AutoFilterItem: A filter value as specified in **AutoFilterItem** (section 3.1.4.11.3.3).

3.1.4.11.3.3 AutoFilterItem

Specifies a filter value filtering state and its caption.

```
<s:complexType name="AutoFilterItem">
  <s:sequence>
    <s:element name="Selected" type="s:boolean"/>
    <s:element name="DisplayString" type="s:string" minOccurs="0"/>
  </s:sequence>
</s:complexType>
```

Selected: Specifies whether the filter value is included in the filter. A **true** value specifies that the filter value is included. A **false** value specifies that the filter value is excluded.

DisplayString: The caption of a filter value. MUST be present. The number of characters MUST be greater than or equal to 1 and less than or equal to 255.

3.1.4.12 GetImage

This operation is used to return a chart image.

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```
<wsdl:operation name="GetImage">
    <wsdl:input message="GetImageSoapIn" />
    <wsdl:output message="GetImageSoapOut" />
</wsdl:operation>
```

The protocol client sends a **GetImageSoapIn** request message, and the protocol server responds with a **GetImageSoapOut** response message, as follows:

- The protocol server MUST return a chart image as specified in the **imageId** field. The image MUST be in the format specified in [RFC2083].

In the event of an application error on the protocol server during this operation, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessag**e MUST be one of the values specified in section 2.2.9.4, and SHOULD<20> be one of the following values.

Id	Description
InvalidOrTimedOutSession	See section 2.2.9.5.
RetryError	See section 2.2.9.5.
OperationCanceled	See section 2.2.9.5.
InternalError	See section 2.2.9.5.
MaxRequestDurationExceeded	See section 2.2.9.5.

3.1.4.12.1 Messages

3.1.4.12.1.1 GetImageSoapIn

This message is the request message for **GetImage**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/GetImage
```

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

3.1.4.12.1.2 GetImageSoapOut

This message is the response message for **GetImage**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/GetImage
```

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

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3.1.4.12.2 Elements

3.1.4.12.2.1 GetImage

The **GetImage** element is specified as follows.

```
<s:element name="GetImage">
  <s:complexType>
    <s:sequence>
      <s:element name="parameter" type="tns:CommandParameter" minOccurs="0"/>
      <s:element name="imageId" type="s:string" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

parameter: A **CommandParameter** as specified in section 2.2.4.11. MUST be present.

imageId: The chart identifier. MUST be present. MUST NOT be empty. MUST be the value specified in **Image** element (Section 2.2.4.24.34).

3.1.4.12.2.2 GetImageResponse

If the operation succeeds it MUST return a **GetImageResponse** as follows.

```
<s:element name="GetImageResponse">
  <s:complexType>
    <s:sequence>
      <s:element name="GetImageResult" type="tns:CommandResult" minOccurs="0"/>
      <s:element name="imageFormatType" type="s:string" minOccurs="0"/>
      <s:element name="binaryChartImage" type="s:base64Binary" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

GetImageResult: A **CommandResult** as specified in section 2.2.4.12. MUST be present.

imageFormatType: The image format type that is present in the **binaryChartImage** field. MUST be the string "png".

binaryChartImage: The image of the chart. MUST be present. MUST be in the format specified in [RFC2083].

3.1.4.13 GetPivotFilterItemList

This operation is used to return child PivotTable members that are part of a PivotTable manual filter hierarchy. This operation is used after calling **ConnectAndGetPivotFilterItemList** (section 3.1.4.8) or after calling **GetPivotFilterItemList** for an **ancestor** in the hierarchy.

```
<wsdl:operation name="GetPivotFilterItemList">
    <wsdl:input message="GetPivotFilterItemListSoapIn" />
    <wsdl:output message="GetPivotFilterItemListSoapOut" />
</wsdl:operation>
```


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The protocol client sends a **GetPivotFilterItemListSoapIn** request message, and the protocol server responds with a **GetPivotFilterItemListSoapOut** response message, as follows:

1. The protocol client sends the following information in the **pivotFilterOptions** element:

   - The PivotTable manual filter.

   - The PivotTable member that is the common ancestor of all the PivotTable members in the hierarchy to be returned.

2. The protocol server returns the PivotTable members in **itemList**. The **PivotFilterItems** element of **itemList** MUST contain the list (2) of all the PivotTable members that are children of the PivotTable member that has an **Id** that is equal to the **ParentId** element of **pivotFilterOptions** if there are no more than 1000 such PivotTable members, and MUST contain the first 1000 such PivotTable members if there are more than 1000 such PivotTable members. The **ItemListMaxExceeded** element of **itemList** MUST be set to **true** if the PivotTable member who has an **Id** that is equal to the **ParentId** element of **pivotFilterOptions** has more than 1000 children PivotTable members and MUST be set to **false** otherwise.

In the event of an application error on the protocol server during this operation, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be one of the values specified in section 2.2.9.4, and SHOULD<21> be one of the following values.

Id	Description
InvalidOrTimedOutSession	See section 2.2.9.5.
RetryError	See section 2.2.9.5.
OperationCanceled	See section 2.2.9.5.
InternalError	See section 2.2.9.5.
MultipleRequestsOnSession	See section 2.2.9.5.
MaxRequestDurationExceeded	See section 2.2.9.5.

3.1.4.13.1 Messages

3.1.4.13.1.1 GetPivotFilterItemListSoapIn

This message is the request message for **GetPivotFilterItemList**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/GetPivotFilterItemList
```

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

3.1.4.13.1.2 GetPivotFilterItemListSoapOut

This message is the response message for **GetPivotFilterItemList**.

The SOAP action value of the message is defined as follows.

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```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/GetPivotFilterItemList
```

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

3.1.4.13.2 Elements

3.1.4.13.2.1 GetPivotFilterItemList

The **GetPivotFilterItemList** element is specified as follows.

```
<s:element name="GetPivotFilterItemList">
  <s:complexType>
    <s:sequence>
      <s:element name="parameter" type="tns:CommandParameter" minOccurs="0"/>
      <s:element name="pivotFilterOptions" type="tns:PivotFilterOptions" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

parameter: A **CommandParameter** as specified in section 2.2.4.11. MUST be present.

pivotFilterOptions: The PivotTable manual filter location. MUST be present. The following MUST extend or override the standard behavior specified in section 2.2.4.20:

- **ParentId:** MUST be set to the **Id** of the element whose children are to be returned. MUST be equal to the **Id** element of one of the nested **PivotFilterItem** elements returned in the **itemList** element in a previous call to **ConnectAndGetPivotFilterItemList** (section 3.1.4.8) or **GetPivotFilterItemList** (section 3.1.4.13) for the same PivotTable manual filter.

3.1.4.13.2.2 GetPivotFilterItemListResponse

If the operation succeeds it MUST return a **GetPivotFilterItemListResponse** as follows.

```
<s:element name="GetPivotFilterItemListResponse">
  <s:complexType>
    <s:sequence>
      <s:element name="GetPivotFilterItemListResult" type="tns:CommandResult" minOccurs="0"/>
      <s:element name="itemList" type="tns:PivotFilterItemList" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

GetPivotFilterItemListResult: A **CommandResult** as specified in section 2.2.4.12. MUST be present.

itemList: The list (2) of child PivotTable members. MUST be present.

3.1.4.14 GetPivotMenu

This operation is used to return information about a PivotTable area.

```
<wsdl:operation name="GetPivotMenu">
```


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```
    <wsdl:input message="GetPivotMenuSoapIn" />
    <wsdl:output message="GetPivotMenuSoapOut" />
</wsdl:operation>
```

The protocol client sends a **GetPivotMenuSoapIn** request message, and the protocol server responds with a **GetPivotMenuSoapOut** response message, as follows:

1. The protocol client sends the information identifying the PivotTable area in the **pivotFilterOptions** element.
2. The protocol server returns the PivotTable area information in the **pivotMenu** element.

In the event of an application error on the protocol server during this operation, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be one of the values specified in section 2.2.9.4, and SHOULD<22> be one of the following values.

Id	Description
InvalidOrTimedOutSession	See section 2.2.9.5.
RetryError	See section 2.2.9.5.
OperationCanceled	See section 2.2.9.5.
InternalError	See section 2.2.9.5.
MultipleRequestsOnSession	See section 2.2.9.5.
MaxRequestDurationExceeded	See section 2.2.9.5.

3.1.4.14.1 Messages

3.1.4.14.1.1 GetPivotMenuSoapIn

This message is the request message for **GetPivotMenu**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/GetPivotMenu
```

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

3.1.4.14.1.2 GetPivotMenuSoapOut

This message is the response message for **GetPivotMenu**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/GetPivotMenu
```

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

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3.1.4.14.2 Elements

3.1.4.14.2.1 GetPivotMenu

The **GetPivotMenu** element is specified as follows.

```
<s:element name="GetPivotMenu">
  <s:complexType>
    <s:sequence>
      <s:element name="parameter" type="tns:CommandParameter" minOccurs="0"/>
      <s:element name="pivotFilterOptions" type="tns:PivotFilterOptions" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

parameter: A **CommandParameter** as specified in section 2.2.4.11. MUST be present.

pivotFilterOptions: The PivotTable area location. MUST be present. The following MUST extend or override the standard behavior specified in section 2.2.4.20:

- **SourceIndex** MUST be 0.
- **FieldId** MUST NOT be present.

3.1.4.14.2.2 GetPivotMenuResponse

If the operation succeeds it MUST return a **GetPivotMenuResponse** as follows.

```
<s:element name="GetPivotMenuResponse">
  <s:complexType>
    <s:sequence>
      <s:element name="GetPivotMenuResult" type="tns:CommandResult" minOccurs="0"/>
      <s:element name="pivotMenu" type="tns:PivotMenu" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

GetPivotMenuResult: A **CommandResult** as specified in section 2.2.4.12. MUST be present.

pivotMenu: The information about the PivotTable area as specified in section 3.1.4.14.3.1. MUST be present.

3.1.4.14.3 Complex Types

3.1.4.14.3.1 PivotMenu

The **PivotMenu** type contains information about a PivotTable area that is returned by the protocol server.

```
<s:complexType name="PivotMenu">
  <s:sequence>
    <s:element name="Top10MaxItems" type="s:int"/>
    <s:element name="AdvancedFiltering" type="s:boolean"/>
    <s:element name="IsPageFilter" type="s:boolean"/>
```


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```
      <s:element name="PivotDataFields" type="tns:ArrayOfPivotField" minOccurs="0"/>
      <s:element name="PivotFields" type="tns:ArrayOfPivotField" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
```

Top10MaxItems: The maximum value to be used when applying a top N filter or a bottom N filter as specified in section 3.1.4.4.

AdvancedFiltering: Specifies whether the protocol server implementation supports PivotTable custom filters for the current PivotTable. MUST be set to **true** if the protocol server implementation supports PivotTable custom filters for the PivotTable that contains the current PivotTable area, and MUST be set to **false** otherwise.

IsPageFilter: Specifies whether the PivotTable area is a PivotTable page field filter. MUST be **true** if the PivotTable area is a PivotTable page field filter. MUST be **false** if the PivotTable area is not a PivotTable page field filter.

PivotDataFields: The list (2) of PivotTable data fields of the PivotTable. MUST be present. MUST contain the list (2) of all the PivotTable data fields of the PivotTable that contains the PivotTable area, in the same order as they appear in the PivotTable.

PivotFields: The list (2) of PivotTable fields of the PivotTable area. MUST be present. MUST contain the list (2) of all the **PivotTable** fields in the PivotTable area as follows:

- The first **PivotField** element in the **ArrayOfPivotField** MUST be the first hierarchy PivotTable field.
- The **PivotField** elements following a **PivotField** element in the **ArrayOfPivotField** that is a hierarchy PivotTable field MUST be all the **PivotTable** fields that belong to that hierarchy **PivotTable** field, ordered from the highest level **PivotTable** field to the lowest level PivotTable field.
- The **PivotField** element following a **PivotField** element in the **ArrayOfPivotField** that is the lowest level PivotTable field that belongs to a hierarchy PivotTable field that is not the last hierarchy **PivotTable** field of the PivotTable area MUST be the next hierarchy PivotTable fields of the PivotTable area.

3.1.4.14.3.2 ArrayOfPivotField

The **ArrayOfPivotField** type contains a list (2) of **PivotField** elements (section 3.1.4.14.3.3).

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

PivotField: A **PivotField** element that is a **PivotTable** field.

3.1.4.14.3.3 PivotField

The **PivotField** type contains information about a **PivotTable** field.

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```
<s:complexType name="PivotField">
  <s:sequence>
    <s:element name="MemberProperties" type="tns:ArrayOfPivotField" minOccurs="0"/>
    <s:element name="PivotFilterParameters" type="tns:ArrayOfPivotFilterParameter"
minOccurs="0"/>
    <s:element name="IsNonnumericCaptionFilteringEnabled" type="s:boolean"/>
    <s:element name="IsDateFilteringEnabled" type="s:boolean"/>
    <s:element name="IsCaptionFilteringEnabled" type="s:boolean"/>
    <s:element name="IsFilteringEnabled" type="s:boolean"/>
    <s:element name="IsDateField" type="s:boolean"/>
    <s:element name="IsDataField" type="s:boolean"/>
    <s:element name="FilterParameter" type="tns:Top10FilterParameter" minOccurs="0"/>
    <s:element name="IsSortedDescending" type="s:boolean"/>
    <s:element name="IsSortedAscending" type="s:boolean"/>
    <s:element name="HasCustomFilter" type="s:boolean"/>
    <s:element name="HasManualFilter" type="s:boolean"/>
    <s:element name="HasTop10Filter" type="s:boolean"/>
    <s:element name="IsHierarchy" type="s:boolean"/>
    <s:element name="IdString" type="s:string" minOccurs="0"/>
    <s:element name="DisplayString" type="s:string" minOccurs="0"/>
  </s:sequence>
</s:complexType>
```

MemberProperties: The list (2) of member properties for this **PivotTable** field MUST be present. If **IsDataField** is **true**, **MemberProperties** MUST contain zero **PivotField** elements. If **IsHierarchy** is **true**, **MemberProperties** MUST be ignored on receipt by the protocol client. If this **PivotField** element is nested inside a **MemberProperties** element, **MemberProperties** MUST contain zero **PivotField** elements. Otherwise, **MemberProperties** MUST contain the list (2) of all member properties associated with this **PivotTable** field.

PivotFilterParameters: The PivotTable custom filters applied to this **PivotTable** field MUST be present. MUST have zero **PivotFilterParameter** elements if **HasCustomFilter** is **false**. MUST have one **PivotFilterParameter** element if **HasCustomFilter** is **true**.

IsNonnumericCaptionFilteringEnabled: Specifies whether certain types of text PivotTable custom label filtering are allowed on this PivotTable field. If **IsDataField** is **true**, **IsNonnumericCaptionFilteringEnabled** MUST be ignored on receipt by the protocol client. If **IsHierarchy** is **true**, **IsNonnumericCaptionFilteringEnabled** MUST be ignored on receipt by the protocol client. If this **PivotField** element is a sub-element of a **MemberProperties** element, **IsNonnumericCaptionFilteringEnabled** MUST be ignored on receipt by the protocol client. Otherwise, **IsNonnumericCaptionFilteringEnabled** MUST be set to **true** if the following values for **FilterType** are allowed when calling **ApplyPivotFilter** (section 3.1.4.2) for this **PivotTable** field, and to **false** if they are not one of the following:

- CaptionBeginsWith
- CaptionDoesNotBeginWith
- CaptionEndsWith
- CaptionDoesNotEndWith
- CaptionContains
- CaptionDoesNotContain

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IsDateFilteringEnabled: Specifies whether PivotTable custom label filtering is allowed for dates on this **PivotTable** field. If **IsDataField** is **true**, **IsDateFilteringEnabled** MUST be ignored on receipt by the protocol client. If **IsHierarchy** is **true**, **IsDateFilteringEnabled** MUST be ignored on receipt by the protocol client. If this **PivotField** element is a sub-element of a **MemberProperties** element, **IsDateFilteringEnabled** MUST be ignored on receipt by the protocol client. Otherwise, **IsDateFilteringEnabled** MUST be set to **true** if the following values for **FilterType** are allowed when calling **ApplyPivotFilter** for this **PivotTable** field, and to **false** if they are not one of the following:

- DateEquals
- DateOlderThan
- DateNewerThan
- DateBetween
- DateTomorrow
- DateToday
- DateYesterday
- DateNextWeek
- DateThisWeek
- DateLastWeek
- DateNextMonth
- DateThisMonth
- DateLastMonth
- DateNextQuarter
- DateThisQuarter
- DateLastQuarter
- DateNextYear
- DateThisYear
- DateLastYear
- DateYearToDate
- DateAllDatesInPeriodQuarter1
- DateAllDatesInPeriodQuarter2
- DateAllDatesInPeriodQuarter3
- DateAllDatesInPeriodQuarter4
- DateAllDatesInPeriodJanuary

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- DateAllDatesInPeriodFebruary
- DateAllDatesInPeriodMarch
- DateAllDatesInPeriodApril
- DateAllDatesInPeriodMay
- DateAllDatesInPeriodJune
- DateAllDatesInPeriodJuly
- DateAllDatesInPeriodAugust
- DateAllDatesInPeriodSeptember
- DateAllDatesInPeriodOctober
- DateAllDatesInPeriodNovember
- DateAllDatesInPeriodDecember
- DateNotEqual
- DateOlderOrEqual
- DateNewerOrEqual
- DateNotBetween

IsCaptionFilteringEnabled: Specifies whether PivotTable custom label filtering is allowed for this PivotTable field. If **IsDataField** is **true**, **IsCaptionFilteringEnabled** MUST be ignored on receipt by the protocol client. If **IsHierarchy** is **true**, **IsCaptionFilteringEnabled** MUST be ignored on receipt by the protocol client. If this **PivotField** element is a sub-element of a **MemberProperties** element, **IsCaptionFilteringEnabled** MUST be ignored on receipt by the protocol client. Otherwise, **IsCaptionFilteringEnabled** MUST be set to **true** if values of **PivotFilterType** that support PivotTable custom label filtering as specified in **PivotFilterType** (section 2.2.5.9) are allowed when calling **ApplyPivotFilter** for this **PivotTable** field, and to **false** if it is not allowed.

IsFilteringEnabled: Specifies whether PivotTable custom filtering is allowed for this **PivotTable** field. If **IsDataField** is **true**, **IsFilteringEnabled** MUST be ignored on receipt by the protocol client. If **IsHierarchy** is **true**, **IsFilteringEnabled** MUST be ignored on receipt by the protocol client. If this **PivotField** element is a sub-element of a **MemberProperties** element, **IsFilteringEnabled** MUST be ignored on receipt by the protocol client. Otherwise, **IsFilteringEnabled** MUST be set to **true** if calls to **ApplyPivotFilter** are allowed for this **PivotTable** field, and it MUST be set to **false** otherwise.

IsDateField: Specifies whether this **PivotTable** field is a date. If **IsDataField** is **true**, **IsDateField** MUST be ignored on receipt by the protocol client. If **IsHierarchy** is **true**, **IsDateField** MUST be ignored on receipt by the protocol client. If this **PivotField** element is a sub-element of a **MemberProperties** element, **IsDateField** MUST be ignored on receipt by the protocol client. Otherwise, **IsDateField** MUST be set to **true** if the **PivotTable** field is a date **PivotTable** field, and to **false** otherwise.

IsDataField: Specifies whether this **PivotTable** field is a **PivotTable** data field. If this **PivotField** element is nested inside the **PivotDataFields** element of the **PivotMenu** (section 3.1.4.14.3.1), **IsDataField** MUST be set to **true**. If this **PivotField** element is nested inside a **MemberProperties**

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element, **IsDataField** MUST be set to **false**. If this element is nested inside the **PivotFields** element of the **PivotMenu**, **IsDataField** MUST be set to **false**.

FilterParameter: The top N filter or bottom N filter for this **PivotTable** field. If **IsDataField** is **true**, **FilterParameter** MUST NOT be present. If **IsHierarchy** is **true**, **FilterParameter** MUST be ignored on receipt by the protocol client. If this **PivotField** element is nested inside a **MemberProperties** element, **FilterParameter** MUST NOT be present. Otherwise, **FilterParameter** MUST NOT be present if **HasTop10Filter** is **false** and it MUST be present according to the specification in **Top10FilterParameter** (section 3.1.4.14.3.6) if **HasTop10Filter** is **true**.

IsSortedDescending: Specifies whether this **PivotTable** field is sorted in descending order. If **IsDataField** is **true**, **IsSortedDescending** MUST be ignored on receipt by the protocol client. If **IsHierarchy** is **true**, **IsSortedDescending** MUST be ignored on receipt by the protocol client. If this **PivotField** element is nested inside a **MemberProperties** element, **IsSortedDescending** MUST be ignored on receipt by the protocol client. Otherwise, **IsSortedDescending** MUST be set to **true** if the **PivotTable** field is sorted in descending order, and it MUST be set to **false** if the **PivotTable** field is sorted in ascending order or is not sorted.

IsSortedAscending: Specifies whether this **PivotTable** field is sorted in ascending order. If **IsDataField** is **true**, **IsSortedAscending** MUST be ignored on receipt by the protocol client. If **IsHierarchy** is **true**, **IsSortedAscending** MUST be ignored on receipt by the protocol client. If this **PivotField** element is nested inside a **MemberProperties** element, **IsSortedAscending** MUST be ignored on receipt by the protocol client. Otherwise, **IsSortedAscending** MUST be set to **true** if the **PivotTable** field is sorted in ascending order, and it MUST be set to **false** if the PivotTable field is sorted in descending order or is not sorted.

HasCustomFilter: Specifies whether there is a PivotTable custom filter applied to this **PivotTable** field. If **HasManualFilter** is **true** or **HasTop10Filter** is **true**, **HasCustomFilter** MUST be set to **false**. If **IsDataField** is **true**, **HasCustomFilter** MUST be **false**. If **IsHierarchy** is **true**, **HasCustomFilter** MUST be ignored on receipt by the protocol client. If this **PivotField** element is nested inside a **MemberProperties** element, **HasCustomFilter** MUST be ignored on receipt by the protocol client. Otherwise, **HasCustomFilter** MUST be set to **true** if there is a PivotTable custom filter applied to this **PivotTable** field and it MUST be set to **false** if there is no PivotTable custom filter applied to this **PivotTable** field.

HasManualFilter: Specifies whether there is a PivotTable manual filter applied to this **PivotTable** field. If **HasCustomFilter** is **true** or **HasTop10Filter** is **true**, **HasManualFilter** MUST be set to **false**. If **IsDataField** is **true**, **HasManualFilter** MUST be ignored on receipt by the protocol client. If **IsHierarchy** is **true**, **HasManualFilter** MUST be ignored on receipt by the protocol client. If this **PivotField** element is nested inside a **MemberProperties** element, **HasManualFilter** MUST be ignored on receipt by the protocol client. Otherwise, **HasManualFilter** MUST be set to **true** if there is a PivotTable manual filter applied to this **PivotTable** field and it MUST be set to **false** if there is no PivotTable manual filter applied to this **PivotTable** field.

HasTop10Filter: Specifies whether there is a top N filter or a bottom N filter applied to this PivotTable field. If **HasCustomFilter** is **true** or **HasManualFilter** is **true**, **HasTop10Filter** MUST be set to **false**. If **IsDataField** is **true**, **HasTop10Filter** MUST be ignored on receipt by the protocol client. If **IsHierarchy** is **true**, **HasTop10Filter** MUST be ignored on receipt by the protocol client. If this **PivotField** element is nested inside a **MemberProperties** element, **HasTop10Filter** MUST be ignored on receipt by the protocol client. Otherwise, **HasTop10Filter** MUST be set to **true** if the **PivotTable** field has a top N filter or a bottom N filter set. MUST be set to **false** if the PivotTable field does not have a top N filter or a bottom N filter set.

IsHierarchy: Specifies whether this **PivotTable** field is a hierarchy PivotTable field. If **IsDataField** is **true**, **IsHierarchy** MUST be ignored on receipt by the protocol client. If this **PivotField** element

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is nested inside a **MemberProperties** element, **IsHierarchy** MUST be set to **false**. Otherwise, **IsHierarchy** MUST be set to **true** if the PivotTable field is a hierarchy **PivotTable** field, and it MUST be set to **false** otherwise.

IdString: An identifier for the **PivotTable** field. MUST be present. MUST NOT be empty. If **IsDataField** is **true**, **IdString** MUST have a unique value among all the **IdString** elements of all the **PivotField** elements of the **PivotDataFields** element of the **PivotMenu**. If this **PivotField** element is nested inside a **MemberProperties** element, **IdString** MUST have a unique value across all the **IdString** elements of all the **PivotField** elements of all the **MemberProperties** elements of all the **PivotField** elements of the **PivotFields** element. Otherwise, **IdString** MUST have a unique value among all the **IdString** elements of all the **PivotField** elements of the **PivotFields** element of the **PivotMenu** that have the same value in the **IsHierarchy** field as this element.

DisplayString: The **PivotTable** field caption. MUST be present.

3.1.4.14.3.4 ArrayOfPivotFilterParameter

The **ArrayOfPivotFilterParameter** type contains a list (2) of **PivotFilterParameter** elements (section 3.1.4.14.3.5).

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

PivotFilterParameter: A **PivotFilterParameter** in the list (2).

3.1.4.14.3.5 PivotFilterParameter

The **PivotFilterParameter** type specifies a PivotTable custom filter applied to a **PivotTable** field.

```
<s:complexType name="PivotFilterParameter">
  <s:sequence>
    <s:element name="FilterString2" type="s:string" minOccurs="0"/>
    <s:element name="FilterString1" type="s:string" minOccurs="0"/>
    <s:element name="MemberPropertyId" type="s:string" minOccurs="0"/>
    <s:element name="DataFieldId" type="s:string" minOccurs="0"/>
    <s:element name="FilterType" type="tns:PivotFilterType"/>
    <s:element name="FilterValue2" type="s:double"/>
    <s:element name="FilterValue1" type="s:double"/>
  </s:sequence>
</s:complexType>
```

FilterString2: The second PivotTable filter parameter, if the filter type supports two PivotTable filter parameters and is used for PivotTable custom label filter. MUST be present. MUST be empty and MUST be ignored on receipt by the protocol client when **FilterType** supports zero parameters or one parameter, as specified in **PivotFilterType** (section 2.2.5.9). MUST be empty and MUST be ignored on receipt by the protocol client when **FilterType** is used for PivotTable custom value filter as specified in **PivotFilterType**. Otherwise, it MUST contain the value of the second PivotTable filter parameter.

FilterString1: The first PivotTable filter parameter, if the filter type supports one or two PivotTable filter parameters and is used for PivotTable custom label filter. MUST be present. MUST be empty

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and MUST be ignored on receipt by the protocol client when **FilterType** supports zero parameters, as specified in **PivotFilterType**. MUST be empty and MUST be ignored on receipt by the protocol client when **FilterType** is used for PivotTable custom value filter as specified in **PivotFilterType**. Otherwise, it MUST contain the value of the first PivotTable filter parameter.

MemberPropertyId: The identifier of the member property used with a PivotTable custom label filter on a member property. MUST be present. MUST be empty when **FilterType** is used for PivotTable custom value filter as specified in **PivotFilterType**. MUST be empty when **FilterType** is used for PivotTable custom label filter, as specified in **PivotFilterType**, but not on a member property. When **FilterType** is used with PivotTable custom label filter, as specified in **PivotFilterType** on a member property, **MemberPropertyId** MUST be equal to the **IdString** element of one of the **PivotField** elements of one of the **MemberProperties** elements of one of the **PivotField** elements of the **PivotFields** element of the **PivotMenu**.

DataFieldId: The identifier of the **PivotTable** data field used with a PivotTable custom value filter. MUST be present. MUST be empty when **FilterType** is not used with PivotTable custom value filter as specified in **PivotFilterType**. When **FilterType** is used for PivotTable custom value filter, as specified in **PivotFilterType**, **DataFieldId** MUST be equal to the **IdString** element of one of the **PivotField** elements of the **PivotDataFields** element of the **PivotMenu**.

FilterType: The type of the filter applied as specified in **PivotFilterType**. MUST be used with PivotTable custom label filter or with PivotTable custom value filter as specified in **PivotFilterType**.

FilterValue2: The second PivotTable filter parameter, if the filter type supports two PivotTable filter parameters and is used for PivotTable custom value filter. MUST be ignored on receipt by the protocol client when **FilterType** supports zero or one parameter as specified in **PivotFilterType**. MUST be ignored on receipt by the protocol client when **FilterType** is used with PivotTable custom label filter as specified in **PivotFilterType**. Otherwise, it MUST contain the value of the second PivotTable filter parameter.

FilterValue1: The first PivotTable filter parameter, if the filter type supports one or two PivotTable filter parameters and is used for PivotTable custom value filter. MUST be ignored on receipt by the protocol client when **FilterType** supports zero parameters, as specified in **PivotFilterType**. MUST be ignored on receipt by the protocol client when **FilterType** is used with PivotTable custom label filter as specified in **PivotFilterType**. Otherwise, it MUST contain the value of the first PivotTable filter parameter.

3.1.4.14.3.6 Top10FilterParameter

The **Top10FilterParameter** type contains information about the top N filter or bottom N filter that is applied to a PivotTable field.

```
<s:complexType name="Top10FilterParameter">
  <s:sequence>
    <s:element name="DataFieldId" type="s:string" minOccurs="0"/>
    <s:element name="FilterType" type="tns:Top10FilterType"/>
    <s:element name="FilterValue" type="s:double"/>
    <s:element name="IsTopFilter" type="s:boolean"/>
  </s:sequence>
</s:complexType>
```

DataFieldId: The unique identifier of the **PivotTable** data field to which the top N filter or bottom N filter is applied. MUST be equal to the **IdString** element of one of the **PivotField** elements in the **PivotDataFields** element of the **PivotMenu**.

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FilterType: The kind of the top N filter or bottom N filter as specified in section 3.1.4.14.4.1.

FilterValue: The value of the PivotTable filter parameter. If **FilterType** is **Count**, **FilterValue** MUST be greater than or equal to 1 and less than or equal to 2147483647. If **FilterType** is **Percent**, **FilterValue** MUST be greater than or equal to 0 and less than or equal to 100. If **FilterType** is **Sum**, **FilterValue** MUST be greater than or equal to 0.

IsTopFilter: Specifies whether this is a top N filter or a bottom N filter. MUST be **true** if a top N filter is applied. MUST be **false** if a bottom N filter is applied.

3.1.4.14.4 Simple Types

3.1.4.14.4.1 Top10FilterType

The **Top10FilterType** type is an enumeration that specifies the type of top N filter or bottom N filter that is applied to a PivotTable field.

```
<s:simpleType name="Top10FilterType">
  <s:restriction base="s:string">
    <s:enumeration value="Invalid"/>
    <s:enumeration value="Count"/>
    <s:enumeration value="Percent"/>
    <s:enumeration value="Sum"/>
  </s:restriction>
</s:simpleType>
```

The following table specifies possible values for **Top10FilterType**.

Value	Meaning
Invalid	This value MUST NOT be used.
Count	A top N filter by count or a bottom N filter by count is applied.
Percent	A top N filter by percent or a bottom N filter by percent is applied.
Sum	A top N filter by sum or a bottom N filter by sum is applied.

3.1.4.15 GetRange

This operation is used to get a **SpreadsheetDataXML** range (section 2.2.4.24).

```
<wsdl:operation name="GetRange">
    <wsdl:input message="GetRangeSoapIn" />
    <wsdl:output message="GetRangeSoapOut" />
</wsdl:operation>
```

The protocol client sends a **GetRangeSoapIn** request message, and the protocol server responds with a **GetRangeSoapOut** response message.

In the event of an application error on the protocol server during this operation, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be one of the values specified in section 2.2.9.4, and SHOULD<23> be one of the values described in the following table.

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Id	Description
InvalidOrTimedOutSession	See section 2.2.9.5.
RetryError	See section 2.2.9.5.
OperationCanceled	See section 2.2.9.5.
InternalError	See section 2.2.9.5.
MultipleRequestsOnSession	See section 2.2.9.5.
MaxRequestDurationExceeded	See section 2.2.9.5.

3.1.4.15.1 Messages

3.1.4.15.1.1 GetRangeSoapIn

This message is the request message for **GetRange**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/GetRange
```

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

3.1.4.15.1.2 GetRangeSoapOut

This message is the response message for **GetRange**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/GetRange
```

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

3.1.4.15.2 Elements

3.1.4.15.2.1 GetRange

The **GetRange** element is specified as follows.

```
<s:element name="GetRange">
  <s:complexType>
    <s:sequence>
      <s:element name="parameter" type="tns:CommandParameter" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

parameter: A **CommandParameter** as specified in section 2.2.4.11. MUST be present.

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3.1.4.15.2.2 GetRangeResponse

If the operation succeeds it MUST return a **GetRangeResponse** as follows.

```
<s:element name="GetRangeResponse">
  <s:complexType>
    <s:sequence>
      <s:element name="GetRangeResult" type="tns:CommandResult" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

GetRangeResult: A **CommandResult** as specified in section 2.2.4.12. MUST be present.

3.1.4.16 GetRangeValues

This operation is used to get the values contained in a specified range in a workbook.

```
<wsdl:operation name="GetRangeValues">
    <wsdl:input message="GetRangeValuesSoapIn" />
    <wsdl:output message="GetRangeValuesSoapOut" />
</wsdl:operation>
```

The protocol client sends a **GetRangeValuesSoapIn** request message, and the protocol server responds with a **GetRangeValuesSoapOut** response message, as follows:

1. If the **SheetName** element in the **sheetRange** element is empty, the protocol server MUST return the range from the first worksheet.

2. Depending on security settings, the protocol server MAY<24> return an error even if the requested range is present in the workbook.

3. Each element inside the **cellValues** element MUST be of type **ArrayOfAnyType** and be a row (2) of worksheet cells returned from the protocol server. The number of rows returned MUST be equal to the number of rows requested in the **SheetRange** element.

4. Each element inside each of the **ArrayOfAnyType** type nested inside **cellValues** MUST be a single workbook worksheet cell. The number of elements inside each such nested **ArrayOfAnyType** MUST be equal to the number of columns requested in the **sheetRange** element.

5. If **formatted** is **true**, all worksheet cells returned as part of the **cellValues** element MUST either be empty and with the **xsi:nil** attribute set to **true** when the worksheet cell does not contain data or be of type string and MUST be formatted using a **number format** according to how the worksheet cell is number formatted in the workbook.

6. If **formatted** is **false**, all worksheet cells returned as part of the **cellValues** element MUST either be empty and with the **xsi:nil** attribute set to **true** when the worksheet cell does not contain data or one of the following types: **boolean**, double, string or **CellError** (section 2.2.5.2).

In the event of an application error on the protocol server during this operation, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the ExcelServerMessage MUST be one of the values specified in section 2.2.9.4, and SHOULD<25> be one of the values described in the following table.

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Id	Description
InvalidOrTimedOutSession	See section 2.2.9.5.
RetryError	See section 2.2.9.5.
OperationCanceled	See section 2.2.9.5.
InternalError	See section 2.2.9.5.
MultipleRequestsOnSession	See section 2.2.9.5.
MaxRequestDurationExceeded	See section 2.2.9.5.
InvalidSheetName	The protocol server could not find a worksheet with the name specified in **SheetName** element inside the **sheetRange** element.

3.1.4.16.1 Messages

3.1.4.16.1.1 GetRangeValuesSoapIn

This message is the request message for **GetRangeValues**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/GetRangeValues
```

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

3.1.4.16.1.2 GetRangeValuesSoapOut

This message is the response message for **GetRangeValues**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/GetRangeValues
```

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

3.1.4.16.2 Elements

3.1.4.16.2.1 GetRangeValues

The **GetRangeValues** element is specified as follows.

```
<s:element name="GetRangeValues">
  <s:complexType>
    <s:sequence>
      <s:element name="parameter" type="tns:CommandParameter" minOccurs="0"/>
      <s:element name="sheetRange" type="tns:SheetRange" minOccurs="0"/>
      <s:element name="formatted" type="s:boolean"/>
    </s:sequence>
```


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```
    </s:complexType>
  </s:element>
```

parameter: A **CommandParameter** as specified in section 2.2.4.11. MUST be present. The following MUST extend or override the standard behavior specified in **CommandParameter**:

- **StateId** MUST be -1.
- **EwrCall** MUST be **false**.

sheetRange: The range that the protocol client requests data to be fetched from the protocol server. MUST be present.

formatted: Specifies whether or not the data retrieved is formatted. This element MUST be **true** if the values need to be formatted and **false** if the values do not need to be formatted.

3.1.4.16.2.2 GetRangeValuesResponse

If the operation succeeds it MUST return a **GetRangeValuesResponse** as follows.

```
<s:element name="GetRangeValuesResponse">
  <s:complexType>
    <s:sequence>
      <s:element name="GetRangeValuesResult" type="tns:CommandResult" minOccurs="0"/>
      <s:element name="cellValues" type="tns:ArrayOfAnyType" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

GetRangeValuesResult: A **CommandResult** as specified in section 2.2.4.12. MUST be present.

cellValues: The values returned from the protocol server. MUST be present.

3.1.4.17 GetRangeValuesA1

This operation is used to get the values contained in a specified range in a workbook.

```
<wsdl:operation name="GetRangeValuesA1">
    <wsdl:input message="GetRangeValuesA1SoapIn" />
    <wsdl:output message="GetRangeValuesA1SoapOut" />
</wsdl:operation>
```

The protocol client sends a **GetRangeValuesA1SoapIn** request message, and the protocol server responds with a **GetRangeValuesA1SoapOut** response message, as follows:

1. If **sheetName** is not present, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the ExcelServerMessage MUST be **InternalError**.
2. Depending on security settings, the protocol server MAY<26> return an error even if the requested range is present in the workbook.
3. The protocol server determines the range to return in the following manner:

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- If **sheetName** is empty and the protocol server cannot determine the worksheet from the **rangeName** element, the protocol server MUST return the requested values from the range specified in **rangeName** on the first worksheet.
- If **sheetName** is empty and the protocol server can determine the worksheet from the **rangeName** element, the protocol server MUST return the requested values from the range specified in **rangeName** on the determined worksheet.
- If **sheetName** is not empty and exists in the workbook, and **rangeName** references a worksheet that is different than the worksheet referenced by **sheetName**, then the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be **SheetRangeMismatch**.
- If **sheetName** is not empty and exists in the workbook, the protocol MUST return the range specified in **rangeName** from the worksheet that is specified in **sheetName**.
- If **sheetName** is not empty and does not reference an existing worksheet in the workbook, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be **InvalidSheetName**.

4. Each element inside the **cellValues** element MUST be of type **ArrayOfAnyType** and be a row (2) of worksheet cells returned from the protocol server. The number of rows returned MUST be equal to the number of rows requested in the **rangeName** element.
5. Each element inside each of the **ArrayOfAnyType** type nested inside **cellValues** MUST be a single workbook worksheet cell. The number of elements inside each such nested **ArrayOfAnyType** MUST be equal to the number of columns requested in the **rangeName** element.
6. If **formatted** is **true**, all worksheet cells returned as part of the **cellValues** element MUST be of type string and MUST be number formatted according to how the worksheet cell is number formatted in the workbook.
7. If **formatted** is **false**, all worksheet cells returned as part of the **cellValues** element MUST either be empty and with the **xsi:nil** attribute set to **true** when the worksheet cell does not contain data or one of the following types: **boolean**, double, string, or **CellError** (section 2.2.5.2).

In the event of an application error on the protocol server during this operation, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be one of the values specified in section 2.2.9.4, and SHOULD<27> be one of the values described in the following table.

Id	Description
InvalidOrTimedOutSession	See section 2.2.9.5.
RetryError	See section 2.2.9.5.
OperationCanceled	See section 2.2.9.5.
InternalError	See section 2.2.9.5.
MultipleRequestsOnSession	See section 2.2.9.5.
MaxRequestDurationExceeded	See section 2.2.9.5.

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Id	Description
InvalidSheetName	The protocol server could not find a worksheet with the name that is in the **sheetName** element
SpecifiedItemNotFound	The protocol server cannot return the information requested because of security settings.
SheetRangeMismatch	The worksheet referenced by the **sheetName** element does not match the worksheet referenced by the **rangeName** element.

3.1.4.17.1 Messages

3.1.4.17.1.1 GetRangeValuesA1SoapIn

This message is the request message for **GetRangeValuesA1**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/GetRa
ngeValuesA1
```

The SOAP body contains a **GetRangeValuesA1** element.

3.1.4.17.1.2 GetRangeValuesA1SoapOut

This message is the response message for **GetRangeValuesA1**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/GetRa
ngeValuesA1
```

The SOAP body contains a **GetRangeValuesA1Response** element.

3.1.4.17.2 Elements

3.1.4.17.2.1 GetRangeValuesA1

The **GetRangeValuesA1** element is specified as follows.

```
<s:element name="GetRangeValuesA1">
  <s:complexType>
    <s:sequence>
      <s:element name="parameter" type="tns:CommandParameter" minOccurs="0"/>
      <s:element name="sheetName" type="s:string" minOccurs="0"/>
      <s:element name="rangeName" type="s:string" minOccurs="0"/>
      <s:element name="formatted" type="s:boolean"/>
    </s:sequence>
  </s:complexType>
</s:element>
```


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parameter: A **CommandParameter** as specified in section 2.2.4.11. MUST be present. The following MUST extend or override the standard behavior specified in **CommandParameter**:

- **StateId** MUST be -1.
- **EwrCall** MUST be **false**.

sheetName: The name of the worksheet to fetch values from. The length of the element MUST NOT be longer than 31 characters.

rangeName: The name of the workbook range requested. MUST NOT be longer than 32,768 characters. See section 2.2.5.10.

formatted: Specifies whether or not the data retrieved is formatted. This element MUST be **true** if the values need to be formatted and **false** if the values do not need to be formatted.

3.1.4.17.2.2 GetRangeValuesA1Response

If the operation succeeds it MUST return a **GetRangeValuesA1Response** as follows.

```
<s:element name="GetRangeValuesA1Response">
  <s:complexType>
    <s:sequence>
      <s:element name="GetRangeValuesA1Result" type="tns:CommandResult" minOccurs="0"/>
      <s:element name="cellValues" type="tns:ArrayOfAnyType" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

GetRangeValuesA1Result: A **CommandResult** as specified in section 2.2.4.12. MUST be present.

cellValues: The values returned from the protocol server. MUST be present.

3.1.4.18 GetSessionInformation

This operation is used to return information about a session (2).

```
<wsdl:operation name="GetSessionInformation">
    <wsdl:input message="GetSessionInformationSoapIn" />
    <wsdl:output message="GetSessionInformationSoapOut" />
</wsdl:operation>
```

The protocol client sends a **GetSessionInformationSoapIn** request message, and the protocol server responds with a **GetSessionInformationSoapOut** response message, as follows:

- The protocol server MUST return the UI culture and the data culture for the specified session (2). These are the languages specified in the **OpenWorkbook** operation (section 3.1.4.20) or the languages that the protocol server falls back to as specified in **OpenWorkbook**.

In the event of an application error on the protocol server during this operation, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be one of the values specified in section 2.2.9.4, and SHOULD<28> be one of the values described in the following table.

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Id	Description
InvalidOrTimedOutSession	See section 2.2.9.5.
RetryError	See section 2.2.9.5.
OperationCanceled	See section 2.2.9.5.
InternalError	See section 2.2.9.5.
MultipleRequestsOnSession	See section 2.2.9.5.
MaxRequestDurationExceeded	See section 2.2.9.5.

3.1.4.18.1 Messages

3.1.4.18.1.1 GetSessionInformationSoapIn

This message is the request message for **GetSessionInformation**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/GetSessionInformation
```

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

3.1.4.18.1.2 GetSessionInformationSoapOut

This message is the response message for **GetSessionInformation**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/GetSessionInformation
```

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

3.1.4.18.2 Elements

3.1.4.18.2.1 GetSessionInformation

The **GetSessionInformation** element is specified as follows.

```
<s:element name="GetSessionInformation">
  <s:complexType>
    <s:sequence>
      <s:element name="parameter" type="tns:CommandParameter" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```


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parameter: A **CommandParameter** as specified in section 2.2.4.11. MUST be present. The following MUST extend or override the standard behavior specified in section 2.2.4.11:

- **StateId** MUST be -1.
- **EwrCall** MUST be **false**.

3.1.4.18.2.2 GetSessionInformationResponse

If the operation succeeds it MUST return a **GetSessionInformationResponse** as follows.

```
<s:element name="GetSessionInformationResponse">
  <s:complexType>
    <s:sequence>
      <s:element name="GetSessionInformationResult" type="tns:CommandResult" minOccurs="0"/>
      <s:element name="serverVersion" type="s:string" minOccurs="0"/>
      <s:element name="uiCultureName" type="s:string" minOccurs="0"/>
      <s:element name="dataCultureName" type="s:string" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

GetSessionInformationResult: A **CommandResult** as specified in section 2.2.4.12. MUST be present.

serverVersion: The version of the protocol server. MUST be present. MAY<29> contain any string value.

uiCultureName: The UI culture. MUST be present. MUST be a language tag as specified in [RFC1766], section 2.

dataCultureName: The data culture. MUST be present. MUST be a language tag, as specified in [RFC1766], section 2.

3.1.4.19 GetWorkbook

This operation is used to retrieve a workbook file.

```
<wsdl:operation name="GetWorkbook">
    <wsdl:input message="GetWorkbookSoapIn" />
    <wsdl:output message="GetWorkbookSoapOut" />
</wsdl:operation>
```

The protocol client sends a **GetWorkbookSoapIn** request message, and the protocol server responds with a **GetWorkbookSoapOut** response message, as follows:

- The protocol server MAY<30> return a different workbook form than the form specified in **workbookType**.

In the event of an application error on the protocol server during this operation, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be one of the values specified in section 2.2.9.4, and SHOULD<31> be one of the following values.

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Id	Description
InvalidOrTimedOutSession	See section 2.2.9.5.
RetryError	See section 2.2.9.5.
OperationCanceled	See section 2.2.9.5.
InternalError	See section 2.2.9.5.
MultipleRequestsOnSession	See section 2.2.9.5.
MaxRequestDurationExceeded	See section 2.2.9.5.

3.1.4.19.1 Messages

3.1.4.19.1.1 GetWorkbookSoapIn

This message is the request message for requesting a workbook.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/GetWorkbook
```

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

3.1.4.19.1.2 GetWorkbookSoapOut

This message is the response message for retrieving a workbook.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/GetWorkbook
```

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

3.1.4.19.2 Elements

3.1.4.19.2.1 GetWorkbook

The **GetWorkbook** element is specified as follows.

```
<s:element name="GetWorkbook">
  <s:complexType>
    <s:sequence>
      <s:element name="parameter" type="tns:CommandParameter" minOccurs="0"/>
      <s:element name="workbookType" type="tns:WorkbookType"/>
    </s:sequence>
  </s:complexType>
</s:element>
```


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parameter: A **CommandParameter** as specified in section 2.2.4.11 MUST be present. The following MUST extend or override the standard behavior specified in section 2.2.4.11.

- **StateId** MUST be -1.

workbookType: The form of the requested workbook as specified in section 3.1.4.19.3.1.

3.1.4.19.2.2 GetWorkbookResponse

If the operation succeeds it MUST return a **GetWorkbookResponse** as follows.

```
<s:element name="GetWorkbookResponse">
  <s:complexType>
    <s:sequence>
      <s:element name="GetWorkbookResult" type="s:base64Binary" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

GetWorkbookResult: A workbook file. MUST be present.

3.1.4.19.3 Simple Types

3.1.4.19.3.1 WorkbookType

The **WorkbookType** simple type is an enumeration that is used in the **GetWorkbook** operation to specify the form of the requested workbook.

```
<s:simpleType name="WorkbookType">
  <s:restriction base="s:string">
    <s:enumeration value="FullWorkbook"/>
    <s:enumeration value="FullSnapshot"/>
    <s:enumeration value="PublishedItemsSnapshot"/>
  </s:restriction>
</s:simpleType>
```

The following table specifies possible values for **WorkbookType**.

Value	Meaning
FullWorkbook	The protocol server MUST return the workbook.
FullSnapshot	The protocol server MUST return a **snapshot** that contains the entire contents of the workbook.
PublishedItemsSnapshot	The protocol server MUST return a workbook that only contains snapshots of the published items or the published sheets.

3.1.4.20 OpenWorkbook

This operation is used to open a session (2) giving access to a workbook on the protocol server.

```
<wsdl:operation name="OpenWorkbook">
    <wsdl:input message="OpenWorkbookSoapIn" />
```


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```
    <wsdl:output message="OpenWorkbookSoapOut" />
  </wsdl:operation>
```

The protocol client sends an **OpenWorkbookSoapIn** request message, and the protocol server responds with an **OpenWorkbookSoapOut** response message, as follows:

1. The workbook file, specified by **url**, is specified as follows:

   - It SHOULD be in a format specified by [MS-XLSB] or [ECMA-376] but MAY be in any other format. If it is in the [ECMA-376] format, the following apply:
     - It MAY<32> contain any valid SpreadsheetML records in that format.
     - If an **odcFile** attribute of a **connection (2)** element ([ECMA-376], Part 4, Section 3.13.1) is present it SHOULD be the path of a file in the format specified by [MS-ODCFF].
     - If a **connection** (2) attribute of **dbPr** element ([ECMA-376], Part 4, Section 3.13.3]) is present it SHOULD be in the format specified by [MS-ODBCSTR] or [MS-OLEDBSTR].
   - If it is in the [MS-XLSB] format, the following apply:
     - It MAY<33> contain any valid records in that format.
     - If a **brtBeginExternalConnection** record is present and it has the **stConnectionFile** field present, the **stConnectionFile** SHOULD be the path of a file in the format specified by [MS-ODCFF].
     - If a **BrtBeginECDbProps** record is present, its **stConn** field SHOULD be in the format specified by [MS-ODBCSTR] or [MS-OLEDBSTR].
   - If a file in [MS-ODCFF] is referenced by the workbook file, the following apply:
     - **SourceFile** element of **OfficeDataConnection** ([MS-ODCFF] section 2.7.1.1) MUST NOT be present.
     - **Parameter** elements of **CT_Connection** [MS-ODCFF] section 2.2.1) MUST be ignored.

2. If the operation succeeds, the protocol server MUST return the session (2) identifier of the newly created session (2) in the response message, to be used in any future operations against the newly created session (2).

3. **hasOpenItemPermission** MUST be **true** if the user has the Open Item permission on the workbook file that was opened by the operation, otherwise **hasOpenItemPermission** MUST be **false**.

In the event of an application error on the protocol server during this operation, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be one of the values specified in section 2.2.9.4, and SHOULD<34> be one of the following values.

Id	Description
InvalidOrTimedOutSession	See section 2.2.9.5.
RetryError	See section 2.2.9.5.

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Id	Description
OperationCanceled	See section 2.2.9.5.
InternalError	See section 2.2.9.5.
MultipleRequestsOnSession	See section 2.2.9.5.
MaxRequestDurationExceeded	See section 2.2.9.5.
FileOpenNotFound	The specified workbook file could not be found.
FileOpenAccessDenied	Access to the workbook file was denied by either the file-server supplying access to the file, or because the protocol server has determined that the user should not have access.
FileCorrupt	The workbook file is not following any of the file formats supported by the protocol server implementation.

3.1.4.20.1 Messages

3.1.4.20.1.1 OpenWorkbookSoapIn

This message is the request message for **OpenWorkbook**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/OpenWorkbook
```

The SOAP body contains an **OpenWorkbook** element.

3.1.4.20.1.2 OpenWorkbookSoapOut

This message is the response message for **OpenWorkbook**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/OpenWorkbook
```

The SOAP body contains an **OpenWorkbookResponse** element.

3.1.4.20.2 Elements

3.1.4.20.2.1 OpenWorkbook

The **OpenWorkbook** element is specified as follows.

```
<s:element name="OpenWorkbook">
  <s:complexType>
    <s:sequence>
      <s:element name="url" type="s:string" minOccurs="0"/>
      <s:element name="parameter" type="tns:CommandParameter" minOccurs="0"/>
```


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```
      <s:element name="cultureParameter" type="tns:CultureCommandParameter" minOccurs="0"/>
      <s:element name="requestSiteId" type="s1:guid"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

url: The location of the workbook file. MUST be present. The protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2, with the value of the **id** element of the **ExcelServerMessage** set to **FileOpenAccessDenied**, if one of the following conditions is satisfied:

- The value is longer than 65,534 characters.
- The value is not a **Universal Naming Convention (UNC)** as specified in [MS-GLOS], or a **Uniform Resource Identifier (URI)** as specified in [RFC3986].

parameter: A **CommandParameter**, as specified in section 2.2.4.11. MUST be present.

cultureParameter: UI culture, data culture and **host data language** related information. MUST be present.

requestSiteId: The **site identifier**. MUST be present.

3.1.4.20.2.2 OpenWorkbookResponse

If the operation succeeds it MUST return an **OpenWorkbookResponse** as follows.

```
<s:element name="OpenWorkbookResponse">
  <s:complexType>
    <s:sequence>
      <s:element name="OpenWorkbookResult" type="tns:CommandResult" minOccurs="0"/>
      <s:element name="workbookId" type="s:string" minOccurs="0"/>
      <s:element name="hasOpenItemPermission" type="s:boolean"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

OpenWorkbookResult: A result, as specified in section 2.2.4.12. MUST be present.

workbookId: The session (2) identifier of the newly created session (2). MUST be present.

hasOpenItemPermission: Specifies whether the user has the Open Item permission on the workbook file.

3.1.4.20.3 Complex Types

3.1.4.20.3.1 CultureCommandParameter

The **CultureCommandParameter** is used to specify UI culture, data culture and host data language related information when creating a new session (2).

```
<s:complexType name="CultureCommandParameter">
  <s:sequence>
    <s:element name="UICultureName" type="s:string" minOccurs="0"/>
    <s:element name="DataCultureName" type="s:string" minOccurs="0"/>
    <s:element name="SharePointDataCultureName" type="s:string" minOccurs="0"/>
```


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```
      <s:element name="TimeZoneSerialization" type="s:string" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
```

UICultureName: A language tag, as specified in [RFC1766] section 2. Specifies the UI culture. MUST be present. MUST NOT be empty. MUST NOT be longer than 32,768 characters. If the language represented by **UICultureName** is unsupported on the protocol server, the protocol server MAY<35> fall back to some other supported language.

DataCultureName: A language tag, as specified in [RFC1766] section 2. Specifies the data culture. MUST be present. MUST NOT be empty. MUST NOT be longer than 32768 characters. The protocol server MUST use **SharePointDataCultureName** as a **fallback data culture** if **DataCultureName** is not supported.

SharePointDataCultureName: A language tag, as specified in [RFC1766] section 2. Specifies the host data language. MUST be present. MUST NOT be longer than 32768 characters.

TimeZoneSerialization: The time zone of the session (2). MUST be present. MUST be exactly 73 characters long. MUST have the following layout, which is specified using ABNF, as specified in [RFC2234].

TimeZone	=	Bias "#" StandardDate "#" StandardBias "#" DaylightDate "#" DaylightBias
Bias	=	"+"\"-" 4DIGIT
StandardDate	=	Date %d84 Time
StandardBias	=	"+"\"-" 4DIGIT
DaylightDate	=	Date %d84 Time
DaylightBias	=	"+"\"-" 4DIGIT
Date	=	Year "-" Month "-" DayOfWeek "-" Day
Time	=	Hour ":" Minute ":" Second ":" Millisecond
Year	=	4DIGIT
Month	=	2DIGIT ; 01-12
DayOfWeek	=	2DIGIT ; 00-06 (Sunday-Saturday)
Day	=	2DIGIT ; 01-31
Hour	=	2DIGIT ; 00-23
Minute	=	2DIGIT ; 00-59
Second	=	2DIGIT ; 00-59
Millisecond	=	4DIGIT

The following restrictions MUST apply on the **TimeZoneSerialization**:

- Bias MUST be the **time zone bias**.
- **StandardDate** MUST be the **time zone standard date**.

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- **StandardBias** MUST be the **time zone standard bias**.
- **DaylightDate** MUST be the **time zone daylight date**.
- **DaylightBias** MUST be the **time zone daylight bias**.
- The following restrictions are specified in [RFC3339]:
  - **Month** MUST be date-month.
  - **Day** MUST be date-mday.
  - **Hour** MUST be time-hour.
  - **Minute** MUST time-minute.
  - **Second** MUST be time-second.
- **DayOfWeek** MUST have one of the values in the following table.

Value	Meaning
00	Sunday
01	Monday
02	Tuesday
03	Wednesday
04	Thursday
05	Friday
06	Saturday

3.1.4.21 Recalc

This operation is used to calculate a specified range in the workbook.

```
<wsdl:operation name="Recalc">
    <wsdl:input message="RecalcSoapIn" />
    <wsdl:output message="RecalcSoapOut" />
</wsdl:operation>
```

The protocol client sends a **RecalcSoapIn** request message, and the protocol server responds with a **RecalcSoapOut** response message.

In the event of an application error on the protocol server during this operation, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be one of the values specified in section 2.2.9.4, SHOULD<36> be one of the values described in the following table.

Id	Description
InvalidOrTimedOutSession	See section 2.2.9.5.

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Id	Description
RetryError	See section 2.2.9.5.
OperationCanceled	See section 2.2.9.5.
MultipleRequestsOnSession	See section 2.2.9.5.
MaxRequestDurationExceeded	See section 2.2.9.5.
InvalidSheetName	The specified sheet (2) was not found in the workbook.
InternalError	See section 2.2.9.5.

3.1.4.21.1 Messages

3.1.4.21.1.1 RecalcSoapIn

This message is the request message for **Recalc**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/Recalc
```

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

3.1.4.21.1.2 RecalcSoapOut

This message is the response message for **Recalc.**

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/Recalc
```

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

3.1.4.21.2 Elements

3.1.4.21.2.1 Recalc

The **Recalc** element is specified as follows.

```
<s:element name="Recalc">
  <s:complexType>
    <s:sequence>
      <s:element name="parameter" type="tns:CommandParameter" minOccurs="0"/>
      <s:element name="sheetRange" type="tns:SheetRange" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```


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parameter: A **CommandParameter** as specified in section 2.2.4.11. MUST be present. The following MUST extend or override the standard behavior specified in **CommandParameter**.

- **StateId** MUST be -1.
- **EwrCall** MUST be **false**.

sheetRange: The range to calculate in the workbook. MUST be present. **SheetName** MUST be present and MUST NOT be empty.

3.1.4.21.2.2 RecalcResponse

If the operation succeeds it MUST return a **RecalcResponse** as follows.

```
<s:element name="RecalcResponse">
  <s:complexType>
    <s:sequence>
      <s:element name="RecalcResult" type="tns:CommandResult" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

RecalcResult: A **CommandResult** as specified in section 2.2.4.12. MUST be present.

3.1.4.22 RecalcA1

This operation is used to calculate a specified range in the workbook.

```
<wsdl:operation name="RecalcA1">
    <wsdl:input message="RecalcA1SoapIn" />
    <wsdl:output message="RecalcA1SoapOut" />
</wsdl:operation>
```

The protocol client sends a **RecalcA1SoapIn** request message, and the protocol server responds with a **RecalcA1SoapOut** response message, as follows:

1. If the **sheetName** element is missing or the **rangeName** element is missing then the protocol server MUST return an ExcelServerMessage as specified in section 2.2.9.2, with the value of the **id** element of the **ExcelServerMessage** set to **InternalError.**
2. **sheetName** MUST NOT be empty.
3. If **rangeName** is empty, the whole sheet (2), which was specified in **sheetName**, MUST be calculated.
4. If **rangeName** is not empty, the specified range MUST be calculated.

In the event of an application error on the protocol server during this operation, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be one of the values specified in section 2.2.9.4, and SHOULD<37> be one of the following values.

Id	Description
InvalidOrTimedOutSession	See section 2.2.9.5.

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Id	Description
RetryError	See section 2.2.9.5.
OperationCanceled	See section 2.2.9.5.
MultipleRequestsOnSession	See section 2.2.9.5.
MaxRequestDurationExceeded	See section 2.2.9.5.
InternalError	See section 2.2.9.5.
InvalidSheetName	No sheet (2) in the workbook was found with a name as specified in **sheetName**.
RangeParseError	**rangeName** was not found in the workbook.

3.1.4.22.1 Messages

3.1.4.22.1.1 RecalcA1SoapIn

This message is the request message for **RecalcA1**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/RecalcA1
```

The SOAP body contains a **RecalcA1** element.

3.1.4.22.1.2 RecalcA1SoapOut

This message is the response message for **RecalcA1**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/RecalcA1
```

The SOAP body contains a **RecalcA1Response** element.

3.1.4.22.2 Elements

3.1.4.22.2.1 RecalcA1

The **RecalcA1** element is specified as follows.

```
<s:element name="RecalcA1">
  <s:complexType>
    <s:sequence>
      <s:element name="parameter" type="tns:CommandParameter" minOccurs="0"/>
      <s:element name="sheetName" type="s:string" minOccurs="0"/>
      <s:element name="rangeName" type="s:string" minOccurs="0"/>
    </s:sequence>
```


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```
    </s:complexType>
  </s:element>
```

parameter: A **CommandParameter**, as specified in section 2.2.4.11. MUST be present.

sheetName: The name of the sheet (2) to calculate. MUST NOT be longer than 31 characters.

rangeName: The name of the range to calculate. MUST NOT be longer than 32,768 characters. See section 2.2.5.10.

3.1.4.22.2.2 RecalcA1Response

If the operation succeeds it MUST return a **RecalcA1Response** as follows.

```
<s:element name="RecalcA1Response">
  <s:complexType>
    <s:sequence>
      <s:element name="RecalcA1Result" type="tns:CommandResult" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

RecalcA1Result: A **CommandResult**, as specified in section 2.2.4.12. MUST be present.

3.1.4.23 RecalcAll

This operation is used to calculate the workbook.

```
<wsdl:operation name="RecalcAll">
    <wsdl:input message="RecalcAllSoapIn" />
    <wsdl:output message="RecalcAllSoapOut" />
</wsdl:operation>
```

The protocol client sends a **RecalcAllSoapIn** request message, and the protocol server responds with a **RecalcAllSoapOut** response message.

In the event of an application error on the protocol server during this operation, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be one of the values specified in section 2.2.9.4, and SHOULD<38> be one of the following values.

Id	Description
InvalidOrTimedOutSession	See section 2.2.9.5.
RetryError	See section 2.2.9.5.
OperationCanceled	See section 2.2.9.5.
MultipleRequestsOnSession	See section 2.2.9.5.
MaxRequestDurationExceeded	See section 2.2.9.5.
InternalError	See section 2.2.9.5.

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3.1.4.23.1 Messages

3.1.4.23.1.1 RecalcAllSoapIn

This message is the request message for **RecalcAll**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/Recal
cAll
```

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

3.1.4.23.1.2 RecalcAllSoapOut

This message is the response message for **RecalcAll**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/Recal
cAll
```

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

3.1.4.23.2 Elements

3.1.4.23.2.1 RecalcAll

The **RecalcAll** element is specified as follows.

```
<s:element name="RecalcAll">
  <s:complexType>
    <s:sequence>
      <s:element name="parameter" type="tns:CommandParameter" minOccurs="0"/>
      <s:element name="calculateType" type="tns:CalculateType"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

parameter: A **CommandParameter** as specified in section 2.2.4.11. MUST be present.

calculateType: The type of calculation to be executed as specified in section 3.1.4.23.3.1.

3.1.4.23.2.2 RecalcAllResponse

If the operation succeeds it MUST return a **RecalcAllResponse** as follows.

```
<s:element name="RecalcAllResponse">
  <s:complexType>
    <s:sequence>
      <s:element name="RecalcAllResult" type="tns:CommandResult" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
```


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```
</s:element>
```

RecalcAllResult: A **CommandResult** as specified in section 2.2.4.12. MUST be present.

3.1.4.23.3 Simple Types

3.1.4.23.3.1 CalculateType

Specifies the type of calculation to be executed.

```
<s:simpleType name="CalculateType">
  <s:restriction base="s:string">
    <s:enumeration value="Recalculate"/>
    <s:enumeration value="CalculateFull"/>
  </s:restriction>
</s:simpleType>
```

The following table specifies possible values for **CalculateType**.

Value	Meaning
Recalculate	The protocol server MUST calculate all formulas in the workbook that needs to be calculated.
CalculateFull	The protocol server MUST calculate all formulas in the workbook.

3.1.4.24 Refresh

This operation is used to refresh connected data on a workbook.

```
<wsdl:operation name="Refresh">
    <wsdl:input message="RefreshSoapIn" />
    <wsdl:output message="RefreshSoapOut" />
</wsdl:operation>
```

The protocol client sends a **RefreshSoapIn** request message, and the protocol server responds with a **RefreshSoapOut** response message, as follows:

1. If **dataConnectionName** is not present or is empty, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be **InternalError**.

2. If **dataConnectionName** is present and is not empty, the protocol server MUST refresh the specified connected data.

In the event of an application error on the protocol server during this operation, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be one of the values specified in section 2.2.9.4, and SHOULD<39> be one of the values described in the following table.

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Id	Description
InvalidOrTimedOutSession	See section 2.2.9.5.
RetryError	See section 2.2.9.5.
OperationCanceled	See section 2.2.9.5.
MultipleRequestsOnSession	See section 2.2.9.5.
MaxRequestDurationExceeded	See section 2.2.9.5.
InternalError	See section 2.2.9.5.
ExternalDataRefreshFailed	Connected data refresh failed.

3.1.4.24.1 Messages

3.1.4.24.1.1 RefreshSoapIn

This message is the request message for **Refresh**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/Refresh
```

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

3.1.4.24.1.2 RefreshSoapOut

This message is the response message for **Refresh**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/Refresh
```

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

3.1.4.24.2 Elements

3.1.4.24.2.1 Refresh

The **Refresh** element is specified as follows.

```
<s:element name="Refresh">
  <s:complexType>
    <s:sequence>
      <s:element name="parameter" type="tns:CommandParameter" minOccurs="0"/>
      <s:element name="dataConnectionName" type="s:string" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```


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parameter: A **CommandParameter**, as specified in section 2.2.4.11. MUST be present.

dataConnectionName: A data connection (2). MUST NOT be longer than 255 characters.

3.1.4.24.2.2 RefreshResponse

If the operation succeeds, a **RefreshResponse** MUST be returned by the protocol server as follows.

```
<s:element name="RefreshResponse">
  <s:complexType>
    <s:sequence>
      <s:element name="RefreshResult" type="tns:CommandResult" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

RefreshResult: A **CommandResult**, as specified in section 2.2.4.12. MUST be present.

3.1.4.25 RefreshAll

This operation is used to refresh all connected data on a workbook.

```
<wsdl:operation name="RefreshAll">
    <wsdl:input message="RefreshAllSoapIn" />
    <wsdl:output message="RefreshAllSoapOut" />
</wsdl:operation>
```

The protocol client sends a **RefreshAllSoapIn** request message, and the protocol server responds with a **RefreshAllSoapOut** response message, as follows:

1. If there is nothing to refresh, the protocol server MUST NOT return an error.
2. If the value of the **periodic** element in Elements (Section 3.1.4.25.2.1) is set to **true** and there is no external data that can expire, the protocol server MUST NOT return an error.

In the event of an application error on the protocol server during this operation, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be one of the values specified in section 2.2.9.4, and SHOULD<40> be one of the following values.

Id	Description
InvalidOrTimedOutSession	See section 2.2.9.5.
RetryError	See section 2.2.9.5.
OperationCanceled	See section 2.2.9.5.
MultipleRequestsOnSession	See section 2.2.9.5.
MaxRequestDurationExceeded	See section 2.2.9.5.
InternalError	See section 2.2.9.5.
ExternalDataRefreshFailed	Connected data refresh failed.

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3.1.4.25.1 Messages

3.1.4.25.1.1 RefreshAllSoapIn

This message is the request message for **RefreshAll**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/RefreshAll
```

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

3.1.4.25.1.2 RefreshAllSoapOut

This message is the response message for **RefreshAll**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/RefreshAll
```

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

3.1.4.25.2 Elements

3.1.4.25.2.1 RefreshAll

The **RefreshAll** element is specified as follows.

```
<s:element name="RefreshAll">
  <s:complexType>
    <s:sequence>
      <s:element name="parameter" type="tns:CommandParameter" minOccurs="0"/>
      <s:element name="periodic" type="s:boolean"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

parameter: A **CommandParameter**, as specified in section 2.2.4.11. MUST be present.

periodic: Specifies whether to only refresh external data that has expired. If set to **true**, the protocol server MUST refresh only external data that has expired. If set to **false**, the protocol server MUST refresh all connected data on the workbook.

3.1.4.25.2.2 RefreshAllResponse

If the operation succeeds it MUST return the **RefreshAllResponse** as follows.

```
<s:element name="RefreshAllResponse">
  <s:complexType>
    <s:sequence>
      <s:element name="RefreshAllResult" type="tns:CommandResult" minOccurs="0"/>
```


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```
    </s:sequence>
  </s:complexType>
</s:element>
```

RefreshAllResult: A **CommandResult**, as specified in section 2.2.4.12. MUST be present.

3.1.4.26 RemovePivotFilter

This operation is used to remove any PivotTable filters that are applied to a PivotTable field.

```
<wsdl:operation name="RemovePivotFilter">
    <wsdl:input message="RemovePivotFilterSoapIn" />
    <wsdl:output message="RemovePivotFilterSoapOut" />
</wsdl:operation>
```

The protocol client sends a **RemovePivotFilterSoapIn** request message, and the protocol server responds with a **RemovePivotFilterSoapOut** response message, as follows:

1. The protocol client sends the information identifying the PivotTable field in the **pivotFilterOptions** element.
2. The protocol server removes any PivotTable filters that are applied to that PivotTable field.

In the event of an application error on the protocol server during this operation, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be one of the values specified in section 2.2.9.4, and SHOULD<41> be one of the following values.

Id	Description
InvalidOrTimedOutSession	See section 2.2.9.5.
RetryError	See section 2.2.9.5.
OperationCanceled	See section 2.2.9.5.
InternalError	See section 2.2.9.5.
MultipleRequestsOnSession	See section 2.2.9.5.
MaxRequestDurationExceeded	See section 2.2.9.5.

3.1.4.26.1 Messages

3.1.4.26.1.1 RemovePivotFilterSoapIn

This message is the request message for **RemovePivotFilter**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/RemovePivotFilter
```

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

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3.1.4.26.1.2 RemovePivotFilterSoapOut

This message is the response message for **RemovePivotFilter**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/Remov
ePivotFilter
```

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

3.1.4.26.2 Elements

3.1.4.26.2.1 RemovePivotFilter

The **RemovePivotFilter** element is specified as follows.

```
<s:element name="RemovePivotFilter">
  <s:complexType>
    <s:sequence>
      <s:element name="parameter" type="tns:CommandParameter" minOccurs="0"/>
      <s:element name="pivotFilterOptions" type="tns:PivotFilterOptions" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

parameter: A **CommandParameter**, as specified in section 2.2.4.11. MUST be present.

pivotFilterOptions: The PivotTable field identification as specified in section 2.2.4.20. MUST be present.

3.1.4.26.2.2 RemovePivotFilterResponse

If the operation succeeds it MUST return a **RemovePivotFilterResponse** as follows.

```
<s:element name="RemovePivotFilterResponse">
  <s:complexType>
    <s:sequence>
      <s:element name="RemovePivotFilterResult" type="tns:CommandResult" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

RemovePivotFilterResult: A **CommandResult**, as specified in section 2.2.4.12. MUST be present.

3.1.4.27 SetParameters

This operation is used to set values of workbook parameters in a workbook.

```
<wsdl:operation name="SetParameters">
    <wsdl:input message="SetParametersSoapIn" />
    <wsdl:output message="SetParametersSoapOut" />
</wsdl:operation>
```


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The protocol client sends a **SetParametersSoapIn** request message, and the protocol server responds with a **SetParametersSoapOut** response message.

In the event of an application error on the protocol server during this operation, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be one of the values specified in section 2.2.9.4, and SHOULD<42> be one of the following values.

Id	Description
InvalidOrTimedOutSession	See section 2.2.9.5.
RetryError	See section 2.2.9.5.
OperationCanceled	See section 2.2.9.5.
MultipleRequestsOnSession	See section 2.2.9.5.
MaxRequestDurationExceeded	See section 2.2.9.5.
InternalError	See section 2.2.9.5.
ParameterDoesNotExist	The workbook parameter does not exist in the workbook.
SetParameterFailure	The value cannot be set to a workbook parameter in the workbook.
FormulaEditingNotEnabled	The value cannot be set to a workbook parameter in the workbook because the worksheet cell contains a formula.

3.1.4.27.1 Messages

3.1.4.27.1.1 SetParametersSoapIn

This message is the request message for **SetParameters**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/SetParameters
```

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

3.1.4.27.1.2 SetParametersSoapOut

This message is the response message for **SetParameters**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/SetParameters
```

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

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3.1.4.27.2 Elements

3.1.4.27.2.1 SetParameters

The **SetParameters** element is specified as follows.

```
<s:element name="SetParameters">
  <s:complexType>
    <s:sequence>
      <s:element name="parameter" type="tns:CommandParameter" minOccurs="0"/>
      <s:element name="workbookParameters" type="tns:ArrayOfWorkbookParameter"
minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

parameter: A **CommandParameter**, as specified in section 2.2.4.11. MUST be present.

workbookParameters: The workbook parameters to be set in the workbook as specified in section 3.1.4.27.3.1. MUST be present.

3.1.4.27.2.2 SetParametersResponse

If the operation succeeds it MUST return a **SetParametersResponse** as follows.

```
<s:element name="SetParametersResponse">
  <s:complexType>
    <s:sequence>
      <s:element name="SetParametersResult" type="tns:CommandResult" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

SetParametersResult: A **CommandResult**, as specified in section 2.2.4.12. MUST be present.

3.1.4.27.3 Complex Types

3.1.4.27.3.1 ArrayOfWorkbookParameter

The **ArrayOfWorkbookParameter** complex type contains an array of workbook parameter. The count of elements in this sequence MUST be greater than 0 and less than or equal to 255.

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

WorkbookParameter: A workbook parameter, as specified in section 3.1.4.27.3.2.

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3.1.4.27.3.2 WorkbookParameter

The **WorkbookParameter** complex type is used to represent a value or a list (2) of values to be set into workbook parameters in the workbook.

```
<s:complexType name="WorkbookParameter">
  <s:sequence>
    <s:element name="Comment" type="s:string" minOccurs="0"/>
    <s:element name="IsPivotPageField" type="s:boolean"/>
    <s:element name="Name" type="s:string" minOccurs="0"/>
    <s:element name="RequiresConnection" type="s:boolean"/>
    <s:element name="Values" type="tns:ArrayOfString" minOccurs="0"/>
  </s:sequence>
</s:complexType>
```

Comment: MUST be set to an empty string.

IsPivotPageField: MUST be set to **false**.

Name: The name of the workbook parameter. MUST be present. MUST be a value of the **Name** attribute as specified in the **Parameter** complex type (section 2.2.4.24.4).

RequiresConnection: MUST be set to **false**.

Values: An array of string values to set in the workbook parameter as specified in section 2.2.4.7. The protocol server MUST ignore all the elements in **ArrayOfString**, if all the following conditions are satisfied:

- The **IsPivotPageField** attribute of the **Parameter** is not present or if it is present and its value is **false**.
- The **Values** element is not present or the number of elements in **ArrayOfString** is not equal to 1.

If the **IsPivotPageField** attribute of the **Parameter** is present and its value is set to **true**, the following apply:

- If the **Values** element is not present the protocol server MUST change the PivotTable manual filter in the workbook to the **default filter value**.
- If the **Values** element is present, and there are no elements in **ArrayOfString**, the protocol server MUST change the PivotTable manual filter in the workbook to the default filter value.
- If the **Values** element is present and the number of elements in **ArrayOfString** is greater than or equal to 1, the protocol server MUST use the values as the PivotTable manual filter in the workbook.

Each string element of **ArrayOfString** MUST NOT be longer than 1024 characters.

3.1.4.28 SetRange

This operation is used to set values to a range of worksheet cells on a workbook.

```
<wsdl:operation name="SetRange">
    <wsdl:input message="SetRangeSoapIn" />
    <wsdl:output message="SetRangeSoapOut" />
```


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```
</wsdl:operation>
```

The protocol client sends a **SetRangeSoapIn** request message, and the protocol server responds with a **SetRangeSoapOut** response message, as follows:

1. If **cellsArray** is not present, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be **InternalError**.
2. If the **SheetName** element inside **sheetRange** is empty, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be **InvalidSheetName**.
3. Each element inside the **cellsArray** element MUST be of type **ArrayOfAnyType** and be a row (2) of worksheet cells sent to the protocol server. The number of rows in **cellsArray** MUST be equal to the number of rows specified in the **sheetRange** element.
4. Each element inside each of the **ArrayOfAnyType** type nested inside **cellsArray** MUST be a single worksheet cell. The number of elements inside each such nested **ArrayOfAnyType** MUST be equal to the number of columns specified in the **sheetRange** element.
5. The protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2, with the value **ObjectTypeNotSupported** in the **id** element of the **ExcelServerMessage**, if any of the worksheet cells in the **cellsArray** element are one of the following:
   - Not empty and with the **xsi:nil** attribute set to **true**.
   - Not in one of the following types: **boolean**, **dateTime**, **decimal**, **double**, **float**, **int**, **short**, **string,** or **unsigned byte**.
6. If any of the worksheet cells of type string in the **cellsArray** element start with and equals sign (=), the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be **FormulaEditingNotEnabled.**
7. The protocol server MUST ignore any worksheet cells in **cellsArray** that intersect with a PivotTable on the workbook.

In the event of an application error on the protocol server during this operation, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be one of the values specified in section 2.2.9.4, and SHOULD<43> be one of the following values.

Id	Description
InvalidOrTimedOutSession	See section 2.2.9.5.
RetryError	See section 2.2.9.5.
OperationCanceled	See section 2.2.9.5.
InternalError	See section 2.2.9.5.
MultipleRequestsOnSession	See section 2.2.9.5.
MaxRequestDurationExceeded	See section 2.2.9.5.

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Id	Description
InvalidSheetName	The protocol server could not find a sheet (2) with the name specified in the **SheetName** element inside **sheetRange**.
SpecifiedItemNotFound	The user does not have Open Item permission on the workbook used by the session (2), and the range requested to be set is not a single worksheet cell, or the worksheet cell in the workbook is not a workbook parameter.
SetRangeFailure	The range requested to be set intersected with a formula or a **table header**.

3.1.4.28.1 Messages

3.1.4.28.1.1 SetRangeSoapIn

This message is the request message for **SetRange**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/SetRange
```

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

3.1.4.28.1.2 SetRangeSoapOut

This message is the response message for **SetRange**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/SetRange
```

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

3.1.4.28.2 Elements

3.1.4.28.2.1 SetRange

The **SetRange** element is specified as follows.

```
<s:element name="SetRange">
  <s:complexType>
    <s:sequence>
      <s:element name="parameter" type="tns:CommandParameter" minOccurs="0"/>
      <s:element name="sheetRange" type="tns:SheetRange" minOccurs="0"/>
      <s:element name="cellsArray" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```


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parameter: A **CommandParameter** as specified in section 2.2.4.11. MUST be present. The following MUST extend or override the standard behavior specified in section 2.2.4.11:

- **StateId** MUST be -1.
- **EwrCall** MUST be **false**.

sheetRange: The range to set. See SheetRange (section 2.2.4.22). MUST be present. **SheetName** MUST be present.

cellsArray: The values to set.

3.1.4.28.2.2 SetRangeResponse

If the operation succeeds it MUST return a **SetRangeResponse** as follows.

```
<s:element name="SetRangeResponse">
  <s:complexType>
    <s:sequence>
      <s:element name="SetRangeResult" type="tns:CommandResult" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

SetRangeResult: A **CommandResult** as specified in section 2.2.4.12. MUST be present.

3.1.4.29 SetRangeA1

This operation is used to set values to a range of worksheet cells on a workbook.

```
<wsdl:operation name="SetRangeA1">
    <wsdl:input message="SetRangeA1SoapIn" />
    <wsdl:output message="SetRangeA1SoapOut" />
</wsdl:operation>
```

The protocol client sends a **SetRangeA1SoapIn** request message, and the protocol server responds with a **SetRangeA1SoapOut** response message, as follows:

1. If **sheetName**, **range**, or **cellsArray** is not present, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be **InternalError**.
2. If **range** is empty, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be **RangeParseError**.
3. If **sheetName** is empty, the protocol server MUST use the first worksheet on the workbook unless a worksheet can be determined from **range**, in which case the worksheet, as determined from **range**, MUST be used.
4. If a worksheet cannot be determined from **range**, the protocol server MUST use **range** on the worksheet determined by **sheetName** to locate the range to set.
5. Each element inside the **cellsArray** element MUST be of type **ArrayOfAnyType** and be a row (2) of worksheet cells sent to the protocol server. The number of rows in **cellsArray** MUST be equal to the number of rows specified in the **range** element, unless not explicitly specified.

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6. Each element inside each of the **ArrayOfAnyType** type nested inside **cellsArray** MUST be a single worksheet cell. The number of elements inside each such nested **ArrayOfAnyType** MUST be equal to the number of columns specified in the **range** element, unless not explicitly specified. Each nested **ArrayOfAnyType** MUST have the same number of elements.

7. The protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2, with the value **ObjectTypeNotSupported** in the **id** element of the **ExcelServerMessage**, if any of the worksheet cells in the **cellsArray** element are one of the following:

   - Not empty and with the **xsi:nil** attribute set to **true**.
   - Not in one of the following types: **boolean**, **dateTime**, **decimal**, **double**, **float**, **int**, **short**, **string,** or **unsigned byte**.

8. If any worksheet cell of type string in the **cellsArray** element starts with "=", the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be **FormulaEditingNotEnabled**.

9. The protocol server MUST ignore any worksheet cells in **cellsArray** that intersect with a PivotTable on the workbook.

In the event of an application error on the protocol server during this operation, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be one of the values specified in section 2.2.9.4, and SHOULD<44> be one of the following values.

Id	Description
InvalidOrTimedOutSession	See section 2.2.9.5.
RetryError	See section 2.2.9.5.
OperationCanceled	See section 2.2.9.5.
InternalError	See section 2.2.9.5.
MultipleRequestsOnSession	See section 2.2.9.5.
MaxRequestDurationExceeded	See section 2.2.9.5.
InvalidSheetName	The protocol server could not find a worksheet with the name specified in the **SheetName** element inside **sheetRange**.
SpecifiedItemNotFound	The user does not have the Open Item permission on the workbook used by the session (2), and the range requested to be set is not a single worksheet cell, or the worksheet cell in the workbook is not a workbook parameter.
SetRangeFailure	The requested range to set intersected with a formula or a table header.
DimensionMismatch	There was a mismatch in the number of rows or number of columns between **cellsArray** and **range**.

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3.1.4.29.1 Messages

3.1.4.29.1.1 SetRangeA1SoapIn

This message is the request message for **SetRangeA1**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/SetRa
ngeA1
```

The SOAP body contains a **SetRangeA1** element.

3.1.4.29.1.2 SetRangeA1SoapOut

This message is the response message for **SetRangeA1**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/SetRa
ngeA1
```

The SOAP body contains a **SetRangeA1Response** element.

3.1.4.29.2 Elements

3.1.4.29.2.1 SetRangeA1

The **SetRangeA1** element is specified as follows.

```
<s:element name="SetRangeA1">
  <s:complexType>
    <s:sequence>
      <s:element name="parameter" type="tns:CommandParameter" minOccurs="0"/>
      <s:element name="sheetName" type="s:string" minOccurs="0"/>
      <s:element name="range" type="s:string" minOccurs="0"/>
      <s:element name="cellsArray" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

parameter: A **CommandParameter**, as specified in section 2.2.4.11. MUST be present. The following MUST extend or override the standard behavior specified in section 2.2.4.11:

- **StateId** MUST be -1.
- **EwrCall** MUST be **false**.

sheetName: The name of the worksheet that contains the range to write values into. MUST NOT be longer than 31 characters.

range: The range to be set. See section 2.2.5.10.

cellsArray: The values to set.

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3.1.4.29.2.2 SetRangeA1Response

If the operation succeeds it MUST return a **SetRangeA1Response** as follows.

```
<s:element name="SetRangeA1Response">
  <s:complexType>
    <s:sequence>
      <s:element name="SetRangeA1Result" type="tns:CommandResult" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

SetRangeA1Result: A **CommandResult**, as specified in section 2.2.4.12. MUST be present.

3.1.4.30 SortFilterColumn

This operation is used to change the sort order (2) of a table or worksheet AutoFilter in the workbook.

```
<wsdl:operation name="SortFilterColumn">
    <wsdl:input message="SortFilterColumnSoapIn" />
    <wsdl:output message="SortFilterColumnSoapOut" />
</wsdl:operation>
```

The protocol client sends a **SortFilterColumnSoapIn** request message, and the protocol server responds with a **SortFilterColumnSoapOut** response message.

In the event of an application error on the protocol server during this operation, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be one of the values specified in section 2.2.9.4, and SHOULD<45> be one of the values described in the following table.

Id	Description
InvalidOrTimedOutSession	See section 2.2.9.5.
RetryError	See section 2.2.9.5.
OperationCanceled	See section 2.2.9.5.
InternalError	See section 2.2.9.5.
MaxRequestDurationExceeded	See section 2.2.9.5.
MultipleRequestsOnSession	See section 2.2.9.5.

3.1.4.30.1 Messages

3.1.4.30.1.1 SortFilterColumnSoapIn

This message is the request message for **SortFilterColumn**.

The SOAP action value of the message is defined as follows.

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```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/SortFilterColumn
```

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

3.1.4.30.1.2 SortFilterColumnSoapOut

This message is the response message for **SortFilterColumn**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/SortFilterColumn
```

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

3.1.4.30.2 Elements

3.1.4.30.2.1 SortFilterColumn

The **SortFilterColumn** element is specified as follows.

```
<s:element name="SortFilterColumn">
  <s:complexType>
    <s:sequence>
      <s:element name="parameter" type="tns:CommandParameter" minOccurs="0"/>
      <s:element name="autoFilterOptions" type="tns:AutoFilterOptions" minOccurs="0"/>
      <s:element name="ascending" type="s:boolean"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

parameter: A **CommandParameter**, as specified in section 2.2.4.11. MUST be present.

autoFilterOptions: The options to be used when sorting the AutoFilter column (2), as specified in section 2.2.4.10. MUST be present. The **CriteriaType** element of **AutoFilterOptions** MUST be set to Nil, and the **Criteria** element MUST NOT be present.

ascending: The sort order (2) to apply to the AutoFilter. A **true** value specifies an ascending order, and a **false** value specifies a descending order.

3.1.4.30.2.2 SortFilterColumnResponse

If the operation succeeds it MUST return a **SortFilterColumnResponse** as follows.

```
<s:element name="SortFilterColumnResponse">
  <s:complexType>
    <s:sequence>
      <s:element name="SortFilterColumnResult" type="tns:CommandResult" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```


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SortFilterColumnResult: A **CommandResult**, as specified in section 2.2.4.12. MUST be present.

3.1.4.31 TogglePivotDrill

This operation is used to expand or collapse a PivotTable member.

```
<wsdl:operation name="TogglePivotDrill">
    <wsdl:input message="TogglePivotDrillSoapIn" />
    <wsdl:output message="TogglePivotDrillSoapOut" />
</wsdl:operation>
```

The protocol client sends a **TogglePivotDrillSoapIn** request message, and the protocol server responds with a **TogglePivotDrillSoapOut** response message, as follows:

1. The protocol client sends the PivotTable member to be expanded or collapsed in the **pivotFilterOptions** element.
2. The protocol server expands the PivotTable member if it was collapsed. The protocol server collapses the PivotTable member if it was expanded.

In the event of an application error on the protocol server during this operation, the protocol server MUST return an **ExcelServerMessage** as specified in section 2.2.9.2. The **id** element of the **ExcelServerMessage** MUST be one of the values specified in section 2.2.9.4, and SHOULD<46> be one of the values described in the following table.

Id	Description
InvalidOrTimedOutSession	See section 2.2.9.5.
RetryError	See section 2.2.9.5.
OperationCanceled	See section 2.2.9.5.
InternalError	See section 2.2.9.5.
MultipleRequestsOnSession	See section 2.2.9.5.
MaxRequestDurationExceeded	See section 2.2.9.5.

3.1.4.31.1 Messages

3.1.4.31.1.1 TogglePivotDrillSoapIn

This message is the request message for **TogglePivotDrill**.

The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/TogglePivotDrill
```

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

3.1.4.31.1.2 TogglePivotDrillSoapOut

This message is the response message for **TogglePivotDrill**.

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The SOAP action value of the message is defined as follows.

```
http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalService/Toggl
ePivotDrill
```

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

3.1.4.31.2 Elements

3.1.4.31.2.1 TogglePivotDrill

The **TogglePivotDrill** element is specified as follows.

```
<s:element name="TogglePivotDrill">
  <s:complexType>
    <s:sequence>
      <s:element name="parameter" type="tns:CommandParameter" minOccurs="0"/>
      <s:element name="pivotFilterOptions" type="tns:PivotFilterOptions" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

parameter: A **CommandParameter**, as specified in section 2.2.4.11. MUST be present.

pivotFilterOptions: The PivotTable member to be expanded or collapsed. MUST be present. The following MUST extend or override the standard behavior specified in section 2.2.4.20: **FieldId:** MUST be present and empty. Column: The column (2) of the PivotTable member. MUST be the zero-based column (2) number of a worksheet cell of the PivotTable that has the **Drillable** attribute of the **Cell** element (Section 2.2.4.24.38) set to **true**. **Row:** The row (2) of the PivotTable member. MUST be the zero-based row (2) number of a worksheet cell of the PivotTable that has the **Drillable** attribute of the **Cell** element set to **true**.

3.1.4.31.2.2 TogglePivotDrillResponse

If the operation succeeds it MUST return a **TogglePivotDrillResponse** as follows.

```
<s:element name="TogglePivotDrillResponse">
  <s:complexType>
    <s:sequence>
      <s:element name="TogglePivotDrillResult" type="tns:CommandResult" minOccurs="0"/>
    </s:sequence>
  </s:complexType>
</s:element>
```

TogglePivotDrillResult: A **CommandResult**, as defined in section 2.2.4.12. MUST be present.

3.1.5 Timer Events

3.1.5.1 Session Timeout

The **Session Timeout** event MAY<47> complete a request for a timed-out session (2) with a SOAP fault, as specified in section 2.2.4.11, with the value of the **Id** element of the **ExcelServerMessage** set to **InvalidOrTimedOutSession**.

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3.1.5.2 Request Timeout

The **Request Timeout** event SHOULD<48> complete a request by the protocol server with a SOAP fault, as specified in section 2.2.4.11, with the value of the **Id** element of the **ExcelServerMessage** set to **MaxRequestDurationExceeded**.

3.1.6 Other Local Events

None.

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4 Protocol Examples

Filtering lists and returning SpreadsheetDataXML

This example shows how this protocol is used to open and close a session (2). It demonstrates how this protocol is used to filter a list (2) in a workbook and to fetch the **SpreadsheetDataXML** (section 2.2.4.24). It also demonstrates how this protocol is used to sort the list (2).

This example assumes that a workbook has already been created and is stored in a location that the protocol server can load files from. The workbook contains a list (2) with an AutoFilter. The following UML diagram illustrates this example.

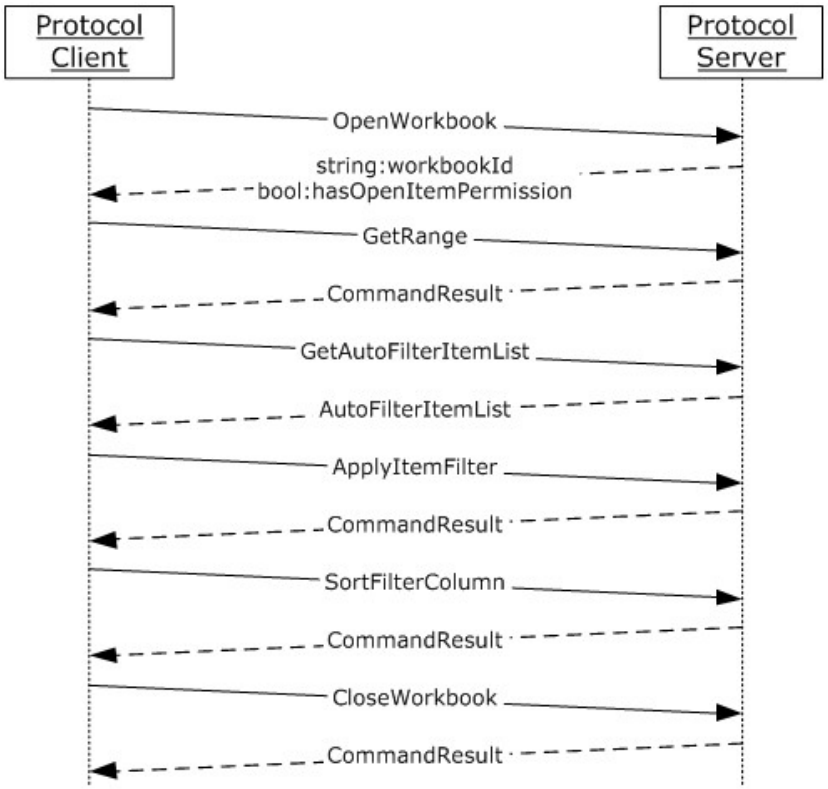

Figure 3: Sequence of communication between protocol client and protocol server to filter lists and return SpreadsheetDataXML

The order of operations, including the relevant **XML** for each step, is as follows:

Opening a new session (2) (loading the workbook)

Request

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <soap:Body>
```


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```
    <OpenWorkbook
xmlns="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalServic
e/">
      <url>http://xas/Docs/Documents/Filter.xlsx</url>
      <parameter>
        <StateId>0</StateId>
        <VisibleSheetRangeRequest>
          <FirstRow>0</FirstRow>
          <VisibleRowsRequested>75</VisibleRowsRequested>
          <FirstColumn>0</FirstColumn>
          <VisibleColumnsRequested>20</VisibleColumnsRequested>
          <VisibleFirstRowOffset>0</VisibleFirstRowOffset>
          <VisibleFirstColumnOffset>0</VisibleFirstColumnOffset>
        </VisibleSheetRangeRequest>
        <Confirmation>Blank</Confirmation>
        <ConfirmationChoice>false</ConfirmationChoice>
        <EwrCall>true</EwrCall>
      </parameter>
      <cultureParameter>
        <UICultureName>en-us</UICultureName>
        <DataCultureName>en-us</DataCultureName>
        <SharePointDataCultureName>en-us</SharePointDataCultureName>
        <TimeZoneSerialization>+0480#0000-11-00-01T02:00:00:0000#+0000#0000-03-00-
02T02:00:00:0000#-0060</TimeZoneSerialization>
      </cultureParameter>
      <requestSiteId>ce39f348-858d-462f-a632-9e19902ff8cd</requestSiteId>
    </OpenWorkbook>
  </soap:Body>
</soap:Envelope>
```

Response

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <soap:Body>
    <OpenWorkbookResponse
xmlns="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalServic
e/">
      <OpenWorkbookResult>
        <StateId>1</StateId>
        <SpreadsheetData>&lt;Workbook&gt;&lt;WorkbookOptions/&gt;&lt;Styles&gt;&lt;Style
ID="sD"&gt;&lt;Font Size="11" FontName="Calibri" Color="#000000"/&gt;&lt;/Style&gt;&lt;Style
ID="1"&gt;&lt;Font Size="11" FontName="Calibri" Color="#000000"/&gt;&lt;Alignment
Horizontal="Left"/&gt;&lt;/Style&gt;&lt;Style ID="2"&gt;&lt;Font Size="11" FontName="Calibri"
Color="#000000"/&gt;&lt;Alignment Horizontal="Right"/&gt;&lt;/Style&gt;&lt;Style ID="-
1"&gt;&lt;Borders/&gt;&lt;/Style&gt;&lt;Style ID="bD"&gt;&lt;Borders&gt;&lt;Border Weight="1"
Position="Right" LineStyle="Continuous" Color="#D0D7E5"/&gt;&lt;Border Weight="1"
Position="Bottom" LineStyle="Continuous"
Color="#D0D7E5"/&gt;&lt;/Borders&gt;&lt;/Style&gt;&lt;Style ID="-
3"&gt;&lt;Borders&gt;&lt;Border Weight="1" Position="Right" LineStyle="Continuous"
Color="#D0D7E5"/&gt;&lt;/Borders&gt;&lt;/Style&gt;&lt;Style ID="-
4"&gt;&lt;Borders&gt;&lt;Border Weight="1" Position="Bottom" LineStyle="Continuous"
Color="#D0D7E5"/&gt;&lt;/Borders&gt;&lt;/Style&gt;&lt;/Styles&gt;&lt;Worksheet
Name="Sheet1"&gt;&lt;WorksheetOptions/&gt;&lt;autofilters&gt;&lt;autofilter Row="0"
ColFirst="0" Type="Sheet"&gt;&lt;item Index="0" DataType="Text" Name="Name"/&gt;&lt;item
Index="1" DataType="Text" Name="Type"/&gt;&lt;item Index="2"
Name="Value"/&gt;&lt;/autofilter&gt;&lt;/autofilters&gt;&lt;Table LastNonEmptyRow="6"
LastNonEmptyColumn="3" CurrentFirstRow="1" FirstVisibleRow="1" LastVisibleRow="1048576"
```


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```
CurrentFirstColumn="1" FirstVisibleColumn="1" LastVisibleColumn="16384" DefaultRowHeight="15"
DefaultColumnWidth="48" DefaultIndentWidth="6.75"&gt;&lt;Column Width="48"
Span="2"/&gt;&lt;Row Height="15"&gt;&lt;Cell
StyleID="1"&gt;&lt;Data&gt;Name&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="1"&gt;&lt;Data&gt;Type&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="1"&gt;&lt;Data&gt;Value&lt;/Data&gt;&lt;/Cell&gt;&lt;/Row&gt;&lt;Row
Height="15"&gt;&lt;Cell StyleID="1"&gt;&lt;Data&gt;a&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="1"&gt;&lt;Data&gt;aa&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="2"&gt;&lt;Data&gt;1&lt;/Data&gt;&lt;/Cell&gt;&lt;/Row&gt;&lt;Row
Height="15"&gt;&lt;Cell StyleID="1"&gt;&lt;Data&gt;b&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="1"&gt;&lt;Data&gt;aa&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="2"&gt;&lt;Data&gt;2&lt;/Data&gt;&lt;/Cell&gt;&lt;/Row&gt;&lt;Row
Height="15"&gt;&lt;Cell StyleID="1"&gt;&lt;Data&gt;c&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="1"&gt;&lt;Data&gt;bb&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="2"&gt;&lt;Data&gt;3&lt;/Data&gt;&lt;/Cell&gt;&lt;/Row&gt;&lt;Row
Height="15"&gt;&lt;Cell StyleID="1"&gt;&lt;Data&gt;d&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="1"&gt;&lt;Data&gt;bb&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="2"&gt;&lt;Data&gt;2&lt;/Data&gt;&lt;/Cell&gt;&lt;/Row&gt;&lt;Row
Height="15"&gt;&lt;Cell StyleID="1"&gt;&lt;Data&gt;e&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="1"&gt;&lt;Data&gt;aa&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="2"&gt;&lt;Data&gt;1&lt;/Data&gt;&lt;/Cell&gt;&lt;/Row&gt;&lt;/Table&gt;&lt;/Workshee
t&gt;&lt;Worksheet Name="Sheet2"&gt;&lt;WorksheetOptions/&gt;&lt;/Worksheet&gt;&lt;Worksheet
Name="Sheet3"&gt;&lt;WorksheetOptions/&gt;&lt;/Worksheet&gt;&lt;/Workbook&gt;</SpreadsheetDat
a>
      </OpenWorkbookResult>
      <workbookId>21.3Myr6lbEcF6xjE1tYWIae90.5.en-US5.en-US73.+0480#0000-11-00-
01T02:00:00:0000#+0000#0000-03-00-02T02:00:00:0000#-0060</workbookId>
      <hasOpenItemPermission>true</hasOpenItemPermission>
    </OpenWorkbookResponse>
  </soap:Body>
</soap:Envelope>
```

Fetching the SpreadsheetDataXML

Request

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <soap:Body>
    <GetRange
xmlns="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalServic
e/">
      <parameter>
        <WorkbookId>21.3Myr6lbEcF6xjE1tYWIae90.5.en-US5.en-US73.+0480#0000-11-00-
01T02:00:00:0000#+0000#0000-03-00-02T02:00:00:0000#-0060</WorkbookId>
        <StateId>1</StateId>
        <VisibleSheetRangeRequest>
          <FirstRow>0</FirstRow>
          <VisibleRowsRequested>75</VisibleRowsRequested>
          <FirstColumn>0</FirstColumn>
          <VisibleColumnsRequested>20</VisibleColumnsRequested>
          <VisibleFirstRowOffset>0</VisibleFirstRowOffset>
          <VisibleFirstColumnOffset>0</VisibleFirstColumnOffset>
        </VisibleSheetRangeRequest>
        <Confirmation>Blank</Confirmation>
        <ConfirmationChoice>false</ConfirmationChoice>
        <EwrCall>true</EwrCall>
      </parameter>
```


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```
    </GetRange>
  </soap:Body>
</soap:Envelope>
```

Response

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <soap:Body>
    <GetRangeResponse
xmlns="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalServic
e/">
      <GetRangeResult>
        <StateId>1</StateId>
        <SpreadsheetData>&lt;Workbook&gt;&lt;WorkbookOptions/&gt;&lt;Styles&gt;&lt;Style
ID="sD"&gt;&lt;Font Size="11" FontName="Calibri" Color="#000000"/&gt;&lt;/Style&gt;&lt;Style
ID="1"&gt;&lt;Font Size="11" FontName="Calibri" Color="#000000"/&gt;&lt;Alignment
Horizontal="Left"/&gt;&lt;/Style&gt;&lt;Style ID="2"&gt;&lt;Font Size="11" FontName="Calibri"
Color="#000000"/&gt;&lt;Alignment Horizontal="Right"/&gt;&lt;/Style&gt;&lt;Style ID="-
1"&gt;&lt;Borders/&gt;&lt;/Style&gt;&lt;Style ID="bD"&gt;&lt;Borders&gt;&lt;Border Weight="1"
Position="Right" LineStyle="Continuous" Color="#D0D7E5"/&gt;&lt;Border Weight="1"
Position="Bottom" LineStyle="Continuous"
Color="#D0D7E5"/&gt;&lt;/Borders&gt;&lt;/Style&gt;&lt;Style ID="-
3"&gt;&lt;Borders&gt;&lt;Border Weight="1" Position="Right" LineStyle="Continuous"
Color="#D0D7E5"/&gt;&lt;/Borders&gt;&lt;/Style&gt;&lt;Style ID="-
4"&gt;&lt;Borders&gt;&lt;Border Weight="1" Position="Bottom" LineStyle="Continuous"
Color="#D0D7E5"/&gt;&lt;/Borders&gt;&lt;/Style&gt;&lt;/Styles&gt;&lt;Worksheet
Name="Sheet1"&gt;&lt;WorksheetOptions/&gt;&lt;autofilters&gt;&lt;autofilter Row="0"
ColFirst="0" Type="Sheet"&gt;&lt;item Index="0" DataType="Text" Name="Name"/&gt;&lt;item
Index="1" DataType="Text" Name="Type"/&gt;&lt;item Index="2"
Name="Value"/&gt;&lt;/autofilter&gt;&lt;/autofilters&gt;&lt;Table LastNonEmptyRow="6"
LastNonEmptyColumn="3" CurrentFirstRow="1" FirstVisibleRow="1" LastVisibleRow="1048576"
CurrentFirstColumn="1" FirstVisibleColumn="1" LastVisibleColumn="16384" DefaultRowHeight="15"
DefaultColumnWidth="48" DefaultIndentWidth="6.75"&gt;&lt;Column Width="48"
Span="2"/&gt;&lt;Row Height="15"&gt;&lt;Cell
StyleID="1"&gt;&lt;Data&gt;Name&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="1"&gt;&lt;Data&gt;Type&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="1"&gt;&lt;Data&gt;Value&lt;/Data&gt;&lt;/Cell&gt;&lt;/Row&gt;&lt;Row
Height="15"&gt;&lt;Cell StyleID="1"&gt;&lt;Data&gt;a&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="1"&gt;&lt;Data&gt;aa&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="2"&gt;&lt;Data&gt;1&lt;/Data&gt;&lt;/Cell&gt;&lt;/Row&gt;&lt;Row
Height="15"&gt;&lt;Cell StyleID="1"&gt;&lt;Data&gt;b&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="1"&gt;&lt;Data&gt;aa&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="2"&gt;&lt;Data&gt;2&lt;/Data&gt;&lt;/Cell&gt;&lt;/Row&gt;&lt;Row
Height="15"&gt;&lt;Cell StyleID="1"&gt;&lt;Data&gt;c&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="1"&gt;&lt;Data&gt;bb&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="2"&gt;&lt;Data&gt;3&lt;/Data&gt;&lt;/Cell&gt;&lt;/Row&gt;&lt;Row
Height="15"&gt;&lt;Cell StyleID="1"&gt;&lt;Data&gt;d&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="1"&gt;&lt;Data&gt;bb&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="2"&gt;&lt;Data&gt;2&lt;/Data&gt;&lt;/Cell&gt;&lt;/Row&gt;&lt;Row
Height="15"&gt;&lt;Cell StyleID="1"&gt;&lt;Data&gt;e&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="1"&gt;&lt;Data&gt;aa&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="2"&gt;&lt;Data&gt;1&lt;/Data&gt;&lt;/Cell&gt;&lt;/Row&gt;&lt;/Table&gt;&lt;/Workshee
t&gt;&lt;Worksheet Name="Sheet2"&gt;&lt;WorksheetOptions/&gt;&lt;/Worksheet&gt;&lt;Worksheet
Name="Sheet3"&gt;&lt;WorksheetOptions/&gt;&lt;/Worksheet&gt;&lt;/Workbook&gt;</SpreadsheetDat
a>
      </GetRangeResult>
    </GetRangeResponse>
  </soap:Body>
</soap:Envelope>
```


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Fetching the list (2) of filter values

Request

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <soap:Body>
    <GetAutoFilterItemList
xmlns="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalServic
e/">
      <parameter>
        <WorkbookId>21.3Myr6lbEcF6xjE1tYWIae90.5.en-US5.en-US73.+0480#0000-11-00-
01T02:00:00:0000#+0000#0000-03-00-02T02:00:00:0000#-0060</WorkbookId>
        <StateId>1</StateId>
        <VisibleSheetRangeRequest>
          <FirstRow>0</FirstRow>
          <VisibleRowsRequested>75</VisibleRowsRequested>
          <FirstColumn>0</FirstColumn>
          <VisibleColumnsRequested>20</VisibleColumnsRequested>
          <VisibleFirstRowOffset>0</VisibleFirstRowOffset>
          <VisibleFirstColumnOffset>0</VisibleFirstColumnOffset>
        </VisibleSheetRangeRequest>
        <Confirmation>Blank</Confirmation>
        <ConfirmationChoice>false</ConfirmationChoice>
        <EwrCall>true</EwrCall>
      </parameter>
      <autoFilterOptions>
        <AutoFilterType>Sheet</AutoFilterType>
        <CriteriaType>Nil</CriteriaType>
        <Id>0</Id>
        <SheetName>Sheet1</SheetName>
        <Column>1</Column>
        <NamedObjectView>false</NamedObjectView>
      </autoFilterOptions>
    </GetAutoFilterItemList>
  </soap:Body>
</soap:Envelope>
```

Response

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <soap:Body>
    <GetAutoFilterItemListResponse
xmlns="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalServic
e/">
      <GetAutoFilterItemListResult>
        <ShowTime>false</ShowTime>
        <ItemListMaxExceeded>false</ItemListMaxExceeded>
        <IsBlanksSelected>false</IsBlanksSelected>
        <HasBlanks>false</HasBlanks>
```


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```
          <AutoFilterDateNodes />
          <AutoFilterItems>
            <AutoFilterItem>
              <Selected>true</Selected>
              <DisplayString>a</DisplayString>
            </AutoFilterItem>
            <AutoFilterItem>
              <Selected>true</Selected>
              <DisplayString>b</DisplayString>
            </AutoFilterItem>
            <AutoFilterItem>
              <Selected>true</Selected>
              <DisplayString>c</DisplayString>
            </AutoFilterItem>
            <AutoFilterItem>
              <Selected>true</Selected>
              <DisplayString>d</DisplayString>
            </AutoFilterItem>
            <AutoFilterItem>
              <Selected>true</Selected>
              <DisplayString>e</DisplayString>
            </AutoFilterItem>
          </AutoFilterItems>
          <SecondValues />
          <SecondKeys />
          <MinuteValues />
          <MinuteKeys />
          <HourValues />
          <HourKeys />
          <DayValues />
          <DayKeys />
          <MonthValues />
          <MonthKeys />
          <YearValues />
          <YearKeys />
        </GetAutoFilterItemListResult>
      </GetAutoFilterItemListResponse>
    </soap:Body>
  </soap:Envelope>
```

Applying the filter and fetching the SpreadsheetDataXML

Request

```
  <?xml version="1.0" encoding="utf-8"?>
  <soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema">
    <soap:Body>
      <ApplyItemFilter
  xmlns="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalServic
  e/">
        <parameter>
          <WorkbookId>21.3Myr6lbEcF6xjE1tYWIae90.5.en-US5.en-US73.+0480#0000-11-00-
  01T02:00:00:0000#+0000#0000-03-00-02T02:00:00:0000#-0060</WorkbookId>
          <StateId>1</StateId>
          <VisibleSheetRangeRequest>
```


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```
          <FirstRow>0</FirstRow>
          <VisibleRowsRequested>75</VisibleRowsRequested>
          <FirstColumn>0</FirstColumn>
          <VisibleColumnsRequested>20</VisibleColumnsRequested>
          <VisibleFirstRowOffset>0</VisibleFirstRowOffset>
          <VisibleFirstColumnOffset>0</VisibleFirstColumnOffset>
        </VisibleSheetRangeRequest>
        <Confirmation>Blank</Confirmation>
        <ConfirmationChoice>false</ConfirmationChoice>
        <EwrCall>true</EwrCall>
      </parameter>
      <autoFilterOptions>
        <AutoFilterType>Sheet</AutoFilterType>
        <CriteriaType>Nil</CriteriaType>
        <Id>0</Id>
        <SheetName>Sheet1</SheetName>
        <Column>1</Column>
        <NamedObjectView>false</NamedObjectView>
      </autoFilterOptions>
      <values>
        <string>c</string>
        <string>d</string>
        <string>e</string>
      </values>
      <blanks>false</blanks>
      <hideBlanks>false</hideBlanks>
    </ApplyItemFilter>
  </soap:Body>
</soap:Envelope>
```

Response

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <soap:Body>
    <ApplyItemFilterResponse
xmlns="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalServic
e/">
      <ApplyItemFilterResult>
        <StateId>2</StateId>
        <SpreadsheetData>&lt;Workbook&gt;&lt;WorkbookOptions/&gt;&lt;Styles&gt;&lt;Style
ID="sD"&gt;&lt;Font Size="11" FontName="Calibri" Color="#000000"/&gt;&lt;/Style&gt;&lt;Style
ID="1"&gt;&lt;Font Size="11" FontName="Calibri" Color="#000000"/&gt;&lt;Alignment
Horizontal="Left"/&gt;&lt;/Style&gt;&lt;Style ID="2"&gt;&lt;Font Size="11" FontName="Calibri"
Color="#000000"/&gt;&lt;Alignment Horizontal="Right"/&gt;&lt;/Style&gt;&lt;Style ID="-
1"&gt;&lt;Borders/&gt;&lt;/Style&gt;&lt;Style ID="bD"&gt;&lt;Borders&gt;&lt;Border Weight="1"
Position="Right" LineStyle="Continuous" Color="#D0D7E5"/&gt;&lt;Border Weight="1"
Position="Bottom" LineStyle="Continuous"
Color="#D0D7E5"/&gt;&lt;/Borders&gt;&lt;/Style&gt;&lt;Style ID="-
3"&gt;&lt;Borders&gt;&lt;Border Weight="1" Position="Right" LineStyle="Continuous"
Color="#D0D7E5"/&gt;&lt;/Borders&gt;&lt;/Style&gt;&lt;Style ID="-
4"&gt;&lt;Borders&gt;&lt;Border Weight="1" Position="Bottom" LineStyle="Continuous"
Color="#D0D7E5"/&gt;&lt;/Borders&gt;&lt;/Style&gt;&lt;/Styles&gt;&lt;Worksheet
Name="Sheet1"&gt;&lt;WorksheetOptions/&gt;&lt;autofilters&gt;&lt;autofilter Row="0"
ColFirst="0" Type="Sheet"&gt;&lt;item Index="0" Filter="1" Type="Filtered" DataType="Text"
Name="Name"/&gt;&lt;item Index="1" DataType="Text" Name="Type"/&gt;&lt;item Index="2"
Name="Value"/&gt;&lt;/autofilter&gt;&lt;/autofilters&gt;&lt;Table LastNonEmptyRow="6"
LastNonEmptyColumn="3" CurrentFirstRow="1" FirstVisibleRow="1" LastVisibleRow="1048576"
```


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```
CurrentFirstColumn="1" FirstVisibleColumn="1" LastVisibleColumn="16384" DefaultRowHeight="15"
DefaultColumnWidth="48" DefaultIndentWidth="6.75"&gt;&lt;Column Width="48"
Span="2"/&gt;&lt;Row Height="15"&gt;&lt;Cell
StyleID="1"&gt;&lt;Data&gt;Name&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="1"&gt;&lt;Data&gt;Type&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="1"&gt;&lt;Data&gt;Value&lt;/Data&gt;&lt;/Cell&gt;&lt;/Row&gt;&lt;Row Hidden="1"
Span="1"/&gt;&lt;Row Index="4" Height="15"&gt;&lt;Cell
StyleID="1"&gt;&lt;Data&gt;c&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="1"&gt;&lt;Data&gt;bb&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="2"&gt;&lt;Data&gt;3&lt;/Data&gt;&lt;/Cell&gt;&lt;/Row&gt;&lt;Row
Height="15"&gt;&lt;Cell StyleID="1"&gt;&lt;Data&gt;d&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="1"&gt;&lt;Data&gt;bb&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="2"&gt;&lt;Data&gt;2&lt;/Data&gt;&lt;/Cell&gt;&lt;/Row&gt;&lt;Row
Height="15"&gt;&lt;Cell StyleID="1"&gt;&lt;Data&gt;e&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="1"&gt;&lt;Data&gt;aa&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="2"&gt;&lt;Data&gt;1&lt;/Data&gt;&lt;/Cell&gt;&lt;/Row&gt;&lt;/Table&gt;&lt;/Workshee
t&gt;&lt;Worksheet Name="Sheet2"&gt;&lt;WorksheetOptions/&gt;&lt;/Worksheet&gt;&lt;Worksheet
Name="Sheet3"&gt;&lt;WorksheetOptions/&gt;&lt;/Worksheet&gt;&lt;/Workbook&gt;</SpreadsheetDat
a>
      </ApplyItemFilterResult>
    </ApplyItemFilterResponse>
  </soap:Body>
</soap:Envelope>
```

Applying the sort and fetching the SpreadsheetDataXML

Request

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <soap:Body>
    <SortFilterColumn
xmlns="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalServic
e/">
      <parameter>
        <WorkbookId>21.3Myr6lbEcF6xjE1tYWIae90.5.en-US5.en-US73.+0480#0000-11-00-
01T02:00:00:0000#+0000#0000-03-00-02T02:00:00:0000#-0060</WorkbookId>
        <StateId>2</StateId>
        <VisibleSheetRangeRequest>
          <FirstRow>0</FirstRow>
          <VisibleRowsRequested>75</VisibleRowsRequested>
          <FirstColumn>0</FirstColumn>
          <VisibleColumnsRequested>20</VisibleColumnsRequested>
          <VisibleFirstRowOffset>0</VisibleFirstRowOffset>
          <VisibleFirstColumnOffset>0</VisibleFirstColumnOffset>
        </VisibleSheetRangeRequest>
        <Confirmation>Blank</Confirmation>
        <ConfirmationChoice>false</ConfirmationChoice>
        <EwrCall>true</EwrCall>
      </parameter>
      <autoFilterOptions>
        <AutoFilterType>Sheet</AutoFilterType>
        <CriteriaType>Nil</CriteriaType>
        <Id>0</Id>
        <SheetName>Sheet1</SheetName>
        <Column>1</Column>
        <NamedObjectView>false</NamedObjectView>
      </autoFilterOptions>
```


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```
      <ascending>false</ascending>
    </SortFilterColumn>
  </soap:Body>
</soap:Envelope>
```

Response

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <soap:Body>
    <SortFilterColumnResponse
xmlns="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalServic
e/">
      <SortFilterColumnResult>
        <StateId>3</StateId>
        <SpreadsheetData>&lt;Workbook&gt;&lt;WorkbookOptions/&gt;&lt;Styles&gt;&lt;Style
ID="sD"&gt;&lt;Font Size="11" FontName="Calibri" Color="#000000"/&gt;&lt;/Style&gt;&lt;Style
ID="1"&gt;&lt;Font Size="11" FontName="Calibri" Color="#000000"/&gt;&lt;Alignment
Horizontal="Left"/&gt;&lt;/Style&gt;&lt;Style ID="2"&gt;&lt;Font Size="11" FontName="Calibri"
Color="#000000"/&gt;&lt;Alignment Horizontal="Right"/&gt;&lt;/Style&gt;&lt;Style ID="-
1"&gt;&lt;Borders/&gt;&lt;/Style&gt;&lt;Style ID="bD"&gt;&lt;Borders&gt;&lt;Border Weight="1"
Position="Right" LineStyle="Continuous" Color="#D0D7E5"/&gt;&lt;Border Weight="1"
Position="Bottom" LineStyle="Continuous"
Color="#D0D7E5"/&gt;&lt;/Borders&gt;&lt;/Style&gt;&lt;Style ID="-
3"&gt;&lt;Borders&gt;&lt;Border Weight="1" Position="Right" LineStyle="Continuous"
Color="#D0D7E5"/&gt;&lt;/Borders&gt;&lt;/Style&gt;&lt;Style ID="-
4"&gt;&lt;Borders&gt;&lt;Border Weight="1" Position="Bottom" LineStyle="Continuous"
Color="#D0D7E5"/&gt;&lt;/Borders&gt;&lt;/Style&gt;&lt;/Styles&gt;&lt;Worksheet
Name="Sheet1"&gt;&lt;WorksheetOptions/&gt;&lt;autofilters&gt;&lt;autofilter Row="0"
ColFirst="0" Type="Sheet"&gt;&lt;item Index="0" Filter="1" Type="BothDesc" DataType="Text"
Name="Name"/&gt;&lt;item Index="1" DataType="Text" Name="Type"/&gt;&lt;item Index="2"
Name="Value"/&gt;&lt;/autofilter&gt;&lt;/autofilters&gt;&lt;Table LastNonEmptyRow="6"
LastNonEmptyColumn="3" CurrentFirstRow="1" FirstVisibleRow="1" LastVisibleRow="1048576"
CurrentFirstColumn="1" FirstVisibleColumn="1" LastVisibleColumn="16384" DefaultRowHeight="15"
DefaultColumnWidth="48" DefaultIndentWidth="6.75"&gt;&lt;Column Width="48"
Span="2"/&gt;&lt;Row Height="15"&gt;&lt;Cell
StyleID="1"&gt;&lt;Data&gt;Name&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="1"&gt;&lt;Data&gt;Type&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="1"&gt;&lt;Data&gt;Value&lt;/Data&gt;&lt;/Cell&gt;&lt;/Row&gt;&lt;Row Hidden="1"
Span="1"/&gt;&lt;Row Index="4" Height="15"&gt;&lt;Cell
StyleID="1"&gt;&lt;Data&gt;e&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="1"&gt;&lt;Data&gt;aa&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="2"&gt;&lt;Data&gt;1&lt;/Data&gt;&lt;/Cell&gt;&lt;/Row&gt;&lt;Row
Height="15"&gt;&lt;Cell StyleID="1"&gt;&lt;Data&gt;d&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="1"&gt;&lt;Data&gt;bb&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="2"&gt;&lt;Data&gt;2&lt;/Data&gt;&lt;/Cell&gt;&lt;/Row&gt;&lt;Row
Height="15"&gt;&lt;Cell StyleID="1"&gt;&lt;Data&gt;c&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="1"&gt;&lt;Data&gt;bb&lt;/Data&gt;&lt;/Cell&gt;&lt;Cell
StyleID="2"&gt;&lt;Data&gt;3&lt;/Data&gt;&lt;/Cell&gt;&lt;/Row&gt;&lt;/Table&gt;&lt;/Workshee
t&gt;&lt;Worksheet Name="Sheet2"&gt;&lt;WorksheetOptions/&gt;&lt;/Worksheet&gt;&lt;Worksheet
Name="Sheet3"&gt;&lt;WorksheetOptions/&gt;&lt;/Worksheet&gt;&lt;/Workbook&gt;</SpreadsheetDat
a>
      </SortFilterColumnResult>
    </SortFilterColumnResponse>
  </soap:Body>
</soap:Envelope>
```

Closing the session (2)

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Request

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <soap:Body>
    <CloseWorkbook
xmlns="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalServic
e/">
      <parameter>
        <WorkbookId>21.3Myr6lbEcF6xjE1tYWIae90.5.en-US5.en-US73.+0480#0000-11-00-
01T02:00:00:0000#+0000#0000-03-00-02T02:00:00:0000#-0060</WorkbookId>
        <StateId>3</StateId>
        <VisibleSheetRangeRequest>
          <FirstRow>0</FirstRow>
          <VisibleRowsRequested>75</VisibleRowsRequested>
          <FirstColumn>0</FirstColumn>
          <VisibleColumnsRequested>20</VisibleColumnsRequested>
          <VisibleFirstRowOffset>0</VisibleFirstRowOffset>
          <VisibleFirstColumnOffset>0</VisibleFirstColumnOffset>
        </VisibleSheetRangeRequest>
        <Confirmation>Blank</Confirmation>
        <ConfirmationChoice>false</ConfirmationChoice>
        <EwrCall>true</EwrCall>
      </parameter>
    </CloseWorkbook>
  </soap:Body>
</soap:Envelope>
```

Response

```
<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <soap:Body>
    <CloseWorkbookResponse
xmlns="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalServic
e/" />
  </soap:Body>
</soap:Envelope>
```


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5 Security

5.1 Security Considerations for Implementers

In addition to the security considerations applicable to the underlying protocols, there are security risks associated with exposing session identifiers. If the session identifier (2) is exposed, then it is possible for an attacker to read information from, or modify data in, a session (2) on the protocol server. An implementer of this protocol needs to consider keeping session identifiers protected. There could be some cases where it is desirable to expose the session identifier (2), however, an implementer is to use caution in how they expose session identifiers and consider the security risks.

5.2 Index of Security Parameters

The following table indicates the section in which security parameters are covered.

Security parameter	Section
UserName	**WorkOnBehalf** (section 2.2.4.26)
UserSid	**WorkOnBehalf**
UserToken	**WorkOnBehalf**
Ticket	**CredentialsResponse** (section 2.2.4.15)

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6 Appendix A: Full WSDL

For ease of implementation, the full WSDL is provided as follows.

```
<?xml version="1.0" encoding="utf-8"?>
<wsdl:definitions xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
xmlns:tm="http://microsoft.com/wsdl/mime/textMatching/"
xmlns:soapenc="http://schemas.xmlsoap.org/soap/encoding/"
xmlns:mime="http://schemas.xmlsoap.org/wsdl/mime/"
xmlns:tns="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalSe
rvice/" xmlns:s1="http://microsoft.com/wsdl/types/"
xmlns:s="http://www.w3.org/2001/XMLSchema"
xmlns:soap12="http://schemas.xmlsoap.org/wsdl/soap12/"
xmlns:http="http://schemas.xmlsoap.org/wsdl/http/"
targetNamespace="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInte
rnalService/" xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/">
  <wsdl:types>
    <s:schema elementFormDefault="qualified"
targetNamespace="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInte
rnalService/">
      <s:import namespace="http://microsoft.com/wsdl/types/" />
      <s:element name="CloseWorkbook">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="parameter"
type="tns:CommandParameter" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:complexType name="CommandParameter">
        <s:sequence>
          <s:element minOccurs="0" maxOccurs="1" name="WorkbookId" type="s:string" />
          <s:element minOccurs="1" maxOccurs="1" name="StateId" type="s:int" />
          <s:element minOccurs="0" maxOccurs="1" name="VisibleSheetRangeRequest"
type="tns:VisibleSheetRange" />
          <s:element minOccurs="0" maxOccurs="1" name="WorkOnBehalfRequest"
type="tns:WorkOnBehalf" />
          <s:element minOccurs="0" maxOccurs="1" name="CredentialsResponse"
type="tns:CredentialsResponse" />
          <s:element minOccurs="1" maxOccurs="1" name="Confirmation"
type="tns:ExcelServerMessageId" />
          <s:element minOccurs="1" maxOccurs="1" name="ConfirmationChoice" type="s:boolean"
/>
          <s:element minOccurs="1" maxOccurs="1" name="EwrCall" type="s:boolean" />
        </s:sequence>
      </s:complexType>
      <s:complexType name="VisibleSheetRange">
        <s:sequence>
          <s:element minOccurs="0" maxOccurs="1" name="SheetName" type="s:string" />
          <s:element minOccurs="0" maxOccurs="1" name="ObjectName" type="s:string" />
          <s:element minOccurs="0" maxOccurs="1" name="ExcelRange" type="s:string" />
          <s:element minOccurs="1" maxOccurs="1" name="FirstRow" type="s:int" />
          <s:element minOccurs="1" maxOccurs="1" name="VisibleRowsRequested" type="s:int" />
          <s:element minOccurs="1" maxOccurs="1" name="FirstColumn" type="s:int" />
          <s:element minOccurs="1" maxOccurs="1" name="VisibleColumnsRequested" type="s:int"
/>
          <s:element minOccurs="1" maxOccurs="1" name="VisibleFirstRowOffset" type="s:int" />
          <s:element minOccurs="1" maxOccurs="1" name="VisibleFirstColumnOffset" type="s:int"
/>
```


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```
        </s:sequence>
      </s:complexType>
      <s:complexType name="WorkOnBehalf">
        <s:sequence>
          <s:element minOccurs="0" maxOccurs="1" name="UserName" type="s:string" />
          <s:element minOccurs="0" maxOccurs="1" name="UserSid" type="s:string" />
          <s:element minOccurs="0" maxOccurs="1" name="UserToken" type="s:base64Binary" />
        </s:sequence>
      </s:complexType>
      <s:complexType name="CredentialsResponse">
        <s:sequence>
          <s:element minOccurs="0" maxOccurs="1" name="Ticket" type="tns:SingleSignOnTicket"
/>
        </s:sequence>
      </s:complexType>
      <s:complexType name="SingleSignOnTicket">
        <s:sequence>
          <s:element minOccurs="1" maxOccurs="1" name="FailedToReserveTicket"
type="s:boolean" />
          <s:element minOccurs="0" maxOccurs="1" name="Value" type="s:string" />
        </s:sequence>
      </s:complexType>
<s:simpleType name="ExcelServerMessageId">
  <s:restriction base="s:string">
    <s:enumeration value="Blank"/>
    <s:enumeration value="ConfirmDataRefresh"/>
    <s:enumeration value="ExternalDataRefreshFailed"/>
    <s:enumeration value="ExternalDataRefreshFailed_Details"/>
    <s:enumeration value="PivotNoOverlapAllowed"/>
    <s:enumeration value="PivotOverlapList"/>
    <s:enumeration value="PivotCubeNotUnique"/>
    <s:enumeration value="NoDataItemsOlap"/>
    <s:enumeration value="OlapSchemaFail"/>
    <s:enumeration value="InvalidPivot"/>
    <s:enumeration value="OlapNoMoreDetail"/>
    <s:enumeration value="DrillActionInvalid"/>
    <s:enumeration value="DriverNotOlap"/>
    <s:enumeration value="CubeMissing"/>
    <s:enumeration value="SkipLine"/>
    <s:enumeration value="CDimMismatch"/>
    <s:enumeration value="DataSetAxisTooBig"/>
    <s:enumeration value="CubeIntegrityError"/>
    <s:enumeration value="PivotNotExpandedtoProtectCellContents"/>
    <s:enumeration value="PivotTruncatedSheetEdge"/>
    <s:enumeration value="DdlGrpNotSup"/>
    <s:enumeration value="PivotFormulasCollided"/>
    <s:enumeration value="NoRetItems"/>
    <s:enumeration value="OlapConnectVisualModeProvider"/>
    <s:enumeration value="PivotNoSourceData"/>
    <s:enumeration value="PivotFilteringError"/>
    <s:enumeration value="PivotTableIncorrectDateFormat"/>
    <s:enumeration value="PivotTableEndingLargerThanStarting"/>
    <s:enumeration value="PivotTableIncorrectNumberFormat"/>
    <s:enumeration value="PivotTableOutOfRange"/>
    <s:enumeration value="MergedCellOverlap"/>
    <s:enumeration value="PivotSourceNotAvailable"/>
    <s:enumeration value="UnexpectedPivotError"/>
    <s:enumeration value="UnsupportedUICulture"/>
    <s:enumeration value="UnsupportedDataCulture"/>
```


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```
    </s:restriction>
  </s:simpleType>
        <s:element name="CloseWorkbookResponse">
          <s:complexType />
        </s:element>
        <s:element name="GetRange">
          <s:complexType>
            <s:sequence>
              <s:element minOccurs="0" maxOccurs="1" name="parameter"
  type="tns:CommandParameter" />
            </s:sequence>
          </s:complexType>
        </s:element>
        <s:element name="GetRangeResponse">
          <s:complexType>
            <s:sequence>
              <s:element minOccurs="0" maxOccurs="1" name="GetRangeResult"
  type="tns:CommandResult" />
            </s:sequence>
          </s:complexType>
        </s:element>
        <s:complexType name="CommandResult">
          <s:sequence>
            <s:element minOccurs="1" maxOccurs="1" name="StateId" type="s:int" />
            <s:element minOccurs="0" maxOccurs="1" name="SpreadsheetData" type="s:string" />
            <s:element minOccurs="0" maxOccurs="1" name="ExtendedInfo"
  type="tns:CommandResultExtendedInfo" />
            <s:element minOccurs="0" maxOccurs="1" name="PeriodicRefreshInfo"
  type="tns:PeriodicRefreshInfo" />
          </s:sequence>
        </s:complexType>
        <s:complexType name="CommandResultExtendedInfo">
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="CredentialsRequest"
  type="tns:CredentialsRequest" />
            <s:element minOccurs="0" maxOccurs="1" name="Messages"
  type="tns:ArrayOfExcelServerMessage" />
            <s:element minOccurs="1" maxOccurs="1" name="WarnOnManualDataRefresh"
  type="s:boolean" />
          </s:sequence>
        </s:complexType>
        <s:complexType name="CredentialsRequest">
          <s:sequence>
            <s:element minOccurs="1" maxOccurs="1" name="ReserveTicket" type="s:boolean" />
          </s:sequence>
        </s:complexType>
        <s:complexType name="ArrayOfExcelServerMessage">
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="unbounded" name="ExcelServerMessage"
  nillable="true" type="tns:ExcelServerMessage" />
          </s:sequence>
        </s:complexType>
        <s:complexType name="ExcelServerMessage">
          <s:sequence>
            <s:element minOccurs="1" maxOccurs="1" name="HasOpenItemPermission"
  type="s:boolean" />
            <s:element minOccurs="1" maxOccurs="1" name="Id" type="tns:ExcelServerMessageId" />
            <s:element minOccurs="1" maxOccurs="1" name="Severity"
  type="tns:ExcelServerMessageSeverity" />
```


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```
          <s:element minOccurs="1" maxOccurs="1" name="Type"
type="tns:ExcelServerMessageType" />
          <s:element minOccurs="1" maxOccurs="1" name="Buttons"
type="tns:ExcelServerMessageButtons" />
          <s:element minOccurs="0" maxOccurs="1" name="Description" type="s:string" />
          <s:element minOccurs="0" maxOccurs="1" name="ExtendedDescription" type="s:string"
/>
          <s:element minOccurs="0" maxOccurs="1" name="Caption" type="s:string" />
          <s:element minOccurs="0" maxOccurs="1" name="HelpTopicId" type="s:string" />
          <s:element minOccurs="0" maxOccurs="1" name="HelpDisplayText" type="s:string" />
        </s:sequence>
      </s:complexType>
<s:simpleType name="ExcelServerMessageSeverity">
  <s:restriction base="s:string">
    <s:enumeration value="Error"/>
    <s:enumeration value="Warning"/>
  </s:restriction>
</s:simpleType>
<s:simpleType name="ExcelServerMessageType">
  <s:restriction base="s:string">
    <s:enumeration value="Alert"/>
    <s:enumeration value="Confirmation"/>
  </s:restriction>
</s:simpleType>

<s:simpleType name="ExcelServerMessageButtons">
  <s:list>
    <s:simpleType>
      <s:restriction base="s:string">
        <s:enumeration value="OK"/>
        <s:enumeration value="Yes"/>
        <s:enumeration value="No"/>
      </s:restriction>
    </s:simpleType>
  </s:list>
</s:simpleType>
      <s:complexType name="PeriodicRefreshInfo">
        <s:sequence>
          <s:element minOccurs="1" maxOccurs="1" name="ExpirationTime" type="s:int" />
          <s:element minOccurs="0" maxOccurs="1" name="ConnectionNames"
type="tns:ArrayOfString" />
        </s:sequence>
      </s:complexType>
      <s:complexType name="ArrayOfString">
        <s:sequence>
          <s:element minOccurs="0" maxOccurs="unbounded" name="string" nillable="true"
type="s:string" />
        </s:sequence>
      </s:complexType>
      <s:element name="GetRangeValues">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="parameter"
type="tns:CommandParameter" />
            <s:element minOccurs="0" maxOccurs="1" name="sheetRange" type="tns:SheetRange" />
            <s:element minOccurs="1" maxOccurs="1" name="formatted" type="s:boolean" />
          </s:sequence>
        </s:complexType>
      </s:element>
```


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```
      <s:complexType name="SheetRange">
        <s:sequence>
          <s:element minOccurs="0" maxOccurs="1" name="SheetName" type="s:string" />
          <s:element minOccurs="1" maxOccurs="1" name="FirstRow" type="s:int" />
          <s:element minOccurs="1" maxOccurs="1" name="LastRow" type="s:int" />
          <s:element minOccurs="1" maxOccurs="1" name="FirstColumn" type="s:int" />
          <s:element minOccurs="1" maxOccurs="1" name="LastColumn" type="s:int" />
        </s:sequence>
      </s:complexType>
      <s:element name="GetRangeValuesResponse">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="GetRangeValuesResult"
type="tns:CommandResult" />
            <s:element minOccurs="0" maxOccurs="1" name="cellValues"
type="tns:ArrayOfAnyType" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:complexType name="ArrayOfAnyType">
        <s:sequence>
          <s:element minOccurs="0" maxOccurs="unbounded" name="anyType" nillable="true" />
        </s:sequence>
      </s:complexType>
      <s:simpleType name="CellError">
        <s:restriction base="s:string">
          <s:enumeration value="Div0" />
          <s:enumeration value="NotApplicable" />
          <s:enumeration value="Name" />
          <s:enumeration value="Null" />
          <s:enumeration value="Num" />
          <s:enumeration value="Ref" />
          <s:enumeration value="Value" />
        </s:restriction>
      </s:simpleType>
      <s:element name="GetRangeValuesA1">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="parameter"
type="tns:CommandParameter" />
            <s:element minOccurs="0" maxOccurs="1" name="sheetName" type="s:string" />
            <s:element minOccurs="0" maxOccurs="1" name="rangeName" type="s:string" />
            <s:element minOccurs="1" maxOccurs="1" name="formatted" type="s:boolean" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="GetRangeValuesA1Response">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="GetRangeValuesA1Result"
type="tns:CommandResult" />
            <s:element minOccurs="0" maxOccurs="1" name="cellValues"
type="tns:ArrayOfAnyType" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="CancelRequest">
        <s:complexType>
          <s:sequence>
```


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```
            <s:element minOccurs="0" maxOccurs="1" name="parameter"
type="tns:CommandParameter" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="CancelRequestResponse">
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      </s:element>
      <s:element name="GetSessionInformation">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="parameter"
type="tns:CommandParameter" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="GetSessionInformationResponse">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="GetSessionInformationResult"
type="tns:CommandResult" />
            <s:element minOccurs="0" maxOccurs="1" name="serverVersion" type="s:string" />
            <s:element minOccurs="0" maxOccurs="1" name="uiCultureName" type="s:string" />
            <s:element minOccurs="0" maxOccurs="1" name="dataCultureName" type="s:string" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="FindRange">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="parameter"
type="tns:CommandParameter" />
            <s:element minOccurs="0" maxOccurs="1" name="searchTerm" type="s:string" />
            <s:element minOccurs="1" maxOccurs="1" name="searchUp" type="s:boolean" />
            <s:element minOccurs="0" maxOccurs="1" name="searchAfterCell"
type="tns:SheetCell" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:complexType name="SheetCell">
        <s:sequence>
          <s:element minOccurs="0" maxOccurs="1" name="SheetName" type="s:string" />
          <s:element minOccurs="1" maxOccurs="1" name="Row" type="s:int" />
          <s:element minOccurs="1" maxOccurs="1" name="Column" type="s:int" />
        </s:sequence>
      </s:complexType>
      <s:element name="FindRangeResponse">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="FindRangeResult"
type="tns:CommandResult" />
            <s:element minOccurs="0" maxOccurs="1" name="foundCell" type="tns:SheetCell" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="GetAutoFilterItemList">
        <s:complexType>
          <s:sequence>
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```
            <s:element minOccurs="0" maxOccurs="1" name="parameter"
type="tns:CommandParameter" />
            <s:element minOccurs="0" maxOccurs="1" name="autoFilterOptions"
type="tns:AutoFilterOptions" />
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        </s:complexType>
      </s:element>
      <s:complexType name="AutoFilterOptions">
        <s:sequence>
          <s:element minOccurs="0" maxOccurs="1" name="AutoFilterType" type="s:string" />
          <s:element minOccurs="0" maxOccurs="1" name="Criteria"
type="tns:ArrayOfAutoFilterCriteria" />
          <s:element minOccurs="1" maxOccurs="1" name="CriteriaType"
type="tns:AutoFilterCriteriaType" />
          <s:element minOccurs="1" maxOccurs="1" name="Id" type="s:unsignedInt" />
          <s:element minOccurs="0" maxOccurs="1" name="SheetName" type="s:string" />
          <s:element minOccurs="1" maxOccurs="1" name="Column" type="s:int" />
          <s:element minOccurs="1" maxOccurs="1" name="NamedObjectView" type="s:boolean" />
        </s:sequence>
      </s:complexType>
      <s:complexType name="ArrayOfAutoFilterCriteria">
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nillable="true" type="tns:AutoFilterCriteria" />
        </s:sequence>
      </s:complexType>
      <s:complexType name="AutoFilterCriteria">
        <s:sequence>
          <s:element minOccurs="1" maxOccurs="1" name="Type" type="tns:OperationType" />
          <s:element minOccurs="1" maxOccurs="1" name="Relation" type="tns:RelationOperator"
/>
          <s:element minOccurs="0" maxOccurs="1" name="Value" type="s:string" />
        </s:sequence>
      </s:complexType>
      <s:simpleType name="OperationType">
        <s:restriction base="s:string">
          <s:enumeration value="EQ" />
          <s:enumeration value="NEQ" />
          <s:enumeration value="GT" />
          <s:enumeration value="GTEQ" />
          <s:enumeration value="LT" />
          <s:enumeration value="LTEQ" />
          <s:enumeration value="LastCount" />
        </s:restriction>
      </s:simpleType>
      <s:simpleType name="RelationOperator">
        <s:restriction base="s:string">
          <s:enumeration value="Nil" />
          <s:enumeration value="And" />
          <s:enumeration value="Or" />
          <s:enumeration value="LastCount" />
        </s:restriction>
      </s:simpleType>
      <s:simpleType name="AutoFilterCriteriaType">
        <s:restriction base="s:string">
          <s:enumeration value="Nil" />
          <s:enumeration value="AboveAverage" />
          <s:enumeration value="BelowAverage" />
          <s:enumeration value="Tomorrow" />
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```
            <s:enumeration value="Today" />
            <s:enumeration value="Yesterday" />
            <s:enumeration value="NextWeek" />
            <s:enumeration value="ThisWeek" />
            <s:enumeration value="LastWeek" />
            <s:enumeration value="NextMonth" />
            <s:enumeration value="ThisMonth" />
            <s:enumeration value="LastMonth" />
            <s:enumeration value="NextQuarter" />
            <s:enumeration value="ThisQuarter" />
            <s:enumeration value="LastQuarter" />
            <s:enumeration value="NextYear" />
            <s:enumeration value="ThisYear" />
            <s:enumeration value="LastYear" />
            <s:enumeration value="YearToDate" />
            <s:enumeration value="Q1" />
            <s:enumeration value="Q2" />
            <s:enumeration value="Q3" />
            <s:enumeration value="Q4" />
            <s:enumeration value="M1" />
            <s:enumeration value="M2" />
            <s:enumeration value="M3" />
            <s:enumeration value="M4" />
            <s:enumeration value="M5" />
            <s:enumeration value="M6" />
            <s:enumeration value="M7" />
            <s:enumeration value="M8" />
            <s:enumeration value="M9" />
            <s:enumeration value="M10" />
            <s:enumeration value="M11" />
            <s:enumeration value="M12" />
            <s:enumeration value="LastCount" />
          </s:restriction>
        </s:simpleType>
        <s:complexType name="AutoFilterItemList">
          <s:sequence>
            <s:element minOccurs="1" maxOccurs="1" name="ShowTime" type="s:boolean" />
            <s:element minOccurs="1" maxOccurs="1" name="ItemListMaxExceeded" type="s:boolean"
/>
            <s:element minOccurs="1" maxOccurs="1" name="IsBlanksSelected" type="s:boolean" />
            <s:element minOccurs="1" maxOccurs="1" name="HasBlanks" type="s:boolean" />
            <s:element minOccurs="0" maxOccurs="1" name="AutoFilterDateNodes"
type="tns:ArrayOfAutoFilterDateNodeInfo" />
            <s:element minOccurs="0" maxOccurs="1" name="AutoFilterItems"
type="tns:ArrayOfAutoFilterItem" />
            <s:element minOccurs="0" maxOccurs="1" name="SecondValues"
type="tns:ArrayOfAnyType" />
            <s:element minOccurs="0" maxOccurs="1" name="SecondKeys" type="tns:ArrayOfAnyType"
/>
            <s:element minOccurs="0" maxOccurs="1" name="MinuteValues"
type="tns:ArrayOfAnyType" />
            <s:element minOccurs="0" maxOccurs="1" name="MinuteKeys" type="tns:ArrayOfAnyType"
/>
            <s:element minOccurs="0" maxOccurs="1" name="HourValues" type="tns:ArrayOfAnyType"
/>
            <s:element minOccurs="0" maxOccurs="1" name="HourKeys" type="tns:ArrayOfAnyType" />
            <s:element minOccurs="0" maxOccurs="1" name="DayValues" type="tns:ArrayOfAnyType"
/>
            <s:element minOccurs="0" maxOccurs="1" name="DayKeys" type="tns:ArrayOfAnyType" />
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          <s:element minOccurs="0" maxOccurs="1" name="MonthValues" type="tns:ArrayOfAnyType"
/>
          <s:element minOccurs="0" maxOccurs="1" name="MonthKeys" type="tns:ArrayOfAnyType"
/>
          <s:element minOccurs="0" maxOccurs="1" name="YearValues" type="tns:ArrayOfAnyType"
/>
          <s:element minOccurs="0" maxOccurs="1" name="YearKeys" type="tns:ArrayOfAnyType" />
        </s:sequence>
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      <s:complexType name="ArrayOfAutoFilterDateNodeInfo">
        <s:sequence>
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nillable="true" type="tns:AutoFilterDateNodeInfo" />
        </s:sequence>
      </s:complexType>
      <s:complexType name="AutoFilterDateNodeInfo">
        <s:sequence>
          <s:element minOccurs="1" maxOccurs="1" name="NodeType" type="tns:DateNodeType" />
          <s:element minOccurs="1" maxOccurs="1" name="Year" type="s:short" />
          <s:element minOccurs="1" maxOccurs="1" name="Month" type="s:short" />
          <s:element minOccurs="1" maxOccurs="1" name="Day" type="s:short" />
          <s:element minOccurs="1" maxOccurs="1" name="Hour" type="s:short" />
          <s:element minOccurs="1" maxOccurs="1" name="Minute" type="s:short" />
          <s:element minOccurs="1" maxOccurs="1" name="Second" type="s:short" />
        </s:sequence>
      </s:complexType>
      <s:simpleType name="DateNodeType">
        <s:restriction base="s:string">
          <s:enumeration value="Nil" />
          <s:enumeration value="Year" />
          <s:enumeration value="Month" />
          <s:enumeration value="Day" />
          <s:enumeration value="Hour" />
          <s:enumeration value="Minute" />
          <s:enumeration value="Second" />
          <s:enumeration value="Max" />
        </s:restriction>
      </s:simpleType>
      <s:complexType name="ArrayOfAutoFilterItem">
        <s:sequence>
          <s:element minOccurs="0" maxOccurs="unbounded" name="AutoFilterItem"
nillable="true" type="tns:AutoFilterItem" />
        </s:sequence>
      </s:complexType>
      <s:complexType name="AutoFilterItem">
        <s:sequence>
          <s:element minOccurs="1" maxOccurs="1" name="Selected" type="s:boolean" />
          <s:element minOccurs="0" maxOccurs="1" name="DisplayString" type="s:string" />
        </s:sequence>
      </s:complexType>
      <s:element name="GetAutoFilterItemListResponse">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="GetAutoFilterItemListResult"
type="tns:AutoFilterItemList" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="GetPivotMenu">
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        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="parameter"
type="tns:CommandParameter" />
            <s:element minOccurs="0" maxOccurs="1" name="pivotFilterOptions"
type="tns:PivotFilterOptions" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:complexType name="PivotFilterOptions">
        <s:sequence>
          <s:element minOccurs="0" maxOccurs="1" name="SheetName" type="s:string" />
          <s:element minOccurs="1" maxOccurs="1" name="SourceIndex" type="s:int" />
          <s:element minOccurs="1" maxOccurs="1" name="IsNamedObject" type="s:boolean" />
          <s:element minOccurs="0" maxOccurs="1" name="FieldId" type="s:string" />
          <s:element minOccurs="0" maxOccurs="1" name="DataFieldId" type="s:string" />
          <s:element minOccurs="0" maxOccurs="1" name="MemberPropertyId" type="s:string" />
          <s:element minOccurs="0" maxOccurs="1" name="FilterValue1" type="s:string" />
          <s:element minOccurs="0" maxOccurs="1" name="FilterValue2" type="s:string" />
          <s:element minOccurs="1" maxOccurs="1" name="FilterType" type="tns:PivotFilterType"
/>
          <s:element minOccurs="1" maxOccurs="1" name="ParentId" type="s:int" />
          <s:element minOccurs="1" maxOccurs="1" name="Column" type="s:int" />
          <s:element minOccurs="1" maxOccurs="1" name="Row" type="s:int" />
          <s:element minOccurs="0" maxOccurs="1" name="Items" type="tns:ArrayOfInt" />
        </s:sequence>
      </s:complexType>
      <s:simpleType name="PivotFilterType">
        <s:restriction base="s:string">
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          <s:enumeration value="FirstTop10" />
          <s:enumeration value="Count" />
          <s:enumeration value="Percent" />
          <s:enumeration value="Sum" />
          <s:enumeration value="LastTop10" />
          <s:enumeration value="CaptionFirst" />
          <s:enumeration value="CaptionEquals" />
          <s:enumeration value="CaptionDoesNotEqual" />
          <s:enumeration value="CaptionBeginsWith" />
          <s:enumeration value="CaptionDoesNotBeginWith" />
          <s:enumeration value="CaptionEndsWith" />
          <s:enumeration value="CaptionDoesNotEndWith" />
          <s:enumeration value="CaptionContains" />
          <s:enumeration value="CaptionDoesNotContain" />
          <s:enumeration value="CaptionIsGreaterThan" />
          <s:enumeration value="CaptionIsGreaterThanOrEqualTo" />
          <s:enumeration value="CaptionIsLessThan" />
          <s:enumeration value="CaptionIsLessThanOrEqualTo" />
          <s:enumeration value="CaptionIsBetween" />
          <s:enumeration value="CaptionIsNotBetween" />
          <s:enumeration value="ValueFirst" />
          <s:enumeration value="ValueEqual" />
          <s:enumeration value="ValueNotEqual" />
          <s:enumeration value="ValueGreaterThan" />
          <s:enumeration value="ValueGreaterThanOrEqual" />
          <s:enumeration value="ValueLessThan" />
          <s:enumeration value="ValueLessThanOrEqual" />
          <s:enumeration value="ValueBetween" />
          <s:enumeration value="ValueNotBetween" />
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            <s:enumeration value="DateFirst" />
            <s:enumeration value="DateEquals" />
            <s:enumeration value="DateOlderThan" />
            <s:enumeration value="DateNewerThan" />
            <s:enumeration value="DateBetween" />
            <s:enumeration value="DateTomorrow" />
            <s:enumeration value="DateToday" />
            <s:enumeration value="DateYesterday" />
            <s:enumeration value="DateNextWeek" />
            <s:enumeration value="DateThisWeek" />
            <s:enumeration value="DateLastWeek" />
            <s:enumeration value="DateNextMonth" />
            <s:enumeration value="DateThisMonth" />
            <s:enumeration value="DateLastMonth" />
            <s:enumeration value="DateNextQuarter" />
            <s:enumeration value="DateThisQuarter" />
            <s:enumeration value="DateLastQuarter" />
            <s:enumeration value="DateNextYear" />
            <s:enumeration value="DateThisYear" />
            <s:enumeration value="DateLastYear" />
            <s:enumeration value="DateYearToDate" />
            <s:enumeration value="DateAllDatesInPeriodQuarter1" />
            <s:enumeration value="DateAllDatesInPeriodQuarter2" />
            <s:enumeration value="DateAllDatesInPeriodQuarter3" />
            <s:enumeration value="DateAllDatesInPeriodQuarter4" />
            <s:enumeration value="DateAllDatesInPeriodJanuary" />
            <s:enumeration value="DateAllDatesInPeriodFebruary" />
            <s:enumeration value="DateAllDatesInPeriodMarch" />
            <s:enumeration value="DateAllDatesInPeriodApril" />
            <s:enumeration value="DateAllDatesInPeriodMay" />
            <s:enumeration value="DateAllDatesInPeriodJune" />
            <s:enumeration value="DateAllDatesInPeriodJuly" />
            <s:enumeration value="DateAllDatesInPeriodAugust" />
            <s:enumeration value="DateAllDatesInPeriodSeptember" />
            <s:enumeration value="DateAllDatesInPeriodOctober" />
            <s:enumeration value="DateAllDatesInPeriodNovember" />
            <s:enumeration value="DateAllDatesInPeriodDecember" />
            <s:enumeration value="DateNotEqual" />
            <s:enumeration value="DateOlderOrEqual" />
            <s:enumeration value="DateNewerOrEqual" />
            <s:enumeration value="DateNotBetween" />
            <s:enumeration value="Last" />
          </s:restriction>
        </s:simpleType>
        <s:complexType name="ArrayOfInt">
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="unbounded" name="int" type="s:int" />
          </s:sequence>
        </s:complexType>
        <s:complexType name="PivotMenu">
          <s:sequence>
            <s:element minOccurs="1" maxOccurs="1" name="Top10MaxItems" type="s:int" />
            <s:element minOccurs="1" maxOccurs="1" name="AdvancedFiltering" type="s:boolean" />
            <s:element minOccurs="1" maxOccurs="1" name="IsPageFilter" type="s:boolean" />
            <s:element minOccurs="0" maxOccurs="1" name="PivotDataFields"
  type="tns:ArrayOfPivotField" />
            <s:element minOccurs="0" maxOccurs="1" name="PivotFields"
  type="tns:ArrayOfPivotField" />
          </s:sequence>
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      </s:complexType>
      <s:complexType name="ArrayOfPivotField">
        <s:sequence>
          <s:element minOccurs="0" maxOccurs="unbounded" name="PivotField" nillable="true"
type="tns:PivotField" />
        </s:sequence>
      </s:complexType>
      <s:complexType name="PivotField">
        <s:sequence>
          <s:element minOccurs="0" maxOccurs="1" name="MemberProperties"
type="tns:ArrayOfPivotField" />
          <s:element minOccurs="0" maxOccurs="1" name="PivotFilterParameters"
type="tns:ArrayOfPivotFilterParameter" />
          <s:element minOccurs="1" maxOccurs="1" name="IsNonnumericCaptionFilteringEnabled"
type="s:boolean" />
          <s:element minOccurs="1" maxOccurs="1" name="IsDateFilteringEnabled"
type="s:boolean" />
          <s:element minOccurs="1" maxOccurs="1" name="IsCaptionFilteringEnabled"
type="s:boolean" />
          <s:element minOccurs="1" maxOccurs="1" name="IsFilteringEnabled" type="s:boolean"
/>
          <s:element minOccurs="1" maxOccurs="1" name="IsDateField" type="s:boolean" />
          <s:element minOccurs="1" maxOccurs="1" name="IsDataField" type="s:boolean" />
          <s:element minOccurs="0" maxOccurs="1" name="FilterParameter"
type="tns:Top10FilterParameter" />
          <s:element minOccurs="1" maxOccurs="1" name="IsSortedDescending" type="s:boolean"
/>
          <s:element minOccurs="1" maxOccurs="1" name="IsSortedAscending" type="s:boolean" />
          <s:element minOccurs="1" maxOccurs="1" name="HasCustomFilter" type="s:boolean" />
          <s:element minOccurs="1" maxOccurs="1" name="HasManualFilter" type="s:boolean" />
          <s:element minOccurs="1" maxOccurs="1" name="HasTop10Filter" type="s:boolean" />
          <s:element minOccurs="1" maxOccurs="1" name="IsHierarchy" type="s:boolean" />
          <s:element minOccurs="0" maxOccurs="1" name="IdString" type="s:string" />
          <s:element minOccurs="0" maxOccurs="1" name="DisplayString" type="s:string" />
        </s:sequence>
      </s:complexType>
      <s:complexType name="ArrayOfPivotFilterParameter">
        <s:sequence>
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nillable="true" type="tns:PivotFilterParameter" />
        </s:sequence>
      </s:complexType>
      <s:complexType name="PivotFilterParameter">
        <s:sequence>
          <s:element minOccurs="0" maxOccurs="1" name="FilterString2" type="s:string" />
          <s:element minOccurs="0" maxOccurs="1" name="FilterString1" type="s:string" />
          <s:element minOccurs="0" maxOccurs="1" name="MemberPropertyId" type="s:string" />
          <s:element minOccurs="0" maxOccurs="1" name="DataFieldId" type="s:string" />
          <s:element minOccurs="1" maxOccurs="1" name="FilterType" type="tns:PivotFilterType"
/>
          <s:element minOccurs="1" maxOccurs="1" name="FilterValue2" type="s:double" />
          <s:element minOccurs="1" maxOccurs="1" name="FilterValue1" type="s:double" />
        </s:sequence>
      </s:complexType>
      <s:complexType name="Top10FilterParameter">
        <s:sequence>
          <s:element minOccurs="0" maxOccurs="1" name="DataFieldId" type="s:string" />
          <s:element minOccurs="1" maxOccurs="1" name="FilterType" type="tns:Top10FilterType"
/>
          <s:element minOccurs="1" maxOccurs="1" name="FilterValue" type="s:double" />
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          <s:element minOccurs="1" maxOccurs="1" name="IsTopFilter" type="s:boolean" />
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      </s:complexType>
      <s:simpleType name="Top10FilterType">
        <s:restriction base="s:string">
          <s:enumeration value="Invalid" />
          <s:enumeration value="Count" />
          <s:enumeration value="Percent" />
          <s:enumeration value="Sum" />
        </s:restriction>
      </s:simpleType>
      <s:element name="GetPivotMenuResponse">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="GetPivotMenuResult"
type="tns:CommandResult" />
            <s:element minOccurs="0" maxOccurs="1" name="pivotMenu" type="tns:PivotMenu" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="GetPivotFilterItemList">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="parameter"
type="tns:CommandParameter" />
            <s:element minOccurs="0" maxOccurs="1" name="pivotFilterOptions"
type="tns:PivotFilterOptions" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:complexType name="PivotFilterItemList">
        <s:sequence>
          <s:element minOccurs="1" maxOccurs="1" name="ItemListMaxExceeded" type="s:boolean"
/>
          <s:element minOccurs="1" maxOccurs="1" name="IsBlanksSelected" type="s:boolean" />
          <s:element minOccurs="1" maxOccurs="1" name="HasBlanks" type="s:boolean" />
          <s:element minOccurs="0" maxOccurs="1" name="PivotFilterItems"
type="tns:ArrayOfPivotFilterItem" />
        </s:sequence>
      </s:complexType>
      <s:complexType name="ArrayOfPivotFilterItem">
        <s:sequence>
          <s:element minOccurs="0" maxOccurs="unbounded" name="PivotFilterItem"
nillable="true" type="tns:PivotFilterItem" />
        </s:sequence>
      </s:complexType>
      <s:complexType name="PivotFilterItem" mixed="false">
        <s:complexContent mixed="false">
          <s:extension base="tns:PivotFilterItemList">
            <s:sequence>
              <s:element minOccurs="0" maxOccurs="1" name="ChildItems"
type="tns:ArrayOfPivotFilterItem" />
              <s:element minOccurs="1" maxOccurs="1" name="CalculatedMember" type="s:boolean"
/>
              <s:element minOccurs="1" maxOccurs="1" name="LeafItem" type="s:boolean" />
              <s:element minOccurs="1" maxOccurs="1" name="Selected" type="s:boolean" />
              <s:element minOccurs="1" maxOccurs="1" name="Id" type="s:int" />
              <s:element minOccurs="0" maxOccurs="1" name="DisplayString" type="s:string" />
            </s:sequence>
          </s:extension>
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```
        </s:complexContent>
      </s:complexType>
      <s:element name="GetPivotFilterItemListResponse">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="GetPivotFilterItemListResult"
type="tns:CommandResult" />
            <s:element minOccurs="0" maxOccurs="1" name="itemList"
type="tns:PivotFilterItemList" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="ConnectAndGetPivotFilterItemList">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="parameter"
type="tns:CommandParameter" />
            <s:element minOccurs="0" maxOccurs="1" name="pivotFilterOptions"
type="tns:PivotFilterOptions" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="ConnectAndGetPivotFilterItemListResponse">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1"
name="ConnectAndGetPivotFilterItemListResult" type="tns:CommandResult" />
            <s:element minOccurs="0" maxOccurs="1" name="itemList"
type="tns:PivotFilterItemList" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="GetWorkbook">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="parameter"
type="tns:CommandParameter" />
            <s:element minOccurs="1" maxOccurs="1" name="workbookType"
type="tns:WorkbookType" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:simpleType name="WorkbookType">
        <s:restriction base="s:string">
          <s:enumeration value="FullWorkbook" />
          <s:enumeration value="FullSnapshot" />
          <s:enumeration value="PublishedItemsSnapshot" />
        </s:restriction>
      </s:simpleType>
      <s:element name="GetWorkbookResponse">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="GetWorkbookResult"
type="s:base64Binary" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="GetImage">
        <s:complexType>
          <s:sequence>
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            <s:element minOccurs="0" maxOccurs="1" name="parameter"
type="tns:CommandParameter" />
            <s:element minOccurs="0" maxOccurs="1" name="imageId" type="s:string" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="GetImageResponse">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="GetImageResult"
type="tns:CommandResult" />
            <s:element minOccurs="0" maxOccurs="1" name="imageFormatType" type="s:string" />
            <s:element minOccurs="0" maxOccurs="1" name="binaryChartImage"
type="s:base64Binary" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="OpenWorkbook">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="url" type="s:string" />
            <s:element minOccurs="0" maxOccurs="1" name="parameter"
type="tns:CommandParameter" />
            <s:element minOccurs="0" maxOccurs="1" name="cultureParameter"
type="tns:CultureCommandParameter" />
            <s:element minOccurs="1" maxOccurs="1" name="requestSiteId" type="s1:guid" />
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        </s:complexType>
      </s:element>
      <s:complexType name="CultureCommandParameter">
        <s:sequence>
          <s:element minOccurs="0" maxOccurs="1" name="UICultureName" type="s:string" />
          <s:element minOccurs="0" maxOccurs="1" name="DataCultureName" type="s:string" />
          <s:element minOccurs="0" maxOccurs="1" name="SharePointDataCultureName"
type="s:string" />
          <s:element minOccurs="0" maxOccurs="1" name="TimeZoneSerialization" type="s:string"
/>
        </s:sequence>
      </s:complexType>
      <s:element name="OpenWorkbookResponse">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="OpenWorkbookResult"
type="tns:CommandResult" />
            <s:element minOccurs="0" maxOccurs="1" name="workbookId" type="s:string" />
            <s:element minOccurs="1" maxOccurs="1" name="hasOpenItemPermission"
type="s:boolean" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="SetRange">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="parameter"
type="tns:CommandParameter" />
            <s:element minOccurs="0" maxOccurs="1" name="sheetRange" type="tns:SheetRange" />
            <s:element minOccurs="0" maxOccurs="1" name="cellsArray" />
          </s:sequence>
        </s:complexType>
      </s:element>
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```
      <s:element name="SetRangeResponse">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="SetRangeResult"
type="tns:CommandResult" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="SetRangeA1">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="parameter"
type="tns:CommandParameter" />
            <s:element minOccurs="0" maxOccurs="1" name="sheetName" type="s:string" />
            <s:element minOccurs="0" maxOccurs="1" name="range" type="s:string" />
            <s:element minOccurs="0" maxOccurs="1" name="cellsArray" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="SetRangeA1Response">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="SetRangeA1Result"
type="tns:CommandResult" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="SetParameters">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="parameter"
type="tns:CommandParameter" />
            <s:element minOccurs="0" maxOccurs="1" name="workbookParameters"
type="tns:ArrayOfWorkbookParameter" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:complexType name="ArrayOfWorkbookParameter">
        <s:sequence>
          <s:element minOccurs="0" maxOccurs="unbounded" name="WorkbookParameter"
nillable="true" type="tns:WorkbookParameter" />
        </s:sequence>
      </s:complexType>
      <s:complexType name="WorkbookParameter">
        <s:sequence>
          <s:element minOccurs="0" maxOccurs="1" name="Comment" type="s:string" />
          <s:element minOccurs="1" maxOccurs="1" name="IsPivotPageField" type="s:boolean" />
          <s:element minOccurs="0" maxOccurs="1" name="Name" type="s:string" />
          <s:element minOccurs="1" maxOccurs="1" name="RequiresConnection" type="s:boolean"
/>
          <s:element minOccurs="0" maxOccurs="1" name="Values" type="tns:ArrayOfString" />
        </s:sequence>
      </s:complexType>
      <s:element name="SetParametersResponse">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="SetParametersResult"
type="tns:CommandResult" />
          </s:sequence>
        </s:complexType>
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      </s:element>
      <s:element name="Refresh">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="parameter"
type="tns:CommandParameter" />
            <s:element minOccurs="0" maxOccurs="1" name="dataConnectionName" type="s:string"
/>
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="RefreshResponse">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="RefreshResult"
type="tns:CommandResult" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="RefreshAll">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="parameter"
type="tns:CommandParameter" />
            <s:element minOccurs="1" maxOccurs="1" name="periodic" type="s:boolean" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="RefreshAllResponse">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="RefreshAllResult"
type="tns:CommandResult" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="RecalcAll">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="parameter"
type="tns:CommandParameter" />
            <s:element minOccurs="1" maxOccurs="1" name="calculateType"
type="tns:CalculateType" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:simpleType name="CalculateType">
        <s:restriction base="s:string">
          <s:enumeration value="Recalculate" />
          <s:enumeration value="CalculateFull" />
        </s:restriction>
      </s:simpleType>
      <s:element name="RecalcAllResponse">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="RecalcAllResult"
type="tns:CommandResult" />
          </s:sequence>
        </s:complexType>
      </s:element>
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```
      <s:element name="Recalc">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="parameter"
type="tns:CommandParameter" />
            <s:element minOccurs="0" maxOccurs="1" name="sheetRange" type="tns:SheetRange" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="RecalcResponse">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="RecalcResult"
type="tns:CommandResult" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="RecalcA1">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="parameter"
type="tns:CommandParameter" />
            <s:element minOccurs="0" maxOccurs="1" name="sheetName" type="s:string" />
            <s:element minOccurs="0" maxOccurs="1" name="rangeName" type="s:string" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="RecalcA1Response">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="RecalcA1Result"
type="tns:CommandResult" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="ApplyTop10Filter">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="parameter"
type="tns:CommandParameter" />
            <s:element minOccurs="0" maxOccurs="1" name="autoFilterOptions"
type="tns:AutoFilterOptions" />
            <s:element minOccurs="1" maxOccurs="1" name="top" type="s:boolean" />
            <s:element minOccurs="1" maxOccurs="1" name="percent" type="s:boolean" />
            <s:element minOccurs="1" maxOccurs="1" name="value" type="s:int" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="ApplyTop10FilterResponse">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="ApplyTop10FilterResult"
type="tns:CommandResult" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="ApplyItemFilter">
        <s:complexType>
          <s:sequence>
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```
            <s:element minOccurs="0" maxOccurs="1" name="parameter"
type="tns:CommandParameter" />
            <s:element minOccurs="0" maxOccurs="1" name="autoFilterOptions"
type="tns:AutoFilterOptions" />
            <s:element minOccurs="0" maxOccurs="1" name="values" type="tns:ArrayOfString" />
            <s:element minOccurs="0" maxOccurs="1" name="autoFilterDateNodes"
type="tns:ArrayOfAutoFilterDateNodeInfo" />
            <s:element minOccurs="1" maxOccurs="1" name="blanks" type="s:boolean" />
            <s:element minOccurs="1" maxOccurs="1" name="hideBlanks" type="s:boolean" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="ApplyItemFilterResponse">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="ApplyItemFilterResult"
type="tns:CommandResult" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="SortFilterColumn">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="parameter"
type="tns:CommandParameter" />
            <s:element minOccurs="0" maxOccurs="1" name="autoFilterOptions"
type="tns:AutoFilterOptions" />
            <s:element minOccurs="1" maxOccurs="1" name="ascending" type="s:boolean" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="SortFilterColumnResponse">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="SortFilterColumnResult"
type="tns:CommandResult" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="ApplyPivotFilter">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="parameter"
type="tns:CommandParameter" />
            <s:element minOccurs="0" maxOccurs="1" name="pivotFilterOptions"
type="tns:PivotFilterOptions" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="ApplyPivotFilterResponse">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="ApplyPivotFilterResult"
type="tns:CommandResult" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="ApplyPivotTop10Filter">
        <s:complexType>
          <s:sequence>
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```
            <s:element minOccurs="0" maxOccurs="1" name="parameter"
type="tns:CommandParameter" />
            <s:element minOccurs="0" maxOccurs="1" name="pivotFilterOptions"
type="tns:PivotFilterOptions" />
            <s:element minOccurs="1" maxOccurs="1" name="top" type="s:boolean" />
            <s:element minOccurs="1" maxOccurs="1" name="value" type="s:double" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="ApplyPivotTop10FilterResponse">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="ApplyPivotTop10FilterResult"
type="tns:CommandResult" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="ApplyPivotSort">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="parameter"
type="tns:CommandParameter" />
            <s:element minOccurs="0" maxOccurs="1" name="pivotFilterOptions"
type="tns:PivotFilterOptions" />
            <s:element minOccurs="1" maxOccurs="1" name="ascending" type="s:boolean" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="ApplyPivotSortResponse">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="ApplyPivotSortResult"
type="tns:CommandResult" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="TogglePivotDrill">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="parameter"
type="tns:CommandParameter" />
            <s:element minOccurs="0" maxOccurs="1" name="pivotFilterOptions"
type="tns:PivotFilterOptions" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="TogglePivotDrillResponse">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="TogglePivotDrillResult"
type="tns:CommandResult" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="RemovePivotFilter">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="parameter"
type="tns:CommandParameter" />
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```
            <s:element minOccurs="0" maxOccurs="1" name="pivotFilterOptions"
type="tns:PivotFilterOptions" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="RemovePivotFilterResponse">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="RemovePivotFilterResult"
type="tns:CommandResult" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="ExpandCollapseOutline">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="parameter"
type="tns:CommandParameter" />
            <s:element minOccurs="0" maxOccurs="1" name="sheetName" type="s:string" />
            <s:element minOccurs="1" maxOccurs="1" name="outlineLevel" type="s:unsignedByte"
/>
            <s:element minOccurs="1" maxOccurs="1" name="rowColumn" type="s:int" />
            <s:element minOccurs="1" maxOccurs="1" name="row" type="s:boolean" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="ExpandCollapseOutlineResponse">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="ExpandCollapseOutlineResult"
type="tns:CommandResult" />
          </s:sequence>
        </s:complexType>
      </s:element>
    </s:schema>
    <s:schema elementFormDefault="qualified"
targetNamespace="http://microsoft.com/wsdl/types/">
      <s:simpleType name="guid">
        <s:restriction base="s:string">
          <s:pattern value="[0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-
9a-fA-F]{12}" />
        </s:restriction>
      </s:simpleType>
    </s:schema>
  </wsdl:types>
  <wsdl:message name="CloseWorkbookSoapIn">
    <wsdl:part name="parameters" element="tns:CloseWorkbook" />
  </wsdl:message>
  <wsdl:message name="CloseWorkbookSoapOut">
    <wsdl:part name="parameters" element="tns:CloseWorkbookResponse" />
  </wsdl:message>
  <wsdl:message name="GetRangeSoapIn">
    <wsdl:part name="parameters" element="tns:GetRange" />
  </wsdl:message>
  <wsdl:message name="GetRangeSoapOut">
    <wsdl:part name="parameters" element="tns:GetRangeResponse" />
  </wsdl:message>
  <wsdl:message name="GetRangeValuesSoapIn">
    <wsdl:part name="parameters" element="tns:GetRangeValues" />
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</wsdl:message>
<wsdl:message name="GetRangeValuesSoapOut">
  <wsdl:part name="parameters" element="tns:GetRangeValuesResponse" />
</wsdl:message>
<wsdl:message name="GetRangeValuesA1SoapIn">
  <wsdl:part name="parameters" element="tns:GetRangeValuesA1" />
</wsdl:message>
<wsdl:message name="GetRangeValuesA1SoapOut">
  <wsdl:part name="parameters" element="tns:GetRangeValuesA1Response" />
</wsdl:message>
<wsdl:message name="CancelRequestSoapIn">
  <wsdl:part name="parameters" element="tns:CancelRequest" />
</wsdl:message>
<wsdl:message name="CancelRequestSoapOut">
  <wsdl:part name="parameters" element="tns:CancelRequestResponse" />
</wsdl:message>
<wsdl:message name="GetSessionInformationSoapIn">
  <wsdl:part name="parameters" element="tns:GetSessionInformation" />
</wsdl:message>
<wsdl:message name="GetSessionInformationSoapOut">
  <wsdl:part name="parameters" element="tns:GetSessionInformationResponse" />
</wsdl:message>
<wsdl:message name="FindRangeSoapIn">
  <wsdl:part name="parameters" element="tns:FindRange" />
</wsdl:message>
<wsdl:message name="FindRangeSoapOut">
  <wsdl:part name="parameters" element="tns:FindRangeResponse" />
</wsdl:message>
<wsdl:message name="GetAutoFilterItemListSoapIn">
  <wsdl:part name="parameters" element="tns:GetAutoFilterItemList" />
</wsdl:message>
<wsdl:message name="GetAutoFilterItemListSoapOut">
  <wsdl:part name="parameters" element="tns:GetAutoFilterItemListResponse" />
</wsdl:message>
<wsdl:message name="GetPivotMenuSoapIn">
  <wsdl:part name="parameters" element="tns:GetPivotMenu" />
</wsdl:message>
<wsdl:message name="GetPivotMenuSoapOut">
  <wsdl:part name="parameters" element="tns:GetPivotMenuResponse" />
</wsdl:message>
<wsdl:message name="GetPivotFilterItemListSoapIn">
  <wsdl:part name="parameters" element="tns:GetPivotFilterItemList" />
</wsdl:message>
<wsdl:message name="GetPivotFilterItemListSoapOut">
  <wsdl:part name="parameters" element="tns:GetPivotFilterItemListResponse" />
</wsdl:message>
<wsdl:message name="ConnectAndGetPivotFilterItemListSoapIn">
  <wsdl:part name="parameters" element="tns:ConnectAndGetPivotFilterItemList" />
</wsdl:message>
<wsdl:message name="ConnectAndGetPivotFilterItemListSoapOut">
  <wsdl:part name="parameters" element="tns:ConnectAndGetPivotFilterItemListResponse" />
</wsdl:message>
<wsdl:message name="GetWorkbookSoapIn">
  <wsdl:part name="parameters" element="tns:GetWorkbook" />
</wsdl:message>
<wsdl:message name="GetWorkbookSoapOut">
  <wsdl:part name="parameters" element="tns:GetWorkbookResponse" />
</wsdl:message>
<wsdl:message name="GetImageSoapIn">
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    <wsdl:part name="parameters" element="tns:GetImage" />
  </wsdl:message>
  <wsdl:message name="GetImageSoapOut">
    <wsdl:part name="parameters" element="tns:GetImageResponse" />
  </wsdl:message>
  <wsdl:message name="OpenWorkbookSoapIn">
    <wsdl:part name="parameters" element="tns:OpenWorkbook" />
  </wsdl:message>
  <wsdl:message name="OpenWorkbookSoapOut">
    <wsdl:part name="parameters" element="tns:OpenWorkbookResponse" />
  </wsdl:message>
  <wsdl:message name="SetRangeSoapIn">
    <wsdl:part name="parameters" element="tns:SetRange" />
  </wsdl:message>
  <wsdl:message name="SetRangeSoapOut">
    <wsdl:part name="parameters" element="tns:SetRangeResponse" />
  </wsdl:message>
  <wsdl:message name="SetRangeA1SoapIn">
    <wsdl:part name="parameters" element="tns:SetRangeA1" />
  </wsdl:message>
  <wsdl:message name="SetRangeA1SoapOut">
    <wsdl:part name="parameters" element="tns:SetRangeA1Response" />
  </wsdl:message>
  <wsdl:message name="SetParametersSoapIn">
    <wsdl:part name="parameters" element="tns:SetParameters" />
  </wsdl:message>
  <wsdl:message name="SetParametersSoapOut">
    <wsdl:part name="parameters" element="tns:SetParametersResponse" />
  </wsdl:message>
  <wsdl:message name="RefreshSoapIn">
    <wsdl:part name="parameters" element="tns:Refresh" />
  </wsdl:message>
  <wsdl:message name="RefreshSoapOut">
    <wsdl:part name="parameters" element="tns:RefreshResponse" />
  </wsdl:message>
  <wsdl:message name="RefreshAllSoapIn">
    <wsdl:part name="parameters" element="tns:RefreshAll" />
  </wsdl:message>
  <wsdl:message name="RefreshAllSoapOut">
    <wsdl:part name="parameters" element="tns:RefreshAllResponse" />
  </wsdl:message>
  <wsdl:message name="RecalcAllSoapIn">
    <wsdl:part name="parameters" element="tns:RecalcAll" />
  </wsdl:message>
  <wsdl:message name="RecalcAllSoapOut">
    <wsdl:part name="parameters" element="tns:RecalcAllResponse" />
  </wsdl:message>
  <wsdl:message name="RecalcSoapIn">
    <wsdl:part name="parameters" element="tns:Recalc" />
  </wsdl:message>
  <wsdl:message name="RecalcSoapOut">
    <wsdl:part name="parameters" element="tns:RecalcResponse" />
  </wsdl:message>
  <wsdl:message name="RecalcA1SoapIn">
    <wsdl:part name="parameters" element="tns:RecalcA1" />
  </wsdl:message>
  <wsdl:message name="RecalcA1SoapOut">
    <wsdl:part name="parameters" element="tns:RecalcA1Response" />
  </wsdl:message>
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```
<wsdl:message name="ApplyTop10FilterSoapIn">
  <wsdl:part name="parameters" element="tns:ApplyTop10Filter" />
</wsdl:message>
<wsdl:message name="ApplyTop10FilterSoapOut">
  <wsdl:part name="parameters" element="tns:ApplyTop10FilterResponse" />
</wsdl:message>
<wsdl:message name="ApplyItemFilterSoapIn">
  <wsdl:part name="parameters" element="tns:ApplyItemFilter" />
</wsdl:message>
<wsdl:message name="ApplyItemFilterSoapOut">
  <wsdl:part name="parameters" element="tns:ApplyItemFilterResponse" />
</wsdl:message>
<wsdl:message name="SortFilterColumnSoapIn">
  <wsdl:part name="parameters" element="tns:SortFilterColumn" />
</wsdl:message>
<wsdl:message name="SortFilterColumnSoapOut">
  <wsdl:part name="parameters" element="tns:SortFilterColumnResponse" />
</wsdl:message>
<wsdl:message name="ApplyPivotFilterSoapIn">
  <wsdl:part name="parameters" element="tns:ApplyPivotFilter" />
</wsdl:message>
<wsdl:message name="ApplyPivotFilterSoapOut">
  <wsdl:part name="parameters" element="tns:ApplyPivotFilterResponse" />
</wsdl:message>
<wsdl:message name="ApplyPivotTop10FilterSoapIn">
  <wsdl:part name="parameters" element="tns:ApplyPivotTop10Filter" />
</wsdl:message>
<wsdl:message name="ApplyPivotTop10FilterSoapOut">
  <wsdl:part name="parameters" element="tns:ApplyPivotTop10FilterResponse" />
</wsdl:message>
<wsdl:message name="ApplyPivotSortSoapIn">
  <wsdl:part name="parameters" element="tns:ApplyPivotSort" />
</wsdl:message>
<wsdl:message name="ApplyPivotSortSoapOut">
  <wsdl:part name="parameters" element="tns:ApplyPivotSortResponse" />
</wsdl:message>
<wsdl:message name="TogglePivotDrillSoapIn">
  <wsdl:part name="parameters" element="tns:TogglePivotDrill" />
</wsdl:message>
<wsdl:message name="TogglePivotDrillSoapOut">
  <wsdl:part name="parameters" element="tns:TogglePivotDrillResponse" />
</wsdl:message>
<wsdl:message name="RemovePivotFilterSoapIn">
  <wsdl:part name="parameters" element="tns:RemovePivotFilter" />
</wsdl:message>
<wsdl:message name="RemovePivotFilterSoapOut">
  <wsdl:part name="parameters" element="tns:RemovePivotFilterResponse" />
</wsdl:message>
<wsdl:message name="ExpandCollapseOutlineSoapIn">
  <wsdl:part name="parameters" element="tns:ExpandCollapseOutline" />
</wsdl:message>
<wsdl:message name="ExpandCollapseOutlineSoapOut">
  <wsdl:part name="parameters" element="tns:ExpandCollapseOutlineResponse" />
</wsdl:message>
<wsdl:portType name="ExcelServiceSoapSoap">
  <wsdl:operation name="CloseWorkbook">
    <wsdl:input message="tns:CloseWorkbookSoapIn" />
    <wsdl:output message="tns:CloseWorkbookSoapOut" />
  </wsdl:operation>
```


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```
<wsdl:operation name="GetRange">
  <wsdl:input message="tns:GetRangeSoapIn" />
  <wsdl:output message="tns:GetRangeSoapOut" />
</wsdl:operation>
<wsdl:operation name="GetRangeValues">
  <wsdl:input message="tns:GetRangeValuesSoapIn" />
  <wsdl:output message="tns:GetRangeValuesSoapOut" />
</wsdl:operation>
<wsdl:operation name="GetRangeValuesA1">
  <wsdl:input message="tns:GetRangeValuesA1SoapIn" />
  <wsdl:output message="tns:GetRangeValuesA1SoapOut" />
</wsdl:operation>
<wsdl:operation name="CancelRequest">
  <wsdl:input message="tns:CancelRequestSoapIn" />
  <wsdl:output message="tns:CancelRequestSoapOut" />
</wsdl:operation>
<wsdl:operation name="GetSessionInformation">
  <wsdl:input message="tns:GetSessionInformationSoapIn" />
  <wsdl:output message="tns:GetSessionInformationSoapOut" />
</wsdl:operation>
<wsdl:operation name="FindRange">
  <wsdl:input message="tns:FindRangeSoapIn" />
  <wsdl:output message="tns:FindRangeSoapOut" />
</wsdl:operation>
<wsdl:operation name="GetAutoFilterItemList">
  <wsdl:input message="tns:GetAutoFilterItemListSoapIn" />
  <wsdl:output message="tns:GetAutoFilterItemListSoapOut" />
</wsdl:operation>
<wsdl:operation name="GetPivotMenu">
  <wsdl:input message="tns:GetPivotMenuSoapIn" />
  <wsdl:output message="tns:GetPivotMenuSoapOut" />
</wsdl:operation>
<wsdl:operation name="GetPivotFilterItemList">
  <wsdl:input message="tns:GetPivotFilterItemListSoapIn" />
  <wsdl:output message="tns:GetPivotFilterItemListSoapOut" />
</wsdl:operation>
<wsdl:operation name="ConnectAndGetPivotFilterItemList">
  <wsdl:input message="tns:ConnectAndGetPivotFilterItemListSoapIn" />
  <wsdl:output message="tns:ConnectAndGetPivotFilterItemListSoapOut" />
</wsdl:operation>
<wsdl:operation name="GetWorkbook">
  <wsdl:input message="tns:GetWorkbookSoapIn" />
  <wsdl:output message="tns:GetWorkbookSoapOut" />
</wsdl:operation>
<wsdl:operation name="GetImage">
  <wsdl:input message="tns:GetImageSoapIn" />
  <wsdl:output message="tns:GetImageSoapOut" />
</wsdl:operation>
<wsdl:operation name="OpenWorkbook">
  <wsdl:input message="tns:OpenWorkbookSoapIn" />
  <wsdl:output message="tns:OpenWorkbookSoapOut" />
</wsdl:operation>
<wsdl:operation name="SetRange">
  <wsdl:input message="tns:SetRangeSoapIn" />
  <wsdl:output message="tns:SetRangeSoapOut" />
</wsdl:operation>
<wsdl:operation name="SetRangeA1">
  <wsdl:input message="tns:SetRangeA1SoapIn" />
  <wsdl:output message="tns:SetRangeA1SoapOut" />
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</wsdl:operation>
<wsdl:operation name="SetParameters">
  <wsdl:input message="tns:SetParametersSoapIn" />
  <wsdl:output message="tns:SetParametersSoapOut" />
</wsdl:operation>
<wsdl:operation name="Refresh">
  <wsdl:input message="tns:RefreshSoapIn" />
  <wsdl:output message="tns:RefreshSoapOut" />
</wsdl:operation>
<wsdl:operation name="RefreshAll">
  <wsdl:input message="tns:RefreshAllSoapIn" />
  <wsdl:output message="tns:RefreshAllSoapOut" />
</wsdl:operation>
<wsdl:operation name="RecalcAll">
  <wsdl:input message="tns:RecalcAllSoapIn" />
  <wsdl:output message="tns:RecalcAllSoapOut" />
</wsdl:operation>
<wsdl:operation name="Recalc">
  <wsdl:input message="tns:RecalcSoapIn" />
  <wsdl:output message="tns:RecalcSoapOut" />
</wsdl:operation>
<wsdl:operation name="RecalcA1">
  <wsdl:input message="tns:RecalcA1SoapIn" />
  <wsdl:output message="tns:RecalcA1SoapOut" />
</wsdl:operation>
<wsdl:operation name="ApplyTop10Filter">
  <wsdl:input message="tns:ApplyTop10FilterSoapIn" />
  <wsdl:output message="tns:ApplyTop10FilterSoapOut" />
</wsdl:operation>
<wsdl:operation name="ApplyItemFilter">
  <wsdl:input message="tns:ApplyItemFilterSoapIn" />
  <wsdl:output message="tns:ApplyItemFilterSoapOut" />
</wsdl:operation>
<wsdl:operation name="SortFilterColumn">
  <wsdl:input message="tns:SortFilterColumnSoapIn" />
  <wsdl:output message="tns:SortFilterColumnSoapOut" />
</wsdl:operation>
<wsdl:operation name="ApplyPivotFilter">
  <wsdl:input message="tns:ApplyPivotFilterSoapIn" />
  <wsdl:output message="tns:ApplyPivotFilterSoapOut" />
</wsdl:operation>
<wsdl:operation name="ApplyPivotTop10Filter">
  <wsdl:input message="tns:ApplyPivotTop10FilterSoapIn" />
  <wsdl:output message="tns:ApplyPivotTop10FilterSoapOut" />
</wsdl:operation>
<wsdl:operation name="ApplyPivotSort">
  <wsdl:input message="tns:ApplyPivotSortSoapIn" />
  <wsdl:output message="tns:ApplyPivotSortSoapOut" />
</wsdl:operation>
<wsdl:operation name="TogglePivotDrill">
  <wsdl:input message="tns:TogglePivotDrillSoapIn" />
  <wsdl:output message="tns:TogglePivotDrillSoapOut" />
</wsdl:operation>
<wsdl:operation name="RemovePivotFilter">
  <wsdl:input message="tns:RemovePivotFilterSoapIn" />
  <wsdl:output message="tns:RemovePivotFilterSoapOut" />
</wsdl:operation>
<wsdl:operation name="ExpandCollapseOutline">
  <wsdl:input message="tns:ExpandCollapseOutlineSoapIn" />
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      <wsdl:output message="tns:ExpandCollapseOutlineSoapOut" />
    </wsdl:operation>
  </wsdl:portType>
  <wsdl:binding name="ExcelServiceSoapSoap" type="tns:ExcelServiceSoapSoap">
    <soap:binding transport="http://schemas.xmlsoap.org/soap/http" />
    <wsdl:operation name="CloseWorkbook">
      <soap:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/CloseWorkbook" style="document" />
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="GetRange">
      <soap:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/GetRange" style="document" />
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="GetRangeValues">
      <soap:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/GetRangeValues" style="document" />
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="GetRangeValuesA1">
      <soap:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/GetRangeValuesA1" style="document" />
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="CancelRequest">
      <soap:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/CancelRequest" style="document" />
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
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    <wsdl:operation name="GetSessionInformation">
      <soap:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/GetSessionInformation" style="document" />
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="FindRange">
      <soap:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/FindRange" style="document" />
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="GetAutoFilterItemList">
      <soap:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/GetAutoFilterItemList" style="document" />
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="GetPivotMenu">
      <soap:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/GetPivotMenu" style="document" />
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="GetPivotFilterItemList">
      <soap:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/GetPivotFilterItemList" style="document" />
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="ConnectAndGetPivotFilterItemList">
      <soap:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/ConnectAndGetPivotFilterItemList" style="document" />
      <wsdl:input>
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        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="GetWorkbook">
      <soap:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/GetWorkbook" style="document" />
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="GetImage">
      <soap:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/GetImage" style="document" />
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="OpenWorkbook">
      <soap:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/OpenWorkbook" style="document" />
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="SetRange">
      <soap:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/SetRange" style="document" />
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="SetRangeA1">
      <soap:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/SetRangeA1" style="document" />
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
      </wsdl:output>
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    </wsdl:operation>
    <wsdl:operation name="SetParameters">
      <soap:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/SetParameters" style="document" />
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="Refresh">
      <soap:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/Refresh" style="document" />
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="RefreshAll">
      <soap:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/RefreshAll" style="document" />
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="RecalcAll">
      <soap:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/RecalcAll" style="document" />
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="Recalc">
      <soap:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/Recalc" style="document" />
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="RecalcA1">
      <soap:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/RecalcA1" style="document" />
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```
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="ApplyTop10Filter">
      <soap:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/ApplyTop10Filter" style="document" />
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="ApplyItemFilter">
      <soap:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/ApplyItemFilter" style="document" />
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="SortFilterColumn">
      <soap:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/SortFilterColumn" style="document" />
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="ApplyPivotFilter">
      <soap:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/ApplyPivotFilter" style="document" />
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="ApplyPivotTop10Filter">
      <soap:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/ApplyPivotTop10Filter" style="document" />
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
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      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="ApplyPivotSort">
      <soap:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/ApplyPivotSort" style="document" />
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="TogglePivotDrill">
      <soap:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/TogglePivotDrill" style="document" />
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="RemovePivotFilter">
      <soap:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/RemovePivotFilter" style="document" />
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="ExpandCollapseOutline">
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      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
  </wsdl:binding>
  <wsdl:binding name="ExcelServiceSoapSoap12" type="tns:ExcelServiceSoapSoap">
    <soap12:binding transport="http://schemas.xmlsoap.org/soap/http" />
    <wsdl:operation name="CloseWorkbook">
      <soap12:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/CloseWorkbook" style="document" />
      <wsdl:input>
        <soap12:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap12:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
```


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```
    <wsdl:operation name="GetRange">
      <soap12:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/GetRange" style="document" />
      <wsdl:input>
        <soap12:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap12:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="GetRangeValues">
      <soap12:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/GetRangeValues" style="document" />
      <wsdl:input>
        <soap12:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap12:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="GetRangeValuesA1">
      <soap12:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/GetRangeValuesA1" style="document" />
      <wsdl:input>
        <soap12:body use="literal" />
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      <wsdl:output>
        <soap12:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="CancelRequest">
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soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/CancelRequest" style="document" />
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        <soap12:body use="literal" />
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    </wsdl:operation>
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ervice/GetSessionInformation" style="document" />
      <wsdl:input>
        <soap12:body use="literal" />
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      <wsdl:output>
        <soap12:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="FindRange">
      <soap12:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/FindRange" style="document" />
      <wsdl:input>
```


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```
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      </wsdl:input>
      <wsdl:output>
        <soap12:body use="literal" />
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    </wsdl:operation>
    <wsdl:operation name="GetAutoFilterItemList">
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soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/GetAutoFilterItemList" style="document" />
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        <soap12:body use="literal" />
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    </wsdl:operation>
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      <soap12:operation
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ervice/GetPivotMenu" style="document" />
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    </wsdl:operation>
    <wsdl:operation name="ConnectAndGetPivotFilterItemList">
      <soap12:operation
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ervice/ConnectAndGetPivotFilterItemList" style="document" />
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        <soap12:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="GetWorkbook">
      <soap12:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/GetWorkbook" style="document" />
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      </wsdl:input>
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    </wsdl:operation>
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```


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```
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    </wsdl:operation>
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soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/RecalcAll" style="document" />
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    </wsdl:operation>
    <wsdl:operation name="ApplyTop10Filter">
      <soap12:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/ApplyTop10Filter" style="document" />
      <wsdl:input>
        <soap12:body use="literal" />
      </wsdl:input>
      <wsdl:output>
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```


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```
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="ApplyItemFilter">
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    </wsdl:operation>
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ervice/ApplyPivotFilter" style="document" />
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    <wsdl:operation name="ApplyPivotTop10Filter">
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ervice/ApplyPivotSort" style="document" />
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      </wsdl:input>
      <wsdl:output>
        <soap12:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="TogglePivotDrill">
```


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```
      <soap12:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/TogglePivotDrill" style="document" />
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        <soap12:body use="literal" />
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        <soap12:body use="literal" />
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    <wsdl:operation name="RemovePivotFilter">
      <soap12:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/RemovePivotFilter" style="document" />
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      <wsdl:output>
        <soap12:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="ExpandCollapseOutline">
      <soap12:operation
soapAction="http://schemas.microsoft.com/office/Excel/Server/WebServices/ExcelServerInternalS
ervice/ExpandCollapseOutline" style="document" />
      <wsdl:input>
        <soap12:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap12:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
  </wsdl:binding>
</wsdl:definitions>
```


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7 Appendix B: Product Behavior

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

- Microsoft® Office SharePoint® Server 2007

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

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

<1> Section 2.2.4.9: If the date value is the 0th day in the month of January of the year 1900, then Office SharePoint Server 2007 sets the value of the **Day** element to 0.

<2> Section 2.2.4.9: If the date value is the 0th day in the month of January of the year 1900, then Office SharePoint Server 2007 sets the value of the **Day** element to 0.

<3> Section 2.2.4.24.32: Office SharePoint Server 2007 places no additional restrictions on the protocol server with respect to the contents of the **Target** element.

<4> Section 2.2.5.10: Office SharePoint Server 2007 uses the A1 reference style. See [MSFT-ACRR].

<5> Section 2.2.9.5: Office SharePoint Server 2007 can use any of the values specified in section 2.2.9.4.

<6> Section 2.2.9.5: Office SharePoint Server 2007 will only initiate a new session (2) if the user was using Excel Web Access and navigated away and then back to the **session view**, or if the user is doing a **navigation operation** on the session view and there were no **state changing** operations done to the session (2) because it was originally opened on the protocol server.

<7> Section 3: Office SharePoint Server 2007 has the following behavior: if at the time a NonConcurrent request is issued to the protocol server there is a Concurrent request currently being processed on the session (2), then the protocol server will try to process the request at fixed intervals for 5 seconds, before giving up and returning an **ExcelServerMessage** as specified in section 2.2.9.2, with the value of the **id** element of the **ExcelServerMessage** set to **MultipleRequestsOnSession**.

<8> Section 3.1.4.1: Office SharePoint Server 2007 can use any of the values specified in section 2.2.9.4.

<9> Section 3.1.4.2: Office SharePoint Server 2007 can use any of the values specified in section 2.2.9.4.

<10> Section 3.1.4.3: Office SharePoint Server 2007 can use any of the values specified in section 2.2.9.4.

<11> Section 3.1.4.4: Office SharePoint Server 2007 can use any of the values specified in section 2.2.9.4.

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<12> Section 3.1.4.5: Office SharePoint Server 2007 can use any of the values specified in section 2.2.9.4.

<13> Section 3.1.4.6: Office SharePoint Server 2007 will only attempt to cancel the last request to come in. If multiple requests execute at the same time, only the last one to come in to the protocol server will actually get cancelled. Anytime any request finishes, Office SharePoint Server 2007 resets the current request and so no requests can be cancelled (even if there are still requests still running).

<14> Section 3.1.4.6: Office SharePoint Server 2007 can use any of the values specified in section 2.2.9.4.

<15> Section 3.1.4.7: Office SharePoint Server 2007 can use any of the values specified in section 2.2.9.4.

<16> Section 3.1.4.8: Office SharePoint Server 2007 can use any of the values specified in section 2.2.9.4.

<17> Section 3.1.4.9: Office SharePoint Server 2007 can use any of the values specified in section 2.2.9.4.

<18> Section 3.1.4.10: Office SharePoint Server 2007 can use any of the values specified in section 2.2.9.4.

<19> Section 3.1.4.11: Office SharePoint Server 2007 can use any of the values specified in section 2.2.9.4.

<20> Section 3.1.4.12: Office SharePoint Server 2007 can use any of the values specified in section 2.2.9.4.

<21> Section 3.1.4.13: Office SharePoint Server 2007 can use any of the values specified in section 2.2.9.4.

<22> Section 3.1.4.14: Office SharePoint Server 2007 can use any of the values specified in section 2.2.9.4.

<23> Section 3.1.4.15: Office SharePoint Server 2007 can use any of the values specified in section 2.2.9.4.

<24> Section 3.1.4.16: Office SharePoint Server 2007 returns the **SpecifiedItemNotFound** value specified in the section 2.2.9.4 if a user does not have Open Item permission and if the requested range is not wholly contained inside a published item.

<25> Section 3.1.4.16: Office SharePoint Server 2007 can use any of the values specified in section 2.2.9.4.

<26> Section 3.1.4.17: Office SharePoint Server 2007 returns the **SpecifiedItemNotFound** value specified in the section 2.2.9.4 if a user does not have Open Item permission and if the requested range is not wholly contained inside a published item.

<27> Section 3.1.4.17: Office SharePoint Server 2007 can use any of the values specified in section 2.2.9.4.

<28> Section 3.1.4.18: Office SharePoint Server 2007 can use any of the values specified in section 2.2.9.4.

<29> Section 3.1.4.18.2.2: Office SharePoint Server 2007 returns "Excel Calculation Services (12.0)" when the **GetSessionInformation** operation is called.

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<30> Section 3.1.4.19: Office SharePoint Server 2007 will use the following logic in the **GetWorkbook** operation:

1. If **workbookType** is **FullWorkbook** or **FullSnapshot**, and the user does not have the Open Item permission.
2. If the **EwrCall** field as specified in the **CommandParameter** (section 2.2.4.11) is **true**, override the **workbookType** with **PublishedItemsSnapshot**.
3. Otherwise, return the **EcsSnapshotAccessDenied** as specified in section 2.2.9.4.

<31> Section 3.1.4.19: Office SharePoint Server 2007 can use any of the values specified in section 2.2.9.4.

<32> Section 3.1.4.20: Office SharePoint Server 2007 has exceptions as noted in [MSDN-UFES].

<33> Section 3.1.4.20: Office SharePoint Server 2007 has exceptions as noted in [MSDN-UFES].

<34> Section 3.1.4.20: Office SharePoint Server 2007 can use any of the values specified in section 2.2.9.4.

<35> Section 3.1.4.20.3.1: Office SharePoint Server 2007 will attempt to fallback to a **fallback UI culture** when an unsupported UI culture is requested.

<36> Section 3.1.4.21: Office SharePoint Server 2007 can use any of the values specified in section 2.2.9.4.

<37> Section 3.1.4.22: Office SharePoint Server 2007 can use any of the values specified in section 2.2.9.4.

<38> Section 3.1.4.23: Office SharePoint Server 2007 can use any of the values specified in section 2.2.9.4.

<39> Section 3.1.4.24: Office SharePoint Server 2007 can use any of the values specified in section 2.2.9.4.

<40> Section 3.1.4.25: Office SharePoint Server 2007 can use any of the values specified in section 2.2.9.4.

<41> Section 3.1.4.26: Office SharePoint Server 2007 can use any of the values specified in section 2.2.9.4.

<42> Section 3.1.4.27: Office SharePoint Server 2007 can use any of the values specified in section 2.2.9.4.

<43> Section 3.1.4.28: Office SharePoint Server 2007 can use any of the values specified in section 2.2.9.4.

<44> Section 3.1.4.29: Office SharePoint Server 2007 can use any of the values specified in section 2.2.9.4.

<45> Section 3.1.4.30: Office SharePoint Server 2007 can use any of the values specified in section 2.2.9.4.

<46> Section 3.1.4.31: Office SharePoint Server 2007 can use any of the values specified in section 2.2.9.4.

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<47> Section 3.1.5.1: Excel Web Calculation Services times out requests after a period of time of inactivity. This period of time is configurable

<48> Section 3.1.5.2: Excel Web Calculation Services times out requests after a period of time of inactivity. This period of time is configurable

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8 Change Tracking

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

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